Missoula County - City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION
Phone (406) 552-6670 / Fax (406) 552-6053
www.ci.missoula.mt.ust/transportation

TRANSPORTATION POLICY COORDINATING COMMITTEE (TPCC)
AGENDA

Date: November 17, 2020, 1:30 PM

Location: ZOOM Webinar

Voting members: Mirtha Becerra, City Council (vice-chair), John Engen, Mayor, Don MacArthur, MUTD, Lucia Olivera, Josh Slotnick, Missoula Co. Commissioner, Dave Strohmaier, Missoula Co. Commissioner (chair), Bob Vosen, MDT-Missoula

Non-voting members: Debbie Johnston, MCCHD

Attend by computer:
Join the meeting
Attend by phone:
Cell phone users: 1-253-215-8782, 1-213-338-8477, or 1-267-831-0333; Landline users: 1-888-475-4499 or 1-877-853-5257
Webinar ID: 891 3735 3256
Password: 752176, Press *9 to raise your hand to be recognized for public comment, *6 to mute and unmute
Watch the meeting:
Web stream (live or on demand), YouTube, or Spectrum Cable Channel 190

For more ways to watch the meeting and submit public comment, see the Citizen Participation Guide.
Issues? Call the City Clerk 406-552-6078

5. Old Business

6. Announcements and Closing Comments

7. Adjournment

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Transportation Policy Coordinating Committee Minutes

October 20, 2020, 1:30 PM
Live Stream and On Demand: http://www.ci.missoula.mt.us/webcasts
Watch Live on Cable TV Channel 190
YouTube Live Stream and On Demand:
https://www.youtube.com/channel/UC5fnfMPFGSk8Gwq6F5UoqGg
Live call in phone numbers: 1 (253) 215-8782 1 (888) 475-4499 (landlines only) Meeting ID: 960 049 3694

Voting members present: Mirtha Becerra, City Council (vice-chair), Peter Bensen Planning Board, John Engen, Mayor, Don MacArthur, MUTD, Lucia Olivera, Josh Slotnick, Missoula Co. Commissioner, Dave Strohmaier, Missoula Co. Commissioner (chair), Bob Vosen, MDT-Missoula

Non-Voter(s) present: Debbie Johnston, MCCHD

1. Roll Call and Introduction of Audience

Dave Strohmaier called the meeting to order at 1:31 PM.

2. Approval of Minutes

The minutes were approved as submitted.

3. Public Comment

There was no public comment.

4. New Business

4.1 Update on the Long Range Transportation Plan scenario development and metrics (Aaron Wilson/Jennifer Wieland)

Aaron Wilson, and Jennifer Wieland presented on update on the Long Range Transportation Plan (LRTP) Scenario development and metrics. For details please find presentation available online.
Aaron Wilson, City of Missoula, emphasized the need to link transportation and land use because they have an impact on each other.
A committee member commented that the enhanced connection is inspiring. The level of connectivity it provides will serve Missoula in the future.
Jennifer Wieland, Nelson/ Nygaard consulting, clarified which LRTP projects have

overlap between scenarios. For example, Brooks Street is a complete street and it overlaps different scenarios. For now, the list of overlapping projects is provided but an illustrative map of these projects does not exist yet.
Ms. Wieland clarified that cost constraint was used when developing scenarios. As projects are being evaluated, she recommended considering cost/benefit. As the projects are going to be evaluated and more refined, there will be benefit cost done.
Mr. Wilson explained the maintenance cost in the plan. He stated that because of a conservative projection in available revenue, we are not considering federal funding. A large part of the gas tax goes toward roadway maintenance. A Montana Department of Transportation representative added that their first focus is maintaining; they recommend considering maintenance cost in future analysis. Mr. Wilson added that the city is also interested in comparing different growth scenarios in terms of cost and revenue.
A committee member showed support of strategic growth. He added that instead of responding to arising needs, there is merit in focusing on strategic growth. The committee recommended considering possible growth even if it does not happen.
Ms. Weiland mentioned that the goals will be measured against a handful of metrics. They are measured against metrics such as safety, transit, vehicle miles traveled etc.
Aaron Wilson clarified that existing development, including Community Hospital, Big Sky High School, and all the future growth thirty years from now is projected in the land use growth scenarios. The memo model describes how jobs are forecasted in 2050. The jobs are allocated based on underlying land use.
Mr. Wilson pointed out that improved transportation and walkable routes will benefit even the out of town residents in not having to rent a car when they are in Missoula.
Ms. Weiland clarified that part of the equity analysis may not directly address the housing equity in the city. However, the county and the city as a whole can benefit from it.

5. Old Business

None

6. Announcements and Closing Comments

1. Around five hundred people participated in the Passenger rail summit last month. The recording of it is available at https://montanapassengerrailsummit.org.
2. A committee member brought up Smart America Champions institute. Strategies can be learned from them for non-motorized transportation projects.
3. Announcement: There will be a public meeting for the East Missoula Highway 200 Corridor Study online on October 22nd, 7pm. Public can register on the Metropolitan Planning Organization's website: www.missoulampo.org.

7. Adjournment

Dave Strohmaier adjourned the meeting at 3:00 PM.

Missoula County – City of Missoula
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Appendix J

DATE: November 12, 2020
SUBJECT: 2016 Long Range Transportation Plan Amendment #5

Background

Project 15 – Intersection improvements at W. Broadway and Mary Jane Blvd
This amendment categorizes the project from Illustrative to Committed and eliminates the left-hand turn at Flynn Lane and W. Broadway. Providing a signalized intersection at W. Broadway and Mary Jane Blvd. effectively reduces traffic pressure of off Flynn Lane which would be reclassified as a local street.

MDT, City of Missoula, and Missoula County are collaborating to complete an intersection project at the intersection of Mary Jane and Broadway. Initially MDT, the city, and county had agreed to work towards the transfer of HSIP funding directly to the BUILD project. However, the proposal to transfer funding to the BUILD project from HSIP was prohibited. Additionally, when reviewing schedules, it was learned that if a signal was going to be constructed in conjunction with the BUILD project, that steps would need to be taken immediately in order to coordinate construction schedules. The first step in the process is to have the project listed in the Missoula TIP and recategorize Project #15 to the Committed Project list from the Illustrative Project list in the 2016 LRTP.

The project scope includes installation of a signal at the future Broadway (N-132E) and Mary Jane intersection along with the reconfiguration of the existing Broadway and Flynn Lane intersection to eliminate the left turn from Flynn to westbound Broadway. Providing a signalized intersection at W. Broadway and Mary Jane Blvd. effectively reduces traffic pressure of off Flynn Lane which would be reclassified as a local street. Although initial design concepts for the BUILD grant recommended a roundabout at this location, separation of the HSIP funding from the rest of the BUILD package increased the likelihood (or risk) that the two projects would not be delivered to construction simultaneously. Imminent development (Including a VA Hospital) is necessitating intersection access be available by November 1 2021. Construction phasing between the BUILD and Intersection Improvement Project is much more effective and possible with a signal intersection. While the roundabout intersection was initially recommended, the signal intersection was also acceptable and operated at high levels of service as well. For these reasons the signal intersection is now the selected design option.

Long Range Plan Amendment
The Long Range Plan is amended to include Project 15 – Intersection improvements at W. Broadway and Mary Jane Blvd in the "Committed" project list (Table 1). This amendment serves as an update to Appendix B and all additional tables and references in the 2016 Long Range Transportation Plan that are affected by the amended project.

Table 1 – Amended Committed Roadway Projects in Appendix B

2016 Status	ID	Score	PROJECT	Agency	Funding Source	Total Cost ($) Current Year	Cost ($) Future Year	2016-2020 State/Local	2016-2020 Federal	2021-2030 State/Local	2021-2030 Federal	2031-2045 State/Local	2031-2045 Federal
Committed Projects	7	N/A	Russell Street and Bridge Reconstruction (Broadway to Dakota)	MDT/City	STPU, BR, EARMARK	$36,750,900	$36,750,900	$4,931,973	$31,818,975				
	11	N/A	2nd half of Russell Street (Dakota to Mount Avenue)	MDT/City	STPU	$19,640,309	$19,640,309	$208,200	$1,343,000	$2,427,558	$15,661,551		
	30	N/A	Street Improvements: Wyoming (California to Russell)	City	Local	$200,000	$200,000	$200,000					
	37	N/A	Bitterroot River - W of Missoula (South Ave Bridge - MacClay Bridge)	County	BR	$10,900,000	$9,657,980	$110,700	$714,300	$1,185,386	$7,647,594	$577,285	$3,724,388
	39	N/A	US 93: North of Desmet Interchange - North	MDT	NH	$8,414,800	$8,414,800	$1,129,300	$7,285,500				
	40	N/A	I-90: Missoula - East and West (Van Buran St, $5,821,000 interchange)	MDT	IM	$8,918,200	$10,838,400	$949,400	$9,889,000				
	40.5	N/A	I-90: Missoula - East and West (Orange Street, $1,969,000 interchange)	MDT	IM	$3,925,800	$3,932,700	$344,500	$3,588,200				
	49	N/A	Street Improvements: California (River Road to Dakota)	City	Local	$400,000	$400,000	$400,000					
	54	N/A	Van Buren Street Reconstruction (Elm to Missoula Ave)	City	Local	$345,000	$345,000	$345,000					
	122	N/A	Grant Creek Road right lane addition at I-90	MDT/City	IM, Local funds	$604,200	$604,200	$235,400	$368,800				
	131	N/A	Huson - East	MDT	STPS	$3,271,300	$3,271,300	$439,000	$2,832,300				
	347	N/A	Higgins Avenue Bridge Improvements - UPN 8807	City/MDT	BR	$11,219,200	$11,219,200	$1,505,600	$9,713,600				
	485	N/A	Intersection improvements - MT 200 and Old Hwy 10	MDT	NH	$1,153,600	$1,153,600	$154,800	$998,800				
	511	N/A	Madison Street Bridge Improvements - UPN 8806	MDT	BR	$8,931,900	$8,932,000	$1,198,700	$7,733,300				
	538	N/A	connector.	City	MRA	$2,500,000	$2,500,000	$2,500,000					
	537	N/A	I-90 Bridge replacement - Bonner	MDT	IM	$20,027,800	$22,741,200	$1,992,100	$20,749,100				
		N/A	Placeholder for future IM projects	MDT	IM	$24,084,053	$24,084,053			$796,252	$8,293,383	$1,313,511	$13,680,907
		N/A	Placeholder for future NH projects	MDT	NH	$9,954,825	$9,954,825			$329,120	$3,427,960	$542,922	$5,654,822
		N/A	Placeholder for future STPX/STPS/SFCN projects	MDT	STPX/STPS/SFCN	$37,914,836	$37,914,836			$1,920,342	$12,389,210	$3,167,829	$20,437,454
		N/A	Placeholder for future BR projects	MDT	BR	$10,269,362	$10,269,362					$1,378,148	$8,891,214
	36	#N/A	BUILD GRANT - Wye/Mullan Plan Collector Routes	y	BUILD	$15,600,000	$15,600,000			$2,600,000	$13,000,000		
	15	#N/A	Intersection Improvements: W. Broadway & Mary Jane	MDT/City	HSIP	$700,756							
Recommended Projects	528	132	Brooks St. (Reserve to Paxson) complete street	City	MRA	$2,200,000	$2,923,751			$2,923,751			
	158	128	Complete Street Improvements: South Ave. (Reserve to 36th) including intersection improvements at Old Fort and South Ave	City	Local	$4,660,000	$4,660,000	$4,660,000					
	394	118.5	East Missoula - Highway 200 complete street reconstruction	County	STPU	$1,835,000	$3,544,792					$475,711	$3,069,081
	469	113	Reconfigure Broadway within existing ROW - Orange St. to Madison, as per the Downtown Master Plan	City	MRA	$2,500,000	$3,322,445			$3,322,445			
	152	104.5	Front/Main conversion to 2-way streets	City	MRA	$5,000,000	$6,644,889			$6,644,889			
	154	103.5	Street Improvements: 3rd (Reserve to Hiberta)	y	STPU	$1,400,000	$2,704,474					$362,940	$2,341,533
	397	98	Reconstruct Curtis St to make it a complete street	City	Local	$770,000	$1,023,313			$1,023,313			
	398	93.5	Reconstruct River Road from Russell to Reserve as a complete street	City	Local	$1,210,000	$1,608,063			$1,608,063			
	14	93	Higgins Avenue: 3-Lane conversion from Brooks Street to Broadway as detailed in the Downtown Master Plan (excluding bridge)	City	Local	$2,500,000	$3,322,445			$3,322,445			
	370	88.5	Brooks	City	Local	$2,500,000	$4,829,417					$4,829,417	
	155	88	Street Improvements: California (3rd to Dakota)	City	MRA	$1,000,000	$1,931,767					$1,931,767	
	336	87.5	Johnson Street: Extend from South Avenue to Brooks Street	City	MRA	$2,500,000	$2,549,932					$2,549,932	
	379	83.5	Carousel Drive reconfiguration	City	Local	$500,000	$965,883					$965,883	
	420	83.5	Intersection improvement at Mullan Rd & Mary Jane Blvd		Local	$100,000	$193,177					$193,177	
	132	73.5	Intersection Improvements: Bancroft/South Ave	City	Local	$300,000	$579,530					$579,530	
	468	67.5	Brooks St. (Stephens to Mount) reconstruct to complete street	City	MRA	$500,000	$965,883					$965,883	
	421	66	Intersection improvement at Higgins Ave & Pattee Creek Rd	City	Local	$100,000	$193,177					$193,177	
	126	65	Intersection Improvements: W. Broadway& George Elmer	MDT/City	Local	$500,000	$965,883					$965,883	
	422	63.5	Intersection Improvements at Gharrett St & 39th St	City	Local	$100,000	$193,177					$193,177	
	147	63	Intersection Improvements: Arthur & South	City	Local	$300,000	$579,530					$579,530	
					Totals	**$394,174,340**	**$282,126,192**	**$21,304,673**	**$97,034,875**	**$28,103,564**	**$60,419,698**	**$21,765,703**	**$57,799,399**
					Federal		**$215,253,973**						
					State/Local		**$71,173,940**						
					Rec & Illustr	$158,447,500							

Air Quality Conformity

The 2016 LRTP air quality conformity analysis remains valid and no further air quality analysis is necessary/required. The project will not affect overall VMT, and will enhance operational flow of vehicles at the new Mary Jane Boulevard and existing Flynn Lane intersections. In coordination with the BUILD project, currently funded in the Long Range Transportation Plan and Transportation Improvement Program, will effectively reduce travel distance and times by enhancing network connectivity. The proposed signal will facilitate traffic as analyzed in LRTP Amendment #4, and was in fact included in the that project analysis at the time it was completed.

Fiscal Constraint

The amended “committed” projects are fully funded through the funding sources indicated in Appendix G. The BUILD Grant funding is a competitive grant program managed by the Montana Department of Transportation, and will increase the funding received by the MPO by the amount of the estimated project costs.

Missoula County – City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

To: **TPCC**

From: **Jon Sand, Transportation Planner**

Date: **November 12, 2020**

Re: **Proposed 2016 Long-Range Transportation Plan Amendment #5**

Purpose

The purpose of this memo is for the TPCC to consider the proposed Amendment #5 to the 2016 Long-Range Transportation Plan (LRTP). The proposed amendment would include the following change:

- Recategorize project #15 – Intersection improvements at W. Broadway and Mary Jane Blvd to the Committed Project list from the Illustrative Project list. Funding for the project would be provided through the Highway Safety Improvement Program (HSIP). The total estimated project costs are $12,791 for PE, $677,965 for CN (including CE), and $12,791 for IC.

Background

MDT, City of Missoula, and Missoula County are collaborating to complete an intersection project at the intersection of Mary Jane and Broadway. Initially MDT, the city, and county had agreed to work towards the transfer of HSIP funding directly to the BUILD project. However, the proposal to transfer funding to the BUILD project from HSIP was prohibited. Additionally, when reviewing schedules, it was learned that if a signal was going to be constructed in conjunction with the BUILD project, that steps would need to be taken immediately in order to coordinate construction schedules. The first step in the process is to have the project listed in the Missoula TIP and recategorize Project #15 to the Committed Project list from the Illustrative Project list in the 2016 LRTP.

The project scope includes installation of a signal at the future Broadway (N-132E) and Mary Jane intersection along with the reconfiguration of the existing Broadway and Flynn Lane intersection to eliminate the left turn from Flynn to westbound Broadway. Providing a signalized intersection at W. Broadway and Mary Jane Blvd. effectively reduces traffic pressure of off Flynn Lane which would be reclassified as a local street. Although initial design concepts for the BUILD grant recommended a roundabout at this location, separation of the HSIP funding from the rest of the BUILD package increased the likelihood (or risk) that the two projects would not be delivered to construction simultaneously. Imminent development (Including a VA Hospital) is necessitating intersection access be available by November 1 2021. Construction phasing between the BUILD and Intersection Improvement Project is much more effective and possible with a signal intersection. While the roundabout intersection was initially recommended, the signal intersection was also acceptable and operated at high levels of service as well. For these reasons the signal intersection is now the selected design option.

If approved, the project is proposed to be included in the FY 2020-2024 Transportation Improvement Program, with anticipated preliminary engineering and construction in FY 2021.

Options

TPCC should consider the following options:

Option 1: Recommend that the TPCC approve Amendment #5 to the 2016 LRTP as proposed.

To: **TPCC**

From: **Jon Sand, Transportation Planner**

Date: **November 12, 2020**

Re: **Proposed 2016 Long-Range Transportation Plan Amendment #5**

Option 2: Do not recommend that the TPCC approve Amendment #5 to the 2016 LRTP and direct staff as necessary.

Recommendation
Staff recommends Option 1

Missoula
TRANSPORTATION IMPROVEMENT PROGRAM
(TIP)

Federal Fiscal Years
2020 – 2024

Prepared by:

Missoula Metropolitan Planning Organization in cooperation with
City of Missoula, Montana
County of Missoula, Montana
Missoula Urban Transportation District
Montana Department of Transportation
Federal Highway Administration
Federal Transit Administration

Approved by:	Amendment 1:	Amendment 2:
TTAC: August 1, 2019	TTAC: March 5, 2020	
TPCC: August 20, 2019	TPCC: April 28, 2020	
MDT: September 18, 2019	MDT: July 22, 2020	
FHWA: September 17, 2019	FHWA: July 21, 2020	
FTA: September 17, 2019	FTA: July 21, 2020	

The preparation of this report has been financed in part through grant[s] from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 [or Metropolitan Planning Program, Section 104(f)] of Title 23, U.S. Code. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

Table of Contents

Acronyms

BUILD	Better Utilizing Investments to Leverage Development
CMAQ	Congestion Mitigation and Air Quality
CN	Construction
CO	Carbon Monoxide
EPA	Environmental Protection Agency
FAST Act	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FY/FFY	Fiscal Year/Federal Fiscal Year. The local and state government fiscal year runs from July 1 - June 30. The Federal fiscal year runs from October 1 – September 30.
GROWTH	Flexible state CMAQ funds distributed to high growth urban areas
HSIP	Highway Safety Improvement Program
IC	Incidental Construction
IM	Interstate Maintenance, IM is a state sub-allocated program funded by the federal National Highway Performance Program
MACI	Montana Air and Congestion Initiative
MAP-21	Moving Ahead for Progress in the 21st Century Act
MDT	Montana Department of Transportation
MIM	Missoula in Motion
MPO	Metropolitan Planning Organization. The Missoula Transportation Policy Coordinating Committee is the MPO for the Missoula urban area.
MR TMA	Missoula-Ravalli Transportation Management Association
MUTD	Missoula Urban Transportation District, or Mountain Line. Missoula's fixed route bus system.
NAAQS	National Ambient Air Quality Standards
NH	National Highway System, NH is a state sub-allocated program funded by the federal National Highway Performance Program
PE	Preliminary Engineering
PLH	Public Lands Highways
PLHD	Public Land Highways Discretionary Fund
PM_{10}	A federal standard for particulate (10 microns or less in size), i.e., road dust, brake lining and/or wood smoke particles.
$PM_{2.5}$	A federal standard for particulate (2.5 microns or less in size), i.e., road dust, brake lining and/or wood smoke particles.
ROW	Right of Way
RP	Road Reference Post
SAFTEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SFC	State Funded Construction
SRTS	Safe Routes to Schools
SIP	State Implementation Plan. A plan for improving air quality in the State, including the Missoula area.
STIP	State Transportation Improvement Program
STPE	Surface Transportation Program Enhancements
STPP	Surface Transportation Program Primary
STPU	Surface Transportation Program Urban
STPX	Surface Transportation Program Off System

TA	Transportation Alternatives Program
TEA-21	Transportation Efficiency Act for the 21st Century
TCM	Transportation Control Measure
TIP	Transportation Improvement Program. A multi-year program of highway and transit projects on the Federal aid system, which addresses the goals of the long-range plans and lists priority projects and activities for the region.
TPCC	Transportation Policy Coordinating Committee. Together with the TTAC, the transportation planning organization for Federal aid projects in the Missoula urbanized area.
TSP	Total Suspended Particulate
TTAC	Transportation Technical Advisory Committee. Together with the TPCC, the transportation planning organization for Federal aid projects in the Missoula urbanized area. The TTAC recommends projects to the TPCC for review and approval.
UHPIP	Urban Highway Pilot Improvement Program
UPP	Urban Pavement Preservation

Introduction

FAST Act

The Fixing America's Surface Transportation (FAST) Act was passed by Congress on December 3 and signed by President Barack Obama on December 4, 2015, authorizing funding for Federal transportation programs for the six-year period from 2016-2021. The FAST Act effectively replaces the Moving Ahead for Progress in the 21st Century (MAP-21) Act. MAP-21 authorized the Federal surface transportation programs for highways, highway safety, and transit for the 2-year period FFY 2013-2015. Previously, the Safe, Accountable, Flexible, Efficient Transportation Equity Act, A Legacy for Users (SAFETEA-LU) was adopted as the six-year transportation funding bill in 2005. Like SAFETEA-LU and MAP-21, the FAST Act requires that each Metropolitan Planning Organization (MPO) prepare a financially constrained transportation project programming document called a Transportation Improvement Program (TIP). While the FAST Act may have replaced MAP-21 and SAFETEA-LU in 2015, any previously obligated but unspent funds under the previous acts are still available at this time.

About the Transportation Improvement Program

The TIP is developed in cooperation with local, state and federal agencies. The TIP shows a priority list of projects and project segments to be carried out in each five-year period after the initial adoption of the TIP and a financial plan that demonstrates how the TIP can be implemented. The TIP is required to cover a scope of at least four years and must be updated at least every four years. Missoula updates the TIP annually. The FAST Act legislation currently continues the TIP process, the major focus of which is to enhance participation on the part of the public agencies. The TIP is the incremental implementation (5 years) of the Missoula Long Range Transportation Plan (30 years). The TIP presents manageable components of funding the long-range plan to funding agencies and to the public.

Although the TIP is a multi-year program, it is typically updated annually. Updating the TIP begins with analysis of transportation needs in Missoula and then a recommendation is made by the Transportation Technical Advisory Committee (TTAC), which forwards its recommendations to the Transportation Policy Coordinating Committee (TPCC). The TPCC makes final changes and approves the document at the local level. The TIP may be amended so long as the MPO operates under a SAFETEA-LU compliant long-range transportation plan demonstrating fiscal constraint as per a finding of the responsible federal and state agencies (FHWA, FTA, EPA and MDEQ).

TIP Process and Development

The Missoula Metropolitan Planning Organization prepares the TIP in cooperation with the City and County of Missoula, Missoula Urban Transportation District, Montana Department of Transportation, Federal Highway Administration, Federal Transit Administration, and in a manner consistent with feedback received through public involvement. As federal funding programs under the MPO's control are developed, notifications are sent out to eligible agencies and the public, informing them of the appropriate manner in which projects may be submitted for consideration. In a parallel

process, the State is also required to carry out a public participation process during development and adoption of its programs. The MPO's programs, upon adoption, are submitted for inclusion in the State Transportation Improvement Program (STIP).

In addition to general notifications made through all types of media, the Missoula Metropolitan Planning Organization has an extensive mailing list that contains many interested parties who can review the agenda for any TTAC or TPCC meeting. Interested parties may then determine for themselves if there are any issues upon which they wish to comment.

The projects in this TIP are a subset of the 2016 Missoula Long Range Transportation Plan Update, which was the subject of extensive public review and comment throughout 2016, and

Project Selection

The Missoula Metropolitan Planning Organization has developed a number of tools that can be used to help objectively select transportation projects based on their capacity to support Missoula's overarching goals including, but not limited to, safety, community health and social equity, environmental protection, and economic vitality. These tools include the Bicycle Facilities Master Plan (BFMP) recommendations, the Pedestrian Priority Needs Assessment Map developed for the Pedestrian Facilities Master Plan (PFMP) and the project scoring methodology developed for the 2016 Missoula Long Range Transportation Plan (LRTP). Other factors such as project readiness, funding availability, and political and economic feasibility also contribute to the project selection process.

Amendment Process

An amendment to the Transportation Improvement Program (TIP) is required when: a new project is programed within the 5-year funding window; a programmed project is canceled or postponed; the costs of a particular project change significantly; changes are made to the scope details or description of a project; and/or there is some other change that affects the funding of a project. Amendments are typically brought forward to the MPO by MDT or other eligible project sponsors, and when received they undergo a process similar to the development of the TIP. Amendments are presented to the TTAC, and the TTAC votes on whether or not to recommend that the TPCC approve to adopt the amended TIP. Upon TPCC approval, the amended TIP is sent to the appropriate state and federal agencies for final approval. When the final amended TIP is published all changes to the funding tables will appear in red. The full amendment process, including opportunities and process for public input, can be found in the MPO's Public Participation Plan (http://www.ci.missoula.mt.us/DocumentCenter/View/27526/PPP_Update_2014?bidId=).

Performance Management

Performance measures have historically been used in Transportation Planning; the Moving Ahead for Progress in the 21st Century Act (MAP-21) transformed the Federal-aid highway program by establishing requirements for performance management to promote the most efficient investment of Federal transportation funds. The Fixing America's Surface Transportation (FAST) Act continues these requirements to increase the accountability and transparency of this program and to support improved investment decisions through a focus on performance outcomes for national transportation goals. Establishing performance measures encourages Metropolitan Planning Organizations (MPOs) and State Transportation Departments to maximize the allocation of resources in their respective areas, as well as monitor the performance of the system for eventual use of future resources.

The MPO supports the State targets for applicable performance measures for safety, pavement and bridge condition, system performance, freight, and CMAQ, and supports the transit performance targets and measures established by the Missoula Urban Transportation District (MUTD). Thus, the MPO will plan and program projects that contribute toward relevant targets for each performance measure.

Safety

Improving safety along public roads was the first national goal area addressed by federal requirements for performance management. The Federal Highway Administration (FHWA) established five safety performance measures intended to carry out the Highway Safety Improvement Program (HSIP). The national goal behind establishing safety performance measures and targets is to reduce the number of traffic fatalities and serious injuries along all public roads. The safety targets set by MDT and the associated national performance measures are shown in the table below.

Performance Measure	State Target (based on 5-year rolling average)
Number of fatalities	No more than 172 annual fatalities by 2020, which is an annual reduction of 2.7 percent (5 fewer fatalities per year)
Rate of fatalities per 100 million vehicle miles traveled (VMT)	No more than 1.28 fatalities per 100 million vehicle miles traveled (VMT) by 2020 (reduction of 4.3 percent per year)
Number of serious injuries	No more than 796 serious injuries by 2020 (3.6 percent annual reduction)
Rate of serious injuries per 100 million vehicle miles traveled (VMT)	No more than 5.9 serious injuries per 100 million VMT (reduction of 5.1 percent per year)
Number of non-motorized fatalities and non-motorized serious injuries	No target

Interstate Maintenance, National Highway, Highway Safety Improvement Program, Surface Transportation Program Off System, Secondary, and State Funded Construction funding sources support projects with the intent to improve safety measures and will influence progress towards these performance targets. More information regarding the safety performance targets established by MDT can be found within the Montana Comprehensive Highway Safety Plan.

Infrastructure Condition

The FHWA has established performance measures to assist in the management of pavement and bridge condition on the National Highway System (NHS) to guide infrastructure maintenance in such a way that it remains functional and in good repair. The table below lists the performance measures established by the FHWA to address the condition of NHS pavement and bridge condition and the state targets established by MDT:

Performance Measure	State Target
Pavement Condition	
Percentage of pavements of the Interstate System in Good condition	54%
Percentage of pavements of the non-Interstate NHS in Good condition	44%
Percentage of pavements of the Interstate System in Poor condition	3%
Percentage of pavements of the non-Interstate NHS in Poor condition	6%
Bridge Condition	
Percentage of NHS Bridges Classified as in "Good" Condition	12%
Percentage of NHS Bridges Classified as in "Poor" Condition	9%

Pavement and Bridge Condition are impacted most by Interstate Maintenance, National Highway, Bridge Program, and Urban Pavement Preservation funding sources. Projects included for funding under these sources were selected in part due to their contribution towards pavement and bridge condition targets. More information regarding the infrastructure performance targets established by MDT can be found in the Montana Transportation Asset Management Plan.

