FACILITY RECOMMENDATIONS

Technical Memorandum

FINAL

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Abbreviations / Acronyms

ADA	Americans with Disabilities Act
ADU	Accessory Dwelling Unit
CIP	Capital Improvement Plan
CMSN	Committed Major Street Network
CTSM	Committed Transportation System Management
FY	Fiscal Year
GVLT	Gallatin Valley Land Trust
HAWK	High-Intensity Activated Crosswalk
LOS	Level of Service
LPI	Leading Pedestrian Interval
LRCDP	Long Range Campus Development Plan
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MOR	Museum of the Rockies
mph	miles per hour
MSN	Major Street Network
MSU	Montana State University
NEPA	National Environmental Policy Act
PROST	Parks, Recreation, Open Space and Trails (Plan)
PROWAG	Public Rights-of-Way Accessibility Guidelines

RRFB	Rectangular Rapid Flashing Beacon
RP	Reference Post
RPA	Robert Peccia and Associates
TCC	Transportation Coordinating Committee
TMP	Transportation Master Plan
TSM	Transportation System Management
TWG	Technical Working Group
TWLTL	Two-way Left-Turn Lane
UDO	Unified Development Ordinance
WTI	Western Transportation Institute
YOE	Year of Expenditure

Facility Recommendations

1.0. INTRODUCTION

The following sections present a variety of recommended street improvement projects. 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 TMP goals and objectives previously defined. In most cases, the recommended projects are either needed to meet the anticipated traffic demands for the year 2040 or to bring sub-standard roadways up to current standards based on the functional classification of the roadway. There are two categories of street improvement projects - major street network (MSN) and transportation system management (TSM) projects. These two categories are consistent with past long range transportation planning efforts completed in the greater Bozeman community.

2.0. RECOMMENDED MAJOR STREET NETWORK PROJECTS

MSN projects are typically large road reconstruction projects that take time to development, are costly, and are needed to meet existing or future capacity demands. Recommended MSN projects are shown in **Figure 2.1** at the end of this section. A summary of MSN projects from the 2007 Update and the status of each project is shown in **Table 2.1** to provide background for the currently proposed MSN projects. Committed MSN projects currently in process for FY 2018 thru FY 2022 are shown in **Table 2.2** and **Figure 2.1**.

2.1.1. MSN Projects from the 2007 Transportation Plan

A list of recommended major street network (MSN) projects made as part of the *Greater Bozeman Area Transportation Plan (2007 Update)*, and their status for this TMP, are listed in this section. The 2007 update of the Transportation Plan included 46 recommended MSN projects. Of these projects, 12 were completed, 12 are partially completed, and 22 have not been completed. Of the either partially completed or not completed projects from the previous plan, 25 projects have been included in this update of the plan as recommended projects. The various 46 projects recommended from the previous plan and their resultant status is summarized in **Table 2.1**.

Table 2.1: MSN Projects from 2007 Update & Status for this TMP

Project #	Location	Past Recommendation	Status for TMP
CMSN-1	S. 19th Ave (Babcock St to Kagy Blvd)	This project consists of reconstructing S. 19th Avenue from the intersection with Babcock Street south to the intersection with Kagy Boulevard to meet 5-lane principal arterial standards. This project comes from the high traffic volumes found on this roadway and the expected growth in the Bozeman area. This segment is approximately 1.25 miles long.	**COMPLETED**
CMSN-2	College St (S. 19th Ave to S. 8th Ave)	This project consists of reconstructing College Street from the intersection with S. 19th Avenue east to the intersection with S. 8th Avenue to meet minor arterial standards. This section of West College Street has already exceeded the volume of traffic it was projected to carry in 2020. Planned improvements to S. 19th Avenue and increased development in the S. 19th Avenue corridor will only further increase traffic demand on this facility. This facility also lacks bicycle and pedestrian facilities, therefore, this project will improve not only safety and capacity for motorized vehicle but for bicycle and pedestrians as well.	**PARTIALLY COMPLETED,** modified and included herein as **MSN-17** & **MSN-19**
CMSN-3	Hulbert Rd (Love Ln to Jackrabbit Ln)	Hulbert Road will be paved from the intersection with Love Lane west to the intersection with Jackrabbit Lane. This segment is approximately 2 miles long and is classified as a collector roadway. This project also consists of paving Hulbert Road west from the intersection with Jackrabbit Lane to the Gallatin Heights Major property boundary. This segment is approximately 0.5 miles long and is a local roadway.	**NOT COMPLETED,** not included herein for further consideration (outside of study area)
CMSN-4	Durston Rd (Fowler Ave to Ferguson Ave)	This project consists of constructing a new roadway between Fowler Avenue and Ferguson Avenue. It is apparent from recent development activity that the areas served by this minor arterial roadway may cause the predicted volumes to be exceeded along this corridor. This project will improve the safety and capacity for motorized vehicles as well as bicycles and pedestrians.	**NOT COMPLETED,** modified and included herein as **CMSN-5**
CMSN-5	Baxter Ln (N. 7th Ave to N. 19th Ave)	This project consists of reconstructing Baxter Lane from the intersection with N. 19th Avenue east to the intersection with N. 7th Avenue to meet minor arterial standards. Baxter Lane is positioned to become a major commercial route due to zoning on the south side of the road from N. 19th Avenue to N. 7th Avenue. By 2020 it has been projected that this roadway will carry more than double the vehicles per day than what it currently carries. This project will improve the safety and capacity for motorized vehicles as well as bicycles and pedestrians.	**PARTIALLY COMPLETED,** modified and included herein as **MSN-41**
CMSN-6	Baxter Ln (N. 19th Ave to Harper Puckett Rd)	This project consists of reconstructing Baxter Lane from the intersection with Harper Puckett Road east to the intersection with N. 19th Avenue to meet minor arterial standards. Continued development in the northwest quadrant of the City insures that this improvement will be needed. This project will improve the capacity and safety of this corridor.	**PARTIALLY COMPLETED,** modified and included herein as **MSN-39** & **MSN-40**
CMSN-7	Baxter Lane (Harper Puckett Rd to Jackrabbit Ln)	Baxter Lane will be paved from the intersection with Harper Puckett Road west to the intersection with Jackrabbit Lane. This segment of Baxter Lane is classified as a minor arterial roadway.	**NOT COMPLETED,** not included herein for further consideration (outside of study area)
CMSN-8	Harper Puckett Rd	Harper Puckett Road will be paved from the intersection with Cameron Bridge Road south to approximately 0.5 miles south of Valley Center Road. This segment is approximately 1.5 miles long and is classified as a minor arterial roadway.	**COMPLETED**

Project #	Location	Past Recommendation	Status for TMP
CMSN-9	Durston Rd	Durston Road will be extended approximately one mile from the current western termination point through Black Bull Run Subdivision and Middle Creek Parklands Subdivision to intersect with Jackrabbit Lane. Durston Road will also be paved from the current western end of asphalt location at the Bozeman City limits to the end of its extension. This segment of Durston Road is classified as a minor arterial roadway.	**PARTIALLY COMPLETED,** not included herein for further consideration (outside of study area)
CMSN-10	Valley Center Rd	This project consists of paving Valley Center Road from the intersection with Jackrabbit Lane west to the Gallatin Heights Major property boundary. This segment is approximately 0.5 miles long and is a local roadway.	**COMPLETED**
CMSN-11	Cameron Bridge Rd	Cameron Bridge Road will be paved from the intersection with Jackrabbit Lane east to the intersection with Harper Puckett Road. This segment is approximately 3 miles long and is classified as a collector roadway.	**COMPLETED**
CMSN-12	Monforton School Rd	Monforton School Road will be abandoned at the campus of Monforton School via a new cul-de-sac, and a new road will be re-routed to line up across from Cobb Hill Road at Huffine Lane. It is recommended herein that the relocated Monforton School Road be changed to a collector road functional classification.	**COMPLETED**
CMSN-13	Spain Bridge Rd	Spain Bridge Road will be paved from the intersection with Penwell Bridge Road south to the intersection with Airport Road. This segment is approximately 2 miles long and is classified as a minor arterial roadway.	**COMPLETED**
CMSN-14	Penwell Bridge Rd	This project consists of paving a one mile stretch of Penwell Bridge Road east from the intersection with Dry Creek Road. Another stretch of Penwell Bridge Road will also be paved from the intersection with Spain Bridge Road to East Gallatin River. Penwell Bridge Road is a local roadway.	**COMPLETED**
CMSN-15	Tayabeshockup Rd	Tayabeshockup Road will be paved south from the intersection with Bozeman Trail Road. This segment is approximately 2 miles long and is classified as a collector roadway.	**COMPLETED**
CMSN-16	Valley Center Rd	This project consists of upgrading Valley Center Road from the intersection with Jackrabbit Lane to the intersection with Love Lane to a two-lane urban arterial standard. This section will consist of one travel lane in each direction, 6-foot shoulders on each side, curb and gutter, turn-lanes at major intersections, and sidewalks. This project is approximately 2 miles long.	**COMPLETED**
MSN-1	N. 19th Ave (Interstate 90 to Springhill Road)	This project consists of widening N. 19th Avenue from Interstate 90 (I-90) to the intersection with Springhill Road to a 5-lane urban arterial standard. This project includes widening the I-90 overpass along N. 19th Avenue. This roadway is currently a principal arterial roadway south of I-90 and a minor arterial roadway north of I-90. This project serves as a long-term need that will be necessary to accommodate future development patterns in the region and serve north-south traffic flow. It is expected that a minimum of two travel lanes in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalk, and raised median will be required.	**NOT COMPLETED,** modified and included herein as **MSN-5**
MSN-2	Kagy Blvd (S. 19th Ave to Willson Ave)	This project consists of widening Kagy Boulevard from the intersection with S. 19th Avenue to the intersection with Willson Avenue to a three-lane urban arterial. This includes one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalks, and a raised median. This project serves as a long-term need that will be necessary to accommodate future development patterns in the region and serve east-west traffic flow around the southern portions of the city. Currently this section of Kagy Boulevard is a two-lane roadway with few left-turn bays.	**NOT COMPLETED,** modified and included herein as **MSN-8**
MSN-3	S. 3rd Ave (Graf St to Kagy Blvd)	This project consists of widening S. 3rd Avenue from the intersection with Graf Street to the intersection with Kagy Boulevard to a three-lane urban arterial roadway. This includes one travel lane in each direction, bike lanes on each side, curb and gutter, sidewalks, and a raised median. This project serves to accommodate development in the region and serve north-south traffic flow around the southern portions of the city.	**NOT COMPLETED,** modified and included herein as **MSN-21**

Project #	Location	Past Recommendation	Status for TMP
MSN-4	Rouse Ave (Main Street to Story Mill Rd)	This project consists of widening Rouse Avenue from the intersection with Main Street to the intersection with Story Mill Road to a three-lane urban arterial. This includes one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalks, and a raised median. This project serves to accommodate increasing traffic volumes along Rouse Avenue and serve traffic flow around the northern portions of the city. Currently Rouse Avenue is a two-lane roadway with few left-turn bays. An Environmental Assessment (EA) has been prepared for this recommended project that identifies specific constraints and known design issues.	**NOT COMPLETED,** modified and included herein as **CMSN-11**
MSN-5	College St (Main St to S. 19th Ave)	This project consists of reconstructing College Street from the intersection with Main Street east to the intersection with S. 19th Avenue to a five-lane urban arterial roadway. It is expected that a minimum of two travel lanes in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalk , and a raised median will be required. This section of College Street has exceeded the volume of traffic it was projected to carry. During peak hours, traffic is backed up from S. 19th Avenue to Huffine Lane and beyond. This project will improve the safety and capacity for motorized vehicles as well as bicycles and pedestrians.	**COMPLETED**
MSN-6	Cottonwood Rd / Harper Puckett Rd (Stucky Rd to Valley Center Rd)	This project consists of widening Cottonwood Road from the intersection with Stucky Road north to its current termini and constructing an extension to Cottonwood Road from its current northern termini to Baxter Lane. It is also recommended that Harper Puckett Road be widened from the intersection with Baxter Lane north to the intersection with Hidden Valley Road and that an extension be constructed north to intersect with Valley Center Road. This project should be constructed to a five-lane urban arterial standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalks, and a raised median. This project is necessitated by the future development patterns in the region and will serve north-south traffic flow around the western edge of the city.	**PARTIALLY COMPLETED,** modified and included herein as **CMSN-2, MSN-12, MSN-15, MSN-26** & **MSN-33**
MSN-7	Fowler Ave / Davis Ln (Stucky Rd to Valley Center Rd)	This project consists of upgrading Fowler Avenue and Davis Lane from the intersection with Stucky Road to the intersection with Valley Center Road to a three-lane urban arterial standard. This includes one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalks, and a raised median. New links will have to be constructed along this corridor between Oak Street and Babcock Street and between Garfield Street and Stucky Road. This project is necessitated by the future development patterns in the region and will serve north-south traffic flow around the western portion of the city.	**PARTIALLY COMPLETED,** modified and included herein as **MSN-11** & **MSN-13**
MSN-8	Deadman's Gulch / Cattail St (N. 27th Ave to Cottonwood Rd)	This project consists of upgrading Cattail Street from the intersection with N. 27th Avenue west to its current termini point to a two-lane urban collector roadway. A new link between the current western termini point of Cattail Street and Cottonwood Road should be created to two-lane collector standards complete with one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. This project is necessitated by the future development patterns in the region and will serve east-west traffic flow around the northern portion of the city.	**PARTIALLY COMPLETED,** modified and included herein as **MSN-10**
MSN-9	Stucky Rd (S. 19th Ave to Gooch Hill Rd)	This project consists of upgrading Stucky Road from the intersection with S. 19th Avenue west to the intersection with Gooch Hill Road to a two-lane urban collector roadway. This includes one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. This project is necessitated by the future development patterns in the region and will serve east-west traffic flow around the southern edge of the city.	**NOT COMPLETED,** modified and included herein as **MSN-16**

Project #	Location	Past Recommendation	Status for TMP
MSN-10	Oak St (Fowler Ave to Cottonwood Rd)	This project consists of constructing a new link along Oak Street from the intersection with Fowler Avenue west to Cottonwood Road. This section should be built to a five-lane urban arterial standard and should include two travel lanes in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalks, and a raised median. This project is necessitated by the future development patterns in the region and will serve east-west traffic flow around the northwestern portion of the city.	**NOT COMPLETED,** modified and included herein as **CMSN-3, CMSN-4, MSN-18** & **MSN-38**
MSN-11	Graf St	Graf Street is to be extended from its current western termini to connect to S. 19th Avenue. This extension would be approximately 0.6 miles long and should be built to meet two-lane collector standards. This extension is an important connection for public safety purposes, allowing fire service to meet their response time requirements in areas where they currently cannot.	**NOT COMPLETED,** modified and included herein as **MSN-27**
MSN-12	S. 11th Ave (Kagy Bld to Graf St extension)	This project would connect S. 11th Avenue between Kagy Boulevard and the future extension of Graf Street as described in MSN-11. This roadway should be built to a two-lane urban collector standard which should include one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. A new link between Opportunity Way and the Graf Street extension would need to be constructed under this project. This project will serve to create a north-south link for the southern portion of the city.	**PARTIALLY COMPLETED,** modified and included herein as **CMSN-7**
MSN-13	N. 11th Ave (Durston Rd to Baxter Ln)	This project consists of upgrading N. 11th Avenue from the intersection with Durston Road to the intersection with Baxter Lane. A new link between Durston Road and Oak Street would need to be constructed under this project. This roadway should be built to a two-lane urban collector standard which should include one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. This project will serve to create an additional north-south link along the north-central part of the city.	**NOT COMPLETED,** modified and included herein as **MSN-3** & **MSN-45**
MSN-14	W. Babcock Street (S. 11th Ave to S. 19th Ave)	W. Babcock Street should be upgraded to a two-lane urban collector standard between the intersection with S. 11th Avenue and the intersection with S. 19th Avenue. This would include one travel lane in each direction, bike lanes on each side, curb and gutter, boulevards, parking, and sidewalks.	**NOT COMPLETED,** modified and included herein as **CMSN-9**
MSN-15	Church St (Main St to Kagy Blvd)	This project consists of reconstructing Church Street from the intersection with Main Street south to the intersection with Kagy Boulevard to a two-lane urban collector standard. This would include one travel lane in each direction, bike lanes on each side, curb and gutter, boulevards, parking, and sidewalks. The need for this project comes from increased traffic due to growth in the South Bozeman area as well as the county area south of Bozeman. This project will improve the safety and capacity for motorized vehicles as well as bicycles and pedestrians.	**NOT COMPLETED,** modified and included herein as **MSN-30**
MSN-16	W. Main St (7th Ave to 19th Ave)	This project consists of installing a raised or landscaped median at appropriate locations along W. Main Street between the intersection with 7th Avenue and the intersection with 19th Avenue. This project will help to increase traffic flow via access control and improve safety along this corridor.	**NOT COMPLETED,** not included herein for further consideration
MSN-17	Frontage Rd (N. 7th Ave to Belgrade)	The Frontage Road between N. 7th Avenue to Belgrade should be upgraded to a three-lane rural arterial roadway. This includes one travel lane in each direction and a two-way center turn lane. This project is necessitated by the future development patterns in the region and will serve as a link between the Belgrade and Bozeman areas. Roadway shoulders should be included to facilitate bicycle travel.	**NOT COMPLETED,** corridor study underway

Project #	Location	Past Recommendation	Status for TMP
MSN-18	Springhill Rd (Frontage Rd to Sypes Canyon Rd)	Springhill Road from the intersection with the Frontage Road to the intersection with Sypes Canyon Road should be widened to a three-lane rural arterial roadway. This includes one travel lane in each direction and a two-way center turn lane. This project is necessitated by the development on the western side of the city and north of the interstate. This project will serve to provide a north-south connection along the northwest side of the city.	**NOT COMPLETED,** modified and included herein as **MSN-6**
MSN-19	Bozeman Trail/Haggerty Ln (Main St to Kagy Blvd)	Bozeman Trail should be upgraded to a two-lane urban collector roadway from the intersection with Kagy Boulevard north to the intersection with Haggerty Lane. Haggerty Lane should also be upgraded to a two-lane urban collector roadway from the intersection with Bozeman Trail northwest to the intersection with Main Street. A two-lane urban collector roadway includes one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. This project is necessitated by the future development in the region and will serve as a north-south link along the southeastern portion of the city.	**PARTIALLY COMPLETED,** modified and included herein as **MSN-23**
MSN-20	East Belgrade Interchange	This project consists of constructing a new I-90 interchange to serve the airport and Belgrade areas. A northern interchange connection is to be made to connect with the Frontage Road. A southern connection to the interchange should be made to connect to Alaska Road. The interchange connections should be constructed to two-lane rural arterial standards complete with one travel lane in each direction. This project is necessitated by the future development in the region and the need for more adequate connection to the airport. Non-motorized facilities should be developed in association with this project as this interchange will serve important cross connectivity north and south of Interstate 90.	**COMPLETED**
MSN-21	Gallatin Rd (Gallatin Gateway to Four Corners)	It is recommended that Gallatin Road be widened to a three-lane rural arterial between Gallatin Gateway and Four Corners complete with one travel lane in each direction and a two-way center turn lane. This project is necessitated by the development in the region and the increasing traffic volumes along this corridor. This project will serve as a vital north-south link for the area and will increase the overall safety of the roadway.	**PARTIALLY COMPLETED,** not included herein for further consideration (outside of study area)
MSN-22	Jackrabbit Ln (Four Corners to Frank Rd)	It is recommended that Jackrabbit Lane be widened to a five-lane arterial between Four Corners and Frank Road, complete with two travel lanes in each direction and a two-way center turn lane or raised median. This project is necessitated by the development in the region and the increasing traffic volumes along this corridor. This project will serve as a vital north-south link for the area and will increase the overall safety of the roadway.	**PARTIALLY COMPLETED,** not included herein for further consideration (outside of study area)
MSN-23	Griffin Dr Railroad Underpass	This project consists of constructing a railroad underpass along Griffin Drive. The railroad crossing separates the northeastern portion of the city and creates a problem for emergency vehicle access and traffic congestion when the train blocks the current at-grade crossings.	**NOT COMPLETED,** not included herein for further consideration
MSN-24	Cedar St / Oak St	This project consists of upgrading Cedar Street to a three-lane urban arterial. An eastern extension of Oak Street from its intersection with Rouse Avenue to connect to Cedar Street and a southern extension of Cedar Street connecting to Main Street at the intersection with Highland Boulevard should also be constructed under this project. This project would also require two grade separated railroad crossings. A three-lane urban arterial includes one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalks, and a raised median. This project in necessitated by the future development patterns in the region and will serve to access development area on the eastern side of the city and relieve neighborhood "cut-thru" traffic issues in the northeast neighborhood area.	**NOT COMPLETED,** not included herein for further consideration

Project #	Location	Past Recommendation	Status for TMP
MSN-25	Ferguson Ave (Durston Rd to Valley Center Rd)	This project consists of extending Ferguson Avenue from its current northern termini point north to intersect with Valley Center Road. This roadway should be constructed to a two-lane urban collector standard which includes one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. This project is necessitated by the future development patterns in the region and will serve north-west traffic flow around the western portion of the city.	**PARTIALLY COMPLETED,** modified and included herein as **CMSN-6**
MSN-26	Highland Blvd (Main St to Kagy Blvd)	This project consists of widening Highland Boulevard from the intersection with Main Street to the intersection with Ellis Street to a five-lane urban arterial standard, and from the intersection with Ellis Street south to the intersection with Kagy Boulevard to a three-lane urban arterial standard. This roadway is currently a minor arterial roadway with one travel lane in each direction. This project serves as a long-term need that will be necessary to accommodate future development patterns in the region and serve north-south traffic flow. It is expected that a minimum of two travel lanes in each direction from Main Street to Ellis Street, one travel lane in each direction from Ellis Street to Kagy Boulevard, bike lanes on each side, curb and gutter, boulevard, sidewalk, and a raised median will be required.	**NOT COMPLETED,** modified and included herein as **MSN-22**
MSN-27	Kagy Blvd (Highland Blvd to Bozeman Trail)	This project consists of widening Kagy Boulevard from the intersection with Highland Boulevard to the intersection with Bozeman Trail to a three-lane urban arterial standard complete with one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalk, and a raised median. This roadway is a two-lane roadway and is classified as a principal arterial. This project serves as a long-term need that will be necessary to accommodate future development patterns in the region and serve east-west traffic flow.	**NOT COMPLETED,** modified and included herein as **MSN-24**
MSN-28	Stucky Rd / Elk Ln Extension	This project consists of constructing an extension of Stucky Road west from the intersection with Gooch Hill Road to the future intersection of Elk Lane and Love Lane. This segment should be constructed to a two-lane collector standard complete with one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. This project is necessitated by the future development patterns in the region and will serve east-west traffic flow around the southwestern edge of the city.	**NOT COMPLETED,** modified and included herein as **MSN-16**
MSN-29	Valley Center Rd (Love Ln to Valley Center Spur Rd)	This project consists of upgrading Valley Center Road from the intersection with Love Lane to the intersection with the Valley Center Spur Road to a two-lane urban arterial standard. This section will consist of one travel lane in each direction, 6-foot shoulders on each side, curb and gutter, turn-lanes at major intersections, and sidewalks. This project in necessitated by the future development patterns in the region and will serve to access development area on the northwestern side of the city.	**COMPLETED**
MSN-30	Valley Center Rd (Valley Center Spur Rd to N. 27th Ave)	This project consists of upgrading Valley Center Road from the intersection with the Valley Center Spur Road to the intersection with N. 27th Avenue to a three-lane urban arterial standard complete with one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalk, and a raised median. This roadway is a two-lane roadway and is classified as a principal arterial. This project in necessitated by the future development patterns in the region and will serve to access development area on the northwestern side of the city.	**NOT COMPLETED,** modified and included herein as **MSN-29**

2.1.2. Committed MSN Projects

Committed projects in the MSN category are only listed if the project will affect capacity and/or delay characteristics of a roadway facility and/or intersection. This distinction is necessary since some committed improvement projects, likely to occur within the next five years, are not listed here as they will not have an effect on capacity and/or delay characteristics (an example might be a street overlay). Committed improvements listed are only considered if they are likely to be constructed within a five-year timeframe (i.e. fiscal year 2018 through fiscal year 2022), and a funding source has been identified and is assigned to the specific project. Committed MSN projects are shown in **Table 2.2**.

