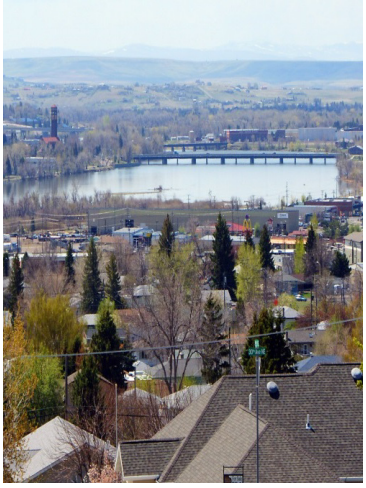
Great Falls Area Long Range Transportation Plan - 2014

Great Falls Metropolitan Planning Organization (MPO)
Great Falls, Montana



March 17, 2014

Great Falls Area Long Range Transportation Plan - 2014

Prepared for:

Great Falls Metropolitan Planning Organization (MPO)
Great Falls, Montana

In Cooperation With:

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Cascade County
Great Falls Transit District Board
Montana Department of Transportation
Environmental Protection Agency
Federal Transit Administration
Federal Highway Administration

Adopted By:

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ACRONYMS

AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ACS	American Community Survey
ADA	Americans with Disabilities Act
AFB	Air Force Base
BEA	Bureau of Economic Analysis
CBD	Central Business District
CDP	Census Designated Place
CEIC	Census & Economic Information Center
CFR	Code of Federal Regulations
CHSP	Comprehensive Highway Safety Plan
CIP	Capital Improvement Program
DEQ	Department of Environmental Quality
DHV	Design Hourly Volume
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GFIA	Great Falls International Airport
GIS	Geographic Information Systems
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HUD	Department of Housing and Urban Development
ITE	Institute of Transportation Engineers
JLUS	Joint Land Use Study
LED	Light-Emitting Diode
LOS	Level of Service
LRTP	Long Range Transportation Plan
MACI	Montana Air Congestion Initiative
MAFB	Malmstrom Air Force Base
MAP-21	Moving Ahead for Progress in the 21st Century Act
MDT	Montana Department of Transportation
MPO	Metropolitan Planning Organization
MSU	Montana State University
MUTCD	Manual on Uniform Traffic Control Devices
PCC	Policy Coordinating Committee
PDO	Property Damage Only
PIP	Public Involvement Plan
REMI	Regional Economic Models, Inc.
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Act: A Legacy for Users
TAC	Technical Advisory Committee
TDM	Travel Demand Model
TDP	Transit Development Plan
TIP	Transportation Improvement Program
TWLTL	Two-way, Left-turn Lane
US	United States
USDOT	US Department of Transportation
v/c	Volume-to-Capacity Ratio

1.0
Introduction and Background

The City of Great Falls, Cascade County and the Montana Department of Transportation (MDT) initiated this community transportation planning process to update their existing Long Range Transportation Plan (LRTP). The existing LRTP (i.e. the "Plan") was completed four (4) years ago and is commonly referred to as the "2009 Update". The Plan provided a blueprint for guiding transportation infrastructure investments based on system needs and associated decision making principles. Because of Federal and State requirements relative to the community's status as a Metropolitan Planning Organization (MPO), coupled with the community's increasing interest in transportation related matters, the governmental entities decided to update the Plan.

The development of the Plan was overseen by the Great Falls Transportation Technical Advisory Committee (TAC). The TAC has historically acted in the advisory and oversight role of previous transportation planning efforts, and submits recommendations to the Great Falls Policy Coordinating Committee (PCC). The PCC is the official decision making body for transportation decisions within the community. The TAC is comprised of a multitude of individuals representing various departments of the City of Great Falls, Cascade County, Great Falls Transit, MDT and the Federal Highway Administration (FHWA). Other area stakeholders also sit on and contribute to the activities of the Great Falls TAC.

This LRTP is intended to offer guidance for the decision-makers in the Great Falls Area by responding to existing transportation system concerns through a menu of large and small improvements to the transportation network. The recommendations made in this document cover all modes of transportation, including travel by private vehicle, foot, bicycle and transit. Recommended projects are intended to relieve existing problems and prepare the Great Falls Area transportation system to meet future needs. As a truly "multi-modal" transportation plan, the LRTP includes not only a traditional examination of traffic operations and the community's road network, but also an assessment of non-motorized transportation, transit, trip reduction strategies, traffic calming and growth management techniques.

In the past, transportation planning in the United States has predominately focused on moving cars, with priority over other transportation modes such as transit, bicycle and pedestrian facilities. Accordingly, this has necessitated more and larger roadways at extensive costs. This LRTP builds upon the 2009 Update by providing a comprehensive vision for non-motorized transportation within the Great Falls Area. Although the roadway needs are well defined and will be the standard by which community transportation infrastructure is measured, the decision makers and community at large must recognize the need for alternatives. These alternatives include more and better bicycle and pedestrian facilities, a focus on transit service, a desire to explore alternative transportation, and the willingness to forge partnerships with adjacent jurisdictions. Growth in the Great Falls Area, although moderate compared to some other Montana communities, is well documented and explained later in **Chapter 5** of this LRTP. Impacts to the transportation system resulting from this growth are a measurable and identifiable quantity, and the community is well positioned to accommodate this growth through measures identified in this planning document.

1.1. FEDERAL REQUIREMENTS FOR TRANSPORTATION PLANS

According to provisions contained in Moving Ahead for Progress in the 21st Century Act (MAP-21) legislation, the MPO of urban areas with a central city of 50,000 or more population is responsible for "…plans and programs which lead to the development and operation of an integrated, intermodal transportation system that facilitates the efficient, economic movement of people and goods". The Great Falls MPO consists of two local governments (City of Great Falls and Cascade County) and one state agency (MDT). The MPO incorporates transportation planning as one of its many planning functions. The forum created to oversee and conduct the transportation planning process consists of the Technical Advisory Committee (TAC) and the Policy Coordinating Committee (PCC). These committees consist of representatives from the City of Great Falls, Cascade County, Planning Advisory Board, the Montana Department of Transportation (MDT), the Federal Highway Administration (FHWA), the Federal Aviation Administration (FAA), the Great Falls Airport Authority, the Great Falls Transit District, and Malmstrom Air Force Base.

The preparation of the Great Falls Area Long Range Transportation Plan – 2014, complies with and follows all applicable regulations of MAP-21 and Title 23 of the Code of Federal Regulations (CFR). The plan is a long term planning document extending to 2035.

1.2. STUDY AREA BOUNDARY

Transportation plans generally begin by defining the study area. Sometimes the study area follows governmental boundaries such as city limits, but most often they include land outside existing city limits in which future growth is seen as likely to occur. As a part of the 2014 update to the Great Falls Area LRTP, an evaluation of the past LRTP's study area boundary was undertaken. Subsequently, adjustments were deemed necessary and made to the study area boundary. The study area boundary is synonymous with the metropolitan planning area boundary – with the latter terminology being specific to FHWA for regulatory purposes.

For Great Falls, the study area boundary includes the entire city limits of Great Falls, as well as a substantial amount of unincorporated lands surrounding the city. The study area boundary also includes about 85% of the population in Cascade County. The boundary is larger than the boundary used in the 2009 Update due two factors:

1. To accommodate the expansion of the city's urban boundary resulting from the 2010 Census (i.e. it is logical to incorporate the entire proposed urban boundary in the LRTP limits); and
2. To include land where recent growth has occurred or is anticipated to occur in the foreseeable future.

Area was added to the boundary on the southeast corner to account for land that is likely to develop in the near future. Residential subdivisions have been developed in this area over the past decade, and are likely to continue in the future. Due to this residential development, it is anticipated that other property in this area will also experience some growth.

On the east end, boundary adjustments were made to include all of Malmstrom AFB, as well as a portion of land east of Malmstrom's easterly border. This portion of land falls within the urban boundary from the 2010 Census, and was included in the LRTP boundary.

Just north of Malmstrom AFB, additional expansion was made due to the expansion of the proposed urban boundary.

The boundary was expanded along the north-central portion of the study area, centered along either side of US Highway 87 travelling out of town to the north. This includes the northern portion(s) of Black Eagle Road. In addition to realizing minor residential development pressure, the area has seen past, current and proposed commercial and industrial usage. This includes a malting plant, gravel storage and processing area, implement machinery supplier, and farm related uses. In the future, it is likely this area will continue to attract similar types of uses.

Lastly, the study area at the northwest portion was expanded to square up the previous boundary, and also to include an expanded area near the Vaughn Interchange – a partial interchange that historically has been considered for a full interchange.

The study boundary is shown on **Figure 1.1** and was used for all aspects of the LRTP planning process. Again, study boundary is synonymous with the metropolitan planning area boundary (for FHWA regulatory purposes). This study boundary includes all of the major employers in the area, and includes all of the land that may be used for employment centers in the next twenty years. It also includes densely developed residential land uses in the area, and those areas likely to increase the housing supply in the future and subsequently add traffic onto the transportation network.

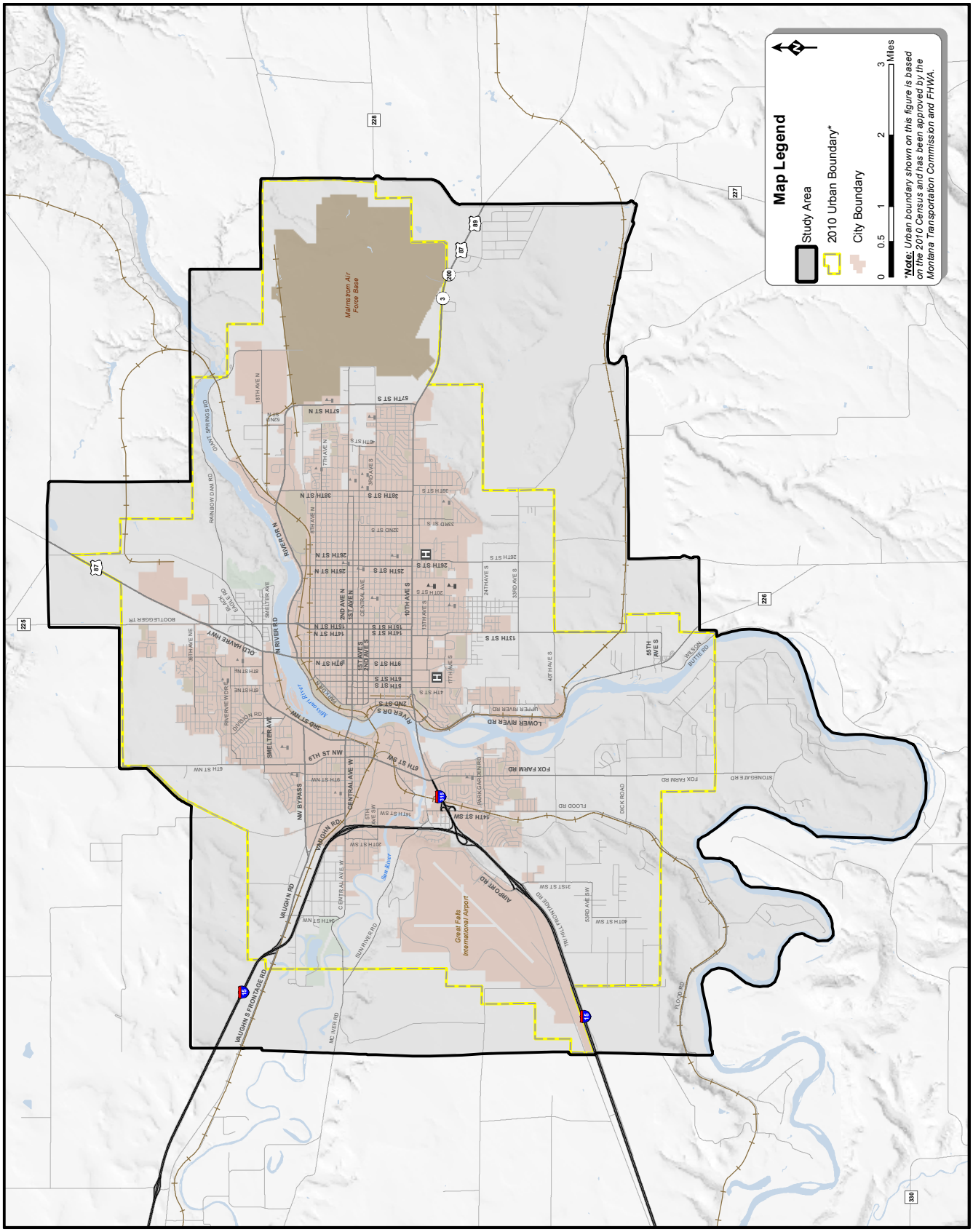

Figure 1.1: Study Area Boundary

2.0 Outreach and Public Involvement

An initial step in the transportation planning process was to develop an appropriate Public Involvement Plan (PIP) that guided public opportunities and input as the LRTP developed. The PIP built on historical processes that the Great Falls community has used on past planning efforts, and utilized several traditional and non-traditional public participation strategies.

The planning process involved early communication with interested parties to help identify needs, constraints and opportunities to determine reasonable improvements given available resources and local support. Community, stakeholder, agency and other interested party involvement were important components in the LRTP planning process. A number of strategies were utilized to disseminate information and elicit meaningful participation. These opportunities included:

- Providing information on the critical elements included in the transportation planning process within the LRTP study area;
- Providing input and asking questions throughout the planning process; and
- Presenting findings and recommendations.

2.1. GOALS OF COMMUNITY INVOLVEMENT AND OUTREACH EFFORT

The goal of the TAC and the consultant team was to have significant and ongoing public involvement for this transportation planning process. Education and public outreach were an essential part of fulfilling the local entities responsibility to successfully inform the public about the transportation planning process. All three contracting entities (i.e. the City of Great Falls, Cascade County and MDT) sought to empower the public to voice their ideas and values regarding transportation issues. The entities strived to ensure early and continuous public involvement in all major actions and decisions.

2.2. PARTICIPATION PROCEDURES

The PIP encouraged active participation in identifying and commenting on transportation issues at every stage of the planning process. Participant involvement included:

- The general community – residents of the City of Great Falls, Cascade County, and adjacent areas;
- Landowners and business;
- Governmental agencies;
- Stakeholders and outreach groups; and
- Other interested parties.

The community and interested parties were informed of all aspects of the planning study, and their input was sought throughout the process by the City of Great Falls, Cascade County, MDT and the consultant team.

To participate is to express one's self at the proper time and in the proper forum. Public participation means participation in planning by people (the public) within the Great Falls area, its area citizens and entities, by planning and engineering professionals, and by those who are not professional planners or government officials. It is a process of taking part in the transportation planning and decision-making that affects the community.

The TAC and the consultant team's efforts to secure participation were targeted to stakeholders, who are individuals or entities that could be significantly affected by the Plan recommendations or could significantly influence implementation. Stakeholders included, but were not limited to: the general public; low income, minority and disabled communities; neighborhood representatives; chamber(s) of commerce; Malmstrom Air Force Base (AFB); downtown business interests; special transportation interests such as transit users and bicycle organizations; local officials; private developers; and federal and state transportation agencies.

The Great Falls area needs the public involved in transportation planning because the public has the right to have a strong voice in all matters of public policy, including planning. Additionally, the public can provide varied and unique information needed to develop, maintain, and carry out an effective planning process. Planning staff, consultants and local officials need comments from those who know the community best: the people who live, work and play there. Public involvement informs and educates the public about transportation planning and creates an informed community, which in turn leads to better planning. Public participation gives the public a sense of ownership of the Plan and fosters cooperation among the public and between them and the TAC.

The PIP contained the following elements:

- **Involvement Opportunities:** Provided the opportunity for the public to be involved in all phases of the planning process;
- **Communication:** Established mechanisms for maintaining communications between the public and local officials such as processes like mailings, legal ads, displays and newsletters;
- **Information:** Assured that technical information is available and in a simplified, understandable form;
- **Response to Public Input:** Described the methods used to respond to comments from the public; and
- **Advisory Committee(s) to this LRTP Update:** The use of the TAC and the means of providing input from a cross-section of affected citizens through the TAC and various other groups of interest.

A brief summary of some of the project outreach activities utilized during the planning process is contained in the following pages.

2.2.1. Technical Advisory Committee (TAC)

The Great Falls Area Technical Advisory Committee (TAC) provided oversight during the planning process. The TAC served in an advisory capacity and reviewed and commented on materials over the project's duration. Meetings were generally held every month. Membership was composed of individuals as noted on the acknowledgements page of this document, and generally included representatives from the Montana Department of Transportation, Cascade County, City of Great Falls, Transit District, Malmstrom AFB, local health department representatives, and local business and citizen interests. The TAC was the principal guiding force behind the LRTP. TAC meetings occurring throughout the planning process are specifically listed in **Table 2.1**.

Table 2.1: Summary of Technical Advisory Committee Meetings

Date	Agency or Individual
05/09/2013	TAC Meeting No. 1
06/13/2013	TAC Meeting No. 2
08/08/2013	TAC Meeting No. 3
09/12/2013	TAC Meeting No. 4
10/10/2013	TAC Meeting No. 5
11/21/2013	TAC Meeting No. 6
12/12/2013	TAC Meeting No. 7
03/20/2014	TAC Meeting No. 8

2.2.2. Regulatory and Resource Agency Participation

To address a requirement of federal Metropolitan Planning Regulations that state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation be consulted, the team developed and distributed a *Possible Environmental Measures and Sources* matrix that delineated possible environmental mitigation strategies for transportation system improvements. The matrix was mailed to a long list of agencies asking for comment on the preliminary strategies developed. The purpose of this mailing was to solicit input on potential environmental mitigation measures and strategies to be considered in conjunction with implementation of potential transportation projects. Following a 30-day review period, additional guidance was provided by some of the agencies and the matrix was modified accordingly. The revised *Possible Environmental Measures and Sources* matrix, and associated text, is contained later in this LRTP in **Chapter 11**.

2.2.3. Public Informational Meetings

Three formal public informational meetings were held during the LRTP planning process. The first meeting was an introductory meeting to discuss and identify the issues and visioning that should be addressed as part of the LRTP. This meeting focused on informing the public about the scope of the planning process, key dates during its development, and a review of the study area boundary and draft goals and objectives for the transportation system.

The second public meeting was held to review the transportation system issues and areas of concern, and to assure that all of the major transportation problems have been identified and included in the analysis. A summary of the existing and proposed transportation system conditions was presented. A variety of key issues were identified. The issues generally fell within four categories: 1) the need to plan for future growth; 2) to relieve traffic congestion; 3) to improve traffic safety; and 4) to provide alternatives to the automobile. Specific problem intersections and roadway corridors were identified and presented at this first meeting.

The third public meeting was held after the preliminary project recommendations were completed and concurrent with the release of an “official” public draft document. This meeting gave the public the opportunity to review the preliminary project recommendations in their entirety, including a thorough review of recommended projects that not only offered mitigation measures to solve existing transportation issues, but also measures to accommodate future growth issues.

All three public opportunities described above were held at the Mansfield Convention Center, Missouri Room. **Appendix A** contains comments received over the course of the planning process.

2.2.4. Other Public Outreach Activities

Formal and informal meeting and presentations occurred many times over the course of the project. These are specifically listed in **Table 2.2**.

Public Hearing

One public hearing was conducted near the completion of this planning process to obtain formal public comment on the public draft document before the Cascade County Commission and separately before the Great Falls City Commission. The public hearing covered all elements of the draft and significant additional time for public comment was provided after the public hearing closed. After reviewing the comments received at the public hearing, the TAC met with the consultant to provide comments and direction in revising the draft document, and developing the final version of the LRTP.

News Releases

Television and newspaper articles were used several times during the planning process to help keep the public informed. These news releases generally were issued prior to public meetings (and the public hearing), to generate interest in the process, and to encourage participation by the public.

Project Newsletters

Several LRTP newsletters were created and distributed via email to an email list. Additionally, the newsletters were posted to the LRTP website, and brought in hard copy format to the various outreach events.

Internet Access

The results of the traffic studies and analyses conducted during the study process were made available to the public on the Internet website. As sections of the report and graphic displays became available, they were posted on the web site for public review and comment. This enabled the public to stay abreast of the developments occurring during the planning process. It also provided an opportunity for the public to submit comments. In addition, a Facebook site was created and maintained throughout the process to disseminate information about meetings and LRTP progress.

Table 2.2: Summary of Other Outreach Activities

Date	Agency or Individual
05/28/2013	Neighborhood Council of Councils
06/10/2013	Neighborhood Council #7
06/13/2013	Neighborhood Council #9
06/17/2013	Cascade County Commission
06/19/2013	Public Meeting No. 1
06/27/2013	Policy Coordinating Committee
06/27/2013	Neighborhood Council #4
07/23/2013	North Industrial Task Force
08/26/2013	Great Falls Transit Board
08/26/2013	Great Falls Chamber of Commerce (Staff)
09/04/2013	Neighborhood Council #6
09/05/2013	Neighborhood Council #3
09/05/2013	Great Falls Airport Authority (Staff)
09/05/2013	Downtown Great Falls Association
09/10/2013	Neighborhood Council #1
09/11/2013	Neighborhood Council #2
09/16/2013	Neighborhood Council #5
09/19/2013	Neighborhood Council #8
09/19/2013	Great Falls Association of Realtors
09/24/2013	Great Falls Development Authority
09/24/2013	Great Falls Airport Authority (Board)
09/25/2013	Great Falls Downtown Development Partnership
10/02/2013	Black Eagle Civic Club
10/28/2013	Public Meeting No. 2
01/23/2014	Public Meeting No. 3
03/24/2014	Joint City / County Commission
03/25/2014	City of Great Falls Planning Board
04/01/2014	Great Falls City Commission
04/08/2014	Cascade County Commission
04/09/2014	Policy Coordinating Committee

2.2.5. Specific Concerns Cited During Outreach

Numerous issue and concerns were identified during the public outreach program. For motorized travel, the general concerns are as noted below. Non-motorized concerns are captured in **Chapter 4** of the LRTP.

- 15th St NE – high truck traffic usage
- Fox Farm Rd – overall congestion and safety
- Central Ave W – speeds, geometry, and sight distance, especially near the interchange with I-15
- 9th St NW – need for / loss of parking, widths, congestion
- 36th Ave NE – congestion, speed and volume of traffic, new housing using the route, safety

- 38th St N – desire for installation of left-turn bays (for access to east-west roads)
- 4th Ave SW to 3rd St SW – desire for lower speed limit (25 mph to pass through residential area)
- 1st Ave N & 37th St N – possibility of some type of traffic control eastbound
- Improvements to 6th St NW – future project north of Smelter Ave as development occurs
- 32nd St S & 11th Ave S – desire for 4-way stop control at the intersection
- 15th Ave S – connect thru to 14th Ave S (at 32nd St S) to strengthen east-west mobility
- 20th St S – presently discontinuous, extend to 24th Ave S to serve future usage
- Park Dr N / 6th St N / 8th Ave N – large intersection with lack of definition
- 25th St N and River Dr N – possible signal or roundabout
- 1st Ave N – lane drop at 10th St N confusing and not well marked
- I-15 to Marketplace – speeds and short merging distances cause concern
- 25th St S & 10th Ave S – southbound left-turns and merging on 10th Ave S to get to 26th Street S
- Butte Ave – candidate for improvements (Black Eagle)
- 25th Ave NE and 15th St NE - possible signal
- Wire Mill Rd / 15th St NE / Montana Ave – large area with poor definition, desire better delineation
- Smelter Ave - between 12th St NE and 14th St NE perceived speeding and safety issues

2.3. NON-MOTORIZED OUTREACH

2.3.1. PUBLIC MEETINGS

Members of the project team gave particular focus to non-motorized planning activities during the duration of the planning process. At the various public outreach events, equal attention was paid to both motorized and non-motorized planning activities. The overall sentiment throughout each of the meetings regarding non-motorized planning was positive and encouraging. Representatives from governments, non-profits, trails groups, bicycling advocacy groups, and health and recreational organizations were supportive of walking and bicycling as a way to contribute to the local economy, provide mobility and safe transportation choices for Great Falls area residents, and build upon and create a world class trail system.

At the first public meeting, attendees participated in two mapping stations: one dedicated to all roadways and traffic improvements, and one specifically for walking and bicycling. The comments received at these mapping stations (including the maps themselves) reflect the attendees' desired improvements for both motorized and non-motorized improvements within the Great Falls area.

2.3.2. STAKEHOLDER MEETINGS

Citizens and community groups that met with the project team during the various outreach events suggested specific projects and broad or general goals that they would like to see implemented over coming years. Government representatives would like to implement the same and desire a plan that not only suggests visionary improvements to bicycling and walking in the area but also provides a plan for implementation so that the area is not left with disjointed bikeways as experiments, sidewalks without connectivity to key destinations, or facilities that are less safe than they should be. With such a plan, all parties agree that there will be a vision to follow and with which all parties can move forward. **Table 2.3** portrays the major "non-motorized" stakeholder groups that were engaged during the planning process.

Table 2.3: Summary of Non-Motorized Stakeholder Outreach Activities

Date	Agency or Individual
6/18/2013	MDT Bike/Ped District Representatives
6/18/2013	Great Falls Bicycle Club
6/19/2013	River's Edge Trail (Recreational Trails Inc.)
6/19/2013	Get Fit Multi-Modal Transportation Task Force
6/19/2013	Great Falls Transit District
6/19/2013	Trails Working Group
6/19/2013	Great Falls Public Works Department (Staff)

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3.0
LRTP Goals and Objectives

Development of goals and objectives for the LRTP is a critical step in the transportation planning process. In addition to capturing all related information from previous community planning efforts, the goals and objectives lay out the general course of action for the LRTP development and represent the community's vision for the future transportation system. Accordingly, developing goals and objectives cannot be accomplished within a vacuum. It is an iterative process that continually evolves through guidance provided by the TAC, specific stakeholders, the general public, and the elected officials.

The goals and objectives described later in this chapter reflect the condition of planning within the general community, and more specifically reflecting the needs and desires relative to transportation. The listed information was vetted with the public throughout the entire planning process in a variety of public forums. Note that although the City's *Downtown Master Plan* and the *Growth Policy* included references to "Complete Streets", the Great Falls City Commission has considered and elected not to adopt it as a policy. Cascade County and the State of Montana have similarly indicated no interest in adoption of a Complete Streets Policy. However, elements of the concept have been and should continue to be considered by the State, City and County. Therefore, this Transportation Plan does not recommend adoption of a Complete Streets Policy but, rather, to continue to strive for accommodation for all modes, considering the desirability, feasibility, functionality, and affordability of doing so.

The goals and objectives developed for the LRTP are connected concepts – that is they represent the desired end result of the community's transportation system once projects identified are implemented. Goals and objectives also provide direction on how to get to that end result. Factoring in specific requirements for MPO transportation planning relative to the eight planning factors contained in MAP-21, it is clear the importance that the establishment of goals and objectives carries. Collectively, the goals and objectives inform the planning process and set the course of action for the transportation system for years to come.

3.1. LOCAL PLANNING PROCESSES

Cascade County Growth Policy Update (Currently Underway)

Cascade County is undergoing their Growth Policy Update. The County's Growth Policy will reaffirm previous policy language and direction, however, where needed new data and policies will be identified, developed and included. Perhaps the most relevant goal from the previous County Growth Policy for this LRTP Update is the transportation goal, as follows:

Transportation:

Goal 6: Promote and maintain a transportation system that provides safety, efficiency, and is cost effective.

Objectives:

A. New additions to the transportation system should be compatible with the existing road system and coordinated with roads from other jurisdictions.

B. Transportation planning for new developments should support the Cascade County Growth Policy.
C. Review and update county road specifications.
D. Ensure that all new roads be built to county specifications.
E. Encourage provisions for multiple types of transportation (bike trails, etc.).
F. Develop and implement road and bridge improvement standards and maintenance schedules (MDT standards for bridges)
G. Develop a policy and implementation program in cooperation with developers and school districts to provide walks, bridges and pathways for children to improve safety and reduce transportation costs between residential neighborhoods, schools and stores.
H. Develop secondary means of access, where practical, to settlements and subdivisions in order to improve safety and overall traffic circulation.
I. Consider the use of grants, Road Improvement Districts, and Rural Maintenance Districts.
J. Coordinate transportation issues with wildfire and fire protection issues, policies and goals.

Imagine Great Falls 2025 Growth Policy Update (August 2013)

The goals and policies in the Growth Policy Update (adopted August 6, 2013) were developed through countless public interactions, and as such have been vetted through the public process. The guidance provided in the goals and policies provided in the Growth Policy Update must be considered in the development of goals and objectives for the LRTP Update.

The goals and policies are crafted around four (4) primary focus areas: Social, Environmental, Economic and Physical. In all four focus areas there are transportation related policies interwoven throughout. For example, *goal SOC 1.2 - employ innovative strategies to promote, enhance and utilize the City's parks*, speaks to improving key intersection improvements to improve pedestrian access to Gibson Park (policy SOC 1.2.8). This transportation related component is embedded within the goals for the City's park system. Examples abound throughout the Growth Policy Update on policies to improve transportation system form and function.

Perhaps most specific to transportation in the community is information developed under the "transportation and mobility" goal found under the Physical focus area. This goal is listed below, along with proposed policies.

Transportation and Mobility:

Phy 4.4 Increase mobility and the access of citizens to transportation alternatives throughout the City.

Policies:

Phy 4.4.1 Improve the ability of residents to travel from home to work, schools, shopping, employment centers and activity centers.
Phy 4.4.2 Support efforts and programs that seek to improve school crossings, pedestrian access and the safety of those enroute to and from schools.
Phy 4.4.3 Enhance public access to community services and programs such as the library, Centene Stadium, Mansfield Center and other civic facilities and events.
Phy 4.4.4 Create a built environment that promotes easy access to safe walking, biking and other opportunities for physical activity.
Phy 4.4.5 Encourage, promote and support transit options for the community of Great Falls, including those required for the elderly and the disabled.

Phy 4.4.6 Review, update and adopt new standards and regulations that encourage pedestrian and bicycle-friendly development.

Phy 4.4.7 Provide sufficient resources to construct and maintain the trails and related facilities recommended in the City's Comprehensive Park and Recreation Master Plan and the Bikeway Facilities Plan.

Phy 4.4.8 Review and adopt formal design standards for all roadways.

Phy 4.4.9 Pursue grant funds to create a "Complete Streets" demonstration project or projects in the City.

Phy 4.4.10 Develop a formal ADA Transition Plan for public rights-of-way.

Phy 4.4.11 Implement elements of the Downtown Access, Circulation and Streetscape Plan, as opportunities arise.

Phy 4.4.12 Encourage development of network improvements that reduce emissions and idling times, reduce maintenance costs and increase efficiency of the road network. Examples include roundabouts, improved signal controls, construction of turn lanes and bike lanes, LED signal and street lighting, etc.

Downtown Access, Circulation and Streetscape Plan (April 2013)

Rather than speak in terms of goals and objectives, the Downtown Access, Circulation and Streetscape Plan developed a concise "Vision and Big Ideas" to articulate planning participants desire for the downtown area. Building upon work contained in the Downtown Master Plan, the following vision and three "big ideas" were formulated:

Vision:

Downtown is the heart and center of Great Falls. Like the Missouri River, it is dynamic, fluid, attractive, and welcoming, connecting the City's heritage to its future. The River's Edge Trail, historic neighborhoods, and parks and open space support and enhance a unique mix of local shops, restaurants, entertainment and special events that make Downtown the place to be – day and night (Great Falls Downtown Master Plan). Three big ideas for Downtown's vision, as articulated in the Downtown Master Plan, which can be impacted by the recommendations that follow in this Plan include:

1. **Connected Downtown:** A transportation and circulation system that provides users with a variety of modes and a diversity in choices is fundamental to the future success of Downtown and will enhance Downtown's value as a place to live, work, shop and recreate. Quality infrastructure for walking, biking, driving and transit provides choice in terms of the safest, healthiest, most efficient and less-expensive route to reach Downtown's various amenities and destinations.

2. **Flourishing Downtown:** A flourishing Downtown is a key indicator of the overall economic health of Great Falls and plays a primary role in shaping the general perception of the City. By strengthening the existing business community and providing incentives for new investment, Downtown has the potential to evolve into a thriving place that enhances the image of the City and the region. Additionally, Downtown has great potential to capitalize on the presence of Malmstrom Air Force Base by providing services to airmen living on and off of the base and better serve students from the University of Great Falls, the Great Falls College, MSU Campuses. Downtown offers a different retail environment than the mall, big box, and neighborhood retail centers found elsewhere in the City and it should be targeted, celebrated, and built upon as a unique shopping and dining environment that can attract a larger segment of the local residents, employees, and students.

3. **Downtown Aesthetics:** Great Falls has a strong historic base and the clear center of this base is Downtown. Downtown's buildings, streetscapes, parks and the Missouri River play a primary role in articulating the rich culture and heritage of the City and are a source of pride for the community. The unique aesthetics of Downtown are an asset that should be preserved, enhanced and celebrated to propel Downtown toward a vibrant and sustainable future.

Malmstrom AFB Joint Land Use Study (March 2012)

The goal of the Malmstrom Air Force Base (MAFB) Joint Land Use Study (JLUS) is to protect the viability of current and future missions at MAFB and the Malmstrom Missile Complex, while at the same time guiding growth, sustaining the economic health of the region, and protecting the public health, safety, and welfare. To that end, several key objectives were developed that speak to the reasoning for preparation of the JLUS, and what the potential benefits of the planning exercise may provide. The objectives are noted as follows:

- **Understanding:** Convene community and military representatives to identify, confirm and understand the issues in an open forum, taking into consideration both community and U.S. Air Force viewpoints and needs. This includes public awareness, education and input organized in a cohesive outreach program.

- **Collaboration:** Encourage cooperative land use and resource planning among the Base, Missile Complex, and surrounding communities so that future community growth and development are compatible with the training and operational missions at the installation and missile sites, while at the same time seeking ways to reduce operational impacts on adjacent lands within the City of Great Falls and the seven counties.

- **Actions:** Provide a set of mutually supported tools, activities, and procedures from which local jurisdictions, agencies, and the U.S. Air Force can select, prepare, approve / adopt, and use to implement the recommendations developed during the JLUS process. The actions include both operational measures to mitigate installation impacts on surrounding communities and local government and agency approaches to reduce community impacts on military operations. These tools will help decision makers resolve compatibility issues and prioritize projects within the annual budgeting process of their respective entity / jurisdiction.

Downtown Master Plan (October 2011)

The Downtown Master Plan provides a strategically focused vision with strategies to guide the growth and development of Downtown Great Falls. The plan seeks to build on the assets of Downtown and reinvigorate the area into a more active, vibrant, accessible and livable area that welcomes residents and visitors. Transportation objectives of primary importance to the LRTP effort include:

- Improve pedestrian connectivity and safety downtown.
- Develop a comprehensive downtown bicycle network to connect into a city wide system and to connect to River's Edge Trail through signage and routes.
- Reduce or eliminate downtown one-ways.
- Improve connectivity for pedestrian and bicycles to the Missouri River, River's Edge Trail and Gibson Park.
- Develop a comprehensive downtown wayfinding system.
- Optimize parking for all stakeholders.
- Improve public realm to provide a safe, attractive and welcoming environment.

Great Falls Transit Development Plan (October 2010)

The most recent comprehensive planning document prepared for the Great Falls Transit District was the Transit Development Plan (TDP) Update (October 2010). Completed by LSC Consultants, the TDP Update provided a comprehensive examination of transit service operations, performance and needs. Chapter 2 of the TDP reiterates the mission of the Great Falls Transit District, that is:

> *"To provide a safe, reliable, affordable and fiscally sound transportation system for the people of Great Falls and Black Eagle, Montana."*

Paramount to this mission, goals and objectives were formulated through an intensive public process. The overarching goals, as specified in chapter 2 of the TDP Update, are as follows:

Goal 1: Maintain the existing ridership base while attracting new riders.
Goal 2: Continue to enhance the environmental sustainability of the transit system.
Goal 3: Provide high quality, customer-oriented service.
Goal 4: Provide efficient, effective, and safe services.
Goal 5: Promote the transit service.

Great Falls Area LRTP Update (2009)

Vision(s), goals, and objectives were developed as part of the 2009 LRTP Update. The transportation planning vision described general, community-wide values of what the community desired in their transportation system. The goals of the Growth Policy and LRTP were developed, described and monitored to ensure compatibility with the vision. Specific objectives for the transportation system were also identified.

The developed transportation planning vision, goals, and objectives from the 2009 LRTP Update were as follows:

Vision:

- Great Falls should be a city of cohesive, distinct, diverse, attractive, and safe neighborhoods with a compact land-use pattern. The transportation and land use decisions made by the City and County should be mutually supportive.
- Our community should have a safe, accessible, and walkable Downtown supported by unique or specialized employment, civic, mixed-use, and commercial activities with adequate vehicular circulation and parking.
- Our community should feature a transportation system incorporating many modes of travel that will protect air quality, minimize traffic congestion, and support compact, efficient land use patterns. The system should fully integrate with public and private transportation facilities.
- Our community should grow in compact patterns that facilitate pedestrian, bicycle, and transit travel. Walking should be a practical, safe, and enjoyable means of travel throughout all neighborhoods and shopping areas. Bicycling should become a more viable transportation choice for all residents and visitors in Great Falls.
- Our community should have a comprehensive and fully accessible public transit system.
- Our community should have streets, trails and walkways that are planned, built, landscaped, and maintained as safe and attractive public spaces linking a balanced system of open lands, natural areas, recreational facilities, schools, and parks with trails and urban streetscapes.
- Our community should continually seek to protect and improve air quality as the area grows, through the creation and implementation of comprehensive programs and policies.

Goals:

- The Transportation Element of the "then-current" Growth Policy included the following goals.
- Provide a safe, efficient, accessible, and cost-effective transportation system that offers viable choices for moving people and goods throughout the community.
- Make transit and non-motorized modes of transportation viable alternatives to the private automobile for travel in and around the community.
- Provide an open public involvement process in the development of the transportation system and in the implementation of transportation improvements to assure that community standards and values, such as aesthetics and neighborhood protection, are incorporated.

The following goal was also developed as a part of the LRTP Update to supplement the previously adopted goals.

- Provide a financially sustainable transportation plan that is actively used to guide the transportation decision-making process throughout the course of the next 20 years.

Objectives:

The following objectives were developed during the 2009 LRTP Update to provide measurable milestones to assist in achieving the goals stated above.

- Implement a comprehensive public involvement process.
- Review all existing and on-going planning reports and studies.
- Conduct a thorough data collection effort.
- Analyze multi-model systems including transit, bicycle and pedestrian systems.
- Evaluate truck route system.
- Review accident history.
- Examine population and employment growth trends.
- Develop a 20-year traffic model.
- Identify current and foreseeable traffic problems.
- Develop a prioritized list of projects that address traffic problems and deficiencies.
- Update street standards.
- Identify Transportation Demand Management strategies to provide alternatives to private vehicle travel.
- Develop a traffic calming program.
- Conduct a financial analysis to ensure the plan is financially feasible and sustainable.
- Add elements required by SAFETEA-LU.
- Ensure fiscal constraint.

Medical District Master Plan (January 2007)

The Great Falls Medical District Master Plan was completed in 2007. Key constituents in the community, most notably the City of Great Falls, Benefis Healthcare, Great Falls Clinic, and others, noted the need for a more explicitly defined vision for the medical district due to significant growth in medical and health care related businesses and services. The following vision was developed by the planning sub-group:

1. Collaboration between major medical providers, adjacent property owners, neighborhood councils, and the City of Great Falls to implement the Master Plan.
2. Reinvestment, redevelopment and growth within the Medical District to increase interest in the area for living, working and business investment.

3. A vibrant mixed-use Medical District that attracts new residents and businesses while respecting existing land uses.
4. Exciting and enjoyable public spaces, streetscapes, trails, and physical connections between a mix of major medical facilities, offices, commercial areas, and residences.

As a follow-up to the development of the vision, the following goals & objectives were formulated during the planning process:

A. Develop a plan to facilitate the physical growth, development, redevelopment and renovation of the medical core area and its adjoining neighbors.
B. Develop a plan to produce a functional, attractive, interrelated and growth friendly medical district.
C. Enhance our community's economic competitiveness in attracting both individuals and businesses to locate in the Medical District.
D. Identify alternative financing approaches, capital strategies, and organizational models to support implementation of the Medical District Master Plan.

Missouri River Urban Corridor Plan (2004)

The primary purpose of this Plan was to present a vision for what is possible in the Missouri River corridor. As a community, Great Falls and Cascade County has done a good job with open space and recreation along the river. The Plan sets forth a series of strategies and actions to make the vision a reality. The Plan recognized that some development patterns along the river corridor represented an opportunity for more desirable, sustainable development that would capitalize on the river as an amenity and a resource.

Much attention in the Plan was paid to transportation as an integrated component of the overall vision for the corridor. To that end, "guiding principles" were formed that were interrelated in form and function. The four (4) guiding principles are as follows (note number 4 speaks to transportation):

1. From the standpoint of river dynamics, no riverside development or stream bank treatment will prevent the Missouri River from safely passing flood stage flows, nor will permanent development be allowed that will be damaged by those flows. (Note: This statement is not intended to prevent the placement of Properly designed and lawfully constructed piers, decks, docks, trails, or other appurtenant improvements associated with a substantial public interest that may in fact be damaged by major flood events).
2. Land and water based recreational values and opportunities associated with the river will be created, preserved, and enhanced, including public access to the river.
3. This Corridor Plan will promote beneficial, sustainable economic development that utilizes the river as an amenity while preserving and enhancing its ecological integrity and asset values. Specifically, water quality, natural shoreline vegetation, and wetlands will be restored, enhanced, or protected, and the environmental health of the river will not be compromised by development.
4. Major through transportation facilities in the river corridor are discouraged. Alternative routing of such facilities already in the corridor through responsible urban area transportation planning is encouraged.

3.2. STATE PLANNING PROCESSES

Comprehensive State Highway Safety Plan (CHSP)

The Montana Comprehensive Highway Safety Plan (CHSP) is just one of many statewide planning level documents that provides guidance and sets policies regarding a multitude of transportation related

issues. Perhaps most applicable to the LRTP is the focus of the CHSP on improving comprehensive safety within the community. The Montana CHSP sets forth goals and objectives that are both broad and distinct at the same time. The CHSP, amended 2010, outlines the following safety vision and goal for the State of Montana:

Vision:

All highway users in Montana arrive safely at their destinations.

Goal:

To reduce fatalities and incapacitating injuries in the State of Montana by half in two decades, from 1,704 in 2007 to 852 by 2030.

3.3. FEDERAL PLANNING REQUIREMENTS

Various laws and regulations at the federal level assist to inform the development of the LRTP. The laws and regulations set forth requirements to be considered in the transportation planning process or to be contained in the LRTP. These include MAP-21 planning requirements, livability principles, environmental justice considerations, and potentially others. Transportation planning activities must provide for consideration of all modes of travel, and are to be continuing, cooperative, and comprehensive.

MAP-21 Planning Factors

MAP-21 was signed into law on July 6, 2012 and replaces the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). MAP-21 creates a streamlined, performance-based, and multimodal program to address the many challenges facing the U.S. transportation system. These challenges include improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery. Collectively, these items represent national goals for transportation as described in MAP-21.

The Metropolitan Planning program under SAFETEA-LU provided funding for the integration of transportation planning processes in the MPOs into a unified metropolitan transportation planning process, culminating in the preparation of a multimodal transportation plan for the MPO. Title 23 of the United States Code, section 134(f) (revised in SAFETEA-LU section 6001(h)) describes Federal Planning Factors issued by Congress to emphasize planning factors from a national perspective. Under Map-21 these planning factors remain unchanged. The eight planning factors are as follows:

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 and economic development patterns.
6. Enhance the integration and connectivity of the transportation system, across and between modes, people and freight.
7. Promote efficient system management and operation.
8. Emphasize the preservation of the existing transportation system.

Livability Principles from HUD/EPA/USDOT

Many federal partners are leading a growing effort to provide communities with a high quality of life that is increasingly sustainable. Livability is a national movement with local implications that are supported within the Great Falls community. Providing transportation options to improve access to housing, jobs, businesses, services and social activities are fundamental desires of most transportation system user groups. Active transportation results in a physically fit population, minimizes auto emissions, extends the life of transportation infrastructure, and delays the needs for infrastructure improvements. The Department of Housing and Urban Development (HUD), Environmental Protection Agency (EPA), and the US Department of Transportation (USDOT) have developed six guiding principles for communities to consider in their effort to achieve better access to affordable housing, more transportation options, and lower transportation costs, while supporting the environment. These principles are listed below:

1. **Provide more transportation choices:** Develop safe, reliable and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions and promote public health.
2. **Promote equitable, affordable housing:** Expand location- and energy-efficient housing choices for people of all ages, incomes, races and ethnicities to increase mobility and lower the combined cost of housing and transportation.
3. **Enhance economic competitiveness:** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers as well as expanded business access to markets.
4. **Support existing communities:** Target federal funding toward existing communities—through such strategies as transit-oriented, mixed-use development and land recycling—to increase community revitalization, improve the efficiency of public works investments, and safeguard rural landscapes.
5. **Coordinate policies and leverage investment:** Align federal policies and funding to remove barriers to collaboration, leverage funding and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.
6. **Value communities and neighborhoods:** Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.

3.4. GOALS AND OBJECTIVES FOR LRTP UPDATE

The Goals and Objectives outlined in this section are based upon a review of relevant planning efforts by the community, as well as public input during the development of this Update. In addition, five primary principles have been adopted to guide this LRTP Update. These principles are founded on the following:

1. The community desires a connected, smarter transportation system through land use and transportation planning. This type of system allows citizens to choose what mode of travel they desire, and makes travel more convenient while promoting an active lifestyle by choice for its citizens.
2. The community is a hub for local, regional and national industry. It is particularly growing as a freight hub serving various types of industries. The community embraces the opportunity to attract regional industry and support ongoing economic vitality.
3. Efficient travel and increased mobility is desirable to minimize transportation and associated costs.

4. Transportation influences quality of life. The community desires a transportation system that is compatible with the environment and context of the Great Falls area, with special consideration given to sustainability and conserving natural and cultural resources.
5. The community desires a safe and secure transportation system, and strives for a reduction in crashes, injuries and fatalities.

Goal 1: Maintain the Existing Transportation System.

The Great Falls Area transportation system is aging, and available funding is not sufficient for the necessary maintenance. Upkeep of roadways is reactive rather than proactive. There is often competition between funding for new projects as compared to maintenance and operations of the existing system. New or wider roadways are generally not being built, rather the short- and mid-term focus should turn to optimizing the existing transportation system to the greatest extent possible.

Objectives:

1.1. Maintain existing roadway systems to optimize their usefulness and minimize life-cycle costs.
1.2. Monitor the performance of key facilities and work with local and regional partners to identify critical deficiencies in the roadway network.
1.3. Use transportation project selection criteria to identify and prioritize maintenance activities and project development.
1.4. Relieve pressures on the existing transportation system through minor infrastructure improvements, maintenance and system preservation activities rather than expanding the current system.
1.5. Encourage reuse and/or redevelopment around existing transportation facilities.

Goal 2: Improve the Efficiency, Performance and Connectivity of a Balanced Transportation System.

A transportation system that performs well allows users to choose multiple transportation modes and to move through those modes in a safe and efficient manner. An efficient system allows people to move from place to place in as direct a route as possible, allowing them to reduce the amount of time spent in travel, the distance that must be traveled, and the amount of time spent in congested traffic. Connectivity allows citizens to make route decisions and mode choices based on traffic and road conditions, or desired destinations.

Objectives:

2.1. Ensure the current street network of collectors, minor arterials, principal arterials and the interstate is adequate to safely and efficiently handle projected traffic.
2.2. Promote the development of an effective roadway network through improvements in intersection and roadway capacity.
2.3. Improve opportunities for active transportation (non-motorized) as part of daily travel mode choice within the community by increasing pedestrian, bicycle and transit connections.
2.4. Ensure that mobility-challenged populations, such as low income, persons with disabilities, or senior citizens, have travel options in the Great Falls area.
2.5. Minimize cut-through traffic in residential neighborhoods.
2.6. Identify and reduce (or eliminate) freight movement impacts on area roadways and identify improvements to eliminate deficiencies with the objective of improving freight movement.

Goal 3: Promote Consistency between Land Use and Transportation Plans to Enhance Mobility and Accessibility.

Minimizing vehicle miles of travel and promoting alternative travel modes are fundamental objectives of a compact, livable urban environment. As the Great Falls Area population ages and the number of persons per household decreases, options in housing and transportation will be need to meet the demands of the population. Transportation improvements should be integrated with local land use planning to ensure the proper mix of roads, trails, transit, paths and other bicycle and pedestrian features co-exist.

Objectives:

- **3.1.** Integrate land use planning and transportation planning to manage and develop the transportation system.
- **3.2.** Use transportation project programming to encourage desired development patterns within the community and ensure new development is adequately served.
- **3.3.** Develop and implement consistent access management and corridor preservation standards, ordinances and plans appropriate to the roadway network and land use throughout the area.
- **3.4.** Ensure an environmentally responsible and sound transportation system that minimizes adverse environmental impacts within the community.

Goal 4: Provide a Safe and Secure Transportation System.

Most community planning efforts recognize the desire for a safe transportation system. Community safety and security can be improved by transportation efforts in a number of ways. Reducing crashes, improving the ability of emergency responders to quickly and reliably respond to emergencies, and providing evacuation routes in the event of a natural disaster will all assist to improving safety and security. Educational programs that help travelers understand the particular safety concerns associated with various travel modes can also help all users travel with increased confidence and security.

Objectives:

- **4.1.** Reduce the rates of fatalities and crashes occurring on all transportation facilities.
- **4.2.** Identify barriers to effective and prompt emergency response.
- **4.3.** Implement safety initiatives and educational programs for all modes of transportation.
- **4.4.** Coordinate with freight operators and agencies on projects that can enhance the security of the freight transportation system in the region.

Goal 5: Support Economic Vitality of the Community.

All economic activity relies on a functioning, diverse transportation network. Vehicle, freight, air, transit, rail and non-motorized infrastructure all have a purpose to serve when linking economic vitality to the costs of doing business. Transportation in terms of economic vitality is only one component of a successful business environment. High quality schools, diversity in housing types, low debt, availability of infrastructure, and access to a highly educated workforce all contribute to the economic success of a community.

Objectives:

- **5.1.** Optimize the transportation system to meet the needs of the Great Falls Area, including the Great Falls International Airport, Malmstrom Air Force Base, Downtown Great Falls, employment centers, and industrial and commercial areas.

5.2. Provide attractive and convenient transportation facilities that attract and retain business, young professionals, families and older adults.
5.3. Facilitate the movement of goods and freight to commercial and industrial centers.

Goal 6: Protect and Enhance Environmental Sustainability, Provide Opportunities for Active Lifestyles, and Conserve Natural and Cultural Resources.

Both the MAP-21 planning factors and the livability principles from HUD/EPA/USDOT point to quality of life concerns in the development of LRTP's. Not only are impacts to the environment taken more seriously, but increasingly Great Falls Area citizens are demanding a more holistic approach to transportation. The preservation of natural, historic and cultural resources, as well as promoting a healthy, active lifestyle, are priorities of this LRTP and current Federal transportation planning guidance.

Objectives:

6.1. Promote transportation projects, plans and/or programs that encourage reducing fuel consumption, reducing vehicle miles of travel, and thereby minimizing air pollution.
6.2. Coordinate transportation planning activities with appropriate federal, state, and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation.
6.3. Engage stakeholders and the public in the decision-making stage of the transportation planning process.
6.4. Coordinate transportation planning activities with local and regional land use planning activities, including the City and County Growth Policy Updates.

Goal 7: Maximize the Cost Effectiveness of Transportation.

Transportation facilities that provide options to the public, reduce the time spent traveling, reduce fuel consumption, and make the best use of limited public funds for infrastructure improvements are desirable. Not only are costs related to the cost of building facilities, but there are also associated costs of time spent in vehicles.

Objectives:

7.1. Identify available funding mechanisms potentially including federal and state gas tax revenue, impact fees, transportation bond issues, local option gas taxes, and other revenue funding sources used in similar cities.
7.2. Encourage cooperation between public, private and non-profit organizations in the development, funding, and management of transportation projects.
7.3. Promote cost-effective recommendations that balance transportation system needs with available funding and expected expenditures.

3.4.1. Alignment of Goals with MAP-21 and Livability Principles

As an MPO, it is necessary to ensure the alignment of local LRTP transportation goals with the MAP-21 planning factors. Additionally, the Livability Principles from HUD/EPA/USDOT, while technically not Federal law, are worthy national transportation process objectives that should be reviewed and considered. **Table 3.1** depicts the relationship between the goals, the required MAP-21 planning factors, and the objectives contained in the Livability Principles from HUD/EPA/USDOT.

Table 3.1: Alignment of Goals with MAP-21 and Livability Principles

			Great Falls Area LRTP Goals						
			Goal 1: Maintain the existing transportation system.	**Goal 2**: Improve the efficiency, performance and connectivity of a balanced transportation system.	**Goal 3**: Promote consistency between land use and transportation plans to enhance mobility and accessibility.	**Goal 4**: Provide a safe and secure transportation system.	**Goal 5**: Support economic vitality of the community.	**Goal 6**: Protect and enhance environmental sustainability, provide opportunities for active lifestyles, and conserve natural and cultural resources.	**Goal 7**: Maximize the cost effectiveness of transportation.
MAP-21 Planning Factors	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 and economic development patterns.						✓	✓
	6	Enhance the **integration and connectivity** of the transportation system, across and between modes, people and freight.		✓	✓				
	7	Promote **efficient system management and operation**.		✓					
	8	Emphasize the **preservation of the existing transportation system**.	✓						
Livability Principles	1	Provide more **transportation choices**.		✓					
	2	Promote equitable, **affordable housing**.		✓	✓				✓
	3	Enhance **economic competitiveness**.					✓		
	4	**Support** existing **communities**.	✓	✓	✓	✓		✓	
	5	Coordinate policies and **leverage investment**.							✓
	6	**Value communities and neighborhoods**.	✓	✓	✓	✓			

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4.0
Existing Transportation System

Current information about the transportation system was analyzed to establish the existing traffic conditions and to determine potential problem areas. Existing data was provided by MDT, the City of Great Falls, and Cascade County. Additional data was collected in the spring and summer of 2013 to supplement available information. The combination of supplied data and collected data was used to determine the existing operational characteristics of the transportation system.

4.1. MAJOR STREET NETWORK

One of the initial steps in trying to understand a community's existing transportation system is to first identify what roadways will be evaluated as part of the larger planning process. A community's transportation system is made up of a hierarchy of roadways, with each roadway being classified according to certain parameters. Some of these parameters are geometric configuration, traffic volumes, spacing in the community transportation grid, speeds, and land use.

Emphasis was placed on roadways that are functionally classified as collectors, minor arterials, and principal arterials within the study area. These functional classifications can be encountered in both the "urban" and "rural" setting. The reasoning for examining the collector, minor arterial and principal arterial roadways, and not local roadways, is that when the major street network (i.e. collectors or above) is functioning to an acceptable level, the local roadways are not used beyond their intended function. When problems begin to occur on the major street network, then vehicles and resulting issues begin to infiltrate neighborhood routes (i.e. local routes). As such, the overall health of a regional transportation system can be typically characterized by the health of the major street network.

Roadway functional classifications within the study area include a segment of the interstate system, principal arterials, minor arterials, collector routes, and local streets. Rural roadways in the study area generally carry smaller volumes than in the urban areas. Although volumes may differ on urban and rural sections of a street, it is important to maintain coordinated right-of-way standards to allow for efficient operation of urban development. A description of these classifications is provided in the following sections.

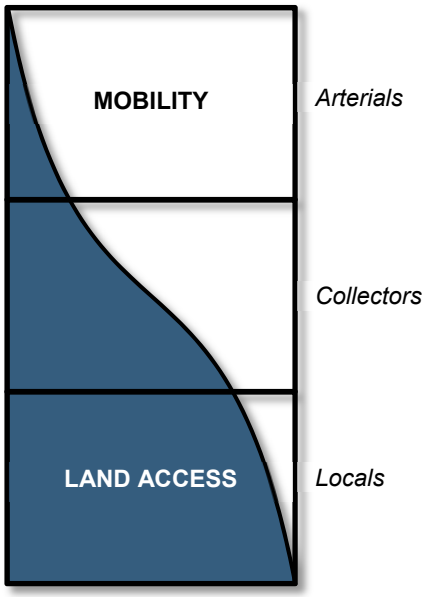


Figure 4.1: Functional Classification Proportion of Service

- **Principal Arterial System:** The purpose of the principal arterial is to serve the major centers of activity, the highest traffic volume corridors, and the longest trip distances in an area. This group of roads carries a high proportion of the total traffic. Most of the vehicles entering and leaving the area, as well as most of the through traffic bypassing the central business district, utilize principal arterials. Significant intra-area travel, such as between central business districts and outlying residential areas, and

between major suburban centers, is served by principal arterials.

The spacing between principal arterials may vary from less than one mile in highly developed areas (e.g., the central business district), to five miles or more on the urban fringes. Principal arterials connect to other principal arterials or to the interstate system. The major purpose of the principal arterial is to provide for the expedient movement of traffic. Service to abutting land is a secondary concern.

- **Minor Arterial Street System:** The minor arterial street system interconnects with and augments the principal arterial system. It accommodates trips of moderate length at a somewhat lower level of travel mobility than principal arterials, and it distributes travel to smaller geographic areas. With an emphasis on traffic mobility, this street network includes all arterials not classified as principal arterials while providing access to adjacent lands.

  The spacing of minor arterial streets may vary from several blocks to a half-mile in the highly developed areas of town, to several miles in the suburban fringes. They are not normally spaced more than one mile apart in fully developed areas.

- **Collector Street System:** The urban collector street network serves a joint purpose – provide equal priority to the movement of traffic, and access to residential, business, and industrial areas. 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 ultimate destinations. The collector streets also collect traffic from local streets in the residential neighborhoods, channeling it into the arterial system.

  The rural collector street network serves the same access and movement functions as the urban collector street network – a link between the arterial system and local access roads. Collectors penetrate but should not have continuity through residential neighborhoods. The actual location of collectors should be flexible to best serve developing areas and the public. Several design guidelines should be kept in mind as new subdivisions are designed and reviewed. The most important concept is that long segments of continuous collector streets are not compatible with a good functional classification of streets. Long, continuous collectors will encourage through traffic, essentially turning them into arterials. This, in turn, results in the undesirable interface of local streets with arterials, causing safety problems and increased costs of construction and maintenance. The collector street system should intersect arterial streets at a uniform spacing of one-half to one-quarter mile in order to maintain good progression on the arterial network. Ideally, collectors should be no longer than one to two miles and should be continuous. Opportunities need to be identified through good design and review of subdivisions to create appropriate collector streets in developing areas.

- **Local Street System:** The local street network comprises all facilities not included in the higher systems. Its primary purpose is to permit direct access to abutting lands and connections to higher systems. Usually service to through-traffic movements is intentionally discouraged.

The existing major street network, along with existing functional classifications, is shown in **Figures 4.2** and **4.3**. Note that the functional classifications shown on these figures represent classifications determined by the City of Great Falls and Cascade County and are not the “Federally Approved” Functional Classification system for the Great Falls area.

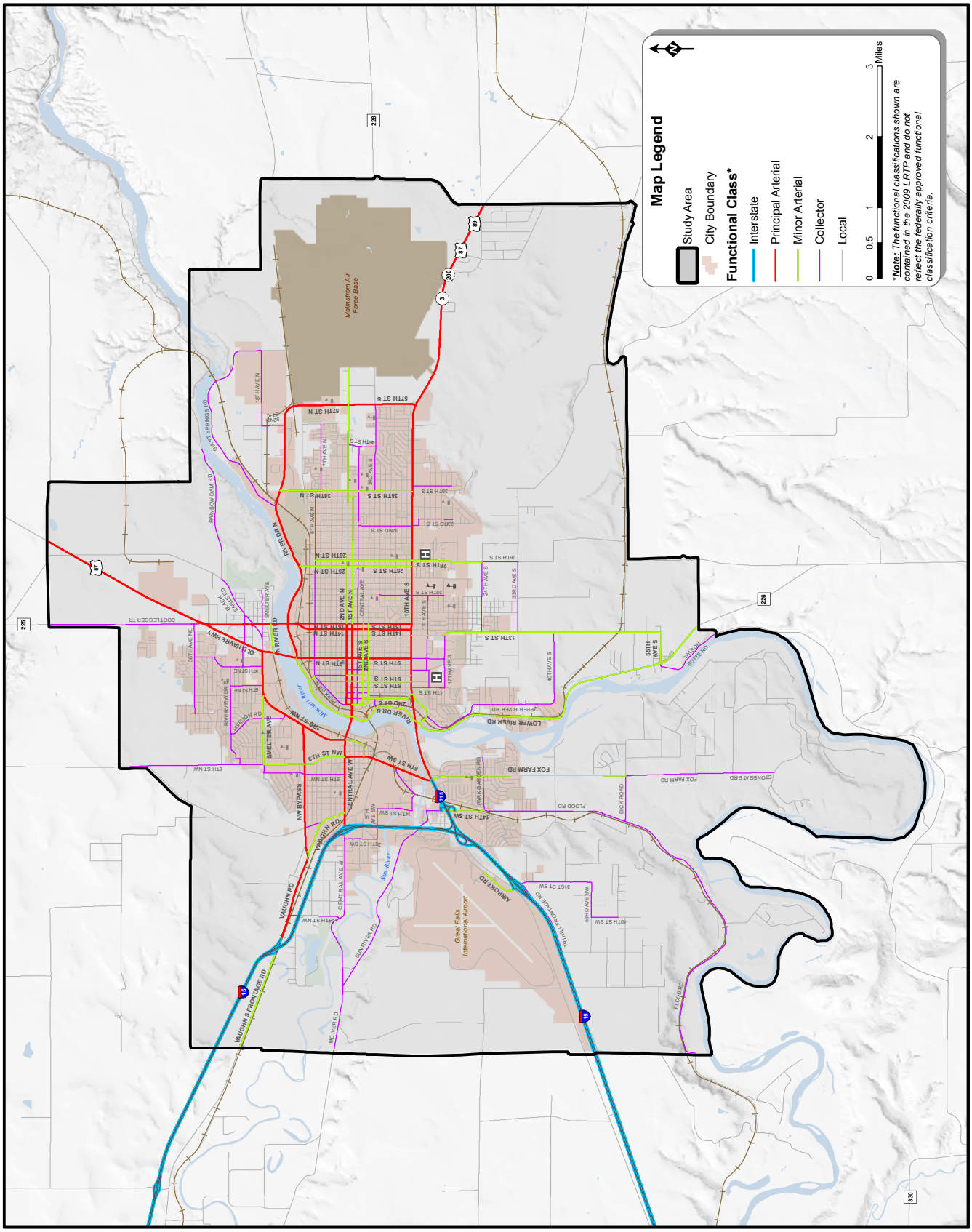


Figure 4.2: Existing Major Street Network

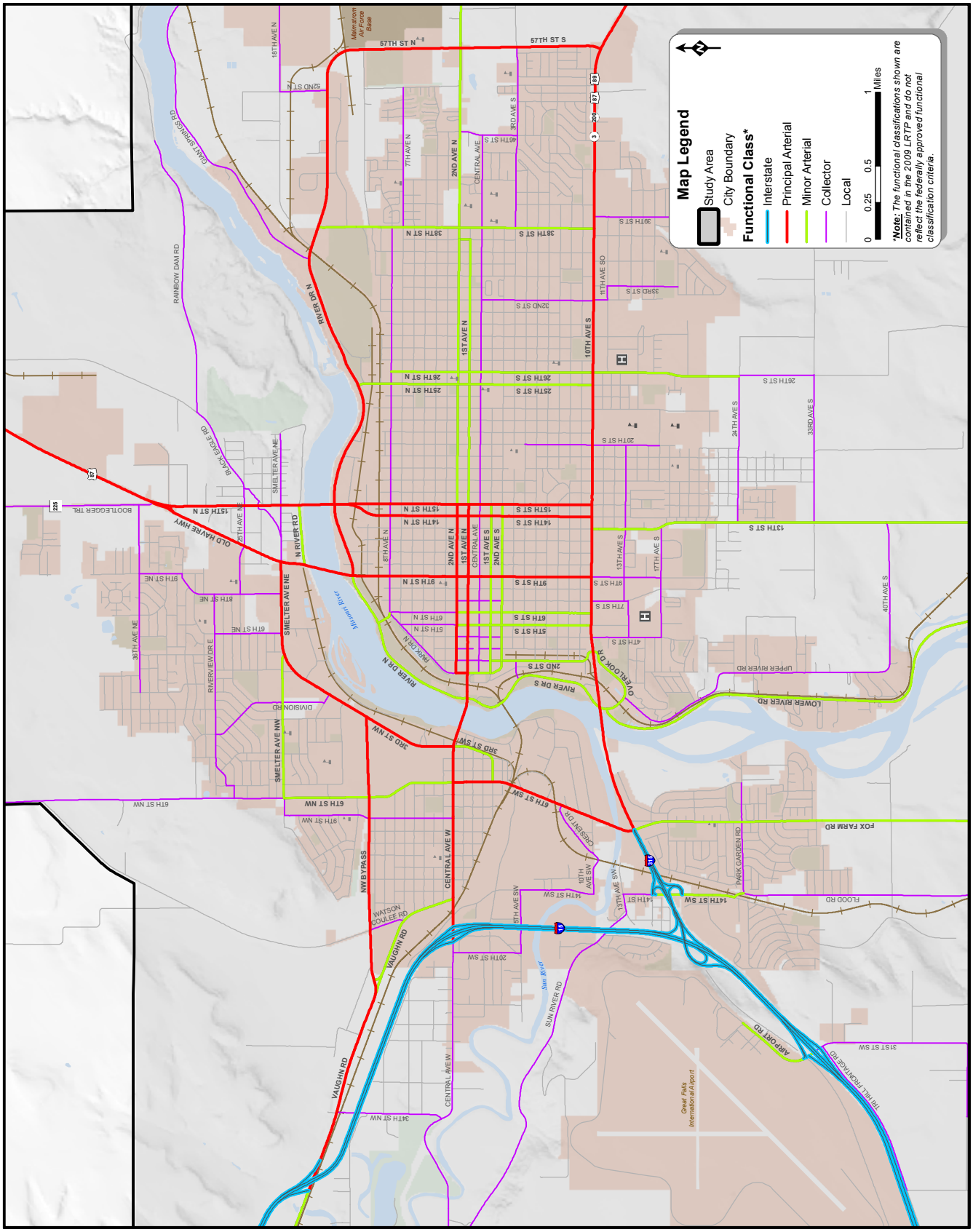


Figure 4.3: Existing Major Street Network (Detail)

4.2. EXISTING ROADWAY VOLUMES AND CAPACITY

Roadway traffic data was collected by MDT, City of Great Falls, and Cascade County. The data was used to establish existing traffic conditions and to provide reliable data on historic traffic volumes. Average annual daily traffic (AADT) counts for the year 2012 were used to represent existing conditions. **Figure 4.4** shows the existing AADT along the major street network. In addition, the major street network was examined to determine the existing facility size. This information is presented in **Figure 4.5**.

Roadway capacity is of critical importance when looking at the growth of a community. As traffic volumes increase, vehicle flow deteriorates. When traffic volumes approach and exceed the available capacity, the road begins to "fail". For this reason it is important to look at the size and configuration of the current roadways and determine if these roads need to be expanded to accommodate the existing or projected traffic needs.

The capacity of a roadway is based on a number of features including number of lanes, intersection function, access and intersection spacing, vehicle fleet mix, roadway geometrics, land use, and vehicle speeds. Individual roadway capacity varies greatly and should be calculated on an individual basis. For planning and comparison purposes, however, theoretical roadway capacities were developed based on simplistic roadway configurations and are shown in **Table 4.1**. These values are not intended to be used to set any thresholds for roadway performance, but rather provide some general information to be used to compare roadway performance.

Table 4.1: Theoretical Roadway Capacities

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

[(a)] 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, intersection operations and access control.
[(b)] TWLTL = two-way, left-turn lane

The capacities shown in **Table 4.1** represent theoretical daily volumes; however, traffic is not evenly distributed during the day. The transportation system experiences significant peaks of demand, especially during the work "rush" hours. These limited times create the greatest periods of stress on the transportation system. By concentrating large volumes in a brief period of time, a road's short-term capacity may be exceeded and a road user's perception of congestion is strongly influenced.

Roadway capacity and volume to capacity (v/c) ratio can be used as a comparison tool when looking at the transportation system. By definition, the v/c ratio is the result of the traffic volume of a roadway divided by the capacity. **Figure 4.6** shows the resultant v/c ratios of the existing major street network. The v/c ratios help identify potential capacity deficiencies for the transportation system.

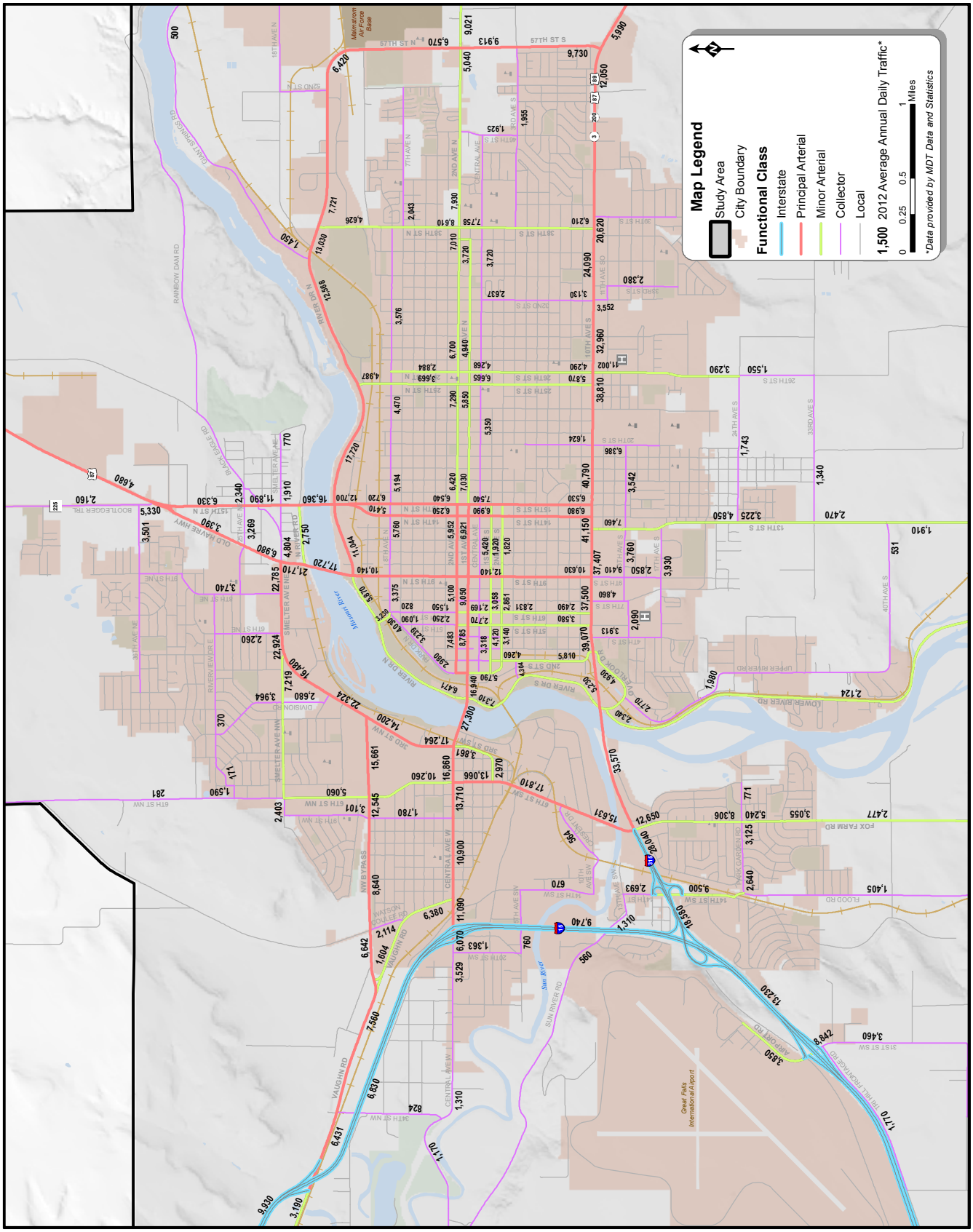


Figure 4.4: Existing Average Annual Daily Traffic

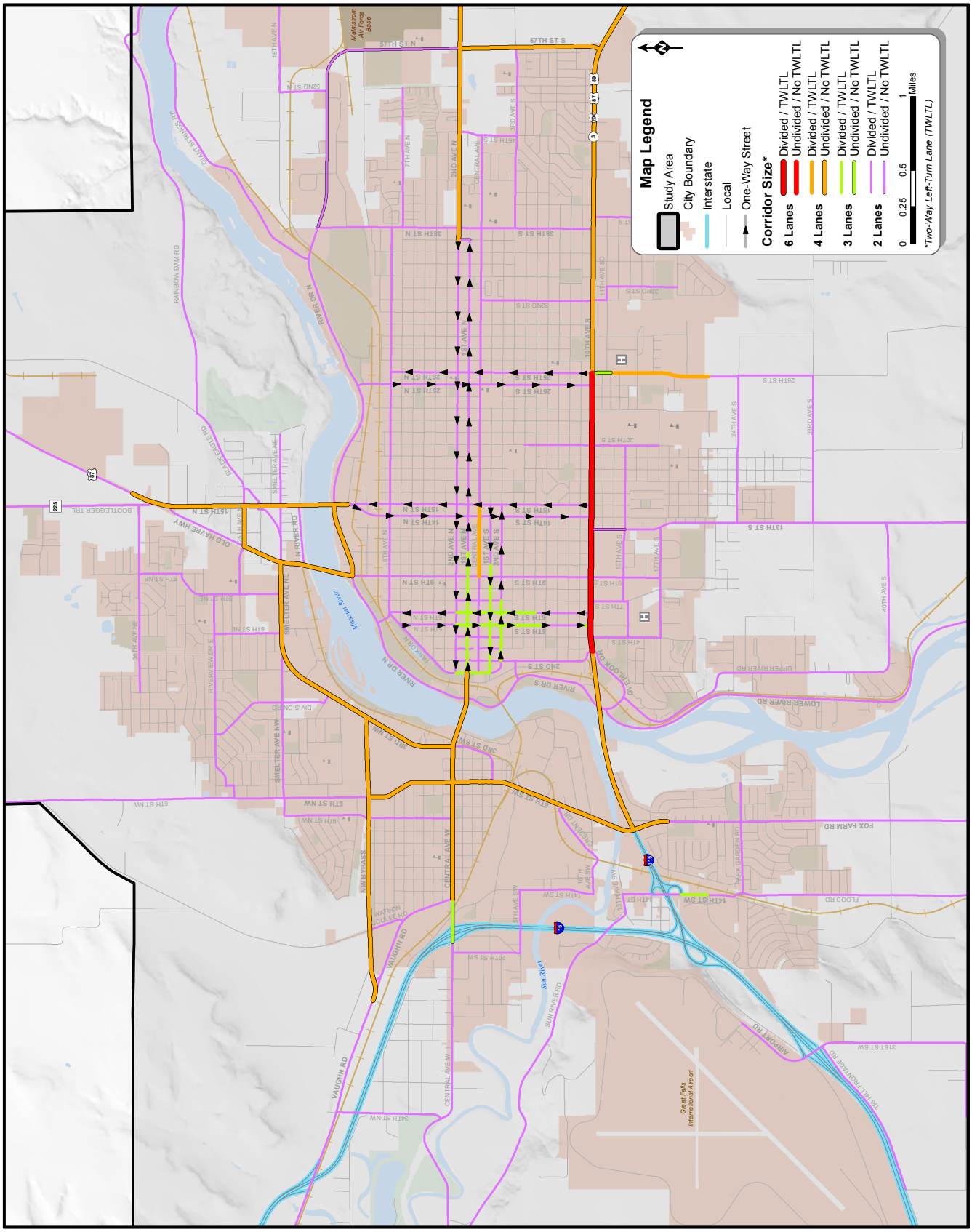


Figure 4.5: Existing Corridor Facility Size

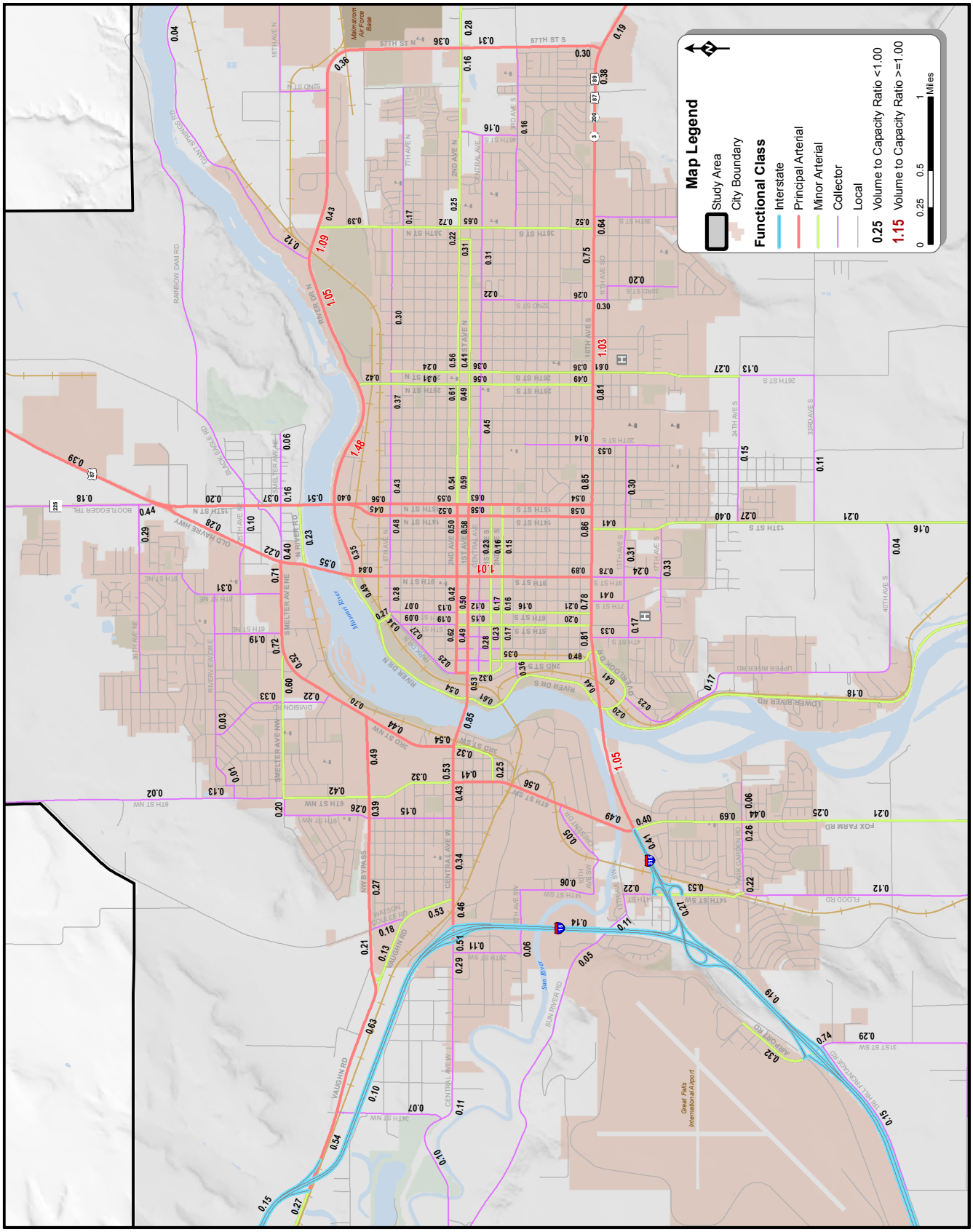


Figure 4.6: Existing Volume to Capacity Ratios

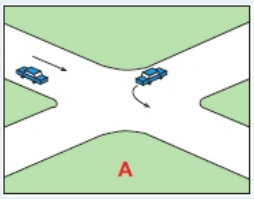
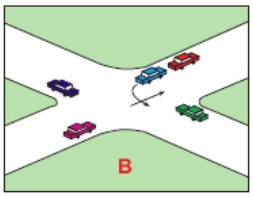
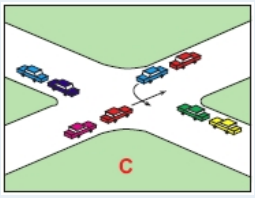
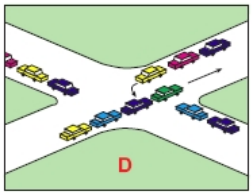
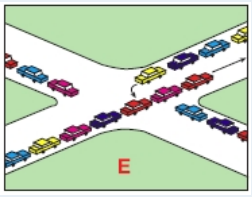
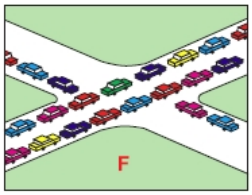
4.3. EXISTING INTERSECTION LEVEL OF SERVICE

Urban road systems are ultimately controlled by the function of the major intersections. Intersection failure directly reduces the number of vehicles that can be accommodated during the peak hours that have the highest demand and the total daily capacity of a corridor. As a result of this strong impact on corridor function, intersection improvements can be a cost-effective means of increasing a corridor's traffic volume capacity. In some circumstances, corridor expansion projects may be able to be delayed with correct intersection improvements. Due to the significant portion of total expense for road construction projects used for project design, construction mobilization, and adjacent area rehabilitation, a careful analysis must be made of the expected service life from intersection improvements. If adequate design life can be achieved with only improvements to the intersection, then a corridor expansion may not be the most efficient solution. With that in mind, it is important to determine how well the major intersections are functioning by determining their Level of Service (LOS).

LOS is a qualitative measure developed to quantify driver perception for elements such as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles. LOS provides a scale that is intended to match the perception by motorists of the operation of the intersection. LOS is used as a means for identifying intersections that are experiencing operational difficulties, as well as a comparison tool to other 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 it. The scale ranges from "A" which indicates little, if any, vehicle delay, to "F" which indicates significant vehicle delay and traffic congestion. **Table 4.2** portrays a graphical representation of LOS.

A total of 61 intersections were analyzed for LOS. Data was collected during the spring and summer of 2013 at 42 of the intersections (20 signalized and 22 unsignalized locations). Each intersection was counted during the peak hours, defined as 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. In addition, peak hour turning movement counts were obtained from MDT for 19 additional signalized locations. Data at these locations was collected at various periods over the past few years. Note that the majority of the signalized intersections located within the core Downtown Business District were not counted or analyzed due to recent planning efforts in the area. **Figure 4.7** shows the intersections where peak hour turning movement counts were collected.

Table 4.2: Intersection LOS Description

LOS	Description	Average Delay per Vehicle (sec)	
		Signalized	Unsignalized
	Traffic moves freely, low volumes accompany the free flow condition. At signalized intersections, progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. At unsignalized intersections, nearly all drivers find freedom of operation with very little time spent waiting for an acceptable gap. Very seldom is there more than one vehicle in queue.	< 10	< 10
	Traffic moves fairly freely, volumes are somewhat low. At signalized intersections, there is good progression and/or short cycle lengths. Vehicles generally clear on one green phase. At unsignalized intersections, some drivers begin to consider the average control delay an inconvenience, but acceptable gaps are still very easy to find. Occasionally there is more than one vehicle in queue.	10 to 20	10 to 15
	Traffic moves smoothly, volumes are beginning to increase. At signalized intersections, higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping. At unsignalized intersections, average control delay becomes noticeable to most drivers, even though acceptable gaps are found on a regular basis. It is not uncommon for an arriving driver to find a standing queue of at least one additional vehicle.	20 to 35	15 to 25
	Traffic approaching unstable flow, the influence of congestion becomes more noticeable. At signalized intersections, longer delays may result from some combination of unfavorable progression, long cycle length, or high volume/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable. At unsignalized intersections, average control delay is long enough to be an irritation to most drivers. Acceptable gaps are hard to find because there is a standing queue of vehicles already waiting when the driver arrives.	35 to 50	25 to 35
	Unstable traffic flow, volumes at or near capacity. At signalized intersections, the high delays generally indicate poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences. At unsignalized intersections, drivers find the length of the average control delay approaching intolerable levels. Acceptable gaps are hard to find because there is a standing queue of vehicles already waiting when the driver arrives.	50 to 80	35 to 50
	Saturation condition, volumes are over capacity. This is considered to be unacceptable to most drivers. This condition occurs with oversaturation. At signalized intersections, it may occur at high volume/capacity ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such high delay values. At unsignalized intersections, delays are high because acceptable gaps are hard to find. Acceptable gaps are hard to find because there is a standing queue of vehicles already waiting when the driver arrives.	> 80	> 50

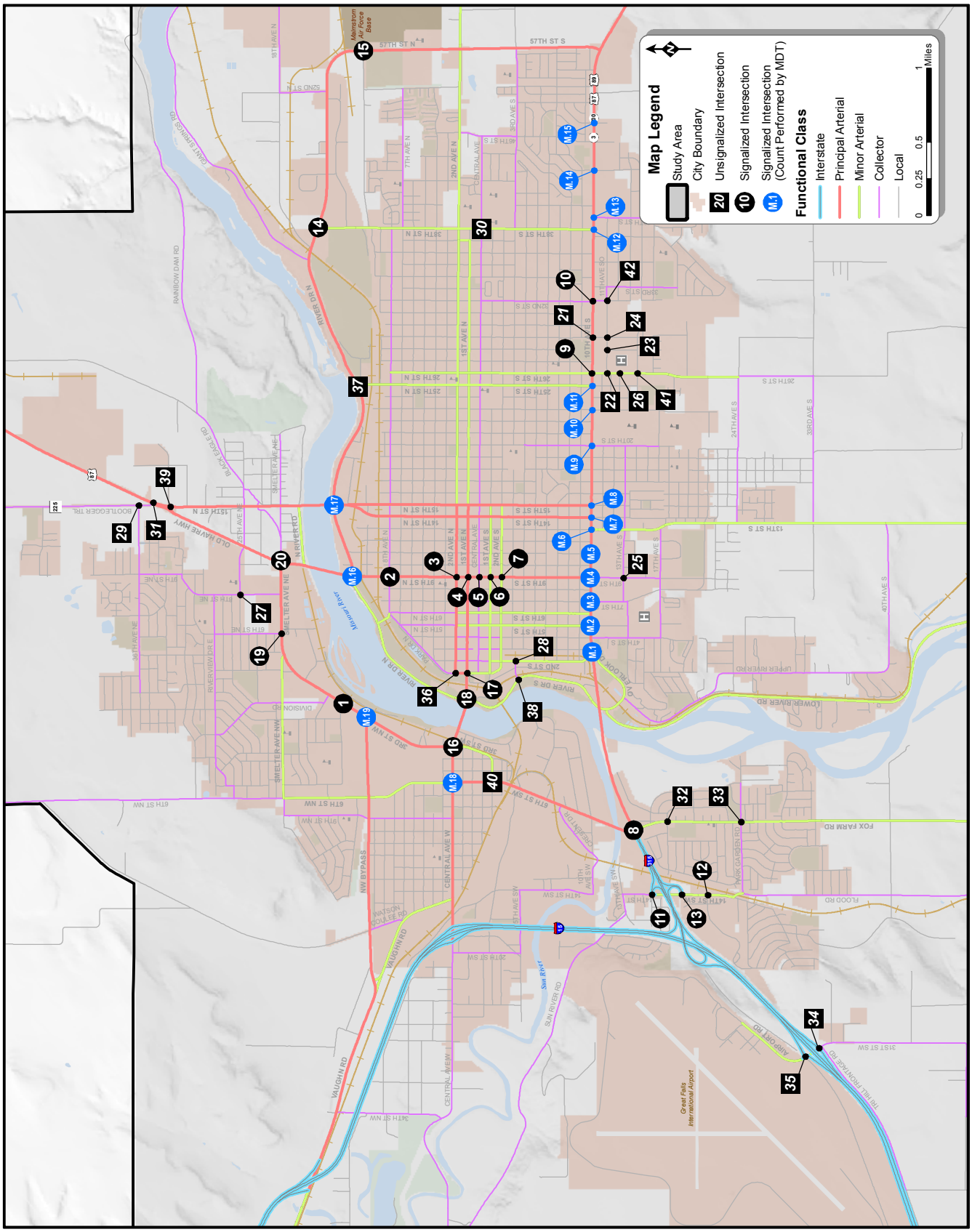


Figure 4.7: Intersection Count Locations

4.3.1. Signalized Intersections

For signalized intersections, the LOS is based on the average stopped delay per vehicle. **Table 4.2** identifies the relationship between LOS and average stopped delay per vehicle. The procedures used to evaluate signalized intersections use detailed information on geometry, lane use, signal timing, peak hour volumes, arrival types and other parameters. This information is then used to calculate delays and determine the capacity of each intersection. An intersection is determined to be functioning adequately if operating at LOS C or better. **Table 4.3** shows the LOS and average vehicle delay for the signalized intersections during the AM and PM peak hours. The exiting intersection LOS is shown in **Figure 4.8**. More detailed results are provided in **Appendix B**.

Table 4.3: Existing Signalized Intersection LOS

ID	Intersection	AM Peak Hour		PM Peak Hour	
		Delay (Sec)	LOS	Delay (Sec)	LOS
1	3rd Street NW / 14th Avenue NW	12.3	B	14.2	B
2	9th Street N / 8th Avenue N	18.5	B	19.7	B
3	9th Street N / 2nd Avenue N	15.0	B	15.4	B
4	9th Street N / 1st Avenue N	11.3	B	15.1	B
5	9th Street / Central Avenue	18.2	B	21.6	C
6	9th Street S / 1st Avenue S	9.1	A	11.8	B
7	9th Street S / 2nd Avenue S	6.8	A	10.6	B
8	10th Avenue S / Fox Farm Road	44.5	D	41.8	D
9	10th Avenue S / 26th Street S	14.1	B	32.3	C
10	10th Avenue S / 32nd Street S	18.3	B	25.9	C
11	14th Street SW / 16th Avenue SW	12.6	B	15.0	B
12	14th Street SW / Marketplace Drive	14.4	B	20.8	C
13	14th Street SW / Ramp B	12.7	B	15.9	B
14	38th Street N / River Drive N	11.6	B	11.1	B
15	57th Street N / 10th Avenue N	21.7	C	25.5	C
16	Central Avenue W / 3rd Street NW	31.5	C	37.8	D
17	Park Drive N / 1st Avenue N	14.9	B	20.2	C
18	River Drive N / 1st Avenue N	30.2	C	109.1	F
19	Smelter Avenue / 6th Street NE	12.9	B	10.4	B
20	Smelter Avenue / 10th Street NE	58.2	E	70.3	E
Intersections Counted by MDT					
M.1	10th Avenue S / 2nd Street S	20.4	C	36.9	C
M.2	10th Avenue S / 5th Street S	14.0	B	28.0	C
M.3	10th Avenue S / 7th Street S	10.5	B	15.0	B
M.4	10th Avenue S / 9th Street S	15.3	B	25.4	C
M.5	10th Avenue S / 11th Street S	7.6	A	5.0	A
M.6	10th Avenue S / 13th Street S	11.4	B	16.5	B
M.7	10th Avenue S / 14th Street S	17.9	B	21.2	C
M.8	10th Avenue S / 15th Street S	7.1	A	12.6	B
M.9	10th Avenue S / 20th Street S	9.4	A	15.2	B

ID	Intersection	AM Peak Hour		PM Peak Hour	
		Delay (Sec)	LOS	Delay (Sec)	LOS
M.10	10th Avenue S / 23rd Street S	12.7	B	23.1	C
M.11	10th Avenue S / 25th Street S	19.4	B	24.1	C
M.12	10th Avenue S / 38th Street S	16.7	B	19.2	B
M.13	10th Avenue S / 39th Street S	6.5	A	8.3	A
M.14	10th Avenue S / 43rd Street S	8.8	A	9.0	A
M.15	10th Avenue S / 49th Street S	4.5	A	5.6	A
M.16	River Drive N / 9th Street N	25.3	C	29.6	C
M.17	River Drive N / 15th Street N	49.1	D	46.9	D
M.18	Central Avenue NW / 6th Street NW	22.4	C	25.4	C
M.19	NW Bypass / 3rd Street NW	17.2	B	29.4	C

4.3.2. Unsignalized Intersections

LOS for two-way stop-controlled intersections is based on the delay experienced by each movement within the intersection, rather than on the overall stopped delay per vehicle at the intersection. This difference from the method used for signalized intersections is necessary since the operating characteristics of stop-controlled intersection are substantially different. Driver expectations and perceptions are also entirely different. For two-way stop controlled intersections the through traffic on the major (uncontrolled) street experiences no delay at the intersection. Conversely, vehicles turning left from the minor street experience more delay than other movements and at times can experience significant delay. Vehicles on the minor street which are turning right or going across the major street experience less delay than those turning left from the same approach. Due to this situation, the LOS assigned to a two-way stop controlled intersection is based on the average delay for vehicles on the minor street approach.

For all-way stop-controlled intersections, LOS is based on average vehicle delay experienced at the intersection. This methodology is similar to that of signalized intersections. The results of the LOS analysis for the unsignalized intersections are shown in **Table 4.4**. The existing intersection LOS is shown in **Figure 4.8**. More detailed results are provided in **Appendix B**.

Table 4.4: Existing Unsignalized Intersection LOS

ID	Intersection	AM Peak Hour		PM Peak Hour	
		Delay (Sec)	LOS	Delay (Sec)	LOS
21	10th Avenue S / 29th Street S	97.7	F	87.4	F
22	11th Avenue S / 26th Street S	24.2	C	16.3	C
23	11th Avenue S / 28th Street S	12.4	B	13.3	B
24	11th Avenue S / 29th Street S	10.7	B	11.2	B
25	13th Avenue S / 9th Street S	15.5	C	25.4	D
26	13th Avenue S / 26th Street S	12.7	B	16.3	C
27	25th Avenue NE / 8th Street NE	47.2	E	32.1	D
28	2nd Street S / 3rd Avenue S	12.3	B	24.6	C
29	36th Avenue NE / Bootlegger Trail	13.4	B	14.5	B
30	38th Street / Central Avenue	19.1	C	18.3	C

ID	Intersection	AM Peak Hour		PM Peak Hour	
		Delay (Sec)	LOS	Delay (Sec)	LOS
31	Bootlegger Trail / U.S. 87	15.4	C	47.8	E
32	Fox Farm Road / 18th Avenue SW	328.8	F	27.4	D
33	Fox Farm Road / Park Garden Road	48.2	E	20.5	C
34	I-15 EB Ramp / Airport Drive	10.8	B	20.6	C
35	I-15 WB Ramp / Airport Drive	13.9	B	23.6	C
36	Park Drive N / 2nd Avenue N	60.7	F	221.3	F
37	River Drive N / 25th Street N	23.0	C	98.9	F
38	River Drive S / 3rd Avenue S	12.7	B	44.4	E
39	Old Havre Highway / 15th Street N	20.3	C	18.1	C
40	6th Street SW / 4th Avenue SW	18.1	C	48.3	E
41	15th Avenue S / 26th Street S	15.7	C	16.7	C
42	32nd Street S / 11th Avenue S	13.7	B	14.8	B

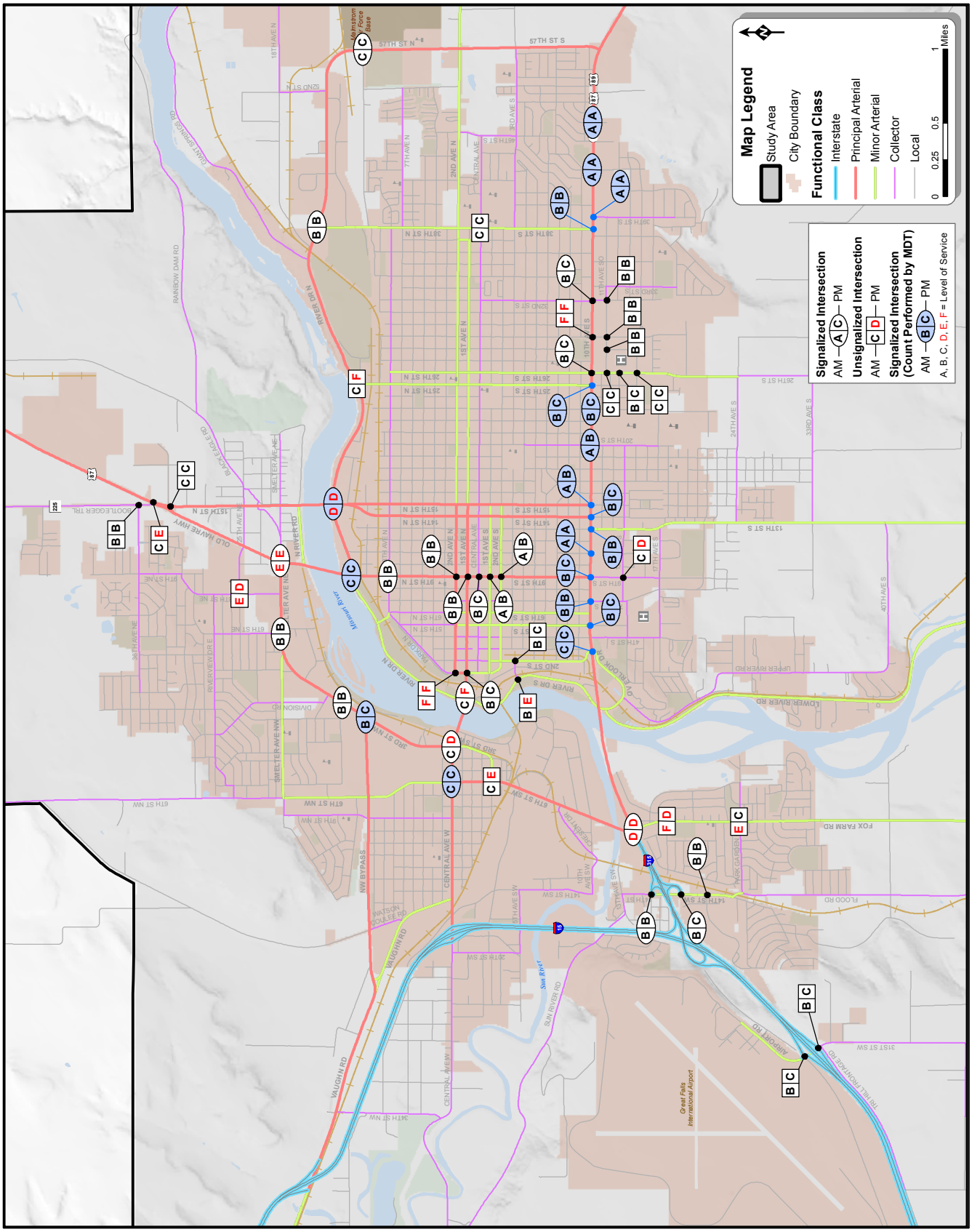


Figure 4.8: Existing Intersection Level of Service

4.4. NON-MOTORIZED TRANSPORTATION

4.4.1. Demographics / Commute and Trip Choice

The vehicle or type of transportation that people choose for their trips, either commuting to and from work, doing errands, or other trips, is available via the American Community Survey (ACS) and the National Household Travel Survey (NHTS). The former includes commute mode share data while the latter includes mode share choices for all trips, regardless of purpose.

4.4.1.1. Commuting (ACS)

Bicycling

Five year ACS averages show that approximately 0.8 percent of commuters choose to travel to and from work by bicycle in Great Falls. This is an increase from 0.5 percent when measured during the 2000 Census. When compared to the rest of the United States, this figure is higher than the average, 0.5 percent, but is less than Montana's average mode share for bicycling to work, which is 1.3 percent. In comparison to other major cities in Montana, Great Falls has fewer bike-to-work commuters than Missoula, Bozeman, Kalispell, and Helena, but outperforms Billings and Butte.

Walking

About 2.7 percent of commuters in Great Falls walk to and from work. This is lower than the national (2.8 percent) and state (5.1 percent) averages, and a decrease from the 2000 Census when 3.1 percent of commuters walked. Of the six other major cities used in the previous comparison, Great Falls has the lowest walking mode share.

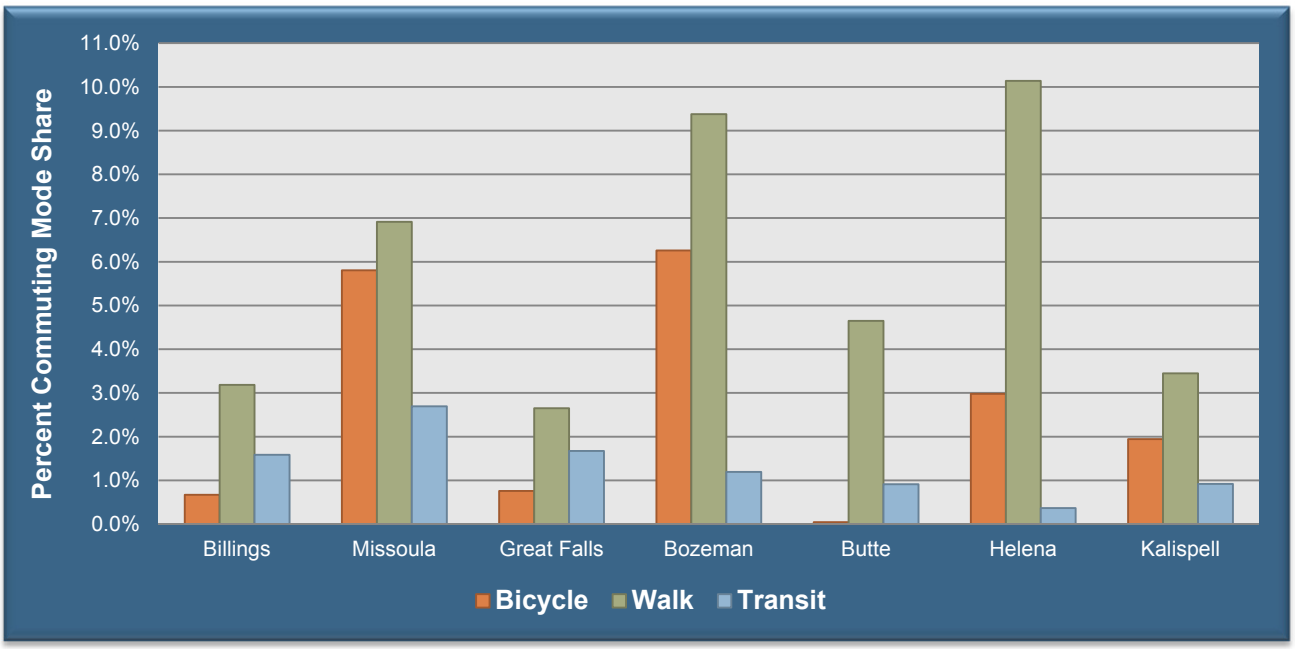


Figure 4.9: 5 Year ACS Commute Share

4.4.1.2. All Trips (NHTS)

Trip mode share from the National Household Travel Survey is data that has been normalized using national averages from NHTS that provide non-motorized averages for percentage of all trips, not just commute trips.

Bicycling

Bicycle mode share for all trips in Great Falls is estimated at 1.4 percent, which is higher than the national average (1.0 percent) but lower than the statewide average for Montana (2.5 percent). In comparison to other Montana cities, Great Falls' total bicycle mode share is higher than Billings and Butte, but lower than the other four larger cities highlighted.

Walking

An estimated 5.5 percent of all trips in Great Falls are walking trips, which is much higher than the ACS data outlining walking to and from work (2.7 percent), but it still remains lower than all six Montana cities in the graph and also lower than the national (6.1 percent) and Montana (10.6 percent) averages.