System Performance

System performance measures exist to improve the efficiency of the overall transportation system, while helping to reduce congestion, travel times, and pollution emissions and increase reliability of the system. The FHWA has established performance measures that pertain to the performance of the National Highway System (NHS).

Performance Measure	State Target	
	2-Year	4-Year
Percent of the person-miles traveled on the interstate that are reliable	98%	98%
Percent of the person-miles traveled on the non-Interstate NHS that are reliable	N/A	80%

These measures are related to Congestion Mitigation and Air Quality, Surface Transportation Program Urban, and Transportation Alternatives funding sources. Projects included in these funding sources will contribute to meeting state targets for system performance.

Freight

The primary goal for establishing freight performance measures and targets is to improve the national freight network, while providing access to trade and enhancing the capacity of communities to participate in, and support regional economic development. The FHWA has established a performance measure specifically related to freight movement on the Interstate System, and MDT has set a 2- and 4-year target to address freight reliability (see table below).

Performance Measure	State Target	
	2-Year	4-Year
Truck Travel Time Reliability (TTTR) Index	1.25	1.25

Freight performance measures are most strongly influenced by the National Highway Freight Program Federal funding source. Projects selected for National Highways funding will contribute to improving the national freight network and meeting state targets. More information regarding freight related performance measures and metrics can be found in the Montana Freight Plan.

Congestion Mitigation and Air Quality (CMAQ)

Establishing performance measures related to the CMAQ program is integral piece to the goal area of environmental sustainability. These measures will help agencies enhance the performance of the transportation system while protecting and enhancing the health of the natural environment. While other performance measures affect congestion and air quality, there are three federal performance measures that address CMAQ directly, one of which is applicable to Montana. MDT was required to set statewide targets for the reduction of Carbon Monoxide (CO), Particulate Matter 10 (PM_{10}), and Particulate Matter 2.5 ($PM_{2.5}$). The table below shows the federal performance measures and associated targets where applicable.

Performance Measure	State Target	
	2-Year	4-Year
CMAQ Traffic Congestion (Annual Hours of excessive delay per capita)	N/A	N/A
Percent of Non-SOV travel	N/A	N/A
CMAQ On-Road Mobile Source Emissions (Total Emission Reductions)		
Carbon Monoxide (CO)	36.33 kg/day	36.33 kg/day
Particulate Matter 10 (PM_{10})	0.10 kg/day	0.10 kg/day
Particulate Matter 2.5 ($PM_{2.5}$)	0.07 kg/day	0.07 kg/day

These performance measures may be impacted by Congestion Mitigation and Air Quality, Montana Air and Congestion Initiative Discretionary Program, Transportation Alternatives, and Federal Transit Administration funding sources and associated projects that provide support for non-motorized transportation projects and programming that enhances air quality and encourages sustainable transportation options.

Transit Asset Management

Performance targets and measures established for transit asset management (TAM) serve to provide safe, cost-effective, and reliable public transportation through a strategic and systematic process of operating, maintaining, and improving public transportation capital assets. The FHWA has established four transit performance measures, three of which are applicable to the Missoula Urban Transportation District (MUTD). Transit agencies are only required to establish targets for assets they have direct capital responsibility over. Thus, MUTD was not required to establish targets for the Infrastructure performance measure in their Transit Asset Management Plan (i.e. the percentage of track segments (by mode) that have performance restrictions). The performance measures and targets established by MUTD, and supported by the MPO are shown in the table below:

Performance Targets & Measures

Asset Category - Performance Measure	Asset Class	2019 Target	2020 Target	2021 Target	2022 Target	2023 Target
REVENUE VEHICLES						
Age - % of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	BU - Bus	8%	4%	6%	12%	10%
	CU - Cutaway Bus	20%	8%	12%	12%	8%
	MV - Mini-van	20%	10%	10%	0%	0%
	RT - Rubber-tire Vintage Trolley	100%	100%	100%	0%	0%
EQUIPMENT						
Age - % of vehicles that have met or exceeded their Useful Life Benchmark (ULB)	Non Revenue/Service Automobile	0%	0%	0%	0%	0%
	Trucks and other Rubber Tire Vehicles	50%	50%	50%	0%	0%
FACILITIES						
Condition - % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	Administration	100%	100%	0%	0%	0%
	Maintenance	100%	100%	0%	0%	0%
	Passenger Facilities	0%	0%	0%	0%	0%

These measures are related to Congestion Mitigation and Air Quality, Federal Transit Administration (FTA) sections 5307, 5339, 5310, and 5311, and TransADE funding sources.

Air Quality Conformity Assessment

The United States Environmental Protection Agency (EPA) has identified areas within the Missoula Transportation Plan Study Area as not being in compliance with the carbon monoxide (CO) and particulate matter National Ambient Air Quality Standards established by the Clean Air Act (CAA). Missoula was classified as a non-attainment area for CO and total suspended particulate (TSP) in 1978. In 1987 the EPA replaced the TSP standard with a new standard for particulate 10 microns in diameter and smaller (PM_{10}). Missoula is currently designated a maintenance area for CO and PM_{10}. In 1997, EPA established an additional standard for particulate 2.5 microns in diameter and smaller ($PM_{2.5}$). Missoula has not violated the $PM_{2.5}$ particulate standard.

Over the years, the Missoula City-County Air Pollution Control Board (MCCAPCB) and the Montana Department of Environmental Quality (DEQ) have developed a State Implementation Plan (SIP) to bring Missoula's air quality into compliance with the NAAQS. The current SIP prescribes several measures to improve air quality. The use of oxygenated fuels during the winter months, combined with improved vehicle emission control technology, has significantly reduced vehicle CO emissions. Ordinances designed to reduce dust emissions from winter traction control practices have reduced PM_{10} emissions. No transportation control measures (TCMs) are included in the SIP or this TIP.

On May 27, 2005 the MC-CAPCB along with the City, County and DEQ petitioned EPA to re-designate Missoula from non-attainment status to a maintenance status for CO. EPA approval of the application was published in the Federal Register on August 17, 2007 (FR/Vol. 72, No. 159, page 46158). A conformity determination on this TIP must be measured against the adequacy finding of the CO emissions budget issued by the EPA on June 16, 2006, and approved for the 2nd 10-year carbon monoxide Limited Maintenance Plan (LMP) for the Missoula area, consistent with the final rule published in the Federal Register on February 1, 2018 (83 FR 4597).

On August 3, 2016 the MC-CAPCB along with the City, County and DEQ petitioned EPA to re-designate Missoula from non-attainment status to a maintenance status for PM_{10}. EPA approval of the application was published in the Federal Register on May 24, 2019 (FR/Vol. 84, page 24037). Under the approved PM_{10} LMP, the motor vehicle emissions budget need not be capped and a regional emissions analysis is not required. Conformity determinations will be completed without submitting a transportation conformity motor vehicle emissions budget that would then need to be analyzed under 40 CFR 93.118.

The CAA requires that transportation plans and regionally significant projects cannot create new violations, increase the frequency or severity of existing violations, or delay attainment of the NAAQS. All regionally significant projects were modeled for air quality conformity during the 2012 Missoula Long Range Transportation Plan Update.

The Missoula Transportation Policy Coordinating Committee (TPCC) approved the 2016 Missoula Long Range Transportation Plan Update on February 21, 2017. The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) issued a finding of conformity for the Update on April 10, 2017. The TIP must also conform to the SIP. The regionally significant projects in this TIP are a subset of those analyzed in the 2016 Missoula Long Range Transportation Plan Update. Therefore, this TIP can rely on the air quality conformity analysis performed for the 2016 LRTP Update. That analysis indicated that implementation of the Update projects would have a positive impact on CO emissions and would not exceed the PM_{10} budget of 16,119 pounds per day, as established in the Missoula SIP.

The Missoula MPO will review and update the transportation plan at least every four years in air quality non–attainment areas and at least every five years in attainment areas to confirm the transportation plan's validity and consistency with current and forecasted transportation and land use conditions and trends. (23 CFR Section 450.32(c))

Projects within the TIP have grouped into two project classifications – projects that are regionally significant and projects exempt from regional analysis – and can be found in the following section (page 17). The first table shows projects that were modeled for air quality conformity during the 2016 LRTP Update. The second table shows projects reviewed by local, state and federal agencies and determined to be exempt.

Energy Conservation Considerations in the TIP

Increased attention has been given to energy conservation and contingency planning. During the 2016 update of the LRTP, energy conservation was considered at the network level. The majority of the projects are Transportation System Management (TSM) improvements, which require little in the

way of committed resources. Long-range projects in the 2016 LRTP will require substantial resources, but are necessary for an efficient transportation system and will result in energy savings due to factors such as decreased delay and less vehicle wear.

Criteria and Process for Implementing Projects

Long-range projects are identified in the 2016 Long Range Transportation Plan Update. Short-range projects are identified and ranked by the sponsoring agency, i.e., City, County, Urban Transportation District, or MDT. All projects requiring a local match are ranked according to criteria developed by the agency providing the match. Project priorities in the Missoula Urbanized Area are established by several different agencies, depending on the source of funds.

Priorities for projects to be funded with Federal Surface Transportation Program (Urban System) Funds and Congestion Mitigation and Air Quality (CMAQ) Funds are established by the TTAC and TPCC.

The selection of projects to be funded with Federal National Highway (NH) System and Interstate Maintenance (IM) Program Funds in the Missoula Urbanized Area are made by the Montana Department of Transportation in cooperation with the local transportation planning participants.

The Missoula Urban Transit District (MUTD) Board makes decisions and priorities on the use of Federal Transit Administration funds.

Major Federally Funded Project Summary

Section 1203(h)(7)(B) of MAP-21 requires publication of an annual listing of projects for which Federal funds have been obligated in the TIP in the preceding year consistent with the categories identified in the TIP. This list is available through the Transportation Program website at http://www.ci.missoula.mt.us/Transportation .

Transportation Options

Through Transportation Options programs, Missoula currently has several efforts in place that are aimed at increasing sustainable mode trips and vehicle occupancy and reducing congestion, number of trips generated, and vehicle miles traveled.

The 2016 LRTP includes strategies applicable to Missoula that increase use of Transportation Options. The Transportation Plan Update also includes regional and sub-area analyses of these strategies, as well as an implementation plan for the preferred strategies.

Missoula In Motion (MIM) is a program of the Transportation Division of the City of Missoula. MIM develops and implements comprehensive Transportation Options strategies rooted in education and encouragement for the Missoula Urban Area. MIM's work is funded through the federal Congestion Mitigation Air Quality (CMAQ) grant and local match.

In FY 2019, MIM will continue progress in key program areas, and work towards the institutionalization of Transportation Options efforts within the community. These efforts include Momentum employer programs, commuter programs including the Way To Go! Club and Guaranteed Ride Home, and community programs such as Sunday Streets.

At the end of FY 2018, MIM programs removed 579,036 vehicle miles traveled from municipal infrastructure and MIM's efforts reduced 295 metric tons of Carbon Dioxide (CO2). In FY 20187 MIM completed a comprehensive 5 year strategic plan which outlines agency priorities, sets annual goals and shifts programming to a performance based model. In FY 2019, MIM will continue to use the Way To Go! Missoula trip planning and tracking software to leverage the impact of its various programs. MIM had notable achievements including an 11% increase in Commuter Challenge participation, record-breaking Sunday Streets attendance, and delivery of customized workplace support services to 16 local employers.

Transportation Options activities in Missoula also include efforts of the Missoula Ravalli Transportation Management Association (MRTMA). MRTMA is a non-profit organization formed in 1996 which is involved in projects that provide regional rideshare and vanpool services. These projects include: a vanpool program serving a five-county area and ridesharing services for persons in MRTMA's ridesharing database. The database is comprised of 157 employees from 86 worksites and includes county employees, University of Montana faculty, staff and students. Eight of the 18 routes take Missoula residents from the city to worksites in adjoining counties. Since the inception of the vanpool program (1997) a total of 681,229 vehicle trips have been saved, 30,487,868 miles not traveled, and 1,232.53 tons of vehicle emissions reduced.

Financial Constraint and the Financial Plan

The TIP must by law be financially constrained and include a financial plan that demonstrates how the projects can be implemented while the existing transportation system is being adequately operated and maintained. Only projects for which construction and operating funds can reasonably be expected to be available may be included.

The funding charts on the following pages show revenues currently available to finance the projects contained within the TIP. The federal and state revenue projections are based on best estimates provided through the MDT and local sponsors.

Estimates of MAP-21 funds, which may be made available to the MPO, also are based on figures provided by MDT. The Missoula Metropolitan Planning Organization has utilized those estimates throughout the community's project selection process with the aim of fully allocating all available revenues against eligible projects.

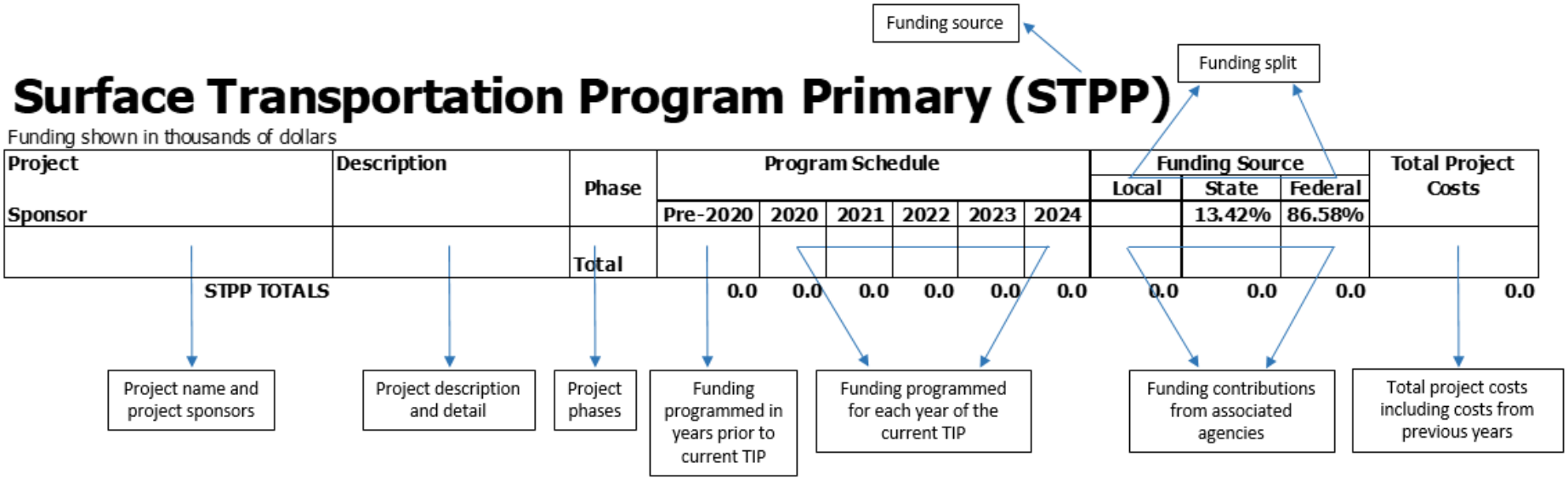
Indirect Cost Recovery and the TIP

The Montana Legislature enacted House Bill 21 (Section 17-1-105 MCA) during the 2002 Special Session as a general fund savings measure. This legislation requires all state agencies, including MDT, to fully recover indirect costs associated with Federal and third party grants. The purpose of indirect cost recovery is to maximize the use of Federal funds for all costs associated with delivering Federal programs. The Federal Highway Administration (FHWA) directed MDT to assess accountability of both direct and indirect costs at the project rather than the program level in order to provide full accountability of both direct and indirect costs.

Indirect costs are applied at the project level to all applicable Federal funding categories in this TIP. Transfers to FTA for projects that FTA administers are considered pass through and are not subject to indirect cost recovery (i.e. CMAQ/STPU transfers eligible for transfer to Section 5307). Sections 5310, 5311, are administered by MDT and are subject to indirect cost recovery

Understanding the TIP Funding Tables

The TIP project funding tables consist of multiple components, and are designed to best display integral information regarding the projects within the TIP. The image below identifies and explains each of the various components of the TIP project funding tables, and can be used as a tool to understand the information being presented within the funding tables.



All construction projects included in the TIP will be completed in multiple phases (i.e. PE, RW, IC, and CN). Funding for each construction project is broken down by the costs of each specific phase. The table below provides a description of construction project phases and additional project phases the reader can expect to see within TIP funding tables.

Project Phase	Description
CN	Construction – Construction and/or reconstruction work performed by the agency or contractor
IC	Incidental Construction – 'Safety net' for unexpected construction expenditures
OT	Other – Additional programmatic expenditures including costs for marketing, education, and outreach
PE	Preliminary Engineering – Analysis and design work completed prior to project construction (the abbreviation EIS will be added if phase includes an environmental impact statement)
Purch.	Purchase – Procuring equipment, software, vehicles, or facilities
RW	Right of Way – Tasks associated with acquiring and preparing the right of way for a project (e.g. property acquisition and utility relocation)
Transit	Transit operations

Project Lists

Projects that are Regionally Significant

PROJECT	SCOPE	COMMENTS
Russell Street - Improve Mount to Broadway	Corridor improvements	Funded with STPU, Earmark, Bridge and STPE funds.

Projects Exempt from Regional Analysis

PROJECT	SCOPE	COMMENTS
CMAQ		
Bicycle Pedestrian Program	Bicycle/Pedestrian safety; bicycle facilities; Bike/Walk/Bus Week;	Annual Program
Transportation Options	Employer TDM activities; Rideshare program; community outreach. Transit Related TDM activities	Annual Program
Mountain Line: Service Operations	Increase service peak, mid-day & Route 2, 8 and 11 service revisions	Continue service revisions as approved by the MUTD Board of Directors.
Capital Purchases - Bus fleet expansion	Continue to purchase new vehicles to expand system per MUTD long-range plan	
Fare incentives, marketing & education	Provide education and marketing for service revisions. Continue partnerships with TDM activities.	
MRTMA: Vanpool Operations	Operations	
Purchase Street Sweeper		New street/parking lot sweeper for the Missoula Parking Commission

Replace Street Sweepers		Annual and semi-annual Replacement
STPU		
Russell Street (Broadway to Idaho)	Reconstruction of roadway and bridge	
Russell Street (Idaho to Dakota)	Reconstruction of roadway	
Russell Street (Dakota to Mount, Broadway)	Reconstruction of roadway	
SRTS		
IM		
Grant Creek Rd & I-90	Intersection improvement	
Missoula-Bonner	Pavement preservation	
Bonner Interchange-East	Pavement preservation	
Reserve St Intch – E & W	Pavement preservation	
NH		
North of DeSmet Intch. - North	Widen, Overlay, S&C	
US 93 & Cartage Rd	Signal upgrade	
Evaro Hill	Pavement preservation, S&C	
Evaro-Whispering Pines	Pavement preservation, S&C	
Junction I90-North (US 93)	Pavement preservation, S&C w/some mill/fill	
Russell Street	Reconstruction of roadway	
Reserve Street - Missoula	Pavement preservation	
NHFP		
Missoula East & West (Van Buren St Intch)	Reconstruction of Interstate ramps and cross street	
STPX, STPS, SFCN		
West of Missoula - NW	Reconstruction	
Slope Stability (Phase 3)	Slide correction	
RR Undercrossing Study-Orange St.	Structure rehab study	
SF 179 US 93 South Safety Improvement	Safety study	
Old MT-200 Erosion Repair	Bank stabilization	
STPP		
RRS		
RRxing-Butler Creek Road	Upgrade RRxing signal	

HSIP		
SF129-Skd Trtmt E Missoula	Add Icy Bridge signs, skid treatment - I-90, RP 109.1 - 109.6	
SF169-Lolo E Msla Safety Improvement	Install centerline rumblestrips	
SF169-Msla Cty Safety Improvement	Signing and Delineation	
SF179-Stephens Orange Safety Improvements	Study	
HSIP Program JOC-Missoula	Signing and delineation	
SF189 D1 CLRS Missoula Area	CL Rumble strips	Only portion in MPO bdry
SF179- Safety Signs Striping	Safety Improvements	Only portion in MPO bdry
BR		
Bitterroot River - W of Missoula	Bridge Replacement	
Higgins Avenue Bridge	Bridge rehab	
Russell Street (Broadway to Idaho)	Bridge and roadway reconstruction	
Steel BR Rehab - Corrosion 1	Bridge rehab	
UPP		
S. 5th and 6th St.-Missoula	Pavement preservation	
Clements/3rd/Speedway/Deer Crk-Missoula	Pavement preservation	
MACI		
Grant Creek Rd & I-90	Intersection improvement	
Missoula ADA Upgrades	ADA upgrades	
Reserve St.-Missoula	Pavement preservation	
Broadway & Toole Ave- Msla	Intersection upgrades	
CITY TA		
EARMARK		
Russell St-Missoula	Intitial ROW phase	
Russell St-Broadway to Idaho	Reconstruction of roadway and bridge	
FTA 5307		
Capital purchases	Transit Capital purchases	
Mountain Line Operations	Transit Operations	MRTMA Vanpool
FTA 5339		Job Access & Reverse Commute (JARC)
IT Upgrade	Upgrade	

Radio System Upgrade	Upgrade	
Purchases	Buses & Bus Stop Amenities	
FTA 5310		
Capital purchases	Purchase paratransit vehicles	
FTA 5311		
Vanpool Vans	Replace 6 15-passenger vans	MRTMA Vanpool
Program Operations	Program Operations, Administration, Maintenance	MRTMA Vanpool
100 % LOCALLY FUNDED PROJECTS		

Estimated Revenue

Amounts shown in thousands of dollars

Federal						STP/S/X									
Fiscal Year	CMAQ#	STPU*	IM*	NH*	NHFP	SFCN	STPP	RRS	HSIP*	BR*	UPP*	MACI	BUILD**	TA	SUBTOTAL
Carryover	2,342.8	-312.4													2,030.4
FFY 2020	1,390.2	1,797.2	852.6	4,966.9	0.0	4,127.5	0.0	277.3	385.4	16,215.4	2,251.4	1,072.1	0.0	0.0	33,335.9
FFY 2021	1,390.2	1,797.2	4,560.1	17,008.5	0.0	642.5	0.0	0.0	0.0	248.0	0.0	128.0	0.0	0.0	25,774.4
FFY 2022	1,390.2	1,797.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,187.4
FFY 2023	1,390.2	1,797.2	0.0	0.0	0.0	8,590.9	0.0	0.0	0.0	15,500.7	0.0	0.0	0.0	0.0	27,279.0
FFY 2024	1,390.2	1,797.2	0.0	15,776.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18,964.0
TOTAL	9,293.9	8,673.4	5,412.7	37,751.9	0.0	13,360.9	0.0	277.3	385.4	31,964.0	2,251.4	1,200.1	0.0	0.0	110,571.0

Federal	FTA 5307		FTA 5339		FTA 5310		FTA 5311		GAS TAX			
Fiscal Year	Federal	Local	Federal	Local	Federal	Local	Federal	Local	CITY	COUNTY	OTHER	TOTAL
Carryover	1,844.8		1,074.8									4,950.1
FFY 2020	1,914.8	1,877.3	354.7	172.6	80.0	20.0	192.0	46.3	1,118.6	321.3	1,786.4	41,219.8
FFY 2021	1,953.1	1,914.8	354.7	0.0	0.0	0.0	192.0	46.3	1,118.6	321.3	2,118.5	33,793.6
FFY 2022	1,992.1	1,953.1	354.7	49.8	80.0	20.0	192.0	46.3	1,118.6	321.3	2,015.8	11,331.0
FFY 2023	2,031.9	1,992.2	354.7	215.8	0.0	0.0	192.0	46.3	1,118.6	321.3	1,934.8	35,486.5
FFY 2024	2,072.6	2,032.0	354.7	0.0	0.0	0.0	192.0	46.3	1,118.6	321.3	1,936.3	27,037.8
TOTAL	11,809.4	9,769.3	2,848.1	438.1	160.0	40.0	960.0	231.7	5,592.9	1,606.4	9,791.8	153,818.8

Funding projections are based on best available information and are subject to change given current funding uncertainties and unknown impacts of future congressional or other federal actions. Federal program funding availability may impact the scheduling of projects. Funding beyond 2012 will be subject to the obligation limitation set by the annual appropriations process.

NOTES:

These estimates are based on historical data and projections.

* STPU, TA, IM, NH, STPX, STPP, STPHS, BR, Earmark, UHPIP, UPP and MACI funds include match.

The CMAQ column reflects federal funding only. Match for these projects is included in the OTHER column.
In addition to including the CMAQ match, the OTHER Column includes other local funds and TransAde

**Reflective of federal share only.

(Operations and Maintenance funds;Average of Fiscal Years 2014-2015) and local match for CMAQ makes up OTHER

Projects that are funded by multiple sources

Funding shown in thousands of dollars

Project / Sponsor		Description	Phase	Program Schedule Pre-2020	2020	2021	2022	2023	2024	Funding Source	Local	State 13.42%	Federal 86.58%	Total Estimated Obligation FY2020-2024
Russell Street	*UPN4128000*	Environmental Impact Statement	PE-EIS	3,968.3								532.5	3,435.7	3,968.3
Missoula		Preliminary Engineering	PE	5,079.7						STPU/Growth(CMAQ)		681.7	4,398.0	5,079.7
MDT-City			**Total**	**9,048.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**			**1,214.2**	**7,833.7**	**9,048.0**
Russell Street	*UPN4128001*	Initial Right of Way Phase	RW	2,700.0						EARMARK		362.3	2,337.7	2,700.0
Missoula												0.0	0.0	0.0
for IC/CN phases see 4128-002 to 004			**Total**	**2,700.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**			**362.3**	**2,337.7**	**2,700.0**
Russell Street	*UPN4128002*	Reconstruction of	RW	1,940.0						EARMARK		260.3	1,679.7	1,940.0
(Broadway to Idaho)		roadway and bridge.	RW	835.0						STPU		112.1	722.9	835.0
			IC	1,144.1						STPU/LOCAL	422.2	96.9	625.0	1,144.1
			CN	12,000.0						BRIDGE		1,610.4	10,389.6	12,000.0
			CN	2,306.2						EARMARK		309.5	1,996.7	2,306.2
			CN	9,248.9						STPU		1,241.2	8,007.7	9,248.9
			Total	**27,474.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**422.2**	**3,630.4**	**23,421.6**	**27,474.2**
Russell Street	*UPN4128003*	Reconstruction of	IC	1,247.6						STPU/LOCAL	470.4	104.3	672.8	1,247.6
(Idaho to Dakota)		roadway	CN	10,762.6						STPU		1,444.3	9,318.3	10,762.6
			Total	**12,010.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**470.4**	**1,548.6**	**9,991.1**	**12,010.2**
Russell Street	*UPN4128004*	Reconstruction of	PE		4,800.0					NH		644.2	4,155.8	4,800.0
(Dakota to Mount)		roadway	RW					6,000.0		STPU/NH		805.2	5,194.8	6,000.0
			IC					3,000.0		STPU		402.6	2,597.4	3,000.0
			CN						24,500.0	STPU/NH		3,287.9	21,212.1	24,500.0
MDT-City			**Total**	**0.0**	**4,800.0**	**0.0**	**0.0**	**9,000.0**	**24,500.0**			**5,139.9**	**33,160.1**	**38,300.0**
Totals				**51,232.4**	**4,800.0**	**0.0**	**0.0**	**9,000.0**	**24,500.0**		**892.7**	**11,895.5**	**76,744.3**	**89,532.4**

Funding projections are based on best available information and are subject to change given current funding uncertainties and unknown impacts of future congressional or other federal actions.

Funding sources shown in Totals (fed\match).

Earmark $6,279,500

Bridge $12,000,000

Growth(CMAQ) $1,418,635

STPU $35,054,165

Per the City-State Project Development Agreement, Missoula will prioritize their annual allocation of urban funds ($1,797,154/year) to complete project.

Beyond 2022 approximately an additional $13.6 M is needed to complete the the project.