Table 2.2: Committed MSN Projects (FY 2018 to FY 2022)

TMP ID	Title	Description	Cost	YOE	Project ID	Source
CMSN-1	Griffin Dr (N. 7th Ave to Rouse Ave)	This project consists of reconstructing Griffin Drive, from the intersection of N. 7th Avenue to Rouse Avenue, to a three-lane urban "minor arterial" standard. This includes one travel lane in each direction, bike lanes on each side, curb and gutter throughout, boulevard, and sidewalks. Turn-bays and flushed or raised medians should be incorporated at major intersections as applicable (i.e. N. 7th Avenue, Manley Road, Rouse Avenue, etc.).	$5,000,000	FY19	SIF113	City
CMSN-2	Cottonwood Rd (Babcock St to Durston Rd)	This project consists of widening Cottonwood Road, from West Babcock Street to Durston Road, to a five-lane urban principal arterial standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalk on the west side and a shared use path on the east side and a raised median. Cottonwood Road serves as an important element in Bozeman's west side street system and serves as a primary north-south corridor on the west side of the city.	$2,555,883	FY18	SIF036	City
CMSN-3	Oak St (New Holland Dr to Ferguson Ave)	This project is the completion of the street segment of Oak Street, from New Holland Drive to Ferguson Avenue, to a five-lane urban principal arterial standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, shared use paths on both sides and a raised median. Currently, the south half of the street is missing, creating a bottleneck in the street network.	$2,000,000	FY18	SIF046	City
CMSN-4	Oak St (Ferguson Ave to Ryunson Way)	This project is the completion of the street segment of Oak Street, from Ferguson Avenue to Ryunson Way, to a five-lane urban principal arterial standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalks and a raised median.	$100,000	FY19	SIF135	City

TMP ID	Title	Description	Cost	YOE	Project ID	Source
CMSN-5	Durston Rd (Ferguson Rd to Fowler Ave)	Complete Durston Road, from Fowler Avenue to Ferguson Road, to a three-lane urban minor arterial standard including sidewalks, parking, medians, boulevards and bike lanes.	$1,514,842	FY19	SIF062	City
CMSN-6	Ferguson Ave (Baxter Ln to Oak St)	Complete Ferguson Avenue, from Baxter Lane to Oak Street, to a two-lane urban collector standard with bike lanes, curb and gutter, boulevards, parking and a sidewalk on the west side and shared use path on the east side.	$1,000,000	FY18	SIF080	City
CMSN-7	S. 11th Ave (Kagy Blvd to Graf St Extension)	Complete S. 11th Avenue, from Kagy Boulevard to Graf Street, to a two-lane urban collector standard including shared use paths on both sides, curb and gutter and bike lanes.	$1,600,000	FY18	SIF102	City
CMSN-8	Story Mill Rd (Griffin Dr to Bridger Canyon Rd)	Reconstruct Story Mill Road, between Griffin Drive and Bridge Canyon Road, to a two-lane urban "collector" standard. This would include one travel lane in each direction, bike lanes on each side, curb and gutter, and sidewalks. Also, north of Griffin Drive install shared use path on the west side as part of a continuous trail connection from south Bozeman to the M trailhead (Story Hill Rail Trail).	$500,000	FY21	SIF117	City
CMSN-9	W. Babcock St (S. 11th Ave to S. 19th Ave)	Upgrade West Babcock Street, between South 11th Avenue and South 19th Avenue, to a three-lane urban "collector" standard. This would include one travel lane in each direction, bike lanes on each side, curb and gutter, boulevards, parking, and sidewalks, with a flush or raised center lane or median.	$1,500,000	FY22	SIF118	City
CMSN-10	Oak St (Rouse Ave thru Cannery District)	Improve Oak Street from Rouse Avenue thru the Cannery District to include curb, gutter, sidewalks, and a turning lane to provide left-turn movement access to the two drive accesses from Oak Street into the Cannery District.	$266,000	FY19	SIF109	City
CMSN-11	Rouse Ave (E Main St to Oak St)	Complete the reconstruction of Rouse Avenue, between E. Main Street and Oak Street, to a three-lane urban principal arterial standard with bike lanes and sidewalks.	$9,185,756	FY18	UPN4805	MDT

2.1.3. Recommended MSN Projects

A number of MSN projects have been identified and are described in this section and shown on **Figure 2.1**. **Table 2.3** contains a summary of the recommended MSN projects that are not identified for funding in the next five years as per the 5-Year CIP. The project numbering scheme does not represent or imply priority with respect to individual projects. 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. It is likely that some of them will become funded at some point during the twenty-five year planning horizon even though no current source is known. For planning level cost estimates, representative "costs per mile" were developed using recent roadway cost estimates from the *Oak Street Improvements* project and the *Cottonwood/Durston Road Improvements* project. Furthermore, for some projects the City of Bozeman's most current *Street Impact Fee Fund CIP (FY 18-22)* and *Arterial and Collector District CIP (FY 18-22)* was utilized. Planning level cost estimates include construction, design, construction administration, utilities and contingencies. The Basis of Planning cost estimates for the MSN projects, absent other defined sources, are as follows:

- $2.2M per mile (2-lane urban)
- $3.0M per mile (3-lane urban)
- $5.0M per mile (4/5-lane urban)
- $1.5M per mile (2-lane rural)
- $1.9M per mile (3-lane rural)
- $250 per sq ft (bridge construction)

MSN-1: Kagy Blvd (Willson Ave to Highland Blvd)

Reconstruct Kagy Boulevard, from the intersection of Willson Avenue to Highland Boulevard, to a four-lane urban principal arterial standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, wide sidewalks or shared use paths, and a raised median. Also included are intersection improvements consisting of traffic signalization or roundabouts at the intersections of Kagy Boulevard with Sourdough Avenue / Church Street and also Highland Boulevard. (SIF 129)

Estimated Cost: $6.0M

MSN-2: Oak Street (N. 7th Avenue to west edge of Cannery District)

This project consists of reconstructing Oak Street, from the intersection of N. 7th Avenue to the west edge of the Cannery District, to a three-lane urban "principal arterial" standard. This includes one travel lane in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalk on the north side, and either a flush center lane or raised median. The shared use path on the south side should remain and be extended to N. 7th Avenue. Turn-bays should be incorporated at major intersections as applicable.

Estimated Cost: $1.95M

MSN-3: N. 11th Avenue (Durston Road to Oak Street)

This project consists of constructing N. 11th Avenue from the intersection with Durston Road to the intersection with Oak Street. This roadway should be built to a two-lane urban "collector" standard which should include one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, sidewalk on the east side, and a shared use path on the west side. This project will serve to create an additional north-south link within the north-central part of the city.

Estimated Cost: $1.12M

MSN-4: N. 15th Avenue (Patrick Street to Baxter Lane)

This project consists of constructing N. 15th Avenue from the intersection with Patrick Street to the intersection with Baxter Lane. This roadway should be built to a three-lane urban "collector" standard which should include one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. This project will serve to create an additional north-south link within the north-central part of the city. A new roundabout intersection at Tschache Lane and N. 15th Avenue will be created with this project.

Estimated Cost: $705K

MSN-5: N. 19th Avenue (Interstate 90 to Springhill Road)

This project consists of reconstructing N. 19th Avenue from Interstate 90 to the intersection with Springhill Road to a 5-lane urban “principal arterial” standard. This project includes widening the I-90 overpass on N. 19th Avenue. This roadway is currently a principal arterial roadway south of I-90 and a minor arterial roadway north of I-90. This project serves a long-term need that will be necessary to accommodate future development patterns in the region and serve north-south traffic flow. It is expected that a minimum of two travel lanes in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalk, and raised median will be required.

Estimated Cost: $2.5M (road only) // $4.7M (includes bridge widening)

MSN-6: Springhill Road (Frontage Road to Sypes Canyon Road)

Springhill Road from the intersection with the Frontage Road to the intersection with Sypes Canyon Road should be reconstructed to a three-lane rural "minor arterial" roadway. This includes one travel lane in each direction and a two-way center turn lane. This project is

necessitated by the development on the western side of the city and north of the interstate. This project will serve to provide a north-south connection within the northwest side of the city. A shared-use path should be added to the east side of Springhill Road linking the Frontage Road with Sypes Canyon Road (could also connect to a future conceptual path to Story Mill Road/Bridger Drive).

Estimated Cost: $2.85M

MSN-7: N. 27th Avenue (Baxter Lane to Valley Center Road)

This project consists of constructing N. 27th Avenue from the intersection with Baxter Lane to the intersection with Valley Center Road. This roadway should be built to a three-lane urban "collector" standard which should include one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. This project will serve to create an additional north-south link within the north-central part of the city.

Estimated Cost: $4.2M

MSN-8: Kagy Blvd (Willson Ave to S. 19th Ave)

Reconstruct Kagy Boulevard, from the intersection of S. 19th Avenue to Willson Avenue, to a four-lane urban principal arterial standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, wide sidewalks or shared use paths, and a raised median. Also included are multi-lane roundabouts at the intersections of Kagy Boulevard with S. 11th, S. 7th, and Willson Avenues. (SIF 009)

Estimated Cost: $8.0M

MSN-9: Oak Street (N. 27th Avenue to N. 19th Avenue)

Reconstruct Oak Street, from N. 27th Avenue to N. 19th Avenue, to a five-lane urban "principal arterial" standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalk on the north side, shared use path on the south side, and either a flush center lane or raised median. Turn-bays should be incorporated at major intersections as applicable.

Estimated Cost: $2.1M

MSN-10: Cattail Street (Davis Lane to Harper Puckett Road)

This project consists of constructing Cattail Street from the intersection with Davis Lane west of its current termini point to a three-lane urban "collector" roadway. A new link between the current western termini point of Ferguson Avenue and Harper Puckett Road should be created with one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. The portion of Cattail Street between Davis Lane and Ferguson Avenue has been constructed but not to a full build-out configuration. This project is necessitated by the future development patterns in the region and will serve east-west traffic flow within the northern portion of the city.

Estimated Cost: $3.0M

MSN-11: Davis Lane (Baxter Lane to Valley Center Road)

This project consists of reconstructing Davis Lane from the intersection with Baxter Lane to the intersection with Valley Center Road to a five-lane urban "minor arterial" standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalk on the east side, shared use path on the west side, and a center turn lane/raised median. This project is necessitated by the future development patterns in the region and will serve north-south traffic flow within the western portion of the city.

Estimated Cost: $8.5M

MSN-12: Cottonwood Road (Oak Street to Cattail Street)

Complete the construction of Cottonwood Road, from Oak Street to Cattail Street, to a five lane urban "principal arterial" standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalk on the west side, shared use path on the east side, and a raised median. Cottonwood Road serves as an important element in Bozeman's west side street system and serves as a primary north-south corridor within the west side of the city.

Estimated Cost: $5.0M

MSN-13: Fowler Avenue Connection (Huffine Lane to Oak Street)

This project consists of reconstructing Fowler Avenue from the intersection with Huffine Lane to the intersection with Oak Street to a five-lane urban "minor arterial" standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter, boulevard,

sidewalk on the east side, and a shared use path on the west side. New links will have to be constructed within this corridor between Oak Street and Durston Road, and between Christopher Way and Babcock Street. This project is necessitated by the future development patterns in the region and will serve north-south traffic flow within the western portion of the city. (SIF 114)

Estimated Cost: $7.5M

MSN-14: Durston Road (Gooch Hill Road to Westgate Avenue)

This project consists of reconstructing Durston Road, from Gooch Hill Road to Westgate Avenue, to a three-lane urban "minor arterial" standard. This includes one travel lane in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalks, and either a flush center lane or raised median. Turn-bays should be incorporated at major intersections as applicable.

Estimated Cost: $900K

MSN-15: Cottonwood Road (Durston Road to Oak Street)

This project consists of constructing Cottonwood Road, from Durston Road to Oak Street, to a five lane urban "principal arterial" standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalk on the west side, shared use path on the east side, and a raised median. Cottonwood Road serves as an important element in Bozeman's west side street system and serves as a primary north-south corridor within the west side of the city. (SIF 105)

Estimated Cost: $2.5M

MSN-16: Stucky Road (S. 19th Avenue to Gooch Hill Road)

This project consists of reconstructing Stucky Road from the intersection with S. 19th Avenue west to the intersection with Gooch Hill Road to a three-lane urban "collector" roadway. This includes one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. This project is necessitated by the future development patterns in the region and will serve east-west traffic flow around the southern edge of the city.

Estimated Cost: $9.0M

MSN-17: College Street (S. 11th Avenue to S. 19th Avenue)

This project consists of reconstructing College Street, from the intersection of S. 11th Avenue to S. 19th Avenue, to a three-lane urban "minor arterial" standard. This includes one travel lane in each direction, bike lanes on each side, parking on each side, curb and gutter throughout, boulevard, flush and/or raised medians with left turn lanes at major intersections, and shared use paths on both sides (currently exists on south side). The roundabout at College Street and S. 11th Avenue should remain. (SIF 115)

Estimated Cost: $1.1M

MSN-18: Oak Street (Cottonwood Road to Flanders Mill)

This project consists of reconstructing Oak Street, from Cottonwood Road to Flanders Mill, to a five-lane urban principal arterial standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalks and a raised median. (SIF 134)

Estimated Cost: $1.55M

MSN-19: W. College Street (S. 8th Avenue to S. 11th Avenue)

This project consists of reconstructing College Street, from the intersection of S. 8th Avenue to S. 11th Avenue, to a two-lane urban "minor arterial" standard. This includes one travel lane in each direction, bike lanes on each side, parking on each side, curb and gutter throughout, boulevard, and sidewalks. The roundabout at College Street and S. 11th Avenue should remain.

Estimated Cost: $440K

MSN-20: Mendenhall Street and Babcock Street (Streetscape Improvements)

This project consists of completing streetscape improvements along Mendenhall Street and Babcock Street to include curb bulb-outs, landscaping and crossing enhancements.

Estimated Cost: $2.1M

MSN-21: S. 3rd Avenue (Graf Street to Kagy Boulevard)

This project consists of reconstructing S. 3rd Avenue from the intersection with Graf Street to the intersection with Kagy Boulevard to a three-lane urban "collector" roadway. This includes one travel lane in each direction, bike lanes on each side, curb and gutter, sidewalks, and left turn lanes at major intersections. This project serves to accommodate development in the region and serve north-south traffic flow within the southern portion of the city.

Estimated Cost: $2.1M

MSN-22: Highland Boulevard (Main Street to Kagy Boulevard)

This project consists of reconstructing Highland Boulevard from the intersection with Main Street to the intersection with Knolls Drive to a five-lane urban "principal arterial" standard, and from the intersection with Knolls Drive south to the intersection with Kagy Boulevard to a three-lane urban "principal arterial" standard. This project serves as a long-term need that will be necessary to accommodate future development patterns in the area and serve north-south traffic flow. It is expected that a minimum of two travel lanes in each direction from Main Street to Knolls Drive, and one travel lane in each direction from Knolls Drive to Kagy Boulevard, will be necessary. Also included are bike lanes on each side, curb and gutter, boulevard, sidewalk (on the east side of Highland Boulevard), and a flush/raised median. The shared use path on the west side of Highland Boulevard will need to be reconstructed to the west to fit in a three-lane roadway section. (SIF 111)

Estimated Cost: $10.0M

MSN-23: Bozeman Trail Road / Haggerty Lane (Main Street to Kagy Boulevard)

Bozeman Trail Road should be reconstructed to a three-lane urban "minor arterial" roadway from the intersection with Kagy Boulevard north to the intersection with Haggerty Lane. Haggerty Lane should also be upgraded to a three-lane urban "minor arterial" roadway from the intersection with Bozeman Trail Road northwest to the intersection with Main Street. A three-lane urban "minor arterial" roadway includes one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, sidewalk on the east side, a shared use path on the west side, and a center turn lane/raised median as appropriate. This project is necessitated by the future development in the area and will serve as a north-south link within the southeastern portion of the city.

Estimated Cost: $5.55M

MSN-24: Kagy Boulevard (Highland Boulevard to Bozeman Trail Road)

This project consists of reconstructing Kagy Boulevard from the intersection with Highland Boulevard to the intersection with Bozeman Trail Road to a three-lane urban "principal arterial" standard complete with one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, shared use paths on both sides, and a flush/raised median. This roadway is currently a two-lane roadway with no shoulder, steep fill slopes, and limited non-motorized amenities. This project serves as a long-term need that will be necessary to accommodate future development patterns in the area and serve east-west traffic flow. Two grade separated underpasses below Kagy Boulevard are envisioned to provide north-south non-motorized connectivity to trails in the area.

Estimated Cost: $5.0M

MSN-25: Kagy Boulevard / Bozeman Trail Road (Bozeman Trail Road to Interstate 90)

This project consists of reconstructing Kagy Boulevard from the intersection with Bozeman Trail Road, east to Interstate 90, to a two-lane rural "principal arterial" standard complete with one travel lane in each direction, bike lanes on each side, and shared use paths (as per PROST Plan). This roadway is currently a two-lane roadway with no shoulder, steep fill slopes, and limited non-motorized amenities. This project serves as a long-term need.

Estimated Cost: $4.35M

MSN-26: Cottonwood Road (Loyal Drive to Graf Street)

This project consists of reconstructing Cottonwood Road, from the intersection of Loyal Drive to Graf Street, to a five-lane urban "principal arterial" standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalks (on the west side), a shared use path on the east side, and a flush or raised median. Cottonwood Road serves as an important element in Bozeman's west side street system and serves as a primary north-south corridor on the west side of the city.

Estimated Cost: $5.5M

MSN-27: Graf Street Extension (Ritter Drive to S. 19th Avenue)

This project consists of completing Graf Street, from Ritter Drive to S. 19th Avenue, to a two-lane urban collector standard with bike lanes. This also includes shared use paths on both sides.

Estimated Cost: $1.035M

MSN-28: Gooch Hill Road (Huffine Lane to Durston Road)

Reconstruct Gooch Hill Road, from Huffine Lane to Durston Road, to a five lane urban "minor arterial" standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalks and a raised median. Gooch Hill Road will serve as an important element in Bozeman's future west side street system.

Estimated Cost: $5.0M

MSN-29: Valley Center Road (Valley Center Spur Road to N. 27th Avenue)

This project consists of reconstructing Valley Center Road from the intersection with Valley Center Spur Road (at underpass) to the intersection with N. 27th Avenue to a three-lane urban “principal arterial” standard complete with one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, a shared use path (on the south side), and a flush/raised median. This project in necessitated by the future development patterns in the region and will serve to access development area on the northwestern side of the city.

Estimated Cost: $3.51M

MSN-30: Church Street (Main Street to Kagy Boulevard)

This project consists of reconstructing Church Street from the intersection with Main Street south to the intersection with Kagy Boulevard to a two-lane urban "collector" standard. This would include one travel lane in each direction, curb and gutter, bike lanes, and sidewalks. This project will improve the safety and capacity for motorized vehicles as well as pedestrians. It is possible that due to land constraints that sidewalk may not be feasible on both sides of the street.

Estimated Cost: $3.52M

MSN-31: "L" Street / Story Mill Road (Tamarack Street to Griffin Drive)

This project consists of reconstructing "L" Street and Story Mill Road, from the intersection with Tamarack Street to Griffin Drive, to a two-lane urban "collector" standard. This would include one travel lane in each direction, bike lanes on each side, curb and gutter, and sidewalks. Also, from where "L" Street becomes Story Mill Road, up to Griffin Drive, a segment of shared use path is recommended on the west side as part of a continuous trail connection from south Bozeman to the M trailhead (Story Hill Rail Trail). The need for this project comes from increased traffic due to growth in the northeast Bozeman area as well as the county area northeast of Bozeman.

Estimated Cost: $2.14M

MSN-32: Interstate 90 Corridor Planning Study

It is recommended that a "pre-NEPA/MEPA Corridor Planning Study" be completed for Interstate 90, between the West Belgrade Interchange and the Bear Canyon Exit, to assess issues, constraints and opportunities regarding operations and access between Belgrade and east of Bozeman before entering the canyon. The purpose of the study is to assess existing and projected interstate operations, determine needs, and analyze the current lane configurations and their ability to serve the community into the future. An assessment of the need and feasibility of a new interchange between the East Belgrade Interchange and the N. 19th Avenue Interchange should also be included as a component of the study.

Estimated Cost: $250K

MSN-33: Harper Puckett Road (Gooch Hill Road to E. Valley Center Road)

Reconstruct Harper Puckett Road, from Gooch Hill Road to E. Valley Center Road, to a five lane urban "minor arterial" standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalk on the west side, a shared use path on the east side, and a raised median. Harper Puckett Road will serve as an important element in Bozeman's future west side street system.

Estimated Cost: $2.50M

MSN-34: Cattail Street (N. 19th Avenue to N. 27th Avenue)

This project consists of constructing Cattail Street from the intersection with N. 19th Avenue west to N. 27th Avenue to a three-lane urban "collector" roadway. A new link should be created with one travel lane in each direction, bike lanes on each side, curb and gutter, boulevard, parking, and sidewalks. This project is necessitated by the future development patterns in the region and will serve east-west traffic flow within the northern portion of the city.

Estimated Cost: $960K

MSN-35: Story Mill Road North / McIlhattan Road (Bridger Canyon Drive to Landfill)

This project consists of reconstructing Story Mill Road North to McIlhattan Road, and McIlhattan Road northwest to the Landfill, to a two-lane urban "collector" road standard. This would include one travel lane in each direction, a shared use path on the west side, and curb and gutter. Sidewalks may not be necessary along the McIlhatten portion of the roadway. The need for this project comes from increased traffic due to growth in the northeast Bozeman area as well as the county northeast of Bozeman.

Estimated Cost: $3.08M

MSN-36: Manley Road (Griffin Drive to Gallatin Park Drive North)

This project consists of reconstructing Manley Road from Griffin Drive north to Gallatin Park Drive North to an urban "collector" road standard. This would include one travel lane in each direction, bike lanes on each side, curb and gutter, and sidewalks. Beginning about 800 feet north of Griffin Drive, parking should also be provided via a widened shoulder on both sides of Manley Road for a distance of approximately 750 feet. The need for this project comes from increased traffic in this part of Bozeman.

Estimated Cost: $1.95M

MSN-37: W. Lincoln Street (N. 19th Avenue to S. 11th Avenue)

This project consists of reconstructing W. Lincoln Street, from S. 11th Avenue to S. 19th Avenue, to a three-lane urban “collector” roadway. This includes one travel lane in each direction, bike lanes on each side, curb and gutter, sidewalk on the south side, a shared use path on the

north side, and a flush or raised median. Traffic signal control at the intersection of S. 19th Avenue and W. Lincoln Street should be included with the project.

Estimated Cost: $1.5M

MSN-38: Oak Street (Flanders Mill to Ryunson Way)

This project consists of reconstructing Oak Street, from Flanders Mill to Ryunson Way, to a five-lane urban principal arterial standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalks and a raised median. (SIF 057).

Estimated Cost: $1.5M

MSN-39: Baxter Ln (Ferguson Ave to Harper Puckett Rd)

This project consists of completing Baxter Lane, from Ferguson Avenue to Cottonwood Road, to a three-lane urban minor arterial standard including sidewalks, parking, medians, boulevards and bike lanes. This also includes a short 600-foot section of shared use path from Flanders Mill Road to the stream corridor to the east.

Estimated Cost: $1.5M

MSN-40: Baxter Lane (N. 19th Avenue to Davis Lane)

This project consists of completing Baxter Lane, from N. 19th Avenue to Davis Lane, to a three-lane "urban" minor arterial standard. This includes one travel lane in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalks and flush/raised medians as warranted.

Estimated Cost: $1.5M

MSN-41: Baxter Ln (N. 7th Avenue to N. 19th Avenue)

This project consists of completing Baxter Lane, from N. 7th Avenue to N. 19th Avenue, to a three-lane urban collector standard including sidewalks on both sides and bike lanes. This also includes a shared use path from N. 11th Avenue to N. 19th Avenue on the south side.

Estimated Cost: $1.5M

MSN-42: Catamount Street (N. 27th Avenue to Valley Center Road)

This project consists of completing Catamount Street, from N. 27th Avenue to Valley Center Road, to a two-lane urban minor arterial standard including bike lanes.

Estimated Cost: $600k

MSN-43: Oak Street (N. 15th Avenue to N. 19th Avenue)

This project consists of completing Oak Street, from N. 15th Avenue to N. 19th Avenue, to a five-lane urban principal arterial standard including addition of 1 lane (5 lanes total), bike lanes and a shared use path on the south side.

Estimated Cost: $765k

MSN-44: N. 27th Ave (Oak St to Tschache Ln)

This project consists of completing N. 27th Avenue, from Oak Street to Tschache Lane, to a five-lane urban collector standard including medians for power poles.

Estimated Cost: $350k

MSN-45: N. 11th Avenue (Oak Street to Baxter Lane)

This project consists of reconstructing N. 11th Avenue from the intersection with Oak Street to the intersection with Baxter Lane. This roadway should be built to a two-lane urban "collector" standard which should include one travel lane in each direction, bike lanes on each

side, curb and gutter, boulevard, parking, sidewalk on the east side, and a shared use path on the west side. This project will serve to create an additional north-south link within the north-central part of the city.

