missoula connect

2050 Long-Range Transportation Plan

Appendices

Missoula County ~ City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

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APPENDIX A

Community Engagement Summary

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MISSOULA CONNECT

Community Engagement Activities

Missoula Connect was shaped by extensive input from Missoula area residents, beginning in January 2020 and continuing through June 2021. Activities included presentations and briefings at standing meetings, engagement with a Long-Range Transportation Plan (LRTP) Citizens Advisory Committee and Technical Advisory Committee, briefings for neighborhood and community councils, in-person and virtual public meetings and open houses, online surveys, videos, and comment forums. A project website, along with notices via social media, provided additional opportunities for people to engage with the MPO and the project team and in the development of the plan.

Feedback from the events and activities listed below has been incorporated into the long-range transportation plan, and summaries of the input received are available in the Final Plan, the Existing Conditions Report, in meeting notes, and upon request.

Missoula MPO Transportation Policy Coordinating Committee (TPCC)

The Transportation Policy Coordinating Committee (TPCC) is a standing committee of the Missoula MPO. TPCC members include the Mayor, a City Council member, County Commissioners, the District Administrator for the Federal Highway Administration (FHWA), and representatives from the Planning Board, the Missoula Urban Transportation District (MUTD) Board, and the Montana Department of Transportation (MDT). TPCC members guide transportation planning in the Missoula area and approve the final LRTP. All TPCC meetings include an opportunity for public comment.

- **January 21, 2020** – Project overview and schedule
- **February 18, 2020** – Updated work plan, advisory committee membership, and public engagement plan
- **April 28, 2020** – Preliminary existing conditions data and analyses, community transportation values, and initial public input
- **May 19, 2020** – Existing conditions findings, review of 2016 LRTP project list, and proposed call for projects
- **June 16, 2020** – Draft goals and desired outcomes and approach to evaluation framework
- **July 21, 2020** – Final goals and desired outcomes and draft evaluation framework
- **August 18, 2020** – Final evaluation framework and proposed approach to scenario planning
- **October 20, 2020** – Approach to scenario development and draft growth and transportation network scenarios
- **December 15, 2020** – Scenario evaluation results and overview of outreach activities
- **February 16, 2021** – Draft recommended scenario and revenue projections
- **March 16, 2021** – Revised recommended scenario and programmatic recommendations

- **April 20, 2021** – Final recommended scenario and potential funding sources
- **May 18, 2021** – Review of draft plan and near-term priorities
- **June 15, 2021** – Review of final revised plan

Missoula MPO Transportation Technical Advisory Committee (TTAC)

The Transportation Technical Advisory Committee (TTAC) is a standing committee of the Missoula MPO and provides technical advice to the TPCC. TTAC includes staff from various City and County departments, the City-County Health Department, the Missoula Redevelopment Agency, MUTD, and MDT. TTAC typically meets two weeks priority to TPCC and may recommend actions to TPCC. All TTAC meetings include an opportunity for public comment.

- **February 6, 2020** – Project overview and workplan, advisory committee membership, and public engagement plan
- **March 5, 2020** – Updated work plan, project areas of focus, preliminary existing conditions data and analyses, and initial engagement activities
- **May 7, 2020** – Existing conditions findings, review of 2016 LRTP project list, and proposed call for projects
- **June 4, 2020** – Draft goals and desired outcomes and approach to evaluation framework
- **July 2, 2020** – Preliminary programmatic recommendations, final goals and desired outcomes, and draft evaluation framework
- **August 11, 2020** – Final evaluation framework and proposed approach to scenario planning
- **October 5, 2020** – Approach to scenario development, draft growth and transportation network scenarios, and draft performance metrics
- **December 3, 2020** – Scenario evaluation results and overview of outreach activities
- **February 4, 2021** – Draft recommended scenario and revenue projections
- **March 4, 2021** – Revised recommended scenario and discussion of program and policy recommendations
- **April 1, 2021** – Final recommended scenario and potential funding sources
- **May 6, 2021** – Review of draft plan and near-term priorities
- **June 3, 2021** – Review of final revised plan

LRTP Technical Advisory Committee (TAC)

The LRTP Technical Advisory Committee (TAC) included staff representatives from City and County Planning, Public Works & Mobility, Community Development & Housing, the Missoula Redevelopment Agency, MUTD, the City-County Health Department, and MDT. TAC members provided technical guidance about project development and evaluation, cost estimates and revenue sources, project prioritization, and program and policy recommendations.

- **March 6, 2020** – Project overview and work plan, preliminary existing conditions data and analyses, and public engagement approach

- **April 30, 2020** – MDT small group interview
- **April 30, 2020** – Health & Equity small group interview
- **May 4, 2020** – Climate small group interview
- **May 4, 2020** – Active Transportation & Open Space small group interview
- **May 7, 2020** – Transit small group interview
- **May 8, 2020** – Public Works & Infrastructure small group interview
- **May 8, 2020** – Land Use, Economic Development, & Growth small group interview
- **June 12, 2020** – Draft goals and desired outcomes, approach to evaluation framework, and call for projects
- **September 18, 2020** – Preliminary scoring of draft project list and approach to scenario development
- **October 30, 2020** – Draft transportation and growth scenarios, results of scenario analysis, and public outreach activities
- **February 18, 2021** – Draft recommended scenario, preliminary revenue projections and funding sources, draft programs and policies, and plans for engagement
- **May 13, 2021** – Review of draft plan and near-term priorities

LRTP Citizen's Advisory Committee (CAC)

The LRTP Citizens Advisory Committee (CAC) included representatives from a diverse group of community organizations, such as the Bicycle Pedestrian Advisory Board, the Chamber of Commerce, Missoula Organization of Realtors, the Community Forum, Community Councils, Aging Services, and Climate Smart Missoula. The CAC identified key issues and opportunities, provided input on priority projects and programs, and engaged their communities throughout the planning process.

- **March 5, 2020** – Project overview and work plan, preliminary existing conditions data and analyses, and public engagement approach
- **June 16, 2020** – Draft goals and desired outcomes, approach to evaluation framework, call for projects, and plans for engagement
- **September 16, 2020** – Preliminary scoring of draft project list and approach to scenario development
- **October 29, 2020** – Draft transportation and growth scenarios, results of scenario analysis, and public outreach activities
- **February 10, 2021** - Draft recommended scenario, preliminary revenue projections and funding sources, draft programs and policies, and plans for engagement
- **May TBD, 2021** – Review of draft plan and near-term priorities

General Public Engagement

Due to COVID-19, most general public engagement activities for Missoula Connect were held virtually. Through online open houses and workshops, the MPO and the project team met with

hundreds of Missoula area residents. These meetings were complemented by other digital engagement activities, including surveys that invited people to share their mobility values, describe improvements needed to make traveling in Missoula better, and map ideas for specific walking, biking, and driving projects.

There were five rounds of community engagement, which were linked to key deliverables for Missoula Connect. An overview of the type of input we collected and the tools we used in each phase is provided below.

- **Round 1: March and April 2020** – Understanding mobility values, identifying desired outcomes, soliciting "big ideas," and reviewing existing conditions analyses
    - In-person event: March 6, 2020 History of Transportation First Friday Exhibit
    - Online survey
    - Social media posts
    - Press release
- **Round 2: May, June, and July 2020** – Identifying potential projects and programs and reviewing draft goals
    - Online surveys (2)
    - Interactive online map
    - Project videos (2)
    - Social media posts
    - Press release
- **Round 3: December 2020 and January 2021** – Sharing transportation network and growth scenarios, reviewing scenario analysis, and identifying priority project types
    - Virtual community meetings (5)
    - Live polling at meetings
    - Online survey
    - Interactive online map
    - Project video
    - Social media posts
    - Press release
- **Round 4: March 2021** – Developing final recommended scenario, prioritizing programs, and setting funding priorities
    - Online open house (2)
    - Live polling at meetings
    - Online survey
    - Interactive online map
    - Social media posts

  - Press release
- **Round 5: May and June 2021** – Reviewing draft plan and near-term priorities
  - Online comment forum for draft plan
  - Online survey
  - Social media posts
  - Press release

Other Community Briefings

The Missoula MPO and project team members participated in community association meetings and other briefings throughout the project. A list of the dates and groups involved in these meetings is provided below. All meetings after March 2020 were held virtually. The information shared with the group corresponded to the point in the planning process at which the briefing or meeting took place. Other informal, one-on-one and small group meetings were held throughout the development of Missoula Connect and helped to shape the final plan.

- **January 9, 2020** – City and County Planning, Mountain Line, and Parks Department needs assessment meeting
- **February 6, 2020** – University of Montana, Seeking Sustainability Lecture Series
- **February 27, 2020** – Community Forum
- **March 4, 2020** – City Council Public Works Committee
- **March 4, 2020** – University of Montana ASUM Office of Transportation
- **March 5, 2020** – County Commissioners meeting
- **March 6, 2020** – Mayor John Engen meeting
- **March 6, 2020** – History of Transportation First Friday Event
- **May 8, 2020** – City Development Community meeting
- **May 19, 2020** – Missoula in Motion meeting
- **May 22, 2020** – Specialized Transportation Advisory Committee
- **June 15, 2020** – Reserve Street stakeholder meeting
- **June 26**, **2020** – County Public Works call-for-projects meeting
- **June 26, 2020** – Specialized Transportation Advisory Committee
- **July 7, 2020** – Bicycle & Pedestrian Advisory Board
- **July 20, 2020** – City of Missoula Infrastructure & Mobility call-for-projects meeting
- **July 20, 2020** – Mountain Line call-for-projects meeting
- **August 3, 2020** – City and County Planning Departments growth scenarios meeting
- **December 1, 2020** – Bicycle & Pedestrian Advisory Board
- **December 1, 2020** – Missoula Planning Board
- **December 1, 2020** – Missoula Downtown Association Board
- **December 3, 2020** – Reserve Street Neighborhoods (Grant Creek, Captain John Mullan, Two Rivers) community meeting

- **December 8, 2020** – Downtown and Broadway Corridor Neighborhoods (Northside-Westside, Heart of Missoula, Lower Rattlesnake, Upper Rattlesnake, Marshall Canyon) community meeting
- **December 8, 2020** – Lolo Community Council
- **December 9, 2020** – City Council Public Works Committee
- **December 10, 2020** – West Central Neighborhoods (Franklin to the Fort, Southgate Triangle, River Road) community meeting
- **December 14, 2020** – Bonner-Milltown Community Council
- **December 15, 2020** – Central Neighborhoods (Rose Park, Lewis and Clark, University District, Riverfront) community meeting
- **December 17, 2020** – Missoula Redevelopment Agency Board meeting
- **December 17, 2020** – Hill Neighborhoods (Farviews/Pattee Canyon, Moose Can Gully, South 39th Street, Miller Creek) community meeting
- **March 2, 2021** – Missoula Planning Board
- **March 24, 2021** – Community Open House
- **March 25, 2021** – Community Open House

APPENDIX B

Existing Conditions Report

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Envision the Future

The Missoula area is home to more than 82,000 residents spread over 263 square miles. With a thriving downtown, unique residential neighborhoods, a large public research university, and proximity to world-class outdoor recreation, it's no surprise that Missoula is growing quickly.

But as we grow, we need a transportation system that reflects our community's character and supports a region that is more livable, equitable, and sustainable. Missoula Connect, led by the Missoula Metropolitan Planning Organization (MPO), will help us envision that future.

Get to Know the MPO

WHO

The MPO, or Metropolitan Planning Organization, works to plan a safe transportation network for the Missoula area to ensure our home has comprehensive, cooperative, and connected transportation systems.

WHEN

The Missoula MPO was formed nearly 40 years ago, following the 1980 Census. Today the MPO is responsible for long- range planning and programming of federal transportation funds within the Missoula area.

WHY

Once the Missoula Urban Area had more than 50,000 residents, the MPO was created to coordinate the region's shared transportation vision.

Introducing Missoula Connect

One of the Missoula-area's primary planning projects in 2020 is an update to our Long-Range Transportation Plan (LRTP), which we're calling Missoula Connect. Missoula Connect is a 30-year plan that looks at all modes of transportation and identifies future priorities for projects and funding. This action plan will help to steer our community toward a healthier, safer, and more sustainable future while preserving and expanding mobility for all Missoulians.

Relying on previous planning work and extensive community outreach, Missoula Connect integrates existing plans and projects to create a sustainable transportation future that improves mobility and access across all modes for all Missoula area residents, workers, and visitors. A strong transportation plan is critical to the success of Missoula's growth policy, and Missoula Connect will knit together our land use and transportation goals. Missoula is on the move and we need to ensure we're not only keeping pace but staying ahead.

WHAT

Because the Missoula Urban Area has more than 50,000 residents, the federal government requires that an organization be established to carry out metropolitan transportation planning.

HOW

The MPO facilitates collaboration between federal, state, and local government agencies, interested parties, and community members in the planning process. The primary responsibility of the MPO is to create a Long-Range Transportation Plan that prioritizes funding and improvements throughout the Missoula area.

WHERE

The MPO serves the Missoula Urban Area, which is a larger area than the Missoula city limits but smaller than Missoula County.

Building on a Solid Foundation

What's been done? A lot of good planning work! Since the 2016 Long Range Transportation Plan, we've adopted a Community Transportation Safety Plan and bicycle and pedestrian master plans. We've also completed the Downtown Master Plan, the Missoula Area Mapping Project, the Housing Policy, and Climate Ready Missoula. And we have the Mullan Area Master Plan underway now.

Together, these efforts have identified important transportation projects and programs and set new goals for our region. The recommendations in these plans now must be prioritized and integrated into Missoula Connect so that we have a single list of projects that we can advance with our region's limited transportation funding. These recent plans—and many more—share common values that will inform our initial work on Missoula Connect.

Common Values from Previous Plans

Integrated land use and transportation planning

Community health, economic development, and social equity

Accessibility, efficiency, and connectivity

Sustainability and resilience

Safe and secure transportation options

Delivering the Goods

In addition to planning for future transportation projects, the City of Missoula, Missoula County, the MPO, and the Montana Department of Transportation have all been hard at work turning these plans into real projects, some of which have been in the works for 20+ years! A few examples of projects that are about to start construction or that we have recently completed include:

- Russell Street Reconfiguration and Bridge Replacement
- Bitterroot Trail Completion
- Grant Creek/I-90 Intersection Improvements
- South Avenue Improvements: Reserve to 36th Street
- Mary Avenue Roadway Extension and Shared-Use Path
- Higgins Street Bridge Improvements
- Madison Street Bridge Rehabilitation
- BUILD Grant: Mary Jane Boulevard, George Elmer Drive, England Boulevard, and Commuter Trail Connections
- Bicycle Safety Project at Stephens and Orange
- Community Development Block Grant Sidewalk Project
- Orange and Van Buren I-90 Interchange Roundabouts
- Americans with Disabilities Act (ADA) Upgrades on Orange, Higgins, and Broadway

Our Work Together

We need your help to ensure that Missoula Connect prioritizes investments that respond to the needs of the community. There will be many opportunities to get involved in our work, and we want to hear from you throughout this process.

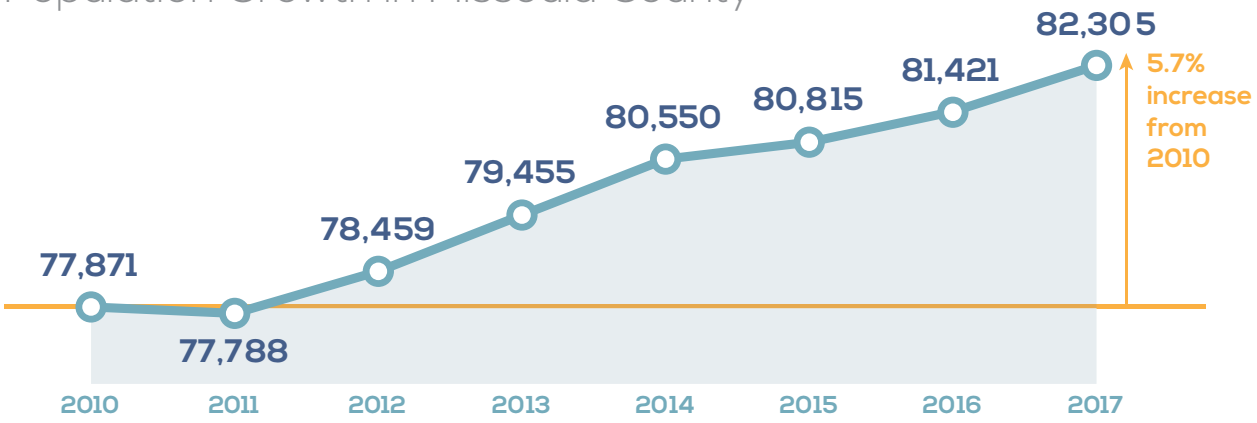
Ongoing Community Engagement

JAN - MAR 2020	APR - JUN	JUL - SEP	OCT - DEC	JAN - FEB 2021	MAR
Community Values & Existing Conditions	Goals, Evaluation Framework, & Project Identification	Project Prioritization, Scenario Development, & Programmatic Recommendations	Scenario Refinement, Funding, & Implementation Plan	Draft Plan for Review	Plan Adoption

A Growing Region

With more people come new opportunities and new challenges. In the last 10 years, the population of the Missoula area grew nearly 6%. As our population grows, demand for transit service and active transportation investments, like trails and sidewalks, is increasing. This means we need to find creative ways to use our existing infrastructure to move more people and goods.

Population Growth in Missoula County



Source: Montana Department of Commerce, Census & Economic Information Center, Total Population by County (2018)

Integrating Land Use & Transportation

The "Our Missoula" City Growth Policy guides growth and development in Missoula. The vision is one of managed growth while meeting the needs of the community's residents. The policy estimates there will be approximately 6,500 new residential units in the Missoula area in the next 10 years.

To create a long-range transportation plan that works for the region, land use and transportation must be fully integrated. Development should be directed where infrastructure can support it, within walking distance to grocery stores and other basic necessities, near transit, biking, and walking routes, and close to schools and parks.

In recent years, the Missoula area economy has grown increasingly diversified. Education, healthcare, tourism, and professional services have replaced agriculture and resource extraction as the major economic drivers of the region.

42%
Business Information & Financial Services

18%
Manufacturing, Transportation, Warehousing, & Trade

12%
Education & Health Services

9%
Retail Trade & Leisure/Hospitality

7%
Agriculture, Forest, Fishing, Hunting, & Mining

4%
Construction

4%
Government

4%
Other Services

45% of all workers in Missoula County earn less than $35,000

Source: 2013-2017 ACS 5-Year Estimates, Industry by Occupation for the Civilian Population 16 Years and Older

Challenges of Affordability

Like many desirable metropolitan areas throughout the United States, housing costs in the Missoula region are climbing faster than wages, making it difficult for many residents to find housing they can afford. This reinforces the need for accessible, affordable, and reliable transportation options that connect Missoulians with jobs, schools, services, and recreation.

32K
Total Housing Units

49%
Units Owner Occupied

41%
Units Renter Occupied

As we grow, we must ensure that all Missoulians have access to high-quality transportation options that connect us to the places we go. Almost half our residents make less than $35,000 per year, and 14% of us live below the poverty line. That's a lot higher than the national average of 12%. Providing affordable options–like Mountain Line, which is free to ride–can increase access to jobs, schools, and services for everyone.

14%
of residents live below the poverty line ($25,750)

5%
of residents are unemployed

3%
of households do not have access to a vehicle

Population over 65 years old has increased
47%
since 2010

13%
of the population has a disability

8%
of the population is under 17 years old

13%
of the population is over 65 years old

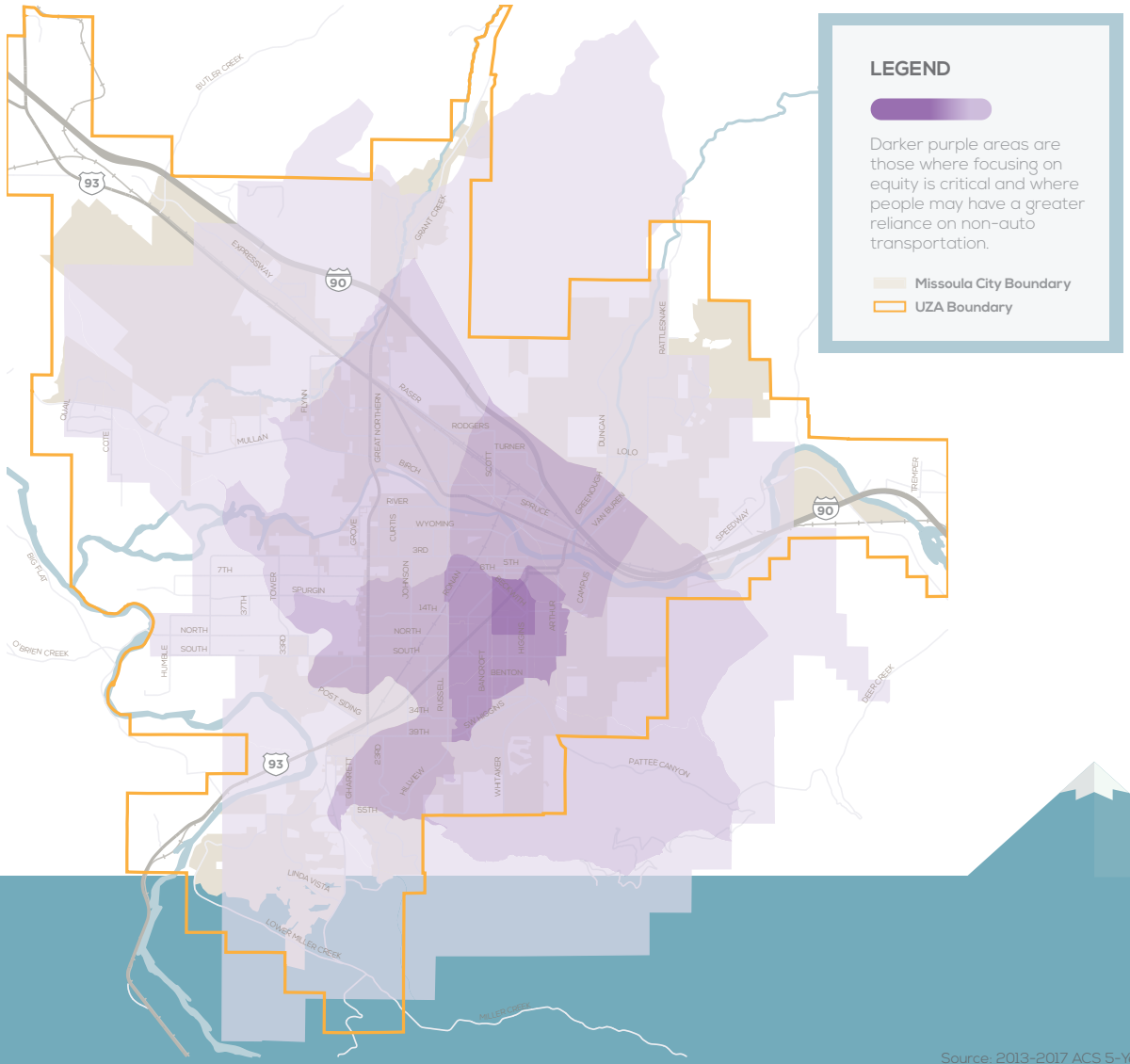
Source: 2013-2017 ACS 5-Year Estimates, Selected Housing Characteristics

Focusing on Equity

Equity is an important tool for analyzing people's access to transportation and for planning future investments. Planning within an equity framework empowers decision-makers to invest in places where transportation projects and programs can support historically under-represented communities that may have fewer transportation options.

Increasing access to quality transportation options is an important way to promote community health and social equity. Some steps we're taking to better serve historically under-represented communities include providing fare-free public transportation and improving multimodal access to affordable housing, parks, schools, health care facilities, and social services.

Equity Index



Source: 2013-2017 ACS 5-Year Estimates

Missoula By The Numbers

1 **229** bridges

2 **27** trains per day

3 **40%** of streets with sidewalks on at least one side

4 **25K** commercial trucks per day

5 **49** miles of bike lanes

6

907K

passengers per year at Missoula International Airport

7

2M

daily vehicle miles traveled (VMT)

8

88%

of residents live within 1/2 mile of a bus stop

9

16

Mountain Line and UDASH bus routes

10

70

miles of commuter paths

Moving Missoulians

What does our transportation network look like today? How are Missoulians getting around the region? How do employees commute to or from adjacent counties? How do visitors arriving from the airport reach their hotels?

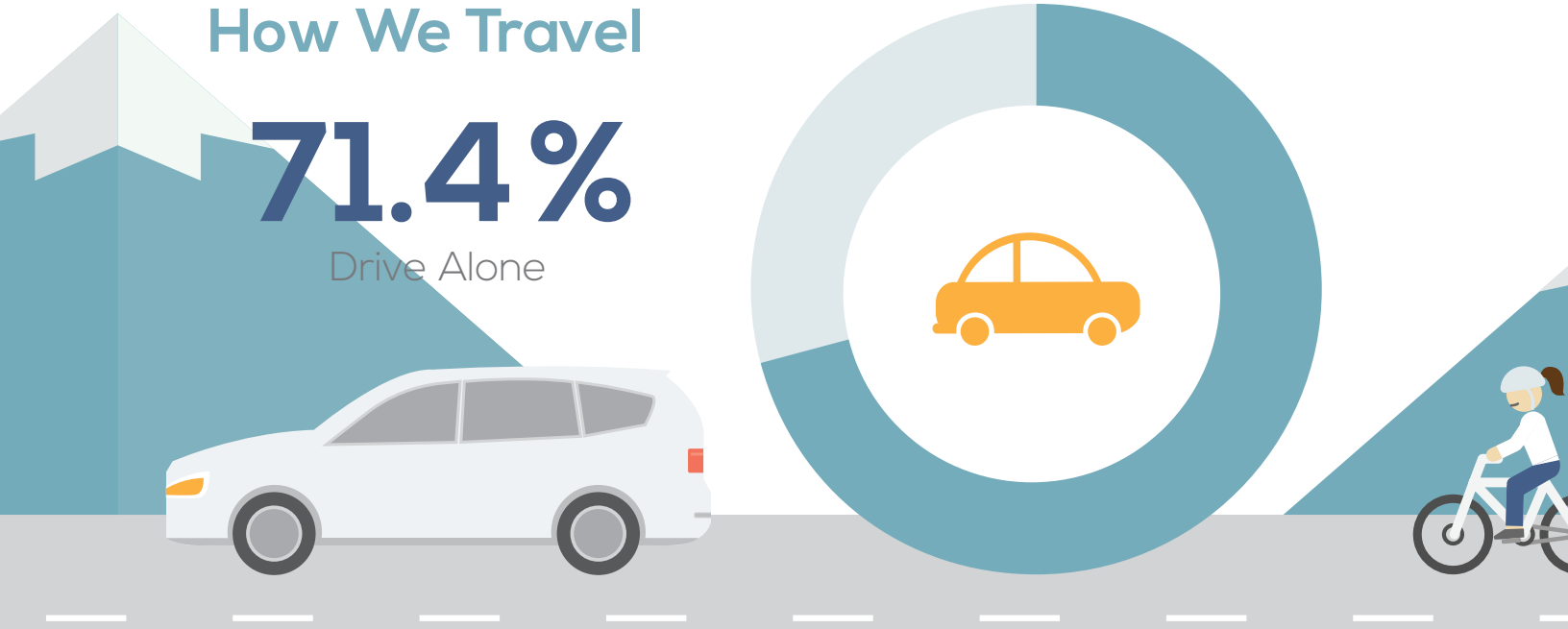
Well, mostly by driving. Given our relatively low density and large area—and our role as a regional economic, educational, and tourism hub—driving is often the fastest and most convenient way to travel. Additionally, low gas prices, abundant parking, and a strong economy make it easy for people to drive.

However, drive-alone rates among Missoula area residents are less than the state average, while active transportation modes such as biking and walking are well above what we see in the rest of the Montana and across the country.

How We Travel

71.4%

Drive Alone

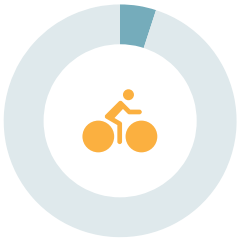


Source: 2013-2017 ACS 5-Year Estimates

9.2%
Carpool

6.1%
Walk

5.3%
Other (taxi, telecommute, etc.)



5.3%
Bike

2.7%
Bus

In our 2016 Long-Range Transportation Plan, we set some ambitious mode-share goals to provide people with better travel options and shift some trips away from driving:

- Reduce drive-alone commute share to **34% by 2045**
- Reduce drive-alone commute trips by **20,000 by 2045**
- **Triple** bike and walk shares and **quadruple** transit share by 2045
- Achieve a **small increase** in carpool and work from home

Since then, our drive-alone rate has remained fairly constant, and carpool, walk, and telecommute shares have stayed mostly the same. Trips by transit and bicycle have both increased slightly, by about 1%.

Regional Commute Patterns

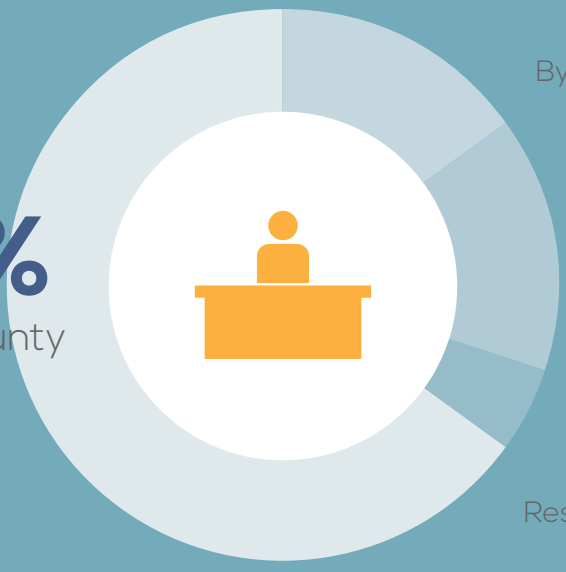
Missoula is the economic heart of our region. Each day, Missoula County welcomes a large number of commuters from neighboring communities in Mineral County, Granite County, Ravalli County, and Lake County. Nearly a third of Missoula County workers commute from another county, and these are typically longer trips than Missoula County residents make to work. In most cases, commuters from adjacent counties have limited options beyond driving.

The 65% of Missoula County workers who live within the county's boundaries enjoy shorter travel times to work than people in many cities and towns across the nation. Our residents spend an average of 17 minutes traveling to work each day, compared to the national average of 25 minutes.

But for some Missoula County residents, trips to work can still cover many miles—workers from more rural areas have fewer travel modes to choose from than people in more urban parts of the county. Some parts of the county aren't served by Mountain Line, for example, and not everyone is able to make a bike ride to work. In the MPO's 2019 travel survey, nearly 99% of County residents reported driving to work as their typical mode of travel.

Who Fills the Jobs in Missoula County?

64.5%
By Missoula County Residents



15.1%
By Neighboring Montana County Residents

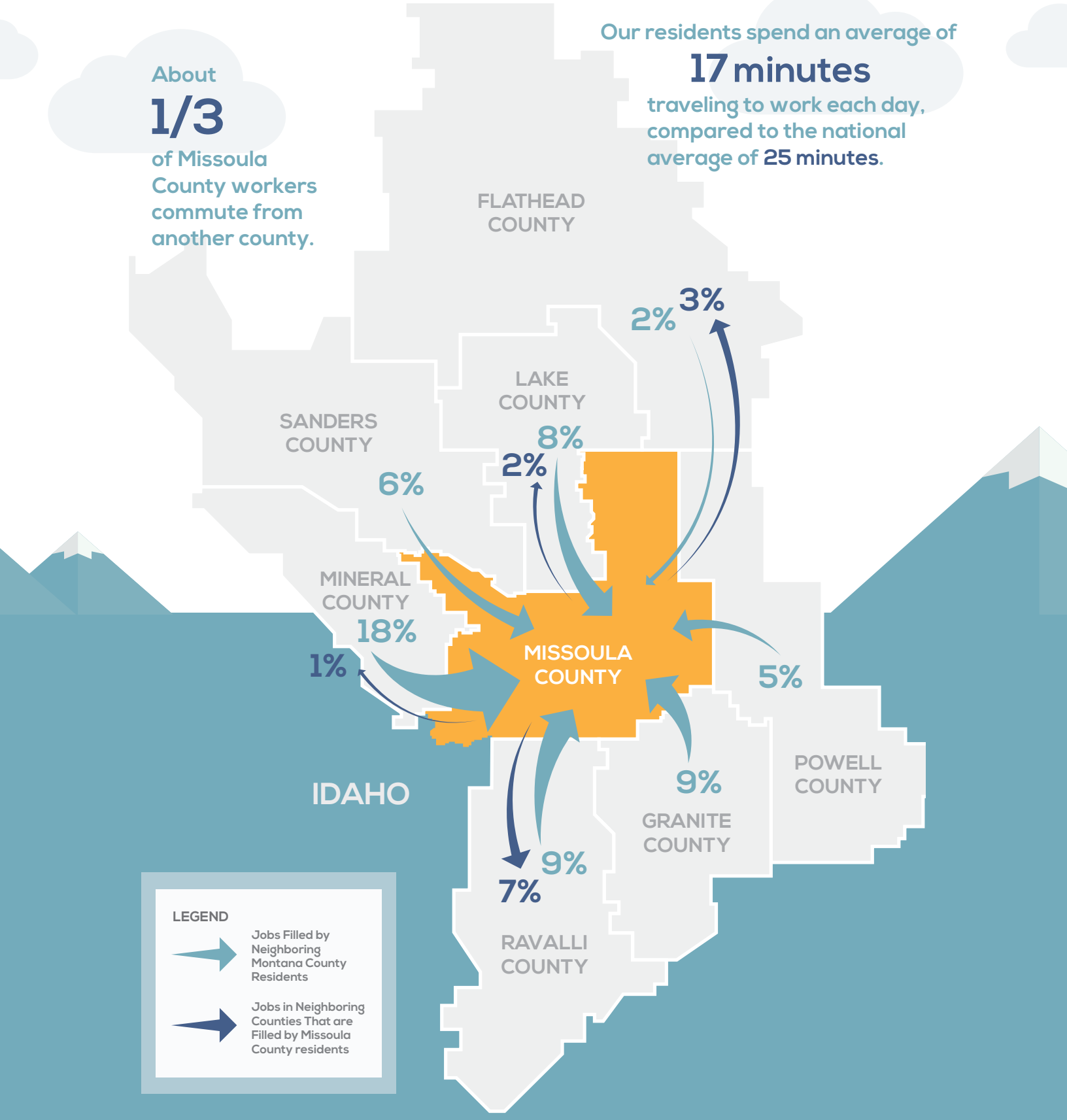
14.9%
By Non-Adjacent Counties

5.5%
Of Missoula County Residents Commute Outside the County for Work

Source: U.S. Census Longitudinal Employer-Household Dynamics, Origin-Destination Employment Statistics (LODES), Main (JT00) Montana (2017)

About **1/3** of Missoula County workers commute from another county.

Our residents spend an average of **17 minutes** traveling to work each day, compared to the national average of **25 minutes**.



Source: U.S. Census Longitudinal Employer-Household Dynamics, Origin-Destination Employment Statistics (LODES), Main (JT00) Montana (2017)

Driving in Missoula

Over 70% of trips in the Missoula area are made by people driving alone, and a handful of corridors carry most of our vehicles. The highest concentration of daily auto trips is along the Reserve Street corridor, which sees 40,000 vehicles each day. Other roadways with high traffic volumes include Brooks Street in the Southgate Triangle area, the bridges into downtown, and I-90 between downtown and East Missoula.

As we look for options to make it safer and more convenient for people to travel across the region, we're focusing on multimodal improvements as part of roadway reconstruction. The Russell Street Project is a great example—we've partnered with the Montana Department of Transportation to create complete streets that move even more people and goods efficiently and safely.

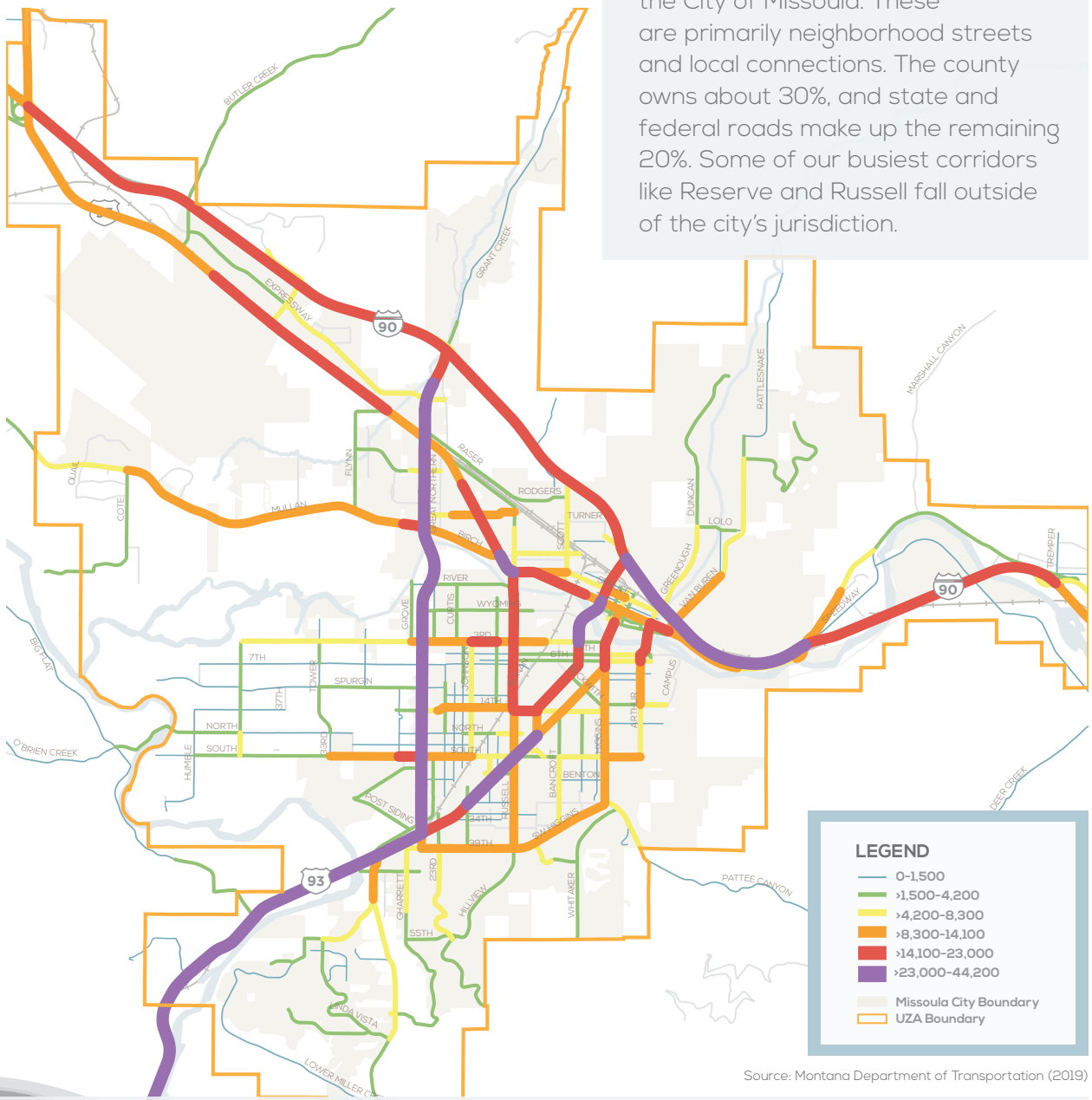
In the 2019 Missoula Area Transportation Survey, fewer residents (36%) reported that **traffic congestion had at least a somewhat large impact on them** in 2019 compared with 2015 (46%).

Missoula area residents who reported **longer commute times** also reported that **traffic congestion had a larger impact on them personally.**

Missoula's Busiest Roads

1/2

Roughly 50% of roads in the Missoula area are owned by the City of Missoula. These are primarily neighborhood streets and local connections. The county owns about 30%, and state and federal roads make up the remaining 20%. Some of our busiest corridors like Reserve and Russell fall outside of the city's jurisdiction.



Source: Montana Department of Transportation (2019)

Regional Air Quality

According to the Environmental Protection Agency, motor vehicles are the largest contributor to greenhouse gas emissions and climate change in the United States. In the Missoula area, driving is one of the main ways that many of us get around. To mitigate transportation-related climate impacts, we must improve access to and connectivity for more sustainable transportation options such as public transportation, biking, and walking.

Traffic Safety in Missoula

One of our biggest priorities as we plan for the future is keeping people safe on our streets. Between 2013 and 2017 there were nearly 12,000 transportation-related collisions in the Missoula area that impacted people using all modes of travel. These five corridors have the highest rate of collisions:

- Reserve Street from Broadway Street to Mullan Road
- Reserve Street from 3rd Street to 39th Street
- Brooks Street from Reserve Street to Higgins Avenue
- Russell Street from Broadway Street to South Avenue
- Broadway Street through downtown

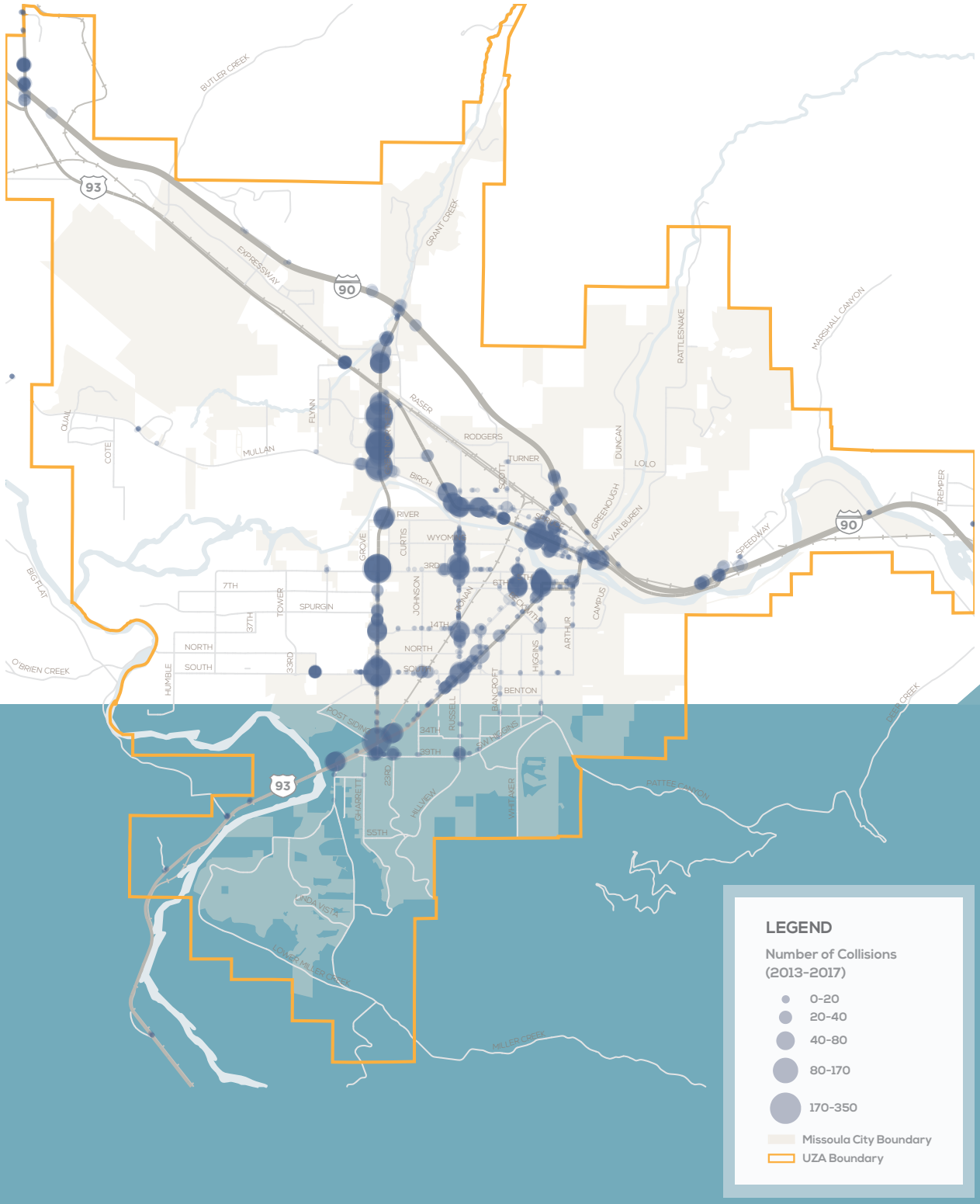
In that same period of time, there were 462 collisions that involved people walking or biking. While a relatively small percentage of the total number of collisions, pedestrians and cyclists are our most vulnerable travelers. They face a high risk of injury or death, particularly when hit by a vehicle traveling at speeds greater than 25 miles per hour.

There were 85 crashes involving people biking and walking in 2018

Vehicle Travel Speeds and Pedestrian Injury

Source: Tefft, Brian, 'Impact speed and a pedestrian's risk of severe injury or death' (Accident Prevention Analysis, 2013)

Where Do Collisions Occur?



Source: Missoula MPO 2007-2018 Crash Data; Montana Department of Transportation 2007-2018 Crash Data

Walking in Missoula

Each day, people walk, roll, or use mobility devices like wheelchairs to move around the Missoula region. Whether getting to the bus stop, to their parked car, or around the neighborhood, people should feel safe and comfortable.

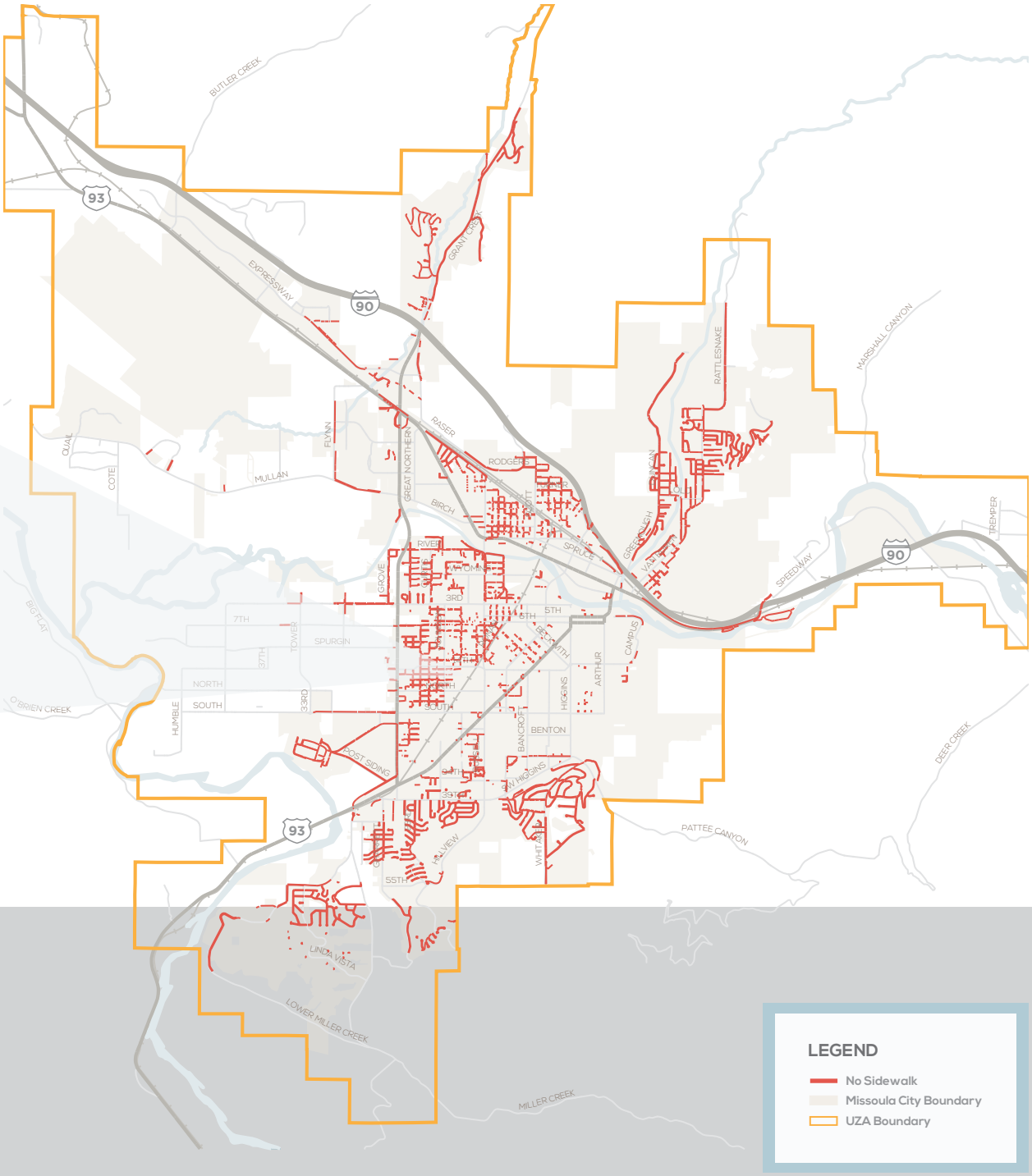
Only 40% of Missoula area roads have a sidewalk on even one side of the street. That leaves a considerable percentage of streets without sidewalks, and most of those streets are in residential neighborhoods such as Franklin to the Fort, River Road, Westside, and Northside. And outside of the more urban areas of the region, there are even fewer safe and connected places for people to walk. While not every road—especially in our more rural areas—needs a sidewalk on both sides of the street, having a dedicated space to walk or roll should be a priority.

AREAS WITH NO SIDEWALKS

Having a complete network of sidewalks is important, but those sidewalks also have to be maintained and in good condition. For people who use a mobility device or push kids in a stroller, the condition of a sidewalk or path is as important as whether one exists.

Safe crossings are a critical piece of the pedestrian environment. High-visibility crosswalks, along with traffic signs and signals, help to connect our neighborhoods.

Pedestrian Network Gaps in the Region



Source: Missoula MPO 2019 Sidewalk Data

Biking in Missoula

With more than 70 miles of commuter paths, 40 miles of on-street facilities, and a fairly flat urban center, biking is a great way to travel around the Missoula area. And over 5% of Missoula area commuters make their trips to work by bike. This is significantly higher than the national average, which is less than 1% of commuters.

At the same time, there are important opportunities to improve the biking network, especially by focusing on intersections and building out the neighborhood greenway network. The City of Missoula has one protected intersection (at Johnson and South) for people on bikes, and 29 miles of designated greenways. But to create a network that is safe and comfortable for people of all ages and abilities, continued investment in protected and low-stress facilities is needed.

Missoula's 2018 Bicycle and Pedestrian Count Program Report found that non-motorized travel is the heaviest in Downtown Missoula, particularly along Higgins and on the primary commuter paths. People walking and biking cited better street crossings and wider facilities as the most needed active transportation improvements.

What's a greenway?

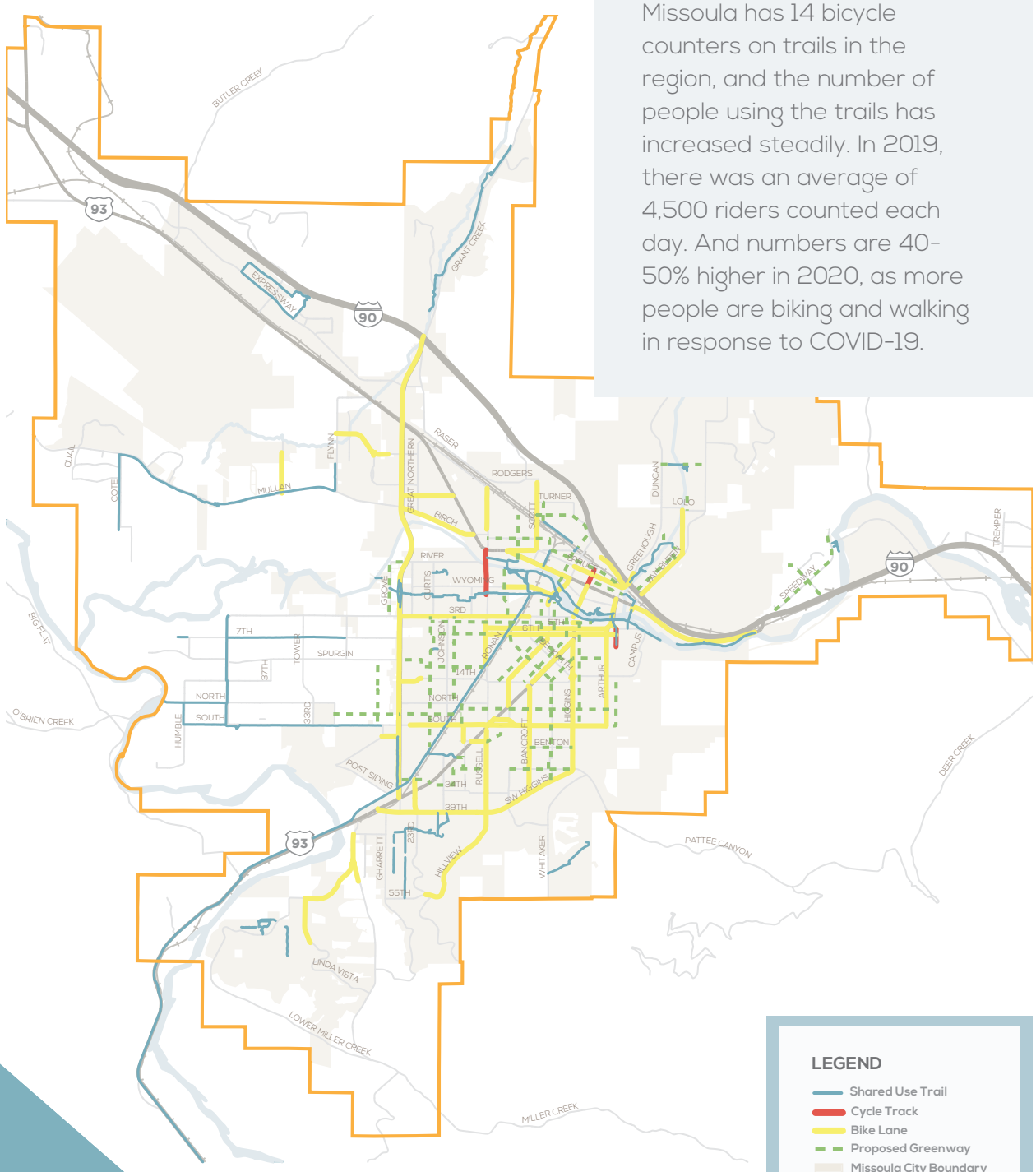
Neighborhood greenways are residential streets, close to main roads, with relatively low volumes of vehicles and slow speeds. These important connectors are comfortable places to ride for people of all ages and help to increase safety for people who bike and walk.

Missoula has been a **Gold Level Bike Friendly Community** since 2012

Bike Facilities in the Region

How many people bike?

Missoula has 14 bicycle counters on trails in the region, and the number of people using the trails has increased steadily. In 2019, there was an average of 4,500 riders counted each day. And numbers are 40-50% higher in 2020, as more people are biking and walking in response to COVID-19.



LEGEND

- Shared Use Trail
- Cycle Track
- Bike Lane
- Proposed Greenway
- Missoula City Boundary
- UZA Boundary

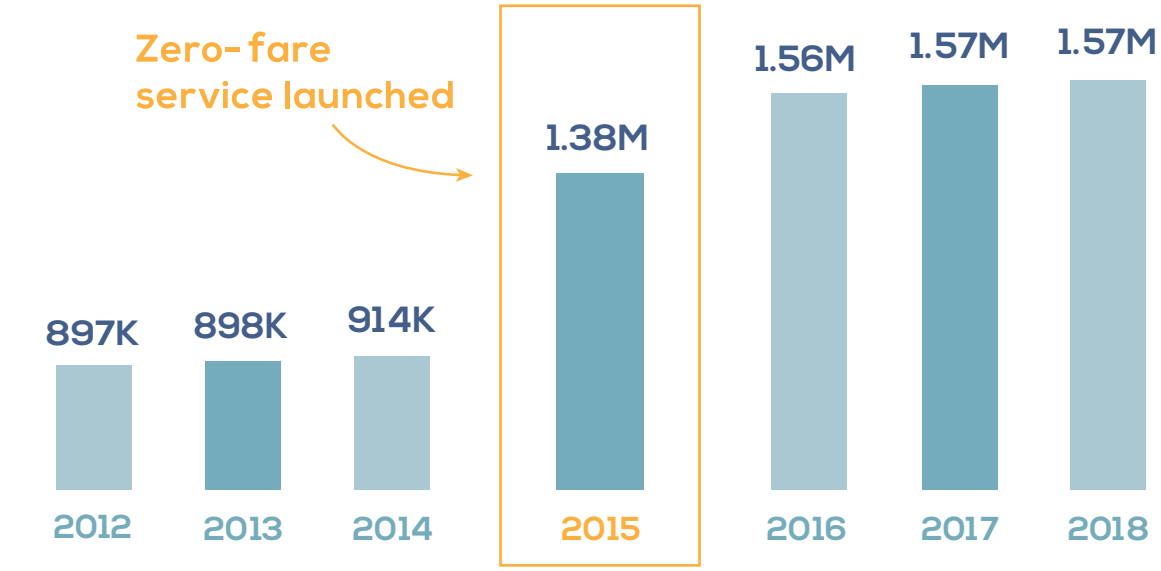
Source: Missoula MPO 2019 Bicycle Facilities Data

Taking the Bus in Missoula

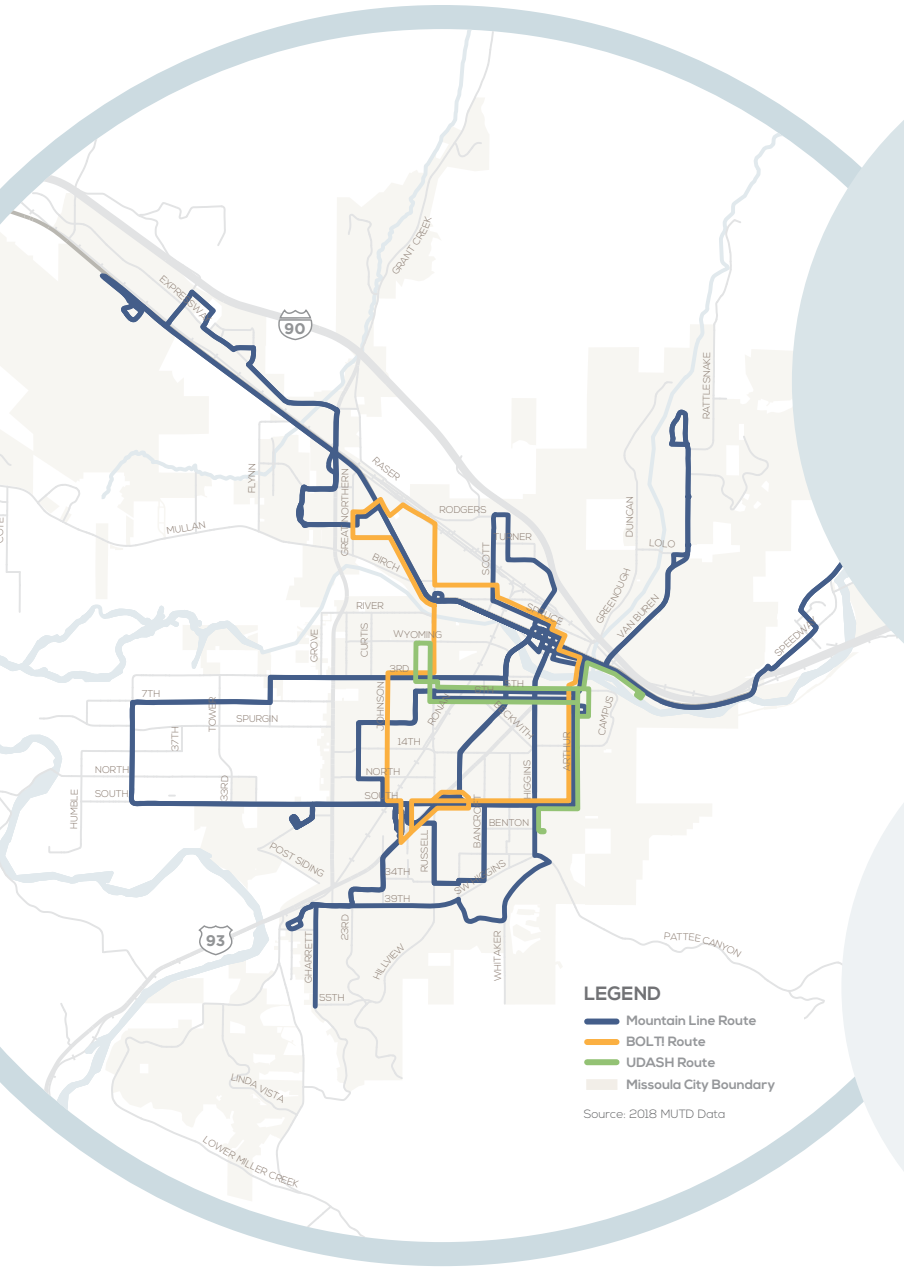
Transit ridership in the Missoula area has nearly doubled since 2012, as Mountain Line launched and then expanded 15-minute frequency BOLT! service and added later evening service. In 2015, Mountain Line implemented zero-fare service, which boosted ridership almost 50% in one year. Since that time, ridership has continued to grow, although less than 3% of Missoula area residents use the bus to get to work.

Mountain Line has 12 routes and also offers Americans with Disabilities Act (ADA) paratransit service and a Senior Van. While 88% of Missoula residents live within a half-mile of a bus stop, service hours and the frequency of service can make it challenging for people to ride Mountain Line. There is no service on Sundays, and the last bus generally stops running at 10 PM.

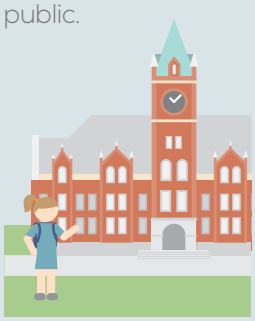
Mountain Line Ridership



Source: 2018 MUTD



The University of Montana's UDASH service includes four routes, which are also fare-free and open to the public.



There are more than **10,000 college and university students** in Missoula.

In February 2020, the Missoula Urban Transportation District–Mountain Line's governing board–adopted a resolution committing the agency to eliminating all tailpipe emissions from its buses by 2035. The agency's new electric buses are an important part of achieving that goal.

Key Findings & Next Steps

So where do we go from here? This report gives us a glimpse into growth and transportation in Missoula today. It reflects previous plans, existing data, and preliminary conversations with Missoula area residents and stakeholders. There's a lot more to learn, but we have some key findings that will help us take the next steps.

Connecting urban and rural

The Missoula region covers 263 square miles. This presents challenges for delivering transportation choices for all residents across a large geography. Many of the people who most need affordable and efficient transportation live far from the downtown core. And the urban parts of our region are fairly disconnected from the rural areas, especially when it comes to biking and walking connections. Missoula Connect can help to knit these areas together, recognizing that tailored solutions will always be needed.

Moving the dial on mode share

Driving is the way that most people get around the Missoula area today. But the region is growing and preferences are changing. Missoulians are asking for safe, efficient, and cost-effective transportation choices to support getting them to the places they need to go. This means creating a more robust transit system. And it means doing more to manage transportation demand, including creating new policies and programs to shift people to non-drive-alone modes. We must be bold to change behavior and meet our ambitious mode share goals.

Integrating land use and transportation

"Our Missoula" sets a vision for growth that focuses inward. And our transportation system is shaped by our land uses. We must continue to focus growth in our core neighborhoods to create complete communities and to ensure that people can make sustainable choices for most trips. We need to concentrate on moving people and our responsibility to manage the 30% of the Missoula area's land that is devoted to that purpose. We're not going to get more space to build roads, so we have to make the best use of the space we have.

"Our Missoula" anticipates **6,500 new housing units** in the area in the next 10 years.

Advancing safe and local networks

Each year, there are more than 2,000 transportation-related collisions in the Missoula area. To keep people safe on our roads, we need to complete and maintain our networks. We also have an opportunity to create local systems—like neighborhood greenways—that focus on low-speed and low-volume streets to enhance safety for people walking and biking. But safety is about more than infrastructure. To create streets that work for people of all ages and abilities, we must be willing to trade speed for saving lives.

There are **29 miles** of designated greenways in the Missoula area.

Preparing for an uncertain future

We are at a pivotal moment in time—we're in the midst of a global pandemic that is reshaping the ways people travel and the places they are allowed to go. And we continue to face the challenges of a rapidly warming climate, new and expanding technologies, and the pressures of development. This is a period of unprecedented change in transportation, presenting incredible opportunities and potential challenges for the Missoula area and our residents, workers, and visitors. These changes have the potential to increase accessibility, but also to increase inequalities.

The ways we move and the ways mobility is provided will be different tomorrow than they are today.

Expanding the pie

There's never enough money to design or build all the projects that are needed in our region. Nor is there enough funding available each year to take care of our transportation system's basic maintenance needs. We can make the dollars we have stretch further by focusing on lower cost and higher impact investments. And we must also seek opportunities to expand the funding sources that are available for transportation projects, by looking beyond the gas tax and considering public-private partnerships.

Failing to maintain our infrastructure is similar to making only the minimum payment on a credit card bill each month—deferring maintenance compounds the problem, just like monthly interest payments!

Leading with values

Missoula's past planning efforts have helped to articulate what matters most to our residents: preserving what's great about this region while leading the way to a more sustainable future. Missoula Connect gives us the opportunity to translate our core values into decision-making tools to prioritize how we use limited resources. If we are guided by our values—which include sustainability; safety; access to jobs, schools, and services; and creating more options for all—we can develop a transportation system that is both resilient and adaptable, one that is ready for whatever the future holds.

Missoula area residents were invited to share the mobility values that matter most to them. Sustainability was the most often selected value, with safety and access to jobs, schools, and services close behind.

Working together

We need your help! To plan and fund the transportation system Missoula wants—both today and in 2050—requires commitment and decisive action. We must be guided by our values, which are key to identifying projects and programs that will help us achieve our goals. There's a lot of good work to build upon, so we're not starting from scratch. Throughout 2020, we'll invite you to share your ideas and priorities with our team. Missoula Connect must reflect what matters to you, and we hope to hear from you regularly.

Visit us at our website for more information:
https://www.missoulampo.com/long-range-transportation-plan

missoula connect

2050 Long-Range Transportation Plan

Missoula County - City of Missoula MPO METROPOLITAN PLANNING ORGANIZATION

APPENDIX C

Project Evaluation Framework

missoula connect
2050 Long-Range Transportation Plan

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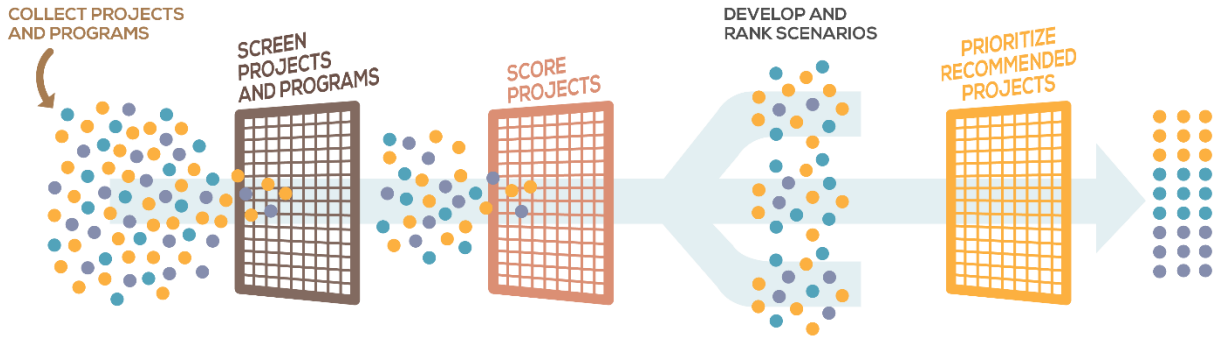
MISSOULA CONNECT: PROJECT EVALUATION APPROACH

RECOMMENDED FRAMEWORK (8/5/2020)

This memo recommends a five-step evaluation framework to help screen, score, and prioritize projects for funding and implementation through Missoula Connect. The steps and the criteria associated with each are described in more detail below:

1. **Collection –** Gather potential project and program concepts, using recommendations from the 2016 Long-Range Transportation Plan (LRTP) as well as new input from committees and the public.
2. **Screening –** Filter concepts for LRTP eligibility.
3. **Scoring –** Use geographic criteria to score projects based on metrics that will help achieve Missoula Connect goals.
4. **Scenarios –** Use the regional travel demand model to test network performance.
5. **Prioritization –** Collaborate with the Technical Advisory Committee (TAC), Citizen's Advisory Committee (CAC), Transportation Technical Advisory Committee (TTAC), and Transportation Policy Coordinating Committee (TPCC) to prioritize high-scoring projects based on descriptive criteria to develop a recommended project list.

Figure 1 Evaluation Process



Step 1: Collect Projects & Programs

The project team will work with the project committees and the public to develop a comprehensive list of transportation projects and programmatic needs for the Missoula area. The list, which will include unbuilt recommended and illustrative projects from the previous LRTP, will be supplemented by a three-pronged Call for Projects:

Interactive Map

An interactive map illustrates existing in-progress, recommended, and illustrative projects and invites members of the public to identify locations where they would like to see new projects. People are required to provide a brief description of their project, including articulating how it helps to advance Missoula Connect goals. Participants are also able to submit comments on existing projects or those recommended by others.

Call for Projects Form

The public is also invited to submit project ideas through a simple online form. This mobile-friendly tool asks people to provide a project type, location, and description; explain how the project meets Missoula Connect goals; and share their contact information.

Virtual Workshops

The purpose of workshops is to gather feedback on the draft evaluation framework and to identify new projects. Due to restrictions on public gatherings as a result of COVID-19, the workshops will occur virtually on Zoom. Members of the LRTP TAC and CAC have detailed knowledge of or ideas about projects that could address critical gaps, advance Missoula Connect goals and desired outcomes, and offer high potential for successful implementation.

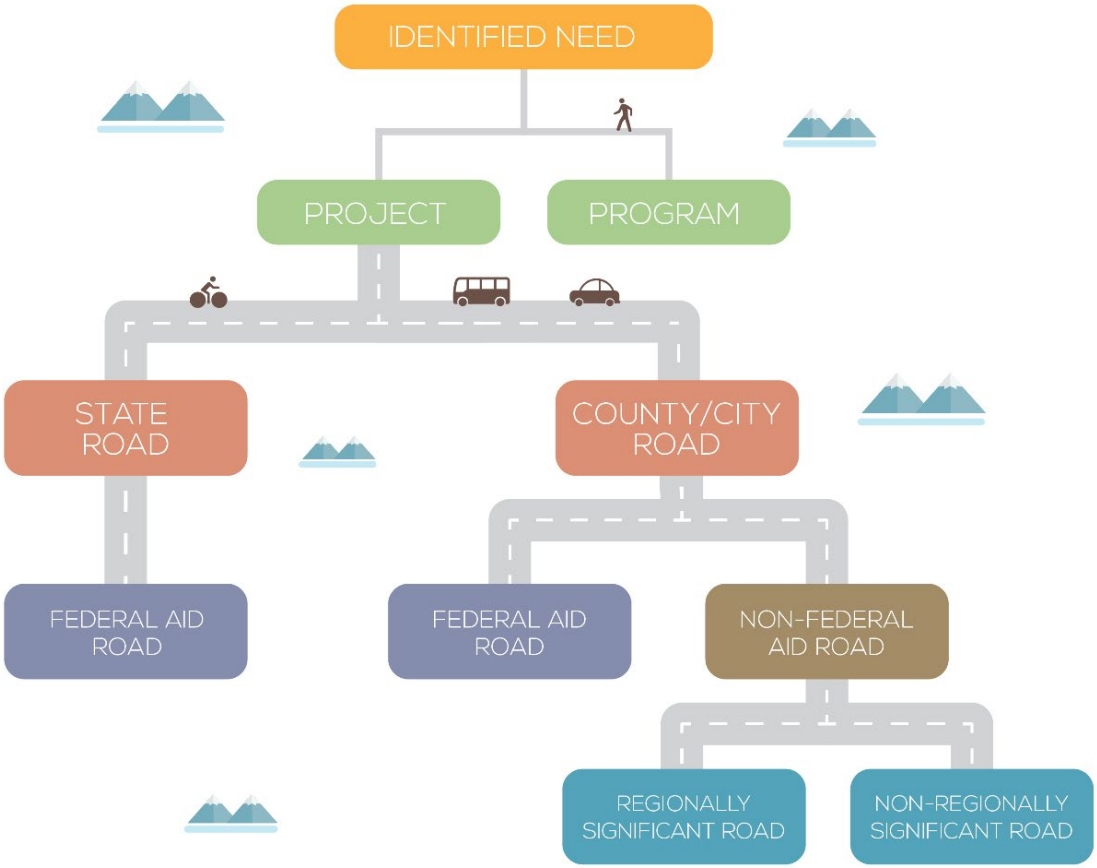
Step 2: Screen Projects & Programs

Once the collection phase is complete, the project team will develop a master list of suggested projects. This list will be screened to ensure that projects are eligible for the LRTP prioritization process. Proposed screening criteria are as follows:

a. **Is the concept a project or a program?** Submissions classified as Transportation Options will be considered programs. Projects continue through the process, and programmatic needs are included in a separate section of the LRTP.
b. **Is the project on a State road or County road?** Projects located on State or County roads continue through the process. A list of non-regionally significant projects identified on local roads will be compiled for scoring separately and then prioritized through the City's framework for CIP development.
c. **Is the project on a Federal Aid Road?** Only projects on Federal Aid Roads are eligible for funding through the MPO and will continue through the process.
d. **Is the project on a regionally significant road?** Select Non-Federal Aid Roads or off-road paths may be regionally significant or may be classified as Federal Aid Roads in the future. Projects that are deemed regionally significant will continue through the process.