**Remaining balance of future funding to be spent on Dakota to Mount as shown in 2019/2020.

Transportation Improvement Program (by Funding Source)

Congestion Mitigation & Air Quality (CMAQ)

Funding shown in thousands of dollars

Unless otherwise indicated the matching ratios for these projects are 86.58% Federal and 13.42% local Match

Project / Sponsor	Description	Phase	2020	2021	2022	2023	2024	Funding Source: Local 13.42%	Funding Source: State 13.42%	Funding Source: Federal 86.58%	Total Project Costs
Carryover (Federal)			2,342.8	2,471.9	2,398.7	2,849.0	3,290.6				
Estimated allocation (Federal)			1,390.2	1,390.2	1,390.2	1,390.2	1,390.2				
Bicycle / Pedestrian Program		OT	46.9	47.8	48.8	49.8	50.8	32.8		211.3	244.1
Marketing, Education and Outreach											0.0
Development Services		**Total**	**46.9**	**47.8**	**48.8**	**49.8**	**50.8**	**32.8**		**211.3**	**244.1**
Transportation Options	Public Education and Outreach	OT									
City of Missoula Development Services			332.9	339.6	346.4	353.3	360.4	232.5		1,500.1	1,732.6
		Total	**332.9**	**339.6**	**346.4**	**353.3**	**360.4**	**232.5**		**1,500.1**	**1,732.6**
Service Operations*											
Operating - 80% match	Transfer from CMAQ to 5307	Transit	365.0	365.0	365.0	365.0	365.0	365.0		1,460.0	1,825.0
Mountain Line		**Total**	**365.0**	**365.0**	**365.0**	**365.0**	**365.0**	**365.0**		**1,460.0**	**1,825.0**
Capital Purchases - Bus fleet expansion*		Purch.	75.3	614.3	0.0	0.0	0.0	92.5		597.1	689.6
Mountain Line		**Total**	**75.3**	**614.3**	**0.0**	**0.0**	**0.0**	**92.5**		**597.1**	**689.6**
Marketing, Education* - 80% match		OT	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Mountain Line		**Total**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**0.0**	**0.0**
Program Operations & Capital		OT	107.4	109.5	111.7	114.0	116.3	111.8		447.1	558.9
Operating - 80% match	Local van pool										
Capital - 86.58% match											
MRTMA		**Total**	**107.4**	**109.5**	**111.7**	**114.0**	**116.3**	**111.8**		**447.1**	**558.9**
Replace / Lease Street Sweepers											
City - sweeper / flush truck		Purch.	250.0	250.0	250.0	250.0	250.0	167.8		1,082.3	1,250.0
County - sweeper / flush truck		Purch.	250.0	0.0	0.0	0.0	0.0	33.6		216.5	250.0
City & County Public Works		**Total**	**500.0**	**250.0**	**250.0**	**250.0**	**250.0**	**201.3**		**1,298.7**	**1,500.0**
Purchase Street Sweeper											
New street/parking lot sweeper		Purch.	65.0	0.0	0.0	0.0	0.0	8.7		56.3	65.0
City Parking Commission			**65.0**	**0.0**	**0.0**	**0.0**	**0.0**	**8.7**		**56.3**	**65.0**
Project Adjustments/Closures											
CMAQ Totals			**1,492.5**	**1,726.3**	**1,121.9**	**1,132.1**	**1,142.4**	**843.3**	**0.0**	**5,570.6**	**6,615.2**
Federal			**1,261.2**	**1,463.4**	**940.0**	**948.6**	**957.4**				
Local			**231.4**	**262.9**	**181.9**	**183.4**	**185.0**				
Ending Balance (Federal)* **			**2,471.9**	**2,398.7**	**2,849.0**	**3,290.6**	**3,723.4**				

* Requires transfer to FTA

*** Ending balance is for future transit, bike/ped projects

Funding projections are based on best available information and are subject to change given current funding uncertainties and unknown impacts of future congressional or other federal actions.

Federal program funding availability may impact the scheduling of projects. Funding will be subject to the obligation limitation set by the annual appropriations process.

Surface Transportation Program Urban (STPU)

Funding shown in thousands of dollars

Project / Sponsor	Description	Phase	Pre-2020	2020	2021	2022	2023	2024	Funding Source: Local	Funding Source: State 13.42%	Funding Source: Federal 86.58%	Total Project Costs
Carryover				-312.4	-1,660.1	137.1	1,934.3	731.4				
Estimated Allocation (STPU)				1,797.2	1,797.2	1,797.2	1,797.2	1,797.2				
STPU Borrow												
Russell Street - Missoula	Reconstruction	PE	7,629.3							1,023.9	6,605.5	7,629.3
UPN 4128000												
MDT		**Total**	**7,629.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1,023.9**	**6,605.5**	**7,629.3**
Russell Street	Reconstruction of											
(Broadway to Idaho)	roadway and bridge.	RW	835.0							112.1	722.9	835.0
BR and Earmark also fund this project		IC	721.9							96.9	625.0	721.9
UPN 4128002		CN	9,249.0	544.8						1,314.3	8,479.5	9,793.8
MDT-City	RP 2.7 to 3.0	**Total**	**10,805.9**	**544.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1,523.3**	**9,827.5**	**11,350.7**
Russell Street	Reconstruction of roadway											
(Idaho to Dakota)		IC	777.1							104.3	672.8	777.1
UPN 4128003		CN	10,762.6							1,444.3	9,318.3	10,762.6
MDT-City	RP 2.5 to 2.7	**Total**	**11,539.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1,548.6**	**9,991.1**	**11,539.7**
Russell Street	Reconstruction of roadway	PE		2,600.0						348.9	2,251.1	
(Dakota to Mount)		IC					3,000.0			402.6	2,597.4	
UPN 4128004		CN						8,723.4		1,170.7	7,552.7	8,723.4
*MDT-City CN beyond timeframe of TIP***	RP 1.5 to 2.5	**Total**	**0.0**	**2,600.0**	**0.0**	**0.0**	**3,000.0**	**8,723.4**	**0.0**	**1,922.2**	**12,401.2**	**14,323.4**
Adjustment / Closures												
STPU Totals			**29,975.0**	**3,144.8**	**0.0**	**0.0**	**3,000.0**	**8,723.4**	**0.0**	**4,994.1**	**32,219.8**	**44,843.2**
Federal			**25,952.3**	**2,722.8**	**0.0**	**0.0**	**2,597.4**	**7,552.7**				
State			**4,022.6**	**422.0**	**0.0**	**0.0**	**402.6**	**1,170.7**				
Balance				**-1,660.1**	**137.1**	**1,934.3**	**731.4**	**-6,194.8**				

Funding projections are based on best available information and are subject to change given current funding uncertainties and unknown impacts of future congressional or other federal actions.
Federal program funding availability may impact the scheduling of projects. Funding will be subject to the obligation limitation set by the annual appropriations process.

**Remaining balance of future funding to be spent on Dakota to Mount as shown in FY2023.

Interstate Maintenance (IM)*

Funding shown in thousands of dollars

Project / Sponsor	Description	Phase	Pre-2020	2020	2021	2022	2023	2024	Funding Source: Local	Funding Source: State 8.76%	Funding Source: Federal 91.24%	Total Project Costs
GRANT CREEK RD & I-90 (MSLA)	Intersection Improv.	PE	319.4							28.0	291.5	319.4
UPN 9034	additional lane	IC	0.0	16.7						1.5	15.3	16.7
		CN	0.0	692.4					200.0	60.7	631.7	892.4
MDT	I-90 RP 100.8	**Total**	**319.4**	**709.1**	**0.0**	**0.0**	**0.0**	**0.0**	**200.0**	**90.1**	**938.5**	**1,228.6**
RESERVE ST INTCH - E & W	Pavement Preservation	PE	70.9							6.2	64.7	70.9
UPN 9184	mill/fill	CN	8,709.9	831.5						835.8	8,705.6	9,541.5
MDT	I-90 RP 94.4 to 105.7	**Total**	**8,780.9**	**831.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**842.0**	**8,770.3**	**9,612.4**
MISSOULA - BONNER	Pavement Preservation	PE	0.0	105.4						9.2	96.2	105.4
UPN 9699	mill/fill	CN	0.0			3,055.7				267.7	2,788.0	3,055.7
MDT	I-90 RP 105.7 to 110.2	**Total**	**0.0**	**105.4**	**0.0**	**3,055.7**	**0.0**	**0.0**	**0.0**	**276.9**	**2,884.2**	**3,161.1**
BONNER INTERCHANGE - EAST	Pavement Preservation	PE	0.0	38.1						3.3	34.8	38.1
UPN 9700	mill/fill in passing lane	CN	0.0			1,504.4				131.8	1,372.6	1,504.4
MDT	I-90 RP 110.2 to 119.3**	**Total**	**0.0**	**38.1**	**0.0**	**1,504.4**	**0.0**	**0.0**	**0.0**	**135.1**	**1,407.4**	**1,542.5**
IM TOTAL			**9,100.3**	**1,684.1**	**0.0**	**4,560.1**	**0.0**	**0.0**	**200.0**	**1,344.2**	**9,708.8**	**15,544.5**

Funding projections are based on best available information and are subject to change given current funding uncertainties and unknown impacts of future congressional or other federal actions.

Federal program funding availability may impact the scheduling of projects. Funding will be subject to the obligation limitation set by the annual appropriations process.

*IM is a state sub-allocated program funded by the federal National Highway Performance Program.

**41% of project within MPO boundary

National Highway (NH)*

Funding shown in thousands of dollars

Project / Sponsor	Description	Phase	Pre-2020	2020	2021	2022	2023	2024	Funding Source: Local	Funding Source: State 13.42%	Funding Source: Federal 86.58%	Total Project Costs
North of DeSmet Intch. - North		PE	943.5							126.6	816.9	943.5
UPN 5071	Widen, Overlay, S&C	RW	615.0							82.5	532.5	615.0
		IC	492.4							66.1	426.3	492.4
		CN	0.0		8,300.2					1,113.9	7,186.3	8,300.2
MDT	RP 1.1 to 4.3	**Total**	**2,050.9**	**0.0**	**8,300.2**	**0.0**	**0.0**	**0.0**	**0.0**	**1,389.1**	**8,962.0**	**10,351.1**
US 93 & CARTAGE ROAD (MSLA)	Signal upgrade	PE	31.1							4.2	26.9	31.1
UPN 9033		CN	148.2	27.6						23.6	152.3	175.9
MDT	RP 0.2 to 0.4	**Total**	**179.3**	**27.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**27.8**	**179.2**	**206.9**
RESERVE STREET - MISSOULA	Pavement Preservation	PE	64.9	32.1						13.0	83.9	96.9
UPN 9492	Joint Seal & Grinding	IC	0.0	27.8						3.7	24.0	27.8
		CN	0.0	4,846.1						650.3	4,195.7	4,846.1
MDT	RP 0 to 5.3	**Total**	**64.9**	**4,905.9**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**667.1**	**4,303.7**	**4,970.8**
JCT I-90 - NORTH (US-93)	Pavement Preservation	PE	0.0	80.6						10.8	69.8	80.6
UPN 9705	Seal cover, mill fill	IC	0.0	12.4						1.7	10.7	12.4
		CN	0.0		508.3					68.2	440.0	508.3
MDT	RP 0 to 1.0	**Total**	**0.0**	**93.0**	**508.3**	**0.0**	**0.0**	**0.0**	**0.0**	**80.7**	**520.6**	**601.2**
Russell Street**	Reconstruction of	PE	0.0	4,800.0						644.2	4,155.8	4,800.0
(Dakota to Mount)	roadway	RW	0.0				3,400.0			456.3	2,943.7	3,400.0
UPN 4128004		CN	0.0					15,776.6		2,117.2	13,659.4	15,776.6
MDT-City	RP 1.5 to 2.5	**Total**	**0.0**	**4,800.0**	**0.0**	**0.0**	**3,400.0**	**15,776.6**	**0.0**	**3,217.7**	**20,758.9**	**23,976.6**
NH TOTAL			**2,295.1**	**9,826.6**	**8,808.5**	**0.0**	**3,400.0**	**15,776.6**	**0.0**	**5,382.3**	**34,724.4**	**40,106.7**

Funding projections are based on best available information and are subject to change given current funding uncertainties and unknown impacts of future congressional or other federal actions.

Federal program funding availability may impact the scheduling of projects. Funding will be subject to the obligation limitation set by the annual appropriations process.

*NH is a state sub-allocated program funded by the federal National Highw ay Performance Program.

** Broadway CN beyond timeframe of TIP

National Highway Freight Program (NHFP)*

Funding shown in thousands of dollars

Project Sponsor	Description	Phase							Funding Source			Total Project Costs
									Local	State	Federal	
			Pre-2020	2020	2021	2022	2023	2024		13.42%	86.58%	
MSLA - E&W - VAN BUREN ST INTCHG	Reconstruction of	PE	2,544.0							341.4	2,202.6	2,544.0
UPN 4855001	interchange ramps	RW	63.0							8.5	54.5	63.0
	and cross street	IC	71.7							9.6	62.0	71.7
		CN	16,473.0							2,210.7	14,262.3	16,473.0
MDT	I-90 RP 94.4 to 110.2	**Total**	**19,151.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**2,570.1**	**16,581.5**	**19,151.6**
NHFP TOTAL			**19,151.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**2,570.1**	**16,581.5**	**19,151.6**

Funding projections are based on best available information and are subject to change given current funding uncertainties and unknown impacts of future congressional or other federal actions.

Federal program funding availability may impact the scheduling of projects. Funding will be subject to the obligation limitation set by the annual appropriations process.

*NHFP is funded by the federal National Highway Performance Program.

Surface Transportation Program Off System (STPX), Secondary (STPS), State Funded Construction (SFCN)

Funding shown in thousands of dollars

Project / Sponsor	Description	Phase	Pre-2020	2020	2021	2022	2023	2024	Funding Source: Local	Funding Source: State 13.42%	Funding Source: Federal 86.58%	Total Project Costs
Russell Street *UPN4128002*	Reconstruction of									0.0	0.0	0.0
(Broadway to Idaho)	roadway and bridge.									0.0	0.0	0.0
		CN	2,400.0							322.1	2,077.9	2,400.0
MDT	RP 2.7 to 3.0	**Total**	**2,400.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**322.1**	**2,077.9**	**2,400.0**
West of Missoula - NW	Reconstruction	PE	2,159.1							289.7	1,869.3	2,159.1
UPN 6141		RW				642.5				86.2	556.2	642.5
		IC					642.5			86.2	556.2	642.5
		CN								0.0	0.0	0.0
MDT	RP5.5 TO RP 10.6	**Total**	**2,159.1**	**0.0**	**0.0**	**642.5**	**642.5**	**0.0**	**0.0**	**462.2**	**2,981.8**	**3,444.0**
RR UNDERCROSSING STUDY	Study to identify structure	OT	179.3							24.1	155.2	179.3
UPN 91283	rehab options									0.0	0.0	0.0
Not all locations inside MPO boundary	Orange Street									0.0	0.0	0.0
MDT	RP 2.0 - 2.1	**Total**	**179.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**24.1**	**155.2**	**179.3**
SF 179 US 93 SOUTH SFTY IMPRV	Study	OT	194.6							26.1	168.5	194.6
UPN 9447	Safety study for US 93									0.0	0.0	0.0
Not all locations inside MPO boundary	between Hamilton/Missoula									0.0	0.0	0.0
MDT	RP 49 to 90.3	**Total**	**194.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**26.1**	**168.5**	**194.6**
D1 - SLOPE STABILITY (PHASE 3)	Slide Correction on Pulp Mill RD	PE	334.1							44.8	289.3	334.1
UPN 9557		RW		32.0						4.3	27.7	32.0
		IC		153.5						20.6	132.9	153.5
		CN			3,299.6					442.8	2,856.8	3,299.6
MDT	RP .4 to 1.1	**Total**	**334.1**	**185.4**	**3,299.6**	**0.0**	**0.0**	**0.0**	**0.0**	**512.5**	**3,306.7**	**3,819.2**
OLD MT-200 EROSION REPA IR	Bank Stabilization	PE	474.3							63.6	410.6	**474.3**
UPN 9642		CN		5,952.0						798.8	5,153.2	**5,952.0**
MDT	RP 0.5 to 0.8	**Total**	**474.3**	**5,952.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**862.4**	**5,563.9**	**6,426.3**
TOTALS			**5,741.4**	**6,137.4**	**3,299.6**	**642.5**	**642.5**	**0.0**	**0.0**	**2,209.4**	**14,254.0**	**16,463.4**

Surface Transportation Program Primary (STPP)

Funding shown in thousands of dollars

Project / Sponsor	Description	Phase	Program Schedule: Pre-2020	2020	2021	2022	2023	2024	Funding Source: Local	Funding Source: State 13.42%	Funding Source: Federal 86.58%	Total Project Costs
No New Projects		**Total**										
STPP TOTALS			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Railroad Crossing (RRS)

Funding shown in thousands of dollars

Project / Sponsor	Description	Phase	Program Schedule						Funding Source			Total Project Costs
									Local	State	Federal	
			Pre-2020	2020	2021	2022	2023	2024		10.00%	90.00%	
RRX ING- BUTLER CRK RD- MISSOULA	Upgrade RR crossing	PE		6.6						0.7	6.0	6.6
UPN 9692	signal equipment	CN		270.7						27.1	243.6	270.7
MDT	RP .02 to .02	**Total**	**0.0**	**277.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**27.7**	**249.6**	**277.3**
RRX ING - DESCHAMPS RD - MSLA	Upgrade RR crossing	PE		8.8						0.9	7.9	8.8
UPN 9825	signal equipment and add gates	CN		282.6						28.3	254.4	282.6
MDT	L-32-184 RP 1.242	**Total**	**0.0**	**291.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**29.1**	**262.3**	**291.5**
TOTALS			**0.0**	**568.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**56.9**	**511.9**	**568.8**

Highway Safety Improvement Program (HSIP)

Highway Safety Improvement Program (HSIP)

Funding is shown in thousands of dollars

Project / Sponsor	Description	Phase	Pre-2020	2020	2021	2022	2023	2024	Funding Source: Local	Funding Source: State 10.00%	Funding Source: Federal 90.00%	Total Project Costs	
SF129-Skd Trtmt E Missoula	Add Icy Bridge signs, skid treatment -	PE	43.4							4.3	39.1	43.4	
UPN 8061	I-90, RP 109.1 - 109.6	CN	640.3	497.6						113.8	1,024.1	1,137.9	
MDT		**Total**	**683.7**	**497.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**118.1**	**1,063.2**	**1,181.3**	
SF 169 LOLO E MSLA SFTY IMPRV	Install Centerline Rumblestrips and	PE	23.8							2.4	21.5	23.8	
UPN 9373	Signing	CN	160.5							16.0	144.4	160.5	
MDT		**Total**	**184.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**18.4**	**165.9**	**184.3**	
SF 169 MSLA CNTY SFTY IMPRV		PE	19.6							2.0	17.6	19.6	
UPN 9418	Installation of signing and delineation	CN	140.2							14.0	126.2	140.2	
MDT		**Total**	**159.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**16.0**	**143.8**	**159.8**	
SF179 STEPHENS ORANGE SFTYIMPR	Safety study	PE	0.0	126.6						12.7	113.9	126.6	
UPN 9526		CN	0.0		591.6					59.2	532.5	591.6	
MDT		**Total**	**0.0**	**126.6**	**591.6**	**0.0**	**0.0**	**0.0**	**0.0**	**71.8**	**646.4**	**718.2**	
SF179 D1 SFTY SIGNS STRIPING	Safety Improvements	PE	0.0	16.0						1.6	14.4	16.0	
UPN 9634		CN	0.0	54.2						5.4	48.7	54.2	
MDT	Only portion in MPO Boundary	**Total**	**0.0**	**70.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**7.0**	**63.1**	**70.1**	
HSIP PROGRAM JOC - MISSOULA	Safety Improvements	PE	4.7							0.5	4.2	4.7	
UPN 9668		CN	17.3							1.7	15.6	17.3	
MDT	Only portion in MPO Boundary	**Total**	**22.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**2.2**	**19.8**	**22.0**	
SF189 D1 CLRS MISSOULA AREA	Install CL Rumble strips	PE	2.8							0.3	2.5	2.8	
UPN 9672	3% of project within MPO	CN		122.4						12.2	110.2	122.4	
MDT		**Total**	**2.8**	**122.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**12.5**	**112.7**	**125.2**	
SF199 MSLA HT MEDIAN CABLERAIL	Install High Tension Cable Rail	PE		251.5						25.1	226.3	251.5	
UPN 9839		CN				2,095.8				209.6	1,886.2	2,095.8	
MDT	Only portion in MPO Boundary	**Total**	**0.0**	**251.5**	**0.0**	**2,095.8**	**0.0**	**0.0**	**0.0**	**234.7**	**2,112.5**	**2,347.3**	
SF199 MARYJANE BROADWAY INTX	intersection improvements at 2 areas	PE			12.8					1.3	11.5	12.8	New Project
UPN 9920		IC			12.8					1.3	11.5	12.8	
	N-132 RP 4.8-5.1	CN			678.0					67.8	610.2	678.0	
MDT	L-32-825 RP 1.4-1.5	**Total**	**0.0**	**0.0**	**703.5**	**0.0**	**0.0**	**0.0**	**0.0**	**70.4**	**633.2**	**703.5**	
HSIP Totals			**1,052.6**	**1,068.2**	**1,295.2**	**2,095.8**	**0.0**	**0.0**	**0.0**	**551.2**	**4,960.6**	**5,511.7**	

No funding summary or carryover balance is shown because MDT makes allocations of revenue in the amount of the project for each year.

Bridge Program*

Funding shown in thousands of dollars

Project / Sponsor	Description	Phase	Pre-2020	2020	2021	2022	2023	2024	Funding Source: Local	Funding Source: State 13.42%	Funding Source: Federal 86.58%	Total Project Costs
Russell Street *UPN4128002*	Reconstruction of	CN	12,000.0							1,610.4	10,389.6	12,000.0
(Broadway to Idaho)	roadway and bridge.											
MDT/City	RP 2.7 to 3.0	**Total**	**12,000.0**							**1,610.4**	**10,389.6**	**12,000.0**
Bitteroot River - W of Missoula	Replace Bridge	PE	1,913.5							256.8	1,656.7	1,913.5
(Maclay Bridge, South Ave Bridge)		RW				826.3				110.9	715.4	826.3
UPN 6296		IC					248.0			33.3	214.7	248.0
		CN						15,500.7		2,080.2	13,420.5	15,500.7
Missoula County (LAG)		**Total**	**1,913.5**	**0.0**	**0.0**	**826.3**	**248.0**	**15,500.7**		**2,481.2**	**16,007.3**	**18,488.5**
Higgins Avenue Bridge	Bridge rehab	PE	2,594.9	570.7						424.8	2,740.7	3,165.5
UPN 8807		RW	750.0							100.7	649.4	750.0
		IC	70.9							9.5	61.4	70.9
		CN		21,577.9					1,700.0	2,895.7	18,682.1	23,277.9
MDT		**Total**	**3,415.7**	**21,577.9**	**0.0**	**0.0**	**0.0**	**0.0**	**1,700.0**	**3,005.9**	**19,392.8**	**27,264.3**
Steel BR Rehab - Corrosion 1	Bridge rehab	PE	88.5							11.9	76.6	88.5
UPN 8886		CN		1,850.6						248.4	1,602.2	1,850.6
MDT		**Total**	**88.5**	**1,850.6**	**0.0**	**0.0**	**0.0**	**0.0**		**260.2**	**1,678.9**	**1,939.1**
BR TOTAL			**17,417.8**	**23,428.5**	**0.0**	**826.3**	**248.0**	**15,500.7**	**1,700.0**	**7,357.7**	**47,468.7**	**59,691.9**

No funding summary or carryover balance is shown because MDT makes allocations of revenue in the amount of the project for each year.

Urban Pavement Preservation (UPP)

Funding shown in thousands of dollars

Project / Sponsor	Description	Phase	Program Schedule						Funding Source			Total Project Costs
									Local	State	Federal	
			Pre-2020	2020	2021	2022	2023	2024		13.42%	86.58%	
S 5TH & 6TH STREET - MISSOULA	Pavement Preservation	PE		111.3						14.9	96.3	111.3
UPN 9747	Mill and Fill	IC		24.7						3.3	21.4	24.7
	RP 0.0 to 1.0	CN		1,357.5						182.2	1,175.3	1,357.5
MDT		**Total**	**0.0**	**1,493.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**200.4**	**1,293.1**	**1,493.5**
CLEMNTS / 3RD / SPDWY / DEER CR - MSLA	Chip Seal	PE		98.9						13.3	85.6	98.9
		IC		11.3						1.5	9.8	11.3
UPN 9748		CN		659.0						88.4	570.5	659.0
MDT	Various Urban Routes	**Total**	**0.0**	**769.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**303.6**	**1,959.0**	**769.2**
UPP TOTAL			**0.0**	**2,262.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**504.1**	**3,252.1**	**2,262.7**

No funding summary or carryover balance is shown because MDT makes allocations of revenue in the amount of the project for each year.

Montana Air and Congestion Initiative (MACI)-Discretionary Program

Funding shown in thousands of dollars

Project / Sponsor	Description	Phase							Funding Source			Total Project Costs
									Local	State	Federal	
			Pre-2020	2020	2021	2022	2023	2024		13.42%	86.58%	
GRANT CREEK RD & I-90 (MSLA)	Intersection Improv.									0.0	0.0	0.0
UPN 9034		CN		361.3					0.0	48.5	312.8	361.3
MDT		**Total**	**0.0**	**361.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**48.5**	**312.8**	**361.3**
MISSOULA ADA UPGRADES	ADA upgrades	PE	883.2							118.5	764.7	883.2
UPN 9213		IC	46.0							6.2	39.8	46.0
		CN	3,558.2							477.5	3,080.7	3,558.2
MDT	Various Locations	**Total**	**4,487.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**602.2**	**3,885.2**	**4,487.4**
RESERVE STREET - MISSOULA	Pavement Preservation										0.0	
UPN 9492	Joint Seal	CN		682.1					0.0	91.5	590.5	682.1
MDT	RP 0.0 to 5.3	**Total**	**0.0**	**682.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**91.5**	**590.5**	**682.1**
BROADWAY & TOOLE AVE - MISSOULA	INT UPGRADE/SIGNALS	PE	38.4	37.1						10.1	65.4	75.5
		IC		28.7						3.9	24.8	28.7
UPN 9569		CN			128.0				0.0	17.2	110.8	128.0
MDT		**Total**	**38.4**	**65.8**	**128.0**	**0.0**	**0.0**	**0.0**	**0.0**	**31.2**	**201.0**	**232.2**
		Total	**4,525.8**	**1,109.2**	**128.0**	**0.0**	**0.0**	**0.0**	**0.0**	**773.4**	**4,989.6**	**5,763.0**

No funding summary or carryover balance is shown because MDT makes allocations of revenue in the amount of the project for each year.

Transportation Alternatives

Funding shown in thousands of dollars

Project / Sponsor	Description	Phase	2020	2021	2022	2023	2024	Funding Source Local 4.73%	Funding Source State 8.69%	Funding Source Federal 86.58%	Total Project Costs
		PE						0.0	0.0	0.0	0.0
		CN						0.0	0.0	0.0	0.0
		Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TA TOTALS			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Federal			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**				
Local			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**				

Funding dependent on the outcome of a competitive process and funding availability.