Estimated Cost: $750K

MSN-46: S. 19th Avenue (Kagy Boulevard to Goldenstein Lane)

This project consists of reconstructing S. 19th Avenue from the intersection with Kagy Boulevard south to the intersection with Goldenstein Lane to a five-lane principal arterial standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalks, and turn pockets with raised median as applicable.

Estimated Cost: $9.0M

MSN-47: Durston Road (Cottonwood Road to Ferguson Avenue)

This project consists of reconstructing Durston Road from the intersection with Cottonwood Road to the intersection with Ferguson Avenue to a three-lane minor arterial standard. This includes two travel lanes in each direction, bike lanes on each side, curb and gutter throughout, boulevard, sidewalks, and turn pockets with raised median as applicable.

Estimated Cost: $2.5M

Table 2.3: Summary of Recommended MSN Projects (not in City's 5-Year CIP)

TMP ID	Title	Description	Cost
MSN-1	Kagy Blvd (Willson Ave to Highland Blvd)	Reconstruct Kagy Boulevard, from the intersection of Willson Avenue to Highland Boulevard, to a four-lane urban principal arterial standard. (SIF 129)	$6,000,000
MSN-2	Oak Street (N. 7th Avenue to west edge of Cannery District)	Reconstruct Oak Street, from the intersection of N. 7th Avenue to the west edge of the Cannery District, to a three-lane urban "principal arterial" standard.	$1,950,000
MSN-3	N. 11th Avenue (Durston Road to Oak Street)	Construct N. 11th Avenue, from the intersection with Durston Road to the intersection with Oak Street, to a two-lane urban "collector" standard.	$1,120,000
MSN-4	N. 15th Avenue (Patrick Street to Baxter Lane)	Construct N. 15th Avenue, from the intersection with Patrick Street to the intersection with Baxter Lane, to a three-lane urban "collector" standard.	$705,000
MSN-5	N. 19th Avenue (Interstate 90 to Springhill Road)	Reconstruct N. 19th Avenue, from Interstate 90 to the intersection with Springhill Road, to a 5-lane urban "principal arterial" standard. This project includes widening the I-90 overpass on N. 19th Avenue.	$2,500,000 (road only) // $4,700,000

TMP ID	Title	Description	Cost
			(includes bridge widening)
MSN-6	Springhill Road (Frontage Road to Sypes Canyon Road)	Reconstruct Springhill Road, from the intersection with the Frontage Road to the intersection with Sypes Canyon Road, to a three-lane rural "minor arterial" roadway.	$2,850,000
MSN-7	N. 27th Avenue (Baxter Lane to Valley Center Road)	Construct N. 27th Avenue, from the intersection with Baxter Lane to the intersection with Valley Center Road, to a three-lane urban "collector" standard.	$4,200,000
MSN-8	Kagy Blvd (Willson Ave to S. 19th Ave)	Reconstruct Kagy Boulevard, from the intersection of S. 19th Avenue to Willson Avenue, to a four-lane urban principal arterial standard. (SIF 009)	$8,000,000
MSN-9	Oak Street (N. 27th Avenue to N. 19th Avenue)	Reconstruct Oak Street, from N. 27th Avenue to N. 19th Avenue, to a five-lane urban "principal arterial" standard.	$2,100,000
MSN-10	Cattail Street (Davis Lane to Harper Puckett Road)	Construct Cattail Street, from the intersection with Davis Lane west of its current termini point, to a three-lane urban "collector" roadway. The portion of Cattail Street between Davis Lane and Ferguson Avenue has been constructed but not to a full build-out configuration.	$3,000,000
MSN-11	Davis Lane (Baxter Lane to Valley Center Road)	Reconstruct Davis Lane, from the intersection with Baxter Lane to the intersection with Valley Center Road, to a five-lane urban "minor arterial" standard.	$8,500,000
MSN-12	Cottonwood Road (Oak Street to Cattail Street)	Construct Cottonwood Road, from Oak Street to Cattail Street, to a five lane urban "principal arterial" standard.	$5,000,000
MSN-13	Fowler Avenue Connection (Huffine Lane to Oak Street)	Reconstruct Fowler Avenue, from the intersection with Huffine Lane to the intersection with Oak Street, to a five-lane urban "minor arterial" standard. (SIF 114)	$7,500,000
MSN-14	Durston Road (Gooch Hill Road to Westgate Avenue)	Reconstruct Durston Road, from Gooch Hill Road to Westgate Avenue, to a three-lane urban "minor arterial" standard.	$900,000
MSN-15	Cottonwood Road (Durston Road to Oak Street)	Construct Cottonwood Road, from Durston Road to Oak Street, to a five lane urban "principal arterial" standard. (SIF 105)	$2,500,000
MSN-16	Stucky Road (S. 19th Avenue to Gooch Hill Road)	Reconstruct Stucky Road, from the intersection with S. 19th Avenue west to the intersection with Gooch Hill Road, to a three-lane urban "collector" roadway.	$9,000,000
MSN-17	College Street (S. 11th Avenue to S. 19th Avenue)	Reconstruct College Street, from the intersection of S. 11th Avenue to S. 19th Avenue, to a three-lane urban "minor arterial" standard. The roundabout at College Street and S. 11th Avenue should remain. (SIF 115)	$1,100,000
MSN-18	Oak Street (Cottonwood Road to Flanders Mill)	Reconstruct Oak Street, from Cottonwood Road to Flanders Mill, to a five-lane urban principal arterial standard. (SIF 134)	$1,550,000
MSN-19	W. College Street (S. 8th Avenue to S. 11th Avenue)	Reconstruct College Street, from the intersection of S. 8th Avenue to S. 11th Avenue, to a two-lane urban "minor arterial" standard. The roundabout at College Street and S. 11th Avenue should remain.	$440,000
MSN-20	Mendenhall Street and Babcock Street (Streetscape Improvements)	Complete streetscape improvements along Mendenhall Street and Babcock Street to include curb bulb-outs, landscaping and crossing enhancements.	$2,100,000
MSN-21	S. 3rd Avenue (Graf Street to Kagy Boulevard)	Reconstruct S. 3rd Avenue, from the intersection with Graf Street to the intersection with Kagy Boulevard, to a three-lane urban "collector" roadway.	$2,100,000

TMP ID	Title	Description	Cost
MSN-22	Highland Boulevard (Main Street to Kagy Boulevard)	Reconstruct Highland Boulevard, from the intersection with Main Street to the intersection with Knolls Drive, to a five-lane urban "principal arterial" standard; and from the intersection with Knolls Drive south to the intersection with Kagy Boulevard, to a three-lane urban "principal arterial" standard. (SIF 111)	$10,000,000
MSN-23	Bozeman Trail Road / Haggerty Lane (Main Street to Kagy Boulevard)	Reconstruct Bozeman Trail Road, from the intersection with Kagy Boulevard north to the intersection with Haggerty Lane, to a three-lane urban "minor arterial" roadway.	$5,550,000
MSN-24	Kagy Boulevard (Highland Boulevard to Bozeman Trail Road)	Reconstruct Kagy Boulevard, from the intersection with Highland Boulevard to the intersection with Bozeman Trail Road, to a three-lane urban "principal arterial" standard.	$5,000,000
MSN-25	Kagy Boulevard / Bozeman Trail Road (Bozeman Trail Road to Interstate 90)	Reconstruct Kagy Boulevard, from the intersection with Bozeman Trail Road east to Interstate 90, to a two-lane rural "principal arterial" standard.	$4,350,000
MSN-26	Cottonwood Road (Loyal Drive to Graf Street)	Reconstruct Cottonwood Road, from the intersection of Loyal Drive to Graf Street, to a five-lane urban "principal arterial" standard.	$5,500,000
MSN-27	Graf Street Extension (Ritter Drive to S. 19th Avenue)	Complete Graf Street, from Ritter Drive to S. 19th Avenue, to a two-lane urban collector standard.	$1,035,000
MSN-28	Gooch Hill Road (Huffine Lane to Durston Road)	Reconstruct Gooch Hill Road, from Huffine Lane to Durston Road, to a five lane urban "minor arterial" standard.	$5,000,000
MSN-29	Valley Center Road (Valley Center Spur Road to N. 27th Avenue)	Reconstruct Valley Center Road, from the intersection with Valley Center Spur Road (at underpass) to the intersection with N. 27th Avenue, to a three-lane urban "principal arterial" standard.	$3,510,000
MSN-30	Church Street (Main Street to Kagy Boulevard)	Reconstruct Church Street, from the intersection with Main Street south to the intersection with Kagy Boulevard, to a two-lane urban "collector" standard.	$3,520,000
MSN-31	"L" Street / Story Mill Road (Tamarack Street to Griffin Drive)	Reconstruct "L" Street and Story Mill Road, from the intersection with Tamarack Street to Griffin Drive, to a two-lane urban "collector" standard.	$2,140,000
MSN-32	Interstate 90 Corridor Planning Study	Complete a "pre-NEPA/MEPA Corridor Planning Study" for Interstate 90, between the West Belgrade Interchange and the Bear Canyon Exit, to assess issues, constraints and opportunities regarding operations and access between Belgrade and east of Bozeman before entering the canyon.	$250,000
MSN-33	Harper Puckett Road (Gooch Hill Road to E. Valley Center Road)	Reconstruct Harper Puckett Road, from Gooch Hill Road to E. Valley Center Road, to a five lane urban "minor arterial" standard.	$2,500,000
MSN-34	Cattail Street (N. 19th Avenue to N. 27th Avenue)	Construct Cattail Street, from the intersection with N. 19th Avenue west to N. 27th Avenue, to a three-lane urban "collector" roadway.	$960,000
MSN-35	Story Mill Road North / McIlhattan Road (Bridger Canyon Drive to Landfill)	Reconstruct Story Mill Road north to McIlhattan Road, and McIlhattan Road northwest to the Landfill, to a two-lane urban "collector" road standard.	$3,080,000
MSN-36	Manley Road (Griffin Drive to Gallatin Park Drive North)	Reconstruct Manley Road, from Griffin Drive north to Gallatin Park Drive North, to an urban "collector" road standard.	$1,950,000
MSN-37	W. Lincoln Street (N. 19th Avenue to S. 11th Avenue)	Reconstruct W. Lincoln Street, from S. 11th Avenue to S. 19th Avenue, to a three-lane urban "collector" roadway.	$1,500,000

TMP ID	Title	Description	Cost
MSN-38	Oak Street (Flanders Mill to Ryunson Way)	Reconstruct Oak Street, from Flanders Mill to Ryunson Way, to a five-lane urban principal arterial standard. (SIF 057)	$1,500,000
MSN-39	Baxter Ln (Ferguson Ave to Harper Puckett Rd)	Complete Baxter Lane, from Ferguson Avenue to Cottonwood Road, to a three-lane urban minor arterial standard.	$1,500,000
MSN-40	Baxter Lane (N. 19th Avenue to Davis Lane)	Complete Baxter Lane, from N. 19th Avenue to Davis Lane, to a three-lane "urban" minor arterial standard.	$1,500,000
MSN-41	Baxter Ln (N. 7th Avenue to N. 19th Avenue)	Complete Baxter Lane, from N. 7th Avenue to N. 19th Avenue, to a three-lane urban collector standard.	$1,500,000
MSN-42	Catamount Street (N. 27th Avenue to Valley Center Road)	Complete Catamount Street, from N. 27th Avenue to Valley Center Road, to a two-lane urban minor arterial standard.	$600,000
MSN-43	Oak Street (N. 15th Avenue to N. 19th Avenue)	Complete Oak Street, from N. 15th Avenue to N. 19th Avenue, to a five-lane urban principal arterial standard.	$765,000
MSN-44	N. 27th Ave (Oak St to Tschache Ln)	Complete N. 27th Avenue, from Oak Street to Tschache Lane, to a five-lane urban collector standard including medians for utility poles.	$350,000
MSN-45	N. 11th Avenue (Oak Street to Baxter Lane)	Reconstruct N. 11th Avenue, from the intersection with Oak Street to the intersection with Baxter Lane, to a two-lane urban "collector" standard.	$750,000
MSN-46	S. 19th Avenue (Kagy Boulevard to Goldenstein Lane)	Reconstruct S. 19th Avenue, from the intersection with Kagy Boulevard south to the intersection with Goldenstein Lane, to a five-lane "principal arterial" standard.	$9,000,000
MSN-47	Durston Road (Cottonwood Road to Ferguson Avenue)	Reconstruct Durston Road, from the intersection with Cottonwood Road to the intersection with Ferguson Avenue, to a three-lane urban "minor arterial" standard.	$2,500,000

2.1.4. Future Road Connections

The road network consists of all interstate principal arterial, non-interstate principal arterial, minor arterial, and collector routes. 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 where the future road network needs to be located. The future connections shown are conceptual in nature and may vary based on factors such as topography, wetlands, land ownership, and other unforeseen factors. The purpose of the connections are to illustrate the anticipated network at full build-out. It is likely that many of the corridors shown will not be developed into roads for many decades to come. On the other hand, if development is proposed in a particular area, the recommended road network will ensure that the arterial and collector will be established in a fashion that produces an efficient and logical future road system. **Table 2.4** contains the list of future road connections to complete the network over the foreseeable planning horizon. **Figure 2.1** shows the future road connections as dashed lines.

Table 2.4: Future Road Connections

Road Segment	From	To	Approximate Length (ft)	Possible Cost (assumes various urban sections)
Principal Arterials				
Kagy Boulevard	Cottonwood Road	S. 19th Avenue	9,370	$8,870,000
Oak Street	Twin Lakes Avenue	Laurel Parkway	1,930	$1,830,000
Oak Street	West Termini	Study Area Boundary	4,000	$3,790,000
Harper Puckett Road	Cattail Street	Valley Center Road	7,910	$7,490,000
Johnson Road	Fowler Avenue	Private Approach	4,030	$1,680,000
Minor Arterials				
Fowler Avenue	Garfield Street	Stucky Road	4,000	$3,790,000
Goldenstein Lane	Cottonwood Road	S. 19th Avenue	10,625	$4,430,000
Gooch Hill Road	Durston Road	Harper Puckett Road	13,330	$12,620,000
Catamount Street	Davis Lane	Love Lane	15,900	$9,030,000
Goldenstein Lane	Sourdough Road	Tayebeshockup Road	13,180	$5,490,000
Baxter Lane	Cottonwood Road	Study Area Boundary	8,010	$4,550,000
Durston Road	Gooch Hill Road	Study Area Boundary	2,640	$1,500,000
Collectors				
Ferguson Avenue	Huffine Lane	Johnson Road	21,200	$12,050,000
Blackwood Road	Fowler Avenue	S. 31st Avenue	1,345	$560,000
Blackwood Road	S. 3rd Avenue	Parkway Avenue	5,830	$2,430,000
S. 27th Avenue	Garfield Street	Stucky Road	3,975	$2,260,000
S. 27th Avenue	Stucky Road	Graf Street	2,675	$1,520,000
S. 27th Avenue	Blackwood Road	Patterson Road	5,340	$2,230,000
Garfield Street	Fowler Avenue	Ferguson Avenue	2,815	$1,600,000

Road Segment	From	To	Approximate Length (ft)	Possible Cost (assumes various urban sections)
Ferguson Avenue	Cattail Street	Valley Center Road	7,650	$4,350,000
S. 11th Avenue	Alder Creek	Goldenstein Lane	4,020	$2,280,000
Johnson Road	S. 19th Avenue	Sourdough Road	10,440	$4,350,000
Sir Arthur Drive	Subdivision Access	Johnson Road	2,670	$1,110,000
N/S Connector	Goldenstein Lane	Nash Road	10,630	$4,430,000
Goldenstein Lane	Tayebeshockup Road	Study Area Boundary	13,190	$5,500,000
Fort Ellis Road	Termini	Goldenstein Lane	2,700	$1,130,000
Cattail Street	Cottonwood Road	Study Area Boundary	7,980	$4,530,000
Laurel Parkway	Valley Center Road	Oak Street	13,265	$7,540,000
Babcock Street	Water Lily	Study Area Boundary	6,430	$2,680,000
Laurel Parkway	Durston Road	Huffine Lane	5,325	$3,030,000

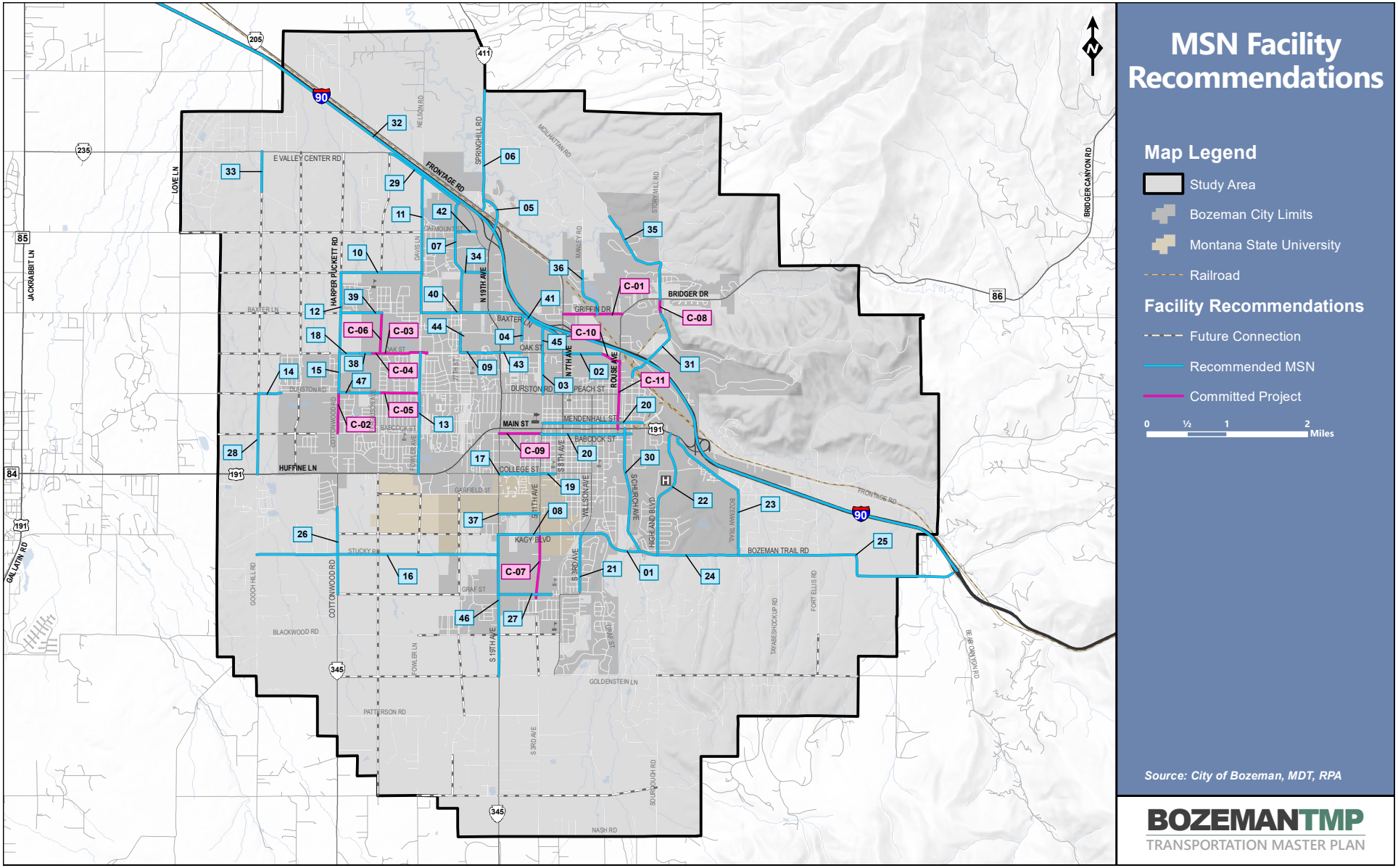


Figure 2.1: Recommended and Committed MSN Projects

3.0. RECOMMENDED TRANSPORTATION SYSTEM MANAGEMENT PROJECTS

Transportation System Management (TSM) projects are "tune-up" type improvements with a reasonable chance of being implemented within a two- to ten-year timeframe. Problem areas which can usually be addressed in the short range 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. Recommended TSM projects are shown in **Figure 3.1** at the end of this section. A summary of TSM projects from the 2007 Update and the status of each project is shown in **Table 3.1** to provide background for the currently proposed TSM projects. Committed TSM projects currently in process for FY 2017 thru FY 2021 are shown in **Table 3.2** and **Figure 3.1**.

3.1.1. TSM Projects from the 2007 Transportation Plan

A list of recommended transportation system management (TSM) projects made as part of the *Greater Bozeman Area Transportation Plan (2007 Update)*, and their status for this TMP, are listed in this section. The 2007 update of the Transportation Plan included 43 recommended TSM projects. Of these projects, 20 were completed, 2 are partially completed, and 21 have not been completed. Of the either partially completed or not completed projects from the previous plan, 15 projects have been included in this update of the plan as recommended projects. The various 43 projects recommended from the previous plan and their resultant status is summarized in **Table 3.1**.

Table 3.1: TSM Projects from 2007 Update & Status for this TMP

Project #	Location	Past Recommendation	Status for TMP
CTSM-1	S. 19th Ave / Koch St	This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device to the intersection of S. 19th Avenue and Koch Street. S. 19th Avenue is currently a 3-lane principal arterial roadway at this location. Koch Street is a two-lane collector roadway east of the intersection and a two-lane local roadway west of the roadway. This intersection currently has stop control along Koch Street. This project will improve traffic flow and safety at this intersection.	**COMPLETED**
CTSM-2	College St / S. 11th Ave	This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device to the intersection of S. 11th Avenue and College Street. Both College Street and S. 11th Avenue are two-lane collector roadways at this location. This intersection is currently a 4-way stop control and backs up at peak hours significantly. Volumes for this intersection area approaching those predicted for 2020, and with increasing development to the immediate west and south of the City, warrants will likely be met in the very near future. This project would improve the traffic flow and safety at this intersection.	**COMPLETED**

Project #	Location	Past Recommendation	Status for TMP
CTSM-3	College St / Willson Ave	This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device to the intersection of College Street and Willson Avenue. College Street is a two-lane collector roadway west of the intersection and a two-lane local roadway east of the roadway. Willson Avenue is a two-lane minor arterial roadway at this location. This intersection currently has stop control along College Street. This project will improve traffic flow and safety at this intersection.	**NOT COMPLETED,** not included herein for further consideration
CTSM-4	S. 11th Ave / Kagy Blvd	This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device to the intersection of S. 11th Avenue and Kagy Boulevard. Kagy Boulevard is a three-lane roadway west of S. 11th Avenue and a 2-lane roadway east of S. 11th Avenue and is classified as a principal arterial. S. 11th Avenue is a 2-lane roadway classified as a collector. This intersection currently has stop control along S. 11th Avenue. Recent development proposals (primarily south of Kagy Boulevard as well as the hospital) and increasing traffic volumes indicate that the need for this signal improvement will soon be warranted. This intersection is a major access point for the MSU campus. This project will improve traffic flow and safety at this intersection.	**COMPLETED**
CTSM-5	N. 27th Ave / Oak St	This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device to the intersection of N. 27th Avenue and Oak Street. Oak Street is a three-lane principal arterial at this location; N. 27th Avenue is a two-lane collector roadway. This intersection currently has stop control along N. 27th Avenue. Recent development proposals and increasing traffic volumes indicate that the need for this signal improvement will soon be warranted. This project will improve traffic flow and safety at this intersection.	**NOT COMPLETED,** modified and included herein as **TSM-2**
CTSM-6	College St / S. 19th Ave	This project consists of constructing additional northbound and southbound thru lanes. It is expected that this project will be completed in conjunction with CMSN-1 which calls for S. 19th Avenue to be upgraded to a five-lane corridor at this location. This intersection is a signalized intersection and has a LOS failure during both AM and PM peak hours. The poor performance of this intersection is a result of the intersection and S. 19th Avenue corridor being undersized to adequately handle the large amounts of traffic that pass through.	**COMPLETED**
TSM-1	N. 7th Ave / Mendenhall St	It is recommended that the intersection of N. 7th Avenue and Mendenhall Street be re-striped to include a designated westbound right-turn lane. This is a signalized three-legged signalized intersection that current analysis shows has a poor LOS along the east approach. A designated right-turn lane on this approach will help improve the traffic flow characteristics of this intersection.	**NOT COMPLETED,** modified and included herein as **TSM-20**
TSM-2	Willson Ave (Olive St to Main St)	It is recommended that parking be removed from the east side of Willson Avenue at the intersection with Olive Street. It is also recommended that two northbound lanes be striped from this intersection to the intersection with Main Street. This intersection experiences stacking problems that cause increased delay and poor LOS.	**PARTIALLY COMPLETED,** not included herein for further consideration
TSM-3	Main St / 11th Ave	It is recommended that the radius on the southwest corner be increased to improve the intersection geometrics. This corner causes maneuvering difficulties for larger vehicles turning right off of Main Street to travel south on 11th Avenue.	**NOT COMPLETED,** not included herein for further consideration