The flow of the screening process in shown in Figure 2 below.

Figure 2 Screening Process



Step 3: Score Projects

With a screened list of projects, the Missoula Connect team will use geographic criteria to score the remaining projects. A focus on geographic criteria at this stage makes it possible to evaluate many projects quickly, adjusting weighting of goals or criteria as needed to match the community's values, needs, and technical priorities.

For consistency with the previous LRTP, all projects, regardless of mode, will be scored with the same criteria. This approach recognizes that roadway projects can incorporate complete street elements that benefit all modes while non-motorized projects can contribute to overall system performance and safety. The revised scoring criteria—based on the draft Missoula Connect goals—are described in Figure 3.

Figure 3 Revised Project Scoring Criteria

Goal	Desired Outcomes	Geographic Criteria
Improve safety and promote health to enhance quality of life **(7)**	▪ Eliminate traffic-related fatalities and serious injuries ▪ Improve safety for people walking and biking ▪ Enhance active transportation and transit linkages to lower-income neighborhoods ▪ Increase physical activity and human connections by making walking and biking convenient modes of travel ▪ Improve access to recreational facilities and trails to support healthy lifestyles	**Crash Reduction (all modes):** 1 point – Project is located within ¼ mile of a high crash frequency corridor or intersection 2 points – Project is located at a high crash frequency corridor or intersection
		Bicycle/Pedestrian Safety: 1 point – Project will improve bicycle/pedestrian safety within ¼ mile of a high crash frequency/high level of stress corridor or intersection 2 points – Project will improve bicycle/pedestrian safety and is located at a high crash frequency/high level of stress corridor or intersection
		Economic Equity: 1 point – Project is located in an Invest Health neighborhood or a high LMI (low to moderate income) census tract
		Access to Recreational and Active Facilities: 1 point – Project provides multimodal access within ½ mile of a public recreation facility, park, playground, or trail 2 points – Project directly connects to or expands multimodal access to a public recreation facility, park, playground, or trail

Goal	Desired Outcomes	Geographic Criteria
Advance sustainability and community resilience to protect natural resources and address climate change **(5)**	▪ Improve climate resilience and advance toward carbon neutrality ▪ Reduce transportation-related air emissions ▪ Minimize sediment, nutrients, and litter entering surface water ▪ Expand the urban canopy and green stormwater infrastructure ▪ Protect and enhance natural, cultural, historic resources, including agricultural lands ▪ Create adaptable and resilient infrastructure to respond to changing needs	**Climate Change:** 1 point – Project will reduce VMT, SOV trips, or carbon emissions **Natural Preservation:** 1 point – Project is outside a floodplain, protected wetland, or critical species habitat area **Historic and Cultural Resources:** 1 point – Project enhances multimodal access to a site(s) listed on the National Register of Historic Places **Agricultural Preservation:** 1 point – Project is outside land designated for agricultural preservation **Emergency Response:** 1 point – Project is located on an evacuation corridor or provides a second route for areas with 1-way emergency access
Expand mobility choices to improve efficiency and accessibility for people and goods **(6)**	▪ Build complete streets and increase access to multimodal options ▪ Increase street, trail/greenway, and sidewalk network connectivity for all ages and abilities ▪ Optimize the efficiency and accessibility of the transportation system ▪ Reduce person hours of delay for people driving and improve freight movement ▪ Improve access to high-quality and high-frequency transit stops and routes to advance local plans	**Modal Density:** 1 point – Project increases network density for one out of three non-auto modes (sidewalk, bike/trail, transit network) 2 points – Project increases network density for two or more non-auto modes (sidewalk, bike/trail, transit network) **Network Connectivity:** 1 point – Project increases the link-node ratio[1] **Freight:** 1 point – Project is located on a designated truck route or is located within ½ mile of an industrial or manufacturing center

[1] See https://www.cnu.org/our-projects/street-networks/street-networks-101

Goal	Desired Outcomes	Geographic Criteria
		Transit Access: 1 point – Project closes a gap, removes a barrier, or improves transit operations within ½ mile of a Mountain Line or UDASH stop 2 point – Project closes a gap, removes a barrier, or improves transit operations within ½ mile of an existing Bolt! Route stop or future high-frequency stop identified in Mountain Line's Strategic Plan
Connect and strengthen communities to create a more equitable region **(7)**	▪ Increase affordability and reduce overall household transportation costs ▪ Develop an integrated mobility system that connects destinations with sustainable travel options to create complete neighborhoods ▪ Integrate land use and transportation planning to support infill development and responsible growth, and to create complete neighborhoods ▪ Improve access to schools, jobs, parks, essential services, affordable and senior housing, and basic life needs ▪ Engage with and invest in historically disadvantaged areas and in neighborhoods that have been adversely impacted by transportation decisions	**Equity:** 1 point – Project improves multimodal access within a high threshold census tract in the Equity Index
		Access to Essential Services: 1 point – Project improves multimodal access within ½ mile of an essential service, school, childcare facility, hospital, or health/social service provider 2 points – Project directly connects to or expands multimodal access to an essential service, school, childcare facility, hospital, or health/social service provider
		Sustainable Growth: 1 point – Project is located within one or more Tier 3 Composite Suitability hexagons in Our Missoula Development Guide 2 points – Project is located within one or more Tier 4 Composite Suitability hexagons in Our Missoula Development Guide
		Access to Affordable or Senior Housing: 1 point – Project is within ½ mile of existing or planned affordable or senior housing units 2 points– Project provides direct access to existing or planned affordable or senior housing units

Goal	Desired Outcomes	Geographic Criteria
Maintain assets and invest strategically to boost economic vitality **(5)**	▪ Bring existing infrastructure and transit assets into a state of good repair to support the regional economy, local industry, and goods movement ▪ Balance cost-effective, implementable projects with high-impact projects ▪ Plan for a transportation system that makes the best use of public financial resources ▪ Provide a network that targets growth inward to support existing centers and mixed use development ▪ Support access to businesses and commercial and industrial centers to enhance economic recovery and growth ▪ Explore more equitable and sustainable funding sources for transportation projects and programs	**Facility Preservation:** 1 point – Project improves pavement, bridge, or transit facility with fair condition rating 2 points – Project improves pavement, bridge, or transit facility with poor condition rating **Revitalization:** 1 point – Project is located within an Urban Renewal District. **Access to Employment:** 1 point – Improves access to key commercial and industrial employment centers for one mode 2 points – Improves access to key commercial and industrial employment centers for two or more modes

Step 4: Develop and Rank Scenarios

The project team will compile scenarios that combine projects based upon scoring results, geographic distribution, and project types. The scenarios will be structured in ways that maximize differences and help to illustrate the types of projects and programs that will move the needle on Missoula's goals.

The *Missoula Connect Scenario Approach Memo (8/5/20)* provides more information about the proposed approach to scenario planning. It is anticipated that there will be two land use scenarios and three or four transportation network scenarios. The scenarios will be fiscally constrained and will be evaluated across metrics that respond to the project's goals.

Scenarios will be tested within the regional travel demand model and select off-model tools to assess future network performance and other outcomes for 2050. Factors to consider include network congestion, person trips, multimodal levels of service, shift toward mode share goals, vehicle miles traveled, and air quality, among others.

Step 5: Prioritize Recommended Projects

With a preferred scenario, the project team will hold an internal working session and collaborate on a shared matrix to answer questions about each project. This work session will help to determine which projects are the highest priority given their need and potential return on investment for the community. Members of the TAC and other relevant stakeholders will be included in this work session, as appropriate. The results of the prioritization process will be an appendix to the final LRTP. The appendix will include a column for scoring rationale that also provides space for comments submitted as part of the public Call for Projects process. Potential prioritization questions include the following:

Goal 1: Improve safety and promote health to enhance quality of life

i. Does the project include proven countermeasures to reduce driver fatalities and serious injury crashes?
ii. Does the project include proven countermeasures to reduce bicycle or pedestrian fatalities and serious injury crashes?
iii. Is the project likely to increase bicycle or walking mode share or support increased physical activity?
iv. Does the project include placemaking elements like public art, street furniture, or new lighting?

Goal 2: Advance sustainability and community resilience to protect natural resources and address climate change

i. Is the project likely to decrease single-occupancy vehicle (SOV) mode share?
ii. Is the project likely to decrease vehicle miles traveled (VMT)?
iii. Would the project contribute to improved air quality outcomes?
iv. Does the project help achieve the goal of carbon neutrality in the Missoula urban area? Does the project include adaptive or green infrastructure features such as street trees, native landscaping, or bioswales?

v. Does the project include adaptable or resilient elements to future-proof the investment for changing needs?
vi. Does the project strengthen the transportation system to provide safe travel during a natural disaster?

Goal 3: Expand mobility choices to improve efficiency and accessibility for people and goods

i. Does the project fill a network gap?
ii. Does the project address existing deficiencies in Americans with Disabilities Act (ADA) access or facilities?
iii. Does the project reduce person hours of delay for people driving?
iv. Does the project improve freight movement by improving truck route operations?

Goal 4: Connect and strengthen communities to create a more equitable region

i. Does the project support the needs of a local social service organization?
ii. Does the project have the potential to reduce household transportation costs by supporting non-automobile trips?
iii. Does the project improve multimodal access in an outlying area with a need for more regional connectivity?
iv. Does the project support infill development and help create more complete neighborhoods?
v. Does the project expand connectivity to create more attractive neighborhoods for the development of affordable housing?
vi. Does the project have stated support or previous engagement with historically disadvantaged areas that have been adversely impacted by transportation decisions?

Goal 5: Maintain assets and invest strategically to boost economic vitality

i. Is the project in an advanced state of readiness (e.g., shovel ready, preliminary design)?
ii. Will the project significantly increase roadway preservation costs?
iii. Does the project have an identified public funding source or potential for a public-private partnership?
iv. Does the project address a long-standing deferred maintenance issue?
v. Does the project support efforts for revitalization of an area for local business or mixed-use development (e.g., consistent with Downtown Master Plan or supports community cores outside of Downtown)?
vi. Does the project expand access and development potential for necessary industrial and commercial employment centers?

APPENDIX D

Scenario Planning Approach & Descriptions

missoula connect
2050 Long-Range Transportation Plan

Missoula County - City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

MEMORANDUM

To: Missoula MPO

From: Nelson\Nygaard

Date: October 30, 2020

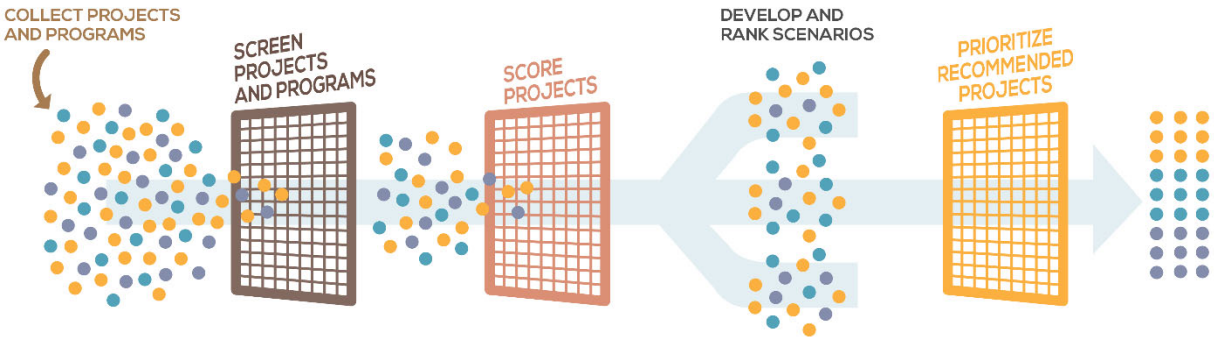
Subject: Scenario Planning Approach & Proposed Scenarios

This memorandum describes the approach to scenario planning to inform the development of the Missoula region's long-range transportation plan (LRTP), Missoula Connect, and summarizes the land use and transportation network scenarios that are proposed for 2050.

MISSOULA CONNECT EVALUATION FRAMEWORK

Missoula Connect is using a five-step evaluation framework to screen, score, and prioritize projects for funding and implementation. The figure below describes the steps in this process, and more detail is available in the *Missoula Connect Project Evaluation Framework (8/5/20).*

Figure 1 Evaluation Framework Process



The development of Missoula Connect is strongly rooted in community values. Drawing from conversations and input from the public, the Transportation Technical Advisory Committee (TTAC), the Transportation Policy Coordinating Committee (TPCC), the LRTP Technical Advisory Committee (TAC), and the LRTP Citizens Advisory Committee (CAC), the scenarios help to illustrate how projects that scored well in Step 3 of the evaluation process can meet the Missoula region's values and desired outcomes in different ways. The key steps are outlined below:

1. **Collection:** Gather potential project and program concepts, using recommendations from the 2016 LRTP as well as new input from committees and the public.
2. **Screening:** Filter concepts for LRTP eligibility and appropriateness. Local projects that do not meet eligibility for federal funding will be referred back to the City and County for consideration in future capital improvement programs.
3. **Scoring:** Use geographic criteria to score projects based on metrics that will advance Missoula Connect goals.
4. **Scenarios:** Use better scoring projects to develop scenarios that illustrate relative value, tradeoffs, and potential futures; identify a preferred scenario based on quantitative and

qualitative analyses, including using the regional travel demand model and off-model spreadsheet tools to test network performance. Review these results with the public.

5. **Prioritization:** Collaborate with the Technical Advisory Committee (TAC), Citizen's Advisory Committee (CAC), Transportation Technical Advisory Committee (TTAC), and Transportation Policy Coordinating Committee (TPCC) to create a recommended scenario, prioritize projects within that scenario, and develop a recommended project list.

When these steps are complete, the project team will establish a fiscally constrained list of final projects and programs for the long-range plan based on the preferred scenario, supported by a financial plan and implementation strategy.

WHY SCENARIO PLANNING

A key opportunity in developing Missoula Connect is to evaluate and communicate the benefits of a future multimodal transportation system. A scenario planning approach supports analysis of possible investments to illustrate how the Missoula region can make choices to maximize value in its transportation investments. Scenario planning will help Missoula stakeholders:

- Understand how combined transportation networks and growth decisions interact to improve performance and help Missoula meet its long-range transportation goals.
- Illustrate the relative tradeoffs associated with transportation performance goals and targets.
- Identify performance measures, develop baseline data, and confirm methodologies Missoula can use for long-term monitoring.

The scenario development and evaluation process is objective, transparent, and informative. The process responds to stakeholder input to foster productive dialogue about potential futures and tradeoffs. The scenario planning process is one part of a data-driven evaluation framework that will provide quantitative and qualitative ways for Missoula to identify and prioritize investments.

The Missoula MPO has historically used scenario planning as part of the LRTP. While the process proposed for Missoula Connect is somewhat different from that used in the 2016 LRTP, there are also similarities to provide consistency between plans.

DEVELOPING SCENARIOS

The Missoula MPO values community and stakeholder input in the planning process, and takes a nimble approach to respond to community direction. At the same time, Missoula Connect requires a solid quantitative process for justifying future investments. The LRTP scenarios are multimodal, tailored to advance community goals, and fiscally constrained. They explore different modal investment and policy changes required to meet the mode share targets, goals, and performance measures established for Missoula Connect.

The scenarios are shaped in ways that create measurable results and differences between them to help the project team and stakeholders understand what actually "moves the needle" when it comes to transportation and land use investments. The scenarios hold constant external factors beyond growth and the transportation system (e.g., economic or population trends not already represented in the model assumptions) to best illustrate the outcomes of the analysis. The sections below describe the growth scenarios and transportation network scenarios.

GROWTH SCENARIOS

The City of Missoula and Missoula County have identified an anticipated growth rate for population and employment, which is approximately 1.5% to 2050. Missoula Connect is using this single growth rate, holding it constant across two growth scenarios. While it is possible the region's growth will be faster than anticipated—especially as people reconsider their ability to work remotely as a result of COVID-19—growth has generally held steady between 1.2% and 1.5%. If the region does grow faster, it simply means Missoula will hit the growth target faster than expected, not that growth will be happening in unanticipated places.

Therefore, using a consistent growth rate but using two scenarios for siting that growth is an appropriate and meaningful approach to support LRTP scenario planning. The Missoula Connect project team met with Missoula City and County long-range land use planners in September 2020 to shape an alternative growth scenario that will be used to test how different growth patterns have an impact on transportation.

To support this exercise, population growth was translated into households, which were allocated in the *Our Missoula Development Guide (OMDG)* areas. (Those households were distributed throughout Transportation Analysis Zones [TAZs] for modeling purposes.) Employment distribution was assumed to follow households and was allocated throughout TAZs as the additional scenario was coded into the travel demand model.

The LRTP is using two growth scenarios to test the transportation scenarios against different growth patterns: Business as Usual Growth and Strategic Growth. These scenarios are described below, and the maps in Figures 2 to 6 illustrate the areas where growth is anticipated to occur.

Business as Usual Growth

This scenario is the 2050 base in the regional travel demand model. It assumes that future households will be located where current City and County Growth Policies have identified areas for future growth. It does not direct growth in particular areas but locates growth where there is capacity in each area, considering entitled lots and Urban Fringe Development Area (UFDA) allocations. Capacities are determined by underlying land use and zoning, and 25% of the growth is anticipated outside of the urban service area. See Figure 2 for a map of the 2050 household allocations and Figure 3 for the change between 2018 and 2050.

Figure 2 Business as Usual: 2050 Households

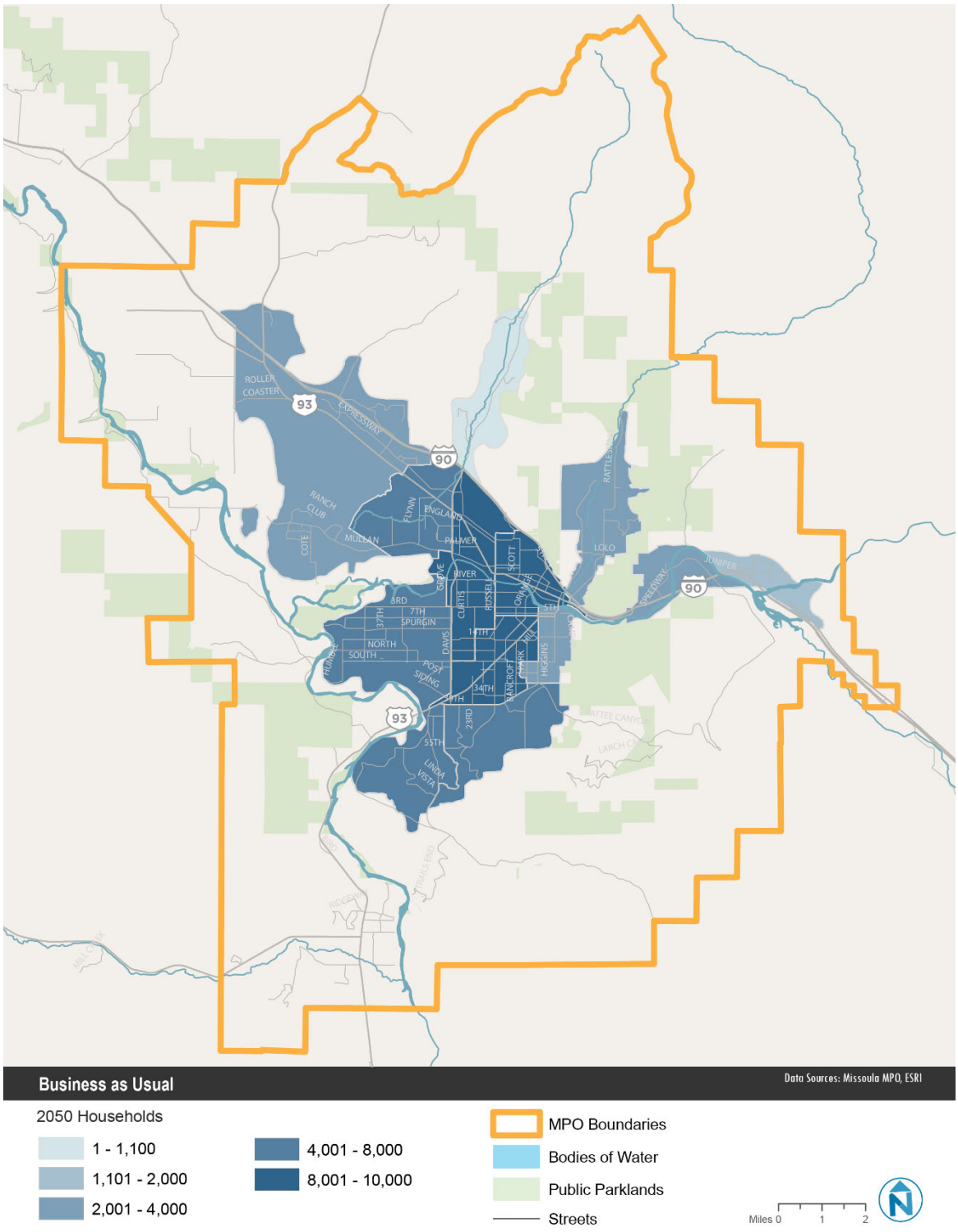
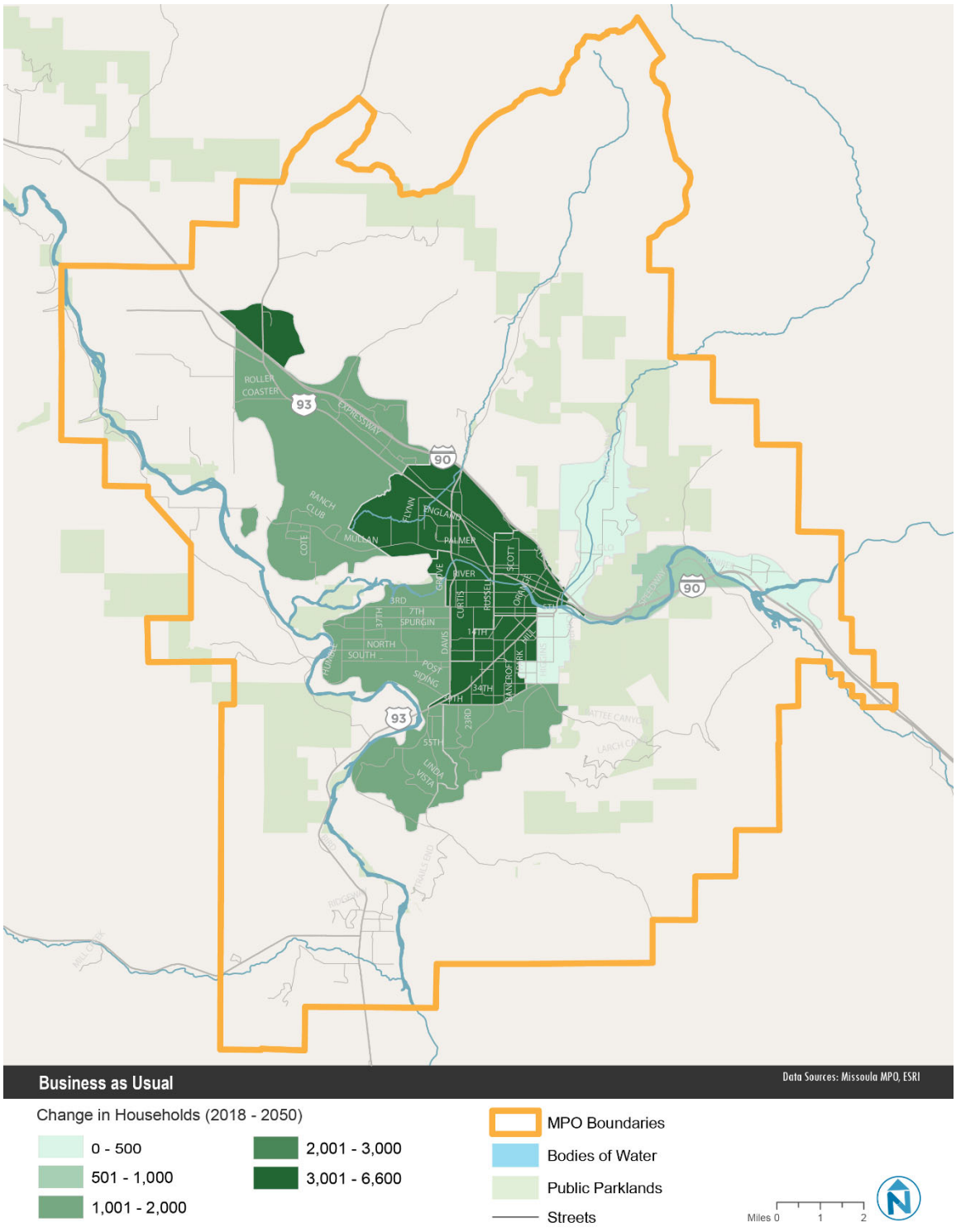


Figure 3 Business as Usual: Change in Households (2018 to 2050)



Strategic Growth

Aligned with other recent and ongoing planning efforts, this scenario maximizes focused inward development. It targets growth in specific areas, including places that have existing services and proximity to good transit, mixed-use development, and transportation network connectivity. This scenario assigns growth to areas where increased household capacity could be expected to have the largest effect on transportation infrastructure. It also decreases the households outside the urban service area by 15%. See Figure 4 for a map of the 2050 household allocations and Figure 5 for the change between 2018 and 2050.

Differences from the Business as Usual scenario include the following:

- The Strategic Growth scenario assumes more focused growth within the urban core, with much of that growth happening in the Mullan Master Plan area.
- Mullan East was increased to match the master plan—an additional 3,000 households—which includes much higher densities and mixed use, more typical of a compact traditional neighborhood.
- Growth was shifted to the Brooks Corridor, Central, and Russell to Reserve areas due to high suitability, good transit service, and available capacity given current zoning and land use. These areas are also the most walkable and compact and are served by existing bike and trail facilities.
- Some of the shift in growth to central neighborhoods reflects an emphasis on the potential for accessory dwelling units (ADUs), with reduced barriers to development.
- Growth was shifted away from Grant Creek, Miller Creek, Target Range, South Hills, and West Mullan due to lack of suitability, lack of existing or planned transit service, and other challenges like single point of access (e.g., Miller Creek, Grant Creek).

Figure 4 Strategic Growth: 2050 Households

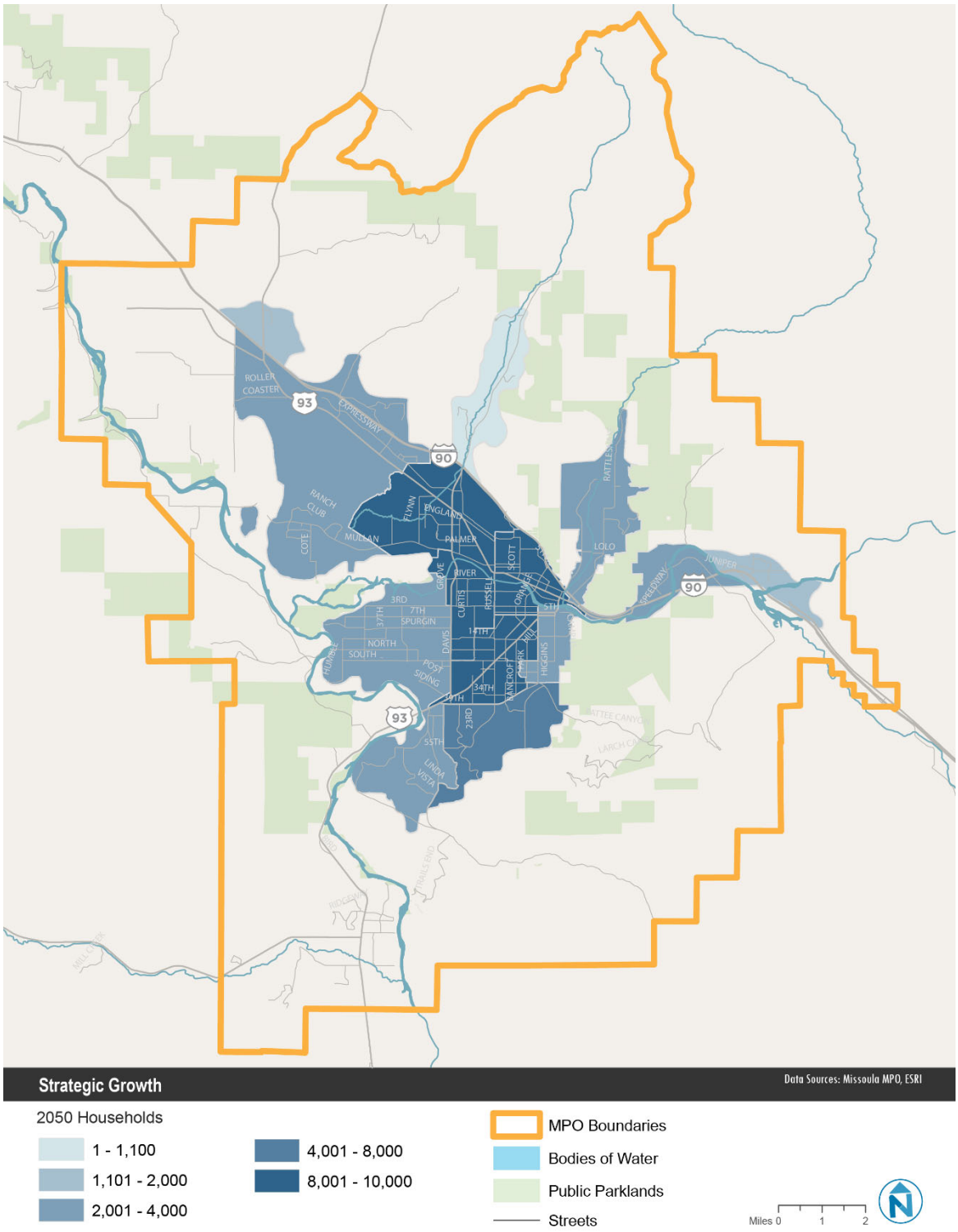
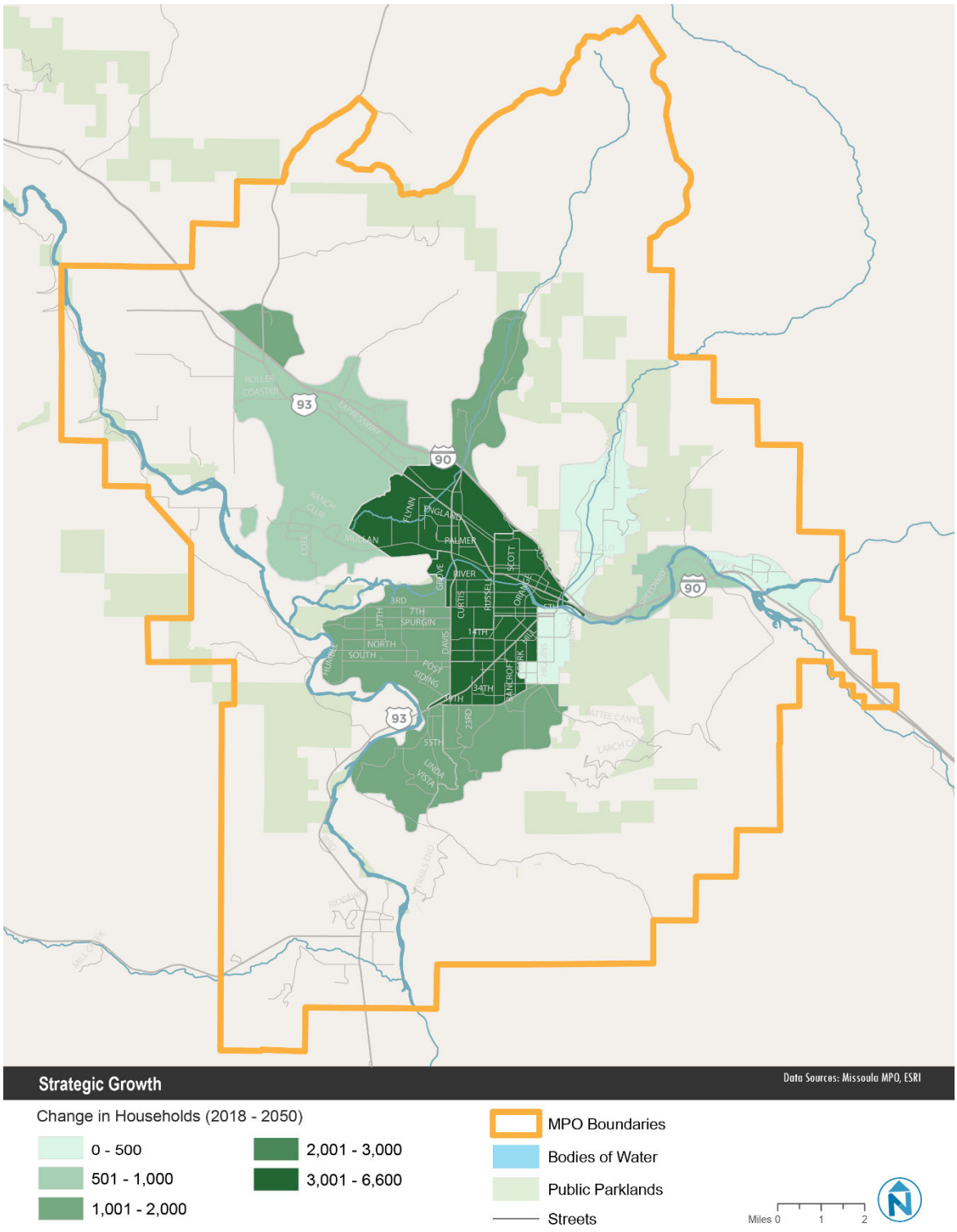
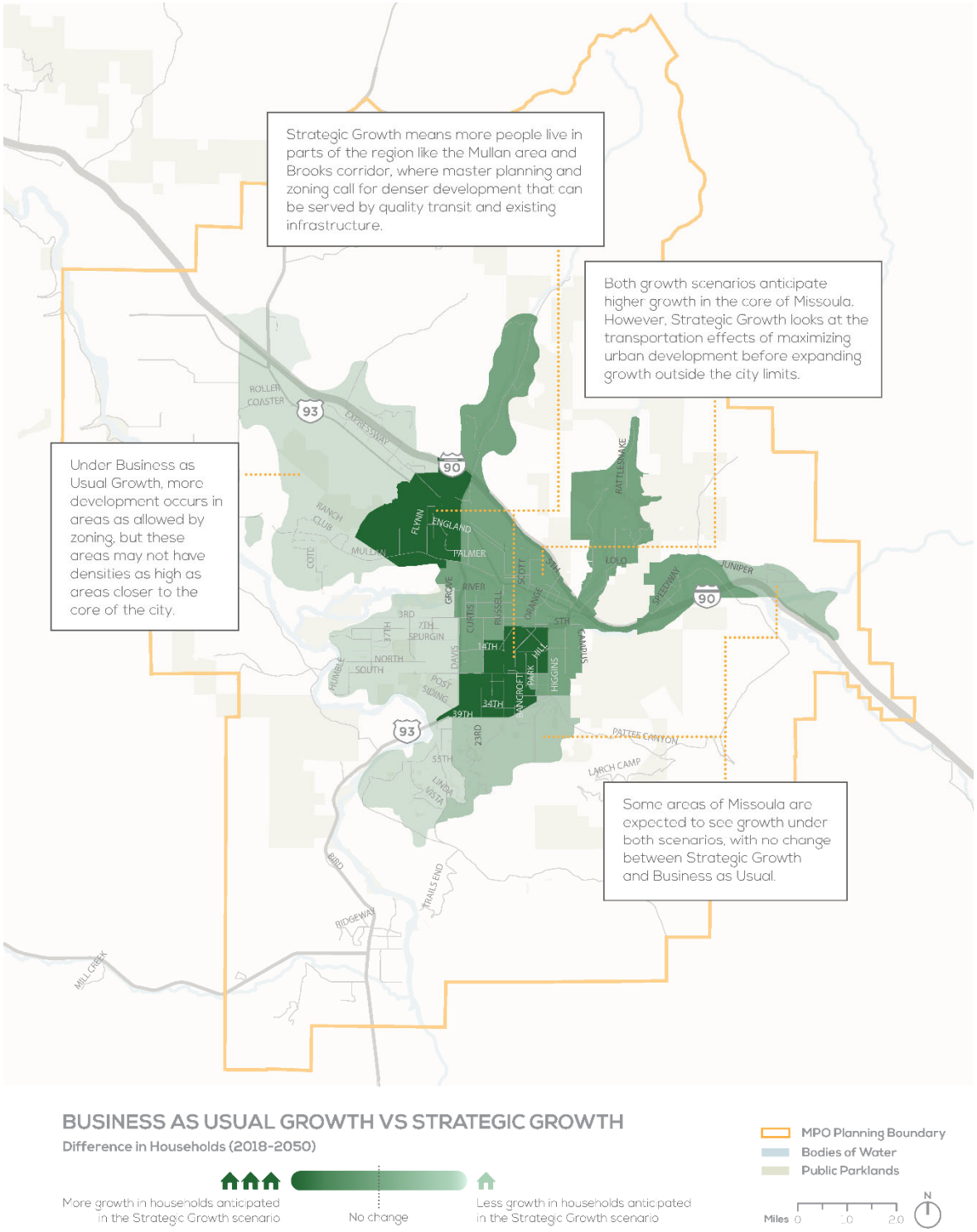


Figure 5 Strategic Growth: Change in Households (2018 to 2050)



To help illustrate the differences between the Business as Usual and Strategic Growth scenarios, Figure 6 shows the difference in household allocation by UFDA. The darkest green areas are those with additional households in the Strategic Growth Scenario.

Figure 6 Difference in Allocation of Households by UFDA between Scenarios



TRANSPORTATION NETWORK SCENARIOS

Because Missoula Connect is a multimodal plan, the transportation network scenarios must help to envision a multimodal future and explore different combinations of modal investments and programmatic and policy changes. We have developed three transportation network scenarios that will be tested against the different growth patterns represented in the Business as Usual and Strategic Growth scenarios.

Transportation network scenarios include potential capital investments within the transportation system ranging from construction of new roads, bridges, and shared-use paths to the enhancement of existing active transportation facilities, streets, intersections, and crossings of major barriers. By assigning projects to one or more scenarios, the project team can test the combinations of projects that will best achieve the region's goals and accommodate future growth. There are many more potential projects than future funding can support, and creating project scenarios helps to explore the tradeoffs inherent in funding different types of projects within a fiscally constrained plan. In scenario planning, investments in a scenario can lean more heavily toward one type of project vs another depending on which goals are prioritized within that scenario.

Developing the Scenarios

The project team worked with the LRTP and MPO committees and solicited feedback from the public through a call for projects to generate a list of potential transportation projects and programs. The project team screened the full list of committee and public project ideas for suitability and separated capital project suggestions from program and policy suggestions.

All projects that remained following the screening step were scored using a GIS-based tool. The tool assigned point values across 15 metrics based on project type and description to assess a project's ability to advance the five goals of Missoula Connect and achieve the associated desired outcomes. More detail on the specific scoring criteria is in the *Missoula Connect Project Evaluation Framework Memo.* Using the final scores, each project was assigned into four equally proportioned tiers, with Tier 4 projects being those with the highest overall score. The project team also developed two sets of weighted scores and tiers, first tripling the weight for the safety and equity metrics and then also weighting the equity metrics by a multiple of 10. This step helped to illustrate how projects performed relative to specific objectives as opposed to their aggregate scores.

Projects were assigned to three scenarios based on the intent described in the following section. Committed projects—those included within the TIP and CIP to which funding has already been allocated—were assigned to all three scenarios. All projects that ranked within Tier 3 or Tier 4 were included in at least one scenario. Once projects within the top two tiers were allocated, the scenario lists were rounded out by adding projects that specifically address the intent of the New Connections, Enhanced Connections, or Equity scenarios. Select projects were added to scenarios to increase geographic diversity, particularly in outlying areas with greater need for local investments, and to support ongoing planning efforts, such as the Mullan Area Master Plan.

To prioritize projects further, each project was reviewed to determine if it would greatly enhance connectivity to or operations of transit or has been previously expressed as a priority for the MPO, the City or County, or the community. The team also estimated high-level planning costs for each project using average per mile/intersection unit costs for the region, which were adjusted with references from comparable recent projects where needed.

To bind the scenarios, the team developed revenue forecasts and assigned a fiscal constraint of $178M (for all non-committed projects). The revenue forecasts are based on a conservative estimate

of MPO revenues available for capital projects in the 30-year LRTP horizon. This estimate does not include Federal or State funds that are not programmed by the MPO, CMAQ funding currently earmarked for specific programs, STP funds through 2028 committed to the Russell Street project, and local funding through 2024.

Where tradeoffs were required to fit within the fiscal constraint, projects that build on other projects within the scenario were included rather than projects with limited potential network benefits or with significant feasibility constraints related to design and/or right-of-way. The full list of projects with weighted and unweighted scores, preliminary costs, and scenario assignments is available at the end of this memo.

Three Proposed Scenarios

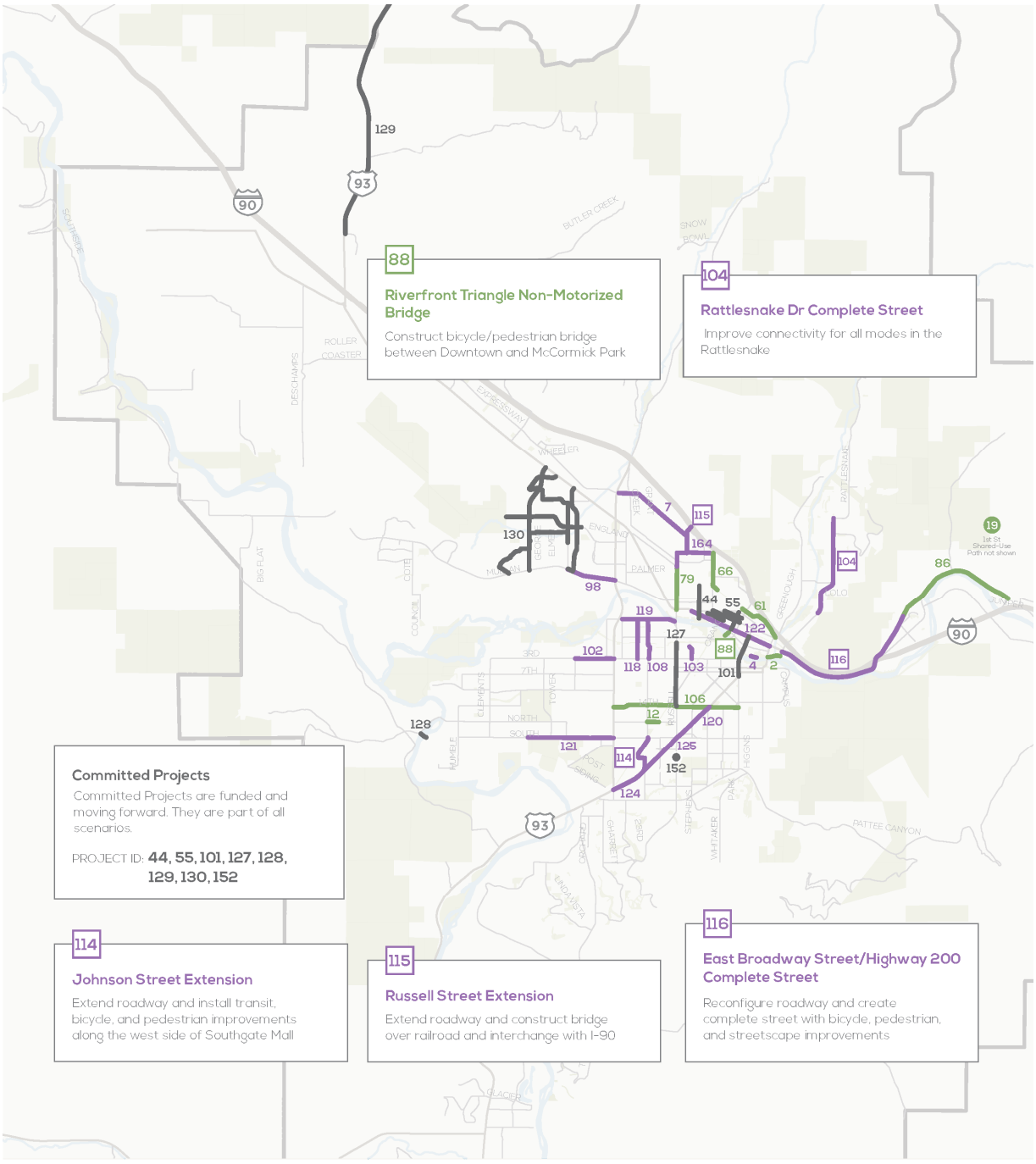
Described below are the three proposed transportation network scenarios. Each scenario is designed to meet the goals of Missoula Connect but achieve these outcomes in different ways. All three scenarios include projects that are considered “committed” due to allocation of available funding with the current 5-year Transportation Improvement Program (federal funds) or the City’s Capital Improvement Program (local funds). Including these projects in each scenario reflects the commitment to see the projects completed within the next five years. Committed projects include multimodal improvements on Higgins Avenue and South Avenue, reconstruction of Russell Street, enhanced crossings on Russell Street, Burton neighborhood greenways, replacement of the MacClay Bridge, US-93 widening north of Wye, and BUILD Grant Roads in support of the Mullan Plan.

New Connections

This scenario focuses on expanding the roadway network and creating new routes for all modes. The New Connections scenario includes larger projects like complete street reconstruction and extensions and new trails and bridges. Projects that expand or significantly alter the collector/arterial network tend to come at a higher cost, thus this scenario has fewer projects and more limited “quick-wins” compared to the other scenarios.

Examples of projects assigned to this scenario include the extension of Russell Street to I-90, a non-motorized bridge from McCormick Park to the Riverfront Triangle development, and reconfigurations of Brooks Street and Mullan Road to accommodate complete streets elements in certain areas. Figure 7 illustrates the projects included in the New Connections Scenario, and the list of projects is available at the end of this memo.

Figure 7 New Connections Scenario Map

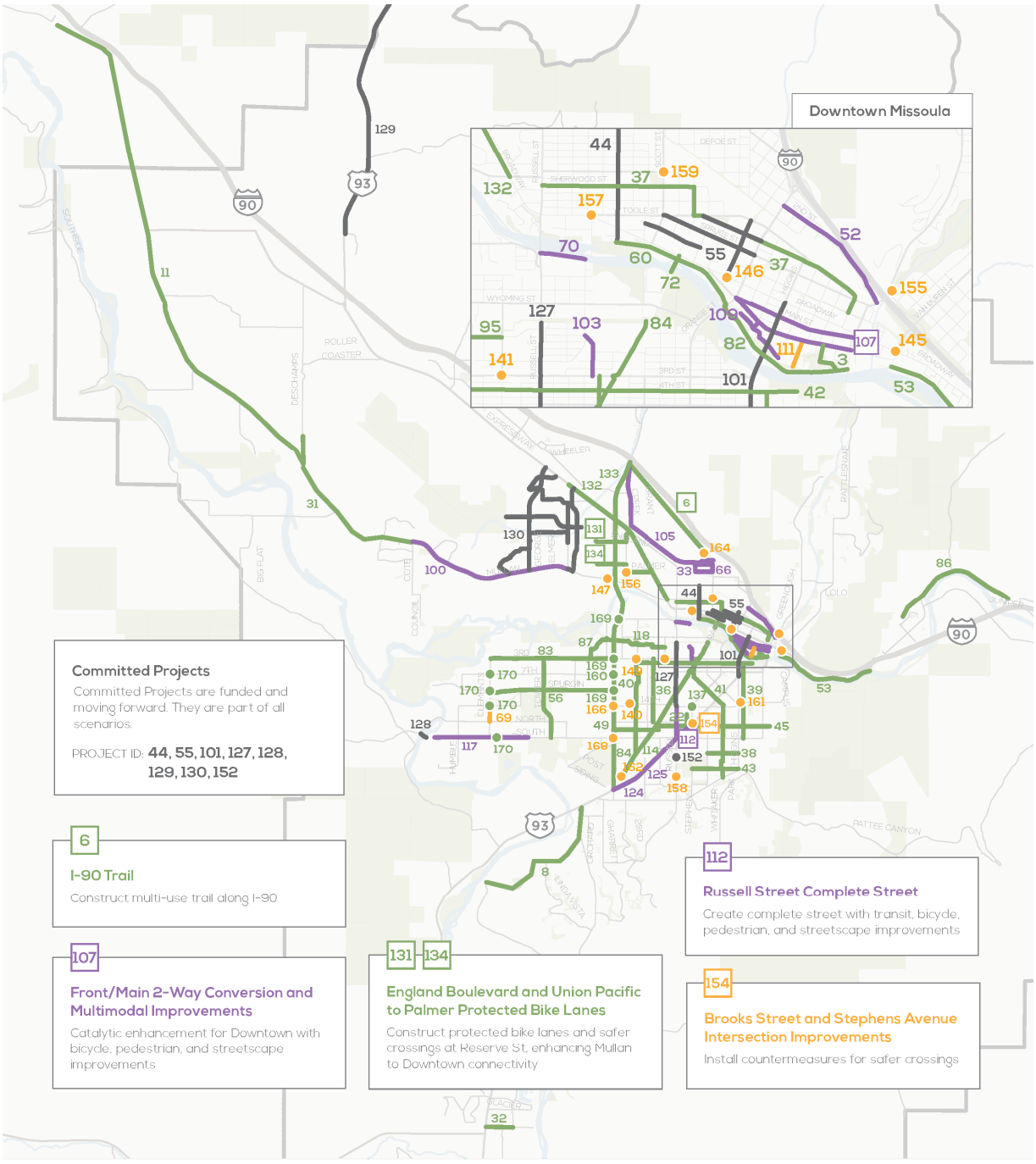


Enhanced Connections

This scenario focuses on maintaining and improving the existing transportation network rather than creating new routes or additional vehicular capacity. The Enhanced Connections scenario includes smaller key connection projects, such as closing trail gaps, establishing greenways, and completing intersection improvements. This scenario is more closely tied to a strategic approach to growth that looks toward focusing more density inward and opportunities for infill than the New Connections scenario.

Examples of projects assigned to this scenario include widening and reconfiguring Ron's River Trail, certain neighborhood greenway projects, and numerous projects that improve intersection safety, such as crossing improvements, multimodal signals, and roundabouts. In addition, the project team created four new projects that enhance existing routes with protected bicycle lane and intersection treatments to complete this scenario. Figure 8 illustrates the projects included in the New Connections Scenario, and the list of projects is available at the end of this memo.

Figure 8 Enhanced Connections Scenario Map

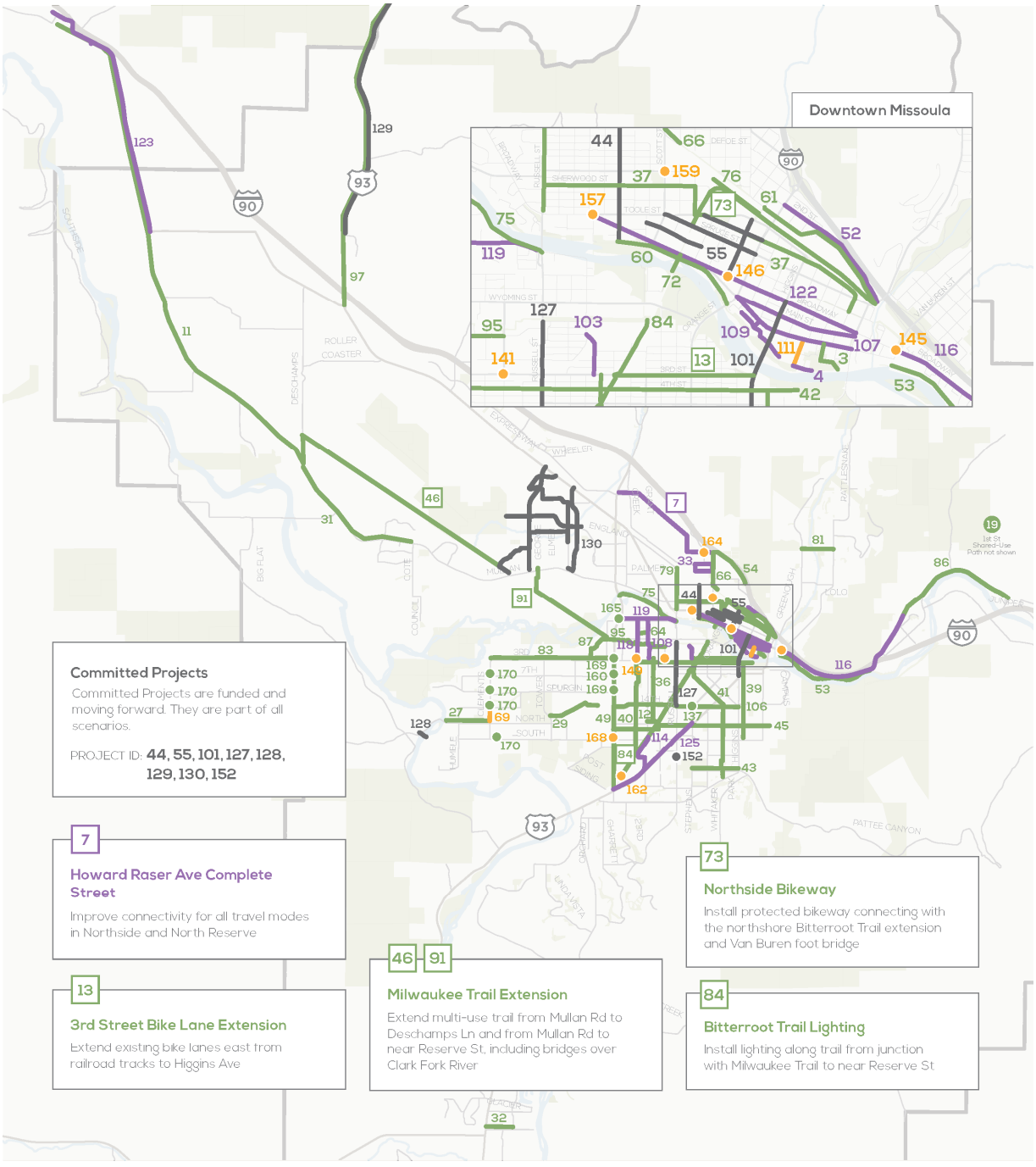


Regional Equity

This scenario focuses on projects that specifically advance the objective of creating a more equitable region. The Regional Equity scenario is comprised of projects that ranked in the higher tiers when additional weight was added to the equity metrics, as well as projects in Invest Health neighborhoods. Missoula Invest Health neighborhoods identify areas within the community that experience persistent poverty or poor outcomes related to social determinants of health. Additional factors used to assign projects to this scenario include consideration of projects that represent a more equitable use of transportation funding.

Projects in this scenario lean away from investments that prioritize private automobiles and focus instead on those that help to reduce household transportation costs (e.g, supporting transit operations) or facilitate greater connectivity to services within historically disadvantaged areas and neighborhoods. Examples of projects assigned to this scenario include the Westside Greenway Trail, Inverness Place Shared-Use Path, and Northside Greenway Connector. Figure 9 illustrates the projects included in the New Connections Scenario, and the list of projects is available at the end of this memo.

Figure 9 Regional Equity Scenario Map



NEXT STEPS

The transportation network scenarios have been coded into the regional travel demand model and analyzed against the two regional growth scenarios to assess how well each scenario performs against key metrics. The project team is evaluating alternatives based on the following factors:

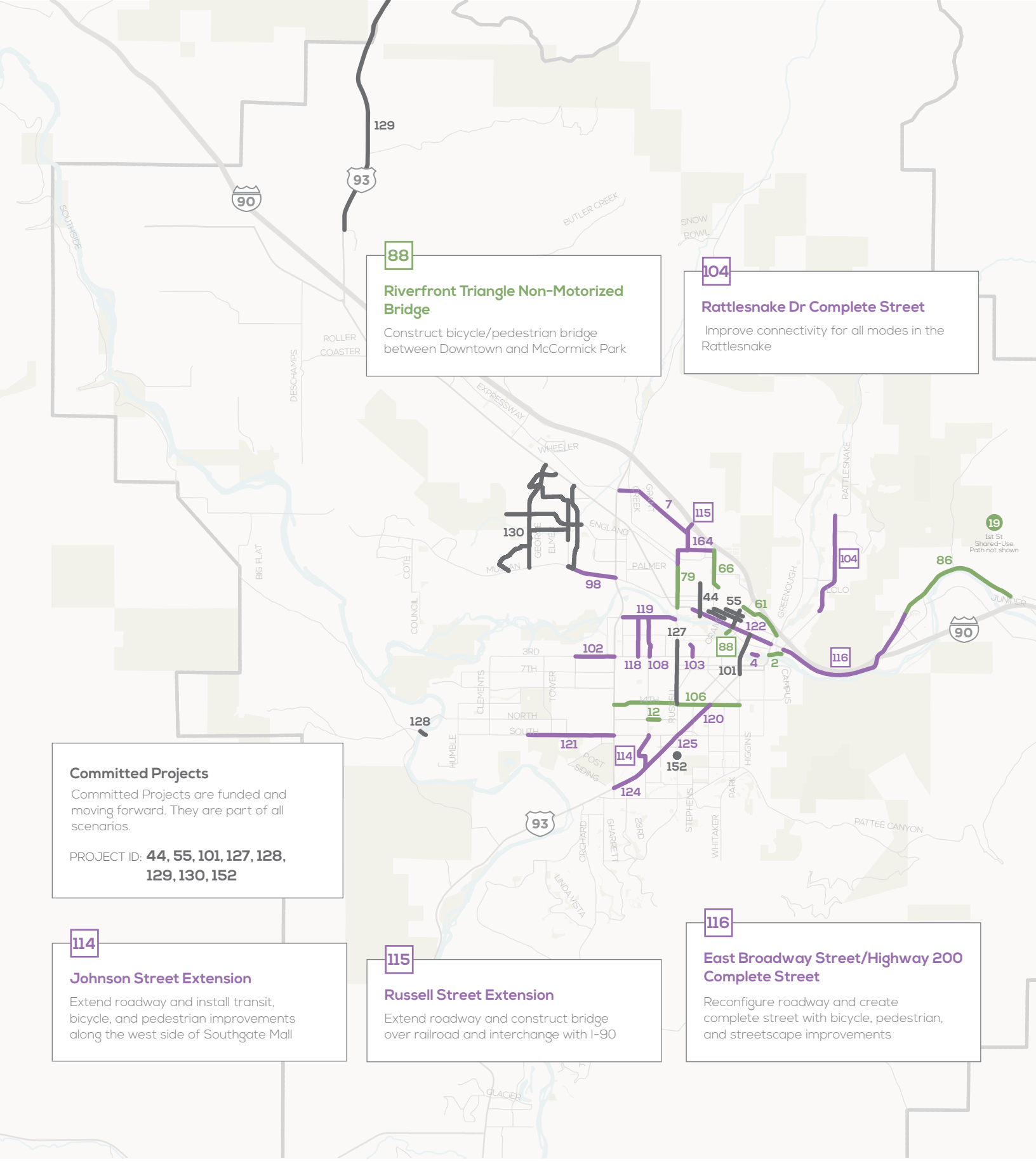
- Safety / crashes
- Transit, walking, and/or biking trips
- Vehicle miles traveled
- Single occupancy vehicle trips
- Delay and travel time
- System reliability
- Greenhouse gas emissions
- Jobs accessibility (number of jobs reachable within 30 minutes)
- Access to schools, parks, and community places
- Affordability (demographic overlays of mode split)
- Ability to support growth
- Network condition (projections for need to reach state of good repair)

The team will perform select post-processing of the model runs to account for project benefits that may not be understood by the travel demand model, such as an increase in traveler comfort and safety attributed to projects like neighborhood greenways, intersection and crossing improvements, and increasing levels of protection on bicycle facilities.

Evaluation results will be absolute as well as relative, comparing the scenarios to one another. To shape the final recommended scenario, the project team will work closely with the Transportation Technical Advisory Committee, the Transportation Policy Coordinating Committee, the LRTP Technical Advisory Committee, and the LRTP Citizens Advisory Committee to review the results and determine if any weighting of key outcomes is needed to best express community priorities.

We anticipate that the final recommended scenario will take a “mix-and-match” approach to identify the set of recommended projects, using input from the public and the various committees to further refine the combination of transportation projects based on analysis and feedback.

Transportation Scenarios: Lists and Maps



NEW CONNECTIONS SCENARIO

Intersection Projects
- Committed

Corridor Projects
- Committed
- Active Transportation
- Complete Streets and Roadway

- MPO Planning Boundary
- Bodies of Water
- Public Parklands

NEW CONNECTIONS SCENARIO

PROJECT LIST

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION
2	Northside Riverfront Trail Extension	Extend multi-use trail and construct footbridge over Rattlesnake Creek
4	Levasseur St Complete Street	Install pedestrian and streetscape improvements and extend trail
7	Howard Raser Ave Complete Steet	Create complete street with pedestrian and streetscape improvements
12	North Ave Bike Lanes	Install on-street bicycle facilities
19	1st St Shared-Use Path	Construct shared-use path
44	Burton Neighborhood Greenway	Install neighborhood greenway
55	Westside Area Mobility Enhancements	Install greenway, bicycle, pedestrian, and streetscape improvements
61	N 1st St Shared-Use Path	Construct shared-use path
66	Northside Shared-Use Path Connection	Construct shared-use path
79	Russell St Bike Lanes	Install on-street bicycle facilities
86	Hwy 200 Shared-Use Path	Construct shared-use path
88	Riverfront Triangle Non-Motorized Bridge	Construct bicycle/pedestrian bridge
98	Mullan Rd Complete Street	Reconfigure roadway and create complete street with bicycle, pedestrian, and streetscape improvements
101	Higgins Ave Multimodal Improvements	Create complete street with transit, bicycle, pedestrian, and streetscape improvements
102	S 3rd St Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
103	California St Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
104	Rattlesnake Dr Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
106	Mount/S 14th Ave Bike Lane	Install on-street bicycle facilities
108	Johnson St Extension and Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
114	Johnson Street Extension	Extend roadway and install transit, bicycle, and pedestrian improvements
115	Russell St Extension	Extend roadway and construct bridge/I-90 interchange
116	E Broadway St/Hwy 200 Complete Street	Reconfigure roadway and create complete street with bicycle, pedestrian, and streetscape improvements
118	Curtis St Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
119	River Rd Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements

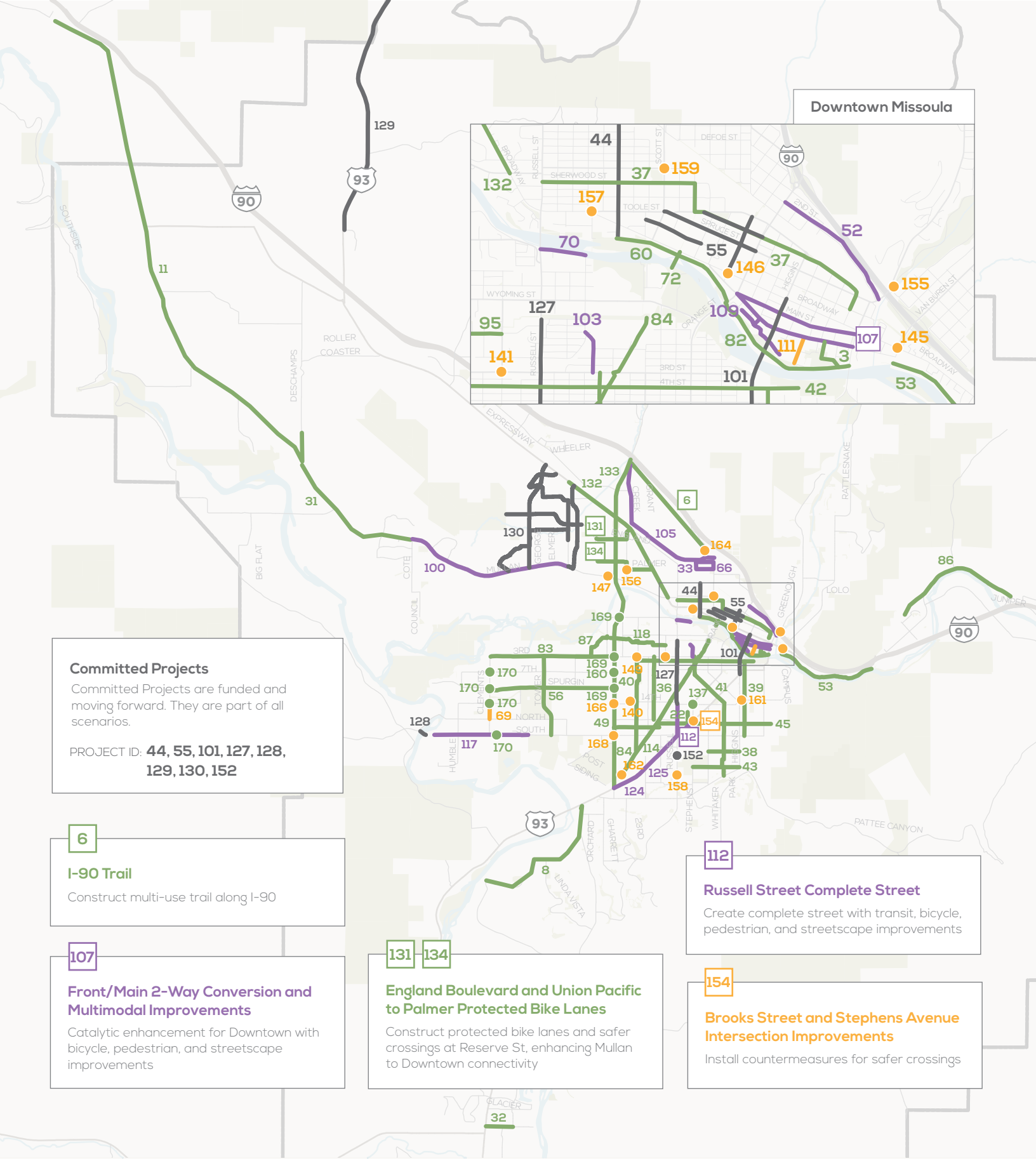
PROJECT TYPE

Committed · Safety · Active Transportation · Complete Streets and Roadway

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION
120	Brooks St Complete Street	Reconfigure roadway and install bicycle facilities
121	South Ave Complete Street and Shared-Use Path	Create complete street with bicycle, pedestrian, and streetscape improvements
122	Broadway Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
124	Brooks St Complete Street and Transit Improvements	Create complete street with bus rapid transit, bicycle, pedestrian, and streetscape improvements
125	Brooks St Complete Street and Transit Improvements	Create complete street with bus rapid transit, bicycle, pedestrian, and streetscape improvements
127	Russell Street Reconstruction	Reconfigure roadway and install bicycle and pedestrian facilities
128	Bitteroot River Crossing (South Ave Bridge - MacClay Bridge)	Construct bridge
129	US 93: North of Desmet Interchange	Widen and improve roadway
130	BUILD Grant Roads - Wye/Mullan Plan Collector Routes	Extend roadways and install trail connections
152	Russell St and Fairview Ave Crossing Improvements	Install crossing safety countermeasures

PROJECT TYPE

Committed · Safety · Active Transportation · Complete Streets and Roadway


Downtown Missoula
Committed Projects
Committed Projects are funded and moving forward. They are part of all scenarios.
PROJECT ID: 44, 55, 101, 127, 128, 129, 130, 152
6
I-90 Trail
Construct multi-use trail along I-90
107
Front/Main 2-Way Conversion and Multimodal Improvements
Catalytic enhancement for Downtown with bicycle, pedestrian, and streetscape improvements
131 134
England Boulevard and Union Pacific to Palmer Protected Bike Lanes
Construct protected bike lanes and safer crossings at Reserve St, enhancing Mullan to Downtown connectivity
112
Russell Street Complete Street
Create complete street with transit, bicycle, pedestrian, and streetscape improvements
154
Brooks Street and Stephens Avenue Intersection Improvements
Install countermeasures for safer crossings
ENHANCED CONNECTIONS SCENARIO
Intersection Projects
Committed
Safety
Active Transportation
Corridor Projects
Committed
Safety
Active Transportation
Complete Streets and Roadway
MPO Planning Boundary
Bodies of Water
Public Parklands
Miles 0 1.0 2.0
N

ENHANCED CONNECTIONS SCENARIO

PROJECT LIST

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION
3	Kiwanis Park Trail Widening	Extend and widen multi-use trail
6	I-90 Trail (Alternative 2)	Construct multi-use trail
8	Lower Miller Creek Rd Shared-Use Path	Construct shared-use path
11	Mullan Rd - Frenchtown Trail	Construct shared-use path
22	Regent St Greenway	Install neighborhood greenway
31	Mullan Rd Shared-Use Path	Construct shared-use path
32	Lewis & Clark Dr Shared-Use Path	Construct shared-use path
33	Scott St Complete Street	Create complete street with traffic calming, bicycle, pedestrian, and streetscape improvements
36	Grant St Neighborhood Greenway	Install neighborhood greenway
37	Sherwood Neighborhood Greenway	Install neighborhood greenway
38	Benton Neighborhood Greenway	Install neighborhood greenway
39	Gerald Neighborhood Greenway	Install neighborhood greenway
40	Schilling Neighborhood Greenway	Install neighborhood greenway
41	Ivy/Franklin/Park Neighborhood Greenway	Install neighborhood greenway
42	4th St Neighborhood Greenway	Install neighborhood greenway
43	Pattee Creek Neighborhood Greenway	Install neighborhood greenway
44	Burton Neighborhood Greenway	Install neighborhood greenway
45	Kent/Central Neighborhood Greenway	Install neighborhood greenway
49	Reserve St Protected Bike Lanes	Install on-street bicycle facilities
52	N 2nd St Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
53	Northbank Riverfront Trail	Extend multi-use trail
55	Westside Area Mobility Enhancements	Install greenway, bicycle, pedestrian, and streetscape improvements
56	Spurgin Rd Shared-Use Path	Construct shared-use path
60	Ron's River Trail Extension	Extend multi-use trail
69	Clements Rd Shared-Use Path	Construct shared-use path
70	River Rd Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
72	Bitterroot Trail Bridge at Clark Fork River	Construct bicycle/pedestrian bridge

PROJECT TYPE

Committed · Safety · Active Transportation · Complete Streets and Roadway

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION
82	Ron's River Trail - widening, reconfiguration and relocation	Relocate, widen, and extend multi-use trail
83	S 3rd St Bicycle and Pedestrian Facilities	Construct shared-use path
84	Bitterroot Trail Lighting	Install lighting
86	Hwy 200 Shared-Use Path	Construct shared-use path
87	Hawthorne School to Milwaukee Trail Shared-Use Path	Construct shared-use path
95	Milwaukee Trail Lighting	Install lighting
100	Mullan Rd Widening	Widen roadway
101	Higgins Ave Multimodal Improvements	Create complete street with transit, bicycle, pedestrian, and streetscape improvements
103	California St Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
105	Old Grant Creek/Cemetery Rd/Rodgers St Multimodal Improvements	Create complete street with bicycle, pedestrian, and streetscape improvements
107	Front/Main 2-Way Conversion and Multimodal Improvements	Reconfigure roadway and install bicycle, pedestrian, and streetscape improvements
109	Carousel Dr Reconfiguration	Reconfigure roadway and install open space
111	Clay St Streetscaping and Intersection Control	Install streetscape and traffic safety countermeasures
112	Russell St Complete Street	Create complete street with transit, bicycle, pedestrian, and streetscape improvements
117	South Ave Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
124	Brooks St Complete Street and Transit Improvements	Create complete street with bus rapid transit, bicycle, pedestrian, and streetscape improvements
125	Brooks St Complete Street and Transit Improvements	Create complete street with bus rapid transit, bicycle, pedestrian, and streetscape improvements
127	Russell Street Reconstruction	Reconfigure roadway and install bicycle and pedestrian facilities
128	Bitteroot River Crossing (South Ave Bridge - MacClay Bridge)	Construct bridge
129	US 93: North of Desmet Interchange	Widen and improve roadway
130	BUILD Grant Roads - Wye/Mullan Plan Collector Routes	Extend roadways and install trail connections
131	England Blvd Protected Bike Lanes	Install on-street bicycle facilities and improved crossings
132	Broadway Protected Bike Lanes	Install on-street bicycle facilities and improved crossings
133	Reserve St Protected Bike Lanes	Install on-street bicycle facilities