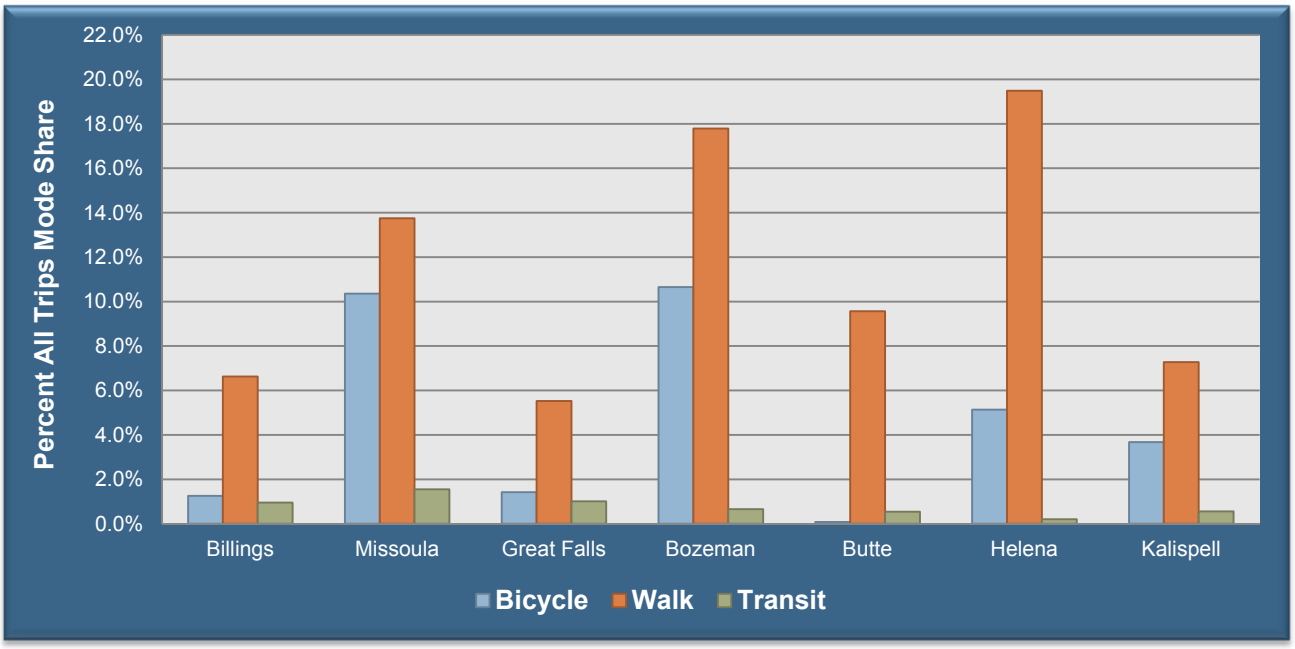


Figure 4.10: Overall Mode Share Based on ACS and NHTS

4.4.2. Existing Plans, Codes, and Policies

4.4.2.1. Plans and Surveys

City of Great Falls Downtown Access, Circulation, and Streetscape Plan (April 2013)

A design document intended to supplement recommendations, vision, and plans made in the Great Falls Downtown Master Plan (2011).

This plan provides several options for recommended bicycle and pedestrian improvements on 1st Avenue South, 2nd Avenue South, 5th Street, and 6th Street – all currently one way streets. Improvements such as better sidewalks, street trees, bike lanes, shared lane markings, and two-way cycle tracks are included.

The final recommendation for bicycle facilities on all four of the streets (which are currently one-way couplets) will have lane configurations consisting of two one-way travel lanes, parallel parking on both sides, and a one-way buffered bike lane (three foot buffer on the travel lane side and two foot buffer on the parking lane side) in the remaining space of the 50 ft of each street. The extents are below:

- **1st Avenue South:** 10th Street South to Park Drive
- **2nd Avenue South:** Park Drive to 6th Street South
- **5th Street:** 2nd Avenue North to 6th Avenue South
- **6th Street:** 5th Avenue South to 2nd Avenue North

Great Falls Area 2009 Transportation Plan

The last comprehensive update was adopted in 2003 with a minor update in 2009. The Great Falls Metropolitan Area must, at a minimum, update the Transportation Plan and perform a conformity determination no less frequently than every four years (ref. 40 CFR 93.104(b)(3)).

The vision of the plan and the community is that "our community should grow in compact patterns that facilitate pedestrian, bicycle, and transit travel. Walking should be a practical, safe, and enjoyable means of travel throughout all neighborhoods and shopping areas. Bicycling should become a more viable transportation choice for all residents and visitors in Great Falls" (p. 1-3).

The plan suggests that policies should be enacted in order to require 1) infill development where the land use pattern should be self-contained and promote compact, pedestrian-oriented development, and, 2) protecting and enhancing the area's air quality by reducing vehicle miles traveled and trips generated by using transit and non-motorized transportation modes (bicycling and walking) (p.1-7).

According to this document, when reviewing and updating the Bikeway Facilities Plan, planners/consultants should address the following issues:

- Balance the plan with a variety of facilities to meet the needs of cyclists with different skill levels.
- Link parks, schools, and other activity centers.
- Link the River's Edge Trail to the area-wide bike route system wherever possible.
- Study the expansion of the existing trail system to connect to Wadsworth Park along the Sun River and flood control levees.
- Explore opportunities for unpaved multi-use trails for mountain bikers and hikers.
- Develop policies and procedures for obtaining easements or rights-of-way for non- motorized transportation corridors throughout the community.
- Coordinate the Bikeway Facilities Plan with recommendations in the *Park and Recreation Master Plan (1995).* In some areas, the seven new trails recommended in the Master Plan duplicate routes in the proposed Bikeway Facilities Plan (p. 1-11)

In Chapter 1, pilot traffic-calming projects including bulbouts, a City-County Bicycle and Pedestrian Advisory Committee, increased trail and path construction, and review of design standards for roadways are suggested (p. 1-10 – 1-14).

Chapter 2 addresses bicycle and pedestrian traffic on the River's Edge Trail, in the Central Business District, as well as ADA wheelchair access ramps, and sidewalk locations on major streets. Maps providing where there exist sidewalk gaps, ADA wheelchair access ramps, lighted corridors, and existing trail system are also included in this chapter. The figures and maps in this chapter should be used as a starting point for prioritizing corridors for upgrades. Each individual block face and intersection should be separately evaluated for sufficiency of pedestrian and bicycle facilities, according to the Plan. ADA

facilities in outlying areas are lacking, as well as sidewalks and other non-motorized transportation mode facilities.

The maps included in Chapter 5, which are completely dedicated to pedestrian and bicycle planning, differ significantly from the Existing/Proposed Trails Network map (Figure 2-18) included in Chapter 2 (Existing Conditions). Maps in Chapter 5 are somewhat confusing in that they lump all existing facilities regardless of type together in one line type and show proposed bike lanes, bike routes, and some trails as by individual facility type. Additionally new recommendations as proposed in the 2009 plan are all one color regardless of the recommended facility type. Committed and proposed bikeway network and system improvements are outlined and include extent, cost, and proposed location. The total cost for the bikeway network and system projects is estimated by this plan at $3,462,900.

Chapter 7 includes further discussion of and suggestion for traffic calming in order to benefit pedestrians, especially around schools (p. 7-29). In Chapter 12, suggested street alignments, traffic calming, and ROW requirements are outlined. Most of the suggested cross sections include at least one option depicting facilities for pedestrians and bicyclist. These facilities typically include improved sidewalks and vegetated buffers, bike lanes, and shared use paths. Chapter 14 includes possible funding sources for bicycle and pedestrian projects, such as CMAQ and MACI (which have been used previously), and TIF.

Downtown Great Falls 2013 Safety Plan

This plan makes relatively no mention of bicycling or walking. Chapter 2: Safety Plan Framework references the Downtown Master Plan in identifying one safety related goal/strategy, which is, to “improve pedestrian connectivity and safety Downtown and develop public/private partnerships to ensure Downtown is safe for all users” (p. 5).Chapter 6: Downtown Public Safety Resource & Referral List makes a quick mention of the link to report non-emergency crimes, which include bike thefts (http://www.greatfallsmt.net/police/report-crime-online).

City of Great Falls 2011 Downtown Master Plan

“The Downtown Master Plan provides a strategically focused, goal driven “blueprint” for the future growth and development of Downtown. The plan includes 82 strategies that each serve to make Downtown Great Falls a more desirable place to live, conduct business, recreate and visit.”

This plan identifies several objectives that apply to bicycling and walking, both individually and when the two modes overlap. The following objectives and sections apply to bicycling and walking and include visual and some semi-technical elements to consider in the redesign of streets and surrounding areas and corridors in order to increase viability and safety of bicycling and walking. In Chapter 3, under Goal 1: Connected Downtown:

- Objective 1 (improve pedestrian connectivity and safety)
- Objective 2 (develop a comprehensive Downtown bicycle network to connect into a city-wide system)
- Objective 4 (improve connectivity to the Missouri River, River’s Edge Trail, and Gibson Park for bicycles and pedestrians)
- Exhibit 1: A Closer Look at Complete Streets
- Exhibit J: A Closer Look at One-way Conversion
- Objective 6: Optimize Downtown parking for all stakeholders (bicycle parking)

Figure 8: Implementation Table (Chapter 3) describes the intention of capital improvement projects and how basic upgrades of public infrastructure are great gateways to accomplishing projects related to bicycling and walking. Chapter 3’s Strategy 1: Connected, defines the objectives included above by

individual, implementable projects including funding sources, project timeline range, and what type of project it is (capital improvement, program, regulation, etc.).

An online survey was included in the creation of this plan and nearly 450 respondents contributed to better understand demographics and preferences downtown (p. 69-72).

- 52 percent of respondents use downtown daily
- 56 percent come for the shopping, 52 percent work downtown, 42 percent enjoy dining in downtown, and 37 percent use other services provided by downtown businesses
- 94 percent use a car to get to downtown, 4 percent walk, 2 percent ride a bicycle, and none took the bus
- 47 percent of respondents believe that downtown is safe; 56 percent agree that it is clean
- Very few people, however believe that downtown is a desirable place to raise a family (only 10 percent)
- A cleaner and safer environment, with better landscaping and more green space, would be appealing to some (23 percent) respondents.
- Parking issues (9 percent) were identified by some respondents as detriments to downtown living

Conclusions from the One-way Street Conversion Survey

This report is an important document to consider in light of bicycle and pedestrian planning because it shows public sentiment regarding traffic lane realignment and significant changes to existing infrastructure. The Great Falls Business Improvement District (BID) asked the City to consider a proposal to convert two downtown, one-way couplets back to two-way streets. The couplets and segments in question are 5th and 6th Streets between 8th Avenue North and 10th Avenue South, and 1st and 2nd Avenues South between Park Drive and 15th Street.

The project sought public comment and, overall, most respondents were in favor of keeping the streets one-way, in couplets, and improving them with trees and improved storefronts. The majority of customers and home and business owners on ALL streets highlighted in this survey analysis and conclusion said that one-way streets helped, instead of hindered, customers getting to businesses downtown. They also said that smooth traffic flow was more important than slower traffic. 53 percent said they would not support any changes to the streets identified in the survey.

One respondent who owns properties on 5th Street and 6th Street South, where 3 lanes merge to 2 lanes, had a different opinion. He / she reports fast automobile traffic and almost no one stopping for foot traffic, even school children unloading from the bus, even though there is a pedestrian crossing on the corner.

This report is significant as it depicts observed public resistance (from at least some of the population) to traffic lane realignment and significant changes to existing infrastructure.

4.4.2.2. Code

City of Great Falls Municipal Code

The municipal code includes legality of certain actions and includes definitions of ordinances and laws pertaining to bicycling and walking in Great Falls.

The code sets several definitions including defining a bicycle as a type of vehicle (10.3.010 – Definitions), and that bicyclists as operators of vehicles shall obey the instruction of any official traffic-control device" (10.21.020 – Obedience required).

The code further states that it is illegal to bicycle on the sidewalk within the CBD east of the west side of Park Drive. Bicycles operated by the Police Department are exempt from the CBD sidewalk law. Additionally, any person bicycling on the sidewalk in the rest of the City, where it is legal, must yield the ROW to any pedestrian and give audible signals before passing them (10.72.010). In 12.32.020, this code is contradicted because it states that it is illegal for horses, mules, animals, buggy, wagon, bicycle or other vehicle to be ridden or driven on any sidewalk in the City.

Property owners are responsible for the maintenance of sidewalks in front of and adjoining their property. They are responsible also for reconstruction of buckled or dangerous sidewalks caused by natural deterioration (12.28.130).

Developers may propose and the City may require traffic calming to provide safety and encourage walking as transportation and will be determined on a case-by-case basis (17.32.130).

All new streets must meet the City's growth policy, as outlined in the 2009 Great Falls Area Transportation Plan. Sidewalks must also be provided on both sides of public and private streets. In residential areas, a boulevard area (vegetated, usually) shall be included and must be at least six feet wide. Sidewalks must also be ADA compliant (17.32.080).

There is no bicycle parking requirement in Great Falls. However, when bicycle parking is provided, it may substitute for a vehicular parking space up to a maximum of 5 percent of the required number of parking space, or 10 spaces, whichever is less (17.36.3.010). Exhibit 36-6 in the Municipal Code gives recommended number of bicycle parking spaces at different types of buildings. The code does get stricter on where the bicycle parking spaces are located. They cannot be more than 100 feet from the entrance and should be as close as or closer than the nearest automobile parking space. Parking must be distributed to serve all buildings or entrances when there are more than one, must have adequate lighting, must hold the frame and not just the wheel, must be able to be used with a U-lock, must accommodate a variety of bicycle types, must be securely fastened to the ground, and must be accessible without moving another bicycle.

Cascade County Zoning Regulations (2012)

A recreational trail is defined by Cascade County as a "linear path which may be dedicated to a single use or multiple uses". The zoning regulations definitions section then states that hiking trails, bike trails, cross-country ski trails, and horse trails are all examples of a recreation trail. The document does not, however, list bicycles as a recreation vehicle, reserving this definition for camping trailers, motor homes, and the like. Pedestrian walkways are listed as cross-routes that should affect the planning of landscaping plans.

Cascade County Subdivision Regulations (2007)

In the section on "Blocks", the regulations document states that "rights-of-way for adequate and safe pedestrian access, at least 10 feet wide, must be provided where deemed essential to provide circulation to schools, playgrounds, shopping, transportation, and other community facilities". In Section VI-H, subsection b titled "Improvements", it states that subdivision street improvements including "pavement, curbs, gutters, sidewalks, and drainage must be constructed in accordance with the specifications prescribed" in the document using materials approved by the Cascade County Commissioners. Specifications are provided after in the form of sample designs and materials lists and procedures. Furthermore, any proposed road plan and profile must include the type and location of sidewalks and curbs. There is no mention of or reference to bicycling, bicycle infrastructure, or bicyclists as users in the whole of the document.

Table 4.5: Great Falls Municipal Code 17.36.3.010 - Bicycle parking

Land use	Number of recommended spaces
Multi-family housing	1 space per 2 apartments
Primary or secondary school	10 percent of the number of students, plus 3 percent of the number of employees
College or university	6 percent of the number of students, plus 3 percent of the number of employees
Dorms, fraternities, sororities	1 spaces per 3 students
Shopping mall	5 percent of the number of vehicle parking spaces
Office	5 percent of the number of vehicle parking spaces
Governmental	10 percent of the number of vehicle parking spaces
Movie theater	5 percent of the number of vehicle parking spaces
Restaurant	5 percent of the number of vehicle parking spaces
Manufacturing/industrial	3 percent of the number of vehicle parking spaces
Other	5 percent to 10 percent of the number of vehicle parking spaces

From field observations in Great Falls it appears that few businesses have provided bicycle parking.

4.4.2.3. Policies

Imagine Great Falls 2025 Growth Policy Update

The Growth Policy is an official public document that is intended to guide future social, physical, environmental, and economic growth and development of the City. The updated GP was adopted on August 6, 2013 and is used by the City of Great Falls to guide policies and decisions regarding future growth and development. The transportation and mobility element strives to "*increase mobility and the access of citizens to transportation alternatives throughout the City*".

The Multimodal Mobility element of the GP recognizes a diversity of users on the transportation network in addition to auto drivers. These users include transit riders, residents who no longer drive or are too young to drive, people with disabilities that prevent them from driving, residents who choose not to drive and residents who cannot afford to own or operate a vehicle. The City is working toward implementing more bike, pedestrian and strategic trail projects and connections. These improvements are sought for the health, safety and well-being of all elements of the community, from the elderly to children in strollers. These efforts are ongoing.

Past GP efforts have recognized the benefits of bicycling are not only physical for the user, but also that motor vehicle traffic can potentially be reduced or expensive street improvements may be avoided or delayed. Residents have expressed a desire for more pedestrian and bicycling facilities in the area, which reflects their interest in having more choices in how to travel around the community. The expansion of the River's Edge Trail system is cited as another indicator that Great Falls residents desire more non-motorized infrastructure, especially separated facilities.

Shared roadways (including shared lane markings), bike lanes, paved shoulders, and multi-use paths have all been mentioned in past planning efforts.

Policies or parts of policies in the GP that apply to bicycling and walking include:

- The land use pattern should promote pedestrian-oriented development, address transportation system needs, and enhance opportunities for walking and bicycling, while increasing connectivity and smooth flow of all transportation modes throughout the community
- New development on the urban fringes or in rural areas should give primary consideration to non-motorized circulation and to transit service
- Pedestrian bicycle access to natural features, historic and cultural resources, parks, schools, and other focal points should be improved. The emerging identities of new neighborhoods should include multiple transportation choices
- Air quality can be improved by using non-motorized transportation modes
- New streets should be in compliance with the Great Falls Area Transportation Plan
- Private enterprise should also be encouraged and supported to provide non-motorized transportation choices. On-street bicycle lanes or off-street pedestrian/bicycle paths should connect all neighborhoods
- The movement of traffic to, from, and within downtown should be a prime consideration in planning, designing, and building all roads as well as pedestrian and bicycle infrastructure.
- Pedestrian and bicycle facilities should be linked when planning transportation system improvements and when reviewing land development proposals. New public and private developments should accommodate the bicycle system by providing access to schools, parks, jobs, shopping centers, and transit facilities and should provide users with facilities for safe and direct crossings of Principal and Minor Arterials. Developers should be required to install paths that connect to the bikeway system recommended in the Bikeway Facilities Plan. In some cases, it may be appropriate to relax a requirement, such as for a sidewalk on one side of a residential street in favor of a comparable bicycle path in the development.

Further, strategies and actions regarding new standards and regulations that encourage pedestrian and bicycle-friendly development, traffic calming, bikeway facilities plan updates, a City-County BPAC, provide sufficient resources to construct trails and bikeways in Parks and Rec & the Bikeway Facilities Plans, access to Smelter Hill by bicycle and foot are all encouraged. Most policies, goals, strategies, and plans within the Growth Policy relate in one way or another to non-motorized transportation choices. The universal incorporation of these modes in the GP is encouraging, but action is required to make the vision of the City and its residents a reality.

4.4.3. Bicycling

4.4.3.1. Types of Bikeways

Consistent with bikeway classifications throughout the nation, these Bikeway Design Guidelines identify the following bikeway classes by degree of separation from motor vehicle traffic.

Paved Shoulder Bikeway This type of bicycle facility may be helpful for Cascade County. The AASHTO Guide for the Development of Bicycle Facilities includes this bikeway type especially for application in rural communities in which “adding of improving paved shoulders often can be the best way to accommodate bicyclists”. The paved shoulder also has geometric benefits for motorists, as well, which are described below under ‘Bike Lanes’.	
Shared Roadways Bikeways where bicyclists and cars operate within the same travel lane, either side by side or in single file depending on roadway configuration. The most basic type of bikeway is a signed shared roadway. This facility is used to connect other bikeways (usually bike lanes), or designate preferred routes through high-demand corridors.	
Bicycle Boulevards Shared roadways may also be designated by pavement markings, signage, and other treatments including directional signage, traffic diverters, and/or other traffic calming devices to reduce vehicle speeds or volumes.	
Bike Lanes This type of separated bikeways uses signage and striping to delineate the right-of-way assigned to bicyclists and motorists. Bike lanes encourage predictable movements by both bicyclists and motorists.	
Cycle Tracks Bikeways that combine the user experience of a separate path with the on-street infrastructure of conventional bike lanes.	

Shared Use Paths Bikeways in rights of way separate from roads, and are for the use of bicyclists, pedestrians, and other non-motorized users such as skateboarders and rollerbladers.	
Shared-use Sidewalk Wide sidewalk either attached to the curb or separated by a planting strip. It may be on one or both sides of a street with the intent of accommodating pedestrians and slower moving bicyclists who may not be comfortable sharing the roadway with vehicles.	

Why Separated On-Street Facilities

A national study comparing streets with bike lanes to those without found that 15 percent of bicyclists on streets without bike lanes rode on the sidewalks, versus 3 percent on the streets with bike lanes. In addition, on streets with bike lanes, 81 percent of bicyclists obeyed stop signs, versus 55 percent on streets without[1].

One's chance of injury drops by about 50 percent when riding on a major city street with a bike lane and no parked cars (as opposed to a major city street without bike lanes and with parking)[2].

Separated facilities also provide a buffer for pedestrians by creating more space between sidewalks and moving motor vehicle travel lanes. They also provided a breakdown lane for motorists and a clear recovery zone (for errant vehicles that leave the traveled way to recover into their own lane).

When Bozeman, Montana, installed a greater network of bike lanes, bicycle commuting mode share went from 4.7 percent of commute trips to 6.3 percent of commute trips between 2000 and 2010. Missoula's bicycle commuting mode share also increased to 5.8 percent for similar reasons. Bozeman measured an instantaneous increase in bicycling and walking along West Babcock Street in 2007 of 256 percent when bike lanes and sidewalks were installed.

4.4.3.2. Facilities and Programs

The Great Falls area is fortunate to boast an approximately 47 mile off-street bicycling and walking system along the banks of the Missouri River. The city's first bike lane was installed in Summer 2013. Two signed east-west bike routes exist north of downtown. Sharrow pavement markings are being placed, or will be placed by the Summer of 2014, on 9th St (between 8th Ave N and 2nd Ave N) and 2nd St S (between 10th Ave S and 2nd Ave S). Even with these improvements, a significant opportunity exists to plan and implement a network of bicycle facilities in the Great Falls area.

[1] *"CDD." City of Cambridge, Massachusetts. Web. 5 Aug. 2013.* *http://www.cambridgema.gov/cdd/transportation/design/bicycling/bicyclelanes.aspx*.
[2] *Badger, Emily. "Dedicated Bike Lanes Can Cut Cycling Injuries in Half." The Atlantic Cities. Web. 5 Aug. 2013.* *http://m.theatlanticcities.com/commute/2012/10/dedicated-bike-lanes-can-cut-cycling-injuries-half/3654/*.

River's Edge Trail

According to the River's Edge Trail (RET) website, this 47+ mile trail system "is the result of 20 years of cooperative partnership efforts by the City of Great Falls, Cascade County, Montana Department of Fish, Wildlife & Parks, Montana Department of Transportation, electric utility PPL Montana, a volunteer trail advocacy group Recreational Trails, Inc., and a supportive community. As a result of this work, the River's Edge Trail has grown into a treasured community asset. Since 1990, the trail has grown to more than 47 miles.

River's Edge Trail northwest of Downtown Great Falls.

The RET system is composed of:

- 20.34 miles of paved paths and trails,
- 1.42 miles of a mix of paved and unpaved or natural trails, and,
- 25.32 miles of unpaved or natural trails (primarily used for singletrack mountain bike riding and walking/hiking).

The history of the River's Edge Trail began with a conceptual plan for a riverside recreational trail in Great Falls (as developed by the City-County Planning Board staff in 1989). Dubbed the *Riverfront Recreational Corridor*, the trail was to extend 7 miles from the Broadwater Bay area downstream to Rainbow Falls. The trail, re-named the *River's Edge Trail* following a Name-the-Trail contest in the Great Falls Tribune, captured the interest and support of the community. A volunteer group that advocated local bike trails, also in 1989, as part of the Vision 2000 community planning process, began working with the City to develop the first segments of the trail. That group was formalized as a non-profit 501 c3 corporation named *Recreational Trails, Inc. (RTI).*

River's Edge Trail signage.

Over the last 20 years RTI has continued to work with the City, County, FWP, PPL Montana and many other partners, agencies, groups and individuals to extend and improve the 47+ mile trail. Much of the trail has been constructed on abandoned railroad and road rights-of-way and structures. Miles of new trail connecting these segments have been constructed, as have many new tunnels, underpasses, bridges and trailheads. Volunteers have undertaken an on-going intensive cleanup of riverfront lands that had been littered with debris over the past decades, and have spent thousands of hours on weed control, tree planting, maintenance, and enhancement projects.[3]"

In March 2013, the Great Falls Tribune reported that the River's Edge Trail is the envy of other communities, local and otherwise, with five waterfalls and breathtaking views[4]. In the first public open house and in many meetings with stakeholders for this plan, which were held on June 19, 2013, the

[3] *"History of the Trail." The River's Edge Trail. Web. 5 Aug. 2013. http://thetrail.org/history.html.*
[4] *"Meandering trail is envy of other towns." Great Falls Tribune 24 Mar. 2013. Web. 5 Aug. 2013.*

attractiveness of the trail was a big talking point. Many see it as a central spine of the active transportation system and something that additional infrastructure should tie into, wherever possible.

New signage on the River's Edge Trail, including wayfinding directions and distance to popular destinations and trail featured, was installed in summer 2013. Signage existing prior to this improvement featured standard paper maps of the trail system behind weatherproof glass (see photo). Trailhead markers with the River's Edge Trail logo and restrictions are also near many entrances/exits on the trail.

57th Street North / 2nd Avenue North Bike Lanes

The 57th Street North / 2nd Avenue North bike lanes were installed in June and July 2013 between the 2nd Avenue North gate of Malmstrom Air Force Base on the east, west to the intersection of 57th Street North and 2nd Avenue North, and then north and northwest until 38th Street North and the River's Edge Trail extension. There is no parking along 57th Street North for the entirety of the section with bike lanes. Bike lanes are against the curb. There are also minimal driveways, which may equate to fewer motorists crossing the path of bicyclists than on other residential streets or those with commercial density. The bike lanes were installed to connect the Air Force base population to the River's Edge Trail and to the community at large, among other benefits. Although 'Bike Lane' signs (R3-17, MUTCD) are optional, the City has requested that MDT install them along the route.

57th St N/2nd Ave N bike lanes, installed Summer 2013.

4th Ave N Bike Route

The bike route on 4th Avenue North was the first of Great Falls' signed shared roadways. It is an east-west route north of Downtown between River Drive on the west and 38th St N on the east.

This is a quiet neighborhood street (25 mph speed limit), close to homes and parks. Many of the intersections on 4th Avenue North are uncontrolled (no stop signs or signals) and bicyclists must be vigilant at each intersection and check for cross traffic from perpendicular streets. There is also a problematic link with Gibson Park and the River's Edge Trail on the western terminus of the bike route. Crossing Park Drive North after the bike route ends requires navigating another uncontrolled intersection of 4th Avenue North and a much busier road. MDT was initially hesitant to this improvement because of the lack of receiving infrastructure on the opposite side of the road (e.g. sidewalks, paths, etc.). The signs along 4th Avenue North indicating that it is a bike route are standard D11-1 signs (MUTCD).

Bicyclist riding on the 4th Ave N bike route.

8th Avenue North Bike Route

8th Avenue North is a two-way, two lane "urban route" or collector road. It is 45 ft wide with two 15 ft travel lanes and two 7.5 ft parking lanes. It slopes downhill toward the west and uphill toward the east. Similar to 4th Avenue North, it provides connectivity between Park Drive on the west and 38th Street North on the east. This road is busier than 4th Avenue North, with between 3,000 and 5,000 vehicles each day (depending on the section of the street) but still a 25 mph speed limit (and 20 mph for trucks) and has the same bikeway classification. There is not great connectivity to the River's Edge Trail or to parks on its western terminus. It is one of the most northern continuous east-west streets on the south side of the Missouri River. The signs along 8th Avenue North indicating that it is a bike route are standard D11-1 signs (MUTCD).

4.4.3.3. Bicycle Parking

The existing policies and programs regarding bicycle parking for the City of Great Falls and for Cascade County state that there is not a requirement to provide bicycle parking. The installation of bike racks is currently completely up to the developer or the business owner. There is, however, a credit for vehicle parking spaces if bike parking spaces are also provided (17.36.3.010). The location of proposed bicycle parking spaces is reviewed by City staff and the Design Review Board when development plans are submitted to the City.

Bicycle parking at the Great Falls Public Library.

In Downtown, permission was granted to the Business Improvement District (BID) to place bike racks on sidewalks in the public right of way (ROW). As new bicycle parking has been installed on downtown streets, it has been accepted and utilized by the community. There are, however, no long-term maintenance agreements between the City and the BID or the individual business owners regarding the future upkeep of the existing and any additional racks.

If bike racks are installed independently and on private property, the City does not have any responsibility to maintain them. Their only role is to encourage it and support future growth of bicycle parking.

Although there are many racks at public places like the Great Falls Public Library and in some locations in the BID, there is not a City or area-wide ordinance, initiative, or program to ensure that bicyclists have a place to park their bicycles when arriving at destinations. Without the assurance or predictability of bicycle parking, bicycling use may not be reaching its potential.

4.4.3.4. Maintenance

River's Edge Trail

Maintenance of the River's Edge Trail is shared between the Great Falls Parks and Recreation Department, Recreational Trails, Inc. (RTI), and contracted maintenance crews, with funding for maintenance provided by the former two. Great Falls' Parks and Recreation Department mows the two feet on either side of the trail (because of the trail's nature as a linear park facility), clears snow, cleans and empties toilets and trash cans, and arranges with Cascade County for weed abatement and spraying.

Budget

All other maintenance, including repaving and crack sealing, is completed with a $5,000 budget provided by the City in addition to private funds from RTI, which contracts with private maintenance companies to complete repairs and maintenance. Current available funding is inadequate for annual trail needs. In addition to the annually budgeted $5,000 spent on maintenance, the City spent $4,087 in 2009, $7,822 in 2010, and $10,175 in 2011. The $5,000 represents the capacity to repave less than 100 feet annually for the existing trail system. RTI would like to contribute monetarily to the City of Great Falls so that they can maintain the trail better and in its entirety. The annual documented trail operations and maintenance costs have averaged around $80,000 per year in recent years. This figure, however, does not include staffing costs to manage and administer the Trail, overhead costs of responsible agencies, and costs to purchase, own, and repair mechanical equipment. Adding these costs would bring total annual cost to approximately $100,000 per year, or $4,000 per paved mile, slightly lower than the typical national average maintenance cost per paved mile ($5,000 per year).

The River's Edge Trail Maintenance Plan is in an advanced draft at the time of publication and outlines maintenance costs for current trail and future expansion. The plan seeks to help the trail function well and retain its popularity and utility. The report is a comprehensive look at all amenities available and requiring maintenance along the River's Edge Trail. More than just a strip of asphalt or concrete, the trail includes hundreds of acres of land and vegetation owned and managed by different agencies, bridges, tunnels, underpasses, paint, parking areas, toilets, drinking fountains, fencing and guardrails, bollards, shelters, gazebos, information kiosks, telescopes and binoculars, benches, tables, sculptures, drainage swales, culverts, and crossings. The goal of the maintenance plan is to achieve cost effective maintenance of all these trail components.

- The maintenance plan introduced a GIS based trail map and a trail segment inventory to visually illustrate the trail network, features, and amenities in order to facilitate planning and maintenance activities.
- Some of the recommendations and key elements of the maintenance plan include:
- Continued active pursuit of private donations and governmental funding commitments
- Establishing an overall trail coordinating group to manage interagency maintenance efforts
- Hire a system-wide maintenance planner/coordinator/performer through City Planning, paid for by a combination of City, Planning, State Parks, RTI, and other private and grant funding (job description included in the plan)
- Develop a Maintenance Capital Fund
- Develop a long term capital campaign to raise funds for and complete the process in which asphalt trail is replaced with more durable concrete (replacement priorities are also included)
- Recommended maintenance schedule
- Paved and unpaved maintenance trail maintenance
- Public opinion survey analysis
- Trail inspection forms
- Asphalt treatment guidelines
- Overview and analysis of historical trail maintenance costs

Examining trail maintenance budgets from other cities and counties in the United States will provide some insight into how to best utilize a limited budget and what costs are in areas with similar climate conditions and trail infrastructure. Although there are many variables in maintenance and construction costs (crossings, concrete vs. asphalt vs. natural surfaces, climate, use, etc.), experience from other places may yield ideas and innovation in Great Falls.

- **Milwaukee County, Wisconsin:** Milwaukee County maintains about 130 miles of paved and natural surface trails. The County spends $2,525 per mile to maintain existing asphalt paths and between $24.13 to $154.13 per mile for snow plowing, depending on the trail and surface type, width, and amount of snowfall. Trimming back vegetation and removing storm-damaged material for approximately 16 weeks out of the year costs $150,000. Landscaping on new trails and replacing landscaping on existing trails totals $110,000 while drainage installation, asphalt and washout repair for two weeks of the year costs $20,000.

- **Wisconsin Department of Natural Resources:** On paths and trails within the WDNP's jurisdiction, approximately $2,000 per mile is spent on all maintenance costs combined according to their internal Trail Cost Model.

- **Iowa Department of Transportation:** IDOT builds and maintains trails and paths of a variety of surface types. Total annual maintenance costs are estimated at approximately $1,500 per mile.

- **Rails to Trails Conservancy:** According to the Conservancy's Rail Trail Maintenance & Operation Manual, a minimum of $1,200 per mile for privately owned trails and approximately $2,077 per mile for government-maintained trails is spent on maintenance. This is applicable to Great Falls and the River's Edge Trail because parts of the RET are on former rail right of way[5].

- **Michigan Trails and Greenways Alliance:** In 2007, the Michigan Trails and Greenways Alliance produced a document entitled "Statewide Greenways Maintenance Inventory and Case Studies", which outlines different maintenance costs on different trail type throughout the state[6].

  On unpaved, low-maintenance natural trails with few if any trailheads, MTGA found that costs were much lower than for hard surface trails that run through cities, under roads, and with many trailheads and accesses. On the former type, MTGA estimated maintenance costs at around $221 to $500 per mile. Some snowmobile clubs, where they exist, near the natural surface trails split the costs of maintenance equipment 60/40 with the county and then buy the equipment in earnest over 5 years. They also provide most of the maintenance labor.

  Mid-level trails that require more maintenance than the aforementioned type cost between $984 and $1,453 per mile. These trails include paved, boardwalk, or other hardscaped trail surfaces.

  High maintenance trails, which include hardscaped trails that run near or through cities and densely populated areas that also see high usage (178,000 users per year for the Pere Marquette Trail and 80,000 to 90,000 on the Kal-Haven Trail) have an estimated cost of $2,275 to $3,500 per mile. These costs cover weekly trash removal and toilet maintenance, tree removal, pruning, picnic table cleaning, graffiti removal, and pesticide spraying and invasive species removal.

Street Sweeping

Currently, there is no preferential treatment for streets with designated (separated or otherwise) bikeways. In the case of 8th Ave N (bike route), however, it is on a preferential schedule due to its nature as a snow route and a collector street.

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[5] *"Maintenance." American Trails – National Resource for Trails and Greenways. Web. 5 Aug. 2013. http://www.americantrails.org/resources/ManageMaintain/MilwMaintcost.html,*

[6] *"Statewide Greenways Maintenance Inventory and Case Studies." Michigan Trails and Greenways Alliance. Web. 5 Aug. 2013. http://www.michigantrails.org/blog/wp-content/uploads/statewide-trail-maintenance-survey-final.pdf.*

- **Spring, Summer, and Fall:** In the fair weather seasons in Great Falls, sweeping is done from west to east in the older City core (grid system), and then continues into the surrounding areas (e.g. south of 10th Avenue South, and in the Riverview and Valley View neighborhoods). The Downtown core is on an enhanced schedule that includes 4 AM sweeping so as to take advantage of the lack of motorized traffic and on-street parking (in commercial areas). Sweeping may also be performed as needed after heavy summer storms to clean up impacted areas (fallen branches, leaves, and other debris).

- **Winter:** The City of Great Falls also sweeps in the winter in order to clear debris from the streets. It is done during breaks in the snowfall and preference is give (as mentioned before) to snow routes and arterials and collectors.

- **Montana Department of Transportation (MDT):** MDT sweeps all of the routes over which they have jurisdiction as needed. With the introduction of salt brine as a preventative measure, their sweeping has been cut down considerably. Although most sweeping is for spot improvements, maintenance crews do pay more attention to high usage routes such as 10th Avenue South, 14th / 15th Street, and other major roadways.

On-street Snow Removal

The Great Falls area receives approximately 62 in of snow per year, receiving the most snow in March. The River's Edge Trail is plowed promptly by the Parks and Recreation Department.

4.4.3.5. Law Enforcement

As a matter of priority and utilizing manpower effectively, the Great Falls Police Department does not prioritize enforcement of bicycling laws. Because of a lack of available officers on duty proactive enforcement is not encouraged.

4.4.4. Walking

As stated previously, about 2.7 percent of commute trips to and from work in Great Falls are done on foot, and about 5.5 percent of all trips, regardless of type, are walking trips. Both of these figures are below state and national averages for commute trips and all trips, respectively. Great Falls' older core neighborhoods and grid street system with small blocks lend themselves to walking and non-motorized transportation.

4.4.4.1. Facilities and Programs

Pedestrians use sidewalks, trails, alleys, and bridges in and around Great Falls. Other than maintenance of sidewalks and other pedestrian facilities (either proprietary or shared with other users, like the River's Edge Trail), the City of Great Falls and Cascade County do not currently have any programs dedicated to encouraging walking.

Walking and jogging are very popular on the River's Edge Trail.

The downtown core streets like 1st and 2nd Avenue South have recently seen multiple pedestrian improvements. Bulbouts (or curb extensions) and new street trees and plants have provided simplified and safer street crossings and a more inviting

environment, respectively. Bulbouts also have the ability to calm or slow down traffic. This is important in core commercial areas where walking is more prevalent (even by people who travel by car to get there).

Several non-governmental groups in Great Falls are dedicated to encouraging more active and fit residents, including Recreational Trails, Inc. (discussed previously) and Get Fit Great Falls (GFGF), a group that desires to have a healthier and more active community that is also more economically vibrant and physically active. Get Fit Great Falls is made up of representatives from 20 community organizations and agencies and although it is not officially a non-profit organization, it has been successful in its initial initiatives to encourage more walking and bicycling to Great Falls Voyagers baseball games, overall walkability of the City, and improving the relationship between pedestrians and other roadway users. Bicyclists and pedestrians sharing sidewalks can be dangerous according to GFGF and an improvement on the current situation is another goal of the organization. Focusing also on wheelchair accessibility and safety concerns for disabled users, GFGF has sought to work with the City to close sidewalk gaps and improve ADA access.

4.4.4.2. Sidewalk Maintenance

The presence of sidewalks along streets and in neighborhoods can have a dramatic impact on physical activity levels of residents and the transportation options available to the community. Nationally, 43 percent of people with safe places to walk within 10 minutes of home meet recommended activity levels, whereas only 27 percent of people without safe places to walk meet these activity levels. Residents were found to be 65 percent more likely to walk in a neighborhood with sidewalks[7].

Often the biggest hurdle for communities is coming up with ways to fund sidewalk infill projects. Typically, available funding for sidewalk construction and maintenance in operational budgets is scarce. In many communities this is because sidewalk construction and maintenance is the legal responsibility of the adjacent property owner (in the case of existing development) or the developer (in the case of new development). Local ordinance and subdivision regulations typically govern sidewalk installation and maintenance responsibilities.

Per Montana state law, sidewalk maintenance including tree root heaves, crumbling, etc., is the responsibility of the adjoining property owner(s) and is only enforced by the City (state law does not provide Counties with a mechanism for forcing adjoining property owners to maintain sidewalks). The enforcement process is complaint-driven. After receiving a hazardous sidewalks complaint, a member of the City's Engineering Department staff performs a site inspection to determine if it is, in fact, a condemnable defect. If that is the case, a letter is then issued to the property owner notifying them of the defect and that they will be allowed 30 days for repairs. In 90 percent of cases, according to the City of Great Falls, the owner complies and the defect is remedied. The remaining 10 percent require a condemnation process that continues with the City hiring a contractor to do the repairs and the owner being charged for any labor and materials needed. If the owner does not pay for the repairs after they have been completed, then a lien is placed on the property.

In some cases where the defect is very minor, like small rises (usually less than one inch) in sidewalks sections that turn into "toe stubbers", especially in Downtown, grinding the concrete level has been done. Grinding, however, is limited to very minor offsets and to strong or newer concrete because old or deteriorated concrete tends to shatter.

[7] *"Health | Smart Growth America." Smart Growth America. Web. 6 Aug. 2013.* *http://www.completestreets.org/complete-streets-fundamentals/factsheets/health/.*

In an effort to ward off future maintenance concerns, the City and MDT have replaced and repaired sidewalk as funding has allowed or as part of larger projects. For example, in 2013 MDT replaced some sidewalk along 9th Street North as part of that larger roadway project. Additionally, since 2001 the City has obtained CDBG funding annually to replace defective sidewalk for low-to-moderate income homeowners. This has frequently inspired adjoining homeowners to perform similar repairs on their own volition. Another series of sidewalk replacement projects, funded by City Utilities, replaced sidewalk that sunk over public utilities - usually fire hydrant leads.

As far as expanding the sidewalk network, several MACI funded projects have filled gaps in the system, as well as installing ADA ramps and replacing some defective sidewalk. CTEP and City Street Division funded projects have done the same things, although on a smaller scale. More of these types of projects are being planned for the future. Also, when sites are redeveloped and go before the Design Review Board, City Engineering checks for defective (or missing) sidewalks and makes repair or installation a requirement.

4.4.5. Connectivity to Transit

Trips by transit (in Great Falls' case, by bus) often begin and end on foot or bicycle or both. When connectivity to transit is poor, ridership and ease of use of the system is also 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.

Currently, the Great Falls Transit District (GFTD) bus route network is mostly a flag-down system, but there are plans and programs now in place to include fixed stops and the amenities that go along with them. A completely fixed stop system has been discussed internally at GFTD, but a plan for implementation has not been created yet. The advantages of a fixed stop system, especially for bicyclists and pedestrians, would be, among others, improved predictability of route time tables and scheduling, both for the user and the Transit District.

Overall ridership in the last year has increased and always goes up during the school year.

Bicycling

Nearly all GFTD buses now have bike racks mounted on the front of the bus that allow users to use buses to connect longer legs of a trip, in case of an emergency or breakdown, or to avoid inclement weather or difficult topography. GFTD has not, however, tracked or counted their use to determine demand on certain routes, or where bicyclists board and alight most.

Walking

The GFTD is currently focused heavily on addressing connectivity to newly implemented fixed stops via sidewalks and applicable improvements.

The City's Planning Department expressed interest in seeing GFTD provide a priority analysis on Safe Routes to Schools and sidewalks and their relationship with transit accessibility. According to the City and GFTD, there are transit users with limited mobility who use paratransit and other transit services because there are not sidewalks where they want to go or that access traditional bus stops and not necessarily because they require a paratransit ride.

4.4.6. Non-Motorized Survey

4.4.6.1. Bicycling

A public survey was created as part of this plan in order to collect information about the preferences and key identifiers of different types of people interested in bicycling in the Great Falls area. Of the 298 total respondents to the "Bicycling Survey", 152 of them (52 percent) were women, while 142 (48 percent) were men.

The survey was not statistically valid (because of the reach and response) and was distributed and promoted primarily by stakeholder groups in the transportation planning process and advertised in the newspaper.

Age, Education, and Income

28 percent (the largest group of respondents by age) were between 50 and 59 years old. The respondents were overwhelmingly well educated with over 70 percent of respondents achieving at least a bachelor's degree. There was a fairly even split between income levels among those surveyed, with about 20-25 percent in each level, except for the $0-$24,999 range, which only had 5 percent of the total respondents. The other levels were: $25,000-$49,999; $50,000-$74,999; $75,000-$99,999; and $100,000 and above.

Types of Bicyclists

It is important to consider bicyclists of all skill levels when developing recommendations for a non-motorized network. Bicyclist skill level greatly influences expected speeds and behavior, both in separated bikeways and on shared roadways. Well planned bicycle networks should accommodate as many user types as possible, with decisions for separate or parallel facilities based on providing a comfortable experience for the greatest number of people. The bicycle planning and engineering professions currently use several systems to classify the population, which can assist in understanding the characteristics and infrastructure preferences of different bicyclists. The most conventional framework classifies existing "design cyclists" as *'Experienced and Confident' or 'Casual and Less Confident'*.[8] A more detailed understanding of the US population as a whole was developed and supported by data collected nationally since 2005[9]. This classification provides the following categories to address varying attitudes towards bicycling in the US:

- **Strong and Fearless:** Characterized by bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes and will typically choose roadway connections - even if shared with vehicles - over separate bikeways such as shared use paths.

  Of those surveyed in Great Falls, "Strong and Fearless" male bicyclists made up a significant percentage of respondents and were the second most common type (31 percent of respondents). Fewer women (only 7 percent of respondents) identified themselves in this category.

[8] *Guide for the Development of Bicycle Facilities, 4th Edition. (2012). AASHTO.*
[9] *Four Types of Cyclists. (2009). Roget Geller, City of Portland Bureau of Transportation.* http://www.portlandonline.com/transportation/index.cfm?&a=237507

- **Enthused and Confident:** This user group encompasses bicyclists who are fairly comfortable riding on all types of bikeways but usually choose low traffic streets or shared use paths when available. These bicyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of bicyclists such as commuters, recreationalists, and utilitarian bicyclists.

  The most common type of self-identified male bicyclist in Great Falls was the "Enthused and Confident" type (38.5 percent).

- **Interested but Concerned:** This user type comprises the bulk of the overall population and represents bicyclists who typically only ride on low traffic streets or shared use paths under favorable weather conditions. This category of existing and potential cyclists perceives significant barriers to increased cycling, specifically traffic and other safety issues. These people may become "Enthused & Confident" with encouragement, education and experience.

  Survey respondents constituted a higher percentage of existing bicyclists than the overall population of Great Falls would indicate. 44 percent of the 152 female Great Falls Bicycling survey respondents answered that they were bicyclists or potential bicyclists that were "Interested but Concerned", whereas only 23 percent of the 142 male respondents considered themselves part of this type of bicyclist.

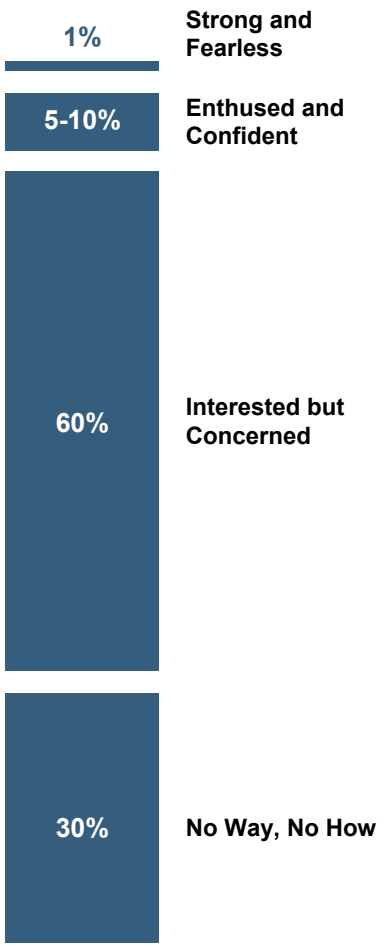


Figure 4.11: Typical Distribution of Bicyclist Types

  Recent developments in bicycle facility planning and design have focused largely on one principle: lowering the perceived level of traffic stress by providing separation from traffic or preferential routes on shared streets with low traffic speeds and volumes. Separation often is typically provided by physical space on the road dedicated to bicyclists such as bike lanes, or protected facilities that go further by providing a physical barrier to automobile traffic. Additionally, bicyclists have also responded well to travelling on local roadways with low volumes of traffic traveling at low speeds. This focus stems from the popularity of national programs such as Rails to Trails, planning research of bicycle-friendly cities in Europe and Canada, and from the common finding that fear is the number one reason people do not bicycle more in the U.S.

- **No Way, No How:** Persons in this category are not bicyclists, and perceive severe safety issues with riding in traffic. Some people in this group may eventually become more regular cyclists with time, improvements to infrastructure and education. A significant portion of these people will not ride a bicycle under any circumstances.

  Nine percent of respondents self-identified within this category.

Preferred Facilities

Survey respondents were given the chance to select which facilities and types of bikeways they preferred or wished to have in their community (on a scale of 1-5, with one being least desirable and five being the most, depending on how much they liked it and how desirable it was). Most of the bikeways types received an average score of 3.5, but shared use paths received a 4.3, which is indicative of the fact that Great Falls residents are familiar with this type of facility (River's Edge Trail). All other facility types ranked nearly the same, which likely indicates unfamiliarity with any on-street bicycle infrastructure, or it could also indicate a general preference for improved bicycle accommodation, regardless of the facility type.

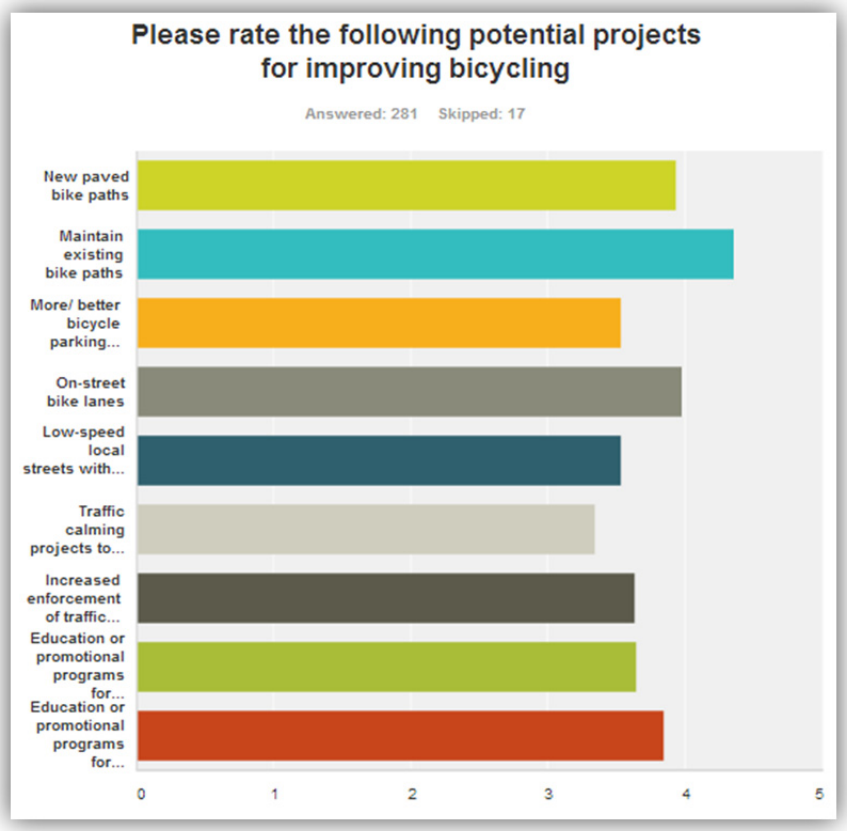


Figure 4.12: Preferred Bicycle Facilities

Destinations

When asked what their normal destinations are in Great Falls, respondents showed that trails, open space, and community spaces are among the most visited. The top 5 destinations among respondents were:

1. River's Edge Trail
2. Downtown Great Falls
3. Gibson Park
4. Giant Springs Interpretive Center
5. Riverfront Parks

Funding

An overwhelming majority of survey respondents believe that local funds should be prioritized and complement existing State or Federal funds in order to provide bicycle facilities. 66 percent said that they would be willing to pay more taxes, pay more in street assessments, or approve a local bond to implement a bicycle network more quickly. The 8 percent (or 25 people) who identified themselves as those who do not and will not ride a bicycle also, for the most part, opposed bicycle infrastructure of any kind and often stated that bicyclists should pay for bike lanes themselves via licensing fees or that federal or state money should be used instead of local money. Only 4 of the 25 said that local money should be used in concert with state and federal funds.

Improving Bicycling

When asked what methods they would prefer in order to improve bicycling in Great Falls, the only option that received a higher score than 4 (on a scale of 1 to 5), was "Maintain existing bike paths". New on-

street bike lanes was second at 4.0, with new paved bike paths at 3.9. All other options were closely clustered, receiving an average score of 3.5, with the lowest being 3.3 ("Traffic calming to slow cars").

4.4.6.2. Walking

A public survey dealing with walking and the preferences of pedestrians in the Great Falls area ran concurrently with the bicycling survey discussed previously. A total of 192 responses from Great Falls area residents were gathered. Of these 192 people surveyed, 116 (61%) of them were women, while 75 (39%) were men.

Age, Education, and Income

The age, education, and income characteristics for this survey were nearly identical to the Bicycling Survey.

Walking Habits

In addition to demographic information, respondents were also asked about their walking habits. About half walk a few times per week, the next most common response was "5+ times per week" with only a cumulative 10 percent of respondents saying that they walk a few times per month or never.

Most respondents walk primarily for exercise and the next reasons are, (in order): spending time outdoors, transportation to a destination, social visits, and walking to school.

An overwhelming amount of people surveys responded that they currently enjoy walking on the River's Edge Trail, with the next most popular responses being "riverfront parks", "Downtown Great Falls", and "grocery stores".

Proximity to Destinations

Nearly 50 percent of respondents say that it only takes one to five minutes to walk to a park or playground, 30 percent have a 6-10 minute walk to a small grocery store, and 35 percent have an 11-20 minute walk to a supermarket. There was an even split of about 18 percent of respondents who lived 21-30 minutes walking from a supermarket, fast food restaurant, pharmacy, or trail or greenway. Only 10 percent of respondents lived within a one to five minute walk from a trail or greenway.

Sidewalk Network

44 percent of the 192 respondents believe that the sidewalk network near their home is complete.

Preference

70 percent of respondents said that they would walk more often if there were more sidewalks, greenway trails, and safe roadway crossings (in that order) according to the preference survey question.

Automobile speed & traffic, lack of sidewalks & trails, and a lack of pedestrian crossings at intersections were the top 3 reasons why people surveyed choose not to walk. Connectivity was also a big draw for respondents who said that they would like to see more pedestrian connectivity between neighborhood,

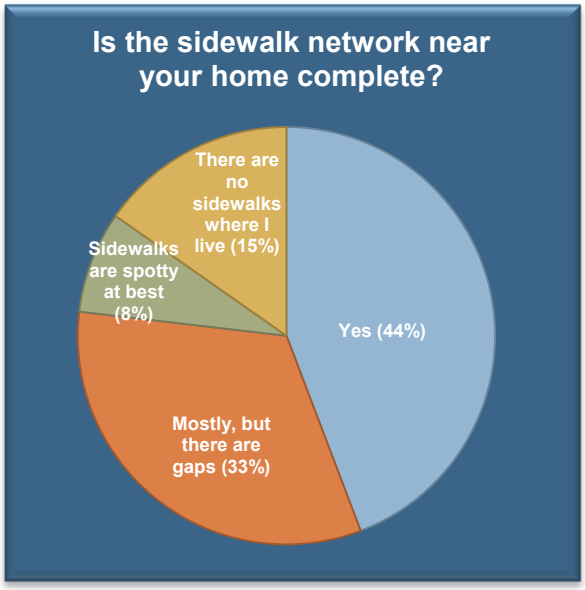


Figure 4.13: Sidewalk Network Survey Results

shopping centers, park, and other destinations more than any other improvement. Marked crosswalks and sidewalks rounded out the top three.

10th Avenue South and Fox Farm Rd were noted repeatedly in open-ended questions that asked for additional thoughts on locations or corridors that could be improved for pedestrians. Respondents cited these as routes and barriers that were difficult to use and were unattractive as a pedestrian.

4.4.7. Linear Barriers

Great Falls has multiple linear barriers that present challenges for bicycling and walking. Some barriers that survey respondents commonly cited as major obstacles to a safe and cohesive bicycling and walking network were 10th Avenue South, the Missouri River (at multiple points), River Drive, and Fox Farm Road. The following is a short summary of the major barrier connection priorities and opportunities for the Great Falls area.

10th Avenue South

Nearly every bicycling and walking survey respondent mentioned 10th Avenue South when asked to identify problem areas or barriers to walking or bicycling. They cited high speeds, uncomfortable crossing opportunities, distance between pedestrian crossings, and inattentive right turning motorists.

Missouri River

Of the four major bridges over the Missouri that are open to automobile traffic, three have non-motorized accommodations on or adjacent to them. Two additional crossings not open to automobiles, bicyclists, or pedestrians are, the decommissioned 10th Street Bridge and the railroad crossing at approximately 3rd Avenue South. Existing bridges with bicycling and walking facilities are: 10th Avenue South, 1st Avenue North and 9th Street North. The bridge without bicycling and walking facilities is 15th Street North.

Observations regarding bridges that were gleaned from survey respondents, public workshop attendees, and field work indicate that the facilities surrounding and connecting to and from these bridges are in some cases incomplete while accommodation on the bridge itself was not a barrier. Improving connections to and from bridges will make them more attractive and useful for all users.

River Drive

River Drive is a truck route with high traffic volumes on the south and east bank of the Missouri River. Crossing or travelling along River Drive is difficult for pedestrians and bicyclists because of a lack of facilities. Between 10th Avenue South and the 9th Street Bridge, the River's Edge Trail acts as a viable alternative to River Drive.

4.4.8. Crashes

Analysis of bicycle and pedestrian collision data provides a basis for infrastructure and programmatic recommendations that can improve safety of bicyclists and pedestrians. Crash data in Great Falls includes many details that help create an informed and complete analysis, including speed limit, involvement of alcohol, time of day, date, day of the week, weather conditions, road surface conditions, and severity. While collision data are sometimes incomplete and does not capture the safety performance of trails nor the frequency of "near misses", unreported crashes, and other potentially harmful or negative interactions between roadway users, it does provide a general sense of the safety issues facing bicyclists and pedestrians in Great Falls.

Bicycling Crashes

Nationwide, bicyclists are typically at fault in the majority of crashes where dedicated bicycle infrastructure does not exist. This is often due to erratic and unsafe riding behavior including riding on the wrong side of the road, riding on sidewalks, and disobeying traffic control devices. Dedicated bicycling infrastructure such as bike lanes has been shown to improve behavior by providing designated road space and directional cues.

For the period of January 1, 2008 through December 2010, there were a total of 48 crashes involving bicycles in the City of Great Falls. Three of the 48 were between bicyclists and pedestrians; the remaining 45 were motor vehicle-bicycle crashes. Three of the 45 motor vehicle-bicycle crashes were alcohol-related; none of the bicyclist-pedestrian crashes were alcohol-related. 37 of the 48 total crashes (77 percent) occurred at intersections, driveways, roadway access points, or other junctions. Two of the 48 occurred during inclement weather, two at dusk, and five at night. There have been no fatal crashes involving a bicyclist recorded in the Great Falls area between the above mentioned time period.

When crash data is visualized, concentrations of crashes occur near major arterials, state, and U.S. routes such as 10th Avenue South, 9th Street, and Central Ave.

Pedestrian Crashes

There have been 88 total pedestrian-related crashes recorded between January 1, 2008 and December 2012 in the City of Great Falls. Seven crashes were alcohol-related, with two of these seven fatal. 48 of the 88 total were at intersections, driveways, roadway access points, or were otherwise intersection-related. Three occurred during inclement weather, three were during dusk, and 28 at night.

Similar to bicycle-related crashes, there is a concentration of pedestrian crashes on or near major arterial roadways, state and U.S. routes (e.g. 10th Avenue South between 13th Street South and 26th Street South; 9th Street; 15th Street; and in the Downtown core).

All three fatal crashes occurred between midnight and 8:00 AM. In these crashes, at least one pedestrian was killed while none of the motorists were killed.

High Frequency Collision Locations

Identifying corridors, intersections, or specific points where collision occur at a higher frequency than others may help create a case for improving infrastructure and programs at these locations and throughout the Great Falls area.

Bicyclist-motorist collisions are concentrated in the following areas or along the following corridors, ranked by number of collisions between January 1, 2008 and December 2010 (out of 48 total crashes):

- Downtown (generally bound by 5th Avenue North on the north, 5th Avenue South on the south, 15th Street on the east, and the Missouri River on the west) – **14 collisions**
- 10th Avenue South – **10 collisions**
- 9th Street – **5 collisions**

Pedestrian-motorist collisions are concentrated in the following areas or along the following corridors, ranked by number of collisions between January 1, 2008 and December 2012 (out of 88 total crashes):

- Downtown (generally bound by 5th Avenue North on the north, 5th Avenue South on the south, 15th Street on the east, and the Missouri River on the west) – **21 collisions (including one fatal collision)**

- 10th Avenue South – **10 collisions (including one collision that caused multiple fatalities)**
- 1st Avenue North– **8 collisions**
- Central Avenue (east side of Missouri River) – **5 collisions**
- 9th Street – **5 collisions**
- 15th Street – **5 collisions**

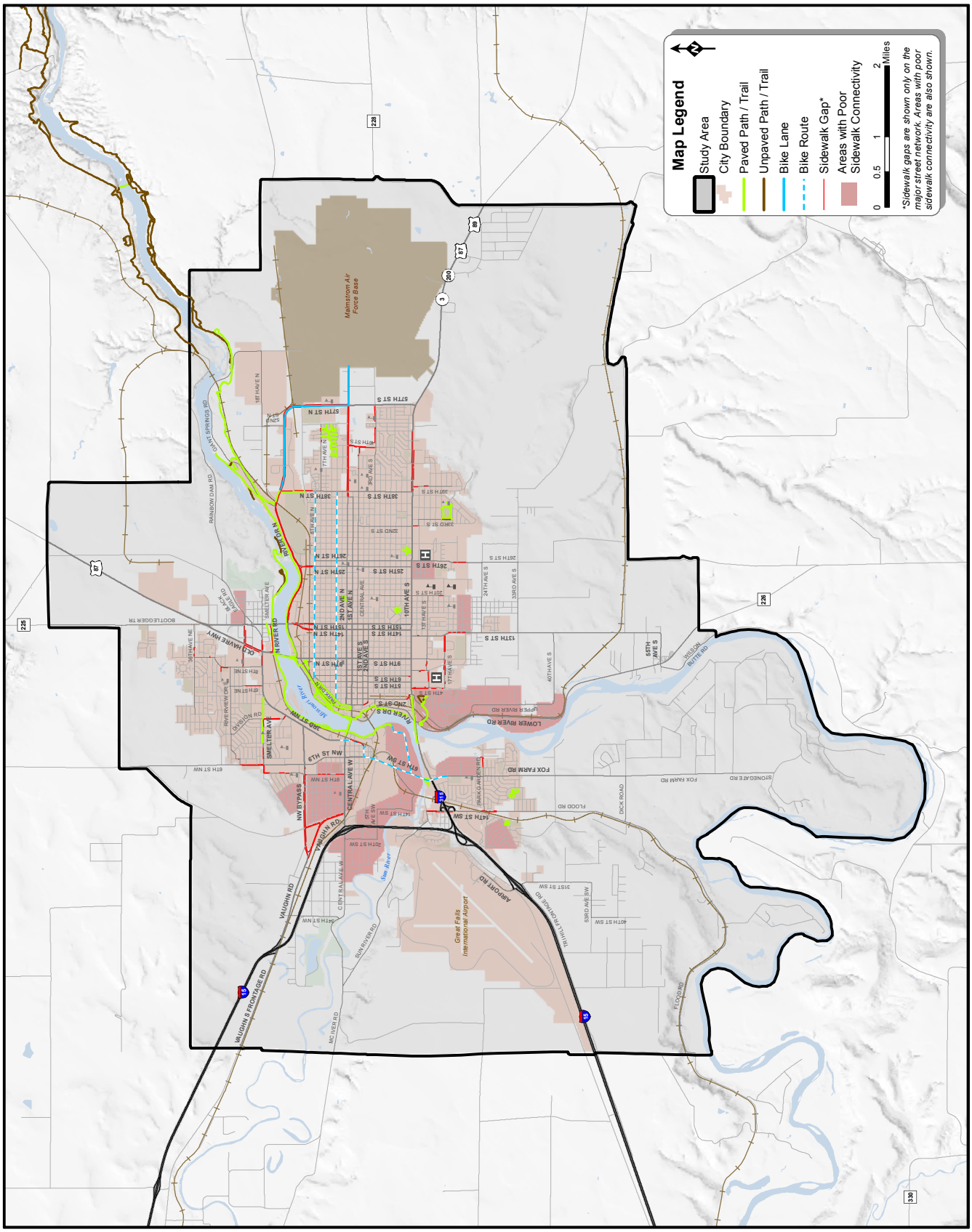


Figure 4.14: Existing Non-Motorized Network

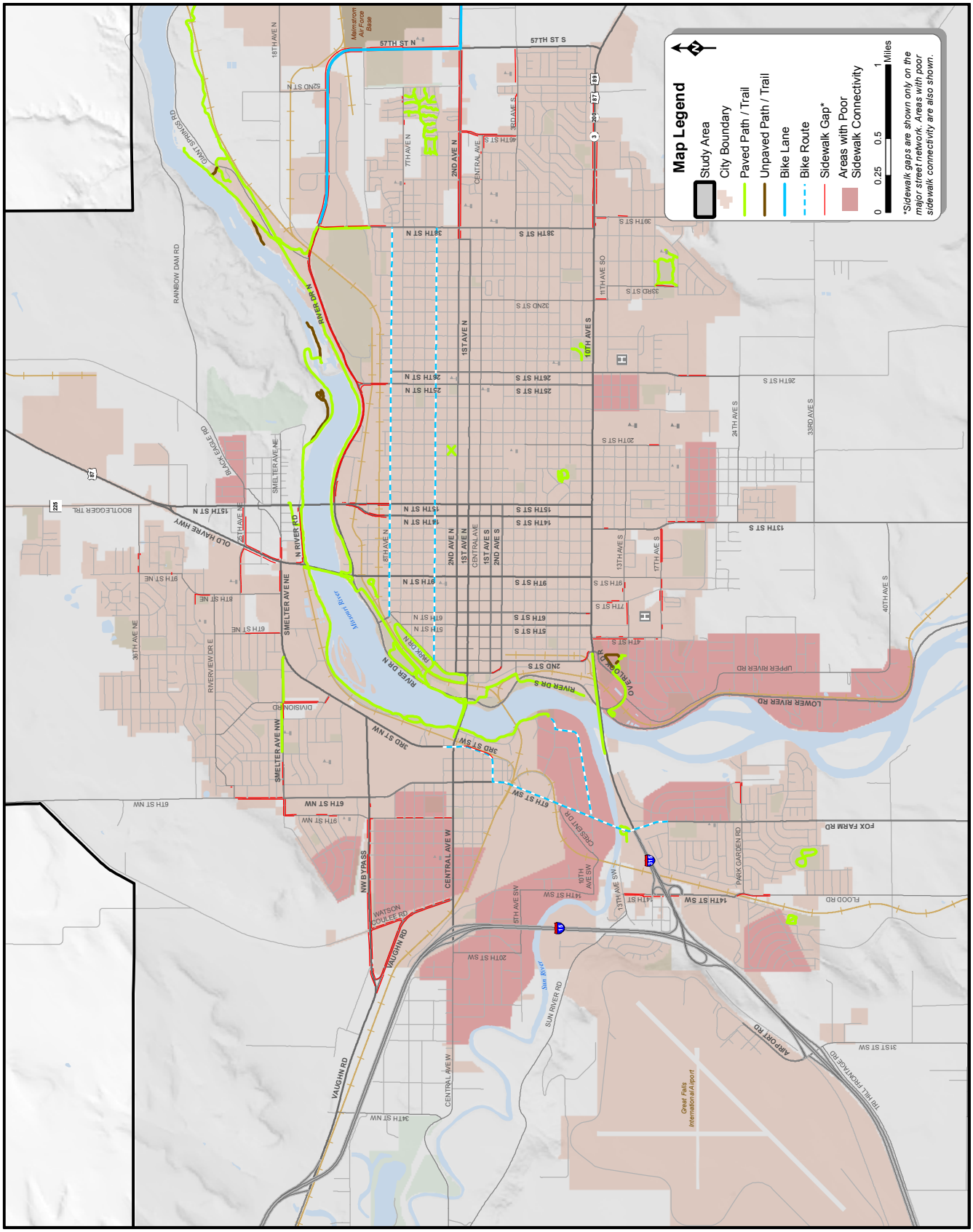


Figure 4.15: Existing Non-Motorized Network (Detail)

4.5. TRANSIT

The history of the existing public transit system in Great Falls goes back to 1978 when, by voter referendum, the establishment of a Transit District was approved. The purpose of the Transit District is to provide an alternative form of transportation to city and county residents in the Great Falls area. Passenger service started in February, 1982. Funding for the district is provided by a combination of fare collections, property tax revenue, and Federal funds. MDT administers some funds (such as Section 5339 dollars), but the majority of Federal funds are administered directly to GFTD from FTA, as Great Falls Transit is a direct recipient of Section 5307 monies.

Since the creation of the Great Falls Transit District, a variety of studies and plans have been created to assist the District with operations, and specific measures to improve financial sustainability and customer needs were identified. Recently, a comprehensive *Transit Development Plan (TDP)* was completed by LSC Consultants (dated October 9, 2010). Much of the existing and proposed information presented herein relies heavily on the TDP.

4.5.1. EXISTING TRANSIT SYSTEM

Routes and Operations

Currently, the Great Falls Transit District operates seven regular fixed routes. The fixed routes operate from roughly 6:30 AM to 6:30 PM on weekdays and from 9:30 AM to 5:30 PM on Saturday. 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). This allows for extensive coverage during both school hour and commuter business hour travel times. Saturday service is hourly on every line. There is no transit service provided on Sundays.

The seven lines radiate from a timed-transfer point downtown at 1st Avenue South and 4th Street (referred to as the Downtown Timed Transfer Hub). Lines one thru four also make a timed connection at 57th Street South and 3rd Avenue South (called the East End Timed Transfer Hub).

A short description of the seven transit routes, along with their primary service market and basic ridership characteristics, is contained below. The seven routes are also shown graphically on **Figure 4.16**. **Table 4.6** shows the most recent daily boardings by route available from the TDP, reflecting year 2010 daily boarding data. The intent in showing the daily boarding information is to depict comparative percentages of the seven routes. It is noted the data is a snapshot in time and may be subject to change.

- **Route 1 (Southeast):** this route serves various medical facilities, shopping destinations, lower and higher educational facilities, and residential areas. The presence of all these components makes Route 1 one of the strongest lines in the Great Falls system. Route 1 achieves this performance despite being very slow and circuitous. This route snakes its way through the area on minor streets, rather than running straight along an east – west roadway route. Route 1 gets relatively strong ridership all day, without a significantly strong morning or evening peak.

- **Route 2 (Central):** this route serves Central Avenue from the Central Business District (CBD) to 44th Street, then turns south and east along 3rd Avenue South to the East End Timed Transfer Hub. Route 2 serves numerous public and private schools, some commercial areas, and extensive residential areas. This route has an average demand when compared to other routes, and primarily serves the schools on Central Avenue. Route 2 is comparatively consistent in its

productivity throughout its entire length, with boardings occurring along the entire route, with primary focus centered around the various adjacent schools.

- **Route 3 (Northcentral):** this route primarily runs along 8th Avenue North and has consistently low ridership when compared to the boardings of Routes 1 and 2. Route 3 runs adjacent to residential areas, a few small commercial centers, and services the Malmstrom Air Force Base. Ridership is generally low along the entire route, with the exception of each end. Route 3 is the only line that has a significant morning and evening peak at typical work-commute hours, with virtually no school hour peak.

- **Route 4: (Southcentral):** Route 4 has its highest boarding counts between the CBD and 20th Street South. Daily activity is strongest in the early morning and mid-afternoon. These times correspond with school arrivals and releases. Additionally, there is a slight peak in the late evening, including some commuter traffic. However as a whole this route has the lowest boardings of all routes.

- **Route 5 (Northwest):** Route 5 has high boardings around CM Russell High School, and in the older west side neighborhood around 3rd Avenue Northwest and 14th Street Northwest. Except for these two areas, each end of the route and Central Avenue West are the only areas of any significant activity. Ridership peaks in the early morning and in the mid-afternoon, corresponding to the beginning and end of school. A transfer site is located at 23rd Avenue NW and Division Road that allows transferring between Route 5 and Route 6.

- **Route 6 (Northeast):** Ridership on Route 6 occurs primarily at a few locations: the transit center, North Middle School, Skyline School, and Wal-Mart. There are also a number of boardings around the node of commercial land uses at the intersection of 10th Avenue North and 14th Street North, which includes the Women's Transition Center. Other than these points, the route has few boardings on the rest of its length. Daily activity on Route 6 is greatest in the morning and in the mid-afternoon, corresponding with school hours.

- **Route 7 (Southwest):** This line provides service to the Marketplace Shopping Center on 14th Street Southwest, via Fox Farm and Park Garden Roads. As development has increased in these areas, the route has grown over the past decade, and now realizes boardings on par with other routes, on average.

Table 4.6: Transit Daily Boardings by Route (2010)

Route	Boardings	Percent
1 - Southeast	275	26.9%
2 - Central	104	10.2%
3 - Northcentral	116	11.3%
4 - Southcentral	99	9.7%
5 - Northwest	120	11.7%
6 - Northeast	183	17.9%
7 -Southwest	126	12.3%
TOTAL	1,023	

Source: Great Falls Transit Development Plan, LSC Consultants (October 9, 2010)

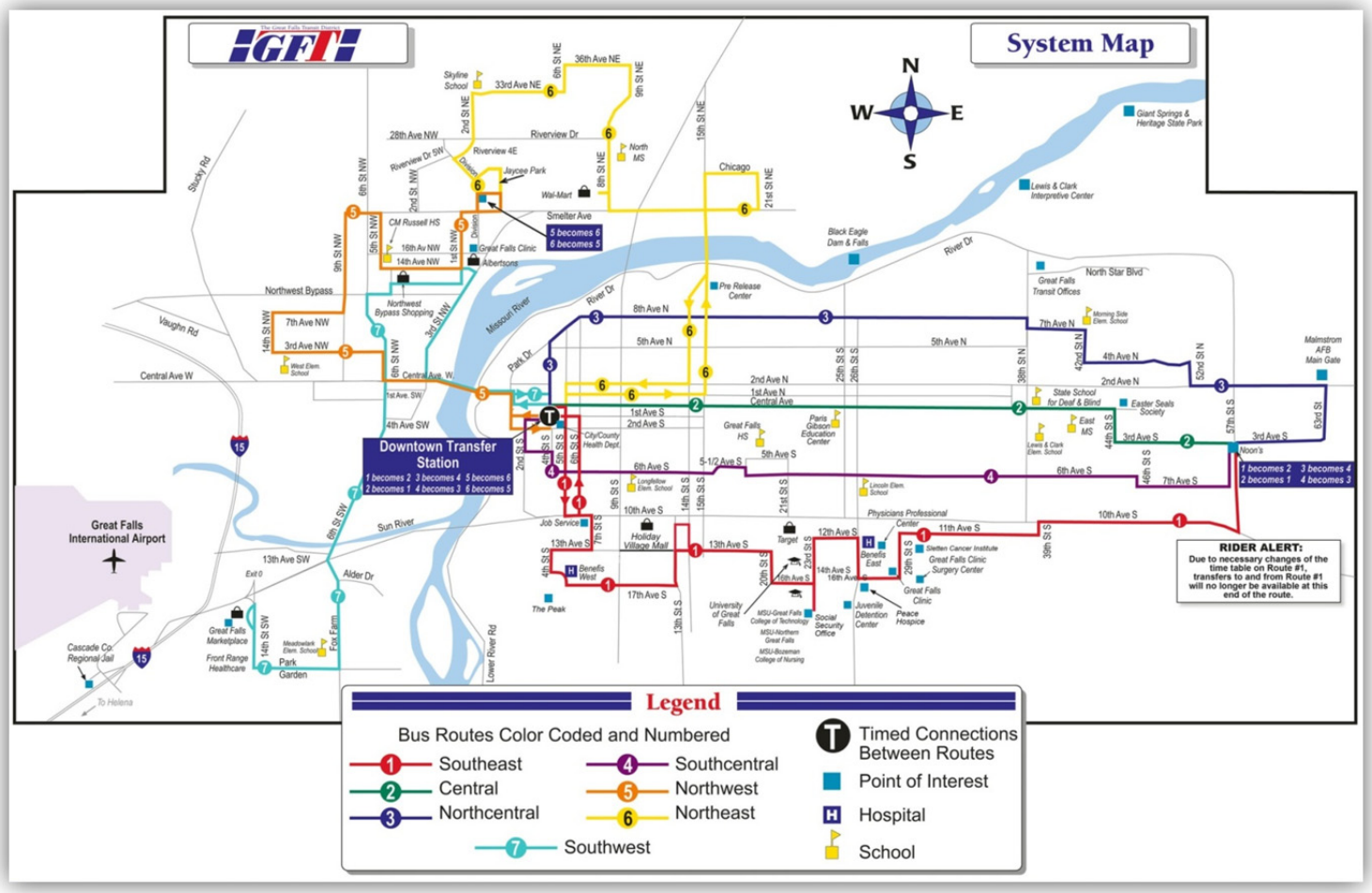


Figure 4.16: Existing Transit System Route Map

The current transit rate schedule is shown in **Table 4.7**.

Table 4.7: Transit Rate Schedule (2013)

Fare / Pass	Current Rate
Fare	
Adult	$1.00
Student (Full-time with ID)	$0.75
Senior Citizen (60 yrs or older)	$0.50
Disabled (with I.D.)	$0.50
Children (5 yrs and Under)	FREE
Transfers	FREE
Paratransit Service Clients (with I.D.)	FREE
Pass	
Regular Punch Pass	$10.00
Student Punch Pass	$10.00

Fare / Pass	Current Rate
Senior Citizen Punch Pass	$10.00
People with Disabilities Punch Pass	$10.00
Regular Monthly	$30.00
Student Monthly	$25.00
Monthly Pass for Seniors and People with Disabilities	$21.00
Day Pass	$4.00

Source: http://www.gftransit.com/fares_&_passes.htm (accessed August 23, 2013)

Vehicle Inventory

The current inventory of buses that GFTD owns, for both fixed-route and paratransit service, are listed in **Table 4-8** and **Table 4-9**. These tables provide details about the buses including the model year and vehicle type. As seen in the tables, there are currently 21 fixed-route vehicles and nine paratransit vehicles. The majority of the fixed-route vehicles are manufactured by Gillig and are between 29 and 35 feet in length. These buses are primarily low-floor models, which make it easier for passengers to board and exit the vehicle as they are closer to the ground. Seven of the buses are 19 years old and have exceeded their useful life and another four are 11 years old. There are two different types of paratransit vehicles. Great Falls Transit District currently operates four Chevrolet vans and five Dodge vans.

Table 4.8: Transit Fixed-Route Vehicles (Existing Fleet)

Unit Number	Model Year	Vehicle Type	Length (in feet)
9102	1991	GILLIG Phantom	35
9104	1991	GILLIG Phantom	35
9106	1991	GILLIG Phantom	35
9110	1991	GILLIG Phantom	35
9111	1991	GILLIG Phantom	35
9112	1991	GILLIG Phantom	35
9113	1991	GILLIG Phantom	35
9114	1999	Blue Bird	25
9915	1999	Blue Bird	25
9916	1999	Blue Bird	25
9917	1999	Blue Bird	25
318	2003	GILLIG Low Floor	35
319	2003	GILLIG Low Floor	35
320	2003	GILLIG Low Floor	35
321	2003	GILLIG Low Floor	35
922	2009	GILLIG Low Floor	29
923	2009	GILLIG Low Floor	29
1024	2010	GILLIG Low Floor	29
1025	2010	GILLIG Low Floor	29
1026	2010	GILLIG Low Floor	29
1027	2010	GILLIG Low Floor	29

Source: Great Falls Transit Development Plan, LSC Consultants (October 9, 2010)

Table 4.9: Paratransit Vehicles (Existing Fleet)

Unit Number	Model Year	Vehicle Type
P-07	2005	Chevrolet Entervan
P-08	2005	Chevrolet Entervan
P-09	2005	Chevrolet Entervan
P-10	2005	Chevrolet Entervan
P-11	2010	Dodge Grand Caravan
P-12	2010	Dodge Grand Caravan
P-13	2010	Dodge Grand Caravan
P-14	2010	Dodge Grand Caravan
P-15	2010	Dodge Grand Caravan

Source: Great Falls Transit Development Plan, LSC Consultants (October 9, 2010)

Annual Ridership Trends

Table 4.10 provides a monthly analysis of ridership for the five-year period between FY2009 and FY2013. March had the highest average ridership over the five-year period, with an average of 38,660 passengers. The chart shows the seasonal variation in ridership, with more passenger trips in the winter than in the summer months. The data allows for averages to be tabulated by month to show seasonal variation. The data show that March is historically the best month for ridership, with July being the lowest. The difference between these months based on the five-year average is 11,104 passengers, a significant disparity. FY2010 realized the lowest annual ridership total of 355,744 passengers. This value is the lowest recorded yearly total since FY82. FY2013 saw the highest total in the five year period of 440,944 passengers. Of note is that the highest annual ridership ever was recorded in FY01 and amounted to 556,761 passengers. During the early 1990s, ridership was stable but relatively low. Ridership began to increase through the late 1990s before tapering off in the early 2000s. There has been a decreasing trend in ridership since 2003. Fixed route ridership models completed as part of the *TDP Update* suggest ridership will remain relatively stable and not grow over the foreseeable future.

Table 4.10: Fixed-Route Monthly Ridership (FY09 – FY13)

Month	FY2009	FY2010	FY2011	FY2012	FY2013	Average
July	31,061	26,364	25,466	24,261	30,630	27,556
August	27,145	25,890	28,231	31,717	35,168	29,630
September	32,729	30,979	31,993	32,815	32,420	32,187
October	35,090	29,655	32,242	32,182	36,860	33,206
November	27,269	27,530	31,447	33,048	36,203	31,099
December	32,864	30,595	33,884	31,793	36,624	33,152
January	34,094	30,574	37,149	36,580	39,664	35,612
February	31,843	31,752	36,819	36,924	36,813	34,830
March	35,291	35,541	44,363	38,551	39,556	38,660
April	33,127	31,477	38,447	33,989	41,311	35,670
May	30,737	27,588	34,961	34,656	39,556	33,500
June	30,130	27,799	33,140	31,890	36,139	31,820
TOTAL	**381,380**	**355,744**	**408,142**	**398,406**	**440,944**	**396,923**

Source: Great Falls Transit District (08/21/2013)

4.5.2. Existing Transit Goals

One of the immediate goals of the Great Falls Transit District will be to work towards implementation of the service design changes recommended in the current *Transit Development Plan*. Local governments should continue to support the Transit District to the greatest extent possible. In some cases, this may be in the form of requirements that a new development provide some sort of infrastructure compatible with transit facility usage. It may also mean expansion of Transit District boundaries as development occurs around the perimeter of the community. The mission of the Great Falls Transit District as articulated in their current TDP is as follows:

> *"The mission of the Great Falls Transit District is to provide a safe, reliable, affordable, and fiscally sound transportation system for the people of Great Falls and Black Eagle, Montana."*

The five basic goals and corresponding objectives that govern the day-to-day operation of the system, and which were presented in previous study efforts, are noted as follows. Note that the various objectives can be considered opportunities, as well as constraints. As an example, an objective related to smaller, more fuel efficient vehicles to reduce the carbon footprint of the entire transit system is an opportunity to better the environment, however it is also a constraint due to the limited funding mechanisms available to Great Falls Transit:

GOAL #1: Maintain the existing ridership base while attracting new riders;

- Objective 1.a: Serve high schools and middle schools; government buildings; nursing homes; and low-income, minority, and non-English-speaking population areas.
- Objective 1.b: Maintain the existing level of ridership by continuing to serve the elderly, people with disabilities, low-income, minority, and non-English-speaking individuals as well as those that cannot drive or cannot afford a vehicle.
- Objective 1.c: Operate 30-minute frequency service during peak periods on all routes. All routes should have a minimum frequency of 60 minutes during off-peak periods.
- Objective 1.d: Develop a strategy to get new riders to use the system through a combination of marketing and providing more efficient services.
- Objective 1.e: Provide better amenities at bus stops to enhance the rider experience and provide an environment that is more user-friendly and attractive to new users.

GOAL #2: Continue to enhance the environmental sustainability of the transit system;

- Objective 2.a: Use smaller vehicles, more fuel efficient vehicles, and alternative energy vehicles to reduce the carbon footprint of the entire transit system.
- Objective 2.b: Pursue federal funding through all available programs to help offset the cost of new alternative fuel vehicles.

GOAL #3: Provide high quality, customer-oriented service;

- Objective 3.a: Distribute a rider survey once a year to obtain input from system users on the adequacy of Great Falls Transit services and any unmet needs.
- Objective 3.b: Operate fixed routes with a 95 percent on-time rate as defined by never leaving a scheduled stop early and being no later than five minutes behind the scheduled arrival time at each stop along the route.
- Objective 3.c: Operate the paratransit service within 15 minutes (plus or minus) of the scheduled arrival time.
- Objective 3.d: Provide transit service until at least 7:00 p.m. for all routes to ensure that commuters can use the service for work trips.

- Objective 3.e: Implement Intelligent Transportation System (ITS) applications to monitor system performance and provide real-time information to users.

GOAL #4: Provide efficient, effective, and safe services; and

- Objective 4.a: Operate the route service at an average productivity of 13 passengers per service-hour, with routes maintaining a productivity of at least eight passengers per service-hour, and routes that do not meet the minimum standards reviewed annually for service changes.
- Objective 4.b: Operate the paratransit service to have an average productivity of 2.5 passengers per hour.
- Objective 4.c: Coordinate transportation services with the other transportation providers in the area in order to meet regional needs.
- Objective 4.d: Provide service to 85 percent of the population in the areas with the greatest transit needs.
- Objective 4.e: Ensure operations have fewer than 2.5 preventable accidents per 100,000 vehicle-miles.

GOAL #5: Promote the transit service.

- Objective 5.a: Use every opportunity to promote transit service including, but not limited to, the following ideas:
    1. Provide a listing in the regional telephone directory.
    2. Display the telephone number for rides prominently on fleet vehicles.
    3. Provide information on the Great Falls city website.
    4. Post flyers with the telephone number for rides and the hours of operation at various locations in the service area including retail centers, medical facilities, and motels.
    5. Place regular public service announcements in the newspaper, on radio, and on television.
    6. Offer reduced fares to attract ridership during slower times of the day, week, or year.
    7. Run periodic special promotions, such as holiday season fares for shoppers, promotions for the university and colleges, and free ride days.
- Objective 5.b: Develop a public education program on the benefits of transit services and the need to maintain/improve the overall transportation system in Great Falls.
- Objective 5.c: Work with local employers to promote the use of the transit system, especially for employers that are expected to bring in employees from outside of the area.

4.5.3. Recent and Planned Committed Improvements

The approved Great Falls 2011 – 2015 (TIP) was reviewed for a listing of recent and planned projects, with funding sources identified and committed. Part II of the TIP contains project priorities, and a series of tables portrays various Federal, State, Local and Other funding agency projects. These tables were reviewed to identify any transit related obligated improvements. The bulleted list below summarizes these findings:

- Purchase four (4) buses - Montana Air Congestion Initiative (MACI) funding (2011)

This capital expenditure was made and the four buses were purchased. GFT plans for the replacement of at least four vehicles every four years, as funding allows. Accordingly, major bus purchases to coincide with the four-year cycle are tentatively slated for year 2015, 2019, 2023, 2027, 2031 and 2035.

4.5.4. Paratransit Operations

There are a number of paratransit operators that provide an alternative transit mode of travel to system users in the community. First and foremost is the paratransit known as the "Access Transportation Service", which is the ADA paratransit service provided by Great Falls Transit. The service is restricted to eligible registrants based on a functional assessment administered by the Great Falls Transit staff.

In addition, there are several retirement developments that provide service to residents of the various retirement facilities. Some of the facilities that are served by Aging Services are the Lodge, Cambridge Court, Cambridge Place, and Rainbow Retirement Center.

4.5.5. Other Transit Considerations

This section of the transit summary and considerations presents planning level guidance on bus stop placement and shelter design parameters. Great Falls Transit currently uses a flag stop system for their fixed-route service. Buses will stop at any safe location along a route, preferably near an intersection. While this service provides a great deal of flexibility for the rider, it can be confusing for new or infrequent users to determine where a potential stop may be. The amount of current ridership being experienced by Great Falls Transit is conducive to creating fixed stops for service. The creation of fixed stops will allow users to board at convenient locations, if they are placed properly.

The addition of fixed stops will allow Great Falls Transit to have greater visibility to the passenger. Knowing that standing at a designated location will result in a transit vehicle passing by provides reassurance to riders, especially those that may be unfamiliar with the system. This may also reduce some of the confusion that is associated with benches currently located throughout the city that are not affiliated with Great Falls Transit.

Bus stops should be placed at least every 1,000 feet, which equates to roughly each two blocks. Boarding and alighting data can be used to help determine the best potential locations for stops. All attempts should be made to place bus stop signs in the most accessible locations for passengers.

In addition to including fixed bus stops, shelters should be placed at the locations with the highest amount of activity. Great Falls Transit currently provides shelters at a few locations that denote transit stops. Placing shelters at popular boarding locations such as Benefis West, Benefis East, Westwood Shopping Center, and Walmart gives passengers better protection from the elements and once again provides Great Falls Transit with greater visibility.

Bus Stop Placement

During the development of this LRTP the desire was expressed to provide general guidance on bus stop placement, potential configurations, and overall advantages or disadvantages of curb side bus stop locations. Bus stop placement is an important factor to achieving the best performing transit system possible. Below is a list of factors that should be taken into consideration when deciding on where to locate bus stops.

- Spacing along the route
- Location of passenger traffic generators
- Operational effectiveness
- Safety
- Access to the stop including pathways leading to and from the stop
- Right-of-way

- Curb clearance

Table 4.11 gives a list of advantages and disadvantages for the location of the bus stop at intersections. **Figure 4.17**, **4.18** and **4.19** shows the minimum recommended distances required for a bus stop based on the location relative to the intersection. These minimum recommended distances assume that either a 40-foot bus, or a 60-foot articulated bus, is being used. For Great Falls, the 40-foot bus would be considered the appropriate design vehicle.

Table 4.11: Bus Stop Placement Advantages and Disadvantages

Bus Stop Location	Advantages	Disadvantages	Recommended When the Following Location Conditions Exist
NEARSIDE: Located immediately before an intersection	• Less potential conflict with traffic turning onto the bus route street from a side street. • The bus boarding door is close to the crosswalk. • Bus has intersection to merge into traffic. • Bus driver can see oncoming buses with transfer passengers.	• Potential conflicts with right turning traffic due to cars cutting in front of the bus. • The stopped bus obscures the sight distance of drivers and pedestrians entering from the right. • The stopped bus may block visibility of the stop signs or traffic signals. • At signalized intersections, may result in schedule delays.	• When traffic is heavier on the farside than on the approaching side of the intersection. • When pedestrian access and existing landing area conditions on the nearside are better than on the farside. • When street crossings and other pedestrian movements are safer when the bus stops on the nearside than the farside. • When the bus route goes straight through the intersection. • When adequate sight distance can be achieved at the intersection.
FARSIDE: Located immediately after an intersection	• Does not conflict with vehicles turning right. • Appropriate after the route has made a turn. • The stopped bus does not obscure sight distance to the left for vehicles entering or crossing from the side street. • At signalized intersections, buses can more easily re-enter traffic. • The stopped bus does not obscure traffic control devices or pedestrian movements at the intersection.	• The stopped bus obscures the sight distance to the right of drivers entering from the cross street to the right of the bus. • If the bus stopping area is of inadequate length, the rear of the stopped bus will block the cross street (especially an issue for stops where more than one bus may be stopped at a time). • If the bus stops in the travel lane, it may result in queued traffic behind it blocking the intersection.	• When traffic is heavier on the nearside than on the farside of the intersection. • At intersections where heavy left or right turns occur. • When pedestrian access and existing landing area conditions on the farside are better than on the nearside. • At intersections where traffic conditions and signal patterns may cause delays • At intersections with transit signal priority treatments.
MID-BLOCK: Located 300 feet or more beyond or before an intersection	• The stopped bus does not obstruct sight distances at an intersection. • May be closer to major activity centers than the nearest intersection. • Less conflicts between waiting and walking pedestrians.	• Requires most curb clearance of the three options (unless a mid-block sidewalk extension or bus bulb is built). • Encourages mid-block jaywalking. • May increase customer walking distances if the trip generator is close to an intersection. Length of mid-block stops can vary due to depth of a turn-out and a bus' ability to maneuver in/out of traffic lanes.	• When traffic or street/sidewalk conditions at the intersection are not conducive to a near-side or far-side stop. • When the passenger traffic generator is located in the middle of a long block. • When the interval between adjacent stops exceeds stop spacing standards for the area. • When a mid-block stop is compatible with a corridor or district plan.

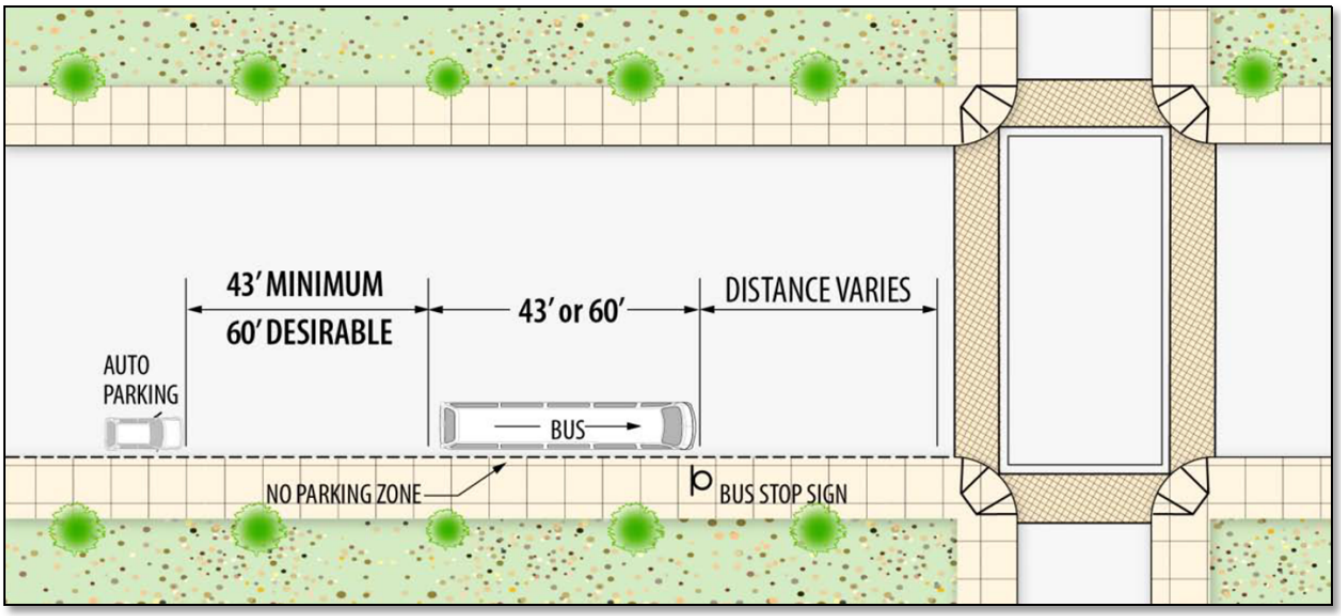


Figure 4.17: Suggested Bus Stop Distance for Nearside Locations

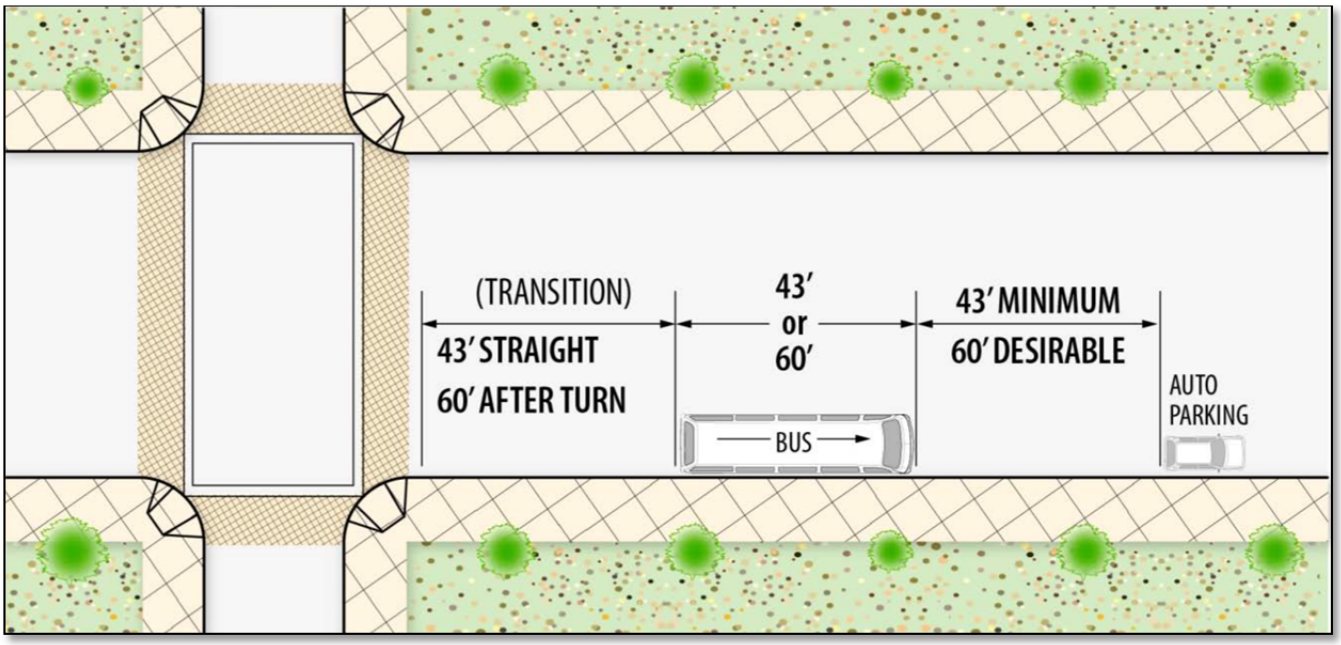


Figure 4.18: Suggested Bus Stop Distance for Farside Locations

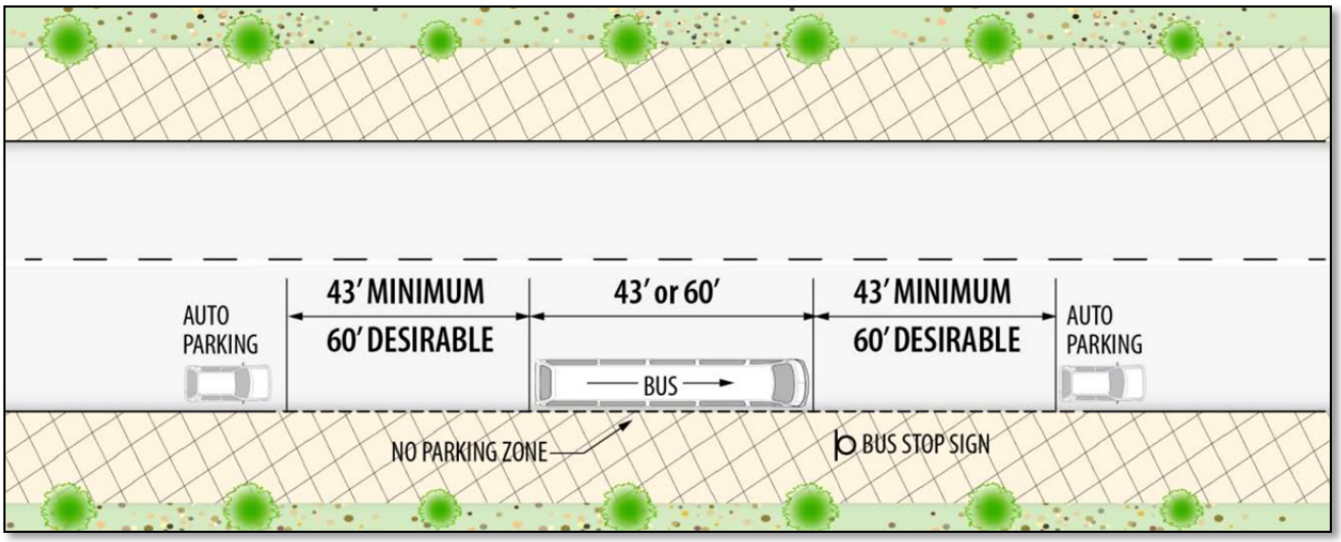


Figure 4.19: Suggested Bus Stop Distance for Mid-Block Locations

4.5.6. Bus Stop Elements

Great Falls Transit currently does not have design guidance in place for typical shelter configurations, or typical bus stop design elements. Each potential bus stop could incorporate a number of elements. A list of the minimum elements that each bus stop should have is listed below.

- **Landing Area:** The landing area must allow for lifts or ramps to be deployed on a suitable surface to permit a wheelchair to maneuver safely on and off the bus.
- **Pedestrian Connections:** A landing area of 5-feet wide by 8-feet long must be connected to a sidewalk of at least 4-feet wide.
- **Curb Ramps:** These shall be designed to conform to state and federal ADA standards.
- **Signage:** Appropriate signage must be used to mark the location of the bus stop. Route and schedule information should also be supplied at each bus stop.
- **Safety and Security:** Bus stops should not have hazardous conditions that could be potentially unsafe to users. The area should be well lit and free of obstacles.

Figure 4.20, **4.21** and **4.22** show typical shelter characteristics at bus stops.

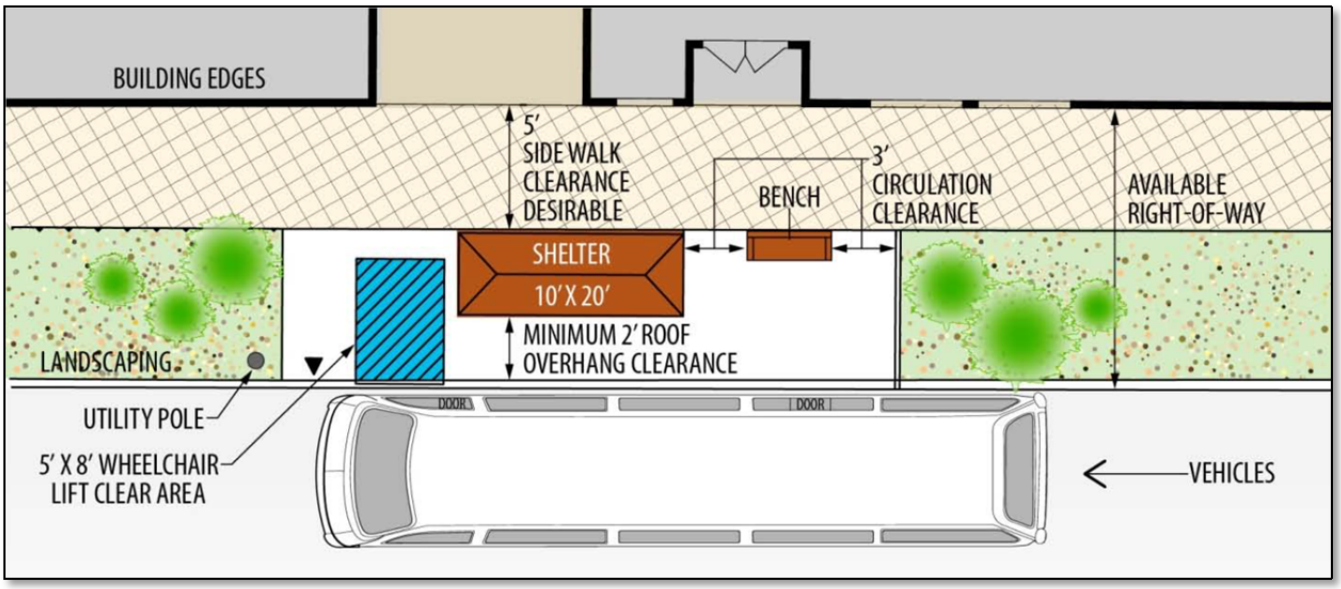


Figure 4.20: Typical Shelter Layout

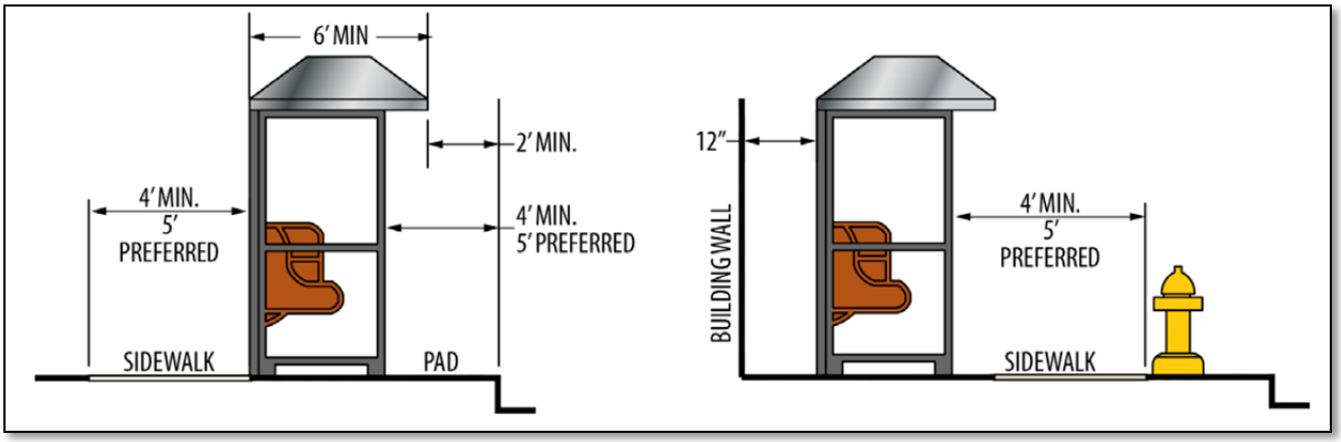


Figure 4.21: Typical Shelter Clearance

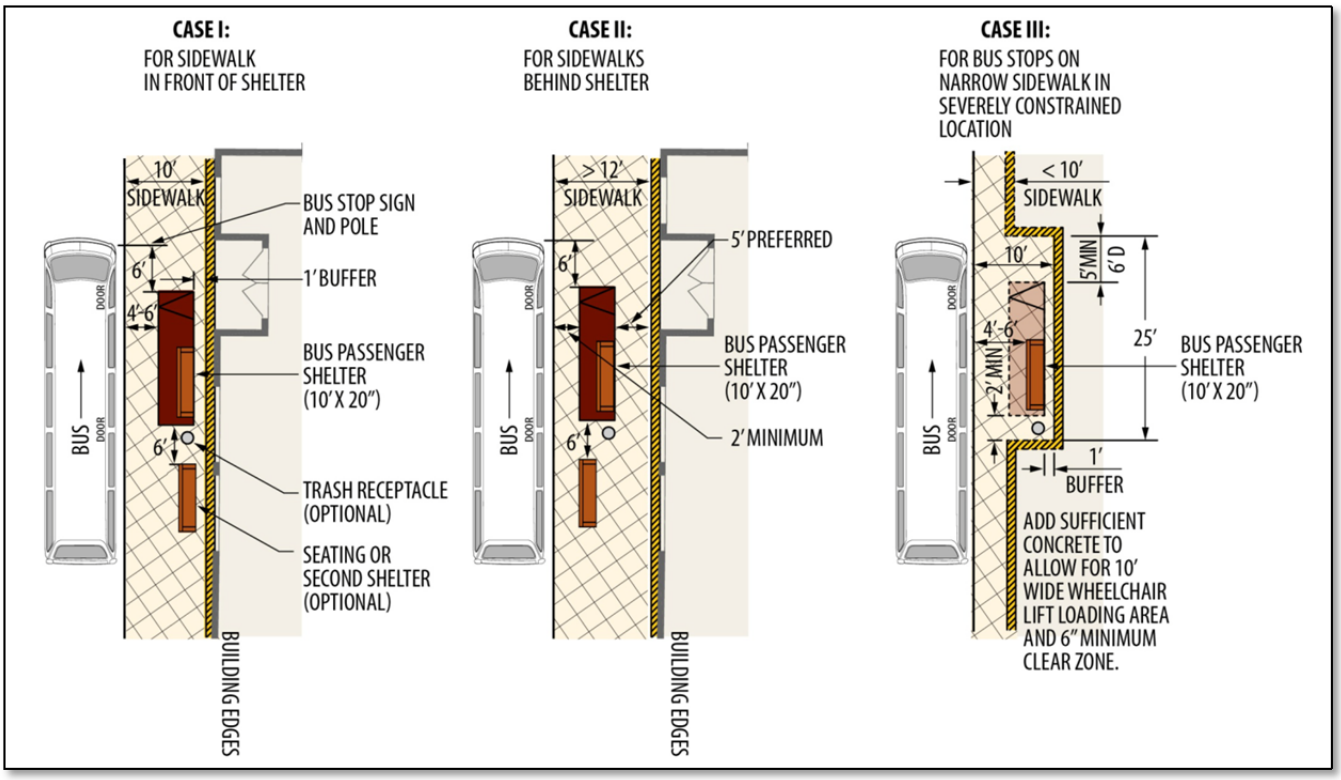


Figure 4.22: Typical Shelter Placement

4.6. CITY'S PAVEMENT CONDITION

The City of Great Falls utilizes a specialized Pavement Management Program (PMP) application which allows agency staff to identify, inventory, and track the growth of the City's roadway network.