Project #	Location	Past Recommendation	Status for TMP
TSM-4	Rouse Ave / Peach St	This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device when warrants are met to the intersection of Rouse Avenue and Peach Street. The intersection is a skewed four-legged intersection with stop control on Peach Street. This intersection currently has a failing LOS on the eastbound leg during the PM peak hour. It should be noted that the Rouse Avenue Environmental Assessment recommends that a traffic signal be installed at this location.	**NOT COMPLETED,** modified and included herein as **CMSN-11**
TSM-5	Main St / Haggerty Ln	It is recommended that the intersection of Main Street and Haggerty Lane be modified to include a designated northbound right-turn lane, a northbound left-turn lane, and an eastbound right-turn lane. This intersection currently has stop control on Haggerty Lane. A designated westbound left-turn lane exists at this intersection. Current analysis of this intersection shows a LOS failure due to the northbound movement.	**NOT COMPLETED,** modified and included herein as **TSM-22**
TSM-6	College St / S. 23rd Ave / Technology Blvd	It is recommended that left-turn lanes be added to the intersection of College Street and S. 23rd Avenue / Technology Boulevard as necessitated by the growing traffic demand. The intersection is a four-legged intersection with stop control on S. 23rd Avenue / Technology Boulevard. This intersection frequently has delay problems during peak traffic periods due to the inability of vehicles to make left-hand turns, particularly southbound left-turns. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met.	**COMPLETED**
TSM-7	Willson Ave / Garfield St	It is recommended that left-turn lanes be added to the intersection of Wilson Avenue and Garfield Street as necessitated by the growing traffic demand. The intersection is a four-legged intersection with stop control on Garfield Street. This intersection frequently has delay problems during peak traffic periods due to the inability of vehicles to make left-hand turns. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met.	**NOT COMPLETED,** not included herein for further consideration
TSM-8	Kagy Blvd / Sourdough Rd / Church St	This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device when warrants are met to the intersection of Kagy Boulevard and Sourdough Road / Church Street. This intersection currently has stop control on Sourdough Road and Church Street. Current LOS analysis shows that this intersection fails during AM and PM peak hours due to excessive delay along the northbound and southbound approaches.	**NOT COMPLETED,** modified and included herein as **TSM-25**
TSM-9	Highland Blvd / Kagy Blvd	This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device when warrants are met to the intersection of Highland Boulevard and Kagy Boulevard. Highland Boulevard is currently a two-lane minor arterial roadway and Kagy Boulevard is a two-lane principal arterial. This intersection currently has stop control along Highland Boulevard. A modern roundabout will help to improve traffic flow and safety at this intersection.	**NOT COMPLETED,** modified and included herein as **TSM-24**
TSM-10	Oak St / Ferguson Ave	It is recommended that left-turn lanes be added to the intersection of Oak Street and Ferguson Avenue as necessitated by the growing traffic demand. The intersection will become a four-legged intersection with stop control on Ferguson Avenue. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met. This project is expected to serve future need in the area.	**NOT COMPLETED,** modified and included herein as **CTSM-4**

Project #	Location	Past Recommendation	Status for TMP
TSM-11	Oak St / Cottonwood Rd	It is recommended that left-turn lanes be added to the intersection of Oak Street and Cottonwood Road as necessitated by the growing traffic demand. The intersection will become a four-legged intersection with stop control on Cottonwood Road. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met. This project is expected to serve future need in the area and should be completed in conjunction with MSN-6 and MSN-10.	**NOT COMPLETED,** modified and included herein as **TSM-4**
TSM-12	Baxter Ln / Cottonwood Rd / Harper Puckett Rd	It is recommended that left-turn lanes be added to the intersection of Baxter Lane and Cottonwood Road / Harper Puckett Road as necessitated by the growing traffic demand. The intersection will become a four-legged intersection with stop control on Cottonwood Road / Harper Puckett Road. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met.	**NOT COMPLETED,** modified and included herein as **TSM-3**
TSM-13	Durston Road / N. 27th Ave	It is recommended that left-turn lanes be added to the intersection of Durston Road and N. 27th Avenue as necessitated by the growing traffic demand. The intersection is a three-legged intersection with stop control on N. 27th Avenue. Durston Road is a minor arterial roadway and N. 27th Avenue is a collector roadway. This intersection experiences delay problems associated with the difficulty of vehicles being able to make left-turns during peak hours. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met.	**PARTIALLY COMPLETED,** modified and included herein as **TSM-12**
TSM-14	Hulbert Rd / Jackrabbit Ln	It is recommended that left-turn lanes be added to the intersection of Hulbert Road and Jackrabbit Lane as necessitated by the growing traffic demand. The intersection is a four-legged intersection with stop control on Hulbert Road. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met.	**COMPLETED**
TSM-15	Nelson Rd / Frontage Rd	It is recommended that a left-turn lane be added to Nelson Road at the intersection with the Frontage Road as necessitated by the growing traffic demand. The intersection is a three-legged intersection with stop control on Nelson Road. The Frontage Road is a minor arterial roadway and Nelson Road is classified as a collector. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met.	**COMPLETED**
TSM-16	Sacajawea Peak / Frontage Rd	It is recommended that left-turn lanes be added to the intersection of Sacajawea Peak and Frontage Road as necessitated by the growing traffic demand. The intersection is a three-legged intersection with stop control on Sacajawea Peak. The Frontage Road is a minor arterial roadway and Sacajawea Peak is classified as a local. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met.	**NOT COMPLETED,** modified and included herein as **CTSM-8**
TSM-17	Gallatin Field / Frontage Rd	It is recommended that a traffic signal, roundabout, or other adequate traffic control device be installed at the intersection of Gallatin Field and Frontage Road when warrants are met. This is a three-legged intersection with stop control on Gallatin Field. There currently are designated left-turn lanes on each approach leg of this intersection.	**COMPLETED**
TSM-18	College St / S. 8th Ave	It is recommended that a traffic signal, roundabout, or other adequate traffic control device be installed at this intersection when warrants are met. This intersection is currently four-way stop controlled and analysis shows a failing level of service due to excessive delay at the intersection.	**NOT COMPLETED,** not included herein for further consideration

Project #	Location	Past Recommendation	Status for TMP
TSM-19	West Babcock St / Main St	It is recommended that the intersection signal timing/phasing be reconfigured to provide a dedicated left-turn phase along the Babcock leg. This intersection currently has a failing LOS due to the eastbound and westbound movements. If the LOS does not improve to an acceptable level by changing the signal timing/phasing, then this intersection should be reevaluated to determine other possible traffic control measures.	**NOT COMPLETED,** not included herein for further consideration
TSM-20	Highland Blvd / Ellis St	This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device when warrants are met to the intersection of Highland Boulevard and Ellis Street. Highland Boulevard is currently a two-lane minor arterial roadway and Ellis Street is a two-lane local roadway. This intersection currently has stop control along Ellis Street.	**NOT COMPLETED,** modified and included herein as **TSM-23**
TSM-21	Kagy Blvd / Willson Ave	The existing intersection should be modified to add a designated southbound right-turn lane. This intersection currently operates at a LOS of D or lower during the AM and PM peak hours. If conditions do not improve at this intersection, it should be reevaluated to determine other potential traffic control solutions.	**NOT COMPLETED,** modified and included herein as **MSN-8**
TSM-22	Durston Rd / N. 25th Ave	It is recommended that left-turn lanes be added to the intersection of Durston Road and N. 25th Avenue as necessitated by the growing traffic demand. The intersection is a four-legged intersection with stop control on N. 25th Avenue. Durston Road is a minor arterial roadway and N. 25th Avenue is a local roadway. This intersection experiences delay problems associated with the difficulty of vehicles being able to make left-turns during peak hours. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met. This intersection serves as a major access to Emily Dickinson School and as such, there are increases in traffic volumes and pedestrian traffic at this location.	**COMPLETED**
TSM-23	Babcock St / S. 11th Ave	It is recommended that crosswalks be painted on all legs of the intersection of Babcock Street and S. 11th Avenue. This intersection is a block south of Bozeman High School and experiences high pedestrian traffic. This is a four-legged intersection with stop control on Babcock Street.	**NOT COMPLETED,** modified and included herein as **CMSN-9**
TSM-24	Highway 191 Speed Zone Study	It is recommended that a speed zone study be completed to determine if the 50 mph speed zone can be extended north to Axtell Anceney Road and south to Cottonwood Road along Highway 191. It is also recommended that signage be installed at both ends of the speed zone to indicate "congested area next 2 miles" or "dangerous intersection ahead". Also, determine if the speed differential can be eliminated between cars and trucks along the remainder of Highway 191 by posting a day speed of 65 mph and night speed of 60 mph.	**COMPLETED**
TSM-25	Highway 191 / Mill St	It is recommended that a traffic signal with a pre-emptive traffic device be installed at the intersection of Mill Street and Highway 191 to allow the Gallatin Gateway Fire Department safer and speedier access to the highway. The west side of this intersection serves an elementary school, fire station, the Gallatin Gateway Community Center, and businesses and homes in town, as well as the Gallatin River and a network of rural roads. To the east, it serves the Post Office, and businesses and residences. Although the intersection is currently at a LOS C for the A.M. and P.M. peak hours, expected future growth could diminish the LOS to a failing grade.	**NOT COMPLETED,** not included herein for further consideration (outside of study area)

Project #	Location	Past Recommendation	Status for TMP
TSM-26	Highway 191 / Axtell Anceney Rd	It is recommended that designated turn lanes complete with appropriate length turn bays be installed at the intersection of Highway 191 and Axtell Anceney Road as necessitated by the growing traffic demand. This is a three-legged intersection with stop control on Axtell Anceney Road. Designated turn lanes will help increase the safety level and traffic flow at the intersection.	**COMPLETED**
TSM-27	Highway 191 / Zachariah Ln	It is recommended that designated turn lanes complete with appropriate length turn bays be installed at the intersection of Highway 191 and Zachariah Lane as necessitated by the growing traffic demand. This is a four-legged intersection with stop control on Zachariah Lane. Designated turn lanes will help increase the safety level and traffic flow at the intersection.	**COMPLETED**
TSM-28	Highway 191 / Cottonwood Rd	It is recommended that designated turn lanes complete with appropriate length turn bays be installed at the intersection of Highway 191 and Cottonwood Road as necessitated by the growing traffic demand. This is a four-legged intersection with stop control on Cottonwood Road. Designated turn lanes will help increase the safety level and traffic flow at the intersection.	**COMPLETED**
TSM-29	Access Management Plan on Highway 191	Eliminate excessive curb cuts and access points on Highway 191 by restricting access as much as possible to major intersections with turn lanes. Require developers to provide frontage road access via intersections with turn lanes instead of multiple curb cuts. It is further recommended that a formal access control study be undertaken in hopes of preparing an access control management plan for this corridor.	**COMPLETED**
TSM-30	Highway 191 / Huffine Ln	It is recommended that a pre-emptive traffic device be installed at the intersection. A pre-emptive traffic device would allow for safer and speedier access for the Gallatin Gateway Fire Department.	**COMPLETED**
TSM-31	S. 7th Ave / Kagy Blvd	This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device to the intersection of S. 7th Avenue and Kagy Boulevard. S. 7th Avenue is a two-lane collector roadway north of the intersection and a two-lane local roadway south of the intersection. Kagy Boulevard is a two-lane principal arterial roadway at the intersection. This intersection currently has stop control along S. 7th Avenue. Recent development proposals and increasing traffic volumes indicate that the need for this signal improvement will soon be warranted. This intersection is a major access point for the MSU campus. This project will improve traffic flow and safety at this intersection.	**NOT COMPLETED,** modified and included herein as **CTSM-14**
TSM-32	Truck Route Alternatives	Study possible routes that would allow commercial trucks to by-pass Mill Street when accessing Highway 191. Possible routes include Gateway South, Axtell Gateway, and /or Axtell Anceney.	**NOT COMPLETED,** not included herein for further consideration (outside of study area)
TSM-33	Mill St Speed Zone Study	Conduct a Speed Zone study to determine if the 25 mph speed zone can be extended to the west at the intersection with Cottonwood Road, Axtell Gateway Road, and Gateway South Road. Also, determine if Gateway South Road from the intersection with Mill Road should be a 35 mph speed zone for 3 miles.	**COMPLETED**
TSM-34	Implement Huffine Ln Access Control Plan	The MDT has an adopted Access Control Plan in place for Huffine Lane that delineates allowed access spacing, frontage road locations, and future signalization of intersections. As improvements and/or developments are considered along this corridor, reference should be made to the Access Control Plan for allowable traffic mitigation improvements.	**COMPLETED**

Project #	Location	Past Recommendation	Status for TMP
TSM-35	Implement Jackrabbit Ln Access Control Plan		COMPLETED
TSM-36	Development Review/Coordination Efforts	It is desirable to have a formal mechanism by which Streamline board and staff can participate in the development revise process. This will allow for continued coordination of proper bus stop location and identification of appropriate bus bay design and locations. The goal is to be able to participate in the formal review such that knowledge is disseminated to all affected parties pertinent to transit growth opportunities (routes, destinations, etc.) and how those opportunities interface with private development infrastructure.	COMPLETED
TSM-37	Formalize Transit Representation on TCC	It is recommended that a member of Streamline (board or staff) have a formal, allocated seat on the Bozeman Transportation Coordinating Committee (TCC).	COMPLETED

3.1.2. Committed TSM Projects

As described for the MSN projects, committed projects are typically only listed if the project will affect capacity and/or delay characteristics of a roadway facility and/or intersection. This distinction is necessary since some committed improvement projects, likely to occur within the next five years (i.e. fiscal year 2018 through fiscal year 2022), are not necessarily listed since they will not have an effect on the traffic model. For completeness, though, all committed TSM improvement projects are listed in this section. Committed TSM projects are shown in **Table 3.2**.

Table 3.2: Committed TSM Projects (FY 2018 to FY 2022)

TMP ID	Title	Description	Cost	YOE	Project ID	Source
CTSM-1	Manley Rd and Griffin Dr	Improvements to the intersection to include installation of a traffic signal, roundabout or other adequate traffic control device when warrants are met.	$2,000,000	FY19	SIF110	City
CTSM-2	Ferguson Ave and Durston Rd	Control of the intersection of Ferguson Avenue & Durston Road. Includes the installation of a traffic signal or roundabout. Future development and the resulting increased traffic indicate that intersection improvements will be needed.	$2,256,220	FY18	SIF039	City
CTSM-3	Oak St and Davis Lane	Installation of a roundabout at the intersection of Oak Street & Davis Lane. Peak hour level of service for northbound traffic is degrading due to lack of north-south connectivity in the network. Geometric deficiencies will be addressed.	$1,761,508	FY18	SIF074	City

TMP ID	Title	Description	Cost	YOE	Project ID	Source
CTSM-4	Oak St and Ferguson Ave	Includes installation of a traffic signal, roundabout or other adequate traffic control device when warrants are met.	$1,345,331	FY18	SIF061	City
CTSM-5	S. 3rd Ave and Graf St	Control of the intersection of S. 3rd Avenue & Graf Street. Includes the installation of a traffic signal or roundabout. Future development and the resulting increased traffic indicate that intersection improvements will be needed.	$1,000,000	FY19	SIF108	City
CTSM-6	Cottonwood Rd and Babcock St	Installation of a traffic signal when warrants are met.	$1,435,336	FY18	SIF104	City
CTSM-7	N. 19th Ave Interchange	Signal on I-90 eastbound (EB) off-ramp.	$1,494,900	FY19	UPN8999	MDT
CTSM-8	SF 129 - Slope Flattening Belgrade	Slope flattening from reference post (RP) 22.5-24.3 on Primary 205 (Frontage Road).	$3,716,816	FY18	UPN8031	MDT
CTSM-9	Bozeman Signal Safety	Upgrade signals in 4 systems (Main Street, West Main St., Bozeman Radio System, & isolated intersections) and signals along Huffine Lane, and Jackrabbit Lane (Baxter Lane & Durston Road) - flashing yellow arrows. Adding a protective left turn phase signal at signal of Ferguson Avenue and Huffine Lane.	$1,635,776	FY17	UPN8642	MDT
CTSM-10	Cottonwood Rd & Stucky Rd	Roundabout installation at the intersection of Cottonwood Road and Stucky Road.	$3,158,260	FY18	UPN8190	MDT
CTSM-11	Highland Blvd and Main St	Improve intersection control at Highland Boulevard and Main Street by adding additional phases and improving geometry to increase capacity for deficient movements.	$150,000	FY18	SIF112	City
CTSM-12	Baxter Lane and Davis Street	Improve intersection to include signalization and geometric improvements.	$2,500,000	FY20	SIF121	City
CTSM-13	Babcock St and Ferguson Ave	Improve intersection to include geometric improvements with installation of a traffic signal.	$800,000	FY18	SIF122	City
CTSM-14	Kagy Blvd (S. 19th Ave to Willson Ave) – Interim Improvements	Improve Kagy Boulevard from approximately 500 feet west of S. 11th Avenue to approximately 500 feet east of S. 7th Avenue to a full three-lane cross section with two-way left-turn lane (TWLTL) and associated improvements.	$500,000	FY18	SIF130	City

3.1.3. Recommended TSM Projects

A number of TSM projects have been identified and are described in this section and shown on **Figure 3.1**. **Table 3.3** contains a summary of the recommended TSM projects that are not identified for funding in the next five years as per the 5-Year CIP. The project numbering scheme does not represent or imply priority with respect to individual projects. 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. It is likely that some of them will become funded at some point during the twenty-five year planning horizon even though no current source is known. For planning level cost estimates, representative costs were utilized from recent roadway cost estimates from the *Oak Street Improvements* project and the *Cottonwood/Durston Road Improvements* project. Furthermore, for some projects the City of Bozeman's most current *Street Impact Fee Fund CIP (FY 18-22)* and *Arterial and Collector District CIP (FY 18-22)* was utilized. Planning level cost estimates include construction, design, construction administration, utilities and contingencies. The Basis of Planning cost estimates for the TSM projects, absent other defined sources, are as follows:

- $2.35M (traffic signal – large)
- $1.15M (traffic signal – small to medium)
- $750K (traffic signal – modifications to existing)
- $2.85M (roundabout – large)
- $2.00M (roundabout – small)

An item to note is that many of the TSM recommendations identified in this section call for the separation of turning movements at intersections by installing left-turn, thru- or right-turn lanes (bays). There are some instances where a recommendation may suggest a "combination thru- / right- turn lane". These recommendations may be for projects that are already in the design phase and which have approved corridor concept plans already in place (Oak Street, Baxter Lane, Cottonwood Road), or are in very constrained locations where the thru-lane and right-turn lane just can't be separated at the intersection. Separating the thru-movement and the right-turn movement by a designated right-turn lane is almost always more desirable; this is especially true for bicyclists.

Many of the TSM projects include recommendations for traffic signals or roundabouts. It is worthy of mention that both types of intersection control treatments have different initial set-up and long-term maintenance costs. The costs for building a roundabout and a traffic signal are quite different. Generally, initial capital costs are less for a traffic signal compared to a roundabout. Part of the reason is that a roundabout may need more property within the actual intersection. In the long-term, however, roundabouts eliminate hardware, maintenance and electrical costs associated with traffic signals, which can cost between $5,000 and $10,000 per year. Roundabouts are also

more effective during power outages. Unlike traditional signalized intersections, which must be treated as a four-way stop or require police to direct traffic, roundabouts continue to work like normal.

TSM-1: Durston Road and Laurel Parkway

It is recommended that geometric improvements be made to the intersection with traffic signalization control. The intersection should include dedicated left-turn bays and shared through/right turn lanes for all four legs of the intersection. Signal warrants would need to be met prior to installation of a traffic signal. On-street bicycle lanes will be marked on all four legs of the intersection.

Estimated Cost: $1.15M

TSM-2: N. 27th Avenue and Oak Street

It is recommended that geometric improvements be made to the intersection with includes installation of a traffic signal, roundabout or other adequate traffic control device when warrants are met. (SIF 058)

Estimated Cost: $650k

TSM-3: Baxter Lane and Cottonwood Road

It is recommended that geometric improvements be made to the intersection with includes installation of a traffic signal, roundabout or other adequate traffic control device when warrants are met. (SIF 086)

Estimated Cost: $2.5M

TSM-4: Oak Street and Cottonwood Road

It is recommended that geometric improvements be made to the intersection with includes installation of a traffic signal, roundabout or other adequate traffic control device when warrants are met. (SIF 098)

Estimated Cost: $2.75M

TSM-5: Durston Road and Flanders Mill Road

It is recommended that geometric improvements be made to the intersection with installation of a single-lane roundabout. This is a three-legged intersection and Durston Road will be reconstructed to a three-lane roadway in the future. It is unlikely that Flanders Mill Road will be extended to the south. On-street bicycle lanes will be marked on all three legs of the intersection. School zone context should be considered.

Estimated Cost: $2.0M

TSM-6: Bridger Drive and Story Mill Road

It is recommended that geometric improvements be made to the intersection with includes installation of a traffic signal, roundabout or other adequate traffic control device when warrants are met. (SIF 116)

Estimated Cost: $1.0M

TSM-7: Fowler Avenue and Babcock Street

It is recommended that geometric improvements be made to the intersection with installation of a traffic signal when warrants are met. The future vision for Fowler Avenue is a five-lane minor arterial with amenities as described under project **MSN-13**. As the full reconstruct will take time to develop due to right-of-way needs and other constraints, a stand-alone intersection project may be warranted to provide improved operations at the intersection for the northbound left-turn movement. An interim traffic signal project should include designated northbound left-turn and right turn bays on the south leg. Trail crossing amenities should be provided. (SIF 063)

Estimated Cost: $2.0M

TSM-8: Construction of ADA Compliant Roadway Crossing Improvements

This project includes the construction of ADA compliant pedestrian roadway crossing improvements at three locations: (1) Fowler Avenue and Babcock Street, (2) Oak Street and Hunters Way, and (3) Durston Road Trail Crossing between Hunters Way and N. 27th Ave. ADA crossing improvements may include widened sidewalks, curb ramps, refuge islands, rectangular rapid flashing beacons and crosswalk markings.

Estimated Cost: $167K

TSM-9: Fowler Avenue and Durston Road

The intersection of Fowler Avenue and Durston Road is currently a three-legged intersection with stop control along Fowler Avenue. Future plans to complete Fowler Avenue from Oak Street to Babcock Street call for the intersection to be four-legged with a five-lane typical section on Fowler Avenue. It is recommended to construct a four legged intersection with traffic signal control. The typical section of Fowler Avenue is planned to be five lanes. Durston Road will be constructed to a three-lane typical section. Signal warrants would need to be met prior to installation of a traffic signal. (SIF 073)

Estimated Cost: $2.0M

TSM-10: Davis Lane and Cattail Street

This project includes geometric improvements to the intersection with a single-lane roundabout or traffic signal when warrants are met. The future vision for Davis Lane is a five-lane minor arterial with amenities as described under project **MSN-11**. For Cattail Street, a westerly extension as a three-lane collector roadway is envisioned as described under **MSN-10**. As both of these major projects will take time to develop due to right-of-way needs and funding constraints, a stand-alone intersection project may be warranted to provide improved operations at the intersection as development occurs in the surrounding area.

Estimated Cost: $2.0M

TSM-11: Davis Lane and Catamount Street

This project includes geometric improvements to the intersection with a single-lane roundabout or traffic signal when warrants are met. The future vision for Davis Lane is a five-lane minor arterial with amenities as described under project **MSN-11**. Although a specific project is not identified for the westerly extension of Catamount Street, it has been planned for a future minor arterial out to Love Lane. As development occurs in the surrounding area, a stand-alone intersection improvement project may be needed at the intersection in the form of a single-lane roundabout or traffic signal (when warrants are met).

Estimated Cost: $2.0M

TSM-12: Durston Road and N. 27th Avenue

It is recommended that left-turn lanes be added to the intersection of Durston Road and N. 27th Avenue as necessitated by the growing traffic demand. The intersection is a three-legged intersection with stop control on N. 27th Avenue. Durston Road is a minor arterial roadway and N. 27th Avenue is a collector roadway. This intersection experiences delay problems associated with the difficulty of vehicles being able to make left-turns during peak hours. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met.

Estimated Cost: $1.15M

TSM-13: N. 27th Avenue and Tschache Lane

This project includes geometric improvements to the intersection with traffic signalization when warrants are met. The future vision for N. 27th Avenue is a five-lane urban collector, with medians for the power poles, south of Tschache Lane to Oak Street as described in **MSN-44**. Ideally the intersection improvement will be constructed with the roadway improvements, however constraints with funding and right-of-way may necessitate an interim intersection project. Due to the varying existing and future cross sections on each of the roadways, a traffic signal will likely be the better choice for intersection control compared to a roundabout.