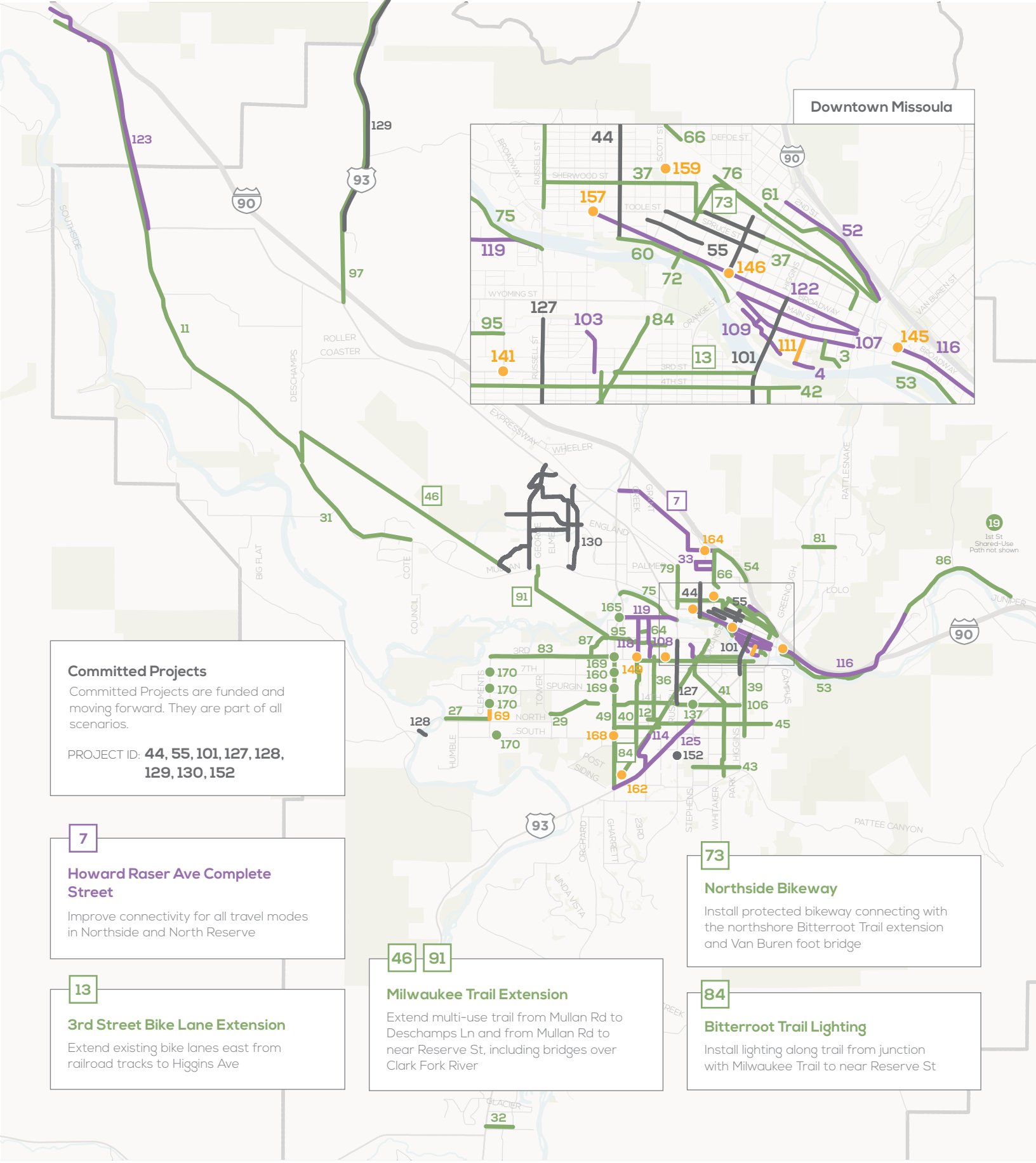
PROJECT TYPE

Committed · Safety · Active Transportation · Complete Streets and Roadway

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION
134	Union Pacific - Palmer Protected Bike Lanes	Install on-street bicycle facilities and improved crossings
137	Stephens Bike Lane Intersection Improvements	Address bicycle facility gaps through intersection
140	14th St and Eaton St Intersection Improvements	Install roundabout
141	Catlin St and 3rd St Intersection Improvements	Install pedestrian/bicycle crossing to connect to trail
145	E Broadway St and N Van Buren St Intersection Improvements	Install crossing safety countermeasures
146	Owen St and Broadway St Enhanced Crossing	Install crossing safety countermeasures
147	Clark Fork Ln and Mullan Rd Intersection Improvements	Improve turning movements
149	3rd St and Schilling St Intersection Improvements	Install crossing safety countermeasures
152	Russell St and Fairview Ave Crossing Improvements	Install crossing safety countermeasures
154	Brooks St and Stephens Ave Intersection Improvements	Install crossing safety countermeasures
155	Greenough Dr and Vine St Intersection Improvements	Install crossing safety countermeasures
156	Great Northern Ave and Palmer St Intersection Improvements	Install roundabout
157	California St/Toole Ave/Broadway St Intersection Improvements	Reconfigure roadway and install roundabout
158	McDonald Ave and Russell St Intersection Improvements	Install roundabout
159	Philips St and Scott St Intersection Improvements	Install traffic safety countermeasures
160	Reserve St and 7th St Enhanced Bicycle Crossing	Install signalized bicycle crossing
161	Beckwith Ave and Higgins Ave Intersection Improvements	Install traffic safety countermeasures
162	McDonald Ave and Clark St Enhanced Trail Crossing	Install pedestrian/bicycle crossing to connect to trail
164	Shakespeare St and Otis St Intersection Improvements	Install traffic safety countermeasures
166	14th St and Mount Ave Intersection Improvements	Reconfigure roadway and install traffic safety countermeasures
169	Reserve St Intersection Improvements	Install crossing safety countermeasures
170	Clements Rd Intersection Improvements	Install crossing safety countermeasures

PROJECT TYPE

Committed · Safety · Active Transportation · Complete Streets and Roadway


Downtown Missoula
Committed Projects
Committed Projects are funded and moving forward. They are part of all scenarios.
PROJECT ID: 44, 55, 101, 127, 128, 129, 130, 152
7
Howard Raser Ave Complete Street
Improve connectivity for all travel modes in Northside and North Reserve
13
3rd Street Bike Lane Extension
Extend existing bike lanes east from railroad tracks to Higgins Ave
46 91
Milwaukee Trail Extension
Extend multi-use trail from Mullan Rd to Deschamps Ln and from Mullan Rd to near Reserve St, including bridges over Clark Fork River
73
Northside Bikeway
Install protected bikeway connecting with the northshore Bitterroot Trail extension and Van Buren foot bridge
84
Bitterroot Trail Lighting
Install lighting along trail from junction with Milwaukee Trail to near Reserve St
REGIONAL EQUITY SCENARIO
Intersection Projects
Committed
Safety
Active Transportation
Corridor Projects
Committed
Safety
Active Transportation
Complete Streets and Roadway
MPO Planning Boundary
Bodies of Water
Public Parklands
Miles 0 1.0 2.0
N

REGIONAL EQUITY SCENARIO

PROJECT LIST

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION
3	Kiwanis Park Trail Widening	Extend and widen multi-use trail
4	Levasseur St Complete Street	Install pedestrian and streetscape improvements and extend trail
7	Howard Raser Ave Complete Steet	Create complete street with pedestrian and streets-cape improvements
11	Mullan Rd - Frenchtown Trail	Construct shared-use path
12	North Ave Bike Lanes	Install on-street bicycle facilities
13	3rd St Bike Lane Extension	Install on-street bicycle facilities
19	1st St Shared-Use Path	Construct shared-use path
27	North Ave Shoulderway Improvements	Install roadway improvements to create a shoulder pathway
29	Mount Ave Trail Connection	Extend multi-use trail
31	Mullan Rd Shared-Use Path	Construct shared-use path
32	Lewis & Clark Dr Shared-Use Path	Construct shared-use path
33	Scott St Complete Street	Create complete street with traffic calming, bicycle, pedestrian, and streetscape improvements
36	Grant St Neighborhood Greenway	Install neighborhood greenway
37	Sherwood Neighborhood Greenway	Install neighborhood greenway
39	Gerald Neighborhood Greenway	Install neighborhood greenway
40	Schilling Neighborhood Greenway	Install neighborhood greenway
41	Ivy/Franklin/Park Neighborhood Greenway	Install neighborhood greenway
42	4th St Neighborhood Greenway	Install neighborhood greenway
43	Pattee Creek Neighborhood Greenway	Install neighborhood greenway
44	Burton Neighborhood Greenway	Install neighborhood greenway
45	Kent/Central Neighborhood Greenway	Install neighborhood greenway
46	Milwaukee Trail Extension	Extend multi-use trail
49	Reserve St Protected Bike Lanes	Install on-street bicycle facilities
52	N 2nd St Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
53	Northbank Riverfront Trail	Extend multi-use trail
54	Northside Greenway Connector	Construct multi-use trail
55	Westside Area Mobility Enhancements	Install greenway, bicycle, pedestrian, and streetscape improvements
60	Ron's River Trail Extension	Extend multi-use trail

PROJECT TYPE

Committed · Safety · Active Transportation · Complete Streets and Roadway

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION
61	N 1st St Shared-Use Path	Construct shared-use path
64	Inverness Place Shared-Use Path	Extend shared-use path
66	Northside Shared-Use Path Connection	Construct shared-use path
69	Clements Rd Shared-Use Path	Construct shared-use path
72	Bitterroot Trail Bridge at Clark Fork River	Construct bicycle/pedestrian bridge
73	Northside Bikeway	Install on-street bicycle facilities
75	Southbank Riverfront Trail Extension	Extend multi-use trail
76	Westside Greenway Trail	Construct multi-use trail
79	Russell St Bike Lanes	Install on-street bicycle facilities
81	Mountain View Drive Multimodal Improvements	Install pedestrian, bicycle, and streetscape improvements to create Safe Route to School
83	S 3rd St Bicycle and Pedestrian Facilities	Construct shared-use path
84	Bitterroot Trail Lighting	Install lighting
86	Hwy 200 Shared-Use Path	Construct shared-use path
87	Hawthorne School to Milwaukee Trail Shared-Use Path	Construct shared-use path
91	Milwaukee Trail Extension and Bridges	Extend multi-use trail and construct bicycle/ pedestrian bridges
95	Milwaukee Trail Lighting	Install lighting
97	People's Way Trail Phase 1	Construct multi-use trail
101	Higgins Ave Multimodal Improvements	Create complete street with transit, bicycle, pedestrian, and streetscape improvements
103	California St Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
106	Mount/S 14th Ave Bike Lane	Install on-street bicycle facilities
107	Front/Main 2-Way Conversion and Multimodal Improvements	Reconfigure roadway and install bicycle, pedestrian, and streetscape improvements
108	Johnson St Extension and Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
109	Carousel Dr Reconfiguration	Reconfigure roadway and install open space
111	Clay St Streetscaping and Intersection Control	Install streetscape and traffic safety countermeasures
114	Johnson Street Extension	Extend roadway and install transit, bicycle, and pedestrian improvements
116	E Broadway St/Hwy 200 Complete Street	Reconfigure roadway and create complete street with bicycle, pedestrian, and streetscape improvements

PROJECT TYPE

Committed · Safety · Active Transportation · Complete Streets and Roadway

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION
118	Curtis St Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
119	River Rd Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
122	Broadway Complete Street	Create complete street with bicycle, pedestrian, and streetscape improvements
123	Mullan Rd Multimodal Improvements	Construct shared-use path and crossings
124	Brooks St Complete Street and Transit Improvements	Create complete street with bus rapid transit, bicycle, pedestrian, and streetscape improvements
125	Brooks St Complete Street and Transit Improvements	Create complete street with bus rapid transit, bicycle, pedestrian, and streetscape improvements
127	Russell Street Reconstruction	Reconfigure roadway and install bicycle and pedestrian facilities
128	Bitteroot River Crossing (South Ave Bridge - MacClay Bridge)	Construct bridge
129	US 93: North of Desmet Interchange	Widen and improve roadway
130	BUILD Grant Roads - Wye/Mullan Plan Collector Routes	Extend roadways and install trail connections
137	Stephens Bike Lane Intersection Improvements	Address bicycle facility gaps through intersection
141	Catlin St and 3rd St Intersection Improvements	Install pedestrian/bicycle crossing to connect to trail
145	E Broadway St and N Van Buren St Intersection Improvements	Install crossing safety countermeasures
146	Owen St and Broadway St Enhanced Crossing	Install crossing safety countermeasures
149	3rd St and Schilling St Intersection Improvements	Install crossing safety countermeasures
152	Russell St and Fairview Ave Crossing Improvements	Install crossing safety countermeasures
157	California St/Toole Ave/Broadway St Intersection Improvements	Reconfigure roadway and install roundabout
159	Philips St and Scott St Intersection Improvements	Install traffic safety countermeasures
162	McDonald Ave and Clark St Enhanced Trail Crossing	Install pedestrian/bicycle crossing to connect to trail
164	Shakespeare St and Otis St Intersection Improvements	Install traffic safety countermeasures
168	South Ave and Reserve St Intersection Improvements	Address bicycle facility gaps through intersection
169	Reserve St Intersection Improvements	Install crossing safety countermeasures
170	Clements Rd Intersection Improvements	Install crossing safety countermeasures

PROJECT TYPE

Committed · Safety · Active Transportation · Complete Streets and Roadway

Project Scenarios - Master Project List

Project ID	Project Title	Extent To	Extent From	Project Description	Estimated Cost	Enhanced Scenario	New Connections Scenario	New Connections Excluded	Equity Scenario	Committed	Illustrative	Feasibility Constraints	Total Score (Equal Weighting)	Total Score Tier (Equal Weighting)	Total Score (Weighting - Safety & Equity x3	Total Score Tier (Weighting - Safety & Equity x3	Total Score (Weighting Equity x10)	Total Score Tier (Weighting - Equity x10)
14	Higgins Ave Multimodal Improvements	Broadway St	Brooks St	Project (from Downtown Plan) could include realignment of parking, bicycle facilities for all ages and all abilities, intersection improvements, enhanced curbing at intersections, transit improvements, and two-way left turn lane or left-hand turn pockets at intersections	$2,115,623					x			29	4	57	4	92	4
152	Front/Main 2-Way Conversion and Multimodal Improvements	Madison St	Orange St	Convert Front St and Main St to 2-way streets and include multimodal improvements	$3,916,629	x			x				29	4	57	4	92	4
469	Broadway Complete Street	Madison St	Toole Ave	Realign roadway per the Downtown Master Plan, with improvements potentially including bike facilities (lanes or protected cycle tracks), improved intersections for pedestrian access and safety, two-way center left turn lane, enhanced curbing, street lighting, and landscaping/streetscape improvements.	$4,378,294		x		x				29	4	57	4	92	4
383	Northside Bikeway	RUX Trail	Toole Ave/Bitterroot Trail	Protected bikeway along the northside of the railway, connecting with the northshore Bitterroot Trail extension to the west and Van Buren foot bridge	$1,678,731				x				28	4	54	4	91	4
701	Sherwood Neighborhood Greenway	Russell St	Pine St	Greenway connection	$109,040	x			x				28	4	56	4	91	4
336	Johnson Street Extension	South Ave	Brooks St	Create new entrance to Southgate Mall *Revise: extend Johnson Street along the west side of Southgate Mall, from South Ave to Brooks Street, including multi-modal facilities such as sidewalks, bike and transit facilities, and street lighting (AW)	$2,606,004		x		x				27	4	53	4	81	4
382	N 2nd St Complete Street	Madison St	A St	Add sidewalks, bike lanes, and streetscaping	$2,080,431	x			x				27	4	49	4	72	3
394	E Broadway St/Hwy 200 Complete Street	Staple St	Van Buren St	Reconstruction of E Broadway St and Hwy 200 from Van Buren St to Staple St to include multimodal transportation improvements, curb/gutter, safe crossings, access management, multi-modal access through RR underpass, and intersection improvements at I-90 interchange.	$8,157,405		x		x				27	4	55	4	90	4
703	Gerald Neighborhood Greenway	4th St	South Ave W	Greenway connection	$105,923	x			x				27	4	55	4	90	4
706	4th St Neighborhood Greenway	Schilling St	Toole Park	Greenway connection	$409,282	x			x				27	4	55	4	90	4
135	Mount/S 14th Ave Bike Lane	Reserve St	Higgins Ave	Add bike facilities along S 14th St and Mount Ave from Reserve St to Higgins.	$10,066		x		x				26	4	52	4	80	4
181	Reserve St Protected Bike Lanes	US Hwy 93	S 3rd St	Add protected bike lanes	$125,431	x			x				26	4	54	4	89	4
529	Brooks St Complete Street and Transit Improvements	Paxson St	Stephens Ave	Improve Brooks Street to accommodate Bus Rapid Transit, and multi-modal transportation options, potentially including a center two-way dedicated bus line, center island bus stops, improved bike/ped facilities, street lighting, and additional safe non-motorized crossing locations.	$30,000,000	x	x		x				26	4	52	4	80	4
708	Burton Neighborhood Greenway	Stoddard St	Riverfront Trail	Greenway connection	$202,637					x			26	4	52	4	80	4
709	Kent/Central Neighborhood Greenway	Maurice Ave	Reserve St	Greenway connection	$1,212,489	x			x				26	4	52	4	80	4
1290194	3rd St Bike Lane Extension	Ash St	Higgins Ave	Continue bike lanes east from where they currently end (at railroad tracks) to Higgins	$3,251				x				26	4	50	4	80	4
153	Johnson St Extension and Complete Street	River Rd	S 3rd St	May include sidewalks, grade separated trails, crosswalks, pedestrian buttons, dedicated bike lanes, bike routes, and sharrows	$2,060,525		x		x				25	4	51	4	79	4
158	South Ave Complete Street and Shared-Use Path	36th St	Reserve St	May include sidewalks, grade separated trails, crosswalks, pedestrian buttons, dedicated bike lanes, bike routes, and sharrows	$4,372,476		x						25	4	51	4	79	4
359	Westside Area Mobility Enhancements	Multiple	Multiple	Mobility improvements for the Westside area between Orange, Broadway, and Toole. Improvements include bike lanes on Spruce Street between Orange and Toole, greenway improvements to Owen St, ADA ramp improvements, replacement and repair of sidewalks. Intersection safety and crossing improvements at Orange/Alder, Toole/Alder, Broadway/Owen, and McCormick/Spruce. Also may include angled parking on Alder St and improvement of parking lot and ped bridge access on the north side of Owen & Railroad intersection.	$1,800,000					x			25	4	49	4	79	4
366	N 1st St Shared-Use Path	Madison Ave	Northside Pedestrian Bridge/Grand Ave	Trail from Northside Pedestrian Bridge to Madison Ave/Rattlesnake Creek	$1,076,396		x		x				25	4	49	4	79	4
379	Carousel Dr Reconfiguration	Front St	Higgins Ave	Reconfigure Carousel Dr as a through street and replace parking lot at Caras Park with additional park space	$1,674,160	x			x				25	4	53	4	88	4
472	Bitterroot Trail Lighting	Reserve St	Milwaukee Trail	Add trail lighting	$1,600,000	x			x				25	4	51	4	79	4
524	Milwaukee Trail Lighting	Reserve St	Catlin St	Add trail lighting	$350,000	x			x				25	4	53	4	88	4
528	Brooks St Complete Street and Transit Improvements	Reserve St	Paxson St	Improve Brooks Street to accommodate Bus Rapid Transit, and multi-modal transportation options, potentially including a center two-way dedicated bus line, center island bus stops, improved bike/ped facilities, street lighting, and additional safe non-motorized crossing locations.	$20,000,000	x	x		x				25	4	49	4	79	4
704	Shilling Neighborhood Greenway	3rd St	Benton Ave	Greenway connection	$407,812	x			x				25	4	49	4	70	3
705	Ivy/Franklin/Park Neighborhood Greenway	S 3rd St	Pattee Creek	Greenway connection	$710,633	x			x				25	4	49	4	70	3
11	Russell Street Reconstruction	Mount Ave	Dakota Ave	Reconstruct with added capacity, including W Broadway from Mullan to Toole. Includes multi-modal improvements such as sidewalks and bike facilities, and improved trail crossing at Bitterroot Trail and Russell St	$38,300,000					x			24	4	52	4	87	4
188	Ron's River Trail Extension	Burton St	Orange St	Create trails that extend the Shady Grove Trail west of Burton to the Fox Site, following riverfront as much as possible, and developings trails and access points on the island in the river	$923,344	x			x				24	4	52	4	87	4
189	Northbank Riverfront Trail	Reserve St	Russell St	Construct 10' paved trail between the Russell St Bridge undercrossing and Reserve St; include connection from Reserve St bike lanes and sidewalks	$1,614,753							x	24	4	48	4	69	3
338	Johnson St Shared-Use Path Connection	Johnson St	Curtis St	Provide a bicycle-pedestrian connection between the Emma Dickinson Learning Center, the Council Grove Apartments, and a future segment of Johnson Street (north from 3rd St)	$270,859							x	24	4	50	4	78	4
370	Russell St Complete Street	Brooks St	Mount Ave	Project may include additional right-of-way aquisition, bike lanes, improved sidewalk, transit, and crossing facilities, and roadway resurfacing	$1,606,414	x							24	4	46	3	69	3
380	Ron's River Trail - widening, reconfiguration and relocation	Madison St	Orange St	Relocate North Riverfront Trail along Kiwanis Park adjacent to the Clark Fork River; widen and reconfigure Ron's River Trail through Bess Reed Park and Caras Park per the Downtown Riverfront Parks & Trails Master Plan	$2,000,000	x							24	4	52	4	87	4
397	Curtis St Complete Street	S 3rd St	River Rd	Project may include center turn lane, sidewalks, improved crossings, bike lanes, streetscaping	$2,000,504		x		x				24	4	48	4	69	3
398	River Rd Complete Street	Reserve St	Russell St	Project may include center turn lane, sidewalks, improved crossings, bike lanes, streetscaping	$2,693,673		x		x				24	4	48	4	69	3
700	Grant St Neighborhood Greenway	3rd St	North Ave W	Greenway connection	$105,033	x			x				24	4	50	4	78	4
902	Reserve St Protected Bike Lanes	3rd St	I-90	Protected bikelanes	$194,398	x							24	4	50	4	78	4
3010	Madison St and Front St Intersection Improvements	Madison St	Front St	Convert to a 3-lane cross-section and replace signal with a modern single-lane roundabout	$450,000							x	24	4	50	4	78	4
1290190	North Ave Bike Lanes	Johnson St	Bitterroot Trail	Create bi-directional bike lanes to connect Bitterroot Trail, Grant St Greenway, and Johnson St bike lanes	$5,548		x		x				24	4	48	4	69	3
155	California St Complete Street	S 3rd St	River St	May include sidewalks, grade separated trails, crosswalks, pedestrian buttons, dedicated bike lanes, bike routes, and sharrows	$4,000,000	x	x		x				23	3	43	3	68	3
367	Northside Shared-Use Path Connection	Defoe St	Otis St	Trail along Scott St or through future White Pine Sash development area joining the Grand St/Scott St Rail Greenway to the Interstate Greenway	$898,964		x		x				23	3	45	3	59	2
378	Clay St Streetscaping and Intersection Control	Levasseur St	Front St	Include streetscaping on Clay St south of Front St along with a traffic circle capping the southern end of the street	$200,000	x			x				23	3	49	4	77	4
399	Russell St Bike Lanes	Railroad	Broadway St	Stripe bike lanes	$3,306		x		x				23	3	45	3	68	3
3013	Owen St and Broadway St Enhanced Crossing	Owen St	Broadway St	Hawk beacon crossing of W Broadway for people traveling on Owen St	$300,000	x			x				23	3	49	4	77	4
1288793	Levasseur St Complete Street	Clay St	Dead End	Convert to "woonerf" and extend trail east to connect to Kiwanis St, per North Riverside Parks and Trails Master Plan	$296,415		x		x				23	3	47	4	68	3
1288822	Burlington Ave Complete Street	Margaret St	Reserve St	Turn unpaved portion of Burlington Ave into a complete street, including sidewalk, curb, gutter, and paving	$543,148							x	23	3	47	4	77	4
1289561	Howard Raser Ave Complete Steet	Old Grant Creek Rd	Scott St	Complete Howard Raser per the North Reserve Scott Street Master Plan	$8,032,170		x		x				23	3	45	3	59	2
124	Mullan Rd Complete Street	Mary Jane Blvd	Reserve St	Create 4-5 lanes cross-section, including sidewalks, grade separated trails, crosswalks, pedestrian buttons, dedicated bike lanes, bike routes, and sharrows	$3,122,115		x						22	3	44	3	67	3

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154	S 3rd St Complete Street	Hiberta St	Reserve St	May include sidewalks, grade separated trails, crosswalks, pedestrian buttons, dedicated bike lanes, bike routes, and sharrows	$1,986,743		x						22	3	44	3	67	3
156	Rattlesnake Dr Complete Street	Creek Crossing	Missoula Ave	May include sidewalks, grade separated trails, crosswalks, pedestrian buttons, dedicated bike lanes, bike routes, and sharrows	$5,217,848		x						22	3	42	3	67	3
159	Old Grant Creek/Cemetery Rd/Rodgers St Multimodal Improvements	Shakespeare St	Howard Raser Ave	Complete street reconstruction, to include bicycle and pedestrian facilities	$6,800,000	x							22	3	44	3	58	2
339	Mullan Rd Bicycle and Pedestrian Bridge	Monroc	Cooper St/Riverfront Trail	Add a bicycle/pedestrian bridge from Mullan Rd over the Clark Fork River to the Missoula Ready Mix site, about halfway between Reserve St and Russell St	$8,000,000							x	22	3	46	3	67	3
350	Westside Greenway Trail	Owen St	Bitterroot Railroad Spur Line	Westside Greenway Trail, subject to property owner coordination	$390,502				x				22	3	46	3	76	4
377	Pedestrian Undercrossing Connecting Downtown to Northside	Railyard/B St/N 1st St	Higgins Ave	Construct a pedestrian facility under the railroad tracks connecting downtown at Circle-Square Plaza with the new development of the railyard north of the tracks	$29,344							x	22	3	42	3	76	4
468	Brooks St Complete Street	Stephens Ave	Mount Ave	Reconfigure roadway section to 2 travel lanes plus a center turn lane, including bike lanes in both directions	$1,122,684		x						22	3	42	3	67	3
900	England Blvd Protected Bike Lanes	Connery Way	Great Northern Ave	Protected bike lanes with intersection improvements at Reserve and Great Northern	$2,558,717	x							22	3	44	3	58	2
903	Union Pacific - Palmer Protected Bike Lanes	Clark Fork Ln	Broadway St	Create protected bikeway connection from Mullan Area to Broadway including safe crossing of Reserve	$4,000,000	x							22	3	44	3	67	3
2015	Regent St Greenway	Mount Ave	Kent Ave	Greenway connection	$100,898	x							22	3	42	3	67	3
3003	Brooks St and Holborn St Enhanced Crossing	Brooks St	Holborn St	Pedestrian crossing	$125,000							x	22	3	42	3	67	3
1288792	Kiwanis Park Trail Widening	Ron's River Trail	Front St	Widened trail to connect the library to Ron's River Trail as included in Kiwanis Park proposed master plan	$260,082	x			x				22	3	48	4	76	4
36	BUILD Grant Roads - Wye/Mullan Plan Collector Routes	Multiple	Multiple	Roadway improvements: Extend and improve George Elmer Dr, England Blvd, and Mary Jane Blvd, including intersection improvements at Broadway and Mullan. New trail connections: Tipperary Way, Flynn Lane, and Mullan Road.	$34,967,414					x			21	3	43	3	66	3
196	Southbank Riverfront Trail Extension	Reserve St	Russell St	Assumes the MonRock Site is acquired by the City as a public park	$1,532,236				x				21	3	43	3	57	2
340	Mountain View Drive Multimodal Improvements	Duncan Dr	Rattlesnake Dr	Designs such as woonerfs, shared streets, greenways and other methods to connect active transportation. along Mountain View Dr from Rattlesnake Dr across footbridge to Duncan Dr, including sidewalk improvements to address deficiencies in Walk to School Route	$352,316				x				21	3	43	3	66	3
347	Higgins Ave Bridge Improvements - UPN 8807	S 3rd St	Front St	Replace structurally deficient bridge and enhance bicycle and pedestrian facilities	N/A							x	21	3	45	3	66	3
372	Madison St Underbridge to Arthur Street Shared-Use Path	Southside Riverfront Trail	S 5th St E	Connection from underbridge to Arthur St (southbound)	$170,823							x	21	3	41	2	66	3
534	Riverfront Triangle Non-Motorized Bridge	Riverfront Triangle	McCormick Park	Non-motorized bridge connection from McCormick Park to Riverfront Triangle development	$8,000,000		x						21	3	47	4	75	4
707	Pattee Creek Neighborhood Greenway	S Higgins Ave	Bitterroot Trail	Greenway connection	$303,711	x			x				21	3	45	3	66	3
2001	Higgins Pedestrian Bridge	Ron's River Trail	Milwaukee Trail	Create bank-to-bank pedestrian bridge within 75 yards of Higgins Bridge	$6,000,000							x	21	3	41	2	66	3
3012	E Broadway St and N Van Buren St Intersection Improvements	E Broadway St	N Van Buren St	Increase safety, visibility, and predictability of people biking and walking at the intersection of Van Buren with Broadway through the intersection with Front St. Designs could include curb extensions, moving the west curb eastward to separate right turning vehicles from through moving bike/ped traffic, widening trail on SE corner to shared use path standards, right turn on red prohibition, access control at driveway entrances, and raised medians.	$450,000	x			x				21	3	45	3	66	3
3034	Ryman St and Front St Intersection Improvements	Ryman St	Front St	Add stop signs or roundabout	$450,000							x	21	3	43	3	75	4
1288791	Northside Riverfront Trail Extension	Madison St	Van Buren St	Extend Northside Riverfront Trail from Madison to Van Buren and construct foot bridge over Rattlesnake Creek	$750,000		x						21	3	45	3	66	3
1289828	Brooks St and Regent St Enhanced Crossing	Brooks St	Regent St	Pedestrian crossing	$125,000							x	21	3	41	2	66	3
175	Northbank Riverfront Trail	Easy St	Van Buren St	Complete the Northbank Riverfront Trail between Van Buren and Easy Street	$2,318,467	x		x	x				20	2	44	3	74	4
179	Whitaker Dr Complete Street	Ben Hogan Dr	Higgins Ave	Complete street reconstruction, to include bicycle and pedestrian facilities	$5,716,819			x					20	2	42	3	56	2
180	S 3rd St Bicycle and Pedestrian Facilities	Clements Rd	Hiberta St	Separate boulevard trail on 3rd St and connect to trail on Clements Rd	$2,862,611	x		x	x				20	2	44	3	65	3
337	Inverness Place Shared-Use Path	Inverness Place cul-de-sac	N Johnson St/Montana St	Continue shared-use path in Inverness Place eastward across the Rice Addition via the public right-of-way easement that extends east from the present cul-de-sac	$140,645				x				20	2	40	2	47	2
351	Northside Greenway Connector	Scott St	Northside Park	Create interstate greenway system on south side of I-90 with connecting access to North Hills via Coal Mine Road; explore loop trail system	$1,083,392				x				20	2	40	2	47	2
369	Strand Ave to Burlington Ave Shared-Use Path	Strand Ave	Burlington Ave	Install a shared-use path between Russell St and Stephens Ave through the redevelopment process	$91,537							x	20	2	36	2	56	2
387	Russell St Extension	I-90	Railroad	Project would include bridge/underpass of train tracks, routing around the Missoula cemetery, and an interchange with I-90	$70,000,000		x						20	2	38	2	38	1
400	Hiberta St Bike Lanes	Spurgin Rd	S 3rd St	Stripe bike lanes	$2,504			x					20	2	40	2	56	2
435	Gharrett St Bike Lanes	39th St	Briggs St	Add bike lanes	$737,230			x					20	2	40	2	65	3
901	Broadway Protected Bike Lanes	Mullan Rd	Mary Jane Blvd	Protected bike lanes with intersection improvements at Mullan and Palmer	$548,484	x							20	2	40	2	56	2
3004	Russell St and 4th St Intersection Improvements	4th St	Russell St	Add HAWK crossing signal with center islands to limit turns	$200,000							x	20	2	42	3	65	3
3008	Catlin St and 3rd St Intersection Improvements	Catlin St	3rd St	Signalized pedestrian/bicycle crossing to connect to Milwaukee Trail	$200,000	x			x				20	2	44	3	74	4
3015	California St and River St Intersection Improvements	California St	River St	Install urban mini roundabout	$450,000							x	20	2	40	2	65	3
3016	3rd St and Schilling St Intersection Improvements	3rd St	Schilling St	Relocate crosswalks and add rapid-flash beacon	$125,000	x			x				20	2	42	3	65	3
3033	McDonald Ave and Clark St Enhanced Trail Crossing	McDonald Ave	Clark St	Enhance trail crossing at intersection and consider all-way stop	$75,000	x			x				20	2	40	2	56	2
93	Milwaukee Trail Extension and Bridges	Mullan Rd (via Schmidt Rd)	Grove St	Extend Milwaukee Trail from Reserve St to Mullan Rd, including right-of-way acquisition and several bridges over the Clark Fork River	$8,518,009			x	x				19	2	43	3	64	3
101	River Rd Complete Street	California St	Russell St	Upgrade River Rd from west side of California St bridge to proposed Russell St bridge, including planned trail crossing	$688,615	x							19	2	39	2	46	2
187	Reserve St Intersection Improvements	Spurgin Rd	River Rd	Create signalized crossing at 7th or 3rd. Improve at-grade crossing conditions at Spurgin and River intersections	$450,000	x		x	x				19	2	41	2	64	3
349	Bitterroot Trail Bridge at Clark Fork River	McCormick Park/Ogren Field	Broadway St	Create Bitterroot Branch Trail bicycle and pedestrian crossing On or next to existing rail bridge	$6,000,000	x			x				19	2	45	3	73	3
352	Spurgin Rd Shared-Use Path	Clements Rd	Reserve St	Create shared-use paths in Target Range	$4,805,294	x							19	2	41	2	55	2
361	Hwy 200 Shared-Use Path	Tamarack Rd	Staples St	Add path from bottom of Brickyard Hill to Bonner to complete connection from East Missoula to Turah	$3,785,572	x	x		x				19	2	41	2	64	3
376	Railyard St Grid Construction	Ryman St	Madison St	Create six new north/south streets and two new east/west streets for Northside Railyard Redevelopment	$2,312,464						x		19	2	37	2	64	3
395	South Ave Complete Street	Hanson Dr	36th St	Project may include center turn lane, sidewalks, improved crossings, bike lanes, streetscaping	$4,779,096	x							19	2	37	2	46	2
518	Hawthorne School to Milwaukee Trail Shared-Use Path	S 3rd St/Hawthorne School	Grove St	Create shared-use path connection	$1,084,836	x			x				19	2	39	2	55	2
1002	Scott St Complete Street	Palmer St	Pullman St	Consider multimodal improvements and egress on Scott St for new development with traffic calming and re-route of landfill traffic	$2,506,055	x			x				19	2	37	2	37	1
2021	Stephens Bike Lane Intersection Improvements	Stephens Ave	Mount Ave	Finish connect of north-south bike lanes through intersection with bike boxes	$75,000	x			x				19	2	35	2	55	2
3009	Russell St and 6th St Intersection Improvements	S 6th St	Russell St	Consider signalized pedestrian/bicycle crossing to connect to Bitterroot Trail	$200,000							x	19	2	41	2	64	3
3019	Russell St and River Rd Intersection Improvements	Russell St	River Rd	Improve crossings	$200,000							x	19	2	35	2	37	1

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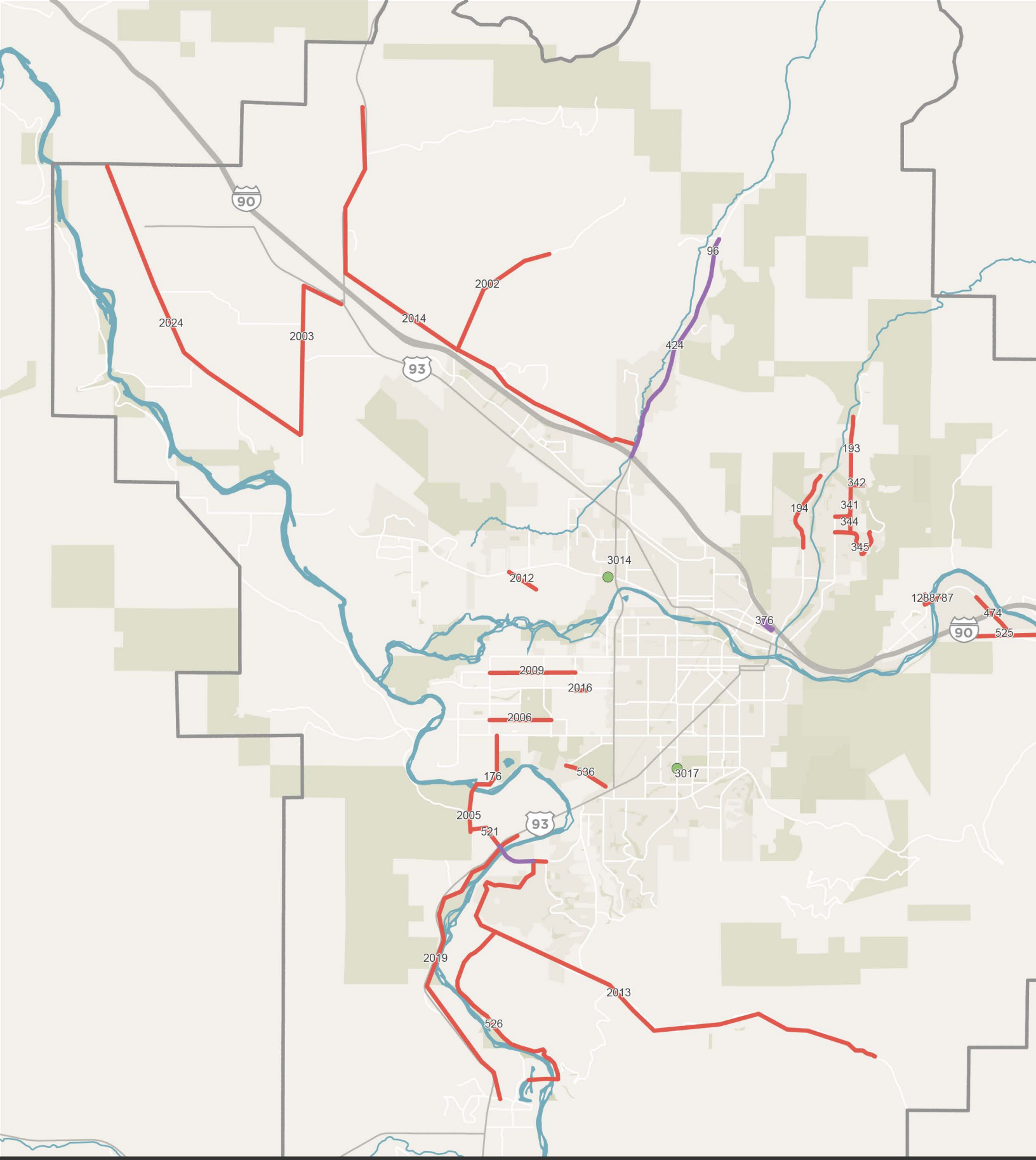
3023	Brooks St and Stephens Ave Intersection Improvements	Brooks St	Stephens Ave	Implement signal and striping adjustments	$125,000	x							19	2	39	2	64	3
3037	6th St and Ronan St Enhanced Trail Crossing	6th St	Ronan St	Add sensors to trigger trail crossing flashing beacons and move push-button stands near pathway	$125,000							x	19	2	37	2	55	2
1288787	Deer Creek Rd/Speedway Ave Trail	Canyon River Rd	US Hwy 200	Connect long-proposed "Bonner Streetcar Trail" with Canyon River Trail to provide safe pedestrian/bicycle route from the I-90 Turah exchange (Piltzville pedestrian trail) to existing Kim Williams Trail	$718,454						x		19	2	39	2	55	2
1289560	I-90 Trail (Alternative 2)	Grant Creek Rd	Coal Mine Rd	Trail along I-90	$2,525,489	x							19	2	35	2	37	1
1289707	Lower Miller Creek Rd Shared-Use Path	Briggs St	Jordan Ct	Separated bicycle/pedestrian facility along Lower Miller Creek from Briggs St to J Rankin School, connecting to Marilyn Park and Maloney Park	$3,547,925	x							19	2	41	2	64	3
1289840	Mullan Rd - Frenchtown Trail	Deschamps Ln	Hamel Rd	Shared-use path from end of proposed trail at Deschamps Ln along Mullan Rd connecting to trails in Frenchtown	$13,062,052	x		x	x				19	2	39	2	55	2
345	Lincoln Hills Dr Bicycle and Pedestrian Improvements	Contour Ln	Applehouse Ln	Bicycle/pedestrian facilities connecting to trailhead on Lincoln Hills Dr	$612,301						x		18	2	32	1	36	1
536	Post Siding Road Shared-Use Path	Old Hwy 93	Fort Missoula Rd	Created shared-use path	$1,036,001						x		18	2	38	2	54	2
702	Benton Neighborhood Greenway	Higgins St	Bancroft St	Greenway connection	$102,489	x							18	2	36	2	63	2
2006	North Ave Trail Connection	17th Ave	Tower St	Complete trail connection	$1,424,950						x		18	2	36	2	45	2
3006	Russell St and 7th St Intersection Improvements	7th St	Russell St	Add HAWK crossing signal with center islands to limit turns	$200,000							x	18	2	38	2	54	2
3017	Russell St and Ernest Ave Enhanced Crossing	Ernest Ave	Russell St	Move signal from current midblock location to Ernest Ave; consider HAWK signal	$200,000						x		18	2	38	2	63	2
3020	Russell St and Fairview Ave Crossing Improvements	Russell St	Fairgrounds Trail	Add rapid-flash beacon and center median crossing of Russell St at new Fairgrounds Trail	$200,000					x			18	2	38	2	63	2
3026	California St/Toole Ave/Broadway St Intersection Improvements	Broadway St	Toole Ave/California St	Add roundabout, realign intersection, eliminate slip lane, add crosswalk to west leg, and ensure bike access through intersection	$450,000	x			x				18	2	38	2	54	2
3029	Philips St and Scott St Intersection Improvements	Philips St	Scott St	Add signal or roundabout and crosswalks	$450,000	x			x				18	2	36	2	45	2
3031	Beckwith Ave and Higgins Ave Intersection Improvements	Beckwith Ave	Higgins Ave	Provide multimodal circulation improvements and signs or markings to support merging bicycles and vehicles	$75,000	x							18	2	38	2	63	2
1289817	4th and Orange Enhanced Crossing	4th St	Orange St	Add HAWK crossing signals at Russell St and Orange St, explore center islands limiting vehicles to right in/right out turns	$200,000							x	18	2	38	2	63	2
1290196	South Ave and Reserve St Intersection Improvements	South Ave	Reserve St	Add bike lanes through Reserve St intersection and reduce turning movement conflicts	$150,000	x		x	x				18	2	36	2	54	2
35	Mullan Rd Widening	Chuckwagon	Mary Jane Blvd	Widen to 2 lanes plus auxiliary (Flynn/new collector to Cote Ln)	$10,692,243	x							17	2	35	2	44	2
129	Duncan Dr/Greenough Dr Complete Street	Mountain View Dr	Minckler Loop	Improvements will consist of new curbs, sidewalks, bike lanes, drainage, pavement and utility reconstruction	$3,850,202			x					17	2	33	1	35	1
341	Rattlesnake Dr Bicycle and Pedestrian Facilities	Tamarack St/Fox Hollow	Creek Crossing Rd	Bicycle/pedestrian facilities	$500,470						x		17	2	29	1	26	1
344	Lincoln Hills Shared-Use Path	Rattlesnake Ct	Lincoln Hills Dr	Bicycle/pedestrian facilities along east side of soccer fields connecting all neighborhoods above Rattlesnake Ct with the fields and Lincoln Hills Dr	$400,371						x		17	2	31	1	35	1
2007	1st St Shared-Use Path	US 200	W Riverside Dr	Sidewalk or shared use path from US 200 to W Riverside Dr	$351,184		x		x				17	2	33	1	44	2
2014	I-90 Trail (Alternative 2)	Grant Creek Rd	Oliver Rd	Trail along I-90	$11,777,152						x		17	2	35	2	53	2
3027	McDonald Ave and Russell St Intersection Improvements	McDonald Ave	Russell St	Add roundabout	$450,000	x							17	2	35	2	53	2
176	Fort Missoula to McClay Shared-Use Path and Bridge	Blue Mountain Rd	South Ave	Trails connecting Fort Missoula, Target Range School on 40th Ave, McClay Flats, and Blue Mountain Rd; need bridge over Bitterroot River	$2,216,364						x		16	1	32	1	43	2
193	Rattlesnake Dr Shared-Use Path	USFS Trailhead	Tamarack St/Fox Hollow	Extends from UTP project p. 88 #3	$1,579,269						x		16	1	26	1	16	1
194	Duncan Dr Shared-Use Path	Duncan Dr Trailhead	Mountain View Dr	Create path from Greenough Park to end of Duncan Dr	$1,883,539						x		16	1	30	1	25	1
342	Tamarack St Bicycle and Pedestrian Improvements	USFS Trailhead	Rattlesnake Dr	Bicycle/pedestrian facilities	$148,927						x		16	1	26	1	16	1
343	Lincoln Hills Dr Bicycle and Pedestrian Improvements	Rattlesnake Dr	Applehouse Ln	Bicycle/pedestrian facilities	$188,911						x		16	1	30	1	34	1
521	Blue Mountain Rd Shared-Use Path	Bitterroot Trail	Blue Mountain Recreation Area	Constructed shared-use path	$866,189						x		16	1	32	1	34	1
2008	North Ave Shoulderway Improvements	Clements Rd	Edward Ct	Shoulderway improvements	$480,587				x				16	1	32	1	34	1
2009	7th St Shoulder Improvements	Clements Rd	Tower St	Shoulder path improvements	$952,028						x		16	1	32	1	34	1
2011	Cowboy Trail Rd Shared-Use Path	Cowboy Trail Rd	Hellgate Lions Park	Create neighborhood access to river from W Riverside Dr	$988,272						x		16	1	30	1	34	1
2022	Lewis & Clark Dr Shared-Use Path	Hwy 93	Lakeside Dr	Shared use path from neighborhoods to school in Lolo	$625,807	x		x	x				16	1	32	1	34	1
3007	14th St and Eaton St Intersection Improvements	14th St	Eaton St	Install roundabout	$450,000	x							16	1	30	1	43	2
3011	Park St and Mount Ave Intersection Improvements	Park St	Mount Ave	Enhance crossing with rapid-flash beacons and bulb outs	$125,000							x	16	1	28	1	43	2
3024	Greenough Dr and Vine St Intersection Improvements	Greenough Dr	Vine St	Add crossing improvements for people walking and biking	$200,000	x							16	1	32	1	52	2
3030	Reserve St and 7th St Enhanced Bicycle Crossing	7th St	Reserve St	Signalized bicycle crossing	$200,000	x							16	1	32	1	43	2
3036	Shakespeare St and Otis St Intersection Improvements	Otis St	Shakespeare St	Add traffic calming to reduce speeds	$75,000	x			x				16	1	30	1	25	1
354	Clements Rd Shared-Use Path	North Ave	Mount Ave	Relocate path from east to the west side of street to reduce crossings along high-use school and neighborhood route	$443,453	x		x	x				15	1	31	1	33	1
355	Clements Rd Intersection Improvements	South Ave W	S 7th St	Establish pedestrian crossings at Mount, Spurgin, and S 7th; include a pedestrian crossing in the proposed traffic circle at South Ave W and 40th	$200,000	x		x	x				15	1	33	1	42	1
424	Grant Creek Rd Complete Street	Snowbowl Rd	I-90	Improvements would include capacity and safety enhancements	$12,170,864						x		15	1	33	1	42	1
2004	West Riverside Trail	Anaconda St	Cowboy Trail Rd	Trail connection from Anaconda St Bridge to Cowboy Trail along Blackfoot	$1,143,382						x		15	1	31	1	33	1
2013	Miller Creek Shared-Use Path (Lower Miller Creek Connection)	Linda Vista Blvd	Bear Run Creek Rd	Miller Creek open space connection	$13,041,042						x		15	1	33	1	42	1
2016	Spurgin Rd Trail Connection	Hibertha St	Maverick Ln	DNRC trail connection	$263,187						x		15	1	29	1	33	1
2017	Mount Ave Trail Connection	27th Ave	Tower St	DNRC trail connection	$1,190,134				x				15	1	31	1	42	1
2019	Bitterroot Spur Connection	Glacier Dr	Yumas Ranch Ln	Complete trail connection *Revised PD: Complete a trail connect along the Bitterroot Branch Rail line from Missoula to Lolo, pending decommissioning of the rail by Montana Rail Link. (AW)	$7,585,556						x		15	1	33	1	42	1
2023	Mullan Rd Shared-Use Path	Deschamps Ln	Cote Ln	Shared-use path	$3,304,449	x		x	x				15	1	29	1	24	1
2024	Great American Trail	Loiselle Ln	Deschamps Ln	Great American Rail Trail from Milwaukee County line to county line	$7,948,589						x		15	1	29	1	42	1
3014	Clark Fork Ln and Mullan Rd Intersection Improvements	Clark Fork Ln	Mullan Rd	Improve turning movements	$450,000	x					x		15	1	29	1	51	2
3022	George Elmer Dr and Mullan Rd Intersection Improvements	Mullan Rd	George Elmer Dr	Install traffic signal	$450,000							x	15	1	33	1	42	1
3025	Great Northern Ave and Palmer St Intersection Improvements	Great Northern Ave	Palmer St	Add roundabout	$450,000	x							15	1	33	1	42	1
3039	14th St and Mount Ave Intersection Improvements	14th St	Mount Ave	Widen or repaint 14th St and Mount Ave westbound and adjust signals to provide right-turn lane, through lane, and left-turn lane	$75,000	x							15	1	31	1	42	1
197	Milwaukee Trail Extension	Deschamps Ln	Mullan Rd	Extend Milwaukee Trail	$5,759,611				x				14	1	30	1	32	1
474	Kim Williams Trail Connector	Canyon River Rd	Bandmann Trail	Create a public bicycle and pedestrian trail connection	$1,179,578						x		14	1	24	1	23	1

Project Scenarios - Master Project List

Project ID	Project Title	Extent To	Extent From	Project Description	Estimated Cost	Enhanced Scenario	New Connections Scenario	New Connections Excluded	Equity Scenario	Committed	Illustrative	Feasibility Constraints	Total Score (Equal Weighting)	Total Score Tier (Equal Weighting)	Total Score (Weighting - Safety & Equity x3	Total Score Tier (Weighting - Safety & Equity x3	Total Score (Weighting Equity x10)	Total Score Tier (Weighting - Equity x10)
519	Missoula College Non-Motorized Bridge	Missoula College	Kim Williams Trail	Construct bicycle/pedestrian bridge	$8,000,000			x					14	1	30	1	32	1
526	Miller Creek to Lolo Trail Connection	Lolo/Lakeside Dr	Lower Miller Creek Rd	Construct shared-use path connection to Lolo Trail	$5,685,537						x		14	1	28	1	23	1
533	Mullan Rd Multimodal Improvements	Frenchtown	Pulp Mill Rd	Construct shared-use path and active transportation crossings	$6,120,331				x				14	1	32	1	41	1
525	Kim Williams Trail Extension and Bridge	Milltown State Park	Kim Williams Trail End	Create trail extension and bridge	$8,998,075						x		13	1	27	1	31	1
539	People's Way Trail Phase 1	Evaro	I-90	Construct off-road trail	$11,875,407				x				13	1	27	1	40	1
2002	Butler Creek Rd Trail	Angus Ln	Covenant Rd	Complete trail connection	$3,271,740						x		13	1	25	1	22	1
2003	Deschamps Ln Shared-Use Path	Laflesch Ln	Bruins Ln	Create shared-use path connection to Wye	$4,397,402						x		13	1	25	1	31	1
2012	Mullan Rd Connection Trail	Mullan Rd	Schmidt Rd	Mullan connection	$424,358						x		13	1	29	1	31	1
39	US 93: North of Desmet Interchange	Waldo Rd	Evaro Rd	Add a lane and seal and cover; project number: NH 5-1(33)1.4	$10,351,100					x			12	1	24	1	30	1
96	Grant Creek Trail Phase II	Snowbowl Rd	Mellot Ln	Create 3.5 mile, 10' wide paved or gravel trail parallel to Grant Creek Rd, connecting to I-90 and Reserve St	$1,000,000						x		12	1	20	1	12	1
2005	Blue Mountain Rd Trail	Forest Hill Ln	Future Bridge	Trail connection from Blue Mountain Rd to future bridge	$425,388						x		12	1	22	1	21	1
37	Bitteroot River Crossing (South Ave Bridge - MacClay Bridge)	South Ave	River Pines Rd	Replace single lane bridge with new alignment connecting North Ave or South Ave and River Pines Rd	$18,488,500					x			8	1	20	1	17	1
1000	Deschamps Ln Re-Surfacing	Rollercoaster Rd	Mullan Rd	Improve pavement	N/A							x	7	1	15	1	7	1
905	England Blvd Extension	Great Northern Ave	I-90	Create a new connection and extension of England Blvd from Great Northern Ave to a new I-90 interchange, including a bridge over the railroad.	$70,000,000			x					18	2	38	2	54	2
906	Lower Miller Creek Bridge	Lower Miller Creek Rd	Hwy-93	New bridge connecting Lower Miller Creek Rd to Hwy 93 across the Bitterroot River, connecting to the Blue Mtn Road intersection.	$20,000,000						x		11	1	27	1	29	1



Illustrative Projects

Data Sources: Missoula MPO, ESRI

Intersection Projects

Category

- Committed
- Safety

Corridor Projects

Category

- Active Transportation
- Complete Streets and Roadway

- MPO Boundaries
- Bodies of Water
- Public Parklands
- Streets

Miles 0 0.85 1.7

APPENDIX E

Scenario Analysis Findings

missoula connect
2050 Long-Range Transportation Plan

Missoula County - City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

MISSOULA CONNECT

Summary of Scenario Analysis Findings (11/30/20)

Missoula County - City of Missoula MPO METROPOLITAN PLANNING ORGANIZATION

missoula connect 2050 Long-Range Transportation Plan

INTRODUCTION

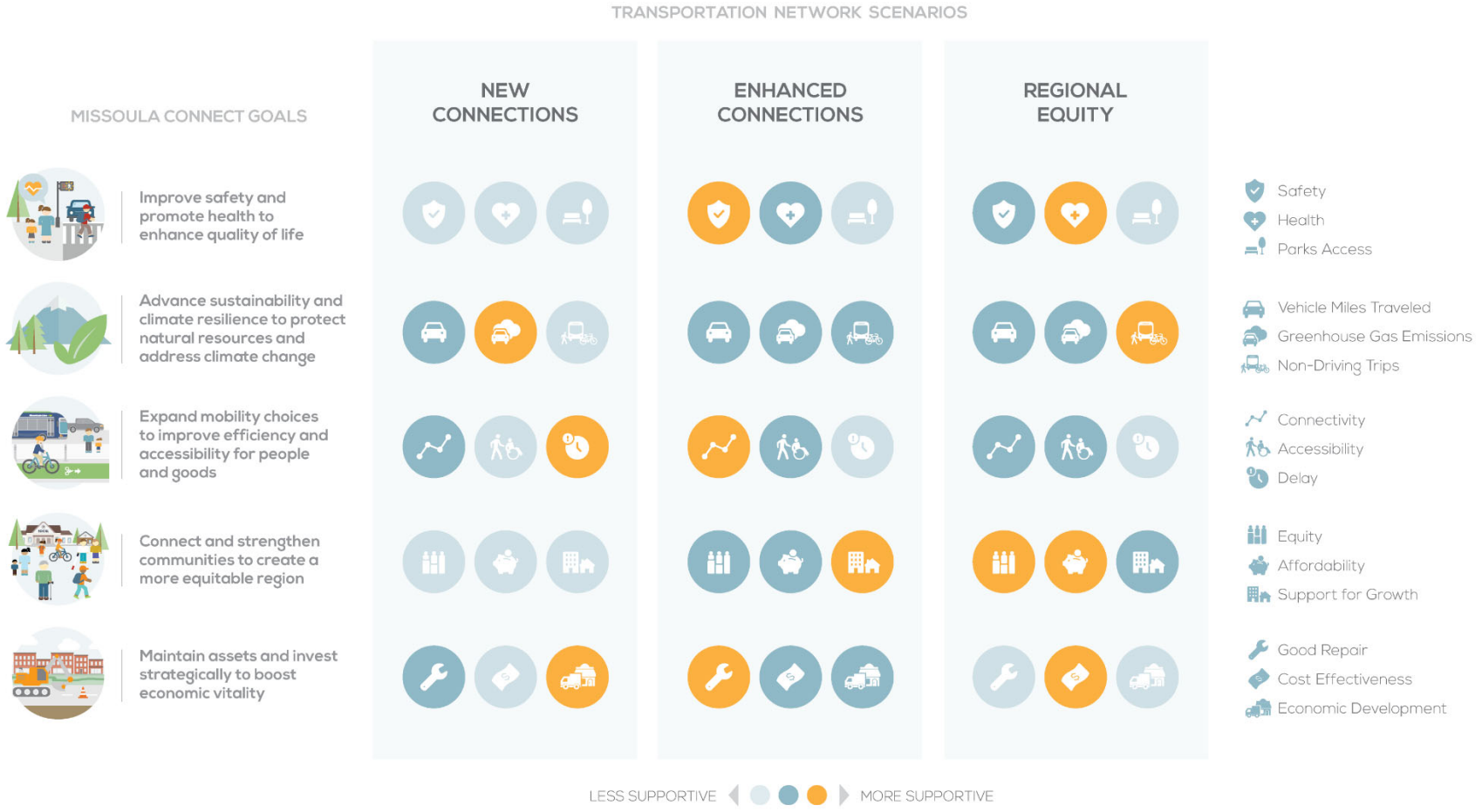
This document summarizes the approach and findings of analyses conducted to compare the transportation network scenarios developed for the Missoula region's long-range transportation plan (LRTP), Missoula Connect. Details on the two growth scenarios and three transportation network scenarios can be found in the *Scenario Planning Approach & Proposed Scenarios* memo (Appendix D).

To conduct this analysis, the transportation network scenarios were coded into the regional travel demand model and analyzed against the two regional growth scenarios for 2050 to assess how well each scenario performs against key metrics estimated by the model, such as vehicle miles traveled (VMT). In addition, post-processing of the model runs and additional off-model analysis was conducted to better account for project benefits that may not be well understood by the travel demand model. The metrics analyzed are presented in the following order in this document:

- Jobs Accessibility
- Parks Accessibility
- School Accessibility
- Social Services Accessibility
- Bicycle Connectivity
- Affordability
- Safety
- Ability to Support Growth
- Good Repair
- Equity
- Vehicle Miles Traveled (VMT)
- Vehicle Hours of Delay (VHD)
- Automobile Mode Share
- Transit Mode Share
- Walk Mode Share
- Bike Mode Share
- Greenhouse Gas (GhG) Emissions

Table 1 on the following page shows the level of support each transportation scenario provides for the Goals and Desired Outcomes of Missoula Connect. The table reports on 15 metrics, using a "less supportive" (light blue) to "more supportive" (orange) scale to demonstrate the relative performance of each scenario compared to the other two scenarios.

Table 1 Summary of Scenario Performance



JOBS ACCESSIBILITY

Supporting the regional economy and improving access to jobs and opportunities is a vital component of the Missoula Connect vision. This analysis reveals how each transportation network scenario provides accessibility to jobs within a 15- and 30- minute walking or biking commute under both Business as Usual and Strategic Growth scenarios in 2050.

Maps were created by calculating the extent to which someone walking or riding a bicycle could reach jobs by using the active transportation facilities provided by each transportation network (Base, New Connections, Enhanced Connections, and Regional Equity). The network for walking includes sidewalks and streets with a Level of Traffic Stress 1 (LTS 1). To estimate access to jobs, the coverage of each network was then overlayed with the estimated number of jobs by Traffic Analysis Zone (TAZ) for each growth scenario.

Maps provided in Figure 1 through Figure 12 illustrate the area that encompasses all accessible bicycle or pedestrian pathways that are within a 15-minute or 30-minute walk or bike commute from the center of a TAZ. If a proposed project improves connectivity to another proposed or existing facility in a certain area, the broader network becomes more accessible in those areas. The expansiveness of the network does not directly correlate to increased job access, though it does provide a rough estimation. If a proposed facility or roadway improvement expands the network in a neighborhood where projected job growth is minimal, for instance, the maps will show an expansion of the network; however, that does not necessarily indicate an increase in access to jobs. Table 2 and Table 3 indicate overall changes in walking and biking access by growth and transportation network scenario. Key findings are as follows:

- The Enhanced Connections scenario includes more projects that integrate pedestrian improvements than the other scenarios. However, given that the pedestrian network is well connected in areas with expected job growth, the change from base conditions is not as significant as it is with the bicycle network.
- Enhanced Connections includes projects that improve pedestrian connectivity in the Northside area, where job growth is expected.
- The Regional Equity scenario provides the biggest increase in access to jobs via bicycle within 15 minutes under the Business as Usual scenario, whereas Enhanced Connections performs slightly better in the 15-minute range under the Strategic Growth scenario.
- Regional Equity and Enhanced Connections provide very similar increases in access when bike commute times are increased to 30 minutes in both growth scenarios
- Regional Equity and Enhanced Connections projects improve the connectivity of the base bicycle network within the central core, as well as in Hellgate, Lower Rattlesnake, and near the University, where there is anticipated job growth. Unlike the Enhanced Connections scenario, the Regional Equity Scenario provides connections to Wye and Frenchtown, where there is also anticipated job growth.
- Proposed projects in the New Connections scenario expand on the base bicycle network. However, expansion would occur in areas where projected job growth is not as great as the projected job growth in areas served by the facilities proposed in the Enhanced Connections and Regional Equity scenarios.