The Pavement Management Software Program provides a means to collect, store, and analyze information on pavement conditions, and determine treatment needs to make optimal use of roadway funds. Pavement management systems do not replace the expertise of local public works officials, but they can be a valuable tool to help them plan for future maintenance needs.

Through a systematic analysis of pavement life cycles, the City's PMP can determine the most cost-effective means to keep pavements functioning at a desirable, safe, condition level. **Figure 4.23** illustrates the need for a road "wellness" program.

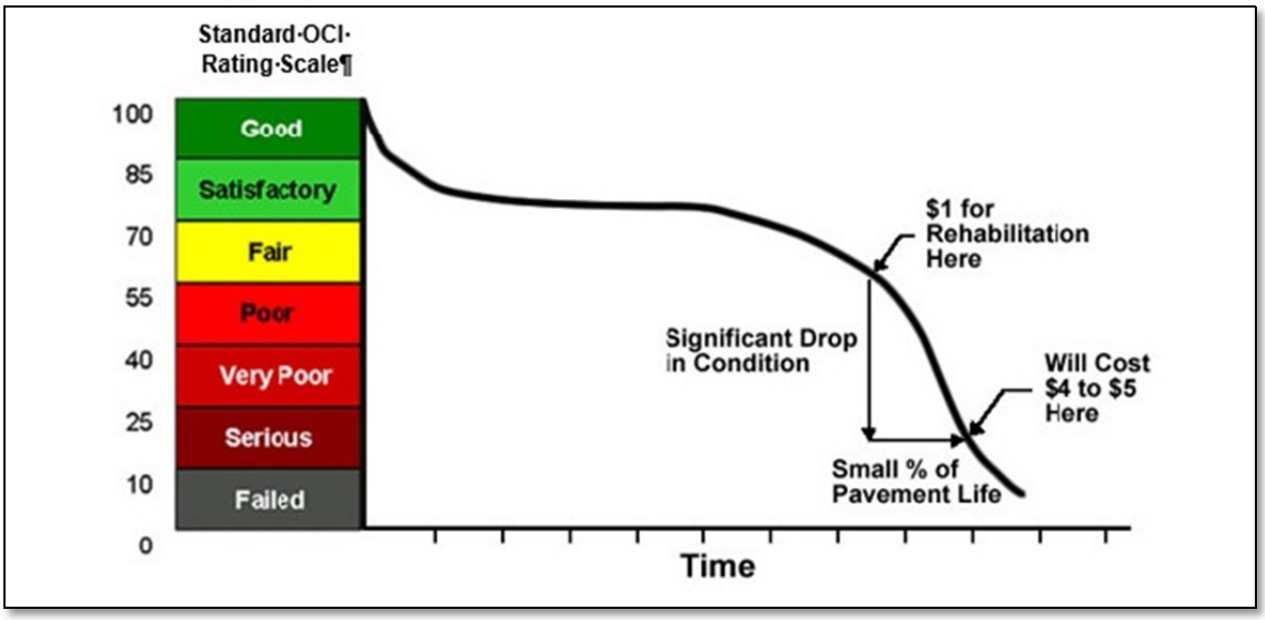


Figure 4.23: Relationship of Pavement Condition / Time & Maintenance / Rehabilitation Costs

The City of Great Falls retained Cartegraph to perform a tear 2013 pavement condition assessment on all city maintained streets in order to update of the city's Pavement Management Program. The overall current pavement condition can be termed as "present status". The Present Status component of the pavement management application software is extremely important in that it readily provides valuable data to the end user. The objective of the present status analysis is to provide updated pavement performance information for the entire roadway network that allows city staff to evaluate:

- The deterioration of streets as determined by the performance indicators; and,
- The overall change in the network performance indicator distributions over time.

The Overall Condition Index (OCI) is a measure of the overall serviceability (ranking) of a particular pavement to the end user. It is calculated by combining the ranking of two basic indicators; i) pavement surface defects and; ii) roughness measurements. These serviceability terms are described as follows:

i. a pavement distress measuring the apparent defects on the roadway (surface cracking, potholes, etc..)
ii. Roughness measurements determine the vehicle travel "ride ability" performance of the roadway section. These roughness measurements are correlated to an assessment of vehicle ride quality ranging from an extremely smooth ride extremely rough ride.

Figure 4.24 illustrates a standard overall pavement condition rating scale: The OCI varies between zero (0) and one hundred (100), with 0 representing the poorest, and 100 representing the best possible pavement. ASTM has adopted the OCI as standard practice for roads. Typical values for a newly constructed road range from 95 to 100 and the point at which a pavement becomes in need of rehabilitation is typically in the 40 to 60 range, depending on traffic volume. The road deficiency information described herein is stored in detail within the city's Pavement Management System.

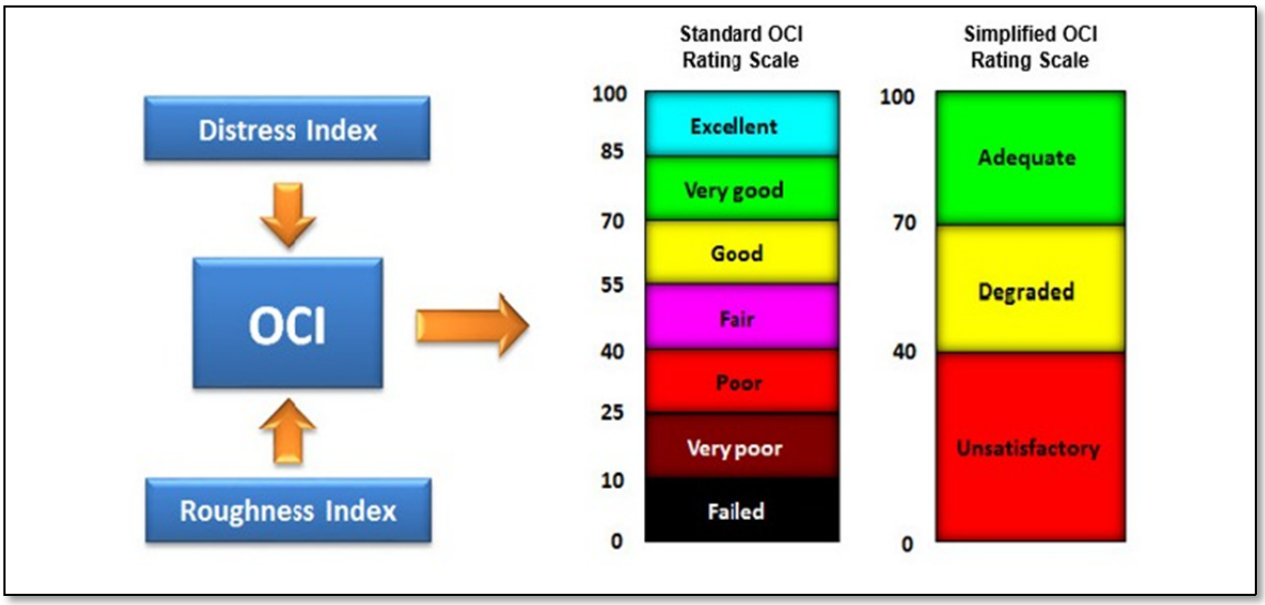


Figure 4.24: Standard Overall Pavement Condition Rating Scale

The city's network current average OCI is **61.4**. Reference is made to the city's recently completed *Pavement Management System Present Status Report* (Cartegraph, November 18, 2013) which documents roadway segment OCIs for 292 miles of city roadways. This report is listed by section identifier, along with street and street termini descriptions, surface type, last inspection date, and overall pavement condition index (OCI) values for each pavement section of roadway. **Figure 4.25** depicts a graphical representation of 2013 OCI conditions on city roadways.

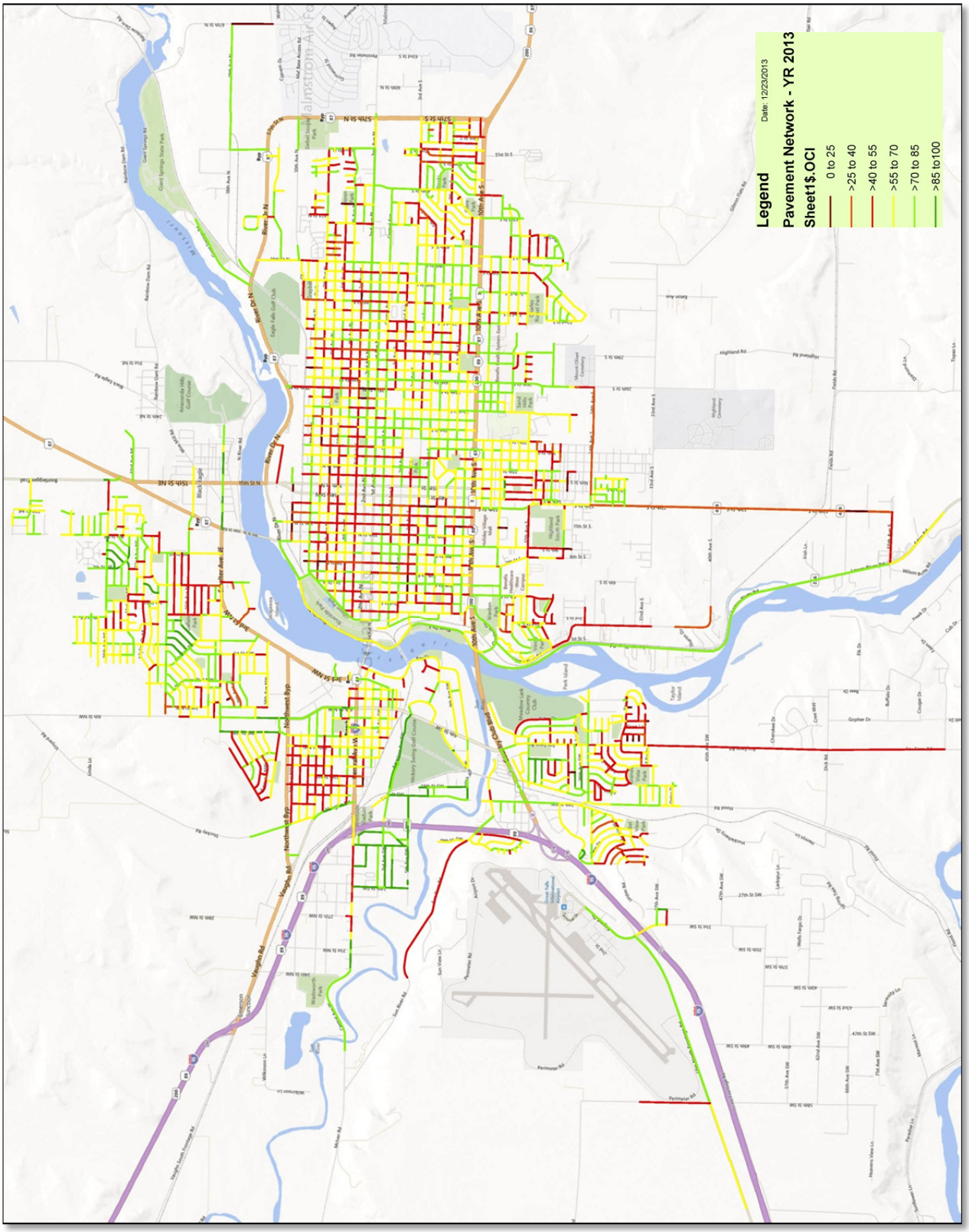


Figure 4.25: City's OCI Results (2013)

5.0
Projected Transportation System

Projected transportation conditions were analyzed to estimate how traffic patterns and characteristics may change compared to existing conditions. The analysis was based on known existing conditions and anticipated land development expected to occur out to 2035.

A summary of the traffic modeling effort conducted to project anticipated future travel conditions is provided in this section. The projected future travel conditions are used to identify potentially deficient areas within the transportation system.

5.1. SOCIOECONOMICS

Local and regional population and economic characteristics have important influences on motor vehicle travel in the Great Falls Area. The study area includes all of the land within the City of Great Falls, Malmstrom Air Force Base (AFB), the unincorporated community of Black Eagle, Great Falls International Airport, and adjacent lands in Cascade County where suburban development has occurred or may occur in the future.

A review of demographics within the study area is appropriate to gain an understanding of historical trends in population, age, race and ethnicity. Understanding the composition of the population is necessary, as the data may influence the types of improvements that are identified. For example, an aging population may indicate a need for specific types of transportation improvements such as transit services and/or non-motorized infrastructure improvements. Additionally, the presence of a disadvantaged population may warrant other considerations.

Likewise, existing land uses and potential land use changes have a direct influence on the transportation network and its use. For this reason, it is important to review community development patterns over time and understand where community conditions may be favorable for new residential and non-residential growth.

This chapter discusses the background and assumptions used to project growth in the Great Falls area to the year 2035. By using population, employment and other socioeconomic trends as aids, the future transportation requirements will be defined. A travel demand model (traffic model) of the transportation system for the Great Falls area was built by the Montana Department of Transportation (MDT) and information from this analysis will be used to update the allocations of future residential and employment growth. The changes to the system that are projected to occur by the year 2035 will be incorporated into the model to forecast the future transportation conditions. Using the updated model, various scenarios will be developed to test a range of transportation improvements to determine what affects they will have on the transportation system within the Great Falls area.

5.1.1. Population and Demographic Trends

Table 5.1 shows the total populations for Cascade County, the City of Great Falls and Malmstrom AFB and the Black Eagle Census Designated Places according to the Census over the 1970 to 2010 period.

Census designated places (CDPs) are delineated by the Census Bureau to provide data for settled concentrations of population that are identifiable by name but are not legally incorporated. Population data is available for Malmstrom AFB over the 1970-2010 period. The Black Eagle CDP was initially created for the 2000 Census and data for earlier censuses is not available for this subdivision of Cascade County. **Table 5.1** also shows the overall change (shown numerically and as a percentage) in residents of the County, the City of Great Falls, and other geographies of interest during each decade since 1970.

The table shows the total population of Cascade County has fluctuated slightly but has generally remained near 81,000 residents over the 1970-2010 period. The City of Great Falls recorded its highest population (60,091) at the time of the 1970 Census. After two decades of decline, the City's population began to increase after 1990 and was more than 58,500 residents in 2010. The population of Malmstrom AFB has decreased sharply every decade since 1970 and by 2010 had 5,000 fewer residents than at the time of the 1970 Census. The population of the Black Eagle CDP was about 900 at the time of the last two census counts were recorded.

Table 5.1: Historic Population Data

Area	1970	1980		1990		2000		2010	
Cascade County	**81,804**	**80,696**		**77,691**		**80,357**		**81,327**	
Net Change (%)	--	*-1,108*	*-1.4%*	*-3,005*	*-3.7%*	*2,666*	*3.4%*	*970*	*1.2%*
City of Great Falls	**60,091**	**56,725**		**55,097**		**56,690**		**58,505**	
Net Change (%)	--	*-3,366*	*-5.6%*	*-1,628*	*-2.9%*	*1,593*	*2.9%*	*1,815*	*3.2%*
Malmstrom AFB CDP	**8,374**	**6,675**		**5,938**		**4,544**		**3,472**	
Net Change (%)	--	*-1,699*	*-20.3%*	*-737*	*-11.0%*	*-1,394*	*-23.5%*	*-1,072*	*-23.6%*
Black Eagle CDP	[a]	[a]		[a]		**914**		**904**	
Net Change (%)	--	--		--		--		*-10*	*-1.1%*
State of Montana	**694,409**	**786,690**		**799,065**		**902,195**		**989,415**	
Net Change (%)	--	*92,281*	*13.3%*	*12,375*	*1.6%*	*103,130*	*12.9%*	*87,220*	*9.7%*
United States	**203,392,031**	**226,545,805**		**248,709,873**		**281,421,906**		**308,745,538**	
Net Change (%)	--	*23,153,774*	*11.4%*	*22,164,068*	*9.8%*	*32,712,033*	*13.2%*	*27,323,632*	*9.7%*

Source: US Bureau of the Census, Census of the Population
[a] *No data available*

Both the State of Montana and the United States showed population increases during each decade between 1970 and 2010. Overall, the population of the US and State of Montana, increased by 52% and 42%, respectively over the 1970-2010 period. During the same period, the total population of Cascade County declined approximately 0.6% and the population of the City of Great Falls showed a 2% overall decline. Between 1990 and 2010, the County's population increased by 4.7% and the City's population grew by 4.4%.

Table 5.2 presents historical annual population growth rates for Cascade County and the City of Great Falls and compares them with the growth rates seen for the State of Montana and the nation. The population losses seen in Cascade County and the City of Great Falls during the 1970s and 1980s coupled with the slow growth seen over the last 20 years has resulted in long term growth rates of near zero. Positive rates of annual population growth have been recorded for both the County and City in the last 20 years. However, these annual growth rates are well below those seen for the state and nation.

Table 5.2: Historic Annual Population Growth Rates

Area	Last 40 Years (1970 - 2010)	Last 20 Years (1990 - 2010)	Last 10 Years (2000 - 2010)
Cascade County	-0.01%/yr	0.23%/yr	0.12%/yr
City of Great Falls	-0.05%.yr	0.22%/yr	0.32%/yr
State of Montana	1.05%/yr	1.19%/yr	0.97%/yr
United States	1.30%/yr	1.20%/yr	0.97%/yr

5.1.1.1. Population Changes Since 2010

The Census Bureau releases population estimates each year for various geographies to update information collected in the most recent census. Each new series of data incorporates the latest administrative record data, geographic boundaries, and methodology to provide annual revisions to the decennial census. **Table 5.3** shows the US Census Bureau estimates of current (2012) populations for Cascade County, the City of Great Falls, the State of Montana, and the nation. These estimates show that populations in the County and City are continuing to increase at rates comparable to those seen during the last two decades. The rate of growth continues to lag behind that seen for the state and nation.

Table 5.3: Population Changes Since 2010

Area	2010 Population	Estimate as of July 1, 2012	% Change since 2010
Cascade County	81,327	81,723	0.49%
City of Great Falls	58,505	58,893	0.66%
State of Montana	989,415	1,005,141	1.59%
United States	308,745,538	313,914,040	1.67%

Source: US Bureau of the Census, Current Estimates Data, available at http://www.census.gov/popest/data/index.html

5.1.1.2. Race and Ethnicity

Table 5.4 depicts the race and ethnicity characteristics in Cascade County, the City of Great Falls, and within the Malmstrom AFB and Black Eagle CDPs as indicated in the *American Community Survey (ACS)* Profile Report for the 2007-2011 period for these selected geographies. Similar statistics are provided for the State of Montana and the United States for comparison purposes. The ACS data are *period estimates* meaning they represent the characteristics of the population and housing over a specific data collection period (in this case 5 years). For this reason, the total populations shown differ from those recorded during the 2010 Census. The percentages listed for ethnic groups presented in the table may not match the Census total percentages and percentages may not add up to 100%.

Table 5.4: Population Race and Ethnicity Data (2007-2011)

Subject	City of Great Falls	Cascade County	Malmstrom AFB CDP	Black Eagle CDP	State of Montana	United States
White	89.70%	89.10%	82.20%	93.70%	89.70%	74.10%
Black or African American	1.10%	1.30%	7.50%	0.00%	0.40%	12.50%
American Indian and Alaska Native	5.10%	4.30%	0.40%	0.90%	6.20%	0.80%
Asian	0.50%	0.50%	1.30%	1.50%	0.60%	4.70%
Native Hawaiian and Other Pacific Islander	0.00%	0.00%	0.00%	0.00%	0.10%	0.20%
Some Other Race	0.40%	0.50%	3.40%	0.00%	0.60%	5.10%
Two or More Races	3.80%	3.60%	5.10%	3.90%	2.30%	2.50%
Hispanic or Latino (of any race)	3.00%	3.40%	16.30%	6.30%	2.90%	16.10%
Total Population	58,207	80,931	4,266	1,080	982,854	306,603,772

Source: US Bureau of the Census, American Community Survey (ACS) Profile Report 2007-2011 Estimates, available at http://mcdc1.missouri.edu/acsprofiles/acsprofilemenu.html

The populations of Cascade County and the City are predominately white with percentages of minority populations generally similar to those seen for the State of Montana. The racial and ethnic composition of the Malmstrom AFB and Black Eagle CDPs varies somewhat from that of Cascade County and City of Great Falls. These CDPs have populations with higher percentages of some minority groups.

5.1.1.3. Age Distribution

Table 5.5 depicts the change in total population and age composition for Cascade County and the City of Great Falls since 1980. Three age categories—residents less than 18 years old, residents 18 to 64 years old, and residents over age 65—were considered in the analysis of age distribution.

Table 5.5: Age Distribution (1980 to 2010)

Year	Cascade County				City of Great Falls			
	<18 Years	18-64 Years	65+ Years	Median Age	<18 Years	18-64 Years	65+ Years	Median Age
1980	23,544	49,164	7,988	28.6	15,713	34,489	6,523	30.6
1990	21,520	46,304	9,867	32.7	14,325	32,507	8,265	34.4
2000	20,912	48,197	11,248	36.7	14,138	33,654	8,898	37.8
2010	18,630	50,007	12,690	38.9	13,161	35,648	9,696	39
Change (1980-2010)	-4,914	843	4,702	10.3	-2,552	1,159	3,173	8.4
	-20.9%	1.7%	58.9%	36.0%	-16.2%	3.4%	48.6%	27.5%

Source: US Bureau of the Census, Census of the Population

As discussed earlier, the County's population showed only a slight net increase in residents between 1980 and 2010 and the City's population increased by about 3.1% over the same period. Between 1980 and 2010, the share of County residents in the "less than 18 years old" category has decreased by nearly 21% and the number of residents in "65 years and over" category increased by nearly 59%. During the same time period, the number of City residents in the "less than 18 years old" category decreased by about 16% and the number of residents in "65 years and over" category increased by nearly 49%. The median ages of both County and City residents showed notable increases over the 1980-2010 period.

The median ages of County and City residents were 38.9 years and 39.0 years, respectively, at the time of the 2010 Census. These statistics point to the aging of the population, and corresponds to similar trends within Montana and the United States.

To examine more specifically how age groups have changed in Cascade County, age group data from the 2000 Census and 2010 Census were reviewed for the County, the City of Great Falls and the Black Eagle CDP. This review showed the following changes:

- All three geographies showed notable (12-23%) declines in the population between 5 to 17 years;
- All three geographies showed declines of nearly 30% in the 35-44 year old population;
- The share of the population between 55 and 64 years increased by 30-50% in all three geographies; and
- The population over the age of 65 (including the share of residents over age 85) grew substantially.

5.1.1.4. Disability Status

The 2009-2011 ACS 3-Year Estimate for Cascade County and the City of Great Falls was consulted to obtain information about the number of residents with disabilities (which include hearing or vision difficulties, cognitive difficulties, and ambulatory difficulties). This information is important to review since segments of the population with disabilities may require special accommodations for transport or unique considerations in the design of transportation infrastructure.

The ACS data for the 2009-2011 period showed that approximately 15% of the civilian non-institutionalized populations of the County and City were considered to have one or more disabilities. This data also indicated the following for disabled residents of the County and City:

- About 1.2% of residents under the age of 18 had one or more disabilities;
- 7.8% of the residents between 18 and 64 years had one or more disabilities; and
- More than 6% of residents 65 years and older had one or more disabilities.

5.1.1.5. Personal Travel and Commuting Characteristics

According to the ACS profile for the 2007-2011 period, residents in about 92% of all occupied housing units in Cascade County and the City of Great Falls had access to at least one vehicle. In comparison, residents of nearly 95% of all occupied housing units in Montana and 91% of all occupied housing units in the nation had access to one or more vehicles.

Information about the number of workers (16 years and older) and their commuting characteristics is available from the ACS. The ACS information provided 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. **Table 5.6** presents commuting characteristics for workers in Cascade County, the City of Great Falls, and the Malmstrom AFB and Black Eagle CDPs. Similar statistics for the State of Montana and the United States are provided for comparison.

Table 5.6: Mode of Transportation to Work (2007-2011)

Subject	City of Great Falls	Cascade County	Malmstrom AFB CDP	Black Eagle CDP	State of Montana	United States
Number of Workers 16 Years and Older	**27,726**	**38,869**	**2,197**	**590**	**470,715**	**139,488,206**
% Who Commuted to Work	*97.30%*	*96.60%*	*98.00%*	*98.10%*	*94.20%*	*95.80%*
% Who Worked at Home	*2.70%*	*3.40%*	*2.00%*	*1.90%*	*5.80%*	*4.20%*
Transportation Mode						
Drove alone, car, truck, van	*80.50%*	*79.40%*	*83.60%*	*71.90%*	*75.80%*	*76.10%*
Carpooled	*10.50%*	*11.10%*	*6.60%*	*22.70%*	*10.40%*	*10.20%*
Public Transportation (excluding taxicabs)	*1.70%*	*1.30%*	*0.00%*	*2.40%*	*0.90%*	*5.00%*
Walked to Work	*2.90%*	*3.10%*	*6.20%*	*1.20%*	*4.80%*	*2.80%*
Other means of commuting	*1.70%*	*1.70%*	*1.60%*	*0.00%*	*2.40%*	*1.70%*
Mean Travel Time to Work	**14.7 min**	**16.3 min**	**8.0 min**	**10.9 min**	**18.2 min**	**25.4 min**

Source: US Bureau of the Census, American Community Survey (ACS) Profile Report 2007-2011 Estimates, available at http://mcdc1.missouri.edu/acsprofiles/acsprofilemenu.html

The table shows that about 90% of the commuting workers in Cascade County and City of Great Falls rely on personal vehicles or carpools for transportation to work destinations. The share of workers who drove alone to work is higher that seen for the state and nation. The share of workers who walked to work or used other means to commute is also below that seen for Montana and the nation as a whole. The table also indicates that public transportation options are limited for Montana residents at all geographies as compared to elsewhere in the United States. Workers in Cascade County and the City also have notably shorter commute times than elsewhere in the state or nation.

5.1.2. Housing Units and Households

The Census Bureau identifies a "housing unit" as a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live and eat separately from any other persons in the building and which have direct access from the outside of the building or through a common hall. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements. A "household" includes all the persons who occupy a housing unit according to the Census Bureau definition. For purposes of allocating future residential growth, housing units are of interest since they are inputs to the traffic model.

5.1.2.1. Number of Housing Units

Table 5.7 lists the number of housing units that existed within the various geographies of Cascade County during recent decennial censuses. Overall, the number of housing units in Cascade County increased by nearly 16% during the 1980-2010 period with significant increases in the number of housing units recorded during each of the last two decades in the County. This trend is similar for the City of Great Falls which showed an 11.6% increase in housing units between 1980 and 2010.

Table 5.7: Number of Housing Units (1980-2010)

Area	1980	1990	2000	2010
Cascade County				
Population	80,696	77,691	80,357	81,327
Housing Units	32,199	33,063	35,225	37,276
Net Change	--	864	2,162	2,051
Population per Housing Unit	2.51	2.35	2.28	2.18
City of Great Falls				
Population	56,725	55,097	56,690	58,505
Housing Units	24,056	24,152	25,243	26,854
Net Change	--	96	1,091	1,611
Population per Housing Unit	2.36	2.28	2.25	2.18
Malmstrom AFB CDP				
Population	6,675	5,938	4,544	3,472
Housing Units	1,566	1,496	1,405	1,171
Net Change	--	-70	-91	-234
Population per Housing Unit	4.26	3.97	3.23	2.96
Black Eagle CDP				
Population	[a]	[a]	914	904
Housing Units	[a]	[a]	458	474
Net Change	--	--	--	16
Population per Housing Unit	--	--	1.99	1.91

Source: US Bureau of the Census, Census of the Population
[a] No data available

Several other trends are obvious from the housing unit data presented in **Table 5.7**:

- The County has seen an increase of more than 4,200 housing units over the last 20 years with 64% of these housing units being added within the City of Great Falls.
- The number of housing units in the Malmstrom AFB CDP has decreased by nearly 25% over the period.

5.1.2.2. Population per Housing Unit

The data in **Table 5.7** shows that the population per housing unit decreased for all geographies over the 1980-2010 period. The population per housing unit in Cascade County and the City of Great Falls was identical at 2.18 persons per housing unit at the time of the 2010 Census. The population per housing unit for the State of Montana was 2.04 in according to the 2010 Census.

Because not all housing units are occupied, it is interesting to consider the number of residents per occupied housing unit. At the time of the 2010 Census, more than 90% of the housing units in the County were occupied and more than 94% of those in the City of Great Falls were occupied. If only occupied housing units are considered, the resulting population per housing unit rates are 2.41 people per unit in the County and 2.31 people per unit in the City. Comparable rates for 2010 in the Malmstrom AFB and Black Eagle CDPs were determined to be 4.04 and 2.12 persons per unit, respectively.

5.1.3. Employment and Income Trends

Cascade County is Montana's fifth most populous county, while Great Falls, the county seat, is the state's third largest city. Great Falls accounts for 72% of Cascade County's total population. The city is home to Malmstrom AFB which is a driving force in the regional economy. Great Falls is also home to the C. M. Russell Museum, the Lewis & Clark Interpretive Center, Great Falls College Montana State University, University of Great Falls, and associated College of Technology.

5.1.3.1. Historic Employment in Cascade County

Employment by industry for Cascade County for milestone years between 1980 and 2011 is represented in **Table 5.8**. The most recent available data shows that total full and part-time employment in the county was 50,143 in 2011 with about 98% of the jobs being non-farm related employment. Total full and part-time employment in Cascade County in 2011 was 17% higher than that recorded in 1980.

The data in **Table 5.8** shows that between 1980 and 2011, the most notable net increase in employment occurred in the services industry where the total number of jobs more than doubled. Other industry sectors showing sizable increases in employment since 1980 include: construction (net gain of 1,026 jobs); finance, insurance and real estate (net gain of 1,124 jobs); and state and local government (net gain of 352 jobs). Notable declines in employment were seen in the transportation and public utilities sector, wholesale and retail trade sectors, and manufacturing. Combined, the declines in these sectors resulted in nearly 4,600 fewer jobs in 2010 than in 1980.

Malmstrom AFB accounts for the majority of the military employees in Cascade County. Total full and part-time military employment in 1980 accounted for 11.6% of jobs in the County. Military employment in the county has steadily declined since 1980 and there were 1,467 fewer jobs in 2011 than in 1980. Total full and part-time military employment represented about 7% of jobs in the County in 2011. Most recently, military job losses resulted after a 2007 decision by the United States Air Force to deactivate the 564th Missile Squadron from its existing mission at Malmstrom.

Table 5.8: Historical Employment Trends for Cascade County (1980–2011)

Employment	1980	1990	2000	2010	2011	% Change (1980 - 2011)
Total Full/Part time Employment	**42,836**	**43,160**	**48,105**	**50,342**	**50,143**	**17%**
Farm Employment	1,039	1,036	1,209	1,078	1,092	5%
Non-Farm Employment	41,797	42,124	46,896	49,264	49,051	17%
Employment by Industry						
Agricultural Services & Forestry	159	352	[(a)]	167	170	7%
Mining	60	66	[(a)]	87	97	62%
Construction	2,211	1,837	2,673	3,308	3,237	46%
Manufacturing	1,659	1,244	1,428	1,010	1,032	-38%
Transportation & Public Utilities	2,193	2,165	2,058	1,561	1,508	-31%
Wholesale Trade	3,193	2,347	1,919	1,469	1,506	-53%
Retail Trade	7,697	8,571	10,075	6,167	6,098	-21%
Finance, Insurance & Real Estate	3,804	3,119	4,073	4,910	4,928	30%
Services	10,264	12,000	14,804	20,951	21,019	105%
Federal & Civilian Government	1,773	1,780	1,532	1,858	1,787	1%
Military	4,989	4,726	3,881	3,569	3,522	-29%
State & Local Government	3,795	3,917	3,869	4,207	4,147	9%

Source: US Department of Commerce Bureau of Economic Analysis – Table CA25 and Table CA25N.
[(a)] Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

5.1.3.2. Employment Trends by Industry

Table 5.9 presents data on the estimated number of civilian employees (age 16 years and older) and the industries in which they are employed in Cascade County, the City of Great Falls, and the Malmstrom AFB and Black Eagle CDPs. The data in the table, taken from 2007-2011 ACS profile for these geographies, also includes employment estimates by industry. It is important to recognize that the employment numbers shown in **Table 5.9** do not account for military employment in the Cascade County or its various other geographic subdivisions. It is also worth noting that all ACS data are survey estimates with varying margins of error. Many of the employment numbers presented for the Malmstrom AFB and Black Eagle CDPs are considered "statistically suspect" due to their margins of error. The *Malmstrom AFB Joint Land Use Study Final Report* released in March 2012 states that total employment at the Base (excluding dependents) was 4,524, composed of 3,149 military and 1,375 civilian (appropriated, non-appropriated, contract, and private business) personnel.

The employment by industry data from the 2007-2011 ACS for the various geographies of Cascade County supports the information presented earlier in **Table 5.8**. The majority of the employment in the County and City of Great Falls is associated with the service industries followed by the retail trade and construction industries.

The most recent *Montana County Flier* publication for Cascade County (February 2012) prepared by the Montana Department of Labor and Industry identifies the largest civilian employers in the County:

- Benefis Hospital (2,400 employees)
- Great Falls Public Schools (1,600 employees)
- Great Falls Clinic (780 employees)
- National Electronic Warranty (687 employees)
- City of Great Falls (528 employees)

- Cascade County (500 employees)
- Walmart (501 employees)

Table 5.9: Civilian Employment by Industry (2007-2011)

Subject	Cascade County		City of Great Falls		Malmstrom AFB CDP		Black Eagle CDP	
Agriculture, forestry, fishing, hunting, and mining	1,118	3.0%	439	1.6%	0	0.0%	48	8.2%
Construction	3,184	8.7%	2,308	8.6%	0	0.0%	62	10.6%
Manufacturing	1,189	3.2%	753	2.8%	56	6.5%	60	10.2%
Wholesale Trade	1,026	2.8%	716	2.7%	0	0.0%	8	1.4%
Retail Trade	5,191	14.1%	3,860	14.3%	153	17.7%	67	11.4%
Transportation, warehousing, and public utilities	1,896	5.2%	1,228	4.6%	24	2.8%	20	3.4%
Information	676	1.8%	578	2.1%	0	0.0%	0	0.0%
Finance and Insurance, and real estate and rental and leasing	2,853	7.8%	2,355	8.8%	32	3.7%	45	7.7%
Professional, scientific, management and administrative	2,636	7.2%	2,186	8.1%	0	0.0%	25	4.3%
Education services, health care, and social assistance	8,214	22.4%	6,058	22.5%	177	20.5%	131	22.4%
Arts, entertainment, and recreation, and accommodation, and food services	4,020	10.9%	3,178	11.8%	85	9.9%	34	5.8%
Other services, except public administration	1,729	4.7%	1,254	4.7%	0	0.0%	74	12.6%
Public administration	2,999	8.2%	1,987	7.4%	335	38.9%	12	2.0%
Total Employed Population 16 yrs and over	**36,731**		**26,900**		**862**		**586**	

Source: US Bureau of the Census, American Community Survey (ACS) Profile Report 2007-2011 Estimates, available at http://mcdc1.missouri.edu/acsprofiles/acsprofilemenu.html

5.1.3.3. Unemployment Rates

Unemployment rates are represented in **Table 5.10** and are current as of April 2013. The data shows an unemployment rate for Cascade County lower than that for the State of Montana (5.0% versus 5.5%) and for the United States (7.1%). Corresponding unemployment information for the City of Great Falls is unavailable so information from the 2007-2011 ACS profile is presented. The ACS for the 2007-2011 period showed that the unemployment rates in Cascade County and the City of Great Falls were typically lower than that seen for the State (6% versus 6.4%) and nation (8.7%).

Table 5.10: Employment Statistics (2013)

Area	Total Labor Force	Employed	Unemployed	Unemployment Rate
Cascade County	40,535	38,521	2,014	5.00%
City of Great Falls	28,626 [(a)]	26,900 [(a)]	1,726 [(a)]	6.0% [(a)]
State of Montana	508,794	480,728	28,066	5.50%
United States	154,739,000	143,724,000	11,014,000	7.10%

Source: MT Department of Labor and Industry, Research and Analysis Bureau – Labor Force Statistics, April 2013 (data is not seasonally adjusted).
[(a)] US Bureau of the Census, American Community Survey (ACS) Profile Report 2007-2011 Estimates

5.1.3.4. Income Levels

Estimates of median household income and per capita income for Cascade County, the City of Great Falls, and other geographies are available in the 2007-2011 ACS profile and shown in **Table 5.11**. The ACS shows estimated median household incomes for in Cascade County and the City of Great Falls as $44,074 and $42,540, respectively. ACS median household income estimates for the Malmstrom AFB and Black Eagle CDPs were $38,721 and $ 28,796, respectively. Median household income levels for all geographies in Cascade County were below the median household income for the State of Montana ($45,324). In general, households within Cascade County earn about 3% less than what is earned by an average Montana household. Cascade County's median household income was about 84% of that estimated for the nation ($52,762). Similar relationships exist when reviewing per capita income levels in Cascade County and the City of Great Falls. The per capita income levels for all geographies in the County are below those seen for the state and nation.

Estimates of per capita personal income for 2011 are available from the U.S. Department of Commerce, Bureau of Economic Analysis (BEA) for the nation, states, counties, and other selected geographies. Personal income is the income received by all persons from all sources. Per capita personal income is calculated as the total personal income of the residents of an area divided by the population of the area. BEA data for 2011 shows that Cascade County's estimated per capita personal income is above that for the state but below that of the nation.

Table 5.11: Income Levels (2007-2011)

Area	Median Household Income	Per Capita Income	2011 Per Capita Personal Income
United States	$52,762	$27,915	$41,560
State of Montana	$45,324	$24,640	$36,016
Cascade County	$44,074	$23,554	$39,448
City of Great Falls	$42,540	$22,894	--
Malmstrom AFB CDP	$38,721	$15,443	--
Black Eagle CDP	$28,796	$17,865	--

Source: US Bureau of the Census, American Community Survey (ACS) Profile Report 2007-2011 Estimates and U.S. Department of Commerce, Bureau of Economic Analysis (BEA).

5.1.3.5. Poverty Status

Table 5.12 presents poverty statistics for various geographies in Cascade County and comparable statistics for the State of Montana and the nation.

Table 5.12: Poverty Status (2007-2011)

Area	Persons Living in Poverty (%)	Persons Under 18 in Poverty (%)	Persons over 65 in Poverty (%)
United States	14.3	19.4	9.4
State of Montana	14.6	20	8.7
Cascade County	13.8	21	7.9
City of Great Falls	15.8	24.6	7.7
Malmstrom AFB CDP	17.6	9.2	0
Black Eagle CDP	6.9	26.2	33.3

Source: US Bureau of the Census, American Community Survey (ACS) Profile Report 2007-2011

According to the 2007-2011 ACS profile, the number of residents living below the poverty line was higher for the City of Great Falls than for the State and Cascade County. About 14.6% of all individuals living in Montana were estimated to be below the poverty line. The ACS estimates show 13.8% and 15.8% of the individuals living in Cascade County and City of Great Falls, respectively, were living in poverty.

The ACS data also shows the County and City likely had a greater percentage of persons under the age of 18 living in poverty than seen for the state and nation. However, the share of persons over the age of 65 living in poverty is likely lower than seen at the state and national level.

Note the poverty statistics shown for the Malmstrom AFB and Black Eagle CDPs are considered "statistically suspect" due to their margins of error.

5.2. LAND USE AND PROJECTED GROWTH

5.2.1. EXISTING LAND USE AND DEVELOPMENT

Land use plays a critical role in shaping transportation networks. Land use decisions affect the transportation system and can increase viable options for people to access work and recreation sites, goods, services, and other resources in the community. In turn, the existing and future transportation system may be impacted by the location, type, and design of land use developments through changes in travel demands, travel mode choices, and travel patterns.

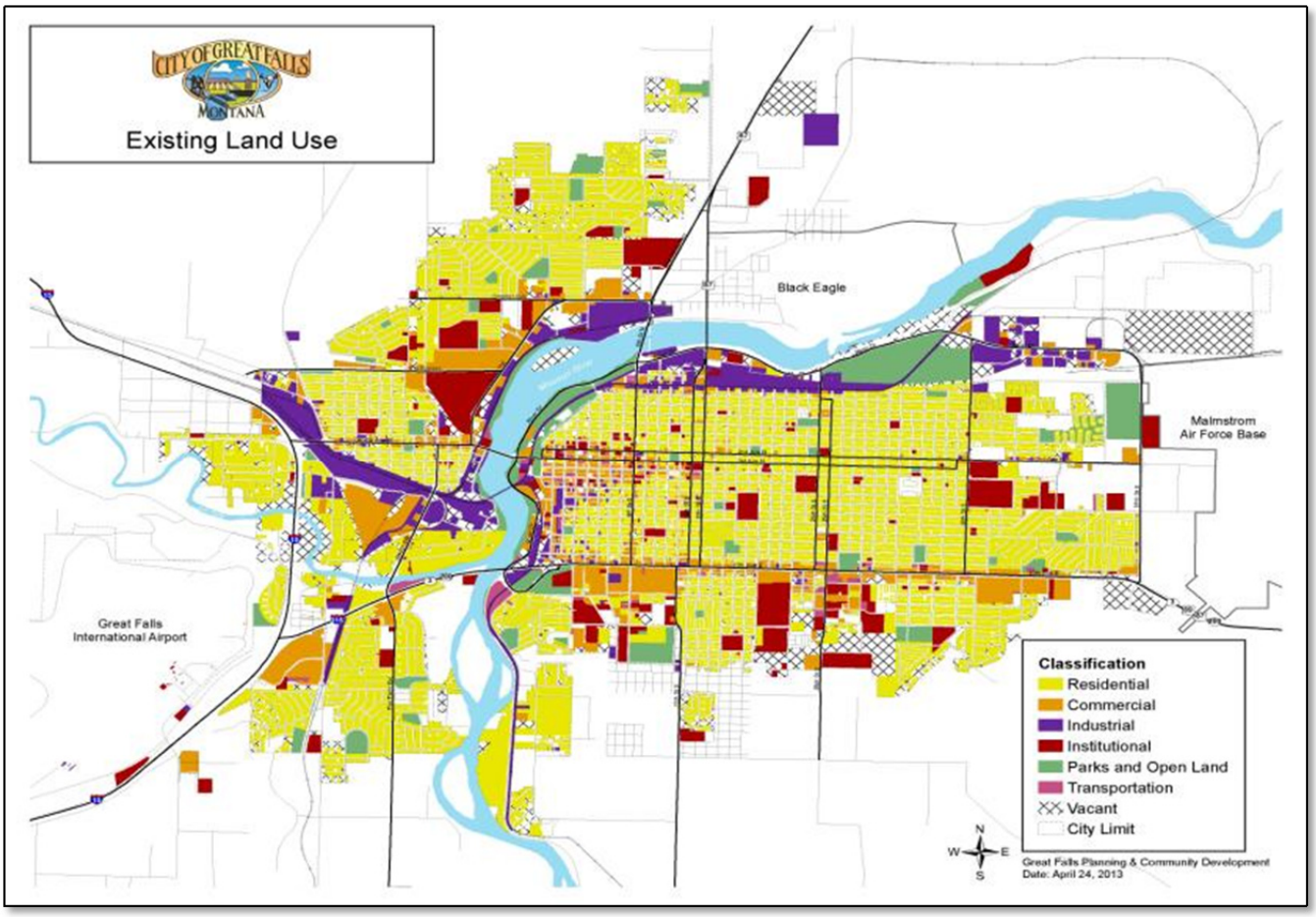
The City of Great Falls was built on a grid system of streets with a defined Central Business District surrounded by residential development. Commercial and industrial uses were typically concentrated in the Central Business District or along railroad lines or major roads and streets. The community has evolved over the years as population growth and new development has been realized. Commercial development is no longer focused on the downtown area and many retail functions have shifted to outlying shopping centers and commercial areas, like those along Tenth Avenue South and Third Street Northwest. Today, downtown Great Falls is the governmental and financial center of the community and houses many professional offices and specialty retail stores.

Extensive residential uses are still seen in the areas around the central City. However, the residential development pattern has extended to the fringe areas surrounding the City and is characterized by low-density residential development on lots of one to ten acres. Multiple family residential development is widely scattered throughout the community. Most new housing development in the Great Falls area, has occurred to the southwest, southeast, and north of the city.

The City's current Growth Policy indicates "increased reliance on trucking has allowed manufacturers and other types of industries to locate wherever land is available with good access, adequate utilities, and proper zoning." It is no longer necessary for industrial land uses to be located near railroad lines. As a result, few substantial concentrations of new industrial development occurs within the city proper. However, concentrations do occur in the North Park industrial subdivision and at the Great Falls International Airport.

Figure 5.1 illustrates current land uses in the City of Great Falls. A breakdown of current land uses by type is also provided for reference in **Table 5.13**.

Figure 5.1: Existing Land Use



Source: Imagine Great Falls 2025, Growth Policy Update, August 6, 2013

Table 5.13: Existing Land Uses (2012)

Classification	Uses	Acres	Percent
Residential	Single, multifamily, mobile home, retirement	4,318	39%
Commercial	Retail, shopping center, FIRE, Hotel/Motel, Commercial with residential, child care	1,004	9%
Industrial	Light and heavy	1,276	12%
Institutional	Government, education, church, semi public	2,114	19%
Open Land	Green space	731	7%
Transportation	Public, private parking, ROW, RR and utilities	91	1%
Vacant	Commercial and residential	1,534	14%
Total		**11,068**	

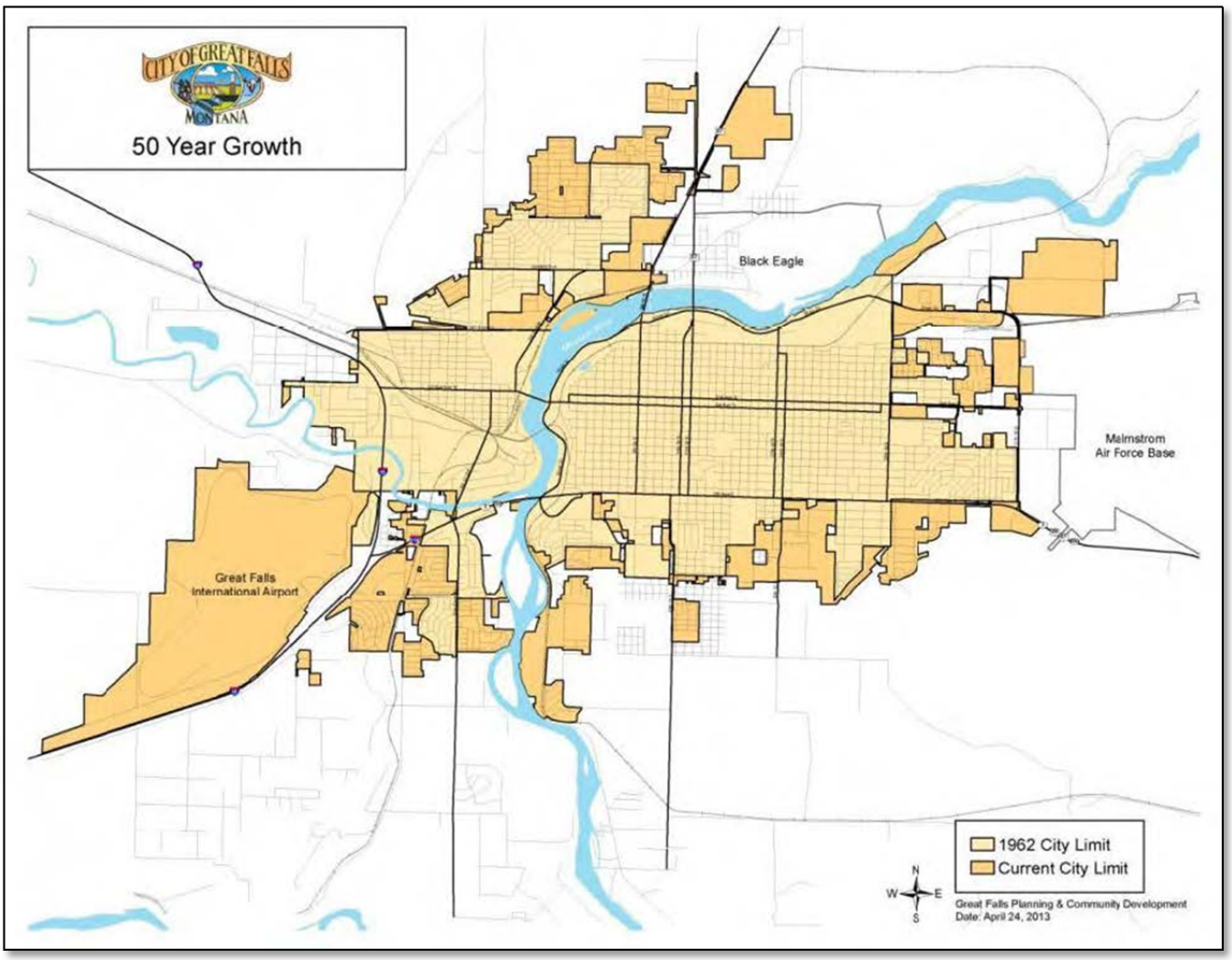
Source: Imagine Great Falls 2025, Growth Policy Update, August 6, 2013

5.2.1.1. Recent Development Trends and Future Growth Areas

A map showing how the land area of the City of Great Falls has expanded between 1962 and 2012 is presented in **Figure 5.2**. The incorporated area of the City has increased by more about 9.3 square miles over the past 50 years and now encompasses more than 22.5 square miles of land. As **Figure 5.2**

shows, the city has grown around most of its periphery. Notable areas where expansion has occurred include along the southern of expansion exist along the southern perimeter of the city and to the southwest in the vicinity of Great Falls International Airport. Infill development has occurred to the east between the city and Malmstrom AFB and north of the Missouri River along US Highway 87 and Black Eagle.

Figure 5.2: City Expansion Since 1962



Source: Imagine Great Falls 2025, Growth Policy Update, August 6, 2013

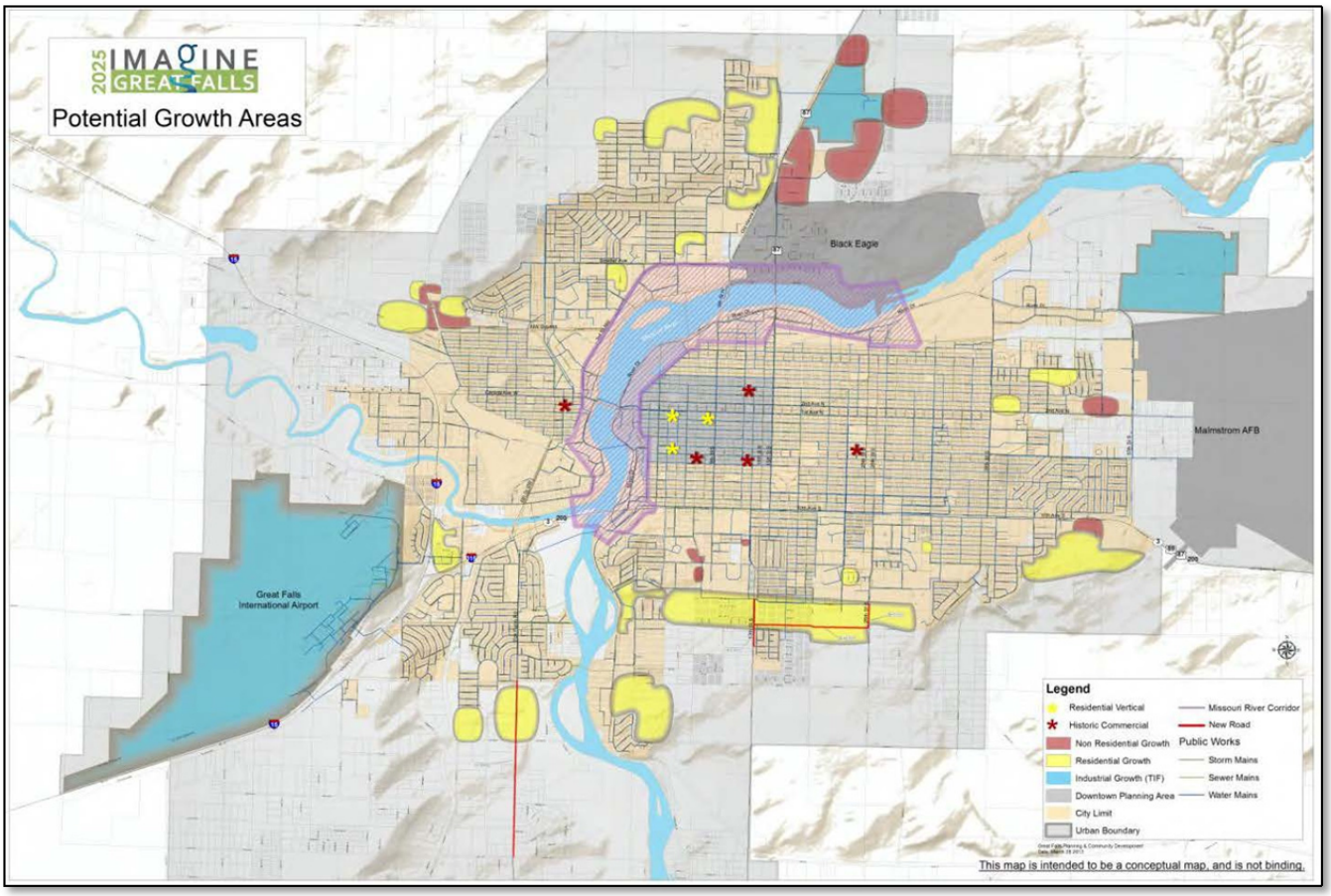
Numerous special area plans have been produced in Great Falls in recent years which help identify development goals and objectives and contain detailed evaluations of localized areas within the community. These plans are listed below:

- Downtown Access, Circulation, and Streetscape Plan (April 2013)
- Malmstrom AFB Joint Land Use Study (March 2012)
- Downtown Master Plan (October 2011)
- Medical District Master Plan (January 2007)
- Missouri River Urban Corridor Master Plan (2004)

The City's growth policy identifies potential growth areas within the community. These growth areas are shown on **Figure 5.3**. The principal areas for new residential growth are envisioned along the southern edge of the city in the southwestern portion of the community. Residential growth is also anticipated along the northern perimeter of the city west of US Highway 87. Non-commercial development and industrial growth are envisioned around the airport, east of US Highway 87 and north of Black Eagle, and in the northeastern portion of the urban area near Malmstrom AFB.

These potential growth areas were considered when allocating future residential and non-residential growth to the year 2035 within the study area.

Figure 5.3: Potential Growth Areas



Source: Imagine Great Falls 2025, Growth Policy Update, August 6, 2013

5.2.2. Population, Housing, and Employment Projections

5.2.2.1. Cascade County Population Projections

Projections are estimates of the population for future dates. They illustrate reasonable estimates of future population based on assumptions about current or expected demographic trends. Population projections (along with forecasts of the number of future housing units or households and employment conditions) are used to help predict future travel patterns and assess the performance of the transportation system.

County level population projections are available from Montana Department of Commerce Census & Economic Information Center (CEIC). The CEIC projections were developed by Regional Economic Models, Inc. (REMI) and provide complete annual demographic forecasts through 2060 for the State of Montana and each county. Similar projections are not available from the CEIC for other geographies in the State.

The projected population of Cascade County through the year 2035 based on the REMI model is provided below in **Table 5.14**.

Table 5.14: Population Projections

Year	Cascade County Projected Population [(a)]	Population in Transportation Plan Study Area [(b)]
2010 Census	81,327	69,515
2012 Estimate	81,723	69,853
2015	85,673	73,320
2020	90,176	77,079
2025	94,147	80,473
2030	96,502	82,486
2035	96,676	82,635

[(a)] Montana Department of Commerce, CEIC, Montana County Population Projections-County Comparison, 1990-2060, eREMI projections, released April 2013.
[(b)] 2010 Study Area population calculated through GIS analysis of traffic model.

As **Table 5.14** shows, the REMI model projects that Cascade County's population may approach 96,700 by the year 2035. This represents an overall increase in population of 18.9% over the 2010 population and an increase in population of about 0.75% per year.

5.2.2.2. Transportation Plan Study Area Population Projections

The share of the population living within the Great Falls Transportation Plan Study Area in 2010 was estimated using the travel demand model and GIS analysis to identify the number of residents living within the study area boundary. The analysis estimated the study area population to be 69,515 residents in 2010 with the remainder of the County's population attributed to other areas including the communities of Belt, Cascade, Eden/Stockett, Monarch/Neihart, Sun River, Sun Prairie, Ulm and Vaughn.

The population of the study area accounted for about 85% of the County's population in 2010. This relationship was held constant to project the future populations of the study area through 2035. As **Table 5.14** shows, the population of the study area is projected to grow by 13,120 residents over the 2010 to 2035 period and may be more than 82,600 by 2035.

These projections acknowledge and support the trend that most of the County's population and economic activity will continue to be located in the Great Falls area. Great Falls will continue to serve as the population and economic center for north-central Montana.

5.2.2.3. Cascade County Housing Projections

The number of housing units is a key component in the traffic model. Housing units distribute people throughout the network to given locations. They represent the population and act as a hub for traffic within the network. Having an accurate value for number of people per housing unit helps distribute the traffic more accurately. However, it is often quite difficult to accurately represent the population through housing units. This is in part because the number of people per housing units varies based on location and can

change at any time. The best that can be done is to take an average for the entire study area and apply that value to the model.

The population in Cascade County was 81,327 people according to the 2010 Census. The traffic model developed for the Great Falls area uses 37,276 housing units for Cascade County which results in an overall occupancy rate of about 2.18 people per housing unit. If the current occupancy rate for housing units in the County is held constant, there will be approximately 44,311 housing units in 2035. This means the County would have about 7,035 more housing units by 2035 than were recorded in 2010.

As shown earlier, the majority of the population and housing in Cascade County is located within the Great Falls area. The traffic model shows a 2010 study area population of 69,515 distributed among 31,151 housing units. This results in an occupancy rate of 2.23 people per housing unit for the study area. Based on this occupancy rate and the projected 2035 population, the transportation plan study area would have 37,056 housing units by 2035—an increase of 5,905 housing units over the number established for 2010.

Table 5.15 shows population and housing unit projections for Cascade County and the study area to the year 2035.

Table 5.15: Housing Unit Projections

Area	2010	2015	2025	2035	Net Change (2010 - 2035)
Cascade County					
Population	81,327	85,673	94,147	96,676	15,349
Housing Units [(a)]	37,276	39,268	43,152	44,311	7,035
Transportation Plan Study Area					
Population	69,515	73,230	80,743	82,635	13,120
Housing Units [(b)]	31,151	32,838	36,087	37,056	5,905
Other County Areas					
Population	11,812	12,443	13,674	14,041	2,229
Housing Units	6,125	6,430	7,065	7,255	1,130

[(a)] *Based on 2.18 persons per housing unit*
[(b)] *Based on 2.23 persons per housing unit in Study Area*

For the purposes of this plan, an additional 5,905 housing units will be allocated to the transportation plan study area and 1,130 housing units will be distributed in other areas of the county to account for the overall residential growth anticipated to occur by 2035 in Cascade County. These allocations are discussed later in this chapter.

5.2.2.4. Cascade County Employment Projections

Employment numbers are used in the traffic model to help distribute vehicle traffic as accurately as possible within the street and road network. Places with high levels of employment will tend to generate high levels of vehicle traffic. The traffic generated is based in part on the employment type: either retail or non-retail jobs. Non-retail jobs consist of all types of jobs broken out by the *North American Industry Classification System* classifications excluding “retail trade.”

The traffic model developed for the Great Falls area establishes the total employment for Cascade County at 49,259—including 10,107 retail jobs and 39,152 non-retail jobs. Future employment for Cascade County was projected using an annual growth rate of 0.87%—which represents the overall

annual rate of employment growth between 1970 and 2010 in the county. Retail jobs and non-retail jobs accounted for about 21% and 79%, respectively, of the total employment in the county in 2010. These percentages were held constant and used to estimate the number of retail and non-retail jobs to the year 2035. Based on the 40-year growth rate for employment and the breakdown of retail versus non-retail jobs, the total employment in Cascade County is projected to be 60,754 by 2035 consisting of 12,551 retail jobs and 47,280 non-retail jobs. This suggests there would be 11,495 more jobs in the county by 2035 than were seen in 2010.

Within the study area, the traffic model showed a total employment of 44,874 consisting of 9,709 retail jobs and 35,165 non-retail jobs in 2010. Future employment was projected to 2035 using the same long-term annual employment growth rate seen for the county (0.87% per year) and the same distribution of retail versus non-retail jobs seen within the study area. This methodology resulted in a 2035 projection of 55,724 total jobs within the study area (12,057 retail jobs and 43,668 non-retail jobs). This indicates there would be 10,850 more jobs in the study area by 2035 than were estimated in 2010. The projection also shows most of the future employment growth projected for the county will occur within the study area.

Table 5.16 presents employment projections for Cascade County and the Transportation Plan Study Area to the year 2035.

Table 5.16: Employment Projections

Area	2010	2015	2020	2025	2030	2035	Net Change (2010 - 2035)
Cascade County							
Total Employment	49,259	51,361	53,557	55,851	58,249	60,754	11,495
Retail Employment	*10,107*	*10,554*	*11,022*	*11,509*	*12,019*	*12,551*	*2,444*
Non-Retail Employment	*39,152*	*40,806*	*42,535*	*44,342*	*46,230*	*48,203*	*9,051*
Transportation Plan Study Area							
Total Employment	44,874	46,860	48,934	51,100	53,362	55,724	10,850
Retail Employment	*9,709*	*10,139*	*10,588*	*11,056*	*11,546*	*12,057*	*2,348*
Non-Retail Employment	*35,165*	*36,722*	*38,347*	*40,044*	*41,817*	*43,668*	*8,503*
Other County Areas							
Total Employment	4,385	4,500	4,623	4,751	4,887	5,030	645
Retail Employment	*398*	*415*	*434*	*453*	*473*	*492*	*94*
Non-Retail Employment	*3,987*	*4,084*	*4,118*	*4,298*	*4,413*	*4,538*	*551*

An additional 10,850 jobs (2,350 retail jobs and 8,500 non-retail jobs) will be allocated to the transportation plan study area and the remaining 645 jobs will be distributed in other areas of the county to account for the employment increases anticipated to occur in Cascade County by 2035. The allocation of employment within the study area is discussed in the following section.

5.3. TRAVEL DEMAND MODEL DEVELOPMENT

A travel demand model was developed by MDT for Cascade County. *TransCAD* software was used to develop the model. The process to develop the model consists of generating, distributing, and assigning vehicle trips to the roadway system to generate vehicle traffic. The following steps are made for developing the model:

- **Trip Generation:** Trip generation consists of applying nationally developed trip rates to land use quantities by the type of land use in the area. The trip generation step actually consists of two

individual steps: trip production and trip attraction. Trip production and trip attraction help to "explain" why the trip is made. Trip production is based on relating trips to various household characteristics. Trip attraction considers activities that might attract trip makers, such as offices, shopping centers, schools, hospitals and other households. The number of productions and attractions in the area is determined and is then used in the distribution phase.

- **Trip Distribution:** Trip distribution is the process in which a trip from one area is connected with a trip from another area. These combined trips are referred to as trip exchanges.
- **Mode Split:** Mode choice is the process by which the amount of travel will be made by each available mode of transportation. There are two major types: automobile and transit. The automobile mode is generally split into drive alone and shared ride modes. For this travel demand model, there were no "mode split" assignments (i.e. all trips are assumed to be automobile mode).
- **Trip Assignment:** Once the trip distribution element is completed, the trip assignment tags those trips to the major street network. The variables that influence the street or location tagged are travel time, length, and capacity.

To reflect existing conditions, the model uses 2010 population census information, 2010 employment information from *GeoResults*, and Geographic Information System (GIS) information for the existing roadway network. Traffic volumes generated by the existing conditions model are compared to existing physical traffic counts and adjustments are made to "calibrate" the model to ensure accuracy.

The projected conditions model was developed specifically for the year 2035 planning horizon. Additional housing and employment centers were added to the system to analyze projected traffic conditions. Census blocks and census tracts were used to distribute the population and employment growth that is projected to occur between now and 2035.

Built into the model are assumptions about traffic characteristics. The model assumes that traffic characteristics in the future will be similar to those seen today. Changing factors such as fuel costs, technological advances, and other unknown issues may affect the amount and type of traffic on the road network in the future. The model also assumes that the socioeconomic projections will be realized by the year 2035. Ultimately, the projected conditions model is used as a planning tool to help predict how traffic patterns might be affected by anticipated future developments.

5.3.1. Allocation of Future Growth

Modeling of future travel patterns out to the year 2035 planning horizon using MDT's traffic model required identification of future socioeconomic characteristics within each census tract and census block. County population and employment projections were translated into predictions of increases in housing and employment within Cascade County and the Transportation Plan Study Area.

To accomplish this task, an initial allocation of future housing and employment growth within the study area was made based on a review of existing land use and zoning maps for the City of Great Falls and surrounding county area, draft versions of City and County growth policy updates, and other community planning documents. These planning documents helped identify where residential, commercial and industrial development has occurred in the Great Falls area and provided information about where future residential and commercial growth is expected in the community. The *Imagine Great Falls 2025* growth policy update includes several exhibits illustrating past annexation patterns, residential development areas over time, vacant lands, and future growth areas. The initial allocation of future housing units and

employment attempted to reflect known patterns of growth and potential new growth areas within the study area.

After the initial assignment of housing and employment through the year 2035 was made, the consultant met with representatives of the City and County on August 16, 2013 to discuss and reach consensus on the distribution of future housing and employment growth within the Great Falls area. This enabled local government staff to consider and revise the growth assignments as needed based on their knowledge of recent land use trends, land availability and development limitations, land use regulations, planned public improvements, and known development proposals.

Figure 5.4 shows where future housing units are expected to be developed by the year 2035. As discussed previously, 5,905 new housing units were allocated within the study area. An additional 1,130 units were distributed outside of the study area and within the County based on a growth rate applied to select census blocks.

Similarly, **Figures 5.5** and **5.6** show where the projected increases in retail and non-retail employment are anticipated through the year 2035, respectively. Within the study area, 2,350 retail and 8,500 non-retail jobs were allocated. An additional 94 retail and 551 non-retail jobs were distributed outside of the study area and within the County by applying a growth rate to select census blocks.

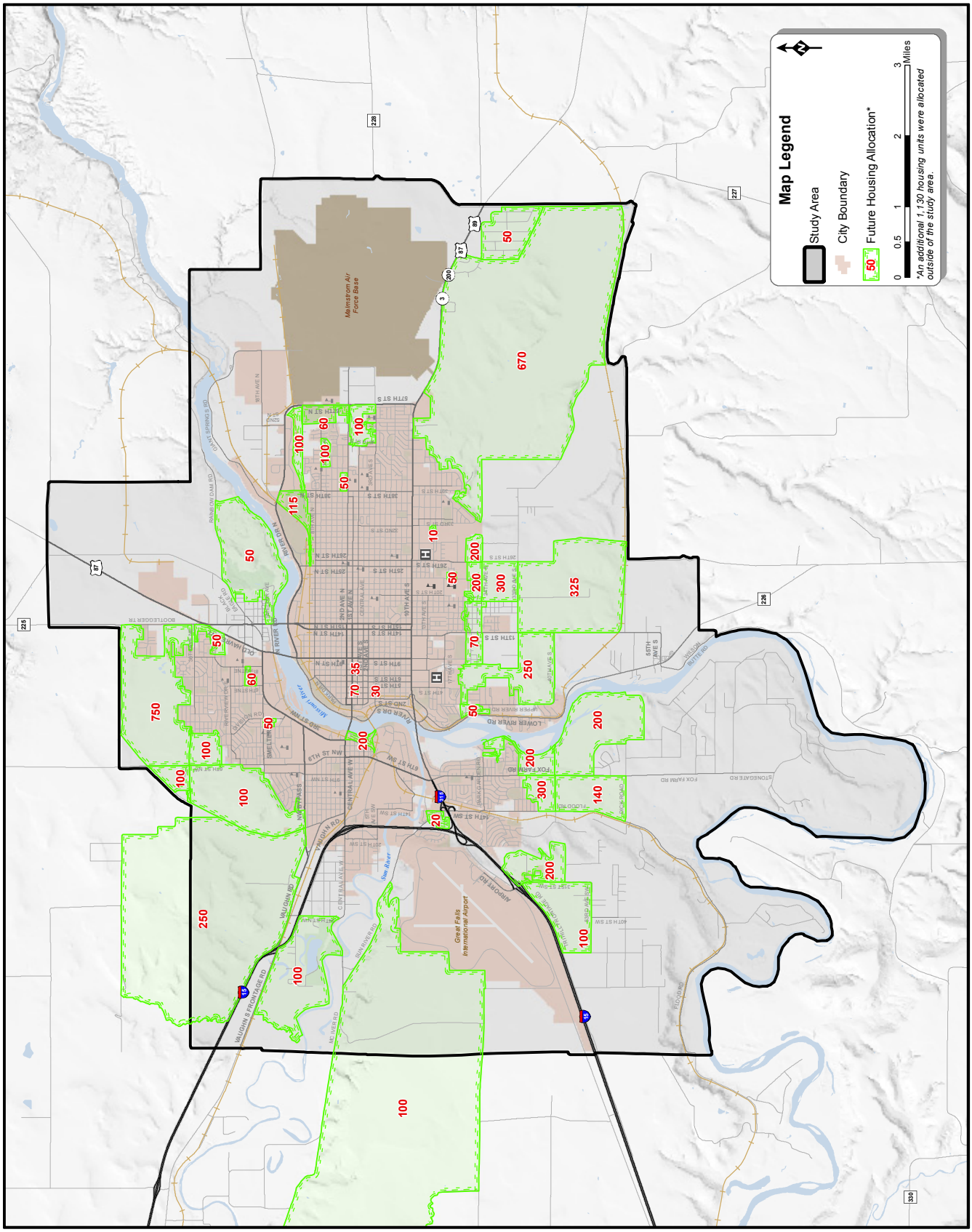


Figure 5.4: Future Housing Growth Allocation

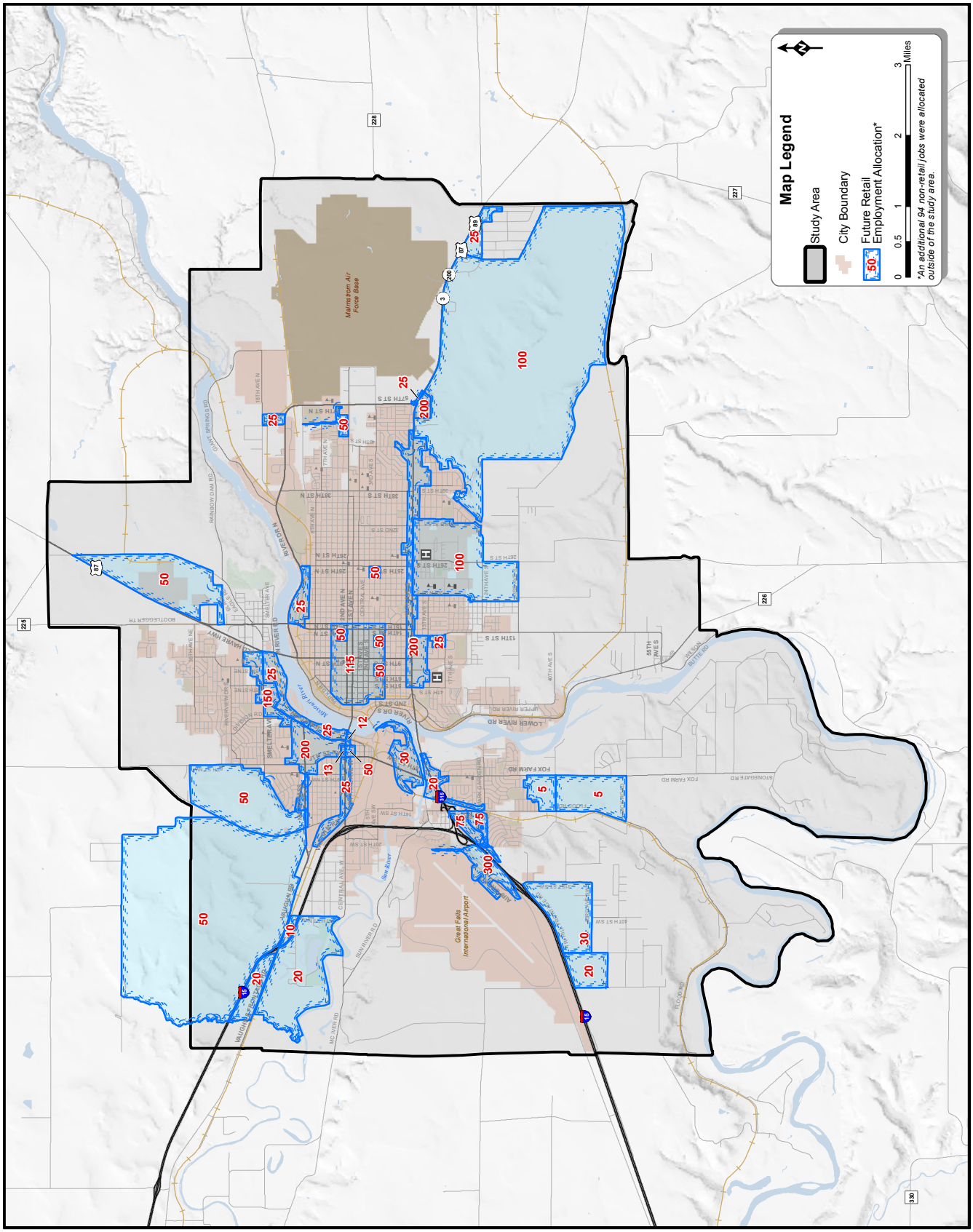


Figure 5.5: Future Retail Employment Growth Allocation

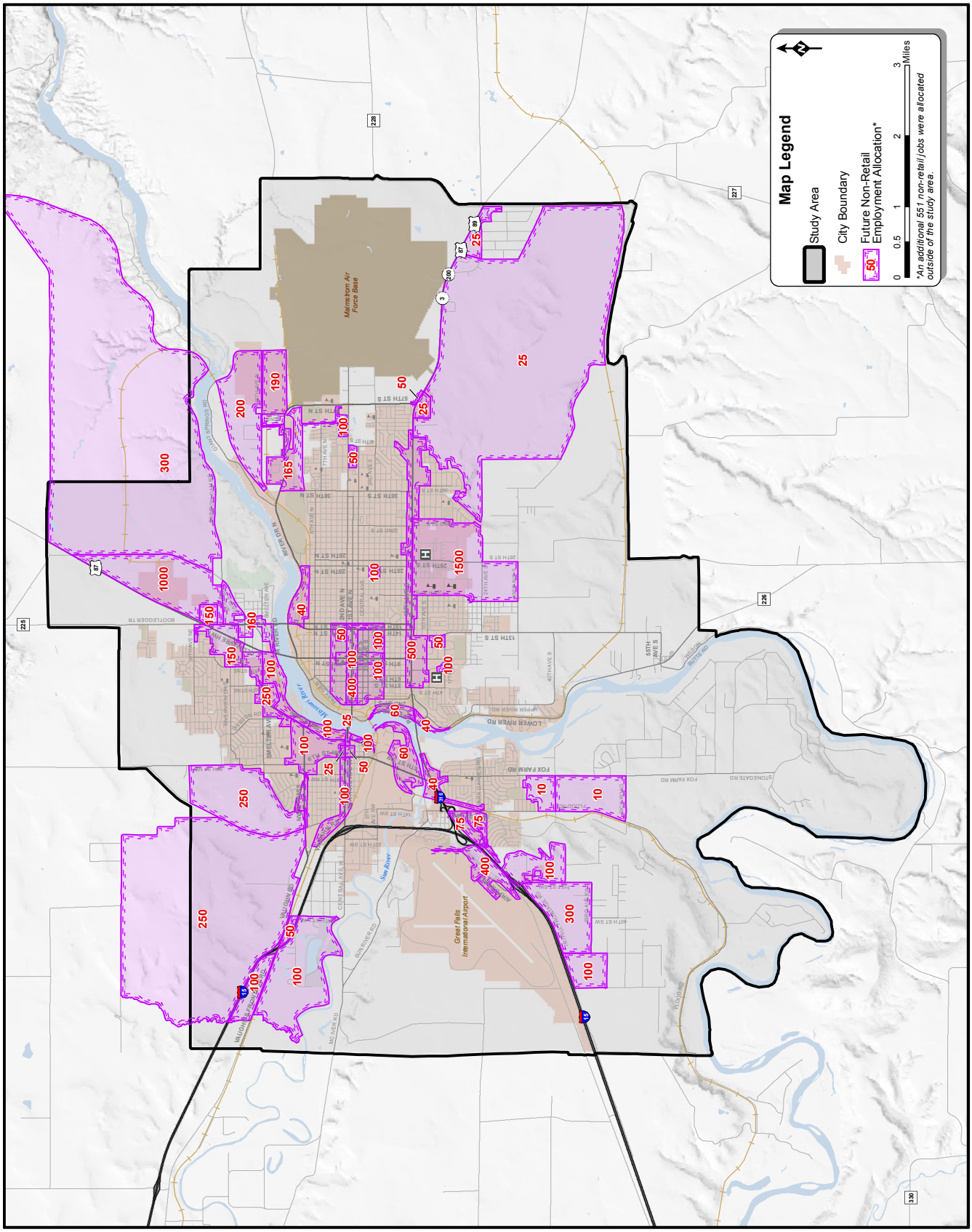


Figure 5.6: Future Non-Retail Employment Growth Allocation

5.4. PROJECTED ROADWAY VOLUMES AND CAPACITY

Projected (year 2035) traffic volumes were estimated using the travel demand model. A comparison of the existing conditions and projected conditions models was made to determine the percent change in traffic volume. The percent change was then applied to known existing AADT count sites to reflect projected daily traffic volumes. **Figure 5.7** shows the resulting projected daily traffic volumes within the study area; similarly, **Figure 5.8** shows the projected v/c ratios.

Note that the volumes shown on **Figure 5.7** and the v/c ratios shown on **Figure 5.8** are based on the "Existing plus Committed" roadway network. In other words, these are the volumes and v/c ratios if no changes to the transportation system are made other than those currently committed to.

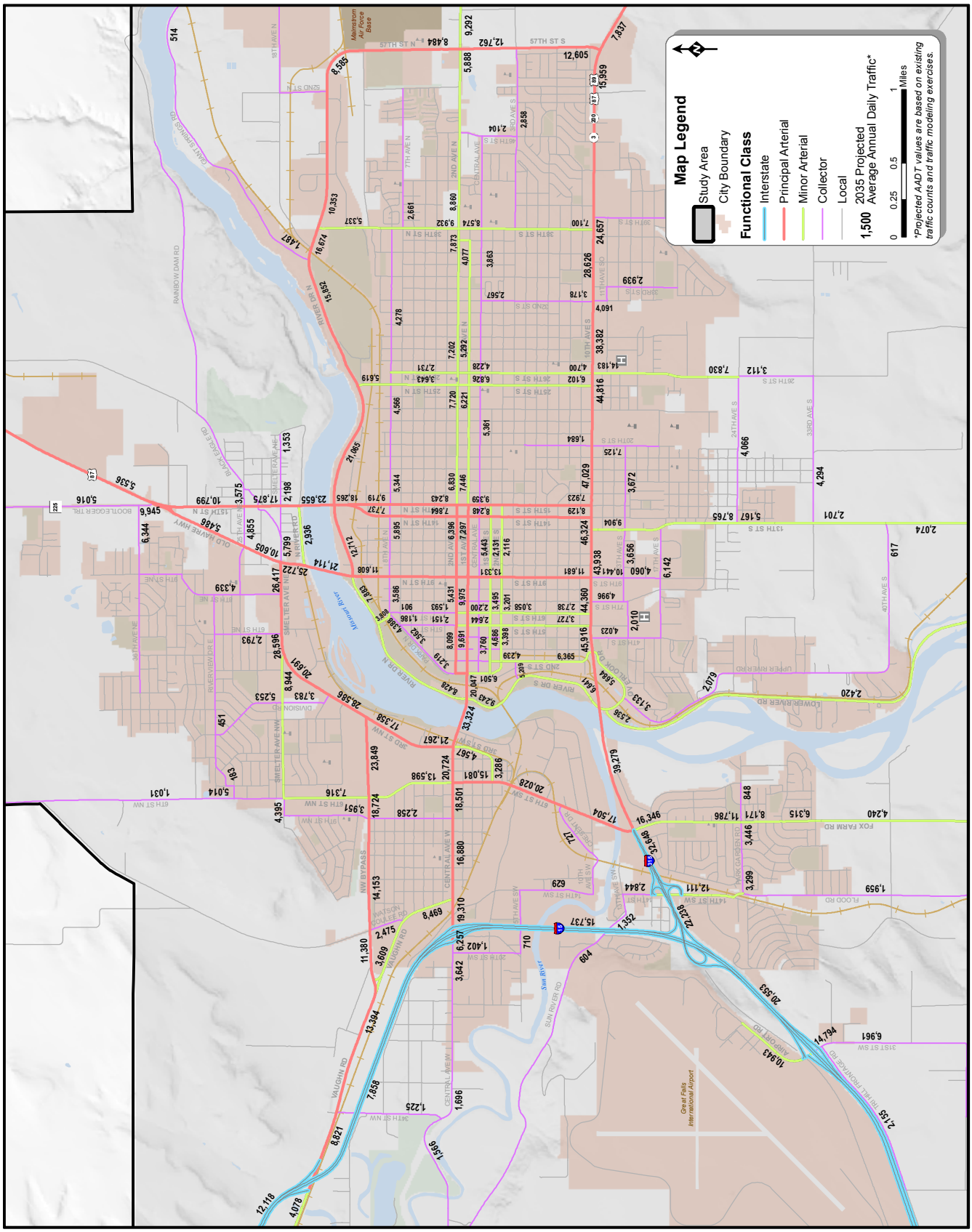


Figure 5.7: Projected (Year 2035) Average Annual Daily Traffic

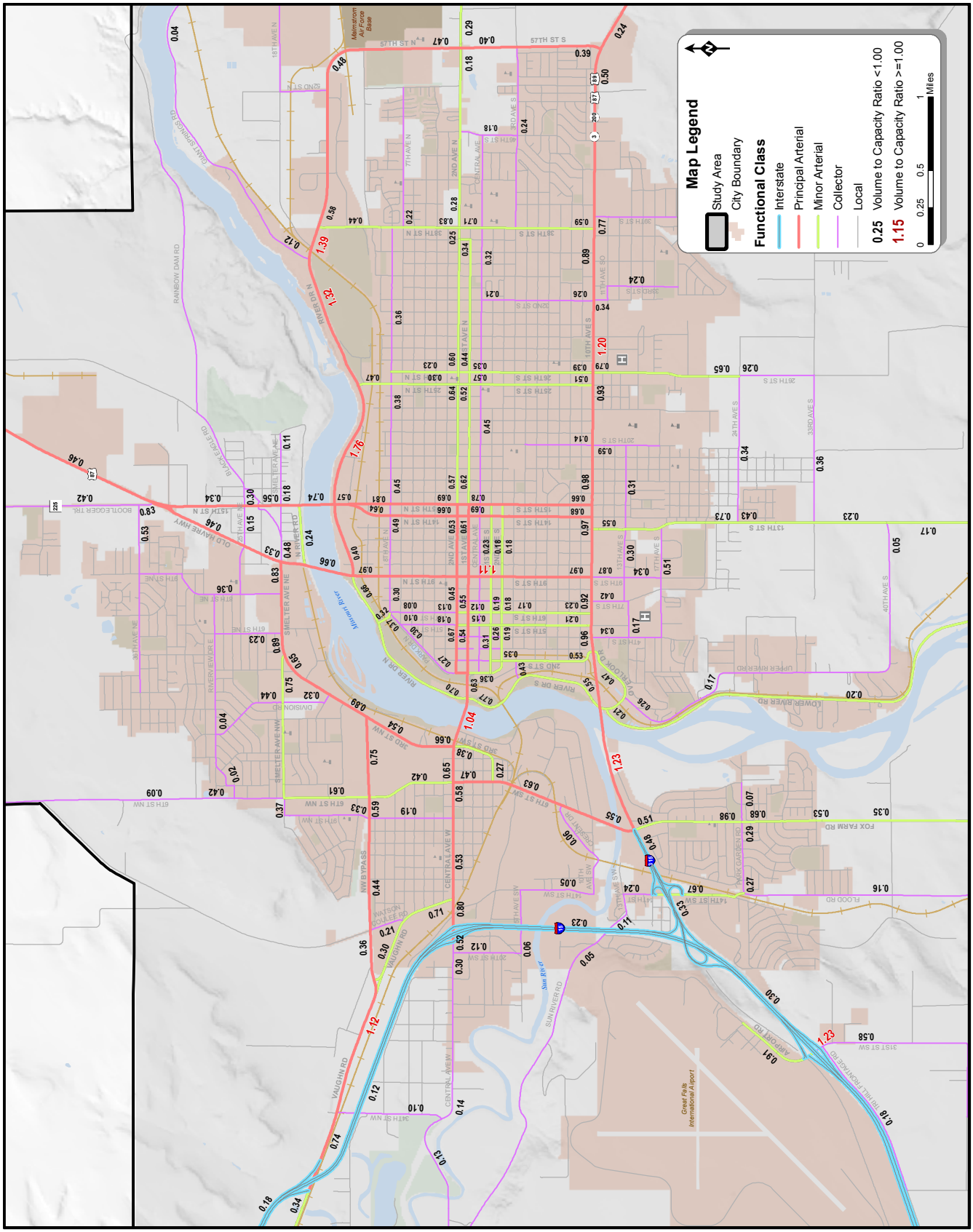


Figure 5.8: Projected (Year 2035) Volume to Capacity Ratios

5.5. PROJECTED INTERSECTION LEVEL OF SERVICE

Projections for intersection traffic volumes were made for the 61 intersections analyzed previously in **Section 4.3**. These projections were based on percent growth rates calculated from the travel demand model for the year 2035. A growth rate determined for the intersection as a whole was applied to each individual turning movement 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 **Tables 5.17** and **5.18**. **Figure 5.9** shows the projected conditions LOS graphically. More detailed information is provided in **Appendix B**.

Table 5.17: Projected (Year 2035) Signalized Intersection LOS

ID	Intersection	AM Peak Hour		PM Peak Hour	
		Delay (Sec)	LOS	Delay (Sec)	LOS
1	3rd Street NW / 14th Avenue NW	13.9	B	16.6	B
2	9th Street N / 8th Avenue N	18.9	B	20.8	C
3	9th Street N / 2nd Avenue N	16.4	B	17.7	B
4	9th Street N / 1st Avenue N	11.6	B	16.2	B
5	9th Street / Central Avenue	18.5	B	22.3	C
6	9th Street S / 1st Avenue S	11.3	B	12.6	B
7	9th Street S / 2nd Avenue S	7.0	A	11.8	B
8	10th Avenue S / Fox Farm Road	56.2	E	55.0	D
9	10th Avenue S / 26th Street S	16.2	B	47.2	D
10	10th Avenue S / 32nd Street S	21.8	C	36.9	D
11	14th Street SW / 16th Avenue SW	13.1	B	18.7	B
12	14th Street SW / Marketplace Drive	14.7	B	24.2	C
13	14th Street SW / Ramp B	13.9	B	18.7	B
14	38th Street N / River Drive N	13.7	B	13.6	B
15	57th Street N / 10th Avenue N	23.1	C	26.3	C
16	Central Avenue W / 3rd Street NW	46.4	D	64.3	E
17	Park Drive N / 1st Avenue N	16.3	B	23.4	C
18	River Drive N / 1st Avenue N	37.1	D	170.1	F
19	Smelter Avenue / 6th Street NE	14.8	B	11.9	B
20	Smelter Avenue / 10th Street NE	110.5	F	130.4	F
Intersections Counted by MDT					
M.1	10th Avenue S / 2nd Street S	21.4	C	63.9	E
M.2	10th Avenue S / 5th Street S	15.5	B	34.3	C
M.3	10th Avenue S / 7th Street S	11.8	B	18.2	B
M.4	10th Avenue S / 9th Street S	18.6	B	32.9	C
M.5	10th Avenue S / 11th Street S	8.4	A	5.3	A
M.6	10th Avenue S / 13th Street S	13.0	B	19.9	B
M.7	10th Avenue S / 14th Street S	19.7	B	24.6	C
M.8	10th Avenue S / 15th Street S	8.1	A	17.1	B
M.9	10th Avenue S / 20th Street S	9.7	A	22.7	C
M.10	10th Avenue S / 23rd Street S	14.4	B	27.0	C
M.11	10th Avenue S / 25th Street S	21.4	C	24.9	C

ID	Intersection	AM Peak Hour		PM Peak Hour	
		Delay (Sec)	LOS	Delay (Sec)	LOS
M.12	10th Avenue S / 38th Street S	19.3	B	27.0	C
M.13	10th Avenue S / 39th Street S	7.1	A	9.6	A
M.14	10th Avenue S / 43rd Street S	9.2	A	10.0	A
M.15	10th Avenue S / 49th Street S	4.7	A	6.0	A
M.16	River Drive N / 9th Street N	25.9	C	35.4	D
M.17	River Drive N / 15th Street N	73.7	E	83.4	F
M.18	Central Avenue NW / 6th Street NW	24.5	C	30.1	C
M.19	NW Bypass / 3rd Street NW	17.3	B	58.5	E

Table 5.18: Projected (Year 2035) Unsignalized Intersection LOS

ID	Intersection	AM Peak Hour		PM Peak Hour	
		Delay (Sec)	LOS	Delay (Sec)	LOS
21	10th Avenue S / 29th Street S	305.0	F	533.2	F
22	11th Avenue S / 26th Street S	43.2	E	32.9	D
23	11th Avenue S / 28th Street S	13.6	B	15.3	C
24	11th Avenue S / 29th Street S	10.7	B	11.2	B
25	13th Avenue S / 9th Street S	16.6	C	31.0	D
26	13th Avenue S / 26th Street S	20.4	C	37.9	E
27	25th Avenue NE / 8th Street NE	176.1	F	34.5	D
28	2nd Street S / 3rd Avenue S	12.8	B	32.6	D
29	36th Avenue NE / Bootlegger Trail	139.1	F	358.8	F
30	38th Street / Central Avenue	19.1	C	15.7	C
31	Bootlegger Trail / U.S. 87	117.8	F	1105.0	F
32	Fox Farm Road / 18th Avenue SW	1382.0	F	379.2	F
33	Fox Farm Road / Park Garden Road	710.4	F	49.4	E
34	I-15 EB Ramp / Airport Drive	16.6	C	4498.0	F
35	I-15 WB Ramp / Airport Drive	247.4	F	1757.0	F
36	Park Drive N / 2nd Avenue N	121.4	F	480.7	F
37	River Drive N / 25th Street N	37.6	E	353.3	F
38	River Drive S / 3rd Avenue S	16.4	C	199.1	F
39	Old Havre Highway / 15th Street N	181.2	F	171.8	F
40	6th Street SW / 4th Avenue SW	21.4	C	87.1	F
41	15th Avenue S / 26th Street S	780.7	F	1430.0	F
42	32nd Street S / 11th Avenue S	15.5	C	17.3	C

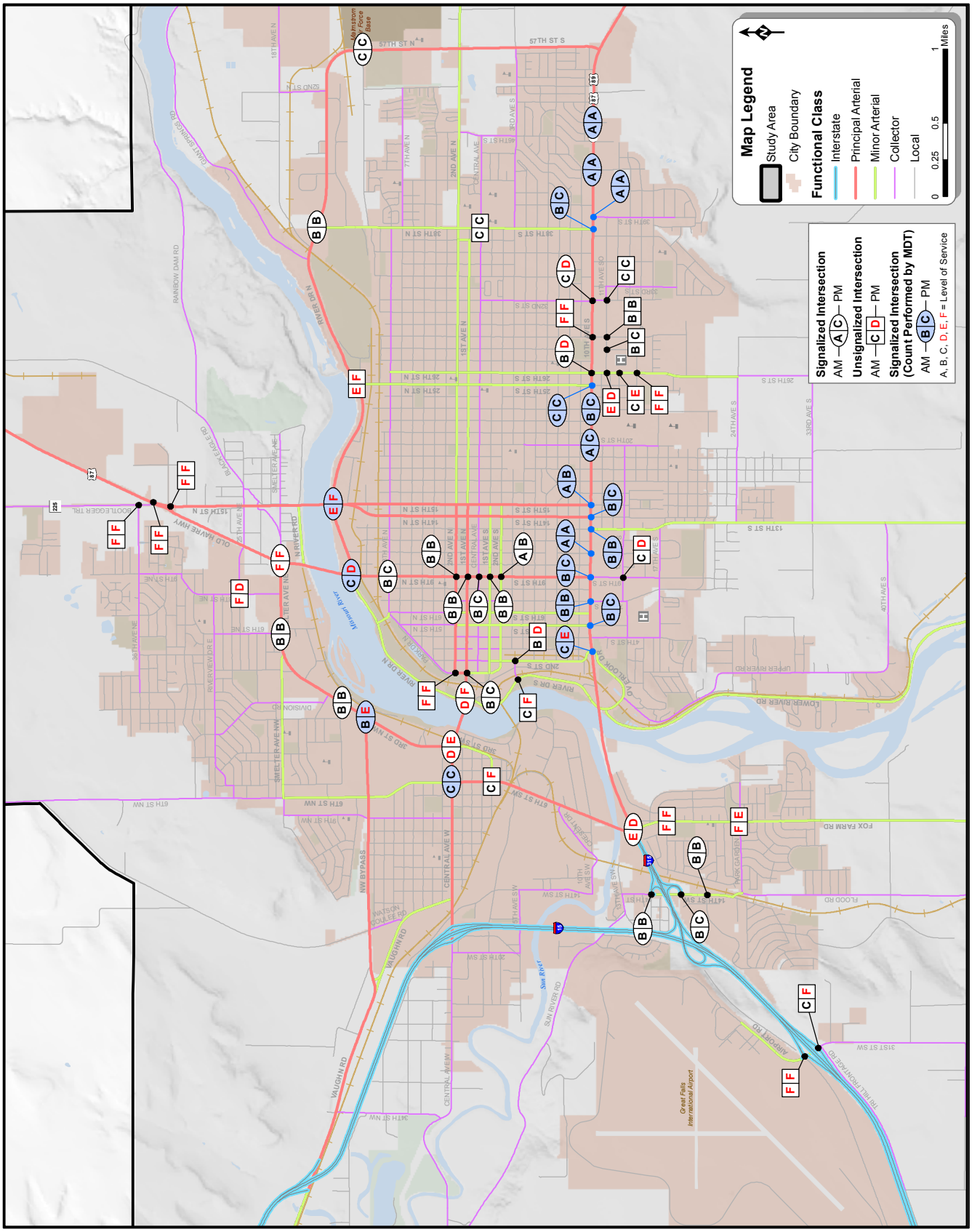


Figure 5.9: Projected (Year 2035) Intersection Level of Service

5.6. MEDICAL DISTRICT SUB-AREA

The Great Falls Medical District is located south of 10th Avenue South, loosely bordered by 23rd Street South to the west and 33rd Street South to the east. The Medial District has been a catalyst for job and housing growth over the recent decade(s) due to its core medical and health care related business focus. Numerous medical related entities are found within the Medical District, including Benefis Healthcare, Great Falls Clinic, Centene, and others.

Due to the potential growth opportunities and unique traffic characteristics, the Medical District was analyzed in more detail as a separate sub-area to the Transportation Plan study area. This section is intended to quantify existing and future transportation system considerations specific to this sub-area.

5.6.1. ROADWAY NETWORK

There exist a number of roadways of varying classification that provide vehicular access to the Medical District. The following sections describe the roadways that are considered major routes within the Medical District:

East – West Roads

- **10th Avenue South:** is functionally classified as a principal arterial and carries the highest traffic volumes within the Great Falls urban area. The route begins at the termini of Interstate 315 and ends at 57th Street South on the eastern edge of town near Malmstrom Air Force Base, where it transitions to US Highway 87 / 89. The route consists of two- to three-travel lanes in each direction and dedicated left-turn bays at most intersections. The entire length of 10th Avenue South contains raised median either for channelization of left-turn bays or to prohibit left-turn movements out of private approaches. Eighteen traffic signals are found at major intersections along the 5.25-mile route.

- **11th Avenue South:** parallels 10th Avenue South one block to the south. There is a small segment classified as a collector (located between 32nd Street South and 33rd Street South); the remaining portion is classified as a local road. The route provides direct access to the Benefis parking lots north of 11th Avenue South, as well as to the Hospital's emergency room. 11th Avenue South is also used to connect to 28th and 29th Streets South and other businesses in the area. 11th Avenue South is a two-lane roadway, with one travel lane in each direction. There are multiple pedestrian crosswalks across the facility near Benefis.

- **15th Avenue South:** is a local roadway that provides access to a variety of businesses and residential complexes. Recently an extension was constructed between 23rd Street South and 26th Street South. The facility is a two-lane roadway, with one travel lane in each direction.

- **21st Avenue South:** is a local roadway that is not completed in continuity. Recently, a segment was constructed between 21st Street South and 23rd Street South as part of a development project. The area south and north of 21st Avenue South is a potential growth area. As development occurs in the area, it is envisioned that this roadway will continue to be expanded to connect to adjacent streets.

- **24th Avenue South:** is a rural collector roadway. 24th Avenue South is expected to be upgraded in the next few years to an urban collector standard as part of the *South Arterials Project*. 24th Avenue South provides for continuous east-west flow at the southern end of the Medical District. In its present form it is a rural, two-lane roadway, with one travel lane in each direction.

North-South Roads

- **25th Street South:** Classified as a local roadway south of 10th Avenue South. It captures traffic from the one-way couplet north of 10th Avenue South, and ends at 15th Avenue South. The roadway consists of one travel lane in each direction.

- **26th Street South:** Classified as a minor arterial north of 24th Avenue South. The roadway consists of two travel lanes in each direction between 11th Avenue South and 21st Avenue South. Between 21st Avenue South and 24th Avenue South, the roadway has one travel lane in each direction. As part of the *South Arterials Project*, the roadway will be expanded to include two travel lanes in each direction between 21st Avenue South and 24th Avenue South. There are currently no turn-bays at any location between 11th Avenue South and 24th Avenue South, making this a true four-lane road. Pedestrian activity is high crossing the road near 13th Avenue South due to parking lots on the west side of 26th Street South.

- **28th Street South:** Local roadway that provides internal business connectivity. The roadway connects between 11th Avenue South and 15th Avenue South. Ultimately, the extension of the roadway is restricted by the presence of residential and business units.

- **29th Street South:** Local roadway that terminates at 18th Avenue South. The roadway serves businesses and residential units in the Medical District.

- **32nd Street South:** Classified as a collector roadway between 10th Avenue South and 11th Avenue South and as a local roadway south of 11th Avenue South. The roadway serves traffic accessing 11th Avenue originating from north and east of 10th Avenue South. A traffic signal at 10th Avenue South and 32nd Street South allows ease of egress and ingress to 32nd Street South. 32nd Street South predominately serves businesses in the Medical District.

- **33rd Street South:** Collector between 11th Avenue South and 19th Avenue South. The roadway primarily serves local residential units. The majority of traffic along the roadway results from the adjacent residential neighborhood and does not appear to be related to Medical District business destinations.

5.6.2. Average Annual Daily Traffic Volumes

MDT and the City of Great Falls collect AADT traffic data at nine sites located within the Medical District. The traffic data is either manually collected or estimated on a yearly basis. **Table 5.19** shows the most recent traffic data for the count sites located within the Medical District. In addition, traffic volumes from the year 2012 were projected out to the year 2035 using growth rates derived from the travel demand model.

Table 5.19: Medical District AADT

Site ID	Location	2008	2009	2010	2011	2012	2035 [(a)]
7-2A-14	10th Ave S, W of 25th St	36,300	34,910	33,790	37,060	38,810	44,816
7-2A-15	10th Ave S, E of 26th St	29,650	30,180	24,550	30,340	32,960	38,382
7-2A-153	26th St S, S of 10th Ave S	11,520	11,750	12,430	12,380	11,002	14,183
7-2A-156	33rd St S, between 13th and 14th Ave S	2,630	2,890	3,060	2,400	2,380	2,939
7-2A-246	23rd St S, S of 10th Ave S	4,110	4,190	4,430	4,410	4,487	5,540
7-2A-247	32nd St S, S of 10th Ave S	4,040	4,120	4,490	4,470	3,552	4,091
7-2A-264	29th St S, S of 10th Ave S	3,700	3,770	3,990	3,970	2,499	2,730
7-2A-265	11th Ave S, E of 29th St S	4,420	4,510	4,770	4,750	4,404	5,332
7-2A-278	26th St, N of 24th Ave S	2,840	3,430	3,630	3,850	3,290	7,830

[(a)] *Projected AADT determined by applying the percent growth determined from the travel demand model to 2012 AADT counts.*

5.6.3. Intersection Level of Service

Vehicle turning movement data was collected at twelve intersections within the Medical District. AM and PM peak hour turning movement counts were collected to capture both community peak hour travel times and shift changes within the medical district complex. In addition to turning volumes and movement characteristics of vehicles, data was collected for trucks, pedestrians and bicyclists.

Tables 5.20 and **5.21** show the existing and projected intersection LOS for the intersections within the Medical District. The LOS is shown for the AM and PM peak hours for the intersection as a whole as well as for each individual turning movement.