Estimated Cost: $2.0M

TSM-14: Davis Lane and Valley Center Road

This intersection will become fairly well used as development pressure continues west of N. 19th Avenue and south of Valley Center Road. Future recommendations suggest Davis Lane be built to a five-lane urban minor arterial standard (see **MSN-11**) and Valley Center Road be developed to a three-lane urban principal arterial standard (see **MSN-29**). Both of these projects will take years to develop. In the short term, a traffic signal should be included at the intersection when warrants are met, with geometric improvements. Potential lane configuration include northbound left and right-turn bays, a westbound left-turn bay, and an eastbound right-turn lane.

Estimated Cost: $2.0M

TSM-15: N. 27th Avenue and Valley Center Road

This intersection will become fairly well used as development pressure continues west of N. 19th Avenue and south of Valley Center Road. Future recommendations suggest N. 27th Avenue be built to a three-lane urban collector standard (see **MSN-7**) and Valley Center Road west of N. 27th Avenue be developed to a three-lane urban principal arterial standard (see **MSN-29**). Both of these projects will take years to develop. In the short term, a traffic signal should be included at the intersection when warrants are met, with geometric improvements. Potential lane configuration modifications include the addition of an eastbound right-turn lane.

Estimated Cost: $2.0M

TSM-16: Oak Street and N. 19th Avenue

The intersection of Oak Street and N. 19th Avenue will be modified to add additional lanes on the west approach of Oak Street, coupled with traffic signal modification. Currently, the west leg of Oak Street realizes a designated left turn bay and a combination thru / right turn lane. This recommendation includes keeping the designated left-turn bay as-is, but adding two thru lanes and a designated right-turn lane to the west approach to the intersection (i.e. the west leg of Oak Street). On-street bicycle lanes will be added to the newly apportioned leg of the intersection, and some adjustment to traffic signal mast arms and other hardware will be required. Consideration should also be given to **TSM-29**, which recommends making the Stoneridge Drive approaches "right-in, right-out" movements.

Estimated Cost: $530K

TSM-17: Oak Street and N. 11th Avenue

The intersection of Oak Street and N. 11th Avenue is currently a four-legged unsignalized intersection with stop control and a slight offset on N. 11th Avenue. Oak Street exhibits a five-lane typical section, and N. 11th Avenue will realize left turn bays and a combination thru / right turn lane on both approaches. On-street bicycle lanes will be marked on the Oak Street approaches. It is recommended to install traffic signal control at the intersection when signal warrants are met.

Estimated Cost: $1.15M

TSM-18: N. 7th Avenue and Griffin Drive

The intersection of N. 7th Avenue and Griffin Drive should be modified to add additional designated turning lanes on all approaches, and to provide revised traffic signalization. The Griffin Drive westbound and eastbound approaches should have designated left-turn bays, and combination thru / right-turn lanes. On N. 7th Avenue, designated left-turn bays should be provided in both directions. There should be a designated thru lane and combination thru / right-turn lanes in each direction on N. 7th Avenue. This intersection improvement will complement long term improvements recommended for Griffin Drive described under **CMSN-1**.

Estimated Cost: $2.35M

TSM-19: Oak Street and N. 7th Avenue

The intersection of Oak Street and N. 7th Avenue will be modified to add additional lanes on the east approach of Oak Street, coupled with traffic signal modification. Currently, the east leg of Oak Street realizes a designated left turn bay and a combination thru / right turn lane. This recommendation includes keeping the designated left-turn bay as-is, but adding two thru lanes and a designated right-turn lane to the east approach to the intersection (i.e. the east leg of Oak Street). On-street bicycle lanes will be added to the newly apportioned leg of the intersection, and some adjustment to traffic signal mast arms and other hardware will be required.

Estimated Cost: $750K

TSM-20: N. 7th Avenue and Mendenhall Street

It is recommended that the intersection of N. 7th Avenue and Mendenhall Street be revised on the northeast quadrant to provide a short right-turn bay for westbound to northbound turning vehicles. This is a heavy movement and the provision of a short right-turn bay at this location would reduce intersection delay on this leg and improve operations. The northeast corner of the intersection would need to be pulled back in the adjacent parking lot, resulting in the loss of potentially two to three private parking spaces.

Estimated Cost: $120K

TSM-21: Babcock Street and Willson Avenue

The traffic signal hardware at the intersection of Babcock Street and Willson Avenue is an older style in terms of light poles, mast arms and foundations. Upgrading the traffic signal system at this intersection will allow the poles to be relocated out of the sidewalks/pedestrian ramps, and improvements to the intersection corners can be made through geometric updates to provide better crosswalk alignment.

Estimated Cost: $750K

TSM-22: Main Street and Haggerty Lane

This project includes modifying the intersection of Main Street and Haggerty Lane to include a designated northbound right turn lane, a northbound left turn lane, and an eastbound right turn lane. This intersection currently has stop control on Haggerty Lane. A designated westbound left turn lane exists at this intersection. Also install traffic signalization control when warrants are met.

Estimated Cost: $1.15M

TSM-23: Highland Boulevard and Ellis Street

This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device when warrants are met to the intersection of Highland Boulevard and Ellis Street. Highland Boulevard is currently a two-lane minor arterial roadway and Ellis Street is a two-lane local roadway. This intersection currently has stop control along Ellis Street. Future recommended improvements for Highland Boulevard (see **MSN-22**) include a five-lane roadway section north of Ellis Street and a three-lane roadway section south of Ellis Street. Traffic signalization could only occur if signal warrants are met. A roundabout could be utilized without warrants being met, and roundabout "right turn slip lanes" could be utilized for the southbound movement of Highland Boulevard (lane drop) and the westbound movement of Ellis Street (lane pick-up).

Estimated Cost: $2.0M

TSM-24: Highland Boulevard and Kagy Boulevard

This project includes the installation of a traffic signal, roundabout, or other adequate traffic control device when warrants are met to the intersection of Highland Boulevard and Kagy Boulevard. Highland Boulevard is currently a two-lane minor arterial roadway and Kagy

Boulevard is a two-lane principal arterial. This intersection currently has stop control along Highland Boulevard. A modern roundabout will help to improve traffic flow and safety at this intersection. Future vision for both Highland Boulevard and Kagy Boulevard at this location includes a three-lane roadway section (see **MSN-22** and **MSN-24**). Traffic signalization could only be realized if signal warrants are met.

Estimated Cost: $2.85M

TSM-25: Kagy Boulevard and S. Church Avenue / Sourdough Road

This project includes three options to improve safety and reduce delay at the intersection of Kagy Boulevard and S. Church Avenue / Sourdough Road, as follows:

- **Option 1:** Installation of a roundabout or traffic signal when warrants are met. This option would be a major project due to chasing the grades both east and west of the intersection on Kagy Boulevard. Recommended project **MSN-1** includes a complete reconstruction of Kagy Boulevard, between Willson Avenue and Highland Boulevard. A stand-alone intersection project in this area could be developed, but due to the grade issues and other constraints it is still a robust effort which requires a fair amount of road work on Kagy Boulevard.
- **Option 2:** Narrowing (i.e. necking) down Kagy Boulevard just east and west of the intersection for about 200 feet to reduce the distance that vehicles, pedestrians and bicyclists must cross. This intersection currently has stop control on Sourdough Road and S. Church Avenue.
- **Option 3:** Restrict turning movements at the intersection such that the north-south movements could only make right-in and right-out turns. This would be accomplished by placing a raised median on Kagy Boulevard in an east – west direction to effectively block off left-turns and through movements from the north and south legs of the approach.

Estimated Cost: $2.85M (Roundabout or Signal) // $280K (Narrow Kagy Boulevard) // $100K (Raised Median on Kagy Blvd)

TSM-26: Huffine Lane and Ferguson Avenue

This intersection should continue to be evaluated for eastbound and westbound left-turn phasing on Huffine Lane. Designated left-turn phases were not recommended nor warranted during MDT's most recent signal upgrade project on Huffine Lane. There is quite a lot of development occurring in the northwest part of Bozeman, and left-turn phasing warrants should be re-evaluated to identify whether designated left-turn phases are beneficial.

Estimated Cost: $150K

TSM-27: Huffine Lane and Fowler Avenue

This intersection should continue to be evaluated for eastbound and westbound left-turn phasing on Huffine Lane. Designated left-turn phases were not recommended nor warranted during MDT's most recent signal upgrade project on Huffine Lane. There is quite a lot of development occurring in the northwest part of Bozeman, and left-turn phasing warrants should be re-evaluated to identify whether designated left-turn phases are beneficial. The roadway grades and minimal offsets for left turning traffic on Fowler Avenue make vehicles very difficult to see when making northbound lefts.

Estimated Cost: $150K

TSM-28: Flanders Mill Road and Oak Street

Flanders Mill Road is routinely being used as a north-south cut through to avoid congestion on both Cottonwood Road and Ferguson Avenue. Installation of a traffic diverter to limit cut through traffic is desirable in the form of a chicane or other calming feature near the intersection of Oak Street. Flanders Mill Road is a local street on Bozeman's functional classification system.

Estimated Cost: $30K

TSM-29: Oak Street and Stoneridge Drive

Stoneridge Drive is a local road that accesses a residential neighborhood south of Oak Street and a retail/commercial development north of Oak Street. There are numerous left-turn conflicts on the Stoneridge approaches that make traffic flow congested due to the close proximity to N. 19th Avenue. It is recommended that the Stoneridge approaches on both sides of Oak Street be made three-quarter movement approaches such "left-out" turning movements are prohibited.

Estimated Cost: $70K

TSM-30: Durston Road and N. 19th Avenue

The east leg of this intersection (Durston Road) exhibits poor level of service and severe queuing issues during all peak hours. It is recommended to revise the east leg by providing a longer westbound right-turn bay for westbound-to-northbound turning vehicles. Ideally, a longer westbound left-turn bay would also be installed, however to do so in this location would block northbound left-turning

movements from N. 18th Avenue. A longer right-turn bay on the east leg of Durston Road will improve storage and operations for this heavy movement onto N. 19th Avenue.

Estimated Cost: $750K

TSM-31: Durston Road and N. 15th Avenue

This intersection is currently signalized and realizes long vehicle queues during peak hours due to its proximity to the schools and athletic fields. Extending left-turn bays into the center two-way, left-turn lanes (TWLTL) will necessitate removal of parking and blockage of many private drive approaches along each approach. It is recommended that long term a single-lane roundabout be considered for this intersection to better meter flows. All four legs of the intersection receive approximately equal traffic, and its proximity to the schools warrants long term improvements to the intersection.

Estimated Cost: $2.0M

TSM-32: Beall Street and N. 15th Avenue

Similar to **TSM-31**, this intersection realizes long vehicle queues and substantial pedestrian conflict during peak hours due to its proximity to the schools and athletic fields. It is recommended that a traffic signal or single-lane roundabout be installed at this location when warrants are met (i.e. for traffic signalization).

Estimated Cost: $1.15M (Traffic Signal) // $2.0M (Roundabout)

TSM-33: Willson Avenue and Peach Street

This intersection was very heavily commented on during public outreach associated with the TMP. Willson Avenue essentially acts as a "bypass" to downtown for those wanting to avoid Rouse Avenue or N. 7th Avenue. The intersection exhibits a crash trend associated with rear end and right-angle collisions. This project includes the installation of a traffic signal (when warrants are met) or single-lane roundabout at the intersection.

Estimated Cost: $1.15M (Traffic Signal) // $2.0M (Roundabout)

TSM-34: Willson Avenue and Grant Street

Grant Street realizes traffic entering and exiting the MSU campus by virtue of its direct connection from Willson Avenue all the way to S. 11th Avenue. The intersection of Willson Avenue and Grant Street could use a higher level of traffic control in the form of a single-lane roundabout. This traffic control would allow for left-turn movements off of both legs of Grant Street, but not at the expense of impeding traffic flow adversely on Willson Avenue. Some parking would likely be lost at each quadrant of the intersection. Additional study will be needed.

Estimated Cost: $2.0M (Roundabout)

TSM-35: Main Street and Cypress Street

This intersection should be revised to a right-in, right-out approach on Cypress Street to alleviate cut-thru traffic though the neighborhood. In addition, the existing pedestrian crossing across Main Street should be removed as it has no control and is on the hill into downtown where traffic is decelerating from 40 mph. The new signal at Broadway offers nearby controlled crossing. Improvements to Highland Boulevard and its intersection with Main Street will provide better access in the future.

Estimated Cost: $70K

TSM-36: Durston Road (West of Laurel Parkway)

The segment of Durston Road just west of Westgate Avenue has realized several severe crashes due to the abrupt change in alignment. A short term project is recommended to straighten the roadway in this area to remove the two back-to-back horizontal curves. **MSN-14** recommends a longer term project to completely reconstruct Durston Road, from Westgate Avenue to Gooch Hill Road, to a three-lane urban "minor arterial" standard.

Estimated Cost: $200K

TSM-37: Grant Street and S. 11th Avenue

This intersection operates under all-way stop-control (i.e. 4-way stop). This intersection is recommended for a single-lane urban compact roundabout. The roundabout will provide for better traffic flow and better channelization. Currently, the intersection operates at a LOS B

(AM peak hour) and C (PM peak hour). The intersection has a very high share of pedestrians; in fact traffic counts showed about 34 percent pedestrian mode share at the intersection. During the year 2040, the intersection is anticipated to deteriorate to an overall intersection LOS of C and F.

Estimated Cost: $2.0M (Roundabout)

TSM-38: Grant Street and S. 7th Avenue

This intersection is currently a three-legged stop-controlled intersection that functions at a LOS A (AM peak hour) and B (PM peak hour). A single-lane roundabout is recommended at this location as the intersection is not a good candidate for traffic signalization. A single-lane roundabout would serve to better meter traffic flow, calm traffic, and improve pedestrian and bicycle access. A single-lane roundabout in this location may also serve as a "gateway" treatment on the eastern side of MSU's core campus. The 2040 projected LOS is anticipated to degrade to a D and F without any improvements to the intersection. This intersection realizes a fair amount of traffic destined for MSU from the east via Willson Avenue.

Estimated Cost: $2.0M (Roundabout)

TSM-39: Lincoln Street and S. 11th Avenue

The intersection of South 11th Avenue and Lincoln Street is a four legged intersection, with the east leg serving as a parking lot access. This intersection is recommended for a single-lane roundabout to provide for better traffic flow and improved pedestrian access and safety. The intersection currently operates at a LOS B (AM peak hour) and B (PM peak hour). The intersection is projected to degrade to a LOS D and F by the year 2040.

Estimated Cost: $2.0M (Roundabout)

Table 3.3: Summary of Recommended TSM Projects (not in City's 5-Year CIP)

TMP ID	Title	Description	Cost
TSM-1	Durston Road and Laurel Parkway	Geometric improvements to the intersection with traffic signalization control. The intersection should include dedicated left-turn bays and shared through/right turn lanes for all four legs of the intersection. Signal warrants would need to be met prior to installation of a traffic signal. On-street bicycle lanes will be marked on all four legs of the intersection.	$1,150,000
TSM-2	N. 27th Avenue and Oak Street	Geometric improvements to the intersection with includes installation of a traffic signal, roundabout or other adequate traffic control device when warrants are met. (SIF 058)	$650,000
TSM-3	Baxter Lane and Cottonwood Road	Geometric improvements to the intersection with includes installation of a traffic signal, roundabout or other adequate traffic control device when warrants are met. (SIF 086)	$2,500,000
TSM-4	Oak Street and Cottonwood Road	Geometric improvements to the intersection with includes installation of a traffic signal, roundabout or other adequate traffic control device when warrants are met. (SIF 098)	$2,750,000
TSM-5	Durston Road and Flanders Mill Road	Geometric improvements to the intersection with installation of a single-lane roundabout. Mark on-street bicycle lanes on all legs of the intersection. School zone context should be considered.	$2,000,000
TSM-6	Bridger Drive and Story Mill Road	Geometric improvements to the intersection with includes installation of a traffic signal, roundabout or other adequate traffic control device when warrants are met. (SIF 116)	$1,000,000
TSM-7	Fowler Avenue and Babcock Street	Geometric improvements to the intersection with installation of a traffic signal when warrants are met. Trail crossing amenities should be provided. (SIF 063)	$2,000,000
TSM-8	Construction of ADA Compliant Roadway Crossing Improvements	Construct ADA compliant pedestrian roadway crossing improvements at three locations: (1) Fowler Avenue and Babcock Street, (2) Oak Street and Hunters Way, and (3) Durston Road Trail Crossing between Hunters Way and N. 27th Avenue. ADA crossing improvements may include widened sidewalks, curb ramps, refuge islands, rectangular rapid flashing beacons and crosswalk markings.	$167,000
TSM-9	Fowler Avenue and Durston Road	Geometric improvements to construct a four legged intersection with traffic signal control. Signal warrants would need to be met prior to installation of a traffic signal. (SIF 073)	$2,000,000
TSM-10	Davis Lane and Cattail Street	Geometric improvements to the intersection with a single-lane roundabout or traffic signal when warrants are met.	$2,000,000
TSM-11	Davis Lane and Catamount Street	Geometric improvements to the intersection with a single-lane roundabout or traffic signal when warrants are met.	$2,000,000
TSM-12	Durston Road and N. 27th Avenue	Geometric improvements to include left-turn lanes as necessitated by the growing traffic demand. A traffic signal, roundabout, or other traffic control device should be added to this intersection when warrants are met.	$1,150,000
TSM-13	N. 27th Avenue and Tschache Lane	Geometric improvements to the intersection with traffic signalization when warrants are met. Due to the varying existing and future cross sections on each of the roadways, a traffic signal will likely be the better choice for intersection control compared to a roundabout.	$2,000,000
TSM-14	Davis Lane and Valley Center Road	Geometric improvements with traffic signalization when warrants are met. Potential lane configuration include northbound left and right-turn bays, a westbound left-turn bay, and an eastbound right-turn lane.	$2,000,000

TMP ID	Title	Description	Cost
TSM-15	N. 27th Avenue and Valley Center Road	Geometric improvements with traffic signalization at the intersection when warrants are met. Potential lane configuration modifications include the addition of an eastbound right-turn lane.	$2,000,000
TSM-16	Oak Street and N. 19th Avenue	Modify the intersection of Oak Street and N. 19th Avenue to add additional lanes on the west approach of Oak Street, coupled with traffic signal modification.	$530,000
TSM-17	Oak Street and N. 11th Avenue	Geometric improvements to the intersection of Oak Street and N. 11th Avenue with traffic signal installation when signal warrants are met.	$1,150,000
TSM-18	N. 7th Avenue and Griffin Drive	Modify the intersection of N. 7th Avenue and Griffin Drive to add additional designated turning lanes on all approaches, and to provide revised traffic signalization.	$2,350,000
TSM-19	Oak Street and N. 7th Avenue	Modify the intersection of Oak Street and N. 7th Avenue to add additional lanes on the east approach of Oak Street, along with traffic signal modification.	$750,000
TSM-20	N. 7th Avenue and Mendenhall Street	Revise the northeast quadrant at the intersection of N. 7th Avenue and Mendenhall Street to provide a short right-turn bay for westbound to northbound turning vehicles.	$120,000
TSM-21	Babcock Street and Willson Avenue	Update the traffic signal hardware at the intersection of Babcock Street and Willson Avenue, and relocate the poles out of the sidewalks/pedestrian ramps. Make geometric improvements to the intersection corners to provide better crosswalk alignment.	$750,000
TSM-22	Main Street and Haggerty Lane	Modify the intersection of Main Street and Haggerty Lane to include a designated northbound right turn lane, a northbound left turn lane, and an eastbound right turn lane. Install traffic signalization control when warrants are met.	$1,150,000
TSM-23	Highland Boulevard and Ellis Street	Geometric improvements to include the installation of a traffic signal, roundabout, or other adequate traffic control device when warrants are met.	$2,000,000
TSM-24	Highland Boulevard and Kagy Boulevard	Geometric improvements to include the installation of a traffic signal, roundabout, or other adequate traffic control device when warrants are met.	$2,850,000
TSM-25	Kagy Boulevard and S. Church Avenue / Sourdough Road	Includes three options to improve safety and reduce delay at the intersection of Kagy Boulevard and S. Church Avenue / Sourdough Road: **Option 1:** Installation of a roundabout or traffic signal when warrants are met. This option would be a major project due to chasing the grades both east and west of the intersection on Kagy Boulevard, and would require a fair amount of road work on Kagy Boulevard. **Option 2:** Narrowing (i.e. necking) down Kagy Boulevard just east and west of the intersection for about 200 feet to reduce the distance that vehicles, pedestrians and bicyclists must cross. **Option 3**: Restrict turning movements at the intersection such that the north-south movements could only make right-in and right-out turns. This would be accomplished by placing a raised median on Kagy Boulevard in an east – west direction to effectively block off left-turns and through movements from the north and south legs of the approach.	$2,850,000 (Roundabout or Signal) // $280,000 (Narrow Kagy Boulevard) // $100,000 (Raised Median on Kagy Blvd)
TSM-26	Huffine Lane and Ferguson Avenue	Continue to evaluate eastbound and westbound left-turn phasing on Huffine Lane (designated left-turn phases were not recommended nor warranted during MDT's most recent signal upgrade project on Huffine Lane).	$150,000

TMP ID	Title	Description	Cost
TSM-27	Huffine Lane and Fowler Avenue	Continue to evaluate eastbound and westbound left-turn phasing on Huffine Lane (designated left-turn phases were not recommended nor warranted during MDT's most recent signal upgrade project on Huffine Lane).	$150,000
TSM-28	Flanders Mill Road and Oak Street	Install traffic diverter or other form of traffic calming to limit cut through traffic near the intersection of Oak Street.	$30,000
TSM-29	Oak Street and Stoneridge Drive	Make Stoneridge Drive approaches on both sides of Oak Street three-quarter movement approaches such that "left-out" turning movements are prohibited.	$70,000
TSM-30	Durston Road and N. 19th Avenue	Geometric improvements to revise the east leg by providing a longer westbound right-turn bay, which will improve storage and operations for this heavy movement onto N. 19th Avenue.	$750,000
TSM-31	Durston Road and N. 15th Avenue	Consider a single-lane roundabout to better meter traffic flows. All four legs of the intersection receive approximately equal traffic, and its proximity to the schools warrants long term improvements to the intersection.	$2,000,000
TSM-32	Beall Street and N. 15th Avenue	Geometric improvements to include traffic signalization or single-lane roundabout installation when warrants are met (i.e. for traffic signalization).	$1,150,000 (Traffic Signal) // $2,000,000 (Roundabout)
TSM-33	Willson Avenue and Peach Street	Geometric improvements to include installation of a traffic signal (when warrants are met) or single-lane roundabout.	$1,150,000 (Traffic Signal) // $2,000,000 (Roundabout)
TSM-34	Willson Avenue and Grant Street	The intersection of Willson Avenue and Grant Street could use a higher level of traffic control in the form of a single-lane roundabout. This traffic control would allow for left-turn movements off of both legs of Grant Street, but not at the expense of impeding traffic flow adversely on Willson Avenue. Some parking would likely be lost at each quadrant of the intersection. Additional study will be needed.	$2,000,000 (Roundabout)
TSM-35	Main Street and Cypress Street	Revise Cypress Street legs to "right-in, right-out" approaches to alleviate cut-thru traffic though the neighborhood. In addition, remove the existing pedestrian crossing across Main Street as it has no control and is on the hill into downtown where traffic is decelerating from 40 mph. The new signal at Broadway offers nearby controlled crossing.	$70,000
TSM-36	Durston Road (West of Laurel Parkway)	Revise and straighten the segment of Durston Road just west of Westgate Avenue to remove the two back-to-back horizontal curves.	$200,000
TSM-37	Grant Street and S. 11th Avenue	Geometric improvements to include a single-lane urban compact roundabout to better meter traffic flow, calm traffic, and improve pedestrian and bicycle access.	$2,000,000 (Roundabout)
TSM-38	Grant Street and S. 7th Avenue	Geometric improvements to include a single-lane roundabout to better meter traffic flow, calm traffic, and improve pedestrian and bicycle access. A single-lane roundabout in this location may also serve as a "gateway" treatment on the eastern side of MSU's core campus.	$2,000,000 (Roundabout)
TSM-39	Lincoln Street and S. 11th Avenue	Geometric improvements to include a single-lane roundabout to better meter traffic flow, calm traffic, and improve pedestrian and bicycle access.	$2,000,000 (Roundabout)

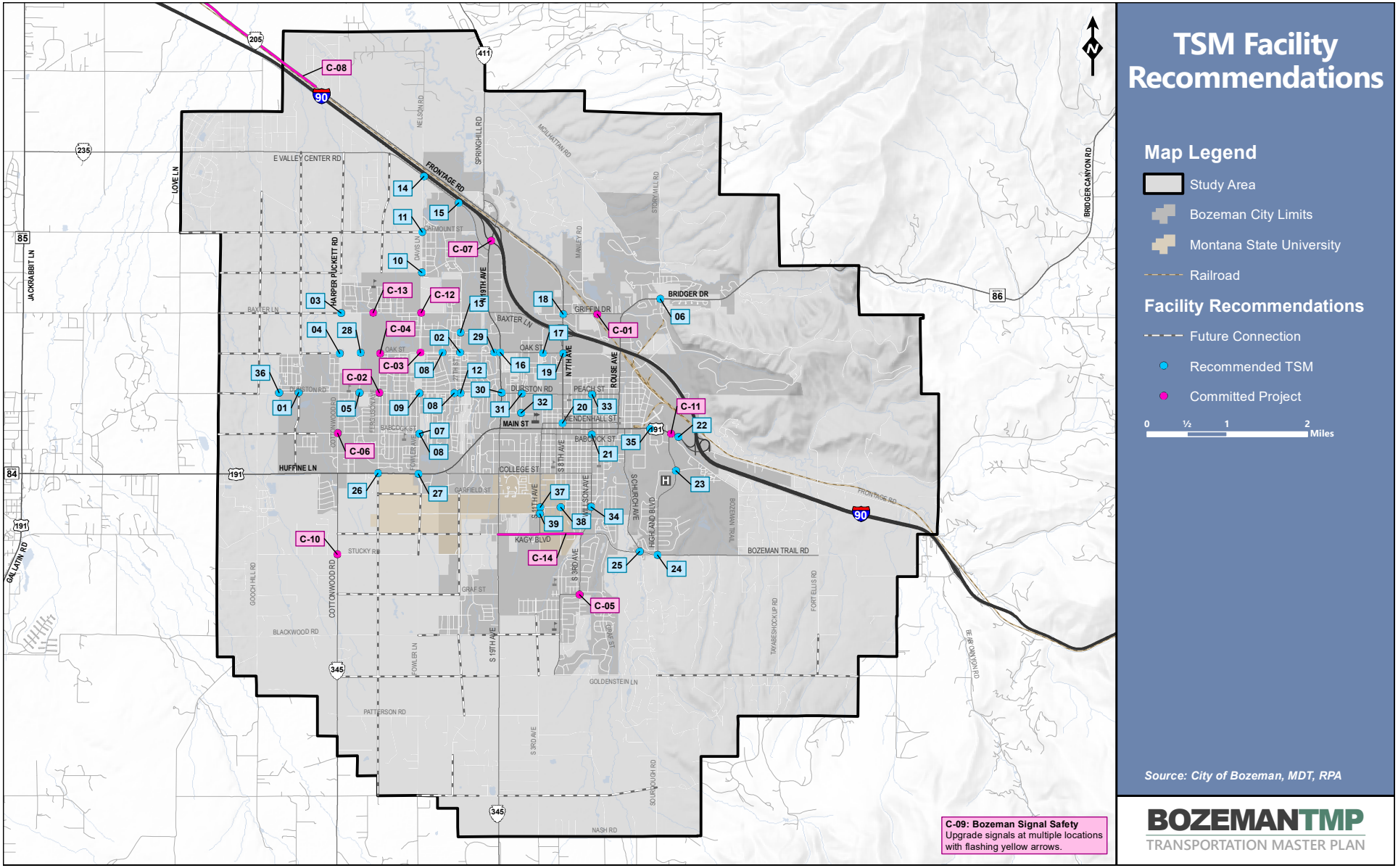


Figure 3.1: Recommended and Committed TSM Projects

4.0. PEDESTRIAN IMPROVEMENTS

This section outlines potential active transportation facilities relative to sidewalks, street crossings, and natural surface trails. The recommendations are intended to encourage active living by residents and visitors and accommodate a variety of ability levels with particular emphasis on making the pedestrian network more comfortable and accessible to a wider range of the population. As Bozeman's growth rate is currently very high, projects are organized into a number of different implementation mechanisms.