Table 2 Changes in Walking Access to Jobs – 2050

Growth Scenario	Commute Time	Base	New Connections	Change from Base	Enhanced Connections	Change from Base	Regional Equity	Change from Base
Business as Usual	15 min	80,598	80,931	0%	82,229	2%	81,786	1%
	30 min	89,664	89,997	0%	91,278	2%	90,950	1%
Strategic Growth	15 min	80,594	80,929	0%	82,174	2%	81,698	1%
	30 min	89,546	89,881	0%	91,109	2%	90,748	1%

Table 3 Changes in Biking Acess to Jobs – 2050

Growth Scenario	Commute Time	Base	New Connections	Change from Base	Enhanced Connections	Change from Base	Regional Equity	Change from Base
Business as Usual	15 min	57,353	58,717	2%	59,834	4%	60,928	6%
	30 min	67,059	67,959	1%	68,936	3%	68,990	3%
Strategic Growth	15 min	58,730	59,906	2%	60,906	4%	59,764	2%
	30 min	67,059	68,232	2%	69,108	3%	69,240	3%

Figure 1 Walking Access to Jobs (15 mins) – New Connections

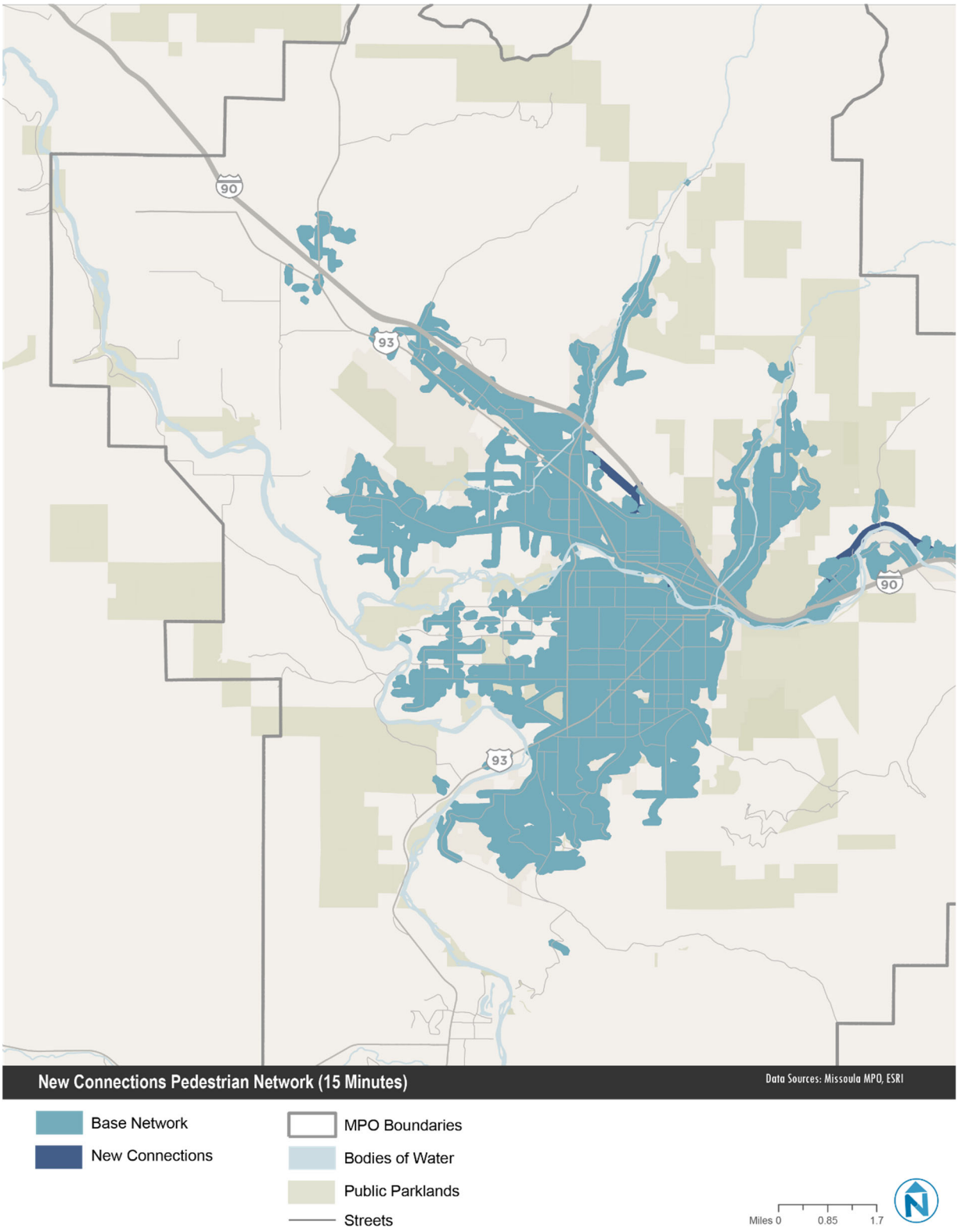


Figure 2 Walking Access to Jobs (15 mins) – Enhanced Connections

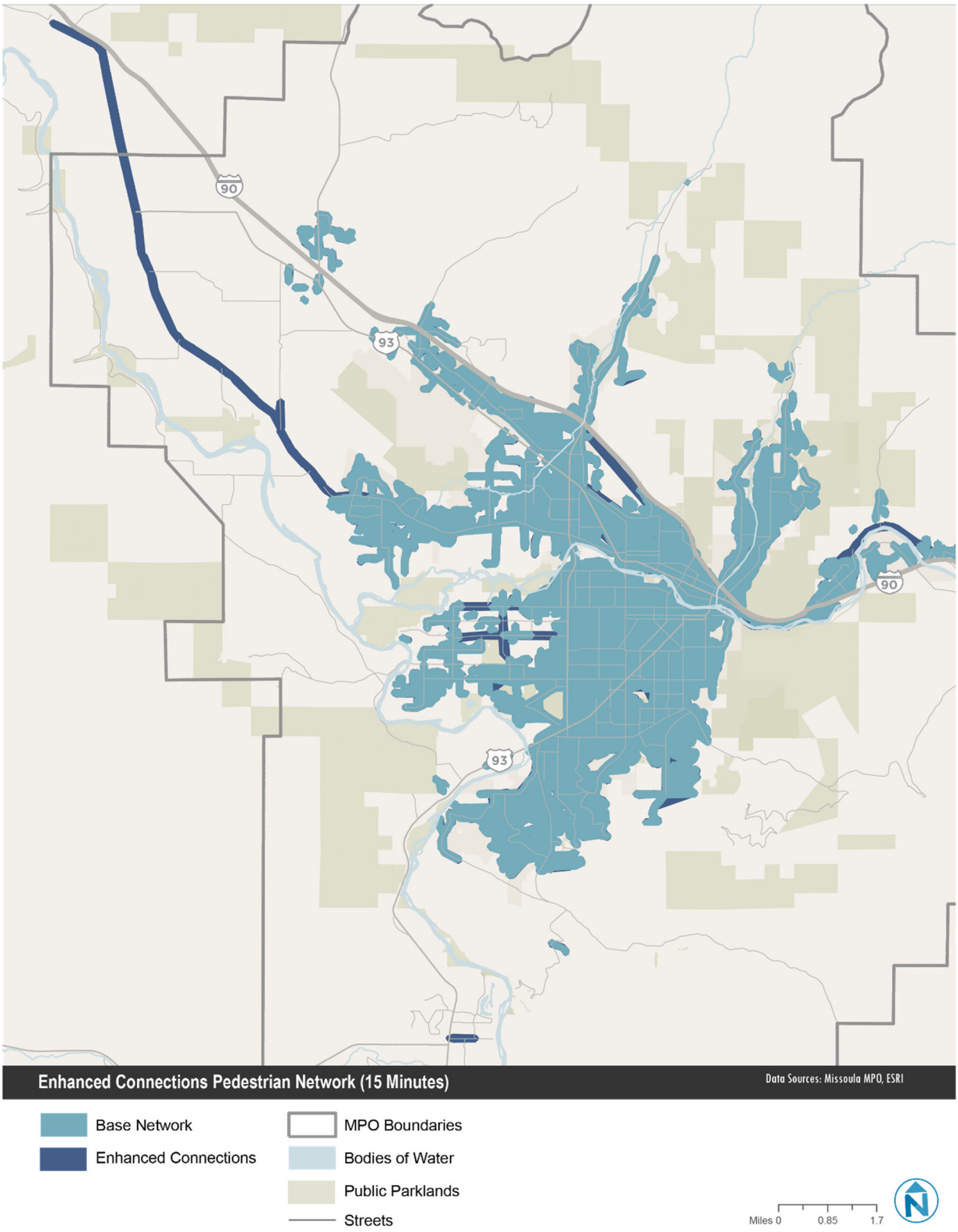


Figure 3 Walking Access to Jobs (15 mins) – Regional Equity

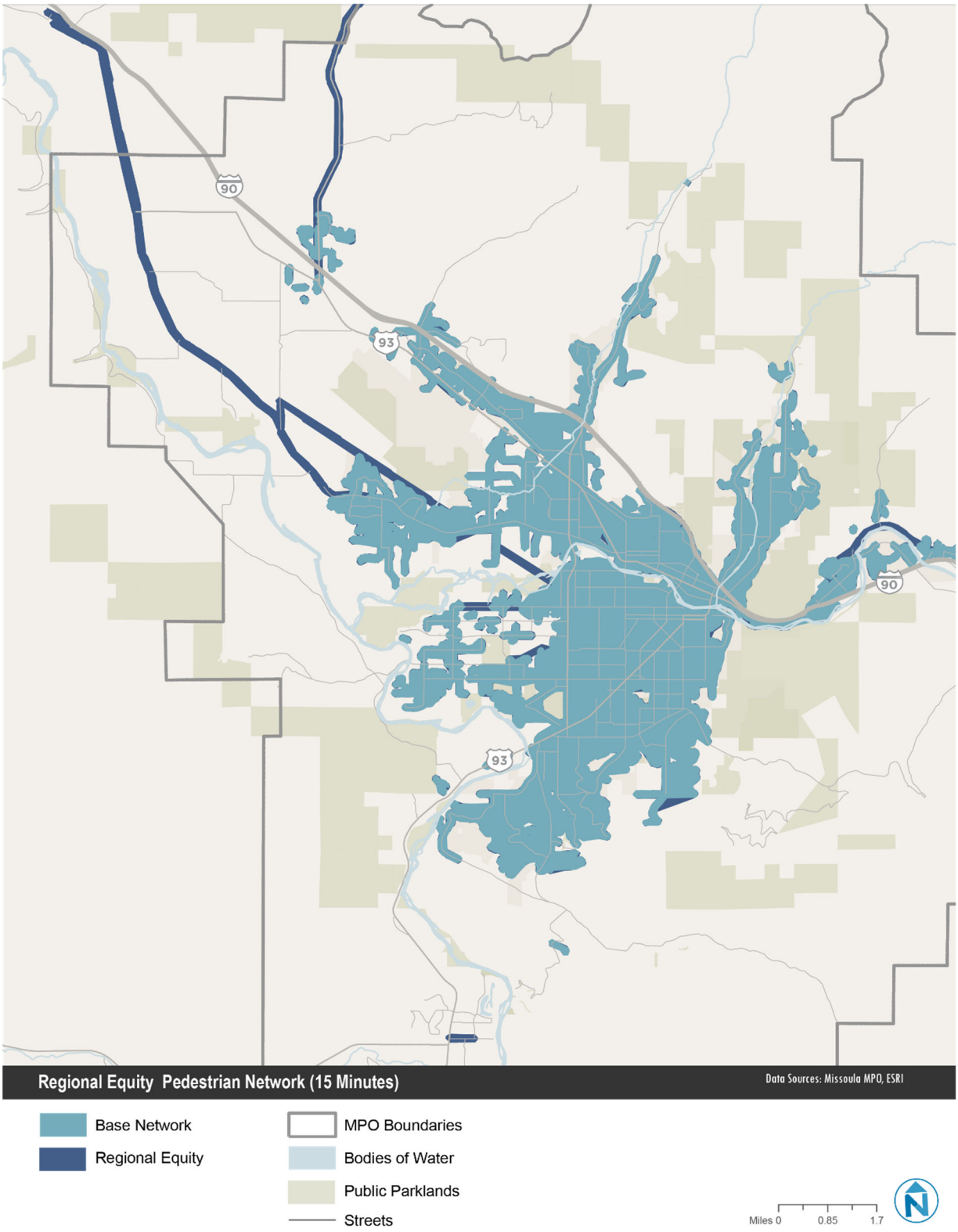


Figure 4 Walking Access to Jobs (30 mins) – New Connections

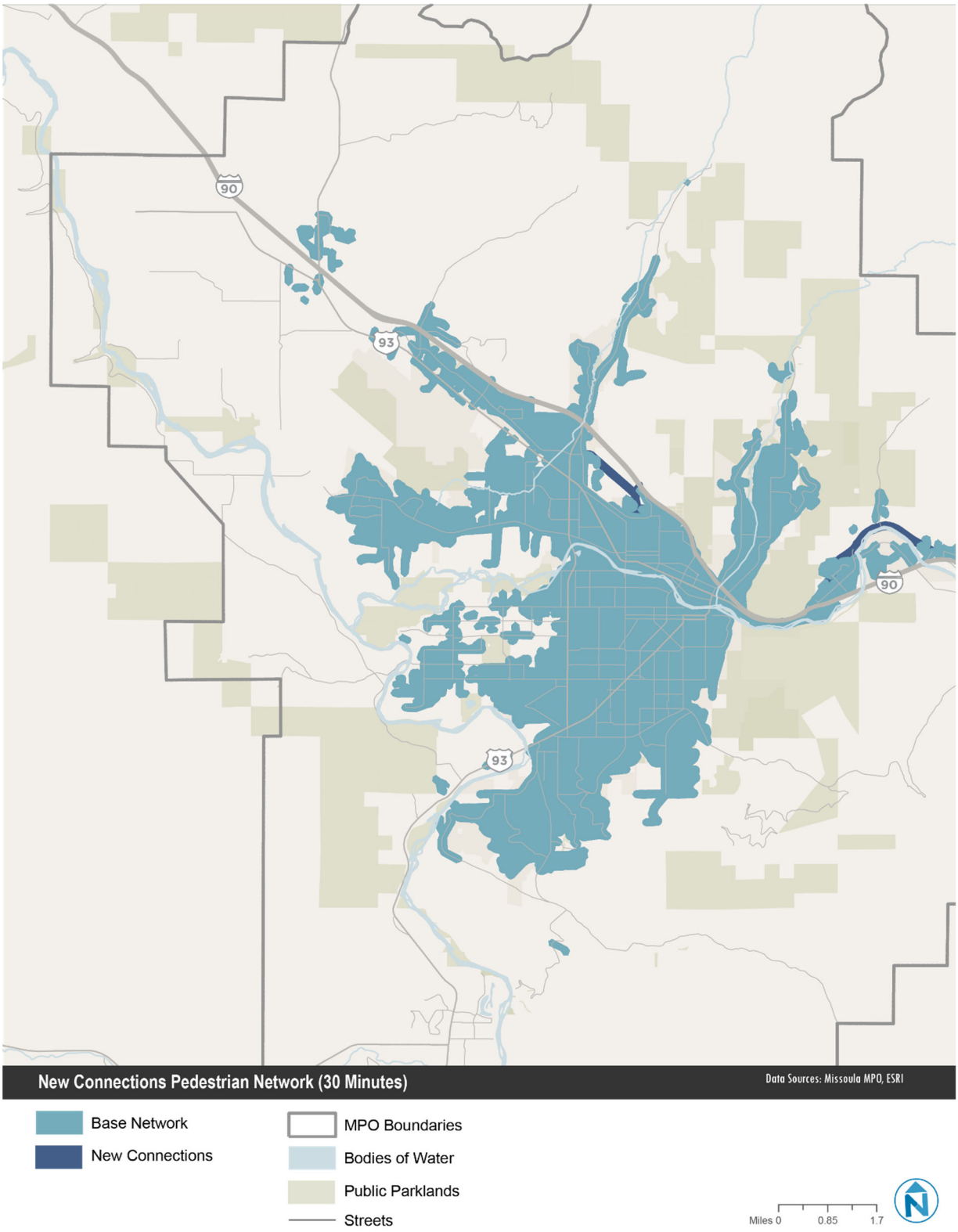


Figure 5 Walking Access to Jobs (30 mins) – Enhanced Connections

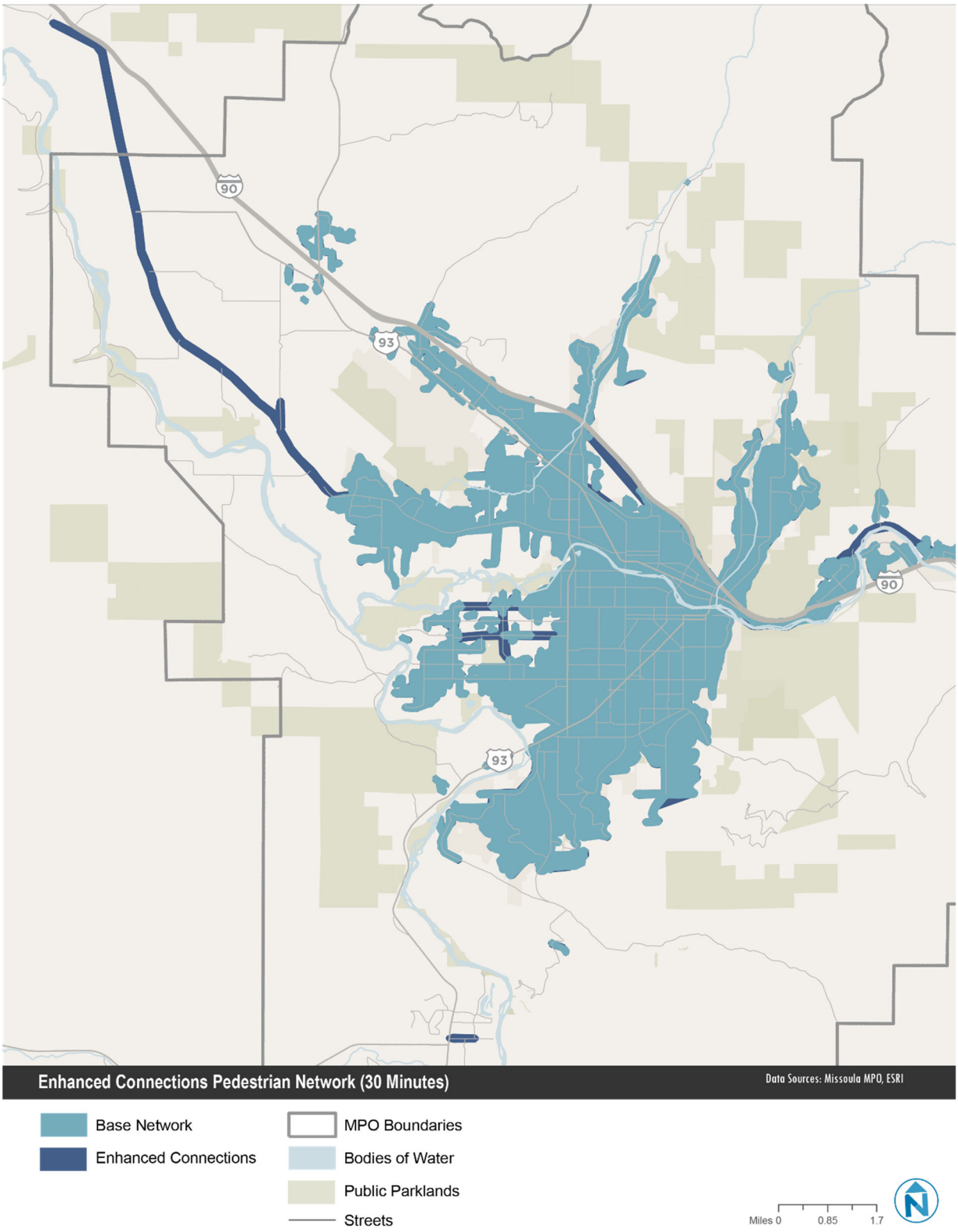


Figure 6 Walking Access to Jobs (30 mins) – Regional Equity

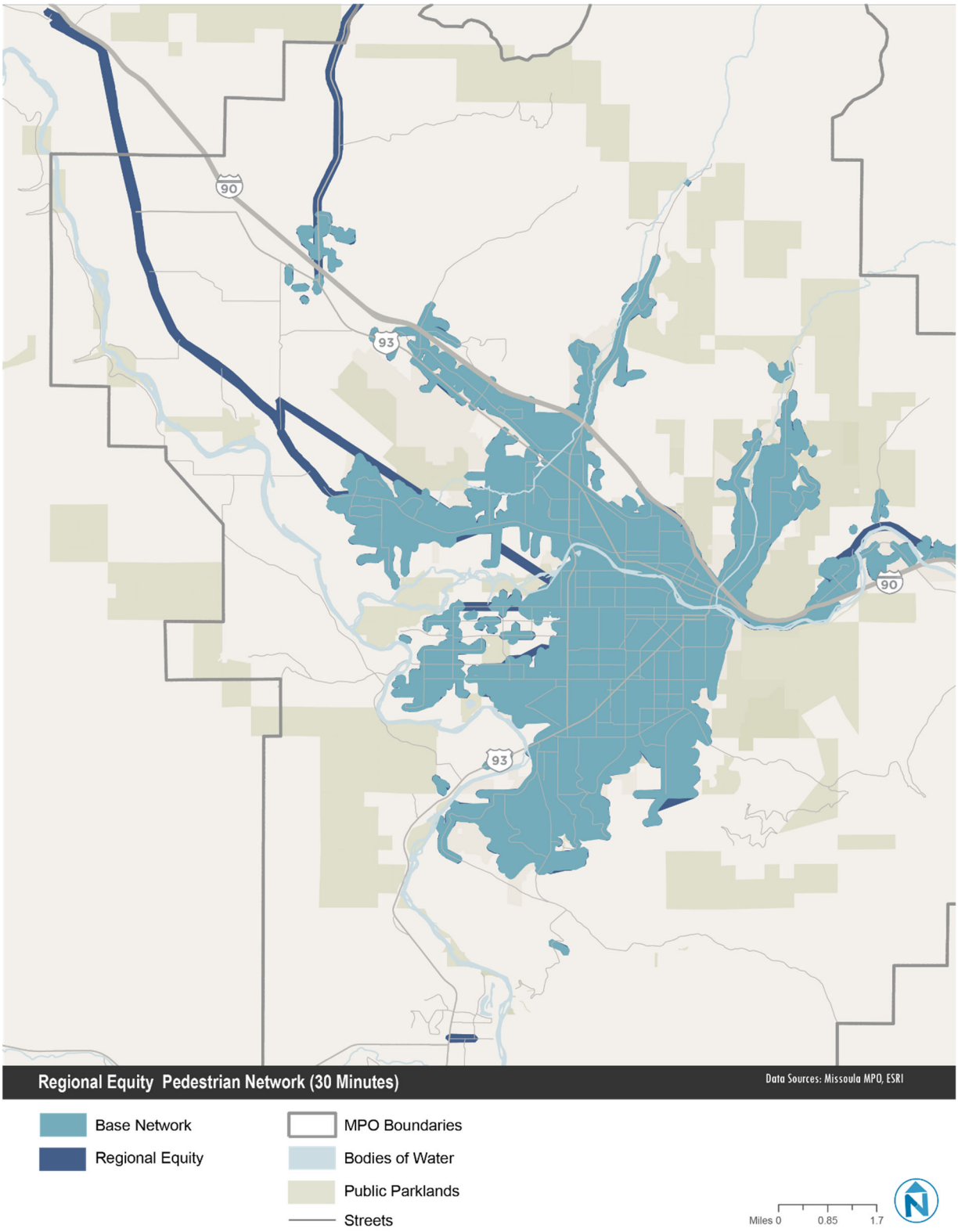


Figure 7 Biking Access to Jobs (15 mins) – New Connections

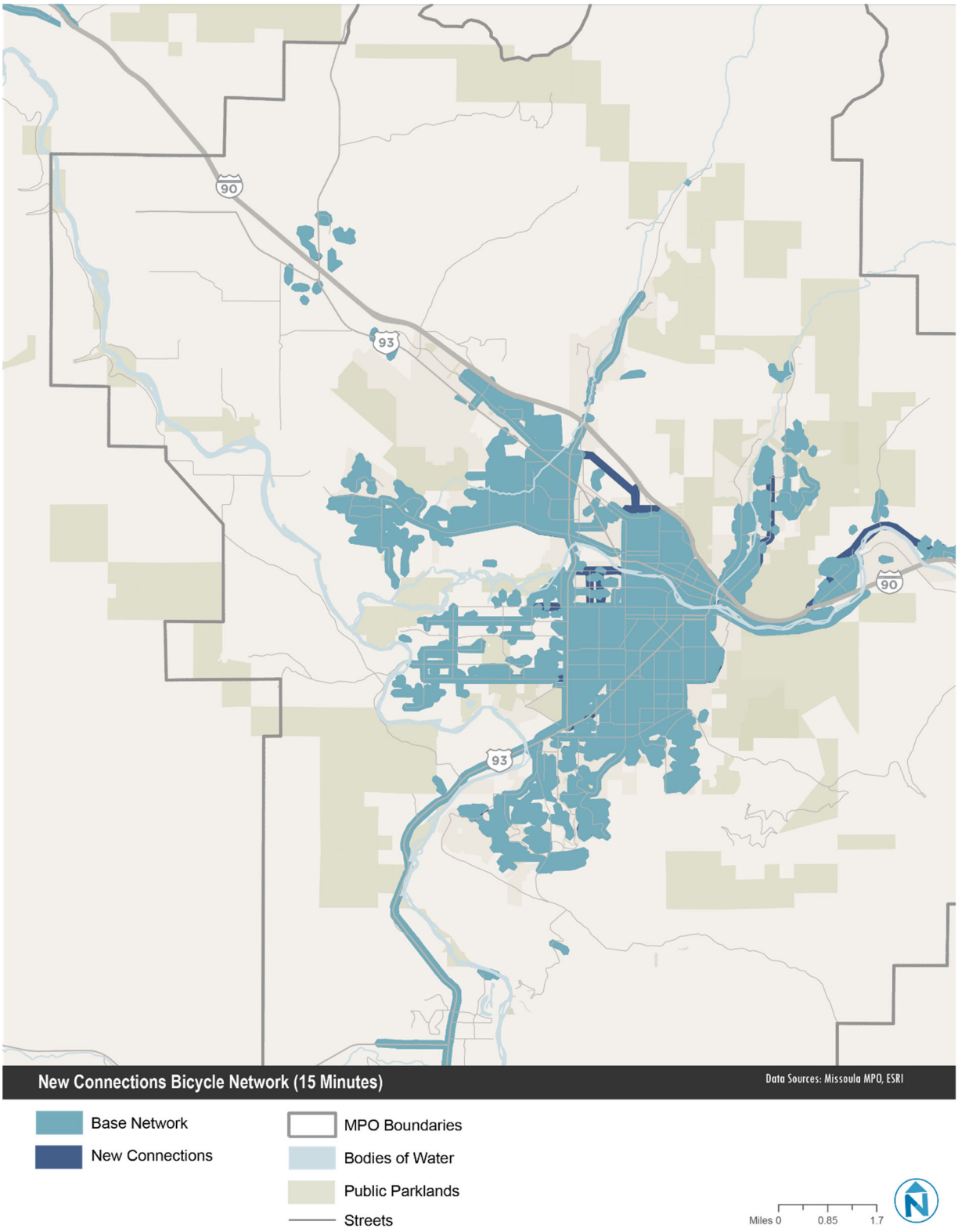


Figure 8 Biking Access to Jobs (15 mins) – Enhanced Connections

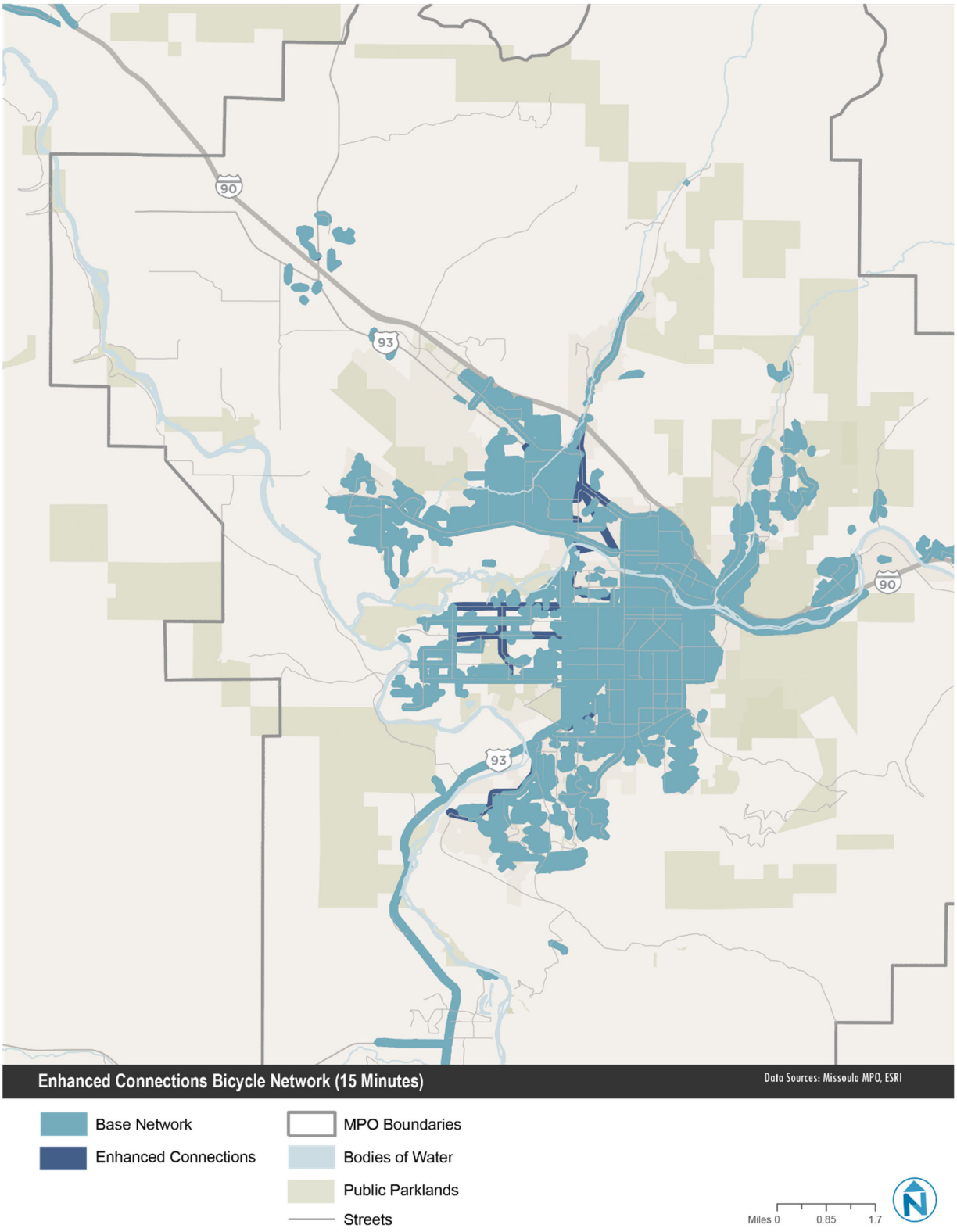


Figure 9 Biking Access to Jobs (15 mins) – Regional Equity

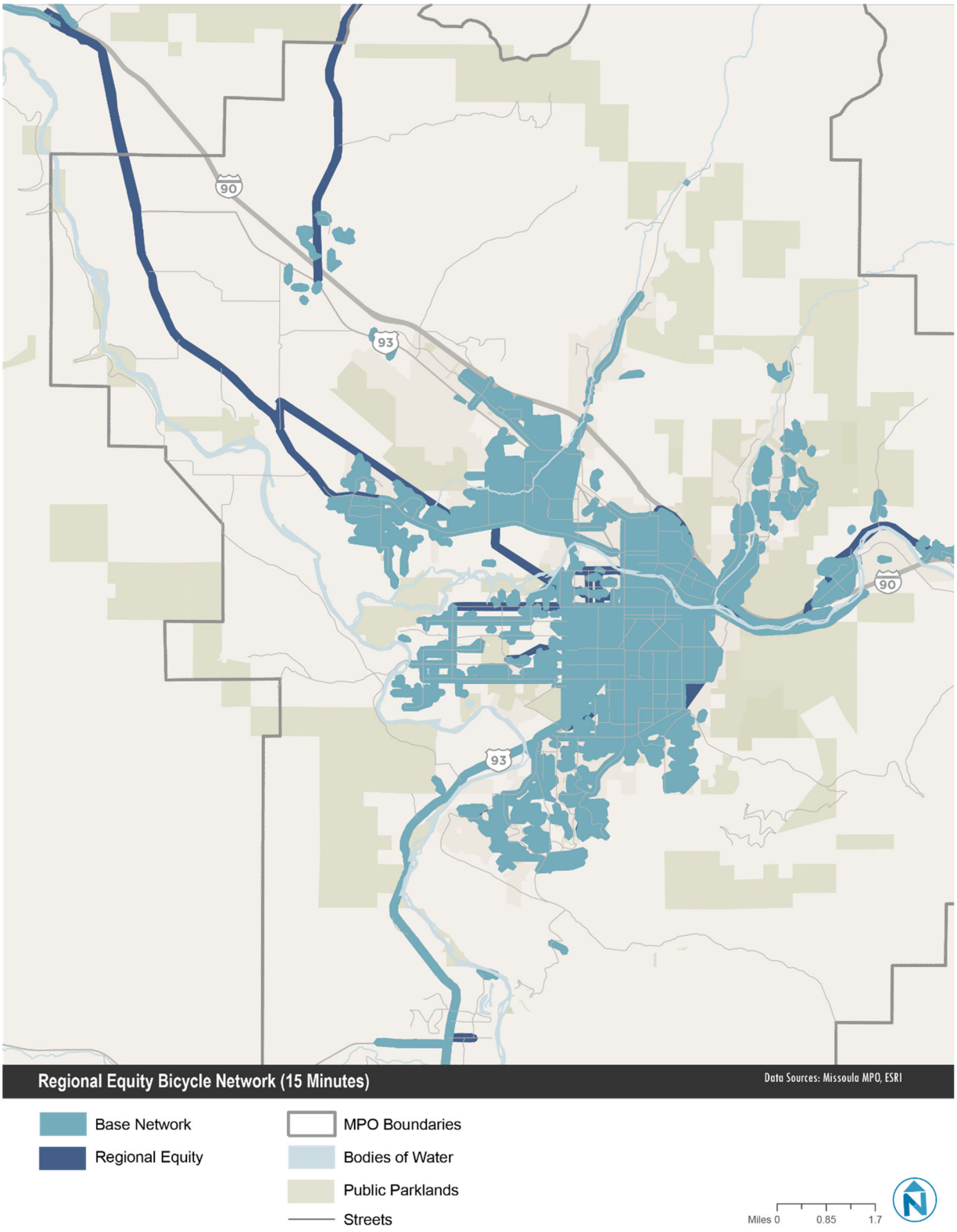


Figure 10 Biking Access to Jobs (30 mins) – New Connections

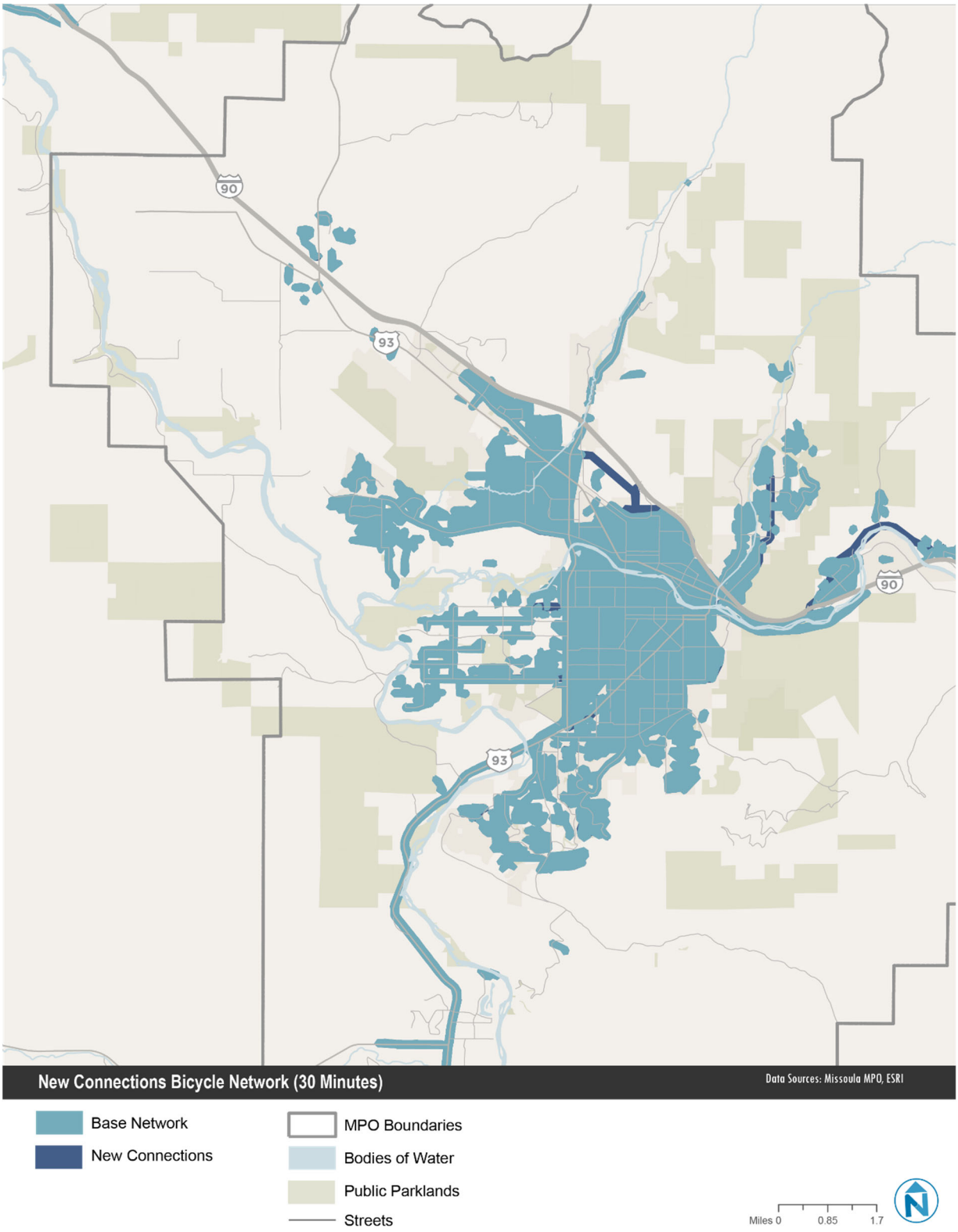


Figure 11 Biking Access to Jobs (30 mins) – Enhanced Connections

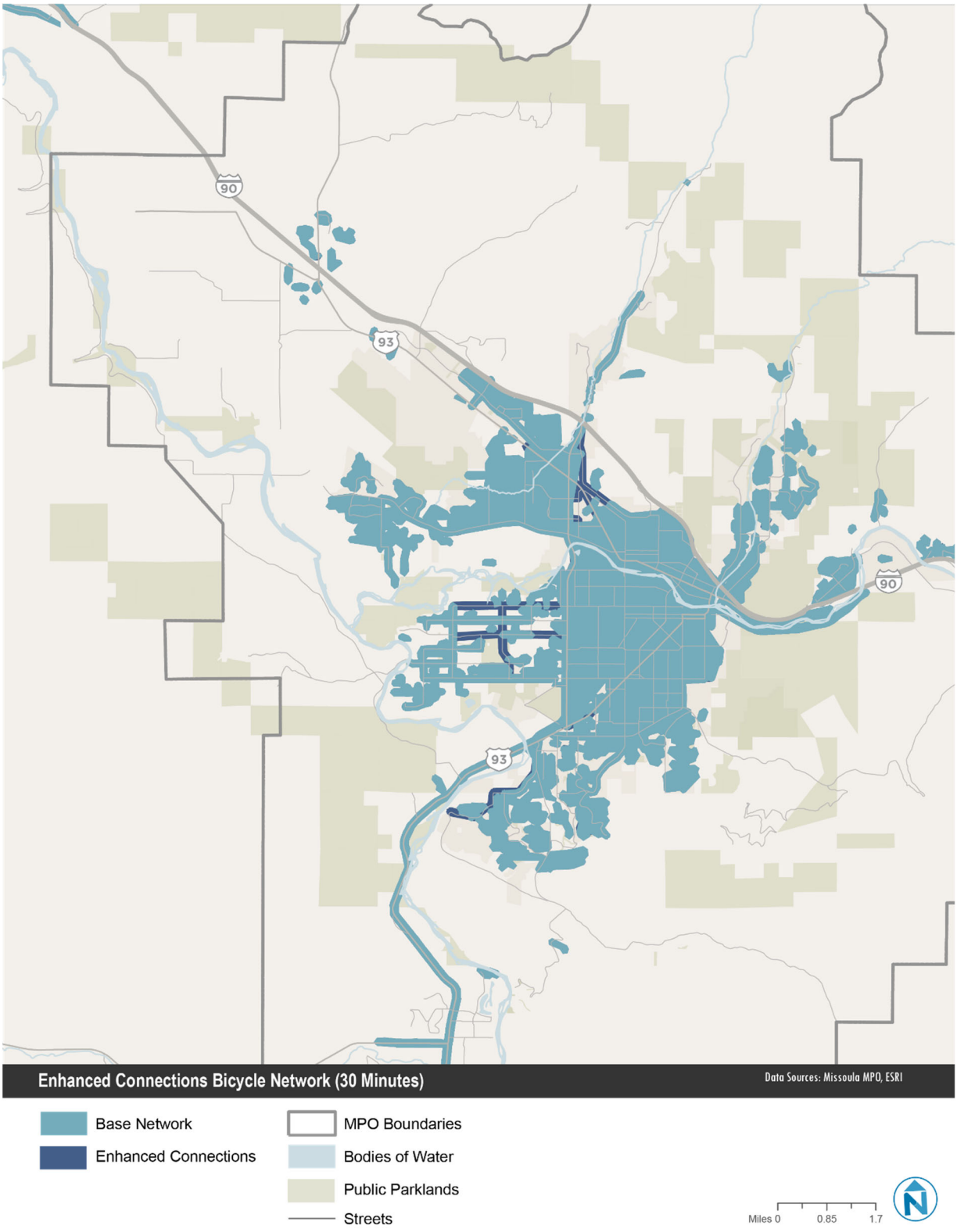
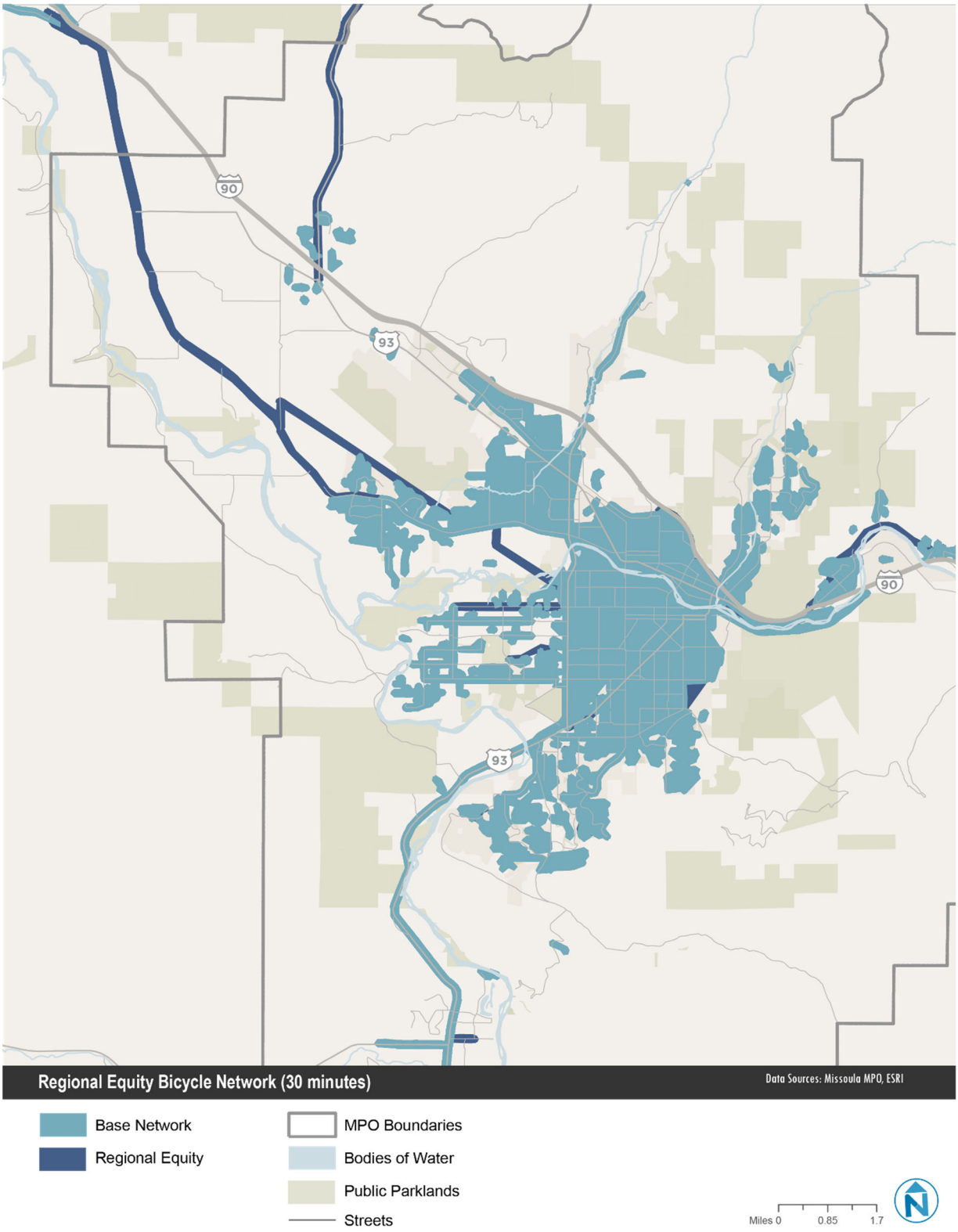


Figure 12 Biking Access to Jobs (30 mins) – Regional Equity



PARKS ACCESSIBILITY

Increased access to parks is an indicator that the transportation network is supportive of enhanced quality of life, access to recreation, and improved public health outcomes. This analysis reveals how each transportation network scenario provides accessibility to parks within a 15- and 30-minute walk or bicycle ride. For the destination to be considered accessible, the entire journey must be possible without the traveler deviating from designated pedestrian or bicycle facilities. For example, the accessibility of the trip would be "broken" if someone riding a bicycle to a park needed to ride on an arterial street without a bicycle lane or adjacent shared-use path for a few blocks to bridge a gap between bicycle facilities.

As with jobs, maps were created by calculating the extent to which someone walking or riding a bicycle could reach a park by using the active transportation facilities provided by each transportation network (Base, New Connections, Enhanced Connections, and Regional Equity). The network for walking includes sidewalks and streets with LTS 1. The network for biking includes on-street bicycle facilities, commuter trails, and LTS 1 streets.

To estimate access, the coverage of each network was then overlayed with the point location of parks in the region. Due to the high number of locations classified as parks in local land use data, facilities included in this analysis are regional, community, and neighborhood parks. Facilities classified as right-of-way, open space, special use, special use trails, trails, and green space adjoining trails have been excluded.

Figure 13 through Figure 24 are maps indicating overall changes in walking and biking access to parks by transportation network scenario. Key findings are as follows:

- Enhanced Connections includes pedestrian projects that improve connectivity to parks in the Miller Creek and South 39th Street neighborhoods.
- The Enhanced Connections network results in a 14% increase in accessibility from the base for a 30-minute walk to a park.
- Proposed projects within the transportation network scenarios do not significantly increase bicycle access to parks in Missoula. In general, parks are already well served by the base bicycle network.
- Overall, the Enhanced Connections and Regional Equity scenarios provide greater connectivity to parks than New Connections.

Table 4 and Table 5 (see following page) show the change in the number of future (2050) households with walking and biking access to parks for one transportation network scenario compared to the base network. For this calculation, we used the transportation network that showed the greatest increase in overall coverage from the base.

The most significant increase is shown by the number of households that would be able to reach parks within a 30-minute walk under both growth scenarios in the Regional Equity transportation scenario. As with overall network coverage, an increase in households with access to parks by bicycle would be nominal for all three transportation scenarios. The change for the Enhanced Connections scenario is shown here.

Table 4 Household Walking Access to Parks with Regional Equity Scenario – 2050

Growth Scenario	Commute Time	Base	Regional Equity	Change from Base
Business as Usual	15 min	28,870	28,903	0.1%
	30 min	33,135	41,553	25.4%
Strategic Growth	15 min	31,522	31,570	0.2%
	30 min	35,920	43,915	22.3%

Table 5 Household Biking Access to Parks with Enhanced Connections Scenario – 2050

Growth Scenario	Commute Time	Base	Enhanced Connections	Change from Base
Business as Usual	15 min	28,870	28,900	0.1%
	30 min	33,135	33,176	0.1%
Strategic Growth	15 min	31,522	31,551	0.1%
	30 min	35,920	35,967	0.1%