Table 5.20: Medical District Signalized Intersection LOS

ID	Intersection	Existing 2013		Projected 2035	
		AM	PM	AM	PM
9	**10th Avenue S / 26th Street S**	**B**	**C**	**B**	**D**
	Eastbound Left	*A*	*C*	*A*	*F*
	Eastbound Thru	*A*	*C*	*B*	*C*
	Eastbound Right	*B*	*B*	*B*	*B*
	Westbound Left	*A*	*B*	*A*	*C*
	Westbound Thru	*B*	*B*	*B*	*C*
	Westbound Right	*B*	*B*	*B*	*C*
	Northbound Left	*E*	*F*	*E*	*F*
	Northbound Thru	*D*	*D*	*D*	*D*
	Northbound Right	*D*	*D*	*D*	*D*
10	**10th Avenue S / 32nd Street S**	**B**	**C**	**C**	**D**
	Eastbound Left	*A*	*B*	*A*	*B*
	Eastbound Thru	*B*	*C*	*B*	*C*
	Eastbound Right	*B*	*C*	*B*	*D*
	Westbound Left	*A*	*B*	*A*	*C*
	Westbound Thru	*B*	*B*	*B*	*C*
	Westbound Right	*B*	*B*	*B*	*C*
	Northbound Left / Thru / Right	*D*	*E*	*E*	*F*
	Southbound Left / Thru / Right	*C*	*D*	*C*	*D*
M.9	**10th Avenue S / 20th Street S**	**A**	**B**	**A**	**C**
	Eastbound Left	*A*	*B*	*B*	*C*
	Eastbound Thru	*A*	*B*	*A*	*B*

ID	Intersection	Existing 2013		Projected 2035	
		AM	PM	AM	PM
	Eastbound Right	*A*	*B*	*A*	*B*
	Westbound Left	*B*	*B*	*B*	*C*
	Westbound Thru	*A*	*B*	*A*	*B*
	Westbound Right	*A*	*B*	*A*	*B*
	Northbound Left	*C*	*E*	*C*	*F*
	Northbound Thru / Right	*C*	*C*	*C*	*C*
	Southbound Left / Thru / Right	*C*	*C*	*C*	*C*
M.10	**10th Avenue S / 23rd Street S**	**B**	**C**	**B**	**C**
	Eastbound Left	*B*	*D*	*B*	*D*
	Eastbound Thru	*A*	*B*	*A*	*B*
	Eastbound Right	*A*	*B*	*B*	*C*
	Westbound Left	*B*	*C*	*C*	*D*
	Westbound Thru	*A*	*C*	*B*	*C*
	Westbound Right	*B*	*C*	*B*	*C*
	Northbound Left / Thru	*E*	*D*	*E*	*D*
	Northbound Right	*D*	*C*	*D*	*C*
	Southbound Left / Thru / Right	*D*	*D*	*E*	*E*
M.11	**10th Avenue S / 25th Street S**	**B**	**C**	**C**	**C**
	Eastbound Thru	*B*	*C*	*B*	*C*
	Eastbound Right	*B*	*C*	*B*	*C*
	Westbound Thru	*B*	*C*	*B*	*C*
	Northbound Left / Right	*C*	*D*	*C*	*D*
	Southbound Left	*D*	*C*	*D*	*D*
	Southbound Thru	*C*	*C*	*C*	*D*
	Southbound Right	*C*	*C*	*D*	*E*

Table 5.21: Medical District Unsignalized Intersection LOS

ID	Intersection	Existing 2013		Projected 2035	
		AM	PM	AM	PM
21	**10th Avenue S / 29th Street S**	**F**	**F**	**F**	**F**
	Northbound Left / Thru / Right	*F*	*F*	*F*	*F*
	Southbound Left / Thru / Right	*F*	*B*	*F*	*B*
22	**11th Avenue S / 26th Street S**	**C**	**C**	**E**	**D**
	Eastbound Left / Thru / Right	*C*	*C*	*E*	*C*
	Westbound Left / Thru	*D*	*D*	*F*	*F*
	Westbound Right	*A*	*B*	*A*	*C*
23	**11th Avenue S / 28th Street S**	**B**	**B**	**B**	**C**
	Northbound Left / Thru / Right	*B*	*B*	*B*	*C*
	Southbound Left / Thru / Right	*A*	*B*	*A*	*B*
24	**11th Avenue S / 29th Street S**	**B**	**B**	**B**	**B**
	Eastbound Left / Thru / Right	*A*	*B*	*A*	*B*
	Westbound Left / Thru / Right	*B*	*B*	*B*	*B*
	Northbound Left / Thru / Right	*A*	*B*	*A*	*B*
	Southbound Left / Thru / Right	*B*	*B*	*B*	*B*
26	**13th Avenue S / 26th Street S**	**B**	**C**	**C**	**E**
	Eastbound Left / Thru / Right	*B*	*C*	*C*	*E*
	Westbound Left / Thru / Right	*B*	*B*	*C*	*D*

ID	Intersection	Existing 2013		Projected 2035	
		AM	PM	AM	PM
41	**15th Avenue S / 26th Street S**	**C**	**C**	**F**	**F**
	Eastbound Left / Thru / Right	*C*	*C*	*-*	*F*
	Westbound Left / Thru / Right	*C*	*C*	*F*	*F*
42	**32nd Street S / 11th Avenue S**	**B**	**B**	**C**	**C**
	Northbound Left / Thru / Right	*B*	*B*	*C*	*C*
	Southbound Left / Thru / Right	*B*	*B*	*B*	*B*

5.7. ALTERNATIVE MODELING SCENARIOS

The travel demand model developed for the LRTP was used to analyze the effects that various network improvements would have on the transportation network. Using the traffic model provided by MDT, it is possible to produce traffic assignments that predict the effects of major modifications and additions to the street network.

Alternatives such as the addition of new arterial links, street closures, or the extension of existing routes were identified and discussed by the TAC. Modeling scenarios were ultimately developed to include roadway capacity additions or new roadway links in areas where transportation needs presently exist, or where future investment may be needed as a result of expected population/employment growth. **Figure 5.10** gives a graphical representation of the alternative scenarios.

The alternatives presented in this section are for modeling purposes only and do not represent actual project recommendations at this time. The analysis of these alternatives was made to give a theoretical idea of how certain network modifications made to the transportation system affect the overall network and surrounding area. Should projects arise in the future along these corridors, design alternatives to those discussed in this section will need to be analyzed to determine the appropriate configuration of the roadways.

Fifteen modeling scenarios were developed for the purposes of this exercise and are discussed in the following sections. The alternative scenarios are generally localized and create new links or expand existing facilities in a particular study subarea. The effect of each scenario on the network generally occurs most noticeably in a concentrated area where changes to the network are made. Because all scenarios involve new links and/or roadway capacity additions, the scenario analysis is focused on how traffic volumes are shifted on key facilities throughout the major effected area.

Listed below are narrative descriptions of the proposed modifications for each model run, along with a brief description of the results. The modeling of each alternative scenario was completed under projected year 2035 conditions assuming that no other modifications to the existing traffic network were made. For comparison purpose, the projected year 2035 Existing plus Committed (E+C) modeling results were used as baseline conditions. The results of each alternative scenario run under were compared to the baseline model. The main attribute used for determining the affect that the alternative scenario has on the transportation system is the percent change in traffic volumes compared to the baseline traffic model.

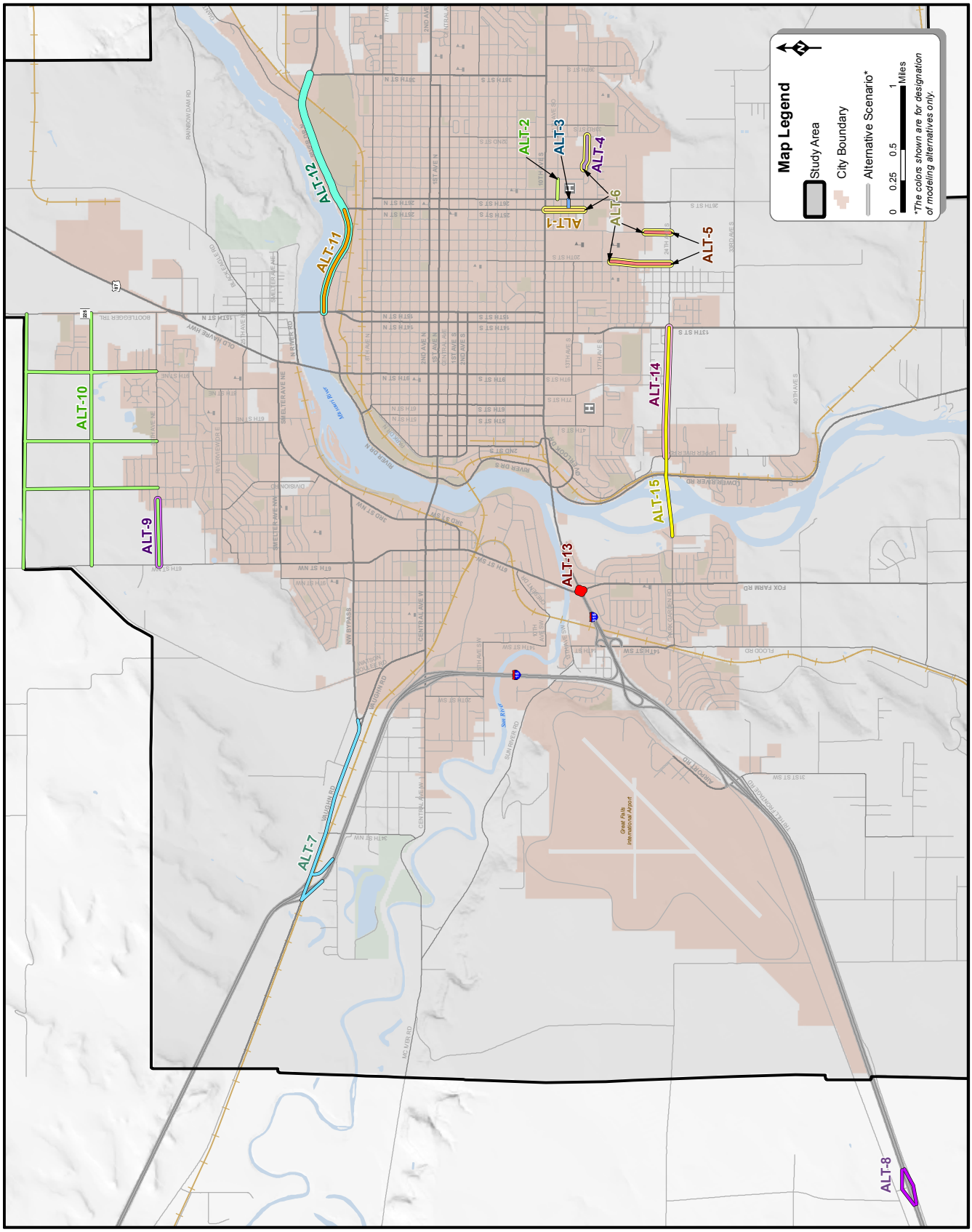


Figure 5.10: Alternative Modeling Scenarios

Alt-1: 25th Street South / 26th Street South

This alternative would extend the 25th / 26th Street South couplet system south of 10th Avenue South to 15th Avenue South. 25th Street South would be modeled as one-way southbound between 10th Avenue South and 15th Avenue South. 26th Street South would remain two-way traffic flow south of 10th Avenue South.

Traffic Volume Modeling Results:

- 23rd Street South (south of 10th Avenue South): +55%.
- 24th Street South (south of 10th Avenue South): +42%.
- 25th Street South (south of 10th Avenue South): -45%.
- 26th Street South (south of 10th Avenue South): negligible change.
- 10th Avenue South: negligible change.

Alt-2: 11th Avenue South

The connection between 26th Street South and 28th Street South along 11th Avenue South would be closed to vehicular traffic.

Traffic Volume Modeling Results:

- 10th Avenue South (between 26th Street South and 29th Street South): +7 to + 11%.
- 11th Avenue South (between 29th Street South and 32nd Street South): +50% to +60%
- 32nd Street South (south of 10th Avenue South): -2%
- 26th Street South (between 10th Avenue South and 15th Avenue South): negligible decrease.

Alt-3: 13th Avenue South

13th Avenue South would be closed to vehicular traffic between 25th Street South and 26th Street South.

Traffic Volume Modeling Results:

- 12th Avenue South (east of 25th Street South): +72%.
- 25th Street South (south of 10th Avenue South): -7%.
- 26th Street South (south of 10th Avenue South): +3%.
- 10th Avenue South: negligible change.

Alt-4: 15th Avenue South

A connection would be completed along 15th Avenue South between 29th Street South to 32nd Street South.

Traffic Volume Modeling Results:

- 11th Avenue South (east of 29th Street South): -4%.
- 32nd Street South (south of 10th Avenue South): negligible change.
- 29th Street South (south of 10th Avenue South): negligible change.
- 10th Avenue South: negligible change.
- 15th Avenue South (new extension): +300 vpd.

Alt-5: 23rd Street South / 20th Street South

23rd Street South and 20th Street South would be extended to 24th Avenue South. This would include opening up and adding a link between 17th Avenue South and 18th Avenue South.

Traffic Volume Modeling Results:

- 10th Avenue South (between 20th Street South and 23rd Street South): +1% to +3%.
- 20th Street South (south of 10th Avenue South): +17%.
- 20th Street South (new extension): +1,300 vpd
- 23rd Street South (south of 10th Avenue South): -15%.
- 23rd Street South (new extension): 1,100 vpd.
- 24th Avenue South (between 20th Street South and 23rd Street South): -54% to -25%.

Alt-6: Medical District Modifications

Includes all modifications in alternatives 1, 4, and 5:

- Extend the 25th / 26th Street South couplet system south of 10th Avenue South to 15th Avenue South.
    - 25th Street South would be modeled as one-way southbound.
    - 26th Street South would remain two-way traffic flow (south of 10th Avenue South).
- Complete the connection of 15th Avenue South from 29th Street South to 32nd Street South.
- Extend 23rd Street South to 24th Avenue South.
- Extend 20th Street South to 24th Avenue South
    - Includes opening up and adding link between 17th Avenue South and 18th Avenue South.

Traffic Volume Modeling Results:

- 10th Avenue South: negligible decrease.
- 20th Street South (south of 10th Avenue South): negligible change.
- 20th Street South (new extension): +800 vpd
- 23rd Street South (south of 10th Avenue South): -17%.
- 23rd Street South (new extension): 1,800 vpd.
- 11th Avenue South (east of 26th Street South): -4%.
- 15th Avenue South (new extension): +400 vpd.
- 25th Street South (new extension): +300 vpd.

Alt-7: Emerson Junction

Connections would be added to the Emerson junction interchange to allow full, double access vehicular movements. A northbound off-ramp and southbound on-ramp are included. In addition, the capacity on Vaughn Road would be increased.

Traffic Volume Modeling Results:

- I-15 Southbound Off-ramp: negligible change.
- I-15 Southbound On-ramp (new connection): +1,200 vpd.
- I-15 Northbound Off-ramp (new connection): +500 vpd.
- I-15 Northbound On-ramp: negligible change.
- Vaughn Road (east of I-15): +6%.
- Vaughn Road (west of I-15): +27%.
- I-15 Northbound (south of Vaughn Road): +11%.
- I-15 Southbound (south of Vaughn Road): +4%.

Alt-8: Southwest Interchange

A new interchange to I-15 would be added at the existing underpass, near the westerly projection of 62nd Avenue Southwest. The interchange would connect to the I-15 frontage road (to the north) and the Tri-Hill frontage road (to the south).

Traffic Volume Modeling Results:

- Eastbound Off-ramp (new connection): +200 vpd.
- Eastbound On-ramp (new connection): +200 vpd.
- Westbound Off-ramp (new connection): +800 vpd.
- Westbound On-ramp (new connection): +100 vpd.
- Tri Hill Frontage Road (south of new connection): +96%.
- I-15 Frontage Road (north of new connection): -61%.
- Airport Interchange (Eastbound On-ramp): -3%.
- Airport Interchange (Westbound Off-ramp): -9%.

Alt-9: 36th Avenue Northeast

36th Avenue Northeast would be extended from its westerly end near 1st Street Northeast to connect with 6th Street Northwest.

Traffic Volume Modeling Results:

- 36th Avenue Northeast (new extension): +2,800 vpd.
- 36th Avenue Northeast (west of 9th Street Northeast): -4%.
- 36th Avenue Northeast (west of Bootlegger Trail): -4%.
- 6th Street Northwest (south of 36th Avenue Northeast): +922%.
- 2nd Street Northeast (south of 36th Avenue Northeast): -64%.
- Skyline Drive (east of 6th Street Northwest): -43%.

Alt-10: Northern Grid Modifications

This alternative includes the extension of 36th Avenue Northeast contained in Alt-9 as well as the following new connections:

- 44th Avenue Northeast between US 87 and 6th Street Northwest
- Watson Lane between US 87 and 6th Street Northwest
- 2nd Street Northeast between 40th Avenue Northeast and Watson Lane
- 5th Street Northeast between 36th Avenue Northeast and Watson Lane
- 9th Street Northeast between 41st Avenue Northeast and Watson Lane)

Traffic Volume Modeling Results:

- 36th Avenue Northeast (new extension): +2,600 vpd.
- 36th Avenue Northeast (west of 9th Street Northeast): -30%.
- 6th Street Northwest (south of 36th Avenue Northeast): +855%.
- 2nd Street Northeast (new extension): +2,300 vpd.
- 5th Street Northeast (new extension): +500 vpd.
- 9th Street South (new extension): +50 vpd.
- 44th Avenue Northeast (new extension): +2,000 to +3,000 vpd.
- Bootlegger Trail (south of 36th Avenue Northeast): -17%.

Alt-11: River Drive North (A)

River Drive North would be reconstructed to increase capacity between 15th Street North and 25th Street North. The capacity increase would be representative of a three-lane facility.

Traffic Volume Modeling Results:

- 15th Street North (south of River Drive North): -5%.
- 25th Street North (south of River Drive North): +11%.
- River Drive North (between 15th Street North and 25th Street North): +10%.

Alt-12: River Drive North (B)

River Drive North would be reconstructed to increase capacity between 15th Street North and 38th Street North. The capacity increase would be representative of a four-lane facility.

Traffic Volume Modeling Results:

- 15th Street North (south of River Drive North): -6%.
- 25th Street North (south of River Drive North): +8%.
- 38th Street North (south of River Drive North): +35%
- River Drive North (between 15th Street North and 38th Street North): +11% to +14%.

Alt-13: Fox Farm Road / 10th Avenue South

Left-turning movements from 10th Avenue South would be removed from the intersection and would be modeled as grade separated movements.

Traffic Volume Modeling Results:

- I-315 (west of Fox Farm Road): negligible increase.
- 10th Avenue South (east of Fox Farm Road: negligible increase.
- 6th Street SW (north of 10th Avenue South): negligible increase.
- Fox Farm Road (south of 10th Avenue South): negligible decrease.
- Eastbound Left-turn (new grade separated connection): 5,700 vpd.
- Westbound Left-turn (new grade separated connection): 5,800 vpd.

Alt-14: 24th Avenue South Extension

24th Avenue South would be extended between 4th Street South and 13th Street South.

Traffic Volume Modeling Results:

- Upper River Road (north of 24th Avenue South): negligible increase.
- 24th Avenue South (east of Upper River Road): +53%.
- 24th Avenue South (new extension): +1,400 vpd.
- 24th Avenue South (east of 13th Street South): +14%.
- 13th Street South (north of 24th Avenue South): -3%.
- 17th Avenue South (east of 4th Street South): -6%
- 10th Avenue South (east of 4th Street South): negligible decrease.

Alt-15: Park Garden Road Extension

Park Garden Road would be extended from its eastern termini near Park Garden Lane to 13th Street South along the existing 24th Avenue South alignment. This alternative includes a new bridge across the Missouri River.

Traffic Volume Modeling Results:

- Fox Farm Road (north of Park Garden Road): -8%.
- 10th Avenue South (east of Fox Farm Road): -9%
- 10th Avenue South (east of 4th Street South): -7%.
- Upper River Road (north of 24th Avenue South): -32%.
- Park Garden Road (east of Fox Farm Road): +850%.
- 24th Avenue South (new bridge): +4,400 vpd.
- 24th Avenue South (new extension west of 13th Street South): +4,900 vpd.
- 24th Avenue South (east of 13th Street South): +54%.
- 13th Street South (north of 24th Avenue South): -11%.
- 17th Avenue South (east of 4th Street South): -11%

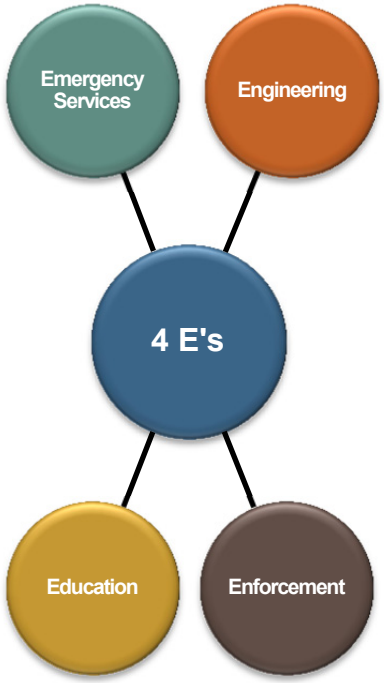


Figure 6.1: Four E's of Transportation Safety

6.0 Safety

Improving transportation safety requires more than just fixing a road or increasing police patrols. In order to be the most effective, safety improvements need to consider the "four E's" of transportation safety: Education, Enforcement, Engineering, and Emergency Services.

Crash data within the study area was analyzed to determine problem areas, "hot-spot" crash locations and behavioral characteristics. Trend analysis comparisons were also made for the City of Great Falls, Cascade County, and the State of Montana to help identify unique trends. The following sections provide an analysis of available crash data to help identify crash trends and contributing factors.

6.1. STUDY AREA CRASH ANALYSIS

The MDT Traffic and Safety Bureau provided crash data for the five-year period from January 1st, 2008 to December 31st, 2012. The crash data was obtained from the MDT Safety Management System. The crash reports are a summation of information from the scene of the crash provided by responding officers. As such, some of the information contained in the crash reports may be subjective.

According to the MDT crash database, there were 9,130 crashes reported within the study area during the analysis time period. The crash database was plotted spatially based on the XY coordinates recorded for each crash. **Figures 6.1** and **6.2** show the density of crashes within the study area based on the spatial data. Crash clusters are generally noted at intersections with the highest traffic volumes.

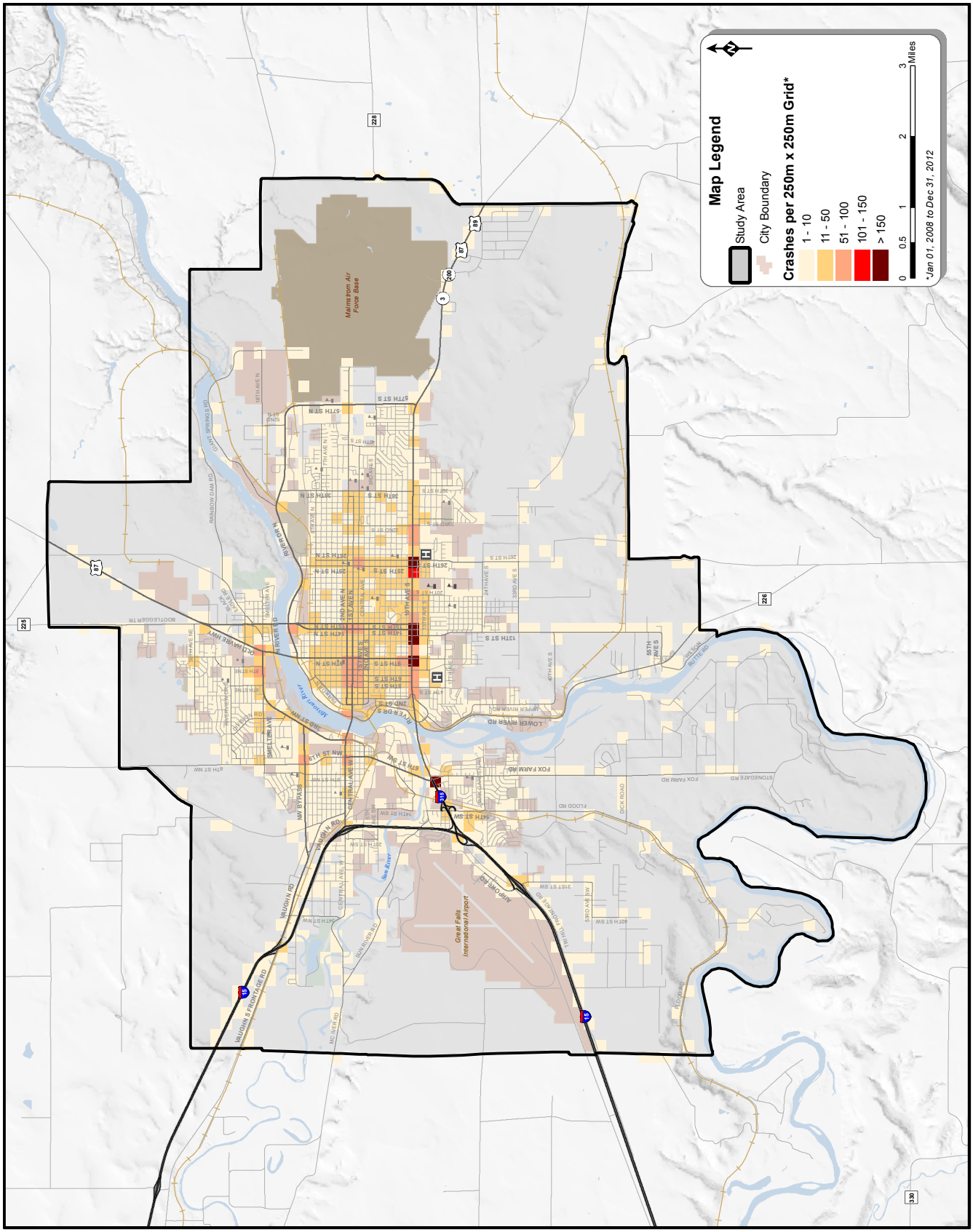


Figure 6.2: Crash Density

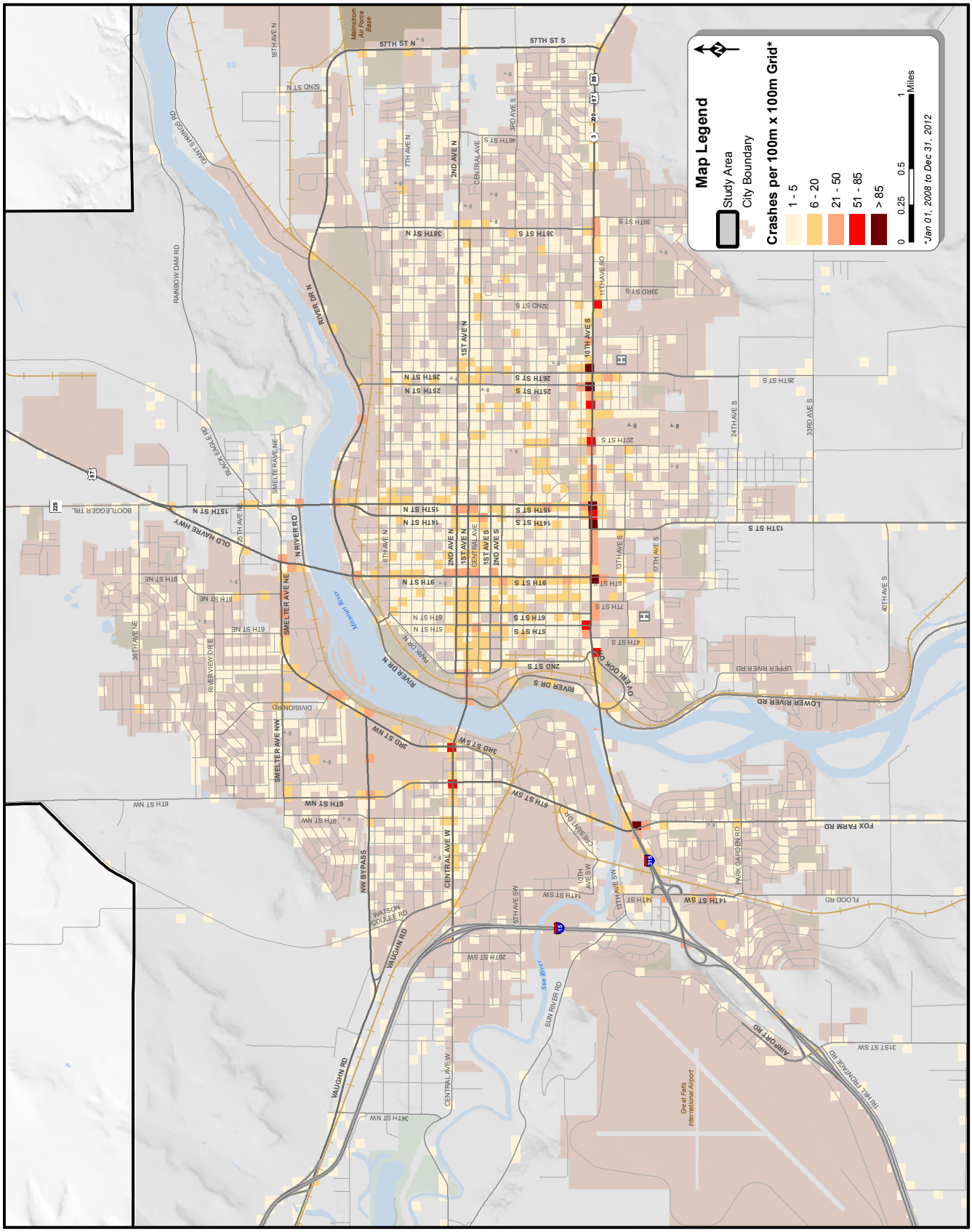


Figure 6.3: Crash Density (Detail)

6.1.1. Crash Period

Crash data for the study area was evaluated based on the period of time when the crash occurred. With regards to time of day, spikes in the number of crashes occur during the peak hours. Almost 50 percent of crashes were reported between 12:00 PM and 6:00 PM. The PM peak hours (3:00 PM to 6:00 PM) accounted for approximately 26 percent of reported crashes.

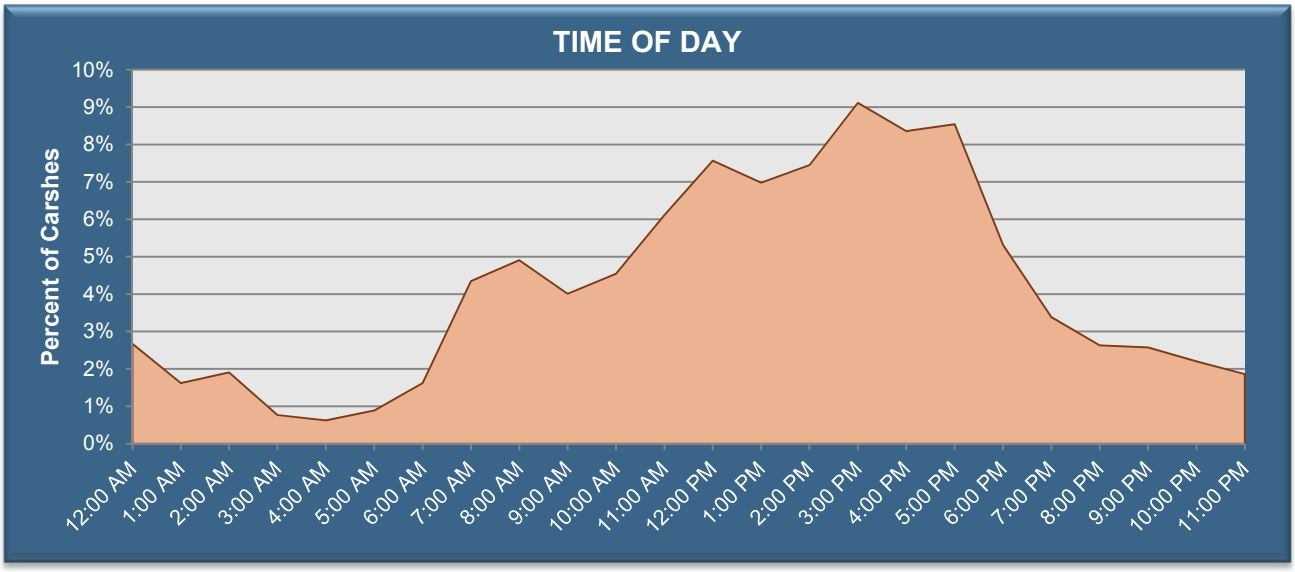
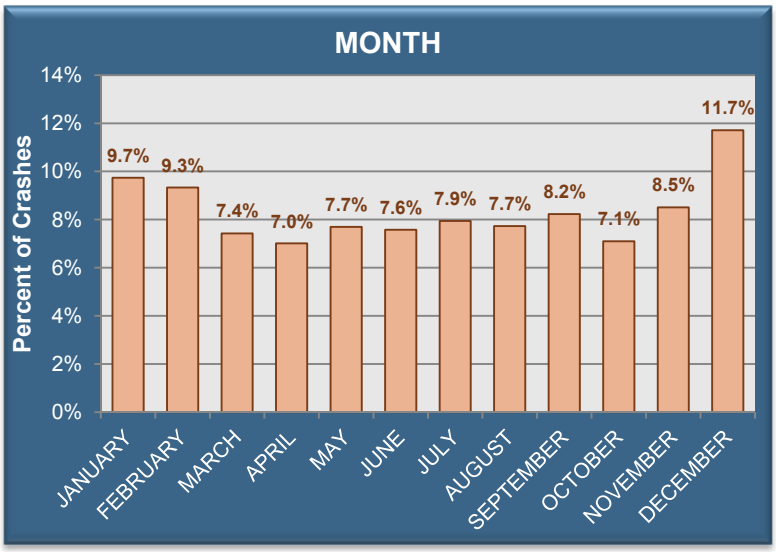


Figure 6.4: Crash Statistics for Time of Day

The most common month for crashes is December, followed by January and February. During these months, inclement weather conditions often exist which can contribute to an increase in the number of crashes. Traffic volumes also commonly increase during the month of December due to increased holiday related traffic. Over 78 percent of crashes occur on a weekday, with Friday being the most common day with 17.5 percent of crashes. The fewest number of crashes were reported on Sundays.



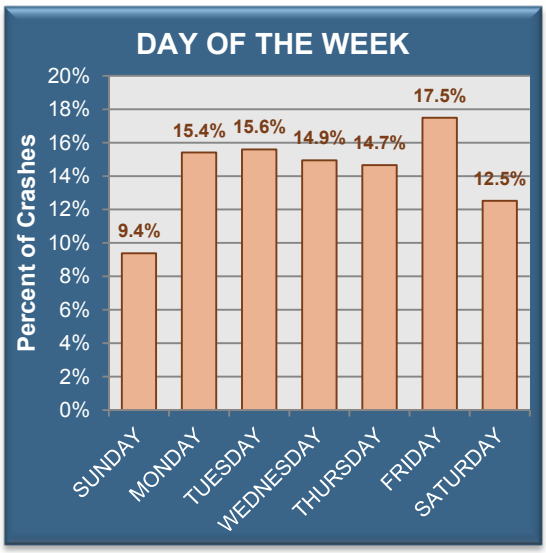


Figure 6.5: Crash Statistics for Month and Day of the Week

6.1.2. Environmental Factors

Crash data was reviewed to see if any trends exist related to environmental factors such as weather, roadway surfacing, and light conditions. Approximately 65 percent of the reported crashes occurred while road surfacing was dry while 33 percent occurred on wet, icy, snowy or slushy surfacing. Inclement weather conditions (i.e. rain, snow, sleet, or fog) were present for approximately 13.5 percent of crashes. Over 70 percent of reported crashes occurred during the daylight, while almost 18 percent were reported as under dark lighted conditions.

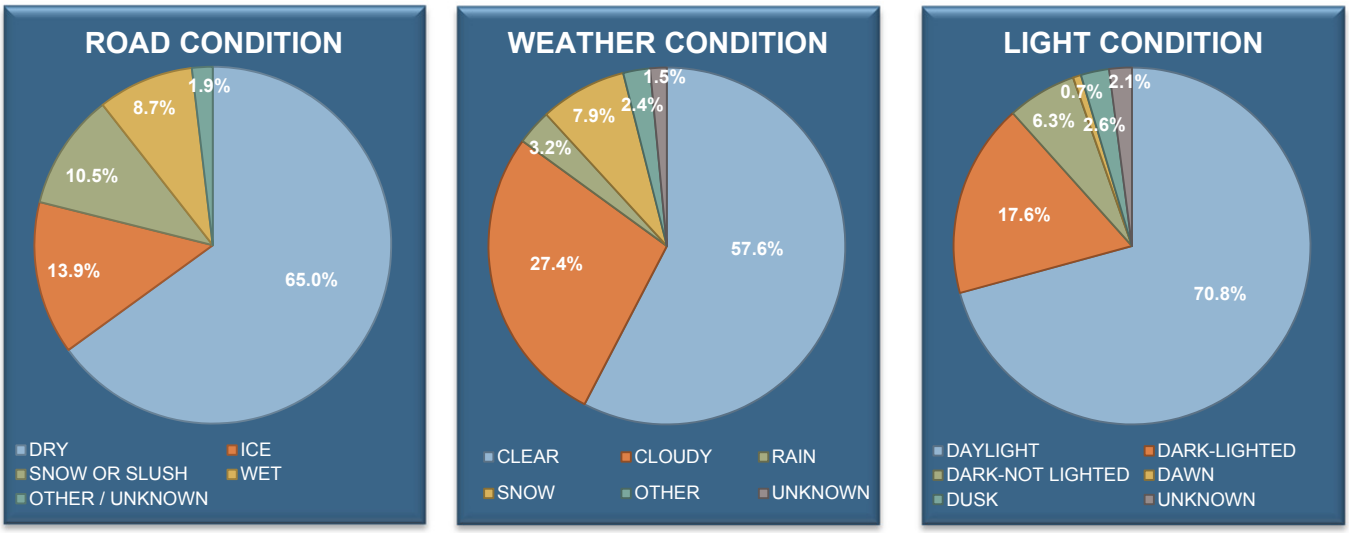


Figure 6.6: Crash Statistics for Environmental Factors

6.1.3. Crash Type

Almost 43 percent of crashes occurred at non-junction locations, while just over 50 percent of crashes occurred in an intersection or were related to an intersection. Over 87 percent of crashes occurred on the roadway, while approximately 9 percent occurred on the shoulder. Single vehicle crashes accounted for just over 16 percent of crashes.

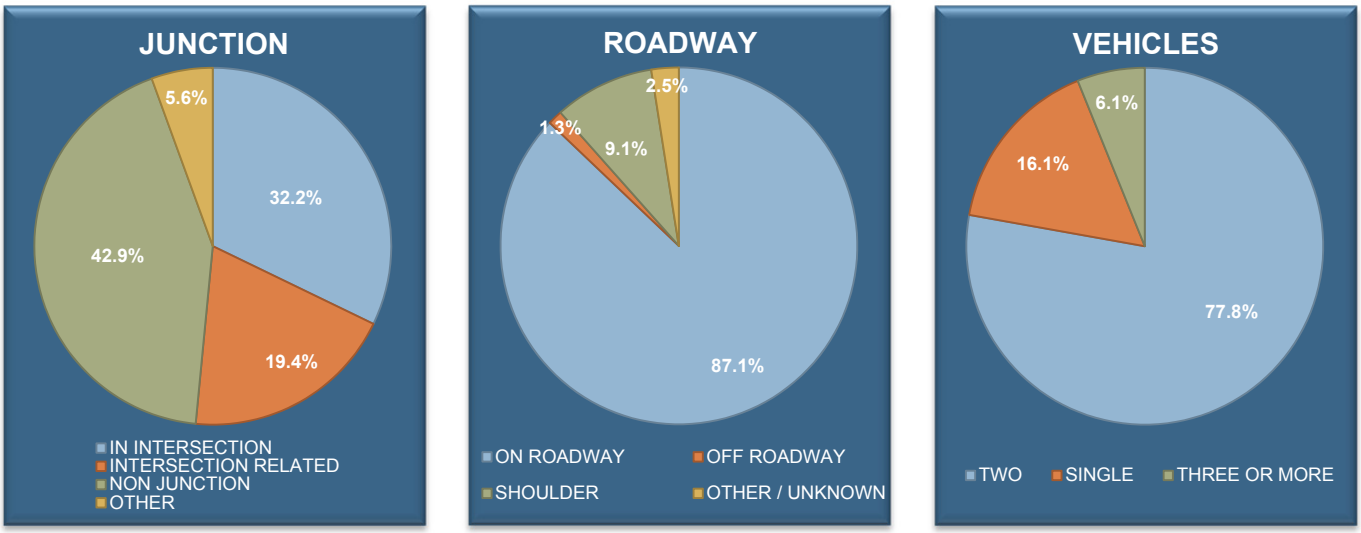


Figure 6.7: Crash Statistics for Location and Number of Vehicles

The most common manner of collision were rear-end crashes which accounted for approximately 30.5 percent of reported crashes. Right angle crashes and sideswipe crashes were the next most common manners of collision accounting for approximately 27 and 14 percent of crashes, respectively.

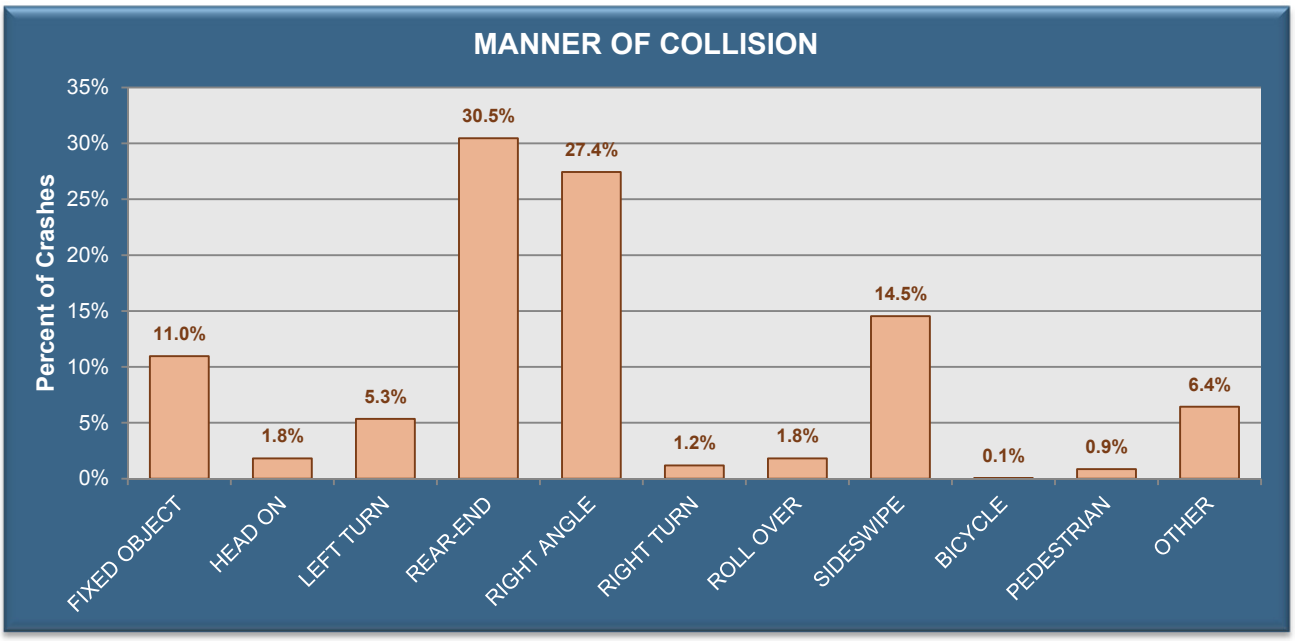


Figure 6.8: Crash Statistics for Collision Type

6.1.4. Crash Severity

Reported crashes are categorized by crash severity. The most severe injury defines the severity of the crash. For example, if a crash results in a fatality and an injury, the crash would be defined as a fatal crash.

Figures 6.9 and **6.10** show the location of the crashes which resulted in incapacitating injuries and/or fatalities. An incapacitating injury is defined as an injury, other than a fatality, which prevents the injured person from walking, driving or normally continuing the activities they were capable of performing before the injury.

During the five-year analysis period, there were 2,038 injury crashes (22 percent) which resulted in 2,790 injuries. Of the injury crashes, 109 (1.2 percent) resulted in incapacitating injuries. In addition, there were 17 fatal crashes (0.2 percent) resulting in 19 fatalities.

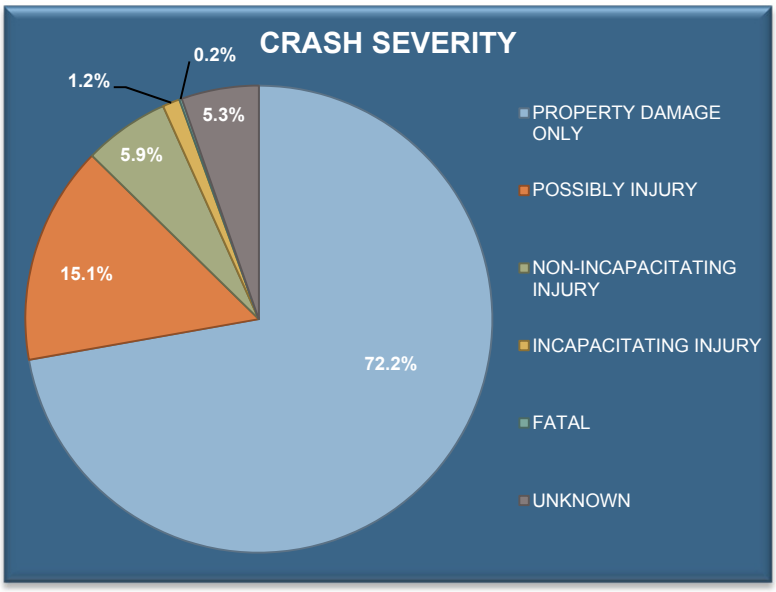


Figure 6.9: Crash Statistics for Severity

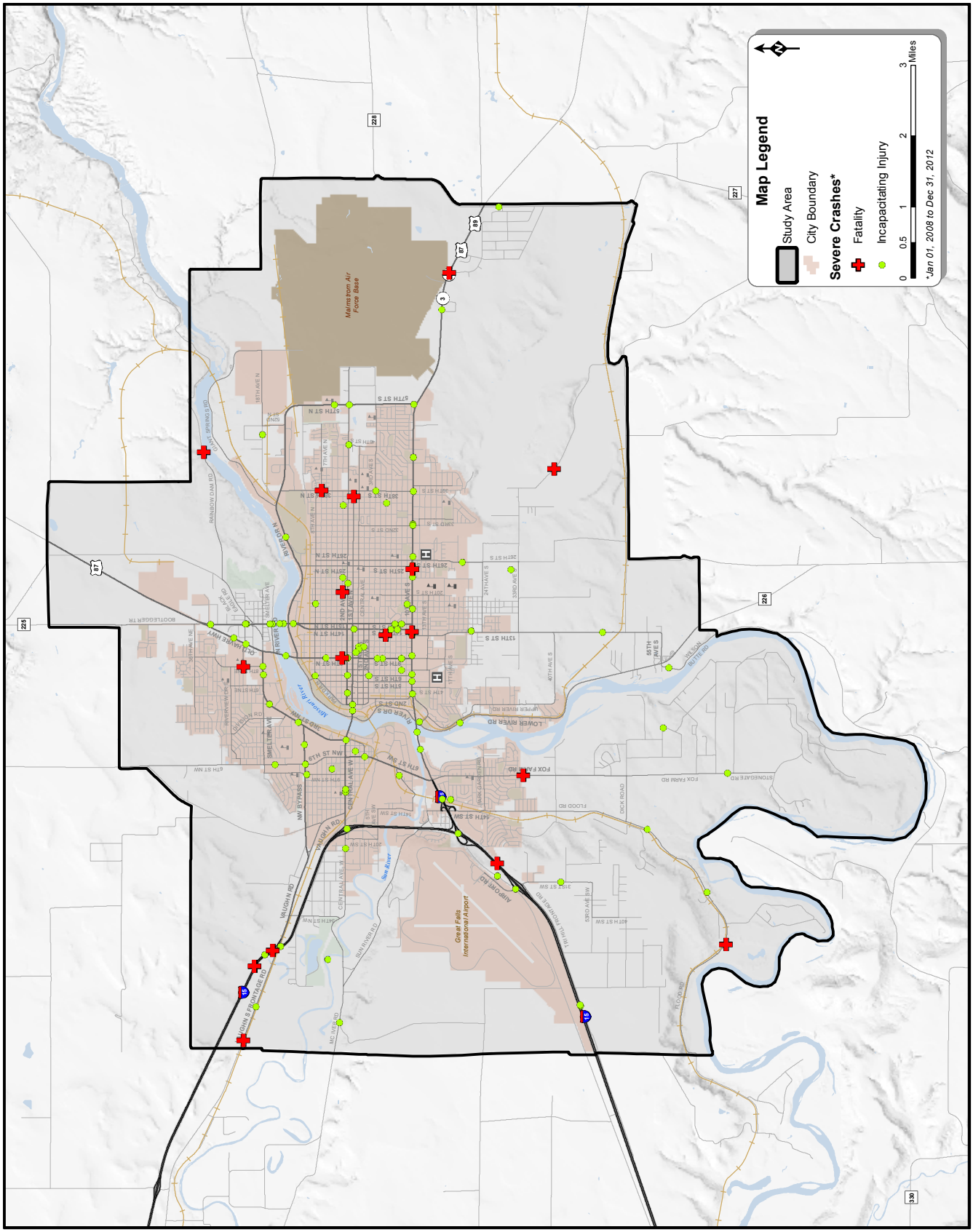


Figure 6.10: Severe Crashes

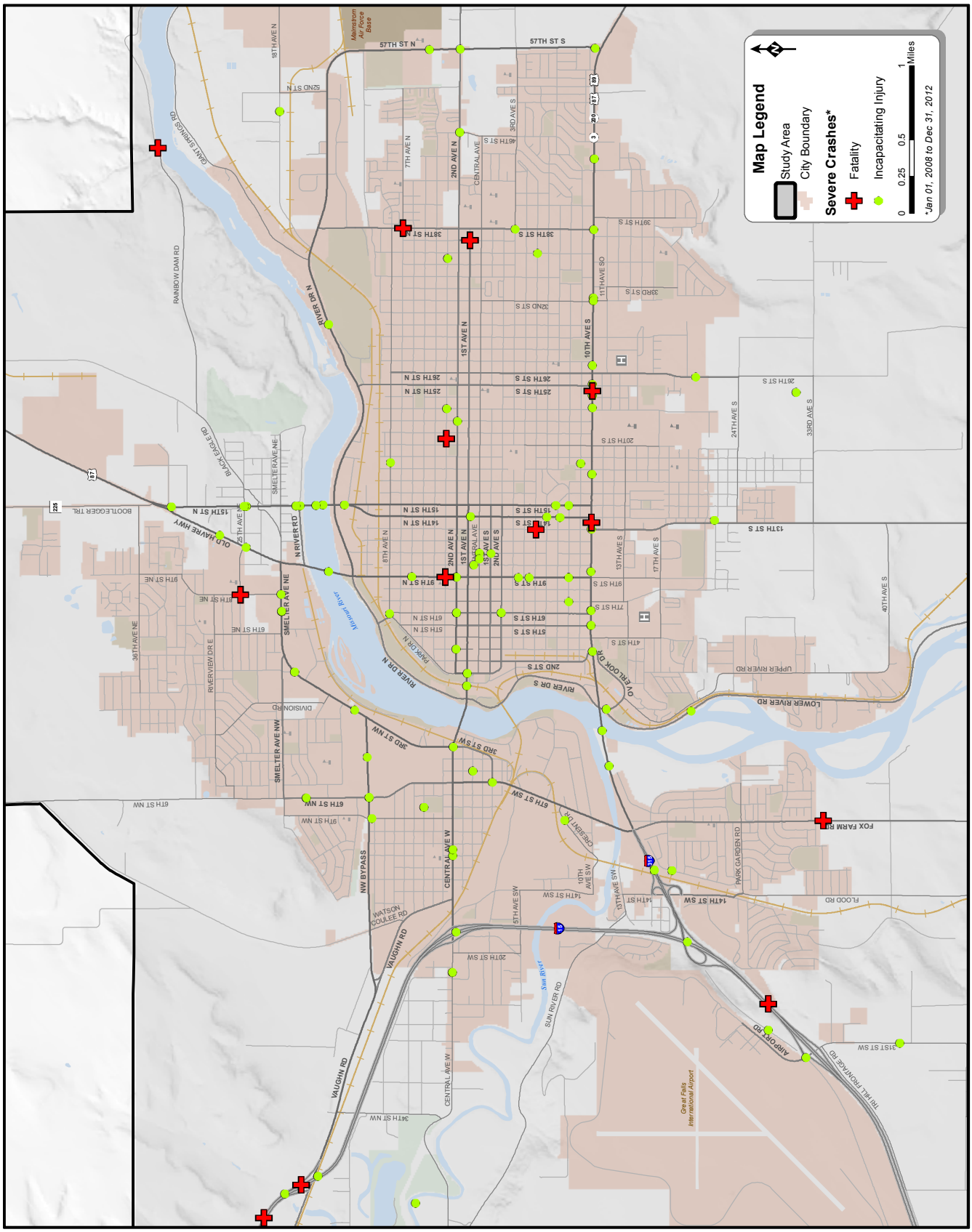


Figure 6.11: Severe Crashes (Detail)

6.1.5. Intersection Crashes

The 61 intersections that were studied for LOS were also evaluated for crash statistics. The crash information was analyzed to identify those intersections with crash characteristics that may warrant further study. Some locations may have been improved during the study period. Thus, the following information may not necessarily reflect current crash characteristics at locations where improvements have been made after the crash analysis period.

The number of crashes at each intersection was determined spatially from the GIS crash database. Any crash located within 150 feet was counted for that intersection. Intersection traffic volumes were determined from PM peak hour turning movement counts. A design hourly vehicle (DHV) factor of 10.87 percent was applied to the peak hour counts to estimate daily volumes based on MDT permanent count sites located within the study area.

The crash rate represents the number of crashes against the daily traffic volumes of the intersection. The rate is expressed as the number of crashes per million entering vehicles. The following equation is used to calculate crash rate:

$$\frac{Total\ Number\ of\ Crashes\ \times 1{,}000{,}000\ vehicles}{Vehicles\ per\ day \times Number\ of\ Years\ \times 365\ days/year} = Crash\ Rate$$

The severity index is calculated by applying multipliers to crashes based on severity. For the severity index, crashes were broken into three categories of severity: property damage only (PDO), non-incapacitating injury, and fatality or incapacitating injury crashes. Each of these three types is given a different multiplier: one (1) for PDO, three (3) for injury, and eight (8) for fatality or incapacitating injury crashes. The following equation is used to calculate severity index:

$$\frac{(\#PDO \times 1) + (\#Injury \times 3) + (\#Fatal\ or\ Incap \times 8)}{Total\ Number\ of\ Crashes} = Severity\ Index$$

The severity rate was determined by multiplying the crash rate by the severity index. **Table 6.1** lists the crash statistics for the studied intersections.

Table 6.1: Intersection Crashes

ID	Intersection	Total Crashes	Fatal	Incap. Injury	Injury	Crash Rate	Severity Index	Severity Rate
1	3rd Street NW / 14th Avenue NW	19	0	0	6	0.65	1.63	1.06
2	9th Street N / 8th Avenue N	13	0	0	4	0.75	1.62	1.21
3	9th Street N / 2nd Avenue N	32	0	2	13	1.64	2.25	3.70
4	9th Street N / 1st Avenue N	25	0	0	6	1.01	1.48	1.50
5	9th Street / Central Avenue	16	0	0	7	0.83	1.88	1.56
6	9th Street S / 1st Avenue S	23	0	0	10	1.30	1.87	2.43
7	9th Street S / 2nd Avenue S	12	0	0	4	0.63	1.67	1.05
8	10th Avenue S / Fox Farm Road	149	0	0	41	2.88	1.55	4.47
9	10th Avenue S / 26th Street S	78	0	0	22	1.53	1.56	2.39
10	10th Avenue S / 32nd Street S	66	0	2	21	1.80	1.85	3.33
11	14th Street SW / 16th Avenue SW	6	0	0	1	0.37	1.33	0.50
12	14th Street SW / Marketplace Drive	23	0	0	6	1.58	1.52	2.41
13	14th Street SW / Ramp B	21	0	0	6	0.89	1.57	1.40
14	38th Street N / River Drive N	3	0	0	1	0.20	1.67	0.33

ID	Intersection	Total Crashes	Fatal	Incap. Injury	Injury	Crash Rate	Severity Index	Severity Rate
15	57th Street N / 10th Avenue N	7	0	0	0	0.65	1.00	0.65
16	Central Avenue W / 3rd Street NW	52	0	1	13	1.30	1.63	2.12
17	Park Drive N / 1st Avenue N	27	0	1	7	1.03	1.78	1.83
18	River Drive N / 1st Avenue N	48	0	0	10	1.06	1.42	1.50
19	Smelter Avenue / 6th Street NE	23	0	0	11	0.78	1.96	1.53
20	Smelter Avenue / 10th Street NE	48	0	0	9	1.40	1.38	1.92
21	10th Avenue S / 29th Street S	29	0	0	10	0.79	1.69	1.34
22	11th Avenue S / 26th Street S	22	0	0	2	1.51	1.18	1.78
23	11th Avenue S / 28th Street S	0	0	0	0	0.00	0.00	0.00
24	11th Avenue S / 29th Street S	2	0	0	1	0.22	2.00	0.44
25	13th Avenue S / 9th Street S	17	0	0	2	1.70	1.24	2.10
26	13th Avenue S / 26th Street S	5	0	0	1	0.51	1.40	0.72
27	25th Avenue NE / 8th Street NE	6	1	0	1	0.61	2.50	1.52
28	2nd Street S / 3rd Avenue S	6	0	0	0	0.51	1.00	0.51
29	36th Avenue NE / Bootlegger Trail	4	0	0	0	0.54	1.00	0.54
30	38th Street / Central Avenue	17	0	0	3	1.25	1.35	1.70
31	Bootlegger Trail / U.S. 87	3	0	0	1	0.23	1.67	0.38
32	Fox Farm Road / 18th Avenue SW	7	0	0	4	0.44	2.14	0.94
33	Fox Farm Road / Park Garden Road	5	0	0	1	0.40	1.40	0.56
34	I-15 EB Ramp / Airport Drive	16	0	0	2	1.54	1.25	1.93
35	I-15 WB Ramp / Airport Drive	7	0	1	2	0.78	2.57	2.00
36	Park Drive N / 2nd Avenue N	14	0	0	3	1.36	1.43	1.94
37	River Drive N / 25th Street N	9	0	0	2	0.43	1.44	0.61
38	River Drive S / 3rd Avenue S	10	0	0	1	0.77	1.20	0.92
39	Old Havre Highway / 15th Street N	13	0	1	6	1.08	2.46	2.67
40	6th Street SW / 4th Avenue SW	5	0	1	1	0.26	2.80	0.73
41	15th Avenue S / 26th Street S	3	0	0	0	0.31	1.00	0.31
42	32nd Street S / 11th Avenue S	4	0	0	1	0.58	1.50	0.86
M.1	10th Avenue S / 2nd Street S	60	0	1	22	1.26	1.85	2.33
M.2	10th Avenue S / 5th Street S	54	0	1	18	1.10	1.80	1.97
M.3	10th Avenue S / 7th Street S	40	0	1	11	0.85	1.73	1.46
M.4	10th Avenue S / 9th Street S	124	0	0	24	2.25	1.39	3.12
M.5	10th Avenue S / 11th Street S	45	0	0	12	1.01	1.53	1.55
M.6	10th Avenue S / 13th Street S	109	0	1	34	2.26	1.69	3.81
M.7	10th Avenue S / 14th Street S	75	0	0	17	1.48	1.45	2.15
M.8	10th Avenue S / 15th Street S	91	0	0	17	1.75	1.37	2.40
M.9	10th Avenue S / 20th Street S	68	0	0	17	1.40	1.50	2.10
M.10	10th Avenue S / 23rd Street S	67	0	1	15	1.42	1.55	2.20
M.11	10th Avenue S / 25th Street S	89	0	1	19	1.91	1.51	2.88
M.12	10th Avenue S / 38th Street S	36	0	1	17	1.11	2.14	2.37
M.13	10th Avenue S / 39th Street S	19	0	0	7	0.70	1.74	1.22
M.14	10th Avenue S / 43rd Street S	8	0	0	4	0.35	2.00	0.70
M.15	10th Avenue S / 49th Street S	6	0	0	2	0.35	1.67	0.58
M.16	River Drive N / 9th Street N	35	0	0	14	1.27	1.80	2.28
M.17	River Drive N / 15th Street N	41	0	0	11	1.13	1.54	1.74

ID	Intersection	Total Crashes	Fatal	Incap. Injury	Injury	Crash Rate	Severity Index	Severity Rate
M.18	Central Avenue NW / 6th Street NW	47	0	0	13	1.51	1.55	2.35
M.19	NW Bypass / 3rd Street NW	33	0	0	11	1.07	1.67	1.78

6.2. SAFETY DATA TREND ANALYSIS

The MDT Highway Traffic Safety Section supplied crash statistics for January 01, 2008 to December 31, 2012. A safety data trend analysis was conducted to compare the crash characteristics of Great Falls, Cascade County, and the State of Montana.

6.2.1. IMPAIRMENT

Of the reported crashes for Great Falls, less than 7 percent were alcohol and/or drug related. Cascade County had a slightly higher rate of alcohol / drug related crashes (7.5 percent), while over 9 percent of crashes in State of Montana were related to alcohol /drugs.

Table 6.2: Crash Statistics for Alcohol / Drug Related

Location	Total Crashes	Alcohol / Drug Related Crashes	
Great Falls	8,614	625	6.8%
Cascade County	11,011	891	7.5%
State of Montana	103,024	10,388	9.2%

6.2.2. SAFETY BELT USE

Crashes in Great Falls had a higher rate of occupants using proper restraint than both Cascade County and the State of Montana. Under 4 percent of occupants involved in crashes in Great Falls were either not using safety belts, or not using them properly. Almost 5 percent of occupants in Cascade County and almost 8 percent in the State of Montana were not using proper restraint.

Table 6.3: Crash Statistics for Safety Belt Usage

Location	Occupants Using Proper Restraint	Occupants Not Using Proper Restraint	
Great Falls	16,560	650	3.8%
Cascade County	20,220	1,042	4.9%
State of Montana	165,720	14,191	7.9%

6.2.3. DRIVER AGE

The trends for drivers age in Great Falls follow similar trends as Cascade County and the State of Montana. Younger drivers (under the age of 21) were involved in 17.6 percent of crashes within Great Falls, compared to 17.3 percent in Cascade County and 17 percent in the State of Montana. Drivers over the age of 65 were involved in 11.7 percent of crashes within Great Falls, compared to 11.2 percent for Cascade County and 9.5 percent for the State of Montana.

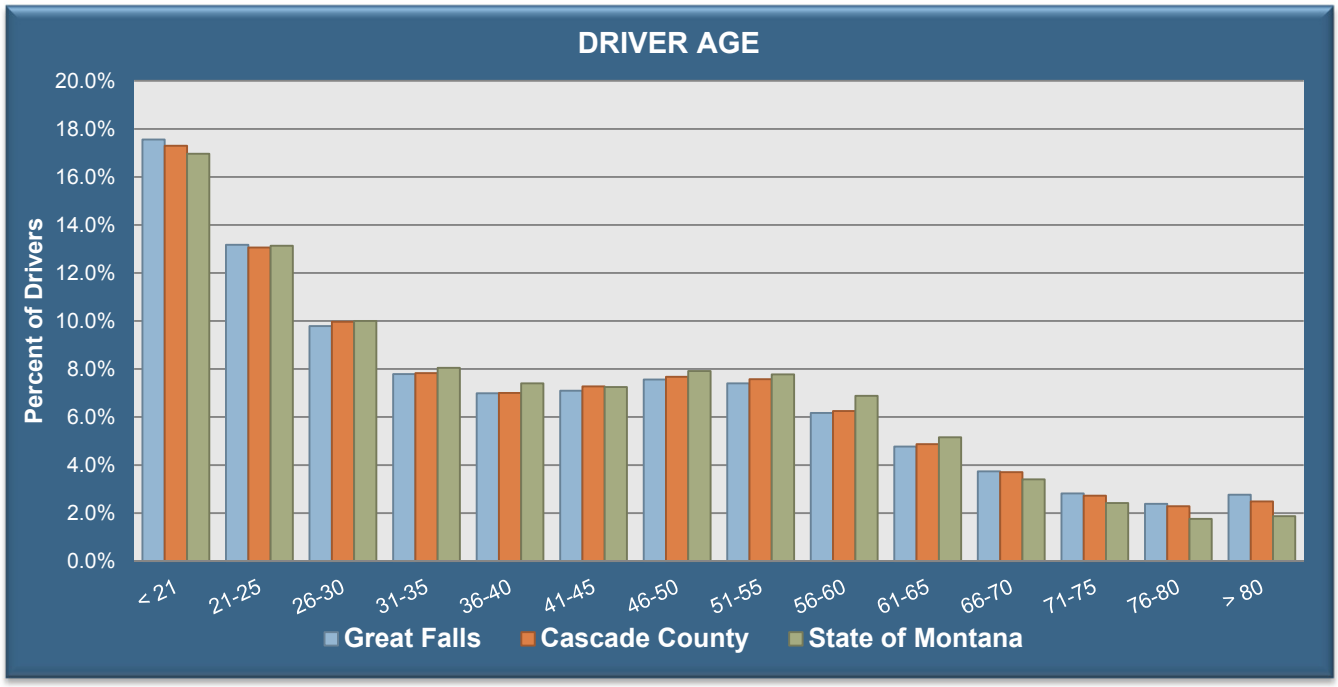


Figure 6.12: Crash Statistics for Driver Age

6.2.4. Vehicle Type

Reported crashes within Great Falls involved motorcycles 1.4 percent of the time. Motorcycles were involved in 1.7 percent of crashes within Cascade County and 2.1 percent of crashes in the State of Montana. Large vehicles were involved in 6.5 percent of crashes in Great Falls which is less than that of Cascade County (7 percent) and the State of Montana (9.1 percent).

Table 6.4: Crash Statistics for Vehicle Type

Location	Total Crashes	Motorcycle Crashes		Large Vehicle Crashes	
Great Falls	8,614	122	1.4%	559	6.5%
Cascade County	11,011	191	1.7%	770	7.0%
State of Montana	103,024	2,181	2.1%	9,415	9.1%

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7.0 Freight

Moving goods efficiently and safely in the region is critical to the economy and quality of life in the Great Falls Area. Local businesses engaged in industrial, agricultural, office and retail activities rely on timely deliveries to supply finished goods and services to their customers. These businesses contribute primary jobs that grow the region's economy and maintain long-term economic competitiveness. Goods movement is important to local consumers, as increasing numbers of people shop online and expect goods delivered quickly to their homes. The Great Falls Area is part of long-distance goods movement corridors supporting interstate and international commerce.

Goods movement affects all modes of transportation and a broad mix of land uses in the Great Falls Area. Goods move through the region alongside drivers, pedestrians, cyclists, and passengers traveling by bus, rail, and air. The goods movement network connects and passes through commercial districts, residential neighborhoods, and parks. Demand for goods movement is increasing as the region's economy and population grows. Integrating goods movement into the transportation system and local land uses is critical to protecting safety and quality of life.

This chapter describes the role of goods movement in the regional economy and explains how it relates to the regional transportation system. Also addressed are the following questions about goods movement today and in the future:

- How does goods movement support the economy and quality of life in the Great Falls Area, and across the state?
- What kinds of goods are transported to, from, and through the Great Falls Area, and how are they moved through the region?
- How will the demand for goods movement change in the future?

The information in this chapter relies on information from a range of publicly available resources, most notably from the City of Great Falls, the Great Falls Development Authority, the Cascade County Commission, and MDT.

7.1. GOODS MOVEMENT AND THE REGIONAL ECONOMY

Goods movement is very important to the Great Falls Area and Montana, serving as a key destination and transfer point for goods carried regionally by truck, rail, and air. Perhaps more importantly, goods movement supports the well-being of local residents and businesses. Businesses receive key inputs and supplies to keep their operations going, and rely on shipping networks to get their products to customers. Residents rely on goods movement to support day-to-day activities such as buying groceries, going out to dinner, and online shopping.

7.1.1. Local Context

The Great Falls Area is the primary population and employment center for north-central Montana. This includes areas encompassed by Cascade County, the Sweetgrass Economic Development region[10], and the Bear Paw Development Corporation. The Great Falls Area's industrial sectors have grown steadily over the past 30 years. This growth supports the City of Great Falls' nearly 59,000 residents and 27,000 jobs, and Cascade County's population of about 81,000 people and nearly 37,000 jobs. **Figure 7.1** illustrates the City of Great Falls' employment sectors in 2012. The five sectors include management and business, sales, professional services, natural resources and construction, and production and transportation. Military employment is not included in this analysis. The largest sector, management, business, science and arts, employs 30 percent of the City of Great Falls' workforce. Sales and office jobs represent 27 percent of the region's employment. Together these sectors represent nearly two-thirds of employment, with services comprising one-fifth of employment, and production, transportation, natural resources, and construction also making up one-fifth of the region's jobs.

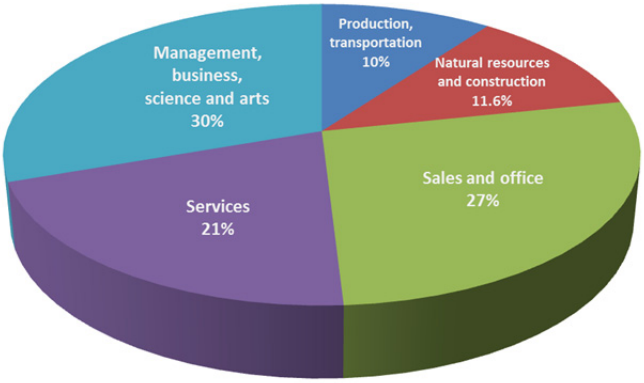


Figure 7.1: Great Falls Non-Military Jobs by Sector (2012)

Source: Imagine Great Falls 2025 Growth Policy Update, City of Great Falls, 2013. Military employment is not included in these figures.

Each employment sector relies on a high-quality goods movement network. To understand how these employment sectors relate to the goods movement network is to look at three main employment categories, including heavy industry; service, retail and management; and military.

- **Heavy Industry:** Goods movement is typically associated with heavy industry. Businesses in these industries make location decisions based on access to efficient, secure, and safe transportation infrastructure to support their growth. Heavy industry has an important role in the Great Falls Area. Figure 1 illustrates that two employment sectors – production and transportation, and natural resources and construction – make up about 21 percent of jobs. These industries are expecting continued growth in the Great Falls Area to support developments in oil and gas extraction and refining, and agriculture. Notable products on the goods movement system include oil and gas extraction materials and equipment, grains and other perishables, aerospace equipment and parts, and wind energy equipment and supplies. Examples of employers in these industries include the Calumet Montana Refining, Pacific Steel and Recycling, ADF Group (Steel Fabrication), Pasta Montana, Malteurop and General Mills.

[10] The Sweetgrass Economic Development Region includes Glacier, Toole, Pondera, Teton, Conrad and Cascade Counties.

- **Service, Retail, and Management:** Goods movement is critical to the local service, retail, and management businesses that account for nearly 80 percent of the jobs in the City of Great Falls. Businesses in these industries are less likely to make location decisions based on goods movement access. Service and office businesses are more concerned with customer and employee transportation access. However, all rely on efficient shipment of goods to conduct day-to-day business. Retail businesses, for example, require regular, large shipments of products to keep stores stocked. Management offices require office supplies and mail shipments, and health care facilities require medical diagnostic equipment and pharmaceuticals. Service and office businesses are expected to continue to grow in the Great Falls Area because of a skilled workforce, growing demand for health care, and the natural environment that attracts tourists from around the world. Examples of employers in these industries include Benefis Health System, Wal-Mart, N.E.W. Customer Service, and local government offices.

- **Military:** The military maintains a strong presence in the Great Falls Area. Malmstrom Air Force Base (AFB) employs over 4,400 military-related personnel. The Montana Air National Guard has over 800 military-related personnel. Malmstrom AFB's direct and indirect economic impact totaled over $330 million, and expenditures for construction, services, materials, equipment, and supplies totaled about $69 million in 2012.[11] The AFB relies on an efficient and secure goods movement network to transport these goods to and from the base. In particular, the AFB relies on roadway connections to Great Falls International Airport, which is a key component of the military transportation network.

7.1.2. Interstate and International Context

Goods movement routes in and around the Great Falls Area play a significant role on the state and national economies. The key statewide industries reliant on the goods movement system are oil and gas extraction, and agriculture.

- **Oil and Gas Extraction:** The oil and gas industry represents a nine billion dollar economic sector in Montana, with 4,600 jobs across the state in exploration, production, and refining. Expansion in this industry is leading businesses to locate in the Great Falls Area due to its skilled workforce, access to major transportation routes, and proximity to oil and gas resources such as the Alberta Basin Bakken Fairway and Williston Basin oil fields. The Calumet Montana refinery in Great Falls is currently expanding and will generate increased volumes of crude and refined oil products.

- **Agriculture:** The Great Falls Area is located near the "Golden Triangle" of Montana, known for producing large quantities of wheat between the Cities of Great Falls, Conrad, and Havre. Related industries process the wheat to supply consumer product manufacturing. The greater Sweetgrass Economic Development Region is known for its prairie grazing lands, other small grains such as barley, forage crops, and forage animals. Demand for organics and natural products has been growing quickly. The region has competitive advantages for agri-processing, such as high quality commodities, energy sources (i.e., electricity, natural gas, and oil), rail transportation, water resources, and a skilled workforce. Expansion of local agri-based processors is being promoted, and some increase is likely.

[11] *2025 Imagine Great Falls Growth Policy Update*, City of Great Falls, 2013.

7.2. EXISTING GOODS MOVEMENT SYSTEM

The existing transportation system facilitates considerable goods movement to, from, and through the region. This section describes the types and quantities of goods moved, how the goods are moved, the routes and freight facilities, and gaps or needs on the regional goods movement transportation system.

7.2.1. COMMODITIES AND PRODUCTS OVERVIEW

Montana exports over 61 million tons of goods, with a total value of over $6.6 billion.[12] Over 75 percent of outbound freight tonnage is coal products. Other leading outbound commodities include minerals, metallic ores, and cereal grains. However, the top outbound commodities by value are more diverse. The "other" commodity category makes up 54 percent of commodities value. Coal products make up about 20 percent of outbound value, with the remaining value distributed across commodities including mixed freight, printed products, cereal products, articles-base metals, and machinery.

About 11 million tons of goods terminate in Montana, valued at about $12.1 billion. These inbound goods are mixed, with over 50 percent of weight (5.8 million tons) categorized as "other". Wood products make up 11 percent of inbound goods by weight, with other top commodities including coal, wood, cereal grains, chemical products, and fertilizer. By value, 42 percent of inbound goods are in the "other" commodity category, and 19 percent in mixed freight. Other inbound goods leading in value include machinery, chemical products, meat products and miscellaneous manufactured goods.

7.2.2. GOODS MOVEMENT BY TRANSPORTATION MODE

Montana is part of a trade corridor linking midwestern and northwestern port markets. This leads to a large share of through-bound goods movement. For rail, 74 percent of goods by value and over half of the goods by weight pass through Montana.[13] Trucking serves a greater share of locally serving trips – those originating and terminating in Montana – due to the ability of trucks to serve diffuse markets. While the Great Falls Area is affected by through trips on the highway and rail networks, locally serving trips have the greatest impact on the regional economy and quality of life.

Trucks carry 59 percent of goods by value that originate in Montana, and 82 percent of goods by value destined for Montana. **Figure 7.2** illustrates the value of freight transportation in Montana by transportation mode. Truck and intermodal modes represent large proportions of overall value because more valuable commodities tend to be transported as containerized or truck trailer freight.

[12] *Montana State Rail Plan*, Montana Department of Transportation, 2010.
[13] *Montana State Rail Plan*, Montana Department of Transportation, 2010. Does not include pipeline and intermodal shipments.

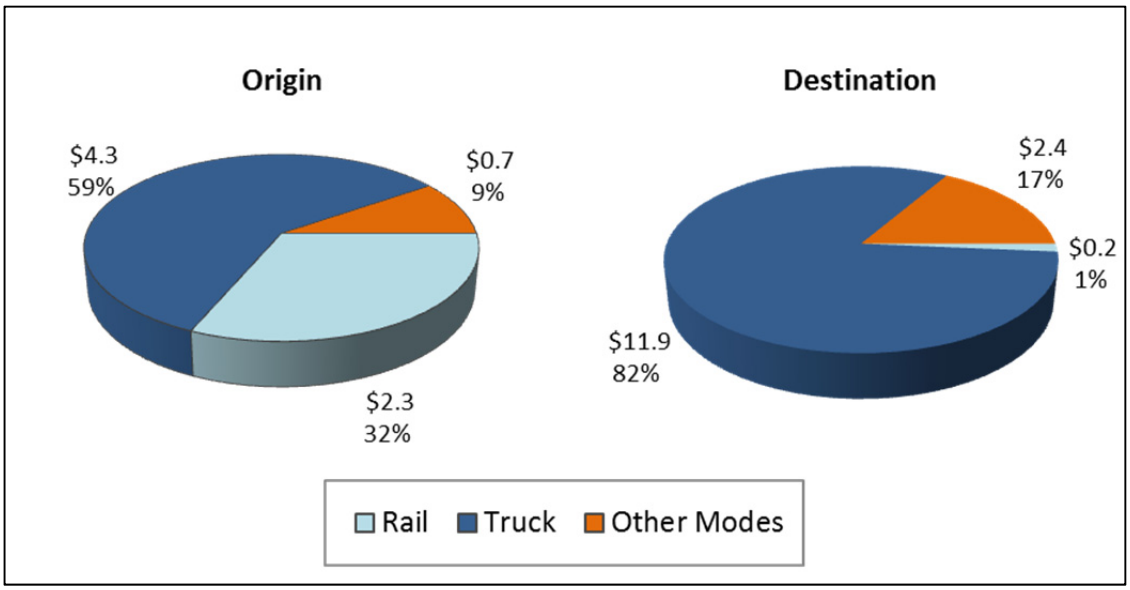


Figure 7.2: Montana Freight Value by Mode (2007, Billions of U.S. Dollars)

Source: Montana State Rail Plan, Montana Department of Transportation, 2010. Does not include pipeline and intermodal shipments.

The Port of Sweetgrass is located along Interstate 15 approximately 120 miles north of Great Falls, and is Montana's largest international port of entry. It is the only port in western Montana that is open twenty-four hours a day. It is located near three of western Canada's largest cities: Calgary, Lethbridge, and Edmonton. Together, these cities have a population of approximately 1.25 million. Approximately 980,000 people travel through the Sweetgrass Port of Entry each year.[14] After passing through the Port of Sweetgrass, trucks largely travel on Interstate 15 through Great Falls and continue to destinations to the south, southeast, and west.

Great Falls is located along the Canamex Trade Corridor, which was designated as a High Priority Corridor by Congress in the 1995 National Highway Systems Designation Act. Interstate 15 is the designated corridor through Great Falls and northern Montana. South of Great Falls to Mexico the corridor includes a combination of roadways. The corridor's main objective is to facilitate trade between these nations and strengthen its position in the global economy.[15]

Rail accounts for 32 percent of the freight value originating in Montana, but it accounts for only one percent of the freight value with a destination in Montana. This is partly due to the fact that trucks (hauling containers or trailers) are better suited to distributing high-value finished goods to diffuse markets (e.g. grocery stores, retail stores). Developing industrial sectors in Montana, such as oil and gas extraction, move goods primarily by truck freight, while agriculture-related industries transport goods both by truck and rail.[16]

Great Falls International Airport sees a significant share of Montana air cargo, which extends into southern Alberta, Canada. Large distances and rough terrain between cities and towns often make air

[14] U.S. Customs and Border Protection, *Sweetgrass Station,* http://www.cbp.gov/xp/cgov/border_security/border_patrol/border_patrol_sectors/havre_sector_mt/stations/sweetgrass.xml. Accessed October, 2013.
[15] Canamex Corridor Coalition, *CANAMEX Corridor -The Canamex Trade Route.* http://www.cbp.gov/xp/cgov/border_security/border_patrol/border_patrol_sectors/havre_sector_mt/stations/sweetgrass.xml. Accessed October, 2013.
[16] *Great Falls Regional Transportation Task #7*, Cascade County Commission, 2011.

travel the most efficient mode of transportation. FedEx Express uses the airport as their statewide hub, linking smaller flights to communities within the state, and linking to hubs in other states. FedEx also contracts with the United States Postal Service (USPS) to carry first class mail.

There are about 42,000 annual enplanements on average. **Table 7.1** breaks out the enplanements by purpose and compares Great Falls International Airport to Billings Logan International Airport and Helena Regional Airport. These two airports provide a comparison of operations at other Montana airports that are similar in size to Great Falls International Airport.

Table 7.1: Great Falls International Airport Infrastructure

	Great Falls International	Helena Regional	Billings Logan International
Number of Terminal Gates	4	2	7
Cargo Apron Area (sq.ft.)	531,000	Fixed Base Operator Ramp	296,500
Cargo Warehouse (sq.ft.)	72,000	None	27,000
Annual Enplanements	41,704	49,509	83,500
% Commercial	15%	5%	14%
% Air Taxi	22%	12%	31%
% GA Local	21%	34%	34%
% GA Itinerant	29%	35%	20%
% Military	13%	14%	1%

Source: Great Falls Regional Transportation Task #7, Cascade County Commission, 2011.

Air cargo transport trends at Great Falls International Airport declined in response to the economic recession, and due to reduced FedEx Express' weekend service in 2006. **Table 7.2** presents the total air cargo tonnage from 2005 to 2010.

Table 7.2: Great Falls International Airport Air Cargo 2005 to 2010

	2005	2006	2007	2008	2009	2010
Tons Air Cargo	22,257	20,187	18,192	17,525	16,624	15,391
Change from previous year	Na	-9%	-10%	-4%	-5%	-7%

Source: Great Falls Regional Transportation Task #7, Cascade County Commission, 2011.

Air cargo is typically high value and relatively low weight, so trends in air cargo by weight is not necessarily indicative of economic strength. Great Falls International Airport has regularly transported cargo that supports the local economy. Common inbound goods include:

- aerospace parts and equipment;
- legal and financial documents;
- cell phones;
- wind energy parts and equipment to repair local wind turbines;
- mining parts and equipment; and
- oil and gas extraction parts and equipment.

Other goods arrive bound for local medical facilities, including diagnostic equipment, pharmaceuticals, and medical devices. Other inbound goods include flowers, tractor, and heavy equipment parts. Outbound air cargo is based on the local tourism industry (related to hunting and fishing), as well as financial and management service and aerospace industries. The top local commodities include:

- meat products related to the local hunting and fishing industry;

- taxidermies;
- music concert equipment;
- documents and forms; and
- aerospace related equipment and supplies.

7.2.3. Origins and Destinations

Much of the locally serving goods movement is destined for industrial or commercial districts. Heavy industrial areas (I-2 District) are located within the northeastern quadrant of the city, along Highway 87, heading northeast from Great Falls, or along River Drive North on the east side of Great Falls. There are some light industrial districts (I-1 District) just north of a high-density residential district (R-3 District) adjacent to 8th Avenue North, and also on the west side of Great Falls between the Missouri River and Interstate 15. The latter area is the location of the BNSF rail yard. Great Falls International Airport is an important location in the area's freight network, as goods move to and from the region via this location. **Figure 7.3** illustrates the City of Great Falls zoning map, indicating where these districts are.

Goods move to and from commercial districts of the city as well, many of which are located on the city's south side, along 10th Avenue South. The Central Business Core (C-4 District) is located north of 10th Avenue South, just east of the Missouri River. Goods moving to the Central Business Core arrive by various arterials connecting to the Core, including:

- 2nd Street South, River Drive North and South, 5th / 6th Streets South one-way couplet;
- 1st / 2nd Avenues North one-way couplet;
- 9th Street North and South; and
- Central Avenue West / 1st Avenue North.

More information on truck routes is provided in **Section 7.4.2**.

Cascade County has two industrial zoning designations: Light Industrial (I-1) and Heavy Industrial (I-2). Areas of I-2 zoning are found in and around the unincorporated area of Black Eagle, along several miles of Vaughn Road, and southwest of Great Falls International Airport adjacent to the Tri-Hill Frontage Road. Areas of I-1 zoning are spread across the same areas, with additional zoning in areas near the Emerson Junction interchange and adjacent to the NW Bypass. All of these areas are located outside of the City limits but within the study area boundary for the LRTP. These areas are likely to have future industrial uses develop over the 25-year planning horizon in the LRTP.

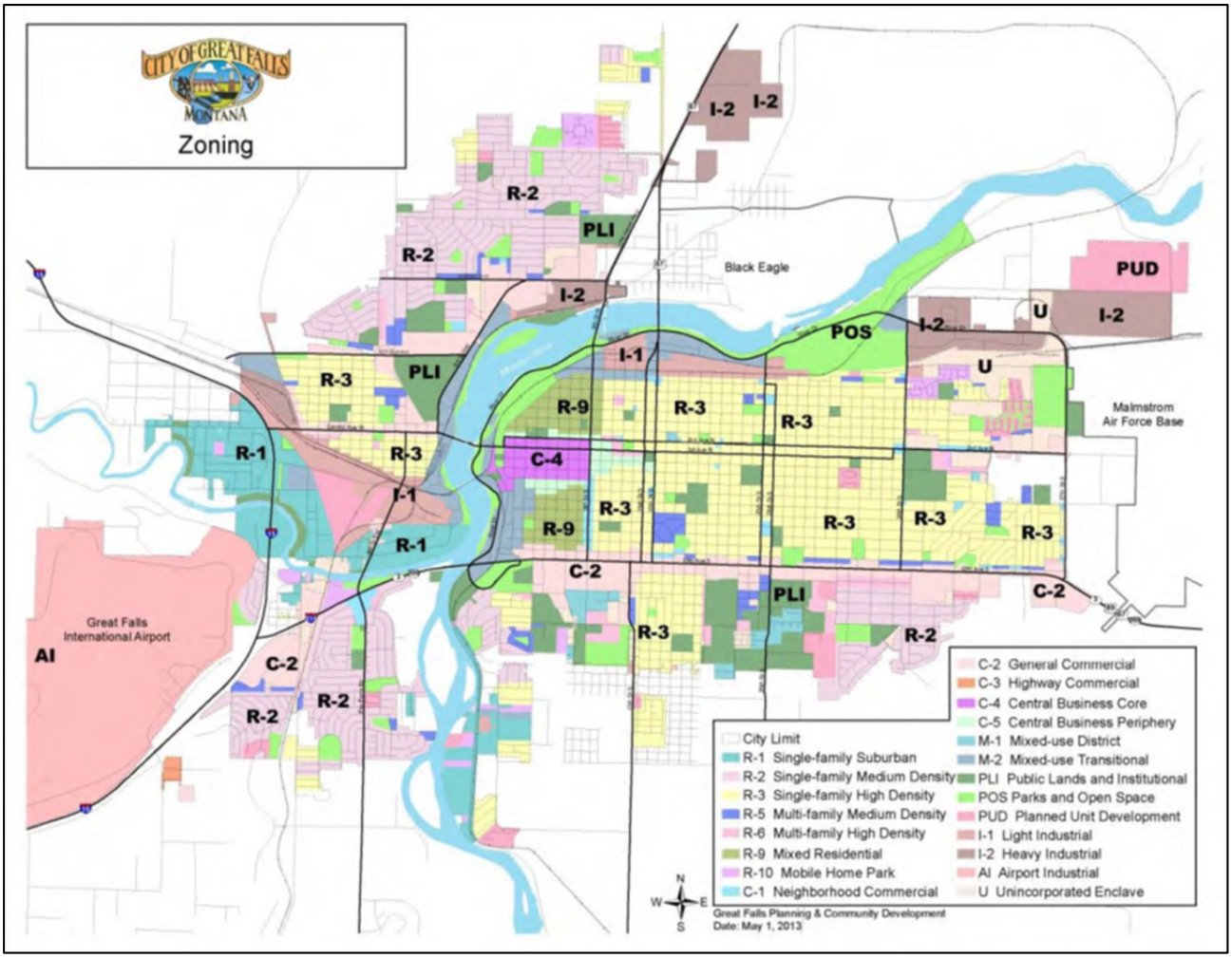


Figure 7.3: City of Great Falls Zoning Districts

Source: Imagine Great Falls 2025: Growth Policy Update 2013, City of Great Falls, 2013.

Figure 7.4 presents employment intensity and location in the City of Great Falls. The size of a symbol corresponds to the number of employees (i.e. the larger the bubble, the more employees work at that establishment). The number of employees is one indicator of economic activity. It can indicate total economic output of a business. The number of employees is also associated with local spending, as employees spend their income in the region. Providing efficient goods movement to and from employment clusters supports business activity and helps preserve jobs in the region. This is important for retail and office professions as well as manufacturing and industrial sectors. Retail stores, offices and other establishments, for example, located near River Drive North and 1st Avenue North rely on regular shipments of supplies and materials to support employee activity. The University of Great Falls and Great Falls Clinic Medical Center rely on regular shipments of medical equipment, food, and other products to serve thousands of customers and employees. The ability to receive goods on a regular basis is especially critical in industrial job centers. Employment in **Figure 7.4** shows significant activity in outlying areas and near Great Falls International Airport near existing industrial activities. Malmstrom AFB has over 4,000 employees, but is not represented in this map.

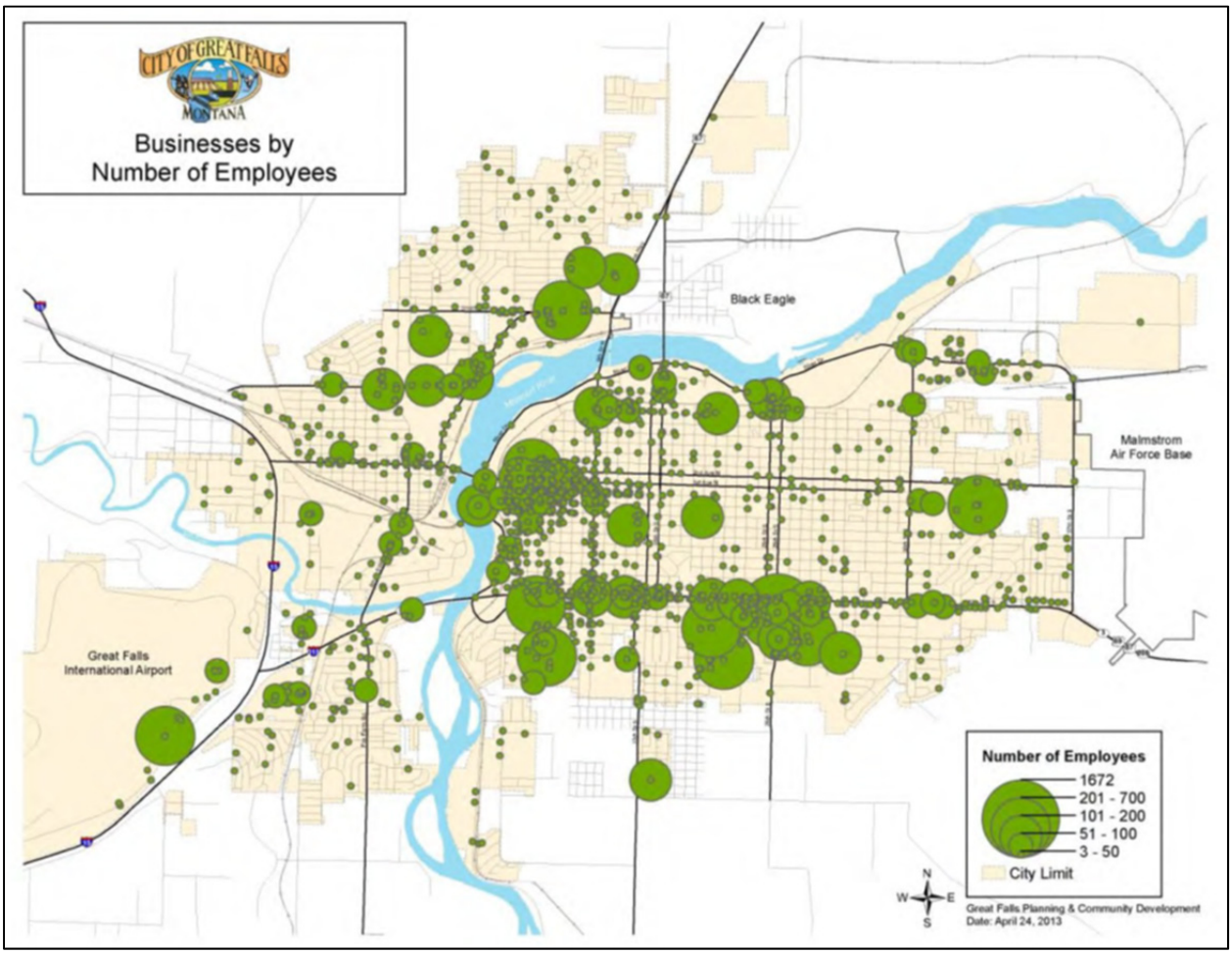


Figure 7.4: City of Great Falls Business Location by Number of Employees

Source: Imagine Great Falls 2025: Growth Policy Update 2013, City of Great Falls, 2013.

7.2.4. Routes and Facilities

The Great Falls Area's goods movement network benefits from truck, rail, and air transportation modes that facilitate goods movement throughout the region. **Figures 7.5** and **7.6** presents the goods movement routes and facilities in the Great Falls Area, which are discussed in greater detail in the following sections.

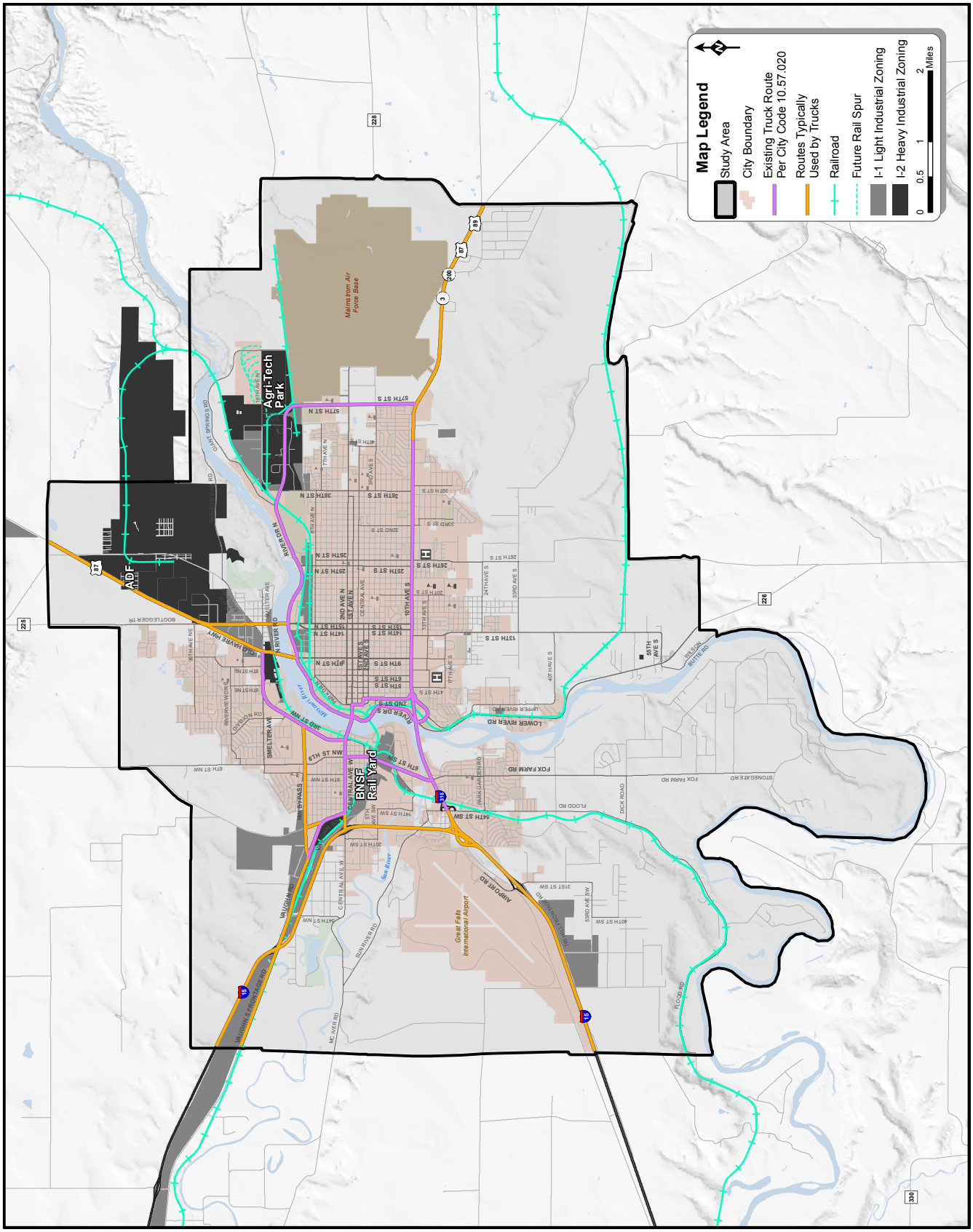


Figure 7.5: Existing Goods Movement Routes and Facilities

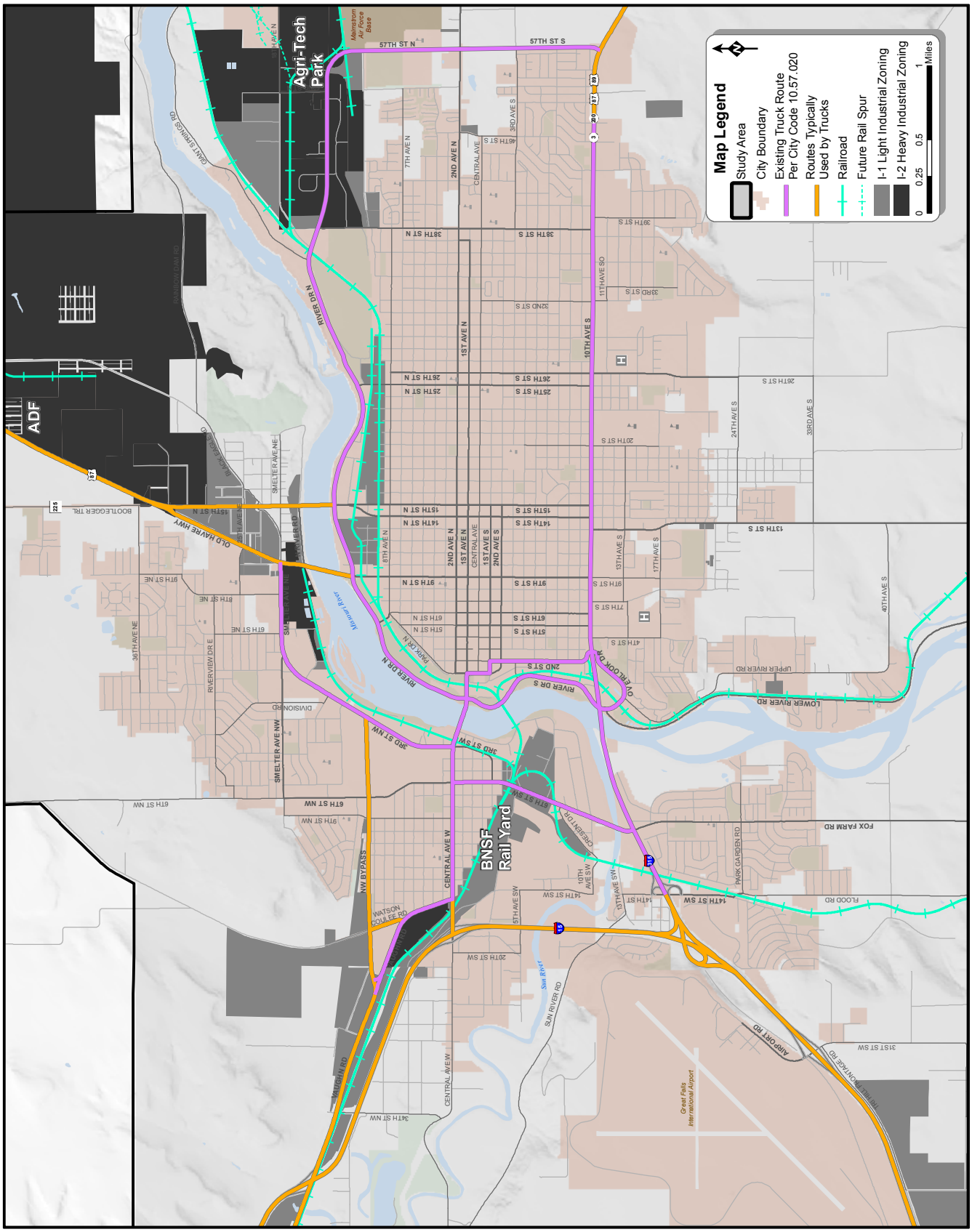


Figure 7.6: Existing Goods Movement Routes and Facilities (Detail)

Trucks

Figures 7.5 and **7.6** illustrate the routes generally used by trucks in the Great Falls Area. Official truck routes to be used by through trucks are identified in the City of Great Falls city code[17]. Typical truck routes are those that are outside the municipal boundary and connect to the official truck routes, forming complete goods movement routes. The official truck routes are:

- 10th Avenue South from the west City limits to the east City limits;
- The Northeast Bypass from the intersection at 57th Street South and 10th Avenue South, north and then westerly to the 10th Street Bridge;
- River Drive from its connection with 9th Avenue South near the Warden Bridge to the 1st Avenue North Bridge; 1st Avenue North from Park Drive westerly through the 1st Avenue North Bridge; Central Avenue West from the west end of the 1st Avenue North Bridge to the west City limits on Vaughn Road;
- 3rd Street Northwest and Smelter Avenue from Central Avenue West to Old Havre Highway;
- 2nd Street from the 10th Avenue South approaches north to 1st Avenue South;
- 1st Avenue South from 2nd Street South, west to Park Drive; Park Drive from 1st Avenue South to 1st Avenue North;
- 6th Street Southwest from Central Avenue West to 10th Avenue South; and
- River Drive from 1st Avenue North to the 9th Street Bridge.

Trucks generally travel on Interstate 15 to access markets outside the region. Locally-serving trucks access the city via the NW Bypass or Central Avenue West. From the southwest, trucks access the city on Country Club Boulevard and 10th Avenue South, with access to commercial areas. Trucks access the city via Highway 87 in the northeast, with connections to Smelter Avenue and River Drive. From the southeast, trucks enter along 10th Avenue South.

Analysis for the Great Falls Area Long Range Transportation Plan indicates that traffic congestion occurs on truck routes, including River Road North 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 Burlington Northern Santa Fe (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).[18]

Rail spurs connect the rail network to several industrial facilities in the Great Falls Area, providing direct access to major goods movement facilities. **Figures 7.5** and **7.6** illustrate 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 Malting Plant. 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 construct a rail spur to serve the AgriTech Industrial Park, generally

[17] City Code 10.57.020.
[18] Montana Department of Transportation. (2010). *2010 Montana State Rail Plan: Final Report.*

located north of 18th Avenue North and west of 57th Street North. This facility will be designed and constructed if and when industrial development occurs in the area.

Air

The Great Falls International Airport offers substantial infrastructure for the air cargo industry. The airport's primary runway is 10,502 feet long; the secondary runway is 5,722 feet long. The airport operates a control tower and four terminal gates. The airport occupies just over 2,100 acres and has a 531,000 square foot cargo apron area, and 72,000 square feet of cargo warehouse space. FedEx uses the warehouse space as a sorting and distribution hub for Montana. The airport operates a foreign trade zone that offers tax-free purchases to international customers. The US Customs Border Patrol operates an office on the airport, which facilitates international travel.

The airport's primary runway is adequate to accommodate the mid-size cargo jets such as the B-757 operated by FedEx for interstate shipments, given typical weather and operating conditions. **Figure 7.7** illustrates the FedEx Express and UPS air cargo route network for the western United States and Canada. The majority of air cargo routes from the airport, like many in Montana, are "long-thin" routes that cover long distances with consistently low volume of cargo.