Earmarks

Funding shown in thousands of dollars

Project / Sponsor	Description	Phase	Pre-2020	Program Schedule 2020	2021	2022	2023	2024	Funding Source Local 13.42%	Funding Source State 13.42%	Funding Source Federal 86.58%	Total Project
Russell Street *UPN4128001*	Initial Right of Way Phase	ROW	2,700.0							362.3	2,337.7	2,700.0
Missoula												
										0.0	0.0	0.0
		Total	**2,700.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**362.3**	**2,337.7**	**2,700.0**
Rattlesnake Creek/ Broadway Crossing	Improvements connecting	PE	883.2							118.5	764.7	883.2
(RUX--Rattlesnake-University Crossing)	Rattlesnake with University	ROW	46.0							6.2	39.8	46.0
		CN	3,558.2							477.5	3,080.7	3,558.2
FHWA-Western Federal Lands/ City of Missoula		**Total**	**4,487.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**602.2**	**3,885.2**	**4,487.4**
Russell Street *UPN4128002*	Reconstruction of	ROW	1,940.0							260.3	1,679.7	1,940.0
(Broadway to Idaho)	roadway and bridge.	CN	2,306.2							309.5	1,996.7	2,306.2
		Total	**4,246.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1,172.1**	**3,676.4**	**4,246.2**
		Total	**6,946.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1,534.4**	**6,014.0**	**6,946.2**

Better Utilizing Investments to Leverage Development (BUILD) Grant Program

Funding shown in thousands of dollars

Project Sponsor	Description	Phase	2020	2021	2022	2023	2024	Funding Source City	 County	 State	 Federal	Total Estimated Obligation FY2020-2024
Mullan BUILD (Phase I)	Roadway and shared-use	PE	1,875.0	625.0				2,500.0				2,500.0
	path construction,	ROW										0.0
	intersection improvements	IC										0.0
	(to include portions of Mary	CN		13,000.0							13,000.0	13,000.0
	Jane Blvd, George Elmer											
City-County	Blvd, England Blvd)	**Total**	**1,875.0**	**13,625.0**	**0.0**	**0.0**	**0.0**					**15,500.0**
Mullan BUILD (Phase II)	Roadway and shared-use	PE	0.0	0.0	0.0	0.0	0.0					0.0
	path construction,	ROW	0.0	0.0	0.0	0.0	0.0					0.0
	intersection improvements	IC	0.0	0.0	0.0	0.0	0.0					0.0
		CN	0.0	0.0	0.0	0.0	0.0					0.0
City-County		**Total**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**					**0.0**
TIGER TOTAL		**Total**	**3,750.0**	**13,625.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**15,500.0**

Federal Transit Administration Section 5307*

Federal Transit Administration Section 5307*

Funding shown in thousands of dollars

Project Sponsor	Description	Phase	2020**	2021**	2022	2023	2024	Funding Source Local 20%	 State	 Federal 80%	Total Estimated Obligation FY2020-2024
Carryover			1,844.8	2,622.7	2,494.1	2,362.9	2,229.1				
5311 Transfer from State(Fed Share)											
Allocation (Estimated)(Fed Share)			1,914.8	1,953.1	1,992.1	2,031.9	2,072.6				
Bus & Passenger Amenities	Recurring										0.0
Automated Passenger Counter System	Purch.							0.0		0.0	0.0
Upgrade Equipment on Cutaways								0.0		0.0	0.0
Bus Stop Signage								0.0		0.0	0.0
Mountain Line		**Total**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**0.0**	**0.0**
Replace Supervisory Vehicle	Recurring										0.0
	Purch.							0.0		0.0	0.0
Mountain Line		**Total**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**0.0**	**0.0**
Transit Operations**											
COVID-19 costs			**1,634.2**					0.0		1,634.2	
Paratransit costs			**505.4**					101.1		404.3	
Operating costs			**134.4**					67.2		67.2	
Mountain Line		**Total**	**2,274.0**	**4,163.3**	**4,246.6**	**4,331.5**	**4,418.1**	**168.3**		**2,105.7**	**19,433.5**
Purchase buses	Recurring							0.0		0.0	0.0
2014 Split funded with 5310 purchase	Purch.							0.0		0.0	0.0
Expansion Cutaway								0.0		0.0	0.0
Replacement Buses								0.0		0.0	0.0
Mountain Line		**Total**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**0.0**	**0.0**
Planning								0.0		0.0	0.0
COA, LRTP, Master Facility Plan								0.0		0.0	0.0
		Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**0.0**	**0.0**
Maintenance Vehicle	Recurring										
	Purch.							0.0		0.0	0.0
Mountain Line		**Total**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**0.0**	**0.0**
SECTION 5307 TOTALS*			**2,274.0**	**4,163.3**	**4,246.6**	**4,331.5**	**4,418.1**	**168.3**	**0.0**	**2,105.7**	**19,433.5**
Federal			**1,137.0**	**2,081.7**	**2,123.3**	**2,165.8**	**2,209.1**				
Local			**1,137.0**	**2,081.7**	**2,123.3**	**2,165.8**	**2,209.1**				
Ending Balance (Federal)			**2,622.7**	**2,494.1**	**2,362.9**	**2,229.1**	**2,092.6**				

*FTA administered funds are not subject to indirect cost recovery. 5307 funds may be supplemented by Small Transit Intensive Cities (STIC) funds based on transit system performance for the urbanized area (MUTD and ASUM).

**Transit Operations match ratios vary due to CARES Act (COVID-19).

Federal Transit Administration Section 5339

Funding shown in thousands of dollars

Project Sponsor	Description	Phase	2020	2021	2022	2023	2024	Funding Source Local 20%	 State	 Federal 80%	Total Estimated Obligation FY2020-2024
Carryover			1,074.8	739.1	1,093.7	1,249.2	740.9				
Allocation (Estimated)			354.7	354.7	354.7	354.7	354.7				
IT Upgrade	Upgrade				64.1			12.8		51.3	64.1
			0.0	**0.0**	**64.1**	**0.0**	**0.0**	**12.8**		**51.3**	**64.1**
Radio System Upgrade	Upgrade				150.0			30.0		120.0	150.0
Mountain Line			**0.0**	**0.0**	**150.0**	**0.0**	**0.0**	**30.0**		**120.0**	**150.0**
Support Vehicles	Replace							0.0		0.0	0.0
Mountain Line			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**0.0**	**0.0**
Shop Lifts	Upgrade							0.0		0.0	0.0
Mountain Line			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**0.0**	**0.0**
Buses & Bus Stop Amenities	Replace & Upgrade		863.0			1,078.8		388.4		1,553.4	1,941.8
Mountain Line		**Total**	**863.0**	**0.0**	**0.0**	**1,078.8**	**0.0**	**388.4**		**1,553.4**	**1,941.8**
Telephone Upgrad	Upgrade				34.8			7.0		27.8	34.8
Mountain Line		**Total**	**0.0**	**0.0**	**34.8**	**0.0**	**0.0**	**7.0**		**27.8**	**34.8**
SECTION 5339 TOTALS			**863.0**	**0.0**	**248.9**	**1,078.8**	**0.0**	**438.1**	**0.0**	**1,752.5**	**2,190.7**
Federal			**690.4**	**0.0**	**199.1**	**863.0**	**0.0**				
Local			**172.6**	**0.0**	**49.8**	**215.8**	**0.0**				
Balance			**739.1**	**1,093.7**	**1,249.2**	**740.9**	**1,095.6**				

Federal Transit Administration Section 5310

Funding shown in thousands of dollars

Project Sponsor	Description	Phase	2020	2021	2022	2023	2024	Funding Source Local 15/20%	 State	 Federal 85/80%	Total Estimated Obligation FY2020-2024
Paratransit Vehicles	Purchase cutaway	Purch.	135.8		100.0			47.2		188.7	235.8
	Purchase 2 accessible mini van	Purch.						0.0		0.0	0.0
*MUTD**			**135.8**	**0.0**	**100.0**	**0.0**	**0.0**	**47.2**	**0.0**	**188.7**	**235.8**
Paratransit Vehicles	12 passenger vans (2)	Purch.						0.0		0.0	0.0
	Cutaway low floor bus (1)	Purch.						0.0		0.0	0.0
	Mini van (1)	Purch.						0.0		0.0	0.0
	12 passenger van (1)	Purch.						0.0		0.0	0.0
*ORI**			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**0.0**	**0.0**
Paratransit Vehicles	Mini van (1)	Purch.						0.0		0.0	0.0
	12 passenger van (1)	Purch.						0.0		0.0	0.0
	Mini van (1)	Purch.						0.0		0.0	0.0
	Mini van w/ramp	Purch.						0.0		0.0	0.0
*AWARE***			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**0.0**	**0.0**
SECTION 5310 TOTALS			**135.8**	**0.0**	**100.0**	**0.0**	**0.0**	**47.2**		**188.7**	**235.8**
Federal			**108.7**	**0.0**	**80.0**	**0.0**	**0.0**				
Local			**27.2**	**0.0**	**20.0**	**0.0**	**0.0**				

NOTE: Indirect costs will be recovered on van/bus purchases.
Funding dependent on the outcome of a competitive process and funding availability.

* Missoula Urban Transportation District (MUTD or Mountain Line)
** Opportunity Resources, Inc.
*** Anaconda Work And Residential Enterprises, Inc.
MUTD may overmatch on some vehicles.

Federal Transit Administration Section 5311

Funding shown in thousands of dollars

Project Sponsor	Description	Phase	2020	2021	2022	2023	2024	Funding Source Local	 State	 Federal	Total Estimated Obligation FY2020-2024
Vanpool Vans	Purchase										0.0
6 - 15 Passenger		Purch.	70.0	70.0	70.0	70.0	70.0	49.0		301.0	350.0
(Replacement / Expansion)											
MRTMA		**Total**	**70.0**	**70.0**	**70.0**	**70.0**	**70.0**	**49.0**		**301.0**	**350.0**
Program Operations	Program Operations		11.0	11.0	11.0	11.0	11.0	25.4		29.8	55.2
	Administration		129.3	129.3	129.3	129.3	129.3	297.3		349.0	646.3
	Maintenance		28.1	28.1	28.1	28.1	28.1	64.5		75.7	140.3
MRTMA			**168.3**	**168.3**	**168.3**	**168.3**	**168.3**	**387.2**		**454.5**	**841.7**
SECTION 5311 TOTALS			**238.3**	**238.3**	**238.3**	**238.3**	**238.3**	**436.2**		**755.5**	**1,191.7**
Federal			**192.0**	**192.0**	**192.0**	**192.0**	**192.0**				
Local			**46.3**	**46.3**	**46.3**	**46.3**	**46.3**				

Funding dependent on the outcome of a competitive process and funding availability.

Match ratios:

- Capital = 86% federal / 14% local
- Program Operations = 54% federal / 46% local
- Administration = 80% federal / 20% local
- (Preventive) Maintenance = 80% federal / 20% local

Transade (State Funded)

Funding shown in thousands of dollars

Project Sponsor	Description	Phase	2020	2021	2022	2023	2024	State Funded 100%	Total Estimated Obligation FY2020-2024
Carryover			0.0	0.0	0.0	0.0	0.0		
Allocation (Estimated)			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Transit Operations	Operating		64.8	30.0	30.0	30.0	30.0	**184.8**	
Mountain Line			**64.8**	**30.0**	**30.0**	**30.0**	**30.0**	**184.8**	**184.8**
STATE TOTALS			**64.8**	**30.0**	**30.0**	**30.0**	**30.0**	**184.8**	**184.8**

Illustrative Projects

The Transportation Improvement Program may include, for illustrative purposes, additional projects that would be included in the approved Transportation Improvement Program if reasonable additional resources beyond those identified in the financial plan were available. Illustrative transportation projects are included in the TIP as an informational item. Their inclusion signals the importance the MPO places on these projects as part of Missoula's coordinated transportation improvement efforts.

Project Sponsor	Project	Project Description	Project Cost (in thousands)
CMAQ			
MIM	Car Sharing Pilot	Retro-fit existing municipal fleet with car sharing hardware/software	$60.0
STPU			
City Public Works	Signal Optimization	Continue to upgrade signals	$2,000.0
Community Safety			
City Public Works	Transportation System Management	Small geometric changes for intersection safety at various locations.	$500.0
TA/STPE			
City Public Works	Russell Street	Landscaping, trail connections, sidewalks	$400.0

Public Comment Received

MPO staff posted the draft of the Transportation Improvement Program on the City's website with the agendas for TTAC and TPCC meetings. The MPO published legal ads in The Missoulian on February 16 and 23, March 1, 8, 15, 29, April 5, 12, and 19, noting that the planned adoption of the document would take place on March 5, 2020 and April 28, 2020 respectfully. The ads listed the following meetings that provided opportunities for public comment TIP amendment. The attendance numbers below do not include committee members or staff present.

TTAC – Thursday, March5, 2020.
Attendance at Meeting: 0
Public Comments on Draft UPWP: n/a

TPCC - Tuesday, Aprils 28, 2020.
Attendance at Meeting: 1
Public Comments on Draft UPWP: n/a

Certification

The Missoula Metropolitan Planning Organization for the Missoula, Montana, urbanized area hereby certifies that the transportation planning process is addressing the major issues in the metropolitan planning area and is being conducted in accordance with all applicable requirements of:

I. 49 USC. Section 5303 and 23 USC. 134 and CFR 450.334;
II. Title VI of the Civil Rights Act of 1964, as amended (42 USC. 2000d-1) and 49 CFR, Part 21;
III. Section 1101(b) of the MAP-21 (Pub. L. 112-141) regarding the involvement of disadvantaged business enterprises in the FHWA and the FTA funded projects (49 CFR part 26);
IV. The provision of the Americans With Disabilities Act of 1990 (42 USC. 12101 *et esq.*,) and the U. S. DOT implementing regulation (49 CFR Parts 27, 37 and 38);
V. The provision of 49 CFR part 20 regarding restrictions on influencing certain activities;
VI. Sections 174 and 176(c) and (d) of the Clear Air Act as amended (42 USC. 7504, 7506(c) and (d));
VII. 49 USC. 5332, prohibiting discrimination on the basis of race, color, creed, national origin, sex or age in employment or business opportunity;
VIII. 23 CFR, Part 230, regarding the implementation of an equal employment opportunity on Federal and Federal-aid highway construction contracts;
IX. The Older Americans Act as amended (42 USC. 6101), prohibiting discrimination on the basis of age in program or projects receiving Federal financial assistance;
X. Section 324 of Title 23 USC. regarding the prohibition of discrimination based on gender; and
XI. Section 504 of the Rehabilitation Act of 1973 (29 USC. 794) and 49 CFR, Part 27 regarding discrimination against individuals with disabilities.

Missoula, Montana
Metropolitan Planning Organization

_____
Director, Missoula Development Services

_____
Date

Missoula County – City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

To: **TPCC**

From: **Jon Sand, Transportation Planner**

Date: **November 12, 2020**

Re: **Proposed Amendment #2 to the FFY 2020-2024 Transportation Improvement Program**

Purpose
The purpose of this memo is for TPCC to consider proposed Amendment #2 to the FFY 2020-2024 Transportation Improvement Program (TIP). The FFY 2020-2024 TIP allocates funding for a five-year period, covering federal fiscal years 2020 through 2024.

Background
The TIP is a federally mandated document required to be prepared by MPOs, outlining the priority list of projects, project segments, and programs to be carried out over a five-year period based on anticipated federal funding. Although federal legislation stipulates that the TIP must be updated every two years, Missoula has typically updated the program annually. The most recent approved TIP covers the federal fiscal years 2020 through 2024 and was adopted by TPCC on August 20, 2019.

The proposed amendment includes the following revision, which is shown in the attached FFY 2020-2024 TIP Amendment #2:

Highway Safety Improvement Program (HSIP)

- UPN 9920 – SF199 MARYJANE BROADWAY INTX
  - New Project

MDT, City of Missoula, and Missoula County are collaborating to complete an intersection project at the intersection of Mary Jane and Broadway. Initially MDT, the city, and county had agreed to work towards the transfer of HSIP funding directly to the BUILD project. However, the proposal to transfer funding to the BUILD project from HSIP was prohibited. Additionally, when reviewing schedules, it was learned that if a signal was going to be constructed in conjunction with the BUILD project, that steps would need to be taken immediately in order to coordinate construction schedules. The first step in the process is to have the project listed in the Missoula TIP and recategorize Project #15 to the Committed Project list from the Illustrative Project list in the 2016 LRTP.

The project scope includes installation of a signal at the future Broadway (N-132E) and Mary Jane intersection along with the reconfiguration of the existing Broadway and Flynn Lane intersection to eliminate the left turn from Flynn to westbound Broadway. Providing a signalized intersection at W. Broadway and Mary Jane Blvd. effectively reduces traffic pressure of off Flynn Lane which would be reclassified as a local street. Although initial design concepts for the BUILD grant recommended a

roundabout at this location, separation of the HSIP funding from the rest of the BUILD package increased the likelihood (or risk) that the two projects would not be delivered to construction simultaneously. Imminent development (Including a VA Hospital) is necessitating intersection access be available by November 1 2021. Construction phasing between the BUILD and Intersection Improvement Project is much more effective and possible with a signal intersection. While the roundabout intersection was initially recommended, the signal intersection was also acceptable and operated at high levels of service as well. For these reasons the signal intersection is now the selected design option.

Options
TPCC should consider the following options:

Option 1: Recommend that TPCC approve Amendment #2 to the FFY 2020-2024 Transportation Improvement Program as proposed.

Option 2: Do not recommend that TPCC approve Amendment #2 to the FFY 2020-2024 Transportation Improvement Program and direct staff as necessary.

Recommendation
Staff recommends Option 1.

Western

EAST MISSOULA
HIGHWAY 200 CORRIDOR PLAN

East Missoula

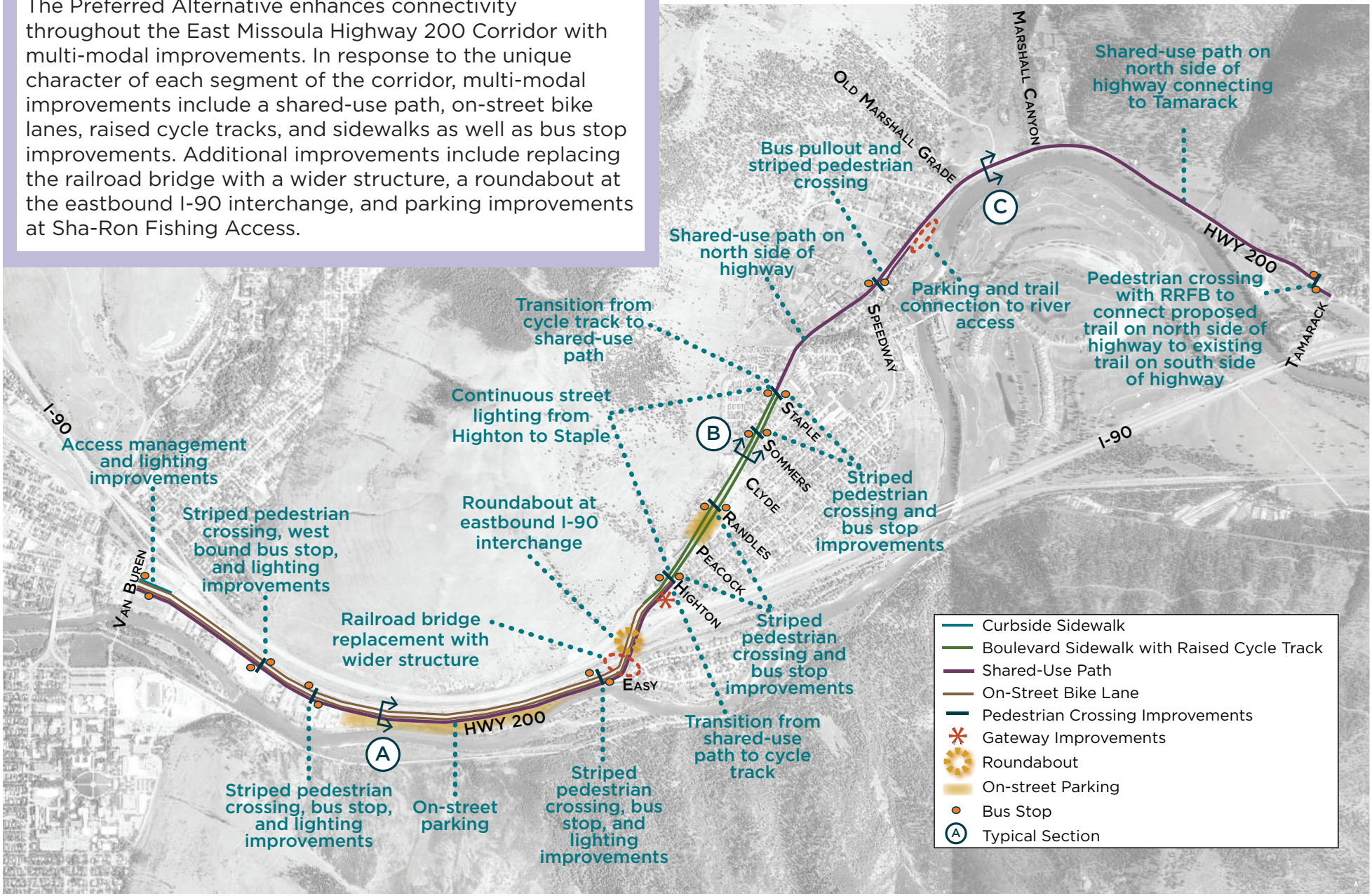
Eastern

Preferred Alternative

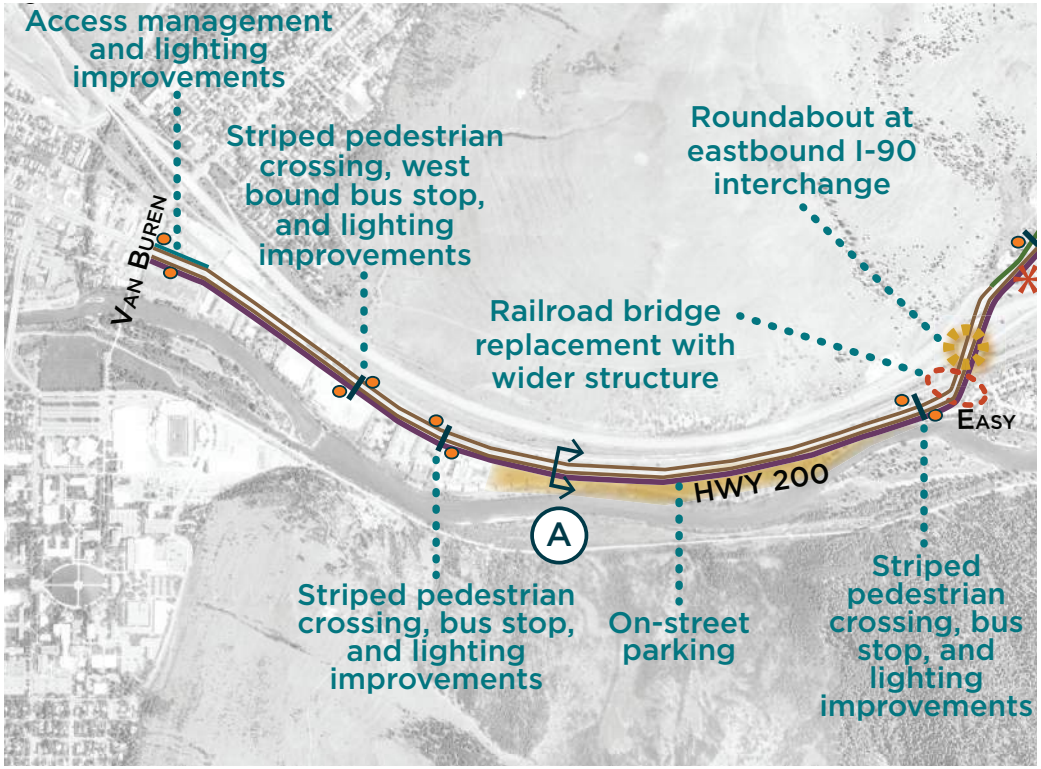
WGMGROUP
Community Values. Inspired Futures.

October 22, 2020

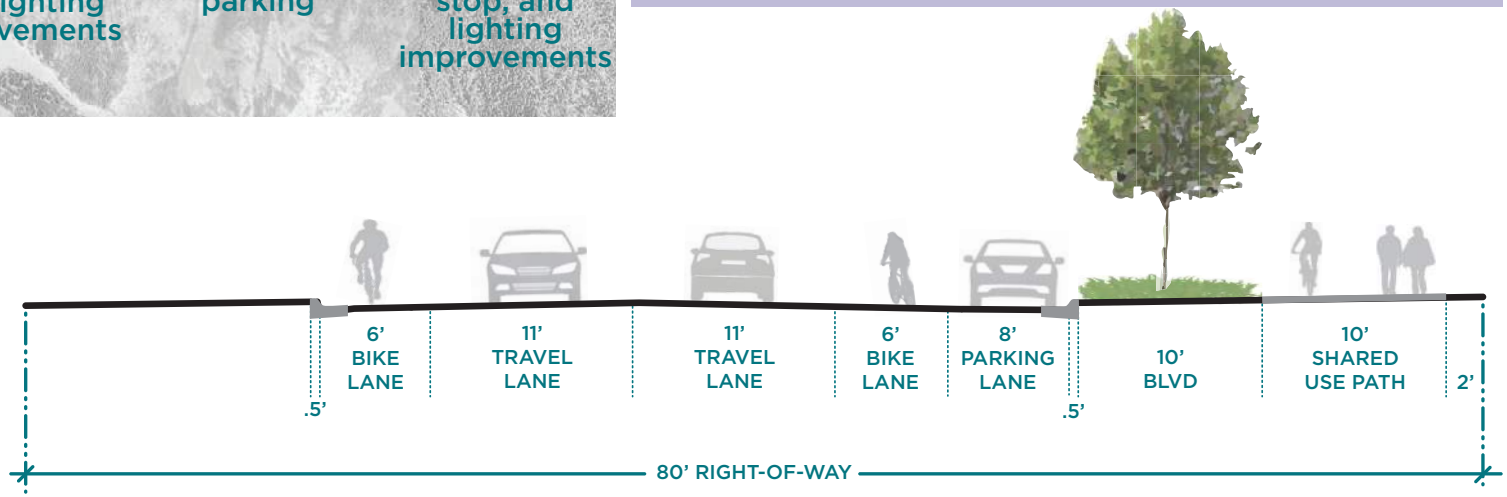
The Preferred Alternative enhances connectivity throughout the East Missoula Highway 200 Corridor with multi-modal improvements. In response to the unique character of each segment of the corridor, multi-modal improvements include a shared-use path, on-street bike lanes, raised cycle tracks, and sidewalks as well as bus stop improvements. Additional improvements include replacing the railroad bridge with a wider structure, a roundabout at the eastbound I-90 interchange, and parking improvements at Sha-Ron Fishing Access.



East Broadway Segment



A shared use path and on-street bike lanes are provided from Van Buren to I-90. The shared-use path provides a two-way connection for users that only want to access locations on the south side of Highway 200, such as students living in apartments along the river and going to classes at the University. The on-street bike lanes cater to commuter bicyclists from East Missoula traveling into Downtown for work. On-street parking is provided where existing right-of-way width allows, providing overflow parking for apartment complexes and events. Street crossings and bus stops are improved and will include lighting. Access management near Van Buren is addressed by extending the median to the east and eliminating the left turn lane at Van Buren for vehicles traveling west. This allows for better access control while creating space for improved bicycle and pedestrian amenities.



A East Broadway Segment Typical Section Looking East

*Right-of-way width varies from 60' to 80'.

Railroad Bridge Improvements

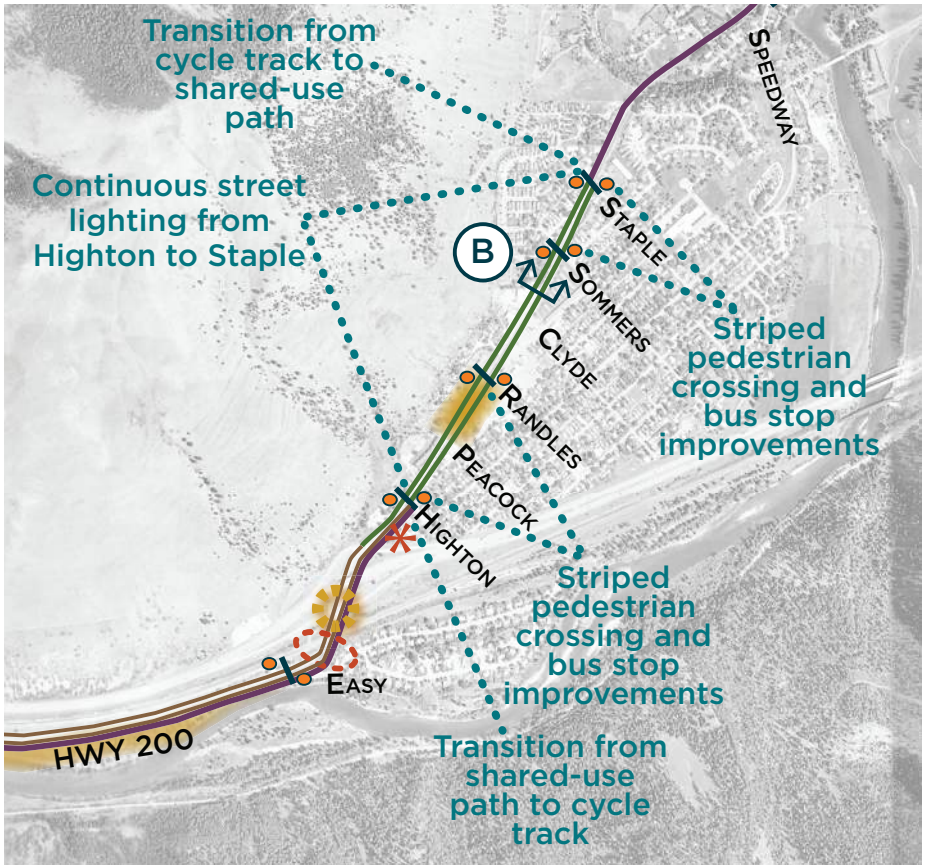
The railroad bridge is replaced to accommodate on-street bike lanes and a shared-use path. The roundabout at the eastbound I-90 interchange improves safety and intersection operations while addressing the challenging geometry of the intersection.