Figure 13 Walking Access to Parks (15 mins) – New Connections

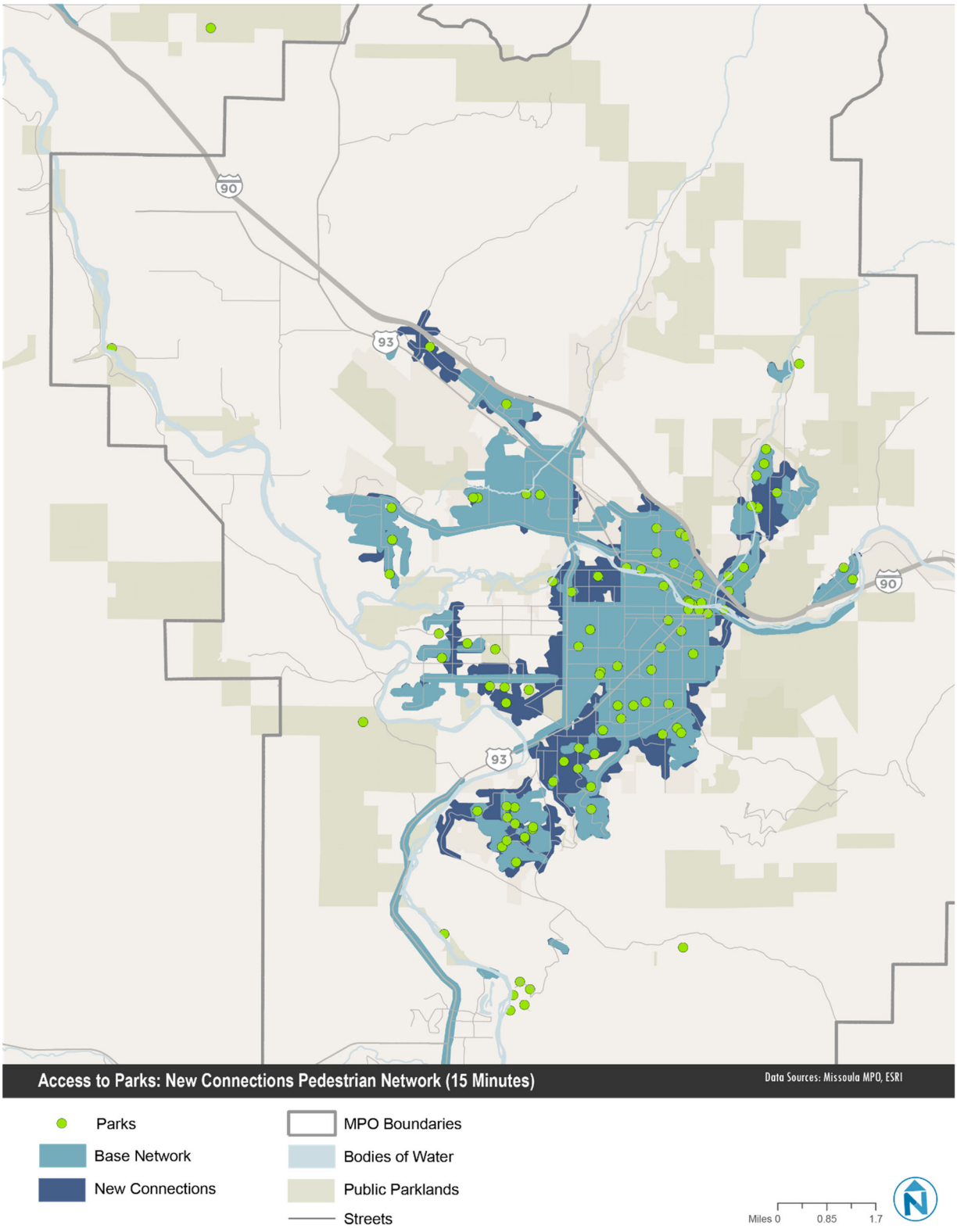


Figure 14 Walking Access to Parks (15 mins) – Enhanced Connections

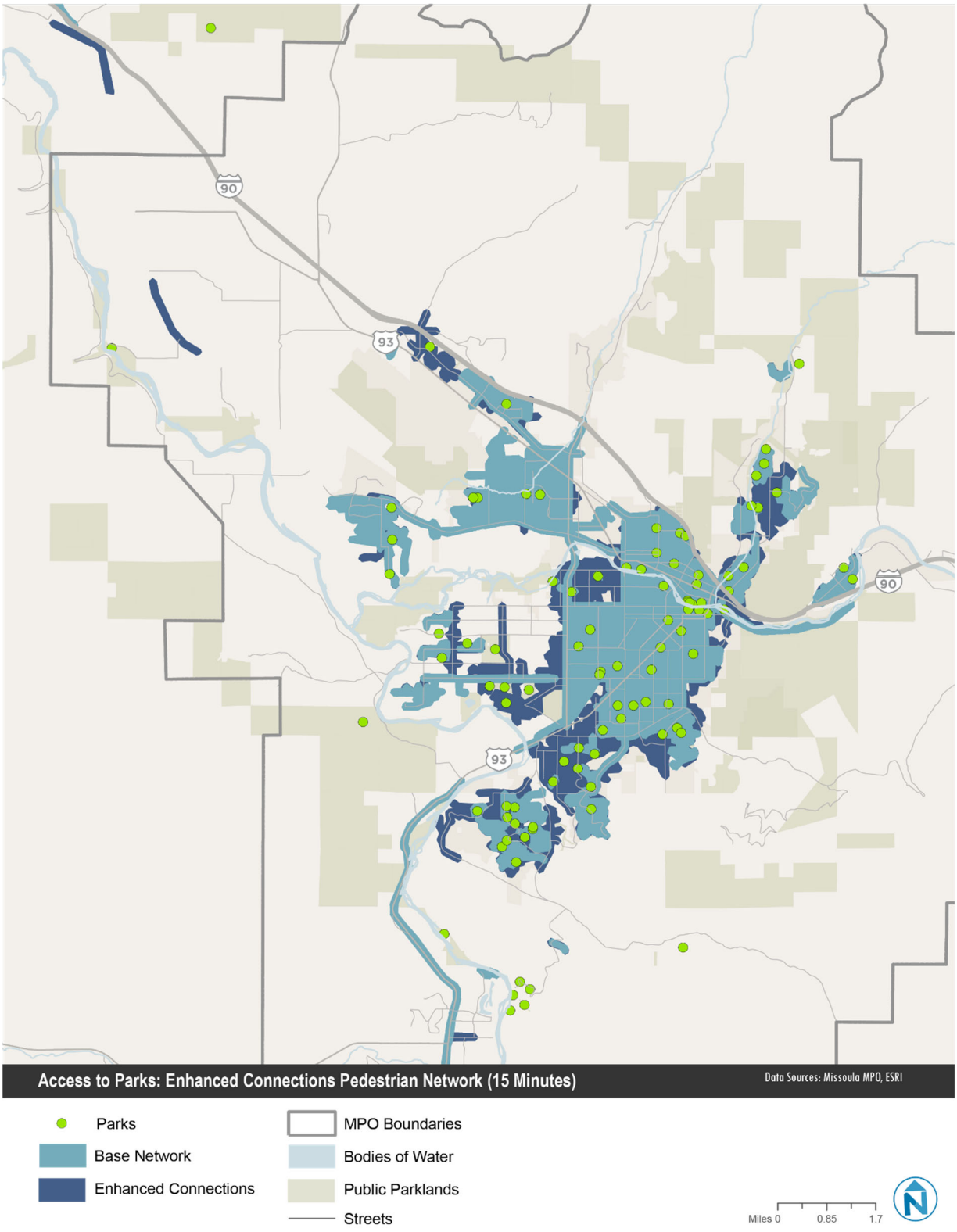


Figure 15 Walking Access to Parks (15 mins) – Regional Equity

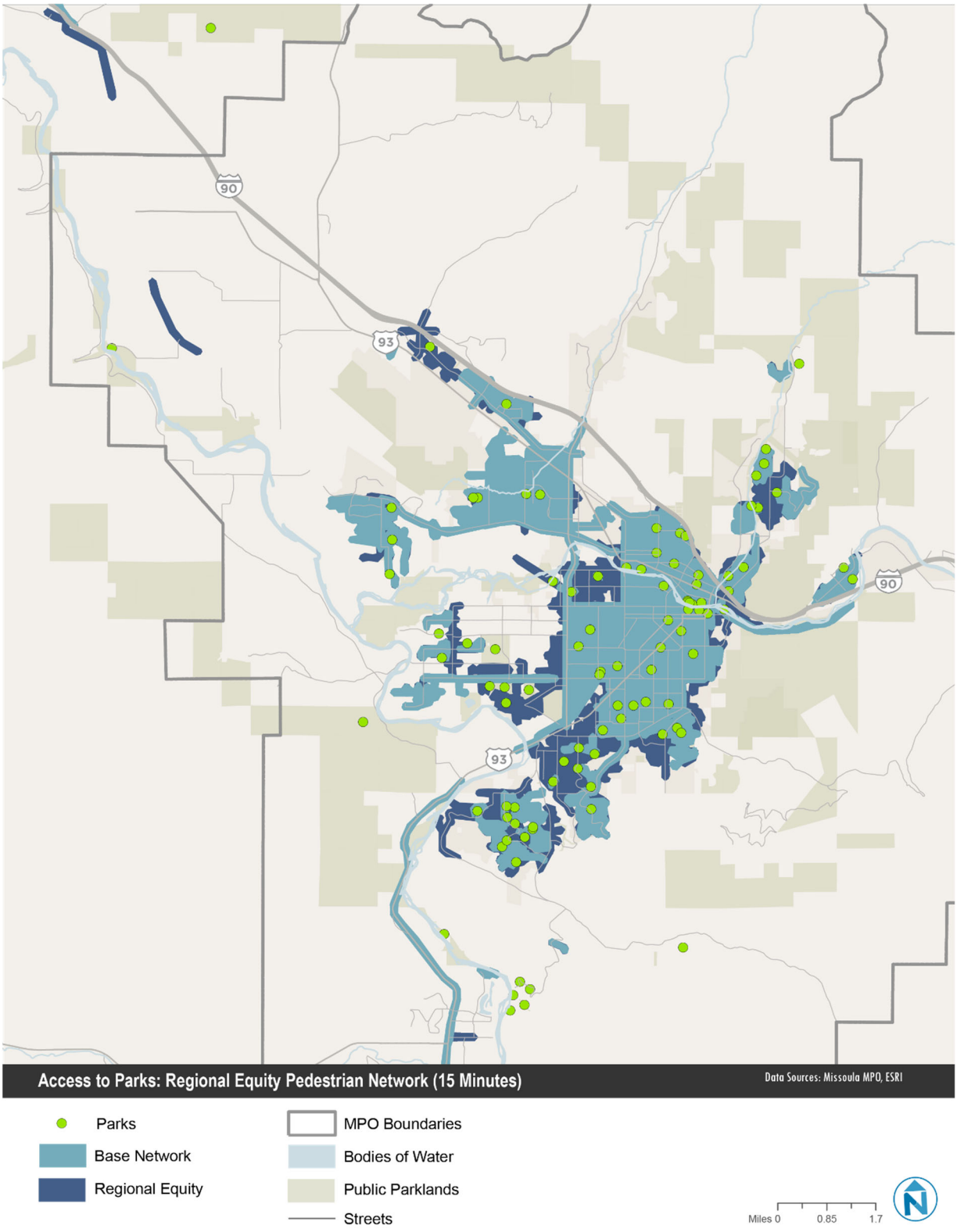


Figure 16 Walking Access to Parks (30 mins) – New Connections

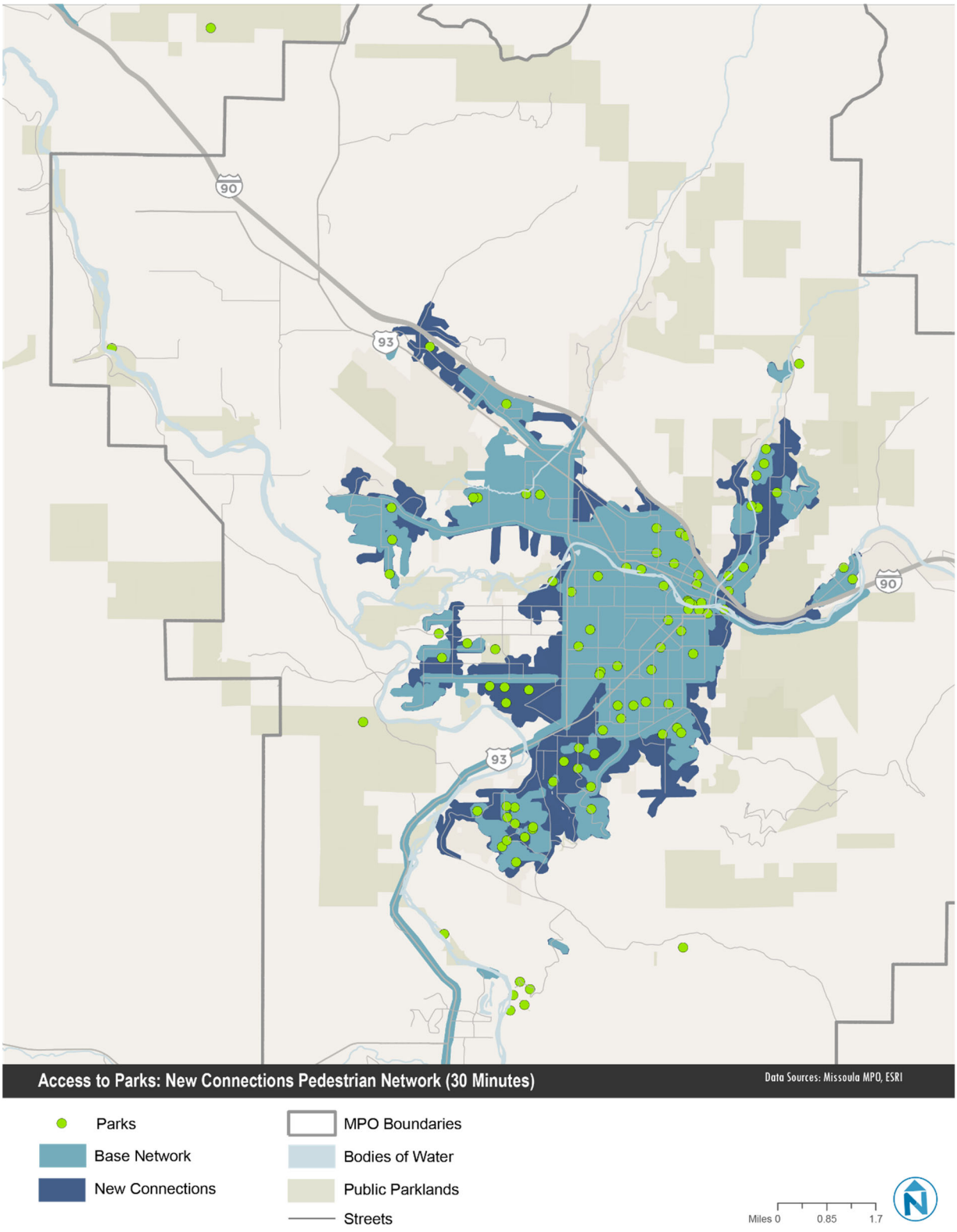


Figure 17 Walking Access to Parks (30 mins) – Enhanced Connections

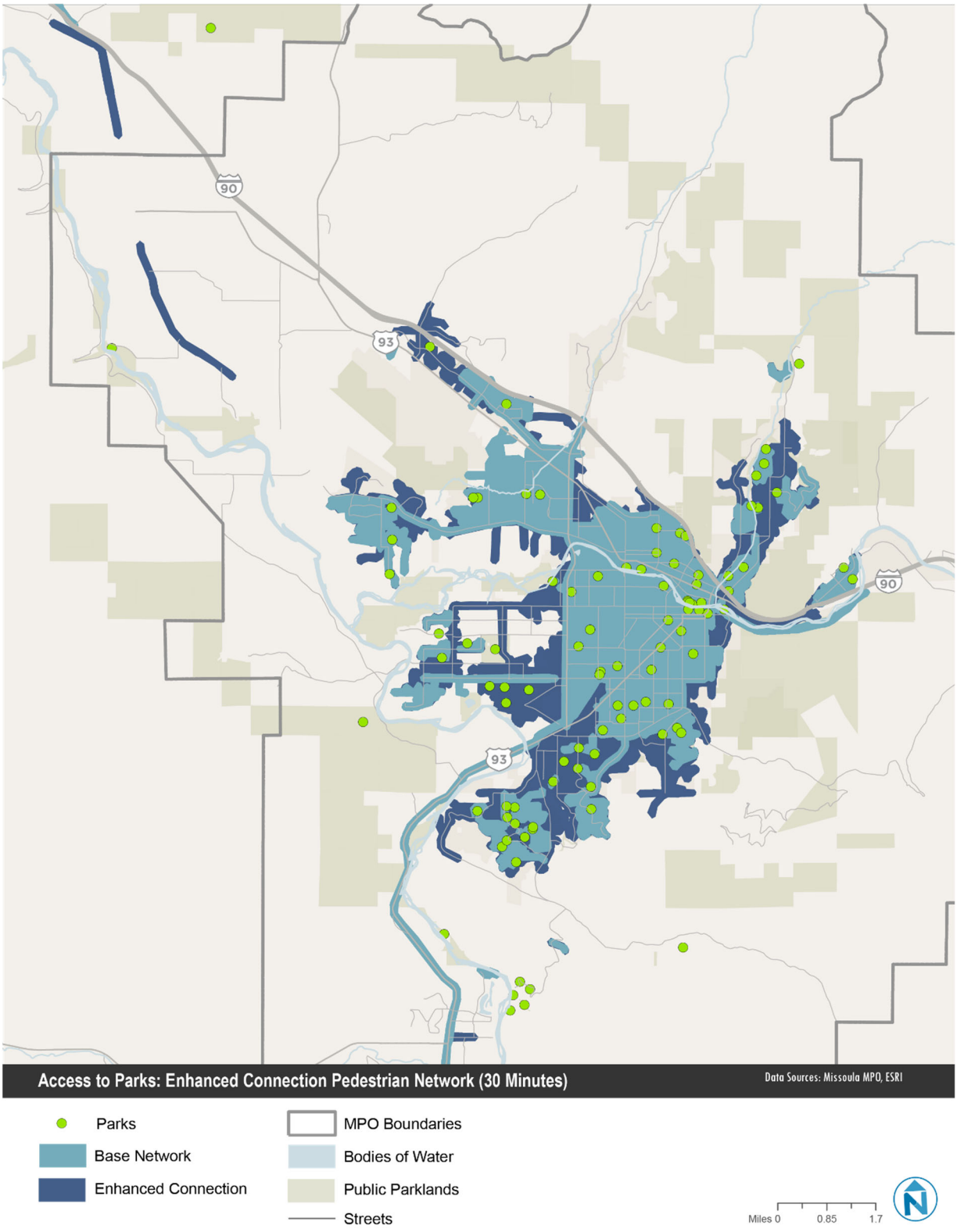


Figure 18 Walking Access to Parks (30 mins) – Regional Equity

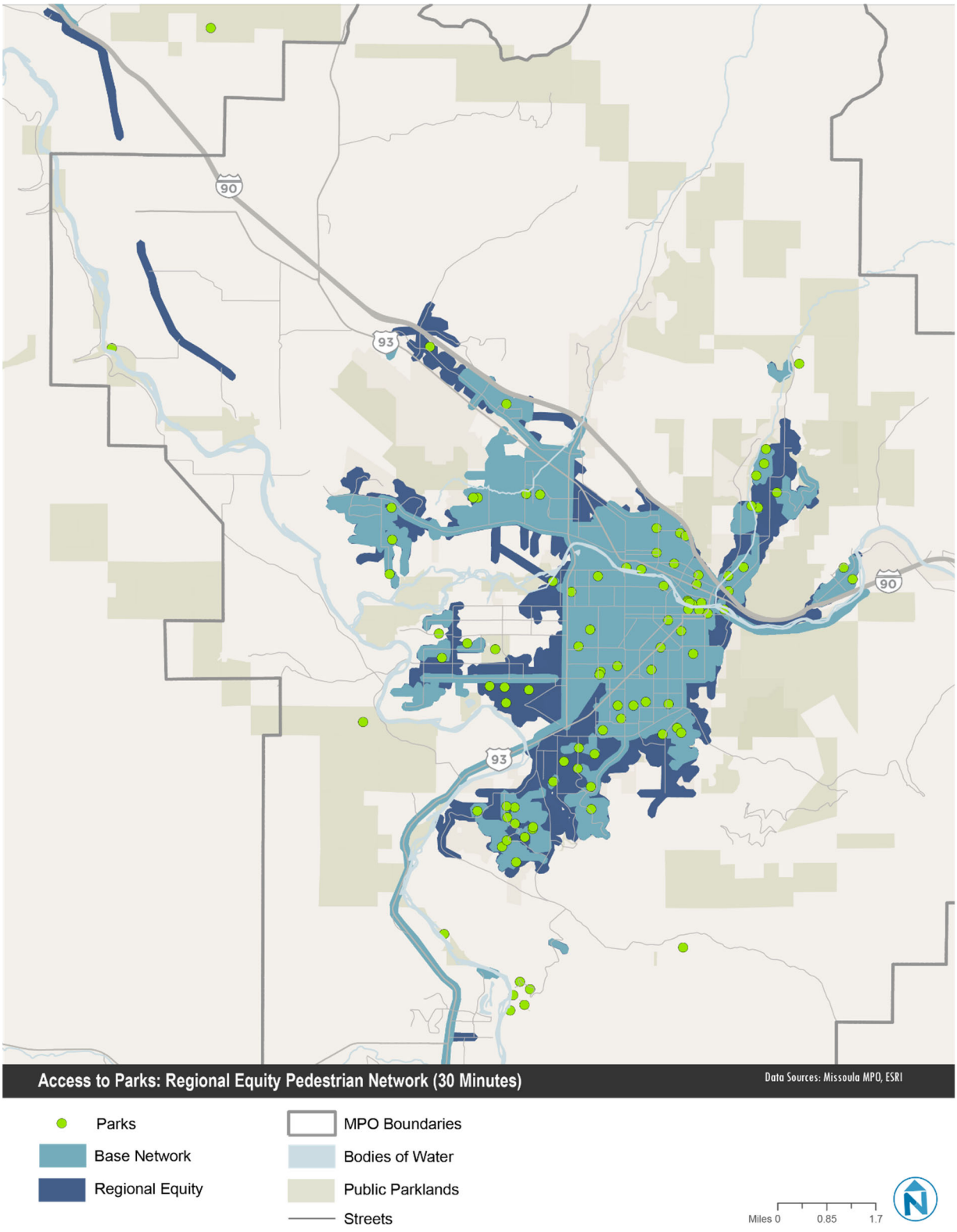


Figure 19 Biking Access to Parks (15 mins) – New Connections

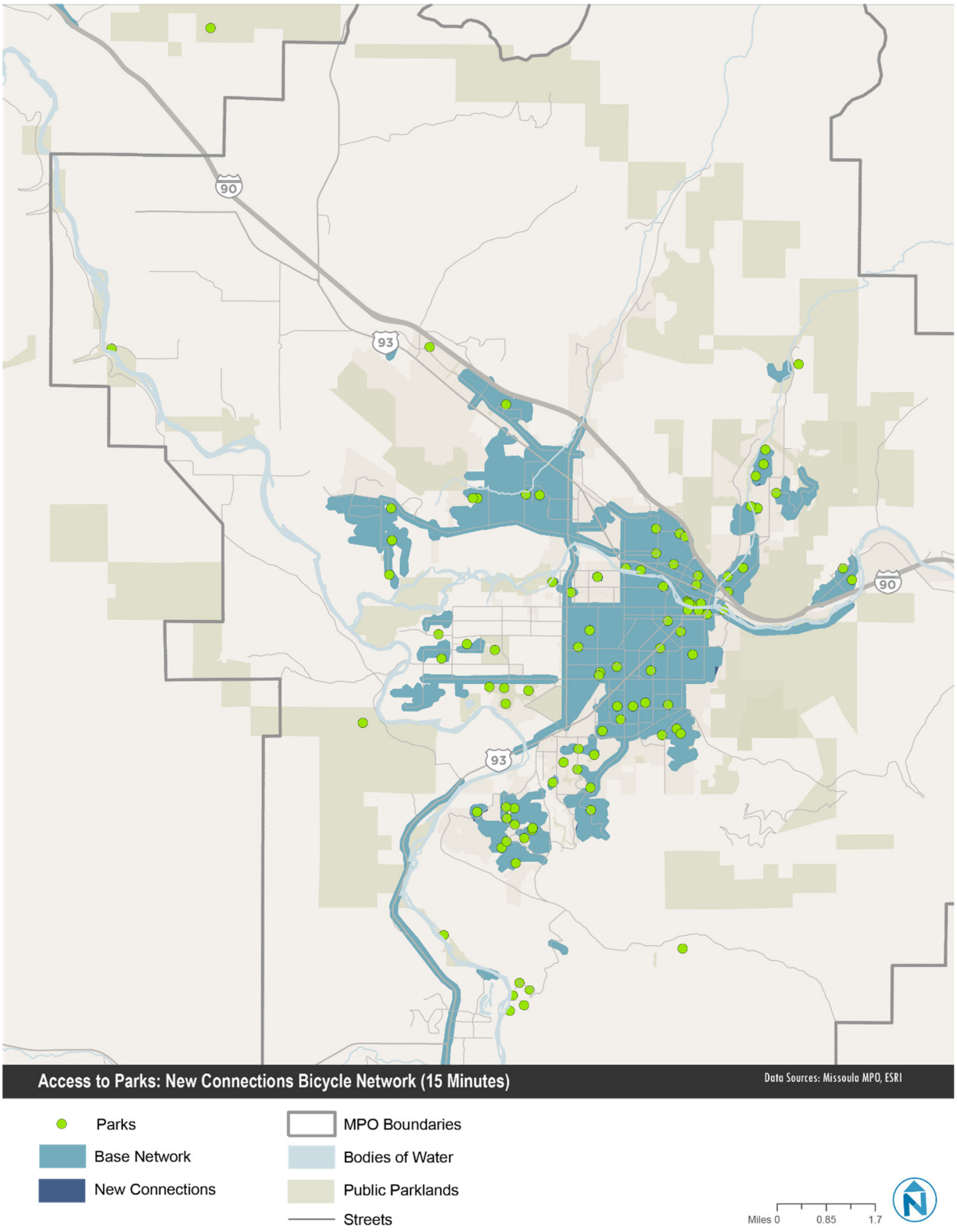


Figure 20 Biking Access to Parks (15 mins) – Enhanced Connections

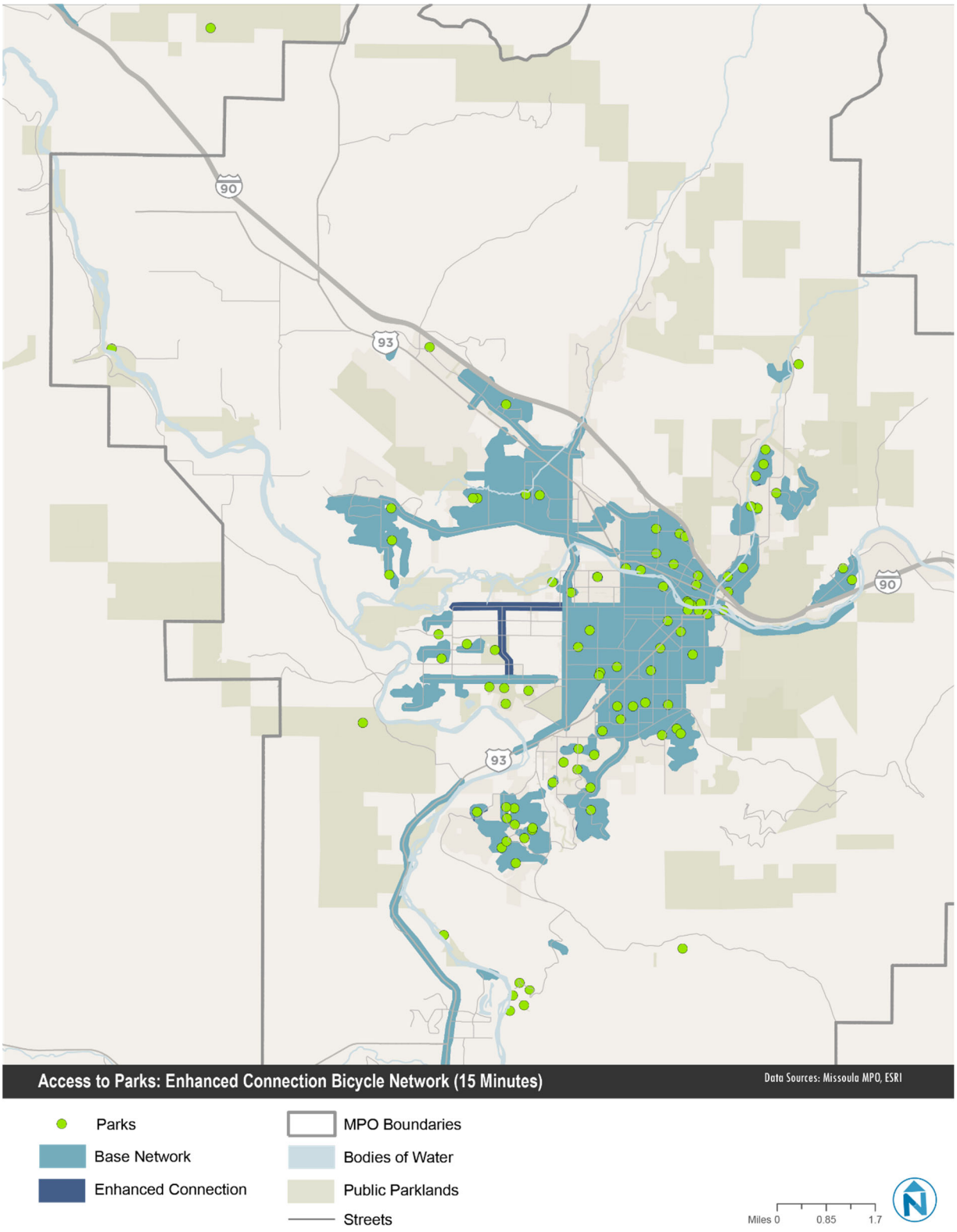


Figure 21 Biking Access to Parks (15 mins) – Regional Equity

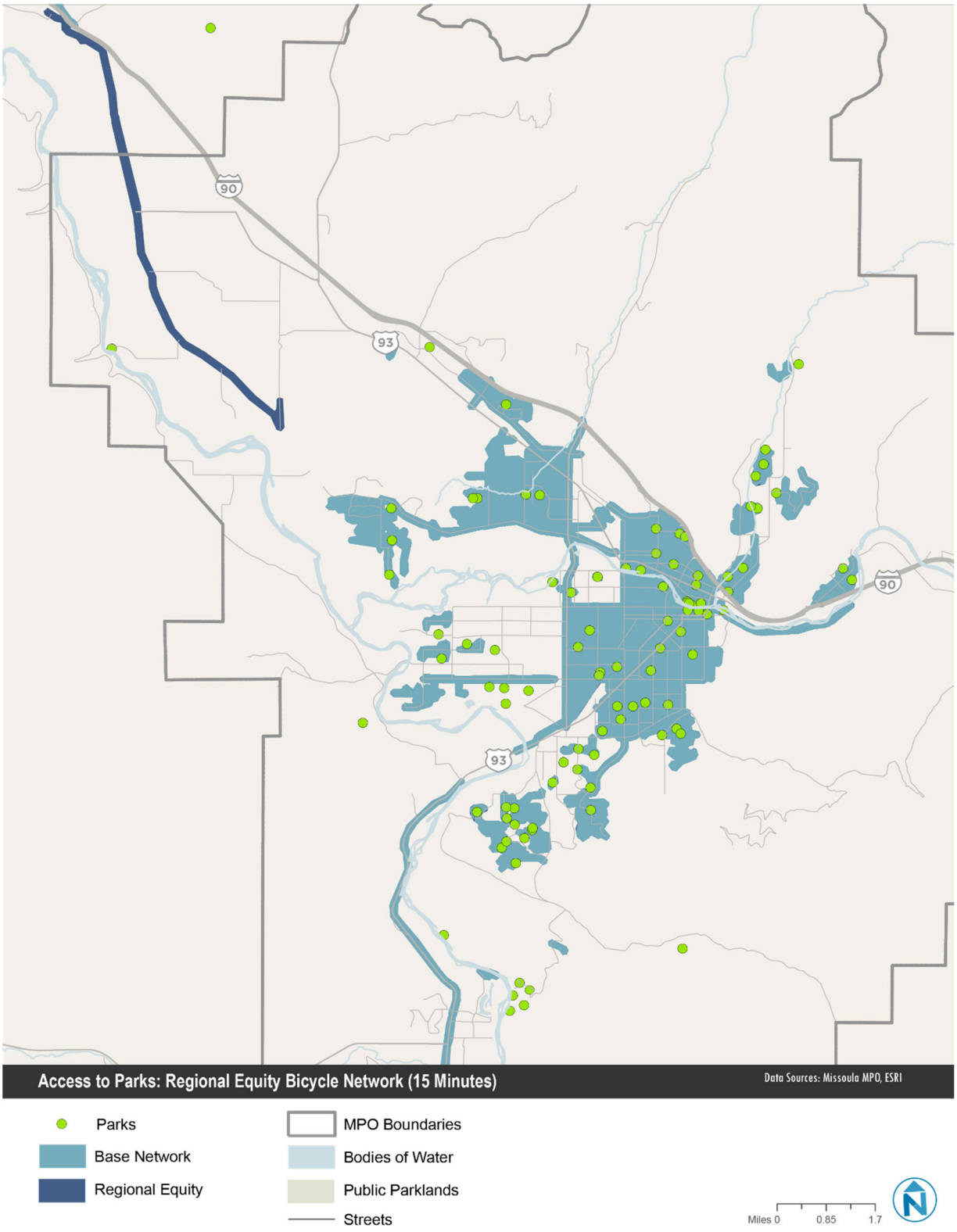


Figure 22 Biking Access to Parks (30 mins) – New Connections

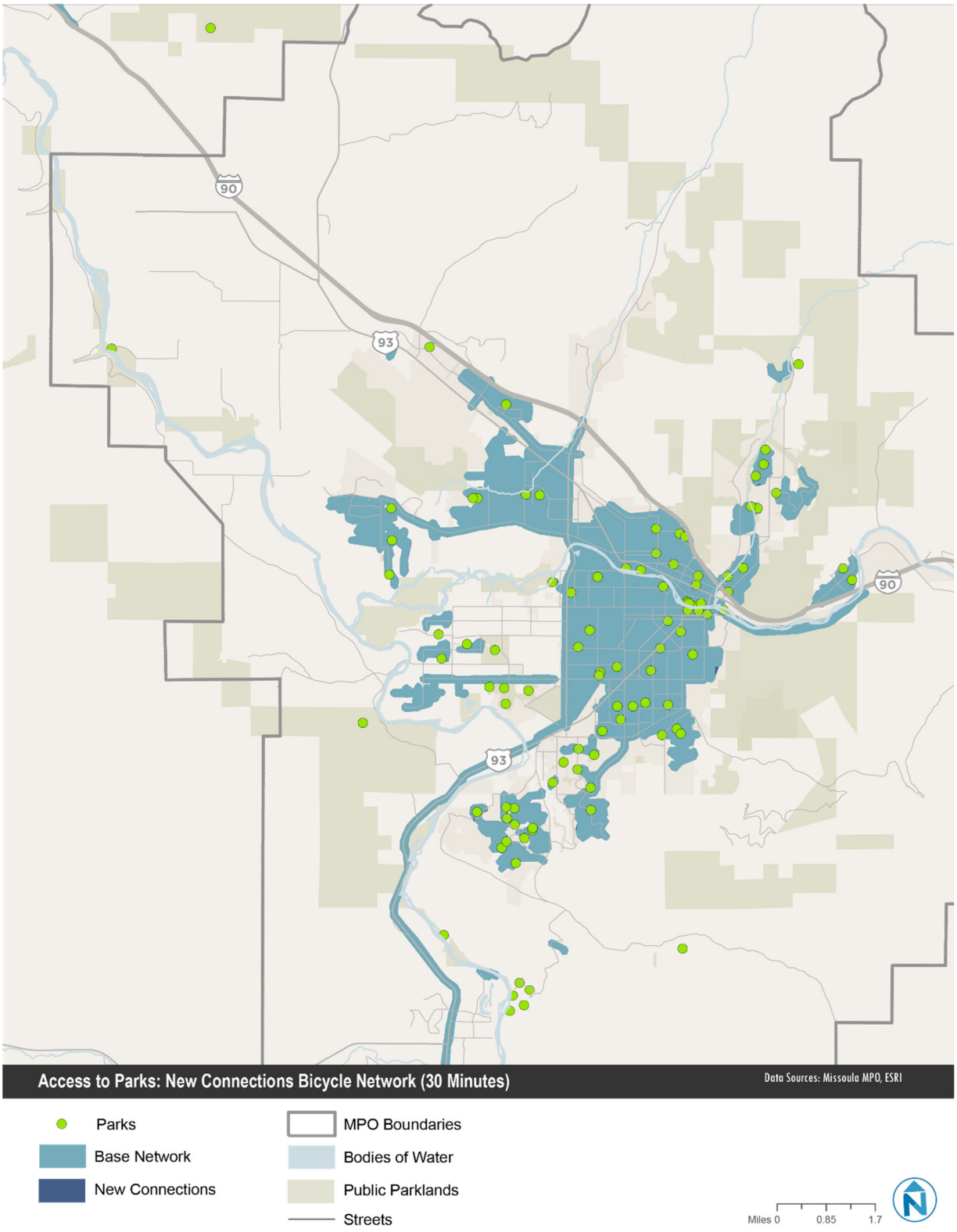


Figure 23 Biking Access to Parks (30 mins) – Enhanced Connections

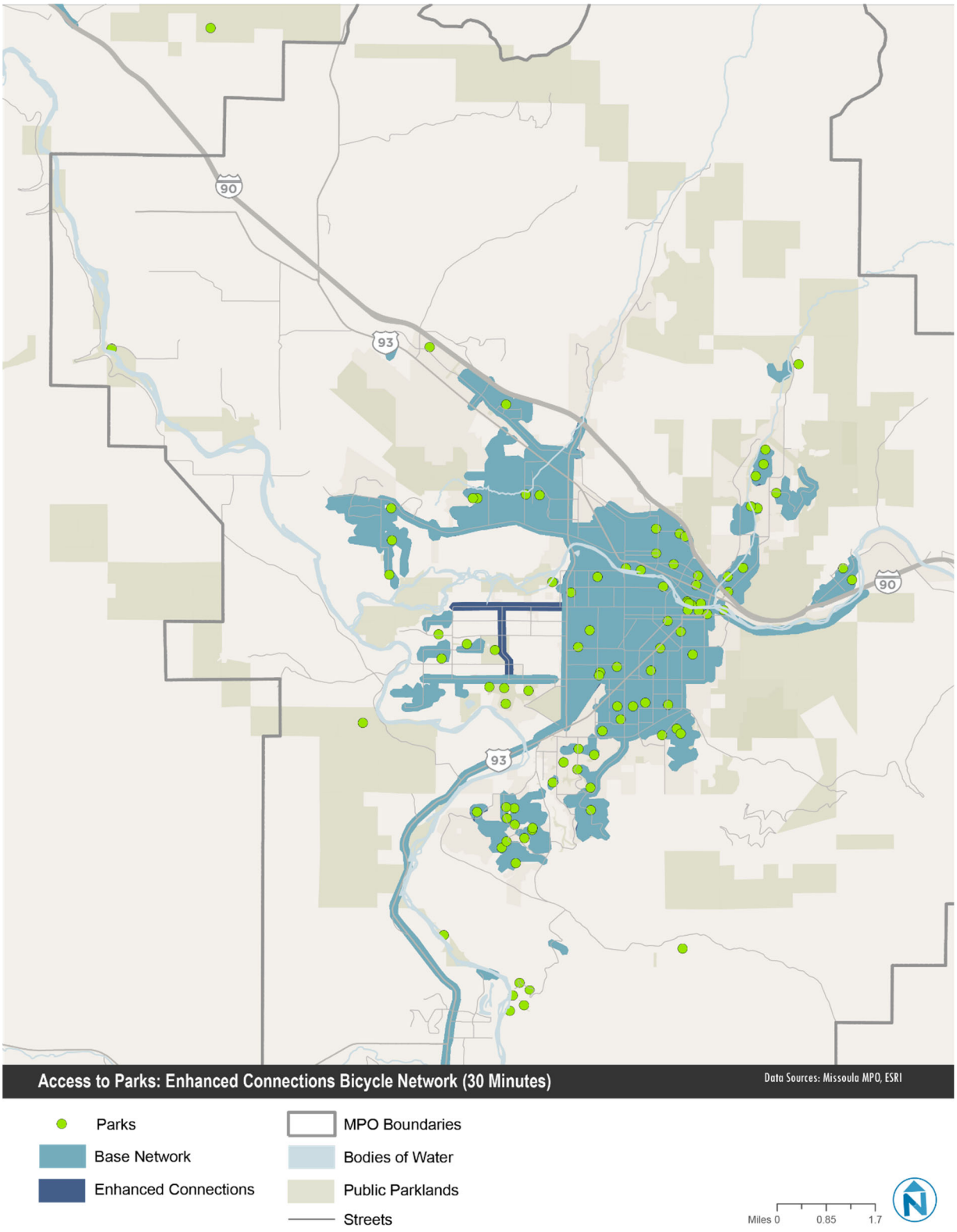
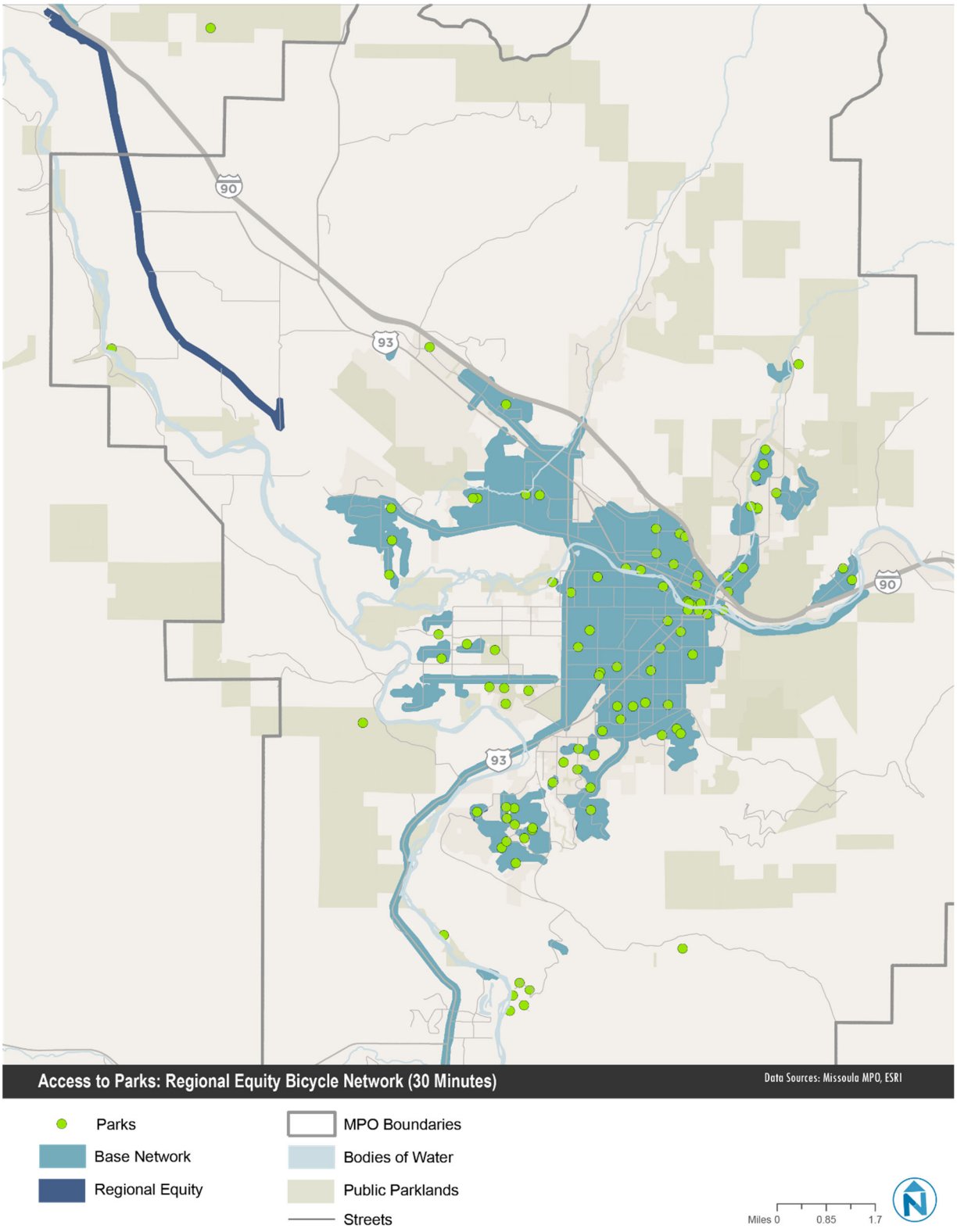


Figure 24 Biking Access to Parks (30 mins) – Regional Equity



SCHOOL ACCESSIBILITY

Increased access to schools is an indicator that the transportation network is supportive of enhanced equity, access to opportunity, and improved public health outcomes. This analysis reveals how each transportation network scenario provides accessibility to schools within a 15- and 30- minute walk or bicycle ride.

As with parks, maps were created by calculating the extent to which someone walking or riding a bicycle could reach schools by using the active transportation facilities provided by each transportation network (Base, New Connections, Enhanced Connections, and Regional Equity). The network for walking includes sidewalks and streets with LTS 1. The network for biking includes on-street bicycle facilities, commuter trails, and LTS 1 streets.

To estimate access, the coverage of each network was overlayed with the point location of schools in the region. For this analysis both public and private schools were included.

Figure 25 through Figure 36 provide maps indicating overall changes in walking and biking access to schools by transportation network scenario. Key findings are as follows:

- Schools within the region's central core are well served by the base pedestrian network.
- All three transportation network scenarios improve pedestrian access to schools in the Grant Creek, South 39th Street, and Lower Rattlesnake neighborhoods.
- With the exception of Orchard Homes in the Enhanced Connections scenario and Frenchtown in the 30-minute travel shed of the Regional Equity scenario, the proposed transportation network scenarios provide limited increased biking access to existing schools. The region's schools are largely served by the base bicycle network.
- DeSmet School, Clark Fork School, and Rattlesnake Elementary, which are not served by the base network, do not benefit from increased bicycle access in any of the three scenarios.

Table 6 and Table 7 show the change in the number of future (2050) households with walking and biking access to schools for one transportation network scenario compared to the base network. For this calculation, we used the transportation network that showed the greatest increase in overall coverage from the base.

The scenarios have a limited impact on the total number of households with walking access to a school, although Regional Equity has a 1% increase in households within a 15-minute walk of schools under both growth scenarios. As with overall network coverage, there is little to no increase in households with access to schools by bicycle in all three transportation scenarios.

Table 6 Household Walking Access to Schools with Regional Equity Scenario – 2050

Growth Scenario	Commute Time	Base	Regional Equity	Change from Base
Business as Usual	15 min	21,406	21,610	1.0%
	30 min	36,162	36,197	0.1%
Strategic Growth	15 min	22,710	22,928	1.0%
	30 min	38,556	38,588	0.1%

Table 7 Household Biking Access to Schools with Enhanced Connections Scenario – 2050

Growth Scenario	Commute Time	Base	Regional Equity	Change from Base
Business as Usual	15 min	32,418	32,421	0.0%
	30 min	32,424	32,424	0.0%
Strategic Growth	15 min	35,185	35,189	0.0%
	30 min	35,190	35,190	0.0%

Figure 25 Walking Access to Schools (15 mins) – New Connections

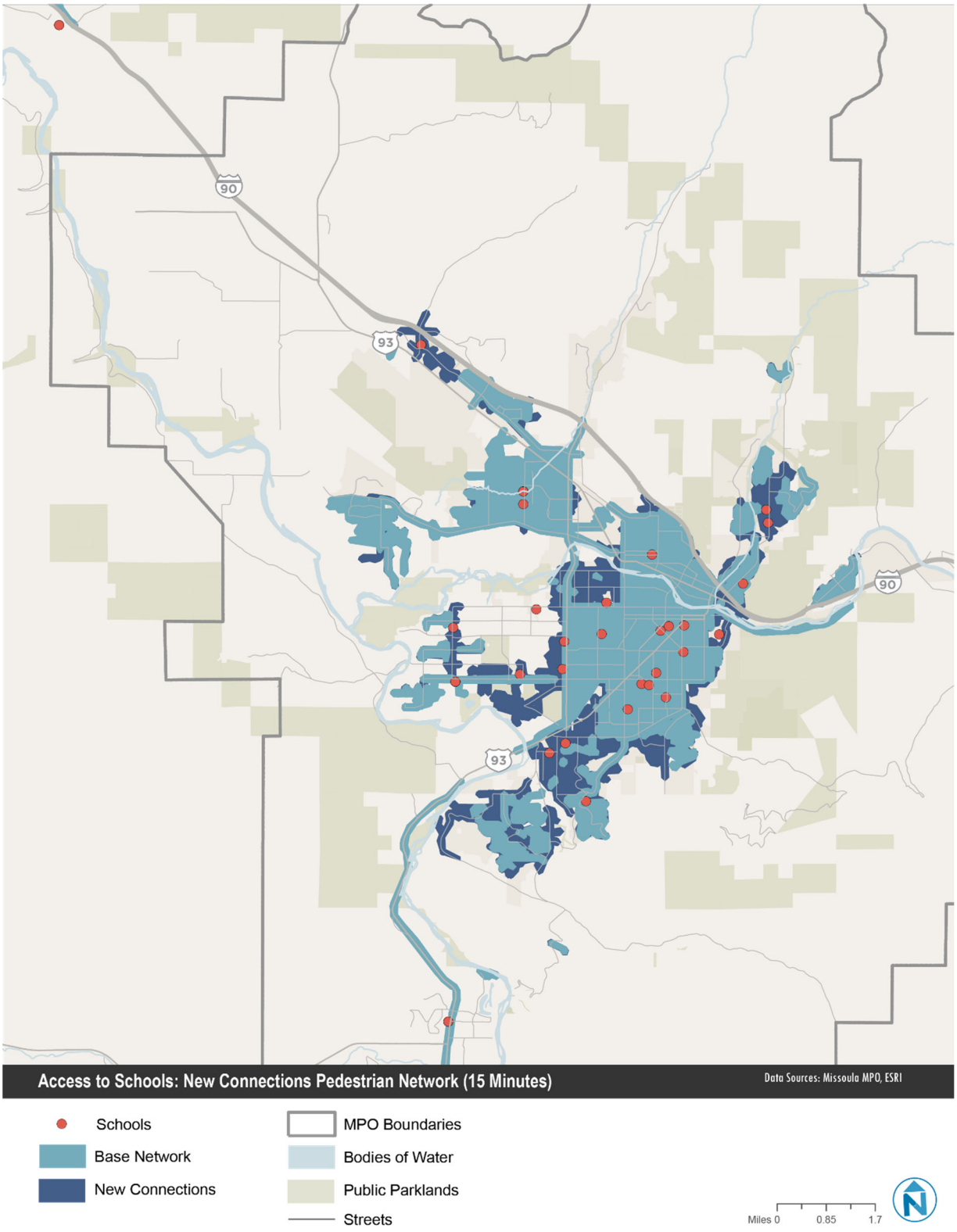


Figure 26 Walking Access to Schools (15 mins) – Enhanced Connections

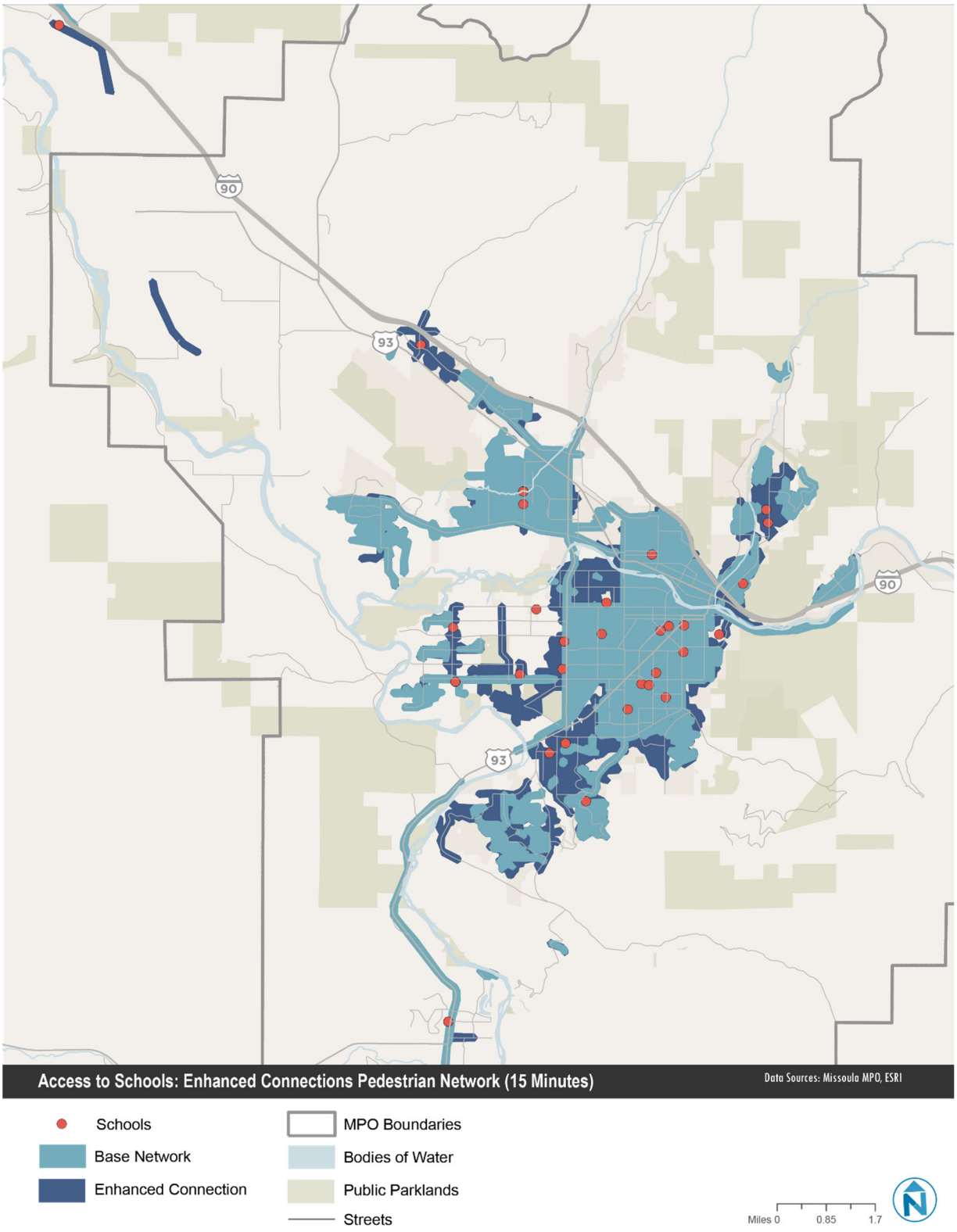


Figure 27 Walking Access to Schools (15 mins) – Regional Equity

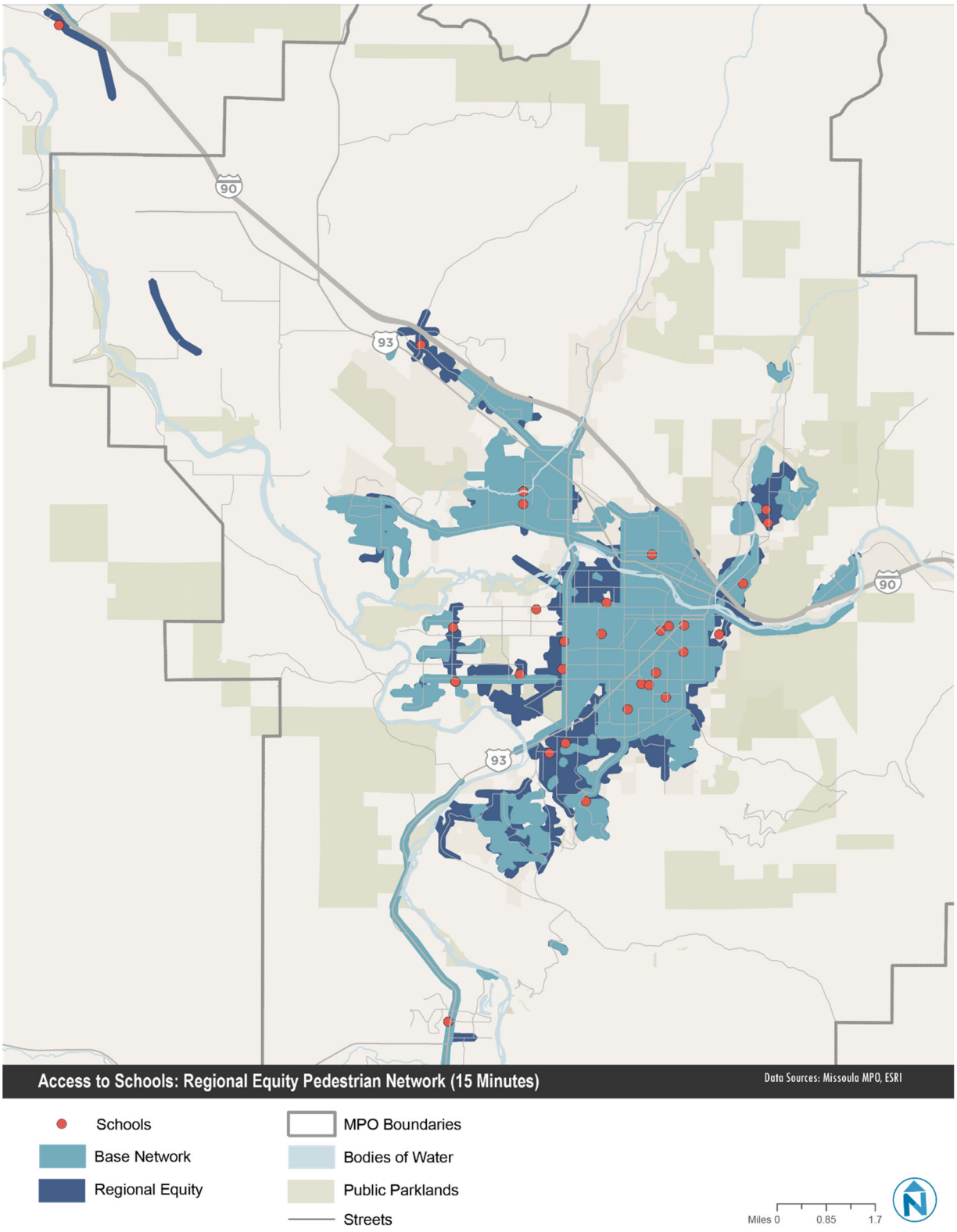


Figure 28 Walking Access to Schools (30 mins) – New Connections

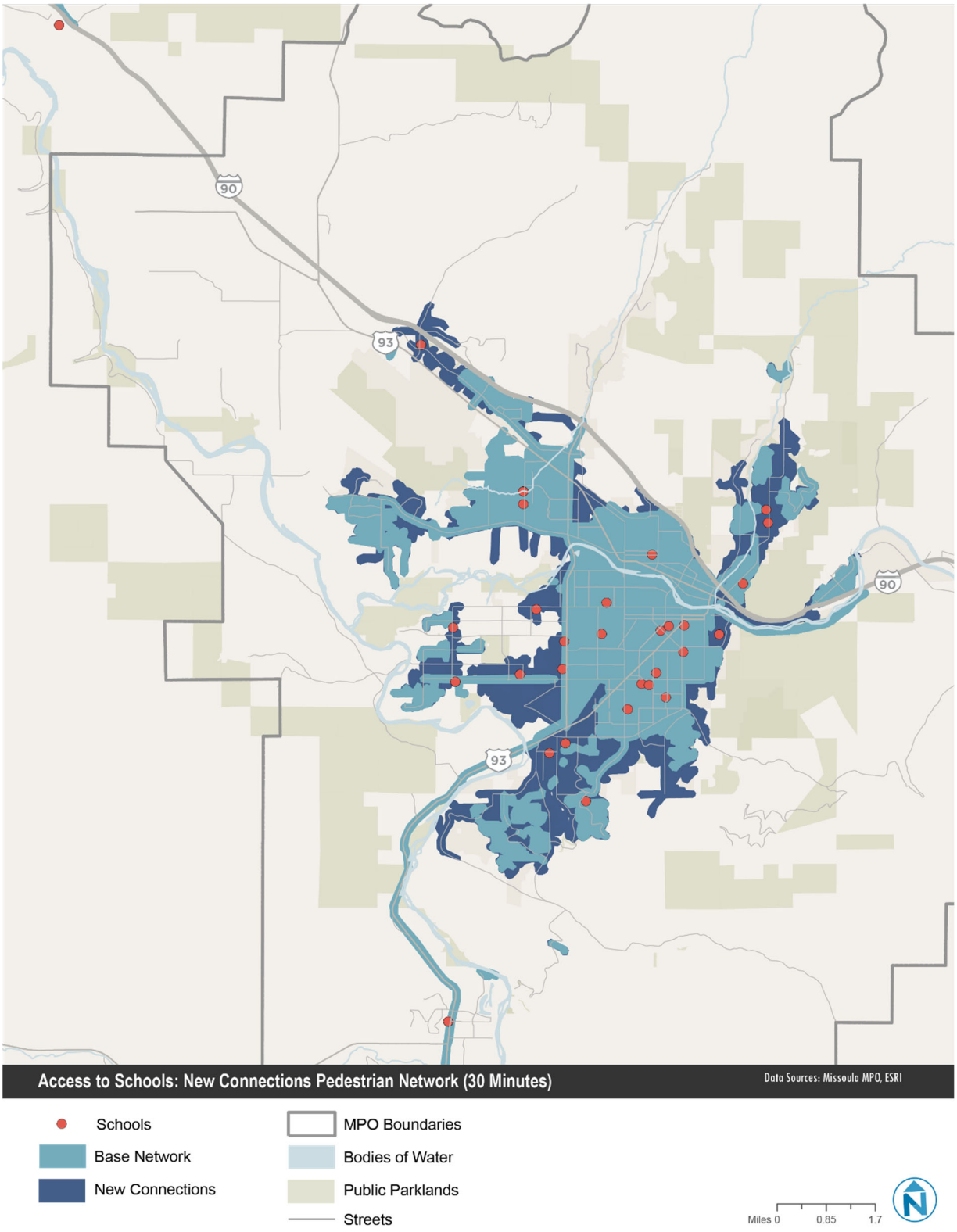


Figure 29 Walking Access to Schools (30 mins) – Enhanced Connections

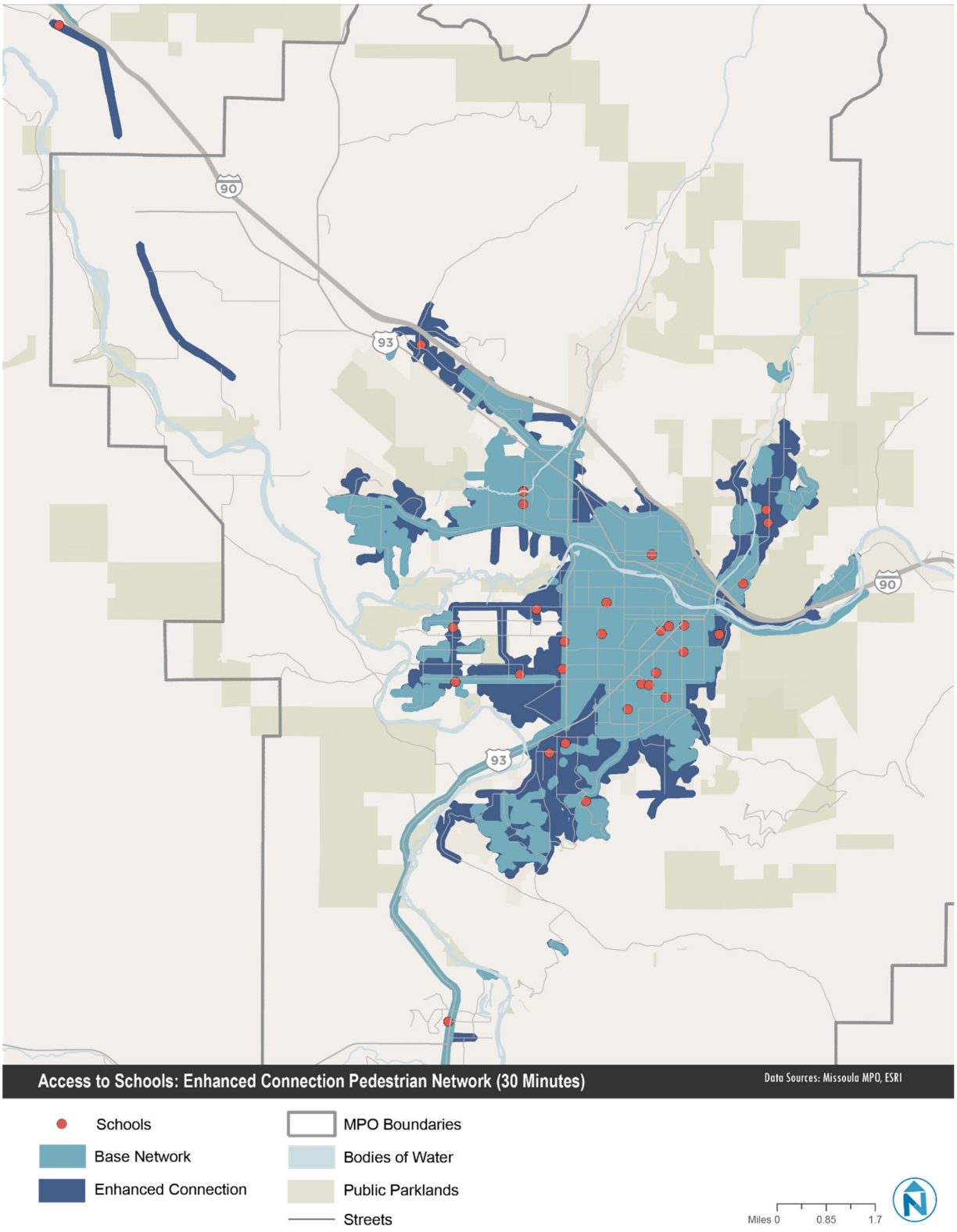


Figure 30 Walking Access to Schools (30 mins) – Regional Equity

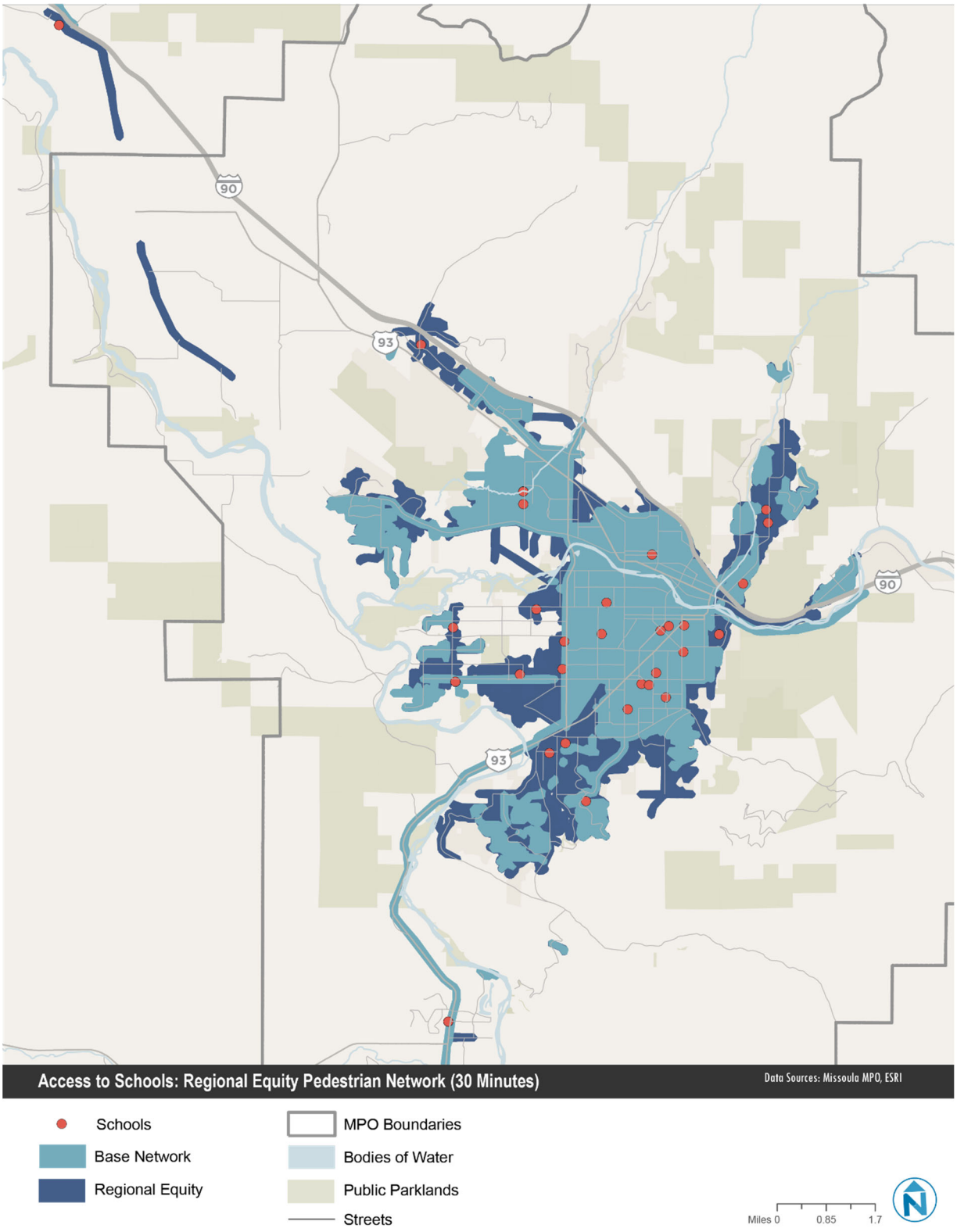


Figure 31 Biking Access to Schools (15 mins) – New Connections

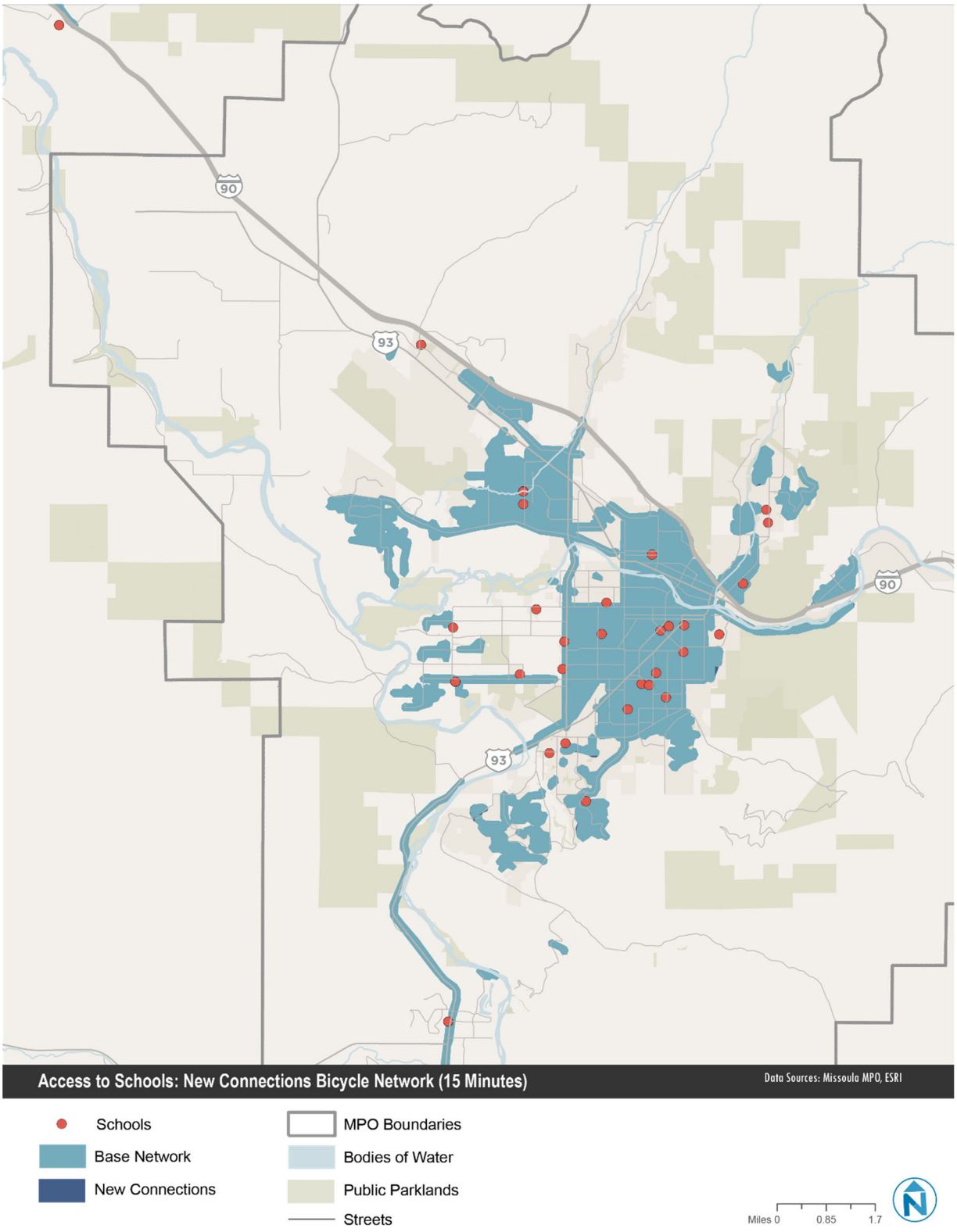


Figure 32 Biking Access to Schools (15 mins) – Enhanced Connections

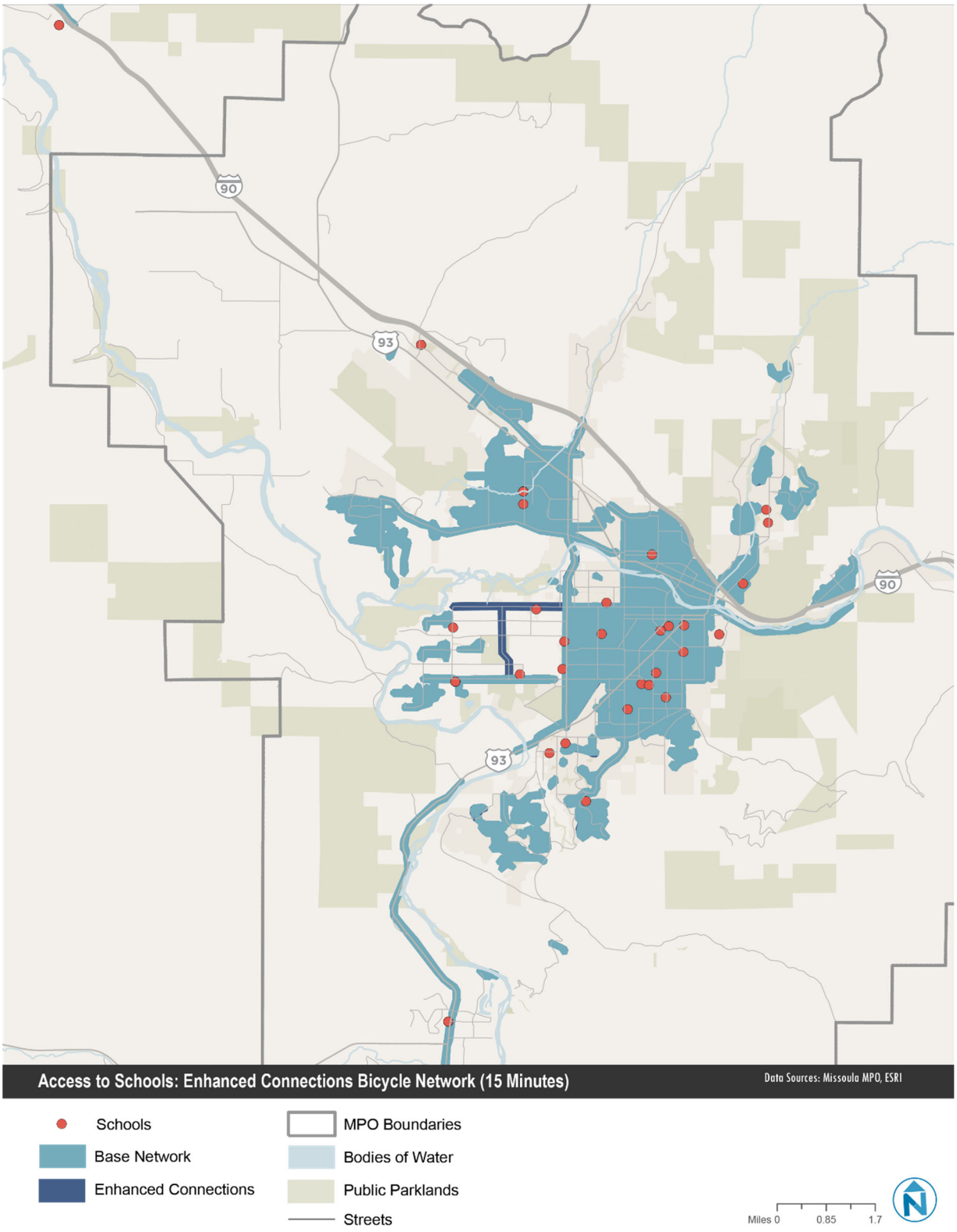


Figure 33 Biking Access to Schools (15 mins) – Regional Equity

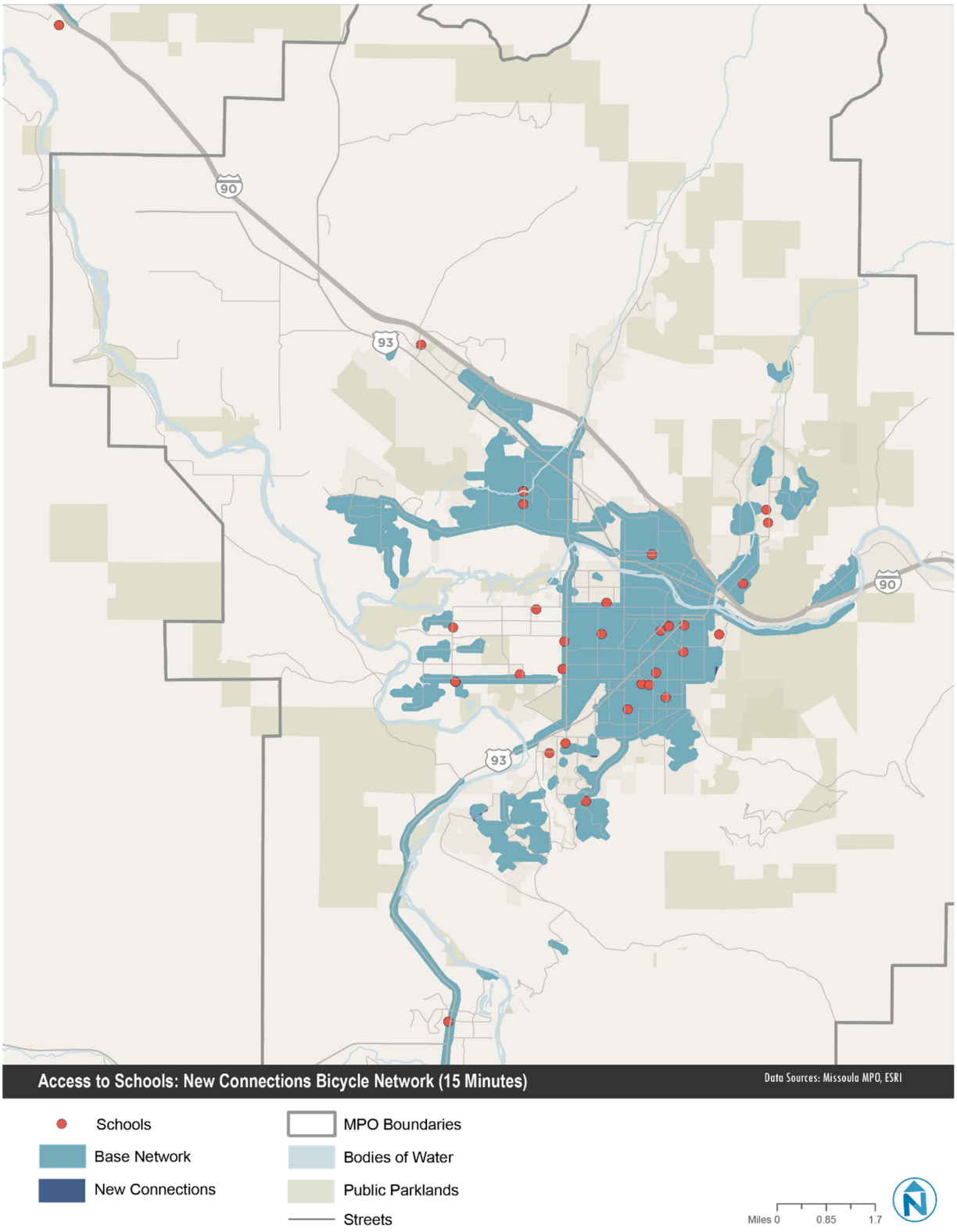


Figure 34 Biking Access to Schools (30 mins) – New Connections

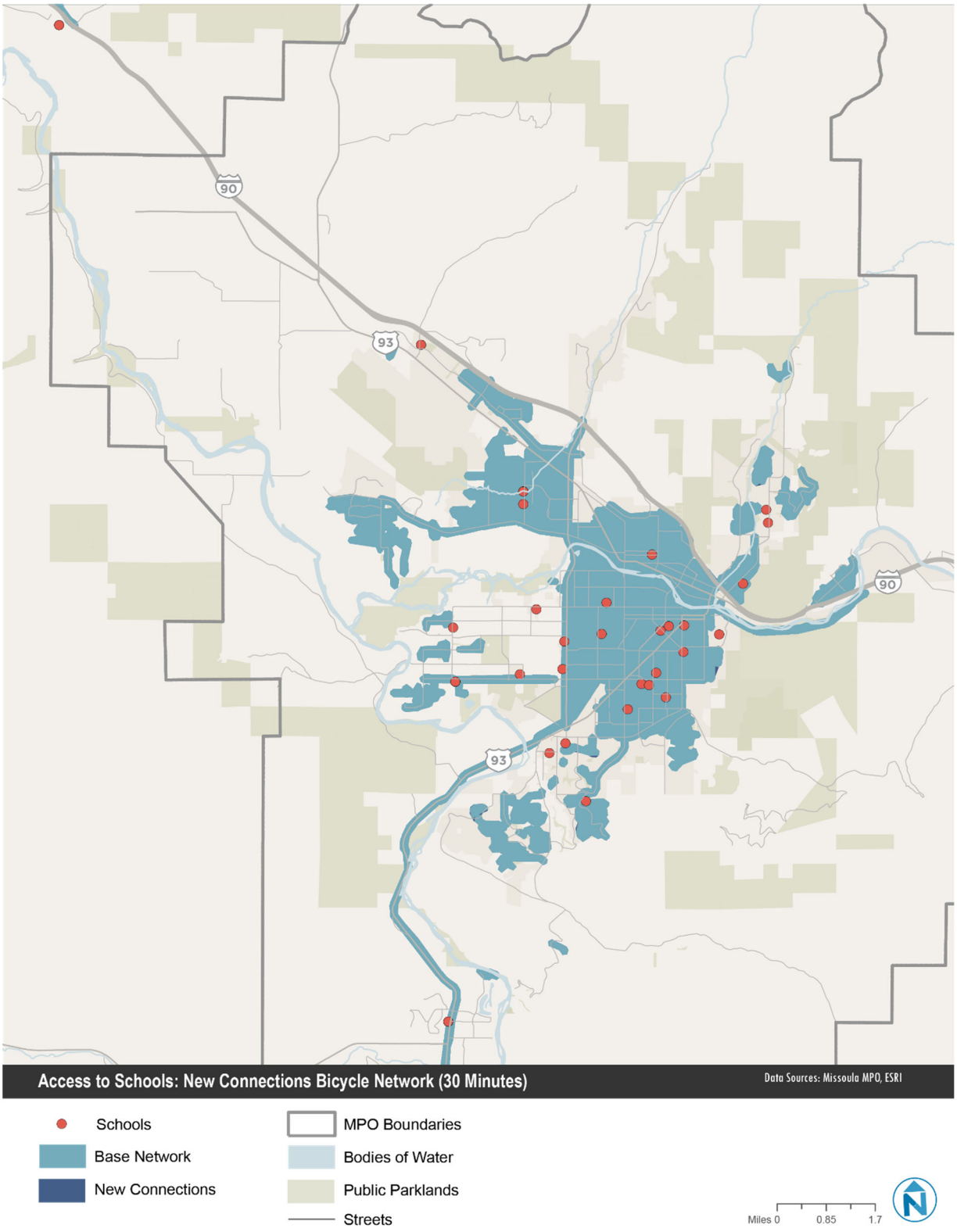


Figure 35 Biking Access to Schools (30 mins) – Enhanced Connections

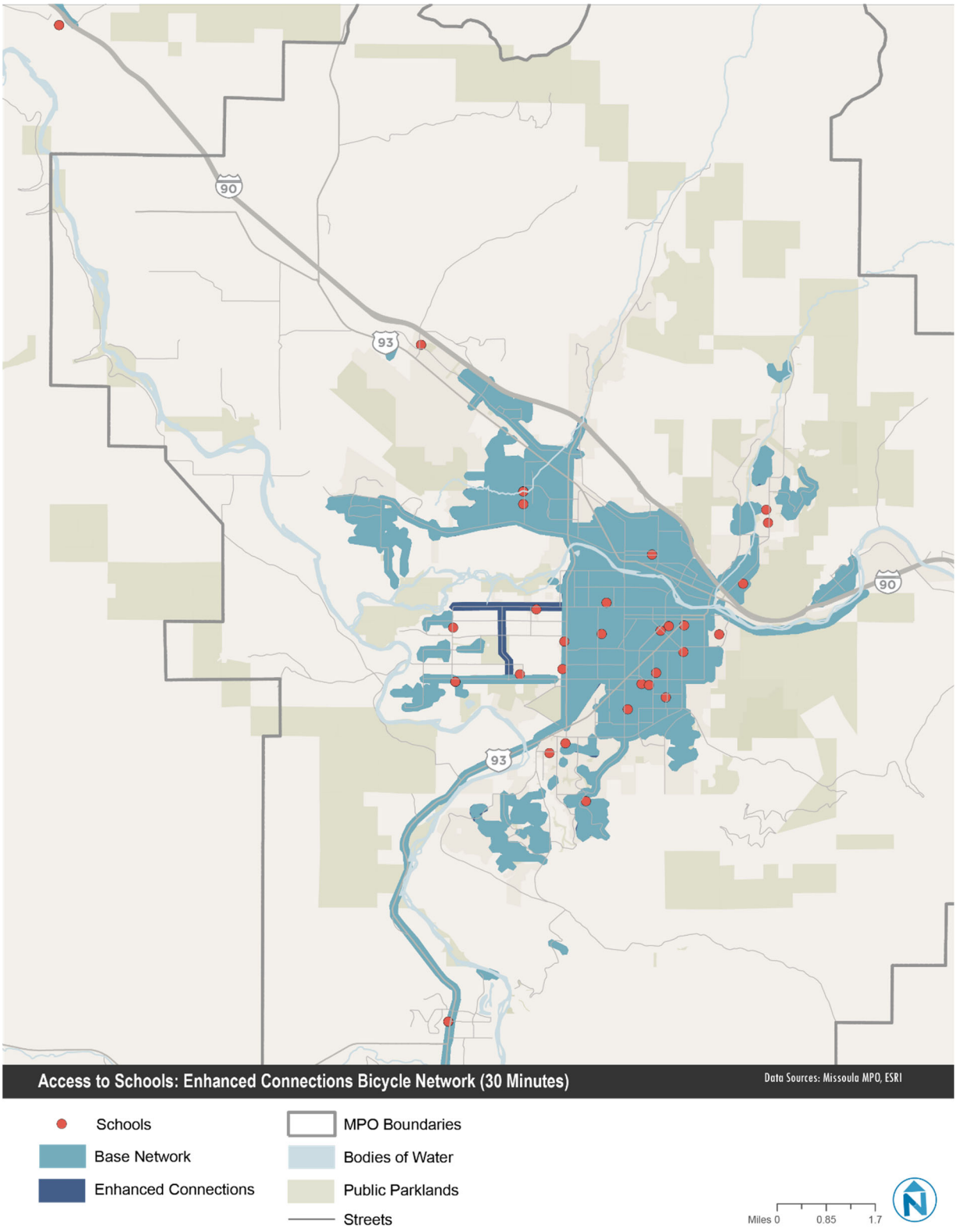
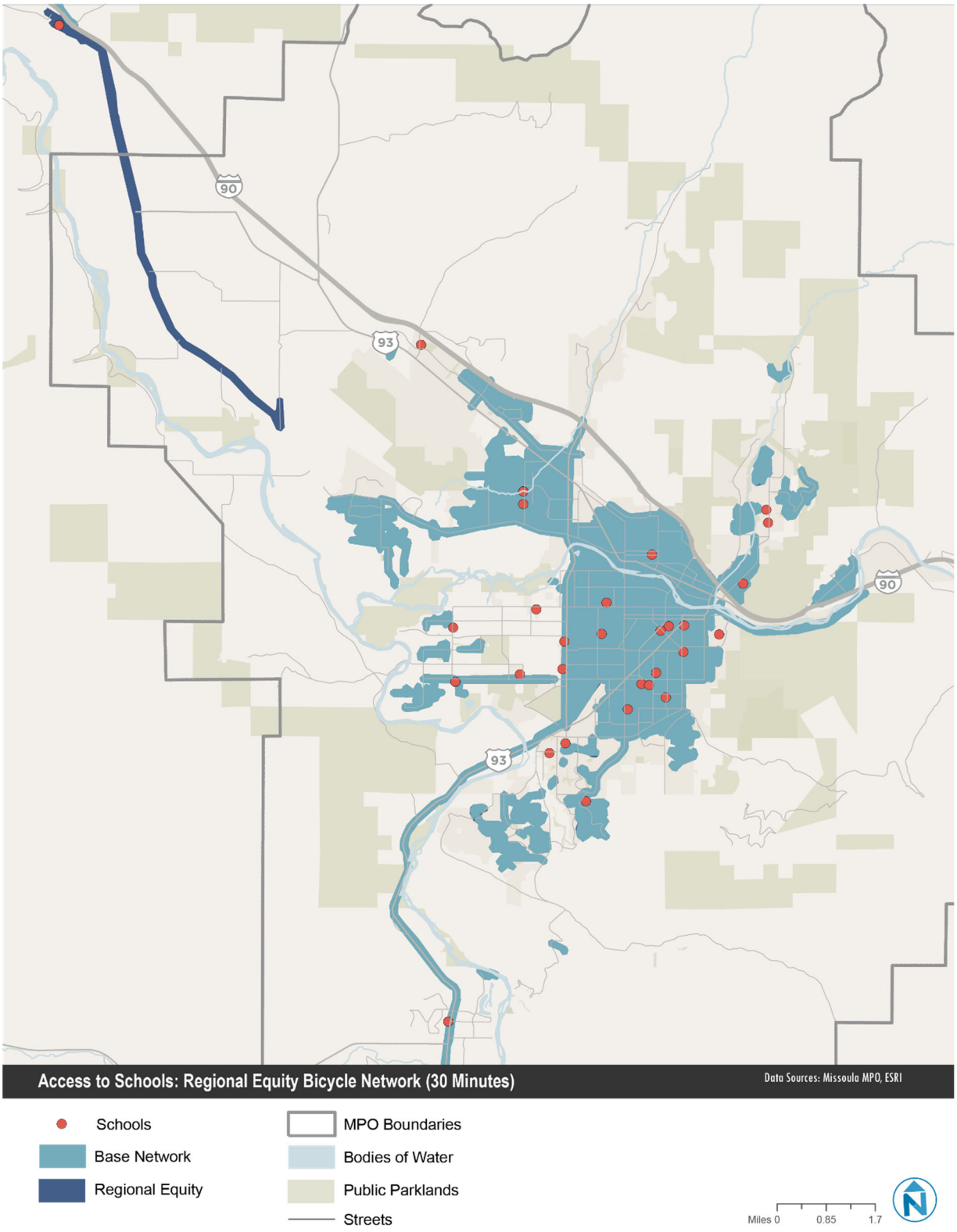


Figure 36 Biking Access to Schools (30 mins) – Regional Equity



SOCIAL SERVICES ACCESSIBILITY

Increased access to social services is an indicator that the transportation network is supportive of enhanced equity, access to opportunity, and improved public health outcomes. This analysis reveals how each transportation network scenario provides accessibility to social service providers within a 15- and 30-minute walk or bicycle ride under both Business as Usual and Strategic Growth scenarios in 2050.

As with schools, maps were created by calculating the extent to which someone walking or riding a bicycle could reach social services by using the active transportation facilities provided by each transportation network (Base, New Connections, Enhanced Connections, and Regional Equity). The network for walking includes sidewalks and streets with LTS 1. The network for biking includes on-street bicycle facilities, commuter trails, and LTS 1 streets.

To estimate access, the coverage of each network was overlayed with the point location of social service facilities in the region. For this analysis, social service facilities include healthcare clinics, senior centers, substance and mental health facilities, emergency food and housing, veterans' associations, and family or children's services.

Figure 37 through Figure 48 provide maps indicating overall changes in walking and biking access to social services by transportation network scenario. Key findings are as follows:

- Most social service facilities are accessible via the existing pedestrian network within a 15-minute walk, with all but the Watson's Children's Shelter accessible within a 30-minute walk.
- All three transportation network scenarios improve bicycle access to social service facilities that are served by the base transportation network, particularly those located in the central core and the Riverfront area.
- However, the transportation network scenarios do not provide access to those few social services facilities that are not currently served by the base transportation network.

Table 8 and Table 9 show the change in the number of future (2050) households with walking and biking access to social services for one transportation network scenario compared to the base network. For this calculation, we used the transportation network that showed the greatest increase in overall coverage from the base.

As with overall network coverage, there would be little to no increase in households with access to social services by walking or biking in any of the transportation scenarios. The greatest impact to access comes from the Strategic Growth scenario (compared to Business as Usual). Concentrating more households in the core of the region increases the number of households with access to social services, which are largely located in the central part of Missoula.