FedEx Express ***UPS***

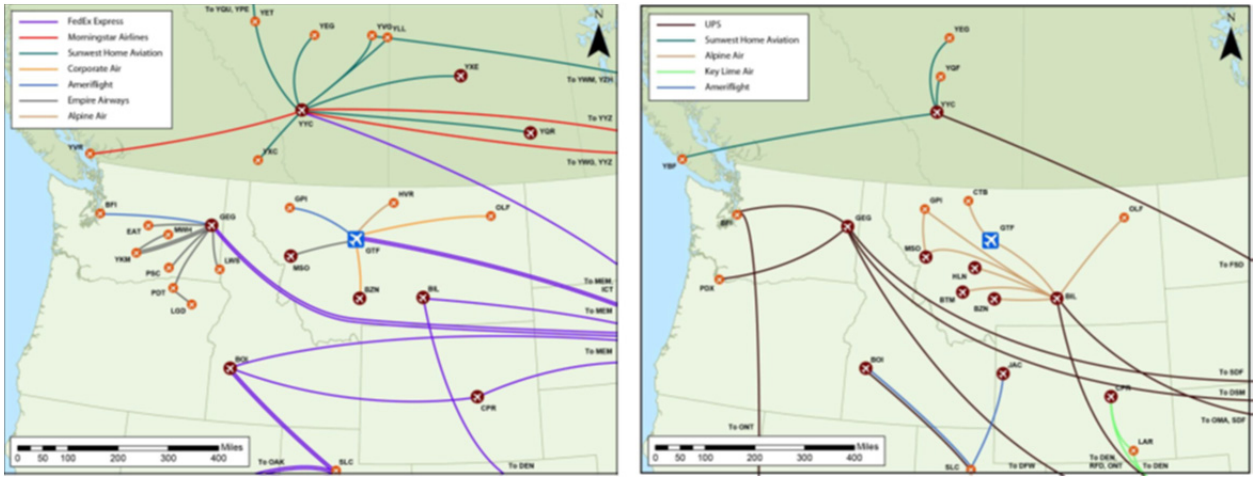


Figure 7.7: FedEx Express and UPS Air Cargo Networks

Source: Great Falls Regional Transportation Task #7, Cascade County Commission, 2011.

7.3. FUTURE GOODS MOVEMENT SYSTEM

The Great Falls Area is planning for continued population, employment, and overall economic growth. A strong goods movement network will support economic growth by maintaining capacity, safety, and security of the transportation system, and preserve quality of life for local businesses and residents.

Production and consumption will increase along with population increases in the Great Falls Area. Population and economic projections across the state suggest that the proportional share of goods shipped by truck, rail and intermodal service are likely to remain the same as they are today, even as demand for goods movement increases. This means that higher-value finished goods produced and consumed in Montana will continue to rely on trucks to distribute goods between dispersed origins and destinations. Rail is expected to continue its primary role in shipping most of the outbound goods by weight.

Tons of goods shipped in Montana are forecast to increase by 101 percent to 216.8 million tons by year 2035. Truck shipments will continue to account for the largest share of in-state goods movement by weight, while rail will continue to account for nearly all of the outbound shipments by weight. **Table 7.3** shows the forecasted change in shipments by weight by 2035, with truck shipments showing the greatest growth, at 156 percent.

Table 7.3: Montana Forecast Change in Shipments by Weight (2002 to 2035, Millions of Tons)

Mode	Total Growth (2002-2035)	Percent Change
Truck	82	156%
Rail	25	47%
Air	0	33%
Intermodal	2	150%
Water	-	0%
Total	**109**	**101%**

Source: Montana State Rail Plan, Montana Department of Transportation, 2010. Does not include pipeline and intermodal shipments.

Forecasts of truck traffic show growing truck volumes by the year 2035 in the Great Falls Area. **Figure 7.8** shows the average annual daily truck traffic (AADTT) in Montana. Highways in the Great Falls Area – in particular on routes Interstate 15 and US Highway 87 – have lower AADTT overall than Montana's east-west Interstate routes, as shown in **Figure 7.8**. The forecasts show growth on routes connecting the region to Alberta, Canada, and to Helena and I-90.

Truck traffic is expected to increase locally due to expected increases in truck-dependent industrial manufacturing, supported by infrastructure improvements to support these industrial sectors. Expected areas of increased truck traffic include the following areas:

- **US Highway 87, 3rd Street Northwest, and NW Bypass:** Steel production at the ADF site will increase as the firm fabricates steel modules for oil and gas sites in Alberta and eastern Montana, to be delivered by truck. The earliest phase of this new industrial complex is being built in 2013, and is located on land on the east side of US 87 and north of Black Eagle.

- **River Drive North and 57th Street North (i.e. NE Bypass):** A new industrial park is planned to be developed north of Malmstrom AFB. Developments in the area are expected to serve firms reliant on goods movement by truck.

- **Vaughn Road near Emerson Junction:** This highway interchange is located near vacant land zoned for industrial uses. The interchange could incentivize future industrial uses and lead to increased truck traffic to and from the area.

- **Airport Interchange:** The location of two truck stops on the southeast side of I-15 has led to increased truck usage in the area. Truck-dependent uses are expected to increase along Tri-Hill Frontage Road and on Ulm-Vaughn Frontage Road, increasing heavy truck use in this corridor.

Figure 7.8: Average Annual Daily Truck Traffic (2002 and 2035)

Source: Montana State Rail Plan, Montana Department of Transportation, 2010.

7.4. CONCLUSION

The Great Falls Area is expected to experience an increase in goods movement as the population and employment grows across the region and the state. A strong goods movement system can facilitate and enhance economic growth by providing low cost, efficient transportation options that also protect the quality of life that is crucial to the region. A more efficient, more accessible freight network can encourage and support the economic growth that the region projects.

Important issues to address in long range planning emerge from this assessment of the goods movement transportation system, including reducing traffic congestion, preserving quality of life, balancing land uses, and creating a safe multimodal transportation network.

- **Reducing traffic congestion:** Trucks make up a relatively small share of overall traffic in the Great Falls Area. However, trucks contend with – and contribute to – traffic congestion. Transportation modeling results indicate that traffic will become severely congested on currently congested routes, and become congested on routes that are nearing congested today. Congested roadway routes will hamper economic growth by reducing efficiency of goods movement. Less efficient goods movement can result in higher prices for local goods, which reduces the economic competitiveness of the region, deters future businesses relocations in the region, and increases out-of-pocket costs for residents.

- **Preserving quality of life:** Quality of life issues related to goods movement include vehicle and loading noise, air quality, and traffic safety. Goods movement directly affects these issues due to interactions with land uses, and interactions with other users of the transportation system. It is essential for trucks to access local markets by using local streets, while through-bound truck traffic is required to use official truck routes. Unfortunately, the volume of truck traffic on local streets is negatively affecting quality of life, as reported by residents and officials in previous regional plans.

- **Balancing land use:** The City of Great Falls, Cascade County, and regional economic development organizations are advocating for continued growth in the regional economy by attracting commercial businesses, industrial businesses, and residents. As the region grows, conflicts may arise between incompatible land uses. In addition, conflict may arise between users of the transportation system. 10th Avenue South is an official truck route along a busy commercial district, with nearby access to Benefis Hospital and the University of Great Falls. The area may need to mitigate transportation congestion and safety on the corridor. Adequate planning can facilitate growth that preserves quality of life while allowing local businesses and industries the ability to efficiently move goods into and out of the region.

- **Providing convenient truck and rail access to heavy industry:** Approximately 21 percent of jobs in the City of Great Falls are associated with heavy industry. Continued growth is expected in these sectors, which include agriculture and oil and gas extraction and refining. These industries are dependent upon the movement of goods such as extraction materials and equipment, grains, aerospace, and wind energy equipment. Accessibility to the Interstate and rail systems is critical for these industries and their daily processes. The City of Great Falls and surrounding region can help support the growth of these industries by providing efficient truck routes and easy access to the Interstate and freight rail systems.

- **Creating a safe multimodal transportation network:** The Great Falls Area has a well-maintained transportation network that serves personal vehicles, trucks, public transit, pedestrians, and cyclists. Preserving multimodal access will be important as demands for transportation, and in particular goods movement, grow. The region should be particularly mindful of balancing transportation needs in downtown areas where major motorized transportation routes intersect with people walking to school, riding bikes, or accessing public transit.

8.0 Security

The Great Falls Area is exposed to many hazards, all of which have the potential to disrupt the community and cause damage. Hazards include a range of human and environmental incidents or events with varying probabilities of occurring and severity of effects. Hazards may threaten the security of the regional transportation system. The transportation system is also a valuable asset in mitigating and responding to emergencies.

The Department of Transportation defines security as the *"…freedom from intentional harm and tampering that affects both motorized and non-motorized travelers, and may also include natural disasters."*[19] Federal, state, and local agencies, and their private partners work together to create plans and policies to maintain a secure regional transportation system. These organizations coordinate to ensure that the transportation system is available as a resource to respond to emergencies in the region. This chapter describes the security issues relevant to the Great Falls Area transportation system, and how the Long Range Transportation Plan (LRTP) helps preserve and enhance transportation security.

This chapter answers the following questions:

- What plans and policies are in place to guide the Great Falls Area in the event of an attack, emergency, or natural disaster?
- Who is responsible for the transportation system security and what are their roles and responsibilities?
- How does the LRTP support a secure transportation system for the community?
- What barriers to a secure transportation system exist, and what general strategies could be used to enhance the community's general emergency preparedness?

Consultations with emergency planning staff at the City of Great Falls, Cascade County, and Malmstrom Air Force Base (AFB) guided and augmented the information available from public documents. The staff, title, organization, and contact information are presented in **Table 8.1**. All consultations took place in October 2013.

Table 8.1: Security Consultation Contact Information

Name	Job Title	Organization	Phone or Email
Vince Kolar	Emergency Manager, Firewarden	County of Cascade Emergency Services	406-454-6900 vkolar@cascadecountymt.gov
Kristal Kuhn	Emergency Management Planner	City of Great Falls	406-727-8070
Royce Shipley	Senior Emergency Manager	Malmstrom AFB	Royce.shipley@us.af.mil

[19] http://www.planning.dot.gov/documents/BriefingBook/BBook.htm#13BB

8.1. TRANSPORTATION SECURITY PLANS AND POLICIES

Montana's political subdivisions have the primary responsibility for emergency operations and manage all available resources to save lives and minimize property damage. Local plans and policies are critical to informing this responsibility. Security and emergency plans guide government and private organizations to ensure efforts are coordinated and comprehensive. A range of different types of plans address different levels of the transportation system in the Great Falls Area and are presented in **Table 8.2**. The plans are organized alphabetically by agency type (federal, state, local). Some plans, such as Moving Ahead for Progress in the 21st Century (MAP-21), identify available security resources and mandate actions required by state and local government agencies. Others, such as the Cascade County Emergency Operations Plan (EOP) outline planning and response procedures for local organizations.

Table 8.2: Plans, Policies and Guidelines for Transportation Security

Document (Year Written)	Agency Type (Name)	Description and Provisions
Implementing the Recommendations of the 9/11 Commission (IRC) Act of 2007	Federal	Identifies the Department of Homeland Security (DHS) as responsible agency for national rail security planning, hazardous materials, and information sharing.
Moving Ahead for Progress in the 21st Century (MAP-21) (2012)	Federal	• Federal surface transportation funding authorization. • Requires states to develop a risk-based asset management plan for the National Highway System to improve or preserve the condition of the assets and the performance of the system. [(a)] • At least 1 percent of Section 5307 funding (Urbanized Area Formula Grants) must be used on security projects unless the recipient determines such expenditures are unnecessary. • Establishes Public Transportation Emergency Relief Program that provides grants to fund capital projects and operating costs related to damage resulting from an emergency.
National Response Framework (NRF) [(b)]	Federal	Provides guidelines to state and local governments to create security and emergency management plans. Guided by the National Preparedness Goal: *"A secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk."*
Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (2005)	Federal	Prior federal surface transportation funding authorization. Emphasized transportation system security by creating security planning factor. Also mandated that states address security in long-range transportation plans.
TranPlan 21 (2002, amended in 2007)	State (Montana DOT)	Montana's long-range transportation plan was amended in 2007 after SAFETEA-LU was passed. Key changes included creating security section, and adding security-related goals, priorities, projects, and policies.
Montana Emergency Response Framework (2012)	State (Montana Disaster and Emergency Services)	Identifies state's roles and actions in the event of an emergency and coordinates all other emergency operations plans in Montana. Emergency Support Function – Transportation explains the role of MDT in the event of an emergency. One key action is to request support from other agencies including local agencies such as Cascade County Disaster and Emergency Services.

Document (Year Written)	Agency Type (Name)	Description and Provisions
Cascade County Emergency Operations Plan (2011)	Local (Cascade County Disaster and Emergency Services)	Provides hazards analysis of the County as well as "annexes" for specific event types such as mass casualties and other events. The plan addresses security in the cities of Great Falls, Belt, and Neihart as well as all unincorporated parts of the country.

[a] 23 U.S.C. 119(e)(1), MAP-21 § 1106. Guidance for risk-based asset-management plans has not yet been developed. Measures will apply to all infrastructure within the highway right-of-way.

[b] Federal Emergency Management Agency. Accessed October 2013 at http://www.fema.gov/national-planning-frameworks.

The Cascade County EOP is the security plan for the Great Falls Area. The plan applies to and incorporates security activities from all jurisdictions in Cascade County, including Great Falls, Belt, Cascade, and Neihart. The EOP integrates with plans from federal and state levels of government, including the National Response Framework and the National Incident Management System. It identifies agencies and staff that have authority to manage security activities, and outlines procedures for implementing the activities. The EOP is designed to address the five disciplines of All-Hazards planning, including:

1. Awareness;
2. Prevention;
3. Preparedness;
4. Response; and
5. Recovery.

The EOP identifies 22 potential hazards facing Cascade County and the municipalities. The County rated the hazards based on historical frequency, affected population, affected environment, affected property, and local response capability. **Table 8.3** presents the hazards, including their probability of occurrence, other related hazards, and a description of the primary risk factors. Four hazards stem directly from the transportation system, including HAZMAT, motor vehicle, air, and rail incidents. The transportation system is also critical to facilitating response efforts of nearly every identified hazard.

The LRTP considers these hazards in planning for transportation projects and programs, to ensure that local agencies have the capability to maintain transportation security and respond to potential events. The Cascade County Local Emergency Planning Committee periodically reviews the EOP, and holds annual hearings to consider updates.

Table 8.3: Potential Hazards

Hazard No.	Hazard Name	Occurrence Probability	Related Hazard No.	Primary Risk Factors
1	Winter storm	Medium	4,6,7,8,10,12	Widespread isolated people and livestock
2	Wind Event	High	4,6,7,8,10,12	Life safety and property damage
3	Flood / Dam Failure	Medium	4,7,9,	Life safety and property damage
4	Communication Failure	Low		Life safety and disruption of response coordination
5	Earthquake	Low	3,4,6,7,8,9,14,17	Widespread structural collapse people entrapped
6	HAZMAT transportation [(a)]	High	14,13	Toxic environment for people near incident
7	Utility failure electric / gas	Medium	13,14	Widespread disruption and life safety
8	Transportation motor vehicle [a]	High	4,7,13,14	Life safety
9	HAZMAT fixed facility	High	14	Large amounts of toxic materials
10	Transportation air [a]	Low	13,14	Mass casualty for commercial carrier
12	Transportation rail [a]	Low	6,8,13	Life safety
13	Wild land forest / grass fire	High	4,7	Property damage
14	Structure fire	Medium	4,7	Life safety and property damage
15	Civil disorder / terrorism	Low	3, 4, 6, 7, 8, 9, 10, 12, 13, 14, 16, 17, 19	Life safety, property damage, panic
16	Radiological	Low	4,7,13	Chronic health effects for people in immediate area
17	Radiological fixed facility	Low		Chronic health effects for people in immediate area
18	Drought / infestation	High	13	Livestock and agricultural loss
19	Disease epidemic	Low		Wide spread health issues
20	Subsidence / landslide	Low	4,6,7,8,10,12	Life safety and property damage
21	Volcanic ash	Low	4,7	Wide spread disruption and chronic health issues
22	Avalanche	Low	4,7,8,10,12	Life safety

Source: Cascade County Emergency Operations Plan, Cascade County, 2011.

[(a)] Hazards occurring on the transportation system.

8.2. TRANSPORTATION SECURITY ROLES

The Great Falls Areas' transportation infrastructure is owned and operated by different public agencies and private organizations. These agencies and organizations coordinate with representatives of federal, state and local governments, neighboring owners/operators, and the surrounding community. Interstate 15, for example, is overseen by MDT, and passes through the City of Great Falls, affecting local traffic, quality of life, and is a key access route for personal travel, freight and emergency services. Likewise, Great Falls International Airport operates commercial flights and carries air freight and is therefore subject to federal security regulations.

Table 8.4 summarizes the agencies that play a role in ensuring a secure transportation system in the Great Falls Area. The table is organized alphabetically within the level of government. Each organization is described by its type (federal, state, or local), its main security role or level of authority, key security-related programs or departments, and the transportation modes addressed.

Table 8.4: Transportation Agencies and Security-Related Roles

Organization or Agency	Type	Security Role or Authority	Key Programs, Departments	Transportation Modes
Customs and Border Protection (CBP)	Federal	• Detect, apprehend, and deter terrorists and weapons from crossing international borders. • Prevent and detect smuggling across international borders. • Department under the U.S. Department of Homeland Security	Customs and Trade Security	• Air passenger • Freight (air, truck, rail) • Passenger Rail • Highways • Transit • Marine
Federal Emergency Management Agency (FEMA)	Federal	• Provide support to first responders and citizens in preparation for and response to all hazards. • Assist government agencies (local, state, tribal, etc.) and private sector in managing transportation systems during threats (ESF #1). • Department under the U.S. Department of Homeland Security	Emergency Support Function #1 - Transportation	All modes
Federal Motor Carrier Safety Administration (FMCSA)	Federal	• Regulates United States trucking industry. • Enhance safety of truck drivers and commercial motor vehicles.	N/A	Truck Freight
Federal Railroad Administration	Federal	• Regulates railroad safety. • Promotes compliance in hazardous materials among other areas. • Investigates accidents. • Develops and implements safety standards. • Conducts railroad safety and customer training.	N/A	
Transportation Security Administration (TSA)	Federal	• Responsible for security of U.S. transportation systems. • Focus on airport security, but also plays many other roles. • Conducts nationwide risk assessment of a terrorist attack on the freight railroad system. [(a)] • Included in Department of Homeland Security (DHS).	HAZMAT Endorsement Threat Assessment Program Air Cargo Screening Federal Air Marshal training and employment	• Air passenger • Freight (air, truck, rail) • Passenger Rail • Highways • Transit • Marine
U.S. Coast Guard	Federal	• Ensure security in inland waterways.		Marine
Montana Department of Disaster and Emergency Services (DES)	State	• Coordinate emergency management plans and policies in Montana.		All modes
Montana Department of Transportation	State	• Plan for and provide traveler safety on state transportation facilities.		• Highways • Passenger Rail • General Aviation

Organization or Agency	Type	Security Role or Authority	Key Programs, Departments	Transportation Modes
Cascade County Disaster and Emergency Services (DES)	Local	• Coordinate with MAFB, State of Montana and cities within Cascade County.	Office of Emergency Manager	All modes
City of Great Falls	Local	• Coordinate with State of Montana, Cascade County, city residents and other stakeholders to prepare for and respond to emergencies.	Mayor's Office; Office of Emergency Management Planner	All modes

*Sources: Websites and other public documents, accessed September 2013. Information was supplemented through consultation with staff presented in **Table 8.1**.*

[(a)] The "Implementing Recommendations of the 9/11 Commission Act of 2007" required that the TSA and other federal agencies conduct a risk assessment of a terrorist attack on railroad carriers and create a national strategy for railroad transportation security.

The EOP identifies responsibilities for agencies and officials at Cascade County, and departments or officials in the cities of Great Falls, Belt, Cascade, and Neihart. It identifies local support organizations relevant to transportation security in the event of an emergency, including the Great Falls Transit Agency, Cascade County Public Schools, contracted bus services, and emergency medical services. For example, the Public Works departments and the Great Falls Transit Agency each have specific roles related to regional transportation security. Key transportation responsibilities identified in the EOP include:

Public Works

- Primary responsibility to open blocked emergency routes to enable first responders to reach disaster areas.
- Remove debris and stabilize public structures to gain access to victims in support of fire and rescue activities.
- Provide personnel, equipment and supplies for flood control and mitigation procedures.
- Provide vehicles and personnel to evacuate critical records and equipment and relocate them.
- Provide emergency repair for all City owned vehicles at the shops or in the field whenever possible.
- Maintain records of the condition and maintenance standards for all city owned equipment.

Great Falls Public Transit

- Provide mass transit assistance during disasters and other emergency situations if necessary.

8.3. COORDINATION

Cascade County and local jurisdictions periodically review emergency and security planning to share local knowledge, update hazard assessments and enhance interagency coordination. In the Great Falls Area, Cascade County and the local jurisdictions jointly plan for and closely coordinate on regional security issues. The Cascade County Emergency Manager works closely with the City of Great Falls Emergency Management Planner[20]. FEMA funds support emergency planning activities in the Great Falls Area.

Malmstrom AFB regularly transports goods using local roads and the Great Falls International Airport. Therefore regional transportation security is critical to its mission. Malmstrom AFB and the Montana Air

[20] The Emergency Management Planner works within the City of Great Falls Fire Department.

National Guard representatives coordinate security planning and response with local governments. Malmstrom AFB assists local governments with security planning and response as needed.

Coordination activities between regional agencies have resulted in, and are guided by, formal agreements to support security-related planning. **Table 8.5** presents these agreements, organized by the agreement type, the jurisdictions involved, and a brief description of the agreement.

Table 8.5: Security-Related Agreements

Agreement Type	Jurisdictions Involved	Description
Formal Agreement	City of Great Falls and Malmstrom AFB	Standing mutual aid agreement to help one another in the event of fire or incidents involving hazardous materials.
Formal Agreement	City of Great Falls Fire Department leads the team; Malmstrom AFB contributes labor and capabilities	Great Falls Regional HazMat Team – Codified in state law; team provides help in form of phone consultation and outreach, dispatch of partial or entire team, public outreach events including HazMat training classes or exercises.
Formal Agreement	Cascade County and Malmstrom AFB; Cascade County and Montana ANG	Standing mutual aid agreement to help one another in the event of fire or incidents involving hazardous materials.
Informal Agreement	City of Great Falls Police Department and Malmstrom AFB	Extreme weather events – In the event of flooding, high winds, severe winter events, or other natural disasters, these two entities agree to assist the other as needed.

Sources: Malmstrom AFB, 2013.

8.4. BARRIERS

The Great Falls Area has an extensive transportation network. This network is strengthened by various infrastructure components that support the basic operation of the transportation system. For the purposes of the LRTP update process, stakeholders and the public were asked during various outreach activities to provide input as to what they perceived were the critical infrastructure and key resources essential to emergency preparedness and overall quality of life of the area's citizens and to its economic vitality. The key components identified during the LRTP outreach process include the following assets:

- Interstate Systems (I-15, I-315)
- U.S. Highways (e.g. U.S. 87, U.S. 89)
- Bridges (10th Ave S, Central Ave W, 10th St N, 15th St N)
- Principal Arterial Roadways (10th Ave S, 3rd St NW, NW Bypass, 14th / 15th St Couplet, 9th St, 57th St, River Dr N)
- Malmstrom Air Force Base
- Great Falls International Airport
- Freight Activity Centers
- Rail Networks
- Pipeline Network
- Great Falls Transit System

Of the assets presented, perhaps most striking is the presence of four bridges crossing the Missouri River. These bridges may act as pinch-points during times of emergency response. Depending on the type and location of an event, routing from one bridge to another may delay emergency response and provide excessive delay. Low lying roadways within or adjacent to the Missouri River floodplain may also present various concerns.

8.5. GENERAL STRATEGIES TO ENHANCE SECURITY

As agencies charged with security develop new and expand existing emergency response plans, and as surface transportation system operators begin to look at security, the following recommendations should be forwarded to the appropriate implementing agencies for consideration:

- Large scale events should have evacuation plans. Inclusion of such plans should be encouraged in such event planning, with the following considerations:
    - Coordinated signals during the evacuation.
    - Identified evacuation routes away from “high-risk areas” or key transportation facilities. Examples may include the petroleum refinery, major bridges, rivers, Malmstrom Air Force Base, Great Falls International Airport and Air National Guard, etc.
    - Detour plans and other alternate routes should also be generally identified.
    - Long-term detours in the event of a major failure (i.e., bridge collapse) or catastrophic event (i.e., destructive flood) should also be identified.
    - Coordination with Cascade County for those areas surrounding the City Limits. Such areas could include the west side near the Sun River; Fox Farm Road area south of the City; Gibson Flats; Black Eagle; County lands between the City and Malmstrom Air Force Base; etc.)

- As owners of the local transportation system (such as BNSF Railroad, Montana Department of Transportation, City of Great Falls and Cascade County) identify specific structures, facilities or other elements of the transportation system that are at high risk of attack, steps should be taken in a timely manner to make them secure.

- Any security measures contemplated for implementation should take into full account the privacy of the transportation user and make every attempt to preserve their privacy, while still providing a safe, secure transportation system.

8.6. CONCLUSION

Coordination between the City of Great Falls, Cascade County, local partners, and federal and state agencies is critical to maintain transportation system security. Coordination is also important to ensure the regional transportation system supports emergency planning for a range of potential hazards.

The Great Falls Area LRTP incorporates information from security plans – in particular the EOP – and contributes to security planning by comprehensively assessing the regional transportation system. Specific elements of transportation planning that contribute to transportation security include:

- Coordinate with Cascade County and local partners to inform and update the EOP through activities such as data sharing and asset inventory.
- Inventory of the Area’s major transportation assets and potential hazards. This includes bridges, roadways, Great Falls International Airport, freight rail, public transportation vehicles and routes, and pedestrian facilities.
- Coordinate with the Great Falls Transit Agency to manage public transportation assets.
- Assess improvements needed and identify resources to maintain critical transportation assets.
- Designate goods movement routes, particularly routes for hazardous materials transport.

9.0 Facility Recommendations

9.1. INTRODUCTION

Recommended improvements (i.e. projects) contained herein were developed through a combination of public process, project solicitation from partnering agencies, travel demand modeling, traffic engineering analysis, and policy choices to support LRTP goals and objectives previously defined. This Chapter describes the improvements identified for the LRTP.

As an MPO, the LRTP update requires a prioritized, fiscally constrained menu of projects - in year of expenditure (YOE) dollars. Projects are listed as committed, recommended and illustrative. **Table 9.1** defines these categories of projects.

Table 9.1: Facility Recommendation Categories

Category	Definition
Committed	Committed projects are those with dedicated funding via the TIP, private sources (new development), transit formula funds, local funds, and/or projects with dedicated funding via a completed environmental document.
Recommended for Funding	Projects recommended to be completed through the planning horizon (year 2035), but that may need further analysis before being committed to implementation via inclusion in the TIP
Illustrative (Unfunded)	Projects or project concepts supported by a sponsoring agency, but not prioritized for implementation or federal funding between 2015 and 2035.

9.2. ROADWAY PROJECTS

9.2.1. SHORT RANGE (SR) IMPROVEMENTS

Short Range (SR) projects are relatively low cost, “tune-up” type improvements. For the purposes of the LRTP an improvement project was classified as a SR project if the cost of the project was estimated to be less than $500,000 and/or there was a reasonable chance that the project could be implemented within a five- to ten-year timeframe. Problem areas which can usually be addressed in the short range, given the dollar threshold listed above, are as follows: intersection capacity problems (both signalized and unsignalized), pavement condition problems (i.e. overlays, chip seals, etc.), crash problems (i.e. sight distance improvements, better signing and/or pavement markings), and roadway/lane width and capacity concerns. Committed, recommended and illustrative SR projects are depicted graphically in **Figure 9.1** and **Figure 9.2**.

Fourteen short range (SR) projects were identified as “committed” in the 2009 LRTP Update. An additional 12 SR projects were “recommended for funding”, and 10 “illustrative” SR projects were identified. **Table 9.2** summarizes these 36 SR projects, and presents the status of their implementation. For those that were not completed and may still be valid, they are incorporated into this LRTP update’s SR project listing.

The most accurate and recent cost estimates known for each project have been used (see **Appendix C**). Although most of the project cost estimates are planning-level estimates, they are in year-of-expenditure dollars (using a yearly inflation factor of 3%) and include all project phases.

Table 9.2: SR Projects from 2009 LRTP Update & Status for 2014 Plan

	SR Identifier	Location of Past SR Project	Past Recommendation	Status for this LRTP Update
Committed	CSR-1	10th Avenue South; at 38th Street South and 23rd Street South	Add side-street turn lanes to reduce delay at the intersections	**Completed**
	CSR-2	26th Street South (20th Avenue South to 33rd Avenue South)	Overlay poor sections on this piece of roadway with new asphalt (**NOTE: Portion between 24th Avenue South and 33rd Avenue South completed.**)	**Partially Completed**, not included herein for further consideration
	CSR-3	33rd Avenue South and 13th Street South	This intersection exhibits poor sight distance and modifications to the intersection legs should be made. Specifically, intersection should be reconfigured to a conventional "T" intersection with stop control on the east leg (33rd Avenue South). In addition, a detailed sight distance study should be completed to examine improvements to the north leg of 13th Street South.	**Not Completed**, modified and included herein as **SR Illustrative No. 7**
	CSR-4	Wilson Butte Road/55th Avenue South/Eden Road/Lower River Road	It is recommended that this intersection be reconfigured into a more conventional four-legged intersection with appropriate stop control as necessary. This modification can be accomplished by relocating Wilson Butte Road as it enters the intersection to line up directly opposite 55th Avenue South. It is recommended that these two legs be stop controlled.	**Not Completed**, modified and included herein as **MSN Illustrative No. 26**
	CSR-5	Construct miscellaneous sidewalk at various locations	A portion has been constructed.	**Partially Completed**, additional segments underway
	CSR-6	1st Avenue North overlay (Park Drive to 9th Street)	Asphalt pavement overlay	**Completed**
	CSR-7	1st Avenue North/River Drive	Asphalt pavement overlay	**Completed**
	CSR-8	6th Street North (Central Avenue to 8th Avenue North	Asphalt pavement overlay	**Completed**
	CSR-9	10th Avenue South overlay (38th Street to 57th Street)	Asphalt pavement overlay	**Completed**
	CSR-10	Great Falls SE: US Highway 87/89, past urban limits	Concrete dowel bar retrofit, surface maintenance	**Completed**

	SR Identifier	Location of Past SR Project	Past Recommendation	Status for this LRTP Update
	CSR-11	Junction Bootlegger Trail NE: US Hwy 87 north	Turn lane/widening	**Not Completed**, modified and included as **MSN-2**
	CSR-12	River Drive (1st Avenue North to 9th Street North)	Asphalt pavement overlay	**Completed**
	CSR-13	Park Drive (6th Street North to 1st Avenue North)	Asphalt pavement overlay	**Completed**
	CSR-14	Fox Farm Road / 6th Street Southwest / I-315	Intersection improvement	**Completed**
Recommended for Funding	SR-1	Signal Warrant Analysis	Intersections of: north and west sides of airport interchange; Central Avenue West and Vaughn Road; 25th Avenue NE and 10th Street NE; 25th Avenue NE and 15th Street NE; Smelter Avenue and Wire Mill Road; Fox Farm Road and Park Garden Road; 3rd Avenue South and River Drive; 38th Street and Central Avenue; and other locations as the need may arise	**Partially Completed**, ongoing depending on need, modified and included herein as **SR-1**
Recommended for Funding	SR-2	Signal Modifications / Upgrades	Upgrade traffic signal heads in the City as appropriate: including but not limited to signal heads, pedestrian push buttons, pedestrian heads, LED upgrades, battery backup systems, etc.	**Partially Completed**, ongoing depending on need, modified and included herein as **SR-2**
Recommended for Funding	SR-3	6th Street North (from River Drive to 8th Avenue North)	Overlay roadway with new asphalt. In addition, construct new curb and gutter and storm drainage system	**Completed**
Recommended for Funding	SR-4	3rd Street NW and Northwest Bypass	Signal replacement / install signal arms and new signals and related equipment	**Completed**
Recommended for Funding	SR-5	6th Street Southwest and 4th Avenue Southwest	Signalize intersection to better accommodate minor approach traffic (i.e. the 4th Avenue Southwest legs). Along with the recommended signalization, it is recommended to provide appropriate intersection lighting and pedestrian crossing facilities.	**Not Completed**, modified and included herein as **SR-1**
Recommended for Funding	SR-6	River Drive North and 25th Street North	Reconfigure and signalize intersection to improve the level of service and better accommodate traffic. Provide appropriate intersection lighting and pedestrian crossing facilities.	**Not Completed**, and not forwarded due to operational issues
Recommended for Funding	SR-7	10th Avenue South and 32nd Street South	Reconfigure 32nd Street South legs of this intersection to align better along a slight skew. These legs are split phased, and by aligning the two legs (i.e. north and south leg), the phasing of the signal can be put on the same phase.	**Not Completed**, modified and included herein as **SR-3**

	SR Identifier	Location of Past SR Project	Past Recommendation	Status for this LRTP Update
	SR-8	Central Avenue West (from 3rd Street Northwest) to 1st Avenue North (at River Drive), including the 1st Avenue North bridge and approaches:	Re-stripe and make intersection modifications to improve traffic flow and operations in the area, as follows: Bridge Structure: re-stripe the existing bridge from a four-lane to a six-lane facility. Central Avenue West / 3rd Street Northwest: re-stripe the south leg to allow for a left turn lane, a combination through and right turn lane, and an exclusive right turn lane. 1st Avenue North / River Drive: on the southbound leg, widen to the west slightly and provide for an exclusive right turn lane, a shared right turn / through lane, and an exclusive left turn lane. 1st Avenue North (between River Drive and Park Drive): re-stripe this segment of roadway to a six-lane principal arterial standard. Park Drive (between 2nd Avenue North and 1st Avenue North): re-stripe to provide for a two lane roadway on Park Drive, south of 2nd Avenue North. Also provide a right turn only lane and a combined thru lane / right turn lane on the north leg of the intersection of 1st Avenue North and Park Drive. A designated left turn lane will also be required on the north leg, with applicable geometric modifications to the south leg to line up the respective turning movements.	**Not Completed**, modified and included herein as **SR-4**
	SR-9	Various Cascade County locations within LRTP study area boundary	26th Street South (between 24th Avenue South and 33rd Avenue South): Rebuild shoulders in spot areas to flatten fill slopes to benefit roadway safety and potential "run-off-the-road" vehicles. This short range project primarily relates to the east side of the roadway. 26th Street South and 33rd Avenue South: Install stop control on the north and south leg (i.e. 26th Street South). The four legs should be modified to gain a suitable approach grade to the intersection. Flood Road and 45th Avenue South: Install stop control on the 45th Avenue South leg of the intersection. It is currently yield controlled, and some minor driver hesitancy was observed during field reviews of this area. **(NOTE: This was completed.)** Flood Road (south of Dick Road): Complete a speed study and install appropriate speed control signs. **(NOTE: Dropped from further consideration)**	**Partially Completed**, modified and included herein as **SR-5**

	SR Identifier	Location of Past SR Project	Past Recommendation	Status for this LRTP Update
	SR-10	10th Avenue South and 2nd Street South	Make geometric improvements to this intersection on the northeast corner by improving the signage, pavement markings and traffic flow. Also, the eastbound to northbound left turning traffic on 10th Avenue South should have a protected / permissive left turning phase.	**Completed**
	SR-11	10th Avenue South and 29th Street South	Make geometric improvements to the intersection by widening the south approach to provide a separate right turn lane and a shared left turn/through lane. Incorporate signalized intersection.	**Not Completed**, not included herein for further consideration
	SR-12	Pavement preservation activities	Overlay/chip seal or partially reconstruct, and including ADA ramps/sidewalk in some locations on various urban roadways, including: 1st Avenue South (from 12th to 13th Street and 14th to 15th Street); 2nd Street South (from 1st to 10th Avenue South); 6th Street South (from 1st to 2nd Avenue South, 3rd to 4th Avenue South, and 8th to 10th Avenue South); 8th Avenue North (from 6th Street to 38th Street); 9th Street North (from 2nd to 8th Avenue North); 9th Street South (from 10th to 13th Avenue South); 25th Street North (from Central Avenue to River Drive); 26th Street North (from Central Avenue to 8th Avenue North); Smelter Avenue (from Division to 6th Street NW); Watson Coulee (from 5th Avenue NW to NW Bypass); other, as needed.	**Partially Completed**, modified and included herein as **SR-6**
Illustrative	N/A	24th Avenue South (from 13th Street to 26th Street)	Overlay with new asphalt.	**Not Completed**, not included herein for further consideration
Illustrative	N/A	33rd Avenue South (from 13th Street to 26th Street)	Overlay with new asphalt. Widen several narrow sections, both for safety considerations and to accommodate bicycle lanes in the future.	**Completed**
Illustrative	N/A	40th Avenue South (from Upper River Road to 13th Street)	Overlay with new asphalt.	**Not Completed**, modified and included herein as **SR Illustrative No. 1**
Illustrative	N/A	Franklin Avenue (from Lower River Road to 13th Street)	Overlay with new asphalt.	**Not Completed**, modified and included herein as **SR Illustrative No. 2**
Illustrative	N/A	55th Avenue South (from Lower River Road to 13th Street)	Overlay with new asphalt.	**Not Completed**, modified and included herein as **SR Illustrative No. 3**

SR Identifier	Location of Past SR Project	Past Recommendation	Status for this LRTP Update
N/A	Fox Farm Road and Park Garden Road	Make geometric improvements and install a traffic signal when signal warrants are met.	**Not Completed**, modified and included herein as **SR-1**
N/A	Fox Farm Road – Alder Drive to Park Garden Road	Re-stripe to a four-lane facility to accommodate existing and projected traffic volumes. Remove on-street parking. Construct a parking lot west of Fox Farm Road to serve the adjacent Meadowlark Elementary School and Montana Park.	**Not Completed**, modified and included herein as **SR Illustrative No. 4**
N/A	Wilson Butte Road (from Eden Road to transportation plan study area boundary)	Overlay poor sections of asphalt.	**Not Completed**, modified and included herein as **SR Illustrative No. 5**
N/A	Upper River Road (from 19th Avenue South to 40th Avenue South)	Overlay poor sections of asphalt.	**Not Completed**, modified and included herein as **SR Illustrative No. 6**
N/A	North Airport Access Road Feasibility Study	Complete an in-depth feasibility study to analyze the constraints and benefits of a new northerly airport access road, in conjunction with a new interchange to I-15 near 13th Avenue Southwest.	**Not Completed**, not included herein for further consideration

9.2.1.1. Committed SR Improvements

The definition of a committed project is one that has been approved by the PCC. It also has committed funding available. Note that known pavement preservation activities are included in this list, even though they are typically addressed through a general "Pavement Preservation" category in the Transportation Improvement Program, and are typically not described as specific projects. Future projects will likely be included similarly – either as specific projects or as part of the overall "Pavement Preservation Category", as well as covered under "Operation and Maintenance" categories and funding types.

CSR-1. 13th Street South (29th Avenue South to Lower River Road)

Asphalt overlay and chip seal 13th Street South for approximately 2.75 miles. The segment of 13th Street South is in poor condition with varying levels of deterioration.

- **Estimated Cost:** $700,000
- **Funding Source:** COUNTY

CSR-2. Flood Road (Delea Drive to Woodland Estates Road)

Asphalt overlay Flood Road between Delea Drive and Dick Road (1.3 miles), and chip seal between Delea Drive and Woodland Estates Road (2.4 miles).

- **Estimated Cost:** $530,000
- **Funding Source:** COUNTY

CSR-3. MACI Traffic Flow Improvements - 10th Avenue South Signals (UPN 8036-4)
Signal timing & controller upgrades along 10th Avenue South.

- **Estimated Cost:** $140,900
- **Funding Source:** CMAQ

CSR-4. MACI Traffic Flow Improvements – 3rd Street NW Signals (UPN 8036-5)
Signal timing & controller upgrades along 3rd Street NW, from NW Bypass to 10th Street NE.

- **Estimated Cost:** $101,000
- **Funding Source:** CMAQ

CSR-5. GTFLS Signal Borders (UPN 7981)
Install retroreflective borders on mainline signals on 10th Avenue South.

- **Estimated Cost:** $88,900
- **Funding Source:** HSIP

CSR-6. GTFLS Wrong Way Signage – Phase 1 (UPN 8002)
Install wrong way signage at numerous locations on I-15.

- **Estimated Cost:** $436,277
- **Funding Source:** HSIP

CSR-7. GTFLS Horizontal Curve Signing (UPN 7980)
Install upgraded signing at numerous locations.

- **Estimated Cost:** $998,929
- **Funding Source:** HSIP

CSR-8. GTFLS Advanced Signal Flasher (UPN 8119)
Install advanced signal flasher.

- **Estimated Cost:** $143,516
- **Funding Source:** STPU

CSR-9. GTFLS Urban Maintenance Program (UPN 7994)
Perform chip seals, overlays and related maintenance activities on urban routes (year 2014).

- **Estimated Cost:** $155,800
- **Funding Source:** STPU

TOTAL COMMITTED SR PROJECTS = $3,295,322

9.2.1.2. Recommended SR Improvements

During the preparation of this Plan, a number of additional SR projects were identified. The following SR projects are not in any particular order with respect to priority:

SR-1. Signal Warrant Analysis
A number of intersections should be periodically checked for signal warrants as development and projects occur around the community. These intersections include: the north and west sides of the airport interchange; the intersection of Central Avenue West and Vaughn Road; Fox Farm Road and Park

Garden Road; Fox Farm Road and 18th Avenue SW; 3rd Avenue South and River Drive; 6th Street SW and 4th Avenue SW; 38th Street and Central Avenue; and other locations as the need may arise.

- **Estimated Cost:** $190,000
- **Possible Funding Source:** MACI

SR-2. Signal Modifications/Upgrades/Roundabout Control

It is recommended that the community work towards upgrading all traffic signal heads in the City as appropriate. Upgrades would include but not be limited to signal heads, pedestrian push buttons, pedestrian heads, LED upgrades, battery backup systems, etc. The size and location to be upgraded will vary and not necessarily be of a consistent type, but rather should consider the surrounding area and be sensitive to the context for which it will be used. Some locations may require a full intersection upgrade. In primarily industrial and/or commercial areas, a standard signal head, consistent with MDT standards, are appropriate. Roundabouts are also a form of intersection control that should be explored at some intersections, coincident to traffic signal evaluation.

- **Estimated Cost:** $240,000
- **Possible Funding Source:** NHPP, STPU, MACI

SR-3. 10th Avenue South and 32nd Street South

It is recommended that the 32nd Street South legs of this intersection be reconfigured to align better along a slight skew. Presently, the PM Peak hour at this intersection experiences a poor level of service due to excessive delay experienced for the minor approaches (32nd Street South). These legs are split phased, and by aligning the two legs (i.e. north and south leg) the phasing of the signal can be put on the same phase. This would in effect provide more time for vehicles to get through this intersection and improve the level of service. The pavement on the south leg should be examined for replacement also as it affects the speed of traffic exiting this leg.

- **Estimated Cost:** $170,000
- **Possible Funding Source:** MACI, HSIP, NHPP

SR-4. Central Avenue West - from 3rd Street NW to 1st Avenue North (at River Drive), including the 1st Avenue North bridge and approaches

It is recommended that this corridor and corresponding intersections undergo re-striping and intersection modifications. Possible improvements are listed below, however a detailed engineering analysis, with feasible recommendations, should be completed prior to any improvements being implemented. Potential improvements include the following:

Bridge Structure: The existing bridge is currently striped as a four-lane facility with very wide travel lanes. The bridge is sufficient in width to re-stripe to add two more lanes – making the facility a six-lane roadway. It is recommended that this be completed to accommodate the recommendations below at the adjoining intersections.

Central Avenue West / 3rd Street NW: This intersection will require some re-configuration on the south leg to improve level of service and operations. It is recommended that the south leg be re-striped to allow for a left turn lane, a combination through and right turn lane, and an exclusive right turn lane.

1st Avenue North / River Drive: This intersection will require modification on the north leg (i.e. River Drive). On the southbound leg, it is desirable to widen to the west slightly and provide for an exclusive right turn lane, a shared right turn / through lane, and an exclusive left turn lane.

1st Avenue North (between River Drive and Park Drive): Re-stripe this segment of roadway to a six-lane principal arterial standard. The available width on the north side of the median is 35 feet. On the south side of the median, there is 33 feet (which is striped as 3 lanes at 11 feet each). The north side of the median should be re-striped at 12 feet, 11 feet, and 12 feet. This measure would improve traffic flow characteristics during the PM peak for vehicles using the intersection of 1st Avenue North / Park Drive.

Park Drive (between 2nd Avenue North and 1st Avenue North): Re-stripe this segment of roadway to provide for a two lane roadway on Park Drive, south of 2nd Avenue North. Also provide a right turn only lane and a combined thru lane / right turn lane on the north leg of the intersection of 1st Avenue North and Park Drive. A designated left turn lane will also be required on the north leg, with applicable geometric modifications to the south leg to line up the respective turning movements. Consider a modern roundabout at the intersection of 2nd Avenue North and Park Drive.

- **Estimated Cost:** $770,000
- **Possible Funding Source:** STPU

SR-5: County Projects

This short-range (SR) project includes two projects within the County that are lumped together due to their proximity. Funding for completion of these projects rests with Cascade County solely. These projects are as follows:

26th Street South (between 24th Avenue South and 33rd Avenue South): This roadway exhibits rural roadway characteristics and has an extremely abrupt shoulder edge in many spots along this corridor. At a minimum, it is recommended to rebuild the shoulders in spot areas to flatten the fill slopes to benefit roadway safety and potential "run-off-the-road" vehicles. This short range project primarily relates to the east side of the roadway.

- **Estimated Cost:** $275,000
- **Possible Funding Source:** COUNTY

26th Street South and 33rd Avenue South: This intersection exhibits poor sight distance and modifications to all four legs should be made. Stop control of this intersection should be installed on the north and south leg (i.e. 26th Street South). The four legs should be modified to gain a suitable approach grade to the intersection.

- **Estimated Cost:** $150,000
- **Possible Funding Source:** COUNTY

SR-6: City Pavement Preservation Activities

A range of pavement preservation activities to include mill, overlay, seal and cover (S&C), chip seal (CS) and striping will be necessary over the planning horizon in some locations on various urban roadways. These roadways are listed in priority, as determined by Great Falls Public Works, as follows*:

1.	8th Ave N – 6th to 38th St N	Mill, overlay, S&C, Striping	$1,080,732
2.	38th St N – 6th Ave N to River Dr	Mill, overlay, S&C, Striping	$220,151
3.	26th St N - Central Ave to 8th Ave N	Mill, overlay, S&C, Striping	$242,908
4.	25th St N - Central Ave to River Dr N	Mill, overlay, S&C, Striping	$333,212
5.	6th St S - Central Ave to 10th Ave S	Mill, overlay, S&C, Striping	$360,574
6.	Smelter Ave - Division Rd to 6th St NW	Mill, overlay, S&C, Striping	$343,825
7.	13th St S – 24th Ave S to 30th Ave S	Mill, overlay, S&C, Striping	$179,061

8. Lower River Rd - Overlook Dr south to City limits	Mill, overlay, S&C, Striping	$480,205
9. Central Ave W – 20th St SW to 27th St SW	Mill, overlay, S&C, Striping	$277,962
10. Watson Coulee Rd - Vaughn Rd to NW Bypass	Mill, overlay, S&C, Striping	$90,990
11. Sun River Rd – 14th St SW west to City limits	Mill, overlay, S&C, Striping	$314,659
12. 1st Ave S – 11th St to 14th St S	Mill, overlay, S&C, Striping	$83,838
13. 2nd Ave S – 9th St to 15th St S	Mill, overlay, S&C, Striping	$195,093
14. Central Ave W – 27th St SW to 30th St SW	S&C, Striping	$15,568
15. Giant Springs Rd - River Dr to City Limits	CS & S&C, Striping	$75,798
16. Park Garden Rd - Fox Farm Rd to Flood Rd	CS & S&C, Striping	$29,028
17. Airport Road	CS & S&C, Striping	$48,053

- **Estimated Cost:** $4,371,657
- **Possible Funding Source:** STPU, UPP, CITY

**Note: Portions of this project may be buildable in shorter timeframes. Pavement Preservation actions would not be necessary if subject roadways were part of a reconstruction project identified as MSN Projects. Also, most pavement preservation and minor improvement projects are not typically included in Transportation Plans, and are covered through general "Maintenance and Operations" and "Pavement Preservation" categories in the TIP and other project planning and scheduling documents.*

SR-7. Central Avenue and 9th Street

Modify the west leg of this intersection (i.e. Central Avenue) by lengthening the existing left-turn bay to provide more storage for eastbound left-turns onto 9th Street North. This will also improve thru-movements on the leg by eliminating the blockage caused by the lack of storage on the existing left-turn bay. This recommendation would require the removal of the angled parking on the north side of Central Avenue, directly west of 9th Street. Parallel parking could remain, however.

- **Estimated Cost:** $15,000
- **Possible Funding Source:** STPU

SR-8. 25th Street South (10th Avenue South to 11th Avenue South)

Modify this one-block segment of 25th Street South to one-way in the southbound direction. The benefit of this is that traffic will be removed from the congested turning movements on 10th Avenue South, between 25th and 26th Streets. By modifying the one-block segment, the lane use on 25th Street South, just north of 10th Avenue South, can be modified to a southbound right-turn lane, a combination thru/left-turn lane, and a designated left turn lane. This will likely remove pressure on the eastbound right-turning movement at 10th Avenue South / 26th Street South, and free up more signal time for northbound traffic on 26th Street South. Before proceeding with this project as envisioned, a detailed traffic engineering study will be necessary to document operational benefits, costs, and other potential impacts.

- **Estimated Cost:** $20,000
- **Possible Funding Source:** STPU, MACI

SR-9. 25th Avenue NE, between Old Havre Highway and 15th Street North

Based on a recent MDT Traffic Control Study, it is recommended to make several improvements along 25th Avenue NE to improve safety and operational characteristics. The corridor is currently a five-lane typical section. The improvements recommended include, but are not limited to:

- Updating all crosswalk yield lines to "sawtooth" design
- Moving stop bars on the 25th Avenue NE approaches closer to the edge of the north/south traveled way

- Installing "Cross Traffic Does Not Stop" plaque on stop signs
- Restriping the 25th Avenue NE corridor as a 3-lane roadway with shared-use paths to provide a consistent typical section between Old Havre Highway and 15th Street
- Narrow down 25th Avenue NE approaches to match 3-lane corridor width

  - **Estimated Cost:** $300,000
  - **Possible Funding Source:** UPP

SR-10. Future Local Street Network

As previously noted, the Great Falls area has a Major Street Network that is comprised of collector, minor arterial, principal arterial, and interstate roadways. Potential changes to the Major Street Network are proposed later in the LRTP in section 11.7. This proposed, future Major Street Network focuses only on those roadway classified as collectors or above. During the LRTP development it was expressed that an evaluation and potential mapping of a future Local Street Network may be desirable to assist in identifying future local roads to accommodate development and connectivity needs. Development of such a network would be initiated and developed by City staff, and would complement area planning documents.

- **Estimated Cost:** $0 (Labor)
- **Possible Funding Source:** CITY

SR-11. MDT-nominated HSIP Safety Projects

MDT evaluates safety trends and concerns on an annual basis. HSIP funds are apportioned to Montana for allocation to safety improvement projects that correct or improve a hazardous road location or feature, or address a highway safety problem. In the Great Falls planning area, MDT identifies potential HSIP projects and programs said projects on an as-needed basis. SR-11 is intended to reflect this MDT-led activity and relies on historical expenditures for this effort as a basis for future expenditures over a five-year period.

- **Estimated Cost:** $1,250,000 ($250,000 per year over 5 years)
- **Possible Funding Source:** HSIP

SR-12. MDT-nominated Pavement Preservation Projects

MDT performs a wide range of pavement preservation activities on MDT routes to include mill, overlay, seal and cover (S&C), chip seal (CS) and striping. Programming of these pavement preservation activities is dynamic and is included in MDTs normal work protocols. SR-12 is intended to reflect MDTs continued efforts to complete pavement preservation activities and relies on historical expenditures for this effort as a basis for future expenditures over a five-year period.

- **Estimated Cost:** $6,000,000 ($1.5 million per year over 5 years)
- **Possible Funding Source:** STP, NH, IM

TOTAL RECOMMENDED SR PROJECTS = $13,751,657

9.2.1.3. SR Improvements with No Identified Funding (Illustrative)

Even short range projects are often not fundable due to budget limitations. The following list of projects are relatively simple in development and execution, but of high enough cost that existing funding mechanisms are likely not capable of funding the improvement. Local transportation agencies and governments should seriously consider special funding such as local option taxes, bonding and rural or special improvement districts to fund improvements. However, because there is not a history of such funding options being used locally, this Plan cannot count on the use of such mechanisms. Therefore,

higher dollar "short range" projects are included here as necessary, but beyond the fiscal feasibility of the plan due to lack of likely funding sources. The projects listed below should be considered "illustrative projects" for the purposes of fiscal constraint of this Plan, and will be moved to development only when adequate funding sources are identified.

1. 40th Avenue South (from Upper River Road to 13th Street)

It is recommended that this piece of roadway be overlaid with new asphalt. This project was contained in the past transportation plan for Great Falls.

- **Estimated Cost:** $2,600,000

2. Franklin Avenue (from Lower River Road to 13th Street)

It is recommended that this piece of roadway be overlaid with new asphalt. This project was contained in the past transportation plan for Great Falls.

- **Estimated Cost:** $1,500,000

3. 55th Avenue South (from Lower River Road to 13th Street)

It is recommended that this piece of roadway be overlaid with new asphalt. This project was contained in the past transportation plan for Great Falls.

- **Estimated Cost:** $1,100,000

4. Fox Farm Road – Alder Drive to Park Garden Road

It is recommended to re-stripe this roadway to a four-lane facility to accommodate existing traffic volumes, as well as projected future traffic volumes. It is recommended to remove on-street parking within this stretch of roadway. A parking lot to serve the adjacent Meadowlark Elementary School and Montana Park should be built west of the road to mitigate loss of on-street parking.

- **Estimated Cost:** $720,000

5. Wilson Butte Road (from Eden Road to LRTP boundary)

It is recommended that poor sections on this piece of roadway be overlaid with new asphalt.

- **Estimated Cost:** $2,000,000

6. Upper River Road (from 19th Avenue South to 40th Avenue South)

It is recommended that poor sections on this piece of roadway be overlaid with new asphalt. This project was contained in the past transportation plan for Great Falls.

- **Estimated Cost:** $4,100,000

7. 33rd Avenue South and 13th Street South

This intersection exhibits poor sight distance and modifications to the intersection legs should be made. Specifically, intersection should be reconfigured to a conventional "T" intersection with stop control on the east leg (33rd Avenue South). In addition, a detailed sight distance study should be completed to examine improvements to the north leg of 13th Street South.

- **Estimated Cost:** $145,000

8. 36th Avenue NE Traffic Calming

Until future MSN project north of Great Falls can be completed to establish a grid street network in the newly developing areas, 36th Avenue NE will continue to encounter the effects of increasing traffic, higher travel speeds, and peak travel demands. Due to the width of the roadway and the aforementioned

concerns, traffic calming along the route should be implemented. The purpose of the traffic calming is to slow travel speeds by giving the appearance of "pinch-points", and to increase the visibility of pedestrians in the area. Curb bulb-outs placed at the major north-south routes that intersect with 36th Avenue NE should be considered, and an evaluation of stop sign control warrants should periodically be made. The likely candidates for curb bulb-outs on 36th Avenue NE include the following intersections: 2nd Street NE; 4th Street NE; 7th Street NE; and 9th Street NE.

- **Estimated Cost:** $100,000

9. 25th Avenue NE and 8th Street NE

Poor levels of service under existing and projected conditions suggest a four-way stop control be appropriate at this intersection to better meter traffic and provide gaps for the various traffic movements. Four-way stop control would also help pedestrian crossing activity in front of the middle school by allowing gaps for pedestrians to be created.

- **Estimated Cost:** $25,000

10. 11th Avenue South Traffic Calming

It is recommended to provide aggressive traffic calming on 11th Avenue South, between 26th Street South and 32nd Street South, to heighten pedestrian visibility and slow traffic down. Traffic calming may include a combination of curb bulb-outs and/or raised speed tables at the major intersections.

- **Estimated Cost:** $75,000

11. 11th Avenue South and 32nd Street South

Continue to monitor this intersection for 4-way stop control. It is presently stop-sign controlled on the south and north legs (i.e. 32nd Street South). With future connectivity improvements (i.e. the extension of 15th Avenue South to 32nd Street South) recommended later in the LRTP, the intersection may see an increase in volume on 32nd Street South that may meet 4-way stop control warrants.

- **Estimated Cost:** $10,000

12. Speed Studies

Several segments of roads may be ideal candidates for periodic speed studies. These include Central Avenue West (from 9th Street NW to 20th Street NW); 3rd Street SW / 4th Avenue SW (from Central Ave West to 6th Street SW); and 36th Avenue NE.

- **Estimated Cost:** $35,000

TOTAL ILLUSTRATIVE SR PROJECTS = $12,410,000

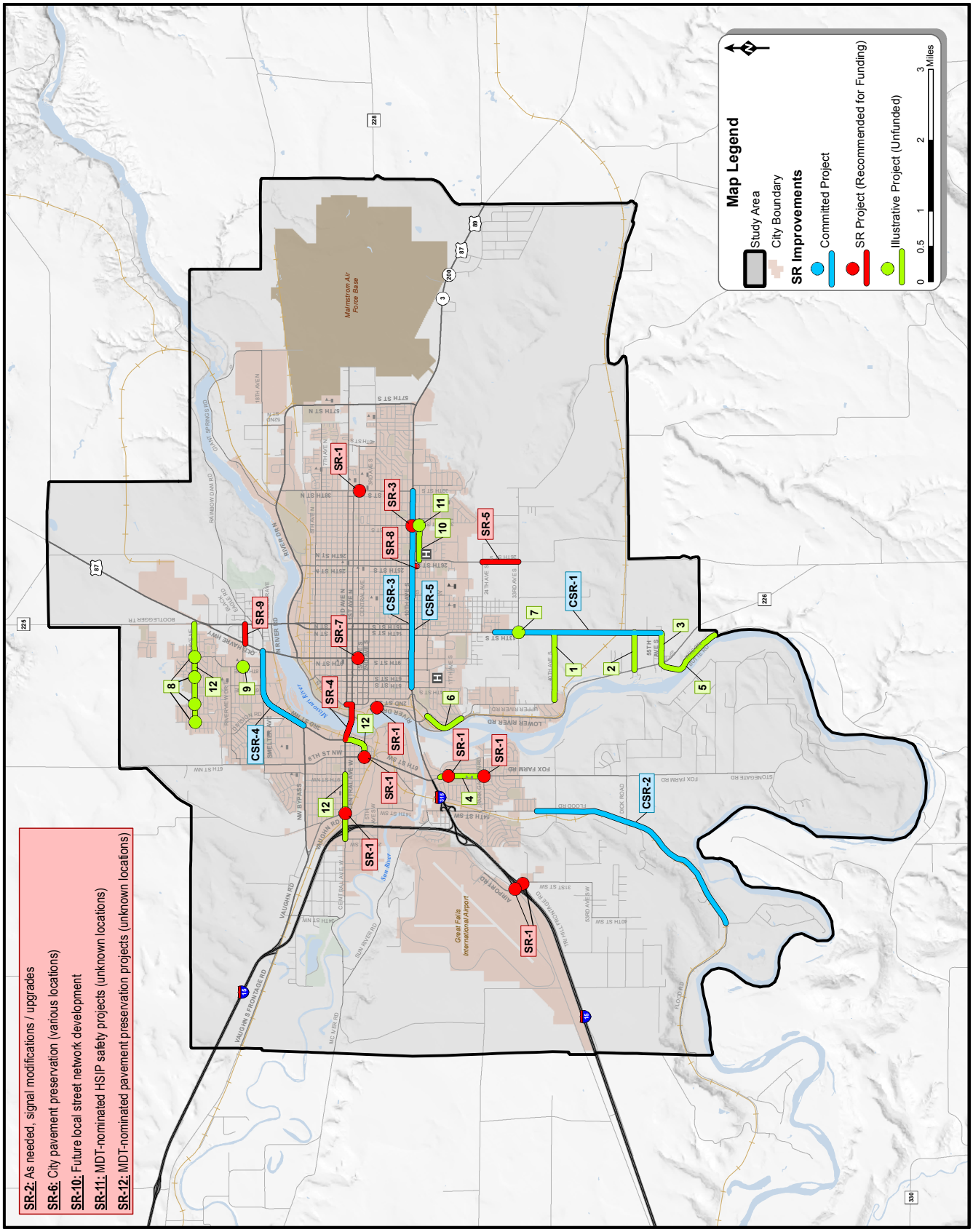


Figure 9.1: SR Improvement Options

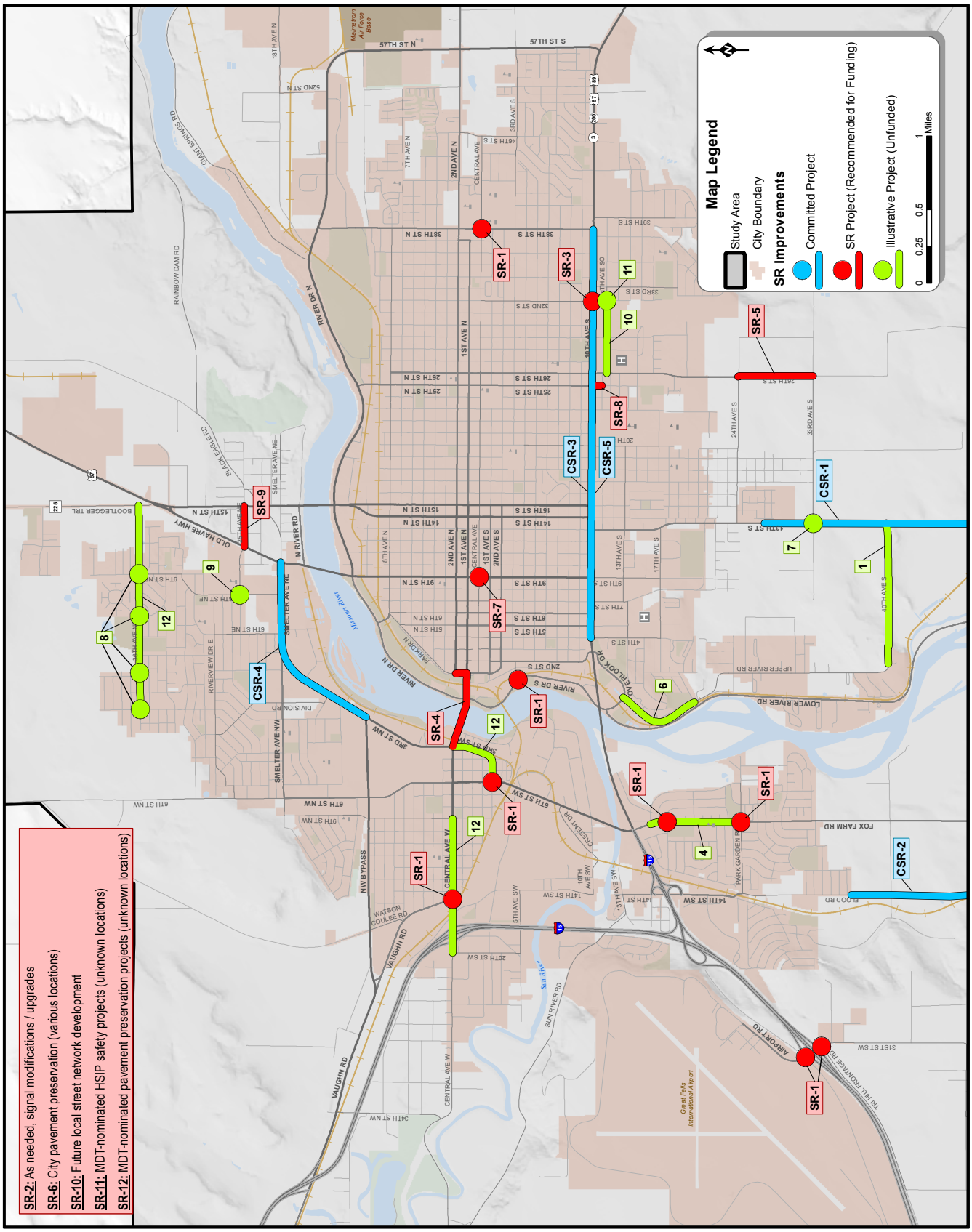


Figure 9.2: SR Improvement Options (Detail)

9.2.2. Major Street Network (MSN) Improvements

Major street network (MSN) improvement projects are larger, higher cost projects that are needed to meet the anticipated traffic demands of the year 2035. Cost estimates shown (see **Appendix C**) are based on year 2013 dollars. Although most of the project cost estimates are planning-level estimates, they are in anticipated year-of-expenditure dollars (using a yearly inflation factor of 3%) and include all project phases. The estimates are conservative estimates; that is, they are considered to be high and to include the most complete facility desired. Any project considered for advancement should undergo a current cost estimate, which would include an examination of site conditions and subsequent development of more detailed project scope. Recommended funding programs are shown in parenthesis after the estimated project cost. Committed, recommended and illustrative MSN projects are depicted graphically in **Figure 9.3** and **Figure 9.4**.

Seven major street network (MSN) projects were identified as "committed" in the 2009 LRTP Update. An additional 6 MSN projects were "recommended for funding", and 16 "illustrative" MSN projects were identified. **Table 9.3** summarizes these 29 MSN projects, and presents the status of their implementation. For those that were not completed and may still be valid, they are incorporated into this LRTP update's MSN project listing.

Table 9.3: MSN Projects from 2009 LRTP Update & Status for 2014 Plan

	MSN Identifier	Location of Past MSN Project	Past Recommendation	Status for this LRTP Update
Committed	C-1	Smelter Avenue (10th Street NE to Golf Course Entrance)	Reconstruct to an urban collector street standard, including sidewalks and a re-alignment of the intersection with Wire Mill Road.	**Completed**
	C-2	10th Avenue South (20th Street South to 26th Street South)	Widen to a six-lane principal arterial standard, including sidewalks.	**Completed**
	C-3	Fox Farm Road	Install raised medians south of intersection with I-315/Country Club Boulevard.	**Completed**
	C-4	Smelter Avenue (Division Road to 3rd Street Northeast)	Reconstruct to a collector street standard, with bicycle/pedestrian facilities and an improved intersection at Division Road and Smelter Avenue (roundabout or signal).	**Completed**
	C-5	River Drive North (15th Street North to 38th Street North)	Perform a Feasibility Study to investigate alternative routes and/or improvement solutions for River Drive North (15th Street North to 38th Street North) for added capacity.	**Completed**
	C-6	Smelter Avenue & 10th Street NE	Reconfigure intersection.	**Completed**
	C-7	South Arterial Route Location Study / Environmental Impact Statement (EIS) / Design	Complete route locations study; prepare environmental document; initiate design activities.	**Partially Completed –** Route location study completed but not advanced
Recommended	MSN-1	38th Street North – 10th Avenue North to River Drive North	Reconstruct to collector street standard.	**Not Completed**, modified and included herein as **MSN Illustrative No. 1**

	MSN Identifier	Location of Past MSN Project	Past Recommendation	Status for this LRTP Update
	MSN-2	9th Street Northwest (from the Northwest Bypass to Central Avenue West)	Reconstruct to a collector street standard.	**Not Completed**, modified and included herein as **MSN Illustrative No. 2**
	MSN-3	Watson Coulee Road (between the Northwest Bypass and Vaughn Road)	Reconstruct to a collector street standard.	**Not Completed**, modified and included herein as **MSN Illustrative No. 5**
	MSN-4	Park Drive – 8th Avenue North to 2nd Avenue North	Reconstruct to a collector street standard, with particular focus on the intersection of Park Drive/6th Street North/8th Avenue North.	**Not Completed**, modified and included herein as **MSN Illustrative No. 7**
	MSN-5	25th Street North – River Drive to 8th Avenue North	Reconstruct to a minor arterial street standard.	**Not Completed**, modified and included herein as **MSN Illustrative No. 20**
	MSN-6	Fox Farm Road - East Fiesta to Urban Boundary	Reconstruct to minor arterial standard.	**Not Completed**, modified and included herein as **MSN Committed C-5**
Illustrative	1	River Drive North – 15th Street North to 38th Street North	Reconstruct after a detailed corridor study that investigates potential alternate routes for River Drive North (15th Street North to 38th Street North). If alternate routes are not feasible, reconstruct along existing alignment to a minimum three-lane principal arterial standard.	**Not Completed**, modified and included herein as **MSN-1**
Illustrative	2	Central Avenue West – 9th Street Northwest to Vaughn Road	Reconstruct to a principal arterial street standard.	**Not Completed**, not included herein for further consideration
Illustrative	3	Flood Road – Park Garden Road to Urban Boundary	Reconstruct to a collector street standard.	**Not Completed**, modified and included herein as **MSN Illustrative No. 3**
Illustrative	4	6th Street Northwest – Smelter Avenue to 36th Avenue Northeast	Reconstruct to a collector street standard with urban roadway features (such as curb & gutter, lighting, sidewalks, etc.). Consider extension north of Skyline Drive to 36th Avenue Northeast to accommodate development.	**Not Completed**, modified and included herein as **MSN Illustrative No. 4**
Illustrative	5	Gore Hill Interchange – Interstate 15	Reconstruct the interchange to accommodate future increases in traffic resulting from airport expansions. Re-align the frontage road on the airport side of the intersection to create more separation between the off ramp and the intersection of the Frontage Road.	**Not Completed**, modified and included herein as **MSN Illustrative No. 29**

MSN Identifier	Location of Past MSN Project	Past Recommendation	Status for this LRTP Update
6	River Drive – 3rd Avenue South to 1st Avenue North	Reconstruct to minor arterial standards, along with a railroad underpass, in conjunction with intersection improvements recommended for the intersection of 1st Avenue North and River Drive. Perform signal warrant analysis at the intersection of River Drive and 3rd Avenue South periodically as development infill occurs. Close access to the Broadwater Bay Park, across from the Applebee's restaurant, to improve traffic flow in the area.	**Not Completed**, modified and included herein as **MSN Illustrative No. 6**
7	Emerson Junction (i.e. interchange at I-15 and Vaughn Road)	Construct a full access interchange to assist in getting vehicles from northwest and northeast Great Falls onto I-15.	**Not Completed**, modified and included herein as **MSN Illustrative No.28**
8	Central Avenue West – 20th Street Northwest to 29th Street Northwest	Reconstruct to collector street standards.	**Not Completed**, modified and included herein as **MSN Illustrative No. 8**
9	Vaughn Road – I-15 to Central Avenue West	Reconstruct to a minor arterial standard.	**Not Completed**, not included herein as a stand-alone project, but combined with **MSN Illustrative No.28**
10	North Airport Access Road	Construct a new access road, connecting the northerly boundary of the Great Falls International Airport to I-15, in the vicinity of 13th Avenue Southwest (Sun River Road). The project should only be implemented after the results of a feasibility study are known.	**Not Completed**, not included herein for further consideration
11	South Arterial Facility	Construct a minimum two-lane roadway facility (ultimately a four-lane facility) between I-15 and 57th Street South. Identify an alignment through a full environmental process.	**Not Completed**, not included herein for further consideration
12	67th Street North - end of pavement on east end of Giant Springs Road to intersection of 18th	Reconstruct a portion of 67th Street North to a paved roadway, to match Giant Springs Road to the west. Rural, local roadway section is applicable for this roadway.	**Not Completed**, modified and included herein as **MSN Illustrative No. 10**
13	Sun River Road - urban boundary to 14th Street Southwest	Overlay with new asphalt, and also reconstruct as needed in poor sections. Widen several narrow sections along this corridor.	**Not Completed**, modified and included herein as **MSN Illustrative No. 11**

	MSN Identifier	Location of Past MSN Project	Past Recommendation	Status for this LRTP Update
	14	Upper River Road – Overlook Drive to 19th Avenue South	Reconstruct to a collector street standard.	**Not Completed**, modified and included herein as **MSN Illustrative No. 12**
	15	17th Avenue South – 7th Street to 13th Street	Reconstruct to collector street standards.	**Not Completed**, modified and included herein as **MSN Illustrative No. 13**
	16	Giant Springs Road - Hatchery to Rainbow Dam	Overlay with new asphalt and widen as needed in existing narrow sections.	**Not Completed**, modified and included herein as **MSN Illustrative No. 14**

9.2.2.1. Committed MSN Improvement Projects

A committed major street network (MSN) improvement project is defined as any transportation project that has an identified funding source, and has been approved and committed to by the Great Falls Policy Coordinating Committee (PCC). A brief description of each of these committed projects is presented below. The committed projects are not listed in any particular order. These committed projects will be implemented as soon as practical.

Projects listed below are currently included in the five-year capital improvement program (CIP) and transportation improvement program (TIP).

C-1: South Central Urban Area Arterial Improvement Project (UPN 4566)

Reconstruct three segments of roadway to two-lane collector street standards, with additional capacity, at the following locations: 24th Avenue South between 13th Street South and 26th Street South; 13th Street South between 21st Avenue South and 27th Avenue South; and 26th Street South between 18th Avenue South and 24th Avenue South.

- **Estimated Cost:** $6,182,687
- **Funding Source:** CMAQ ($2,600,000); MT EARMARK ($3,582,687)

C-2: North Bootlegger Trail – 2KM North of Great Falls North (UPN 4826)

Reconstruct North Bootlegger Trail from the intersection with US 87 to the urban boundary. Between US 87 and the entrance to the Eagle Crossing subdivision the contemplated project is reconstruction to a three-lane typical section. North of the entrance to the Eagle Crossing subdivision the project will rehabilitate the existing surfacing.

- **Estimated Cost:** $8,974,400
- **Funding Source:** STPS ($8,479,553); STPU ($34,874); CMAQ ($460,000)

C-3: Great Falls – North (UPN 7625)
Reconstruct and widen, with passing and turn lanes, for approximately 6.67 miles. The project begins approximately 500 feet south of the malting plant approach road, and travels north past the landfill.

- **Estimated Cost:** $16,243,683
- **Funding Source:** NH

C-4: Emerson Junction – Manchester (UPN 7621)
Major rehabilitation for 3.875 miles

- **Estimated Cost:** $9,918,462
- **Funding Source:** IM

C-5: Fox Farm Road – East Fiesta to Dick Road (UPN 8193)
Reconstruct to minor arterial standard.

- **Estimated Cost:** $8,200,000
- **Funding Source:** STPU

C-6: District 3 Fencing - Great Falls North & South (UPN 7958)
Install fencing at numerous locations within MDT's Great Falls District.

- **Estimated Cost:** $927,225
- **Funding Source:** IM

C-7: Bridge Preservation – Great Falls 2014 (UPN 8085)
Perform bridge maintenance and preservation at numerous locations within MDT's Great Falls District.

- **Estimated Cost:** $7,600,441
- **Funding Source:** STPB

TOTAL COMMITTED MSN PROJECTS = $58,046,898

9.2.2.2. Recommended MSN Improvement Projects

MSN-1. River Drive North – 15th Street North to 38th Street North
Problem: Limited capacity (both currently and in future years); poor condition; lack of non-motorized crossing opportunities.

Recommendation: The existing two-lane facility will be inadequate to handle future traffic volumes. An expansion of the existing facility will be needed by the year 2035, and probably sooner given current travel characteristics exhibited during peak travel hours. Due to a high level of public interest in this corridor and its close proximity to the Missouri River and River's Edge Trail, it is recommended that a detailed corridor study and environmental assessment be undertaken prior to any design or construction which would consider reconstruction scenarios for River Drive North (15th Street North to 38th Street North). Although a student-led study (from MDT Master's degree candidates) has been completed, a pre-NEPA/MEPA corridor planning study should be entertained before proceeding with any project(s), which would then help inform the level of environmental documentation required.

The reconstruction of the facility along its existing alignment should be to a minimum three-lane principal arterial standard. It is recommended that any roadway widening be to the south and away from the river. The entire reconstruction of the facility could be constructed in two phases. Phase 1 could include the

segment between 15th St N and 25th St N, while phase 2 could occur later in the planning horizon and include the segment between 25th St N and 38th St N. Coincident to project development activities, an assessment to the viability of non-motorized amenities should be made as public sentiment and stakeholder feedback has identified this route as an important gap in the visionary bicycle network for the community.

- **Estimated Cost:** $19,300,000
- **Potential Funding Source:** NHPP, HSIP

MSN-2. US 87 – Old Havre Highway / 33rd Avenue NE to Bootlegger Trail

Problem: Poor intersection alignment, crashes, increasing traffic

Recommendation: Reconstruct the area between Old Havre Highway / 33rd Avenue NE and Bootlegger Trail. A detailed traffic engineering analysis should be completed before implementing any improvements. The following measures should be explored to mitigate existing and future traffic concerns:

Intersection of Old Havre Highway / 33rd Avenue NE and 15th Street NE: Reconfigure by eliminating the skew of Old Havre Highway to line up directly opposite the 33rd Avenue NE leg. The reconfigured intersection would have a combined LT/TH/RT-turn lane on the 33rd Avenue NE leg, a combined LT/TH and a separate channelized RT on the Old Havre Highway leg, and two thru lanes with left-turn bays on both legs of 15th Street NE. Also, a SB right-turn "slip-lane" would be created via an additional third lane between Bootlegger Trail and Old Havre Highway.

Southbound Lane: Add a third southbound lane between Bootlegger Trail and Old Havre Highway. This new third lane would allow a swift exit off of Bootlegger Trail in a southerly direction to a new slip lane at Old Havre Highway.

Intersection of Bootlegger Trail and US 87: Reconfigure by creating a raised channelization island to separate SB right-turns off Bootlegger Trail from NB left turns.

- **Estimated Cost:** $5,000,000
- **Potential Funding Source:** NHPP, HSIP

MSN-3. Reconstruct 36th Avenue NE (9th Street NE to Bootlegger Trail)

Problem: Poor east – west continuity, increasing traffic

Recommendation: The section of 36th Avenue NE, between 9th Street NE and Bootlegger Trail, is realizing increasing traffic and associated congestion. Until a future, long-term transportation grid can be established to the north in the vicinity of 44th Avenue NE, an interim project is to reconstruct the aforementioned section of road to an urban collector standard; that includes curb and gutter, sidewalks on both sides, and appropriate turn bays at the intersection with Bootlegger Trail. Four-way stop control or a traffic circle should be considered at the intersection of 36th Avenue NE and 9th Street NE.

- **Estimated Cost:** $4,100,000
- **Potential Funding Source:** STPU, HSIP, CITY

MSN-4. Interstate 15 (I-15) Corridor Study

Problem: Due to preliminary recommendations to make improvements to both the Emerson Junction and Gore Hill interchanges and other identified needs for added lanes and operational improvements on I-15 and I-315, an Interstate Corridor Study for the Great Falls area is recommended. The need for new interchanges, feasibility, and analysis of capacity and operational concerns, will assist in identifying potential locations, priorities, costs and scope for improvements. The study should include westbound

movements on 10th Avenue South, east of the intersection of Fox Farm Road and 6th Street SW, for traffic that exits at "Exit 0", as well as connections with I-315 to I-15.

Recommendation: Develop a pre-NEPA/MEPA Corridor Planning Study for the interstate in the Great Falls Urban Limits.

- **Estimated Cost:** $250,000
- **Potential Funding Source:** NHPP

TOTAL RECOMMENDED MSN PROJECTS = $28,650,000

9.2.2.3. MSN Improvements with No Identified Funding (Illustrative)

System deficiencies and needs are often not fundable in the foreseeable future. However, funding opportunities often arise during the course of time, often from unexpected sources. To be prepared to take advantage of such opportunities, the following list of projects is provided, with no identified funding source or schedule for construction/implementation. While the project costs have been estimated, most are presented in a 2035 year-of-expenditure, using a 3% yearly inflation rate to reach year-of-expenditure. Such projects are included in the Plan for illustration only, and are not considered to be applicable components of the fiscal constraint requirements of this Plan. However, it is likely that some of them will become funded at some point during the twenty year planning horizon even though no current source is known.

1. 38th Street North – 10th Avenue North to River Drive North

Problem: Narrow width and increased traffic, as well as truck traffic, suggests this segment would function better as an urban collector. It is the only segment on the 38th Street North collector corridor that is not an urban standard.

Recommendation: Reconstruct to collector street standard.

- **Estimated Cost:** $3,400,000

2. 9th Street Northwest (from the Northwest Bypass to Central Avenue West)

Problem: Aging infrastructure, narrow width, lack of consistent pedestrian facilities, increased traffic.

This roadway serves as an important north-south collector and is located in an urban setting. The roadway exhibits aging infrastructure. Concerns have been expressed from the public on the removal of on-street parking along the route, especially closer to NW Bypass.

Recommendation: Reconstruct to a collector street standard.

- **Estimated Cost:** $4,600,000

3. Flood Road – Park Garden Road to Dick Road

Problem: Limited capacity; narrow roadway facility; expected traffic increases.

Recommendation: Reconstruct to a collector street standard.

- **Estimated Cost:** $20,000,000

4. 6th Street Northwest – Smelter Avenue to 36th Avenue Northeast

Problem: Narrow roadway; poor sight distance; no shoulder.

Recommendation: Reconstruct to a collector street standard with urban roadway features (such as curb & gutter, lighting, sidewalks, etc.). Consider extension north of Skyline Drive to 36th Avenue Northeast to accommodate development in this area of the City.

- **Estimated Cost:** $8,600,000

5. Watson Coulee Road (between the Northwest Bypass and Vaughn Road)

Problem: Aging infrastructure, lack of pedestrian facilities, traffic mixture, termini geometrics.
This roadway generally has curb and gutter on both sides, but no sidewalks. The roadway surfacing is in varying states of deterioration. Reconstruction of this roadway to bring up to current standards would improve this north-south link on the western edge of the city limits.

Recommendation: Reconstruct to a collector street standard.

- **Estimated Cost:** $2,700,000

6. River Drive – 3rd Avenue South to 1st Avenue North

Problem: Narrow roadway with several curves; approaching capacity under existing conditions.

Recommendation: Reconstruct to minor arterial standards, along with a railroad underpass, in conjunction with intersection improvements at the intersection of 1st Avenue North and River Drive. Perform signal warrant analysis at the intersection of River Drive and 3rd Avenue South periodically as development infill occurs. This corridor is extremely important to the users of the River's Edge Trail and to connecting downtown with the riverfront and hotels on the riverfront with downtown. It is suggested that the access to the Broadwater Bay Park, across from the Applebee's Restaurant, be closed to improve traffic flow in the area. Also, access control along the corridor should be reviewed periodically, as more development occurs to the south of 3rd Avenue South.

- **Estimated Cost:** $11,400,000

7. Park Drive – 8th Avenue North to 2nd Avenue North

Problem: Narrow roadway with several curves. Pedestrian crossing concerns across Park Drive.

Recommendation: Reconstruct to collector street standards. Particular focus should be given to the intersection of Park Drive/6th Street North/8th Avenue North for a more standard intersection design that may better define the use in the intersection. In addition to the standard treatments, a modern "roundabout" should be evaluated at this location. Ample right-of-way appears to be available to accommodate a roundabout configuration. Potential pedestrian improvements should be included in the project, including additional marked crosswalks across Park Drive to connect the neighborhoods to Gibson Park. Although the overall project may not be a high priority given other Great Falls area needs, individual improvements could be contemplated and phased over time. Improvements for pedestrian access and to the 3-way intersection, as well as curb and gutter improvements, could be considered at lower costs.

- **Estimated Cost:** $6,000,000

8. Central Avenue West – 20th Street NW to 29th Street NW

Problem: Facility and community continuity.

Recommendation: Reconstruct to collector street standards.

- **Estimated Cost:** $7,000,000

9. Construct 21st Avenue South

Construct 21st Avenue South, between 23rd Street South and 26th Street South, to a two-lane collector street standard.

- **Estimated Cost:** $2,000,000

10. 67th Street North - end of pavement on east end of Giant Springs Road to intersection of 18th Avenue North

Problem: Poor condition, narrow roadway.

Recommendation: Reconstruct portion of 67th Street North to paved roadway to match Giant Springs Road to the west. Rural, local roadway section is applicable for this roadway.

- **Estimated Cost:** $7,900,000

11. Sun River Road - urban boundary to 14th Street SW

Problem: Poor condition, narrow roadway.

Recommendation: Overlay with new asphalt, and also reconstruct as needed in poor sections. There are also several narrow sections along this corridor that should be widened.

- **Estimated Cost:** $5,100,000

12. Upper River Road – Overlook Drive to 19th Avenue South

Problem: Facility and community continuity.

Recommendation: Reconstruct to a collector street standard.

- **Estimated Cost:** $6,000,000

13. 17th Avenue South – 7th Street South to 13th Street South

Problem: Limited capacity; facility and community continuity.

Recommendation: Reconstruct to collector street standards.

- **Estimated Cost:** $4,300,000

14. Giant Springs Road - Hatchery to Rainbow Dam

Problem: Poor condition, narrow roadway

Recommendation: Overlay with new asphalt and widen as needed in existing narrow sections.

- **Estimated Cost:** $3,000,000

15. Extend 36th Avenue NE (1st Street NE to 6th Street NW)

Problem: Poor east – west continuity, increasing traffic

Recommendation: Extend 36th Avenue NE from its present termini (~350 feet west of 1st Street NE) to the intersection with 6th Street NW. Completion of this segment will allow traffic to better distribute throughout the surrounding neighborhood. This link can only be accomplished with the help of willing landowners upon which the route would be considered. This segment should be built to a collector standard to match existing roadway geometrics.

- **Estimated Cost:** $4,000,000

16. Extend 15th Avenue South (30th Street South to 32nd Street South)

Problem: Lack of east-west connectivity

Recommendation: Extend 15th Avenue South from its current termini (near the theoretical extension of 30th Street South) eastward to connect to 14th Avenue South, at 32nd Street South. This segment should be built to a collector standard.

- **Estimated Cost:** $1,200,000

17. Construct 44th Avenue NE (west of Bootlegger Trail)

Problem: Lack of east-west connectivity

Recommendation: Construct a new roadway along the theoretical alignment of 44th Avenue NE, between Bootlegger Trail (eastern termini) and 6th Street NW (western termini). This route should be built to a minor arterial standard with limited access control, and can only be accomplished with the help of willing landowners upon which the route would be considered. This could occur during individual property development phases, or all at once. As development leap frogs to the north of Great Falls, a new east-west collector route will be necessary to distribute traffic from local, neighborhood roads to area arterials.

- **Estimated Cost:** $17,000,000

18. Construct 44th Avenue NE (between Bootlegger Trail and US 87)

Problem: Lack of east-west connectivity

Recommendation: Construct a new roadway segment along the theoretical alignment of 44th Avenue NE, between Bootlegger Trail (western termini) and US 87(eastern termini). This route should be built to a minor arterial standard with limited access control, and can only be accomplished with the help of willing landowners upon which the route would be considered.

- **Estimated Cost:** $2,650,000

19. North / South Connectors

Problem: Lack of future north-south collectors near 44th Avenue NE

Recommendation: Extend existing north-south routes from north of 36th Avenue NE to the new 44th Avenue NE to complete a gridded network of roads. Routes envisioned for future connections include the following: 2nd Street NE; 4th Street NE; 7th Street NE; and 9th Street NE.

- **Estimated Cost:** $8,800,000

20. 25th Street North – River Drive to 2nd Avenue North

Problem: Limited capacity; narrow roadway facility; lack of consistent pedestrian facilities.

Recommendation: Reconstruct to a minor arterial street standard. The roadway currently exhibits a mixture of urban and rural road characteristics – i.e. curb and gutter, sidewalk, lighting, etc. It is desirable to reconstruct the road to an urban minor arterial to accommodate increasing traffic, provide better non-

motorized facilities and connectivity, and plan for the varied uses in the area (Centene Park, Pasta Montana, General Mills, etc.). The project would require a new bridge crossing of the railroad (estimated size is 100 feet long by 80 feet wide; planning level cost is $150 per square foot). The intersection of 25th Street North and River Drive North should be reconstructed with consideration for either traffic signalization or a modern roundabout. Both treatments may be difficult due to the grade of River Drive North, to the west of 25th Street North.

- **Estimated Cost:** $10,800,000

21. 10th Avenue South (26th Street South to 32nd Street South)

Problem: Existing and future capacity concerns due to increasing traffic

Recommendation: Widen to a six-lane principal arterial standard, including sidewalks. Expansion to a six-lane facility will provide typical section continuity to match roadway sections in place west of 26th Street South.

- **Estimated Cost:** $11,500,000

22. Downtown Traffic Flow Conversion

Problem: Excess capacity, compromised non-motorized connectivity, desire for street beautification

Recommendation: Modify 1st and 2nd Avenues South, and 5th and 6th Streets, to maintain one-way traffic flow, but reduce typical section by one vehicle lane to accommodate new on-street bicycle facilities (see *Downtown Access, Circulation and Streetscape Plan - April 2013*). The existing 3-lane sections of 1st Avenue South, 2nd Avenue South, 5th Street and 6th Street in the downtown area provides traffic capacity in excess of that needed to adequately accommodate existing and forecast traffic volumes. Areas of modification are as follows:

- 1st Avenue South (between Park Drive and 10th Street South
- 2nd Avenue South (between Park Drive and 7th Street South
- 5th Street (North and South) between 2nd Avenue North and 6th Avenue South
- 6th Street (North and South) between 2nd Avenue North and 5th Avenue South

- **Estimated Cost:** $200,000

23. Extend 20th Street South (17th Avenue South to 24th Avenue South)

Problem: Poor north-south connectivity; future development needs

Recommendation: Extend 20th Street South from 17th Avenue South to 24th Avenue South. Build to a collector standard. This can only be accomplished with the help of willing landowners upon which the route would be considered. This extension would require the acquisition of a private parcel with several outbuildings in the vicinity of 18th Avenue South.

- **Estimated Cost:** $3,900,000

24. Extend 23th Street South (21st Avenue South to 24th Avenue South)

Problem: Poor north-south connectivity; future development needs

Recommendation: Extend 23th Street South from 21st Avenue South to 24th Avenue South. Build to a collector standard, and can only be accomplished with the help of willing landowners upon which the route would be considered.

- **Estimated Cost:** $1,630,00

25. Fox Farm Road – Dick Road to Fawn Drive

Problem: Narrow roadway, increasing traffic.

Recommendation: Reconstruct to minor arterial standard.

- **Estimated Cost:** $9,200,000

26. Wilson Butte Road/55th Avenue South/Eden Road/Lower River Road

It is recommended that this intersection be reconfigured with a modern roundabout to better define geometrics and control turning movements through the intersection.

- **Estimated Cost:** $330,000

27. 26th Street North – 8th Avenue North to 2nd Avenue North

Problem: Limited capacity; narrow roadway facility; lack of consistent pedestrian facilities.

Recommendation: Reconstruct to a minor arterial street standard. The roadway currently exhibits a mixture of urban and rural road characteristics – i.e. curb and gutter, sidewalk, lighting, etc. It is desirable to reconstruct the road to an urban minor arterial to accommodate increasing traffic, provide better non-motorized facilities and connectivity, and plan for the varied uses in the area.

- **Estimated Cost:** $6,400,000

28. Emerson Junction (i.e. interchange at I-15 and Vaughn Road)

Problem: Interchange is not full access.

Recommendation: Pending the conclusions of an *I-15 pre-NEPA/MEPA Corridor Study*, construct a full access interchange. The presence of a full movement interchange will assist in getting vehicles from northwest and northeast Great Falls onto I-15.

- **Estimated Cost:** $16,600,000

29. Vaughn Road – Interstate 15 to Central Avenue West

Problem: Limited capacity, narrow roadway, and high truck traffic.

Recommendation: Reconstruct Vaughn Road to a principal arterial street standard. Justification for the project includes limited future capacity, an existing narrow roadway facility, and the presence of heavy truck traffic. The project envisioned is approximately 2.24 miles in length. The influence of a potential “full movement” interchange (see #28 - Emerson Junction) may necessitate evaluating both projects (i.e. #28 and #29) in tandem to determine potential impacts and project limits.

- **Estimated Cost:** $15,100,000

30. Gore Hill Interchange – Interstate 15

Problem: Limited capacity in future years, given projected employment and population growth in the area surrounding the airport.

Recommendation: Pending the conclusions of an *I-15 pre-NEPA/MEPA Corridor Study*, reconstruct the interchange to accommodate future increases in traffic resulting from airport expansions. Without any improvements, the actual interchange overpass will operate at a “v/c ratio” greater than 1, indicating a future capacity problem. The bridge overpass is not wide enough to re-stripe, thus requiring a widening of the substructure and superstructure. This is a long-range need and is dependent on actual economic development at the airport. If economic development is realized as projected, this improvement will be

necessary by the year 2035. Additionally, the frontage road on the airport side of the intersection is too close to the interchange and should be realigned in the future to create more separation between the off ramp and the intersection of the Frontage Road.

- **Estimated Cost:** $12,000,000

TOTAL ILLUSTRATIVE MSN PROJECTS = $213,310,000

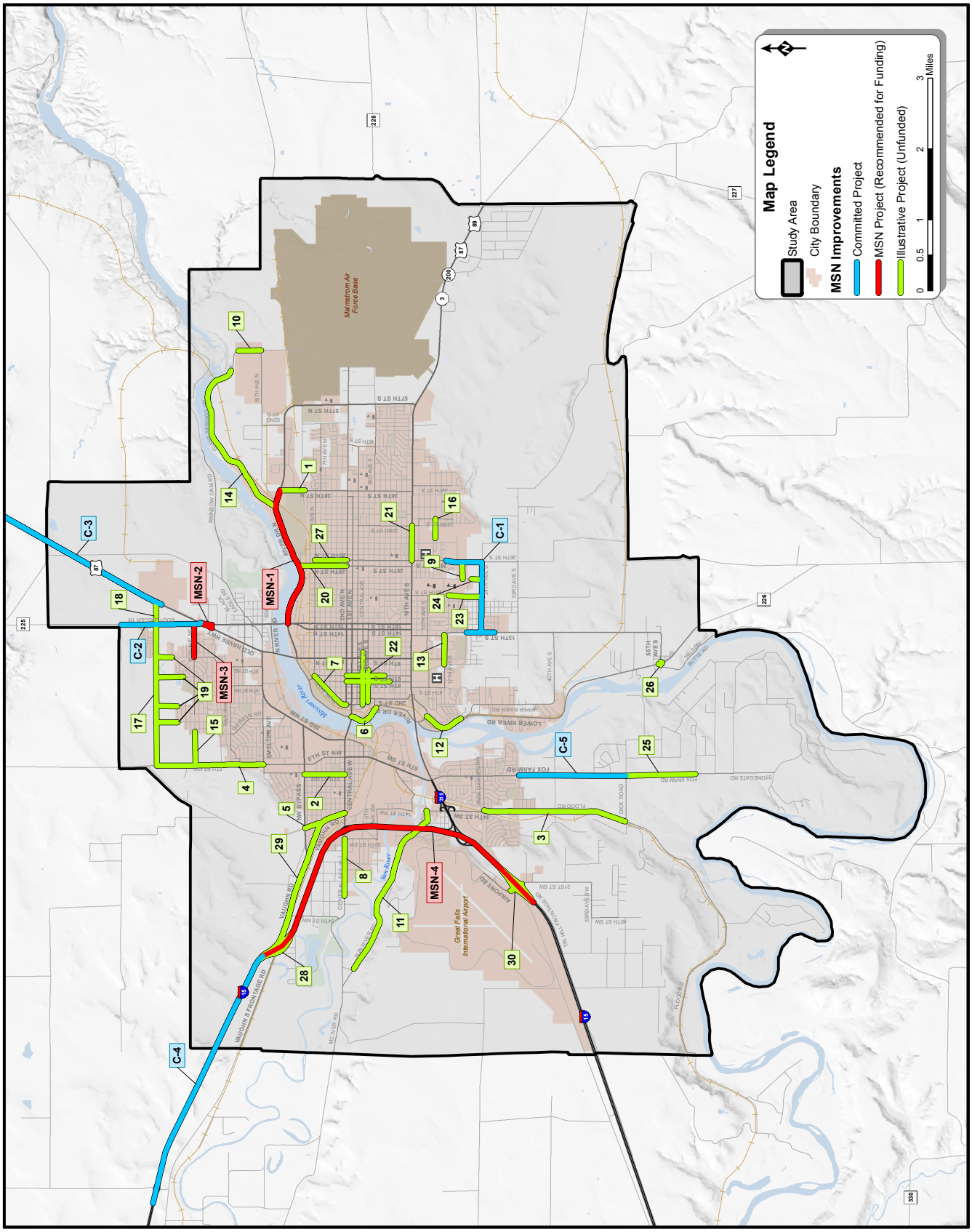


Figure 9.3: MSN Improvement Options

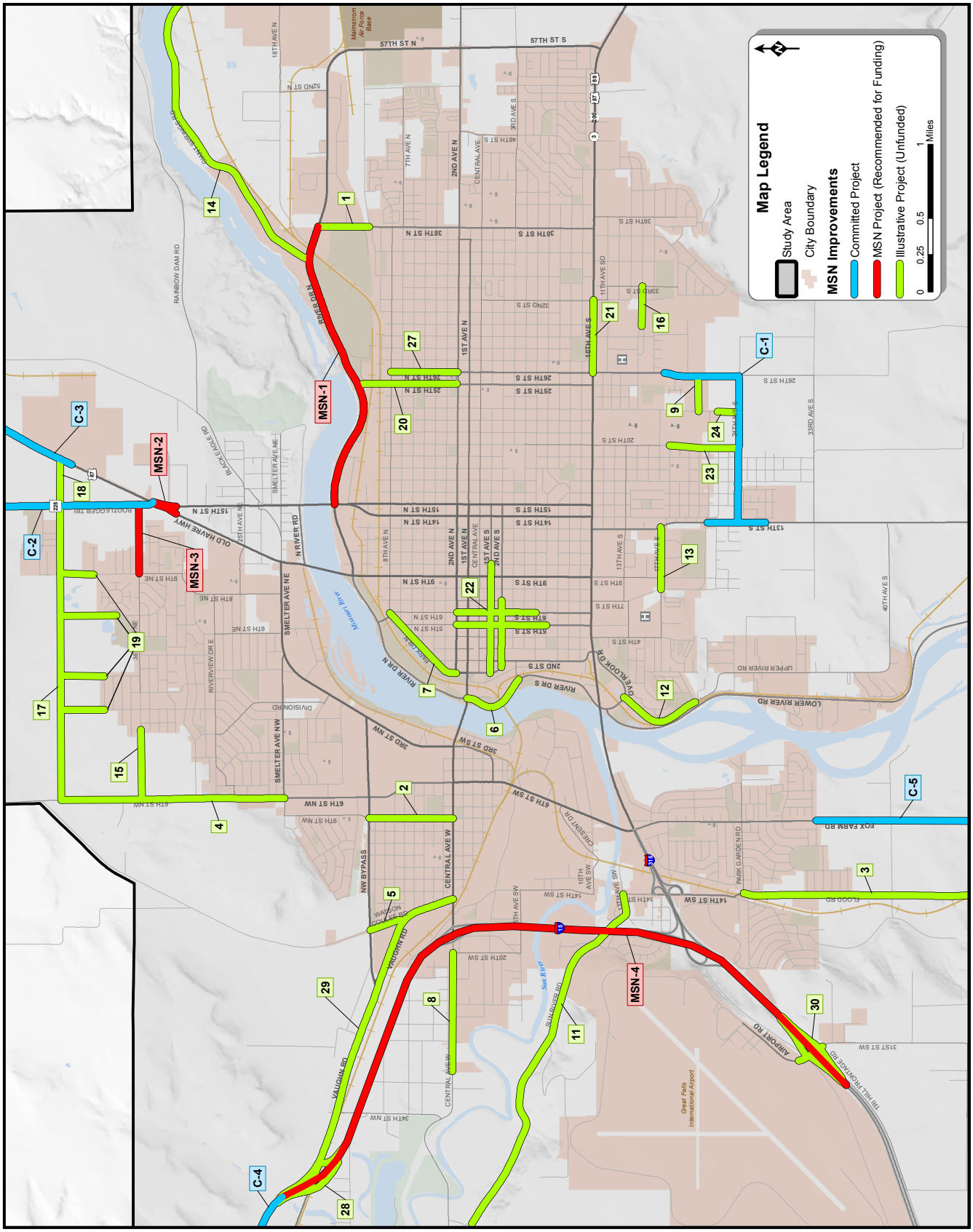


Figure 9.4: MSN Improvement Options (Detail)

9.3. NON-MOTORIZED NEEDS AND RECOMMENDATIONS

This section outlines priority issues and proposed recommendations for improving walking and bicycling in the Great Falls area based on analysis of deficiencies, crash data, public input (survey responses and open house comments), and overall opportunities and constraints in the Great Falls area. Planning level cost estimates for the various non-motorized improvements contained in Section 9.3 are included in **Appendix C**.

9.3.1. PROGRAMS

Great Falls Transportation Improvement Program FFY 2011-15

The Great Falls TIP includes review of projects related to walking and bicycling that have been completed since 2006 and which are planned for implementation during the Federal Fiscal Years (FFY) of 2011 to 2015. **Table 9.4** shows those projects that were completed, while **Table 9.5** shows projects that are planned. Note that the Sun River Trail project listed in **Table 9.5** is a "committed" project, indicating that funds have been programmed and allocated for implementation.

Table 9.4: Great Falls Area Transportation Improvement Program FFY 2011-15

Category	Project	FFY	Description	Funding Agency	Total Cost	Status
Pedestrian Only	Sidewalks - GTF	2006	Sidewalks on 3rd Street NW / Smelter Avenue /NW Bypass	State/Federal	$910,000	Complete
Pedestrian Only	City-wide Sidewalks	2009	Sidewalks (various locations)	State/Federal/ Local	$4,310,100	Complete
Bicycling and Pedestrian	38th St/8th Ave N/6th St SW	2009	Trail/Bike/Ped Improvements	State/Federal/ Local	$634,700	Complete
Bicycling and Pedestrian	Bay Drive Bike/Ped Path	2010	Bike/Ped Path	Federal/Local	$936,000	Complete
Pedestrian only	2001 Sidewalk Program	2011	Construction, additional	MACI, FHWA/CMAQ	$114,076	Complete
Pedestrian only	Sidewalks-GTF 1st Ave N & 2nd Ave N	2011	Construction	Other Highway Funds	$1,360,000	Complete
Bicycling and Pedestrian	2003 Bike/Ped Facility Improvements	2012	RW/IC/Construction-Release	MACI, FHWA/CMAQ	$91,809	Complete
Pedestrian only	Sidewalks-Fox Farms Park Garden	2012	Construction-Release	MACI, FHWA/CMAQ	$32,856	Complete
Pedestrian and Disability	ADA/Curb Ramps Program	2013	PE	MACI, FHWA/CMAQ	$221,546	Complete

TOTAL COST OF BICYCLING AND PEDESTRIAN PROJECTS SINCE 2006: $8,611,087

Table 9.5: Great Falls Area Transportation Improvement Program FFY 2011-15

Category	Project	FFY	Description	Funding	Total cost	Status
Pedestrian only	ADA/Curb Ramps Program I (**MDT**-1st AVE N-35th to 38th-$201,550; **MDT**-2nd Ave N 37th to 15th-$408,760; 9th St N-River Drive-$306,200) (**City**-25th St N, 26th St S, 8th Ave N, 38th St N, 6th St S & Park Drive)	2015	Install ramps at various locations	CMAQ	$2,047,389	Planned
Bicycling and pedestrian	Sun River Trail Connection[21]	2015	Bike/Ped facility adjoining Country Club Blvd (from Warden Bridge to Bike/Ped Facility at 6th St SW)	CMAQ	$2,061,080 (*Updated cost $2,717,156)*	Planned
Pedestrian only	Great Falls Sidewalk Infill Project	n/a	Sidewalks	CMAQ	$833,571	Planned
Pedestrian and disability	ADA/Curb Ramps Program (Local)	2014	RW/IC/Construction	MACI, FHWA/CMAQ	$1,824,141	Planned
Pedestrian only	Sidewalk Infill Project	2014	PE	MACI, FHWA/CMAQ	$168,000	Planned

TOTAL COST OF PLANNED BICYCLING AND WALKING PROJECTS: $7,590,257

9.3.2. Pedestrian Recommendations

Overview

All residents within the Great Falls area are pedestrians at some point in their day – whether walking the dog, walking to the store or work, or from a vehicle to a final destination. This section includes pedestrian needs, system deficiencies, needs of those with disabilities or limited mobility, observation and recommendation development methodology, and proposed recommendations for pedestrian facility improvements that were developed from the public involvement process and from field observations.

Even though the River's Edge Trail provides a high-quality backbone to the Great Falls non-motorized transportation system, it lacks frequent neighborhood connections and its location does not make the trail a viable option for most utilitarian walking trips. The trail is typically the destination for the majority of its

[21] *This is a "COMMITTED" project (UPN 6862). The programmed amount is actually $2,717,156 and is funding though CMAQ.*

users. This, in addition to sidewalk network gaps (in areas of the city) and the attitude and perception of motorists towards non-motorized modes (such a low yielding rates to pedestrians in crosswalks) pose additional challenges to increased rates of walking. Pedestrian network improvements are depicted graphically in **Figure 9.5** and **Figure 9.6**.

Pedestrian Needs

People walk for various reasons and needs vary, often depending on trip purpose. All pedestrians share some common needs including safety, connectivity, and accessibility (especially for persons with disabilities). Senior citizens and mobility-impaired pedestrians may lack motorized transportation options and may consequently depend on transit and pedestrian-focused aspects of the transportation network.