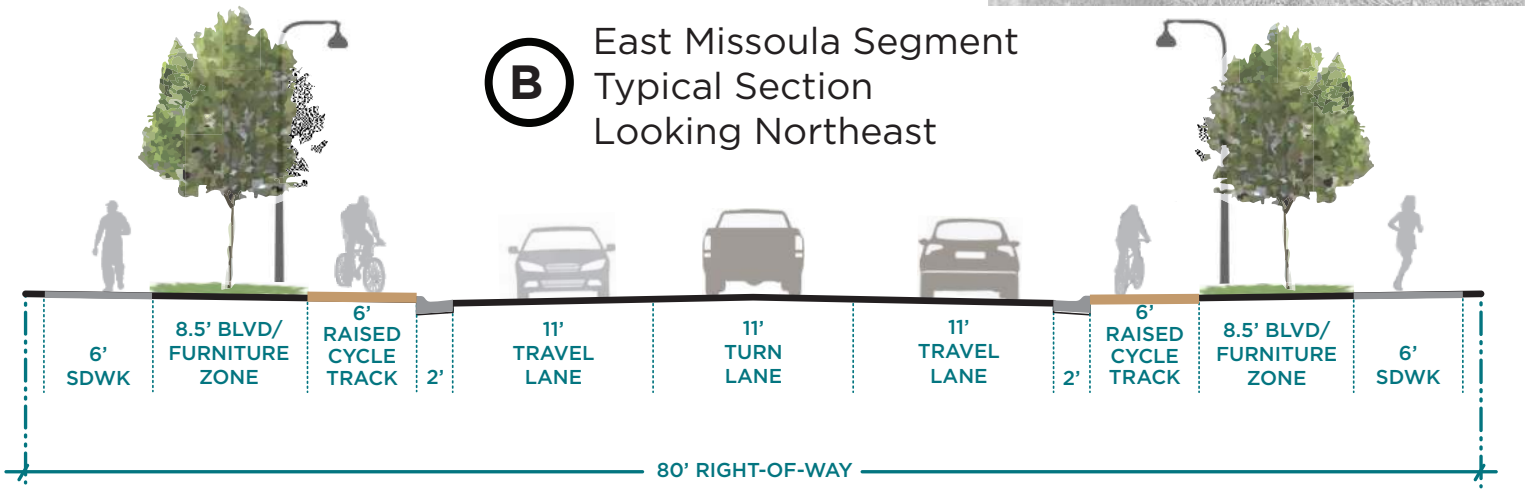
Existing Railroad Bridge

Proposed Railroad Bridge Replacement and Roundabout at Eastbound I-90 Interchange

East Missoula Segment

Improvements through East Missoula include sidewalks, landscaped boulevards, raised cycle tracks, and curb and gutter on both sides of Highway 200. Continuous street lighting is provided from Highton Street to Staple Street. Bus stop and striped crossing improvements are planned for Highton Street, Randles Street, Sommers Street, and Staple Street. With the street improvements, the entire 80' right-of-way will be utilized. This will affect parking for some businesses that currently use the right-of-way for parking. In these areas, on-street parking can be accommodated by eliminating the landscaped boulevards.

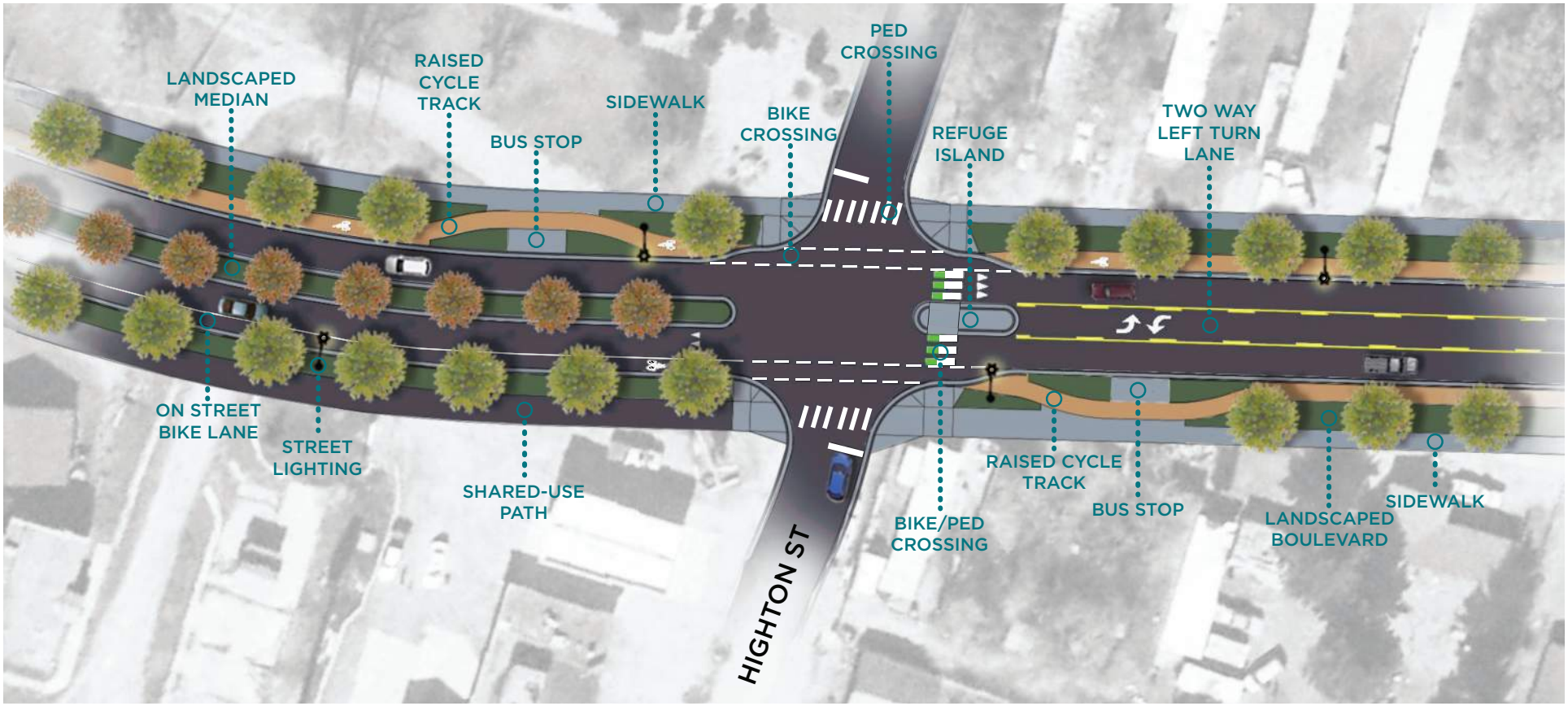




Highton Street Crossing

Transition from Shared Use Path to Cycle Track

The two-way shared-use path will transition to one-way raised cycle tracks on the north and south of Highway 200 through East Missoula. This transition includes a bicycle and pedestrian crossing at Highton Street with a refuge island to allow pedestrians to stop before finishing crossing the street. Bus stops are located at this intersection so users have access to the street crossing.



East Missoula Improvements

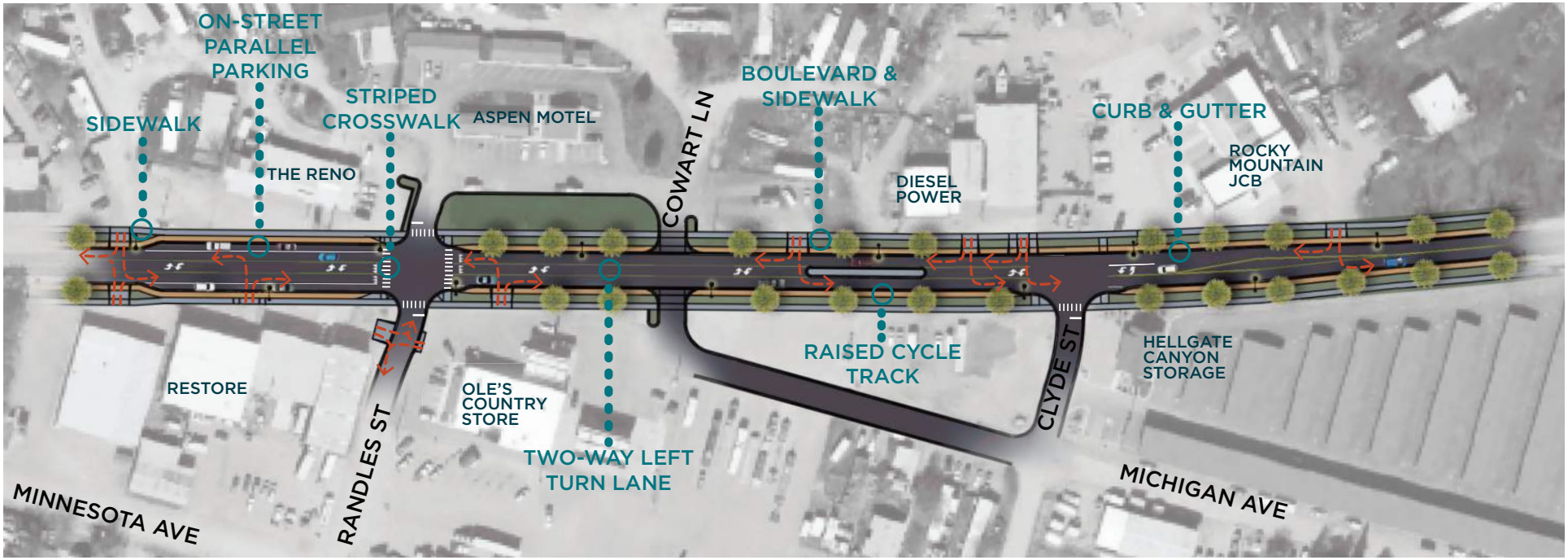
Improvements through East Missoula include raised cycle tracks, landscaped boulevards, sidewalks, and street lighting. This will create a new look for East Missoula while improving safety for vehicles, pedestrians, and bicyclists.

Existing Highway 200 Improvements through East Missoula

Proposed Highway 200 Improvement through East Missoula

This area lacks curb, gutter, and sidewalk as well as having numerous approaches and large areas of continuously paved property abutting the road that result in nearly continual access with few restrictions in place. This causes safety and stormwater issues. To address these issues, curb and gutter will be installed along the entire length of Highway 200 through East Missoula. This will address stormwater and drainage issues and delineate access to businesses and residences as well as street connections. Intersecting streets will be better aligned for more perpendicular street intersections.

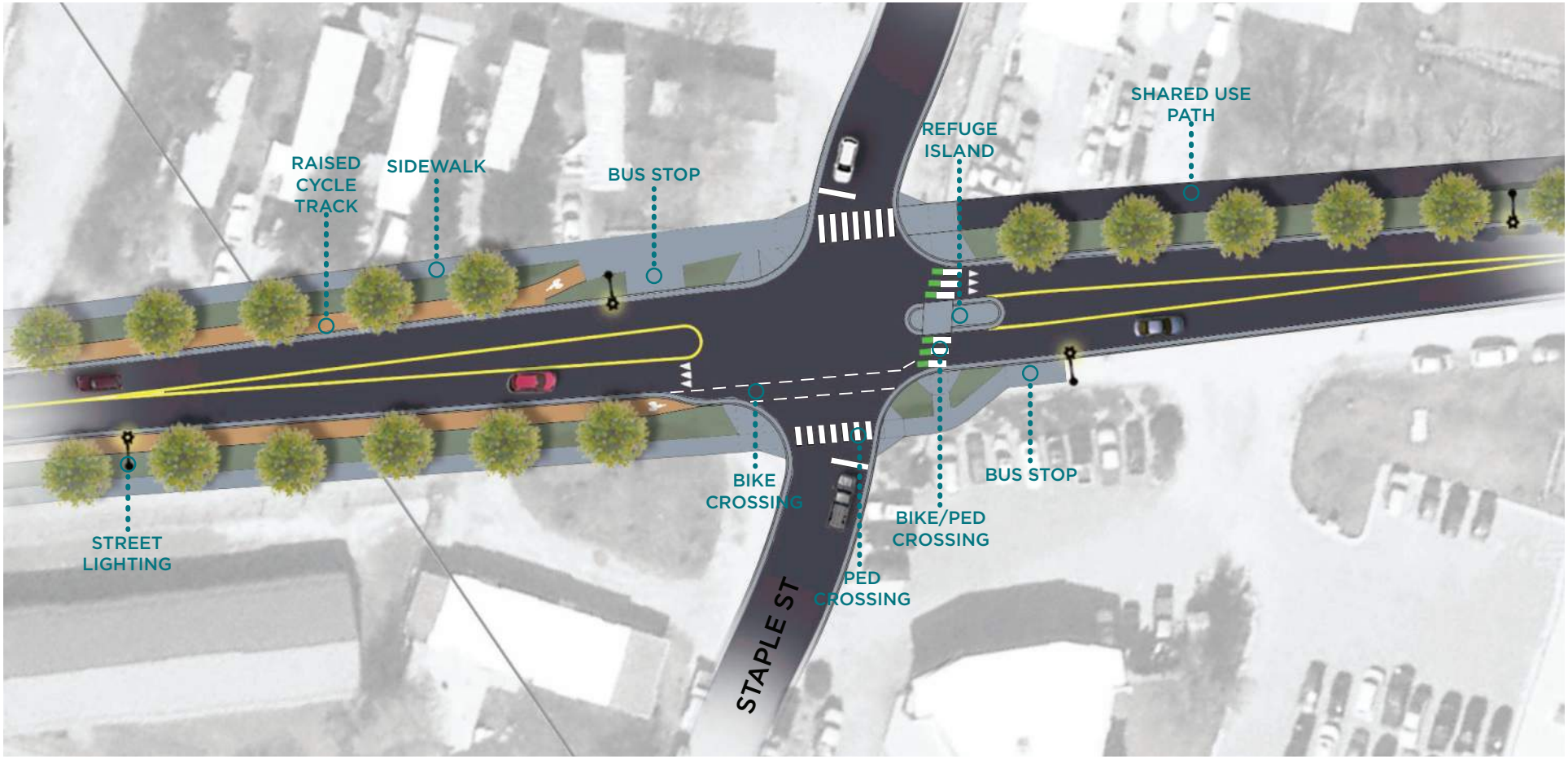
A two-way left turn lane is shown through most of East Missoula, which removes stopped or slow left-turning vehicles from the through lanes and stores those vehicles in the median area until an acceptable gap in opposing traffic is available. Additional driveway access is provided to existing businesses and residences.



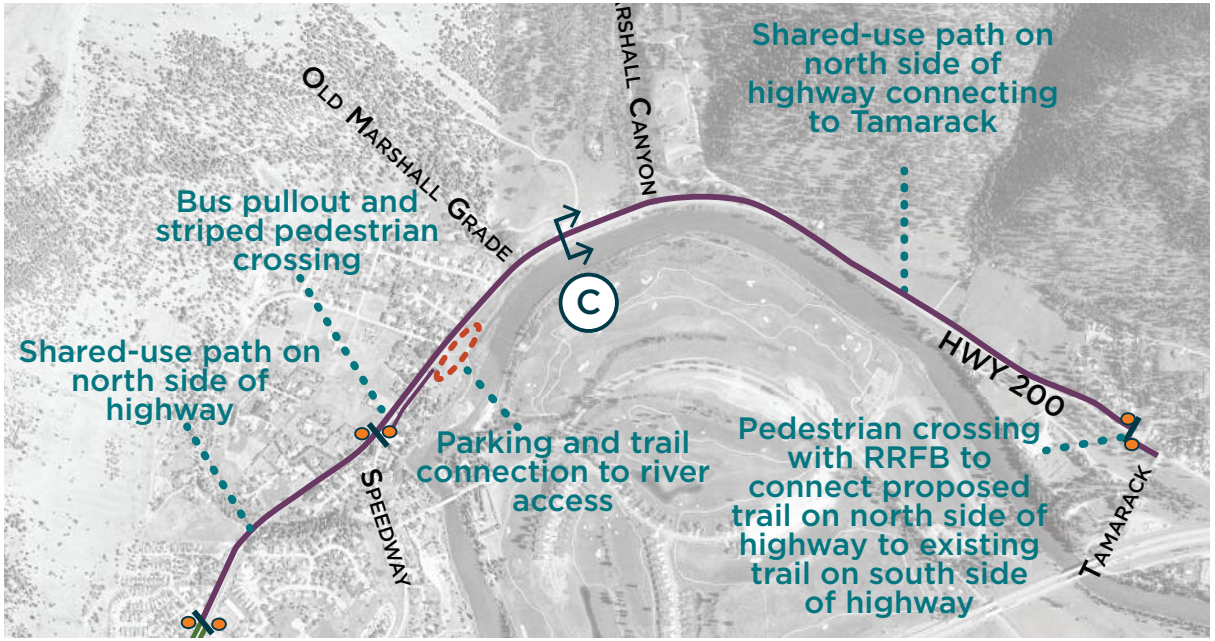
Staple Street Crossing

Transition from Cycle Track to Shared Use Path

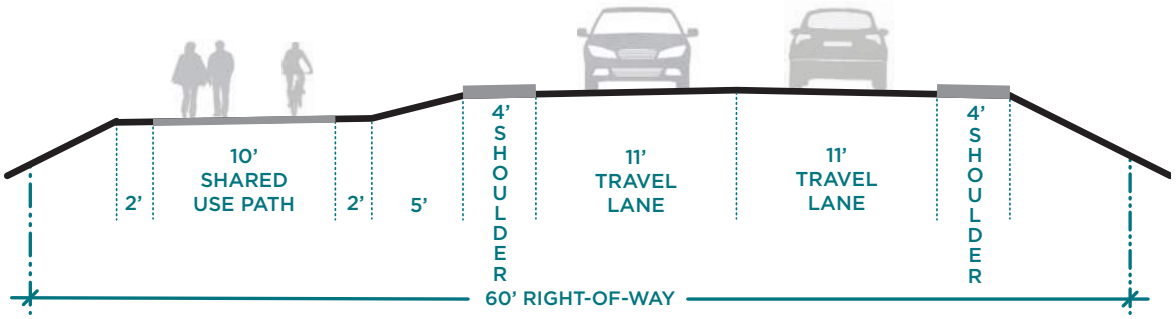
At Staple Street, the raised cycle tracks transition to a shared-use path on the north side of the highway. This transition includes a bicycle and pedestrian crossing with a refuge island to allow pedestrians to stop before finishing crossing the street. Bus stops are located at this intersection so users have access to the street crossing.



Sha-Ron Marshall Segment

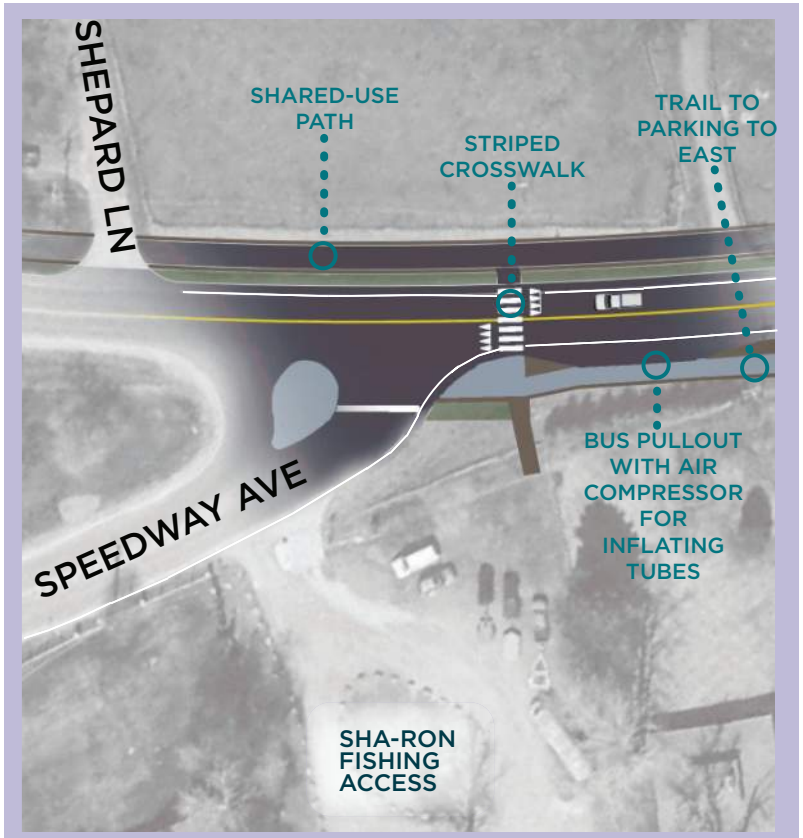


A shared-use path is located on the north side of the highway through the Sha-Ron Marshall segment connecting to the existing path at Tamarack. The path is located on the north side of the highway to provide better access to existing residences and to address construction feasibility issues where there is limited space between the river and hillside. A rectangular rapid flashing beacon (RRFB) is provided near Tamarack for users to cross Highway 200 and connect to the existing trail east of Tamarack. A new parking lot is provided east of the Sha-Ron fishing access with a trail connecting parking to the river access. A bus pullout is also provided at Sha-Ron that can accommodate shuttle service.



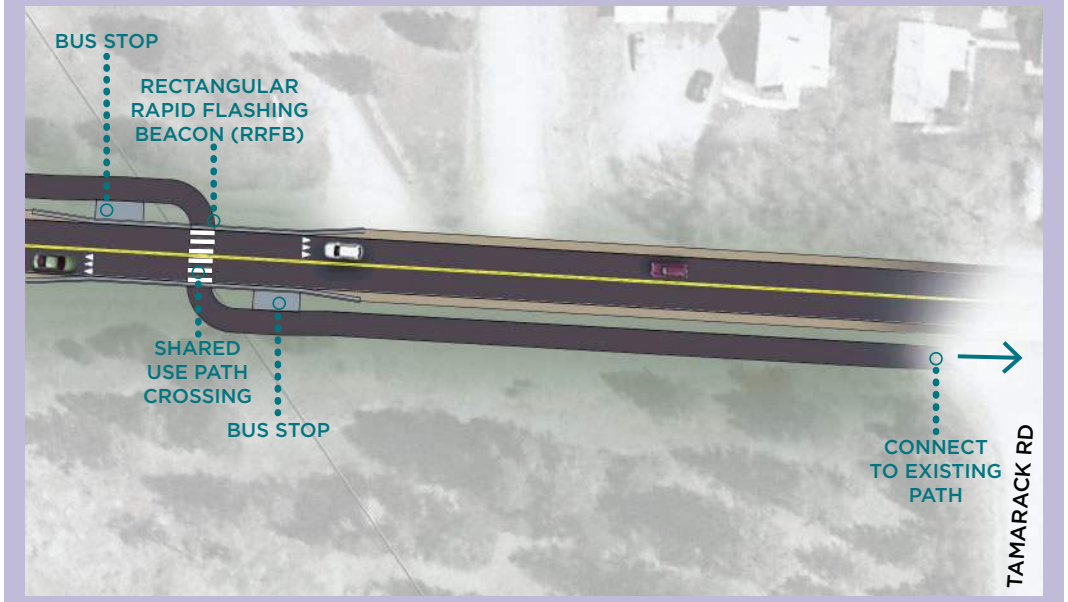
C Sha-Ron Marshall Segment
Typical Section
Looking East

Sha-Ron Bus Pullout & Tamarack Crossing



Sha-Ron Bus Pullout

At the Sha-Ron fishing access, a bus pullout is provided to serve Mountain Line as well as to provide shuttle service for "tubers" accessing the river. An air compressor will be provided at the bus pullout for inflating tubes. A trail will connect to a new parking lot located east of Sha-Ron to minimize parking along Highway 200. A striped crosswalk connects the shared-use path on the north side of Highway 200 to Sha-Ron.



Tamarack Crossing

To transition the shared-use path from the north side of Highway 200 to the existing trail east of Tamarack on the south side of Highway 200, a striped crossing is provided with a rectangular rapid flashing beacon to alert drivers to users crossing the highway. The crossing is coordinated with bus stop locations.

2020 Pavement Management Report

for

Metropolitan Planning Organization
Urbanized Area

Prepared by

Transmap Corporation

5030 Transamerica Drive

Columbus, OH 43228

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Fax: 614-481-4017

Web: Transmap.com

August 2020

Table of Contents

2020 Pavement Management System Report

Executive Summary

The nation's highways represent an investment of billions of dollars by Local, state and federal governments. To protect this investment, the Missoula Metropolitan Planning Organization (MPO) hired Transmap Corporation to assist in the development of a Network Pavement Management System to incorporate the Missoula County and City roads. This program is designed to preserve and extend the useful life of paved surfaces throughout the region and optimize the available funds to meet the network condition needs.

The Missoula Urbanized Area encompasses a mix of Missoula City and County maintained roads consisting of approximately 401.01 miles of asphalt paved roads. This represents an investment of roughly $625.6M, when factoring in a replacement (reconstruction) cost of approximately $1.56 million per mile, and a "fix-all" cost of $115.8M (See Tables 2.1 & 2.2). The $1.56 million per mile is a national estimate obtained from the American Public Works Association (APWA).

TransMap utilizes MicroPAVER (ver. 7.0.10) to perform the analysis of clients' roads. MicroPAVER, a pavement management system (PMS), is a decision-making tool for the development of cost-effective maintenance and repair alternatives for roads and streets, parking lots and airfields. Developed and maintained by the US Army Corp of Engineers Research and Development Center, it provides a Network-Level, systematic approach to pavement management to insure optimum return on investment.

MicroPAVER employs a Pavement Condition Index (PCI) condition rating for each segment of roadway (intersection to intersection) in its assessment, on a 0 (Failed) to 100 (Excellent) scale. The inspection criteria and PCI determination is governed by ASTM Standard D6433-11, "Standard Practice for Roads and parking Lots Pavement Condition Index Surveys" making it an objective and, just as important, repeatable means of assigning a condition rating to the roadways.

Below are graphs of the distribution of the square yardage of the City of Missoula roads and County roads within the Urbanized Area (UZA) that comprise the total population of road segments within the UZA, by PCI range's that was presented at the May 4, 2020 Boot Camp meeting.

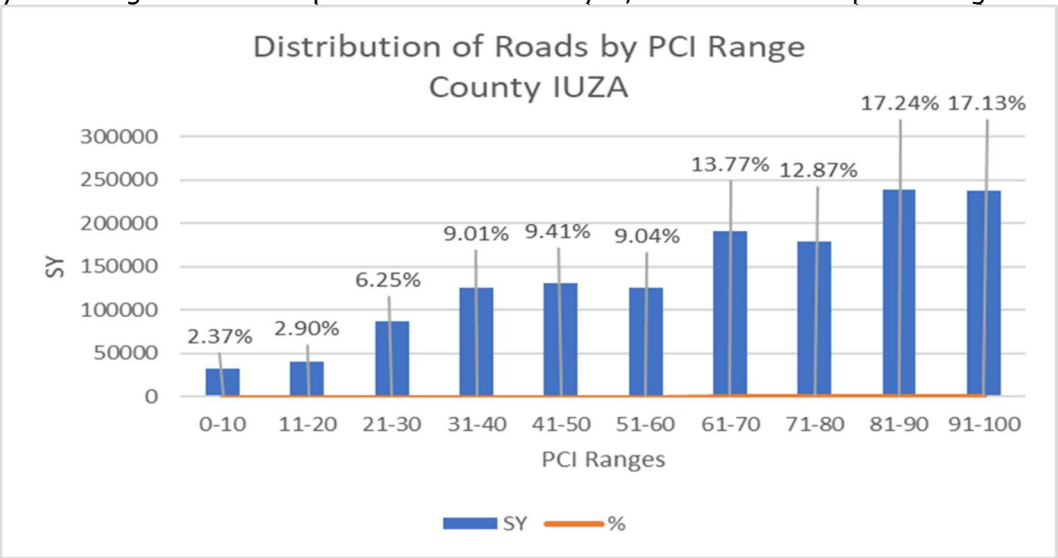


Figure ES-1 Missoula County IUZA Distribution of Roads by PCI Range

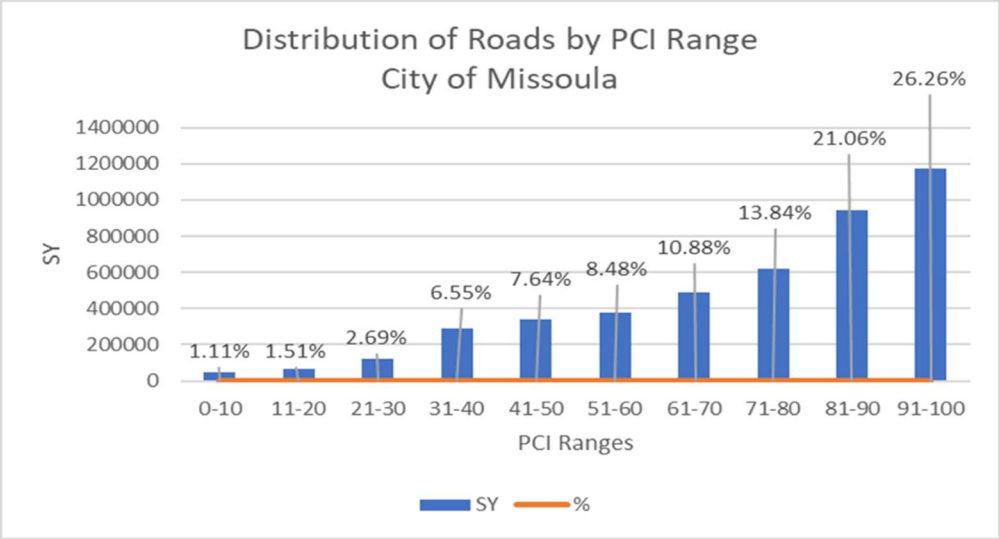


Figure ES-2 City of Missoula Distribution of Roads by PCI Range

Using the City of Missoula's historical information (dates of past roadway treatments) and similar pavement performance models, specific models (See Appendix A) were constructed for Missoula's Arterial/Collector and Local roads. This information coupled with the City and County's approach to pavement maintenance, consisting of a list of Maintenance and Repair (M&R) treatments and their costs, (Table 1.1) tied to PCI ranges within the PCI scale provides the data necessary for MicroPAVER to conduct its analysis.