Table 8 Household Walking Access to Social Services in Regional Equity Scenario – 2050

Growth Scenario	Commute Time	Base	Regional Equity	Change from Base
Business as Usual	15 min	27,526	27,526	0%
	30 min	36,775	36,778	0%
Strategic Growth	15 min	29,027	29,030	0%
	30 min	39,176	39,176	0%

Table 9 Household Biking Access to Social Services in Enhanced Connections Scenario – 2050

Growth Scenario	Commute Time	Base	Enhanced Connections	Change from Base
Business as Usual	15 min	31,959	31,960	0%
	30 min	32,370	32,370	0%
Strategic Growth	15 min	34,742	34,749	0%
	30 min	35,156	35,156	0%

Figure 37 Walking Access to Social Services (15 mins) – New Connections

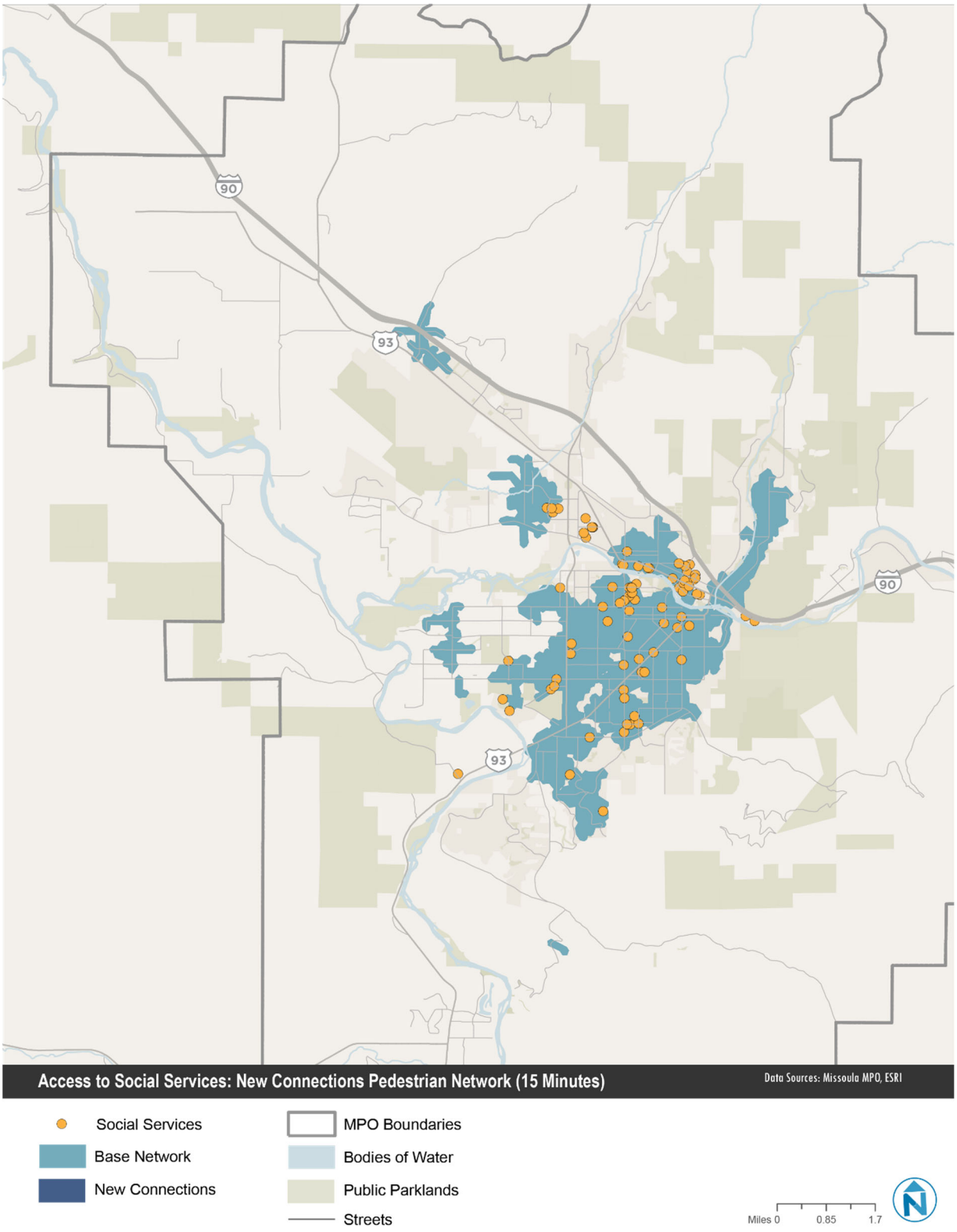


Figure 38 Walking Access to Social Services (15 mins) – Enhanced Connections

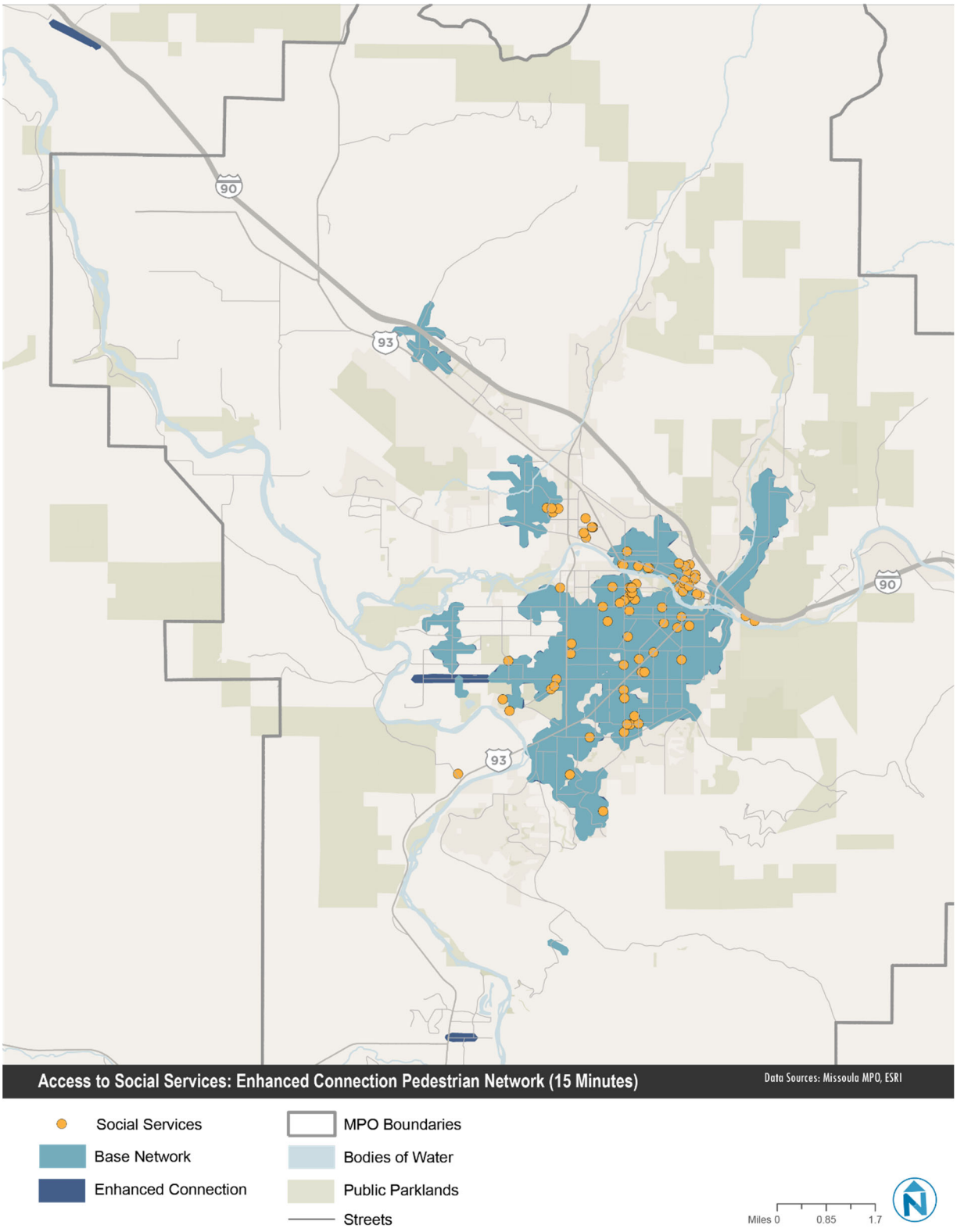


Figure 39 Walking Access to Social Services (15 mins) – Regional Equity

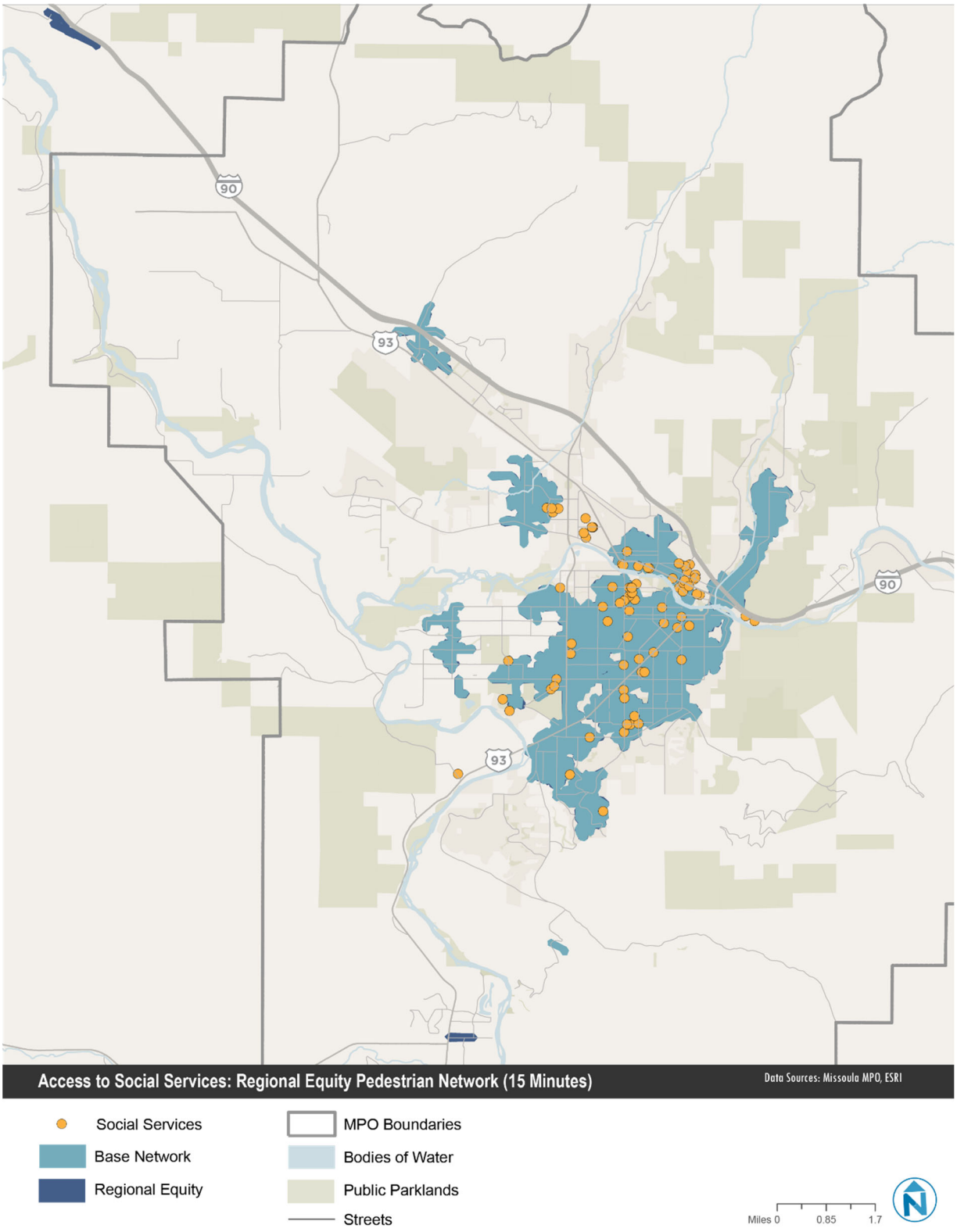


Figure 40 Walking Access to Social Services (30 mins) – New Connections

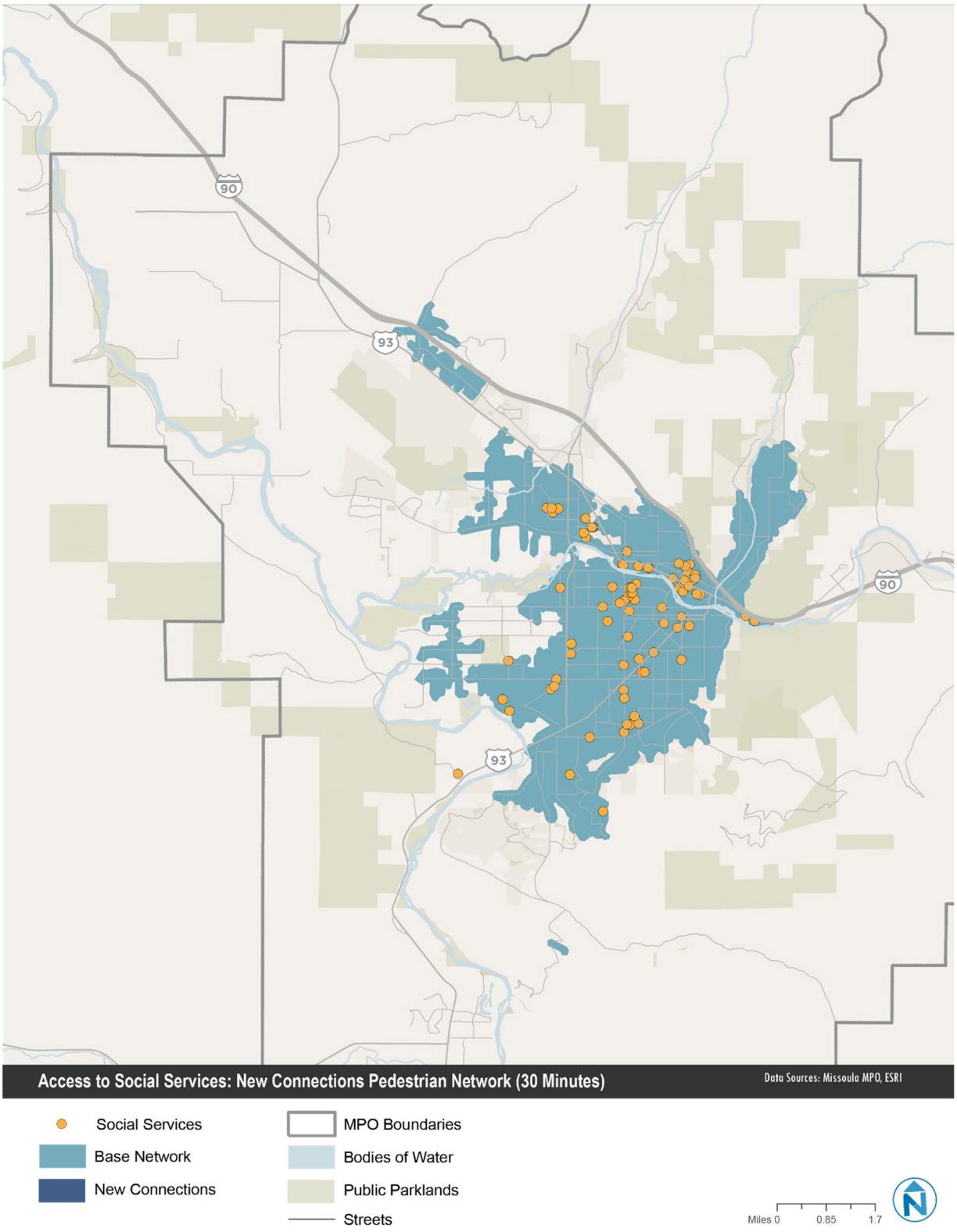


Figure 41 Walking Access to Social Services (30 mins) – Enhanced Connections

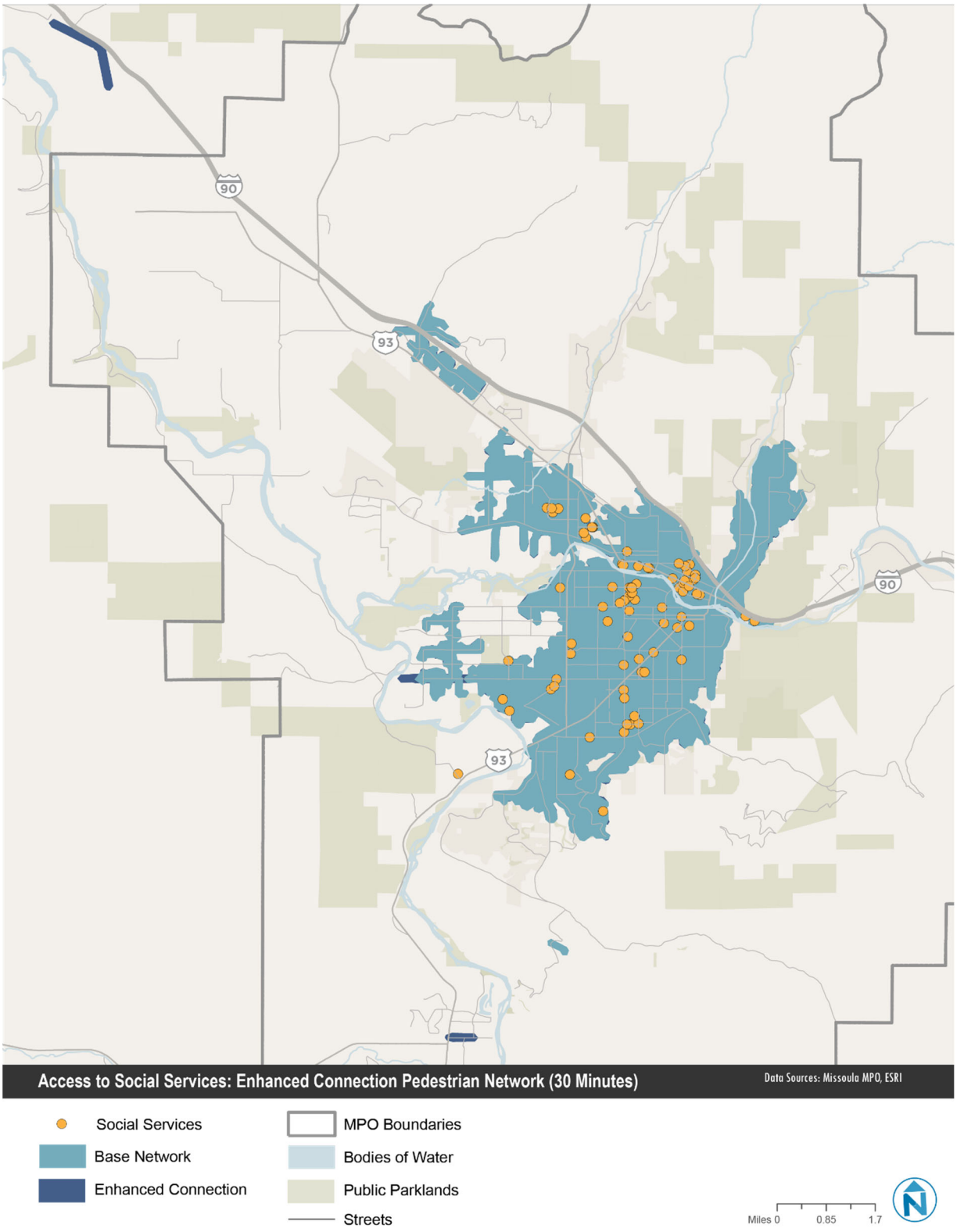


Figure 42 Walking Access to Social Services (30 mins) – Regional Equity

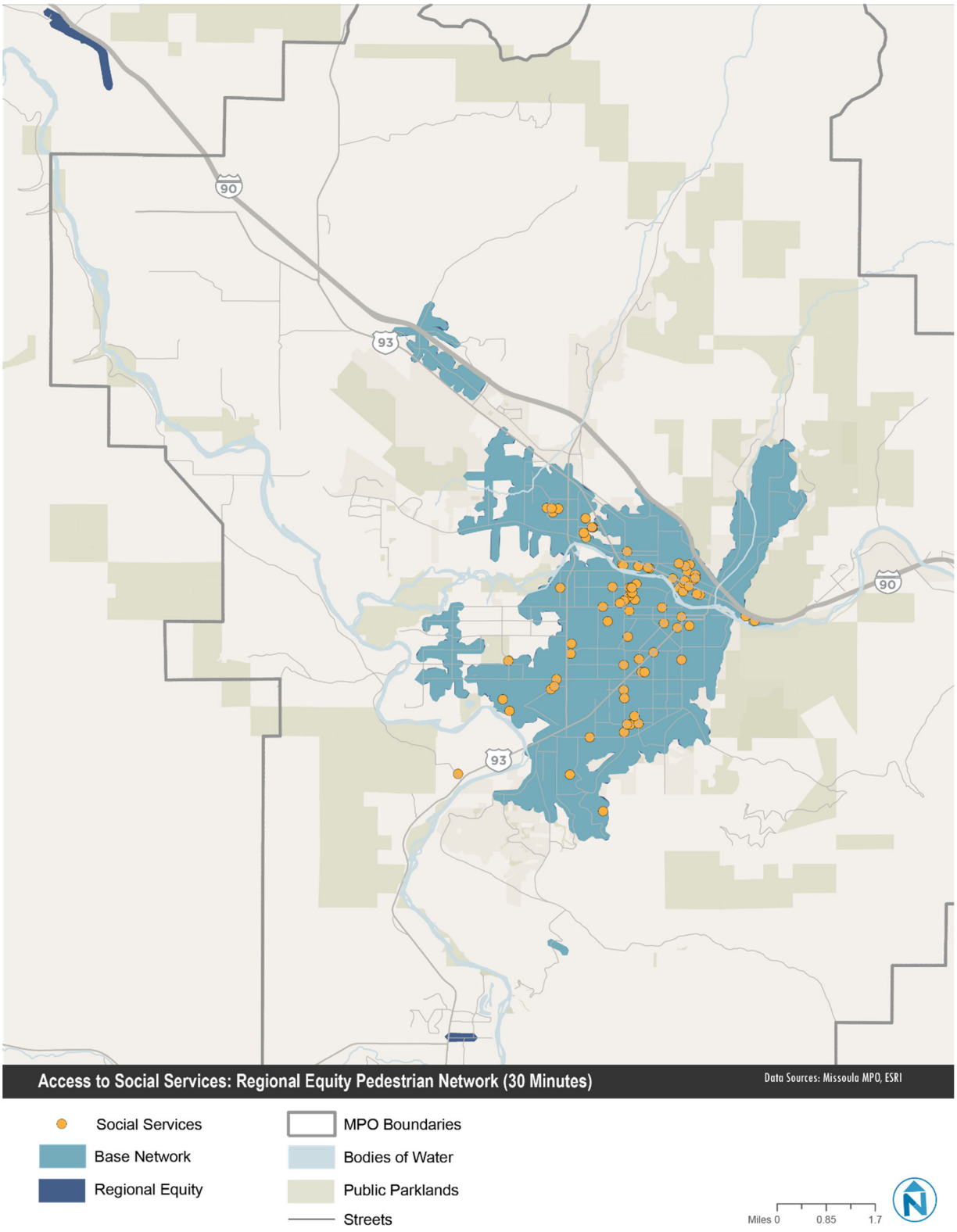


Figure 43 Biking Access to Social Services (15 mins) – New Connections

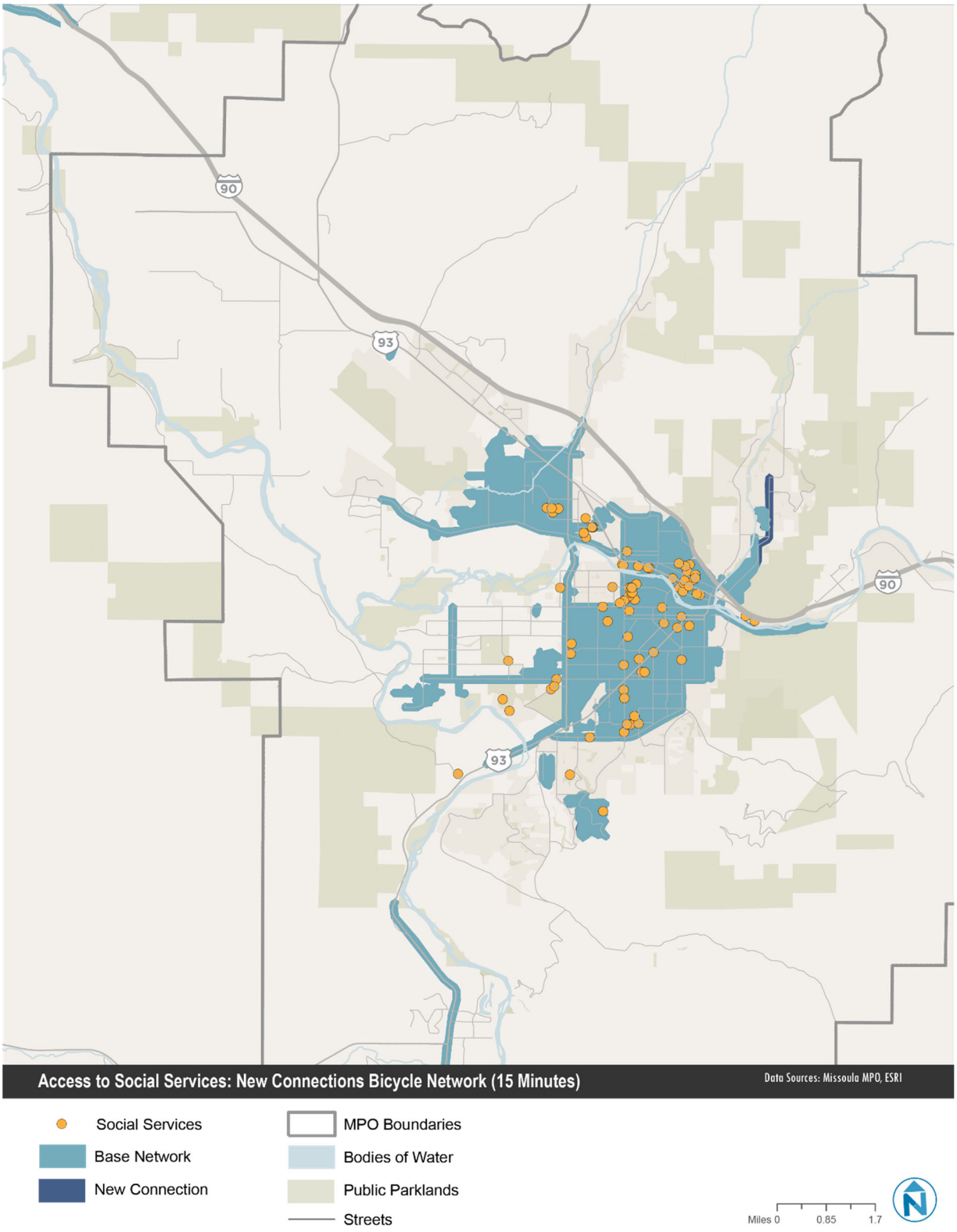


Figure 44 Biking Access to Social Services (15 mins) – Enhanced Connections

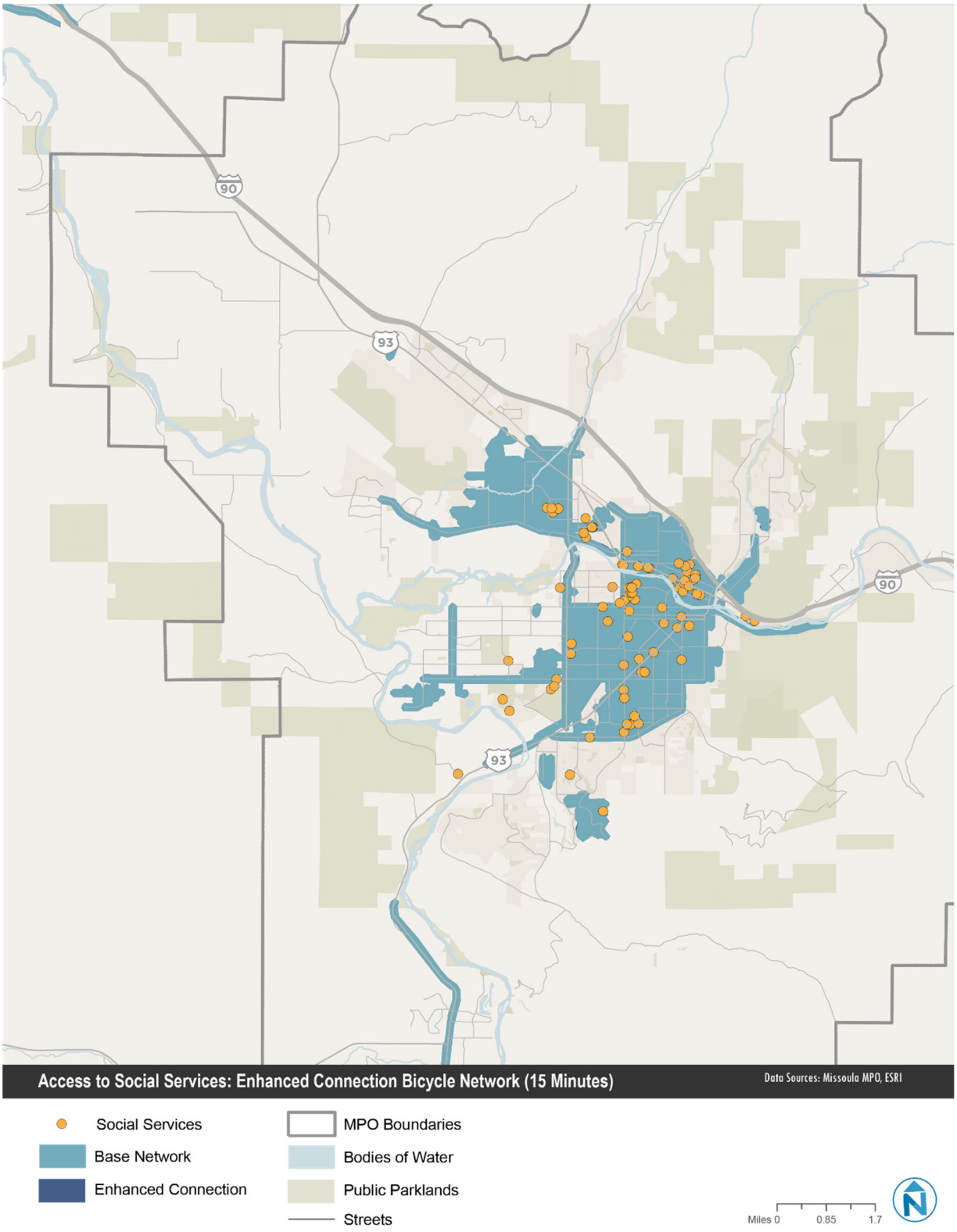


Figure 45 Biking Access to Social Services (15 mins) – Regional Equity

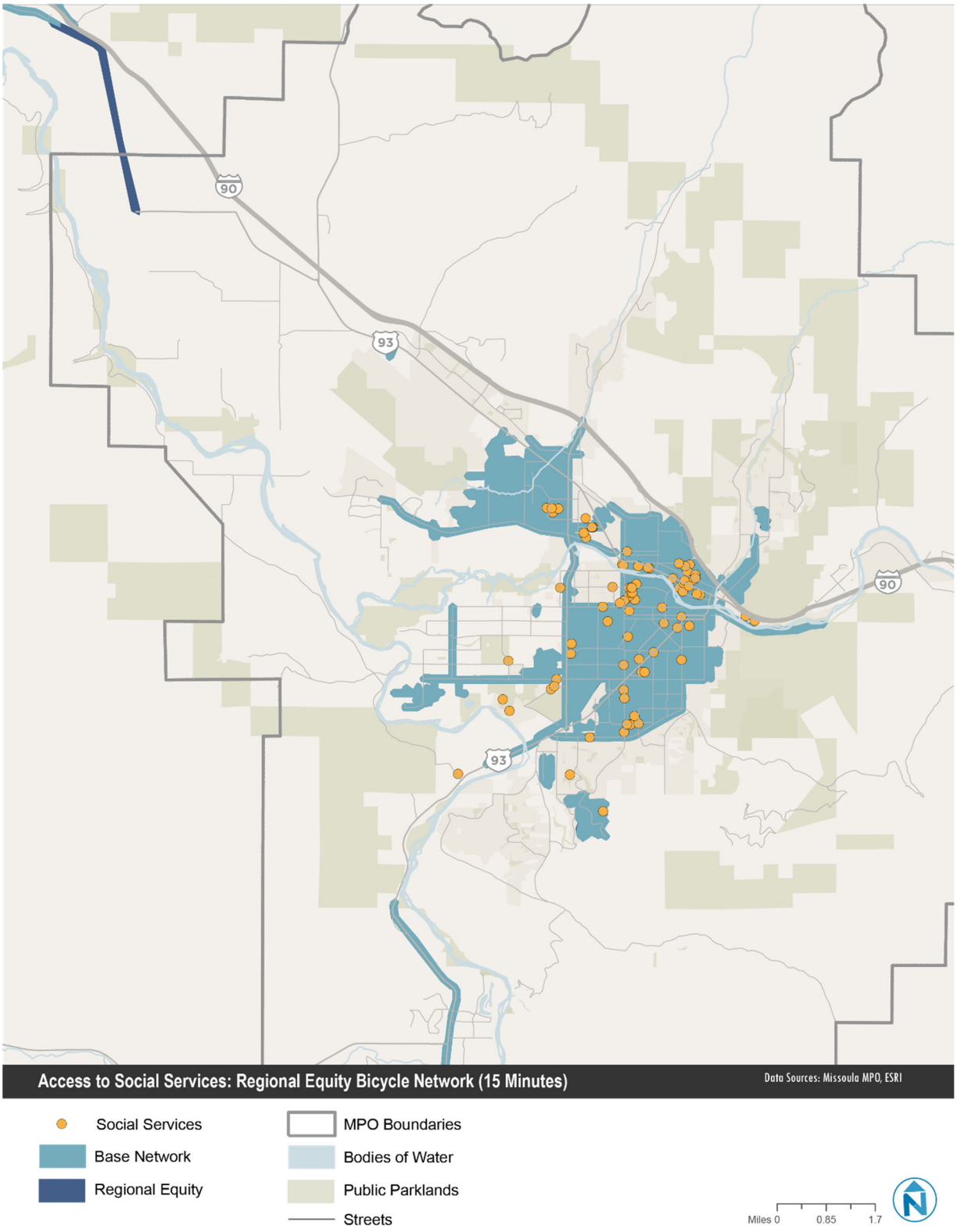


Figure 46 Biking Access to Social Services (30 mins) – New Connections

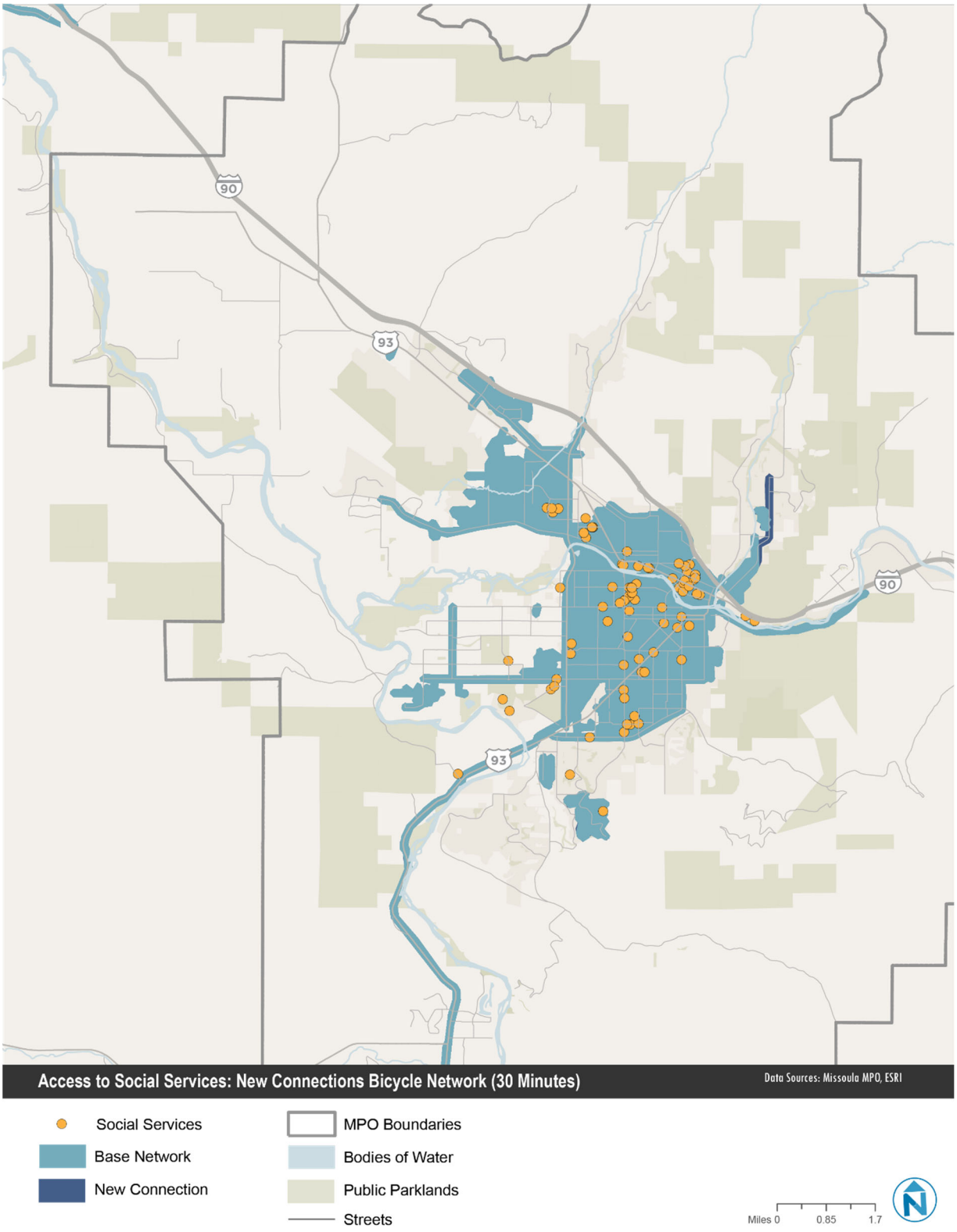


Figure 47 Biking Access to Social Services (30 mins) – Enhanced Connections

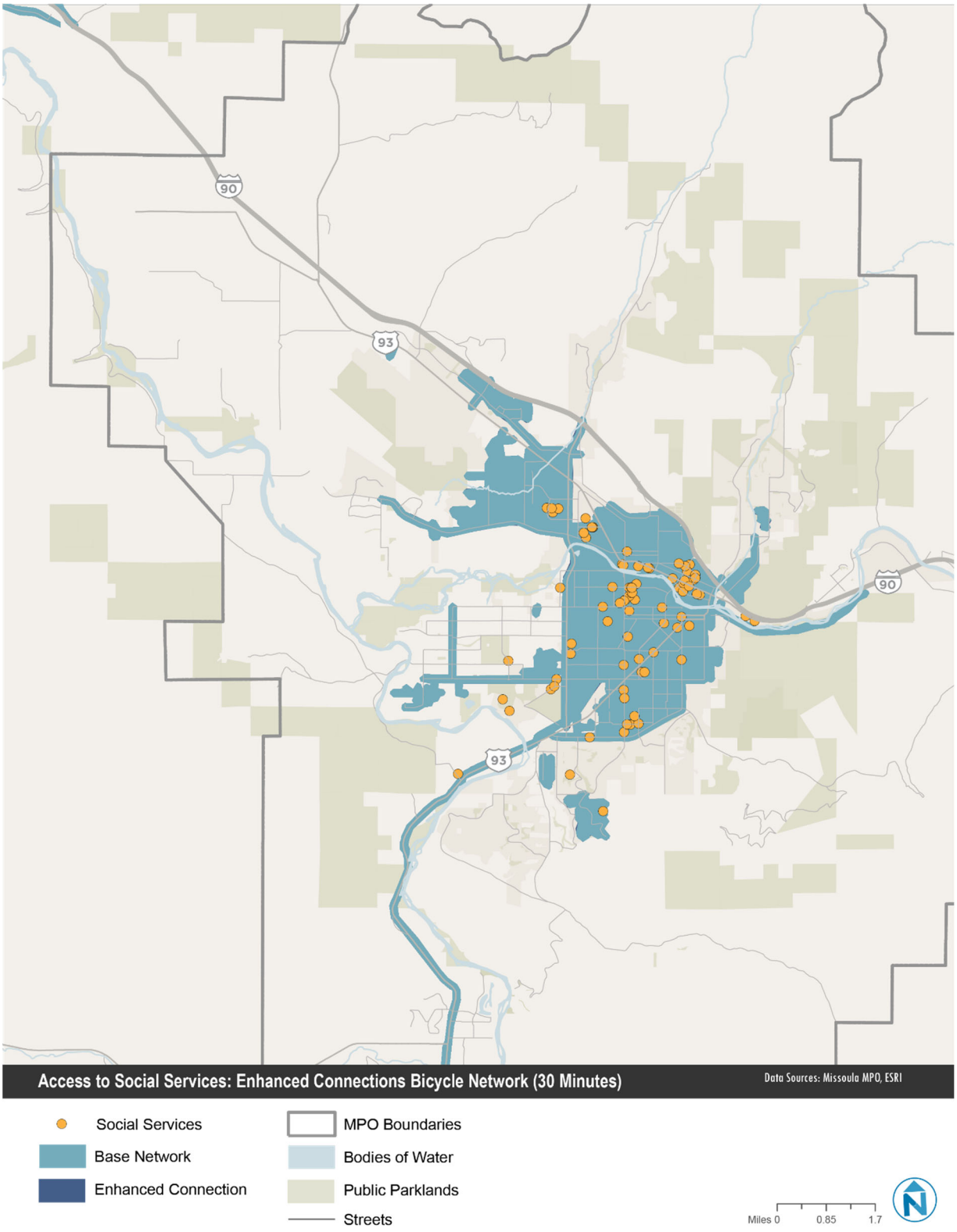
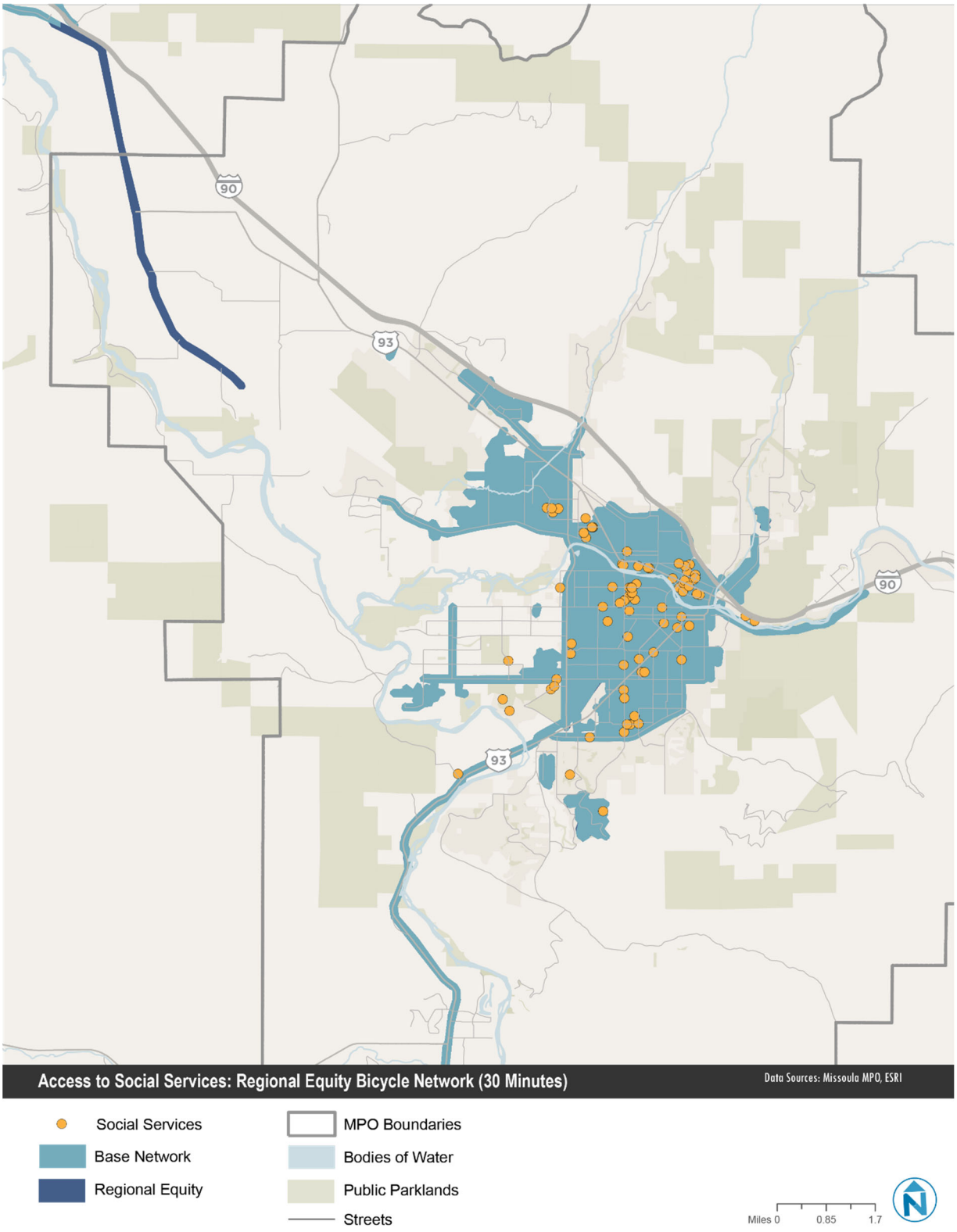


Figure 48 Biking Access to Social Services (30 mins) – Regional Equity



BICYCLE CONNECTIVITY

For a bicycling network to attract as many people as possible, it is critical to improve low-stress connectivity. This means providing routes that allow people riding bicycles to use connections that are within their tolerance for traffic stress and that avoid undue detours.

For this analysis, bicycle improvement projects from each transportation network scenario were overlayed with existing commuter trails and roadways categorized in the 2016 Bicycle Facilities Master Plan as Level of Traffic Stress 1 (LOTS 1). Level of Traffic Stress was determined based on factors such as posted speed limit, traffic volume, street width, and the presence or character of bicycle lanes. LOTS 1 roadways are generally low stress and suitable for all ages and abilities. Clusters of connected roadways and facilities were symbolized with different colors.

To compare scenarios, we also calculated the miles of bicycle projects from each transportation network that would be added to existing on-street facilities that have an LOTS higher than 1. This helps to explain the full scope of the bicycle network that might feel comfortable to a more experienced bicyclist (Table 10).

Figure 49 to Figure 52 depict connected clusters of streets and bicycle facilities within the Missoula region that are suitable for all ages and abilities. In general, existing roadways that are considered comfortable do not provide access between different parts of the region or between neighborhoods. Rather, clusters are fragmented and often “break” at major roadways. Future bicycle improvements that are included in the Enhanced Connections and Regional Equity scenarios—such as protected bike facilities, new crossing improvements, neighborhood greenways, and shared-use paths—would link many of the existing clusters and could increase the percentage of residents who feel comfortable bicycling.

Table 10 Miles of Connected Low-Stress Facilities

Network Scenario	Level of Traffic Stress 1 (LOTS 1) & Commuter Trails	LOTS 1, Commuter Trails, & Existing Bicycle Facilities
Base	50	160
New Connections	74	168
Enhanced Connections	160	210
Regional Equity	175	226

Figure 49 Bicycle Connectivity – Base Network

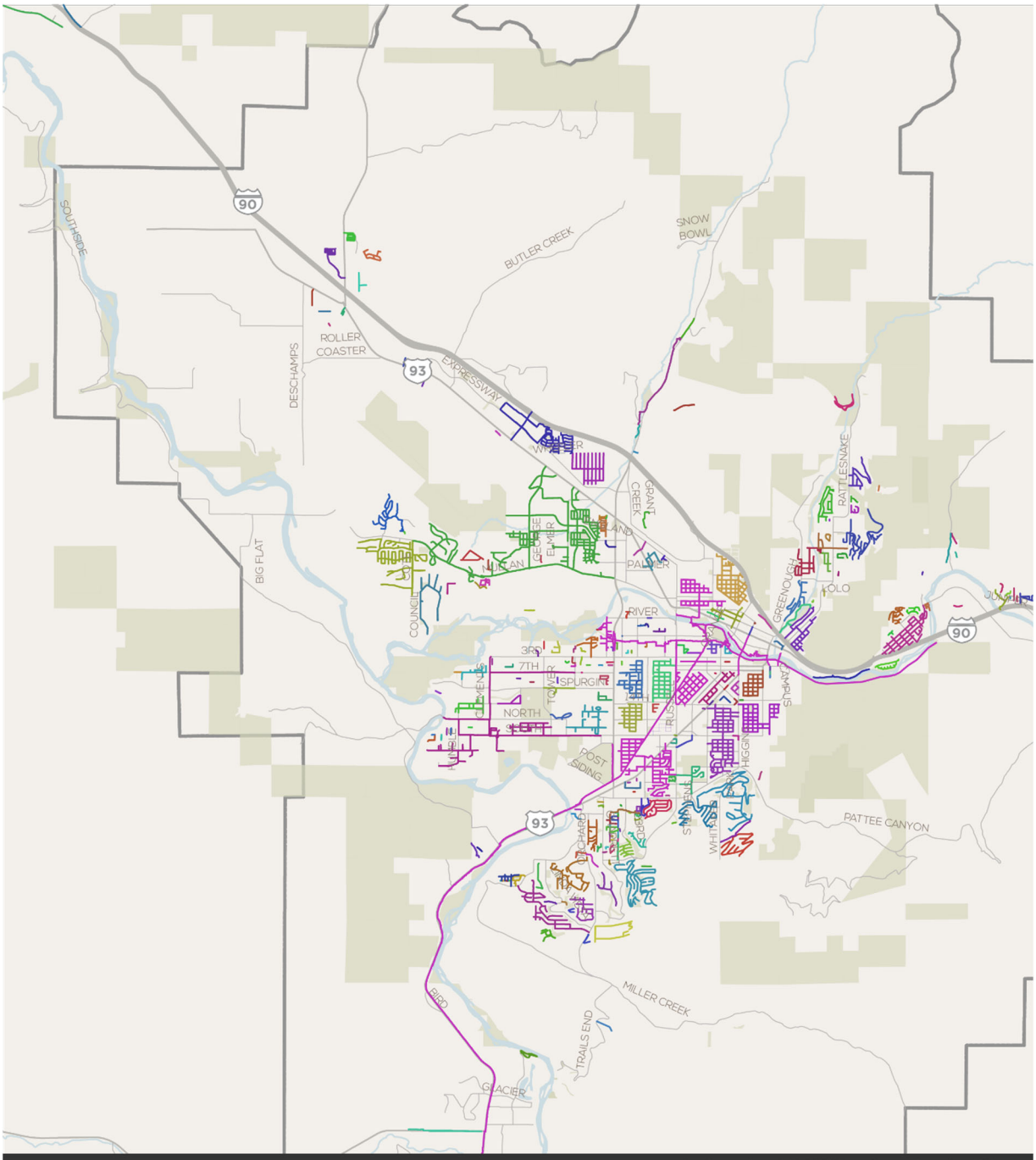
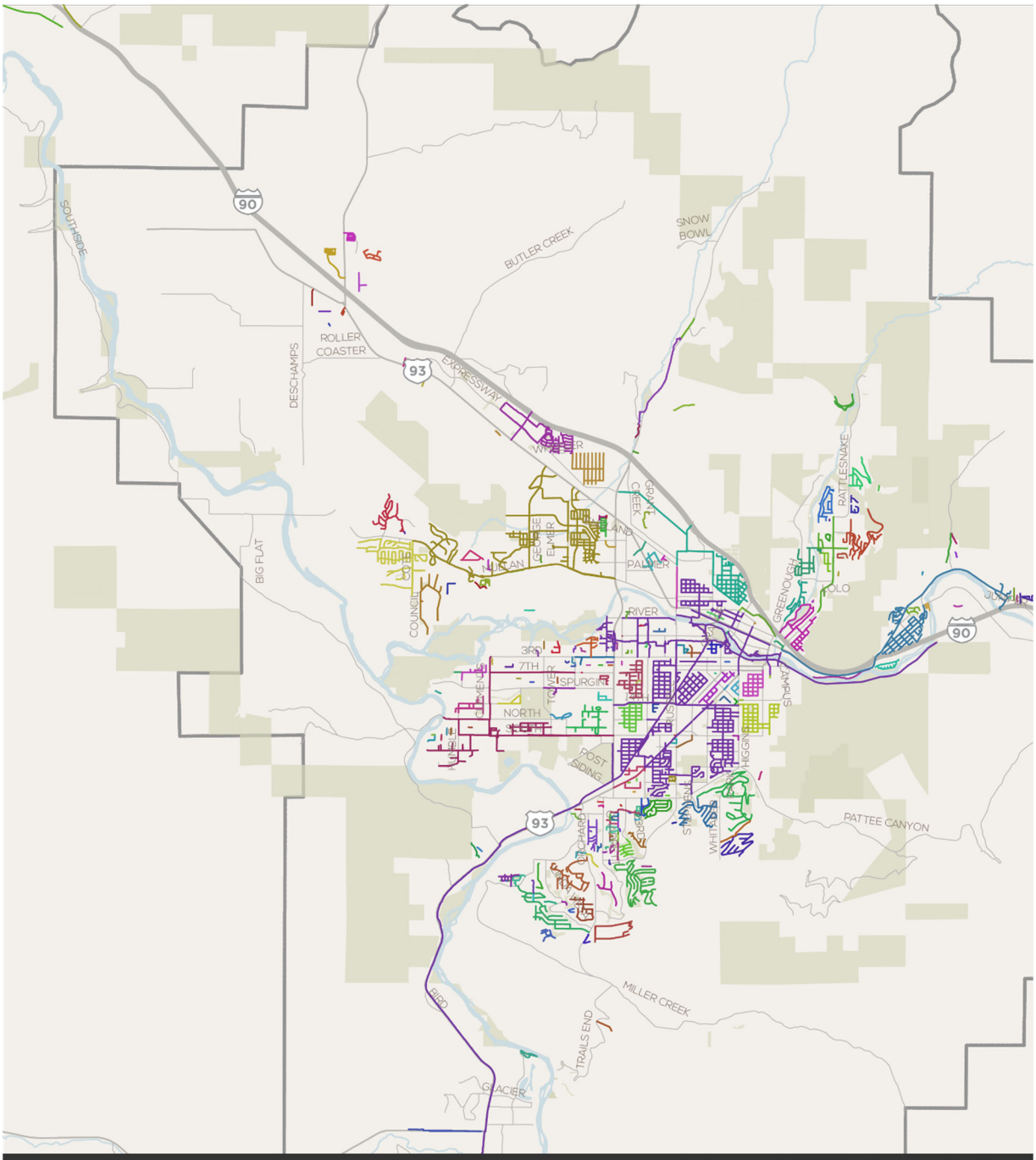


Figure 50 Bicycle Connectivity – New Connections



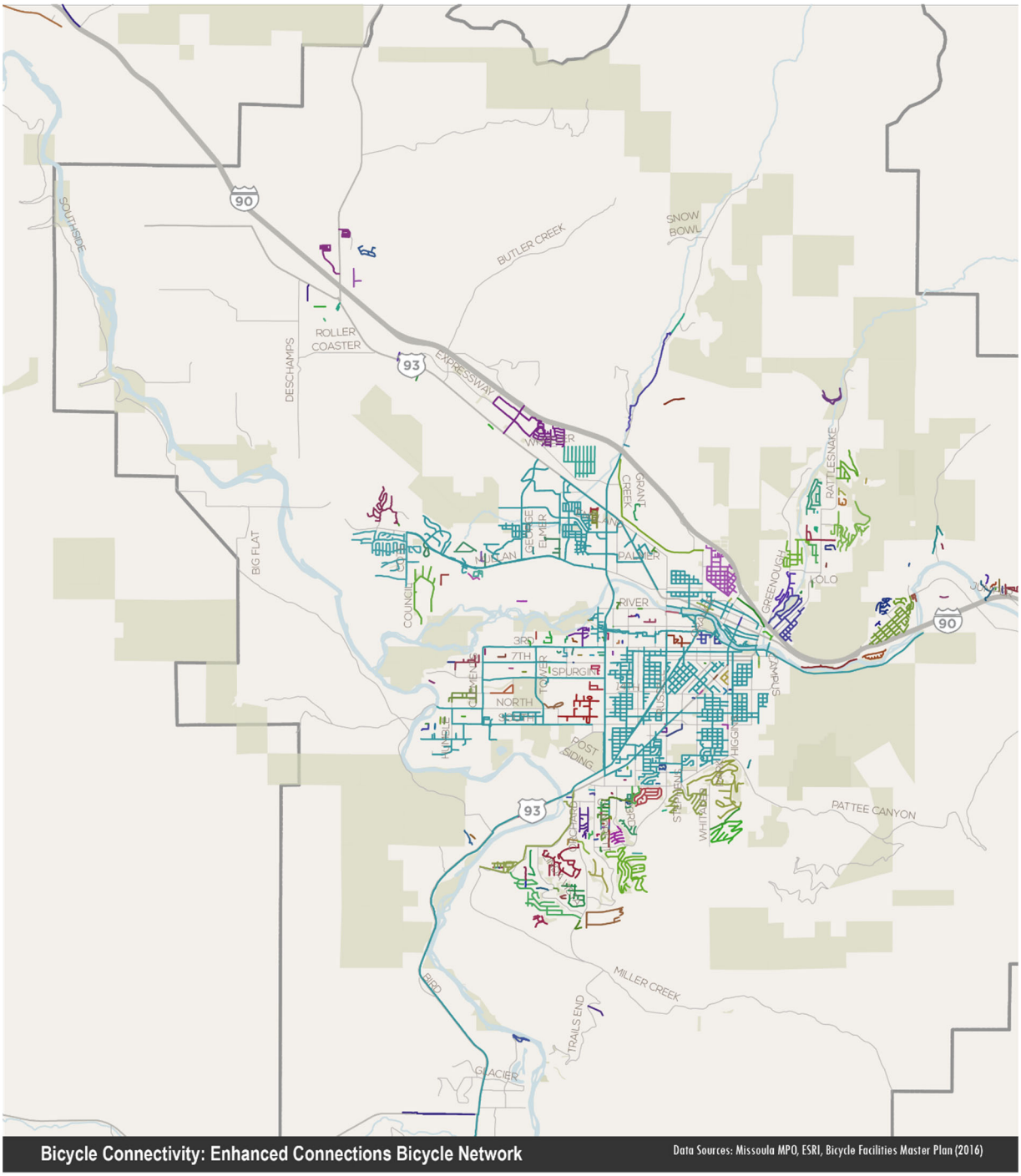
Bicycle Connectivity: New Connections Bicycle Network

Data Sources: Missoula MPO, ESRI, Bicycle Facilities Master Plan (2016)

The mapped clusters depict continuous connectivity for people riding bicycles on roadways classified as suitable for all ages and abilities. These include existing paved shared use paths, on-street bicycle facilities, LTS 1 roadways, and proposed transportation network scenarios. Clusters isolated from each other are identified through different colors, indicating a discontinuation of low stress facilities between points.

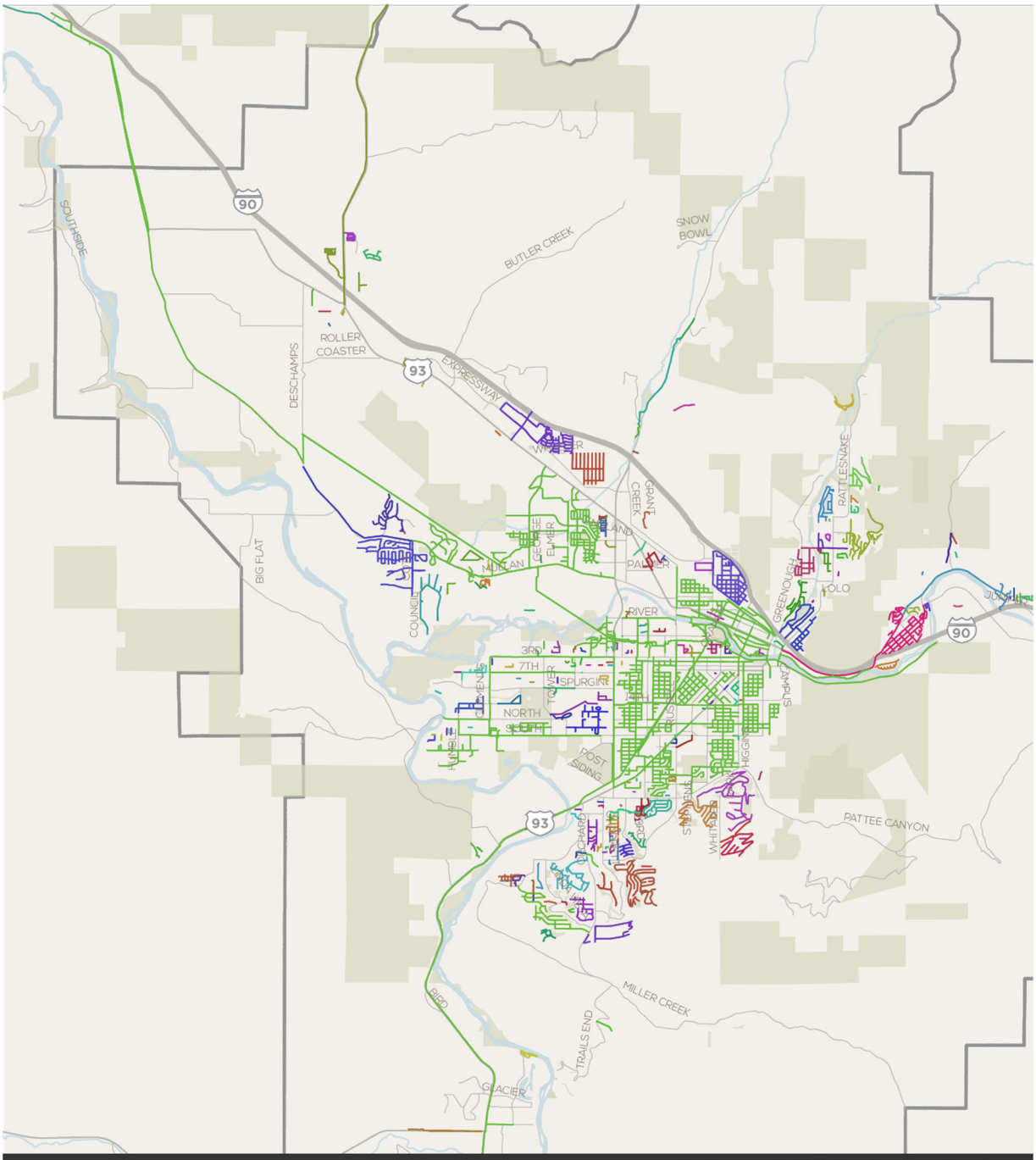
- MPO Boundary
- Bodies of Water
- Public Parklands
- Streets

Figure 51 Bicycle Connectivity – Enhanced Connections



The mapped clusters depict continuous connectivity for people riding bicycles on roadways classified as suitable for all ages and abilities. These include existing paved shared use paths, on-street bicycle facilities, LTS 1 roadways, and proposed transportation network scenarios. Clusters isolated from each other are identified through different colors, indicating a discontinuation of low stress facilities between points.

Figure 52 Bicycle Connectivity – Regional Equity



The mapped clusters depict continuous connectivity for people riding bicycles on roadways classified as suitable for all ages and abilities. These include existing paved shared use paths, on-street bicycle facilities, LTS 1 roadways, and proposed transportation network scenarios. Clusters isolated from each other are identified through different colors, indicating a discontinuation of low stress facilities between points.

MPO Boundary
Bodies of Water
Public Parklands
Streets

AFFORDABILITY

Improving access to affordable housing is part of creating a more equitable region and can help to lower household transportation costs.

For this analysis, each transportation network scenario was overlayed with the point locations of affordable housing facilities in the region. We then calculated the number of sites that would be within 200 meters of a transportation project in each proposed scenario. We defined affordable housing to include all existing (2018 data) housing developments that receive Low-Income Housing Tax Credit (LIHTC), US Department of Housing and Urban Development (HUD), or Section 8 funding, as well as mobile home courts.

Table 11 shows the total number of affordable housing locations served by the projects in each transportation scenario. The maps in Figure 53 through Figure 55 show the location of affordable housing relative to the projects in each scenario. Key findings are as follows:

- Projects in the Regional Equity scenario serve the most affordable housing facilities (both mobile home courts and multi-family complexes) followed by Enhanced Connections.
- All three scenarios include projects that provide access to affordable housing sites in the Franklin to the Fort and River Road neighborhoods.
- New Connections and Regional Equity outperform Enhanced Connections in connecting to affordable housing options in East Missoula.

Table 11 Affordable Housing Locations Served by Transportation Network Scenario

Housing Type	New Connections	Enhanced Connections	Regional Equity
Mobile Home Court	50	74	82
Affordable Housing Complex	27	39	46
Total	**77**	**113**	**128**

Source: Montana Department of Revenue (2018)

Figure 53 New Connections and Affordable Housing

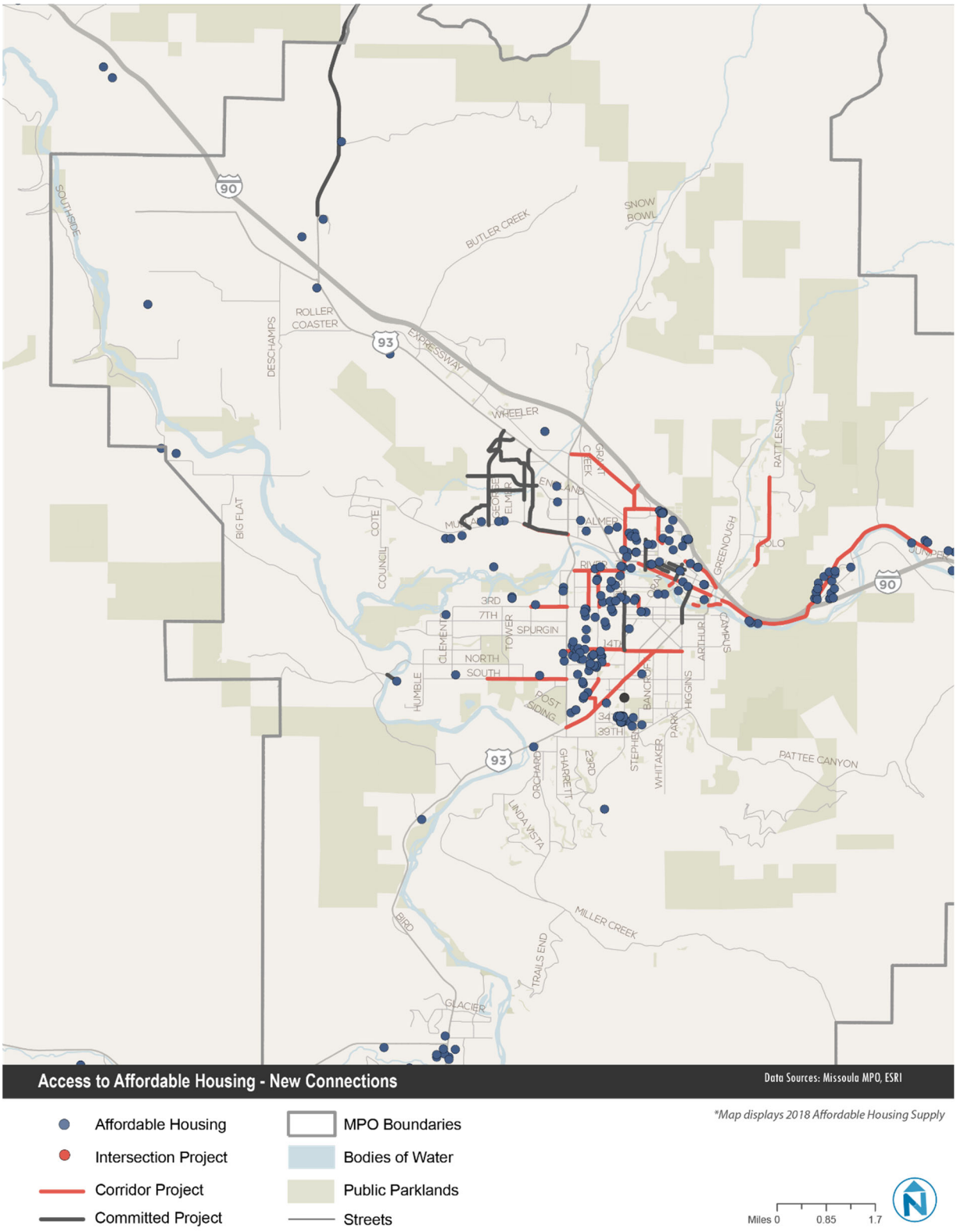


Figure 54 Enhanced Connections and Affordable Housing

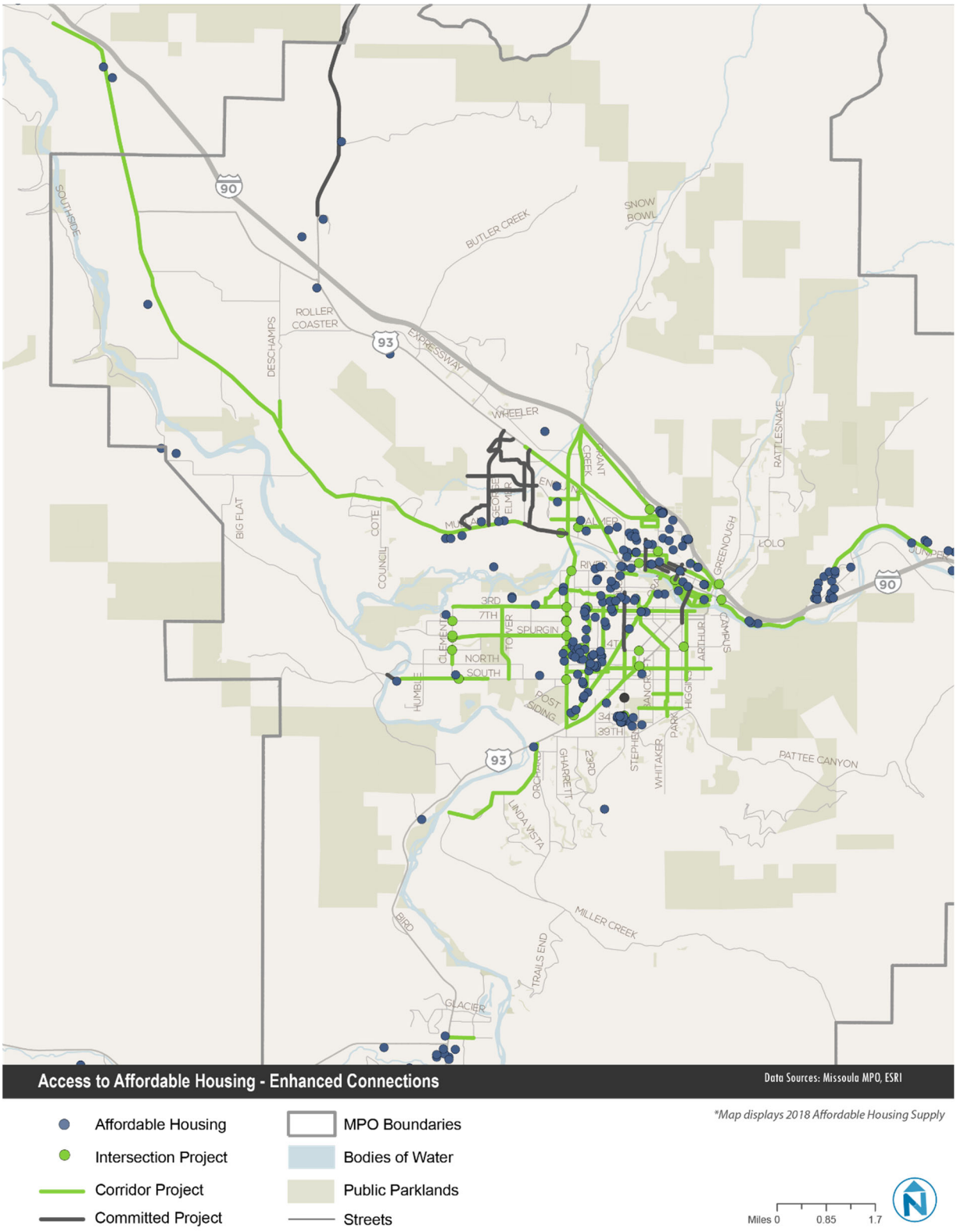
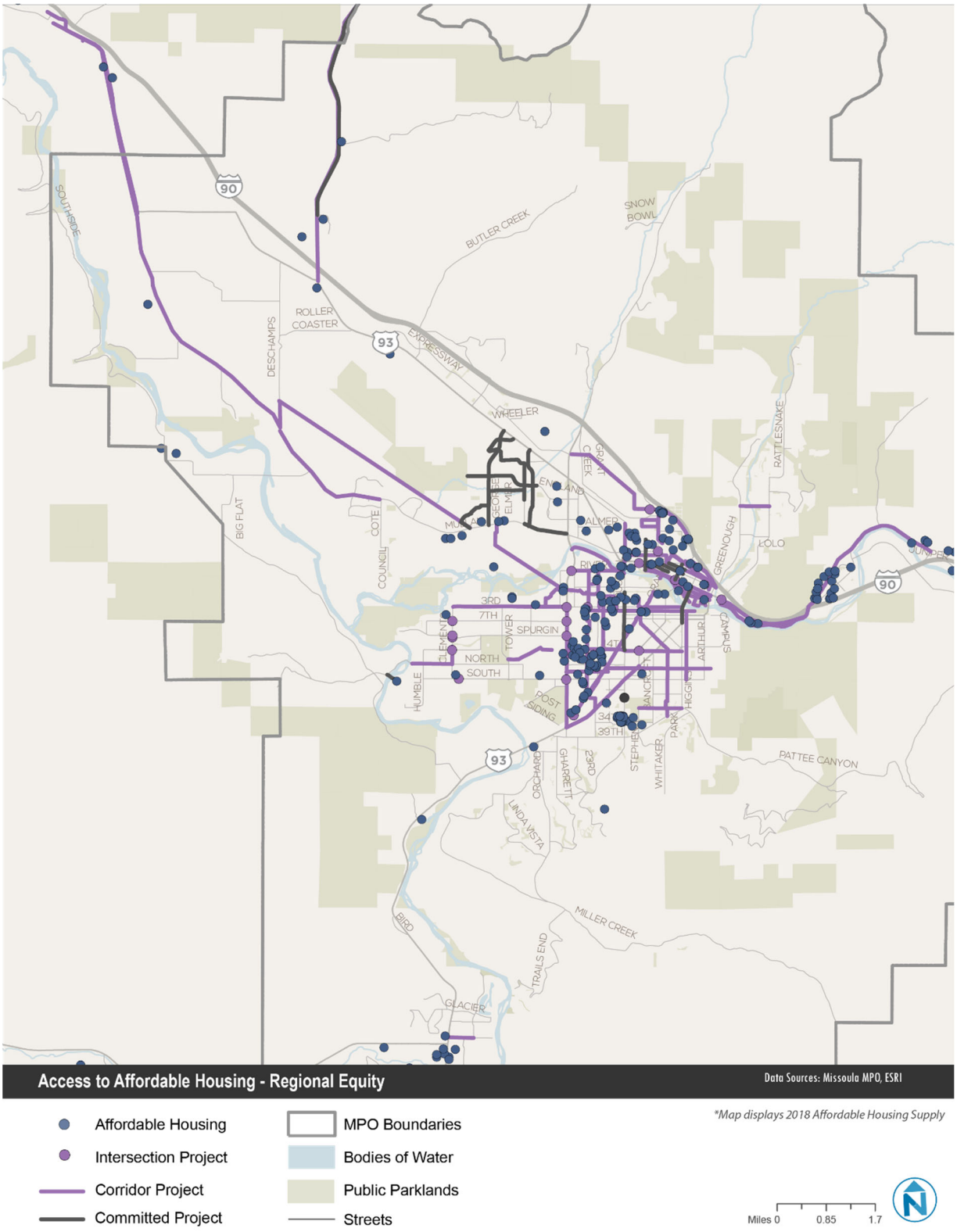


Figure 55 Regional Equity and Affordable Housing



SAFETY

Improving safety at intersections and providing enhanced levels of comfort and separation between modes is key to achieving desired Missoula Connect outcomes, including the elimination of traffic-related fatalities and serious injuries. While we cannot predict the degree to which each transportation network scenario might reduce collisions, all projects recommended by Missoula Connect will incorporate best practice safety countermeasures. Projects will be designed to eliminate modal conflicts and reduce the likelihood and severity of collisions.

Although predictive analysis is not possible, we can use historical collision data to assess whether the transportation scenarios include projects in locations that have previously experienced a high number of collisions. This indicates an opportunity to improve safety at those locations as projects are designed and implemented.

For this analysis, we overlayed each transportation network scenario with the density of bicycle- and pedestrian-involved collisions based on number of crashes from 2007-2018. Crash data is from the Missoula Community Transportation Safety Plan. The dataset includes all crashes that resulted in injury or property damage over $1,500.

The maps in Figure 56 through Figure 58 show the density of previous bicycle and pedestrian collisions relative to the projects in each transportation network scenario. The maps in Figure 59 through Figure 61 show the density of all previous crashes (between 2007 and 2018) relative to the projects in each transportation network scenario. Key findings are as follows:

- Projects in the Enhanced Connections scenario touch the highest number of previous pedestrian- and bicycle-involved collision locations (202), followed by Regional Equity (188), and New Connections (134).
- Enhanced Connections includes 14 intersection improvement projects at locations that had multiple crashes (or clusters) between 2007 and 2018.
- Projects in the Enhanced Connections scenario cover the largest number of previous collision locations along Reserve Street, which has a high total number of collisions relative to other corridors in the region.