4.1. Overview

Bozeman is a walking city. Residents and visitors frequently make use of the City's sidewalks and trails for all types of transportation and recreational trips. The existing conditions and needs analysis identified a number of pedestrian issues including:

- Neighborhoods lacking sidewalks completely
- Incomplete subdivision sidewalks due to piecemeal development
- Arterial and collector streets lacking sidewalks
- Old infrastructure
- Crossings

Each of these issues is addressed in this section through a variety of infrastructure and programmatic improvements. **Figure 4.1** displays the recommended sidewalks, intersection improvements and trails, which will benefit pedestrian activity. All improvements will improve the City's accessibility to pedestrians of all ages and abilities through accessible design. The City of Bozeman should consider adopting the draft Public Rights Of Way Accessibility Guidelines (PROWAG) and continue to retrofit its network for improved accessibility for all users.

4.2. Specific Pedestrian Recommendations

Bozeman's sidewalk gaps constitute some of the greatest challenges to pedestrian connectivity. Some sidewalk gaps can be expected to be closed though already committed or planned roadway projects. Facilities like Oak Street, Durston Road, Babcock Street, Cottonwood Road and Rouse Avenue will all see significant improvements to sidewalk connectivity and accommodation through planned MSN roadway projects. This plan also identifies key sidewalk gaps that do not have an overall road project as a source of implementation. These recommendations include some local streets where connectivity needs are the greatest.

Incomplete subdivision sidewalks were also identified as a major barrier to pedestrian connectivity. As of 2016, subdivision sidewalks on non-publically fronted property are developed with individual lot development. With the growth Bozeman has been experiencing an up to date inventory of sidewalks is nearly impossible as concrete is being poured daily across the city. The current policy of the City requiring the

developer to return and complete unfinished sidewalks after 3 years has proven problematic during the economic downturn of 2009-2012. Tracking and enforcing this policy has been difficult due to lack of data and staff time.

Recommended Policy Change: This plan recommends that the Unified Development Ordinance (UDO) be amended to require sidewalk construction as a basic component of subdivisions and should be installed with the streets and utilities before individual lots are developed. Builders can temporarily bury the sidewalks so that they are not damaged by heavy equipment during the building process. While this change would potentially increase lot prices, the cost of the sidewalk would not be a component of the lot development, so the end cost to the homeowner would be similar.

4.3. Crossing Improvements

This plan includes recommendations for a variety of intersection and mid-block pedestrian crossing improvements, as shown on **Table 4.1** and **Figure 4.1**. Generally, improvements are focused around establishing a safe pedestrian crossing where existing use and/or desire is high. Recommended crossing improvements vary; however, generally include the following typologies:

Pedestrian Refuge: a protected space placed in the center of the street to facilitate bicycle and pedestrian crossings. Pedestrian refuges are the most valuable at uncontrolled crossing locations where the refuge breaks up the crossing into smaller directional crossings, often placing the pedestrian in a less complex situation. No more than two lanes in any direction should be crossed at a time when a pedestrian refuge is utilized without signalization.

Existing pedestrian refuge on Highland Boulevard

Rectangular Rapid Flashing Beacons (RRFB): RRFBs use an irregular flash pattern similar to emergency flashers on police vehicles and can be installed on either two-lane or multi-lane roadways. RRFBs are used to reinforce a driver's legal obligation to yield where pedestrians and/or bicyclists have the right-of-way crossing a road. RRFBs drastically improve motor vehicle yielding compliance over no beacon and even considerably more over steady flashing yellow ball beacons.

RRFBs in front of Whittier School on Peach Street

Pedestrian Hybrid Beacon: A hybrid beacon, also known as a High-intensity Activated Crosswalk (HAWK), consists of a signal-head with two red lenses over a single yellow lens on the major street, and pedestrian signal heads for the minor street or trail crossing. There are no signal indications for motor vehicles on the minor street approaches. Hybrid beacons are used to improve non-motorized crossings of major streets in locations where side-street volumes do not support installation of a conventional traffic signal. Hybrid beacons can operate in areas of heavy traffic and multiple travel lanes where a RRFB would be less effective.

Pedestrian Hybrid Beacon in Billings, MT (*courtesy of Sanderson-Stewart*)

Table 4.1: Recommended Specific Spot Improvements

Project ID	Project Type	Location	Comments	Cost (Low)	Cost (High)
SPOT-1	Grade Separation	W. Kagy Blvd and S. 7th Ave	As part of the W. Kagy Boulevard improvements, a pedestrian tunnel will be constructed linking the main MSU Campus to Western Transportation Institute (WTI), the Museum of the Rockies (MOR) and the neighborhoods to the south.	Part of road project	Part of road project
SPOT-2	Grade Separation	W. Garfield St and S. 19th Ave (south of intersection)	Over or underpass for future central bicycle and pedestrian route as proposed in the MSU Long Range Campus Development Plan (LRCDP).	$1,200,000	$3,500,000
SPOT-3	Install full signal	W. Lincoln St and S. 19th Ave	Recommend installing a full signal to protect pedestrian and bike crossings on W. Lincoln Street. This could allow the current right turn out restrictions to remain and signal would activate for left turns and pedestrian signal calls. This pedestrian crossing has exhibited crash trends in the past.	$40,000	$60,000
SPOT-4	Intersection Improvements	W. Lincoln St and S. 11th Ave	**Short Term:** As EB and NB approaches have combination outer lanes, the stop bar should be set back to provide 6 feet of bicycle forward stop bar. The SB approach does not need improvement. **Long Term:** Convert to roundabout similar to S. 11th Avenue and College Street.	$3,000	$5,000

Project ID	Project Type	Location	Comments	Cost (Low)	Cost (High)
SPOT-5	Intersection Improvements	W. Grant St and S. 11th Ave	**Short Term:** All approaches have combination outer lanes, the stop bar should be set back to provide 6 feet of bicycle forward stop bar. **Long Term:** Convert to roundabout similar to S. 11th Avenue and College Street.	$3,000	$5,000
SPOT-6	Intersection Improvements	W. Kagy Blvd and S. 11th Ave	**Short Term:** Prior to Kagy Boulevard reconstruction, install bicycle boxes in north and south directions with a "right turn on red" prohibition on s. 11th Avenue. This will help queue and move large numbers of bicyclists travelling between campus and the Stadium View Apartments and trails to the south. **Long Term:** Improvements associated with Kagy Boulevard project. Recommend roundabout with grade separation across Kagy Boulevard. If signal is to remain, include leading pedestrian interval, and bike lane to path transitions	$15,000	Part of road project
SPOT-7	Grade Separation	W. Kagy Blvd (MSU Stadium)	As part of the W Kagy Boulevard improvements, a pedestrian tunnel will be constructed linking the main MSU Campus to the Stadium.	Part of road project	Part of road project
SPOT-8	Grade Separation	W. Kagy Blvd and S. Willson Ave	**Short Term:** Prior to reconstruction of Kagy Boulevard, provide bike box on the Willson Avenue approach in front of the through/right lane. Provide new ramp for Gallagator Trail users to access the bike box and provide paved path from end of Gallagator Trail. Provide sharrows in the right turn only lane of the S. 3rd Avenue approach. Formalize short sections of bike lane next to north and south "free right" porkchop islands. **Long Term:** As part of the Kagy Boulevard improvements, a pedestrian tunnel will be constructed providing beneficial pedestrian and bicycle improvements to the Kagy Boulevard/ Willson Avenue / S. 3rd Avenue intersection, as well as serving the existing and future Gallagator Trail. The crossing should serve the intersection and the trail alignment, and should be approximately 75 feet back from the existing pedestrian crossing.	$35,000	Part of road project
SPOT-9	RRFB	W. College St and S. 13th Ave	School crossing for students living in family housing to go to Irving School.	$12,000	$16,000
SPOT-10	RRFB	W. College St and S. 15th Ave	Provide crosswalk and RRFB based crossing for trail/sidewalk connection.	$12,000	$16,000
SPOT-11	Pedestrian Hybrid Beacon	W. Lamme St and N. 7th Ave	Lamme Street is an existing high bicycle and pedestrian use street. This crossing point at N. 7th Avenue is currently difficult and limits the east-west potential of the route. With the 4-lane cross section with no median, a rapid flashing beacon would not be visible enough with the two approach lanes in each direction. A Pedestrian Hybrid Beacon is recommended with a bulb-out on the NE and SW corners for bicyclists to enter and use the pedestrian signal.	$50,000	$75,000
SPOT-12	Beacon Improvement	W. Oak St and Hunters Way	Two options; **Option 1:** Pedestrian Hybrid Beacon to serve shared use path crossings. **Option 2:** RRFB with median extension to create refuge area and allow for two beacons facing each direction.	$20,000	$70,000
SPOT-13	RRFB	Durston Rd and Hunters Way (east of intersection)	Add median refuge and install RRFB. This will be more direct than diverting to Hunters Way where there is significantly more traffic. The mid-block location will also simplify crossings as there will be no turning conflicts or turn lanes to interact with.	$22,000	$26,000

Project ID	Project Type	Location	Comments	Cost (Low)	Cost (High)
SPOT-14	RRFB	W. Babcock St and Hunters Way	Two location options for RRFB. **Option 1:** Hunters Way has more traffic. No refuge can be provided due to narrow cross-section and the need to accommodate eastbound lefts. **Option 2:** The crossing could also be moved 120 feet to the west and improved with a median refuge to isolate trail crossings from the intersection.	$22,000	$26,000
SPOT-15	Crosswalk	W. Babcock St and Hanley Ave	With warning signage.	$3,000	$5,000
SPOT-16	Curb Extensions	W. Lincoln St and S. Willson Ave	Install curb extensions at Gallagator Trail crossing. This crossing will become more heavily used when Kagy Boulevard project is complete. RRFB could be a value added option, however yielding compliance on Willson Avenue is usually good.	$10,000	$15,000
SPOT-17	Intersection Improvement	Bridger Dr and Story Mill Rd	Improve bicycle and pedestrian crossing opportunity here. Rouse Avenue/Bridger Drive will ultimately become 3-lanes which will make this crossing more difficult. Suggest signal, roundabout or a pedestrian hybrid beacon.	$45,000	$90,000
SPOT-18	Realign Path Crossing	Huffine Lane and Harmon Stream Blvd	Re-route path crossing from current location to a location approximately 20 feet south. Utilize median for single lane crossing at a time. Vehicles can then interact with pathway users in a different decision process than merging into/out of traffic.	$18,000	$25,000
SPOT-19	RRFB	W. Kagy Blvd and S. Tracy Ave	Install RRFB to aid bicyclists and pedestrians crossing Kagy Boulevard at this point.	$15,000	$18,000
SPOT-20	RRFB	Carol Place and E. Kagy Blvd	Install RRFB at this location to aid bicyclists and pedestrians crossing Kagy Boulevard. Add bicycle specific buttons on Carol Place and Fairway Drive.	$15,000	$18,000
SPOT-21	RR Grade Crossing Improvement	N. Wallace Ave and Railroad	Extend sidewalks and widen paved surface to at least 34 feet over railroad tracks, with shared use path on the north side of the street.	$7,000	$10,000
SPOT-22	Intersection Improvements	S. 23rd Ave and W. Main St	Add a bike box on Babcock Street in the EB direction in front of the combination lane. This will help bicyclists position to use S. 23rd Avenue to reach College Street. Perform traffic study on WB approach on S. 23rd Avenue to verify right turn queuing requirements. If possible, significantly shorten right turn lane and add through bike lane to connect with Babcock Street. Add lead pedestrian interval when actuated.	$10,000	$15,000
SPOT-23	RRFB	E. Baxter Ln and Buckrake Ave	Install RRFB to assist shared use pathway users.	$12,000	$16,000
SPOT-24	RRFB	E. Baxter Ln and Flanders Mill Rd	Install RRFB to assist shared use pathway users.	$12,000	$16,000
SPOT-25	RRFB	Cascade St and N. Ferguson Ave	New crosswalk and RRFB with bicycle push buttons in addition to pedestrian features.	$17,000	$25,000
SPOT-26	Intersection Improvements	W. Main St and S. 8th Ave	Provide leading pedestrian interval to get pedestrians in crosswalks before vehicles are given green lights. Add shared lane markings in left and right turn lanes in the northbound direction. Add a gore separator between left and right	$1,500	$5,000

Project ID	Project Type	Location	Comments	Cost (Low)	Cost (High)
			only lanes. Main Street does not currently have receiving bicycle lanes, so bikes should be in the travel lane or use crosswalk.		
SPOT-27	Intersection Improvement	S. 8th Ave and W. College St	S. 8th Avenue approaches at College Street are confusing for bikes and drivers. Two options; **Option 1:** Create right turn lane that is shared with the bike lane (this will potentially reduce pedestrian safety). **Option 2:** Mark bike lanes up to intersection and gore out the parking area.	$1,500	$4,000
SPOT-28	Trail Crossing	Breeze Ln and Buckrake Ave	Install curb cuts/warning signage.	$8,000	$10,000
SPOT-29	RRFB	N. 25th Ave and Durston Rd	Add RRFB to existing crossing.	$5,000	$7,000
SPOT-30	Pedestrian Hybrid Beacon	W. Main St and S. 3rd Ave	Pedestrian activated 3-lens beacon. Only activates when pedestrian calls it. Could be coordinated with existing signal progression along Main Street.	$50,000	$75,000
SPOT-31	Ped crossing improvement	Ellis St and Highland Blvd	Important to hospital staff, residents, and all season trail users including skiers. Could be grade separated or a roundabout.	$150,000	$250,000
SPOT-32	Trail Underpass	Trail and Curtis St	Need improved pedestrian crossing in conjunction with new development at Curtis Street or in association with trails. Crossing should be underpass, which should be somewhat straight forward with existing grading on west side. On east side the City of Bozeman owns the land and significant excavation may be needed.	$80,000	$150,000
SPOT-33	Trail Underpass	Trail west of Kagy Blvd and Painted Hills Rd	Replace at-grade crossing with underpass where grading is favorable.	$60,000	$100,000
SPOT-34	Trail Underpass	Kagy Blvd and Painted Hills Trail	Replace at-grade crossing with underpass where grading is favorable.	$60,000	$100,000
SPOT-35	RRFB	Westridge Dr and S. 3rd Ave	Add pedestrian crossing and RRFB.	$12,000	$16,000
SPOT-36	RRFB	W. Arnold St and S. 3rd Ave	Upgrade crossing to include RRFB.	$5,000	$7,000
SPOT-37	RRFB	W. Oak St and Trail	Design with widening of Oak Street. Should have a RRFB and median.	$20,000	$30,000
SPOT-38	Bike/Ped Overpass	I-90	Visionary project, but would provide more direct access for Valley West residents to Bridger Drive trails.	$2,500,000	$4,000,000
SPOT-39	Grade separated crossing	Huffine Ln and Fowler Ave	Could be over or underpass connecting Fowler Avenue trails and MSU to Huffine Lane Trail. Engineering study needed.	$200,000	$400,000
SPOT-40	Signal or grade separation	W. Stevens St and N. 19th Ave	Conceptual project depends on ability to create east-west bicycle boulevard.	$60,000	$250,000

Project ID	Project Type	Location	Comments	Cost (Low)	Cost (High)
SPOT-41	Remove crosswalk	E. Main St and Cypress St	Existing pedestrian crossing has no control and is on the hill into downtown where traffic is decelerating from 40 mph. New signal at Broadway offers nearby controlled crossing. Warrants would not likely support a signalized crossing at this location.	$1,500	$2,500

4.4. General Intersection Improvements

This section provides general recommendations for pedestrian oriented improvements that can be implemented throughout Bozeman as projects are implemented. These recommendations represent national best practices and may be applied as opportunities are provided.

4.4.1. Leading Pedestrian Intervals

A leading pedestrian interval (LPI) is a phase setting for signalized intersections with pedestrian signals. It involves pedestrians being given a walk signal to cross the intersection several seconds in advance of parallel vehicle traffic. This allows pedestrians to begin crossing with a physical head start, which can greatly increase the visibility of pedestrians and reinforce that turning motor vehicles are required to yield to pedestrians in the crosswalk.

The LPI may be an actuated setting where the lead interval is only introduced when a push-button is activated. Having several seconds dedicated to a LPI may mean that there is a corresponding reduction in time in a traffic signal cycle available for motor vehicle travel. Since the pedestrian lead interval is relatively short (generally 3 – 5 seconds) the impacts are usually minimal.

4.4.2. Crosswalk Placement and Corner Radii

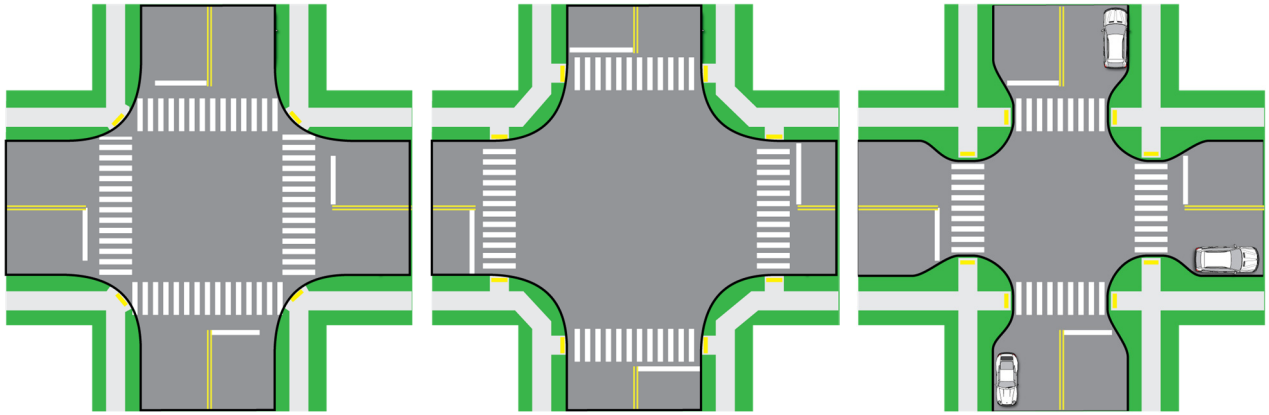
Children are less mentally and physically developed than adults, and often have limited peripheral vision and less ability to judge speed and distance, locate sounds and comprehend street signs. They lack familiarity with traffic, and may act impulsively or unpredictably.

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.

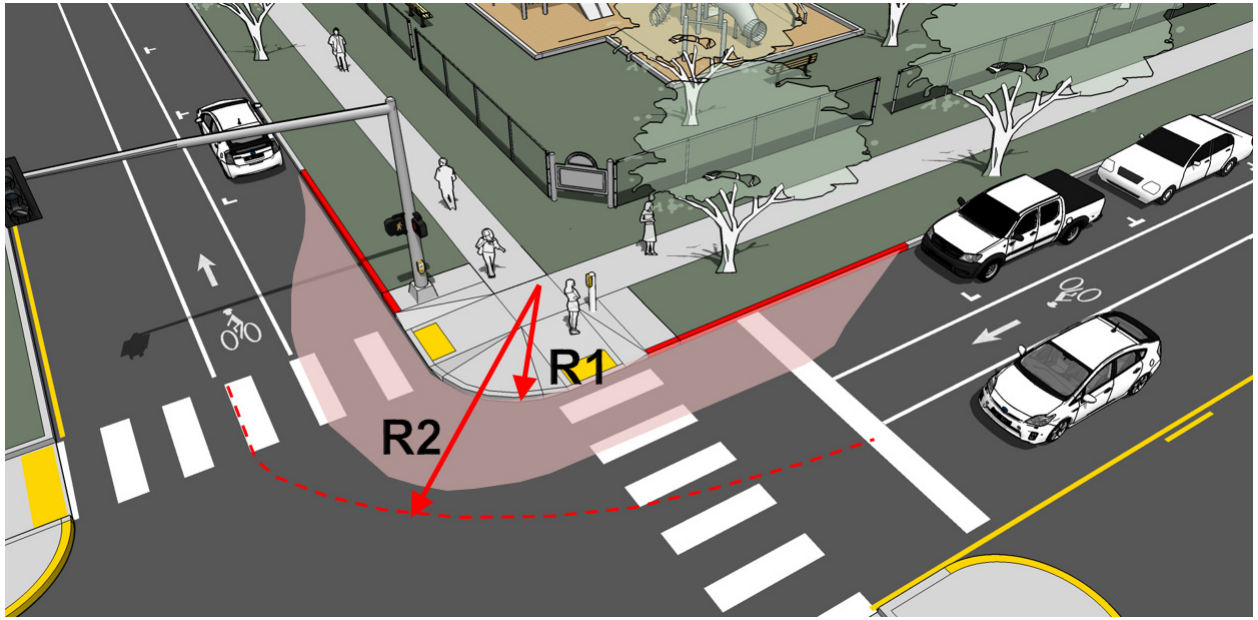
Similar to designing walking facilities for users with disabilities, similar consideration should be given to young and elderly users.

Larger corner radii accommodates heavy vehicles turning while keeping them inside their designated lane. This practice often results in wide sweeping corners that allow smaller vehicles to turn at higher speeds. Additionally crosswalks are typically longer resulting in longer crossing distances, increased pedestrian clearance times and greater exposure to moving vehicles. Several strategies can be employed to mitigate this issue.