The following 5-year scenarios were constructed based on information obtained during the Boot Camp meeting, and preceding discussions with the City and County, divided by Arterial/Collectors and Local Roads, followed by tabular and graphical representations.

- Cost to "Fix-All"
  - **$25.5M – Arterial/Collectors and $90.3M Local**

- Do Nothing Consequences
  - **5 Year Ending PCI's of 54 – Arterial/Collectors and 49 – Local**

- Consequences of existing $4,400,654 Budget
  (This was derived by adding the City budget of $4,244,654 to the percentage of the County $400K budget allocated to IUZA which is 39% or $156,000. Similarly, the Arterial/ Collector budgets consist of $1,056,003 (24.9% of $4,244,654) plus $64.428 (41.3% of $156K) equaling $1,123,431 and Local Roads as $3,185,651 (75.1% of $4,244,654) plus $85,572 (58.7% of $156K) equaling $3,271,223.
  - **5 Year Ending PCI's of 63 – Arterial/Collectors and 56 – Local**

- Budgets to maintain the existing PCI's of 75 – Arterial/Collectors and 68-Local
  - **$3.603M – Arterial/Collectors and $8.699M Local**

- Budgets to Achieve PCI of 71 – Arterial/Collectors and 71 - Local
  - **$3.138M – Arterial/Collectors and $10.479M Local**

One method of comparing the effectiveness of the scenarios, in reaching overall savings, is by comparing the Cost of M&R and the Loss (Deferred/Backlog Cost or depreciated Value) at the end of the 5 year period to the Total Loss (Deferred Cost) of the Do-Nothing scenario. This comparison

should provide a difference indicating the savings realized at the end of the 5 years. Thus, the scenario providing the greatest savings would be the most desirable. Of course, this has to ultimately be balance by practical concerns related to the availability of funding.

The tables on the following page, illustrates this comparison with the overall savings shown in the far-right columns. (The deferred costs can be seen in Section 2 of this report). It demonstrates what is often difficult to illustrate but is intuitively understood; that money spent on maintenance equates to overall savings in the long run. Highlighted below is the scenario that provides the greatest savings.

Table ES.1 –Missoula UZA
Estimated 5-Year M&R Budget Cost Savings Comparisons
Arterial/Collectors

Budget Scenario	Total 5-Year M&R Costs $ Millions (2020-2024)	Deferred M&R Backlog (1) $Millions (2024)	Total 5-Year Cost(2) $Millions	Cost Difference/ Savings $Millions
Do Nothing	0	56.3	56.3	0
Current Budget $1.123M/Yr	5.62	48.5	54.12	2.18
Maintain Current PCI $3.603M/Yr	18.02	28.7	46.72	9.58
Achieve PCI 71 $3.138M/Yr	15.69	33.9	49.59	6.71

1) M&R Backlog is defined as the Fix All Cost
2) Total of 5-Year M&R costs plus Deferred Costs

Table ES.2 –Missoula UZA
Estimated 5-Year M&R Budget Cost Savings Comparisons
Local

Budget Scenario	Total 5-Year M&R Costs $ Millions (2020-2024)	Deferred M&R Backlog (1) $Millions (2024)	Total 5-Year Cost(2) $Millions	Cost Difference/ Savings $Millions
Do Nothing	0	152	152	0
Current Budget $3.271M/Yr	16.36	142.3	132.4	19.6
Maintain Current PCI $8.699M/Yr	43.5	89.7	133.2	18.8
Achieve PCI 71 $10.479M/Yr	52.395	77.2	129.595	22.405

1) M&R Backlog is defined as the Fix All Cost
2) Total of 5-Year M&R costs plus Deferred Costs

1.0 - Missoula UZA, MT – All Asphalt (AC) Pavements

The following unit prices for (M&R) treatments were obtained from discussions during the boot camp meeting and preceding correspondence with County Staff (See Appendix E). Initially it consisted of a mix of City and County pricing till later is was decided to use the City of Missoula prices only. Transmap translated the information and placed it into the M&R Category ranges and unit prices shown in Tables below**.** The column titled "Expected Result" reflects the extended life of the pavement as experienced by the City.

Table 1.1 – Missoula UZA – Treatments, PCI Ranges and Costs
Arterial/Collectors

M&R Category	M&R Treatment	Price per Square Yard	Expected Result
Rejuvenation (PCI 86-100)	Chip Seal	$2.14	5 Years
Global (PCI 71-85)	Crack Seal/ Chip Seal	$2.82	7 Years
Conventional (PCI 66-70)	Thin Overlay/ Chip Seal	$18.97	10 Years
Conventional (PCI 60-65)	Mill/ Overlay/ Chip Seal	$26.52	15 Years
Critical (PCI 40-59)	Structural Mill/ Overlay/ Chip Seal	$33.85	20 years
Reclamation (PCI 0-39)	Reconstruct w/ full base gravel stabilization	$52.46	25 Years

The Pavement Performance models and Treatment PCI Ranges and Costs for the Urbanized Area (UZA), which is a combination of the City and County roads (City + County IUZA), were not able to be analyzed together while maintaining their individual family traits within Micropaver. They are combined utilizing the City of Missoula family traits.

The following sections will consist of budget scenarios for each using the performance models as shown in **Appendix A**, and Boot Camp information in **Appendix B**.

It is important to note that MicroPAVER is designed to optimize and determine a levelized budget based on the treatment cost provided above, the existing conditions and the deterioration model. Its methodology is not a worst-first approach but instead assigns treatments in a manner that may not be intuitively obvious. For example, it will apply preventative treatments early on, letting many of the worst segments get worse or let segments within the range of needing only global treatment drift into requiring conventional treatment or reconstruction before addressing them. It also often applies conventional treatments to segments within a Global range if structural distresses are detected, such as alligator cracking.

One aspect of its logic that is immediately noticeable when analyzing small data sets (i.e. roughly less than 500 segments) are significant peaks in the overall PCI over time. This will generally occur in the first few years when more preventative measures are recommended and concentrating later, on segments requiring more costly treatments.

1.1 - UZA Road Characteristics, Missoula, MT

The table below illustrates the mileage distribution by surface type, number of miles, number of square yards and the overall weighted average Pavement Condition Index (PCI).

Table 1.2 – Missoula UZA
Distribution of Roads by Pavement Type

Pavement Type	# of Sections	# of Miles	# of Square Yards	% by # of Square Yards	Weighted Average PCI
Asphalt	4,685	401.01	6,864,403	100%	70
Concrete	1	0.07	990	0%	91
Total	**4,686**	**401.08**	**6,865,393**	**100%**	**70**

There is only one section of concrete roadway which will not be considered in the remainder of this report.

The tables below show the mileage distribution of asphalt pavement by Functional Classification detailing the number of sections, the number of miles, the number of square yards, and the weighted average Pavement Condition Index (PCI).

Table 1.3 – Missoula UZA
Distribution of Asphalt Roads by Functional Class

Functional Class/Paver Designation	# of Sections	# of Miles	# of Square Yards	% by # of Square Yards	Weighted Average PCI
Arterial/ B	116	8.63	211,764	3.1%	81
Collector C	1,159	107.54	1,841,246	26.8%	75
Local E	3,410	284.84	4,811,393	70.1%	67
Total	**4,685**	**401.01**	**6,864,403**	**100.0%**	**70**

Table 1.4 – Missoula UZA
Distribution of Asphalt Roads

Pavement Type	# of Sections	# of Miles	# of Square Yards	% by # of Square Yards	Weighted Average PCI
City of Missoula	3,735	302.12	5,447,865	79.4%	71
County IUZA	950	98.89	1,416,538	20.6%	64
Total	**4,685**	**401.01**	**6,864,403**	**100%**	**70**

Table 1.5 – Missoula UZA
Distribution of Asphalt Arterial/ Collector Roads

Pavement Type	# of Sections	# of Miles	# of Square Yards	% by # of Square Yards	Weighted Average PCI
City of Missoula	877	75.29	1,465,487	71.4%	78
County IUZA	398	40.89	587,522	28.6%	68
Total	**1,275**	**116.18**	**2,053,009**	**100%**	**70**

Table 1.6 – Missoula UZA
Distribution of Asphalt Local Roads

Pavement Type	# of Sections	# of Miles	# of Square Yards	% by # of Square Yards	Weighted Average PCI
City of Missoula	2,858	226.82	3,982,378	82.8%	69
County IUZA	552	58.01	829,016	17.2%	61
Total	**3,410**	**284.83**	**4,811,394**	**100%**	**70**

2.0 - Missoula UZA, MT – Budget Scenarios

The table below summarizes the number of square yards of pavement into each M&R Category by PCI range. The cost column shows the result of the multiplication of the number of square yards times the unit price. The numbers shown in this table represent the cost to "fix everything".

2.1 - Missoula UZA, MT – Fix-All Scenarios

Table 2.1 UZA Roads, Missoula
Cost for Repair All Asphalt Arterial/ Collector Roads

PCI Range	# of Miles	# of SY	Unit Cost per SY	Total Cost
Rejuvenation (PCI 86-100)	41.04	773,438	$2.14	$1,655,157
Global (PCI 71-85)	34.46	614,253	$2.82	$1,732,193
Conventional (PCI 66-70)	7.79	130,080	$18.97	$2,467,618
Conventional (PCI 60-65)	7.81	131,194	$26.52	$3,479,265
Critical (PCI 40-59)	16.84	270,719	$33.85	$9,163,838
Reclamation (PCI 0-39)	8.23	133,326	$52.46	$6,994,282
Total	**116.17**	**2,053,010**		**$25,492,353**

Table 2.2 – UZA Roads, Missoula
Cost for Repair All Asphalt Local Roads

PCI Range	# of Miles	# of SY	Unit Cost per SY	Total Cost
Rejuvenation (PCI 86-100)	87.26	1,446,432	$2.14	$3,095,364
Global (PCI 71-85)	64.76	1,104,356	$2.82	$3,114,284
Conventional (PCI 66-70)	15.67	266,409	$18.97	$5,053,779
Conventional (PCI 60-65)	24.39	410,946	$26.52	$10,898,288
Critical (PCI 40-59)	46.58	803,987	$33.85	$27,214,960
Reclamation (PCI 0-39)	46.18	779,263	$52.46	$40,880,137
Total	**284.84**	**4,811,393**		**$90,256,812**

Results from MicroPAVER analyses take the following parameters into consideration:

- network cost optimization,
- the performance curve,
- the Critical PCI,
- the application of Preventative and Global Maintenance treatments,
- and a cost by PCI condition.

The following scenarios illustrate the annual major and global recommended budgets for a 5-year period, as determined by MicroPAVER, and the resulting PCI. Major treatments would be those indicated in tables 2.1 & 2.2 as those treatment below PCI 71, where Global would be those treatments above. The last column is the deferred maintenance which consists of the cost of those treatments on sections of road that fall below the Critical PCI, and those above where MicroPaver has identified structural related deficiencies or where it has determined that there is enough remaining budget to address sections of road that are close to dropping to lower state of condition and it would be advantageous to alleviate. Part of MicroPaver's strategy is to begin by tackling those road where preventative treatments will do the most good maintenance and letting major work go till later in the work plan. It is not a worst-first approach and can often appear counter-intuitive.

2.2 - Missoula UZA Roads – Do Nothing Consequences

Table 2.3 – Missoula UZA – Arterial/ Collector Roads
Do Nothing Budget Consequences

Year Beginning September 2020	Annual Budget (Major)	PCI at Year End	Deferred Maint.
2020	$0	72	$ 29,700,000
2021	$0	68	$ 35,200,000
2022	$0	63	$ 41,200,000
2023	$0	59	$ 48,200,000
2024	$0	54	$ 56,300,000

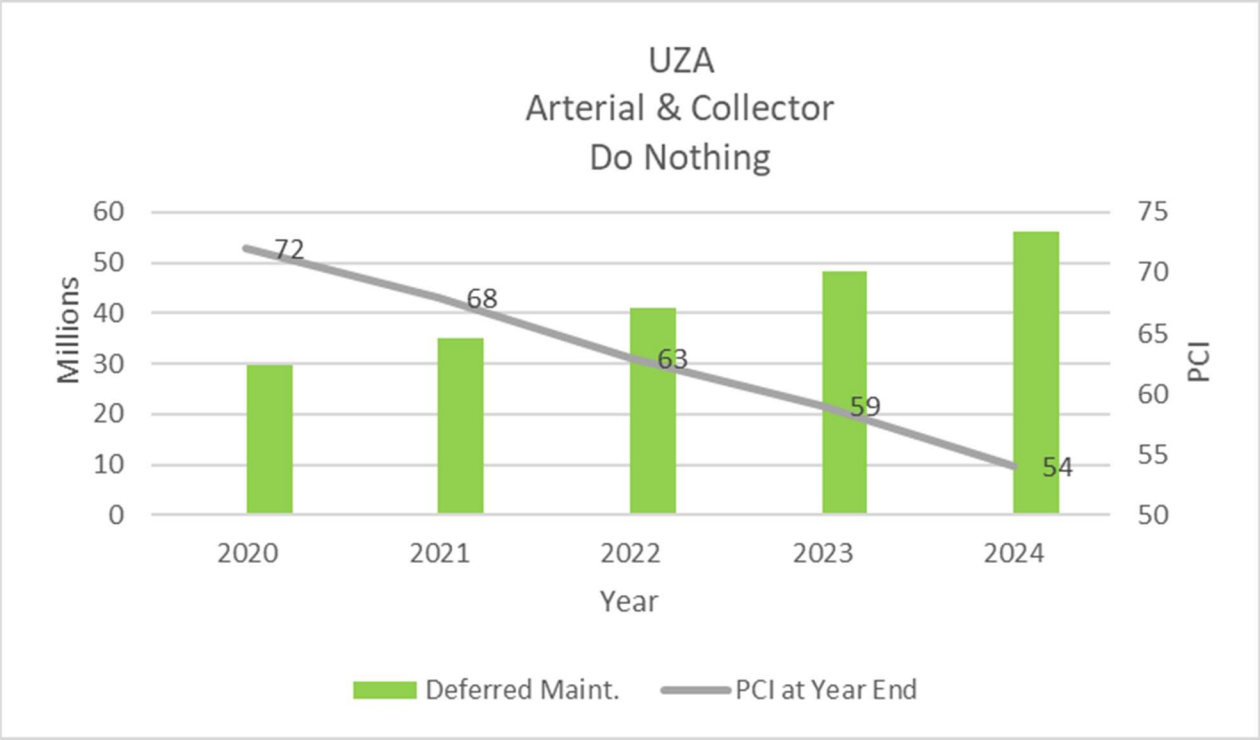


Figure 2-1 – Missoula UZA – Arterial/ Collector Roads
Do Nothing Budget Consequences

Table 2.4 – Missoula UZA – Local Roads
Do Nothing Budget Consequences

Year Beginning September 2020	Annual Budget (Major)	PCI at Year End	Deferred Maint.
2020	$0	64	$ 101,200,000
2021	$0	61	$ 113,800,000
2022	$0	57	$ 125,600,000
2023	$0	53	$ 138,200,000
2024	$0	49	$ 152,000,000

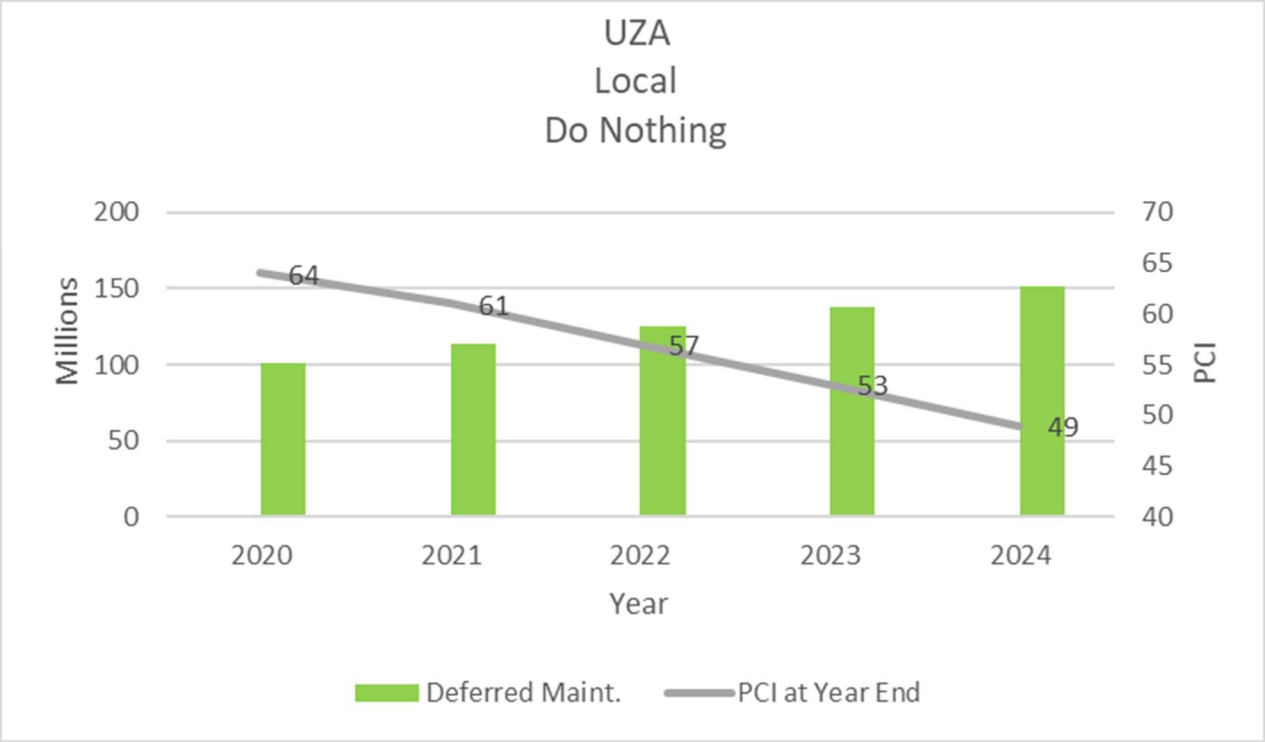


Figure 2-2 – Missoula UZA – Local Roads
Do Nothing Budget Consequences

2.3 - Missoula UZA Roads – Consequences of Existing $4.242M Budget

Table 2.5 – Missoula UZA – Arterial/ Collector Roads
Consequences of Existing $1.123M Budget

Year Beginning September 2020	Annual Budget (Major)	Annual Budget (Global)	PCI at Year End	Deferred Maint.
2020	$0	$1,123,000	74	$ 28,700,000
2021	$500,000	$623,000	72	$ 33,100,000
2022	$1,067,000	$56,000	69	$ 37,900,000
2023	$1,079,000	$44,000	66	$ 42,900,000
2024	$988,000	$135,000	63	$ 48,500,000

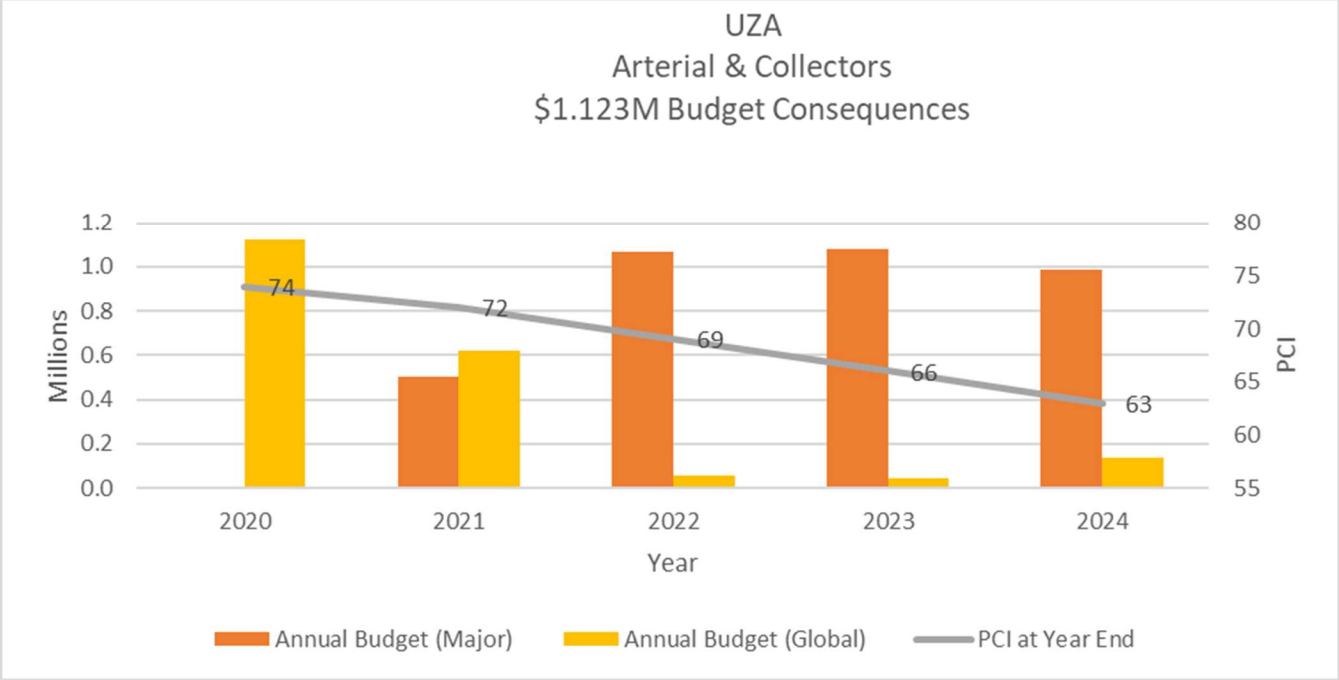


Figure 2-3 – Missoula UZA – Arterial/ Collector Roads
Consequences of Existing $1.123M Budget

Table 2.6 – Missoula UZA – Local Roads
Consequences of Existing $3.271M Budget

Year Beginning September 2020	Annual Budget (Major)	Annual Budget (Global)	PCI at Year End	Deferred Maint.
2020	$585,000	$2,686,000	66	$ 98,000,000
2021	$3,211,000	$60,000	64	$ 107,300,000
2022	$3,211,000	$60,000	61	$ 115,000,000
2023	$3,056,000	$215,000	59	$ 123,500,000
2024	$2,961,000	$310,000	56	$ 132,400,000

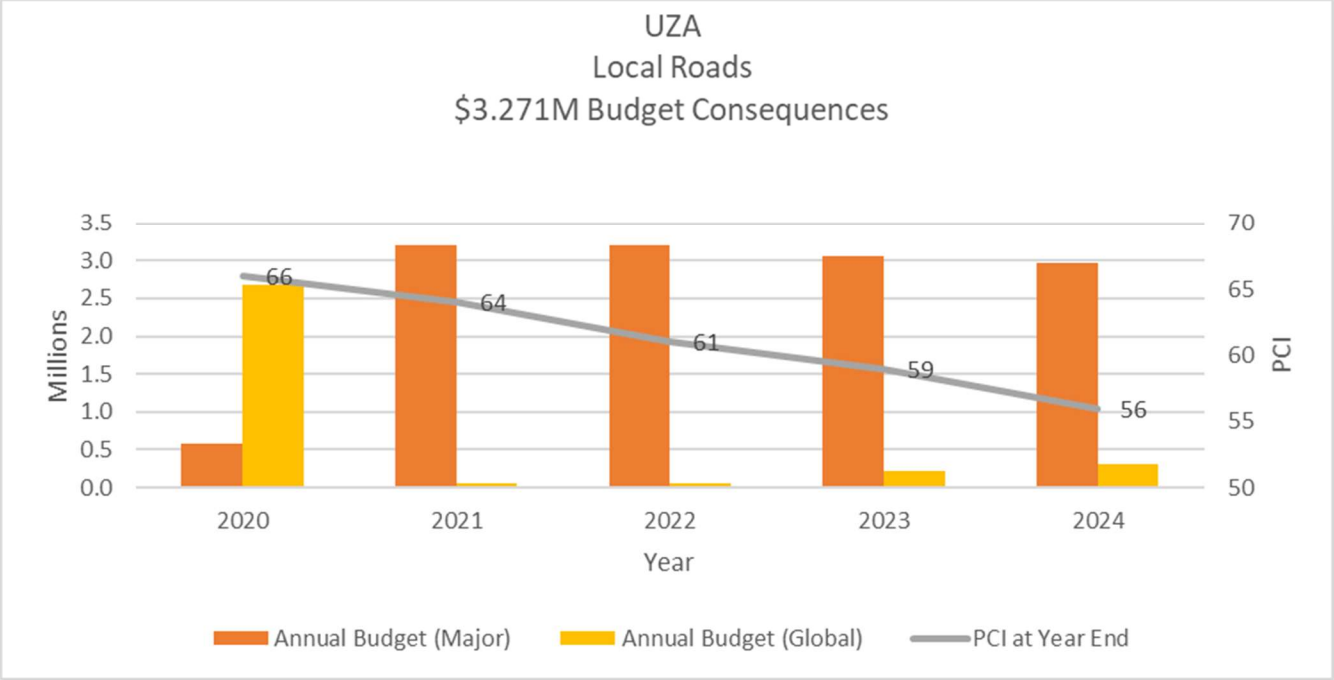


Figure 2-4 – Missoula UZA – Local Roads
Consequences of Existing $3.271M Budget

2.4 - Missoula UZA Roads – Budget to Maintain Existing PCI's

(Tables 1.3 & 1.4 – Arterial/ Collector Roads PCI = 75, Local Roads = 68)

Table 2.7 – Missoula UZA – Arterial/ Collector Roads
$3.603M Budget to Maintain PCI 75

Year Beginning September 2020	Annual Budget (Major)	Annual Budget (Global)	PCI at Year End	Deferred Maint.
2020	$2,046,000	$1,557,000	77	$ 26,100,000
2021	$3,497,000	$106,000	76	$ 27,400,000
2022	$3,547,000	$56,000	75	$ 28,700,000
2023	$3,559,000	$44,000	75	$ 29,900,000
2024	$3,468,000	$135,000	75	$ 28,700,000

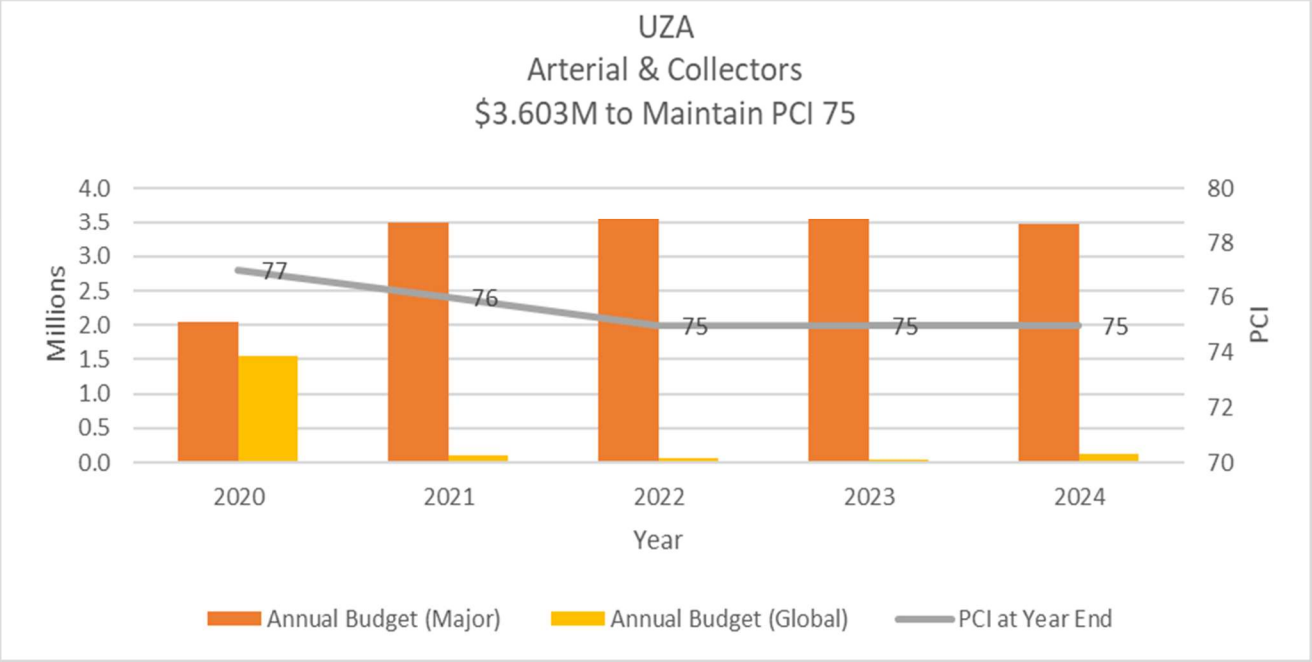


Figure 2-5 – Missoula UZA – Arterial/ Collector Roads
$3.603M Budget to Maintain PCI 75