Figure 56 New Connections and Bicycle/Pedestrian Collision Density

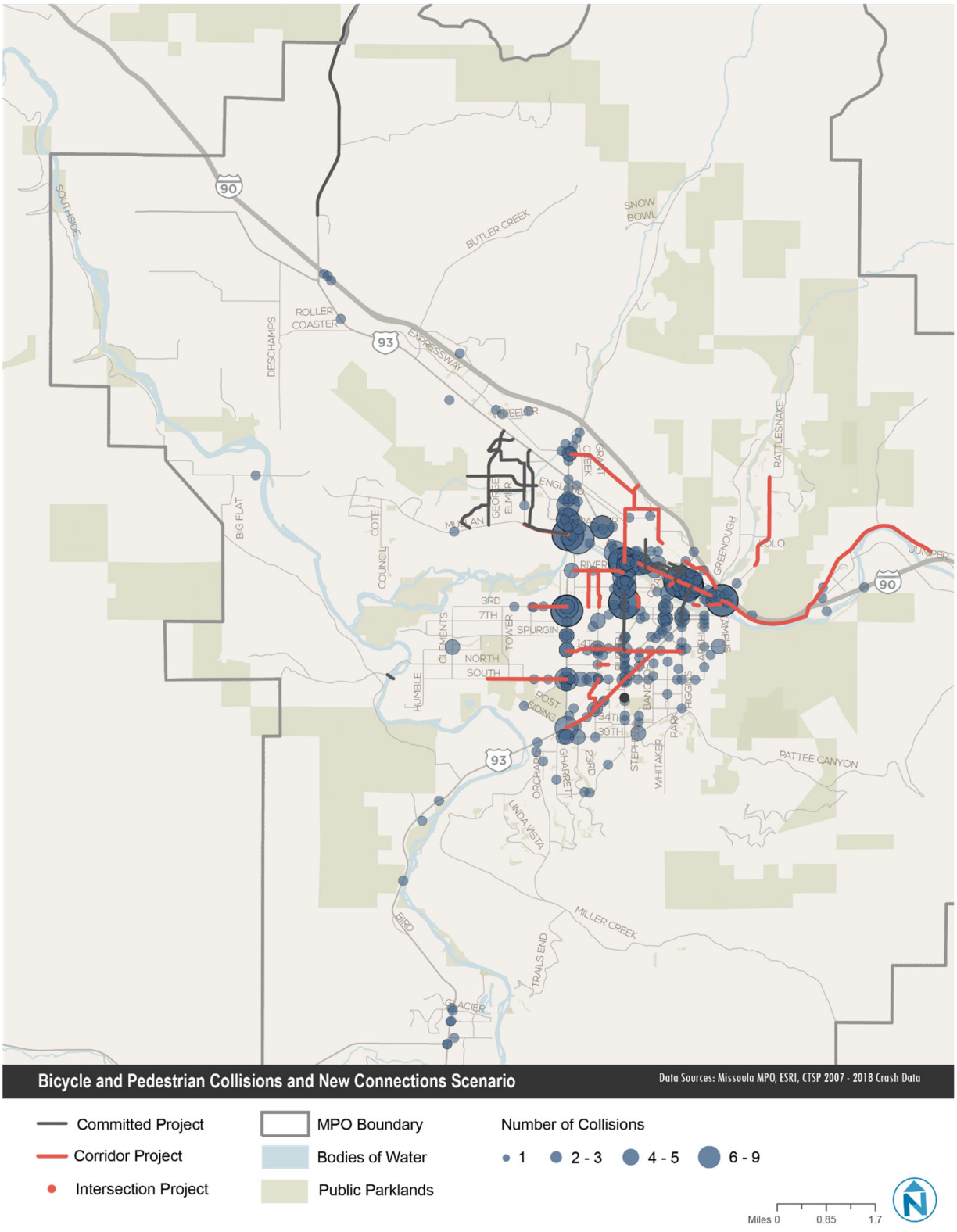


Figure 57 Enhanced Connections and Bicycle/Pedestrian Collision Density

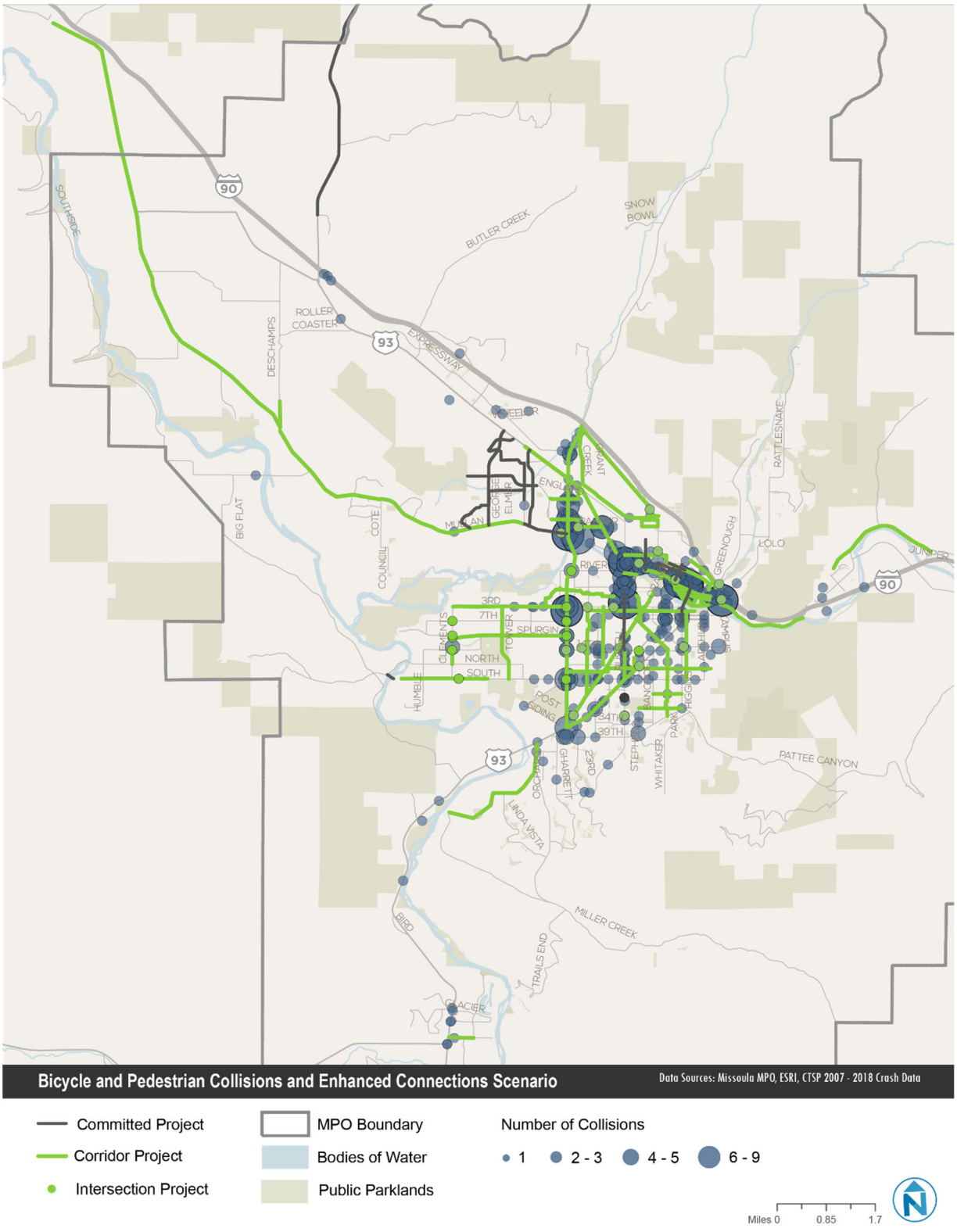


Figure 58 Regional Equity and Bicycle/Pedestrian Collision Density

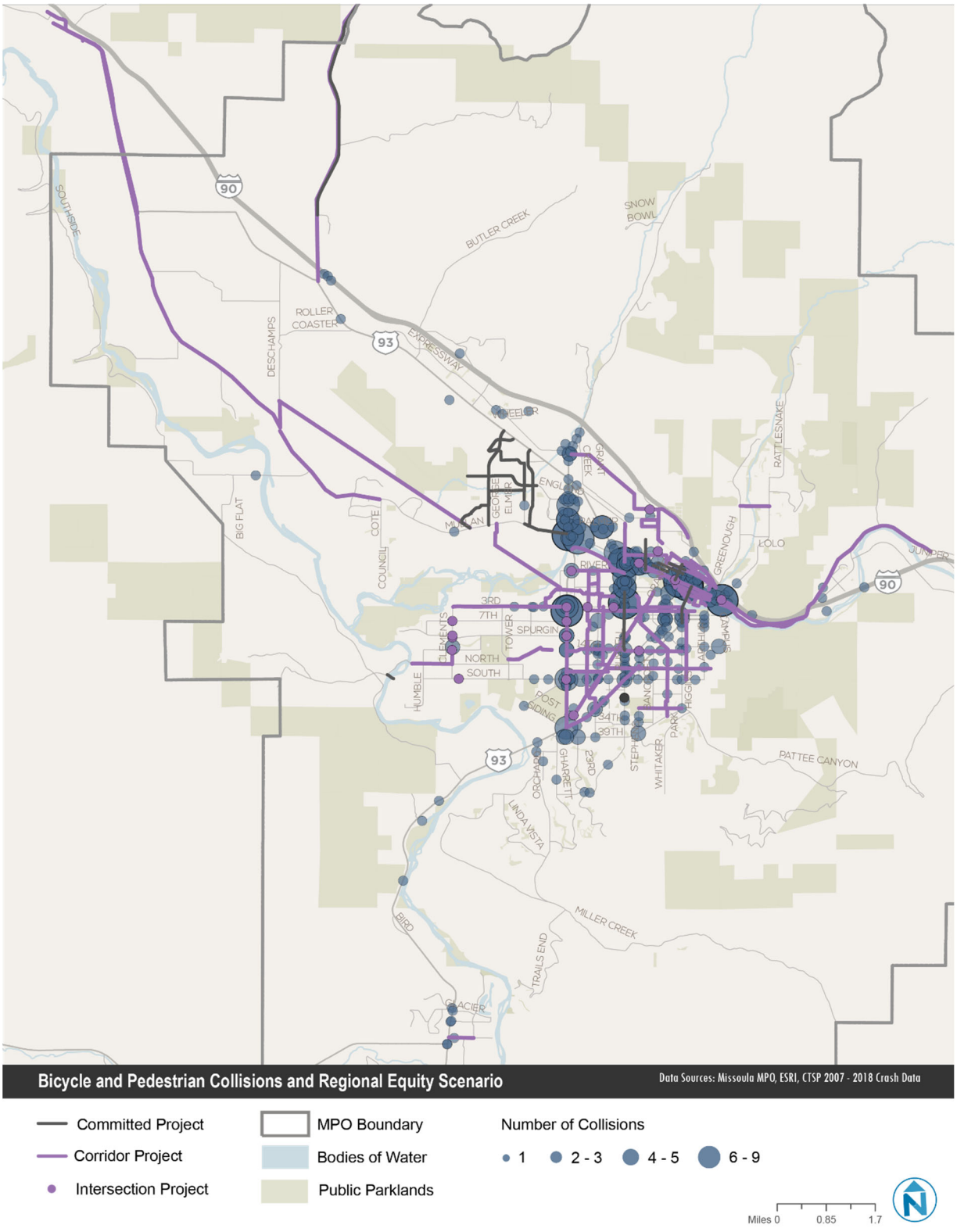


Figure 59 New Connections and All Collisions Density

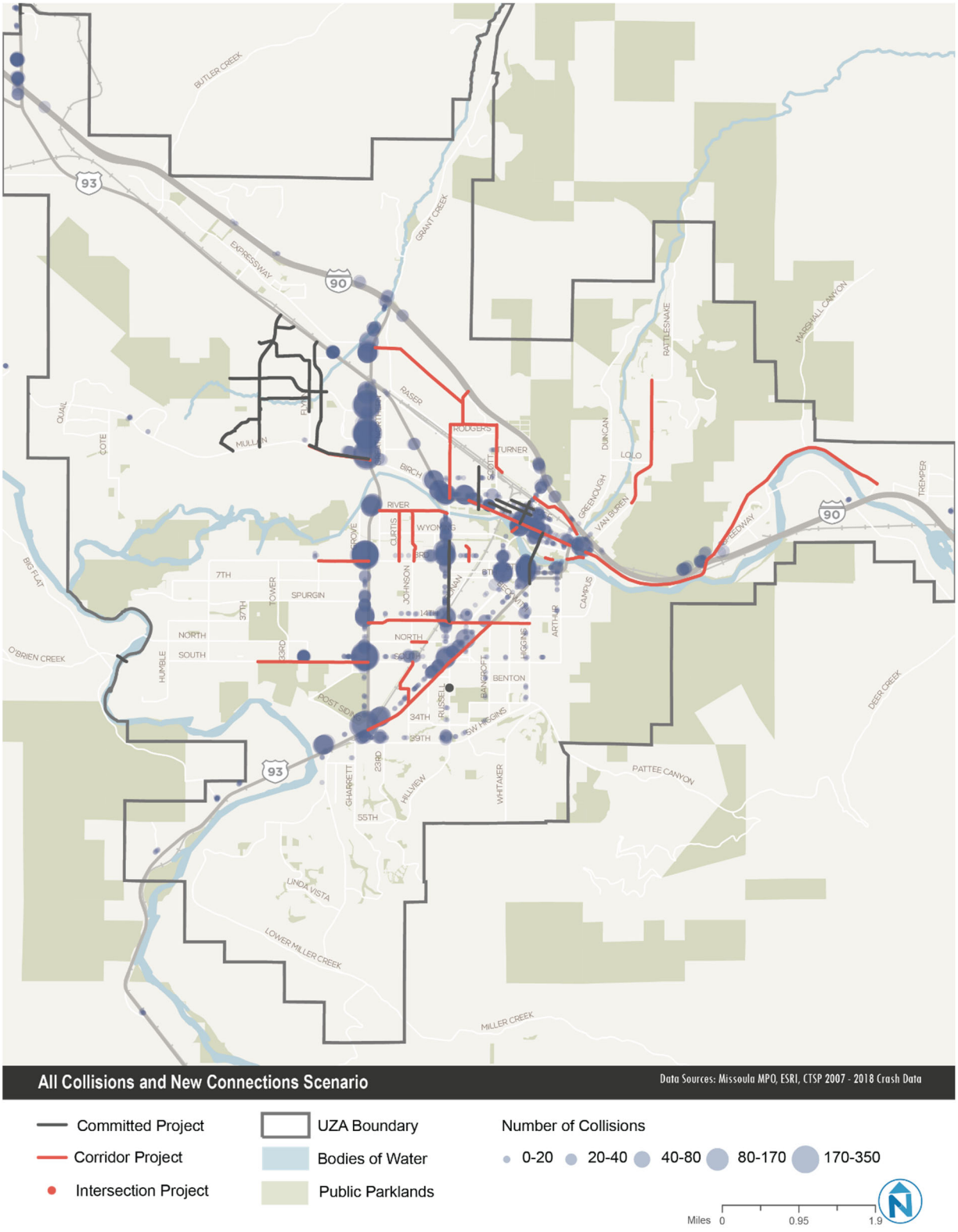


Figure 60 Enhanced Connections and All Collisions Density

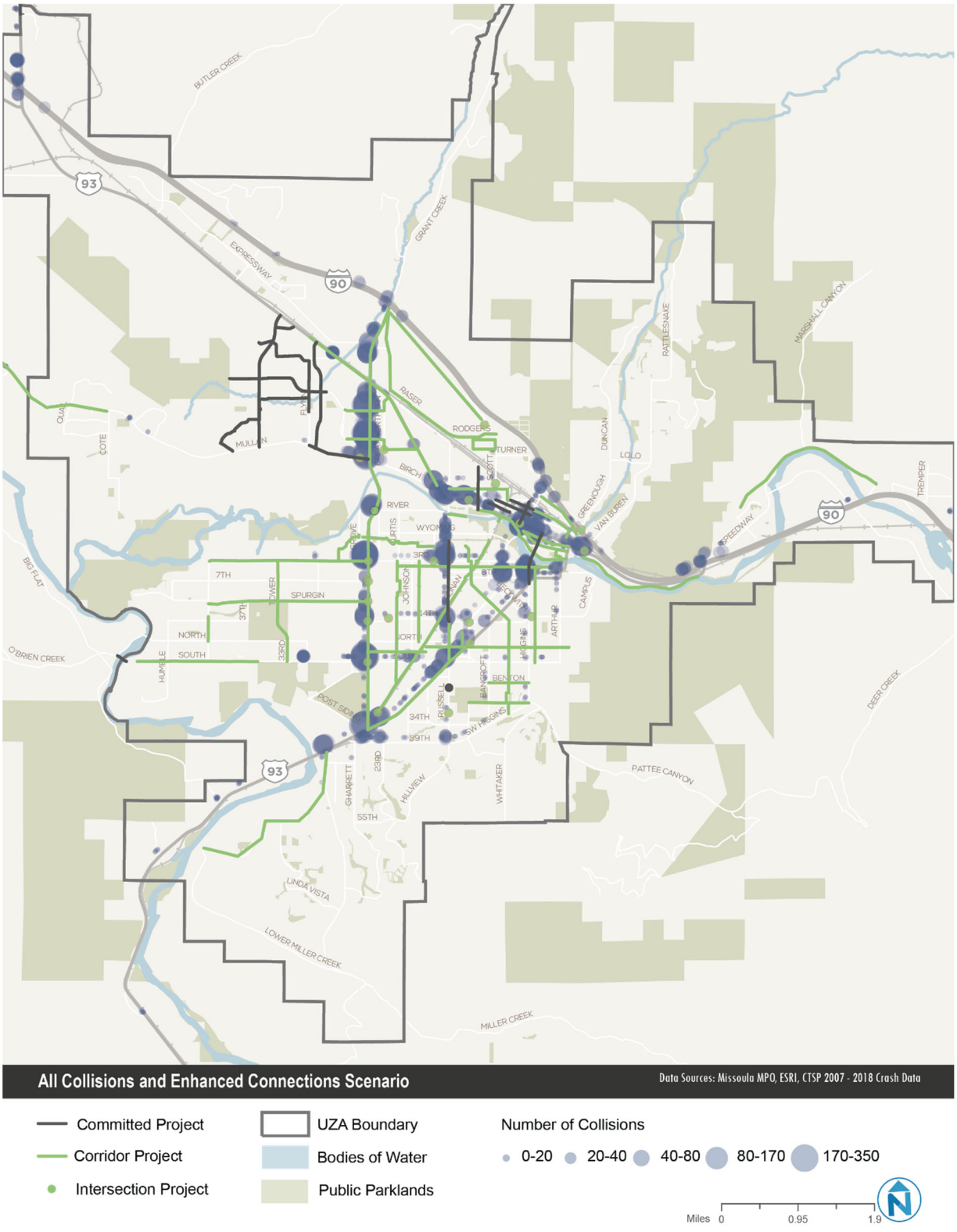
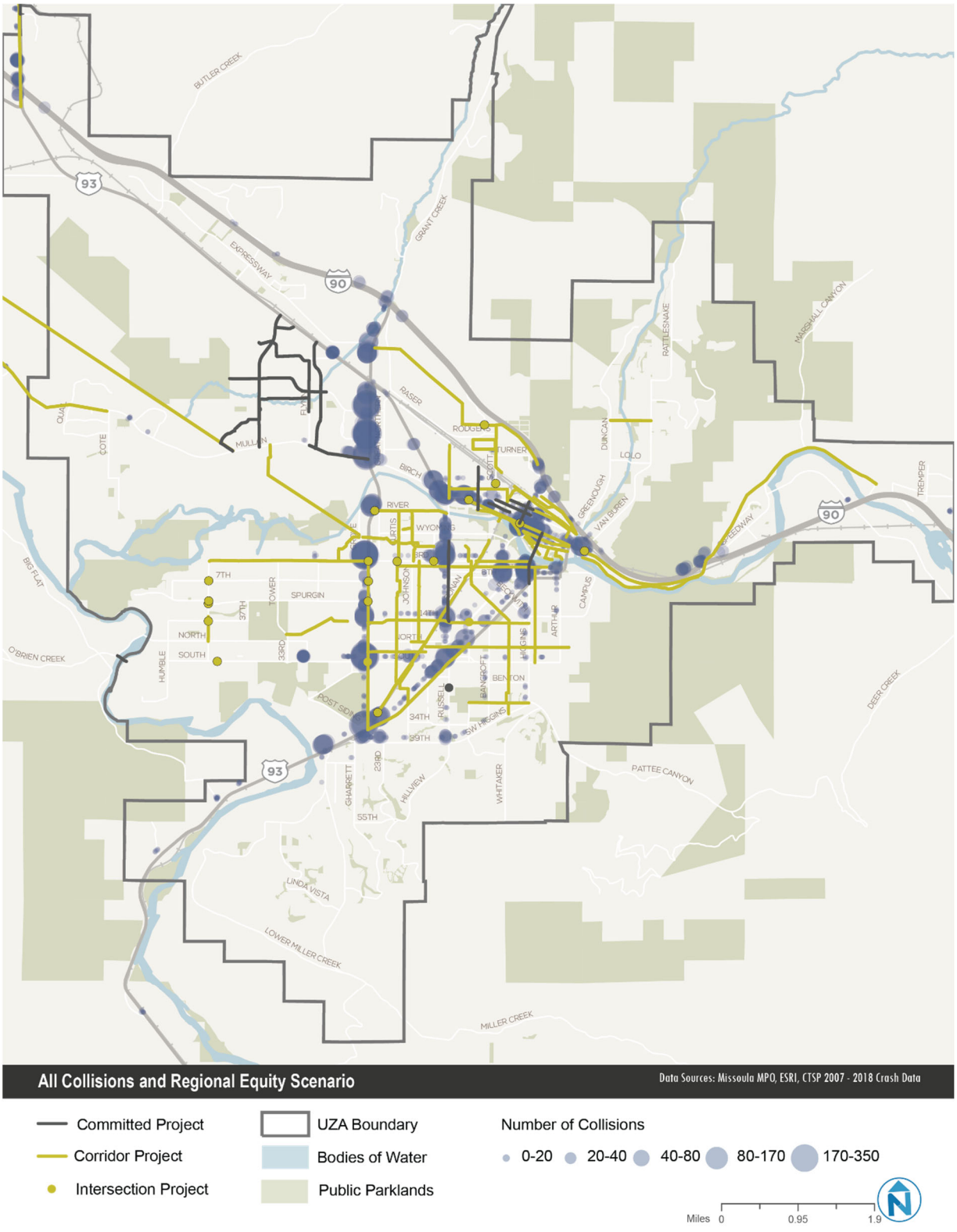


Figure 61 Regional Equity and All Collisions Density



ABILITY TO SUPPORT GROWTH

This analysis considers how the proposed transportation scenarios serve areas with the highest estimated density of housing in the future (2050). These areas may support future inward growth that could accommodate more residents in the core of the region, providing greater access to destinations through non-drive alone modes.

This analysis maps the region's future housing density (dwelling units per square mile) at the TAZ level under the Strategic Growth scenario and overlays that with each transportation network scenario. TAZs that fall within the highest quintile of dwelling units per square mile were designated as areas with the highest housing density. This quintile includes TAZs with an estimated future density of housing between 1,526 and 95,779 dwelling units per square mile.

The maps in Figure 62 through Figure 64 show areas of density in 2050 that would be served by the projects in each transportation network scenario. Key findings are as follows:

- Enhanced Connections and Regional Equity include more projects and provide better coverage than New Connections to higher density housing areas in the core of the region, both north and south of the Clark Fork River.
- All three scenarios include projects supportive of the future Mullan Area Master Plan development.

Figure 62 Ability to Support Growth – New Connections

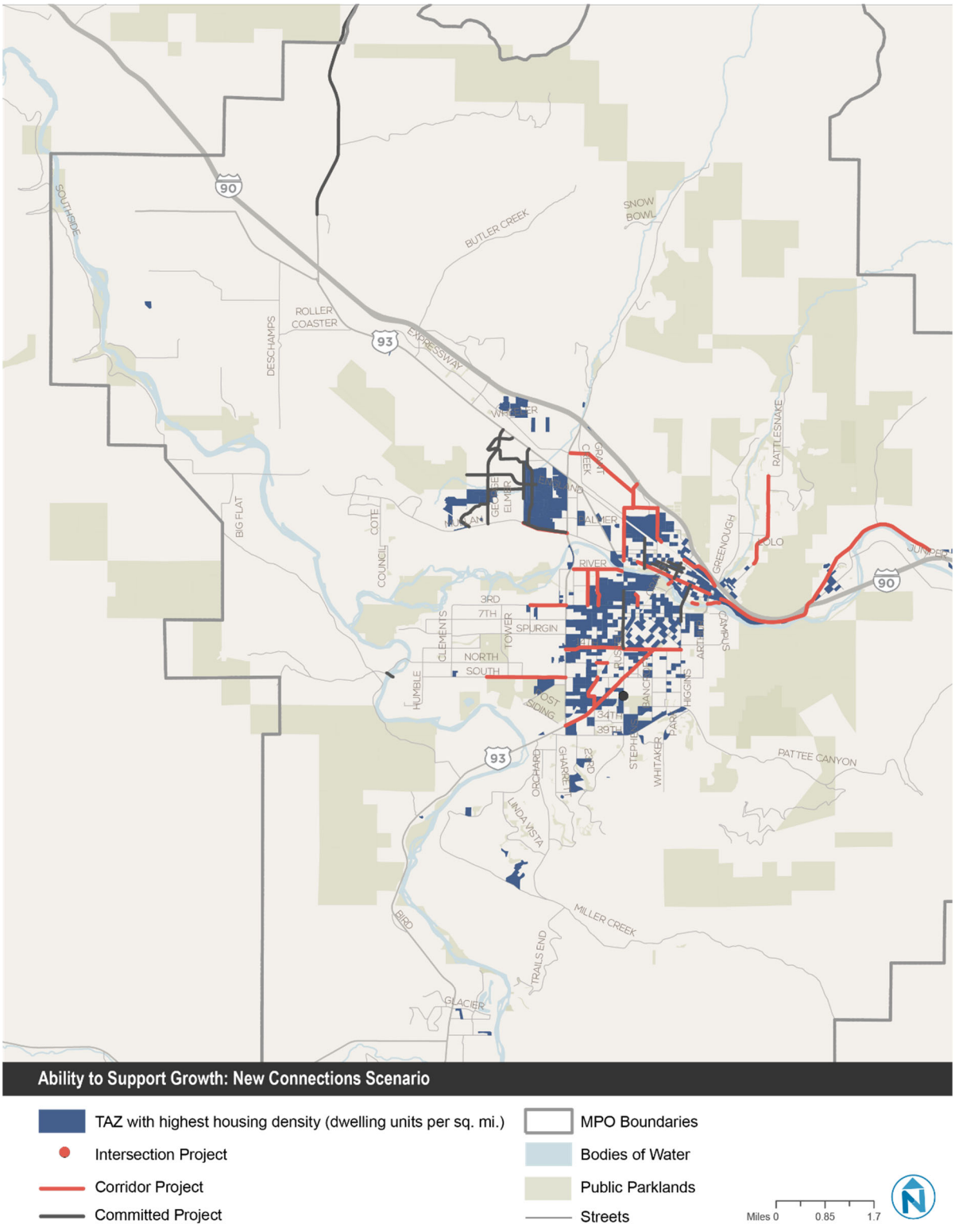


Figure 63 Ability to Support Growth – Enhanced Connections

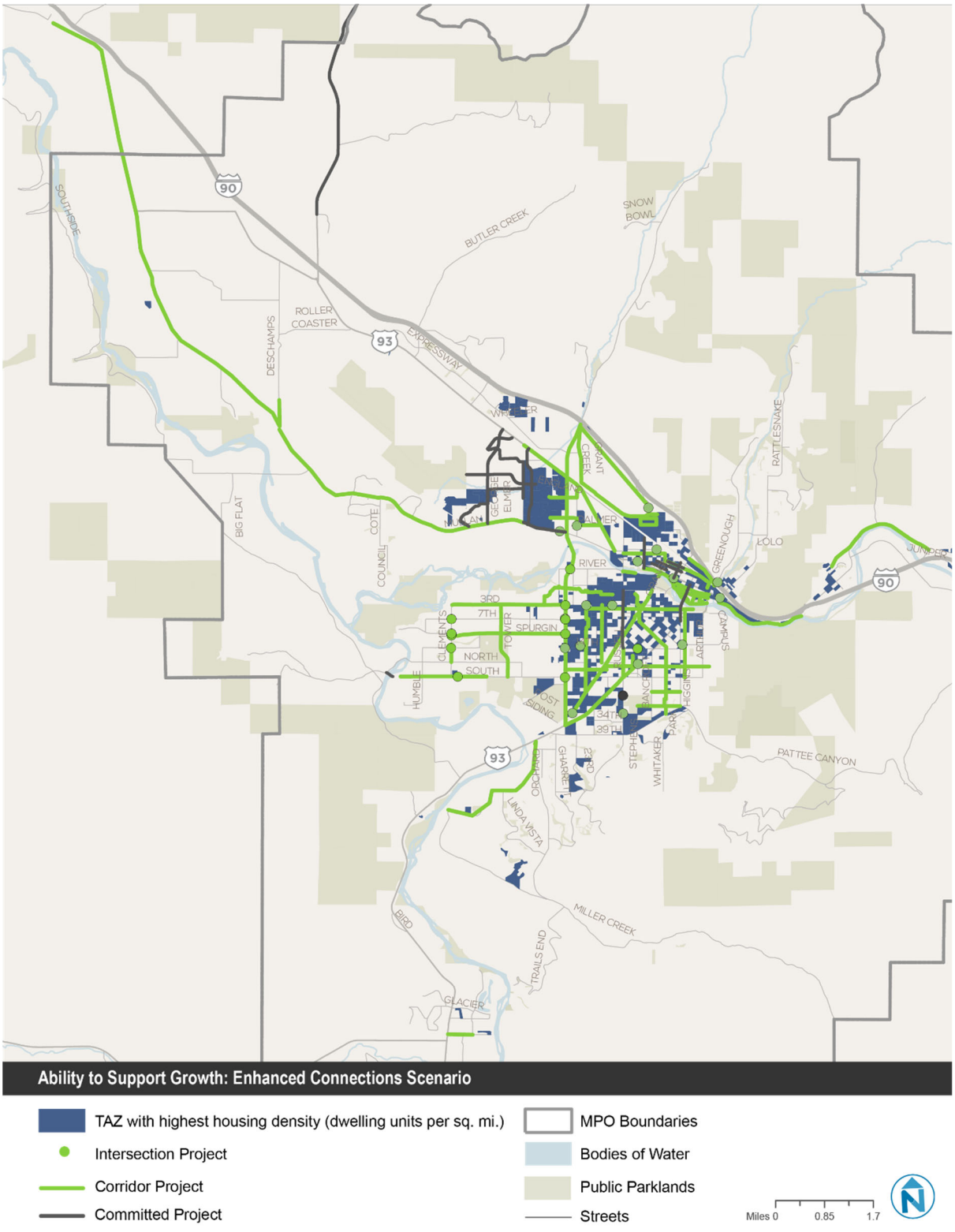
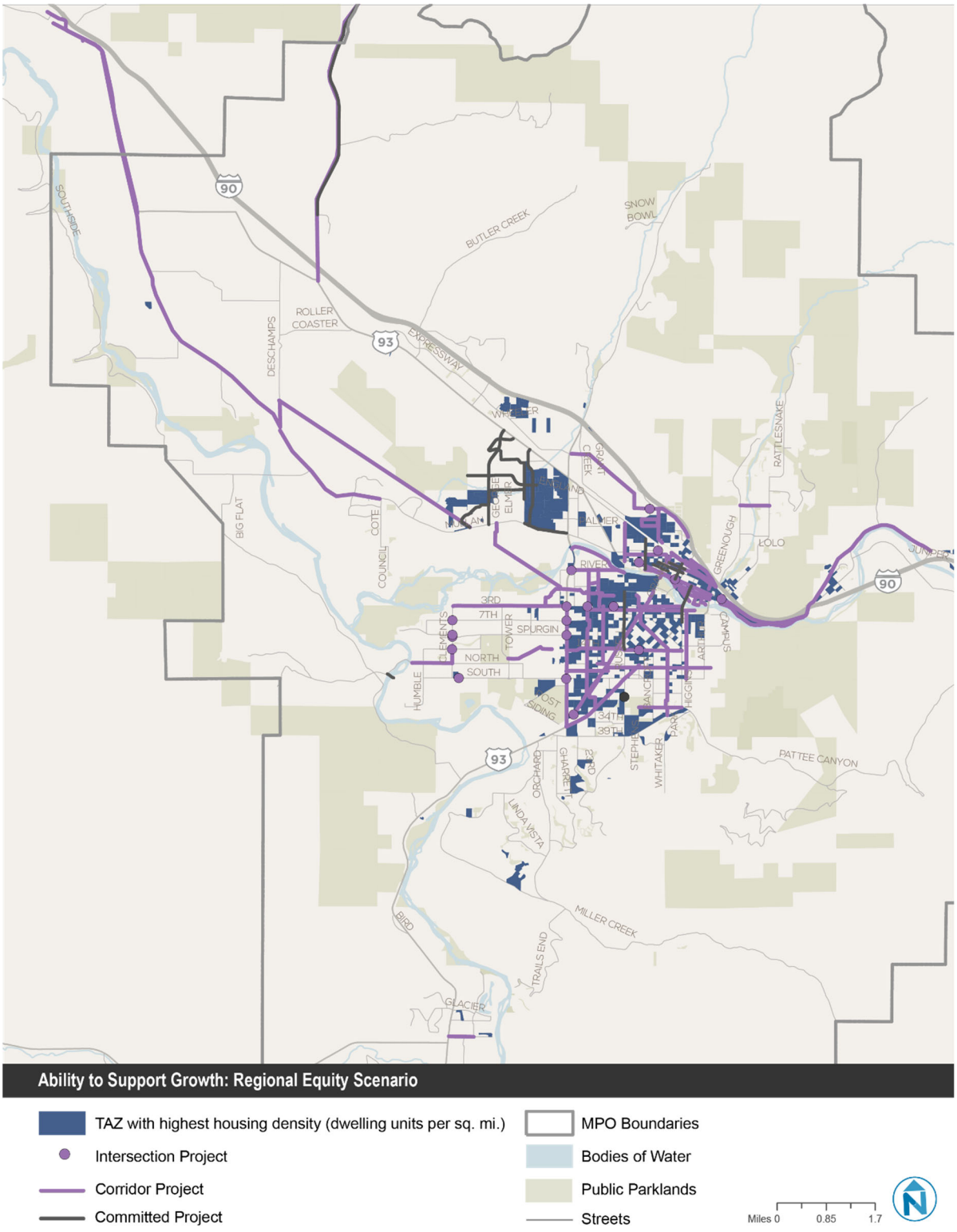


Figure 64 Ability to Support Growth – Regional Equity



GOOD REPAIR

Identifying projects that have the potential to bring existing infrastructure into a state of good repair supports the Missoula Connect goal of maintaining regional assets and investing strategically to make the best use of limited funds.

For this analysis, we identified the complete streets projects or projects that would involve repaving in each transportation network scenario and overlaid them with Pavement Condition Index (PCI) data covering non-State routes and roadways within the City of Missoula. This revealed the location and mileage of roadways in fair or poor condition that potentially could be improved by each transportation scenario. Intersection, bicycle and pedestrian bridge, off-street trail, and greenway projects were excluded, as those projects would not impact existing roadways or do not include project elements that would improve roadway maintenance conditions.

Table 12 shows the total mileage of roadways in fair or poor condition that could be improved by each scenario. In addition to these totals, up to 3 miles of roadway in fair or poor condition could be improved by committed projects. Key findings are as follows:

- Enhanced Connections includes the most projects with the potential to improve facilities with fair or poor pavement conditions.
- There are 6.1 miles of committed new roadway projects in each scenario that would be constructed, adding to future pavement preservation needs. The New Connections scenario increases this total to 9.6 miles with an additional 3.5 miles of new roadway projects.
- Regional Equity contains more projects off the roadway network, such as trail connections, and thus covers the fewest miles of roadway with facilities in fair or poor condition.

Table 12 Miles of Roadway Potentially Improved

Pavement Condition	Committed Projects	New Connections	Enhanced Connections	Regional Equity
Poor	2.2	9.6	9.9	8.3
Fair	0.8	7.4	10.8	6.2
Total (miles)	**3.0**	**17.0**	**20.7**	**14.5**

EQUITY

Connecting and strengthening the community to create a more equitable region is a core goal of Missoula Connect. More equitable transportation networks can increase affordability and lower household transportation costs, improve access to opportunities and services, reduce localized impacts from air pollution, and improve health outcomes for neighborhoods and people traditionally marginalized by planning decisions.

For this analysis, we calculated the density (persons or households per square mile) of the following populations:

- People with disabilities
- Youth (17 years and younger)
- Seniors (65 years and older)
- Non-English speaking households
- Zero-vehicle households
- People of color
- Households with median incomes that are at or below the federal poverty level at the block group level

From these socioeconomic factors, we created an index to identify the Census block groups with the highest prevalence of these populations. These "equity zones" were then overlayed with total person trips mapped at the TAZ level for each growth and transportation network scenario. In addition to mapping equity zones, Invest Health Neighborhoods, which focus on low-income neighborhoods and health equity, were also included as part of this analysis. Key findings are as follows:

- Areas that fall within equity zones when indexed for the socioeconomic factors above[1] include the western half of Downtown, Franklin to the Fort, Riverfront, Rose Park, Lewis and Clark, and the University District.
- The Enhanced Connections and Regional Equity networks result in a greater than 5% reduction in auto person trips in the equity zones under both growth scenarios.
- Regional Equity has the greatest potential to increase walking trips in the equity zones and Invest Health Neighborhoods in both growth scenarios, followed by Enhanced Connections.
- Enhanced Connections has the greatest potential to increase biking trips in the equity zones and Invest Health Neighborhoods in both growth scenarios, followed by Regional Equity.
- There are nearly twice as many biking trips and three times as many walking trips for TAZs within an equity zone compared to non-equity TAZs immediately adjacent to the equity zones under both growth scenarios.

Table 13 through Table 16 show the change in total person trips by mode from the base network for each transportation network scenario under Business as Usual and Strategic Growth.

[1] The index analysis assigned a score of 1 to 5 based on the density values of each socioeconomic characteristic, with a score of 5 representing the highest density. The sum of the scores for all socioeconomic characteristics determines the total score assigned to each TAZ. TAZs with the highest scores (determined using the Quantile function in GIS), are "equity zones."

Table 13 Changes in Equity Zone Person Trips by Mode – Business as Usual 2050

Travel Mode	Base	New Connections	% Change from Base	Enhanced Connections	% Change from Base	Regional Equity	% Change from Base
Auto	39,538.34	38,537.90	-2.5%	37,162.90	-6.0%	37,236.89	-5.8%
Transit	6,807.83	6,377.13	-6.3%	6,418.86	-5.7%	6,376.21	-6.3%
Walk	22,902.88	23,797.38	3.9%	24,699.78	7.8%	24,938.45	8.9%
Bike	11,215.18	11,836.08	5.5%	12,486.05	11.3%	12,235.92	9.1%
Total	**80,464.23**	**80,548.49**	**0.1%**	**80,767.59**	**0.4%**	**80,787.47**	**0.4%**

Table 14 Changes in Equity Zone Person Trips by Mode – Strategic Growth 2050

Travel Mode	Base	New Connections	% Change from Base	Enhanced Connections	% Change from Base	Regional Equity	% Change from Base
Auto	41,364.39	40,312.85	-2.5%	38,906.09	-5.9%	39,043.75	-5.6%
Transit	6,938.95	6,498.79	-6.3%	6,539.11	-5.8%	6,497.85	-6.4%
Walk	24,081.81	25,023.00	3.9%	25,897.59	7.5%	26,119.43	8.5%
Bike	11,429.00	12,066.52	5.6%	12,785.64	11.9%	12,484.15	9.2%
Total	**83,814.15**	**83,901.15**	**0.1%**	**84,128.43**	**0.4%**	**84,145.18**	**0.4%**

Table 15 Changes in Invest Health Neighborhood Person Trips by Mode – Business as Usual 2050

Travel Mode	Base	New Connections	% Change from Base	Enhanced Connections	% Change from Base	Regional Equity	% Change from Base
Auto	72,832.00	72,049.45	-1.1%	70,071.58	-3.8%	70,531.93	-3.2%
Transit	5,485.55	5,119.14	-6.7%	5,178.45	-5.6%	5,118.29	-6.7%
Walk	11,179.51	11,607.16	3.8%	12,581.43	12.5%	12,900.05	15.4%
Bike	11,832.20	12,543.05	6.0%	13,487.71	14.0%	12,768.66	7.9%
Total	**101,329.26**	**101,318.80**	**0.0%**	**101,319.17**	**0.0%**	**101,318.93**	**0.0%**

Table 16 Changes in Invest Health Neighborhood Person Trips by Mode – Strategic Growth 2050

Travel Mode	Base	New Connections	% Change from Base	Enhanced Connections	% Change from Base	Regional Equity	% Change from Base
Auto	76,404.34	75,622.46	-1.0%	73,521.29	-3.8%	74,120.29	-3.0%
Transit	5,555.35	5,181.82	-6.7%	5,239.31	-5.7%	5,180.99	-6.7%
Walk	11,644.80	12,069.78	3.6%	13,043.80	12.0%	13,329.92	14.5%
Bike	12,093.04	12,823.00	6.0%	13,893.11	14.9%	13,066.11	8.0%
Total	**105,697.53**	**105,697.06**	**0.0%**	**105,697.51**	**0.0%**	**105,697.31**	**0.0%**

REGIONAL TRIP MAKING AND TRAVEL CONDITIONS

Following the initial runs of the MPO's regional travel demand model, the project team conducted additional post-processing in TransCAD to refine estimates of the impact that the growth and transportation scenarios could have on future travel behavior and regional trip making. By estimating how each scenario increases or decreases the number of trips made by mode from the base, we can better assess how the scenarios support the desired outcome of reducing the share of regional trips made by automobile and associated externalities like carbon emissions.

This analysis is based on mode choice models estimated from the American Community Survey (ACS) for work trip mode, and then extended to other trip types. We calculated non-auto mode choice based on equations for accessibility by mode. The accessibility equations are similar to the gravity models commonly used in travel demand models, in that destinations that can be reached more quickly are weighted more heavily than destinations further away, and there is no cut-off time.

Home-based work (HBW) trip mode share models were estimated using 2014-2018 5-year ACS data at the Census tract level. The coefficients from the HBW models were then adjusted to match the mode shares presented in the 2018 base year model summary report for other types of trips, such as Home-based school (HBS), Home-based university (HBU), Home-based other (HBO), Work-based other (WBO), and Other-based other (OBO).

Vehicle miles traveled (VMT) was estimated by running a script in TransCAD to calculate the average auto trip length by trip type and TAZ from the base model. Auto productions and attractions at each TAZ were compared between the base model and the post-processing model. TAZ-based VMT was then adjusted up or down in proportion to the difference in auto productions and attractions.

To estimate vehicle hours of delay (VHD), the post-processing model VMT was adjusted to the same range as the base model VMT using Strategic Growth as a reference scenario. Post-processing VHD was set to equal the base model VHD for Business as Usual. From this, a regression model was run to estimate VHD for each transportation network scenario. Because the Strategic Growth scenario has 2% more households within the MPO area than the Business as Usual scenario, VMT and VHD numbers for Strategic Growth were reduced by 2%.

Table 17 and Table 18 present the change from the base network for daily regional vehicle miles traveled, daily regional hours of congestion delay, and daily regional person trips by mode under the growth and transportation network scenarios as derived from the post-processing TransCAD analysis. Associated Level of Service (LOS) maps from the regional travel demand model (not the post-processing model) are provided in Figure 65 through Figure 72. Key findings are as follows:

- All three transportation scenarios are estimated to decrease regional VMT under both growth scenarios, with Enhanced Connections providing the highest reduction (1.8%) if development follows the Strategic Growth pattern.
- Enhanced Connections provides the greatest reduction in auto trips under both growth scenarios, reducing total auto mode share from 81.37% to 79.75% in the Strategic Growth scenario.
- Significant reductions in regional hours of congestion delay are achievable with the Regional Equity and Enhanced Connections scenarios, with Enhanced Connections providing a reduction of up to 21.7% under a Strategic Growth scenario.
- Regional Equity has the greatest potential to increase walking trips and mode share, whereas Enhanced Connections has the greatest potential to increase biking trips and mode share.

- With the base network, the Strategic Growth scenario provides a 3.5% decrease in VMT and an increase in daily person trips for all modes but auto. This suggests that focusing future growth inward is an additional mechanism beyond transportation projects that can help decrease regional auto trips, congestion, and emissions.

Table 17 Regional Trip Making Summary – Business as Usual 2050

Daily Metric (MPO Level)	Base	New Connections	% Change from Base	Enhanced Connections	% Change from Base	Regional Equity	% Change from Base
VMT	3,351,389	3,344,599	-0.2%	3,308,304	-1.3%	3,313,143	-1.1%
VHD	16,817	16,481	-2.0%	14,681	-12.7%	14,921	-11.3%
Automobile – Person Trips	698,198	688,870	-1.3%	685,144	-1.9%	686,350	-1.7%
Transit – Person Trips	20,841	19,543	-6.2%	19,624	-5.8%	19,541	-6.2%
Walk – Person Trips	86,371	92,730	7.4%	93,060	7.7%	94,269	9.1%
Bike – Person Trips	44,416	48,682	9.6%	51,997	17.1%	49,666	11.8%
Automobile – Mode Share	82.16%	81.06%	-1.3%	80.62%	-1.9%	80.76%	-1.7%
Transit – Mode Share	2.45%	2.30%	-6.1%	2.31%	-5.7%	2.30%	-6.1%
Walk – Mode Share	10.16%	10.91%	7.4%	10.95%	7.8%	11.09%	9.2%
Bike – Mode Share	5.23%	5.73%	9.6%	6.12%	17.0%	5.84%	11.7%

Table 18 Regional Trip Making Summary – Strategic Growth 2050

Daily Metric (MPO Level)	Base	New Connections	% Change from Base	Enhanced Connections	% Change from Base	Regional Equity	% Change from Base
VMT	3,234,529	3,214,423	-0.6%	3,177,597	-1.8%	3,185,764	-1.5%
VHD	12,997	12,000	-7.7%	10,174	-21.7%	10,579	-18.6%
Automobile – Person Trips	692,680	683,209	-1.4%	678,898	-2.0%	680,868	-1.7%
Transit – Person Trips	21,175	19,848	-6.3%	19,924	-5.9%	19,846	-6.3%
Walk – Person Trips	91,837	98,373	7.1%	98,583	7.3%	99,712	8.6%
Bike – Person Trips	45,629	49,889	9.3%	53,914	18.2%	50,894	11.5%
Automobile – Mode Share	81.37%	80.25%	-1.1%	79.75%	-2.0%	79.98%	-1.7%
Transit – Mode Share	2.49%	2.33%	-0.2%	2.34%	-6.0%	2.33%	-6.4%
Walk – Mode Share	10.79%	11.56%	0.8%	11.58%	7.3%	11.71%	8.5%
Bike – Mode Share	5.36%	5.86%	9.3%	6.33%	18.1%	5.98%	11.6%

Figure 65 Level of Service and Base Network – Business as Usual 2050

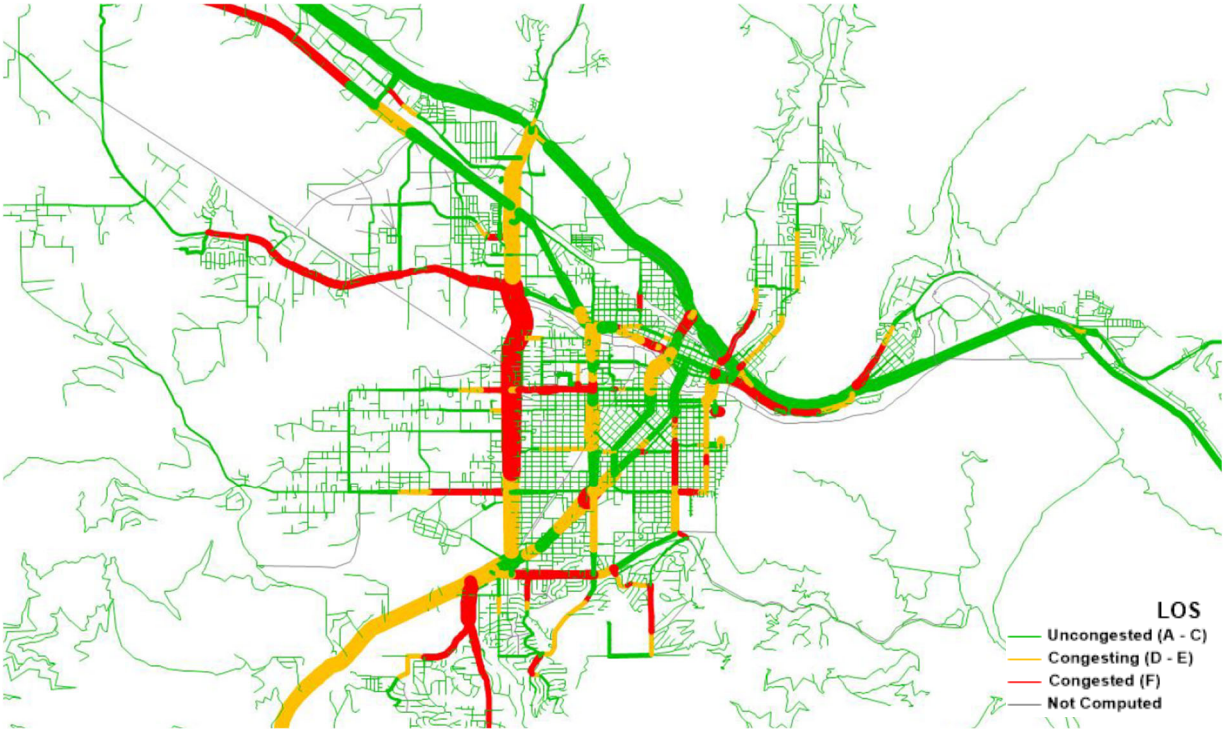


Figure 66 Level of Service and New Connections – Business as Usual 2050

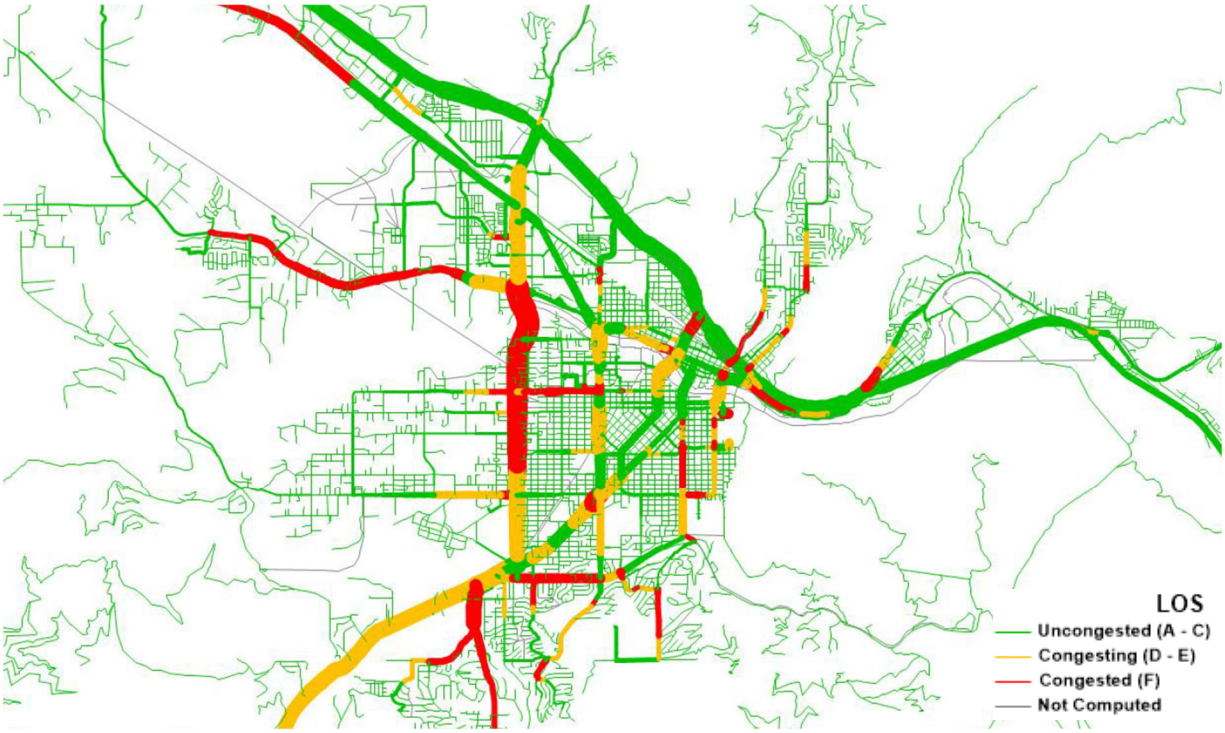


Figure 67 Level of Service and Enhanced Connections – Business as Usual 2050

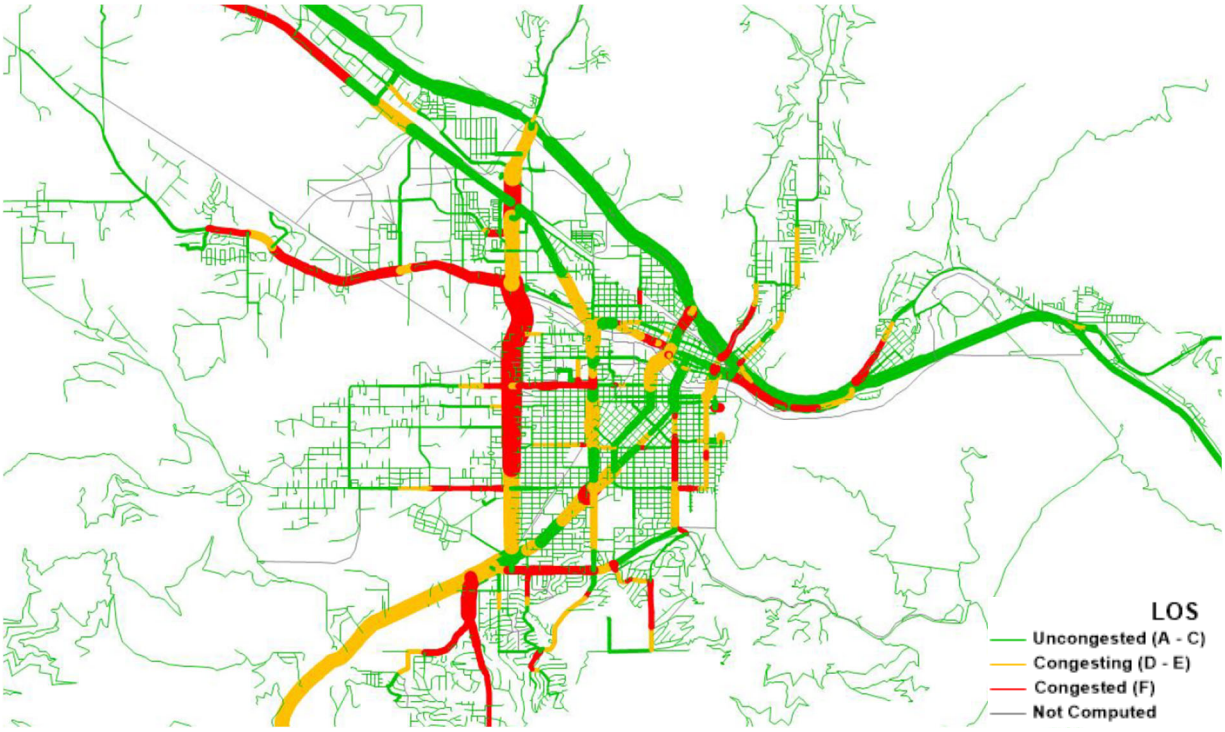


Figure 68 Level of Service and Regional Equity – Business as Usual 2050

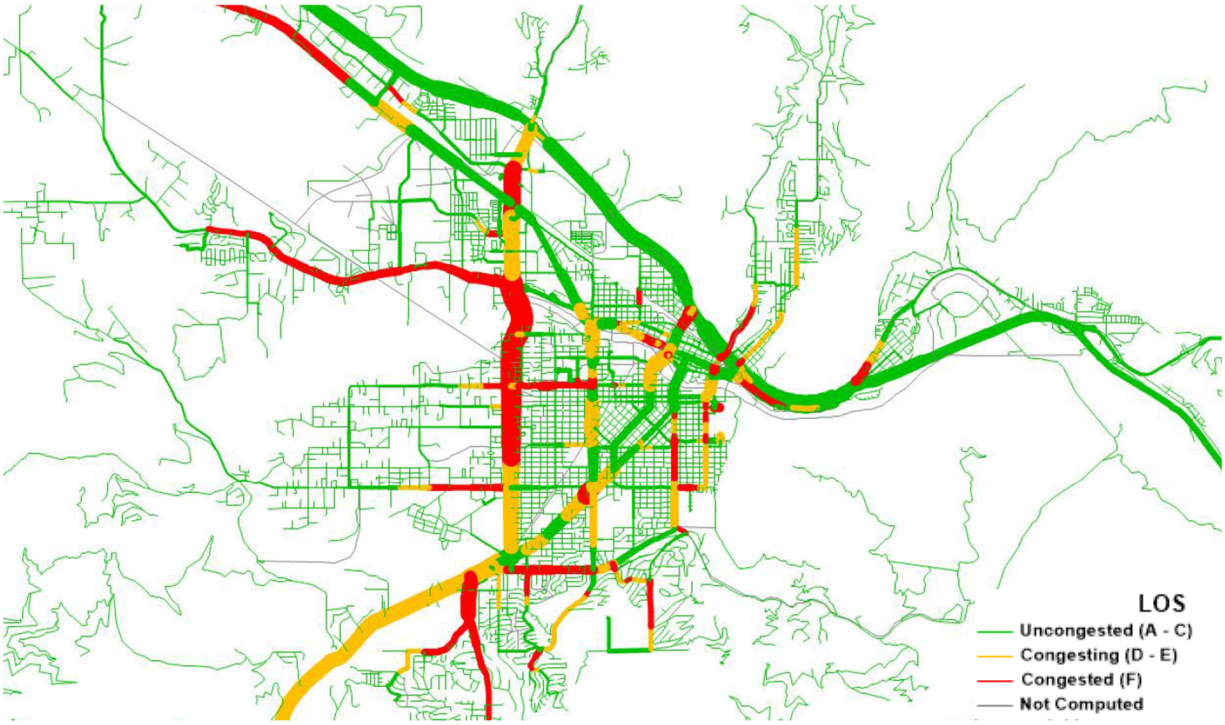


Figure 69 Level of Service and Base Network – Strategic Growth 2050

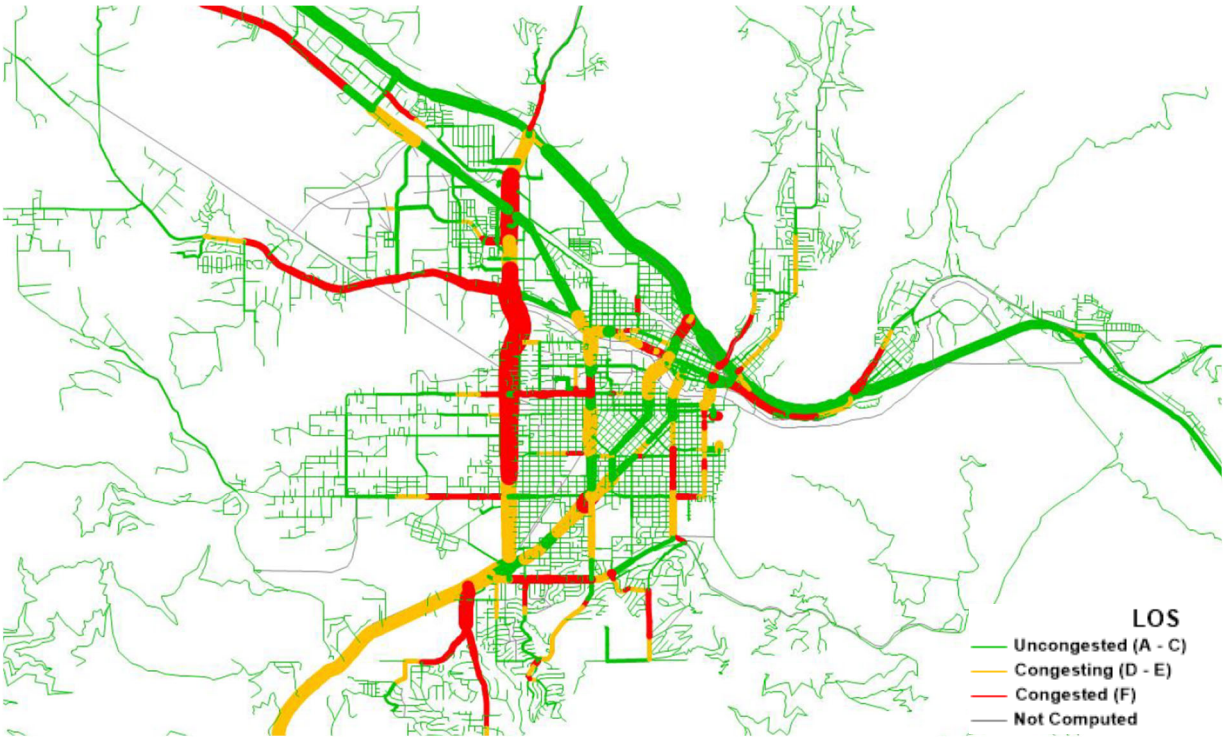


Figure 70 Level of Service and New Connections – Strategic Growth 2050

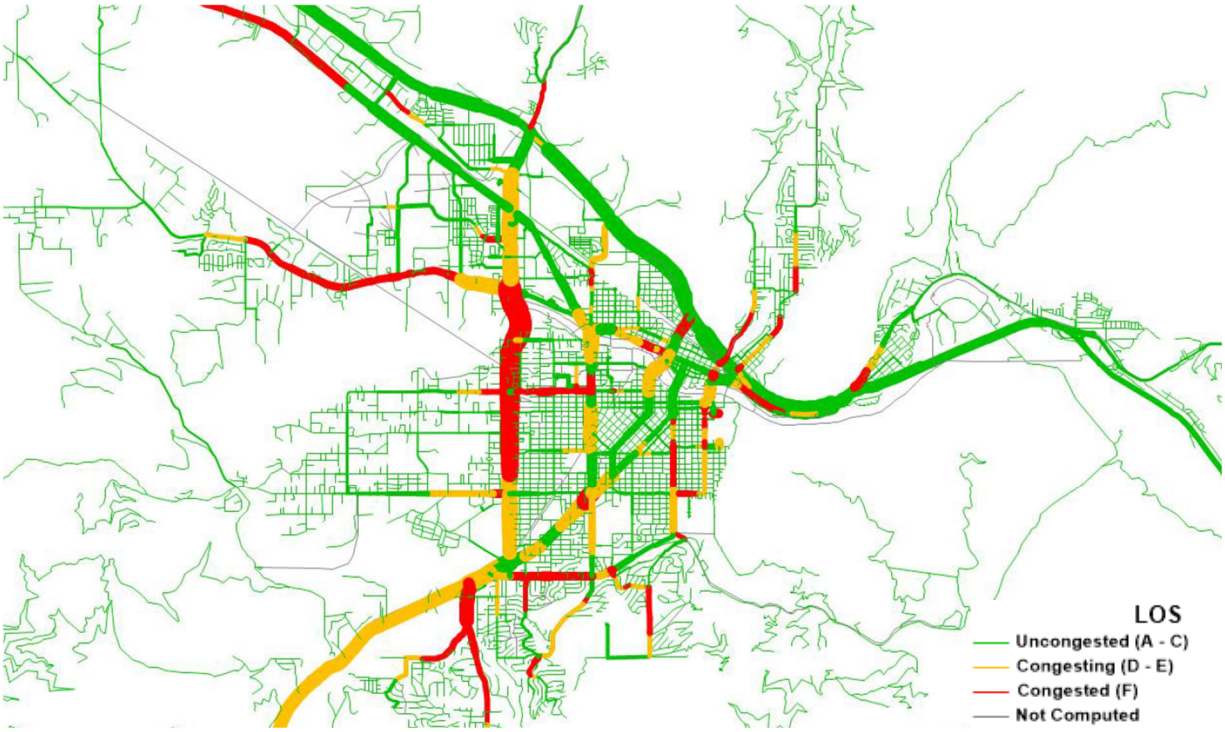


Figure 71 Level of Service and Enhanced Connections – Strategic Growth 2050

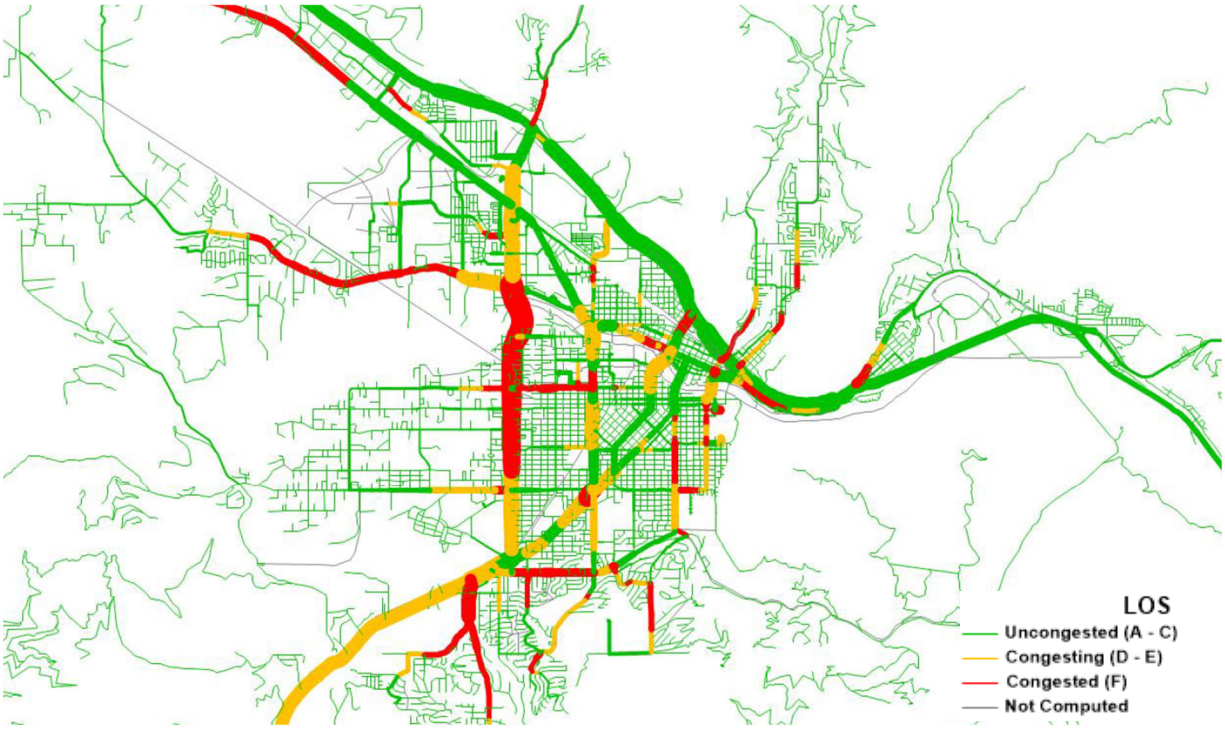
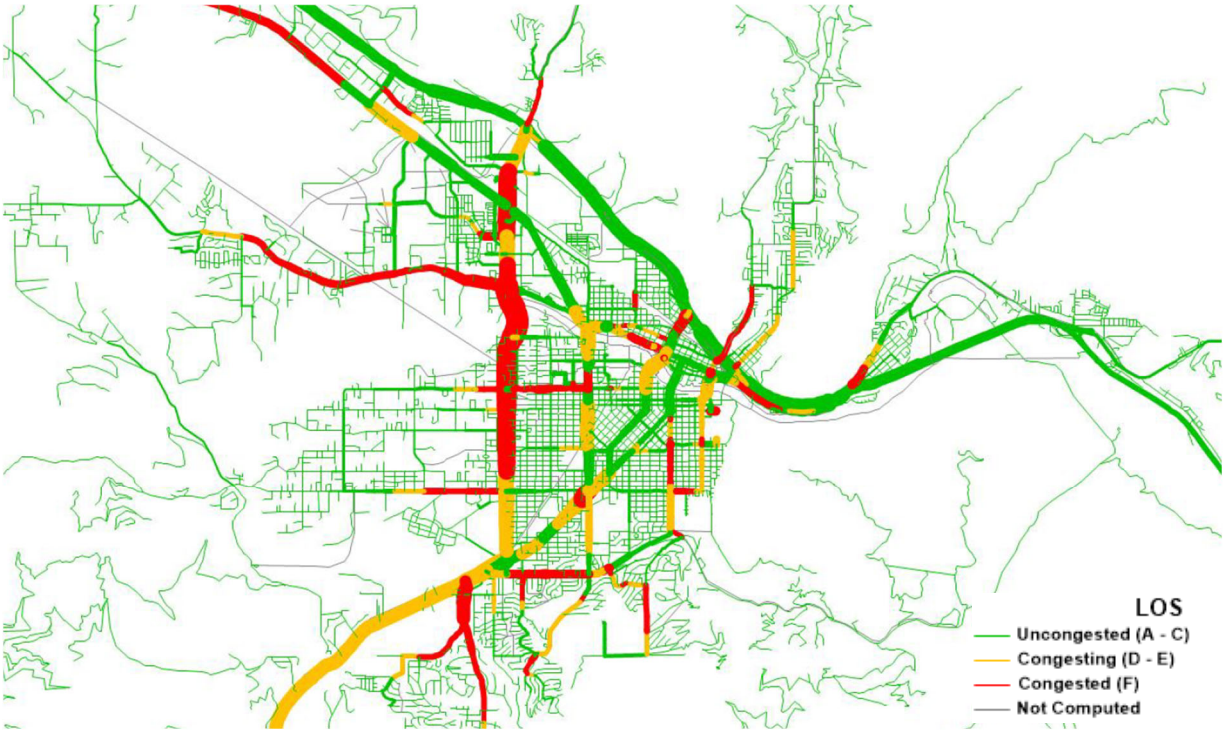


Figure 72 Level of Service and Regional Equity – Strategic Growth 2050



CLIMATE

Advancing sustainability and addressing climate change are key goals for Missoula Connect. Reducing vehicle miles traveled (VMT) can reduce transportation-related greenhouse gas (GHG) emissions and advance the region toward the goal of carbon neutrality.

For this analysis, GHG emissions were calculated with the VMT numbers from model outputs, splitting VMT between congested and non-congested conditions. Journeys in congested conditions take more time, which increases the fuel used by the engine. To account for this, adjustment factors of 0.6 and 0.8 were applied to the fuel economy values for congestion on arterials and freeways, respectively.

Fuel economy (miles per gallon) also depends on the mix of vehicles on the road. Generally, larger and heavier vehicles will consume more fuel to travel a given mile. Since the summary outputs do not provide information on vehicle types, a split of 51% passenger cars and 49% light trucks was applied to the total VMT based on national projections from the U.S. Energy Information Administration (EIA).[2]

According to the EIA projections, the forecasted share of diesel vehicles by 2050 is less than 1% for the total fleet. This emissions assessment assumes that passenger cars and light trucks are powered by gasoline only. The EIA forecasts a fleet-wide fuel economy of 43.5 miles per gallon and 31.5 miles per gallon for passenger cars and light trucks, respectively.[3] These are the values used in the assessment for non-congestion conditions.

The U.S. Environmental Protection Agency provides guidance on the factor emissions of mobile sources by fuel type. Gasoline has a factor emission of 8.78 kgCo2/gallon, which is directly used in this assessment.[4] Given the limited information on transit vehicles, this assessment does not include emissions from transit. However, their impact should be minor since this fleet accounts for a low share of the total vehicles.

The assessment does not make any assumptions regarding the electrification of passenger cars and light trucks. While this would affect the absolute emissions under each scenario (lower emissions), comparison across the scenarios is likely not affected if electrification rates are the same for all scenarios.

Estimated changes in CO2 emissions for each scenario are shown in Table 19. Key findings are as follows:

- The New Connections transportation network scenario resulted in the greatest change from base network CO2 emissions for both growth scenarios. This is likely a result of the greater amount of new roadway projects in the scenario reducing travel delay.
- The 1.1% difference between Business as Usual and Strategic Growth emissions in the base network indicates that land use policy may have a greater potential to reduce emissions than some transportation scenarios due to its ability to reduce VMT.

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[2] Light-Duty Vehicle Stock by Technology Type. EIA Annual Energy Outlook 2020. https://www.eia.gov/outlooks/aeo/supplement/excel/suptab_40.xlsx

[3] Light-Duty Vehicle Miles per Gallon by Technology Type. EIA Annual Energy Outlook 2020. https://www.eia.gov/outlooks/aeo/supplement/excel/suptab_40.xlsx

[4] Emission Factors for Greenhouse Gas Inventories. U.S. EPA. https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

Table 19 Changes in Emissions (Tons of CO2)

Growth Scenario	Base	New Connections	% Change from Base	Enhanced Connections	%Change from Base	Regional Equity	%Change from Base
Business as Usual	816.5	802.6	-1.7%	816.2	0.0%	811.2	-0.7%
Strategic Growth	807.4	796.4	-1.4%	811.9	+0.6%	802.7	-0.6%

APPENDIX F

Travel Demand Model Summary

missoula connect
2050 Long-Range Transportation Plan

Missoula County - City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

Source: Glacier County Tourism

2021 MISSOULA MPO

TRAVEL DEMAND MODEL UPDATE DOCUMENTATION

Source: Edward Blake, Wikipedia

Source: The Guardian

Source: Missoula Transportation Planning

Missoula County ~ City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

May 2021

LSA

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INTRODUCTION

The Missoula MPO recently updated its Long Range Transportation Plan (LRTP). The MPO travel model was updated to assist with the development of its 2050 LRTP development. The trip-based travel model was initially developed in 2010 using Caliper's TransCAD 5.0 and was calibrated and validated to 2010 base year. The MPO travel model includes both Missoula and Ravalli Counties as the modeling area. During this model update, the model was upgraded to TransCAD 8.0 (Build 22320) and was validated to a base year of 2018. The Missoula MPO provided input data, such as household and employment data, and validation data, such as traffic counts and transit boarding, which reflected 2018 ground conditions. The model update effort also included development of 2050 socioeconomic data for the LRTP purposes. Neither the structure of the travel model nor the model components have been modified for this update. The model refresh included modification of inputs and calibration of model parameters for validation. This technical memorandum provides brief model documentation along with the changes conducted as part of the 2018 update. However, the additional model structure and component details can be obtained from the 2010 model documentation.

ROADWAY NETWORK

The roadway network contains basic input information for use in the travel demand model and represents real-world conditions for the 2018 base year. The roadway networks are used in the model to distribute trips and route automobile trips. The networks in the GIS environment used by the model are databases in which all kinds of information can be stored and managed. In addition, the networks provide a foundation for system performance analysis including vehicle miles of travel, congestion delay, level of service, and other performance criteria.

The roadway network is a GIS-based representation of the street and highway system in the City of Missoula and, at a reduced level of detail in Missoula and Ravalli Counties. It operates both as an input database containing roadway characteristics (such as facility type, number of lanes, and area type) and as a data repository that can be used to store and view travel model results. The roadway network is one of the foundational components of the travel model as it serves to represent the supply side of the travel demand/transportation system relationship. As such, the establishment and review of detailed network attribute data were very important to the model's development.

The roadway network is structured to contain data for multiple timeframes or a legacy network format. The roadway network prepared for the Missoula MPO Model contains the base year network and can also store forecast year improvements or alternatives. The 2018 network was developed using the existing and committed network from the 2015 model. The existing and committed improvements from the 2015 network were reviewed by the MPO and appropriate changes were incorporated to develop the base year network. It should be noted that the improvements only constitute changes that would affect the model, such as roadway widening, construction of new a road, or closure of a road.

Network Attribute List

The roadway network contains the input attributes listed in Table 1. Additional fields can be added to the network by MPO staff or other users as desired using the standard tools available in the TransCAD

software. Such fields will not be referenced by the travel model, but can be used to aid in analysis of results.