1. Reduce corner radii. Design engineers should consider the effective turning radius of vehicles to provide for turning while reducing the physical radius of the corner. For example, the presence of a parking lane and/or bike lane allow for a tight corner radius while still providing a larger effective radius for turning vehicles.
2. Locate crossings at narrowest point. If the corner radius can't be narrowed significantly, placing the crosswalks with directional pedestrian ramps at the curve tangent minimizes crossing distance and exposure while affording vehicles greater visibility of pedestrians while turning due to the angle of the vehicle when it encounters the crosswalk while turning.
3. Provide curb extensions. Curb extensions (also known as bulb-outs) utilize the parking setbacks (if a parking lane is present) to make pedestrians more visible when crossing streets and to shorten crossing distance. Bozeman has a number of successful curb extensions and this treatment should be considered as a key component to any future project.



From left to right: Small corner radii (15 feet), perpendicular crossings at the curve tangent, curb extensions.



Where R1 is the actual corner radius and R2 is the effective corner radius. Curb extensions are also possible in otherwise unused intersection space

4.4.3. Downtown Pedestrian Recommendations

Downtown Bozeman is a key activity center for residents and visitors. Significant public comment was received during this planning process about perceived pedestrian safety issues. Mendenhall and Babcock Streets currently do not have traffic control with the exception of Willson Avenue. As a result this busy area has marked crosswalks that rely on motorist yielding. Parked vehicles often make pedestrian visibility difficult and the two travel lanes create a 'double threat' where a yielding vehicle could block the view of a vehicle in the adjacent lane of the pedestrian in the crosswalk. Curb extensions should be a component of any new property development project where the street is being changed or reconstructed. The City should continue to work with the Downtown Bozeman Partnership to identify key intersections with the poorest pedestrian visibility. South Bozeman Avenue and East Babcock Street is a priority intersection.

4.4.4. Sidewalk Program

Sidewalk replacement and expansion is an issue that is important in every Montana city. Currently the City of Bozeman notifies property owners of issues and requires that they repair or replace deficient sidewalk within 30 days. Equitably balancing property owner responsibility

with the overall public benefit of sidewalks in a way that can accelerate sidewalk maintenance and expansion should be a primary goal of a community's sidewalk program. It is recommended that Bozeman pursue a comprehensive sidewalk program through one of the following:

- 50/50 cost sharing sidewalk replacement program where sidewalk construction costs are divided evenly between the City and the property owner. The source of funding can vary; typically, the City can fund it as a defined item in the annual budget. Kalispell and Superior, MT have implemented similar programs.
- Implement a "Health Plan" style sidewalk replacement policy in which the financing model is based on the concept used in the health insurance industry. This policy allows property owners to pay in a fair amount regardless of property size or frontage length. In Missoula, the owner is given an 'up front benefit' by the city of $1,000, then the owner pays a "deductible" amount up to $7,000 of construction costs. The City of Missoula pays constructions costs above the deductible amount up to $15,000 per property. Missoula allocates between $600,000 and $800,000 in funding from a Road District that was created to help pay for construction and maintenance of City roadways. The program focuses on high-priority areas in the sidewalk master plan and has been well-received. In addition to this program, the City has continued to require piecemeal sidewalk development when new or accessory dwelling units (ADU) are built.
- The city of Bozeman could consider low, or no cost, loans for the purposes of sidewalk reconstruction or expansion. The City of Helena offers a no-interest loan to be repaid over a period of 10 years. Other cities have used increased property assessments to repay the cost of construction.

The City's current ADA ramp upgrade program is a good example of proactive incremental progress and could be a key component of an overall sidewalk program.

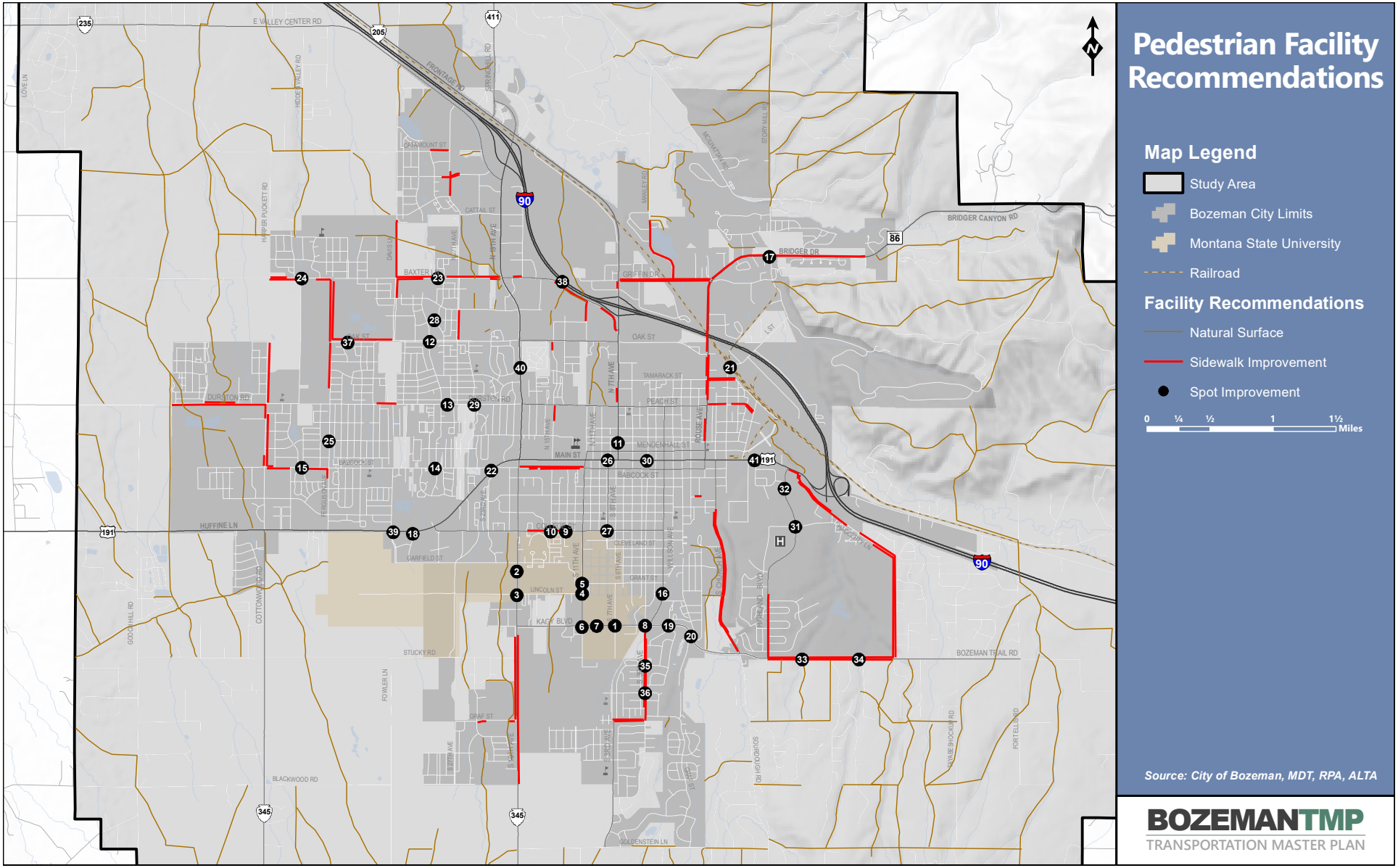


Figure 4.1: Pedestrian Facility Recommendations (Spot Improvements Shown)

5.0. BICYCLE IMPROVEMENTS

Some non-motorized improvements will be completed as part of committed or future MSN or TSM projects. Others will be completed as a component of future site development for residential or commercial purposes. A subset of bikeway projects will need dedicated funding to be realized. Where applicable, recommended bikeways are incorporated into the MSN and TSM project descriptions described earlier.

The majority of the recommendations for distinct bikeway projects (which will not be implemented as part of a MSN, TSM or development project) provide more detailed guidance including roadway cross-sections and various options where multiple roadway configurations may exist. For example streets with excess road space could be configured in a number of ways including a wide bike lane, a buffered bike lane or even a separated bike lane. Some recommendations, however, are more conceptual and additional coordination and study will be needed for implementation. All recommendations are subject to change and refinement as site conditions and development patterns change and as other adjacent or intersecting projects are implemented. Some projects may require feasibility studies to verify routing or applicability.

Figure 5.1 summarizes the existing study area mileage and the proposed additional mileage if all recommended projects are completed.

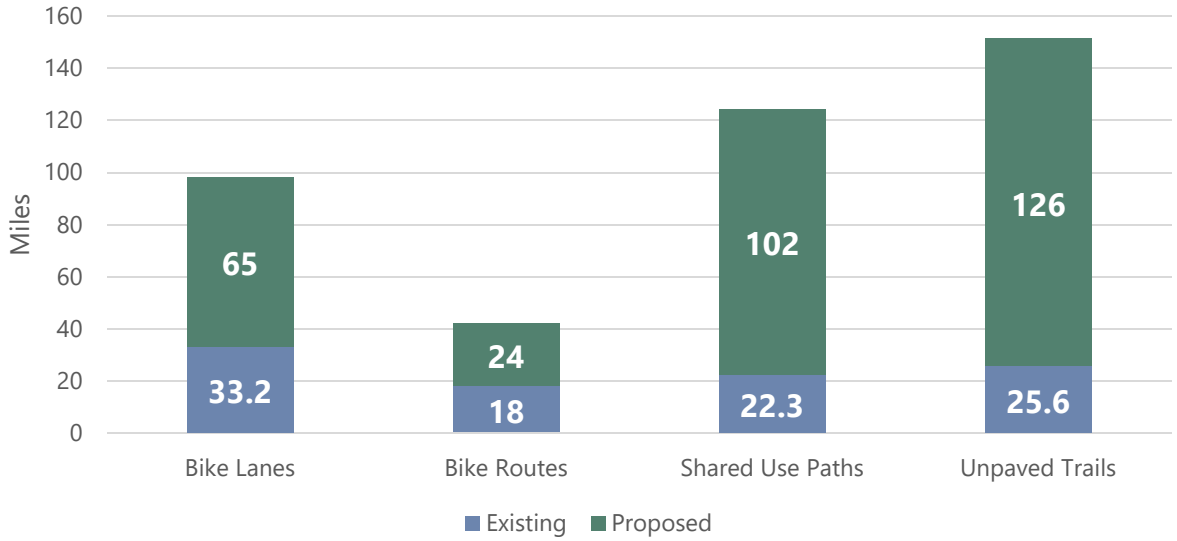


Figure 5.1: Mileage of Existing and Proposed Active Transportation Facilities within the Study Area

5.1. Overview

Bozeman's bicycle transportation mode share is nearly 10 times the national average. This figure is averaged throughout the year and peak bicycle use in the spring, summer and early fall is higher still. Bicycle commuting is, however, not evenly distributed throughout the city, despite distances being comparable in the south, north and west quadrants. The on and off-street recommendations outlined in this plan are intended to, over time, create a balanced bicycle transportation network for all ages and abilities that includes convenient and comfortable routes connecting residents to destinations. The recommended Bozeman bikeway network includes:

- Bicycle boulevards (and other streets with shared lane markings)
- Bike lanes
- Buffered bike lanes
- Separated (also known as protected) bike lanes
- Shared use path projects (and connections to natural surface trails)
- Spot improvements including crossings (signalization, markings, ramps, etc.)

Figures 5.2 and **5.3** depict the proposed bikeway network.

Recommended bikeway projects are included within the corresponding roadway project elsewhere in this memorandum, whether committed or otherwise planned. Additionally, there are a number of bikeway projects which may only be implemented as a distinct active transportation focused project. These projects are summarized in **Table 5.1**.

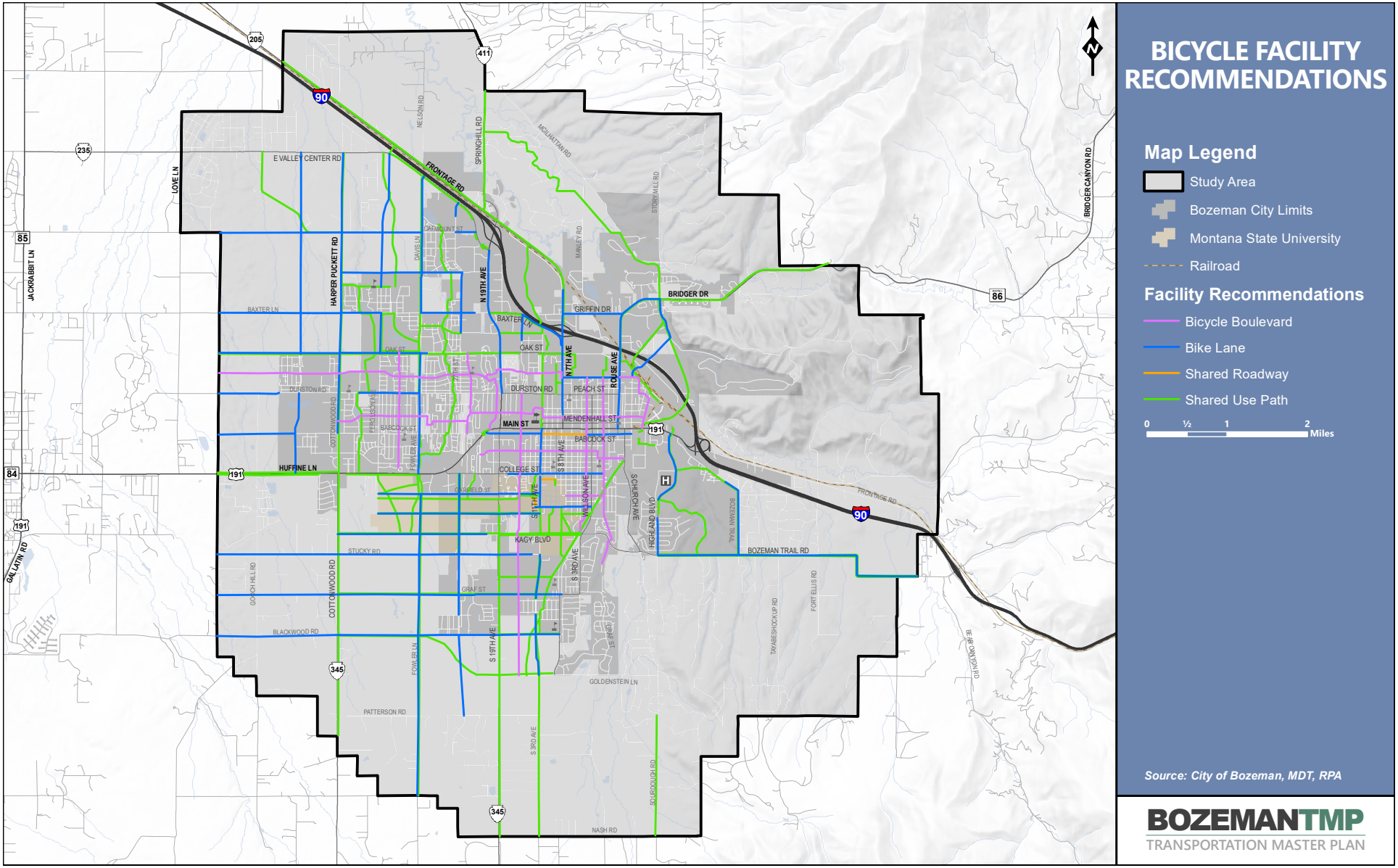


Figure 5.2: Bicycle Facility Recommendations

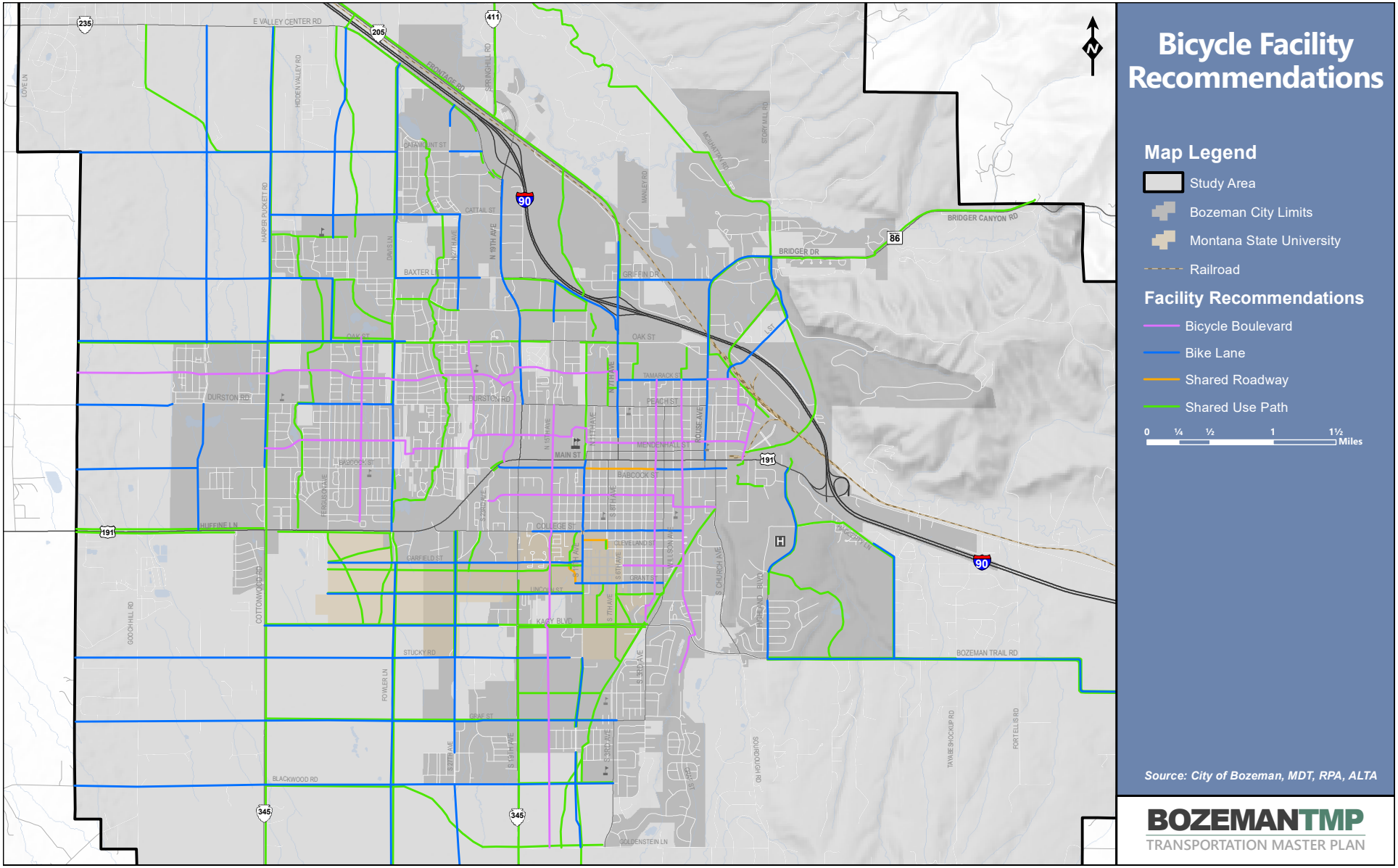


Figure 5.3: Bicycle Facility Recommendations (Detail Area)

Table 5.1: Recommended Distinct Bikeway Projects

Project Type	Street	From	To	Length (ft)	Comments	Cost (Low)	Cost (High)
Buffered Bike Lane	W. Grant St	S. 11th Ave	S. 6th Ave	1,707	Add bike lane signs and stencils every 200 feet, or after ped crossings and at far side of intersections. When road is resurfaced, add buffer to bike lane with the following cross-section. 5' bike lane, 2' buffer (double white line), 10' travel lane. Alternatively, bike lane could be 6' and vehicle lanes 11.	$3,000	$5,000
Bike Lane or Buffered Bike Lane	W. Grant St	S. 6th Ave	S. Willson Ave	1,669	Extend existing bike lanes from MSU campus to S. Willson Avenue. Currently there is parking on the north side, however parking is prohibited on the south. Road is approximately 35 feet wide. **Option 1:** Parking remains on north side where the cross section should be made the same as Peach Street, with a combined bike/parking lane of 12 feet, and a 5' bike lane on the south side. **Option 2:** Prohibit parking on both sides. All homes have side street frontages and/or alley parking opportunities. Use 35 feet to provide buffered bike lanes on both sides. 6.5 ' bike lanes and 11' travel lanes.	$6,000	$8,000
Bike Lane	W. Garfield St	S. 19th Ave	S. 12th Ave	2,137	MSU Campus project. New signal in 2015 at S. 19th Ave makes this even more important as a bike route into campus. Road is 34-35 feet wide. Short Term: **Option 1:** Preserve parking on one side of the street and configure street as an advisory bike lane. Advisory bike lanes have dashed bike lane lines which can be encroachable by vehicles if needed for passing. The cross section would include an 8' parking lane, 5-6' bike lanes and 18' foot driving area. **Option 2:** Utilize shared lane markings every 150 feet and at far sides of minor intersections and keep both parking lanes, however this is less desirable and provides less continuity. **Option 3:** Remove parking on both sides and provide full bike lanes on both sides. 11 foot travel lanes and 6.5 foot bike lanes. Long Term: Road is reconstructed to include bike lanes by design.	$4,000	$4,000
Buffered Bike Lane	S. 11th Ave	W. College St	W. Cleveland Ave	540	MSU Campus Project. For the section of bike lane between the roundabout and the southern parking access just south of Harrison Street, S. 11th Avenue is approximately 45 feet wide. The bike lanes could be significantly wider here and be buffered to provide a more comfortable entrance to the MSU Campus. 7 foot bike lanes with 3 foot striped buffers should be added with 12.5 foot travel lanes in each direction.	$1,000	$2,000
Bike Lane Enhancement	S. 11th Ave	W. Cleveland Ave	W. Grant St	1,469	MSU Campus Project. Add bike lane signs and stencils every 200 feet, or after ped crossings and at far side of intersections. Add 6 inch lane stripe.	$3,000	$3,000
Bike Lane	W. Grant Street	S. 12th Ave	S. 11th Ave	297	MSU Campus Project. This short section of Grant has no bike lanes. Bike lanes can be added with lane striping, stenciling and signage.	$1,000	$1,000

Project Type	Street	From	To	Length (ft)	Comments	Cost (Low)	Cost (High)
Bike Lane or Buffered Bike Lane	W. Lincoln St	S. 19th Ave	S. 11th Ave	2,722	MSU Campus Project. Between S. 19th Avenue and S. 11th Avenue. The eastern section of W. Lincoln Street has curb and gutter and is approximately 37 feet wide. There is a short-term parking lane on south side of road by businesses. Each of these businesses have off-street parking, some of which is underused in large lots with little parking delineation. Short Term: **Option 1:** Restrict parking and provide 6.5 foot bike lanes and 12 foot travel lanes. Alternate design to improve bicycling further would be a 5 foot bike lane, 3 foot buffer and 10.5 foot travel lanes. If parking cannot be removed it should be reduced to 7 feet in width, with 5 foot bike lanes and 10 foot travel lanes. It is generally undesirable to have on-street parking on collector roadways. The western segment is currently more primitive. **Option 2:** Re-stripe roadway to include 5' minimum bike lanes, this may result in 10 to 11 foot travel lanes depending on location. The current shoulder is 4 feet or narrower. Mid-Term: reconstruct with curb, gutter and sidewalk to accommodate 6 foot minimum bike lanes, 7' preferred.	$5,000	$7,000
Bike Lane	W. Garfield St	S. 12th Ave	S. 11th Ave	572	MSU Campus Project. Long Term: If W. Garfield Street is ever extended to S. 11th Avenue, bike lanes should be incorporated into the design.	N/A	N/A
Bike Lane	W. College St	S. 11th Ave	S. 8th Ave	899	The section of W. College Street between S. 11th Avenue and S. 8th Avenue is generally regarded as a poor facility and experience by all road users. The corridor could benefit from some short term improvements, however a full reconstruction is desired due to poor sidewalks, driveway ramps and pavement quality. Short Term: Eliminate parking on the north side of the street. This side hosts the bulk of the driveways and due to sight distance restrictions does not host a large number of parking spaces. It is estimated that 8 parking spaces currently exist on the north side, several of which would probably not meet current standards for setbacks from side streets. With removal of parking 40 feet exists. Recommend an 8 foot parking lane on the south side, with a 6 foot bike lane next to it. The north side should have a 5 foot bike lane and the travel lanes will be 10.5 feet wide. Long Term: Full road reconstruction which would hopefully expand the roadway slightly to the south to achieve wider lanes, better detached sidewalks, pedestrian ramps, crosswalks, landscaping and driveways.	$3,000	$5,000
Bike Lane	W. College St	S. 19th Ave	S.11th Ave	2,009	This is the last part of College Street west of S. 11th Avenue that will not have been reconstructed. The roadway has no curb and gutter and has sub-standard shoulders. There is approximately 32 feet of asphalt. Short Term: The shoulders should be restriped as designated 5' bike lanes with 11 foot travel lanes. Remove parking on the south side of the street on the approach to the roundabout. This parking is not	$4,000	$6,000