Sidewalk Gaps

Most of the established areas of Great Falls have a very cohesive and continuous sidewalk network. The majority of sidewalk gaps are concentrated in particular neighborhoods where facilities were not required during development or were initially developed in Cascade County and subsequently annexed.

It is recommended that some streets along the major street network within the Great Falls area (see **Table 9.6**) be improved for pedestrian use. These corridors have been identified by their existing pedestrian need or anticipated future need. Sidewalks gaps within neighborhoods should be addressed through the implementation of a sidewalk program. The City of Great Falls and MDT have made a considerable effort providing and upgrading sidewalks to be compliant with ADA in recent years. Various projects, most notably those funded with MACI, have eliminated many sidewalk gaps in recent years.

There are some locations in Great Falls where sidewalks end.

ADA Ramps

An (Americans with Disabilities Act) ADA-compliant ramp is an inclined ramp that allows access for those in wheelchairs, with other disabilities (including the elderly), and those pushing carts or strollers to transition gradually and safely between the sidewalk and the street. An ADA ramp also offers visual and tactile cues to users with visual impairments to detect the edge of the sidewalk and where the street begins. The City of Great Falls and MDT have made a considerable effort providing and upgrading curb ramps to be compliant with ADA in recent years.

The Great Falls Transit District ADA Advisory Committee has traditionally been to advise the Board of Trustees or Directors on issues regarding wheelchair access and accommodating and providing services for those with disabilities who use the transit system. In the past, their priority was an ADA ramp program. Over time and as more ADA ramps have been installed, the impetus of the committee has weakened.

Some streets don't have any sidewalks.

Needs of Pedestrians with Disabilities

To adequately plan for pedestrians with disabilities, each disability and its corresponding limitations should be considered. It is important to also be aware of how planning for people with one disability may affect users with other impairments.

People with mobility impairments range from those who use wheelchairs, crutches, canes, orthotics, prosthetic devices, and face constraints. Uneven or rough surfaces that hinder movement or narrow surfaces that make maneuvering and rolling difficult, and steep uphill, downhill, and cross slopes are common obstacles for disabled users. Walking-aid users are most affected by the above mentioned obstacles, as well as long distances between crossing opportunities and situations that require fast reaction time.

Visually-impaired people (those who are partially or full blind or deaf, those with limited perceptions of touch or balance, and those with color blindness) face difficulties with lack of depth perception, information about their surroundings, and non-visual information; the inability to react quickly; complex intersections; and detection of street crossing timing.

Hearing-impaired pedestrians rely on visual information. Their primary mobility difficulties include the inability to hear approaching vehicles and detect the time of their arrival. This is especially an issue in locations with limited sight distances, such as curved street segments, or overgrown vegetation impeding sight lines.

People with cognitive impairments encounter difficulties in thinking, learning, responding, and performing coordinated motor skills and these impairments can cause some to experience difficulty finding their way. They may also not understand standard street signage, and may be unable to read and benefit from signs with symbols and colors.

Each proposed facility should be designed in accordance with the Americans with Disabilities Act (ADA) design standards.

Children and the Elderly

Children are less mentally and physically developed than adults, and often have limited peripheral vision and less ability to judge speed and distance, locating sounds and comprehending street signs, they lack familiarity with traffic, and may act impulsively or unpredictably.

Older adults often exhibit degrading sensory or physical capabilities. This can lead to loss of vision and hearing, the ability to react quickly, and the strength to walk otherwise normal distances between places.

Similar to designing walking facilities for users with disabilities, similar consideration should be given to young and elderly users.

Improvement Recommendation Methodology

Pedestrian network improvements have been selected to close gaps in the network, make connections to and from major destinations, and improve overall comfort and sense of security for pedestrians.

Fieldwork included identifying conditions and needs in the following contexts:

- along major arterials,
- at intersections,
- in the downtown core,
- on and near bridges over the Missouri River,

- in neighborhoods in the urban core and on the fringe of the study area, and
- connections to the River's Edge Trail.

Map discussions of existing needs and proposed improvements were conducted at the public open house in June 2013. Additional information came from the public online survey and from meetings with local stakeholders. Improvements to the pedestrian network will occur over time along the major street network in the Great Falls Area as part of roadway improvement projects, signal upgrade projects and as standalone pedestrian focused projects. In residential areas improvements could occur as part of a coordinated sidewalk program (see recommendation) or as standalone publicly funded projects using sources like the Transportation Alternatives Program.

Recommended Facilities

The proposed pedestrian network for the Great Falls area consists of:

- Sidewalk improvement and completing network gaps,
- Crosswalk improvement and overall intersection improvement, including signals, and,
- Shared use path projects (shown in the Bicycling Network Recommended Facilities tables, **Table 9.13**).

Sidewalks

Completing the sidewalk network gaps on the major street network will allow more predictable trips for pedestrians and will improve the overall connectivity of the Great Falls area.

Table 9.6: Recommended Sidewalks

Name	From	To	Type	Length (miles)	Notes
4th St S	Between 13th Ave S & 12th Ave S	12th Ave S	Sidewalks	0.02	Gap closure
4th St S	Holiday Inn Parking Lot	Pro Lube	Sidewalks	0.02	Gap closure; could be completed with new development in the future.
25th St N	9th Ave N	Pasta Montana Parking Lot	Sidewalks	0.07	A CTEP project has been submitted to provide a pedestrian bridge over the railroad tracks. Sidewalks are needed to provide a walking connection to the stadium.
6th St N	River's Edge Trail	8th Ave N	Sidewalks	0.05	Needed connection to River's Edge Trail from the neighborhoods. There are ample goat trails in this area showing established use. The road could be converted to one lane through the bridges with a directional yield scenario.
17th Ave NE	River's Edge Trail	3rd St NW	Sidewalks	0.15	Connects to River's Edge Trailhead.
16th Ave NW	Existing Sidewalk	Between 16th Ave NW & 17th Ave NW	Sidewalks	0.07	Connections to area businesses.

Name	From	To	Type	Length (miles)	Notes
Division Rd	Herbalife Parking Lot	Smelter Ave NE	Sidewalks	0.16	Unlikely to be added with new development.
8th Street NE and Sacajawea Dr	South of Baseball Field	West of Baseball Field	Sidewalks	0.14	Only 8th Street NE is on the major street network, but the entire length could be a Transportation Alternatives project.
NW Bypass	NW Property Line of Cleary Bldg Corp	6th St NW	Sidewalks	0.06	Retrofit needed to link to 6th Street NW.
9th St NE	Between 32nd Ave NE & 7th St NE	Between 32nd Ave NE & 7th St NE	Sidewalks	0.01	Small gap in sidewalks.
9th St NE	Between 32nd Ave NE & 7th St NE	Between 32nd Ave NE & 7th St NE	Sidewalks	0.01	Small gap in sidewalks.
36th Ave NE	~5th St NE	6th St NE	Sidewalks	0.09	Sidewalk around park perimeter on 36th Ave NE. Fills gap and provides a greater hard edge to the park.
15th St N	Railroad	Credit Union Parking Lot	Sidewalks	0.08	Large gaps on the east side of the street.
15th St N	8th Ave N	10th Ave N	Sidewalks	0.10	Gaps - may eventually access River's Edge trail. Large goat trails already present.
14th St N	8th Ave N	12th Ave N	Sidewalks	0.21	Large gaps on west side.
NW Bypass	Stuckey Rd	9th St NW	Sidewalks	0.74	
3rd Ave S	LDS Church	51st St S	Sidewalks	0.22	Most of these lots are developed and may not redevelop. Sidewalks should be retrofitted.
4th St S	15th Ave S	Between 14th Ave S & 13th Ave S	Sidewalks	0.05	Gap over 3 parcels, two developed.
4th St S	Between 17th Ave S & 16th Ave S	16th Ave S	Sidewalks	0.01	Residential gap along one side of one lot.
23rd Ave NE Connector	~Division Rd	4th St NE	Sidewalks	0.19	Connects along Jaycee Park (pool) also helps get people from cars to front door. Connects to new crosswalk.
4th St S	Between 18th Ave S & 17th Ave S	17th Ave S	Sidewalks	0.02	Residential gap on one side of one lot.
13th Ave S	5th St S	7th St S	Sidewalks	0.15	About half of corridor is developed. Low priority as south side of road already has sidewalks.
7th St S	Golds Gym Parking Lot	~11th Ave S	Sidewalks	0.05	Gap over developed parcels. Will need some access control.

Name	From	To	Type	Length (miles)	Notes
7th St S	Pierce Carpet Mill Outlet	~11th Ave S	Sidewalks	0.04	Gap over partially developed parcels. Will need some access control on southern parcel.
13th Ave S	ERA American Horizon West	ERA American Horizon East	Sidewalks	0.03	Discontinuity in sidewalk. Modifications should be made to make this continuous for pedestrians.
5th Ave NW	9th St NW	~6th St NW	Sidewalks	0.17	

Crosswalks and Intersections

Crosswalks and intersection improvements are a type of spot improvement, or a recommendation to improve the non-motorized transportation system by simultaneously improving the roadway network for all users. Crosswalks allow pedestrians and other non-motorized users to cross streets in predictable and designated places. **Table 9.7** shows recommended crosswalk and intersection treatment locations along the major street network, pending more detailed traffic and engineering investigations at each location.

Table 9.7: Recommended Crosswalks and Intersections

Intersection	Type	Notes
NW Bypass & 3rd St NW	Crosswalks	"T" intersection (i.e. three-legs). Crosswalks are faded on the west and north leg of intersection and non-existing on the south leg. Because of high traffic volumes, ladder crossings (high-visibility) are recommended in order to maintain appearance of crosswalks and designated pedestrian space. Consider adding 'pork chop' islands on both directions on the NW Bypass legs to reduce pedestrian crossing distance.
4th Ave N & Park Dr	Crosswalks and Signals	As recommended in the Downtown Plan.
Ave B NW & 9th St NW	Crosswalks	Near school.
23rd Ave NE & Jaycee Park	Crosswalks	Access to/from playground and pool. Some parking spaces may need to be removed in order to accommodate a safe crosswalk.
23rd Ave NE & 4th St NE	Crosswalks	Add crosswalks on all sides of intersection.
2nd Ave N & 7th St N	Crosswalks	Crosswalks, traffic calming, and increased speed limit enforcement will benefit high pedestrian traffic (especially during school year) that is produced by Whittier and the Community Rec Center.
2nd Ave N & 8th St N	Crosswalks	Crosswalks, traffic calming, and increased speed limit enforcement will benefit high pedestrian traffic (especially during school year) that is produced by Whittier and the Community Rec Center.
3rd Ave S & 46th St S	Crosswalks and Sidewalks	Provide crosswalks on northern and eastern legs of intersection; provide sidewalk along 46th Street South to curb line.
10th Ave S & 18th St S	New Ped Signal or Hybrid Beacon	There are no pedestrian crossings between 15th and 20th Streets (5 pedestrian crashes have been reported in this section).
10th Ave S & 29th St S	New Ped Signal or Hybrid Beacon	There are no pedestrian crossings between 15th and 20th Streets (5 pedestrian crashes have been reported in this section).
4th Ave S & 9th St S	Crosswalks	Near recorded pedestrian crashes on 9th St; mark crossings with yield signs and lines.
5th Ave S & 9th St S	Crosswalks	Near recorded pedestrian crashes on 9th St; mark crossings with yield signs and lines.
8th Ave S & 9th St S	Crosswalks	Near recorded pedestrian crashes on 9th St; mark crossings with yield signs and lines.

Spot Improvements

Improvements such as 4-way stop control, streetscape, and trail connections are known as spot improvements. **Table 9.8** indicates locations along the major street network to be considered for individual spot improvements.

Table 9.8: Recommended "Other" Pedestrian Spot Improvements

Location	From	To	Type	Length (miles)	Notes
25th Ave NE & 8th St NE	N/A	N/A	4-Way Stop	N/A	Convert two-way (east-west) stop to a full, four-way stop. Near school, lower speeds.
3rd St NW & River's Edge Trail	N/A	N/A	Trail Connection	N/A	Connect NW Bypass & 3rd St NW to West Bank Park and the River's Edge Trail
1st Ave N & Park Dr	N/A	N/A	Intersection Improvement	/A	Accessing Gibson Park difficult from downtown. Improve crossing by prioritizing pedestrian traffic on porkchops, and by improving signal timing (leading pedestrian interval).
2nd Ave S / Park Drive	2nd Ave S	1st Ave S	Streetscape	0.06	Sidewalk is lacking in this area, though there is plenty of paved surface. Cars are parking where pedestrians would be walking. Suggest creating a new streetscape with pullouts for parking and a defined sidewalk that has curb separation.
Smelter Ave NE	8th St NE	~10th St NE	Streetscape	0.14	Sidewalk needs to be defined - ideally some access management could occur along here as well.

Sidewalk Program

Sidewalk construction, management, and maintenance programs help renew and expand sidewalk networks that, due to myriad reasons, are currently fragmented, disconnected, or poorly maintained. Many Montana communities, including Great Falls, have programs for repairing aging sidewalk infrastructure; however, fewer communities have programs for funding or financing the installation of new sidewalk.

It is recommended that a solid funding source of at least $50,000 annually be provided to match property owners' costs in a 50/50 cost share split. This program is a model that splits the cost of sidewalk replacement and/or construction between the property owner and the local agency. The source of funding can vary, but is typically a defined item in the agency's annual budget. Funding sources can be diverse and do not necessarily have to come directly from the City's revenue; they can include federal funding, voter-approved taxed or bond measures, fuel taxes, parking tolls, and others. Other cities around Montana utilize a variety of methods including low cost or no interest loans to property owners, adding the expense to street assessments, Special Improvement Districts, and Missoula's 'health plan' style approach where the city provides a minimum level of support and provides property owners with a maximum contribution independent of lot size.

Smaller cities in Montana have a smaller tax base and the total amount of funding (and therefore the amount of sidewalk management and maintenance that can be done) is less than larger cities like Missoula and Billings. For example, Kalispell's FY 2013 general fund appropriation was approximately $40,000 for sidewalk replacement only, while Missoula's was between $500,000 and $800,000 for new sidewalk construction. Great Falls may wish to increase funding over time if the sidewalk program is successful. **Table 9.9** presents suggested sidewalk program elements for consideration.

Table 9.9: Sidewalk Program Elements

Target	Notes
Coordinating Agency and Partners	City of Great Falls Public Works Department
Key Elements	Cost sharing, sidewalk replacement and expansion policies, and City budget appropriation
Timeframe	On-going
Potential Funding Sources	Property owners; City of Great Falls; MDT
Sample Programs	Missoula, MT; Kalispell, MT

9.3.3. Bicycling Network

Overview

Improving the on- and off-street bicycling network will provide cohesive connections between destinations and will contribute to the viability of the bicycle as a transportation mode choice. Although the existing roadway network does not preclude bicycle use, connectivity needs to be accounted for when considering bicycle features.

As of 2013, the on-street network of bicycle facilities is largely undeveloped; there is significant potential to create rapid expansion with much apparent 'low-hanging fruit. As it is for pedestrians, the River's Edge Trail is a high-quality backbone to the Great Falls bicycling network, but the trail's relatively few neighborhood connections and location does not make it as attractive for most utilitarian bicycling trips and the trail is typically a destination for the majority of its users.

Recommended Facilities

Bicycle facilities vary from bicycle routes designated by signage or shared lane markings to separated, off-street facilities along exclusive rights-of-way. Opportunities to develop bicycle facilities and a cohesive network also vary and may range from deliberate and coordinated development on the part of the city to taking advantage of independent street construction, reconstruction and resurfacing projects. Street re-surfacing in particular, is a low-cost way to provide bicycle infrastructure. When streets are resurfaced, new pavement markings are required. During this process, bicycle facilities can often be added depending on existing roadway width and feasibility.

The recommended Great Falls area bike network represents a comprehensive set of existing and proposed bicycle transportation and recreation facilities. Bicycle network improvements are depicted graphically in **Figure 9.5** and **Figure 9.6**.The proposed bicycling network for the Great Falls area consists of:

- Shared lane markings
- Bike lanes
- Buffered bike lanes
- Shared use path projects and connections to trails and paths

- Spot improvements including signalization, crossings, tunnels, traffic diverters, etc.

In the case of roadway retrofit projects where a street may be reconfigured to provide the physical space for bicycle or buffered bicycle lanes additional study, neighborhood outreach, business outreach and other activities may be needed prior to implementation.

Shared Lane Markings

Shared lane markings, or sharrows, are stenciled markings installed as an on-street facility where bicycles share the travel lanes with automobiles. Typically, these facilities occur on local roadways or on roadways with low traffic volumes and speeds. Streets with low motor vehicle volumes and speeds that are prioritized for bicycle travel are known as 'Bicycle Boulevards'. Such streets ideally have speeds of less than 25 mph and volumes of less than 3,000 vehicles per day. Treatments could include reconfiguring or providing stop signs to favor bicyclists, pavement markings, wayfinding signage, and intersection treatments. The level of treatment varies between facilities and is dictated by traffic conditions and safety. Traffic calming should only be applied to bicycle boulevards where traffic speeds or volumes are deemed excessive, or where the neighborhood supports or requests such treatments. **Table 9.10** depicts recommended segments of the major street network for consideration of shared lane markings.

Table 9.10: Recommended Shared Lane Markings

Name	From	To	Length (miles)	Notes
9th Ave S	47th St S	54th St S	0.49	Shared lane markings as alternative to 10th Avenue South; replaces Bike-4 from 2009 LRTP Update which recommends 8th Ave.
9th Ave S	29th St S	Ella Dr	1.26	Alternative to 10th Avenue South; replaces Bike-4 from 2009 LRTP Update which recommends 8th Ave.
9th Ave S	2nd St S	27th St S	2.03	Alternative to 10th Avenue South; replaces Bike-4 from 2009 LRTP Update which recommends 8th Ave.
13th Ave S	River's Edge Trail	20th St S	1.55	East-west route south of 10th Avenue South; part of Bike-13 recommendation from 2009 LRTP Update.
University of Great Falls West	20th St S	Administration Complex	0.09	Shared lane markings.
University of Great Falls East	Providence Hall	23rd St S	0.08	Shared lane markings.
12th Ave S	23rd St S	26th St S	0.24	Shared lane markings.
Huffman Ave	3rd St SW	River's Edge Trail	0.22	Link to 6th St SW (use wayfinding sharrows).
17th Ave NE	River's Edge Trail	17th Ave NE	0.04	Connection to River's Edge Trail for NW neighborhoods; part of Bike-2 Recommendation from 2009 LRTP Update.
20th St	9th Ave S	8th Ave N	0.88	Possible bike boulevard (traffic diversions already exist).
36th St	10th Ave S	38th St N	1.16	Bicycle boulevard on a quieter street, will need wayfinding on the north side of the route to reach the shared use path; Bike - 3 recommendation from 2009 LRTP Update.

Name	From	To	Length (miles)	Notes
2nd St	2nd Ave S	4th Ave N	0.30	Shared lane markings on 2nd Street South from recommended bike lanes at 2nd Avenue South to Riverfront Park. Turn lanes and parking suggest bike lanes may not be realistic for this segment. Parking on one side, or the center turn lanes could be removed, to provide a continuous bike lane at least up to 2nd Avenue North.
4th Ave N	38th St N	52nd St N	0.96	Partially from the Bike-6 recommendation in the 2009 LRTP Update, but instead of terminating at 46th Street South, the route continuous to 52nd Street North, connecting to many additional trails.
46th St	Ella Dr	4th Ave N	0.70	Bike route connecting 4th Avenue North to 9th Avenue South. Partially from the Bike-6 recommendation in the 2009 LRTP Update, but instead of terminating at 3rd Avenue South, the route continuous to 9th Avenue South.
Park Garden Rd	14th St SW	Park Garden Estate	0.81	New bike route; partial fulfillment of Bike-10 recommendation in the 2009 LRTP Update.
13th Ave SW	14th St SW	~11th St SW	0.36	Bike route
14th St SW	Park Garden Rd	13th Ave SW	0.51	Connects Park Garden Road to 13th Avenue SW. Option exists to remove a northbound travel lane, south of Country Club Blvd, and re-stripe road to have bike lanes in both directions. Turn lanes to I-15 interchange can be rebuilt. This bike route was proposed as part of the Bike-14 recommendation in the 2009 LRTP Update. The trail along the BNSF line will provide a more comfortable connection to the mall than designating this arterial as a bike route.
18th Ave SW	BNSF Rail Trail	Fox Farm Rd	0.36	If trail along BNSF railroad is completed.
6th St NW	Smelter Ave NE	36th Ave NE	0.65	Install only if 38th Avenue NE connects through. This is part of the Bike-15 recommendation in the 2009 LRTP Update. This will likely not be a very comfortable route due to gradient and the narrowness of the unimproved road. If the road is ever reconstructed, consider bike lanes, or at least an uphill bike lane.
Park Garden Rd	Gore Hill Connector	14th St SW	0.54	This part of the connection does not tie into the eastern section of Park Garden Road and would have marginal value without the shared-use path at Gore Hill. If the Gore Hill shared-use path is completed, this street should have sharrows added to aid wayfinding. This is part of the Bike-10 recommendation in the 2009 LRTP Update.
36th Ave NE	6th St NW	Bootlegger Trail	2.46	Road is 44 feet wide and could support bike lanes, but due to the character of the street, shared lane markings are recommended. If 36th Avenue NE ever extends to 6th Street NW, the sharrows should be added when constructed. This is part of the Bike-15 and Bike -19 recommendations in the 2009 LRTP Update.
17th & 19th Ave S	Upper River Rd	Overlook Dr	0.53	Part of Bike-17 recommendation in the 2009 LRTP Update.

Name	From	To	Length (miles)	Notes
4th Ave S	3rd St S	3rd Ave S / 43rd St S	3.29	Traffic volumes range from 400-900 vpd - should be a successful bike route. High School provides barrier in vehicular flows.
17th Ave S	13th St S	20th St S	0.54	Connecting bike lanes at each end and Sunnyside Elementary School.
6th St N	8th Ave N	River Rd N	0.10	Shared lane markings.
2nd Ave S	15th St S	38th St S	1.88	Continues from buffered bike lane couplet.
Black Eagle Connector	~15th St N	~20th St N	0.28	Much of this is unpaved, so wayfinding signage is important. The intent is to make Black Eagle more aware of good connections to the River's Edge Trail.
19th St N	Black Eagle Connector	25th Ave N	0.19	North / south spine bike route for Black Eagle. Leads to the River's Edge Trail. Wayfinding signs are important.
6th St & 9th St NE	Smelter Ave NE	36th Ave NE	0.98	This bike route has changed slightly from the 2009 LRTP Update to incorporate access to the school on Sacajawea Dr.
Division Rd / Riverview 4 / 2nd St NE	Smelter Ave NE	~40th Ave NE	0.95	This is modified from the 2009 LRTP Update which calls for the bike route to continue up Division Road and terminate at Riverview Drive. There is considerable growth in this area and modifying the bike route to utilize 2nd Street NE will create more connectivity.
3rd Ave S	43rd St S	57th St S	0.84	This recommendation differs from the 2009 LRTP Update in that it terminates at 57th Street South (future bike lanes), and also at 43rd Street South, to connect with the 4th Avenue South bike route that goes all the way downtown.
Cherry Drive / Meadowlark Dr	Fox Farm Rd	Meadowlark Dr Connector	0.46	From the 2009 LRTP Update. Only makes sense to implement if the Country Club connection can be made at the east end of Meadowlark Drive.
32nd St	Charles Russell Park Trail	8th Ave N	1.26	From the 2009 LRTP Update, with modification at south end to connect with medical center and future trail
8th Ave N	6th St N	38th St N	2.62	Street is already signed as a bike route, shared lane markings would help emphasize bicycle presence, particularly westbound where downhill grades may influence high speeds.
4th Ave N	2nd St N	38th St N	2.93	Street is already signed as a bike route, shared lane markings would help emphasize bicycle presence.

Bike Lanes

A bike lane provides a striped and stenciled lane for one-way travel on a street or highway. Many of the identified projects will be completed by the City of Great Falls, Cascade County, or MDT through retrofit or as part of maintenance activities (striping and signage only). **Table 9.11** identifies potential bike lane locations within the planning area.

Table 9.11: Recommended Bike Lanes

Name	From	To	Length (miles)	Notes
4th St S	10th Ave S	17th Ave S	0.31	Identified as a bike route in the 2009 LRTP Update. Street is approximately 38 feet wide, with surface parking lots along the street. Recommend 6 foot bike lanes be added. No striping changes needed otherwise.
11th Ave S	26th St S	32nd St S	0.50	Typical section options include 12-foot travel lanes and 5-foot bike lanes, or 11-foot travel lanes and 6-foot bike lanes. ADT is 4,750 vpd (in 2011 per MDT). Curb-to-curb width is 34 feet,
11th Ave S	32nd St S	39th St S	0.56	Adapted from Bike-7 in 2009 LRTP Update. Road exhibits 44-45 feet of curb-to curb width. No traffic counts are available. Typical section options include: Option 1: 10-foot travel lanes, 5-foot bike lanes and 7.5-foot parking lanes. Option 2: 12-foot travel lanes, 6-foot bike lanes 8-foot parking lane. Parking would be eliminated on one side of street. Recommend eliminating parking on south side due to land use and availability of off-street parking. Option 3: Provide shared lane markings 13 feet from curb face.
2nd Ave N	38th St N	57th St N	1.22	Pavement symbols and signs needed only.
20th St S	10th Ave S	17th Ave S	0.34	Just south of 10th Avenue South, ADT is 7,790 vpd (in 2011 per MDT). Curb-to-curb width is 34 feet. Typical section options include 12-foot travel lanes and 5-foot bike lanes, or 11-foot travel lanes and 6-foot bike lanes.
16th Ave S	20th St S	23rd St S	0.24	ADT is 3,720 vpd (in 2011 per MDT). Curb-to-curb width is 34 feet. Typical section options include 12-foot travel lanes and 5-foot bike lanes, or 11-foot travel lanes and 6-foot bike lanes.
23rd St S	10th Ave S	South of Hospital Trail	0.33	ADT is 4,410 vpd (in 2011 per MDT). Curb-to-curb width is 34 feet. Typical section options include 12-foot travel lanes and 5-foot bike lanes, or 11-foot travel lanes and 6-foot bike lanes.
26th St S	11th Ave S	24th Ave S	0.63	ADT is 12,380 vpd just south of 10th Avenue South. No turn bay configuration changes would be proposed. ADT is 3,850 vpd just north of 24th Avenue South and 1,560 vpd just south of 24th Avenue South (in 2011 per MDT). 4- to 3-lane conversions have been successful on streets with as high as 23,000 vpd. 20,000 vpd is the generally accepted rule of thumb in the industry. Proposed changes include providing TWLTL and bike lanes. The curb-to-curb width is 50 feet, which would allow for 6-foot bike lanes, 12-foot travel lanes and a 12-foot TWLTL.

Name	From	To	Length (miles)	Notes
13th St S	10th Ave S	21st Ave S	0.53	Road is already striped with a white line and sufficient shoulder in most places. ADT is 7,530 vpd just south of 10th Avenue South, 4,950 vpd just south of 22nd Avenue South and 3,270 vpd just south of 24th Avenue South. When this is restriped, areas with three lanes (turn lane) may need to be narrowed up slightly to provide bicycle access.
24th Ave S	13th St S	Eastern Terminus	1.51	Future project if road is reconstructed or widened. Part of Bike-11 recommendation in the 2009 LRTP Update.
Fox Farm Rd	~Cherry Dr	~E Fiesta	0.74	Road width is 50 feet (curb-to curb). ADT is 6,880 vpd (in 2011) just north of Park Garden Road and has generally been declining since 2007 (MDT). ADT reduces to 5,290 vpd south of Park Garden Road and 2,760 vpd near E Fiesta. Bike lanes can be added while maintaining existing parallel parking, 8.5-foot parking lanes, 5-foot bike lanes, and 12-foot travel lanes. As a second option, parking could be eliminated on the east side of the street where all houses on this section have either existing side street parking or are not oriented to Fox Farm Road. In this option the road would have an 8-foot parking lane on the west, a 2-foot buffer, a 5-foot parking lane, two 12-foot travel lanes, a 10-foot center turn lane (TWLTL) and a 5-foot bike lane.
20th St S	10th Ave S	9th Ave S	0.05	Short section of bike lane to provide continuity with bike lane on south side off 10th Avenue South. Prohibit parking - ample parking exists along this street off-street.
38th St	10th Ave S	River Dr N	1.24	For northern portion (10th Avenue North to River Drive North) pavement width is about 27 feet and would need to be widened at some point in the future during a resurfacing or reconstruction project. For southern portion the road is currently 34 feet in width, making each side of the road about 17 feet - which is not a comfortable dimension for on-street parking. Suggest 11-foot driving lanes and 6-foot bike lanes all the way to 10th Avenue South. This was previously recommended in the 2009 LRTP Update.

Name	From	To	Length (miles)	Notes
2nd St S	10th Ave S	2nd Ave S	0.45	This project replaces the Bike-5 recommendation from the 2009 LRTP Update, which recommended a bike route be established. The street is approximately 47 feet wide which would translate to two options. Option 1: 8-foot parking lanes, 5-foot bike lanes, and 10.5-foot travel lanes, or Option 2: 7.5-foot parking lanes, 5-foot bike lanes, and 11-foot travel lanes. At the extreme south end, suggest ramping southbound bike lane up on to sidewalk and either connecting to trail along north side of 10th Avenue South, or crossing users to the NE corner to connect with the Overlook Drive Path.
57th St S	10th Ave S	2nd Ave N	0.65	All that is needed is to paint the symbols and sign the route. Consider adding a through bike lane at 2nd Avenue North and a bike slip lane going east to Malmstrom AFB.
10th Ave N	38th St N	10th Ave N AFB Gate	1.38	Provide bike lanes if and when road is reconstructed. For approach to Malmstrom AFB, two eastbound lanes currently exist, though these constrict to one in a chicane near the guarded entry point. Consider restriping road to provide bike lanes, and a link for residents on base, to the rest of the Great Falls bicycle system.
Central Ave W	Sun River Trail	I-15	1.08	If road is ever improved or widened, 4-foot shoulders would suffice. Part of Bike-12 recommendation in the 2009 LRTP Update.
Central Ave W	I-15	3rd St NW	1.39	Consider prohibiting on-street parking and providing bike lane symbols and signs west of 9th Street NW. East of 9th Street NW the travel lanes would need to be resized to 10-foot travel lanes to provide 5-foot bike lanes. Road is currently between 60 and 62 feet curb-to-curb. Consider exploring the idea of a road diet which would result in a 3/lane cross-section (which have been shown to handle ADTs in excess of 20,000 vehicles per day). Buffered bike lanes could be created to the railroad crossing if the road were reduced to 3 lanes.
6th St NW	NW Bypass	Smelter Ave NW	0.39	This street is too narrow to provide bicycle lanes and parking. Parking appears to be underutilized. Road appears to have been re-built in recent years with new sidewalks and curb and gutter. Options are to prohibit parking completely, providing for 9-foot bike lanes (no change to the existing striping would be required other than adding pavement markings and signage), or to prohibit parking on one side of the street, relocate the centerline and provide 5-foot bike lanes in both directions. In this second option the street would have one 8-foot parking lane, 5-foot bike lanes and two 12-foot travel lanes.

Name	From	To	Length (miles)	Notes
17th Ave S	4th St S	13th St S	0.75	Bike lanes can be striped along this entire stretch with no changes to configuration. This route connects several major destinations. No on-street parking is currently available except for one stretch where the street has been widened. This project differs from the bike route that was proposed in the Bike 17 recommendation in the 2009 LRTP Update.
25th St N	8th Ave N	N River Rd	0.15	Street is 34 feet wide. Prohibit parking (all businesses have large off-street lots) and provide 5-foot bike lanes. Unless a connection to the River's Edge Trail can be made, there is little point to this project.
15th St N	Wire Mill Rd	Bootlegger Trail	0.49	Add bicycle pavement markings and signs to existing shoulder of 15th Street North, from Montana Avenue to 36th Avenue NE. This project replaces the Bike 19 Recommendation in the 2009 LRTP Update, which recommends bike route signage only. This project also does not connect directly to the River's Edge trail as adequate width does not exist in the street south of Montana Avenue where the road is constrained. Speeds are too high for a shared lane.
9th St N	2nd Ave N	8th Ave N	0.31	Sharrow pavement markings are installed on this segment. Street is 46 feet wide. Bike lanes were recommended on 9th Street in the past two versions of the LRTP. Option 1: Narrow parking and travel lanes. Arrive at a section that includes 7.5-foot parking lanes, 5-foot bike lanes and 10.5-foot travel lanes. Option 2: Most residences/businesses have parking off of east-west cross streets. Remove one parking lane to provide a cross section of an 8-foot parking lane, 2-foot buffer, 5-foot bike lane, 12-foot travel lanes, 2-foot buffer, and a 5-foot bike lane. Removing parking would have to be by action of the City Commission and is highly unlikely.
9th St N	1st Ave N	2nd Ave N	0.05	Sharrow pavement markings have been installed on other segments of this corridor. Street is 42 feet wide curb-to-curb. Reduce travel lanes to 10.67 feet in width, and provide 5-foot bike lanes.
9th St N	Central Ave	1st Ave N	0.05	Sharrow pavement markings have been installed on other segments of this corridor. Remove southbound right turn bay, convert through lane to a combination lane and provide bike lanes. From 2013 RPA TMC's, right turns account for 15% of AM Peak and less than 11% of PM Peak. Because through bicyclists will be to the right of some turning traffic, intersection markings and "yield to bikes" signs should be added at this intersection.

Name	From	To	Length (miles)	Notes
9th St S	1st Ave S	Central Ave	0.05	Sharrow pavement markings have been installed on other segments of this corridor. Remove northbound right turn bay. According to 2013 RPA TMC's, AM Peak hour shows 6% of northbound traffic turning right at Central, whereas PM Peak hour shows 8% of northbound traffic turning right. Eliminating this turn lane will have a very minor impact on traffic. Space can be used to provide bike lanes in both directions. Intersection alignments may be slightly off, but not greatly so.
9th St S	2nd Ave S	1st Ave S	0.05	Sharrow pavement markings have been installed on other segments of this corridor. Street is 42 feet wide curb-to-curb. Reduce travel lanes to 10.67 feet in width, and provide 5-foot bike lanes.
9th St S	10th Ave S	2nd Ave S	0.41	Sharrow pavement markings have been installed on other segments of this corridor. Street section varies as 44-to-46 feet (changes block by block). Bike lanes were recommended on 9th Street in the past two versions of the LRTP. Option 1: Where 46 feet wide - narrow parking and travel lanes. Arrive at a section that includes 7.5-foot parking lanes, 5-foot bike lanes and 10.5-foot travel lanes. Where 44 feet wide: 7-foot parking lanes, 5-foot bike lanes and 10-foot travel lanes. Option 2: Most residences/businesses have parking off of east-west cross streets. Remove one parking lane to provide a cross section of an 8-foot parking lane, 2-foot buffer, 5-foot bike lane, 12-foot travel lanes, 2-foot buffer, and a 5-foot bike lane. Removing parking would have to be by action of the City Commission and is highly unlikely.
9th St S	17th Ave S	10th Ave S	0.31	Sharrow pavement markings have been installed on other segments of this corridor. Section is approximately 34 feet. Street is continuously served by off-street parking lots. Provide 6-foot bike lanes and 11-foot travel lanes. Prohibit parking along entire length. Prohibiting parking would have to be by action of the City Commission and is highly unlikely.

Name	From	To	Length (miles)	Notes
Smelter Ave NW	6th St NW	5th St NE	0.99	Smelter Avenue has vital importance for non-motorized connectivity for adjacent neighborhoods. 2013 realized new widened sidewalks from Riverview Blvd NW to 3rd Street NW. This project reiterates the recommendation for bike lanes from 6th Street NW to Riverview Blvd NW (2009 LRTP Update), however it also recommends continuing them to 3rd Street NW to reduce the need for bicyclists to weave across traffic to access the sidepath and to offer options for those who would rather ride on the street. The street is wide enough for bike lanes with a 52-foot typical section (where it has been improved). Additional curb/gutter/sidewalk work is needed where the street has not yet been improved. Parking would need to be prohibited at the extreme western extent for a short interval.
9th St N	8th Ave N	River Dr N	0.17	North of railroad tracks, widths get tight. Option in this area is to provide one-way travel on sidewalk and ramp down near tracks to bike lanes converted from existing shoulder/parking lanes. Parking lanes not needed along this stretch. Convert parking lanes to bike lanes. Recommend using 10 feet as 6-foot bike lanes with 3 to 4 feet of buffer space.
3rd Ave S	River's Edge Trail	2nd St S	0.13	Road is 40 feet wide with two lanes. All businesses along it have large surface parking lots. 2012 volumes are 4,300 vpd. This connects on-street users to the River's Edge Trail. Ideally the westbound approach to River Drive South would have a through bike lane to connect with the trail. This was recommended as a bike route in the 2009 LRTP Update.
Smelter Ave NE	3rd St NW	Western Walmart Entrance	0.17	For this segment the existing shoulders are not large enough for buffered bike lanes (at least on the north side). Mark pavement for conventional bike lanes.
Division Rd	3rd St NW	Smelter Ave NE	0.26	Recommendation in the 2009 LRTP Update. Road is 40 feet wide. Recommend 14-foot travel lanes and 6-foot bike lanes.
River Dr N	15th St N	38th St N	1.95	If River Drive North is improved to a 3-lane arterial section, an assessment to the viability of this non-motorized amenity should be made as public sentiment and stakeholder feedback has identified this route as an important gap in the visionary bicycle network for the community.
25th St S	15th Ave S	10th Ave S	0.20	If 25th Street South is converted to a one-way street, south of 10th Avenue South, it makes sense to continue the bike lane south of 10th Avenue South. Depending on configuration there could be one travel lane and a bike lane with two parking lanes, or on-street parking could be prohibited. However in this area parking seems well utilized.

Name	From	To	Length (miles)	Notes
13th St S	21st Ave S	24th Ave S	0.15	If roadway is ever reconstructed bike lanes should be included.

Buffered Bike Lanes

Similar to a bike lane in that a striped and stenciled lane is provided for one-way bicycle travel on a street or highway, buffered bicycle lanes provide additional width to 'buffer' the bike lane, on the side of the adjacent travel lane and/or parking lane. They provide a more comfortable experience for bicyclists, but they also are an effective tool to discourage motorists from driving or parking in the bike lane that would otherwise be excessively wide. This excessive width can sometimes be present when a roadway reconfiguration project converts an underutilized travel lane or parking lane to a bike lane. **Table 9.12** contains segments on the major street network that are recommended for buffered bike lanes.

Table 9.12: Recommended Buffered Bike Lanes

Name	From	To	Length (miles)	Notes
5th St N	2nd Ave N	Park Dr N	0.26	Travel volumes are relatively low (ADT under 2,000 vpd). This street will function well with a single travel lane and buffered bike lanes. Alternatively, on-street parking could be prohibited as most residences front side streets and businesses have off-street lots.
6th St SW	Country Club Blvd	Central Ave W	0.91	Shoulders are already 10 feet wide. Designating existing wide shoulders as bike lanes has been done in Kalispell and Missoula on similar roadways. Prohibit non-emergency parking. Bike lane should be buffered, if possible, by putting a 2- to 3-foot buffer between the travel lane and bike lane.
Fox Farm Road	~Cherry Dr	Country Club Blvd	0.13	Currently 5-lane section with ADT of 12,760 vpd just south of Country Club Blvd (becomes 10th Avenue South). Typical section could be narrowed to a single travel lane in each direction, with a wide buffered bike lane, with little significant impact to traffic congestion. Approach lanes at Country Club Blvd would be maintained if possible.
1st Ave S	Park Dr S	10th St S	0.73	Recommendation taken from the *Downtown Great Falls Access Circulation and Connectivity Study* - this buffered bike lane was the preferred alternative. Section includes 5-foot one-way bike lane, a 3-foot travel lane buffer, and a 2-foot parking side buffer (in addition to travel lanes).
2nd Ave S	2nd St S	6th St S	0.33	Recommendation taken from the *Downtown Great Falls Access Circulation and Connectivity Study* - this buffered bike lane was the preferred alternative. Section includes 5-foot one-way bike lane, a 3-foot travel lane buffer, and a 2-foot parking side buffer (in addition to travel lanes).
2nd Ave S	7th St S	15th St S	0.65	From 7th Street South to 15th Street South, drop one of the two travel lanes and provide a buffered bike lane. ADT is just under 1,850 vpd, and at two one-way lanes there is excess capacity - even with a single travel lane. Recommend buffered bike lane aligning with wider section to the west. Provide travel lane and parking lane side buffers.

Name	From	To	Length (miles)	Notes
5th St	6th Ave S	2nd Ave N	0.41	Recommendation taken from the *Downtown Great Falls Access Circulation and Connectivity Study* - this buffered bike lane was the preferred alternative. Section includes 5-foot one-way bike lane, a 3-foot travel lane buffer, and a 2-foot parking side buffer (in addition to travel lanes).
6th St S	5th Ave S	2nd Ave N	0.36	Recommendation taken from the *Downtown Great Falls Access Circulation and Connectivity Study* - this buffered bike lane was the preferred alternative. Section includes 5-foot one-way bike lane, a 3-foot travel lane buffer, and a 2-foot parking side buffer (in addition to travel lanes).
2nd Ave S	6th St S	7th St S	0.08	Continue the buffered bike lane to the east one block from the Downtown study's recommendations
6th St NW	Central Ave W	NW Bypass	0.42	Street is currently 4 lanes with a center median that controls access and provides space for left turn bays. MDT's traffic counts indicate a 2011 ADT of 9,780 vpd, with a peak ADT of 10,740 vpd (in 2010). This is well below the available capacity of a 3-lane cross-section. To add a bike lane (which the 2009 LRTP Update recommends) will require removing a travel lane. This results in between 10 and 11 feet of space being available on each side of the road. This plan recommends a 7-foot bike lane with a 3-foot buffer area. At intersections where a right turn bay is needed the buffered bike lane can terminate with shared lane markings leading bicyclists along the left edge of the right only lane.

Name	From	To	Length (miles)	Notes
14th St	10th Ave S	River Dr N	1.15	This street currently experiences volumes ranging from 5,300 vpd to 7,000 vpd (ADT) with two southbound travel lanes and a 9-foot parking lane. Speed limit is 30 mph, making shared lane use less desirable. Parking is somewhat utilized, however most homes/businesses have ample parking in off-street areas or with frontage on side-streets. Bicycle warning signs are posted along the corridor. Due to the few stops and signalized crossings, this is an attractive fast through route for bicyclists. The recommended facility type is a buffered bicycle lane. This can be achieved via the following two options: Option 1: The parking lane can be removed to provide a 9-foot bicycle area, with a 6-foot wide bike lane and a 3-foot buffer. This would be the most desirable option. Option 2: The road could still likely function well with a single travel lane given the volumes. The buffered bicycle lane could exist either between the parking lane and the driving lane, or on the side of the road with no parking. The buffered bike lane could become an 'add lane' turn bay with shared lane markings where necessary to improve intersection level of service. A conventional bike lane could also be considered. The street is approximately 32 feet wide. If travel lanes were reduced to 10 feet, and the parking lane reduced to 7 feet, a 5-foot bike lane could be provided. However all of these dimensions are at the absolute minimum of current engineering practice. The 2009 LRTP Update recommended bike lanes north of 8th Avenue North in Bike-18.

Name	From	To	Length (miles)	Notes
15th St	10th Ave S	River Dr N	1.18	This street currently experiences volumes ranging from 6,400 vpd to approximately 7,400 vpd (ADT), with two northbound travel lanes and a 9-foot parking lane. Speed limit is 30 mph, making shared lane use less desirable. Parking is somewhat utilized, however most homes/businesses have ample parking in off-street areas or with frontage on side-streets. Bicycle warning signs are posted along the corridor. Due to the few stops and signalized crossings, this is an attractive fast through route for bicyclists. The recommended facility type is a buffered bicycle lane. This can be achieved via the following two options: Option 1: The parking lane can be removed to provide a 9-foot bicycle area, with a 6-foot wide bike lane and a 3-foot buffer. This would be the most desirable option. Option 2. The road could still likely function well with a single travel lane given the volumes. The buffered bicycle lane could exist either between the parking lane and the driving lane, or on the side of the road with no parking. The buffered bike lane could become an 'add lane' turn bay with shared lane markings where necessary to improve intersection level of service. A conventional bike lane could also be considered. The street is approximately 32 feet wide. If travel lanes were reduced to 10 feet, and the parking lane reduced to 7 feet, a 5-foot bike lane could be provided. However all of these dimensions are at the absolute minimum of current engineering practice. The 2009 LRTP Update recommended bike lanes north of 8th Avenue North in Bike-18.
1st Ave S	10th St S	15th St S	0.41	ADT is just under 2,000 vpd. At two one-way lanes, there is excess capacity even with a single travel lane. Recommend buffered bike lane aligning with wider section to the west. Provide travel lane and parking lane side buffers.

Name	From	To	Length (miles)	Notes
25th St	10th Ave S	8th Ave N	0.93	This street currently experiences volumes ranging from 3,000 vpd to approximately 7,000 vpd (ADT), with two southbound travel lanes and a 9-foot parking lane. Speed limit is 30 mph, making shared lane use less desirable. Parking is somewhat utilized, however most homes/businesses have ample parking in off-street areas or with frontage on side-streets. Bicycle warning signs are posted along the corridor. Due to the few stops and signalized crossings, this is an attractive fast through route for bicyclists. The recommended facility type is a buffered bicycle lane. This can be achieved via the following two options: Option 1: The parking lane can be removed to provide a 9-foot bicycle area, with a 6-foot wide bike lane and a 3-foot buffer. This would be the most desirable option. Option 2: Less likely, but it is possible that the road could still function with a single travel lane given the volumes. The buffered bicycle lane could exist either between the parking lane and the driving lane, or on the side of the road with no parking. The buffered bike lane could become an 'add lane' turn bay with shared lane markings where necessary to improve intersection level of service. A conventional bike lane could also be considered. The street is approximately 32-34 feet wide. If travel lanes were reduced to 10 feet, and the parking lane reduced to 7 feet, a 5-foot bike lane could be provided. However all of these dimensions are at the absolute minimum of current engineering practice. This recommendation was depicted as a bike lane in the 2009 LRTP Update.

Name	From	To	Length (miles)	Notes
26th St	10th Ave S	8th Ave N	0.92	This street currently experiences volumes ranging from 3,000 vpd to approximately 4,500 vpd (ADT), with two northbound travel lanes and a 9-foot parking lane. Speed limit is 30 mph, making share lane use less desirable. Parking is somewhat utilized, however most homes/businesses have ample parking in off-street areas or with frontage on side-streets. Bicycle warning signs are posted along the corridor. Due to the few stops and signalized crossings, this is an attractive fast through route for bicyclists. The recommended facility type is a buffered bicycle lane. This can be achieved via the following two options: Option 1: The parking lane can be removed to provide a 9-foot bicycle area, with a 6-foot wide bike lane and 3-foot buffer. This would be the most desirable option. Option 2: Less likely, but it is possible that the road could still function with a single travel lane given the volumes. The buffered bicycle lane could exist either between the parking lane and the driving lane, or on the side of the road with no parking. The buffered bike lane could become an 'add lane' turn bay with shared lane markings where necessary to improve intersection level of service. A conventional bike lane could also be considered. The street is approximately 32-34 feet wide. If travel lanes were reduced to 10 feet, and the parking lane reduced to 7 feet, a 5-foot bike lane could be provided. However all of these dimensions are at the absolute minimum of current engineering practice. This recommendation was depicted as a bike lane in the 2009 LRTP Update.
3rd St NW	Central Ave W	Smelter Ave	1.12	10-12 foot shoulders currently exist on this stretch of 3rd Street NW. With bicycle stencils and signs, bike lanes could be created. It is recommended to provide a 7-foot bike lane and a 3-footbuffer to provide a greater feeling of separation. As the road is resurfaced in the future, opportunities should be utilized to provide through bike lanes into the intersections. ADT volumes are 14,000 vpd to 17,000 vpd.
Smelter Ave	West Walmart Entrance	10th St NE	0.38	Shoulders are wide enough for buffered bike lanes on this segment of Smelter Avenue. If deceleration lanes are strongly desired, they can be shared lanes, with shared lane markings down the middle. Making them as short as possible will be crucial to reduce the speed differential.

Name	From	To	Length (miles)	Notes
5th St S	10th Ave S	6th Ave S	0.20	Travel volumes are relatively low (2,500-3,000 vpd). A buffered bike lane could be maintained until half a block south of 9th Avenue South where the street would revert to existing for intersection capacity. Alternatively, on-street parking could be prohibited as most residences front side streets and businesses have off-street lots.
6th St S	10th Ave S	5th Ave S	0.26	ADT volumes are 2,500 vpd - 3,000 vpd). On-street parking could be prohibited as most residences front side streets and businesses have off-street lots.
6th St N	2nd Ave N	8th Ave N	0.31	ADT volumes are 800 vpd - 1,500 vpd). This street would function well with a single travel lane and buffered bike lanes. Alternatively, on-street parking could be prohibited as most residences front side streets and businesses have off-street lots.

Shared Use Paths

A shared use path provides bicycle travel on a paved right-of-way completely separated from any street or highway. The River's Edge Trail is an example of a shared use path. Shared use paths in the Great Falls area are designed at a minimum to be ten feet wide. **Table 9.13** depicts locations that should be considered for shared use paths.

Table 9.13: Recommended Shared Use Paths

Name	From	To	Length (miles)	Notes
University of Great Falls Connector	Administration Complex	Providence Hall	0.06	Provides an east-west bike route in a section of the city that lacks connectivity.
Clara Park Path	Ella Ave	47th St S	0.16	Formalize existing goat trail. Replaces Bike-4 from 2009 LRTP Update, which recommends 8th Avenue.
Lions Park Path	27th St S	29th St S	0.15	Connects 9th Avenue South. Replaces Bike-4 from 2009 LRTP Update, which recommends 8th Avenue.
Charles Russell Park Trail	29th St S	33rd St S	0.32	Part of 2013 CTEP process.
Utility Easement Path	6th St SW	3rd St SW	0.36	Part of 2009 LRTP Update as Bike-1A.
6th St SW	Country Club Blvd	Utility Easement Path	0.38	Widen concrete sidewalk (if possible), otherwise curb line adjustment might be needed to provide a wide enough surface for two-way traffic along the east side of 6th Street SW. This is a replacement project for Bike 1B from the 2009 LRTP Update. The Bike 1B project would require a safe crossing over 6th Street SW to reach the west from either the Bike 1A project or from 10th Avenue SW, which would have other implications.
Country Club Blvd	6th St SW	Existing Country Club Blvd/Bridge Path	0.53	Add sidepath on north side of Country Club Blvd in accordance with project Bike 1C- Sun River Connector from the 2009 LRTP Update. This project was submitted for TA funding in 2013.

Name	From	To	Length (miles)	Notes
Overlook Drive	River's Edge Trail	10th Ave S	0.22	Bike-1D from the 2009 LRTP Update. This project was submitted for TA funding in 2013
Westgate Development Master Plan Pathway	17th Ave NE	Smelter Ave	0.23	Part of *Westgate Development Master Plan* by CTA Architects.
Meadowlark Dr Connector	Meadowlark Dr	Existing Country Club Blvd/Bridge Path	0.38	From the Bike-8 recommendation in the 2009 LRTP Update. Uses existing underpass and connects to path along north side of bridge.
BNSF Rail Trail	14th St SW	13th Ave SW	0.43	Connects River's Edge Trail to the Marketplace (with underpass).
Gore Hill Connection	Airport Dr	Big Ranch Rd	0.61	From Bike-9 recommendation in the 2009 LRTP Update. This project would likely only be developed in conjunction with a future subdivision in this location. This route differs slightly from the 2009 proposal in that it is wholly a shared-use path and connects to Greenbriar Drive, rather than directly to Park Garden Road. Existing residential lots prevent a direct connection.
67th Street N	18th Ave N	River's Edge Trail	0.35	From the Bike -16 recommendation in the 2009 LRTP Update.
15th St N Connector Trail	15th St N	19th St N	0.33	As recommended in Bike-18 recommendation in the 2009 LRTP Update. If deemed feasible, a trail descending to the existing River's Edge Trail as close as possible to the 15th Street North bridge would be preferred, as it would better serve trail users wanting to go west.
4th St S Connector Trail	Overlook Dr	4th St S	0.08	Connects future bike lanes along 4th Street South to Overlook Drive, and convergence of several facilities.
South of Hospital Trail	23rd St S	29th St S	0.50	To be completed as land develops. Easements at least with plat as construction may be optimized as one project, or in greater batches than by parcel.
10th St Bridge Rehabilitation	River Dr N	N River Rd	0.20	If the 10th Street Bridge is ever rehabilitated.
6th St N Access Ramps	River's Edge Trail	River's Edge Trail	0.08	Access down to 6th Street North from River's Edge Trail.
River Drive South Trail	~1st Ave N	~3rd Ave S	0.33	Will stay on the riverbank under the RR bridge, between River Drive South and the river. Results in no “at-grade” road crossings.
Railroad Trail Connector	10th Ave SW Connector	6th St SW	0.46	If the rail line is ever abandoned, and the connection to the River's Edge Trail made to 6th Street SW using the utility easement, then this link would provide a direct trail-to-trail connection. Would need some sort of signal, or grade-separated crossing, at 6th Street SW.
10th Ave N Sidepath	38th St N	57th St N	1.17	Connects existing path and downtown system to Malmstrom AFB.

Shoulder Widening

Bicycle (and pedestrian) facilities may be able to be accommodated once a roadway's shoulders are widened or improved. This type of improvement is typically found in non-urban settings (refer to **Table 9.14** for future shoulder widening locations).

Table 9.14: Recommended Shoulder Widening

Name	From	To	Length (miles)	Notes
Upper River Rd	40th Ave S	Overlook Dr	1.44	If road is ever rebuilt, provide at least four feet of rideable shoulder. If rumble strips are considered, widen shoulder design to allow for four feet of rideable width. This is a modification of the Bike-17 recommendation from the 2009 LRTP Update.
Lower River Rd	~40th Ave S	Overlook Dr	1.45	If road is ever rebuilt, provide at least four feet of rideable shoulder. If rumble strips are considered, widen shoulder design to allow for four feet of rideable width. This is a modification of the Bike-20 recommendation from the 2009 LRTP Update.

Spot Improvements

Improvements that are recommended at specific locations rather than along a corridor are known as spot improvements. These could include signalization, crossing improvements or other small connections, and fall under this category. **Table 9.15** shows the location of recommended "other" bike spot improvements.

Table 9.15: Recommended "Other" Bike Spot Improvements

Intersection	Type	Connected to Which Linear Type (if any)	Notes
25th St N & River Dr	Trail Connection	Shared Use Pathway	Either follow existing trail down to paved River's Edge Trail (ADA grades unlikely), or construct tunnel going into bluff and travelling under River Drive North and day-lighting in the Veteran's Park to connect to future 25th Street North bike lanes and new pedestrian bridge over railroad tracks.
~14th St SW & 20th Ave SW	Railroad Tunnel	Shared Use Pathway	Connects River's Edge Trail to the Marketplace.
15th St N & River Dr	Intersection Improvement	Buffered Bike Lanes	Facilitate connections from 15th Street North to new trail connection.
Central Ave W & I-15	Travel Lane Reduction	Bike Lanes	Remove travel lane on north side for bike lane/shoulder.
Central Ave W & RR Crossing	Remove Raised Median	Bike Lanes	Remove raised median and provide bike lane.
Fox Farm Rd & ~33rd Ave S	General Roadway Improvement	Bike Lanes	Improve south of development, in addition to providing bike lanes where most people live. The undeveloped section of this road is where most open house and survey suggestions were identified (of those within this neighborhood) and it is also where a fatal crash occurred.
4th Ave S & 20th St S	One-way 'Do Not Enter' Signs	Shared Lane Markings	Only northbound local school traffic can enter here. Except for commute periods, virtually zero cars will be driving here. Recommend "one way / do not enter" signs with an "except bicycles" supplemental plaque.

Intersection	Type	Connected to Which Linear Type (if any)	Notes
2nd Ave S & 20th St S	Formalize Existing Path	Shared Lane Markings	Modifications would be needed to formalize bicycle permeability. Clear goat paths exist where bicyclists already use this to bypass the barriers.
4th Ave S & ~19th St S	Improve Existing Full Roadway Closure	Shared Lane Markings	Make this an obvious part of a bicycle route rather than just bollards sticking out of the concrete. Ensure adequate bicycle passage clearance and include pavement markings and wayfinding signage.
4th Ave S & ~20th St S	Improve Existing Full Roadway Closure	Shared Lane Markings	Make this an obvious part of a bicycle route rather than just bollards sticking out of the concrete. Ensure adequate bicycle passage clearance and include pavement markings and wayfinding signage.
Fox Farm Rd & 18th Ave S	Intersection Signalization Improvement	Shared Lane Markings	Possible RRFB.

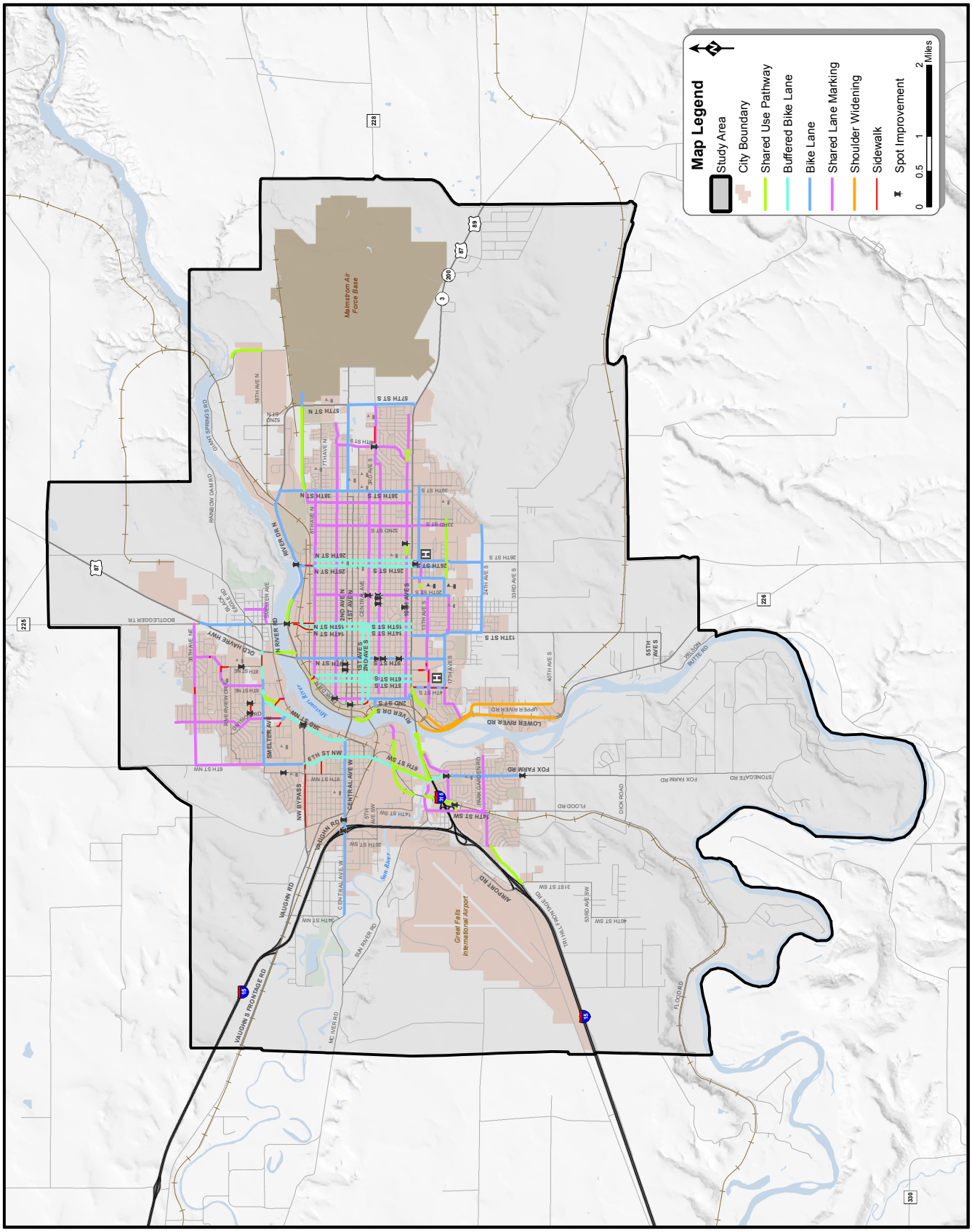


Figure 9.5: Non-Motorized Network Vision

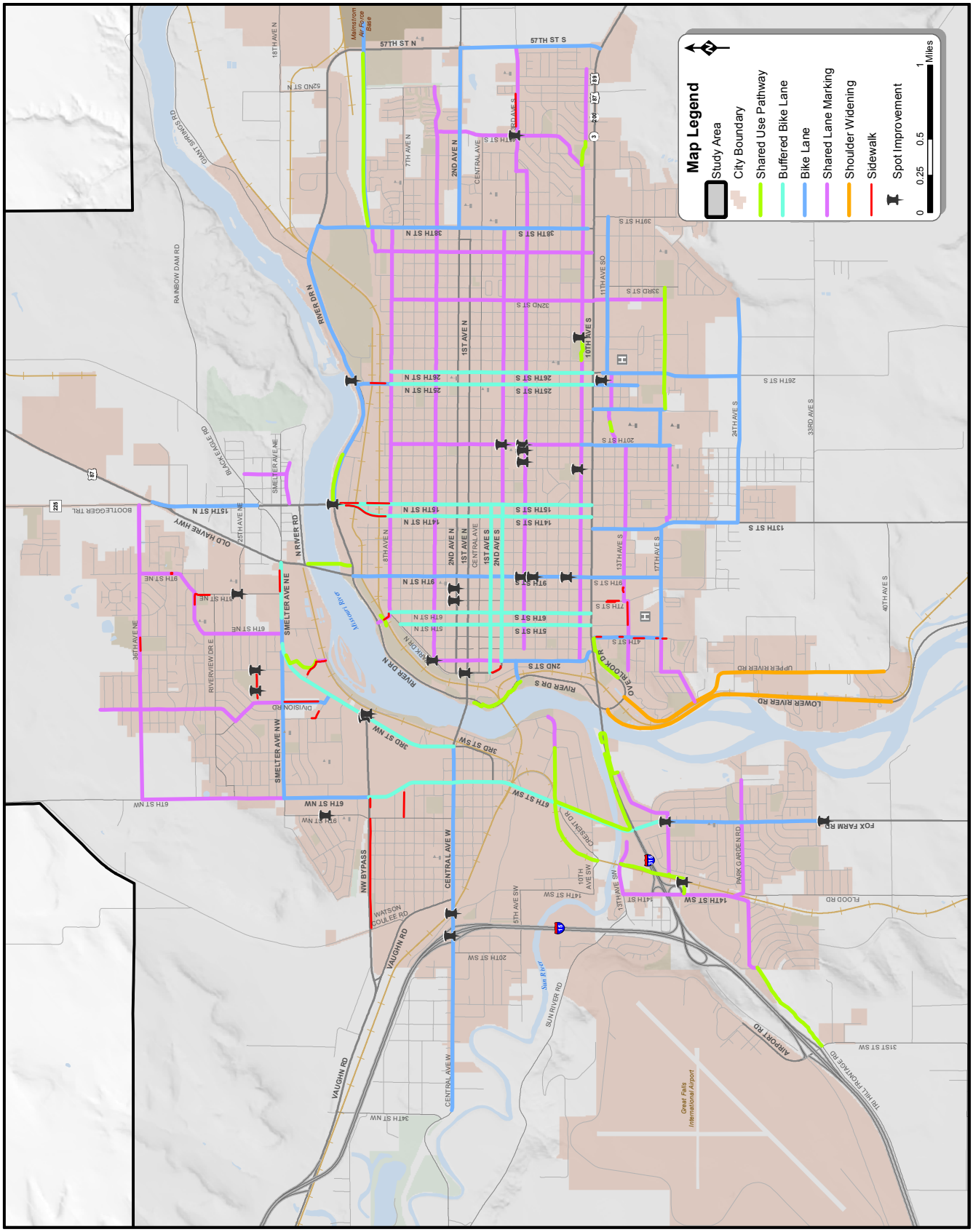


Figure 9.6: Non-Motorized Network Vision (Detail)

9.3.4. Policy and Program Recommendations

While improving walking and bicycling infrastructure is a vital component to increasing active transportation use, supportive programs and policies are a cost-effective complement and their impact should not be underestimated. Working directly with the public to encourage walking and bicycling can increase use of those modes, improve road safety, and strengthen the role of bicycling as a tourism generator in the Great Falls area. This section describes current efforts and future recommendations related to these programs and policies. The goals of these recommendations are to:

- Increase the visibility and legitimacy of bicycling and bicyclists in the Great Falls area;
- Support and enhance the infrastructure recommendations in this Plan; and
- Increase the number, safety, and comfort of people walking in the Great Falls area.

Bicycle and Pedestrian Advisory Committee (BPAC)

A Bicycle and Pedestrian Advisory Committee (BPAC) is made of citizen volunteers to advise the community leaders on bicycling and pedestrian issues and to make recommendations for Transportation Alternatives and other grant applications. The BPAC establishes the area's commitment to making bicycling and walking safer and more desirable, and has the potential to assist the City in securing funding for bicycle and pedestrian projects. Having an established BPAC is also desirable for receiving Bicycle or Walk Friendly Communities designation.

The charges of the BPAC may include some or all of the following:

- Review and provide citizen input on capital project planning and design as it affects bicycling and walking (e.g., corridor plans, street improvement projects, signing or signal projects, and parking facilities).
- Review and comment on changes to zoning, development code, comprehensive plans, and other long-term planning and policy documents.
- Participate in the development, implementation, and evaluation of the Transportation Plan recommendations.
- Provide a formal liaison between local government, staff, and the public.
- Develop and monitor goals and indices related to bicycling and walking in the jurisdiction.
- Promote bicycling and walking, including bicycle and pedestrian safety and education.

Because BPAC members are volunteers, it is essential to have strong staffing supporting the committee in order for it to be successful. A designated city staff member is the logical liaison to the BPAC and should take charge of managing the application process, managing agendas and minutes, scheduling meetings, bringing agency issues to the BPAC, and reporting back to the agency and governing body about the BPAC's recommendations and findings.

Alternate Modes Coordinator

The City of Great Falls does not have a designated Alternate Modes Coordinator, though the Planning Department has served some functions. In order for the goals of this plan to be realized, the Alternate Modes Coordinator should be the primary staff person overseeing implementation. In addition, the Alternate Modes Coordinator may have many other duties, including:

- Monitoring the design and construction of bikeways and trails, including those constructed in conjunction with private development projects.
- Ensuring bicycle and pedestrian facilities identified in specific plans are designed appropriately and constructed expediently.

- Serving as the staff liaison to the Bicycle and Pedestrian Advisory Committee.
- Coordinating implementation of the recommended projects and programs listed in this Plan.
- Identifying new projects and programs that would improve the community's environment for bicycling and walking.
- Coordinating evaluation of projects and programs.
- Pursuing external funding sources for project and program implementation.
- Updating the City website and other information portals with bicycling, walking, and trail resources.
- Completing the Bicycle-Friendly Communities application to the League of American Bicyclists.

It is recommended that the City of Great Falls provide dedicated funding for this important position.

9.3.4.1. Bicycle Parking

Adequate bicycle parking is an important component of the bicycle network and represents end-of-trip accommodation for those who choose to travel by bicycle. The recommendations for bicycle parking are separated into several categories, including recommended ordinance and code language, parking design, short- and long-term parking, how bicycle parking may differ depending on land uses and neighborhoods of Great Falls, and how more bicycle parking can be implemented when it doesn't fall into previously outlined categories.

There are no current requirements for providing bicycle parking with new development in Great Falls. The incentive to provide bicycle parking is that it may substitute for a vehicular parking space up to a maximum of 5 percent of the required number of parking space, or 10 spaces, whichever is less (17.36.3.010). Because bicycle parking is not required, it may not be considered for a variety of reasons.

Without a mandatory bicycle parking requirement, existing and potential bicyclists in Great Falls cannot depend on secure, dedicated parking spaces at their destinations. Bicycle parking and end-of-trip facilities can be a determining factor in whether someone decides to make a bicycling trip.

Short-term Bicycle Parking

Short-term bicycle parking is intended for shoppers, customers, and other visitors who require bicycle storage and security for up to several hours. Short-term bicycle parking should serve at least the main entrance of a building and should be visible to pedestrians and bicyclists. Acceptable racks enable the bicyclist to lock the frame and one or both wheels with a user-provided U-lock or cable and support a bicycle by its frame in a stable upright position without damage to the bicycle or its finish.

In addition to the existing standards for bicycle parking in the Great Falls Municipal Code in 17.36.3.010-B (which are not included in the recommendations below, but are available in the Existing Conditions section), the City should consider adding the following as bicycle parking area design requirements:

1. If located outside, bicycle parking shall be located within 50 feet of each entrance to the building in a visible and obvious location to bicyclists. Bicycle parking should be permanently secured to a paved surface and be located such that it will not become buried by snow removal operations. Covered bicycle parking is recommended wherever possible.
2. Bicycle parking may be provided within a building, but the location must be easily accessible.
3. Bicycle racks and the area required for parking and maneuvering must meet the following standards:
    a. In covered situations the overhead clearance must be at least 7 feet.
    b. Each required bicycle parking space must be accessible without moving another bicycle.

c. Areas set aside for bicycle parking must be clearly marked and reserved for bicycle parking only.
d. At the same grade as the sidewalk or at a location that can be reached by an accessible route

"Inverted U" or "Staple" rack.

"Coat Hanger" rack.

"Post and Loop" rack.

Recommended Bike Racks

Rack Design

Rack design standards ensure that required bicycle racks are designed so that bicycles may be securely locked to them without undue inconvenience and will be reasonably safeguarded from accidental damage. In addition to the requirements outlined already in the Great Falls Municipal Code, bicycle racks must hold bicycles securely and meet the following criteria:

- Allow the frame and one wheel to be locked to the rack when both wheels are left on the bike
- Allow the frame and both wheels to be locked to the rack if the front wheel is removed
- Be usable by bikes with no kickstand
- Be usable by bikes with water bottle cages

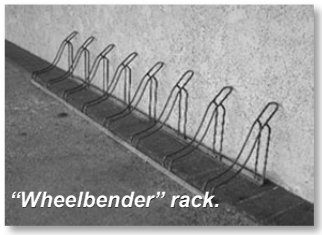
Recommended Racks

The following is based on guidance published by the Association of Pedestrian and Bicycle Professionals (APBP).

'Inverted U', or 'Staple' racks are typically secure to a concrete base and are very secure and easy to use.

'Coat Hanger' racks, if used properly, can support a bicycle at two points and can operate fixed to a concrete base or can be moved where needed.

'Post and Loop' or 'Lollypop' racks have many of the same characteristics as 'Inverted U' racks, but are more compact. They can be installed in series (shown) or along a curb line in the sidewalk furnishing zone.


"Wheelbender" rack.

"Comb" rack.

"Wave" rack.

Discouraged Bike Racks

Discouraged Racks

'Wheelbender' racks only support the wheel of the bicycle and can cause serious damage to the bicycle if twisted while secured in the rack. These racks also do not work with all types of locks.

'Comb' racks suffer from many of the same shortcomings as 'Wheelbender' type racks where only the front or rear wheel of the bicycle is supported. Many users of this rack type lift their bicycle over the top and rest the frame on the rack to allow use of a bicycle lock.

'Wave' racks require the cyclist to place their bicycle through the 'wave' pattern, where it is only supported at one point, in order to properly secure the bicycle. Bicycle parked in these racks are unstable and frequently tip over. Many cyclists park their bicycle sideways in this rack to gain stability, thereby reducing the capacity by 60-80 percent.

Bike Corrals (In-street Bicycle Parking)

This type of bicycle parking offers greater quantities of short-term bicycle parking (that would normally be placed on the sidewalk) in a consolidated space on the street occupying a traditional motor vehicle parking space. Bike corrals are commonly installed at locations that attract a high number of bicyclists and where parking bicycles at traditional short-term racks may crowd available sidewalk space. This approach is rapidly gaining popularity in the United States and in Montana (Missoula and Bozeman, pictured).

Example bike corral in Missoula, MT.

Before installing bike corrals, the responsible agency should determine how they will fit into snow removal and storage plans and street sweeping programs. The City may also delegate the installation and/or the maintenance of bike corrals to the BID or similar local, district-based associations.

Example bike corral in Bozeman, MT.

The bike corral parking area can be delineated or protected using poured concrete curbs, bollards, or planter boxes. Whichever type of delineation is chosen, corrals should be designed with the user in mind, allowing for ingress to and egress from the parking area and maintaining the same aisle and spacing standards desired for the short-term bicycle parking.

The benefits of bike corrals are not limited to the users themselves. Corrals can also provide, on average, a ratio of 8 to 12 customers to one parking space, and can focus more customers in targeted areas of downtowns or nearby businesses that tend to attract bicyclists.

Long-term Parking

Long-term bicycle facilities are intended for bicyclists who need to park a bicycle for extended periods during the day, overnight or for a longer duration. Long-term bicycle storage is typically designed for and used by employees, students, residents, and commuters. The facility also frequently protects the bicycle from inclement weather.

Example on-site parking in Seattle, WA.

These facilities may include:

1. **Lockers:** Fully enclosed, secure, and burglar-proof bicycle parking space accessible only to the owner or operator of the bicycle.
2. **Restricted Access Parking:** A location that provides short-term-style bicycle racks within a locked room or locked enclosure accessible only to the owners of bicycles parked within.
3. **Personal Storage:** Storage within the view of the bicycle owner either in his or her office or another secure location within the building.

Facilities that support the above types of long-term bicycle parking include additional end-of-trip facilities like showers and changing areas. It is recommended that the City of Great Falls create a long-term bicycle parking section of the bicycle parking ordinance that provides requirements for new or remodeled buildings, including minimum space standards that should be included in the design and engineering of the building. If a new or remodeled building does not meet the required long-term parking space requirements below, it shall be exempt from this section of the ordinance. An example of ordinance language for long term parking in new and renovated buildings is found in the San Francisco Planning Code, Sections 155.3 and 155.4 (see http://sfgov.org/planning/index.htm).

Downtown Great Falls Bicycle Parking Recommendations

Downtowns are a focal point for bicycle activity due to the high density of employment, restaurants and services. Downtowns are often under supplied in available motor vehicle parking, with many visitors unable to find parking in the immediate vicinity of their destination. Riding a bicycle downtown can offer many advantages to driving, including the ability to park a bicycle at the visitor's intended destination, and as a way to avoid parking fees at meters or in garages. Great Falls' downtown has a few bicycle racks, but there is not a dedicated program to ensure that these prime destinations have adequate accommodations for bicyclists. The 'Inverted U' or 'Post and Loop' rack type located parallel to the curb line in the sidewalk furnishing zone along with bicycle corrals at key locations are recommended.

Request-A-Rack

The City or the Downtown Association should maintain a supply of bicycle racks that can be installed at the request of an existing business owner such a supply will increase the supply of bicycle parking downtown and provide strategic expansion for bicycle parking and to mitigate bicycles locked to posts, signs, and trees.

Minimum Required Bicycle Parking Spaces Ordinance

It is proposed that the following be incorporated into City codes and ordinances (17.36.3.010). Cascade County should also incorporate the same bicycle parking requirements as stated below into existing zoning districts where commercial uses are permitted. Additionally, Cascade County should incorporate bicycle parking requirements into any proposed zoning districts or County-wide zoning efforts for commercial areas. Only those bicycle parking requirements pertaining to allowed uses for each zoning district should be included for that district.

Currently, the Great Falls Municipal Code lists land uses and number of bicycle parking spaces as recommended, with the language, "Bicycle parking *may* be provided consistent with the *recommended* standards contained in [this]…exhibit." The following land use categories and uses, as well as the short- and long-term bicycle parking spaces should be *required*. This ensures that bicyclists will be able to have predictable parking at their destinations.

At minimum, the number of spaces shown in **Table 9.16** should be considered.

Table 9.16: Recommended Minimum Required Bicycle Parking Spaces by Land Use

Use Categories	Specific Uses	Long-term spaces	Short-term spaces
Residential Categories			
Household Living	Multi-dwelling	1 per 4 units; or if no garage is available, 1 per unit	2, or 1 per 20 units
Group Living		2, or 1 per 20 residents	2, or 1 per 20 units
	Dormitory	1 per 8 residents	2, or 1 per 20 units
Commercial Categories			
Retail Sales and Service		2, or 1 per 12,000 sq. ft. of net building area	2, or 1 per 5,000 sq. ft. of net building area
	Temporary Lodging	2, or 1 per 20 rentable rooms	2, or 1 per 20 rentable rooms
Office		2, or 1 per 10,000 sq. ft. of net building area	2, or 1 per 40,000 sq. ft. of net building area
Commercial Parking		10, or 1 per 20 auto spaces	None
Commercial Outdoor Recreation		10, or 1 per 20 auto spaces	None
Major Event Entertainment		10, or 1 per 40 seats	2, or 1 per 40,000 sq. ft. of net building area
Industrial Categories			
Manufacturing and Production		2, or 1 per 15,000 sq. ft. of net building area	1 per 5,000 sq. ft. of floor space
Warehouse and Freight Movement		2, or 1 per 40,000 sq. ft. of net building area	1 per 20,000 sq. ft. of floor space
Institutional Categories			
Basic Utilities	Transit stations	8	None
Community Service		2, or 1 per 10,000 sq. ft. of net building area	2, or 1 per 10,000 sq. ft. of net building area
	Park and Ride	10, or 5 per acre	None
Parks and Open Areas		Per review	Per review
Schools	Elementary and/or Junior High	2 per classroom, or 1 per 5 students	2 near administrative offices
	Senior High or similar school	4 per classroom, or 1 per 10 students	2 near administrative offices
Colleges	Excluding dormitories (see Group Living, above)	2, or 1 per 20,000 sq. ft. of net building area, or per review	2, or 1 per 10,000 sq. ft. of net building area, or per review
Medical Centers		2, or 1 per 70,000 sq. ft. of net building area, or per review	2, or 1 per 40,000 sq. ft. of net building area, or per review
Religious Institutions		2, or 1 per 4,000 sq. ft. of net building area	2, or 1 per 2,000 sq. ft. of net building area
Daycare		2, or 1 per 10,000 sq. ft. of net building area	None
Other Categories			
Aviation and Surface Passenger Terminals, Detention Facilities		5 per terminal	None

Note: Wherever this table indicates two numerical standards, such as "2, or 1 per 3,000 sq. ft. of net building area," the larger number applies.

9.3.4.2. Education and Encouragement Program Recommendations

The following programs are designed to raise awareness of walking and bicycling; connecting users to existing and proposed resources; educating these users; and encouraging residents and visitors in the Great Falls area to walk and ride a bicycle more often. Many of the recommended programs can be administered or implemented by volunteer groups or non-profit organizations.

Bicycling Map

Target:	All bicyclists or potential bicyclists who are interested in knowing how and where to ride a bicycle.
Coordinating Agency and Partners:	City of Great Falls, Recreational Trails, Inc., Great Falls Bicycle Club, Chamber of Commerce, Cascade County.
Key Elements:	Clear symbology, designations, and services attractive for bicyclists. Use the map as a visual representation of bicycle infrastructure in the area and guide bicyclists, potential bicyclists, and visitors to designated bicycling routes, lanes, trails, paths, and related amenities. Update it regularly.
Time frame:	When coordinating agency and partners feel that the on- and off-street infrastructure network has developed to the point that it can and should be mapped; on-going.
Potential funding sources:	City of Great Falls; bike shops (in-kind donation); printers; active wellness, hospitals, and insurance companies; other sources of advertising; other revenue-generating sources to offset cost of printing and distribution.
Sample programs:	Salt Lake City: http://bikeslc.com/WheretoRide/PDF/SLC2013BikeMapWebsite.pdf

One of the most effective ways of encouraging people to bike is through the use of visual information on maps to show where existing or proposed infrastructure is located, communicate the ease of bicycling in Great Falls, and highlight recreational areas, popular destinations, and the area's trails system. The existing River's Edge Trail map, which is displayed and available for free at trail kiosks and in bike shops, provides excellent paved and unpaved trail information for the area. As the on-street bicycling network expands, a print and web version of an area-wide Great Falls bicycle map of on- and off-street bicycle facilities should be created not only to guide users and potential users, but also to provide a visual progress report from edition to edition. Maps should be available from the Chamber of Commerce, City Hall, bike shops, area hotels, and in kiosks along the River's Edge Trail.

Recreation and Bicycle Tourism

Target:	Recreational and touring bicyclists; out-of-town bicyclists
Coordinating Agency and Partners:	Great Falls Area Chamber of Commerce, City of Great Falls, Cascade County, Great Falls Bicycling Club, Recreational Trails, Inc., Adventure Bicycling Association, Get Fit Great Falls

Key Elements: Create and promote existing and future bicycling attractions and events (i.e. River's Edge Trail and mountain bike trails); encourage out-of-town bicyclists to visit, stay, recreate, and spend money

Time Frame: On-going

Potential Funding Sources: Chamber of Commerce; hotels associations; mountain biking organizations (local, state, and national); City of Great Falls; bike shops (in-kind donation)

Sample Programs: http://www.adventurecycling.org
http://www.warmshowers.org

Partnering with the Great Falls Area Chamber of Commerce, the Great Falls area can cater to and attract touring and recreational bicyclists. Great Falls has the opportunity to raise its profile as a recreational bicycling destination and as the home to a world class paved and unpaved trail system. A partnership of the City of Great Falls, the Great Falls Chamber of Commerce, Great Falls Bicycle Club, and Recreational Trails, Inc., can plan how to use their meetings, websites, and other promotional tools to market cycling to current and potential visitors. Additional strategies could include launching a branding and signage campaign; promoting routes to, from, and within Great Falls via the Adventure Cycling Association, a national bicycle tourism and recreational route organization; and organizing a signature event in Great Falls capitalizing on its trails and other attractions that would be inviting to bicyclists, spectators, and other users (similar to Helena's mountain biking events).

Bicycle Touring in Libby, MT

Media Campaign

Target: Motorists, bicyclists, and pedestrians

Coordinating Agency and Partners: Great Falls Area Chamber of Commerce, City of Great Falls, Cascade County, Great Falls Police Department, Get Fit Great Falls

Key Elements: Media outreach, enforcement, education through media

Time Frame: On-going, targeted between March and November

Potential Funding Sources: Local print, television, and digital news outlets; billboard companies; traffic safety foundations and grant programs

Sample Programs: Portland's "See & Be Seen" Campaign: http://www.portlandonline.com/transportation/index.cfm?&c=deibb&a=bebfjh
Pittsburgh's "Care" Campaign: http://bikepgh.org/care

People often do not walk or ride a bike because they don't know the rules of the road or where to walk or ride. A marketing campaign that highlights these elements, safety, other support programs, etc., is an important part of creating awareness of bicycling and walking in the Great Falls area. This type of high-profile campaign is an effective way to reach the general public, highlight bicycling and walking as viable forms of transportation, and reinforce safety for all road users. Campaigns are particularly effective when kicked off in conjunction with other bicycling/walking events, back to school in the fall, major community events, baseball games, or other related initiatives.

Tacoma, WA's media campaign.

Youth Bicycle Safety Education

Target:	Youth and elementary and secondary school-age students
Coordinating Agency and Partners:	Journey from Home Montana, Safe Routes to Schools, Great Falls Public Schools, City of Great Falls
Key Elements:	In-school or otherwise student and youth-focused instruction; safety; transportation mode choice
Time Frame:	On-going
Potential Funding Sources:	Federal and state safety grant funding; grants or other funding sources from the public school district; Department of Education
Sample Programs:	http://www.journeysfromhomemontana.org http://www.saferoutesinfo.org

Journey from Home Montana safety clinic.

The Journeys from Home Montana group (http://www.journeysfromhomemontana.org) provides children and youth with educational opportunities, classes, clinics, and rides to enable them to travel safely and predictably under their own power in their communities. Facilitators and administrators of this program are a multi-generational group of educators, designers, and filmmakers whose aim it is to prevent traffic-related childhood injury. Participating in the classes and services Journeys from Home Montana provides will allow the Great Falls area to benefit from state-wide knowledge and local expertise.

School-based bicycle education programs educate students about the rules of the road, proper use of bicycle equipment, biking skills, street crossing skills, and the benefits of biking. These types of education programs can be part of a Safe Routes to School program (for more information, visit http://www.saferoutesinfo.org), which are usually sponsored by a joint City/school district committee that includes appointed parents, teachers, student representatives, administrators, police, active bicyclists and engineering department staff. The program can be effectively administered by a non-profit or other third party bicycling, education, or safety-oriented organization.

9.3.4.3. Other Bicycling and Walking Recommendations

Data Collection and User Counts

Target:	n/a
Coordinating Agency and Partners:	City of Great Falls, Cascade County, Recreational Trails, Inc., Great Falls Bicycle Club, Get Fit Great Falls, PPL Montana
Key Elements:	Regular bicycle and pedestrian user counts and surveys at set locations to provide for evaluation over time.
Time Frame:	Annually
Potential Funding Sources:	General funds, private donations
Sample Programs:	National Bicycle & Pedestrian Documentation Project: http://www.bikepeddocumentation.org http://www.fhwa.dot.gov/environement/bikeped/study

Bicycle intercept survey and count.

Addressing the lack of existing bicycle and pedestrian count data and beginning data collection will help provide objective, data-driven support for the expansion of a bicycle and pedestrian network. Regularly documenting and assessing actual bicycle/pedestrian activity will help the City of Great Falls and Cascade County target investments where they are most beneficial and measure changes in rates of bicycling and walking over time. Bicycle and pedestrian user counts and surveys can be performed by trained volunteers and can require little, if any, supervision by City staff. In order to determine this Plan's success at increasing bicycling and walking rates, it is necessary to establish an annual data collection program. This program should tally the number of cyclists, pedestrians, and path users at key locations around the community (particularly at pinch points, in downtown, near schools, and on trails/paths); the same locations should be counted in the same manner annually or at standard times of the year to show changes in usage. If major non-motorized infrastructure projects (both public and private) are planned, baseline and post-construction user counts can be performed through this coordinated annual count process for maximum efficiency. Bozeman, Missoula, and Billings have all recently instituted counting programs using both manual volunteer-based counts and also automatic counters using various forms of detection.

A quality data-monitoring program can also help Great Falls obtain funding for new projects. Most grant programs require awardees to monitor the results of funded projects, including a baseline count and usage over time. Cities and counties with established bicycle and pedestrian monitoring programs have an advantage over others when pursuing funding, especially where they are able to suggest a relationship between rising activity levels and new investment(s) over a substantial period of time. Bozeman found in 2005 that adding bicycle lanes and sidewalks during a road retrofit increased bicycling and walking by a combined 258 percent. Subsequent observation over the 2011-2013 period has shown even more dramatic increases in bicycling. Data collection, including the collection of traffic speeds and volumes, crashes, compliance, weather conditions, or other factors (as the City of Great Falls and MDT already do) is also an essential tool for analyzing the success of any project, particularly projects that

employ innovative or new treatments. Great progress on area-wide counts has already made through some unique partnerships. For example, PPL Montana funding has allowed Pinnacle Research to collect user count data on the Rivers Edge Trail (RET) since 2007. The resulting data has been used for a variety of purposes. Most recently, the PPL Montana funded count information on RET has been used to bolster several grant applications for improvements to the RET.

It is recommended that the data collection program use methodology developed by the National Bicycle and Pedestrian Documentation project (http://www.bikepeddocumentation.org). In order to capitalize on moderate climate conditions, counts should be performed in the second week in September; one weekday count (from 5-7 PM on a Tuesday, Wednesday, or Thursday) and one Saturday count (12-2 PM) should be completed. Counters can be volunteers or agency staff, as long as proper training is provided. Procedures, answers to frequently asked question, forms, example, and more information in general are found on the website listed above.

By establishing and dedicating staff resources to a formal count program or initiative, Great Falls can begin to document progress on increasing walking and biking rates via a 'Report Card' and build community support and awareness for future projects.

Benchmarking Report

Target:	n/a
Coordinating Agency and Partners:	City of Great Falls, Cascade County, MDT
Key Elements:	Regular examination of key metrics to track trends in bicycling and walking over time.
Time Frame:	Annually or biannually
Potential Funding Sources:	General funds or grant funding for initial report, staff time to update at regular intervals
Sample Programs:	Minneapolis Bicycle Account: http://www.ci.minneapolis.mn.us/www/groups/public/@publicworks/documents/images/wcms1p-085029.pdf

A benchmarking report will be able to help guide the City of Great Falls as it moves towards improving conditions for non-motorized users by tracking and visualizing past investments and future investments at regular intervals. The document will be created in its first edition to establish baselines in non-motorized user counts, miles of facilities developed over time, crashes and other metrics that can be updated by the city on a regular basis. Such a document is helpful to maintain steady investment over time and to track the benefits of those investments.

9.4. TRANSIT PROJECTS

Public transportation services in the Great Falls area take the form of fixed-route passenger bus service operating on a scheduled service, and "demand-responsive" bus/van service providing door-to-door service for the elderly and those unable to use the fixed-route service. Public transit has been characterized in the Great Falls Area as a service for transit dependents. With one hour gaps between buses, loop routes that add time and inconvenience to bus travel, and lack of support facilities such as connecting sidewalks, bus pads, and stop amenities, service is minimal.

The 2014 LRTP Update envisions an integrated multimodal transportation system that meets sustainable growth expectations, supports economic vitality, and improves quality of life. To achieve this vision, transit must play a much greater role in providing travel choice within the Great Falls Area. This includes increased service frequency, longer service hours, and expanded coverage.

9.4.1. PLANNED COMMITTED IMPROVEMENTS

Due to extensive funding limitations, there are few “committed” projects on the horizon concerning transit. Transit District personnel have reiterated that due to limited funds, they are essentially in a survival mode. Although their recent TDP identified a number of short-term and long-term improvements, none have been implemented due to funding constraints.

Transit service requires a bus fleet and spares. If transit service is to be expanded over time to increase frequency and add coverage area, this fleet needs to expand. In order to be competitive, the buses need to be replaced when approximately 12 years old. With an aged fleet, there are several drawbacks that impact customer satisfaction. Vehicle reliability is not as good as a more modern fleet, leading to an increased number of road failures and service disruptions. Customers are not given the advantage of new technology, such as improvements in seating, accessibility, and comfort when older equipment is kept in service beyond its useful life. Associated with a larger fleet is the requirement for servicing these buses and an improved/expanded fleet facility

As of this writing of the LRTP Update, there is only one planned, committed improvement known for the transit system – the replacement of aging vehicles on their scheduled replacement cycle (see **Table 9.17**). There are currently 21 fixed-route vehicles and nine paratransit vehicles in the existing transit fleet (see **Table 4.8** and **Table 4.9**). Seven of the fixed-route buses are 19 years old and have exceeded their useful life, and another four are 11 years old. Although the TDP identified a handful of recommendations, inadequate funding for vehicles and additional drivers dictate that these items be placed on hold. These improvements are described in greater detail in the following section of this Chapter. Route changes coincident to these recommendations are as shown on **Figure 9.8**.

Fleet replacement on a designated four-year cycle is the most pressing transit need to continue successful operations. As the older vehicles are cycled out of the fleet, and a consistent replacement cycle is realized, GFT will turn attention to other recommendations in the TDP such as installation of bus stops, shelters and route service changes.

Table 9.17: Committed Transit Improvements

ID	Description	Year	Estimated Cost
GFTD-1 (committed)	Bus Purchase - replace 4 buses	2015	$ 1,500,000
GFTD-2 (recommended)	Bus Purchase - replace 4 buses	2019	$ 1,700,000
GFTD-3 (recommended)	Bus Purchase - replace 4 buses	2023	$ 1,900,000
GFTD-4 (recommended)	Bus Purchase - replace 4 buses	2027	$ 2,150,000
GFTD-5 (recommended)	Bus Purchase - replace 4 buses	2031	$ 2,400,000
GFTD-6 (recommended)	Bus Purchase - replace 4 buses	2035	$ 2,700,000

9.4.2. Recommended Improvements from TDP Update

The TDP prepared as a part of past planning efforts identified several service design needs and fixed stop considerations that were recommended for implementation. The Great Falls Transit District plans to eventually implement the recommendations below upon realization of improved funding mechanisms. The needs as identified are shown below:

Short-Term (1-3 Years)

A "preferred service plan" was chosen in conjunction with Great Falls Transit staff from the available transit service information and options in the TDP analysis. The preferred service seeks to provide a high level of quality service to residents of Great Falls at minimal additional cost. The TDP estimates the increase in cost to implement the preferred service plan to be $250,000. The additional costs are due to operating an additional vehicle all day (due to splitting Route 1) and the increased mileage on Route 7 (due to the decreased headway). The preferred service is presented in **Figure 9.7**.

As shown in the figure, Route 1 would be split into two segments—east and west. The east portion of the route will be referred to as Route 1, while the western portion will become Route 8. Splitting this route into two segments provides multiple benefits for the rider. Individuals would now have access to 9th Avenue South stops, which provide access to 10th Avenue South locations as well. In addition, users of Route 1 would have a shorter travel time to Benefis East from downtown.

Route 7 would also be altered to provide a more direct route to the Great Falls Marketplace, which will allow it to be on a 30-minute headway. The portion of Route 7 that was operating in the northwest portion of the city is being covered by Route 5. This change eliminates some of the duplication that was present in the previous service, while allowing for better headways on Route 7. The rest of the routes remain unchanged.

To implement the preferred service plan, an additional vehicle will be required and higher operational costs with an estimated amount of $250,000 may be realized.

Long-Term (4-5 Years)

A more long-term goal for Great Falls Transit is to provide evening service for passengers. Although providing Sunday service was a comment made during various surveys associated with the TDP, it is not a reasonable or feasible service change within the five-year horizon due to funding limitations and more pressing needs. Current service ends at approximately 6:30 PM, which is not late enough for some users. The option that was examined in the TDP report extends fixed-route service 30 minutes (until 7:00 PM) and provides demand-responsive service thereafter. Providing evening service in this manner will allow Great Falls Transit to provide evening service in a cost-effective way, as the demand will likely not be

substantial during the onset of service extension. The estimated cost to extend service until 7:00 PM, with demand-responsive service thereafter until 10:00 PM, is $164,000. Four vehicles are likely needed to provide this service during the time span. As the service is demand-responsive, the number of vehicles required can be changed fairly easily to match the demand of the general public. This cost estimate includes extending the fixed-route service 30 minutes as well as providing three hours of general public demand-response service. While this option is listed in the implementation plan as beginning in four to five years, it is contingent on funding increases and seen as a long-term goal, compared to the route reconfigurations mentioned above under “short-term” goals.

To extend fixed-route service an additional 30 minutes, and provide demand-responsive service thereafter until 10 PM, four vehicles will need to be allocated to the extension, with an overall estimated operational cost of $164,000.

Service Schedules

The overall service concept of the system remains the same. Headways are generally at one hour during off-peak periods (with the exception of Route 7 that will be 30 minutes all day) and 30 minutes during peak periods. New schedules are identified for Route 5, Route 7, Route 1, and Route 8. Note that daily boardings for GFTD were analyzed in the TDP by various times of the day by route to identify “peak periods”. The total boardings were broken down by time period and route, and the percentage of total boardings for various time periods and routes were calculated. The number of passengers by time period determines the boarding patterns during various times of the day, which helps determine peak load times, peak-hour vehicle allocations, and schedules. The following information was determined from the analysis for four time periods:

- Prior to 9 AM 18.4% of total boardings
- 9 AM – Noon 21.2% of total boardings
- Noon – 3 PM 28.0% of total boardings
- After 3 PM 32.5% of total boardings

Routes that are maintaining their current alignment also have a minor schedule change. The current schedules provide for a 15-minute break in the middle of the day to ensure that afternoon schedules better align with passenger needs and to give drivers a lunch break. These 15-minute breaks occur at the outbound terminus of each route. Because the service gap occurs on the outbound portion of the route, many riders must wait for 15 minutes at Noon’s, the Twilite Center, or Great Falls Marketplace. By making a minor change to the schedule and allowing for that break to occur at the downtown transfer center, passengers will have access to the transfer facility and downtown amenities during this break.

Great Falls Transit should coordinate with the local schools to ensure that students are able to use transit for travel to and from school. This may require minor changes to the proposed schedules or adjustments to school start and stop times.

Fixed Stops

Great Falls Transit currently uses a flag stop system for their fixed-route service. Buses will stop at any safe location along a route, preferably near an intersection. While this service provides a great deal of flexibility for the rider, it can be confusing for new or infrequent users to determine where a potential stop may be. The amount of current ridership being experienced by Great Falls Transit is conducive to creating fixed stops for service. Boarding and alighting data show users boarding in primary locations throughout the core service area. The creation of fixed stops will still allow users to board at convenient locations, if they are placed properly.

The addition of fixed stops will allow Great Falls Transit to have greater visibility to the passenger. Knowing that standing at a designated location will result in a transit vehicle passing by provides reassurance to riders, especially those that may be unfamiliar with the system. This may also reduce some of the confusion that is associated with benches currently located throughout the city that are not affiliated with Great Falls Transit.

Bus stops should be placed at least every 1,000 feet, which equates to roughly each two blocks. Boarding and alighting data can be used to help determine the best potential locations for stops. All attempts should be made to place bus stop signs in the most accessible locations for passengers.

In addition to including fixed bus stops, shelters should be placed at the locations with the highest amount of activity. Great Falls Transit currently provides shelters at a few locations that denote transit stops. Placing shelters at popular boarding locations such as Benefis West, Benefis East, Westwood Shopping Center, and Walmart gives passengers better protection from the elements and once again provides Great Falls Transit with greater visibility.

The potential costs to realize fixed stops and shelters at high activity locations range from a potential year one cost of approximately $50,000 (assumes adding five shelters in year one) to $20,000 for years two through five (assumes two new shelters per year).

Development Review

As Great Falls continues to grow at the fringe, newly developed areas should be evaluated for transit need. Great Falls Transit should have a presence in the development review process for the city. This will allow future projects to be considered by Great Falls Transit and for their transit need to be determined. Great Falls Transit would then have the ability to discuss the feasibility of providing transit to a development during the planning stages. Great Falls Transit would also have firsthand knowledge of planned developments so that service changes can be considered and evaluated well before the development is completed.

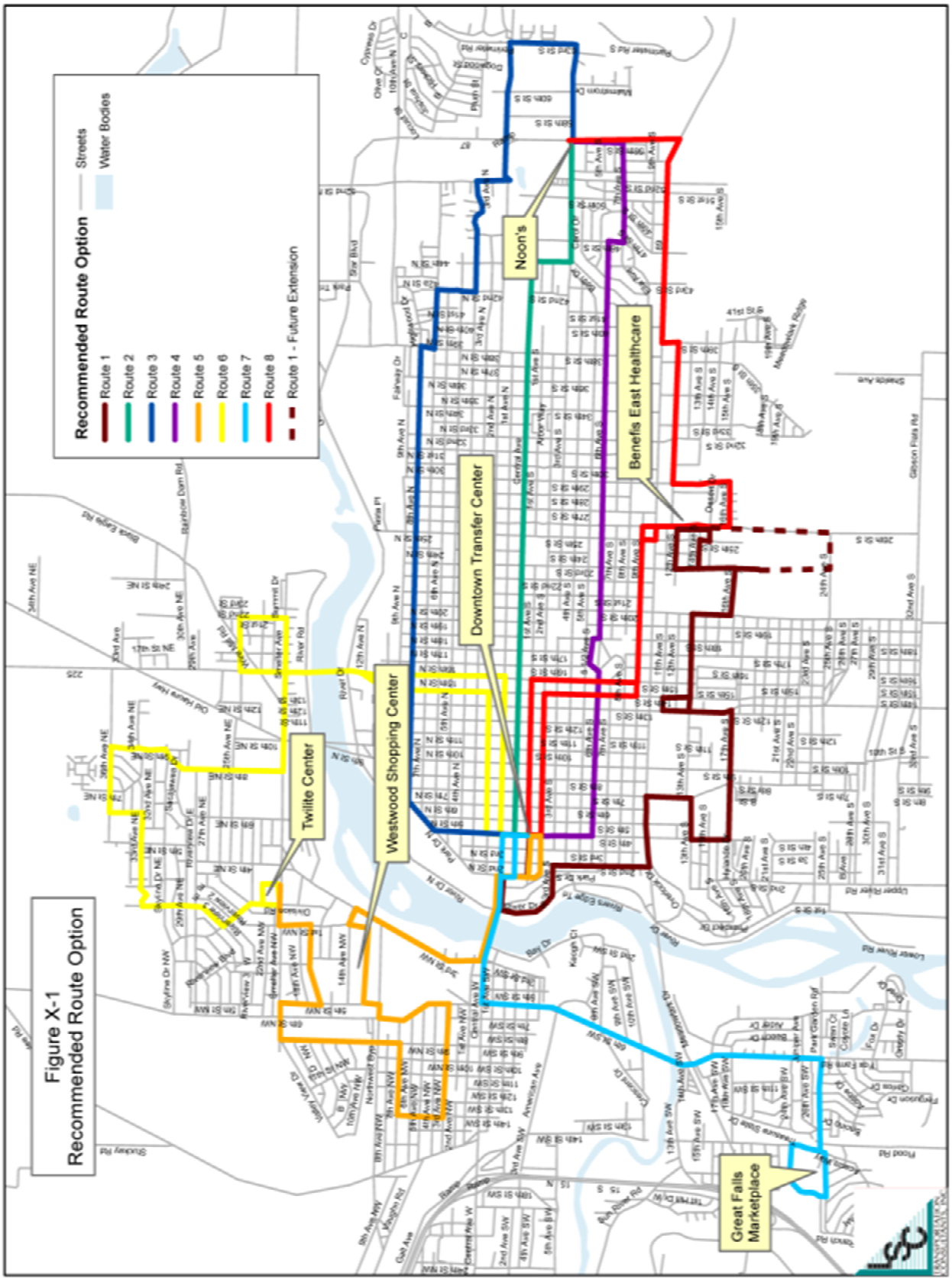


Figure 9.7: Recommended Transit Route Options

10.0
Financial Plan and Fiscal Constraint

10.1. FINANCIAL PLAN

Transportation improvements can be implemented using Federal, State, local and private funding sources. Historically, Federal and State funding programs have been used almost exclusively to construct and upgrade the major roads in the Great Falls area. Considering the current funding limits of these traditional programs, and the extensive list of recommended road projects, it is apparent that more funding will be required from local and private sources if all of the transportation network needs are to be met.

This Chapter discusses the financial plan for the 2014 LRTP, projected out to the year 2035. Federal legislation requires that the LRTP be "fiscally constrained"; in other words, the cost of implementing and maintaining transportation improvements should be within a funding amount that can reasonably be expected to be available during the life of the plan.

Federal regulations establish the requirements for the financial plan in Title 23, Section 450.322(f)(10), of the Code of Federal Regulations. To summarize, the regulations (effective December 2007) state that the financial plan should include the following:

- Estimates of costs and revenue sources needed to operate and maintain federal-aid highways and public transportation.
- Estimates of funds that will be available to support the LRTP implementation and that are agreed upon by the MPO, public transportation operator(s), and the state.
- Recommendations on any additional financing strategies to fund projects and programs included in the LRTP.
- Cost estimates that use an inflation rate to reflect "year of expenditure dollars" and that have been developed cooperatively by the MPO, state, and public transportation operator.

Funding to implement the LRTP recommendations comes from federal, state, and local sources. This financial element of the LRTP includes estimates of costs that would be required to implement the LRTP as well as estimates of existing and contemplated sources of funds available to pay for these improvements.

Much of the following information concerning the Federal and State funding programs was assembled with the assistance of the Statewide and Urban Planning Section of MDT. The intent was to identify traditional Federal, State and local sources of funds for transportation related projects and programs in the Great Falls area. A narrative description of each potential funding source is provided, including: the source of revenue; required match; purpose for which funds are intended; means by which the funds are distributed; and the agency or jurisdiction responsible for establishing priorities for use of the funds.

10.1.1. Overview of Traditional Funding Sources

MDT administers a number of programs that are funded from State and Federal sources. Each year, in accordance with 60-2-127, Montana Code Annotated (MCA), the Montana Transportation Commission allocates a portion of available Federal-aid highway funds for construction purposes and for projects located on the various systems in the state as described throughout this chapter.

The following list includes Federal and State funding sources developed for the distribution of Federal and State transportation funding. This includes Federal funds the State receives under the Moving Ahead for Progress in the 21st Century Act (MAP-21). The list also includes local funding sources available through the city and county, as well as private sources. It should be understood that other funding sources are possible, but those listed below reflect the most probable sources at this time. A narrative description of each source is provided in the following sections of this Chapter.