Table 2.8 – Missoula UZA – Local Roads
$8.699M Budget to Maintain PCI 68

Year Beginning September 2020	Annual Budget (Major)	Annual Budget (Global)	PCI at Year End	Deferred Maint.
2020	$6,013,000	$2,686,000	68	$ 92,500,000
2021	$8,639,000	$60,000	67	$ 94,700,000
2022	$8,639,000	$60,000	68	$ 95,600,000
2023	$8,484,000	$215,000	68	$ 94,600,000
2024	$8,389,000	$310,000	68	$ 89,700,000

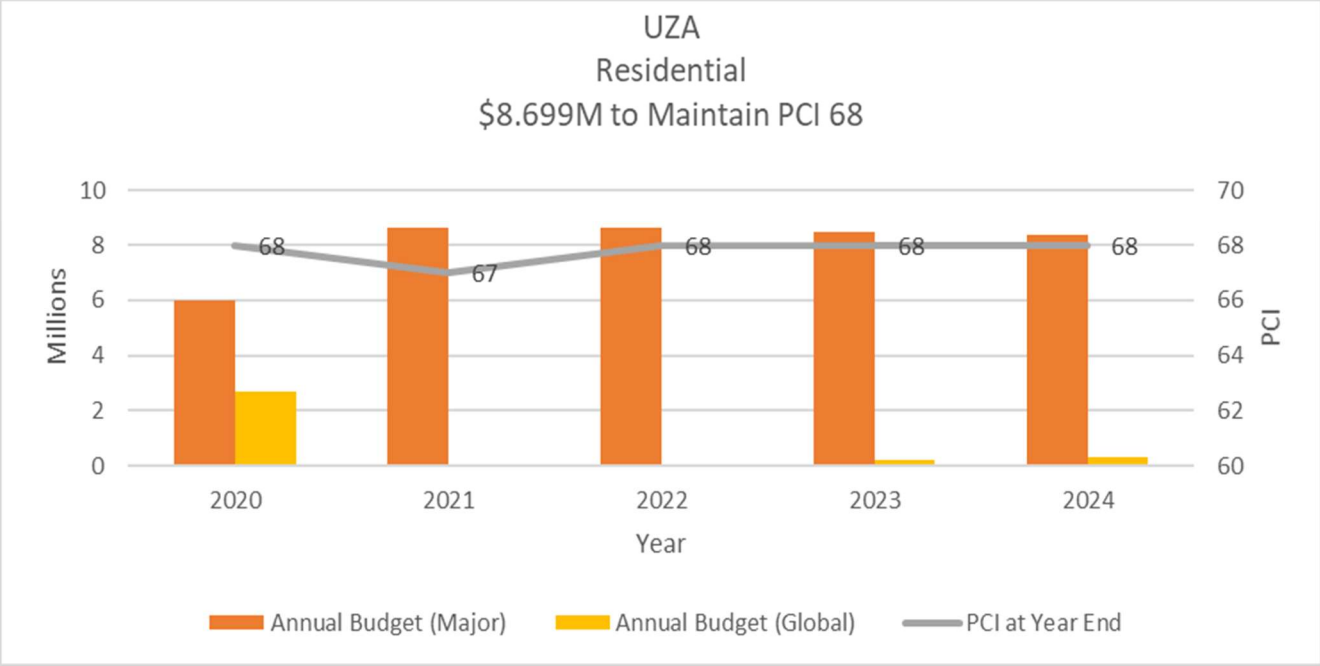


Figure 2-6 – Missoula UZA – Local Roads
$8.699M Budget to Maintain PCI 68

2.5 - Missoula UZA Roads – Budget to Achieve PCI 71

Table 2.9 – Missoula UZA – Arterial/ Collector Roads
$3.138M Budget to Achieve PCI 71

Year Beginning September 2020	Annual Budget (Major)	Annual Budget (Global)	PCI at Year End	Deferred Maint.
2020	$1,581,000	$1,557,000	77	$ 26,600,000
2021	$3,032,000	$106,000	75	$ 28,500,000
2022	$3,082,000	$56,000	74	$ 30,300,000
2023	$3,094,000	$44,000	72	$ 32,400,000
2024	$3,003,000	$135,000	71	$ 33,900,000

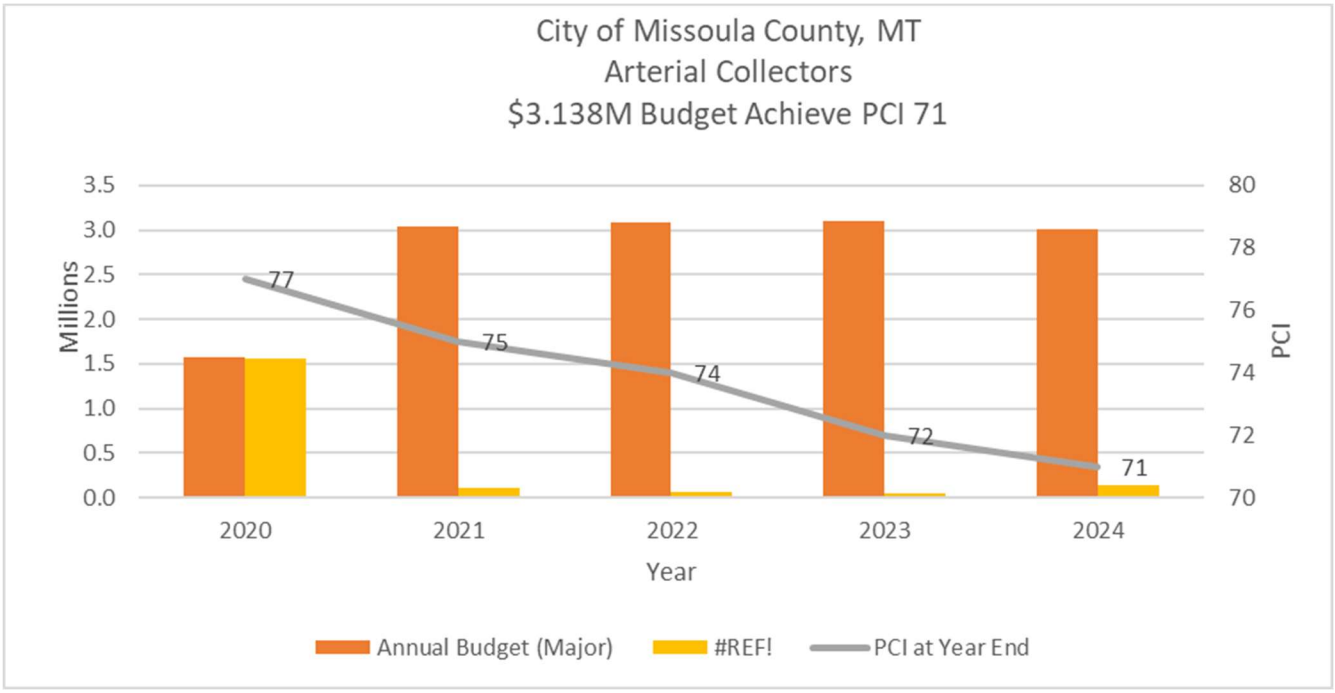


Figure 2-7 – Missoula UZA – Arterial/ Collector Roads
$3.138M Budget to Achieve PCI 71

Table 2.10 – Missoula UZA – Local Roads
$10.479M Budget to Achieve PCI 71

Year Beginning September 2020	Annual Budget (Major)	Annual Budget (Global)	PCI at Year End	Deferred Maint.
2020	$7,793,000	$2,686,000	68	$ 90,800,000
2021	$10,419,000	$60,000	69	$ 91,000,000
2022	$10,419,000	$60,000	71	$ 87,500,000
2023	$10,264,000	$215,000	71	$ 84,500,000
2024	$10,169,000	$310,000	71	$ 77,200,000

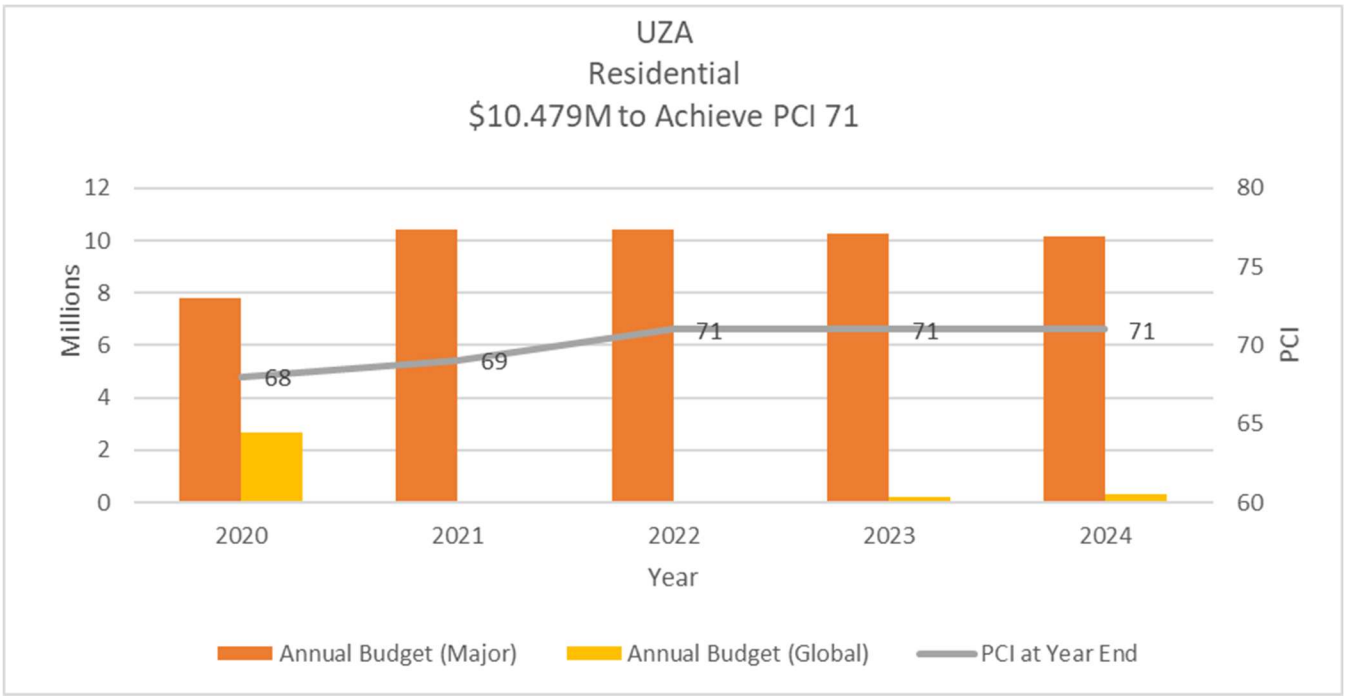


Figure 2-8 – Missoula UZA – Local Roads
$10.479M Budget to Achieve PCI 71

2.6 - UZA Roads, Missoula, MT – Scenario Summaries

Table 2.11 – Missoula UZA - Arterial/ Collector Roads Scenario Summary

Year Beginning September 2020	Do Nothing	$1.123M Budget Consequences	$3.603M to Maintain PCI 75	$3.138M to Achieve PCI 71
2020	72	74	77	77
2021	68	72	76	75
2022	63	69	75	74
2023	59	66	75	72
2024	54	63	75	71

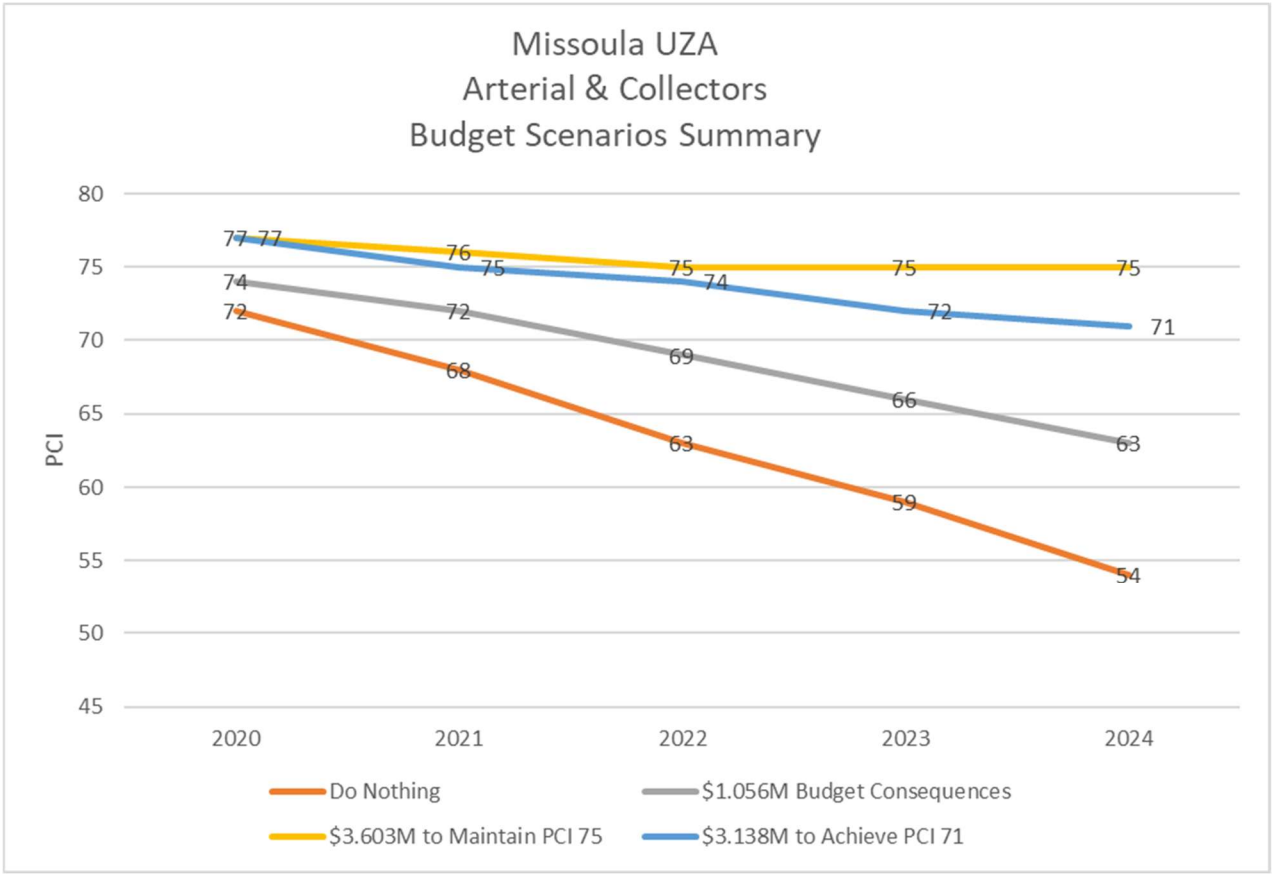


Figure 2-9 – Missoula UZA – Arterial/ Collector Roads Scenario Summary

Table 2.12 – Missoula UZA – Local Roads Scenario Summary

Year Beginning September 2020	Do Nothing	$3.271M Budget Consequences	$8.699 to Maintain PCI 68	$10.479M to Achieve PCI 71
2020	64	66	68	68
2021	61	64	67	69
2022	57	61	68	71
2023	53	59	68	71
2024	49	56	68	71

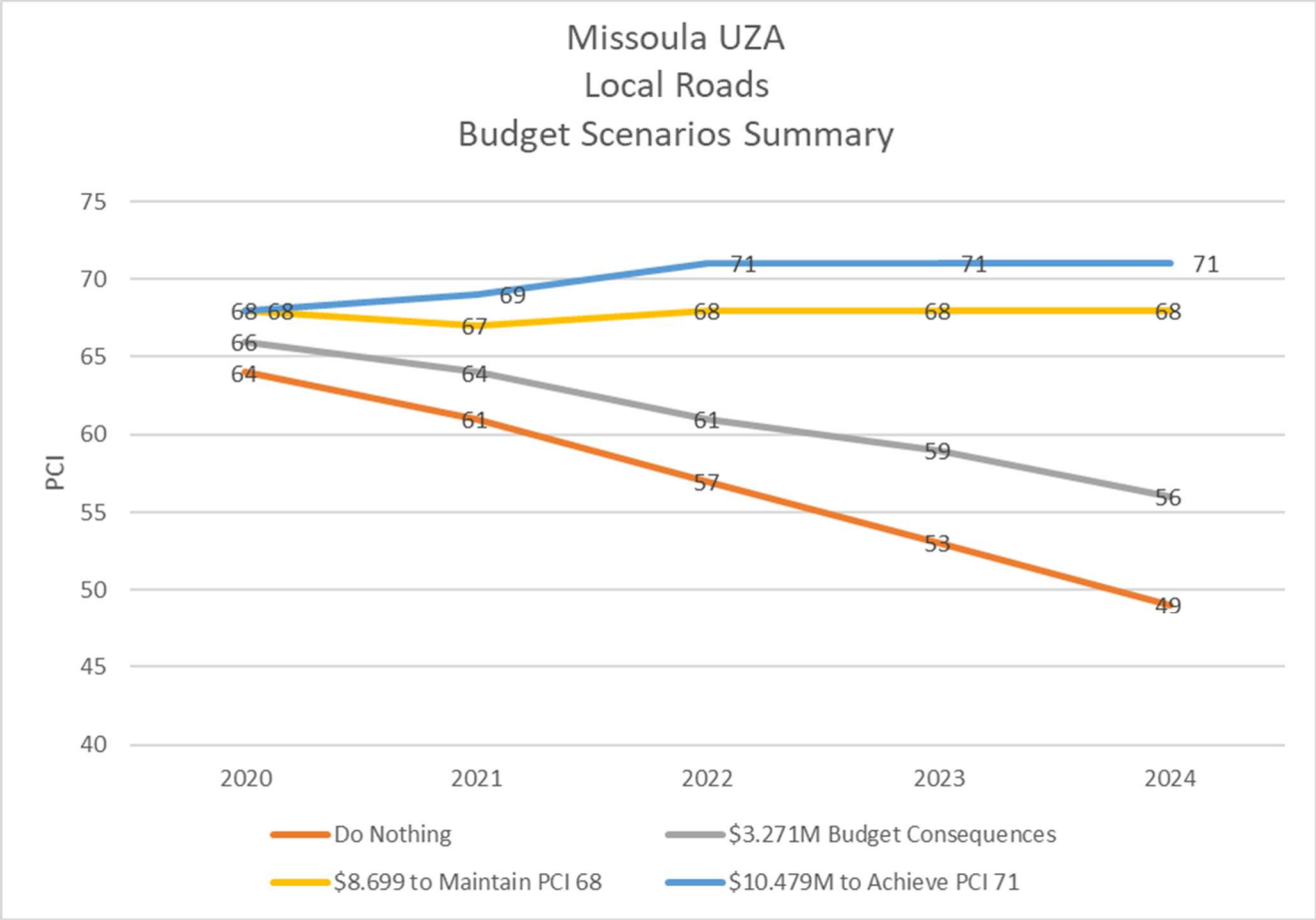


Figure 2-10 Missoula UZA – Local Roads Scenario Summary

Note:

Detailed work plans for scenarios are provided within the separate County and City reports.

Appendix A
Asphalt Pavement Performance Curves for Missoula

The predictive modeling (family modeling) process groups pavements of similar construction that are subjected to similar traffic loads, weather, and other factors that affect pavement life. The historical data on pavement condition can be used to build a model, which can predict the future performance of a group of pavements with similar attributes. In MicroPAVER, this model of a pavement's life is referred to as a "family".

The performance curve plays an important role in the development of network level budget analysis. If the deterioration rate of the curve is too steep, the required budget to repair these pavements will increase. If the deterioration rate of the curve is too flat, the required budget to repair these pavements will be too small. Both situations are erroneous but when analyzing over a short period of time, like 5 years, the change at any point, over that period, need only be close initially. Constructing models that can accurately predict the performance of any road is an iterative process that is refined from the results of multiple condition surveys. Historical maintenance data is useful but can be initially misleading because it will contain many outliers particularly if the data is not being collected specifically for this purpose.

Figure A-1 shows the results from the asphalt performance model developed from the historical construction data provided by Missoula for Arterial/Collector Roads in MicroPAVER and the polynomial defining it.

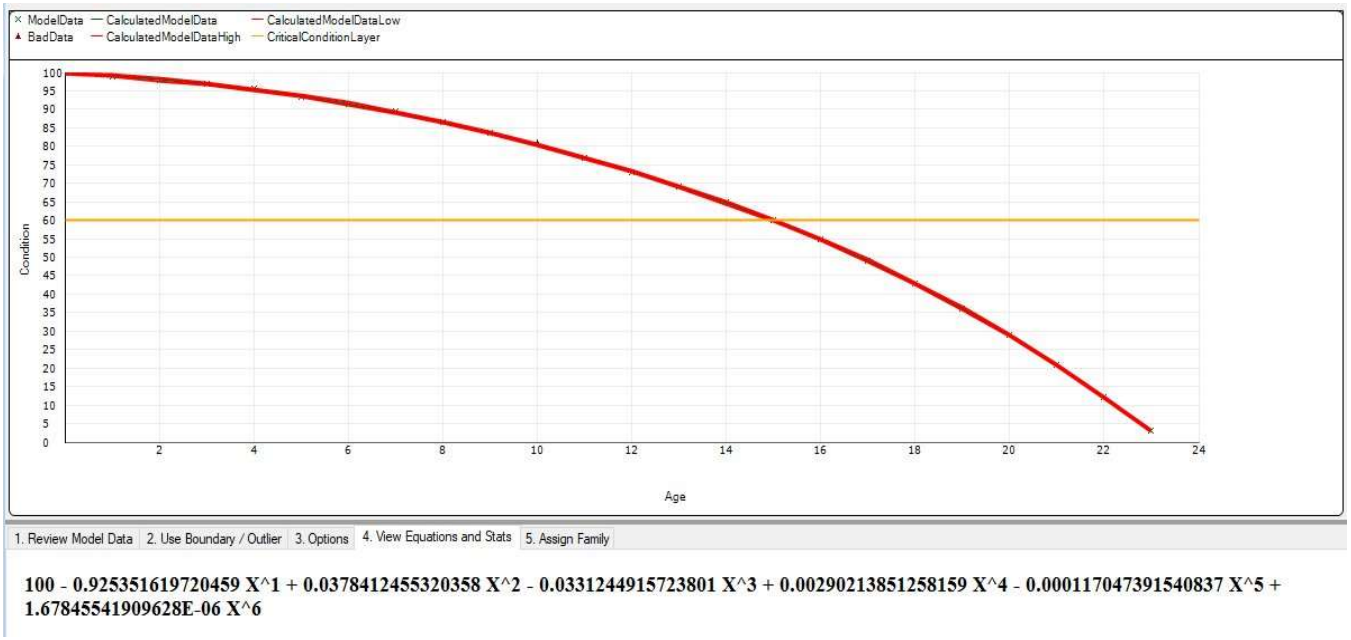


Figure A-1 Missoula Arterial/Collector Asphalt Pavement Performance Curve

Figure A-2 shows the results from the asphalt performance model developed from the historical construction data provided by Missoula for Local Roads in MicroPAVER and the polynomial defining it.

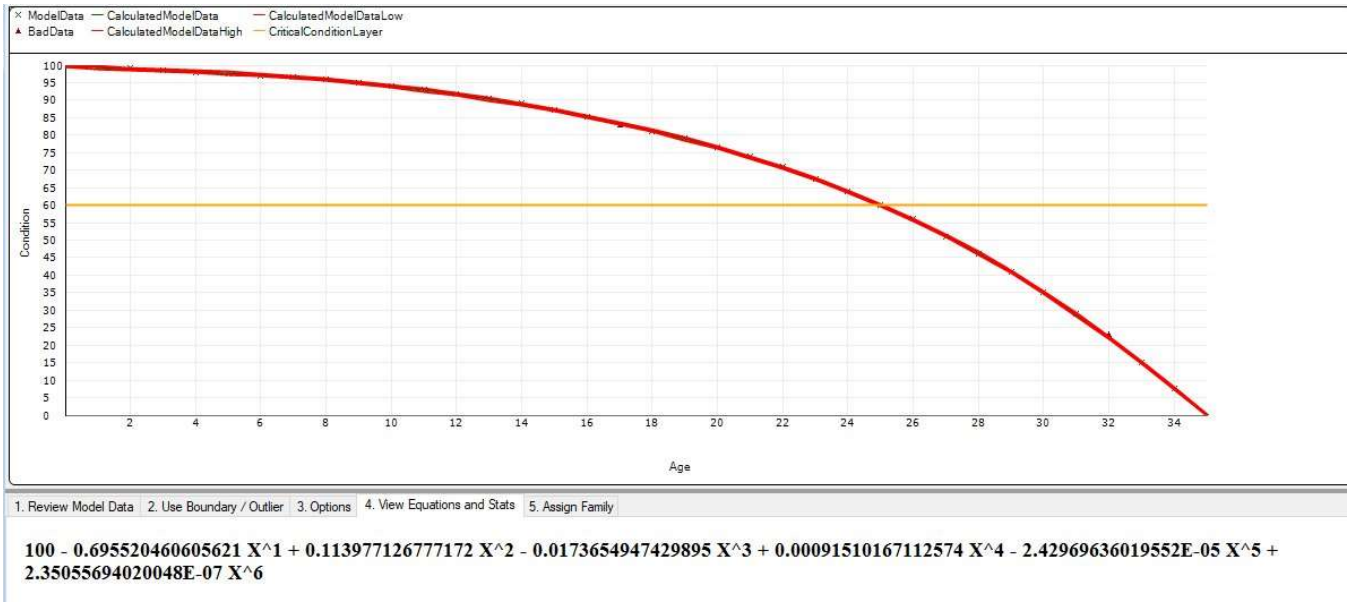


Figure A-2 Missoula Local Asphalt Pavement Performance Curve

Appendix B
Pavement Condition Index (PCI) Formula

Step 1: In a Network Level PMS, a survey of a limited number of sample units per section is sufficient. A sample area is defined as an area of 2,500 square feet plus or minus 1,000. A section is viewed as the smallest management unit when considering the application and selection of maintenance and repair (M&R) treatments.

$$PCI_s = PCI_r = \frac{\sum_{i=1}^{R} PCI_{ri} \times A_{ri}}{\sum_{i=1}^{R} A_{ri}}$$

Where

PCI_s = PCI of a pavement section

PCI_r = area weighted average PCI of random (or representative) sample units

PCI_{ri} = PCI of random sample unit number i

A_{ri} = area of the random sample unit *i*

R = total number of inspected random sample units

Step 2: If additional sample units are inspected, they can be used to enhance the section PCI as follows:

$$PCI_a = \frac{\sum_{i=1}^{A} (PCI_{ai} \times A_{ai})}{\sum_{i=1}^{A} A_{ai}}$$

$$PCI_s = \frac{PCI_r(A_s - \sum_{i=1}^{A} A_{ai}) + PCI_a \times \sum_{i=1}^{A} A_{ai}}{A_s}$$

PCI_a = area weighted average PCI of additional sample units

PCI_{ai} = PCI of additional sample unit number *i*

A_{ai} = area of additional sample unit *i*

A_s = total section area

Step 3: Using customer-defined constraints, such as the desired level of service, available rehabilitation technologies, or budgets, paving plans are developed in the Pavement Management System.

Appendix C

Principles of Pavement Management

Given the persistent shortage of funds for maintaining street systems, the preservation and stewardship of existing roads have become major activities for all levels of government. An excellent way of maximizing the return on investment for the money that exists for road maintenance is to implement a Pavement Management System.

Pavement management is a systematic approach to extending the life of a pavement network. More specifically, it is the process of planning, budgeting, funding, designing, constructing, monitoring, evaluating, maintaining, and rehabilitating the pavement network to provide maximum benefits with available funds.

A Pavement Management System provides tools and methods for finding and implementing the best Maintenance & Rehabilitation (M&R) strategies. Repairing streets when they are still in fair condition ultimately costs less over their lifetime than waiting to fix roads that have fallen into poor condition. In other words, the proactive approach of routine pavement management means less money wasted on frequent roadway reconstruction, and a potential savings of millions of dollars.

A Pavement Management System also provides a way to store an accurate inventory of all roadways, enriched with links to easements, as-built records, and historical documentation. The breadth and depth of information they hold, including digital images of roadways, baseline pavement condition data, and reviews of deterioration over time, are invaluable resources for measuring and tracking the effectiveness of Maintenance and Rehabilitation strategies.

This process is illustrated in **Figure 1-1**. It details how timely intervention can delay the inevitable total reconstruction for as long as practical. If repairs are delayed until a road is rated in "Fair" condition or worse, the cost of rehabilitation becomes 4 to 5 times more expensive than for those roads in "Good" condition. This means without preventive pavement maintenance; the cost of rehabilitation will be prohibitively expensive.