Project Type	Street	From	To	Length (ft)	Comments	Cost (Low)	Cost (High)
					permitted by MSU and currently is highly desired as there is no fee restriction causing many vehicles to drive by to look for free spaces. Approximately 12 spaces exist on the south side of College Street. Long Term: buffered bike lanes should be incorporated into the roadway design if possible when and if the street is ever reconstructed. Parking should be prohibited except for in front of the residences on the north side of the street between S. 13th Avenue and S. 12th Avenue.		
Bike Lane or Buffered Bike Lane	W. Garfield St	Fowler Ave	S. 19th Ave	5,116	On this roadway, a "bike lane only" currently is designated on the north side of the street. This is due to the road being constructed by the development to the north, with the future expectation that any development on the south side by MSU would provide curb/gutter sidewalk and additional width. There is currently space to stripe the bike lane in both directions while still allowing for future improvements which may still be many years away. Short Term: There is 40 feet of pavement which should in the center section (no turn lanes) be 5 foot bike lanes with 3 foot buffers and 11 foot travel lanes. Where turn lanes exist, use 10 foot lanes to maintain a 5 foot bike lane on both sides of the street. Long Term: Build to standards set forth in the Bozeman TMP.	$13,000	$20,000
Bike Lane	E. Tamarack St	N. 7th Ave	N. Rouse Ave	3,720	Street is currently 36 feet wide with parking prohibited on the north. The street is narrow, however Peach Street has the same width and was successfully retrofitted with bike lanes.	$7,000	$8,000
Advisory Bike Lane	E. College St	S. 8th Ave	S. Black Ave	3,161	Street is too narrow for conventional bike lanes. Project involves creating an "advisory bike lane" by removing the roadway centerline and striping 5 foot dashed bike lanes. The center line would be removed leaving an approximate 18 foot center two-way driving lane. Vehicles may encroach into an empty bike lane if needed. Passenger vehicles should be able to pass each other without encroaching into the advisory lane.	$16,000	$19,000
Bike Lane	W. Griffin Dr	I-90 Frontage Rd	N. Rouse Ave	3,899	Approximate 5 foot shoulders currently exist. Short Term: This project involves marking and signing a bike lane along Griffin Drive in the short term. Long Term: if the street is improved, bike lanes should be improved and included in the design.	$10,000	N/A
Buffered Bike Lane	N. 7th Ave	W. Oak St	E. Beall St	3,984	Convert parking lanes to buffered bike lanes. Parking is underutilized. Coordination may be necessary near Oak Street and the hotel/Santa Fe Reds area.	$7,000	$11,000

Project Type	Street	From	To	Length (ft)	Comments	Cost (Low)	Cost (High)
Bike Lane	N. 7th Ave	Red Wing Dr	W. Oak St	4,193	I-90 overpass was designed for bike lanes, but never had them marked or signed. This project completes the bike lanes, adds dotted lane line extensions across the I-90 ramps, and signs/marks bike lane on N. 7th Avenue north of the interchange.	$7,000	$8,000
Bike Lane	N. 19th Ave	E. Valley Center Rd	Durston Rd	9,584	8 foot minimum shoulders already exist. This project involves adding bicycle lane stencils and signage. Future additions include adding through bike lanes where right only lanes exist at intersections. This project is similar to other MDT highways of similar land use in Missoula and Kalispell.	$17,000	$17,000
Bike Lane	W. Babcock St	W. Main St	S. 19th Ave	827	Would require parking removal. Parking is not necessary on this street due to large off-street lots for existing and future businesses. This project should be implemented along with any future rebuild of W. Babcock Street from S. 19th Avenue to S. 11th Avenue.	$2,000	$3,000
Buffered Bike Lane	Graf St	S. 27th Ave	S. 19th Ave	2,567	Current road section has intermittent parking lanes and turn lanes causing the bike lane to deflect multiple times. There is no reason for on-street parking along Graf Street. Restripe bike lane to have buffers where no turn lane exists. This will enhance comfort and simplify the street.	$3,000	$7,000
Bike Lane or Buffered Bike Lane	S. 11th Ave	W. Main Street	W. College St	2,931	S. 11th Avenue is proportioned as a local street, however it is classified as a minor arterial. This is a popular biking and walking route to reach MSU and it carries considerable traffic volumes. S. 11th Avenue is approximately 34 feet in width. This project prohibits parking along S. 11th Avenue and establishes bike lanes 6 foot minimum. If 10 foot travel lanes are acceptable 5 foot bike lanes with 2 foot buffers are possible. This project will improve sight lines for pedestrians and reduce crashes, including collisions with parked vehicles. This project can be striped and signed at any time, or it can be done in conjunction with pavement preservation.	$5,000	$8,000
Separated Two-way Bike Lane	E. Babcock St	S. Grand Ave	S. Wallace Ave	2,964	Short term: provide shared lane markings in both travel lanes. Mid-term: remove northern parking lane and provide a separated two-way bike lane (cycle track) on the north side of the street. This side generally has less existing parking and better aligns with best practice. This route will be the primary bicycle east-west connector through downtown. Maintain two lanes of one-way travel.	$53,000	$282,000
Bicycle Boulevard	Grand Ave	W. Tamarack St	S. 3rd Ave	10,331	Pavement quality poor from College Street to Babcock Street. Has bike route signs, needs shared lane markings, improved wayfinding and intersection modifications (see spot improvements).	$34,000	

Project Type	Street	From	To	Length (ft)	Comments	Cost (Low)	Cost (High)
Bicycle Boulevard	Black Ave	W. Tamarack St	Private St	12,624	Creates a longer north south route using the Gallagator Trail and Sourdough Trail. Currently has shared lane markings and some signage.	$42,000	
Bicycle Boulevard	Lamme St	N. 11th Ave	N. Broadway Ave	7,331	Already has shared lane markings and bike route signs. Needs some intersection treatments (see spot improvements) and improved wayfinding.	$25,000	
Bicycle Boulevard	S. 15th Ave	Durston Rd	Goldstein Ln	18,654	Connection would provide critical north-south route west of 11th Avenue. Future improvements would need to allow bike/ped access from Babcock Street to Main Street. On south side, will connect to trails that have neighborhood connections. Will need coordination with Kagy Boulevard project design.	$62,000	
Bicycle Boulevard	Koch St	S. 23rd Ave	S. Church Ave	10,092	Sharrows and bike route signs are present. The signal at S. 19th Avenue makes this an important connection for bicyclists and pedestrians. Volumes have been recorded higher than desired just east of S. 19th Avenue at 3,700 vehicles per day.	$34,000	
Bicycle Boulevard	Annie St		Stoneridge Dr	18,535	Still has some gaps, however as streets continue to develop, this route will be an important east-west corridor in Valley West. Volumes should be monitored. Some signage may exist, requires improved signage, wayfinding, shared lane markings and minor intersection treatments.	$61,000	
Bicycle Boulevard	Beal St	N. 25th Ave	N. 11th Ave	5,048	Interrupted at Bozeman High School, however extents the Lamme Street Bicycle Boulevard. The signal at N. 19th Avenue is the key element. Requires shared lane markings, and wayfinding signage. Work with High School to formalize a signed route through campus. Many residents currently use this route now.	$17,000	
Bicycle Boulevard	N. 25th Ave	W. Oak St	W. Babcock St	5,410	Connects Babcock Street to Oak Street; also links Emily Dickinson School and takes advantage of improved crossing at Durston Road. Will require shared lane markings and wayfinding signage.	$18,000	
Bicycle Boulevard	Cascade / Mendenhall	Cottonwood Rd	N. 25th Ave	9,405	This could be one of the most important east-west routes as it ultimately feeds into downtown and avoids the busiest of N. 19th Avenue for a crossing. At Valley Drive, there is a Gallatin County inholding, which has two existing street rights of way that do not currently connect (Bitterroot Way and Mendenhall St). If streets are not likely to extend, short shared use paths could make the connection through the street easements.	$31,000	
Bicycle Boulevard	Yellowstone Ave	W. Oak St	Valley Commons Dr	7,733	North / south on-street bikeway to complement trail access.	$26,000	

Project Type	Street	From	To	Length (ft)	Comments	Cost (Low)	Cost (High)
Bicycle Boulevard	Broadway / Peach / Tamarack	N. Rouse Ave	E. Main St	5,123	Provides alternative north-south travel to Wallace, which has more vehicle traffic. Also lines up with new signal at Broadway and Main, including a future shared-use path connector to the Gallagator Trail. This will be the primary route for users to connect from the Story Mill Spur to the Gallagator Trail.	$17,000	
Bicycle Boulevard	Garfield St	S. 6th Ave	S. Black Ave	2,507	Connects MSU Centennial Mall and Garfield Street route to the west with the Gallagator Trail. Requires signing and striping only.	$9,000	
Bicycle Boulevard	N. 20th Ave	N. 22nd Ave	W. Main St	3,520	Provides alternative route to N. 19th Avenue through constrained corridor. Shared use path along W. Main Street needed to connect to W. Babcock Street.	$12,000	
Bicycle Boulevard	Juniper St / Stevens St / Windsor St	Annie St	W. Tamarack St	5,764	Conceptual bicycle boulevard corridor that could be a very important east/west connector. Would require the opportunity to connect Juniper Street with Stevens Street which is unlikely in the short term. Also would require development of vacant land west of N. 7th Avenue and a crossing improvement or grade separated crossing of N. 19th Avenue.	$19,000	
Shared Roadway	S. 12th Ave	W. Garfield St	W. Grant St	974	Short term: Add shared lane markings and bicycle route signage. Mid-term: Street is constructed as a plaza shared street or if reconstructed to a street standard, provide full buffered bike lane.	$1,000	$4,000
Shared Roadway	W. Harrison St	S. 11th Ave	S. 8th Ave	1,006	The presence of angled parking, residence halls, and this street being a gap between bike lanes on S. 11th Avenue and S. 8th Avenue indicates a need to install shared lane markings. Recommend every 100 feet due to the intensity of use.	$1,000	$4,000
Shared Roadway	W. Babcock St	S. 11th Ave	S. Grand Ave	2,982	Requires sharrows to provide eastbound bicycle treatment to match Mendenhall Street.	$3,000	$10,000
Shared Roadway	S. 8th Ave	W. Harrison St	W. Cleveland Ave	348	Median was constructed too narrow to allow for full bike lanes. Shared lane markings should be Installed to provide route continuity.	$1,000	$2,000
Shared Use Path	S. 7th Ave	W. Kagy Blvd	Westridge Cut Through	1,634	MSU Campus Project. This section of S. 7th Avenue is a key linkage for neighborhoods to the south utilizing the Gallagator Trail to access campus. Currently there is no sidewalk or bicycle facilities. A 10' shared use path on the east side of S. 7th Avenue would align with the trail connection. The RRFB or underpass at Kagy Boulevard may influence the location of the path to the east.	$148,000	$156,000

Project Type	Street	From	To	Length (ft)	Comments	Cost (Low)	Cost (High)
Shared Use Path	Campus Shared Use Path	S. 7th Ave	W. Kagy Ave	1,355	MSU Campus Project. Would provide a shortcut to people accessing campus from Kagy Boulevard.	$109,000	$129,000
Shared Use Path	S. 7th Ave	W. Grant St	W. Kagy Ave	1,697	MSU Campus Project. 14' wide shared use pathway with grade separated crossing at Kagy Boulevard. Connect to Gallagator Trail south of Museum of Rockies. The east side currently has fewer driveway openings and vehicular conflicts and should continue to be so even after the addition of the parking garage. Shared use paths are desirable on both sides of the street.	$153,000	$162,000
Shared Use Path	Gallagator Extension	W. Kagy Blvd	Gallagator Trail	1,437	This is a crucial missing link for the Bozeman trail system, creating a sizeable gap in the Gallagator Trail. The former rail bed is on Museum of the Rockies (MOR) property. Efforts by the city and other groups have been unsuccessful due to concerns with the living history display. This can be effectively mitigated though design. This particular segment may not have a significant role in campus transportation, however its importance is still significant. This is estimated to be a longer term project coordinated with redevelopment of the MOR.	$115,000	$137,000
Shared Use Path	Campus Shared Use Path	W. College St	S. 12th Ave	1,631	MSU Campus Project. As proposed in the Long Range Campus Development Plan (LRCDP)	$131,000	$155,000
Shared Use Path	S. 19th Ave	Region 3 HQ's	W Kagy Blvd	1,844	Reconstruct existing sidewalk to shared use path width to extend existing shared use path.	$166,000	$176,000
Shared Use Path	Lincoln St	S. 19th Ave	S. 11th Ave	2,649	MSU Campus Project. 12-14' Shared Use Pathway to connect S. 19th Ave and also the F lot where some vehicle commuters in this remote lot would benefit from a better route to campus.	$239,000	$252,000
Shared Use Path	S. 11th Ave	W. Grant St	W. Kagy Blvd	1,704	MSU Campus Project. Widen sidewalk to 10'-12' shared use path standard. Provide bike lane transitions at Lincoln Street and Kagy Boulevard.	$154,000	$162,000
Shared Use Path	S. 8th Ave	W. Harrison St	W. Cleveland St	336	Widen sidewalk on west side to shared use path standard, or construct new pathway parallel to it in conjunction with new building development. Provide bike lane transitions at W Harrison Street.	$31,000	$32,000
Shared Use Path	Westside Greenway	Trout Meadows Rd	Huffine Ln	19,487	This project would improve existing segments of trail, re-routes and new segments to create a continuous 10-foot minimum paved north-south shared use path. This path would be plowed in the winter and make bicycle use for transportation more feasible for a larger number of Valley West residents. The route depicted is conceptual where no existing path is present.	$1,559,000	$1,852,000
Shared Use Path	Gallagator Trail	S Church Ave	Goldenstein Ln	16,026	This project seeks to pave the unpaved portions of the Gallagator Trail. Advantages would include winter maintenance and a more reliable experience year-round.	$1,283,000	$1,523,000

Project Type	Street	From	To	Length (ft)	Comments	Cost (Low)	Cost (High)
Shared Use Path	Story Mill Spur	Bridge Dr	"L" St	5,292	This project would pave the Story Mill Spur, develop the trail over the existing rail bed, abandoned bridges, etc. Maintain unpaved trail for runners or others that prefer soft surface. This shared use path will connect with the M-Trail and the Oak Street shared use path.	$424,000	$636,000
Shared Use Path	Oak St Extension	N. Rouse Ave	"L" St	1,270	Utilizing City right-of-way, connect the Oak Street and Story Mill Spur shared use paths.	$127,000	$188,000
Shared Use Path	Oak St Extension	N. 12th Ave	N. 7th Ave	2,392	Connects existing sections of shared use path and replaces some existing sidewalk.	$216,000	$228,000
Shared Use Path	N. 11th Ave	N. 11th Ave	W. Oak St	1,025	As called for in the PROST Plan. Parts of alignment have been implemented.	$82,000	$123,000
Shared Use Path	Tschache Ln	Davis Ln	N. 27th Ave	2,721	Improve east-west connection and legibility. Ideally a wide shared use path would be continued to the west linking other north-south facilities.	$245,000	$259,000
Shared Use Path	Story Hill Rail Trail	Story Mill Spur	N. Broadway Ave	8,990	Project would involve property acquisition and the restoration of several significant bridge structures, but would create a continuous trail connection from south Bozeman to the M trailhead with no on-street segments.	$830,000	$875,000
Shared Use Path	Huffine Ln	Willow Peak Dr	Cottonwood Rd	7,863	Provide shared use path to Four Corners (mileage is to study area boundary only).	$630,000	$944,000
Shared Use Path	Springhill Rd	Sypes Canyon Rd	I-90 Frontage Rd	7,884	Path linking Frontage Road with Sypes Canyon Road. Could also connect to conceptual path to Story Mill/Bridger Drive.	$631,000	$947,000
Shared Use Path	Fowler Ave	W. Babcock St	Bozeman Ponds Park	809	Extend through the Bozeman Ponds Park to Babcock Street.	$65,000	$98,000
Shared Use Path	Kimberwicke St	Harper Puckett Rd	Gallatin Green Blvd	3,197	As recommended in PROST Plan.	$256,000	$384,000
Shared Use Path	Springhill to Story Mill Rd	Springhill Rd	Story Mill Rd	19,420	Conceptual project improves existing natural surface trails, utilizes PROST Plan recommendations and new proposed trail to create continuous route from Springhill Road to Story Mill Road. Alignment has high transportation and recreation potential.	$1,554,000	$2,331,000
Shared Use Path	Gallagator Extension	Cambridge Dr	Goldenstein Ln	3,925	Extend Gallagator Trail to the south.	$314,000	$471,000
Shared Use Path	Huffine Ln	Rowland Rd	Advance Dr	6,626	Provide shared use path to Four Corners.	$531,000	$796,000
Shared Use Path	Abandoned RR alignment	Front St	L St	2,646	As proposed in PROST Plan, likely only if railroad area redevelops and there is no freight service.	$212,000	$318,000

Project Type	Street	From	To	Length (ft)	Comments	Cost (Low)	Cost (High)
Shared Use Path	S. 19th Ave	W. Kagy Blvd	Nash Rd	19,898	As recommended in the Bozeman Area Alternative Transportation Study and PROST Plan. Full extents go to Hyalite Canyon Road.	$1,592,000	$2,388,000
Shared Use Path	Valley Center Rd (west)	Catamount St	Catron St	494	Completes connection between exiting Valley Center Road paths and N. 19th Avenue.	$40,000	$60,000
Shared Use Path	Valley Center Rd (east)	Catron St	N. 19th Ave	428	Completes connection between exiting Valley Center Road paths and N. 19th Avenue.	$35,000	$52,000
Shared Use Path	Valley Center Rd (west)	Catron St	N. 19th Ave	290	Completes connection between exiting Valley Center Road paths and N. 19th Avenue.	$24,000	$35,000
Shared Use Path	S. 3rd Ave	Goldstein Ln	Nash Rd	10,566	Could extend Gallagator Trail to Nash Road, this was also proposed in the Bozeman Area Alternative Transportation Study.	$846,000	$1,268,000
Shared Use Path	W. Main St	W. Babcock St	N. 20th Ave	617	12 foot wide sidewalk to facilitate connections between bikeways that provide alternatives to Main Street and N. 19th Avenue.	$68,000	$68,000
Shared Use Path	Sidewalk	S. 23rd Ave	W. Babcock St	249	12 foot wide sidewalk to facilitate connections between bikeways that provide alternatives to W. Main St and N. 19th Avenue.	$28,000	$28,000
Shared Use Path	Gallagator Connector	Gallagator Linear Trail	Golf Way	1,452	Formalizes a commuter route that is maintainable in the winter months.	$117,000	$175,000
Shared Use Path	Frontage Road	I-90 WB on- & off-ramp	Study Area Boundary; ~2,750 ft west of Coulee Dr	26,400	Shared use path contained in 2007 PROST Plan; has robust public support. Locate to the north of existing Frontage Road and east of N. 7th Avenue. Only includes portion of path between Bozeman (I-90) and TMP study area boundary (~5 miles in length). Approximately 4 miles remaining from TMP study area boundary to downtown Belgrade.	$2,508,000	$2,904,000
Shared Use Path	Lincoln St	S. Willson Ave	S. 7th Ave	1,930	Trail would use utility easement to connect Gallagator Trail to MSU. May require redevelopment of MSU property just east of S. 7th Avenue.	$155,000	$184,000
Shared Use Path	N. 5th Ave	W. Oak St	W. Tamarack St	1,692	To be developed within the N. 5th Avenue right-of-way.	$136,000	$161,000
Shared Use Path	N. 8th Ave	Just south of W. Birch St	W. Durston St	1,968	To be added into the N. 8th Avenue right-of-way.	$158,000	$187,000
Shared Use Path	W. Aspen St	N. 8th Ave	N. 7th Ave	372	To be added within the Aspen St right-of-way.	$30,000	$45,000

5.2. Downtown Bozeman Bicycle Recommendations

Downtown Bozeman is a challenging environment for the provision of dedicated bikeways. Main, Mendenhall, Babcock, Olive and Lamme Streets all act as the primary east-west corridors. While Lamme Street lends itself to a bicycle boulevard, Olive Street exhibits higher speed and volume. Mendenhall and Babcock are both one-way streets with minimal additional space for bike lanes other than absolute minimum parking lanes, travel lanes and bike lanes (this configuration was voted down by the Bozeman Area Bicycle Advisory Board when

Mendenhall Street was reconstructed in 2014). Main Street is incompatible with bike lanes in its current 4-lane configuration. Additionally, even if Main Street were converted to a 3-lane configuration, bike lanes would likely be feasible only in the door zone of short term vehicle parking. The cumulative effect of these facts results in the conclusion that providing dedicated space for bicycle travel in Downtown Bozeman is extremely difficult without creating additional space through parking removal. This plan does propose a two-way separated bikeway on the north side of Babcock Street from Grand Avenue to Wallace Avenue. For this stretch of Babcock Street, parking is currently restricted for a portion of the frontage due to sight restrictions with driveways and cross-streets. Parking removal would be a requirement for implementation of this project and this would require political support or timing with another source of new parking such as a second parking garage on the south side of Downtown.

An increased bicycle parking supply is recommended for Downtown. Both through the provision of at least two additional seasonal on-street parking corrals and for an increase in the number of racks placed in the furnishing zones of the Downtown Streets. Partnerships with existing and new businesses should be sought to locate additional parking in alleys or on private property for employee parking to preserve street parking for patrons. One car parking space can park the equivalent of 14 bicycles if configured properly.

5.3. Enhanced Bicycle Wayfinding System

The Gallatin Valley Land Trust (GVLT) has implemented a trail wayfinding system that includes over 600 signs. In 2005, the City of Bozeman installed on-street bicycle route signs that featured limited wayfinding elements such as 'Trails', 'Downtown', or 'MSU' as destinations. With the recommended bicycle boulevard system it is recommended that a comprehensive bicycle wayfinding system be created to upgrade and replace the existing bicycle route sign system. New signs should feature three destinations per sign, distance information and travel time. Signs could complement the existing 'City of Bozeman Bike Route' signs or be of a new enhanced design. Destinations should be identified, categorized and programmed onto a system of signs throughout the on-street network of bikeways.

Existing sign in Bozeman and enhanced example from Jackson, WY

5.4. Shared Use Path Maintenance

The vast majority of Bozeman's paved shared use paths have never been structurally maintained since construction. Maintenance activities can generally be categorized into one of two types; 'routine maintenance' which is done annually or more frequently, and 'major' or 'capital maintenance' which involves more intensive activity at a less than annual frequency. A robust routine maintenance program may include sweeping, trash removal, mowing, tree trimming, weed abatement, snow removal, restroom maintenance, and sign replacement. However, it should be noted that each segment of shared use path in Bozeman will have different needs and levels of expenditure due to its setting and amenities. It is estimated that for routine maintenance approximately $1,000 to $1,500 should be budgeted annually per mile of trail.

Generally the City and GVLT have kept up adequate routine maintenance. Bozeman Parks and Recreation is now conducting snow removal on all of the city's paved shared use paths.

5.4.1. Capital Maintenance

Major or capital maintenance activities typically involve more intensive maintenance repairs such as pavement seal coating, pavement overlays, pavement reconstruction or other structural rehabilitations. Any paved trail surface will deteriorate over time with asphalt surfaces dropping in quality rapidly after 10 years. Preservation efforts such as seal coating extend the life of asphalt efficiently and at a lower cost than waiting for the surface to fail requiring expensive reconstruction. Maintenance activities vary considerably around the country and different approaches and pavement preservation intervals could be considered.

Financial planning for trail maintenance can be challenging to budget for. Typically trails require greater capital maintenance activities with age and ultimately require full reconstruction at some point. Some jurisdictions focus on eventual reconstruction and treat this as a maintenance item to be budgeted for, whereas some treat this as a separate capital project to be considered in the future.

Recent Jackson Hole Community Pathway maintenance costs have contracted seal coating of the pathways at approximately $9,000 per mile which averages (on a 5-year seal coat cycle) approximately $1,800 per year, per mile of path annually. This experience provides a valuable benchmark for Bozeman and if a similar program were to be budgeted the city would need to perform approximately $30,000 in shared use path surfacing annually, increasing over time as the system mileage increases.

5.4.2. Shared Use Path Surfacing

Due to the expensive burden of ongoing capital maintenance to asphalt paths, it is recommended that wherever possible Bozeman adopt a concrete surface standard for future shared use paths. Concrete does not require seal coats, or resurfacing of any kind and lasts considerably longer resulting in a lower life-cycle cost for the City. A new City standard detail should be created that incorporates expansion joints every 100 feet, with saw-cut intermediate joints every 10 feet for path smoothness and snow removal.

Concrete shared use path with saw cut joints in Billings, MT