Federal Funding Sources

- NHPP - National Highway Performance Program
  - Interstate Maintenance
  - National Highway
  - Bridge
- STP - Surface Transportation Program
  - STPP – Primary Highway System
  - STPS – Secondary Highway System
  - STPU – Urban Highway System
  - STP – Bridge Program
  - STPX – Surface Transportation Program for Other Routes (Off-system)
  - UPP – Urban Pavement Preservation Program
- HSIP – Highway Safety Improvement Program
- CMAQ – Congestion Mitigation & Air Quality Improvement Program
  - CMAQ - Formula
  - Montana Air & Congestion Initiative (MACI) – Guaranteed Program
  - Montana Air & Congestion Initiative (MACI) - Discretionary Program
- TA – Transportation Alternatives Program
- FLAP – Federal Lands Highway Program
- Congressionally Directed Funds
- Transit Capital & Operating Assistance Funding
  - FTA Section 5339 (Bus and Bus Facilities)
  - FTA Section 5310 (Enhanced Mobility of Seniors and Individuals with Disabilities
  - FTA Section 5307 (Urbanized Area Formula Grants)

State Funding Sources

- State Fuel Tax Funds - City and County
- State Funds for Transit Subsidies
- State Special Revenue/State Funded Construction
- TransADE
- Rail/Loan Funds

Local Funding Sources

- City Funds

- County Funds
- Private Funding Sources
- Future Potential Funding Sources

10.1.2. Federal Funding Sources

The following summary of major Federal transportation funding categories received by the State through Titles 23-49 U.S.C., including state developed implementation/sub-programs that may be potential sources for projects. In order to receive project funding under these programs, projects must be included in the State Transportation Improvement Program (STIP) and the MPO TIP, where relevant.

10.1.2.1. National Highway Performance Program (NHPP)

The National Highway Performance Program (NHPP) provides funding for the National Highway System, including the Interstate System and National Highways system roads and bridges. The purpose of the National Highway System (NHS) is to provide an interconnected system of principal arterial routes which will serve major population centers, international border crossings, intermodal transportation facilities and other major travel destinations; meet national defense requirement; and serve interstate and interregional travel. The National Highway System includes all Interstate routes, a large percentage of urban and rural principal arterials, the defense strategic highway network, and strategic highway connectors.

Allocations and Matching Requirements: NHPP funds are Federally-apportioned to Montana and allocated to Districts by the Montana Transportation Commission. Based on system performance, the funds are allocated to three programs:

10.1.2.1.1 Interstate Maintenance

Interstate Maintenance (IM) funds are Federally-apportioned to Montana and allocated based on system performance by the Montana Transportation Commission. The Commission approves and awards projects for improvements on the Interstate Highway System which are let through a competitive bidding process. The Federal share for IM projects is 91.24% and the State is responsible for 8.76%.

10.1.2.1.2 National Highway

The Federal share for non-Interstate NHS projects is 86.58% and the State is responsible for the remaining 13.42%. The State share is funded through the Highway State Special Revenue Account.

Eligibility and Planning Considerations: Activities eligible for the National Highway System funding include construction, reconstruction, resurfacing, restoration, and rehabilitation of segments of the NHS roadway; construction, replacement, rehabilitation, preservation and protection of bridges on the National Highway System; and projects or part of a program supporting national goals for improving infrastructure condition, safety, mobility, or freight movements on the National Highway System. Operational improvements as well as highway safety improvements are also eligible. Other miscellaneous activities that may qualify for NHS funding include bikeways and pedestrian walkways, environmental mitigation, restoration and pollution control, infrastructure based intelligent transportation systems, traffic and traveler monitoring and control, and construction of intra or inter-city bus terminals serving the National Highway System. The Transportation Commission establishes priorities for the use of National Highway Performance Program funds and projects are let through a competitive bidding process.

The Great Falls District, is anticipated to receive an average of about $35 million annually of NHPP funds during the next five years. Current Great Falls District priorities already under development total an estimated construction cost of $56.91 million. Given the estimated range of planning level costs, NHPP funding for improvements is highly unlikely over the short term, but may be available toward the end of the planning horizon depending on the other NHS needs within the Great Falls District.

10.1.2.1.3 NHPP Bridge

Federal and state funds under this program are used to finance bridge inspection, improvement, and replacement projects on Interstate and non-Interstate National Highway System routes. NHPB program funding is established at the discretion of the state. However, Title 23 U.S.C. establishes minimum standards for NHS bridge conditions. If more than 10% of the total deck area of NHS bridges in a state is on structurally deficient bridges for three consecutive years, the state must direct NHPB funds equal to 50% of the state's FY 2009 Highway Bridge Program to improve bridges each year until the state's NHS bridge condition meets the minimum standard.

10.1.2.2. Surface Transportation Program (STP)

Surface Transportation Program (STP) funds are Federally-apportioned to Montana and allocated by the Montana Transportation Commission to various programs including the Surface Transportation Program Primary Highways (STPP)*, Surface Transportation Program Secondary Highways (STPS)* and the Surface Transportation Program Urban Highways (STPU).* The Federal share for these projects is 86.58% with the non-Federal share typically funded through Highway State Special Revenue (HSSR).

10.1.2.2.1 Primary Highway System (STPP)*

The Federal and State funds available under this program are used to finance transportation projects on the state-designated Primary Highway System. The Primary Highway System includes highways that have been functionally classified by MDT as either principal or minor arterials and that have been selected by the Montana Transportation Commission to be placed on the primary highway system [MCA 60-2-125(3)].

Allocations and Matching Requirements: Primary funds are distributed statewide (MCA 60-3-205) to each of five financial districts. The Commission distributes STPP funding based on system performance. Of the total received, 86.58% is Federal and 13.42% is State funds from the Highway State Special Revenue Account.

Eligibility and Planning Considerations: STP Primary funds are eligible for a wide range of transportation improvement projects and activities, ranging from roadway reconstruction and rehabilitation, to bridge construction and inspection, to highway and transit safety infrastructure, environmental mitigation, carpooling, and bicycle and pedestrian transportation facilities.

10.1.2.2.2 Secondary Highway System (STPS)*

The Federal and State funds available under this program are used to finance transportation projects on the state-designated Secondary Highway System. The Secondary Highway System includes any highway that is not classified as a local route or rural minor collector and that has been selected by the Montana Transportation Commission to be placed on the Secondary Highway System. Funding is distributed by formula and is utilized to resurface, rehabilitate and reconstruct roadways and bridges on the Secondary System.

Allocations and Matching Requirements: Secondary funds are distributed statewide (MCA 60-3-206) to each of five financial districts, based on a formula, which takes into account the land area, population, road mileage and bridge square footage. Federal funds for secondary highways must be matched by non-Federal funds. Of the total received 86.58% is Federal and 13.42 % is non-Federal match. Normally, the match on these funds is from the Highway State Special Revenue Account.

Eligibility and Planning Considerations: Eligible activities for the use of Secondary funds fall under three major types of improvements: Reconstruction, Rehabilitation, and Pavement Preservation. The Reconstruction and Rehabilitation categories are allocated a minimum of 65% of the program funds with the remaining 35% dedicated to Pavement Preservation. Secondary funds can also be used for any project that is eligible for STP under Title 23, U.S.C. Priorities are identified in consultation with the appropriate local government authorizes and approved by the Montana Transportation Commission.

10.1.2.2.3 Urban Highway System (STPU)*

The Federal and state funds available under this program are used to finance transportation projects on Montana's Urban Highway System, as per MCA 60-3-211. STPU allocations are based on a per capita distribution and are recalculated each decade following the census. STPU funds are primarily used for resurfacing, rehabilitation or reconstruction of existing facilities; operational improvements; bicycle facilities; pedestrian walkways and carpool projects.

Allocations and Matching Requirements: State law guides the allocation of Urban funds to projects on the Urban Highway System in Montana's urban areas (population of 5,000 or greater) through a statutory formula based on each area's population compared to the total population in all urban areas. Of the total received, 86.58% is Federal and 13.42% is non-Federal match typically provided from the Special State Revenue Account for highway projects.

Montana's urban areas are as follows:

- Anaconda
- Belgrade
- Billings
- Bozeman
- Butte
- Columbia Falls
- Glendive
- Great Falls
- Hamilton
- Havre
- Helena
- Kalispell
- Laurel
- Lewistown
- Livingston
- Miles City
- Missoula
- Sidney
- Whitefish

Eligibility and Planning Considerations: Urban funds are used primarily for major street construction, reconstruction, and traffic operation projects on the 430 miles on the State-designated Urban Highway System, but can also be used for any project that is eligible for STP under Title 23 U.S. C. Priorities for the use of Urban funds are established at the local level through local planning processes with final approval by the Transportation Commission.

10.1.2.2.4 Bridge Program (STP)

The Federal and state funds available under this program are used to finance bridge projects for on-system and off-system routes in Montana. Title 23 U.S.C. requires that a minimum amount (equal to 15 percent of Montana's 2009 Federal Bridge Program apportionment) be set aside for off-system bridge projects. The remainder of the Bridge Program funding is established at the discretion of the state. Bridge Program funds are primarily used for bridge rehabilitation or

reconstruction activities on Primary, Secondary, Urban or off-system routes. Projects are identified based on bridge condition and performance metrics.

10.1.2.2.5 Surface Transportation Program for Other Routes - Off-system (STPX)

The Federal and state funds available under this program are used to finance transportation projects on state-maintained highways (or in other areas) that are not located on a defined highway system.

10.1.2.2.6 Urban Pavement Preservation Program (UPP)*

The Urban Pavement Preservation Program (UPP) is a sub-allocation of the larger Surface Transportation Program that provides funding to urban areas with qualifying Pavement Management Systems (as determined jointly by MDT and FHWA). This sub-allocation is approved annually by the Transportation Commission and provides opportunities for pavement preservation work on urban routes (based on system needs identified by the local Pavement Management Systems).

The Montana Transportation Commission establishes priorities for the use of STP funds and projects are

**State funding programs developed to distribute Federal funding within Montana*

10.1.2.3. Highway Safety Improvement Program

HSIP funds are apportioned to Montana for allocation to safety improvement projects approved by the Commission and are consistent with the strategic highway safety improvement plan. Projects described in the State strategic highway safety plan must correct or improve a hazardous road location or feature, or address a highway safety problem. The Commission approves and awards the projects which are let through a competitive bidding process. Generally, the Federal share for the HSIP projects is 90% with the non-Federal share typically funded through the HSSR account.

10.1.2.4. Congestion Mitigation and Air Quality Improvement Program (CMAQ)

Federal funds available under this program are used to finance transportation projects and programs to help improve air quality and meet the requirements of the Clean Air Act. Montana's air pollution problems are attributed to carbon monoxide (CO) and particulate matter (PM10 and PM2.5).

Allocations and Matching Requirements: CMAQ funds are Federally-apportioned to Montana and allocated to various eligible programs by formula and by the Commission. As a minimum apportionment state a Federally-required distribution of CMAQ funds goes to projects in Missoula since it was Montana's only designated and classified air quality non-attainment area. The remaining, non-formula funds, referred to as "flexible CMAQ" is primarily directed to areas of the state with emerging air quality issues through various state programs. The Transportation Commission approves and awards both formula and non-formula projects on MDT right-of-way. Infrastructure and capital equipment projects are let through a competitive bidding process. Of the total funding received, 86.58% is Federal and 13.42% is non-Federal match provided by the state for projects on state highways and local governments for local projects.

Eligibility and Planning Considerations: In general, eligible activities include transit improvements, traffic signal synchronization, bicycle pedestrian projects, intersection improvements, travel demand

management strategies, traffic flow improvements, air quality equipment purchases, and public fleet conversions to cleaner fuels. At the project level, the use of CMAQ funds is not constrained to a particular system (i.e. Primary, Urban, and NHS). A requirement for the use of these funds is the estimation of the reduction in pollutants resulting from implementing the program/project. These estimates are reported yearly to FHWA.

- *CMAQ (formula)*
  Mandatory CMAQ funds that come to Montana based on a Federal formula and are directed to Missoula, Montana's only classified, moderate CO non-attainment area. Not applicable to Whitefish. Projects are prioritized through the Missoula Metropolitan planning process.

- *Montana Air & Congestion Initiative (MACI)–Guaranteed Program (flexible)**
  This is state program funded with flexible CMAQ funds that the Commission allocates annually to Billings and Great Falls to address carbon monoxide issues in these designated, but "not classified", CO non-attainment areas. The air quality in these cities is roughly equivalent to Missoula, however, since these cities are "not classified" so they do not get direct funding through the Federal formula. Projects are prioritized through the respective Billings and Great Falls Metropolitan planning processes.

- *Montana Air & Congestion Initiative (MACI)–Discretionary Program (flexible)**
  The MACI – Discretionary Program provides funding for projects in areas designated non-attainment or recognized as being "high-risk" for becoming non-attainment. Since 1998, MDT has used MACI-Discretionary funds to get ahead of the curve for CO and PM10 problems in non-attainment and high-risk communities across Montana. District Administrators and local governments nominate projects cooperatively. Projects are prioritized and selected based on air quality benefits and other factors. The most beneficial projects to address these pollutants have been sweepers and flushers, intersection improvements and signal synchronization projects.

10.1.2.5. Transportation Alternatives Program

The Transportation Alternatives Program (TA) requires MDT to obligate 50% of the funds within the state based on population, using a competitive process, while the other 50% may be obligated in any area of the state. The Federal share for these projects is 86.58, with the non-Federal share funded by the project sponsor through the HSSR.

Funds may be obligated for projects submitted by:

- Local governments
- Transit agencies
- Natural resource or public land agencies
- School district, schools, or local education authority
- Tribal governments
- Other local government entities with responsibility for recreational trails for eligible use of these funds.

Eligibility and Planning Considerations: Eligible categories include:

- On-road and off-road trail facilities for pedestrians and bicyclists, including ADA improvements;
- Historic Preservation and rehabilitation of transportation facilities;
- Archeological activities relating to impacts for a transportation project;

- Any environmental mitigation activity, including prevention and abatement to address highway related stormwater runoff and to reduce vehicle/animal collisions including habitat connectivity;
- Turnouts, overlooks, and viewing areas;
- Conversion/use of abandoned railroad corridors for trails for non-motorized users;
- Inventory, control, and removal of outdoor advertising;
- Vegetation management in transportation right of way for safety, erosion control, and controlling invasive species;
- Construction, maintenance, and restoration of trails and development and rehabilitation of trailside and trailhead facilities;
- Development and dissemination of publications and operation of trail safety and trail environmental protection programs;
- Educations funds for publications, monitoring, and patrol programs and for trail-related training;
- Planning, design, and construction of projects that will substantially improve the ability of students to walk and bicycle to school; and
- Non-infrastructure-related activities to encourage walking and bicycling to school, including public awareness campaigns, outreach to press and community leaders, traffic education and enforcement school vicinities, student sessions on bicycle and pedestrian safety, health, and environment, and funding for training.

Competitive Process: The State and any Metropolitan Planning Organizations required to obligate Transportation Alternative funds must develop a competitive process to allow eligible applicants an opportunity to submit projects for funding. MDT's process emphasizes safety, ADA, relationships to State and community planning efforts, existing community facilities, and project readiness.

10.1.2.6. Federal Lands Highway Program (FLAP)

The Federal Lands Access Program was created by the "Moving Ahead for Progress in the 21st Century Act" (MAP-21) to improve access to Federal lands. Western Federal Lands administers the funds, not MDT. However, MDT is an eligible applicant for the funds.

The program is directed towards Public Highways, Roads, Bridges, Trails, and Transit systems that are under State, county, town, township, tribal, municipal, or local government jurisdiction or maintenance and provide access to Federal lands. The Federal lands access program funds improvements to transportation facilities that provide access to, are adjacent to, or are located within Federal lands. The program supplements State and local resources for public roads, transit systems, and other transportation facilities, with an emphasis on high-use recreation sites and economic generators. Program funds are subject to the overall Federal-aid obligation limitation. Funds are allocated among the states using a statutory formula based on road mileage, number of bridges, land area, and visitation.

Eligibility and Planning Considerations: The following activities are eligible for consideration on Federal Lands Access Transportation Facilities:

1. Preventive maintenance, rehabilitation, restoration, construction and reconstruction
2. Adjacent vehicular parking areas
3. Acquisition of necessary scenic easements and scenic or historic sites
4. Provisions for pedestrian and bicycles
5. Environmental mitigation in or adjacent to Federal land to improve public safety and reduce vehicle-wildlife mortality while maintaining habitat connectivity
6. Construction and reconstruction of roadside rest areas, including sanitary and water facilities.

7. Operation and maintenance of transit facilities

Proposed projects must be located on a public highway, road, bridge, trail or transit system that is located on, is adjacent to, or provides access to Federal lands for which title or maintenance responsibility is vested in a State, county, town, township, tribal, municipal, or local government.

Allocation and Matching Requirements: Projects are funded in Montana to the ratio of 87.58% federal funds and 13.42% non-federal matching funds. Funding is authorized and allocated for each state under USC, Title 23, Chapter 2, MAP-21, Division A, Title I, Subtitle A, Section 1119 distribution formula.

10.1.2.7. Congressionally Directed Funds

Congressionally Directed funds may be received through either highway program authorization or annual appropriations processes. These funds are generally described as "demonstration" or "earmark" funds. Discretionary funds are typically awarded through a Federal application process or Congressional direction. If a local sponsored project receives these types of funds, MDT will administer the funds in accordance with the Montana Transportation Commission Policy #5 – "*Policy resolution regarding Congressionally directed funding: including Demonstration Projects, High Priority Projects, and Project Earmarks.*"

10.1.2.8. Transit Capital and Operating Assistance Funding

The Federal Transit Administration and MDT Transit Section provide federal and state funding to eligible recipients through federal and state programs. Federal funding is provided through the Section 5310 and Section 5307 transit programs and state funding is provided through the TransADE program. The new highway bill MAP-21 incorporated the JARC and New Freedoms Programs into the Section 5307 and 5310 programs, respectively. It also created a new bus and bus facilities discretionary formula program (Section 5339) for fixed route bus operators. All projects funded must be derived from a locally developed, coordinated public transit-human services transportation plan (a "coordinated plan").

The coordinated plan must be developed through a process that includes representatives of public, private, and nonprofit transportation and human service providers and participation from the public.

10.1.2.8.1 Bus and Bus Facilities (Section 5339)

This program provides capital funding to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities. Federal funds pay 80 percent of capital costs. The remaining 20 percent must come from the local recipient. Funds are eligible to be transferred by the state to supplement urban and rural formula grant programs (5307 and 5311, respectively).

10.1.2.8.2 Enhanced Mobility of Seniors and Individuals with Disabilities (Section 5310)

Authorizes capital grants to eligible organizations to assist in providing transportation for the elderly and/or persons with disabilities. Federal Transit Administration (FTA) funds 80 percent of all costs for equipment, with 20 percent match provided by the local recipient. Eligible recipients for this program are private, nonprofit organizations; public bodies approved by the State to coordinate services for elderly persons and persons with disabilities; or public bodies which certify to the Governor that no nonprofit organization is readily available in a service area to provide this transportation service. Ten percent of the state's Section 5310 apportionment can be used to administer the program, to plan, and to provide technical assistance.

10.1.2.8.3 Urbanized Area Formula Grants (Section 5307)

This program constitutes a core investment in the enhancement and revitalization of public transportation systems in the nation's urbanized areas, which depend on public transportation to improve mobility and reduce congestion. Federal funds pay 80 percent of capital costs and 50 percent of deficit operating costs. The remaining 20 and 50 percent respectively must come from the local recipient. FTA apportions funds to designated recipients, which then suballocate funds to state and local governmental authorities, including public transportation providers.

10.1.3. State Funding Sources

10.1.3.1. State Fuel Tax

The State of Montana assesses a tax of $0.2775 per gallon on gasoline and diesel fuel used for transportation purposes. According to State law, each incorporated city and town within the State receives an allocation of the total tax funds based upon:

1. the ratio of the population within each city and town to the total population in all cities and towns in the State, and
2. the ratio of the street mileage within each city and town to the total street mileage in all incorporated cities and towns in the State. (The street mileage is exclusive of the Federal-Aid Interstate and Primary Systems.)

State law also establishes that each county be allocated a percentage of the total tax funds based upon:

1. the ratio of the rural population of each county to the total rural population in the state, excluding the population of all incorporated cities or towns within the county and State;
2. the ratio of the rural road mileage in each county to the total rural road mileage in the State, less the certified mileage of all cities or towns within the county and State; and
3. the ratio of the land area in each county to the total land area of the State.

For State Fiscal Year 2014, the City of Great Falls will receive $993,168 and Cascade County will receive $200,917 in State fuel tax funds. The amount varies annually, but the current level provides a reasonable base for projection throughout the planning period.

All fuel tax funds allocated to the city and county governments must be used for the construction, reconstruction, maintenance, and repair of rural roads or city streets and alleys. The funds may also be used for the share that the city or county might otherwise expend for proportionate matching of Federal funds allocated for the construction of roads or streets that are part of the primary, secondary or urban system. Priorities for the use of these funds are established by each recipient jurisdiction.

10.1.3.2. State Funds for Transit Subsidies

The 46th Montana Legislature amended Section 7-14-102 MCA providing funds to offset up to 50 percent of the expenditures of a municipality or urban transportation district for public transportation. The allocation to operators of transit systems is based on the ratio of its local support for public transportation to the total financial support for all general purpose transportation systems in the State. Local support is defined as:

$$\text{Local Support} = \frac{\text{Expenditure for public transportation operations}}{\text{Mill value of City or urban transportation district}}$$

10.1.3.3. State Special Revenue/State Funded Construction

Allocations and Matching Requirements: The State Funded Construction Program, which is funded entirely with state funds from the Highway State Special Revenue Account, provides funding for projects that are not eligible for Federal funds. This program is totally State funded, requiring no match.

Eligibility and Planning Considerations: This program funds projects to preserve the condition and extend the service life of highways. Eligibility requirements are that the highways be maintained by the State. MDT staff nominates the projects based on pavement preservation needs. The District's establish priorities and the Transportation Commission approves the program.

10.1.3.4. TransADE

The TransADE grant program offers operating assistance to eligible organizations providing transportation to the elderly and persons with disabilities.

Allocations and Matching Requirements: This is a state funding program within Montana statute. State funds pay 54.11 percent of deficit operating costs, 80 percent of administrative costs, and 80 percent of maintenance costs. The remaining 45.89, 20, and 20 percent respectively must come from the local recipient. Applicants are also eligible to use this funding as match for the Federal transit grant programs.

Eligibility and Planning Considerations: Eligible recipients of this funding are counties, incorporated cities and towns, transportation districts, or non-profit organizations. Applications are due to the MDT Transit Section by the first working day of March each year. To receive this funding the applicant is required by state law (MCA 7-14-112) to develop a strong, coordinated system in their community and/or service area.

10.1.3.5. Rail/Loan Funds

Administration and Matching Requirements: The Montana Rail Freight Loan Program (MRFL) is a revolving loan fund administered by the Montana Department of Transportation to encourage projects for construction, reconstruction, or rehabilitation of railroads and related facilities in the State and implements MCA 60-11-113 to MCA 60-11-115. Loans are targeted to rehabilitation and improvement of railroads and their attendant facilities, including sidings, yards, buildings, and intermodal facilities. Rehabilitation and improvement assistance projects require a 30 percent loan-to value match. Facility construction assistance projects require a 50 percent match.

Eligibility and Planning Consideration: Eligible applicants for loans under the program include railroads, cities, counties, companies, and regional rail authorities. Port authorities may also qualify, provided they have been included in the state transportation planning process. Projects must be integrally related to the railroad transportation system in the State and demonstrate that they will preserve and enhance cost-effective rail service to Montana communities and businesses.

10.1.4. Local Funding Sources

Local governments generate revenue through a variety of funding mechanisms. Typically, several local programs related to transportation exist for budgeting purposes and to disperse revenues. These programs are tailored to fulfill specific transportation functions or provide particular services. The following text summarizes programs that are or could be used to finance transportation improvements by the city and county.

10.1.4.1. City of Great Falls

Special Revenue Funds
These funds are used to budget and distribute revenues that are legally restricted for a specific purpose. Several such funds that benefit the transportation system are discussed briefly in the following paragraphs.

SID Revolving Fund
This fund provides financing to satisfy bond payments for special improvement districts in need of additional funds. The city can establish street SID's with bond repayment to be made by the adjoining landowners receiving the benefit of the improvement. The city has provided labor and equipment for past projects through the General Fund, with an SID paying for materials.

Gas Tax Apportionment
Revenues are generated through State gasoline taxes apportioned from the State of Montana. The City's FY 2014 state gas tax apportionment will be approximately $993,168. Transfers are made from this fund to the General Fund to reimburse expenditures for construction, reconstruction, repair and maintenance of streets.

Street Maintenance Assessment
Every parcel within the city limits is assessed for street maintenance, with a square footage cap based on the type of property (residential versus commercial). Revenues generated from the assessment fund maintenance activities on public roadways. Street maintenance includes, but is not limited to, the following: sprinkling; graveling; oiling; chip sealing; seal coating; overlaying; treating; general cleaning; sweeping; flushing; snow and ice removal; and leaf and debris removal.

Great Falls Parking Commission
Monthly lease rental payments and meter collections fund this program. Revenues are used to fund parking improvements in the downtown area.

Tax Increment Financing (TIF)
Great Falls currently has five (5) active Tax Increment Financing (TIF) districts: 1) Central Montana Agricultural and Technology Park District; 2) West Bank Urban Renewal District; 3) Great Falls International Airport District; 4) AgriTech Park District, and; 5) Great Falls Downtown Urban Renewal District. The funds generated from TIF districts could be used to finance projects including street and parking improvements; tree planting; installation of new bike racks; trash containers and benches; and other streetscape beautification projects. TIF funds were used to pave Great Bear Avenue in 2013, and could possibly be used in other districts in the future.

Community Development Block Grant Program (CDBG)
Authorized in 1974, the CDBG program replaced a number of individual or categorical Federal assistance programs to cities, the Model Cities Program and Urban Renewal among the major ones. The funds are provided to metropolitan areas and urban counties with populations of 50,000 and above on an entitlement basis, with individual allocations determined by a formula of poverty, population, overcrowded housing, growth lag, and age of housing stock factors.

In Great Falls and Cascade County, the city is a direct recipient of the funds from the U.S. Department of Housing and Urban Development, whereas the County receives funds through the Montana Department

of Commerce on a competitive basis. The State administers the block grant program and allocates funds to projects in small urban areas and counties based on a state adopted selection and priority program.

In planning for and using CDBG funds, recipients must ensure that no less than 51 percent of the funds must be used for activities that benefit low- and moderate-income persons, over a period specified by the grantee, but not to exceed three years.

There are numerous eligible activities for use of the funds, including construction of public facilities, which would include transportation improvements. Great Falls has used CDBG funds for many years to finance sidewalk repairs and handicap ramp installations. In some years, these funds have also been used for street paving and other street improvements.

10.1.4.2. Cascade County

Road Fund

The County Road Fund provides for the construction, maintenance, and repair of all county roads outside the corporate limits of cities and towns in Cascade County. Revenue for this fund comes from intergovernmental transfers (i.e., State gas tax apportionment and motor vehicle taxes), and a mill levy assessed against county residents living outside cities and towns. The county mill levy has a ceiling limit of 15 mills. Cascade County's FY 2014 state gas tax apportionment will add approximately $200,917 to the Road Fund.

County Road Fund monies are primarily used for maintenance with little allocated for new road construction. It should be noted that only a small percentage of the total miles on the county road system are located in the study area. Projects eligible for financing through this fund will be competing for available revenues on a county-wide basis.

Bridge Fund

The Bridge Fund provides financing for engineering services, capital outlays, and necessary maintenance for bridges on all off system and Secondary routes within the county. These monies are generated through intergovernmental fund transfers (i.e., vehicle licenses and fees), and a county wide mill levy. There is a taxable limit of four mills for this fund.

Motor Vehicle License Fee

The fees collected by counties from the licensing of motor vehicles are available for construction, maintenance, and repair of highways and streets within the transportation study area. The revenue collected is distributed among the jurisdictional areas of the county based on vehicle registration. In 1987, the State of Montana changes its method of licensing motor vehicles of ¾ ton or less. The flat fee tax on light vehicles was replaced by a 2 percent tax on the assessed value of the vehicle, using average trade-in or wholesale value. An ad valerom tax is still issued for all vehicles in excess of ¾ ton. A use tax of 1.5% is imposed on the list price of all newly licensed vehicles. The proceeds of this tax are credited to the State highway account of the State Special Revenue Fund. The funds from the 2 percent tax are distributed in the relative proportions required by the levies for State, County, School District and municipal purposes in the same manner personal property taxes are distributed. Additionally, counties have the option of imposing a 0.5 percent local vehicle tax that is distributed, with some restrictions, in the same manner as the base vehicle tax.

Urban Transportation Districts

Urban Transportation Districts are another method of providing local funds for transportation improvements. The creation of an urban transportation district is initiated by a petition of at least 20 percent of the registered voters within the proposed district. A formal public hearing must be held after which the creation of the district is put to a vote. The county commissioners determine whether a special election is necessary, or if a vote can take place at the next general election. Urban Transportation Districts are governed by an elected board, which is responsible for all operations of the district. The Great Falls Transit District was created under and operates under the guidelines for Urban Transportation Districts.

County Elderly Activities Tax

Counties are allowed to levy up to one mill to promote, establish, and maintain recreational, educational, and other activities of the elderly. Funds from this source could be used to match the FTA Section 5310 funds for providing transportation services to the elderly and disabled.

Special Revenue Funds

Special revenue funds may be used by the county to budget and distribute revenues legally restricted to a specific purpose. Several such funds that benefit the transportation system are discussed briefly in the following paragraphs.

Capital Improvements Fund

This fund is used to finance major capital improvements to county infrastructure. Revenues are generated by loans from other county funds, and must be repaid within ten years. Major road construction projects are eligible for this type of financing.

Rural Special Improvement District (RSID) Revolving Fund

This fund is used to administer and distribute monies for specified RSID projects. Revenue for this fund is generated primarily through a mill levy and through motor vehicle taxes and fees. A mill levy is assessed only when delinquent bond payments dictate such an action.

Special Bond Funds

A fund of this type may be established by the county on an as-needed basis for a particularly expensive project. The voters must approve authorization for a special bond fund. The county is not currently using this mechanism.

Specialized Transportation Fund

This type of fund may be established to supplement the cost of transit service to disabled or low-income county residents. The county is not currently using this mechanism.

10.1.4.3. Private Funding Sources

Private financing of roadway improvements, in the form of right of way donations and cash contributions, has been successful for many years. In recent years, the private sector has recognized that better access and improved facilities can be profitable due to increases in land values and commercial development possibilities. Several forms of private financing for transportation improvements used in other parts of the United States are described in this section.

Cost Sharing
The private sector pays some of the operating and capital costs for constructing transportation facilities required by development actions.

Transportation Corporations
These private entities are non-profit, tax exempt organizations under the control of state or local government. They are created to stimulate private financing of highway improvements.

Road Districts
These are areas created by a petition of affected landowners, which allow for the issuance of bonds for financing local transportation projects.

Private Donations
The private donation of money, property, or services to mitigate identified development impacts is the most common type of private transportation funding. Private donations are very effective in areas where financial conditions do not permit a local government to implement a transportation improvement itself.

Private Ownership
This method of financing is an arrangement where a private enterprise constructs and maintains a transportation facility, and the government agrees to pay for public use of the facility. Payment for public use of the facility is often accomplished through leasing agreements (wherein the facility is rented from the owner), or through access fees whereby the owner is paid a specified sum depending upon the level of public use.

Privatization
Privatization is either the temporary or long term transfer of a public property or publicly owned rights belonging to a transportation agency to a private business. This transfer is made in return for a payment that can be applied toward construction or maintenance of transportation facilities.

General Obligation (G.O.) Bonds
The sale of general obligation bonds could be used to finance a specific set of major highway improvements. A G.O. bond sale, subject to voter approval, would provide the financing initially required for major improvements to the transportation system. The advantage of this funding method is that when the bond is retired, the obligation of the taxpaying public is also retired. State statutes limiting the level of bonded indebtedness for cities and counties restrict the use of G.O. bonds. The present property tax situation in Montana, and recent adverse citizen responses to proposed tax increases by local government, would suggest that the public may not be receptive to the use of this funding alternative.

Tax Increment Financing (TIF)
Increment financing has been used in many municipalities to generate revenue for public improvements projects. As improvements are made within the district, and as property values increase, the incremental increases in property tax revenue are earmarked for this fund. The fund is then used for improvements within the district. Expenditures of revenue generated by this method are subject to certain spending restrictions and must be spent within the district. Tax increment districts could be established to accomplish transportation improvements in other areas of the community where property values may be expected to increase. A TIF is currently being utilized in downtown Bozeman. Additional TIF districts could be established in other areas of the city and county to accomplish a variety of transportation-related improvements.

Multi-Jurisdictional Service District

This funding option was authorized in 1985 by the State Legislature. This procedure requires the establishment of a special district, somewhat like an SID or RSID, which has the flexibility to extend across city and county boundaries. Through this mechanism, an urban transportation district could be established to fund a specific highway improvement that crosses municipal boundaries (e.g., corporate limits, urban limits, or county line). This type of fund is structured similar to an SID with bonds backed by local government issued to cover the cost of a proposed improvement. Revenue to pay for the bonds would be raised through assessments against property owners in the service district.

Local Improvement District

This funding option is only applicable to counties wishing to establish a local improvement district for road improvements. While similar to an RSID, this funding option has the benefit of allowing counties to initiate a local improvement district through a more streamlined process than that associated with the development of an RSID.

10.1.4.4. Future Potential Funding Sources

Local Sales Tax

If authorizing legislation were to be approved, local governments would be able to initiate local option taxes as a potential funding source for transportation improvements. One local option tax would be a local sales tax.

Wheel Tax

If initiated, a tax per wheel on vehicles licensed in counties could generate substantial revenue. The cost to each user of the transportation network would be proportional to the number and type of vehicles owned.

Local Option Motor Fuel Tax

A local option fuel tax is another means of raising revenue for the construction, reconstruction, maintenance, and repair of public streets and roads. This local tax may be imposed by the people of the county or by the adoption of a resolution by the county commissioners and referred to the people. An advantage to a local motor fuel tax, as with a wheel tax, is that it taxes only the users of the transportation system and the tax paid by each individual is directly proportional to their use of the facilities. The revenue from a motor fuel tax must be distributed proportionately among the county and its member municipalities based on vehicle registration.

Excise Taxes

Excise taxes are similar to sales taxes with the exception that items taxed are those considered to be indulgent. The demand for items on which there is an excise tax is generally large, therefore, there is potential to raise a substantial amount of local revenue. Products on which an excise tax could be imposed for additional local revenue include such items as tobacco, alcohol, and various forms of entertainment. A potential problem with excise taxes arises when the tax causes inter-area competition.

Development Impact Fees

Another method funds can be generated for transportation improvements is by assessing a fee to the developers of property based upon the impact the development is likely to have on the transportation network.

Value Capture Taxes

Value capture taxes are a means of raising revenue following the development of transportation improvements. Whereas development fees are assessed to make necessary transportation improvements, value capture taxes impose a fee to businesses which benefit due to their location along improved, highly traveled routes, which assumes improvements have been made. Value capture taxes may be a means to enter into other forms of funding future improvements. One method to consider would be cash flow management that makes wise use of existing revenue rather than continuing to introduce new sources.

10.1.5. Summary of Current Financial Status

Current financial information was obtained from the MDT Statewide and Urban Planning Section to get a picture of the projected revenue available for funding transportation projects in the Great Falls area over the next 20 years. This information is summarized in **Table 10.1**.

Table 10.1: Projected Funding (Estimated) by Funding Source in YOE Dollars

Funding Source	Current Account Balance	Current Annual Allocation (2014)	Projected Annual Allocation (per year)	Revenue Projection 2025	Revenue Projection 2035
NHPP – NH, IM*	0	$ 2,792,000	$ 2,800,000	$ 30,800,000	$ 58,800,000
HSIP Safety*	0	$ 500,000	$ 500,000	$ 5,500,000	$ 10,500,000
STPU – Urban	$ 1,500,000 [a]	$ 1,430,000	$ 1,430,000	$ 15,730,000	$ 30,030,000
STPS – Secondary*	0	$ 267,000	$ 267,000	$ 11,416,553[c]	$ 5,607,000
STP – Bridge*	0	$ 1,773,000	$ 1,773,000	$ 19,503,000	$ 37,233,000
UPP – Preservation*	0	$ 1,392,000	$ 1,392,000	$ 15,312,000	$ 29,232,000
TA	$ 674,770	$ 200,000 [b]	$ 200,000 [b]	$ 2,200,000	$ 4,200,000
MACI - CMAQ	$ 200,000	$ 1,043,000	$ 1,043,000	$ 11,473,000	$ 21,903,000
Operations & Maintenance (State)		$ 1,652,600 [d]	$ 1,653,000	$ 18,183,000	$ 34,713,000
Operations & Maintenance (Local)		$ 376,100 [d]	$ 377,000	$ 4,147,000	$ 7,917,000
State Fuel Tax (City)		$ 993,170	$ 1,000,000	$ 11,000,000	$ 21,000,000
State Fuel Tax (County)		$ 200,920	$ 201,000	$ 2,211,000	$ 4,221,000
FTA Sec. 5307		$ 1,347,594*	$ 1,150,000	$ 12,650,000	$ 24,150,000
FTA Sec. 5310		$ 125,000**	$ 125,000	$ 1,375,000	$ 2,625,000
FTA Sec. 5339		$ 273,474	$ 275,000	$ 3,025,000	$ 5,775,000
Other (Private, Bonds, TIF, CBDG, etc.)Local Transit Mill Levy		$ 1,500,000***	$ 1,500,000	$ 16,500,000	$ 31,500,000
TOTAL [e]				**$ 181,025,553**	**$ 329,406,000**

Notes: Although MAP-21 only provides for Federal funding through FFY2015, 2025 and 2035 projections are based on continuance of current levels of funding unless otherwise noted. It is important to note that the projected funding estimates are based on the best information available at this time and that there is no guarantee that these funding sources will be available beyond MAP-21. Estimated Federal fund allocations do not include amounts of any required local matching funds. Federal revenues, local revenues and local and state matching funds are held constant and do not inflate over time due to uncertainty with federal transportation program reauthorization. Accordingly, future year allocation for year 2025 and 2035 are based on current annual allocations being projected out to the future. Reevaluation of revenue estimation may be necessary as part of the 2018 LRTP update if a trend of shorter authorizations continues.

[a] Current account balance (12/2013) per MDT Statewide and Urban Planning Section.
[b] The TA (Transportation Alternatives) funding program does not have a set allocation. In the past, the CTEP allocations for the Great Falls area (City and County) equaled approximately $460,000. For purposes of estimating, an annual allocation of $200,000 was identified, assuming Great Falls would be successful in procuring some of the statewide TA available funding.

[c] The STPS year 2025 revenue projection is $2,937,000 (based on historical annual allocations), plus $8,479,553 (based on the County's designated priority secondary project for Bootlegger Trail). This results in a total estimated revenue amount available by year 2025 of $11,416,553.
[d] Transportation system operations and maintenance are obligations necessary for routine enhancements and maintenance activities. Local annual allocations for these activities within the urban planning boundary include $50,000 (Cascade County), $326,100 (City of Great Falls) and $1,652,600 (MDT).
[e] Totals given are not entirely available for "road" projects. For example, totals presented include FTA funds (available for transit) and Operations and Maintenance funds (for system refinements). These two funding categories are not for road or intersection construction activities, per se.

** Estimates from MDT are based on historical obligation figures with input from district.*
** 5307 included transfer from 5311, possible future transfers not included in projections.*
*** 5310 administered by MDT for qualified providers.*
**** Based on TIP estimates*

10.2. FISCAL CONSTRAINT

MAP-21 requires that the cost of all projects in the LRTP must be estimated using inflated Year of Expenditure (YOE) dollars in order to provide a consistent and equivalent comparison of project costs to available revenue. Converting all costs to YOE dollars theoretically presents a more accurate picture of costs when compared to revenues, and identifies potential deficits associated with the LRTP. To provide for such a comparison, the total costs of committed projects, and the total costs of committed + recommended projects, were correlated to anticipated total revenue available through the year 2035. The portrayal of estimated costs against potential revenue throughout the life of the LRTP is a requirement of fiscal constraint. Initial project cost estimates were calculated in 2013 dollars and subsequently inflated to YOE dollars under the following assumptions:

- Costs inflate at three percent annually from 2014 through 2035.
- MDT ICAP[22], which is 9.12% for federal fiscal year 2014, applies to federal and non-federal match (either local or state) expenditures for projects administered by MDT. This rate that MDT charges for administration of federal funds is subject to change on a yearly basis.
- The PCC, the Great Falls Area MPO policy coordinating committee, exercises primary authority over determining STPU and CMAQ funded projects, with final project approval by the Montana Transportation Commission.
- MDT exercises primary programming authority over NHPP - National Highway System, Interstate Maintenance and other statewide, non-urban Federal Highway programs, such as the Highway Safety Improvement Program. While these funds are not available to PCC for allocation, these needs and projects are included in the LRTP revenue projections to show this activity that will occur on the system over the life of the LRTP.

Due to funding requirements and jurisdictional boundaries, transportation financing is somewhat compartmentalized. Because of this, it is necessary to evaluate each project, and identify the most likely funding programs to finance each project. Therefore, all of the committed and recommended improvement projects have been subdivided according to improvement type (MSN, SR, etc.) and presented in **Tables 10.2** and **10.5**.

For a "planning level" document such as this LRTP, it is not reasonable to assign priorities to the actual projects being recommended in the Plan. Project prioritization is a function of the transportation planning process, however, and the Transportation Advisory Committee acts in that capacity through advancing projects forward into the Transportation Improvement Program (TIP).

[22] ICAP, or Internal Cost Allocation Program, is the percentage of Federal funds being passed through to Great Falls that are deducted by MDT to cover the cost of the agency's administering of the funds.

10.2.1. Funding of Major Street Network (MSN) Projects

The major street network (MSN) improvement projects recommended through this LRTP Update have been subdivided according to a likely funding source and are presented in **Table 10.2**.

Table 10.2: Committed and Recommended MSN Projects

ID	Category	Project	Funding Source	Primary Justification Category	Cost
C-1	Committed	South Central Urban Area Arterial Improvement Project (UPN 4566)	CMAQ ($2,600,000); MT EARMARK ($3,582,687)	CAPACITY	$6,182,687
C-2	Committed	North Bootlegger Trail – 2KM North of Great Falls North (UPN 4826)	STPS ($8,479,553); STPU ($34,874); CMAQ ($460,000)	SAFETY	$8,974,400
C-3	Committed	Great Falls – North (UPN 7625)	NH	SAFETY	$16,243,683
C-4	Committed	Emerson Junction – Manchester (UPN 7621)	IM	MAINTENANCE	$9, 918,462
C-5	Committed	Fox Farm Road – East Fiesta to Dick Road (UPN 8193)	STPU	CAPACITY	$8,200,000
C-6	Committed	District 3 Fencing - Great Falls North & South (UPN 7958)	IM	MAINTENANCE	$927,225
C-7	Committed	Bridge Preservation – Great Falls 2014 (UPN 8085)	STPB	MAINTENANCE	$7,600,441
MSN-1	Recommended	River Drive North – 15th Street North to 38th Street North	NHPP, HSIP	CAPACITY	$19,300,000
MSN-2	Recommended	US 87 – Old Havre Highway / 33rd Avenue NE to Bootlegger Trail	NHPP	SAFETY	$5,000,000
MSN-3	Recommended	Reconstruct 36th Avenue NE (9th Street NE to Bootlegger Trail)	STPU, HSIP,CITY	CAPACITY	$4,100,000
MSN-4	Recommended	Interstate 15 (I-15) Corridor Study	NHPP	STUDY	$250,000

Total Committed MSN Projects = $ 58,046,898

Total Recommended MSN Projects = $ 28,650,000

Total Committed + Recommended MSN Projects = $ 86,696,898

* Project cost estimates are stated in Year of Expenditure (YOE) dollars. Year 2013 estimated costs were inflated to YOE using a 3% annual inflation.

10.2.2. Funding of Short Range (SR) Projects

The recommended SR improvements are listed in **Chapter 9** of this plan. The SR projects typically allow maximum flexibility by the local government in implementing the various improvements. Assigning priority for the recommended SR projects is complicated by the fact that the State, city, and county all maintain

jurisdiction over various portions of the street network where projects are proposed. Therefore, each of these entities may have separate priorities for implementing SR projects under their respective jurisdictions. Short Range (SR) improvement projects are summarized and shown in **Table 10.3**.

Table 10.3: Committed and Recommended SR Projects

ID	Category	Project	Funding Source	Primary Justification Category	Cost
CSR-1	Committed	13th Street South (29th Avenue South to Lower River Road)	COUNTY	MAINTENANCE	$700,000
CSR-2	Committed	Flood Road (Delea Drive to Woodland Estates Road)	COUNTY	MAINTENANCE	$530,000
CSR-3	Committed	MACI Traffic Flow Improvements - 10th Avenue South Signals (UPN 8036-4)	MACI (CMAQ)	CONGESTION	$140,900
CSR-4	Committed	MACI Traffic Flow Improvements – 3rd Street NW Signals (UPN 8036-5)	MACI (CMAQ)	CONGESTION	$101,000
CSR-5	Committed	GTFLS Signal Borders (UPN 7981)	HSIP	SAFETY	$88,900
CSR-6	Committed	GTFLS Wrong Way Signage – Phase 1 (UPN 8002)	HSIP	SAFETY	$436,277
CSR-7	Committed	GTFLS Horizontal Curve Signing (UPN 7980)	HSIP	SAFETY	$998,929
CSR-8	Committed	GTFLS Advanced Signal Flasher (UPN 8119)	STPU	SAFETY	$143,516
CSR-9	Committed	GTFLS Urban Maintenance Program (UPN 7994):	STPU	SAFETY	$155,800
SR-1	Recommended	Signal Warrant Analysis	MACI	SAFETY	$190,000
SR-2	Recommended	Signal Modifications/Upgrades /Roundabout Control	NHPP, STPU, MACI	SAFETY	$240,000
SR-3	Recommended	10th Avenue South and 32nd Street South	MACI, HSIP, NHPP	SAFETY	$170,000
SR-4	Recommended	Central Avenue West - from 3rd Street NW to 1st Avenue North (at River Drive), including the 1st Avenue North bridge and approaches	STPU	CONGESTION	$770,000
SR-5	Recommended	County Projects: 26th Street South (between 24th Avenue South and 33rd Avenue South) & 26th Street South / 33rd Avenue South intersection	COUNTY	MAINTENANCE	$425,000

ID	Category	Project	Funding Source	Primary Justification Category	Cost
SR-6	Recommended	City Pavement Preservation Activities	STPU, UPP, CITY	MAINTENANCE	$4,371,657
SR-7	Recommended	Central Avenue and 9th Street	STPU	CONGESTION	$15,000
SR-8	Recommended	25th Street South (10th Avenue South to 11th Avenue South)	STPU	CONGESTION	$20,000
SR-9	Recommended	25th Avenue NE, between Old Havre Highway and 15th Street North	UPP	SAFETY	$300,000
SR-10	Recommended	Future Local Street Network	CITY	PLANNING	$0
SR-11	Recommended	MDT-nominated HSIP Safety Projects	HSIP	SAFETY	$1,250,000
SR-12	Recommended	MDT-nominated Pavement Preservation Projects	STP, NH, IM	MAINTENANCE	$6,000,000

Total Committed SR Projects = $ 3,295,322

Total Recommended SR Projects = $ 13,751,657

Total Committed + Recommended SR Projects = $ 17,046,979

* Project cost estimates are stated in Year of Expenditure (YOE) dollars. Year 2013 estimated costs were inflated to YOE using a 3% annual inflation.

Considerations for setting priorities for the SR projects would include safety, cost of the project, availability of alternate funding, availability of right-of-way, ease of implementation, and community interest. Implementation of the projects, beginning with the projects that have the greatest need and available financing, will continue until all projects are completed.

Short range projects within the MDT-nominated preservation and HSIP categories do not rise to regional significance and would be exempt from air quality conformity. Individual short range projects implemented in the TIP selection process will draw from these categories. Funding for these projects have not been allocated to specific projects so the estimates are based upon historical averages.

No aspect of addressing SR improvements will demand more creativity and flexibility than that of project financing. Local governments will be required to be aware of changes in funding sources and of new sources. Local governments should, at all times, be mindful of the following considerations regarding the financing:

- Numerous conventional methods of financing improvements are available to local government (bonds and Special Improvement Districts, for example). Such obvious methods should not be overlooked.
- Financing for special types of projects sometimes are available. Currently, funding is available for certain kinds of safety projects, and projects for bicycle facilities and walking trails.
- Local government should attempt to link private beneficiaries of SR improvements with private sources of financing. Further, in the event that private individuals come forward with funding, local government should be prepared to accept it.

10.2.3. Funding of Non-Motorized Projects

The sole committed non-motorized project is shown in **Table 10.4**. Because the LRTP presents a visionary network for the non-motorized transportation system, it is likely that improvements will coincide with roadway projects as they are developed. Accordingly, the network will be built over time. Non-motorized projects are not "recommended projects" in the conventional sense, however should be developed as time and funding allows. Non-motorized network recommendations in this LRTP should be consulted any time a road or intersection project is being programmed. Most, if not all, of the funding sources previously mentioned can be used to contribute to non-motorized improvements, either as part of an overall project or as a stand-alone project.

Historically, by examining the information contained in **Table 9.4**, it can be seen that approximately $8.6 Million has been expended on non-motorized projects between 2006 and 2013 – a period of 8 years. This amounts to an annual expenditure of roughly $1.1 Million per year. This expenditure can be thought of as an annual program necessary and dedicated to non-motorized infrastructure.

Table 10.4: Committed and Recommended Non-Motorized Projects

ID	Category	Project	Funding Source	Primary Justification Category	Cost
N/A	Committed	Sun River Trail Connection - Bike/Ped facility adjoining Country Club Blvd (from Warden Bridge to Bike/Ped Facility at 6th St SW)	CMAQ	MULTI-MODAL	$ 2,717,156

Total Committed Non-Motorized Projects = $ 2,717,156

Total Recommended Non-Motorized Projects = $ 0

Total Committed + Recommended Non-Motorized Projects = $ 2,717,156

10.2.4. Funding of Transit Projects

As specified in **Chapter 9**, there is only one planned, committed improvement for the transit system – the replacement of aging vehicles on their scheduled replacement cycle. Great Falls Transit attempts to replace four (4) older busses on a 4-year cycle. It is envisioned that this would occur over the course of the LRTP planning horizon (refer to **Table 10.5**). In the table, those replacements designated as GFTD-1 thru GFTD-3 would occur before year 2025, while those designated as GFTD-4 thru GFTD-6 would occur between year 2025 and year 2035. Furthermore, for GFTD-2 thru GFTD-6, fifty percent is assumed to come from CMAQ funds, while the remaining fifty percent is assumed to come from FTA Section 5339 funds (GFTD-1 is assumed to all be from the CMAQ program).

Table 10.5: Committed and Recommended Transit Projects

ID	Category	Project	Funding Source	Primary Justification Category	Cost
GFTD-1	Committed	Bus Purchase (replace 4 buses, year 2015)	CMAQ, LOCAL	TRANSIT (CAPITAL)	$ 1,500,000
GFTD-2	Recommended	Bus Purchase (replace 4 buses, year 2019)	CMAQ, FTA 5339, LOCAL	TRANSIT (CAPITAL)	$ 1,700,000
GFTD-3	Recommended	Bus Purchase (replace 4 buses, year 2023)	CMAQ, FTA 5339, LOCAL	TRANSIT (CAPITAL)	$ 1,900,000

GFTD-4	Recommended	Bus Purchase (replace 4 buses, year 2027)	CMAQ, FTA 5339, LOCAL	TRANSIT (CAPITAL)	$ 2,150,000
GFTD-5	Recommended	Bus Purchase (replace 4 buses, year 2031)	CMAQ, FTA 5339, LOCAL	TRANSIT (CAPITAL)	$ 2,400,000
GFTD-6	Recommended	Bus Purchase (replace 4 buses, year 2035)	CMAQ, FTA 5339, LOCAL	TRANSIT (CAPITAL)	$ 2,700,000

Total Committed Transit Projects = $ 1,500,000

Total Recommended Transit Projects = $ 10,850,000

Total Committed + Recommended Transit Projects = $ 12,350,000

* Project cost estimates are stated in Year of Expenditure (YOE) dollars. Year 2013 estimated costs were inflated to YOE using a 3% annual inflation.

10.2.5. Funding Summary

A comparison of the estimated costs for the various transportation categories, and the potential revenue from sources most likely to be used to fund the various projects, confirms that the LRTP is fiscally constrained over the 20-year life of the Plan (see **Table 10.6**). The revenue available is more than the anticipated costs.

Table 10.6: Comparison of LRTP Estimated Costs and Available Revenue (Planning Year 2035)

Project Category	Estimated Total Costs	Estimated Available Revenue	Difference Between Costs and Revenues	Fiscal Constrain Met?
MSN, SR and NM Projects				
Committed	$ 64,059,376			
Recommended	$ 42,401,657			
TOTAL	**$ 106,461,033**	**$ 131,040,000 [a]**	**$ 24,578,967 [b]**	**YES**
Transit Projects				
Committed	$ 1,500,000			
Recommended	$ 10,850,000			
TOTAL	**$ 12,350,000**	**$ 12,350,000 [c]**	**$ 0**	**YES**
System Operations and Maintenance				
Local & State Combined (Year 2014)	$ 2,030,000			
Local & State Combined (Projected 2015 to 2035)	$ 40,600,000			
TOTAL	**$ 42,630,000**	**$ 42,630,000**	**$ 0**	**YES**

(a) Funding programs selected as sources for estimated available revenue (year 2035) include: NHPP, HSIP, STPU, STPS, TA, and MACI-CMAQ.
(b) Constraints exist on certain funding programs that may limit the amount of $$$ available. As an example, the NHPP program is the most likely funding source for any future interchange work on I-15. The NHPP program is likely to use all the allocated funding source on committed and recommended projects out to year 2035. Thus, the ability to realize a Gore Hill Interchange or Emerson Junction Interchange improvement given present funding constraints is unlikely.
(c) Revenue assumes 50% from FTA Section 5339 and 50% from CMAQ funding sources.

Recommended projects shown in **Chapter 9** as illustrative or long-range projects do not have definite funding sources within the timeframe of the Plan. Therefore, these projects are not included in the summary for the purposes of fiscal constraint. As agencies review needs, identify new funding sources and plan projects, the long-range project list should be used as a guide for new projects.

By viewing the financial summary above and the projects shown in **Chapter 9**, it is clear that it will be important to clearly identify the projects that are considered to have the highest priority through the already established Transportation Improvement Program (TIP) and Capital Improvement Program (CIP) processes. The mechanism for doing this is already in place through the Technical Advisory Committee (TAC) and the Policy Coordinating Committee (PCC).

This LRTP is fiscally responsible in that traditional funding programs, targeted to be utilized for the majority of the projects within the Great Falls area, are identified, available and likely to be funded at current or slightly smaller levels than in past years.

10.3. FINANCIAL PLANNING SUMMARY

10.3.1. EVALUATION OF PROJECTS AND PROGRAMS

The committed and recommended improvements to the transportation system are outlined in **Chapter 9**. Actively pursuing the advance acquisition of rights-of-ways needed for future extensions of already existing roadways is essential to the community as development occurs to the outlying areas. The majority of the recommended improvements developed through this LRTP Update will be able to work within the already established right-of-way corridors. If the property necessary for a low priority improvement, however, does become available prior to the time local government has scheduled the improvement, consideration should be given to changing the project's priority and acquiring the right-of-way at today's lower costs.

The following are additional considerations relating to right-of-way acquisitions:

- Focus on key landowners and work to maintain favorable relations with them. In some instances, particularly in situations in which there is a perception that property will be difficult to obtain, local government should attempt to initiate a negotiation process with the landowner as soon as possible.
- Do not rule out entering into agreements with landowners that may produce a benefit in the long-term. For instance, the local government may be aware of property it will require for future improvement. At present, local government may not have funds available for acquisition, and the landowner may not wish to sell. Nonetheless, by entering into an agreement for first right of refusal, local government can be in a better position to acquire the property in the future, when it may be in a more favorable financial situation.
- Local government can exert considerable influence on the development (or lack thereof), of property which may potentially be required by the community for transportation improvement purposes. Zoning, subdivision, and condemnation powers should not be overlooked particularly in right-of-way matters.

Obviously, another major difficulty in completing most of the major improvement projects will be that of securing financing. Project funding from the traditional public sources will likely be unavailable for many recommended improvements. However, in analyzing each improvement, it may be determined that a private party would benefit significantly from the project. In such a case, private dollars should be used as a match to secure public funds, or to fund the entire project. Therefore, in considering the prioritization of improvements, it is essential for local government to remain flexible and take advantage of financing opportunities as they arise.

The following recommendations present general guidelines for performing financial planning and increasing funding availability for project development and implementation.

- A coherent financial plan is necessary. Both the City and the County should continue to develop five-year Capital Improvement Programs (CIP's) and the Transportation Improvement Program (TIP). The CIP's and the TIP are the principal documents that outline the projects to be completed in the immediate future. These plans must include an analysis of all available sources of financing and link major network improvements to identified sources of financing.
- Matching funds can be a tremendous benefit to the local government. A consideration of matching funds should play a significant role in financial planning. Projects that have matching dollars available should be given a high priority. The City, County and State governments should work to develop new sources of matching funds.
- Financial planning should emphasize that in special cases, private dollars might be available to undertake a project. In such a case, the source of funding must be identified as a direct beneficiary of the project. The local government should bear in mind that such funding could provide the match necessary to receive State or Federal funds.
- Projects should be managed for efficiency and reductions in design and other pre-construction costs should be actively pursued. Incidental project costs such as the State's ICAP (Indirect Cost Allocation Plan) takes needed federal funds away from construction and drains scarce local funds. Local governments should look for ways to eliminate this burden, and the State should actively pursue other, more appropriate methods for funding its operating costs that do not take from funding categories needed for local projects.

Finally, in undertaking major network improvements, the local government should be aware of opportunities for constructing projects in separate phases. Often, funding is simply not available to address an improvement in its entirety. In such cases, a great deal can be accomplished by tackling separate components of individual improvements over the long term, such division of effort should not include separating bicycle and pedestrian facilities from initial street construction.

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11.0
Other Transportation Considerations

This chapter addresses several topics for the LRTP that link the transportation system to broader quality of life considerations within the community. Federal regulations require the LRTP to "include both long-range and short-range program strategies / actions that lead to the development of an integrated intermodal transportation system that facilitates the efficient movement of people and goods." While this is obviously a key consideration, it must be recognized that the design, modal mix, and location of transportation infrastructure and facilities can directly affect urban form and functions and community character.

Current directions in transportation planning place importance on developing transportation systems that help reduce unnecessary travel delays and managing travel demands in ways that create balanced multimodal networks that offer multiple transportation choices. Transportation systems also need to provide facilities and services to help achieve reliable and timely access to jobs, community services, affordable housing, and schools while helping create safe streets and improving economic competitiveness, and enhancing unique community characteristics.

Topics addressed on the following pages include: corridor preservation, access management, transportation demand management (TDM), traffic calming, context sensitive solutions, and the broader concept of livability. These topics are all key considerations to the development of a LRTP that helps support and enhance the overall quality of life in the Great Falls area.

11.1. CORRIDOR PRESERVATION

Corridor preservation is the application of measures to prevent or minimize development within the right-of-way of a planned transportation facility or improvement within a defined corridor. That includes corridors, both existing and future, in which a wide array of transportation improvements may be constructed including roadways, bikeways, multi-use trails, high occupancy vehicle lanes, or fixed route transportation infrastructure.

The objective of corridor preservation is to enable local governments to better plan for future growth. Corridor preservation helps to assure that a transportation system will effectively and efficiently serve existing and future development within a community, region or state, and prevent costly and difficult acquisitions after the fact. Preserving right-of-way for planned transportation facilities promotes orderly and predictable development. As communities expand, land must be set aside for the transportation infrastructure needed to support development and to maintain a desired level of transportation service. The decisions made about the location and design of the transportation network will have a lasting impact on growth patterns, community design, and modal alternatives.

Corridor preservation policies, programs and practices provide numerous benefits to communities, taxpayers and the public at large. These include, but are not limited to, the following:

- **Reducing transportation costs by preservation of future corridors in an undeveloped state.** Right-of-way costs often represent the single largest expenditure for a transportation improvement, particularly in growing urbanized areas where transportation improvement needs

are the greatest. By acquiring or setting aside right-of-way well in advance of construction, the high cost to remove or relocate private homes or businesses is eliminated or reduced.

- **Enhancing economic development by minimizing traffic congestion and improving traffic flow, saving time and money.** Low cost, efficient transportation helps businesses contain final costs to customers and makes them more competitive in the marketplace. Freight costs, for instance, accounts for ten percent of the value of agricultural products, the highest for any industry.

- **Increasing information sharing so landowners, developers, engineers, utility providers, and planners understand the future needs for developing corridors.** An effective corridor preservation program ensures that all involved parties understand the future needs within a corridor and that state, local and private plans are coordinated. Clarifying public intentions about the location, timing, and desired level of access control for roadway improvements reduces the risk associated with the timing and phasing of development projects for the private sector. Advanced notice of such intentions also enables developers to plan projects and site-related improvements in a manner that is more compatible with the planned transportation functions of the corridor.

- **Preserving arterial capacity and right-of-way in growing corridors.** Corridor preservation includes the use of access management techniques to preserve the existing capacity of corridors. When it is necessary, arterial capacity can be added before it becomes cost prohibited by preserving right-of-way along growing transportation corridors.

- **Minimizing disruption of private utilities and public works.** Corridor preservation planning allows utilities and public works providers to know future plans for their transportation corridor and make their decisions accordingly.

- **Promoting urban and rural development compatible with local plans and regulations.** The state and local agencies must work closely together to coordinate their efforts. Effective corridor preservation will result in development along a transportation corridor that is consistent with local policies.

- **Reducing adverse social, economic, and environmental impacts on people and communities.** The social and economic costs of relocation can be high for some communities, particularly low-income, ethnic, or elderly populations and small businesses that serve such populations. In addition, where viable transportation corridors are foreclosed by development, roadways may need to be relocated into more environmentally sensitive areas, thereby increasing adverse impacts on the environment.

A variety of techniques have been applied by communities to help preserve right-of-way for future transportation corridors, ranging from setback ordinances to mandatory dedication. Although many jurisdictions have some method of right-of-way preservation in place, no single method works for all situations. Communities that have been most successful at corridor preservation are those that have assembled a variety of tools that they can mix and match to the circumstances at hand. The following are viewed as important elements of successful corridor preservation programs:

- Develop a long-range transportation plan with broad community support;
- Set clear priorities for transportation improvement projects and complete them in a timely manner;
- Identify a funding source for advance acquisition of necessary or desired rights-of-way; and

- Provide a range of mitigation measures to address potential hardship on property owners and to preserve property rights.

National experience in corridor preservation practices has also shown it is helpful to determine desired design objectives and cross-sections for transportation improvements in the community to establish a basis for future right-of-way needs. This helps to facilitate administration of and public support for the program by identifying in advance the amount of right-of-way that will be needed and why.

11.2. ACCESS MANAGEMENT

Access Management is the proactive management of vehicular access points to land parcels adjacent to all manner of roadways. Good access management promotes safe and efficient use of the transportation network. Access management techniques are increasingly fundamental to preserving the safety and efficiency of a transportation facility. Access control can extend the carrying capacity of a roadway, reducing potential conflicts.

There are six basic principles of access management that are used to achieve the desired outcome of safer and efficient roadways. These principles are:

- Limit the number of conflict points.
- Separate the different conflict points.
- Separate turning volumes from through movements.
- Locate intersection control devices (signals/roundabouts) to facilitate traffic movement.
- Maintain a hierarchy of roadways by function.
- Limit direct access on higher speed roads.

Access management encompasses a set of techniques that local governments can use to control access to highways, major arterials, and other roadways. Access management includes several techniques that are designed to increase the capacity of these roads, manage congestion, and reduce crashes. These techniques include:

- **Signal Spacing:** Increasing the distance between traffic signals improves the flow of traffic on major arterials, reduces congestion, and improves air quality for heavily traveled corridors.

- **Access and Driveway Spacing:** Fewer driveways spaced further apart allows for more orderly merging of traffic and presents fewer challenges to drivers.

- **Safe Turning Lanes:** Dedicated left- and right-turn, indirect left-turns and U-turns, and roundabouts keep through-traffic flowing. Roundabouts represent an opportunity to reduce an intersection with many conflict points or a severe crash history (T-bone crashes) to one that operates with fewer conflict points and less severe crashes (sideswipes) if they occur.

- **Median Treatments:** Two-way left-turn lanes (TWLTL) and non-traversable, raised medians are examples of some of the most effective means to regulate access and reduce crashes.

- **Service and Frontage Roads:** Helps alleviate congestion on major limited access thoroughfares by providing parallel routes which can separate local traffic from through traffic.

- **Right-of-Way Management:** As it pertains to R/W reservation for future widenings, good sight distance, access location, and other access-related issues.

State, regional, and local governments across the United States use access management policies to preserve the functionality of their roadway systems. This is often done by designating an appropriate level of access control for each of a variety of facilities. Local residential roads are allowed full access, while major highways and freeways allow very little. In between are a series of road types that require standards to help ensure the free flow of traffic and minimize crashes, while still allowing access to major businesses and other land uses along a road.

It is recommended that City and County governments adopt a set of Access Management Regulations through which the need for access management principles can be evaluated on a case-by-case basis.

For roadways on the State system and under the jurisdiction of MDT, access control guidelines are available which define minimum access point spacing, access geometrics, etc., for different roadway facilities.

For other roadways (non-State), the adoption of an access classification system based upon the functional classification of the roadway (principal arterial, minor arterial or major collector) is desirable. These local regulations should serve to govern minimum spacing of drive approaches/connections and median openings along a given roadway in an effort to fit the given roadway into the context of the adjacent land uses and the roadway purpose. The preparation and adoption of a local Access Management Ordinance should be pursued that can adequately document the local government's desire for standard approach spacing, widths, slopes and type for a given roadway classification.

11.2.1. Transportation Demand Management

Transportation Demand Management (TDM) measures came into being during the 1970s and 1980s in response to a desire to save energy, improve air quality, and reduce peak-period congestion. TDM strategies focused on identifying alternates to single occupant vehicle use during commuting hours. Therefore, such things as carpooling, vanpooling, transit use, walking and bicycling for work purposes are most often associated with TDM. Many of these methods were not well received by the commuting public and therefore, provided limited improvement to the peak-period congestion problem. Due to the experiences with these traditional TDM measures over the past few decades, it became clear that the whole TDM concept needed to be changed. TDM measures that have been well received by the commuting public include flextime, a compressed workweek and telecommuting. In addition to addressing commute trip issues, managing demand on the transportation system includes addressing traffic congestion associated with special events, such as the fireworks display on the 4th of July, Great Falls White Sox baseball games, and other large cultural or sporting events. A definition of TDM follows:

> *TDM programs are designed to maximize the people-moving capability of the transportation system by increasing the number of persons in a vehicle, or by influencing the time of, or need to, travel. (FHWA, 1994)*

Since 1994, TDM has been expanded to also include route choice. A parallel arterial with excess capacity near a congested arterial can be used to manage the transportation system to decrease congestion for all transportation users. In Montana, an excellent model for TDM strategies can be found by examining the Missoula Ravalli Transportation Management Association (MRTMA). MRTMA offers vanpool, carpool, and guaranteed ride home programs and works with employers to tailor specific commute programs for their staff.

The Great Falls area is projected to grow. The accompanying expansion of transportation infrastructure is expensive and usually lags behind growth. Proper management of demand now will maximize the

existing infrastructure and delay the need to build more expensive additional infrastructure. TDM is an important and useful tool to extend the useful life of a Transportation System.

11.2.2. Role of Transportation Demand Management

TDM strategies are an important part of the Great Falls Area Long Range Transportation Plan due to their inherent ability to provide the following benefits to the commuting public:

- Better transportation accessibility;
- Better transportation predictability;
- More, and timelier, information;
- A range of commute choices; and
- Enhanced transportation system performance.

TDM measures can also be applied to non-commuter traffic and are especially easy to adapt to tourism, special events, emergencies and construction. The benefits to these traffic users are similar to those for commuters, and are listed as follows:

- Better transportation accessibility;
- More transportation reliability;
- More, and timelier, information;
- A range of route choices; and
- Enhanced transportation system performance.

These changes allow the same amount of transportation infrastructure to effectively serve more people. They acknowledge and work within the mode and route choices which motorists are willing to make, and can encourage a sense of community. Certain measures can also increase the physical activity of people getting from one place to another.

Such things as alerting the traveling public to disruptions in the transportation system caused by construction or vehicle crashes can manage demand and provide a valuable service to the traveling public.

Overall, congestion can be avoided or managed on a long-term basis through the use of an integrated system of TDM strategies.

11.2.3. TDM Strategies and Their Effectiveness

TDM strategies, which are or have been used by other communities in the United States, are discussed in this section. By capitalizing on the use of these options, the existing vehicular infrastructure can be made to function at acceptable levels of service for a longer period of time. Ultimately, this will result in lower per year costs for infrastructure replacement and expansion projects, not to mention less disruption to the users of the transportation system.

While some of these options may work well in the Great Falls area, it is clear that some may be inappropriate. Additionally, some of these options are more effective than others. To provide a TDM system that is effective in managing demand, a combination of these methods will be necessary.

Flextime

When provided by employers, flextime allows workers to adjust their commuting time away from the peak periods. This means that employees are allowed some flexibility in their daily work schedules. For example, rather than all employees working 8:00 to 4:30, some might work 7:30 to 4:00, and others 9:00 to 5:30. This provides the workers with a less stressful commute, allows flexibility for family activities and lowers the number of vehicles using the transportation system during peak times. This in turn can translate into reduced traffic congestion, support for ridesharing and public transit use, and benefits to employees. Flextime allows commuters to match their work schedules with transit and rideshare schedules, which can significantly increase the feasibility of using these modes. Costs for implementing this type of TDM strategy can include increased administrative and management responsibilities for the employer, and more difficulty in evaluating an employee's productivity. Flextime is a TDM strategy that has a high probability of being used successfully within Great Falls.

Alternate Work Schedule

A related but more expansive strategy is to provide an alternate work schedule. This strategy involves using alternate work hours for all employees. It would entail having the beginning of the normal workday start at a time other than 8:00 AM. For example, starting the workday at 7:30 AM. would allow all employees to reach the work site in advance of the peak commute time. Additionally, since they will be leaving work at 4:30 PM., they will be home before the peak commute time, and have more time in the evening to participate in family or community activities. This can be a very desirable side benefit for the employees. This has a similar effect on traffic as flextime, but does not give individual employees as much control over their schedules. An alternate work schedule is a TDM strategy that has a high probability of being used successfully within Great Falls.

Compressed Work Week

A compressed work week is different from offering "flextime" or the "alternate work schedule" in that the work week is actually reduced from the standard "five-days-a-week" work schedule. A good example would be employers giving their workers the opportunity to work four (4) ten-hour days a week. A compressed work week reduces commute travel (although this reduction may be modest if employees take additional car trips during non-work days or move farther from worksites). Costs for implementing this type of TDM strategy may be a reduction in productivity (employees become less productive at the end of a long day), a reduction in total hours worked, and it may be perceived as wasteful by the public (for example, if staffing at public agencies is low on Fridays). A compressed work week is a TDM strategy that has a high probability of being used successfully within Great Falls.

Telecommuting

Telecommuting in the work place offers a good chance to reduce the dependence to travel to work via car or bus. This is especially true in technical positions and some fields in the medical industry (such as medical transcription). Additionally, opportunities for distance learning, shopping via computers, basic health care services and recreation also exist and can serve to reduce vehicular travel on the transportation system. Telecommuting is usually implemented in response to an employee request, more so than instigated by the employer. Since telecommuting reduces commute trips, it can significantly reduce congestion and parking costs. It is highly valued by many employees and tends to increase their productivity and job satisfaction. Costs associated with this TDM strategy include increased administrative and management responsibilities, and more difficult evaluation of employee productivity. Some employees find telecommuting difficult and isolating. Telecommuting also may reduce staff coverage and interaction, and make meetings difficult to schedule. Many employers in Montana have tried and currently allow some form of telecommuting. This strategy has a high probability of being used successfully within Great Falls.

Ride Sharing (carpooling)

Carpooling is traditionally one of the most widely considered TDM strategies. The idea is to consolidate drivers of single occupancy vehicles into fewer vehicles, with the result being a reduction in congestion. Carpooling is generally limited to those persons whose schedules are rigid and not flexible in nature. Studies have shown that carpooling is most effective for longer trips greater than ten miles in each direction. Aside for the initial administrative cost of set-up and marketing, ridesharing also may encourage urban sprawl by making longer-distance commutes more affordable.

Transit agencies sometimes consider rideshare as competition that reduces transit ridership. Ridesharing is a strategy that would work within the Great Falls area, especially if set up through the larger employers. An extensive public awareness campaign describing the benefits of this program would help in selling it to the general public.

Vanpooling

Vanpooling is a strategy that encourages employees to utilize a larger vehicle than the traditional standard automobile to arrive at work. Vans typically hold twelve or more persons. Vanpooling generally does not require high levels of subsidy usually associated with a fixed-route or demand-responsive transit service. They can often times be designed to be self-sufficient. The van is typically provided by the employer, or a vanpool brokerage agency, which provides the insurance. The costs of a vanpooling program are very similar to those of ridesharing.

Bicycling

Bicycling can substitute directly for automobile trips. Communities that improve cycling conditions often experience significant increases in bicycle travel and related reductions in vehicle travel. Although this may not be a measurable statistic pertinent to reducing congesting, providing increased bicycling opportunities can help and can also contribute to quality of life issues. Bicycling characteristics within the Great Falls area is primarily recreational in nature, and by implementing the bikeway network improvements, a gradual shift to bicycling as a commuter mode of travel should be realized. Incentives to increase bicycle usage as a TDM strategy include: construction improvements to bike paths and bike lanes; correcting specific roadway hazards (potholes, cracks, narrow lanes, etc.); development of a more connected bikeway street network; development of safety education, law enforcement and encouragement programs; and the solicitation and addressing of bicycling security/safety concerns. Potential costs of this TDM strategy are expenses associated with creating and maintaining the bikeway network, potential liability and accident risks (in some cases), and increased stress to drivers. Bicycling is an excellent, effective TDM strategy that has a great chance for success in Great Falls.

Walking

Walking as a TDM strategy has the ability to substitute directly for automobile trips. A relatively short non-motorized trip often substitutes for a longer car trip. For example, a shopper might choose between walking to a small local store versus driving a longer distance to shop at a supermarket. Incentives to encourage walking in a community can include: making improvements to sidewalks, crosswalks and paths by designing transportation systems that accommodate special needs (including people using wheelchairs, walkers, strollers and hand carts); providing covered walkways, loading and waiting areas; improving pedestrian accessibility by creating location-efficient, clustered, mixed land use patterns; and soliciting and addressing pedestrian security/safety concerns. Costs are similar to that of bicycling and are generally associated with program expenses and facility improvements. As with bicycling, walking is an excellent TDM strategy that has a great chance for success in Great Falls.

Park & Ride Lots

Park and ride lots are effective for communities with substantial suburb to downtown commute patterns. Park and ride consists of parking facilities at transit stations, bus stops and highway on ramps, particularly at the urban fringe, to facilitate transit and rideshare use. Parking is generally free or significantly less expensive than in urban centers. Costs are primarily associated with facility construction and operation. This TDM strategy is not likely to benefit the transportation system within Great Falls.

Car Sharing

Car sharing is a demand reducing technique that allows families within a neighborhood to reduce the number of cars they own and share a vehicle for the limited times when an additional vehicle is absolutely essential. Costs are primarily related to creation, startup and administrative costs of a car sharing organization. This TDM strategy is not likely to benefit the transportation system within Great Falls.

Traditional Transit

Traditional transit service is an effective TDM strategy, especially in a highly urban environment. Several methods to increase transit usage within the community are to improve overall transit service (including more service, faster service and more comfortable service), reduce fares and offer discounts (such as lower rates for off-peak travel times, or for certain groups), and improved rider information and marketing programs. The costs of providing transit depend on many factors, including the type of transit service, traffic conditions and ridership. Transit service is generally subsidized, but these subsidies decline with increased ridership because transit services tend to experience economies of scale (a 10% increase in capacity generally increases costs by less than 10%). TDM strategies that encourage increased ridership can be very cost effective. These strategies may include offering bicycle carrying components on the transit vehicle, changing schedules to complement adjacent industries, etc. Transit as a TDM strategy in Great Falls has a high likelihood of being successful, however funding constraints are the current limiting factor.

Express Bus Service

Express bus service as a TDM strategy has been used by larger cities in the nation as a means to change driver vehicle characteristics. The use of an express bus service is founded on the idea that service between two points of travel can either be done faster or equal to the private automobile (or a conventional bus service that is not “express”). An express bus service TDM strategy would not be applicable to Great Falls.

Installing/Increasing Intelligent Transportation Systems (ITS)

The use of ITS methods to alert motorists of disruptions to the transportation system will be well received by the transportation users, and are highly effective tools for managing transportation demands.

Installing High Occupancy Vehicle (HOV) lanes

High occupancy vehicle lanes would probably have a low cost / benefit ratio and possibly would be ignored in Great Falls. HOV lanes are generally used on very congested roadways where intersections and access control is somewhat limited. They also can be utilized on urban arterials. A HOV is typically described as having two or more persons in the vehicle during the time of travel. The benefits of a HOV lane in a congested corridor is that increased travel speeds and reliability for HOV passengers is realized. The costs include project construction, management and enforcement. Some critics also argue that HOV lanes encourage urban sprawl, contribute to poor air quality, and increase crash rates due to conflicts between vehicles in higher-speed HOV lanes and vehicles in lower speed general use lanes.

Ramp Metering

Ramp metering has been used by some communities and consists of providing a modified traffic signal at on ramps to interstate highway facilities. The use of this TDM strategy would not be applicable to the Great Falls area.

Traffic Calming

Traffic Calming (also called Traffic Management) refers to various design features and strategies intended to reduce vehicle traffic speeds and volumes on a particular roadway. Traffic Calming projects can range from minor modifications of an individual street to comprehensive redesign of a road network. Traffic calming can be an effective TDM strategy in that its use can alter and/or deter driver characteristics by forcing the driver to either use a different route or to use an alternative type of transportation (such as transit, bicycling, walking, etc.). Costs of this TDM strategy include construction expenses, problems for emergency and service vehicles, potential increase in drivers' effort and frustration, and potential problems for bicyclists and visually impaired pedestrians. Traffic calming measures are discussed later in this chapter.

Identifying and Using Special Routes and Detours for Emergencies or Special Events

This type of TDM strategy centers around modifications to driver patterns during special events or emergencies. They can typically be completed with intensive temporary signing or traffic control personnel. A prime example would be modifying travel patterns after a Voyagers baseball game in Great Falls. Temporary traffic control via signs and flaggers could be implemented to provide a swift and safe exit after applicable events.

Linked Trips

This strategy entails combining trips into a logical sequence that reduces the total miles driven on the surrounding transportation system. These trips are generated by associated facilities within a mixed-use development or within an area of the community where adjacent land uses are varied and offer services that would limit the need to travel large distances on the transportation system. This TDM strategy could be successful in Great Falls, particularly as new developments occur in the future that incorporate mixed uses.

Pay for Parking at Work Sites (outside the downtown area)

TDM measures involving "paying for parking" outside the downtown area or at employers or paying more for single occupant vehicles can be regarded by those impacted as Draconian and may be poorly received in Great Falls.

Higher Parking Costs for Single Occupant Vehicles (SOV)

Intuitively, free parking provided by employers is a tremendous incentive for driving alone. If the driver of a SOV is not penalized in some form, there is no perceived reason not to drive to the workplace. One way to counter this reality is to charge a higher price for parking for the SOV user. In Great Falls, this could possibly be implemented within the downtown area, where parking fees are charged for the eight city-owned parking lots. This implementation strategy is not likely to have much of an impact to the frequency of SOV users on the transportation system.

Preferential Parking for Rideshare/Carpool/Vanpools

This concept ties into the discussion above regarding parking of the SOV user. Preferential parking, such as delineating spaces closer to an office for riders sharing their commute or reduced/free parking, can be an effective TDM strategy.

Subsidized Transit by Employers

A subsidized transit program, typically offered by employers to their employees, consists of the employer either reimbursing or paying for transit services in full as a benefit to the employee. This usually comes in the form of a monthly or annual transit pass. Studies show that once a pass is received by an employee, the tendency to use the system rises dramatically.

Guaranteed Ride Home (GRH) Programs for Transit Riders

The guaranteeing of a ride home for transit users is a wise choice for all transit systems, since it gives the users a measure of calm knowing that they will be able to get home. A GRH program provides an occasional subsidized ride to commuters who use alternative modes, for example, if a bus rider must return home in an emergency, or a car pooler must stay at work later than expected. This addresses a common objection to the use of alternative modes. GRH programs may use taxies, company vehicles or rental cars. GRH trips may be free or they may require a modest co-payment. The cost of offering this service tends to be low because it is seldom actually used.

Mandatory TDM Measures for Large Employers

Some communities encourage large employers (typically with at least 50 to 100 employees) to mandate TDM strategies for their employees. This is a control that can be required by local governments on developers, employers, or building managers.

The regulatory agencies often times provide incentives for large employers to make TDM strategies more appealing, such as reduced transit fares, preferred parking, etc.

Required Densification / Mixed Use Elements for New Developments

Requiring new developments to be dense and contain mixed-use elements will ensure that these developments are urban in character and have some services that can be reached by biking, walking or using other non-automobile methods. This also relates to the concept of “linked” or “shared” trips presented later in this chapter. As new developments are proposed, local and regional planners have the opportunity to dictate responsible and effective land use to encourage “shared” trips and reduce impacts to the surrounding transportation system.

Transit Oriented Development (TOD)

Transit Oriented Development (TOD) refers to residential and commercial areas designed to maximize access by transit and non-motorized transportation, and with other features to encourage transit ridership. A TOD usually consists of a neighborhood with a rail or bus station, surrounded by relatively high-density development, with progressively lower-density spreading outwards. Transit Oriented Development generally requires about seven residential units per acre in residential areas and twenty-five employees per acre in commercial centers to adequately justify transit ridership. Transit ridership is also affected by factors such as employment density and clustering, demographic mix (students, seniors and lower-income people tend to be heavy transit users), transit pricing and rider subsidies, and the quality of transit service. This type of development could potentially work well within Great Falls and its outlying areas as development occurs. Features could be built into a given development to encourage transit use from the start, and at the same time could be incorporated into the funding source available to the Great Falls Transit District to help offset costs associated with new service.

Alternating Directions of Travel Lanes

This method of TDM is similar to that of Traffic Calming in that it strives to change driver characteristics and possibly enable users of the system to try different modes of travel. It also can serve to relieve a corridor during particularly heavy times of the day.

11.2.3.1. Effectiveness of TDM Strategies

Measuring the effectiveness of TDM strategies can be done using several different methods such as cost, usage, or those listed below:

- Reduced traffic during commute times;
- Reduced or stable peak hour traffic volumes;
- Increased commuter traffic at off peak times;
- Increased use of modes other than single occupant vehicles;
- Increased use of designated routes during emergencies or special events;
- Eased use of the transportation system by tourists or others unfamiliar with the system;
- Reduced travel time during peak hours; and/or
- Fewer crashes during peak hours.

In order to provide a TDM system that will address the needs of the Great Falls area, the elements of the system must be acceptable to the general population. If elements are proposed which are not acceptable, the TDM system goals will not be reached. However, it is also important to keep in mind the cost of implementing TDM measures.

Table 11.1 presents available TDM measures and ranks them by the likeliness of being accepted and implemented within the Great Falls area. A rank of “3” indicates that the measure has a high likelihood of being successfully implemented, a rank of “2” indicates that the measure would have more difficulty being accepted or implemented and a rank of “1” indicates that this measure would either be difficult to implement, or is inappropriate for the community at this time. This ranking system is based on input from public meetings, as well as consultant knowledge and experience. It is not survey based.

The measures which could best be adopted and accepted by Great Falls area residents are those which allow greater flexibility in work hours, changing modes of transportation, or address specific, time-limited situations.

Those measures that would not be used in Great Falls generally address issues not present in Great Falls, such as significant commuting from a suburb. If such a problem existed, park and ride lots could be installed to address it. However, Interstate 15 presently has less than one-third of the traffic that 10th Avenue South has and operates under free flow conditions at all times of the day. Other measures that would not be implemented in Great Falls in the foreseeable future involve “pay for parking” outside the downtown area. Travel characteristics in Montana are heavily dependent on population densities, distances to services (retail, medical, etc.), and locations of major employment centers.

Often times travel distances are longer than what would be encountered in a larger urban area. Due to this nature of travel in Montana, private automobiles are unlikely to be replaced by other modes of travel until a change in technology occurs which allows travel by a mode that has the same flexibility of the automobile.

Table 11.1: TDM Measures Ranked by Anticipated Usability

Rank	Strategy
1 - Difficult to implement / not applicable at this time.	Alternating directions of travel lanes
	Car sharing
	Express bus service
	Higher parking costs for single occupant vehicles
	Installing HOV lanes
	Mandatory TDM measures for large employers
	Park & Ride Lots
	Pay for parking at work sites (outside the downtown area)
	Preferential parking for rideshare / carpool / vanpools
	Vanpooling
2 - Some difficulty being accepted or implemented.	Bicycling
	Guaranteed ride home program
	Installing /increasing ITS
	Ramp metering
	Required densification / mixed use elements for new developments
	Ride sharing (carpooling)
	Subsidized transit by employers
	Telecommuting
	Transit-Oriented Development
	Use of Transit
	Walking
3 - High likelihood of being successfully implemented.	Alternate work schedule
	Compressed work week
	Flextime
	Identifying routes for emergencies or special events
	Linked trips
	Traffic Calming

Another way to rank TDM measures is by the long-term cost effectiveness of the measure. The following **Table 11.2** ranks the potential TDM strategies by cost effectiveness. Cost effectiveness is defined as the greatest impact on managing traffic demand at the lowest cost to maintain / extend the transportation system. A rank of “3” indicates a measure which is the most cost effective, a rank of “2” indicates a measure which is moderately cost effective, a rank “1” measure is not cost effective, and the cost effectiveness of a rank “0” is unknown. This ranking system is based on input from public meetings, as well as consultant knowledge and experience. It is not survey based.

Efforts merely to make the general public aware of the TDM programs are ineffective. TDM strategies only succeed when people actually change their trip-making behavior. Trip-making behaviors could be changed with incentives. Marketing programs with incentives can successfully introduce people to new ways of making trips, but keeping these same patrons in the new system then depends on additional measures or a change in mindset.

Table 11.2: TDM Measures Ranked by Cost Effectiveness

Rank	Strategy
0 - Unknown	Alternating directions of travel lanes
	Identifying routes for emergencies or special events
	Required densification / mixed use elements for new developments
2 - Moderately cost effective	Alternate work schedule
	Car sharing
	Compressed work week
	Flextime
	Guaranteed ride home program
	Installing HOV lanes
	Linked trips
	Park & Ride Lots
	Ramp metering
	Ride sharing (carpooling)
	Subsidized transit by employers
	Telecommuting
	Traffic Calming
	Transit-Oriented Development
	Vanpooling
3 - Most cost effective	Bicycling
	Express bus service
	Higher parking costs for single occupant vehicles
	Installing/increasing ITS
	Mandatory TDM measures for large employers
	Pay for parking at work sites (outside the downtown area)
	Preferential parking for rideshare / carpool / vanpools
	Use of Great Falls Transit
	Walking

Pricing parking is among the most cost-effective alternatives. Taxes and/or charges for parking, however, are extremely unpopular with day-to-day users of the system, and are not recommended for Great Falls. However, these strategies are cost-effective since they can immediately change travel behavior and can be revenue neutral or generate revenue. In a highly congested, highly urbanized environment, this is a good option.

Another cost effective TDM alternative is using alternate modes of transportation such as transit, carpools, bicycling and walking. Many residential areas in Great Falls are within easy biking / walking distance of employment sites and shopping opportunities. Bus service is also readily available for most of Great Falls. The infrastructure for these alternatives is already in place and ready for use at any time.

Work week changes such as a compressed work week, alternate starting times, and telecommuting are among the most popular strategies with commuters, since they offer employees more time at home. They

are less popular with employers since they may involve a change in the basic operating policies of the work site. Carpool and vanpool programs are less effective than changes to the work week unless there are parking incentives and they are used consistently by employees. Additionally, managing these programs can be expensive and produce limited impact without supporting incentives and disincentives.

Improvements from transit service changes cannot be quickly realized. Transit users must adjust to the changes, and the true impacts of any changes to the transit system will not be realized for approximately one year. Therefore, these changes must be weighed carefully. They are disruptive to the users of the system, and even attempts to reinstate previous routes are disruptive from a user's standpoint.

While some early evidence suggests that transit, bicycle, or pedestrian related developments are effective in increasing the use of these modes at new residential, commercial, and office sites, the cost effectiveness of these strategies is still unknown. Providing these amenities with the installation of the original infrastructure can provide an aesthetically pleasing, highly desirable development to live and work in. One study in southern California showed that employers who combined financial incentives with an "aesthetically pleasing" site, exhibited trip reduction results that were ten percent higher than those without these two critical strategies.

Applying TDM strategies to non-commute trips can be problematic. In Great Falls, as elsewhere, commute trips (home-based work trips) account for fewer than 20 percent of all travel. Trips for shopping, school, recreational, or other purposes generally have higher auto occupancy rates than home-based work trips. Using nationwide averages, home-based work trips have an average occupancy of about 1.1 people per vehicle, whereas other trip types have an average occupancy of 1.4 to 1.5 people per vehicle. Note that in Great Falls there is a high proportion of school related trips that use transit. Over 40 percent of transit users are associated with the schools. Not all TDM measures will work for non-commute trips. An example of this is bicycling to the home improvement store. Items bought at a home improvement store are usually bulky and/or heavy. This makes it difficult to get them home.

Finally, the concept of "linked trips" within an area can be an effective means of limiting traffic on the transportation system. These trips are sometimes referred to as "shared" or "internal" trips. These trips are generated by associated facilities within a mixed-use development or within an area of the community where adjacent land uses are varied and offer services that would limit the need to travel large distances on the transportation system. An example would be a development that incorporates residences, office space, industrial space, retail space, a health club, etc. The vehicle operator in this case may live and work in the same development, therefore reducing the need to access the transportation system outside of the immediate area. Linked trips do not represent additional trips on the surrounding transportation system. Future developments that incorporate mixed uses and travel sharing within its limits should be encouraged through the planning function. This is especially desirable given the noted change in demographics that has occurred and is expected to continue occurring over the foreseeable future in the US and Montana.

11.2.3.2. Event Specific TDM Strategies

TDM strategies can be applied to specific events. If an event occurs on a regular basis which can be planned for, steps can be taken to manage the demands made on the transportation system. In Great Falls there are three events which would benefit from different types of management techniques.

The first is the 4th of July fireworks display. This event draws significant numbers of people in vehicles into the transportation corridors along the Missouri River, near the fireworks display. When the fireworks display ends, all of the vehicles attempt to leave the area at the same time. This causes significant congestion until the vehicles have cleared the area. The City of Great Falls has already adopted one TDM

measure to address this situation, namely, providing specialized signal timing which allows the greatest opportunity for this traffic to disperse to their destinations. A second TDM measure which could be considered would be temporarily modifying the traffic control at certain key locations. This would involve using flaggers to direct traffic and allow vehicles to proceed through intersections at the flaggers' direction rather than using traffic control normally in place. This would allow vehicles to get through these intersections in less time than would be possible without the flaggers' help.

The second event, which has been brought forward by members of the public during the public meetings, deals with exiting the Great Falls Voyagers parking lot after a game is over. Longtime residents of Great Falls remember when this lot had a second exit point which took traffic to the east along River Drive North. This exiting option is no longer available, and these people are frustrated by having to wait at the main entrance. The primary reason for closure of this exit was due to safety related concerns over left turning traffic out of the parking lot and potential crashes with the traffic stream on River Drive North. TDM measures can be put in place to facilitate vehicles exiting this parking lot.

The simplest one is again using flaggers to temporarily modify the traffic control at the exit point. This would allow left and right turning traffic to exit the parking lot in less time than it would otherwise take. Depending upon how the exiting traffic proceeds, a flagger may also be appropriate at the intersection of 25th Street North and River Drive North. Other modifications to the transportation system may also be appropriate depending upon where the traffic actually goes.

The third item which could be addressed using TDM measures is developing detour routes for accidents or other road blockages along the 10th Avenue South corridor (which includes Country Club Boulevard and I-315). Due to the amount of traffic on 10th Avenue South, developing plans ahead of time to plan detours would help manage the demands of the transportation system. Of particular concern is the Interstate 315 / Country Club Boulevard segment which has very few route alternatives. Additionally, 10th Avenue South from 2nd Street South to 32nd Street South would also benefit by having detour plans in place.

11.2.4. TDM Conclusions

Many TDM options are available for use in Great Falls. Existing infrastructure is in place to use alternative modes of transportation including transit, walking and bicycling. There are several major employers in Great Falls including the medical providers, refinery, City government, County government, Montana Air National Guard and Malmstrom Air Force Base who could be approached to implement work week adjustments (flex time, alternate work hours, compressed work week) that could make a noticeable difference to congestion. Designating a couple of prime parking spots for carpooling could increase its use among employees and provide positive recognition for those who carpool.

Developing strategies to manage the demand on the system generated by specific repeatable events such as baseball games or the 4th of July fireworks display would involve a one-time use of Great Falls staff time. Adjustments to these strategies could be made after seeing how they work. Coordination with the Police Department or other departments that would help implement these plans would then be needed on an intermittent basis. Implementing these strategies in Great Falls could be done quickly and would be obvious to the traveling public. As such, it would be easy to demonstrate a successful TDM program and build approval for implementing additional TDM strategies.

11.2.5. Recommended TDM Strategies

Based upon this general TDM evaluation, Great Falls is poised to implement a successful TDM program. The recommended strategies are listed below. These could be implemented in any order. Since the 2009 Transportation Plan, efforts have been made to expand and improve bicyclist access to River's Edge Trail.

- Encourage employers to provide alternate work schedules to their employees.
- Implement a guaranteed ride home program for transit users.
- Provide bike racks in the downtown area for bicycling commuters.
- Increase bicyclist access to River's Edge Trail for commuting purposes.
- Encourage walking as a commute choice.
- Encourage biking as a commute choice.
- Look at ways to increase transit ridership.
- Review access to the Great Falls Voyagers ballpark and develop a plan to manage traffic into and out of the ballpark.
- Consider factors such as land use/zoning issues when approving non-rural projects in the outlying areas.

11.3. TRAFFIC CALMING

Traffic calming refers to a number of methods used to reduce vehicle speeds, improve safety, and enhance the quality of life. In the simplest definition, it is changing the physical environment to reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for pedestrians and other non-motorized street users. Traffic-calming techniques are typically aimed at lowering vehicle speeds, decreasing truck volumes, and/or reducing the amount of cut-through traffic in a given area.

Some of the most universal goals of traffic calming are as follows:

- Reducing the frequency and severity of accidents.
- Addressing speeding or other problems on collectors or minor arterials.
- Improving the quality of life in residential areas.
- Reducing negative environmental impacts of traffic such as air and noise pollution.
- Promoting safe walking and bicycling.

Traffic calming measures can also have the following beneficial effects:

- Reduced need for police enforcement.
- Improved street environment (streetscaping/landscaping).
- Improved water infiltration into the ground.

Traffic calming techniques cannot be used with the same degree of success on all roadway facilities. Traffic calming is rarely seen on roadway facilities higher than a collector roadway functional classification. This is primarily due to roadways functionally classified higher than a collector having the primary purpose of moving traffic, whereas for collector and local roadways the primary purpose tends to shift more towards serving adjacent land uses and infiltration into neighborhoods.

This section serves to delineate a process by which a traffic calming program can be carried out, as well as going further to discuss different traffic calming measures and their applicability to different transportation systems.

11.3.1. Purpose of Traffic Calming

Traffic calming is intended to reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users. It is used on local streets to discourage non-local traffic. Non-local traffic is not invested in the neighborhood, and therefore has less respect for speed limits, and the non- vehicular elements of the street environment. Certain, limited traffic calming measures are appropriate for slowing traffic on collectors or minor arterials as well.

Because traffic calming includes an educational or enforcement campaign, or an engineering study, it can result in the physical construction of traffic elements designed to reinforce the perceived need for caution by the users of the transportation system. The need for physical traffic calming devices indicates the transportation user's consistent failure to appropriately interact with the surroundings. Regardless of any traffic calming measures installed, the primary responsibility for safe use of the streets lies with the individual driver, cyclist, or pedestrian.

The success of traffic calming measures on a local street depends upon strong support by residents in the immediate area. Additionally, the traffic calming measures need to address situations that a number of residents agree should be addressed. Situations that many people agree exist and that could respond to traffic calming techniques will have more support from the neighborhood, and will better enhance the neighborhood environment. Traffic calming projects which involve installing "hard" improvements should meet several criteria before being considered for implementation, because they can be disruptive to the residents in the surrounding area, difficult to fund and maintain, and difficult to remove once installed.

Traffic calming elements can be incorporated into the initial design of subdivision, or can be retrofitted into existing subdivisions. The City of Great Falls has many streets which already contain traffic calming measures. These include street trees, on-street parking, and sidewalks separated from the street by a planting strip. Other techniques can include landscaped medians, pedestrian bulb-outs at corners, traffic circles or other intersection design techniques as well as other mid-block design techniques.

There are however, several circumstances where traffic calming becomes necessary. One of the most common circumstances is when the arterial system is congested or has turn restrictions. This set of circumstances may lead to arterial traffic detouring into an adjacent neighborhood. Local streets near a heavily used arterial can experience arterial traffic. In Great Falls, 9th Avenue South appears to experience this phenomenon due to its proximity to 10th Avenue South. To address this situation, stop signs have been installed at some locations. Installation of stop signs is one of a number of traffic calming measures, and has been used extensively by the City. Stop and yield signs are prevalent on the east/west legs of the intersections of 9th Avenue South with the various north/south streets. These serve to discourage through traffic, while still allowing local traffic and necessary circulation back to 10th Avenue South.

During street construction traffic calming issues may be raised. Detours are necessary but frustrating for residents. However, when motorists use alternate routes instead of the designated detours, concerns with congestion, speed, pollution and enforcement become real. But these issues are temporary, and temporary measures are appropriate to address them. Some examples of temporary traffic calming measures include:

- Removable median curbs to constrict, or choke, a roadway;
- Removable median curbs placed to form a traffic circle within an intersection;
- Removable median curb placed to form forced turn diverters;
- Temporary bollards to close off traffic to a roadway; and
- Temporary speed bumps.

Very few traffic calming techniques are appropriate for use on arterials, because they interfere with an arterial's ability to move people and vehicles quickly from one place to another. The techniques which are appropriate for the arterial system are summarized later.

11.3.2. Types of Traffic Calming Measures

There are two forms of traffic calming, active and passive. Active measures are usually applied after a street has been constructed to correct a perceived problem with driver behavior. Passive measures are more likely to be included during the initial design of a roadway. Generally, active measures are not appropriate for the arterial network as they interfere with the purpose of arterials to move larger volumes of vehicles. However, appropriate use of passive measures may accomplish the purpose of encouraging safer driver, cyclist, or pedestrian behavior without restricting traffic flow. Arterials should be considered in any active traffic calming plan since speeding and cut-through traffic on local streets can be an indicator that the arterial network is not functioning properly. Therefore, improvements to the arterial network may be a more effective solution than active traffic calming on smaller streets.

Traffic calming measures generally fit into one of the following major categories:

- Passive measures;
- Education and enforcement;
- Signing and pavement marking;
- Deflection (either vertical deflection or horizontal deflection); and
- Diversions or restrictions.

11.3.2.1. Passive Measures

Passive measures are described as measures which are built into the street environment. They are not immediately obvious to the traveling public, but nevertheless produce a calming effect on traffic. Some of these measures are listed below.

- Tree-lined streets;
- Streets with boulevards separating the sidewalks;
- Streets with raised center medians (usually landscaped);
- On-street parking (including angled parking);
- Highly visible pedestrian crossings; and
- Short building set-back distances.

These elements tend to slow traffic by giving motorists the impression that the street is narrow and that extra care is required, but these elements do not restrict or interfere with traffic flow. A combination of more than one of these techniques, or these techniques combined with measures from the other categories, will produce better results.

11.3.2.2. Education and Enforcement

Several techniques are available to raise public awareness of traffic problems and change the behaviors contributing to problems. Some of these techniques are discussed in this section.

Neighborhood Speed Watch Program

A speed monitoring program where residents themselves measure vehicle speeds with a radar unit and record license plate numbers of speeding vehicles. Follow-up action of the data can include sending letters to the registered owners of the vehicles explaining the safety concerns within the neighborhood and requesting better observance of the speed limits.

Radar Speed Monitoring Trailer

A pull-behind trailer equipped with speed detection equipment, a readout of vehicle speeds, and a sign with the posted speed limit is brought to an area with speeding problems. The Great Falls Police Department currently has one of these trailers and this service can be requested by contacting the Great Falls Police Department. These trailers are usually unmanned; however better results are obtained if someone is present. Additionally, the trailer can be equipped with a camera that would record license plate information for possible follow-up.

Advantages

- Widely accepted
- Basically run themselves
- Can save data and be used to determine problem areas and times
- Works as a driver education method
- Portable

Disadvantages

- May require additional enforcement
- Can encourage speeding of some groups of drivers
- Vandalism may occur
- Limited effectiveness when not used in conjunction with additional enforcement

Special Considerations

- Signing
- Enforcement level
- Maintenance

Estimated Cost

- $10,000 to $20,000

Neighborhood Traffic Safety Campaign

As a part of the normal neighborhood group activities, newsletters or other materials can be produced containing educational information regarding traffic issues. These materials can be tailored to issues of specific concern to different neighborhoods. These issues can then be addressed at regularly scheduled meetings or at special meetings and recommendations can be put forward to increase neighborhood traffic safety.

Target Enforcement

This is a requested, time-limited addition of police enforcement within a neighborhood. Increasing the level of police enforcement on streets that are prone to speeding problems can be an effective way to reduce the number of speeding vehicles. Additional police enforcement can help to discourage drivers from breaking speed limit laws in the area. The speed reduction, however, usually is only reduced for a short period of time or as long as the enforcement is maintained. In order to have a long term effect on speeding, police enforcement must be on a repetitive non-routine basis while having signage and/or brochures in the area to indicate that enforcement will be increased in the area. There can be significant budget and manpower constraints to having continual police enforcement. Using police personnel to enforce speed limits is typically a low priority for police departments. The cost of enforcing speed limits on a continual basis can be unjustifiable.

Advantages

- Effective at slowing vehicle speeds down
- Widely accepted
- Increases safety level of the area

Disadvantages

- Requires continual enforcement
- Not of high priority to police departments
- Expensive

Special Considerations

- Signs
- Continual enforcement

Estimated Cost

- Varies

Public Service Announcements (PSA's)

The Great Falls Police Department regularly produces video public service announcements on traffic issues, mainly related to safety. These occasionally include traffic calming information, and are televised during local news programs. PSA's could be used more regularly to inform the public on traffic issues and calming techniques.

11.3.2.3. Signage and Pavement Marking

Traffic control signs and pavement markings can be installed as non-intrusive traffic calming measures. These techniques are already in use in the Great Falls area. The signs can include speed limit signs, dead-end street signs, and signs indicating school crossings or general pedestrian crossing. Pavement markings can include marked crosswalks, delineation of (narrow) lanes, and speed limit markings. Traffic calming techniques which specifically fall in this category include:

- **Truck Route Signing:** Signs placed on routes where trucks are allowed, plus signs placed on routes where trucks are not allowed.
- **Basket Weave Stop Sign Pattern:** Stop signs placed at every intersection in a residential neighborhood with stops alternating between east west and north south. Note: this is appropriate for local access streets only, and it disregards MUTCD warrants.
- **Speed Limit Signs:** Installing new or additional speed limit signs.
- **Edge Lines:** Painted lines on the pavement which narrow traffic lanes and/or provide for bicycle lanes or on-street parking.
- **Stop Bars:** Painted lines on the pavement that show motorists where to stop for stop signs.

Decreased Speed Limits

Decreasing speed limits in an area prone to speeding is a simple low cost approach to trying to deter drivers from breaking the speed limit. However, the posted speed limit is generally ignored by the driver. Drivers generally travel at speeds they consider reasonable and are often influenced by other drivers in the area. There is usually little to no effect on vehicle speeds by simply lowering the speed limit in the area. To have an effect on vehicles, the lower speed limits must be accompanied by other means of speed control. These other means could be increased law enforcement, speed bumps, or any other method that would help promote lower speeds in the area. Decreasing speed limits in areas such as school zones is common and does tend to have some effect on speeding. The effect can be much higher by using law enforcement to help monitor the area.