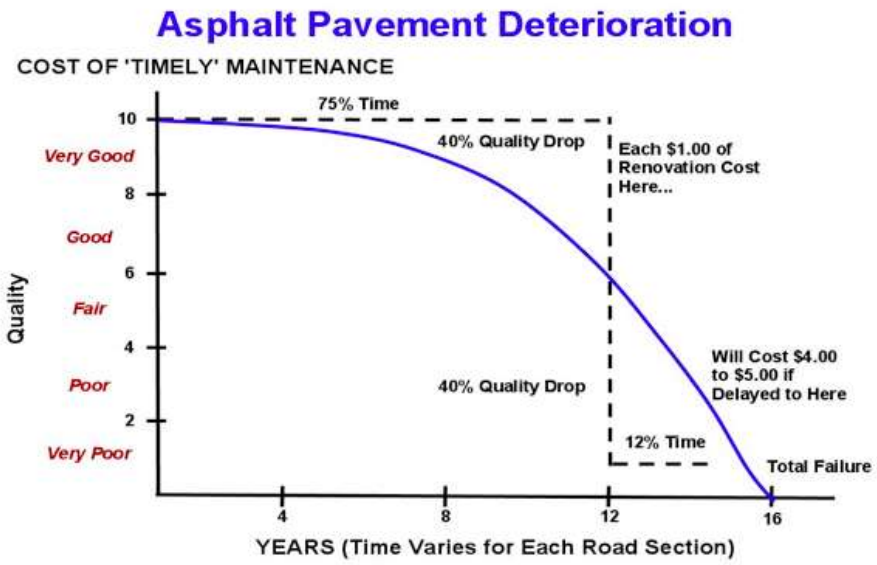


Figure 1-1 - Pavement Life Cycle Curve

Successful pavement management system programs let agency decision makers develop reliable performance models for the roadway, which can be used to generate sound policies and long-term rehabilitation strategies, budgets, and timetables.

Another compelling reason for implementing a Pavement Management System is the Governmental Accounting Standards Board (GASB) Statement 34. This regulation requires agencies that collect taxes for the purpose of managing a long-term, fixed infrastructure asset to either:

- **Option #1** - Implement financial accounting controls to effectively depreciate and plan for the replacement of fixed assets; or,
- **Option #2** - Implement an asset management system that provides a mechanism to gauge and budget for the long-term rehabilitation and/or maintenance of assets.

This study completed on the roadway network can be used as the basis for achieving GASB 34** compliance, either as the foundation for the inventory and valuation of the network (Option #1), or as the foundation of an asset management system (Option #2).

** Although it is not required to meet GASB 34 standards, it is recommended to follow the industry's best practices with regards to monitoring their infrastructure.

1.2 The Pavement Management Process

Figure 1-2 depicts the three unique, but equally important, steps that comprise the Pavement Management Process.

Figure 1-2 - The Pavement Management Process

1. System Configuration

System configuration involves identifying all roadways of the project network and assigning them a unique identifier. Each section has attributes such as physical characteristics (length, width, etc.), pavement type, and road classification. As part of system configuration, the network is linked to a GIS map.

2. Field Data Collection or Field Surveys

After system configuration is completed, every roadway in the system is surveyed and its condition assessed using the following criteria:

Surface Distress

Using high definition digital images, technicians evaluate the distress of the roadways they travel on. They record pavement conditions such as cracking, potholes, and raveling, all of which are examples of surface distress.

Pavement distresses recorded during this survey are itemized in **Table 1.1**, with respect to the pavement type (AC=Asphalt Pavement and PCC=Portland Cement Concrete).

Table 1.1 - Description of Surface Distresses Recorded by Transmap

Pavement Distresses for Asphalt Pavement

Alligator Cracking	**Patching and Utility Cut Patching**
Block Cracking	**Potholes**
Bleeding	**Rutting**
Edge Cracking	**Weathering**
Transverse and Longitudinal Cracking	**Raveling**
	Bumps and Sags, Corrugations and Depressions

Pavement Distresses for Concrete Pavement

Divided Slabs	**Pop Outs**
Linear Cracking	**Pumping**
Corner Breaks	**Scaling or Map Cracking**
Durability ("D") Cracking	**Shrinkage Cracking**
Faulting	**Corner or Joint Spalling**
Joint Seal Damage	**Small or Large Patching**

Detailed descriptions of pavement distress and severity can be found in ASTM D6433-11.

Severity

Once a distress has been identified, its severity (Low, Moderate, High) is attached to the appropriate record and its count (e.g. number of potholes), square footage (area covered by cracking), or linear feet (length of a specific crack) is added, as well.

In a Network Level PMS, a survey of a limited number of sample units per section is sufficient. A sample area is defined as an area of 2,500 square feet plus or minus 1,000. A section is viewed as the smallest management unit when considering the application and selection of maintenance and repair (M&R) treatments. All field survey data is collected in samples and summarized on a section by section basis. Each section constitutes a unit of data to populate the Pavement Management System.

Other data collected during field surveys include the pavement width, the pavement type, GPS coordinates, and digital images.

3. Analysis and Reporting

The results of a Pavement Management System analysis provide a quantitative performance score called Pavement Condition Index (PCI).

Pavement Condition Index (PCI) is engineering terminology representing the surface condition of the pavement on a scale of 0 to 100. For example:

- PCI of 100 is a pavement in perfect condition
- PCI of 0 is a pavement that is destroyed

The PCI is a distress-based condition index, i.e., specific distresses in the pavement are identified and tallied, and the type, severity, and extent of each distress is used to calculate a single number representing the pavement condition. The higher numbers reflect better pavement. The formula used to calculate the PCIs is in **Appendix C**.

All condition ratings of the field surveys are captured at sample areas and combined to calculate one value, which represents the PCI of a pavement section using the area weighted average.

1.3 Understanding the Pavement Condition Index

The following illustration (**Figure 1-3**) shows how the Pavement Condition Index (PCI) deteriorates over time for 3 different types of roadways. It also compares the PCIs to commonly used descriptive terms (Good, Satisfactory, Fair, Poor, Very Poor, Serious, Failed). The divisions

between the descriptive terms are not fixed but are meant to indicate common perceptions of roadway condition.

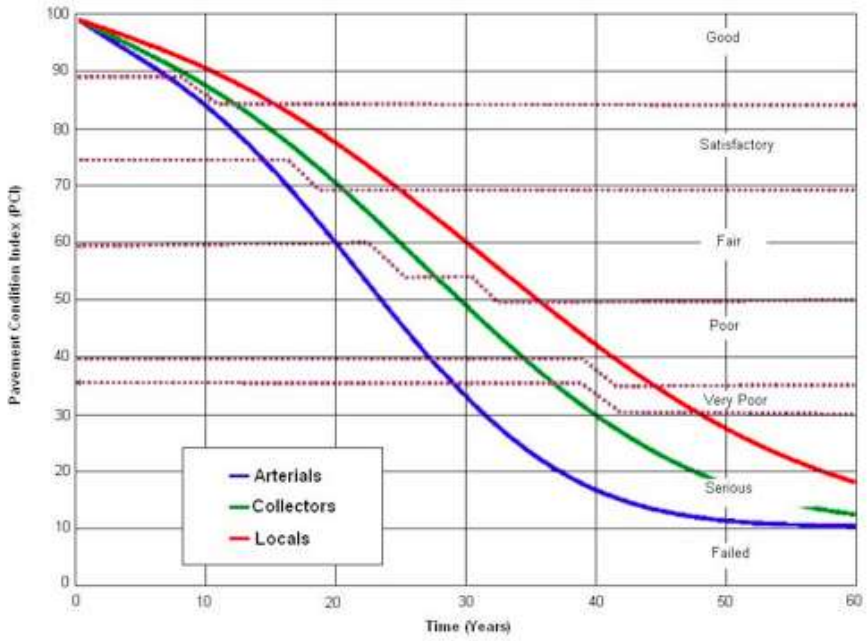


Figure 1-3 - Understanding the Pavement Condition Index Score

Table 1.2, an industry standard, defines the different PCI condition levels with respect to the remaining life of a pavement and typical rehabilitation options recommended.

Table 1.2 - Industry Standard for PCI Condition Levels

PCI Range	Work Type	Rehabilitation Options
86-100 Good	**Rejuvenation**	**Little or no maintenance E.g. Crack Seal, Reclimite, fog seal**
71-85 Satisfactory	**Global**	**Routine Maintenance E.g. Seals such as slurry seal**
56-70 Fair	**Critical**	**Non-structural overlay, cape seal**
41-55 Poor	**Conventional**	**Structural overlay Overlay, Mill and overlay**
26-40 Very Poor	**Conventional**	**Structural Overlay Overlay, Mill and overlay**
11-25 Serious	**Reconstruction**	**Reconstruction, rebuild, full depth reclamation**
0-10 Failed	**Reconstruction**	**Reconstruction, rebuild, full depth reclamation**

2.0 Maintenance and Rehabilitation Planning

2.1 Key Analysis Inputs

All Pavement Management Systems require user inputs to establish budget estimates and pavement Maintenance & Rehabilitation (M&R) plans. During the Boot Camp, decisions were made that affected the pavement rehabilitation program in a variety of ways. The key inputs are:

- The M&R pavement preservation categories
- The M&R pavement treatment type
- The PCI ranges assigned to the M&R categories
- The Critical PCI
- Unit cost for each pavement treatment type
- Expected life of the treatment type
- Agency budget and length of the planning period
- Budget required to achieve a target PCI at the end of the planning period
- Desired deferred maintenance at the end of the planning period

Boot Camp Notes can be seen in Appendix B of this report.

2.2 Pavement Preservation

Figure 2-1 represents the American Public Works Association (APWA) industry standard pavement preservation curve.

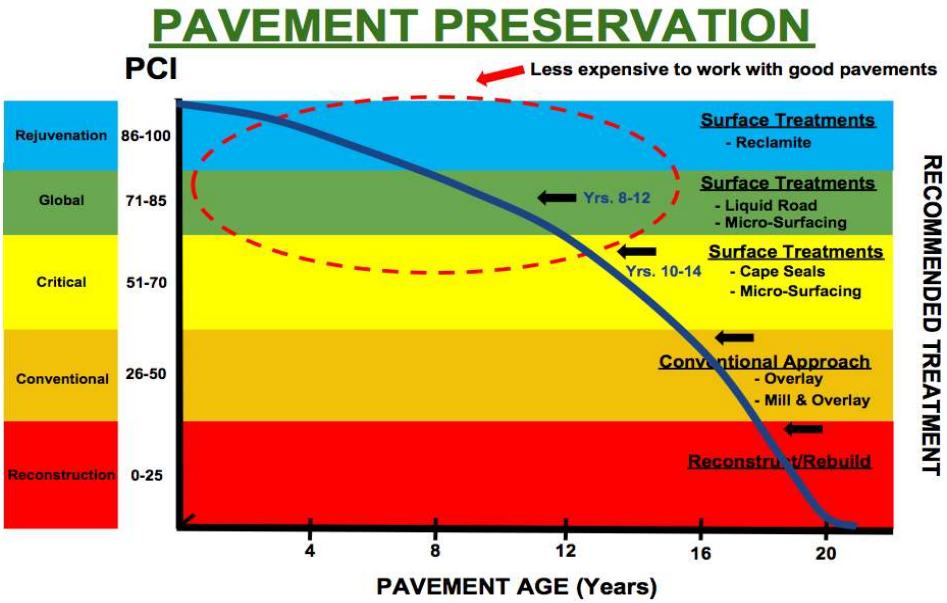


Figure 2-1 - Pavement Preservation

Figure 2-2 represents APWA's Pavement Toolbox. This toolbox looks at possible preservation treatments and how they are cost effective to use as opposed to spending all funding on worst-first maintenance (rehabilitation/reconstruction).

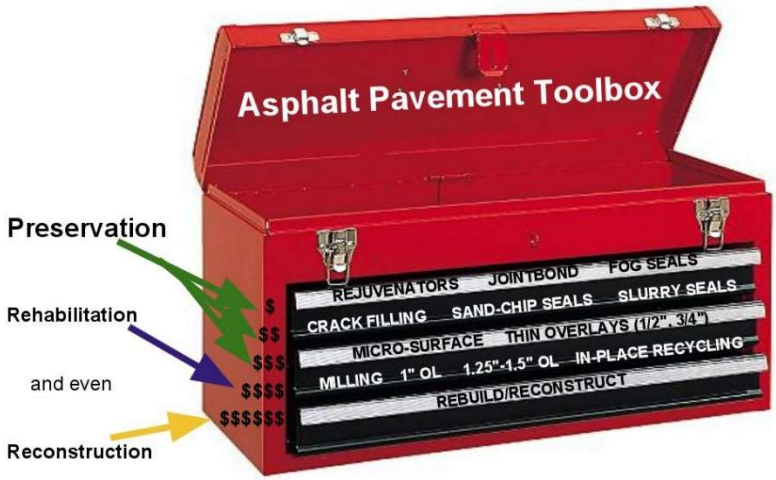


Figure 2-2 - Preservation Treatments

This hierarchical strategy ensures that roadways slated for reconstruction remain in the reconstruction pipeline, even if there is a funding shortfall. Available funds are used to preserve those streets that can be treated with slurries and overlays. No real equity is lost when those roads become unacceptable for use, since they were already scheduled for reconstruction.

Appendix E
Boot Camp Meeting Notes for Missoula and Correspondence

Meeting Description	**Missoula County & City of Missoula, MT Pavement Management Boot Camp Meeting Minutes**
Objective	Pavement Management Understanding & Best Practices
Location	Go-To Meeting
Date	May 4, 2020
Time	1:00 PM (MTZ)

Persons Attended –Missoula	Persons Attending - Transmap
Aaron Wilson **wilsona@missoula.mt.us** **David Gray, Transportation Planner** **grayd@ci.missoula.mt.us** **406-552-6669** **Erik Dickson, PE – County Engineer (Absent)** **edickson@missoulacounty.us** **406-258-3772** **Brian Hensel- Deputy Dir. Public Works-Streets** **BHensel@ci.missoula.mt.us** **Shane Stack** **sstack@missoulacounty.us** **Mary Gayle Padmos (emailed)** **mpadmos@mt.gov** **Lee Macholz – City GIS Manager** MacholzL@ci.missoula.mt.us **Jeremy Keene** KeeneJ@ci.missoula.mt.us	Craig Schorling, GISP, VP cschorling@transmap.com 614-537-6297 Chris Crocker, Operations Manager ccrocker@transmap.com 740-835-1223 Anthony J. Manch PE Senior Reporting Engineer tmanch@transmap.com 614-481-6799 Rob Little PE Senior Project Manager rlittle@transmap.com 813-390-2565

Discussion Topics
Introductions **Project Update**
GIS Data Review **Construction Dates** **Functional Class** **From-To Intersection Data (Transmap)** **Legacy Data Integration (Centerline files)**
Measuring **Distress Review** **Measuring ASTM standards**
Current Pavement Maintenance **Existing Paving Plan - Work Ongoing (3 to 5-year data)** **Treatments / Price / Expected Benefits** **Previous Reports** **CIP Plans**
Pavement Preservation Strategies **Goals** **Commissioners Objectives / Level of Service Analysis** **Discussion of Options** **Above Critical PCI Practices** **Below Critical PCI Practices** **Budget to Keep the PCI at Current Level** **Current Budget** **Family Creation in Micro-PAVER**
Next Steps **Network Re-Inspection - 3-year cycle**

Data Requests
• **Verify PCI ranges, costs and Expected Life for Treatments**

May 4, 2020 Boot Camp Meeting Notes

- Chris Crocker discussed the elements of the ArcGIS Online Site.
- Chris discussed the project viewer, Pavement Data Viewer, and the van images.
- Discussed the Laser Crack Measurement System (LCMS) features and capabilities. Can be thought of as a Crack Heat Map. Cracks are categorized by width.
- Discussed the Crack Intel Map Layer. Ranking from 0 to 8 using the total crack count.
- The rut depths (mm) are grouped into four (4) categories and then extrapolated and input into MicroPAVER.
- LCMS - Mr. SID files are included on the hard drive provided to the city.
- Chris updated the staff regarding Transmap standard project deliverables: PCI Map, and Section Report by unique section ID's.
- City/County requested a Data dictionary describing GIS elements
- Discussion regarding when and how the GIS data and images will be made available resulted in Chris coordinating effort to migrating data from Transmap server to City/ County servers.
- There are two M&R cost matrices, One for the City and a second for the County (See tables below).
- City of Missoula provided Transmap with construction work history that will be included in the MicroPAVER database.
- Network families will consist of Arterial/Collectors and Local for the City and County roads (4 total).
- Transmap will construct two performance models for Arterial/ Collectors and Local for both the City and the County, considering 20 to 25 year life spans for Local Roads and 15 years for Arterial/ Collectors and data from other projects.
- Current Maintenance Budget(s) to conduct Major Maintenance and Rehabilitation (M&R) treatments for the identified families are presently undefined. Transmap will produce Do-Nothing Consequences and Maintain Existing PCI Budget and send to attendees to assist in defining budgets.
- Critical Pavement Condition Index (PCI) will be PCI 60 for City and County.

Present Asphalt M&R Category Ranges, Unit Prices and Treatments

M&R Category	M&R Treatment	City Price per SY	County Price per Sy	Expected Result
Rejuvenation (PCI 86-100)	Crack seal/chip seal	$2.72	$0.68	
Global (PCI 71-85)	Crack seal/chip seal	$3.72	~~$2.73~~ $2.14**	
Critical (PCI 60-70)	Thin overlay/chip seal	$6.50	$8.82	
Conventional (PCI 40 - 59)	Structural overlay/chip seal	$9.15	$8.82?	
Reclamation (PCI 0 - 39)	Reconstruct	~~11.67~~ 18.35*	$18.35	

*Changed during Boot Camp Meeting

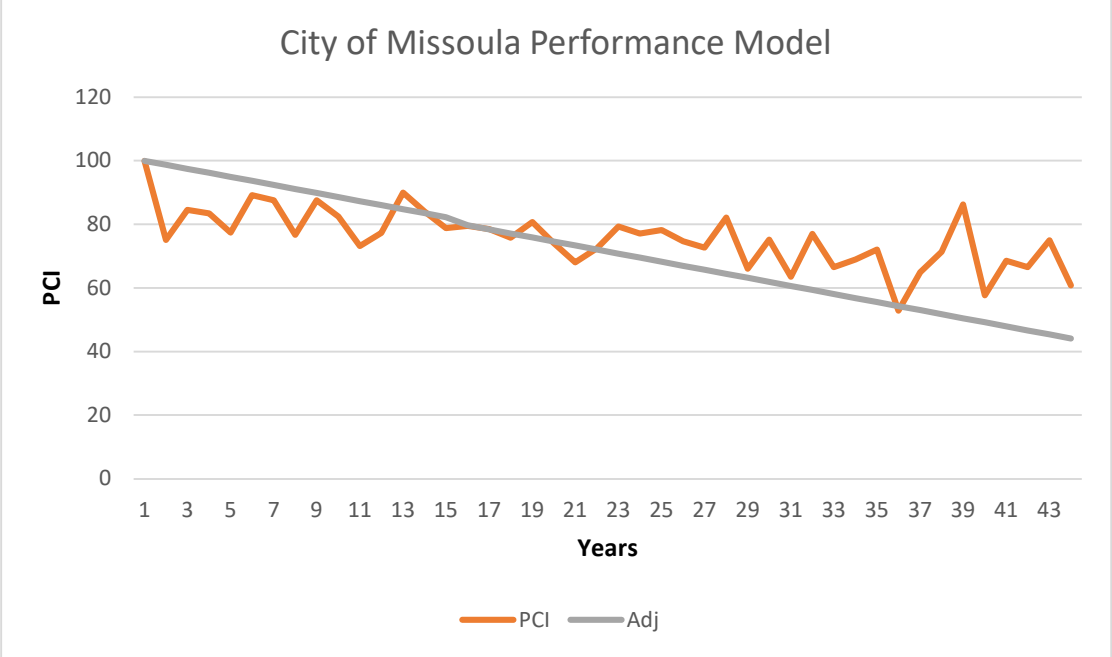
M&R Category	M&R Treatment	Price per Square Yard	Expected Result
Rejuvenation (PCI 86-100)	Crack seal/chip seal	2.72	
Global (PCI 71-85)	Crack seal/chip seal	3.72	
Critical (PCI 60-70)	Thin overlay/chip seal	6.50	
Conventional (PCI 40 - 59)	Structural overlay/chip seal	9.15	
Reclamation (PCI 0 - 39)	Reconstruct	11.67	

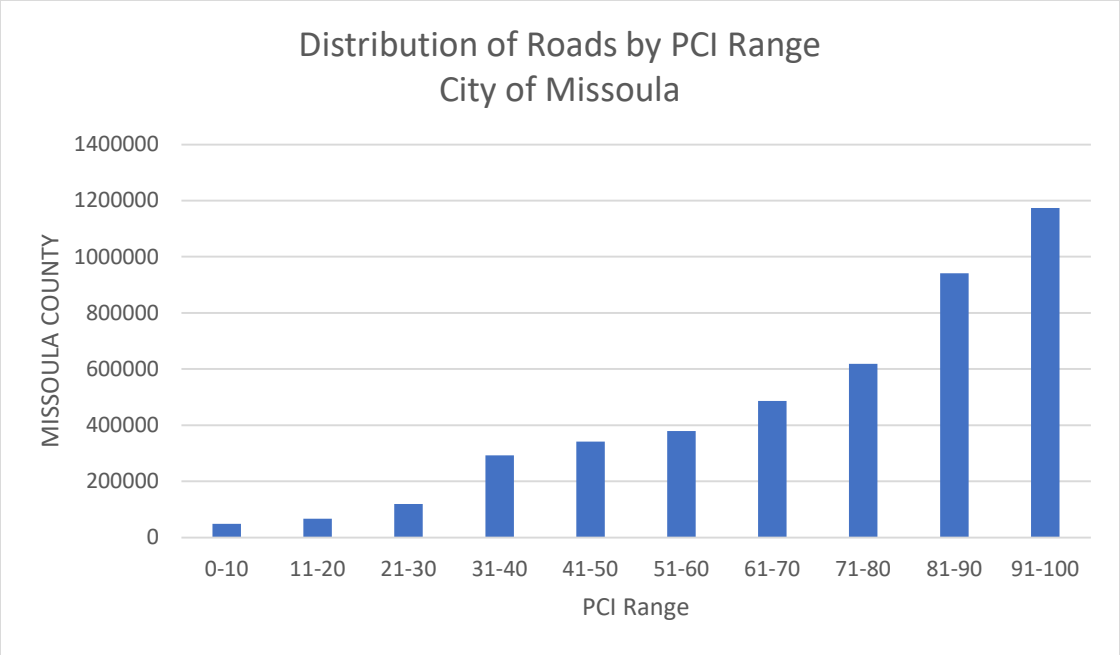
MicroPAVER Input Parameters

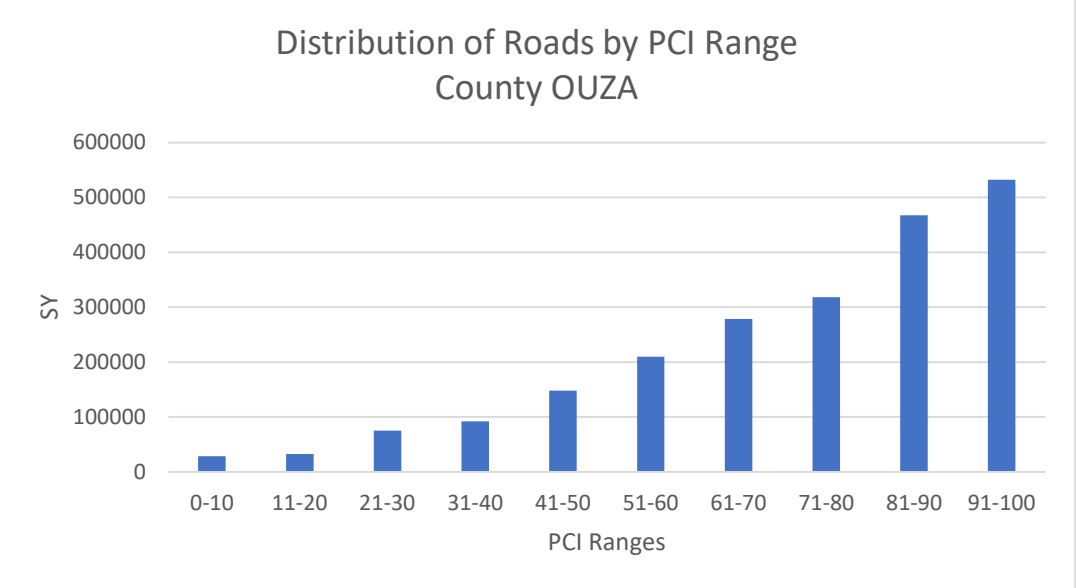
Item	Status
Network(s)	City, County IUZA, County OUZA
Construction History	Received and inputted
Format of Construction History Data	Digital
Number of Families	Arterial/Collectors & Local for City and County
M&R Category by PCI Ranges	See Treatment Table above
Pavement Performance Model	TBD for Arterial/Collectors and Local
Critical PCI Between PCI of 55 and 70. (Recommend PCI=55)	60
M&R Treatments (See Matrix)	See Treatment Table above
Unit Cost (Per Square Yard)	See Treatment Table above
Current Budget	TBD
Given Budget for Major	TBD
Given Budget for Global	TBD
Global PCI Ranges	TBD
Global Life Expectancy	TBD
Start Date for Work Plans	July 1, 2020

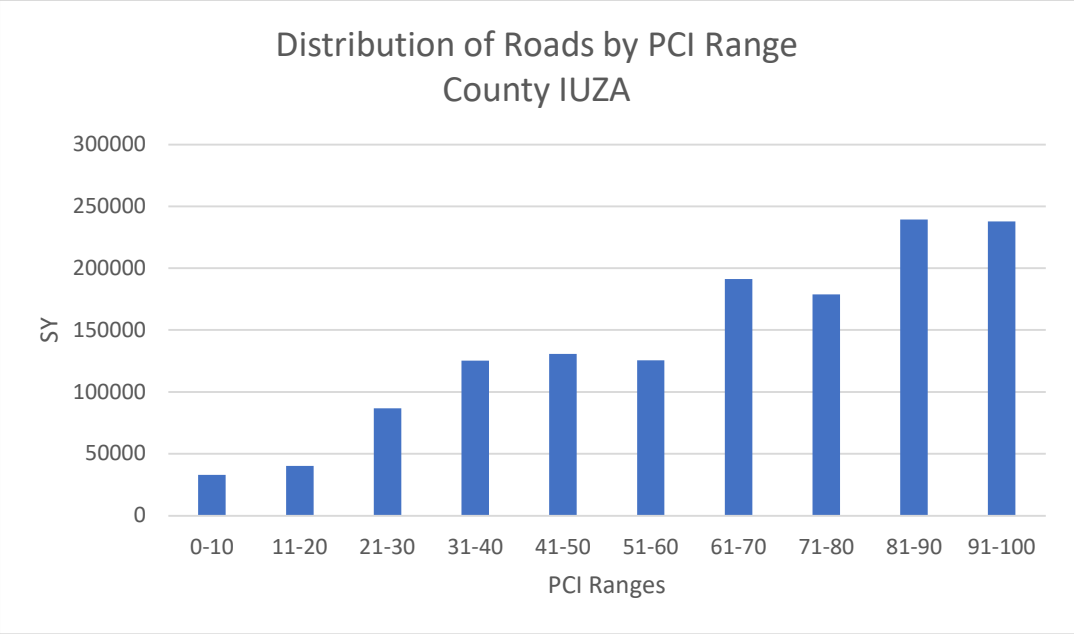
Number of Years for Work Plan (Planning Horizon)	5 years (maybe 10)
Recommended Budget Scenarios: 1- Do Nothing Budget 2- Budget to Maintain the Existing PCI – Using Major M&R Treatments 3- Given the current annual budget- show the resulting change in PCI over time.	Initially will run 1) Do Nothing and, 2) Budget to Maintain Existing PCI

2020 Pavement Performance Model for Asphalt roads




Distribution of Roads by PCI Range
City of Missoula
1400000
1200000
1000000
800000
600000
400000
200000
0
MISSOULA COUNTY
0-10
11-20
21-30
31-40
41-50
51-60
61-70
71-80
81-90
91-100
PCI Range


Distribution of Roads by PCI Range
County OUZA
600000
500000
400000
300000
200000
100000
0
SY
0-10
11-20
21-30
31-40
41-50
51-60
61-70
71-80
81-90
91-100
PCI Ranges


Distribution of Roads by PCI Range
County IUZA
300000
250000
200000
150000
100000
50000
0
SY
0-10
11-20
21-30
31-40
41-50
51-60
61-70
71-80
81-90
91-100
PCI Ranges