Advantages

- Low cost
- Useful when done in conjunction with other speed control methods
- Useful in areas such as school zones
- Disadvantages:
- Little to no effect on vehicle speeds when done alone
- Often times ignored
- Requires additional measures

Disadvantages

- None

Special Considerations

- Signs
- Enforcement
- Maintenance

Estimated Cost

- $4,000 to much higher depending on design

Pavement Markings

Pavement markings can be used for anything from on-street parking, to accentuating already existing features, to creating new features. Using pavement markings to indicate areas where on-street parking would occur creates a safer parking environment and also directs traffic in the area. A slight speed reduction may occur if the travel lanes are narrowed due to the markings. When pavement markings are used to accentuate already existing features, they can make the features look bigger and give advanced warning about them. Pavement markings can also be used to create turning lanes and to direct traffic flow without having to use expensive medians or curbs.

Pavement markings are generally not overly effective on vehicle speed reduction unless they create the impression of a narrowed roadway. While pavement markings don't force drivers to act, they do give them guidance on how to act.

Advantages

- Inexpensive
- Can accentuate already existing features
- Can help create areas of caution
- Gives guidance to the drives

Disadvantages

- Limited effect on vehicle speed reduction
- Must be maintained
- Not easily visible under snow or water

Special Considerations

- Maintenance
- Signage
- Visibility

Estimated Cost

- Varies

11.3.2.4. Deflection, Narrowing, Diversion, and Restriction

There is a wide variety of physical traffic calming measures which fall under the categories of vertical deflection, horizontal deflection and installation of diversions or restrictions. Each measure has both advantages and disadvantages.

Several guidelines should be considered when deciding to implement these types of measures. These include:

- Attempt less restrictive measures before considering more restrictive measures such as road closures or other route modifications.
- Space devices 300 to 500 feet apart in order to contain speeds to a 20 to 25 mile-per- hour speed range.
- Make accommodations for drainage and snow removal.
- Make accommodations for emergency vehicles.
- Consider pedestrian and bicyclist needs.
- Address landscaping or other maintenance issues.

Descriptions of a wide variety of physical traffic calming measures, as well as the advantages and disadvantages of each are presented on the following pages. A general magnitude cost range is shown for a basic installation of each measure. These costs can increase significantly with the addition of irrigation systems and street lighting, or the acquisition of right-of-way. Beautification amenities, such as brick pavers or extensive landscaping, can also dramatically impact project costs.

1.1.1.1.1. Vertical Deflection Methods

Speed Bumps, Humps, Tables, and Cushions

Speed bumps, humps, tables, and cushions are all design features which are raised above the roadway. The differences between the four types are in their geometry. Speed bumps are the smallest and are generally 3 to 6 inches high and 1 to 3 feet long. They are typically used in parking lots and low speed residential areas. Speed bumps slow vehicles traveling at slow speeds down to approximately 5 miles per hour. Vehicles traveling at higher speeds may be impacted less by the bumps.

Speed humps are larger than speed bumps and range from 3 to 4 inches high and 10 to 14 feet long. They can be used on streets where a low speed limit is desired. Speed humps generally can slow vehicles down to approximately 15 miles per hour. If traveled over at higher speeds the vehicle will experience a severe jolting effect.

A speed table is a lengthened speed hump with a flat top. Speed tables are typically long enough so that the entire wheelbase of a car rests on the table. The design of speed tables allows for higher speeds than those of speed humps, but creates a smoother ride for larger vehicles. The height of speed tables is similar to speed humps, but the length can vary. A typical 22-foot long speed table has a design speed of approximately 30 miles per hour.

Speed cushions are a series of speed humps installed across the width of the roadway with spaces between them. The spaces are spaced so that emergency vehicles can pass between them without being affected by the bumps. Ordinary cars have smaller axels and will therefore need to travel over the bump with at least one side of their car. Speed cushions have about the same effect on slowing cars down as speed humps do while still allowing emergency vehicles to be unaffected by them.

These traffic calming measures can be placed at spaces ranging from 250 feet to 800 feet to gain a continuous effect on slowing vehicle speeds. If they are placed at distances greater than 800 feet, there is enough room between them for driver to speed up between the devices which will limit their effectiveness.

Advantages

- Slows traffic down
- Increases safety levels
- Decreases traffic volume
- Self-enforcing
- Relatively inexpensive

Disadvantages

- May promote speeding between them
- May increase volume on other streets
- Difficult to properly construct
- May alter storm drainage flow
- May interfere with snow and ice control measures

Special Considerations

- Emergency vehicles
- Drainage
- Signage
- Snow Removal

Estimated Cost

- $1,000 to $8,000

Raised Intersections

Raised intersections are flat raised areas around the intersection with ramps attaching each approach to the intersection. The ramps and/or the intersection can be made out of a textured or painted material to make them stand out visually. By raising the level of the intersection and the cross walks, the area becomes more noticeable to the driver. This creates a safer environment for pedestrians crossing at the intersection. Raised intersections are ideal in areas with heavy pedestrian traffic and on-street parking that doesn't allow for other measures to be taken.

Advantages

- Improved safety for vehicles and pedestrians
- Can be visually appealing
- They work for the entire intersection, not just one street
- Better for emergency vehicles than speed humps

Disadvantages

- Increases turning difficulty
- Increased maintenance
- Requires additional signage
- Less effective at reducing speeds than speed humps and speed tables
- Can be expensive depending on the materials used
- May alter storm drainage flow
- May interfere with snow and ice control measures

Special Considerations

- Emergency vehicles
- Drainage
- Signage
- Snow Removal

Estimated Cost

- $4,000 to $12,500 depending on materials used and size of intersection

Raised Crosswalks

Raised crosswalks are simply speed tables that have crosswalk signage and markings to allow for pedestrians to cross the roadway. The raised level of the crosswalk makes it more visible to the driver and therefore safer for the pedestrians. Raised crosswalks are ideal in locations where there is heavy pedestrian traffic and high vehicle speeds. Raised crosswalks have the advantage of slowing vehicles down who drive over them and alerting vehicles to possible pedestrian traffic in the area.

Advantages

- Improved safety for vehicles and pedestrians
- Can be visually appealing
- Effective at reducing vehicle speeds
- Makes the crosswalk and pedestrians more visible

Disadvantages

- May promote speeding between them
- Difficult to properly construct
- May slow down emergency vehicles
- May alter storm drainage flow
- May interfere with snow and ice control measures

Special Considerations

- Emergency vehicles
- Drainage
- Signage
- Snow Removal

Estimated Cost

- $2,500 to $8,000

Textured Pavement

Textured pavement can be created by either stamping the pavement or by using an alternative material like brick or cobblestone. The purpose of both methods is to create a surface that is unpleasant to drive over at high speeds due to the uneven texture of the surface. If driven over at higher speeds the texture will cause a noticeable vibration to the car, much like a rumble strip does. The variation in the surface will also cause an audible difference when driven over. Generally the pavement area that is textured is either painted a different color or the materials used are of a different color. The change in color makes the area standout visually and will alert the driver that caution needs to be taken in the area. Warning signs can also be used in conjunction with the textured pavement to increase their effectiveness. Textured pavement can also be used to highlight crosswalks or other areas of interest.

Advantages

- Can reduce vehicle speeds
- Can increase driver awareness
- Provide visual and physical warnings to the driver
- Can be used to highlight most areas
- Aesthetically pleasing if properly designed

Disadvantages

- May be difficult for pedestrians and bicyclists
- Can be very expensive depending on material and area covered
- Can add additional noise to the area
- Maintenance issues may arise

Special Considerations

- Emergency vehicles
- Drainage
- Signage
- Snow Removal

Estimated Cost

- Varies by design

Surface Valley Gutters

Valley gutters are dips in the street that can be used to carry runoff as well as cause discomfort to drivers at high speeds.

Advantages

- Effective if used in series at 300 to 500 foot intervals
- Self-enforcing
- Relatively inexpensive during initial construction

Disadvantages

- Drivers may speed up between dips
- May divert traffic and increase volumes on other streets
- Not usually appropriate for existing streets with established drainage patterns

Special Considerations

- Emergency vehicles
- Drainage
- Signage

Estimated Cost

- $1,000 to $2,000

Transverse Rumble Strips

Rumble strips are patterned sections of rough pavement in the street designed to slow traffic. The vibration caused by driving over the rumble strips is intended to cause motorists to slow down. The rumble strip provides visual and audio cues to alert drivers to areas that require special care (shopping centers, schools, entrances to residential neighborhoods). Changes in pavement color and texture (such as bricks or blocks), used in interesting and visually attractive ways, can also have the effect of rumble strips.

Advantages

- Create driver awareness
- Relatively inexpensive to install

Disadvantages

- High maintenance
- May adversely impact bicyclists
- Noisy by design, not recommended for all areas

Special Considerations

- Emergency vehicles

Estimated Cost

- $1,000 to $2,000

1.1.1.1.2. Horizontal Deflection Methods

Gateway

A gateway is an entry treatment to the roadway or surrounding area that creates a sense of passage or change in traffic conditions to the area. Gateways can consist of vertical elements such as posts, trees, bushes, signs, poles, or columns. They can also be formed using curb extensions, changes in pavement color or type, or any other method that creates a sense of entry into an area. Gateways can cause a small reduction in traffic volume because they can make drivers feel uncomfortable about entering the area. A slight speed reduction can also be achieved through the use of narrowing the roadway at the gateway. Safety levels in the area may be increased as well since attention would be drawn to the area.

Advantages

- May slow vehicle speeds
- Highlights the intersection
- Increased pedestrian safety
- Aesthetically pleasing
- Does not inhibit emergency vehicles
- Possible small volume reduction

Disadvantages

- Increased maintenance
- May have limited effect
- Can increase the difficulty level to maneuver the area
- Can be very expensive

Special Considerations

- Lighting
- Signage
- Drainage
- Maintenance

Estimated Cost

- $4,000 to much higher depending on design

Chokers, Narrowings, Slow or Angle Points, Neckdowns, Bulb-outs

Chokers are curb extensions that narrow a street, effectively creating a pinch point along the street. Chokers can be created by bringing both curbs in, or they can be done by more dramatically widening one side at a midblock location. They can also be used at intersections, creating a gateway effect when entering a street.

Chokers typically narrow the street to two narrow lanes or one lane at selected points and force motorists to slow down to maneuver between them. Curb extensions at midblock or intersection corners that narrow a street by extending the sidewalk or widening the planting strip. At midblock locations, this feature is sometimes referred to as parallel chokers, angled chokers, twisted chokers, angle or pinch points, slow points, or midblock narrowings. At intersections, the feature may be called a neckdown, bulb-out, knuckle, or corner bulge. Chokers are good for areas with substantial speed problems and no on-street parking shortage.

Advantages

- Minor inconvenience to drivers and local traffic
- May create on-street parking bays
- Shorter crossing distance for pedestrians
- Provides space for landscaping, can be aesthetically pleasing
- Can be used in multiple applications along roadway

Disadvantages

- May create opportunities for head-on conflicts on narrow streets
- Cost is greater that many other devices
- May lose some on-street parking near feature
- Unfriendly to bicyclists unless designed to accommodate them
- Can be very expensive

Special Considerations

- Lighting
- Signage
- Irrigation and maintenance of landscaping
- Emergency vehicle access

Estimated Cost

- $8,000 to $50,000 or higher depending on design

Chicanes

Chicanes are offset curb extensions that cause a deviation in the path of travel. They typically alternate from one side of the street to the other, forming S-shaped curves. Chicanes can also be created by shifting parking, either diagonal or parallel, from one side of the street and the other.

Shifting a travel lane has an effect on speeds as long as the taper is not so gradual that motorists can maintain speeds. For traffic calming, the taper lengths should reflect the desired speed which should be posted prior to the chicane.

Advantages

- Imposes minimal inconvenience on local traffic
- Reduces pedestrian crossing distance
- Provides large area for landscaping
- Reduces speeds without significantly increasing emergency response times
- Aesthetically pleasing

Disadvantages

- May create opportunities for head-on conflicts on narrow streets
- Cost is greater that many other devices
- Unfriendly to bicyclists unless designed to accommodate them

Special Considerations

- Lighting
- Signage
- Irrigation and maintenance of landscaping

Estimated Cost

- $20,000 to $30,000

Traffic Circles

Traffic circles are raised circular islands placed in the center of the intersection about which drivers must navigate around. They cause vehicles to slow down through the intersection because they are forced to make turning movements. They are very effective at slowing vehicle speeds down. Pedestrian safety is also increased due to the decrease in speeds. Large vehicles may have trouble navigating around the traffic circles, especially when making left-hand turns. Traffic circles work well for low volume intersections where speeding is a common problem.

Traffic circles are not to be confused with roundabouts, which exhibit large splitter islands, yield signs at each entry way, and are intended for larger intersections with higher traffic volumes.

Advantages

- Reduces crashes over stop control
- Provides space for landscaping
- Provides equal access to intersection for all drivers
- Provides good environment for bicyclists

Disadvantages

- May be restrictive for larger vehicles if designed to a low speed.
- Right-of-way may need to be purchased
- Initial safety issues as drivers adjust
- May increase volume on adjacent streets

Special Considerations

- Lighting
- Signage
- Irrigation and maintenance of landscaping

Estimated Cost

- $10,000 to $50,000 or higher depending on design and location

11.3.2.5. Diversion and Restriction Methods

Half Closures

Half closures are put in place to block a single lane of traffic. They can be used to prevent vehicles from entering a road but still allow vehicles to exit the road. This is an effective means of limiting traffic on a roadway and also limiting turns off of the intersecting roadway. Half closures are generally made by extending the curb or placing a barrier to block entry. Ample signage must be put into place to alert drivers to the partial closure. Half closures are commonly used in areas where a residential road is experiencing heavy amounts of traffic due to its connection to a main road. Most of this traffic can be attributed to cut-through traffic and can be significantly decreased through the use of half closures.

Advantages

- Reduces access for residents or businesses
- May increase trip length
- Increases volumes on other streets
- Drivers may be able to drive around the barrier

Disadvantages

- Reduces access for residents or businesses
- May increase trip length
- Increases volumes on other streets
- Drivers may be able to drive around the barrier

Special Considerations

- Emergency vehicles
- Signage
- Maintenance

Estimated Cost

- $10,000 to $40,000

Diagonal Diverters

Diagonal Diverters consist of a barrier being placed diagonally across a four-legged intersection which interrupts the traffic flow across the intersection. The traffic is diverted away from and is not allowed to drive straight through the intersection. The diverter gets rid of conflict points caused by thru traffic and turning movements within the intersection. They also discourage non-local traffic flow in the area, but still allow for local traffic. This method is effective in areas where there are problems with cut through traffic. The diverter needs to be visible enough to alert the driver to slow down and make the turn.

Advantages

- Eliminates through traffic and reduces traffic volumes
- Not a full road closure
- Provides space for landscaping
- Reduces traffic conflict points
- Increases pedestrian safety
- Can include bicycle path connection

Disadvantages

- May be an inconvenience to area businesses or residents
- May inhibit emergency vehicles
- Can be expensive if done as a retrofit
- Cause circuitous routes

Special Considerations

- Emergency vehicle access
- Lighting
- Signage
- Drainage
- Maintenance

Estimated Cost

- $10,000 to $80,000

Full Closures

Full street closures are created by placing barriers at an existing intersection. The full closures can be done to create a dead end or a cul-de-sac style road. An opening or trail can be placed to connect pedestrians and bicycles to the abutting road. The type of barrier used to create the closures can range from a bollard style to a full landscaped closure. A landscaped style is more aesthetically pleasing to the area, but is also much more expensive then placing bollards to stop vehicle traffic. Another method commonly used to create road closures is installing curb extensions to the roadway.

Road closures are very effective at lowering traffic volumes on the roadway. Cut through traffic can be greatly reduced through the use of full closure. It is common to use full closures to limit the amount of traffic on a residential street that was connected to a main street. By closing the connection to the main street, the traffic that previously used the residential street to connect to the main street would diminish thereby decreasing the overall traffic on that road. This does, however, create more traffic on other roads in the area since those vehicles would still have to access the main street via another street.

Advantages

- Eliminates through traffic
- Improves safety for all street users
- Can still have pedestrian and bicycle access
- Can be aesthetically pleasing

Disadvantages

- Reduces emergency vehicle access
- Reduces access to properties
- May increase trip lengths
- Increases volumes on other streets
- Can be expensive

Special Considerations

- Emergency vehicles
- Signage
- Drainage
- Maintenance

Estimated Cost

- $15,000 to much higher depending on design

Median Barriers

Median barriers are put in place in the middle of intersections to restrict cut-through movements at a cross street. They also restrict left-turns onto the cross streets from the main street. Putting a median barrier in place will reduce the number of conflict points and therefore increase the safety of the intersection. The barrier can be used as a pedestrian refuge for people wanting to cross the main street. This, along with the reduction in left-turns, increases pedestrian safety at the intersection. Median barriers also reduce traffic volumes on the side streets while increasing the traffic flow on the major street since there will no longer be vehicles sopping to take left-turns at the intersection. This type of barrier can work well in areas where the side street has turned into a popular cut-through street or in areas where there are problems with people stopping to make left-turns. The median barrier does restrict all vehicles, including emergency vehicles. However, the barrier can be designed so that emergency vehicles can travel around them if needed.

Advantages

- Lowers traffic volumes on the side street
- Provides space for landscaping
- Reduces traffic conflict points and increases safety
- Increases pedestrian safety

Disadvantages

- May be an inconvenience to area businesses or residents
- May inhibit emergency vehicles
- Require additional street width on the major street

Special Considerations

- Emergency vehicle access
- Lighting
- Signage
- Drainage
- Maintenance

Estimated Cost

- $15,000 to $20,000 per 100 feet

Forced Turn Islands

Forced turn islands are small traffic islands placed at intersections to restrict and channelize turning movements. They are generally put in place to block left-turn and through movements while still allowing for right-turn movements. This method is commonly used where smaller side streets intersect with a larger major street. Heavy left-turn or through traffic off of side streets can cause safety and traffic problems for the area. Restricting the movements from the side streets can increase the safety and traffic levels of the intersection. Forced turn islands are common place for parking lots or similar areas that have multiple entrances and exits. The islands encourage people wanting to turn left or go straight out of the area to use the designated intersections that don't have the forced turn islands; the designated intersections are generally larger safer intersections.

Advantages

- Provides space for landscaping
- Reduces traffic conflict points and increases safety
- May reduce cut through traffic
- Causes vehicles to use designated intersections

Special Considerations

- Emergency vehicle access
- Lighting
- Signage
- Maintenance

Disadvantages

- May be an inconvenience to area businesses or residents
- Driver may be able to maneuver around the island
- Diverts traffic to other roads
- May inhibit emergency vehicles

Estimated Cost

- $4,000 to $8,000

11.3.3. Traffic Calming Program for Existing Streets

The method to implement a traffic calming program for existing streets is recommended in this section of the Chapter. It is important to note when examining this recommended program and its procedures that the process may be modified depending upon various factors. Some of these factors would include the severity of the problem, location of the problem (one intersection or area-wide), cause of the problem (such as a special seasonal event like the State Fair), or other circumstances which affect the situation under consideration. Under any of these circumstances, the process may be altered at the discretion of the Public Works Department. This can include accelerating, slowing down, or terminating the process. Although some traffic calming measures are applicable to higher volume roads like collectors or in some commercial areas, the process outlined here is for local residential streets only.

To facilitate this process, the City will work closely with the Neighborhood Councils. This process would start early with the City supplying all the Neighborhood Councils with information about the traffic calming program and a number of Investigation Request Forms. With this preliminary coordination in place, the process can proceed smoothly.

Phase I – Problem Identification and Investigation

Step 1: Step one can begin in two ways. First, a citizen contacts the Neighborhood Council where the traffic problem is. The Neighborhood Council listens to the circumstances, agrees there is a problem, and then completes an Investigation Request form and sends it to the Public Works Department. The responsibility to fill out the form can be delegated to the resident bringing forward the concern, or remain with the Council; or Second, the Neighborhood Council sees a need for traffic calming within their neighborhood on an area-wide basis and then completes and forwards an Investigation Request form to the Public Works Department.

The form is key to this process, because it has the information about the nature of the problem, its location, and the signatures of at least ten other neighborhood residents who agree the problem exists. Furthermore, it identifies the Neighborhood Council and interested local residents. Note the Investigation Request form requires signatures from ten residents agreeing that the situation observed exists, and this portion must be completed in order to move this process forward.

Step 2: After receiving the form, the Public Works Department would contact the neighborhood to discuss the nature of the perceived problem. This contact would include the Neighborhood Council and, if appropriate, local residents. This is an important step, since this discussion helps determine the types of studies which need to be conducted, and would help focus on potential solutions.

Step 3: The Public Works Department conducts a field review of the location, and collects the appropriate data in order to determine whether or not the perceived problem actually exists. For most requests, the accident records would be reviewed, and traffic volumes collected. Other studies that may be appropriate include a speed study, truck count, or determining the percentage of cut-through traffic.

Once this data is collected, it is reviewed in the office against baseline traffic calming criteria. These should include at least one of the following:

- Traffic volumes higher than 1,000 vehicles per day or 100 vehicles in one hour.
- Three or more accidents in a 12-month period, occurring within the last three years.
- An 85th percentile speed at least 5 mph over the speed limit.
- Truck traffic volumes exceeding five percent of the total traffic volumes.
- More than 25% cut-through traffic during any single hour of an average day.
- Pedestrian crossing volume of 25 people per hour for any single hour of an average day.
- Chronic failure of drivers to yield to pedestrian traffic at an intersection.
- Other criteria as agreed upon by the neighborhood and the Public Works Department.

After the data is collected and reviewed against the baseline criteria, the Public Works Department shares the results of the review with the Neighborhood Council and any interested local residents. If the subject location meets the required criteria, the Public Works Department would review the Phase II process with the Neighborhood Council and interested local residents. If the location does not meet the above criteria, the Public Works Department would discuss options with the neighborhood to address the situation outside of the traffic calming program.

Phase II – Implementation of Passive Traffic Calming Strategies

Step 4: The Public Works Department determines the boundaries of the affected neighborhood. Neighborhood boundaries will generally follow arterial streets or other natural physical boundaries such as rivers, abrupt changes in elevation, etc. A neighborhood meeting would then be scheduled by the Public Works Department to discuss possible educational / enforcement solutions to the problem. The map prepared by the Public Works Department delineating the boundary of the affected neighborhood is given to the Neighborhood Council who is then responsible for contacting the area residents about the meeting. At the meeting, the Public Works Department would present a range of educational / enforcement or low level engineering options. These measures would emphasize the least intrusive measures which may expand beyond educational / enforcement options to only minor physical changes, such as increased signing, installing pavement marking or trimming vegetation. The purpose of this meeting is to agree on a course of action to address the situation. This step may require more than one meeting and should not be considered complete until a course of action is agreed upon.

Step 5: A member of the Neighborhood Council or interested local resident circulates a Phase II petition within the boundary of the affected neighborhood. This petition identifies the proposed education / enforcement / engineering techniques, and asks residents to indicate their approval. The petition must be signed by more than forty percent of the property owners within the boundary of the affected neighborhood for the process to proceed. If a large number of residences are not owner occupied, then neighborhood residents may sign the petition, but the required amount is raised to fifty percent. Because these measures affect residents at their homes and in their neighborhoods, substantial neighborhood support is mandatory. If the required amount of signatures are obtained,

the identified measures can then be implemented. If neighborhood approval cannot be secured, no further action would be taken.

Step 6: Approximately 90 days after implementing the measures, the City would repeat the data collection process it performed in Phase I. Please note that the 90-day time frame is generally enough time for shifts in the traffic patterns to have occurred. However, this may need to be modified depending on seasonal conditions or other factors. If the data collected indicates that the problem has been alleviated, the educational and/or enforcement activities can be considered as adequate and the process a success.

Phase III – Implementation of Active Traffic Calming Strategies

Step 7: If the traffic problem has not been resolved by the measures implemented during Phase II, the Public Works Department then conducts a more intensive engineering study to determine a range of appropriate physical improvements to the location. The study should consider installation of either vertical or horizontal deflection techniques before considering roadway obstruction techniques.

Step 8: The Public Works Departments schedules a neighborhood meeting to review the improvement options. Once again, the Neighborhood Council is responsible for notifying area residents about the meeting. The Public Works Department facilitates this meeting. Based on resident input, a preferred solution is selected from the range of possible solutions. If a temporary version of this traffic calming device is not practical, proceed to Step 11.

Step 9: If a temporary version of the device is feasible, the Neighborhood Council or a designated representative circulates a Phase III Petition for Temporary Measures throughout the affected neighborhood. At least fifty percent of the property owners within the affected neighborhood must sign the petition for the temporary version of the preferred traffic calming device to be installed. Once again, if the neighborhood is predominantly not owner occupied, the residents can sign the petition, but at least sixty percent of the residents must sign the petition. If less than fifty percent of the property owners or sixty percent of the residents sign the petition, the elements from Phase II may remain in place, but no additional elements would be installed.

Step 10: After one year, the City would repeat the same data collection process as completed during Phase I to determine whether or not the temporary device is effective. If it is found not to be effective, the City would notify the Neighborhood Council and remove the device. The process then can begin again at Step 7.

Step 11: If the temporary device is effective, the Public Works Department then develops a preliminary design and cost estimate for installing a permanent traffic calming device. The Public Works Department also determines the funding mechanism to finance the permanent solution. The Public Works Department would look at all possible funding sources including federal or state grants, pilot project funding, etc to lower the costs to local residents. The City would provide the Neighborhood Council with this information, and the “Petition for Installation of Permanent Measures” can be initiated.

Step 12: The Neighborhood Contact circulates the petition for Installation of Permanent Measures, which includes a copy of the preliminary design, the cost estimate and an explanation of financial responsibility to the property owners in the affected neighborhood. The petition must be signed by seventy percent of the property owners in the affected neighborhood to allow the process to move forward. If less than seventy percent of the property owner sign the petition, the process cannot continue, and the temporary measures would be removed. However, if more than seventy percent of

the property owners sign the petition, the Public Works Department would bring this measure before the City Commission for their approval, complete a final design and arrange for construction of the permanent traffic calming device. Note that financial obligations by the residents would be required at this point and must be in place before construction would begin.

Note: there are numerous points during this process at which the traffic calming process can be ended due to completion of the process or lack of adequate neighborhood support. Since neighborhood sentiment can change at a later date, the process can be resumed a year later at the same step where it left off.

11.3.3.1. Project Costs

The cost sharing related to installing traffic calming measures should be based on the initial need for the measure. The need for the measures can arise from one of the following situations.

- Poor initial street design
- Inadequacies of the major street network
- Commercial and/or residential development adjacent to the neighborhood

During Phase I of the process, the nature and cause of the traffic problem would be identified. From this information, the City would proportion the project costs. It is possible that such entities as the City, the neighborhood residents, developers, or other parties would be involved in paying for the traffic calming measures.

The costs of Steps 1 through 11 would be mostly borne by the City, other than the volunteer hours worked to complete paperwork, gather petition signatures, and notify residents of traffic meetings. Permanent traffic calming measures, as proposed in Phase III (Step 12) would likely be financed by neighborhood contributions, development fees, City funds and funds from other sources. The proportion of funding from these sources will vary on a case-by-case basis.

11.3.3.2. Removal of Permanent Traffic Calming Devices

To remove a permanent traffic calming device, the Neighborhood Contact must submit a “Petition for Removal of Traffic Calming Measure”. This petition must be signed by ninety percent of the property owners within the affected neighborhood. The property owners within the affected neighborhood will be fully responsible for paying the cost of removing the traffic calming devices.

11.3.4. Incorporating Traffic Calming in New Street Designs

Much more is known about street function and design now than was known when Great Falls was originally established and developed. As such, street function should be identified at the beginning of the project approval process, and the streets designed to accomplish the functions appropriate for them. Those designed as arterials (part of the major street network) should be designed to efficiently move traffic in a convenient and safe manner. Conversely, streets that are intended to be local access streets or collector streets should be laid out and designed to primarily provide access to adjacent land, while discouraging through traffic and the higher travel speeds that accompany it. New developments, therefore, should include inherent traffic calming features which are an integral part of their design. If designed properly, the appropriate functions of the different categories of street would be intuitively obvious to the traveling public.

Some of the techniques that could be adopted for local access streets include:

- Street layout;
- Design standards including lane width, curve tightness, on-street parking and landscaping;
- Street connectivity;
- Pedestrian / bicycle facilities;
- Intersection treatments such as small corner radii, pedestrian bulb-outs, etc.;
- Judicious use of “T” intersections;
- Entrance treatment; and
- Roundabouts or Traffic circles.

To achieve these goals, the City could incorporate traffic calming improvements into the adopted standard street designs. These designs could include recommendations where various treatments are appropriate as well as when they could be used. Design details could also be included to provide a guideline of what would be acceptable to the City.

Traffic calming design characteristics should also be incorporated into the City’s development review and annexation review processes. Proposed developments or requests to annex would be reviewed by staff to determine whether or not traffic calming elements incorporated into the development’s layout are appropriate for the given location, or alternatively, what strategies are best suited, and what design details could be considered. The process should be designed to pro-actively assist developers in utilizing traffic calming strategies to improve the quality of life in their developments, while minimizing or eliminating the costs for retrofit efforts. Due to the long term effects of original roadway layout and construction, the traffic calming program should apply to all development in the transportation study area.

The designing of new subdivisions with inherent traffic calming procedures in place will ultimately result in better neighborhoods for new residents, and better use of arterials by the traveling public.

11.3.5. Traffic Calming Techniques Applicable to Collectors and Minor Arterials

A few of the measures depicted on the tables on the following pages are applicable to non-local street conditions. Installation of any of these measures will be done at the discretion of City staff. These measures do not fall under the process outlined previously. The measures are restricted to horizontal deflection and include the following:

- Mid-block median;
- Curb bulb-outs / neckdown; and
- On-street parking.

These measures can be used to slow traffic where chronic speeding problems have been shown to exist, or to accommodate pedestrian traffic. The mid-block median usually is present on arterials due to another piece of infrastructure, such as a railroad track which passes over the street, or an overhead pedestrian crossing structure.

On-street parking almost always occurs in a residential area, but also can occur in retail or industrial sectors. Judicious use of on-street parking can influence the traffic flow and help regulate traffic speeds on collectors or minor arterials. Bulb-outs, also called neckdowns, can be used to create the illusion for the driver that the roadway is narrowing. This perception will cause the driver to slow down. A secondary benefit of the bulb-outs is the decreased walking distance for pedestrians at the crosswalks. Bulb outs

generally are wide enough for a car to park in their "shadow". This generally creates good separation between the parked cars and the moving traffic.

11.4. CONTEXT SENSITIVE SOLUTIONS

Context Sensitive Solutions (CSS) are an interdisciplinary approach that seeks effective, multi-modal transportation solutions by working with stakeholders to develop, build and maintain cost-effective transportation facilities which fit into and reflect the project's surroundings – its "context." With respect to transportation projects, context can be defined as "all elements related to the people and place where a project is located." This includes both visible elements such as environmental or historic resources and invisible elements such as community values, traditions, and expectations.

CSS is both process and product, characterized by a number of attributes. It involves all stakeholders, including community members, elected officials, interest groups, and affected local, state, and federal agencies. It puts project needs and both agency and community values on a level playing field and considers all trade-offs in decision making. Through early, frequent, and meaningful communication with stakeholders, and a flexible and creative approach to design, the resulting projects should improve safety and mobility for the traveling public, while seeking to preserve and enhance the scenic, economic, historic, and natural qualities of the settings through which they pass.

CSS is guided by four core principles:

1. Strive towards a shared stakeholder vision to provide a basis for decisions.
2. Demonstrate a comprehensive understanding of contexts.
3. Foster continuing communication and collaboration to achieve consensus.
4. Exercise flexibility and creativity to shape effective transportation solutions, while preserving and enhancing community and natural environments.

Context sensitive designs incorporate a multidisciplinary design team. Residents, business owners, local institutions, city officials, and designers all have a part in the design and implementation of CSS. The conventional approach to design would be to approach the stakeholders at the tail end of the design phase in order to gain approval; involving these people at the beginning of the project ensures that the needs of all the stakeholders and the public are addressed from start to finish. Addressing these needs in the early stages can save valuable time and money in the development process.

Conventional designs place importance strictly on level of service and moving traffic. CSS balances safety, mobility, community, and environmental goals. The idea is to achieve a design that creates a unity for all of the users and for the area. CSS focuses not only on moving traffic, but also on pedestrians, bicycles, and aesthetic issues. Roads are built around the needs of pedestrians and bicyclists instead of just being built to handle the highest amount of traffic at the highest speeds possible. A properly constructed road will be safe for all users, regardless of their mode of travel. A CSS allows flexibility for its users when choosing their travel type.

CSS should encourage "smart growth" within the area. This refers to a type of city center growth that discourages urban sprawl by creating an area where pedestrians, bikes, transit, and vehicles can function in harmony within the network. Mixed-use development is also used in the area to allow for a variety of activities to take place. CSS creates a sense of community and unity to the area, while increasing safety levels and aesthetic value to the area.

Another purpose of CSS is to give users flexibility in the design process of transportation elements. All projects are different and should be treated as such. It is appropriate for some areas to incorporate 12-foot-wide travel lanes, for example, while others may benefit more from smaller 10-foot-wide lanes. The FHWA's *Flexibility in Highway Design* is a guide written for highway engineers and project managers that describes the flexibility available when designing roads and illustrates successful approaches used in other highway projects.

The "Qualities that Characterize Excellence in Transportation Design", elaborated at the Thinking Beyond the Pavement in 1998, illustrate the desired end products of the CSS process:

- The project satisfies the purpose and needs as agreed to by a full range of stakeholders. This agreement is forged in the earliest phase of the project and amended as warranted as the project develops.
- The project is a safe facility for both the user and the community.
- The project is in harmony with the community, and it preserves environmental, scenic, aesthetic, historic, and natural resource values of the area, i.e., exhibits context sensitive design.
- The project exceeds the expectations of both designers and stakeholders and achieves a level of excellence in people's minds.
- The project involves efficient and effective use of the resources (time, budget, community) of all involved parties.
- The project is designed and built with minimal disruption to the community.
- The project is seen as having added lasting value to the community.

11.4.1. Benefits of CSS

As more organizations apply CSS principles, evidence continues to grow that measurable benefits result from this broadly informed and flexible approach to all phases of transportation decision making. Involving stakeholders in decision making yields transportation solutions that balance environmental, engineering, community, mobility, funding, and safety needs with the minimum of delay and controversy. As an approach to transportation, CSS offers many important benefits[23]:

- CSS solves the right problem by broadening the definition of "the problem" that a project should solve, and by reaching consensus with all stakeholders before the design process begins.
- CSS conserves environmental and community resources. CSS facilitates and streamlines the process of NEPA compliance.
- CSS saves time. It shortens the project development process by gaining consensus early, and thereby minimizing litigation and redesign, and expediting permit approvals.
- CSS saves money. By shortening the project development process and eliminating obstacles, money as well as time is saved.
- CSS builds support from the public and from the regulators. By partnering and planning a project with the transportation agency, these parties bring full cooperation, and often additional resources as well.
- CSS helps prioritize and allocate scarce transportation funds in a cost-effective way, at a time when needs far exceed resources.
- Group decisions are generally better than individual decisions. Research supports the conclusion that decisions are more accepted and mutually satisfactory when made by all who must live with them.

[23] http://contextsensitivesolutions.org/

- CSS is the right thing to do. It serves the public interest, helps build communities and leaves a better place behind.

11.4.2. Recommendation

It is recommended that language and themes supporting CSS be included in the LRTP. Also pertinent to the discussion would be the inherent limitations and competing factors that have to be balanced when considering CSS within the greater context of a community transportation system.

11.5. LIVABILITY

Livability is a national movement with local implications that are supported within the Great Falls community. Providing transportation options to improve access to housing, jobs, businesses, services and social activities are fundamental desires of most transportation system user groups. Active transportation results in a physically fit population, minimizes auto emissions, extends the life of transportation infrastructure, and delays the needs for infrastructure improvements.

Fostering livability in transportation projects and programs will result in improved quality of life; will create a more efficient and accessible transportation network; and will serve the mobility needs of communities, families, and businesses.

The concept of livability, which has evolved over the years, is often used to describe a range of initiatives aimed at improving community quality of life while supporting broader sustainability goals. Livability encompasses multi-dimensional issues relative to community design, land use, environmental protection and enhancement, mobility and accessibility, public health, and economic well-being. Incorporating livability into transportation planning, programs, and projects is not a new concept. Communities, developers, advocacy groups, businesses, and neighborhood residents have been working for generations to make places more livable through transportation initiatives, with varying degrees of support from local, regional, State, and Federal agencies. These initiatives have used a range of terms to describe an overlapping set of objectives and strategies - livability, sustainability, community impact assessment, scenario planning, land use and transportation, smart growth, walkable communities, new urbanism, healthy neighborhoods, active living, transit-oriented development, context-sensitive solutions, and many others. The key concept behind livability in transportation: transportation planning is a process that must consider broader community goals.

Livability in transportation is about integrating the quality, location, and type of transportation facilities and services available with other more comprehensive community plans and programs to help achieve broader community goals such as access to a variety of jobs, community services, affordable housing, quality schools, and safe streets. This includes:

- Addressing road safety and capacity issues through better planning, design, and construction.
- Integrating health and community design considerations into the transportation planning process to create more livable places where residents and workers have a full range of transportation choices.
- Using TDM approaches and system management and operation strategies to maximize the efficiency of transportation investments.
- Maximizing and expanding new technologies such as ITS, green infrastructure, and quiet pavements.

- Developing fast, frequent, dependable public transportation to foster economic development and accessibility to a wide range of housing choices.
- Strategically connecting the modal pieces-bikeways, pedestrian facilities, transit services, and roadways-into a truly intermodal, interconnected system.
- Enhancing the natural environment through improved storm water mitigation, enhanced air quality, and decreased greenhouse gases.

Livability provides economic benefits to communities, businesses, and consumers. In practice, livable transportation systems accommodate a range of modes (walking, bicycling, transit, and automobiles) by creating mobility choice within more balanced multimodal transportation networks. This in turn helps support more sustainable patterns of development, whether in an urban, suburban, or rural context. Livable transportation systems can provide better access to jobs, community services, affordable housing, and schools, while helping to create safe streets, reduce energy use and emissions, reduce impacts on and enhance the natural and built environment, and support more efficient land use patterns.

11.5.1. Livability Principles

In June 2009, U.S. Secretary of Transportation Ray LaHood, U.S. Secretary of Housing and Urban Development Shaun Donovan, and U.S. EPA Administrator Lisa P. Jackson announced the new Interagency Partnership for Sustainable Communities to improve access to affordable housing, provide more transportation options, and lower transportation costs while protecting the environment in communities nationwide. The Partnership for Sustainable Communities works to coordinate federal housing, transportation, water, and other infrastructure investments to make neighborhoods more prosperous, allow people to live closer to jobs, save households time and money, and reduce pollution.

Because the concept of livability is place-based and context sensitive, its definition can differ depending on region and whether the community is an urban, suburban, exurban, or rural setting. However, the overall understanding of livability can be conveyed by five of the six principles established by the Sustainable Communities Partnership listed below. A livable community:

1. **Provides more transportation choices that are safe, reliable, and economical.** Develop transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions and promote public health. This can be as simple as increasing walkability, to enable citizens to park their car once in a downtown area, and access their daily needs by foot from that location. Providing transportation to critical social services for rural residents who can't drive is another valuable livability option.

2. **Promotes equitable, affordable housing options.** Expand location- and energy-efficient housing choices for people of all ages, incomes, races and ethnicities to increase mobility and lower the combined cost of housing and transportation. This refers to an availability of location- and energy-efficient housing choices for people of all ages, incomes, races and ethnicities – like neighborhoods with mixed-use, mixed-income housing where a retired couple can live in the same community as a recent college graduate.

3. **Enhances economic competitiveness.** Through reliable and timely access to employment centers, educational opportunities, services and other basic needs, livable communities are those which have higher economic resilience and more economic opportunities. They provide expanded business access to markets – largely through increased accessibility and mobility choices.

4. **Supports and targets funding toward existing communities.** Instead of developing on new land – which can be a waste of funding and resources – livable communities target development toward such strategies as transit oriented, mixed-use development and land recycling – to increase community revitalization, improve the efficiency of public works investments, and safeguard rural landscapes.

5. **Values communities and neighborhoods.** The purpose of livability is to enhance the unique characteristics of all communities by investing in healthy, safe and walkable neighborhoods.

The Partnership's sixth principle addresses the alignment of federal policies and funding to remove barriers to collaboration, leverage funding and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.

11.5.2. Benefits of Livability

Incorporating livability approaches into transportation, land use, and housing policies can help improve public health and safety, lower infrastructure costs, reduce combined household transportation and housing costs, reduce vehicle miles traveled, and improve air and water quality, among many other benefits.

- **Transportation, Development, and Environment:** How we plan and develop communities and choose to travel affects environmental quality. Providing more travel options in compact, connected communities leads to fewer car trips, which improve air and water quality. Developing more compactly, and reusing existing properties, can preserve rural lands and protect natural resources. Coordinating land use and development decisions with transportation investments can produce clear results.

- **Transportation and Safety:** Over the past 50 years, most roadways have been designed primarily for safer automobile and truck travel, which can make them less safe for pedestrians, older adults, children, people with disabilities, or bicyclists. More than 4,600 pedestrians and bicyclists died on U.S. roads in 2009 and more than 108,000 were injured. People who do not drive or have access to private vehicles, such as children and older adults, are disproportionately represented. Making roads safer for all users can have the added benefits of improving access jobs and services, reducing congestion, and sparking business and neighborhood investment.

- **Transportation and Health:** Communities that make it safe and easy to get around by walking, bicycling, and taking transit can generate a number of health benefits, such as reduced obesity; reduced cases of asthma/heart disease/cancer; increased safety, and improved access to schools, parks, and recreation and community facilities.

- **Transportation and Land Use:** Communities benefit when decisions about transportation and land use are made at the same time. Deciding to build houses, schools, grocery stores, employment centers, and transit stations close to one another—while providing a well-connected street network and facilities for walking or biking—provides more transportation choices and convenient access to daily activities. It also ensures community resources and services are used efficiently.

- **Transportation and Housing Costs:** Transportation is the second largest expense for most households after housing. Households living in auto-dependent locations spend 25 percent of its

income on transportation costs. Housing that is located closer to employment, shopping, restaurants and other amenities can reduce household transportation costs to 9 percent of household income.

- **Transportation Management and Operations:** Transportation system management and operations (M&O) coordinates systems to make them more efficient, more convenient, more reliable, safer, and easier to use. M&O strategies make systems work better, allowing us to do more with less - less congestion, less money, less fuel, and less frustration. They support livability by increasing travel choices and efficiency—including transit, bicycling, and walking—while reducing emissions and resource use.

- **Transportation and Economic Development:** Livability and economic development are intertwined: livability draws businesses and businesses contribute to community quality of life through investments in the built environment, culture, and philanthropy. Businesses are choosing to locate in more accessible locations that combine transportation and housing choices, good schools, gathering places, and natural amenities. Targeted transportation investments can improve access to jobs, education, shopping, and goods movement, while providing construction and operations jobs.

- **Transportation and Rural Livability:** Livability in rural areas focuses on the towns, villages, working lands and natural resources that surround and connect them. Rural communities vary widely based on location, geography, economic and resource base, and other factors. "Rural" can describe farming, destination, gateway, resource-based, recreational, or other types of communities. Transportation investments that support rural livability also vary depending on location and context. For rural areas between towns or lands on the urban fringe, livability can mean safer highways and intersections, context-sensitive roadway design, multi-purpose trails, or rural on-demand transit and carpool information linked to smartphones. In small towns and villages, livability can mean a revitalized Main Street, sidewalks and improved crossings, a gateway entry, senior housing in walking distance to a redeveloped shopping district, or new neighborhoods built on the town's existing walkable street network.

- **Freight and Livability:** Getting goods to people and businesses is an essential part of building stronger regional economies, increasing community quality of life, and maintaining the nation's role in a global economy. While freight movement can impact livability and community quality of life, careful planning can help balance freight and livability needs. Communities can be aesthetically pleasing, safe, and walkable, while still providing efficient access for large trucks, rail lines, and other modes of transportation. The HUD-DOT-EPA livability principles call for enhancing economic competitiveness, through reliable and timely access to jobs and services, and expanded business access to markets, as well as for supporting existing communities and valuing communities and neighborhoods.

The FHWA has produced a series of fact sheets on each of the topics above which provide more detailed information and examples[24].

11.5.3. Livability and the LRTP

The LRTP should reflect the future transportation needs of the Great Falls area and include recommended actions, programs and projects to improve, enhance and better manage and operate the

[24] http://www.fhwa.dot.gov/livability/fact_sheets/

public transit and highway systems, promote alternative modes, accommodate bicyclists and pedestrians, consider other non-motorized modes of transportation, provide freight mobility and mitigate environmental impacts. In general, recommendations in the LRTP should also adhere to the livability principles established by the US DOT, HUD and EPA which are aimed at improving access to affordable housing, providing more transportation options, and lower transportation costs. By keeping these considerations in mind, transportation improvement programs and projects will not only accommodate existing travel, make the current transportation system more efficient, meet growing travel requirements and improve mobility, but also be a catalyst for enhancing the overall livability of the Great Falls community.

Livability is about linking the quality and location of transportation facilities to broader opportunities such as access to good jobs, affordable housing, quality schools, and safe streets. This includes addressing safety and capacity issues on all roads through better planning and design, making judicious decisions about improvement projects, and expanding the use of new technologies.

The LRTP continues local efforts to make the transportation network operate as efficiently and effectively as possible and promote a balanced transportation system with alternatives to the private vehicle. The analyses conducted for the update of the LRTP show that some components of the system operate poorly and congestion occurs daily and reaches severe conditions at some locations. However, it is important to preserve and maintain essential infrastructure and services, while making the system operate as efficiently as possible. It is also equally critical to enhance the mobility of people and goods by increasing mode choice, access and convenience, and strategically expanding transportation capacity. Although the highway system dominates movement, non-highway components are equally important and provide alternatives for other system users.

The LRTP also attempts to reinforce future local land use development objectives and economic revitalization goals. Transportation and land use planning have a similar goal: efficient use of a limited resource (land) that allows for the efficient movement of people and goods. Together, transportation and land use planning will lead to the creation of strong communities and better define quality of life and livability in Great Falls.

The City's recent Growth Policy Update (*Imagine Great Falls 2025*) recommends a concept referred to as "Healthy by Design." This is a holistic concept that promotes health, safety and neighborhood oriented considerations in land use review. Many of the goals of Healthy by Design are occurring naturally in Great Falls. This includes an emphasis on trails, safe and comfortable sidewalks, community gardens and small scale commercial and mixed use projects.

11.6. ENVIRONMENTAL MITIGATION

Moving Ahead for Progress in the 21st Century (MAP-21) was passed by Congress and signed into law by President Obama in July 2012. The bill replaces the extensions to the *Safe, Accountable, Flexible, Efficient, Transportation Equity Act, a Legacy for Users* (SAFETEA-LU) federal legislation that were in place during the previous LRTP update. Section 6001 of SAFETEA-LU (Environmental Considerations in Planning) required metropolitan LRTPs to discuss environmental mitigation opportunities and required certain elements and activities to be included in the development of long-range transportation plans, including:

- Consultations with resource agencies, such as those responsible for land-use management, natural resources, environmental protection, conservation and historic preservation.
- Consultations to compare transportation plans to conservation plans, maps, and inventories of natural or historic resources.

- A discussion of potential environmental mitigation activities.
- A participation plan that identifies a process for stakeholder involvement.

These provisions originated from a desire to realize benefits for overall transportation project development by considering environmental resources early on in the transportation planning process. The early consideration of environmental resources can assist in program predictability, project decision-making, project deliverability, and mitigation decisions while responding to the desire to improve both transportation infrastructure and the environment.

While MAP-21 streamlined the environmental review process for some transportation projects, the new legislation reiterates the need, as SAFETEA-LU did, for a discussion in the planning process that addresses:

> *"… potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan. This discussion shall be developed in consultation with federal, state, and Tribal wildlife, land management, and regulatory agencies."*

In December 2012 letter to the Environmental Quality Council, Secretary of Transportation Ray LaHood elaborated several important principles the Department of Transportation intended to follow when implementing MAP-21. Three of the principles specifically address environmental considerations in the transportation planning process and during project development activities including:

- Implementing MAP-21 in a way that uses NEPA and other Federal environmental statutes to promote better environmental outcomes, improve transparency, and support informed decision-making.
- Promoting environmental stewardship, transparency, and early inter-agency consultation and collaboration as it carries out all of the new mandates of MAP-21.
- Encouraging early collaboration among agencies, project sponsors, affected stakeholders and the public to avoid adverse impacts to communities and the environment, minimize or mitigate impacts that may occur, and avoid project delay.

11.6.1. Environmental Mitigation Overview

Environmental mitigation is the process of addressing damage to the human and/or natural environment caused by transportation or other public works and infrastructure projects. The human and natural environment includes such resources as neighborhoods and communities; homes and businesses; cultural resources (archaeological or historical sites); parks and recreation areas; streams and wetlands; important farmlands; wildlife and their habitats; and air and water quality.

Environmental mitigation activities, in reference to transportation planning, refers to the strategies, policies, programs, actions, and activities that, over time, will serve to avoid, minimize, or compensate for the negative effects of a transportation project on the human and/or natural environment. Actions taken to avoid or minimize environmental damage are considered the most preferable method of mitigation. Potential environmental mitigation activities may include:

- Avoiding impacts altogether;
- Altering a proposed activity or project to minimize its potential effects on environmental resources;
- Repairing or restoring impacted resources;

- Implementing precautionary and/or abatement measures to reduce construction impacts;
- Employing special features or operational management measures to reduce impacts over time; and
- Compensating for environmental impacts by providing suitable, replacement or substitute environmental resources of equal or greater value, on or off-site.

This ordered approach to mitigation—known as "sequencing"—involves understanding the affected environment and assessing the effects of transportation projects as they are developed. Effective mitigation starts at the beginning of the NEPA process, not at the end. Mitigation must be an integral part of the alternatives development and analysis process.

Federal transportation planning regulations indicate the mitigation activities described in the LRTP are to be at the policy and/or strategic level and not project specific.

11.6.2. Consultation and Coordination

MAP-21 reiterates the need, as SAFETEA-LU did, for continued consultations with agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation in the development of LRTPs. Consistent with this requirement, Federal, State, and Tribal land management wildlife, and regulatory agencies were contacted in October 2013 for input regarding mitigation activities that may help alleviate the adverse effects of implementing transportation projects in the Great Falls area. Information about the Great Falls Area LRTP, a map of the LRTP study area, and an environmental mitigation matrix summarizing potential impacts and possible mitigating actions were provided to each agency. The matrix also identified readily-available maps and other information sources that can be used to help assess whether key environmental resources in the Great Falls area may be affected by transportation projects and listed agency contact information. Agencies were asked to review the matrix and provide comments about its content.

The agencies contacted in October 2013 are listed below:

Federal Agencies

- Federal Highway Administration - Montana Division
  U.S. Army Corps of Engineers - Montana Regulatory Office
- Bureau of Land Management - Montana State Office
- U.S. U.S. Bureau of Land Management - Undaunted Stewardship Program
- Fish & Wildlife Service - Montana Field Office (Ecological Services)
- U.S. Environmental Protection Agency, Region 8 - Montana Office
- National Park Service - Intermountain Regional Director
- Malmstrom Air Force Base - 341st Missile Wing Public Affairs Office

State Agencies

- Montana Department of Transportation - Great Falls District Administrator
- Montana Department of Transportation - Rail, Transit, and Planning Division
- Montana Department of Transportation - Environmental Services Bureau
- Montana Department of Environmental Quality - Air Resources Protection Bureau
- Montana Department of Environmental Quality - Water Protection Bureau
- Montana Department of Environmental Quality - Wetlands Protection Program
- Montana Department of Environmental Quality - Waste and Underground Tank Management Bureau

- Montana Dept. of Natural Resources & Conservation - Trust Land Management Division
- Montana Dept. of Natural Resources & Conservation – Central Land Office
- Montana Dept. of Natural Resources & Conservation – Water Resources - Floodplain Management
- Montana Fish Wildlife & Parks - Region 4 Fisheries Manager
- Montana Fish Wildlife & Parks - Region 4 Parks Manager
- Montana Fish Wildlife & Parks - Region 4 Wildlife Manager
- Montana Historical Society - State Historic Preservation Office

Local Agencies

- Cascade County Conservation District
- Cascade County Planning Department
- Cascade County Floodplain Administrator
- Cascade County Road Department
- City of Great Falls - Public Works Department
- City of Great Falls - Park and Recreation Department
- City of Great Falls - Floodplain Administrator
- City of Great Falls - Great Falls Planning Department
- Great Falls/Cascade County Historic Preservation Office - Historic Preservation Officer
- West Great Falls Flood Control & Drainage District

Native American Tribes

- Little Shell Tribe of Chippewa Indians of Montana
- Chippewa Cree Tribe
- Blackfeet Nation

11.6.3. Impacts of Transportation Projects

The implementation of transportation projects may result in both positive and negative impacts on the human and natural environments and impacts may include direct, indirect, and cumulative effects. Direct effects are those impacts that are caused by the action and occur at the same time and place. Indirect impacts (also referred to as secondary impacts) are effects caused by the project, but occur at a different location or later time than the action that triggers the effect. Cumulative effects are the collective impacts on the environment that may occur when the project is considered along with other past, present, and reasonably foreseeable future actions.

Because this section of the LRTP discusses environmental mitigation, only potentially adverse or negative impacts are discussed. Environmental resources and areas within the community are generally affected by transportation projects as a result of land acquisition for new or expanded rights-of-way, construction, and the resulting effects of the project (such as increased traffic or traffic-generated noise, storm water runoff from paved surfaces, etc.). The following paragraphs discuss the types of environmental impacts that may result from the implementation of transportation projects in the Great Falls area. It should be noted that these environmental impact categories are not all inclusive and each transportation project must typically undergo Federal and State environmental compliance reviews to identify project-specific impacts, evaluate the need for mitigation activities, and determine permitting requirements.

Air Quality

National ambient air quality standards (NAAQS) have been established for several major pollutants referred to as "criteria" pollutants. The six criteria pollutants are: Carbon monoxide (CO); Particulate Matter; Nitrogen dioxide (NO2); Sulfur dioxide (SO2); Ozone; and Lead (Pb). Transportation contributes to four of the six criteria pollutants: ozone, CO, particulate matter, and NO2.

Vehicle exhaust is a primary source of project-related air pollution. Increasing vehicle emissions is a potential outcome of projects that encourage additional miles of travel. Projects that are designed to reduce congestion and increase traffic flow can also encourage drivers to use such roadways more often and therefore increase CO emissions and other vehicle generated air pollutants. However, such projects often result in decreased travel times and idling times, which translates into reduced emissions. The net result is often an improvement in air quality.

The 10th Avenue South corridor was designated as a CO nonattainment area in 1980 but redesignated to an attainment area in 2002. DEQ utilizes an alternative CO monitoring method that includes an annual review of traffic volumes using data from MDT permanent automatic traffic counters (ATR) in Great Falls. Thresholds are defined based on the percent increase in consecutive, rolling 3-year ADT volumes and correlated to presumed changes in ambient CO concentrations to demonstrate ongoing compliance with the CO NAAQS.

Noise

Noise is most often defined as unwanted sound. Although sound can be easily measured, the perceptibility is subjective and the physical response to sound complicates the analysis of its impact on people. The environmental impact of noise is a function of the sensitivity of the land use where noise is heard. In general, land use sensitivity to noise is a function of human annoyance and community reaction rather than health and safety considerations. Noise can also interfere with nonresidential uses such as schools, libraries, churches, and hospitals.

The noise generated from new or expanded transportation facilities may have a negative impact on adjoining land uses. Traffic noise impacts must typically be investigated in areas adjacent to federally-aided highways for proposed construction of a highway on a new location or the reconstruction of an existing highway to either significantly change the horizontal or vertical alignment or increase the number of through-traffic lanes. If impacts are identified, then abatement measures must be considered and feasible and reasonable noise abatement must be incorporated into the project design.

Hazardous Materials

Transportation projects have the potential for encountering contaminated soils or groundwater, leaking underground storage tanks and piping, or other sources of hazardous materials in the planned work areas. These sites may occur throughout the community and sites are often found along major transportation corridors and established commercial/industrial areas.

In March 2011 EPA, with support from the MDEQ, added the Anaconda Copper Mining Co. (ACM) Smelter and Refinery site to the National Priorities List of Superfund sites. The site is a former metals refinery adjacent to the unincorporated community of Black Eagle in Cascade County.

The City of Great Falls and Cascade County also have numerous brownfields sites that could be encountered during the development of transportation projects. Brownfields are defined as real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

Important Farmlands

Transportation projects have the potential to require new or expanded rights-of-way and it is possible that some projects outside the urban area may convert areas of important farmland to non-agricultural use. The Natural Resources Conservation Service (NRCS) has designated areas of important farmland (prime farmland, unique farmland, or farmland of statewide or local importance). The Farmland Protection Policy Act (FPPA) regulates federal actions with the potential to convert existing such farmlands to nonagricultural uses. Federally-funded transportation projects that would permanently convert designated farmland to a non-agricultural use are subject to FPPA coordination.

Wildlife and Habitat

The construction of new or improved transportation facilities could result in the disturbance, displacement, and/or minor loss of habitat for wildlife species. Transportation projects can also disrupt habitat connectivity and result in habitat fragmentation. Habitat fragmentation is mainly the result of different forms of land use change. The construction and use of transport infrastructure is one of the major agents causing this change as well as creating barriers between habitat fragments.

In accordance with the Endangered Species Act (ESA), the U.S. Fish & Wildlife Service (USFWS) maintains a listing of threatened, endangered, proposed and candidate species for Cascade County. The agency has also designated critical habitat for some species. Listed species designations may change over time.

Section 7(a)(2) of the ESA requires Federal agencies to consult with the USFWS to ensure that actions they fund, authorize, permit, or otherwise carry out will not jeopardize the continued existence of any listed species or adversely modify designated critical habitats.

The construction of new or improved transportation facilities could result in the disturbance and/or minor loss of wildlife habitat. Species can also be displaced (through loss of habitat, increased noise, and increased human activity). Loss of habitat connectivity or habitat fragmentation can be indirect effects of transportation projects.

Parks and Recreation Lands

Transportation projects typically affect parks and recreation lands through the direct acquisition of land for new or expanded rights-of-way, temporary occupancy that adversely affects the property, or by indirect effects such as noise, vibration, diminished access, or visual intrusions.

Section 4(f) of the *Department of Transportation Act of 1966*, provides protection for public parks, recreation areas, wildlife and waterfowl refuges and historic sites of national, State, or local significance. Section 4(f) generally prohibits the use of such lands unless there are no feasible and prudent alternatives and requires projects to include all possible planning to minimize harm.

Parks and recreation lands are often acquired or developed with federal funding assistance from the Land and Water Conservation Fund Act (LWCFA). This funding restricts the future use of parklands or open spaces that have been improved with funds received through the LWCFA. The conversion of lands or facilities acquired with LWCFA funds must be coordinated with the Department of Interior and replacement in kind is typically required.

Cultural Resources

Cultural resources are any prehistoric or historic remains of past human activities including artifacts, sites, structures, landscapes or districts, and objects of importance to a culture or community for scientific, traditional, religious, or other reasons. Like parks and recreation lands, transportation projects have the

potential to adversely affect cultural resource sites directly through the acquisition of land for new or expanded rights-of-way or indirectly by changing the site's surroundings or diminishing the qualities of the resource itself.

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into consideration the effects of their projects on cultural resources that are on or eligible for listing in the National Register of Historic Places (NRHP).

Section 4(f) of the *Department of Transportation Act of 1966*, also provides protection for historic sites of national, State, or local significance.

Environmental Justice

Title VI of the US Civil Rights Act of 1964, as amended, EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* and Order DOT 5610.2, Environmental Justice require that no minority, or, by extension, low-income person shall be disproportionately adversely impacted by any project receiving federal funds.

For transportation projects, this means that no particular minority or low-income person may be disproportionately isolated, displaced, or otherwise subjected to adverse effects. Potential impacts are assessed in terms of property acquisitions or relocations, changes in access to employment areas, and other changes in low-income and minority communities/neighborhoods.

Community Impacts

Transportation projects have the potential to result in effects on a community and its quality of life. Topics that fall under the Community Impact heading include: access, mobility, social isolation/splitting of neighborhoods, history of the community, new development impacts, changes in the quality of life, changes in neighborhood identification, changes in property values, separation of the neighborhood from community facilities, displacements, impacts on community centers of activity whether formal or informal, noise, urban renewal, removal of urban blight, joint land use, and disruption of the natural and human environment.

To establish potential impacts it is necessary to determine the characteristics of the affected area, such as neighborhood boundaries, locations of residences and businesses, demographic information, economic data, the social history of communities, and identify what community based land use plans say about the area. Impacts are best analyzed in conjunction with public involvement activities for the affected neighborhood or community.

Floodplains

Transportation projects occasionally require crossing or working within delineated floodplains. Floodplain involvement (encroachment) typically requires measures to: 1) Avoid significant floodplain encroachment where practicable; 2) Minimize the impact of highway actions that adversely affect the base floodplain; or 3) be compatible with the National Flood Insurance Program of the Federal Emergency Management Agency (FEMA).

Protection of floodplains and floodways is required by Executive Order 11988, "Floodplain Management" and USDOT Order 5650.2, "Floodplain Management and Protection." The intent of these regulations is to avoid or minimize highway encroachments within the 100 year (base) floodplains, where practicable, and to avoid supporting land use development which is incompatible with floodplain values. Where encroachment is unavoidable, the regulations require appropriate measures to minimize impacts.

Streams, Wetlands, and Aquatic Resources

Transportation projects occasionally require crossing or working within perennial or intermittent streams, wetlands, and other aquatic resources. Unavoidable impacts to streams or wetlands may require a variety of permits or authorizations including:

- Nationwide or Individual Section 404 Permit from the Corps of Engineers;
- Section 10 Permit (Navigable Waters) from the Corps of Engineers;
- Stream Protection Act 124 Permit from Montana Fish Wildlife & Parks;
- Short-term Water Quality Standard for Turbidity (318 Authorization); and
- 310 Permits from the Cascade Conservation District (for actions undertaken by non-governmental agencies).

Transportation projects involving construction activities that will disturb one or more total acres including clearing, grading, and excavating also require Montana Pollutant Discharge Elimination System (MPDES) "General Permit" from the Montana Department of Environmental Quality.

11.6.4. Environmental Mitigation Measures

Table 11.3 lists possible mitigating measures to help avoid, minimize, or compensate for negative project-related impacts. The mitigation activities identified in the table are not project-specific; however, they are representative of the types of actions commonly implemented with transportation projects. Future transportation projects will be developed within the context of all applicable state and federal rules and regulations and will be subject to relevant environmental compliance and permitting requirements.

Current contact information for federal, state, and local agencies that may need to be consulted during the assessment of project-related impacts and the development of environmental mitigation measures is also provided in **Table 11.3**.

When developing environmental impacts and appropriate mitigation measures, it is important to be aware of the following considerations:

- Mitigation measures should be considered within the context of the proposed improvement and generally reflect the magnitude and extent of potential impacts.
- Mitigation measures are usually most effective when they occur in close proximity to the area of impact. The appropriate location for many mitigation measures is often within the existing (or expanded) right-of-way and within the limits of the proposed transportation project.
- Environmental impacts and associated mitigation measures should be holistically considered. For example, erecting a noise wall to help alleviate negative transportation noise impacts could result in negative visual impacts to adjoining properties or impede crossings of the transportation facility.
- The appropriate mitigation may include a combination of different actions or measures.
- Environmental approvals and permit authorizations may establish specific actions to mitigate the negative effects of individual projects.
- Mitigation measures must be developed in cooperation with appropriate regulatory agencies and an adequate level of public participation.
- Provisions for long-term maintenance of mitigation measures may be necessary and should be developed in cooperation with the appropriate regulatory agencies, impacted landowners, and/or the public.

Table 11.3: Possible Environmental Mitigation Measures and Sources

	Possible Mitigation Measures or Actions	Potential Information Sources	Agencies to Consult
Air Quality	• Implement Transportation Demand Management (TDM) measures like telecommuting, carpooling, or flexible work hours to promote off-peak commuting. • Promote alternate modes of transportation such as transit, bicycling and walking. • Expand non-motorized facilities within the community.	Nonattainment Area Maps: http://deq.mt.gov/AirQuality/Planning/AirNonattainment.mcpx	**Montana Dept. of Environmental Quality** Air Resources Protection Bureau 1520 E 6th Ave PO Box 200901 Helena, MT 59620-0901 406-444-2544 **Montana Department of Transportation** Environmental Services Bureau PO Box 200507 Helena, MT 59620-0507 406-444-7659
Noise	• Sound-dampening walls, earthen berms, and/or buffering landscaping. • Soundproofing structures at impacted noise-sensitive uses. • Low-noise pavements. • Relocation of impacted uses. • Innovative design features (depressed roadways) to reduce impacts. • Implement local land use planning measures to help avoid development of new noise sensitive uses in proximity to transportation corridors.	Federal Highway Administration – Noise Guidance: http://www.fhwa.dot.gov/environment/noise/ Montana Department of Transportation – Traffic Noise Analysis and Abatement Policy: http://www.mdt.mt.gov/business/contracting/docs/npolicy-2011.pdf	**Montana Department of Transportation** Environmental Services Bureau PO Box 200507 Helena, MT 59620-0507 406-444-7659
Hazardous Materials	A comprehensive survey within the LRTP study area was not conducted to identify existing hazardous materials or possible sources of contamination. Hazardous materials encountered during a project should be removed, treated, or otherwise addressed after consultation with appropriate regulatory agencies. Remediation measures will vary depending on type, extent, location and characteristics of the material, and proximity to adjacent land uses or underground water sources.	Natural Resource Information System (NRIS) Interactive mapping - Federal Superfund Sites, Solid Waste Facilities, Crude Oil Pipelines, EPA Toxic Release Inventory, Abandoned/Active Mines: http://maps2.nris.mt.gov/mapper/ CECRA (State Superfund Sites): http://deq.mt.gov/StateSuperfund/Cecra.mcpx MDEQ Interactive Mapping - Petroleum Tank Release Compensation Sites Remediation Response Sites, Leaking Underground Storage Tanks, Hazardous Waste Handlers: http://svc.mt.gov/deq/wmadst/ Brownfields Sites in Montana and Hazardous Substance Brownfields Registry: http://www.deq.mt.gov/Brownfields/BrownfieldsSites.mcpx	**U.S. Environmental Protection** Agency Region 8 Montana Office Federal Building 10 W. 15th Street, Suite 3200 Helena, MT 59626 406-457-5038 **Montana Dept. of Environmental Quality** 1100 North Last Chance Gulch PO Box 200901 Helena, MT 59620-0901 Remediation Division 406-841-5000 Permitting and Compliance Division Hazardous Waste Section 406-444-2876 Waste and Underground Tank Management Bureau 406-444-5300

	Possible Mitigation Measures or Actions	Potential Information Sources	Agencies to Consult
Farmland Impacts	• Avoidance of important farmlands where practicable. • Consider alternate sites that reduce impacts on important farmlands.	Natural Resource Conservation Service – Soil maps and Farmland Classifications: http://websoilsurvey.nrcs.usda.gov/app/	**Natural Resource Conservation Service** Great Falls Field Office (serves Cascade County Conservation District) 12 3rd Street NW Great Falls, MT 59404-1991 406-727-7580
Threatened and Endangered Species	Assess potential occurrences of listed species or critical habitat within the project areas and make an appropriate determination of effect (i.e. "no effect"/"may affect" and "may affect, not likely to adversely affect"/"may affect, likely to adversely affect" on listed and proposed species or "is not likely to jeopardize the continued existence of a federal proposed or candidate species") based on proposed project activities. If adverse impacts to listed species or critical habitat are unavoidable, then appropriate conservation measures would be determined through consultation procedures with the USFWS under Section 7 of the ESA.	Listed Species in Cascade County: http://www.fws.gov/montanafieldoffice/Endangered_Species/Listed_Species/countylist.pdf Montana Natural Heritage Program – Species searches for project areas: http://mtnhp.org/ Montana Fish Wildlife & Parks – Species information: http://fwp.mt.gov/fishAndWildlife/species/	**U.S. Fish & Wildlife Service** Ecological Services Montana Field Office 585 Shepard Way, Suite 1 Helena, MT 59601 406-449-5225 **Montana Fish Wildlife & Parks** FWP Region 4 Headquarters Regional Wildlife and Fisheries Managers 4600 Giant Springs Road Great Falls, MT 59405 406-454-5840
Wildlife, Fisheries and Habitat	• Wildlife crossing provisions on transportation corridors including overpass or underpasses and culverts that accommodate wildlife passage. • Create new or enhanced habitat in key areas. • Seeding disturbed areas with natural grasses or vegetation to re-establish habitat. • Restore streambanks to pre-existing or better conditions. • Fencing to direct wildlife away from roadway. • Maintain or provide fish passage with drainage facilities.	Montana Fish Wildlife & Parks – Crucial Areas Assessment mapping: http://fwp.mt.gov/fishAndWildlife/conservationInAction/crucialAreas.html Montana Fish Wildlife & Parks – GIS data and mapping: http://fwp.mt.gov/doingBusiness/reference/gisData/dataDownload.html Montana Fish Wildlife & Parks – Montana Fisheries Information System (MFISH): http://fwp.mt.gov/fishing/mFish/ Montana Natural Heritage Program – Species Searches/Species of Concern Reports: http://mtnhp.org/	**Montana Fish Wildlife & Parks** FWP Region 4 Headquarters Regional Wildlife and Fisheries Managers 4600 Giant Springs Road Great Falls, MT 59405 406-454-5840

	Possible Mitigation Measures or Actions	Potential Information Sources	Agencies to Consult
Park and Recreation Lands	• Avoid impacts to park and recreation lands when possible. • If impacts cannot be avoided, identify and coordinate appropriate mitigation measures with officials with jurisdiction over the affected resources. • Provide improved recreational functions or values at affected lands. • Provide replacement park or recreational land of equal value, usefulness and proximity.	City of Great Falls Park and Recreation Department: http://www.greatfallsmt.net/recreation City of Great Falls Planning and Community Development: http://www.greatfallsmt.net/planning/comprehensive-planning Cascade County Planning Department: http://departments.cascadecountymt.gov/planning Montana Fish Wildlife & Parks Public Lands Searches: http://fwp.mt.gov/recreation/visitFwpSite.html LWCF Grants awarded within Cascade County: http://waso-lwcf.ncrc.nps.gov/public/index.cfm	**City of Great Falls** Park and Recreation Department P.O. Box 5021 Great Falls, MT 59403 406-771-1265 **Cascade County** Planning Department 121 4th Street North #2H-2I Great Falls, MT 59401 406-454-6905 **Montana Fish Wildlife & Parks** FWP Region 4 Headquarters Regional Parks Manager 4600 Giant Springs Road Great Falls, MT 59405 406-454-5840 **National Park Service** Intermountain Region 12795 Alameda Parkway Denver, CO 80225 303-969-2500
Cultural Resources	Identify "Area of Potential Effects" (APE) which is usually limited to the footprint of the project including all existing and required rights-of-way and easements. Complete research and/or conduct a survey for historic (50 years of age or older) resources within the APE to identify all individual properties, districts, and multiple property areas that are on, in, or eligible for listing in the NRHP. This is also applicable to former lands formerly occupied by Native American Tribes and Traditional Cultural Properties. Mitigate adverse impacts by: • Design modifications to avoid or complement the property. • Preservation in place for archaeological resources. • Landscaping to reduce visual impacts. • Photo documentation. • Historic archival recording and documentation to preserve historic resource information for the public. • Develop educational materials about affected resource. • Adoption/reuse of historic bridges. • Relocation of a historic structure to avoid the loss of a resource.	Montana State Historic Preservation Office – Project area file searches: http://mhs.mt.gov/shpo/CulturalRecords.asp Montana State Historic Preservation Office – National Register sites for Cascade County: http://mhs.mt.gov/shpo/register/NRmap/NRmap.asp Montana Department of Transportation Environmental Services Bureau (Helena) Archaeologist and Historian	**Montana Historical Society** State Historic Preservation Office 1410 Eighth Avenue Helena, MT 59620 406-444-7715 **Great Falls/Cascade County** Historic Preservation Office Planning & Community Development Office PO Box 5021 Great Falls, MT 59403 406-455-8435

	Possible Mitigation Measures or Actions	Potential Information Sources	Agencies to Consult
Environmental Justice	• Identify if Environmental Justice or disadvantaged populations exist in project area. • Engage Environmental Justice or disadvantaged populations during project development activities. • Land acquisition and residential or commercial relocations necessary for any federally-assisted transportation projects would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act).	U.S. Census Bureau, American Community Survey – Social, Demographic, Economic, and Housing for 1, 3, 5 year periods (Cascade County and City of Great Falls: http://ceic.mt.gov/ACS.aspx Montana Census and Economic Information Center – Demographic/economic information: http://ceic.mt.gov/	**City of Great Falls** Great Falls Planning Department Civic Center, Room 112 Great Falls, MT 59403 406-454-0495 **Cascade County** Planning Department 121 4th Street North #2H-2I Great Falls, MT 59401 406-454-6905
Community Impacts	• Community visioning. • Community impact planning studies. • Incorporate context sensitive design elements. • Streetscape enhancements (decorative lighting and pavements, pedestrian amenities, wayfinding signs, etc.). • Low impact lighting for more appropriate integration into neighborhoods. • Median landscaping. • New or improved non-motorized facilities to enhance linkages within and out of the neighborhood. • Traffic calming measures.	U.S. Census Bureau, American Community Survey – Social, Demographic, Economic, and Housing for 1, 3, 5 year periods: http://ceic.mt.gov/ACS.aspx Montana Census and Economic Information Center – Demographic/economic information: http://ceic.mt.gov/ City of Great Falls – Planning and Community Development – Growth Policy: http://www.greatfallsmt.net/planning/comprehensive-planning Cascade County Planning Department – Growth Policy: http://departments.cascadecountymt.gov/planning	**City of Great Falls** Great Falls Planning Department Civic Center, Room 112 Great Falls, MT 59403 406-454-0495 **Cascade County** Planning Department 121 4th Street North #2H-2I Great Falls, MT 59401 406-454-6905
Floodplains	• Conduct location hydrology studies to establish existing hydraulic conditions and extent of encroachment, quantify potential impacts, and identify appropriate mitigating measures. • Consider alternatives which reduce impacts to the floodplain. • Design and construct transportation facilities in a cost-effective manner such that their components are excluded from the floodway.	FEMA Map Service Center- Currently Issued Flood Maps for Cascade County/City of Great Falls: https://msc.fema.gov/webapp/wcs/stores/servlet/StoreCatalogDisplay?storeId=10001&catalogId=10001&langId=-1&userType=G DNRC Water Resources – Floodplain Management: http://dnrc.mt.gov/wrd/water_op/floodplain/ City of Great Falls Growth Policy Update – Community Floodplain Graphic: http://www.greatfallsmt.net/sites/default/files/fileattachments/growth_policy_update_-_august_6_2013.pdf US Army Corps of Engineers – National Levee Database: http://nld.usace.army.mil/egis/f?p=471:1	**City of Great Falls** Floodplain Administrator Planning & Community Development Civic Center, P.O. Box 5021 Great Falls, MT 59403 406-455-8431 **Cascade County** Floodplain Administrator Cascade County Planning Office 121 4th Street North #2H-2I Great Falls, MT 59401 406- 454-6905 **US Army Corps of Engineers** Omaha District 1616 Capitol Avenue Omaha, NE 68102-4901

	Possible Mitigation Measures or Actions	Potential Information Sources	Agencies to Consult
Wetlands and Streams	Compensatory mitigation involves actions taken to offset unavoidable adverse impacts to wetlands, stream and other aquatic resources authorized by CWA Section 404 and other COE permits. Compensatory mitigation can be achieved through four methods: restoration of a previously-existing wetland/aquatic site; enhancement of an existing aquatic site's functions; creation of a new aquatic site; or preservation of an existing aquatic site. Appropriate mitigating measures will depend on the characteristics of the affected area and may be determine in cooperation with the agencies responsible for issuing permits. Permit conditions may include: • Developing alternatives to avoidance impacts. • Incorporating design features to avoid or minimize impacts (such as bridges, fish passage provisions, and placing natural streambed materials in the bottom of culverts). Mitigation for impacts to streams must be consistent with the 2013 Montana Stream Mitigation Procedure (MTSMP) developed by the Corps of Engineers. The MTSMP describes the method for quantifying the adverse impacts (debits) and the acceptable compensatory mitigation (credits) for projects that would result in more than a minimal adverse impact to a stream. The MTSMP also discusses mitigation procedures and appropriate types of mitigation activities for stream impacts. Mitigating wetland and stream impacts through approved mitigation banks or the Montana Statewide In-Lieu Fee (ILF) Mitigation Program are other options. The ILF Mitigation Program was created through an agreement between the EPA, USFWS, MDEQ, MFWP, COE, and the not-for-profit corporation, Montana Aquatic Resources Services, Inc.	Interactive National Wetlands Inventory Maps (Riparian and Wetland Areas): http://www.fws.gov/wetlands/Data/Mapper.html U.S. Environmental Protection Agency – Wetlands Information: http://water.epa.gov/type/wetlands/ Montana Stream Permitting Guide: http://dnrc.mt.gov/Permits/StreamPermitting/Guide.asp Corps of Engineers – Jurisdictional Information: http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/juris_info.aspx Corps of Engineers – Montana Stream Mitigation Procedure: http://www.nwo.usace.army.mil/Portals/23/docs/regulatory/MT/Mitigation/MTSMP-Revised-February%202013.pdf RIBITS (Regulatory In lieu fee and Bank Information Tracking System): http://geo.usace.army.mil/ribits/index.html Montana Aquatic Resources Statewide In-Lieu Fee Program: http://montanaaquaticresources.org/programs	**U.S. Army Corps of Engineers** Montana Regulatory Office 10 West 15th Street, Suite 2200 Helena, MT 59626 406-441-1375 **Montana Fish Wildlife & Parks** FWP Region 4 Headquarters Regional Fisheries Manager 4600 Giant Springs Road Great Falls, MT 59405 406-454-5840 **Montana Department of Environmental Quality** 1520 E 6th Ave PO Box 200901 Helena, MT 59620-0901 Water Protection Bureau 406-444-3080 Wetlands Protection Program 406-444-6652

	Possible Mitigation Measures or Actions	Potential Information Sources	Agencies to Consult
Storm Sewer Discharge	The Montana Department of Environmental Quality (DEQ) Small Municipal Separate Storm Sewer System (MS4) permit is required for urban areas within the state of Montana that have storm sewer systems that serve a population of at least 10,000 people. Areas included in the permit are Billings, Missoula, Great Falls, Butte, Helena, Kalispell, and Bozeman. Cities, counties, universities, military bases, and the Montana Department of Transportation (MDT) are some of the entities required to obtain the permit for these areas. Under the permit, they are required to develop, implement, and enforce a Storm Water Management Program (SWMP) designed to reduce the discharge of pollutants from the Small MS4, to protect water quality, and to satisfy the appropriate water quality requirements of the Montana Water Quality Act. This SWMP must include the development and implementation of Best Management Practices (BMPs) and measurable goals for the following six "minimum control measures": 1. Public education and outreach on stormwater impacts; 2. Public involvement/participation; 3. Illicit discharge detection and elimination; 4. Construction site stormwater runoff control; 5. Post-construction stormwater management in new development and redevelopment; and, 6. Pollution prevention and good housekeeping for municipal operations. In some of the designated Small MS4 areas, the co-permittee (e.g. the city government) has agreed to be the lead agency with MDT providing technical or financial support, and implementing limited BMPs or portions of the shared SWMP. Generally, MDT is responsible for implementing and maintaining elements of the shared SWMPs in their own jurisdictional areas unless otherwise stipulated in the agreements between the co-permittee agencies.	U.S. Environmental Protection Agency – NPDES (MS4s) http://cfpub.epa.gov/npdes/stormwater/munic.cfm Montana Department of Environmental Quality – MPDES General Permit (MS4s): http://www.deq.mt.gov/wqinfo/MPDES/StormWater/ms4.mcpx Montana Department of Transportation – Stormwater Information (MS4 Permits): http://www.mdt.mt.gov/pubinvolve/stormwater/permits.shtml	**Department of Environmental Quality** 1520 E 6th Ave PO Box 200901 Helena, MT 59620-0901 Water Protection Bureau 406-444-3080 **Montana Department of Transportation** PO Box 201001 Helena MT 59620-1001 Statewide MS4 Program 406-444-0825

11.6.5. Areas to Consider for Mitigation Activities

The list of potential negative impacts discussed earlier can usually be mitigated effectively. Areas where mitigation efforts can be focused in the Great Falls area are discussed below.

Mitigation Areas for Impacts to Streams, Wetlands and Aquatic Habitat

Transportation projects along or across the Missouri and Sun Rivers could potentially affect water quality, riparian areas, fish and wildlife habitat, wetlands, and other environmentally sensitive areas. Additionally, such projects may affect public or neighborhood access to river front areas. Consequently, lands adjoining these river corridors are ideal locations for mitigating such impacts. These lands offer

opportunities to: create or enhance wetlands and riparian areas; improve water quality by filtering runoff; reduce erosion of stream banks; protect development from potential flooding; and improve access to and the quality of riverfront lands. Some of the same opportunities exist in the Sand Coulee Creek, Watson Coulee, and Gibson Flats areas.

For unavoidable adverse impacts to wetlands and aquatic resources that cannot be mitigated on-site, it may be necessary to secure mitigation through the use of established mitigation banks or and in-lieu fee mitigation. The City of Great Falls and Cascade County areas within the LRTP study area lie within *Watershed #7-Missouri-Sun-Smith River Basin*. Several mitigation banking opportunities exist within this watershed. MDT acquired approximately 64 acres of wetland credit from Ducks Unlimited at Little Muddy Creek Wetland Mitigation Site to mitigate for wetland impacts associated with transportation projects in the watershed. Efforts are currently underway to develop the privately-held Missouri-Sun-Smith Mitigation Bank (MSSMB) within this watershed. Once established, wetland and stream mitigation credits will be available for purchase and the credits can be used as acceptable mitigation under Section 404.

Mitigating wetland and stream impacts through the Montana Statewide In-Lieu Fee (ILF) Mitigation Program is also a possibility. The ILF Mitigation Program was created through an agreement between the EPA, USFWS, MDEQ, MFWP, COE, and the not-for-profit corporation, Montana Aquatic Resources Services, Inc. The objective of the ILF program is to mitigate for impacts to wetlands and streams by developing compensatory mitigation projects with each of the sixteen major watersheds in Montana.

Mitigation for Impacts to Archaeological and Historical Resources

Compliance with the *Historic Preservation Act* and coordination with the Montana State Historic Preservation Office will typically establish appropriate mitigation measures for impacts to cultural resources.

Area museums such as the History Center, the Lewis & Clark National Historic Trail Interpretive Center, the Charles M. Russell Museum, or the First Peoples Buffalo Jump Interpretive Center are all potential repositories for excavated artifacts or historical items.

Relocation of historic structures are most appropriate if they occur near their original locations. MDT's Adopt-A-Bridge Program provides a mechanism for the preservation and reuse of historic bridges in other locations in the community. Several historic bridges in the Great Falls area have been adopted and used in furthering the development of non-motorized transportation corridors.

Mitigation for Impacts to Parklands

If new lands are purchased, they should be in proximity to the impacted parklands and/or serve a similar function as provided by the impacted parkland. Other mitigation measures should be implemented in the immediate vicinity of the affected parkland and transportation project.

Mitigation for Neighborhood Impacts

Transportation improvement projects, especially capacity expansion projects, can separate neighborhoods, inhibit pedestrian and bicycle travel, and have negative physical impacts on adjoining properties or land uses. Considerations for pedestrian and bicyclist safety at intersections and effective arterial crossings at other key locations can help reduce adverse effects to non-motorized facility users. Incorporating landscaping, streetscape amenities and traffic calming measures into transportation projects may also help alleviate negative impacts on neighborhoods.

11.7. FUTURE MAJOR STREET NETWORK

The major street network consists of all interstate, principal arterial, minor arterial, and collector routes. Local streets are not included on the major street network. Establishing a plan for a community's future street layout is essential to proper land development and community planning. It is important that planners, landowners, and developers know the intent and location of the future road network. This will assist with future facility planning for right-of-way needs and appropriate land-uses.

The study area was examined to determine the most appropriate placement for the future major street network. A series of future desired collector routes were identified to be constructed as development occurs. The recommended future major street network is shown in **Figures 11.1** and **11.2**.

The future network is intended to be used as a planning tool to assist in the evaluation of long-term traffic needs as development occurs over time. The identified future alignments are conceptual in nature and may vary based on development patterns, geographic features, land ownership, and other issues unknown at this time. Most of these routes are not recommended for construction at this time. The development of these conceptual routes will take time to become reality, and will only be constructed if traffic needs materialize as a result of development in the area. If development is proposed in a particular area, the recommended major street network is intended to help establish desired corridors that produce an efficient and logical road network. Note that presenting the major street network at this time is not intended to control or influence development. It is presented in an effort to help plan for the future development of the road system in the community.

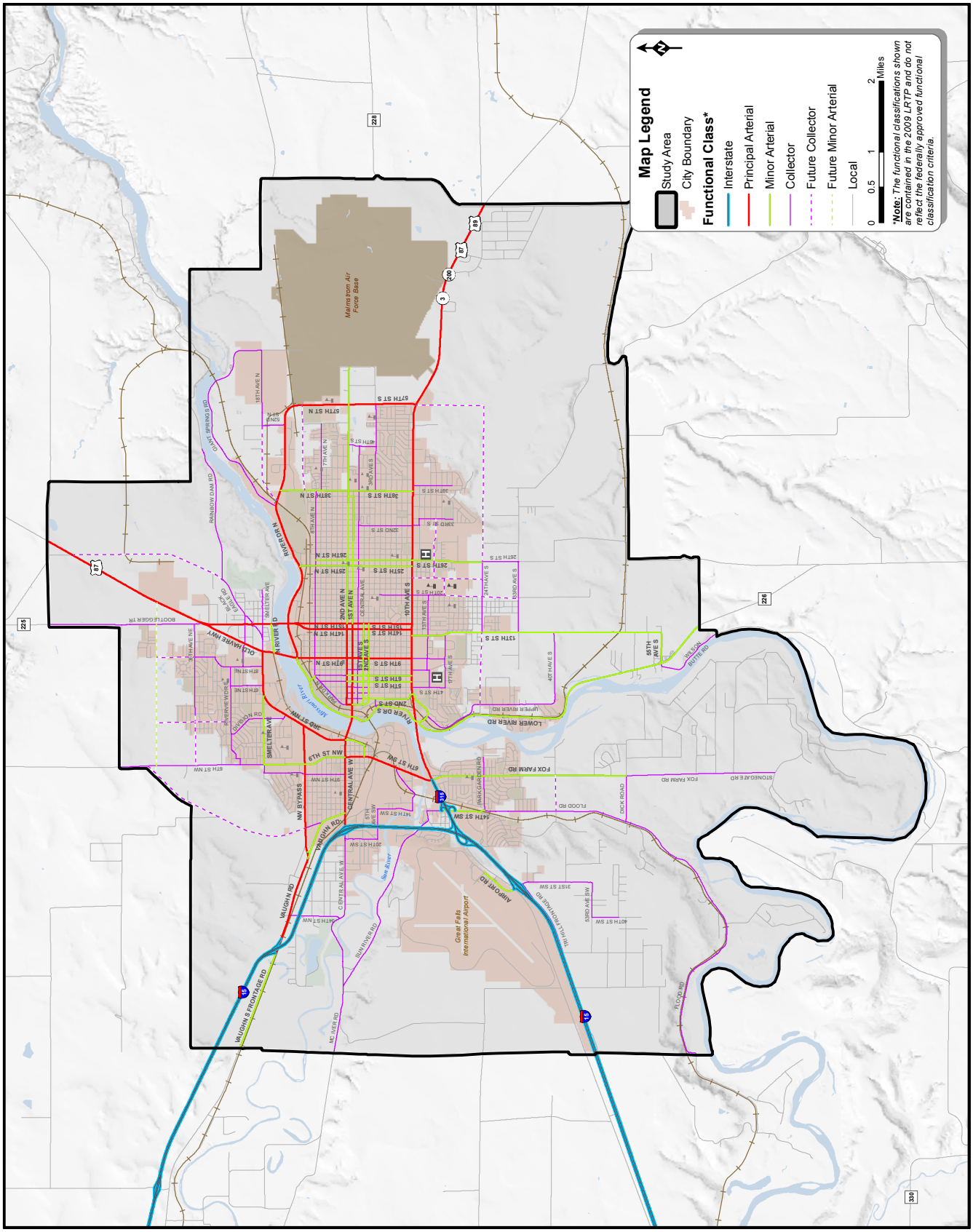

Figure 11.1: Future Major Street Network

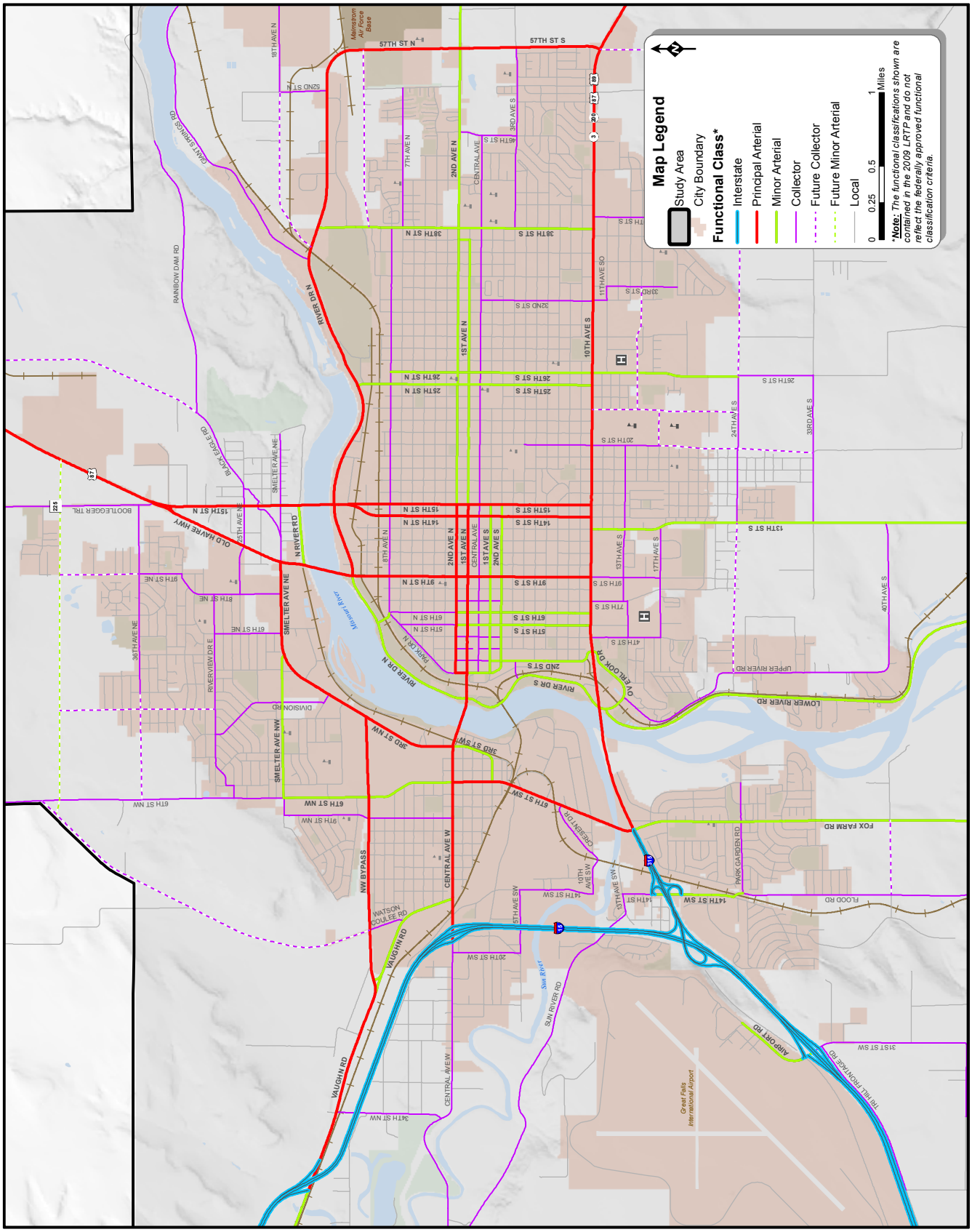

Figure 11.2: Future Major Street Network (Detail)

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12.0
Conformity Determination

On November 15, 1990, the Clean Air Act Amendments (CAAA) of 1990 were signed into law. The CAAA is a detailed and complex law that has had a major impact on the programs of the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). The Act requires substantial vehicle emissions reductions from the transportation sector.

The purpose of the conformity provision of the CAAA is to ensure consistency between the Federal transportation planning process and Federal air quality planning process. The regulations require that for an urban area designated as nonattainment of National Ambient Air Quality Standards (NAAQS) for transportation-related criteria pollutants, or which has a maintenance plan for such pollutants, a conformity determination must be conducted to demonstrate that its long range transportation plan (LRTP), transportation improvement plan (TIP), or any revisions to either will not adversely affect air quality[25]. Transportation-related criteria pollutants for areas designated as nonattainment, or which have a maintenance plan, may include the following[26]:

1. Criteria pollutants including ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}); and particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$).

2. Precursor pollutants including:

   (i) Volatile organic compounds (VOCs) and nitrogen oxides (NO_X) in ozone areas;

   (ii) NO_X in NO_2 areas;

   (iii) VOCs and/or NO_X in PM_{10} areas if the EPA Regional Administrator or the director of the State air agency has made a finding that transportation-related emissions of one or both of these precursors within the nonattainment area are a significant contributor to the PM_{10} nonattainment problem and has so notified the MPO and DOT, or if the applicable implementation plan (or implementation plan submission) establishes an approved (or adequate) budget for such emissions as part of the reasonable further progress, attainment or maintenance strategy;

   (iv) NO_X in $PM_{2.5}$ areas, unless both the EPA Regional Administrator and the director of the state air agency have made a finding that transportation-related emissions of NO_X within the nonattainment area are not a significant contributor to the $PM_{2.5}$ nonattainment problem and has so notified the MPO and DOT, or the applicable implementation plan (or implementation plan submission) does not establish an approved (or adequate) budget for such emissions as part of the reasonable further progress, attainment or maintenance strategy; and

   (v) VOCs, sulfur dioxide (SO_2) and/or ammonia (NH_3) in $PM_{2.5}$ areas either if the EPA Regional Administrator or the director of the state air agency has made a finding that transportation-related emissions of any of these precursors within the nonattainment area are a significant contributor to

[25] 40 CFR 93.102(a)
[26] 40 CFR 93.102(b)

the $PM_{2.5}$ nonattainment problem and has so notified the MPO and DOT, or if the applicable implementation plan (or implementation plan submission) establishes an approved (or adequate) budget for such emissions as part of the reasonable further progress, attainment or maintenance strategy.

12.1. BACKGROUND

On September 9, 1980, the United States Environmental Protection Agency (EPA) designated Great Falls as non-attainment for carbon monoxide (CO). The designation followed sixteen violations of the NAAQS 8-hour CO standard at an air quality monitor on 10th Avenue South. The NAAQS for CO is 9.0 parts per million (ppm) for an 8-hour average concentration, not to be exceeded more than once per calendar year. Consensus between EPA and local officials established the 10th Avenue South corridor as the non-attainment boundary in lieu of the city limits. Following the non-attainment designation, control plans were developed, but none were approved by EPA. The 1977 emissions inventory listed motor vehicle emissions, wood smoke, and industrial processes as the primary contributors to the CO violations. The March 9, 1984 control plan demonstrated attainment based on projected automobile emissions reductions and a significant reduction in CO from the former Phillips Refinery, now Calumet Montana Refining. That control plan was withdrawn due to the failure of the refining company to modify its catalytic cracking unit. A second control plan was submitted to EPA on March 28, 1986. On January 26, 1987, EPA proposed to approve the Great Falls CO control plan. However, Great Falls missed the December 31, 1987 attainment deadline, (meaning Great Falls had a violation of the standard in 1987), and the *Montana CO State Implementation Plan* (SIP) was ruled inadequate, resulting in a “SIP call” for the Great Falls CO non-attainment area on May 26, 1988.

On September 7, 1990, EPA published two actions regarding the Great Falls element of the SIP. EPA published a proposed rule that would disapprove the attainment demonstration contained in the March 28, 1986 SIP revision. However, EPA never took final action on that proposed rule. EPA also published a final rule on September 7, 1990 that approved the CO control measures from the March 28, 1986 SIP revision for their strengthening effect on the SIP. Great Falls was reevaluated in September 1990, based on the 1990 CAAA and the lack of exceedances in the CO monitoring data for 1988 and 1989. On November 6, 1991, EPA designated Great Falls as a “not classified” CO non-attainment area. However, redesignation to attainment required a new emission inventory and the development of a maintenance plan, which the Montana Department of Environmental Quality (DEQ) subsequently developed.

In 1998, DEQ submitted a 1996 Inventory Preparation Plan to Federal, State and local agencies for review and comment. Subsequently, DEQ submitted the 1996 base year emission inventory to EPA in February 2000, along with a ten year maintenance plan and a request to redesignate Great Falls as an attainment area. On July 8, 2002, EPA redesignated Great Falls as a “limited maintenance plan” attainment area.

With the redesignation to attainment, Great Falls was required to comply with the provisions of the December 19, 2000 *Carbon Monoxide Limited Maintenance Plan* (December 2000 LMP) and submit a CAA section 175A(b) required revised maintenance plan in 2010 that provided for maintenance of the CO standards for an additional ten years. Provided Great Falls does not have any further CO NAAQS violations during the maintenance period, it can request full attainment status.

The Montana DEQ submitted an updated *Great Falls Carbon Monoxide Limited Maintenance Plan* (2011 LMP Submittal) on July 13, 2011, as required by 42 USC 7505(a). The 2011 LMP Submittal documents the first ten years of CO monitoring under the December 2000 LMP, and details strategies for maintaining

CO standards for the subsequent ten years. As such, the 2011 LMP Submittal document fulfills the criteria established in 40 CFR Part 51, Appendix V. However, the EPA has not yet acted on this submittal.

On June 22, 2012, the Montana DEQ submitted SIP revisions that included an alternative CO monitoring strategy documented in the 2011 LMP Submittal. Ambient CO levels have decreased significantly due to federal tailpipe standards and turnover of the vehicle fleet in the United States. Therefore the DEQ determined that the using the resource-intensive CO analyzers to confirm CO levels was not justifiable. The alternative CO monitoring method includes an annual review of traffic volumes using data from MDT permanent automatic traffic counters (ATR) in Great Falls. Thresholds are defined based on the percent increase in consecutive, rolling 3-year ADT volumes and correlated to presumed changes in ambient CO concentrations. The DEQ worked closely with EPA Region 8 staff to develop the alternative CO monitoring methodology to ensure that CO LMP areas maintain compliance with national standards. The procedures are presented in the document entitled *State of Montana Alternative CO Monitoring Strategy.* The EPA has not yet acted on this submittal.

Since the EPA has not acted on the July 13, 2011 or the June 22, 2012 submittals, the December 2000 LMP is the controlling document for this air quality conformity determination.

The following conformity determination was made in accordance with the above referenced Federal regulations. The determination is for CO and applies to the *Great Falls Area Long Range Transportation Plan - 2014* and the *Carbon Monoxide State Implementation Plan* for the State of Montana. As of the date of this conformity determination, the Great Falls urban area is not designated as a nonattainment or maintenance area for any other air pollutant.

12.2. CONFORMITY DETERMINATION

Interagency Consultation

This conformity determination follows the general consultation guidance contained in the State of Montana Air Quality Rules on Conformity (ARM Chapter 17.8 Subchapter 13). These rules incorporate by reference Federal regulations contained in 40 CFR Part 93, Subpart A. This consultation generally involved a cooperative and coordinated process including the Montana Department of Transportation (MDT), the Montana DEQ and the Great Falls City-County Planning Board.

The Montana DEQ and MDT coordinate regarding air quality and transportation conformity on behalf of metropolitan planning organizations (MPO) such as the Great Falls City-County Planning Board. Coordination is conducted in accordance with applicable Federal code (40 CFR 93) and state administrative rules (ARM Title 17, Chapter 8, Subchapter 13). Coordination typically takes the form of consultation through letter correspondence between the state agencies.

Air quality planning is an integral part of the Great Falls transportation planning process. As such, air quality has received specific attention during development of the numerous plans, programs and projects of the process. Unified Planning Work Programs have included specific annual work activities dealing with addressing the initial CO problem on 10th Avenue South and the preparation of revisions to the SIP. Any additional activities required to address past CO problems on 10th Avenue South will be completed under

Work Element 100: Transportation Program Administration & Participation[27]. Additionally, *Work Element 302: Transportation Plans, Analyses, Assessments & Consistency Determinations* presents procedures to assure consistency/conformity between air quality and transportation planning plans and programs, as well as other environmental issues such as noise, water quality, air, and aesthetics.

Public Involvement

The Great Falls MPO conducts an ongoing public and stakeholder engagement process for all transportation planning activities, including development and approval of the transportation plan, TIP, and conformity determination. This process is conducted in accordance with the *Great Falls Planning Public Participation Plan*, which was last updated in December 2011. The Public Participation Plan is subject to periodic FHWA and FTA review and concurrence for consistency with Federal planning regulations. Such concurrence was most recently provided through TIP approval on January 10, 2013 (FTA) and February 4, 2013 (FHWA). **Chapter 2** of this LRTP discusses the outreach process conducted during plan development.

Latest Planning Assumptions and Emissions Model

The October 6, 1995 EPA policy memorandum for limited maintenance plans in non-classifiable CO non-attainment areas included a discussion of the applicability of the conformity rule requirements in these areas. The following section addresses the applicable requirements. According to this policy, a limited maintenance plan attainment area is not required to project emissions over the maintenance period because the air quality design value for the area is low enough that the stationary source permitting program, existing SIP controls, and Federal control measures provide adequate assurance of maintenance of the CO standard over the initial 10-year maintenance period.

In the October 6, 1995 policy memorandum, the EPA states: “The maintenance demonstration requirement is considered to be satisfied for nonclassifiable areas if the monitoring data show that the area is meeting the air quality criteria for limited maintenance areas (7.65 ppm or 85% of the CO NAAQS).” According to EPA’s July 8, 2002 Direct Final Rule, the CO design value for the Great Falls area was 4.5 ppm, which was below the limited maintenance requirement of 7.65 ppm. More recent data show lower levels of CO. The 2011 LMP Submittal states: “The current CO monitoring site in Great Falls, Overlook Park (#30-013-0001), has operated in the city park at the corner of 10th Avenue South and 2nd Street since mid-2001. Based on the data from 2008 and 2009, the latest design value is 1.6 ppm, which is well below the 8-hour NAAQS of 9 ppm and the CO LMP eligibility threshold of 7.65 ppm.”

Given the information shown above, the Great Falls area adequately demonstrates maintenance.

Regional Emissions Analysis

As previously noted, the alternative CO monitoring method includes an annual review of traffic volumes using data from MDT permanent automatic traffic counters (ATR) in Great Falls by the Montana DEQ to demonstrate ongoing compliance with the CO NAAQS. Thresholds are defined based on the percent increase in consecutive, rolling 3-year ADT volumes and correlated to presumed changes in ambient CO concentrations.

Based on the satisfaction of these requirements, as noted, no regional emissions analysis under Sections 93.118 or 93.119 of the conformity rule is required for plan conformity.

[27] Great Falls Unified Planning Work Program, http://www.greatfallsmt.net/sites/default/files/fileattachments/upwp_ffy_2014_final.pdf. Accessed November 2013.

Timely Implementation of SIP Transportation Control Measures

Transportation Control Measures (TCM) are actions that are sometime included in a SIP to help reduce on-road mobile source emissions. TCMs are designed to reduce emissions from motor vehicles by reducing vehicle use, changing traffic flow, or changing congestion conditions. The currently-approved SIP for the Great Falls CO LMP area does not include any TCMs. Therefore, the TCM timely implementation requirement is not applicable to this conformity determination.

Fiscal Constraint

Metropolitan transportation plans are required to meet Federal fiscal constraint requirements as detailed in 23CFR450.322(b) (11). For nonattainment and maintenance areas such as Great Falls, this fiscal constraint requirement must be met before a conformity determination is approved. **Chapter 10** of this LRTP documents that planned expenditures are consistent with existing and proposed funding sources that can reasonably be expected to be available for transportation uses. As such, the transportation plan meets the fiscal constraint requirement.

12.3. CONCLUSION

It is the conclusion of this determination that in addition to the satisfaction of the aforementioned conditions and requirements, the G*reat Falls Area Long Range Transportation Plan – 2014* is found to be in conformance with the applicable provisions of section 176(c) of the Clean Air Act, 40 CFR 93 Subpart A, and the Great Falls Carbon Monoxide Maintenance Plan element of the State Implementation Plan for the State of Montana.

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