Table 1: Input Network Link Fields

Field Name	Description	Comments
ID	TransCAD Unique ID	Maintained automatically by TransCAD
Length	Link Length in miles	Maintained automatically by TransCAD
Dir	Link Direction of Flow	Direction of Flow
Name	Street Name	
Dir_yyyy	Scenario-Specific Direction Field	yyyy represents a two through four-digit year code (e.g., 09, 12, 35, 35AA) or the string "AL"
FT_yyyy	Scenario-specific facility type	
AT_yyyy	Scenario-specific area type	
AB_LN_yyyy BA_LN_yyyy	Scenario-specific directional number of through lanes	
CTLMED_yyyy	Scenario-specific presence of a center turn lane or median (1 indicates the presence of a center turn lane)	
SPLM_yyyy	Scenario-specific posted speed limit	
TIMEPEN_yyyy	Link time penalty (minutes)	This field should be used with extreme caution. It is intended for use at external stations and occasionally centroid connectors.
BIKE_yyyy PED_yyyy	Bicycle and pedestrian facility values	These fields are described in the Transit and Non-Motorized Networks section.
AB_FBAM_yyyy AB_FBAM_yyyy BA_FBOP_yyyy BA_FBOP_yyyy	Scenario-specific fields used to hold speed feedback results. These fields are optional and usually managed by the travel model interface.	Fields ending in "AL" are not present for these fields.
ALT	Primary Alternative Number	
ALT2	Secondary Alternative Number	
SUB_REGION	Link sub-region: 1 = Within the MPO 2 = Missoula County outside the MPO 3 = Ravalli County	
CountYY	Traffic count volume	YY represents a two-digit year.
SourceYY	Traffic count source: MDT: Montana Department of Transportation CITY: Provided by the City containing the link COUNTY: Provided by the County containing the link	
Count18_SITEID	MDT count station ID	
FIN_CNT	Traffic count selected for model validation	
FIN_CNTYR	Year that the validation count was collected	

Field Name	Description	Comments
EST_CNT	Estimated traffic count for use in NCHRP-255 adjustments	
BASEVOL	Calibrated base year raw model results for use in NCHRP-255 adjustments	
DO_NCHRP	NCHRP adjustments will be performed for links with a "1" in this field	
Screenlines	Identifies screenline links by screenline number	
BIKE_CNT	Bicycle count	
PED_CNT	Pedestrian count	
OTHER_CNT	Other non-motorized count	
CITY	City name	
Additional Fields	These fields are not required by the travel model and have not been fully reviewed.	
ZIP	ZIP code	
URBAN	Identifies the Missoula Urbanized Area	
CBD	Identifies the Missoula CBD	
CO	County name	
GRID	Air Quality model grid ID	
PM10	Identifies links to be included in particulate modeling	
DEICER	Identifies roadways treated with deicer	
WASH_SAND	Identifies roadways treated with sand	Added to support air quality model
LOSD_CAP_04	Daily LOS D Capacities from 2004 LRTP	
MPO	Identifies links within the MPO boundary	

In addition to link attributes, several attributes are required on the node layer of the roadway network file. Centroid nodes are identified by the ZONE attribute on the node layer. Node attributes are listed in Table 2. The PNR and PULSE fields on the node layer are included to support the transit networks.

Table 2: Input Network Node Fields

Field Name	Description	Comments
ID	TransCAD Unique ID	Maintained automatically by TransCAD
ZONE	Traffic Analysis Zone Number	Populated only for centroid nodes (including external station nodes). Null for all non-centroid nodes.
SUB_REGION	Zone sub-region	This field must be consistent with the sub-region definition in the model database. Populated for centroid nodes only.
PNR_yyyy	Identifies park and ride nodes	Set to 1 for nodes where drive access to transit is permitted
PULSE_yyyy	Identifies nodes with pulsed transfers	Transfer time in minutes. Overrides the standard transfer time at nodes where this field is populated.
INT_ID	Intersection ID (Optional)	Raw modeled turn movements will be saved for nodes on which a value is present. This ID may be synchronized with a Synchro network or other traffic database.

Functional Classification

The functional classification of each roadway link reflects its role in the system of streets and highways. The term "functional classification" (FC) has specific implications with regard to the administration of federal-aid highway programs; however, travel model networks do not always adhere to these definitions. The variable named Facility Type (FT) in the model that refers to the functional classification is used to look up speed, capacity, and volume delay parameters. This will allow facility type to be changed if necessary during the model calibration and validation process. Facility type values used in the Missoula MPO Model are listed in Table 3.

Table 3: Functional Classification/Facility Type Values

Functional Type Code	Functional Classification/Facility Type
1	Freeway
2	Principal Arterial
3	Minor Arterial
4	Collector
5	Rural Highway
6	Local Street
7	Ramps
9	Centroid Connector
10	Walk/Bike Centroid Connector

Area Type

Area type is an attribute assigned to each TAZ and roadway and is based on the activity level and character of the zone. Terminal times, speed limit to freeflow speed conversion factors, roadway capacity, and volume-delay characteristics are dependent on area type. Area type is first defined at the TAZ level based on socioeconomic characteristics and then transferred to the roadway network.

Area type is an attribute that can and should vary with time. Therefore, it was important that area type definitions were specified in a manner that can be updated for future conditions based on available forecast data. While area type definitions based on external information, such as corridor characteristics (e.g., commercial versus residential) or the U.S. Census urbanized area boundary are useful in defining existing area type, this information is not very useful in defining future year area types. Area type definitions were, therefore, specified so that area type forecasts can be developed using forecast socioeconomic data. Area types used in the Missoula MPO Model include central business district (CBD), urban, suburban, and rural, as Table 4 shows.

Table 4: Area Type Categories

Area Type Code	Area Type
1	Central Business District (CBD)
2	Urban
3	Suburban
4	Rural

Zones with the CBD area type were predefined during 2010 and 2015 model update and no changes to CBD area type were proposed for 2018. Initial identification of non-CBD area types was done at the

TAZ level by applying the area type criteria shown in the Table 5 to non-CBD zones based on the model socioeconomic dataset.

Table 5: Area Type Model Criteria

Area Type		Population per Square Mile	Employment per Square Mile
1	CBD	n/a	n/a
2	Urban	4,000 +	4,000–19,999
3	Suburban	300–3,999	300–3,999
4	Rural	0–299	0–299

Note: For each TAZ, the densest non-CBD area type is applied for which at least one of the criteria is met.

After the initial criteria were applied, a manual smoothing process was used to determine the base year area type designation for each zone.

Link Speeds

Network speeds are used in the trip distribution model to distribute trips throughout the region and in the trip assignment model to route traffic on the roadway network. Link freeflow speeds represent average travel time, including intersection delay, needed to traverse the distance of a link with little or no traffic (i.e., no congestion effects). These speeds are generally similar to the speed limit and are calculated as a function of the speed limit, functional class, and area type. Freeflow speeds are typically lower than the speed limit to account for intersection delay on arterials, collectors, and ramps. On other facility types, the speed limit and freeflow speed may be the same.

The Missoula MPO Model uses a set of freeflow to speed limit conversion factors that minimize the difference between speed limit and freeflow speed. The factors in Table 6 are applied in the Missoula MPO Travel Model.

Table 6: Speed Limit to Freeflow Speed Conversion Factors

<table>
<tr><th rowspan="2">ID</th><th rowspan="2">Functional Class</th><th colspan="4">Area Type</th></tr>
<tr><th>CBD</th><th>Urban</th><th>Suburban</th><th>Rural</th></tr>
<tr><td>1</td><td>Freeway</td><td colspan="4">1 (no adjustment)</td></tr>
<tr><td>2</td><td>Principal Arterial</td><td colspan="4" rowspan="2">1</td></tr>
<tr><td>3</td><td>Minor Arterial</td></tr>
<tr><td>4</td><td>Collectors</td><td colspan="3">1</td><td>0.85</td></tr>
<tr><td>5</td><td>Rural Highway</td><td colspan="4">1</td></tr>
<tr><td>6</td><td>Local Street</td><td colspan="4">0.9</td></tr>
<tr><td>7</td><td>Ramp</td><td colspan="4">0.75</td></tr>
<tr><td>9</td><td>Centroid Connector</td><td colspan="4" rowspan="2">1 (no adjustment, values may be specified or obtained from lookup table)</td></tr>
<tr><td>10</td><td>Walk/Bike Centroid Connector</td></tr>
</table>

Link Capacities

Traffic assignment, especially capacity-constrained traffic assignment, requires accurate roadway capacity values. Capacity is used in the model to measure congestion and to determine route diversion due to congestion. This is accomplished through the use of volume-delay equations that are defined and applied in the traffic assignment model.

In the model, per-lane capacity values are retrieved from a lookup table based on the facility type and area type of each link in the roadway network. This approach eliminates opportunities for error in defining capacities at the link level and enforces consistent application of capacity values. Hourly per-lane capacities are retrieved from a lookup table that is stored in an Access database. These hourly lane capacities are used in combination with the number of lanes present on the network to define hourly directional capacity.

The *Highway Capacity Manual* (HCM or HCM 2000) provides guidance on the definition of roadway capacity. The HCM provides link-level capacity guidelines for freeways and rural highways, but does not provide detailed link-level capacity guidelines for urban and suburban collector and arterial streets. Therefore, HCM intersection capacity was used in place of link capacity to develop capacities for these other facilities, as Table 7 shows.

Table 7: Hourly Capacity per Lane

FT	AT	Capacity per Lane
Principal Arterial	CBD	740
	Urban	920
	Suburban	960
	Rural (Expressway)	1,200
Minor Arterial	CBD	650
	Urban	760
	Suburban/Rural	790
Collector	CBD	590
	Urban	680
	Suburban/Rural	710
Local Street	CBD	550
	Urban	630
	Suburban/Rural	660

Turn Lane Adjustments

Presence of a center left-turn lane, median, or left-turn prohibitions can also affect link capacity. The intersection widening factors assumed above account for the presence of frequent left-turn lanes or medians on principal arterials, with occasional left-turn lanes and medians on minor arterials. The Missoula MPO roadway network contains a specific variable that identifies roadway corridors where medians or center left-turn lanes are present. Any corridors where all possible left turns are served by a left-turn lane are identified by this variable. To account for center left-turn lanes, the number of lanes used to compute total directional flow is adjusted as follows:

- Principal/Major Arterial:
  - Left-turn lane present: Add 0.25 lane (0.125 lane in each direction)
  - No left-turn lane present: Subtract 0.5 lane (0.25 lane in each direction)
- Minor Arterial:
  - Left turn-lane present: Add 0.5 lane (0.25 lane in each direction)
  - No left-turn lane present: Subtract 0.25 lane (0.125 lane in each direction)

No center turn lane or median adjustments are made on expressway, collector, or local facilities

Traffic Counts

Traffic counts for 2018 were obtained from MPO and Montana Department of Transportation (MDT) and were included on the roadway network for model validation purpose.

TRANSIT ROUTE SYSTEM

The travel model uses transit and non-motorized networks to build shortest paths between each zone pair for pedestrian, bicycle, and transit trips. The resulting shortest paths are used along with paths built for vehicle trips as inputs to the mode choice model. The Missoula MPO Model uses information stored on the roadway network layer and a TransCAD route system to represent the transit and non-motorized networks. For non-motorized pathbuilding, a bicycle and pedestrian scoring system represents the varying levels of facility quality. For transit pathbuilding, the Missoula MPO Model uses the "Pathfinder" method provided the TransCAD software.

Transit routes and stops are represented within the TransCAD route system. Contents of the route system are based on schedule data from the Mountain Line and UM transit systems.

Route System Attributes

Each route is represented as a unique feature in the route system layer. Like the line layer, the route system layer includes attributes for each feature. As Table 8 shows, these attributes contain route-specific information such as route name, operator, and headway.

Table 8: Route Attributes

Field Name	Description	Comments
Route_ID	TransCAD Unique ID	Maintained automatically by TransCAD
Route_Name	Descriptive route name	These fields are used for informational and summarization purposes only
Route_No	Route number	
AM_Headway	Peak route headway	
MD_Headway	Off-peak route headway	
Mode	Transit Mode	1 = Mountain Line routes 2 = University shuttle routes
Fare	Transit fare in dollars	This value represents the average fare paid by non-university students. The fare is set to zero for UM shuttle routes.
FF_Time	Route freeflow travel time	These fields were used to calibrate the relationship between passenger vehicle and bus travel times. They are not used by the model and are retained for reference only.
PKSch_Time	Scheduled travel time	
OPSchTime		

No changes were proposed to the route system attributes during this model update. Mountain Line provided GIS shape files of the 2018 routes and stops along with their schedules. Transit route alignments, stop locations, and peak and off-peak headways have been updated to reflect the existing conditions for 2018. The headway for each transit route is calculated separately for the peak and off-peak time periods. As discussed in the Trip Assignment chapter of the original 2010 model documentation, the peak time periods include 7:00 a.m. through 8:00 a.m. and 5:00 p.m. through

6:00 p.m. For the transit system, headway is defined as the average headway for all buses starting a route within 15 minutes of the peak period. Similarly, off-peak headway is calculated as the average headway for all remaining buses. See Table 9.

(During the 2015 model update, Mountain Line was in the process of a pilot study, "No Fare/Zero Fare," across all of its system where the riders could use transit for free. The pilot duration was estimated to be three years. Since the purpose of a travel model is planning forecast conditions and, due to uncertainty of this program, it was decided not to include this change in the travel model.)

Table 9: 2018 Route Headway Assumptions

Mountain Line Route	Peak Headway (minutes)	Off-peak Headway (minutes)
Route 1	15	15
Route 2	15	15
Route 3	30	30
Route 4	60	60
Route 5	60	60
Route 6	30	30
Route 7	30	60
Route 8	60	60
Route 9	60	60
Route 11	60	120
Route 12	30	60
Route 14	60	60
Purple Line	30	30
Blue Line	15	15
East Broadway PnR	20	20

NON-MOTORIZED NETWORK

The Missoula MPO Model roadway network includes attributes that describe the presence and quality of non-motorized facilities on roadway links within the MPO. In addition, multiuse paths are included in the roadway network file to allow inclusion of these facilities in the non-motorized pathbuilding process. Non-motorized paths are used to build non-motorized shortest paths for use in mode choice. The non-motorized network was also updated to 2018 conditions. The majority of changes to the non-motorized network involved inclusion of recently built off-street trails or improvements to the existing trails, e.g., Bitterroot Branch Trail. The scoring system used in 2010 and 2015 to rate the travel utility and attractiveness of a non-motorized facility was retained without changes during this model refresh. The scoring system uses a value from 1 to 5 do indicate the quality of bicycle facilities on each network link. While decimal values can be used, the model has been implemented using integer values only.

Initial bike scoring was been performed according to the following rules shown below and in Table 10:

- Bicycles are prohibited on freeways and freeway ramps.
- All multi-use paths receive a score of 1.
- All local streets receive a score of 1.

- For Collector and Arterial Streets:
  - Adjacent multi-use path: 1
  - Collector with Bike Lane: 1
  - Arterial with Bike Lane: 3
  - Collector with no bike lane: 3
  - Arterial with no bike lane: 5

Table 10: Bicycle Scoring Values

Score	Value
1	Good Bicycle Facilities
2	Good to Moderate
3	Moderate Bicycle Facilities
4	Moderate to Inadequate
5	Inadequate Bicycle Facilities, but Bicycle Traffic is Allowed
99	Bicycle Traffic Prohibited

Pedestrian Network

The pedestrian network uses a scoring system identical to the bicycle network scoring system. Initial coding of pedestrian scores used the following rules:

- Pedestrians are prohibited on freeways and freeway ramps.
- All multi-use paths receive a score of 1.
- Local Streets:
  - Streets identified as having deficient sidewalks: 3
  - All other streets (includes all local streets outside the City of Missoula): 1
- For Collector and Arterial Streets:
  - Sidewalk or adjacent multi-use path: 1
  - Collector with a sidewalk on one side: 2
  - Collector with no sidewalks: 3
  - Arterial with a sidewalk on one side only: 4
  - Arterial with no sidewalks: 5

TRAFFIC ANALYSIS ZONES

Traffic analysis zones (TAZs) are small areas containing the land use data that are used as the foundation for trip-making in the travel model. For the Missoula MPO Model, the TAZ layer was identical to the 2000 Census block geography that was established as a part of the 2010 update.

New zone splits were identified by the MPO in the West Mullan area, west of downtown Missoula, based on the proposed development in the area. A total of 18 new zones were created as part of the 2018 model update.

2018 SOCIOECONOMIC DATA

The calibration and validation of the MPO travel model to the 2018 base year requires 2018 estimates of household and employment data. 2018 household information was provided by the MPO at a parcel level in the GIS format. The households were aggregated to the updated TAZs to develop input for the model. The households for Ravalli County were developed based on 2015 household data and interpolated growth between 2015 and 2045 datasets.

Various quality control checks were conducted to the household data for reasonableness, such as comparing the 2018 household data to 2015 data at a TAZ level, most recent American Community Survey (ACS) data, and also by reviewing the annual growth rates by TAZ.

The MDT provided 2018 employment data as a GIS point layer. The employment data contained North American Industry Classification System (NAICS) code were used to classify the employment into modeling categories. This approach is consistent with the previous employment data development efforts. The employment data by employment type were aggregated to TAZs and multiple quality control checks, similar to household checks, were conducted to verify the reasonableness of the 2018 employment data. See Table 11.

Table 11: 2015 and 2018 Household and Employment by County

County	Socioeconomic Data Variable	2015	2018	Growth
Missoula County	Households	40,537	42,563	5%
	Population	96,245	100,007	4%
	Retail Employment	9,955	10,154	2%
	Service Employment	21,800	21,983	1%
	Basic/Production Employment	12,069	11,438	-5%
	Educational Employment	4,774	4,882	2%
	Healthcare Employment	11,457	17,112	49%
	Leisure/Hospitality Employment	9,155	9,264	1%
Ravalli County	Households	24,438	26,440	8%
	Population	58,197	62,535	7%
	Retail Employment	2,920	2,763	-5%
	Service Employment	6,555	5,291	-19%
	Basic/Production Employment	5,741	3,420	-40%
	Educational Employment	1,718	2,052	19%
	Healthcare Employment	2,302	2,679	16%
	Leisure/Hospitality Employment	2,608	2,300	-12%

TRIP GENERATION

Trip generation is the first phase of the traditional four-step travel demand modeling process. It identifies the trip ends (productions and attractions) that correspond to the places where activities occur as represented by socioeconomic data (e.g., households and employment). Productions and attractions are estimated for each TAZ by trip purpose, and then balanced at the regional level so that total productions and attractions are equal. In some cases, production and attraction allocation sub-models are applied to better represent the geographic distribution of trip-ends. The resulting productions and attractions by trip purpose and TAZ are subsequently used by the Trip Distribution model to estimate zone-to-zone travel patterns.

The trip generation model is defined such that trips are produced at home and are generally attracted to other places of activity (employment). Hence, the terms "productions" and "attractions" are the fundamental variables for defining the trip ends associated with travel. Productions generally occur at the home end of a trip; and attractions are typically associated with places of employment.

Trip Purposes

Trip purpose is used in travel models to categorize various types of household-based trips that have similar characteristics, such as location of production or attraction end, trip length, auto occupancy, and others. In this manner, trip rates by trip purpose are sensitive to the specific socioeconomic data associated with each trip type. In general, it is advisable to disaggregate trips by trip purpose only to the point that the base and horizon year activity data can support them.

The current Missoula MPO model includes the following six trip purposes, which were retained for the 2018 update.

- Home-Based Work (HBW): Commute trips between home and work and vice versa (e.g., includes trips between work and home).
- Home-Based Shop (HBS): Trips between home and shopping locations for the purpose of shopping.
- Home-Based University (HBU): Trips between home and the university campus for school related purposes by people not employed by the University (i.e., students and visitors).
- Home-Based Other (HBO): All other trips that have one end at home. These can include trips between home and appointment, home and recreation, etc.
- Work-Based Other (WBO): Work-related trips without an end at home.
- Other-Based Other (OBO): Trips with neither an end at home nor a work-related purpose.

Production Rates

The Missoula MPO Model uses a bivariate trip production model. The production model uses average household size and income for each TAZ to determine the general trip-making characteristics of a household. The average household size and income were obtained from U.S. Census data during the 2010 model development. The model uses household disaggregation models to estimate the univariate distribution of households by size and by income group for each TAZ. Once these distributions have been estimated, the model uses an iterative proportional factoring (IPF) process to develop bivariate distributions of households by income and size for each TAZ. Since these data are

available from the decennial Census data at a block level and are not available from the ACS data, no modifications were made to the univariate or bivariate distributions of household size and income. The average household size from 2015 was used with the number of households to estimate the total population of the county, which was confirmed with ACS population data as a reasonableness check.

Production rates from the 2015 model were used as an initial estimate and the production rates were adjusted during the 2018 model validation to represent the trip activity (traffic counts) in the region, as shown in Table 12.

Table 12: 2018 Trip Production Rates

Trip Purpose	Household Income	Household Size				
		1	2	3	4	5+
HBW	Low Income (up to $19,999)	0.47	0.84	1.70	1.70	1.70
	Medium Income ($20,000–$74,999)	1.08	2.98	2.60	2.92	3.93
	High Income ($75,000 or more)	1.22	2.98	3.45	2.85	3.84
HBO	Low Income (up to $19,999)	1.58	2.16	4.66	6.30	11.36
	Medium Income ($20,000–$74,999)	1.58	2.31	5.00	8.57	11.28
	High Income ($75,000 or more)	1.83	2.46	6.25	9.30	19.36
HBS	Low Income (up to $19,999)	0.55	1.46	1.59	1.59	1.59
	Medium Income ($20,000–$74,999)	0.70	1.84	0.98	1.95	1.95
	High Income ($75,000 or more)	0.91	1.84	1.43	1.93	1.93
OBO	Low Income (up to $19,999)	1.63	1.63	2.37	2.37	2.37
	Medium Income ($20,000–$74,999)	1.46	1.75	3.13	4.72	4.72
	High Income ($75,000 or more)	1.46	1.74	3.61	5.35	5.35
WBO	Low Income (up to $19,999)	0.35	0.67	0.78	0.78	0.78
	Medium Income ($20,000–$74,999)	0.59	0.74	1.25	1.25	1.25
	High Income ($75,000 or more)	1.04	1.30	1.37	1.80	1.86
HBU	Low Income (up to $19,999)	0.97	0.97	0.97	0.97	0.97
	Medium Income ($20,000–$74,999)	0.97	0.97	0.97	0.97	0.97
	High Income ($75,000 or more)	0.97	0.97	0.97	0.97	0.97

Attraction Rates

Attraction rates are used to identify the ends of trips that occur at locations other than the trip-maker's home. For home-based trips, the attraction end of a trip occurs at a non-residential location, or occasionally at another person's home. For WBO trips, trip productions occur at the trip maker's workplace and the trip attraction occurs at the non-work end of the trip. For OBO trips, the trip production and attraction are synonymous with trip origin and destination. For non-home-based trip purposes, allocation models and special procedures are used to properly locate the production and attraction end of each trip. Similar to production rates, attraction rates from the 2015 model were used as an initial estimate but adjusted during model validation. See Table 13.

Table 13: 2018 Trip Attraction Rates

Socioeconomic Variable	HBW	HBS	HBO	WBO	OBO	HBU	WBO_PA
Basic Employees	1.60	0.01	0.27	0.06	0.15	0	0.92
Retail Employees	1.31	2.95	2.56	2.02	6.37	0	0.61
Service Employees	1.36	0.06	1.59	0.30	0.79	0	1.15
Education Employees	1.32	0.41	14.60	1.03	3.45	0	1.00
Health Employees	1.32	0.02	3.04	0.50	1.20	0	0.93
Leisure Employees	1.13	2.17	1.27	2.30	3.27	0	0.43
Total Households	0.00	0.02	0.94	0.14	0.51	0	0.00

Special Generator

Missoula is home to the University of Montana (UM). Because the university is a four-year college, students tend to live on campus or in households concentrated near the university. This suggests that a special university trip purpose and allocation model can improve representation of university trips in the travel model.

The UM campus is separated into four traffic analysis zones. Because universities do not follow the normal trip patterns used by the model, some special considerations were given to trip types at UM. In particular, the Home-Based University (HBU) trip purpose is defined as a trip by a university student or visitor between home and any location on the university campus. Trip ends at the University are associated with University faculty and staff, students living on campus, and students and visitors living off campus and described as follows:

- HBW, HBS, and HBO Productions: These production trip ends can occur only for students living on campus.
- HBW Attractions and WBO Productions: These trip ends can occur only for University faculty and staff.
- WBO Attractions and all OBO Trips: These trip ends can only occur for students and visitors living off campus.
- HBS and HBO Attractions: These trip ends cannot occur at the University. All home-based trips to the University by students and visitors are considered HBU trips and all home-based trips to the University by faculty and staff is considered HBW trips.
- HBU Productions: Trips within the University are not modeled, so HBU productions cannot occur on campus.
- HBU Attractions: HBU attractions can occur only for students and visitors living off campus.

The travel model uses a production allocation model to represent the geographical distribution of the trips made by the university students. The special generator inputs include the student enrollment and the total number of employees at the university, which determines the magnitude of university trips. 2018 Enrollment data were obtained from the UM website. The enrollment for 2018 was very similar to 2015 enrollment data. So it was decided to retain 2015 UM special generator data for 2018. See Tables 14 and 15.

Table 14: UM Employment and Enrollment

Faculty	770
Staff	1,300
Total Faculty and Staff	**2,070**
On-Campus Students	3,730
Off-Campus Students	9,630
Total Enrollment	**13,360**

Table 15: 2018 University Special Generator Values

Trip Purpose	Trip Rate	Unit	Special Generator Value
HBW Productions	0.22	On Campus Students	821
HBW Attractions	1.6	FTE Employment	3,314
HBS Productions	0.2	On Campus Students	746
HBS Attractions	n/a	n/a	0
HBU Productions	n/a	n/a	0
HBU Attractions	3.8	Off Campus Student	36,586
HBO Productions	0.5	On Campus Students	1,865
HBO Attractions	n/a	n/a	0
WBO Production	0.37	FTE Employment	766
WBO Attractions	0.19	Off Campus Student	1,829
OBO Productions	0.25	Off Campus Student	2,407
OBO Attractions	0.25	Off Campus Student	2,407

No changes were suggested to the 2015 university allocation model parameters as enrollment magnitude had not changed and the student address information was not readily available.

External Trips

In addition to the internal-internal trips that occur entirely within the modeling area, the model must include external travel from outside of the region. Trips with one end inside the modeling area and the other outside of the area are called Internal-External (IE) and External-Internal (EI) trips. Through trips, or External-External (EE) trips, are those that pass through the modeling area without stopping (or with only short convenience stops).

External travel is modeled explicitly at the external stations where roadways cross the model boundary. The seven external stations in the MPO model are consistent with the 2015 travel model. The external trips were determined using the 2018 traffic counts at these external stations, which were obtained from the MDT.

The first step in estimating external travel for the model is to determine the average weekday traffic at each location in the base year. Next, it is necessary to determine the split between the EE and IE/EI trips at each external station. This was accomplished using guidance provided in NCHRP Report 365 along with a manual review of external station locations, volumes and connections to other regions. Only a few external stations are assumed to carry a significant number of EE trips. See Table 16.

Table 16: 2018 External Travel Assumptions

External Station	Location	Total Volume	% EE	% IE/EI	EE Trips	IE/EI Trips
5001	Hwy 93 S	825	6%	94%	48	777
5002	I-90 East	8,877	48%	52%	4,300	4,577
5003	I-90 West	8,086	48%	52%	3,910	4,176
5004	Hwy 93 N	8,930	7%	93%	605	8,325
5005	Hwy 200 E	2,778	6%	94%	168	2,610
5006	Hwy 83 N	1,008	0%	100%	0	1,008
5007	Hwy 12 W	1,206	6%	94%	70	1,136

A significant number of EE trips are only assumed to occur at a subset of external stations. EE trips are further restricted to only occur between a subset of all remaining external station pairs. Over the course of a day, the total number of EE trips at each external station is assumed to be equal for both directions (inbound trips = outbound trips). This assumption is used to develop total inbound and outbound trips at each external station. IE/EI and EE volumes were developed using the 2018 traffic counts and an approach consistent with the 2015 approach. See Table 17.

Table 17: 2018 24-hour EE Trip Table

		5001 Hwy 93 S	5002 I-90 East	5003 I-90 West	5004 Hwy 93 N	5005 Hwy 200 E	5007 Hwy 12 W	TOTAL
5001	**Hwy 93 S**	0	0	11	3	9	0	**24**
5002	**I-90 East**	0	0	1,846	273	0	32	**2,150**
5003	**I-90 West**	11	1,846	0	26	72	0	**1,955**
5004	**Hwy 93 N**	3	273	26	0	0	1	**302**
5005	**Hwy 200 E**	9	0	72	0	0	2	**84**
5007	**Hwy 12 W**	0	32	0	1	2	0	**35**
TOTAL		**24**	**2,150**	**1,955**	**302**	**84**	**35**	**4,550**

Sub-Region Trip Rate Factors

The 2010 model validation efforts suggested that suggests that residents of rural Missoula and Ravalli Counties tend to make fewer home-based trips. Instead, these residents tend to link multiple trips together, resulting in more non-home based trips. During model validation, several regional commercial centers were observed to be under-producing trips; therefore, the model applies trip rate factors to increase trip attractions at these locations. 2015 trip rate factors were adopted as the initial starting point and were updated during the model validation. See Table 18.

Table 18: Jurisdictional Trip Rate Factors

Subregion		HBW		HBS		HBU		HBO		WBO		OBO		WBO_PA
		P	A	P	A	P	A	P	A	P	A	P	A	
1	CBD	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Urban MPO	1	1	1	1	1	1	1	1	1	1	1	1	1
3	Suburban MPO	1	1	1	1	1	1	1	1	1	1	1	1	1
4	Rural MPO	0.64	0.75	0.64	0.64	1	1	0.64	0.64	0.75	0.64	0.75	0.64	0.75
5	Missoula County (Non-MPO)	0.5	1	0.5	0.5	1	1	0.5	0.5	1	0.5	1	0.5	0.5
6	Ravalli County	0.7	1	0.53	0.95	1	1	0.5	0.75	0.86	0.53	0.96	0.53	0.53
99	Regional Commercial	1	1	1	3.75	1	1	1	3.125	1	3.75	3.75	3.75	1

TRIP DISTRIBUTION

Trip distribution is the second phase of the traditional four-step demand model. Trip distribution is the process through which balanced person trip productions and attractions from the trip generation model are apportioned among all zone pairs in the modeling domain by trip purpose. The resulting trip table matrix contains both intrazonal (e.g., trips that do not leave the zone) on the diagonal and interzonal trips in all other zone interchange cells for each trip purpose.

The Missoula MPO Model uses a standard gravity model equation and applies friction factors to represent the effects of impedance between zones. As the impedance (e.g., travel time and spatial separation) between zones increases, the number of trips between them will decrease as represented by a decreasing friction factor. This is similar to the standard gravity model, which assumes that the gravitational attraction between two bodies is directly proportional to their masses. The trip distribution model makes a similar assumption in that the number of trips between two zones is directly proportional to the number of productions and attractions contained in those zones.

The gravity model used by trip distribution to estimate the number of trips between each zone pair is defined in Equation (1).

$$T_{ij} = P_i \frac{A_j \cdot F_{ij} \cdot K_{ij}}{\sum_{i=1}^{n} \left(A_j \cdot F_{ij} \cdot K_{ij}\right)} \quad (1)$$

Where:

Tij = trips from zone i to zone j

Pi = productions in zone i

Aj = attractions in zone j

Kij = K-factor adjustment from i to zone j

i = production zone

j = attraction zone

n = total number of zones

Fij = friction factor (a function of impedance between zones i and j)

K-factors are often used in travel demand models to account for nuances in travel behavior and the transportation system that cannot be accurately modeled with simplified aggregate modeling techniques. They are often applied at the district or jurisdictional level to adjust regional distribution patterns. They may be applied by trip purpose or for all trips. Use of K-factors was explored during model validation, but was ultimately found to be unnecessary.

To implement trip distribution by time of day, factors representing the portion of trips occurring in the peak (combined a.m. and p.m. peak hours) and off-peak (all other times) are necessary. Peak hour trips are further separated in the time of day step prior to traffic assignment. The trip distribution time of day factors were retained from the previous model update as shown in Table 19.

Table 19: Peak and Off-Peak Trip Percentages by Purpose

	HBW	HBS	HBU	HBO	WBO	OBO
Off-Peak	0.651	0.923	0.851	0.805	0.771	0.910
Peak	0.349	0.078	0.149	0.195	0.228	0.090

Roadway Network Shortest Path

The impedance portion of the gravity model equation is based on shortest paths between each zone pair. Each shortest path is determined through a process called pathbuilding. This process identifies shortest route between two network centroids that minimizes an impedance variable. Shortest paths cannot pass through other centroid connectors. Various data, such as path distance, can be "skimmed" along the shortest impedance route. The set of all zone to zone shortest paths is called a "shortest path matrix" and is sometimes referred to as a "skim matrix" with the understanding that the skimmed variable may differ from the variable(s) used to determine the shortest path.

The Missoula MPO Model finds shortest path between each zone pair based on peak or off-peak congested travel time. Peak travel time is defined as the a.m. peak hour directional travel time, while off-peak travel time is defined as the off-peak period congested travel time. Travel times are calculated using a speed feedback process, which is described further in the Traffic Assignment section.

Terminal Times

Terminal penalties are applied in the model to the shortest paths. They simulate several travel-related variables, such as the time to locate a parking space, walking to a final destination, paying for a parking space, etc. Terminal penalties, shown in Table 20, are added to both the production and attraction end of each zone pair based on the area type of each zone.

Table 20: Terminal Penalties by Area Type

Area Type		Terminal Time
1	CBD	1.5
2	Urban	1
3	Suburban	1
4	Rural	0.75

Friction Factors

Friction factors represent the impedance to travel between each zone pair. The Missoula MPO Model applies the friction factors in the form of gamma functions for each trip purpose. The gamma function is defined by Equation (2).

$$F_{ij} = \alpha t^{\beta} e^{\gamma t} \qquad (2)$$

Where:

F_{ij} = *friction factor between zones i and j*

T = *travel time*

α, β, γ = *calibration parameters*

Friction factors for the HBW trip purpose were calibrated to the worker flow and reported work commute time data obtained from the 2012–2016 Census Transportation Planning Package. The calibration targets and model results for HBW trips are shown in Figure 1 (see following page).

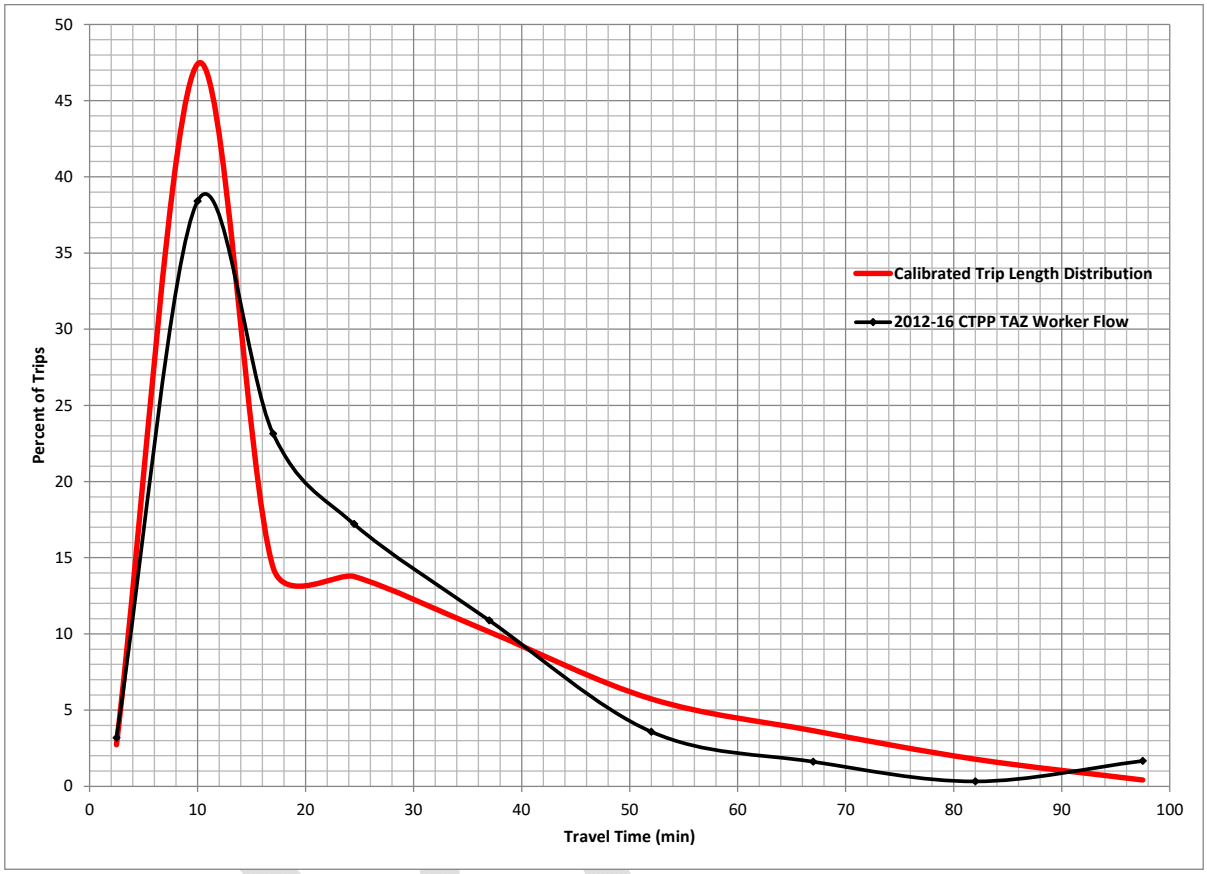
In addition to friction factor adjustments, other model variables and parameters including terminal penalties, intrazonal travel times, volume/delay equations, and K-factors can affect calibration of trip length distribution curves. These variables were monitored during model validation.

Although local data from the CTPP can be used to estimate HBW friction factors, no other local data are available to calibrate friction factors for the other trip purposes. Trip lengths for non-HBW trip purposes are based on a pivot-point analysis using average trip length/time relationship from the 2010 model. Table 21 contains the calibrated gamma function parameters.

Table 21: Friction Factor Gamma Parameters

Trip Purpose	Alpha	Beta	Gamma
HBW	1000	0.054	0.083
HBS	1000	0.139	0.177
HBO	1000	0.139	0.190
HBU	1000	0.139	0.190
WBO	1000	0.098	0.173
OBO	1000	0.161	0.259

Figure 1: HBW Trip Time Distribution



MODE CHOICE

The Missoula model produces and distributes all person trips including non-motorized, carpool, and transit trips. The mode choice model separates the resulting person trip tables into the drive alone, shared ride (i.e., carpool), transit (walk access and drive access), and non-motorized (bicycle and walk) modes. Information about transit routes and the quality of bicycle and pedestrian facilities provides important input to the mode choice model. The mode choice model also considers trip lengths produced by the gravity model, resulting in sensitivity to higher density and mixed-use areas. Such areas will produce shorter trips that are more likely to be made using non-motorized modes.

The Missoula Model includes a logit-based mode choice model that is applied for trips within the MPO boundary. Mode choice is applied using a nested logit model that addresses both motorized and non-motorized modes. Nested logit models represent the current "best-practice" for mode choice modeling. This structure first separates motorized trips from walk and bicycle trips, then separates drive alone, shared ride, and transit trips. Transit trips are further separated into drive and walk access in a third level.

Missoula Model Parameters

Mode choice model coefficients are based on FTA New Starts guidelines that specify preferred ranges for certain model coefficients. These ranges were developed based on extensive review of mode choice model performance and accuracy. The general guidelines are summarized in Table 22.

Table 22: New Starts Coefficient Guidelines

Coefficient	Minimum Value	Maximum Value
In-Vehicle Travel Time (IVTT)	-0.030	-0.020
Out of Vehicle Travel Time (OVTT)	-0.090	-0.040

The coefficient for out of vehicle travel time should be between 2 and 3 times the in-vehicle travel time coefficient.

The logit mode choice model specification implies a value of time that is equal to the coefficient for in-vehicle travel time divided by the coefficient of cost. FTA guidelines state that the value of time should be between one-quarter and one-third the median or average income. For HBW trips, the median income is computed separately for each income group as shown in Table 23. For other trip purposes, the value of time is based on the regional median income.

Table 23: Median Incomes and Values of Time Ranges

Market Segment	Low value of time ($/hour)	High value of time ($/hour)
Low Income ($22,689)	$2.70	$3.60
Medium Income ($36,958)	$4.40	$5.90
High Income ($57,273)	$6.90	$9.20
Regional ($34,542)	$4.20	$5.50

This Missoula MPO mode choice model uses the average allowable coefficient for in-vehicle travel time. For work and university trips, the out of vehicle coefficient is specified to be two times the in-vehicle coefficient. For other trips, the in-vehicle coefficient is specified to be three times the in-vehicle coefficient. Value of time assumptions use the highest allowable value of time for work and

university trips, with the lower value of time for the remaining trip purposes. The resulting coefficients are listed in Table 24.

In addition to time and cost coefficients, the mode choice model uses geographic "dummy" variables to represent the increased likelihood of trips to the central business district or university to be transit trips. The coefficients for these variables vary by mode and are adjusted during model calibration.

The non-motorized modes also include a transit network score. The transit network score is computed as the distance-weighted average transit score over the course of a trip.

Table 24: Mode Choice Model Coefficients

Coefficient	HBW	HBS	HBU	HBO	WBO	OBO
IVTT	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025
OVTT	-0.065	-0.065	-0.065	-0.065	-0.065	-0.065
Cost	—	-0.31	-0.31	-0.31	-0.31	-0.31
Cost (Low Income)	-0.47	—	—	—	—	—
Cost (Med. Income)	-0.29	—	—	—	—	—
Cost (High Income)	-0.19	—	—	—	—	—
CBD Dummy	0.009	0.009	0.009	0.009	0.009	0.009
University Dummy	0.009	0.009	0.06	0.009	0.009	0.009
Walk Score	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025
Drive Score	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025

Note: Travel time is in units of minutes and cost is in units of dollars.

In model application, the above-defined coefficients are multiplied by variables obtained in the transit, non-motorized, and roadway pathbuilding process. The results of the pathbuilding process produce a number of variables that are not immediately consistent with the model coefficients. Variables from pathfinding are each matched with one of the coefficients described above using the information shown in Table 25. Alternative-specific constants are shown in Table 26.

Table 25: Mode Choice Model Variables

Variable Name	Units	Applicable Modes	Coefficient
Origin terminal time	Minutes	Drive alone, shared ride, drive to transit	OVTT
Destination terminal time	Minutes	Drive alone, shared ride	OVTT
Drive time	Minutes	Drive alone, shared ride, drive to transit	IVTT
Parking cost	Dollars	Drive alone, shared ride	Cost
Vehicle operating cost	Dollars	Drive alone, shared ride, drive to transit	Cost
Access walk time	Minutes	Walk to transit	OVTT
Transfer walk time	Minutes	Walk to transit, drive to transit	

Variable Name	Units	Applicable Modes	Coefficient
Initial wait time (First 7.5 minutes)	Minutes	Walk to transit, drive to transit	OVTT
Initial wait time (Time over 7.5 minutes)	Minutes	Walk to transit, drive to transit	IVTT
Transfer wait time	Minutes	Walk to transit, drive to transit	OVTT
Transfer penalty time	Minutes	Walk to transit, drive to transit	OVTT
Transit ride time	Minutes	Walk to transit, drive to transit	IVTT
Transit fare	Dollars	Walk to transit, drive to transit	Cost
CBD Dummy	n/a	All except drive alone	CBD Dummy (Transit only)
University Dummy	n/a	All except drive alone	University Dummy (Transit only)
Walk time	Minutes	Walk	OVTT
Average Walk score	n/a	Walk	Walk Score
Bike time	Minutes	Walk	OVTT
Bike Walk score	n/a	Walk	Walk Score

The observed mode share for transit is based on the number of boardings from Mountain Line's Automatic Passenger Counts (APC) data, whereas the non-motorized shares were obtained from the 2012–2016 Census Transpiration Planning Package (CTPP). The 2018 average daily transit boardings were provided by Mountain Line for transit calibration. The percentage distribution of transit trips by trip purpose was retained from the 2010 model. A similar approach was used for vehicle trips (Drive Alone, Shared Ride2, Shared Ride2+), bicycle and walk modes. No modifications were made to the auto occupancy rates from the 2010 model. However, the 2018 mode choice calibration involved changes to the alternative-specific constants and did not involve any modifications to the mode choice coefficients, value of times, or any of the cost variables.

Table 26: 2018 Alternative-Specific Constants

Trip Purpose	Drive Alone	Shared Ride	Walk to Transit	Drive to Transit	Walk	Bike
HBW	0	-2.017	-1.964	0	0.002	-2.006
HBS	0	-0.289	-2.392	0	-0.084	-2.502
HBU	0	-1.379	-0.179	-1.246	0.546	-0.590
HBO	0	0.015	-2.209	0	1.392	-1.895
WBO	0	-1.786	-3.078	0	-0.514	-2.755
OBO	0	0.000	-3.067	0	-0.307	-3.074

TRAFFIC ASSIGNMENT

The Missoula MPO model includes a time of day component that disaggregates the vehicle trip tables into a.m. peak, p.m. peak, and off-peak periods. The most recent 2018 traffic count data contained daily counts and did not contain hourly information; therefore, time of day factors from the 2010

model were adopted for this update. The time of day factors for the 2010 model were developed using hourly traffic count data available during the update.

The Traffic Assignment module loads the travel demand as represented by the time of day vehicle trip tables onto the roadway network, which is the supply side of the model. The Missoula MPO Model currently uses the equilibrium traffic assignment method, which was selected based on the region, its needs, and the professional experience from tried-and-true methods.

Convergence

When equilibrium traffic assignment is used, oscillations between equilibrium iterations can sometimes result in unstable assignment results. If closure criteria are not sufficient, two very similar model runs (e.g., with only one small adjustment to the roadway network) can produce counter-intuitive results. This generally occurs when the equilibrium traffic assignment algorithm converges at a different number of iterations—sometimes only one iteration difference—for each run. Even when equilibrium traffic assignment converges after the same number of iterations, alternating oscillations in traffic volumes can sometimes be observed in traffic assignment results based on slightly different model networks. While oscillations introduced by the equilibrium traffic assignment procedure can be of concern, they can be managed through introduction of a very tight closure criterion. Traffic assignment is performed with a closure gap of 0.0001 (10-4) and a maximum number of iterations of 500.

Volume Delay Parameters

A volume-delay function represents the effect of increasing traffic volume on link travel time in the assignment process. While several volume delay functions are available for consideration, the most commonly used function is the modified Bureau of Public Roads (BPR) function. The modified BPR function is based on the original BPR equation shown in Equation (3). Alpha and beta values were specified during 2010 model update based on experience in other areas. See Table 27.

$$T_C = T_F\left(1 + \alpha\left(\frac{V}{C}\right)^{\beta}\right) \quad (3)$$

Where:

T_C = Congested travel time

T_F = Freeflow travel time

V = Traffic volume

C = Highway design (practical) capacity

α = Coefficient alpha (0.15)

β = Exponent beta (4.0)

Table 27: Volume Delay Parameters Alpha and Beta

Functional Classification		CBD		Urban		Suburban		Rural	
		Alpha (α)	Beta(β)	Alpha (α)	Beta(β)	Alpha (α)	Beta(β)	Alpha (α)	Beta(β)
1	Freeway	0.8	5.5	0.83	5.5	0.83	5.5	0.83	5.5
2	Principal Arterial	0.4	5	0.4	6	0.4	6	0.4	6
3	Minor Arterial	0.4	5	0.4	6	0.4	6	0.4	6
4	Collector	1	5	1	5	1	5	1	5
5	Rural Highway	1	5	1	5	1	5	1	5
6	Local Street	1	5	1	5	1	5	1	5
7	Ramp	0.4	5	0.4	6	0.4	6	0.4	6
8	Centroid Connector	0	1.1	0	1.1	0	1.1	0	1.1

Note: Parameters are provided for all FT/AT combinations, even though some do not exist (e.g., CBD Freeway).

Speed Feedback

The gravity model used in the trip distribution process relies on congested zone-to-zone travel time information to distribute trips. Later in the model process, the traffic assignment procedure produces estimated congested travel speeds based on traffic flows and application of a volume-delay equation. The speeds input to trip distribution and the speeds output are generally not consistent after the initial model run. To rectify this inconsistency, results from traffic assignment are used to re-compute zone-to-zone travel times for input to trip distribution. The model is rerun and a comparison is then made between the initial and updated zone-to-zone travel times. If the travel times are not reasonably similar, the updated travel times are then used to rerun trip distribution and the subsequent model steps. This process is repeated iteratively until a convergence criterion is met.

Inclusion of a speed feedback process in the travel model process can have interesting and desirable effects on the way the travel model represents the effects of network improvements in congested situations. Without speed feedback, overall regional travel demand remains constant regardless of the roadway network assumptions because trip distribution patterns are not affected by changing congestion levels. (As a side note, vehicle travel routes are always affected by congestion in the traffic assignment model by virtue of the volume-delay functions.)

When speed feedback is added to the process, heavy congestion results in slower speeds, leading to shorter trip patterns throughout the region. As roadway improvements are planned, addition of capacity to the network will initially result in faster travel speeds because of less localized congestion. The speed feedback process recognizes the additional capacity and higher speeds and allows for longer trip lengths across the region, which has the effect of incrementally increasing overall travel demand due to roadway network characteristics.

There are various approaches to solving the speed feedback problem. Three well-documented methods are the naïve method, constant-weight method, and method of successive averages (MSA). The naïve method is not recommended for use as lack of information sharing between subsequent iterations leads to an inefficient process that will often fail to converge. Furthermore, the naïve method feeds speed data directly from traffic assignment to trip distribution, while the constant

weight method and MSA feed volumes to trip distribution that are then used to compute updated speeds (speed feedback is sometimes referred to as volume balancing). The Missoula Model implements speed feedback using the MSA. The method of successive averages is commonly used in regional travel models and is the approach recommended by the TransCAD documentation. The method of successive averages also is supported by built-in functions in the TransCAD software.

Speed Feedback Convergence Criteria

It is important that a meaningful convergence criterion is specified when running a model with speed feedback. It is not acceptable to simply run speed feedback for a specified number of iterations and assume convergence. A meaningful speed feedback convergence measure ensures, either directly or indirectly, that travel time skims input to trip distribution are reasonably similar to travel times skims created from traffic assignment output. It also provides much better consistency between similar model runs so that the differences can be attributable to actual performance and not due to computational issues.

The convergence criterion used must be specified carefully to prevent unnecessary iterations of the speed feedback process, as the convergence measure will provide diminishing benefits after a certain point. The point at which at which the best possible convergence has been met will often vary with the level of congestion in a network. Therefore, it is necessary to monitor speed feedback convergence when first running a dataset that is significantly different than previously considered scenarios.

Two common speed feedback convergence measures are Shortest Path Root Mean Square Error (%RMSE) and Total Misplace Flow. The Shortest Path Root Mean Square Error (%RMSE) was implemented as the convergence measure for use in the Missoula Model due to the more direct measurement of convergence and the ability to compute convergence prior to computation of traffic assignment. The speed feedback convergence criterion is set at 0.1% RMSE and the iteration limit is set to 10.

TRAFFIC ASSIGNMENT VALIDATION

Roadway volumes resulting from traffic assignment were compared against traffic count data. This process, called traffic assignment validation, ensures that the model reasonably represents observed traffic patterns. 2018 traffic count data obtained from the MPO were coded on the roadway network. Travel model results were then compared to traffic count data using a variety of techniques, including regional comparisons, screenline comparisons, and visual inspection of individual link data.

While the model should accurately represent the overall level of activity, it is also important to verify that the model has an acceptably low level of model error on individual links. It is expected that the model will not perfectly reproduce count volumes on every link, but the level of error should be monitored.

The model validation involved changes to model parameters for individual components in addition to the parameter modifications during the calibration of each of the model steps. The validation of the 2018 model included modifications to the trip generation rates, sub-region trip rate factors, gamma parameters for average trip time/length, and alternative specific constants. Tables 28 through 31 and

Figure 2 show various validation checks or statistics that were used as a guideline for the model validation.

Table 28: 2018 Regional Activity Validation

Link Type/Area Type	Number of Counts	Model Volume/Count Volume	Model VMT/Count VMT	Target
Freeway	11	12.0%	7.3%	+/- 10%
Principal Arterial	95	4.4%	4.7%	+/- 10%
Minor Arterial	68	-14.0%	-9.4%	+/- 15%
Collector	200	-10.7%	-12.5%	+/- 25%
Local	77	-22.8%	-15.4%	n/a
CBD	18	-8.6%	-12.1%	n/a
Urban	187	-2.8%	-2.1%	n/a
Suburban	152	-4.0%	5.8%	n/a
Rural	94	3.0%	3.0%	n/a
Total	463	-2.6%	2.35%	+/- 5%

Table 29: 2018 VMT and VHT Totals

Link Type / Area Type	VMT	VHT
Freeway	822,163	11,362
Principal Arterial	1,588,652	30,085
Minor Arterial	406,292	9,310
Collector	488,914	13,212
Local	521,024	17,998
CBD	28,797	1,147
Urban	782,636	24,445
Suburban	874,400	19,647
Rural	2,312,541	43,075
Total	**4,132,556**	**91,267**
Total per Household	59.9	1.3
Total per Person	25.4	0.6

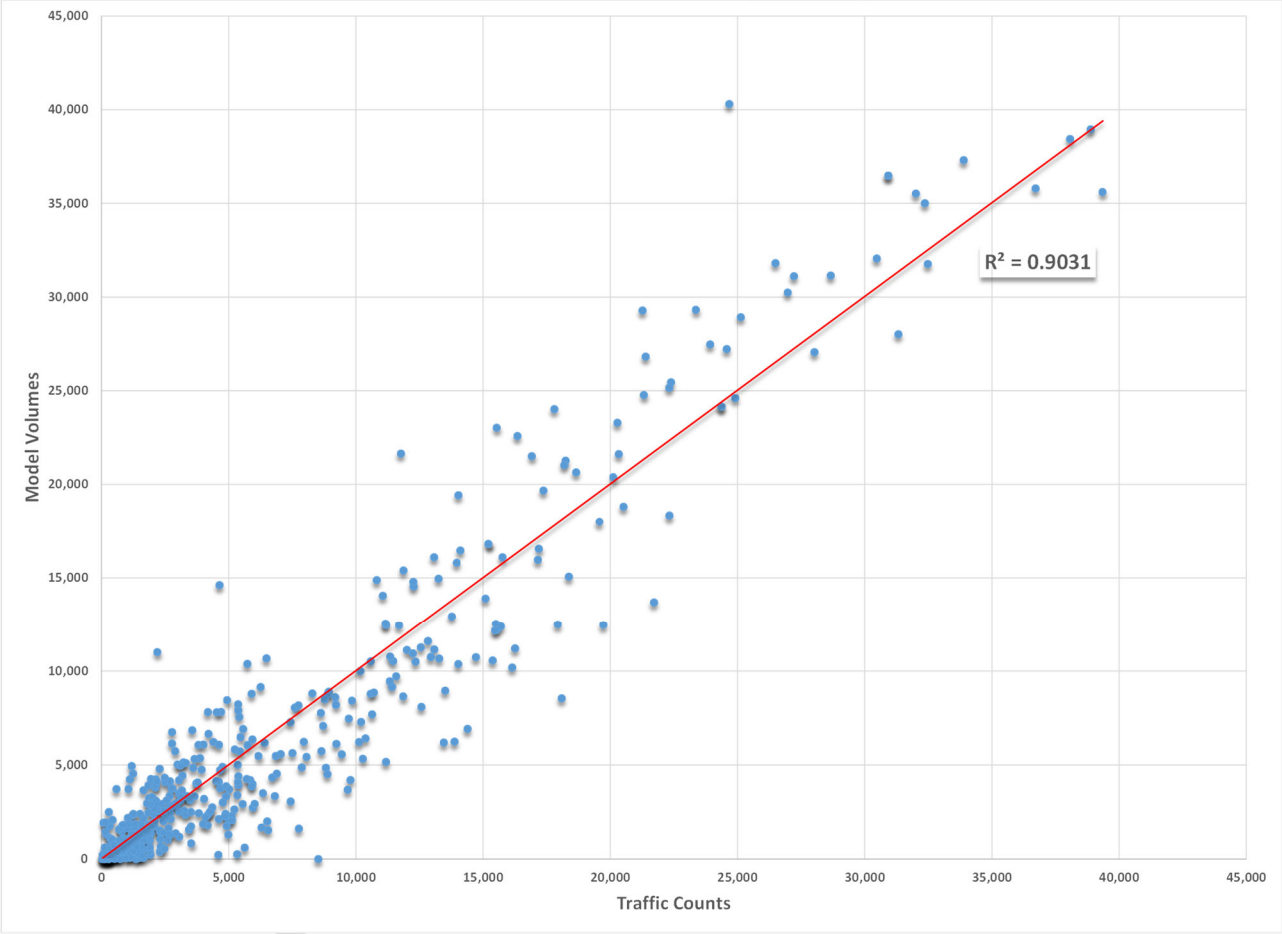
Table 30: Model % Root Mean Square Error

	Number of Counts	%RMSE	Validation Target
Freeway	11	23.3%	30%
Principal Arterial	95	24.2%	40%
Minor Arterial	68	31.6%	40%
Collector	200	64.9%	n/a
Local	77	162.4%	n/a
CBD	18	46.4%	n/a
Urban	187	33.1%	n/a
Suburban	152	45.0%	n/a
Rural	94	56.6%	n/a
Total	**463**	**40.0%**	**40%**

Table 31: Root Mean Square Error by Volume Group

Low	High	Mid-Point	Number of Counts	% RMSE
0	5,000	2,500	242	74%
5,000	10,000	7,500	67	39%
10,000	20,000	15,000	69	30%
20,000	30,000	25,000	20	14%
30,000	40,000	35,000	11	5%
40,000	50,000	45,000	0	n/a

Figure 2: Model Count/Volume Comparison



Source: Glacier County Tourism

2021 MISSOULA MPO

2050 FORECAST DATA DEVELOPMENT

Source: Edward Blake, Wikipedia

Source: The Guardian

Source: Missoula Transportation Planning

Missoula County ~ City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

June 2021

LSA

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CONTEXT & BACKGROUND

The Missoula Metropolitan Planning Organization (MPO) Travel Model includes a base-year (2018) socioeconomic dataset based on U.S. Census data, building permit data, and employment data obtained from the Montana Department of Transportation (MDT). To produce long-term traffic forecasts, the model requires a similar forecast-year dataset that includes household and employment data in a format consistent with the base year dataset. This document describes the process of developing the forecast year dataset.

The primary components of the forecast dataset are household and employment totals by Traffic Analysis Zone (TAZ). To arrive at these components, the process also considers population, dwelling units and vacancy rates, and employment by type. The forecast process is held to regional and sub-regional control totals to ensure consistency with past trends and to account for previous analysis at the sub-regional level. The methodology and the approach used for this data development are same as the approaches used during the 2015 Long Range Transportation Plan (LRTP) update.

CONTROL TOTALS

The first step in creation of the forecast dataset was development of regional growth control totals. The control totals are based on historical growth rates, but previous socioeconomic forecast data were also taken into account. Control totals at the county level include population, households, and employment. At the sub-regional level, control totals are limited to household and employment. Average household sizes are applied later in the process to produce sub-regional and TAZ-level population totals.

Household Population Control Totals

Population control totals are based on an assumed compound annual growth rate (CAGR) that is applied to the base year population total. A growth rate assumption for the next 30 years has been identified based on a review of historical growth rates and has been compared to growth rates from previous forecast efforts. Because the model is household based, the population control totals reflect the population in households rather than the total population. The household population excludes people living in group quarters such as university dorms. University students living in off-campus apartments are generally included in the household population total.

From 2015 through 2018, Missoula County household population experienced a compound annual growth rate of 1.8 percent per year. However, this growth rate is not indicative of long-term expectations. For example, the population growth rate was 0.7 percent per year between 2010 and 2015 whereas it was 1.4 percent between 2000 and 2010. Based on long-term historical growth rate and previous forecast efforts, a compound annual population growth rate of 1.5 percent was used for the 2050 forecast population. Table 1 provides a summary of historical household population growth trends for Missoula County. To best capture trends indicative of a 30-year forecast and due to the large variations in household population growth rates for the 20-, 30-, and 40-year timeframe, an average of the 20-, 30-, and 40-year growth rates has been selected.

Table 1: Historical Household Population Growth in Missoula County

	2018	2015	2010	2000	1990	1980	1970	1960	1950
Household Population	115,418	109,303	105,665	92,183	75,975	73,282	55,477	43,168	33,998
CAGR	1.8%	0.7%	1.4%	2.0%	0.4%	2.8%	2.5%	2.4%	n/a
Cumulative CAGR	1.8%	1.8%	1.9%	2.0%	2.0%	2.6%	2.5%	2.4%	n/a
CAGR to 2018	n/a	1.8%	1.1%	1.3%	1.5%	1.2%	1.5%	1.7%	1.8%

Source: U.S. Census Bureau

Table 2 compares the 2050 household population forecasts with previous forecast datasets. While the growth rate for 2000 through 2025 rate is low compared to the current forecast, the more recent rate (2007 through 2035) is only slightly lower than the 1.5 percent per year rate used in the 2040, 2045, and 2050 forecasts.

Table 2: Household Population Growth Assumptions in Previous Forecast Datasets

Forecast Timeframe	Total Population		CAGR
	Base Year	Forecast Year	
2000 through 2025	88,750	115,200	1.05%
2007 through 2035	93,864	137,900	1.38%
2010 through 2040	105,665	165,163	1.50%
2015 through 2045	109,303	170,849	1.50%
2018 through 2050	115,418	180,408	1.41%

Household Control Totals

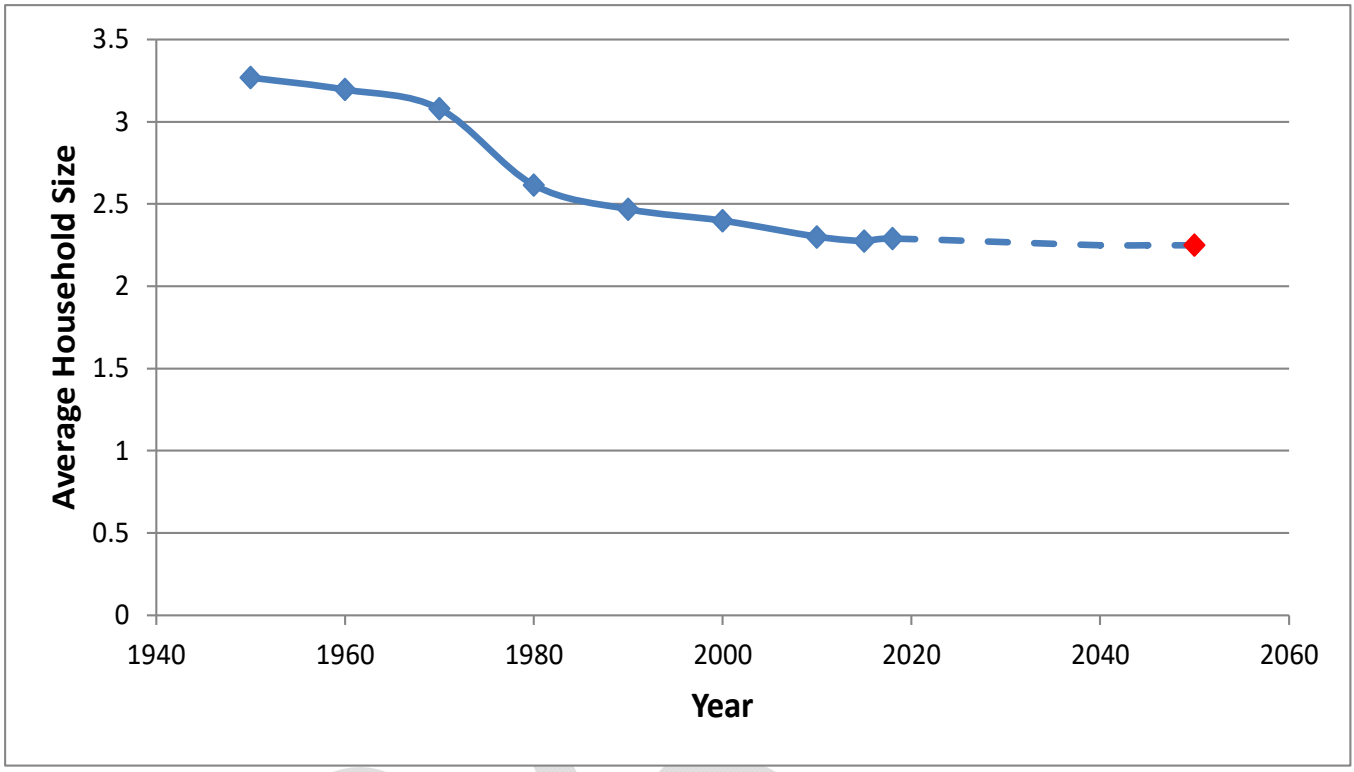
Over the last 60 years, the average household size in Missoula County has been consistently decreasing. This is consistent with national trends of smaller household sizes. In 1950, the U.S. Census indicated an average household size of 3.41 persons per household, while the 2015 Census indicates an average household size of 2.28 persons per household. Because the travel model will generate fewer trips for smaller households, the forecast year model dataset should reflect expected changes in average household size. However, recent trends indicate that this decline is slowing. Due to the slowing of this trend, the average household size for 2050 has instead been set to 2.25, a modest decrease from the current 2.29 people per household. The average household size of 2.25 is consistent with household size assumed for 2040 forecasts. This results in a household growth rate of 1.46 percent.

As shown in Table 3, household growth rates have historically been higher than population growth rates. The difference in growth rates results in the decreasing average household size indicated in Figure 1.

Table 3: Household Growth Assumptions in Previous Forecast Datasets

Forecast Timeframe	Total Households		CAGR
	Base Year	Forecast Year	
2000 through 2025	37,200	48,700	1.08%
2005 through 2035	40,812	62,051	1.41%
2010 through 2040	45,926	73,406	1.58%
2015 through 2045	48,042	75,933	1.54%
2018 through 2050	50,401	80,181	1.46%

Figure 1: Historical and Forecast Changes in Average Household Size



Employment Growth Totals

Development of an employment control total for 2050 is based on the assumption that the jobs-to-population ratio will remain constant. While an alternative approach is to assume a constant jobs-to-household ratio, the jobs-to-population ratio was selected for this effort due to the decreasing household sizes over time. As shown in Table 4, the jobs-to-population ratio for 2018 is 0.68. Using the population growth rates discussed above, a resulting employment total for 2050 is 122,677.

Table 4: Employment Summary

	2018	2050
Population	115,418	180,408
Employment	77,931	122,677
Jobs / Pop Ratio	0.68	0.68

Table 5 compares the updated 2050 employment forecasts with previous forecast datasets. The CAGR assumption of 1.52 percent for employment is slightly higher than employment growth assumptions in previous forecast datasets. However, this updated number maintains a consistent employment-to-population ratio.

Table 5: Employment Growth Assumptions in Previous Forecast Datasets

Forecast Timeframe	Total Employment		CAGR
	Base Year	Forecast Year	
2000 through 2025	56,000	76,300	1.24%
2005 through 2035	57,078	80,360	1.23%
2010 through 2040	82,860	129,517	1.50%
2015 through 2045	73,408	114,743	1.50%
2018 through 2050	77,931	122,677	1.52%

Urban/Rural Allocation

The urban service area (URSA) in Missoula County has historically experienced a higher rate of growth than the remainder of the County. However, the CAGR for households in the previous three years has been slightly higher in the non-URSA than in the URSA. The countywide forecast CAGR for households of 1.46 percent has been prorated to produce a compound annual growth rate of 1.11 percent for the URSA. The remaining household growth has been allocated to the portion of Missoula County outside of the URSA, resulting in a CAGR for the non-URSA of 2.64 percent as shown in Table 6.

As with households, employment control totals have been developed for the URSA and for the non-URSA county. The countywide and URSA jobs-to-population ratios have been held constant, while allowing a slight decrease in the jobs-to-population ratio in the non-URSA county. Table 7 shows resulting employment control totals.

Table 6: Household Growth – County and Urban Service Area

	2010	2018	CAGR (10-18)	Assumed Growth Rate	2050 Forecast (HH)
Missoula County	45,926	50,401	1.17%	1.46%	80,181
Urban Services Area (URSA)	35,757	38,380	0.89%	1.11%	62,352
Non-URSA County	10,169	12,021	2.11%	2.64%	17,829

Source: U.S. Census Bureau (2010 data)

Table 7: Employment Growth Forecasts for Missoula County by URSA/Non-URSA

	2018 Population	2018 Employment	2018 Jobs/ Population	2050 Population	2050 Employment	2050 Jobs/ Population
Missoula County	115,418	77,931	0.68	180,408	122,677	0.68
Urban Services Area (URSA)	87,890	72,421	0.82	139,993	115,353	0.82
Non-URSA County	27,528	5,510	0.20	40,415	7,324	0.18

Employment by Type

The Missoula MPO Model breaks down employment into six categories. Initial forecast year control totals assume that the distribution of employment by category will remain constant for the County as a whole and within the URSA (allowing for a slight change in the distribution in the non-URSA County). Table 8 shows the resulting control totals by employment category.

Table 8: Initial Employment Growth Forecasts by Category

	County			URSA			Remainder County		
	2018	%	2050	2018	%	2050	2018	%	2050
Retail	10,434	13%	16,425	9,838	14%	15,670	596	11%	792
Service	22,700	29%	35,734	21,469	30%	34,196	1,231	22%	1,637
Basic	12,252	16%	19,287	10,769	15%	17,153	1,483	27%	1,972
Educational	5,398	7%	8,497	4,598	6%	7,324	800	15%	1,064
Healthcare	17,290	22%	27,217	16,934	23%	26,972	356	6%	473
Leisure/Hospitality	9,857	13%	15,517	8,813	12%	14,037	1,044	19%	1,388
Total	**77,931**	**100%**	**122,677**	**72,421**	**100%**	**115,352**	**5,510**	**100%**	**7,326**

SUBAREA (UFDA) ALLOCATION

Households within the URSA are allocated to urban fringe development areas (UFDAs). The MPO developed and provided dwelling unit capacities at a parcel level. The dwelling capacities were provided using three different densities, i.e., three different capacities were provided: low, medium, and a high capacity. The capacities from the "medium" scenario were used for the distribution of dwelling unit growth. Distribution of dwelling units to different UFDAs, and to TAZs used the same methodology as the previous efforts (2045 data development).

The subarea allocation process is designed to take advantage of previous work efforts that define the expected growth characteristics in the URSA. The process assumes that areas forecast to grow fastest by 2045 will also continue to grow fastest through 2050. In addition, the process ensures that UFDA-level dwelling unit capacities are not exceeded.

UFDA Dwelling Unit Allocation

Dwelling unit capacity control totals were developed for each of the 14 UFDAs within the urban service area. For each UFDA, the following information was used to identify a 2050 household total:

- Existing Dwelling Units: Total dwelling units based on 2018 model socioeconomic data;
- 2045 Household Forecast: Total household growth (as compared to 2018 conditions) forecast for the 2045 LRTP; and
- Available Capacity: The capacity for new dwelling units as determined by the City of Missoula GIS department.

Because the UFDA capacities reflect dwelling units rather than occupied households, UFDA control totals reflect dwelling units as well. A countywide vacancy rate of 8.34 percent was used to convert control totals from households to dwelling units. As shown in Table 9, the vacancy rate in the non-URSA County is considerably higher than the vacancy rate in the URSA. The significantly higher vacancy rates seen in the non-URSA County reflect the large number of seasonal and part-time dwelling units present in rural Missoula County. Vacancy rates for the County and URSA were held constant, leading to a reduction in the Non-URSA average vacancy rate for 2050.

Table 9: Vacancy Rates

	2018 Vacancy Rate	2050 Vacancy Rate
Missoula County	8.34%	8.34%
Urban Services Area (URSA)	4.98%	4.75%
Non-URSA County	18.48%	19.03%

Forecast dwelling units were allocated to the 14 UFDAs based on the 2045 forecast dataset growth assumptions. The process began with the 2045 forecast totals. Remaining dwelling unit growth was proportionally allocated to the UFDAs based on the previous forecast growth (i.e., new households assumed from 2018 to the 2045 forecast dataset). In cases where the resulting dwelling unit total exceeded a UFDA's capacity, the excess units were allocated to UFDAs that still had remaining capacity. This process was performed iteratively until all growth had been accounted for without any over-capacity UFDA, producing the results shown in Table 10. Detailed calculations are shown in Table 11. The process is represented graphically in Figure 2.

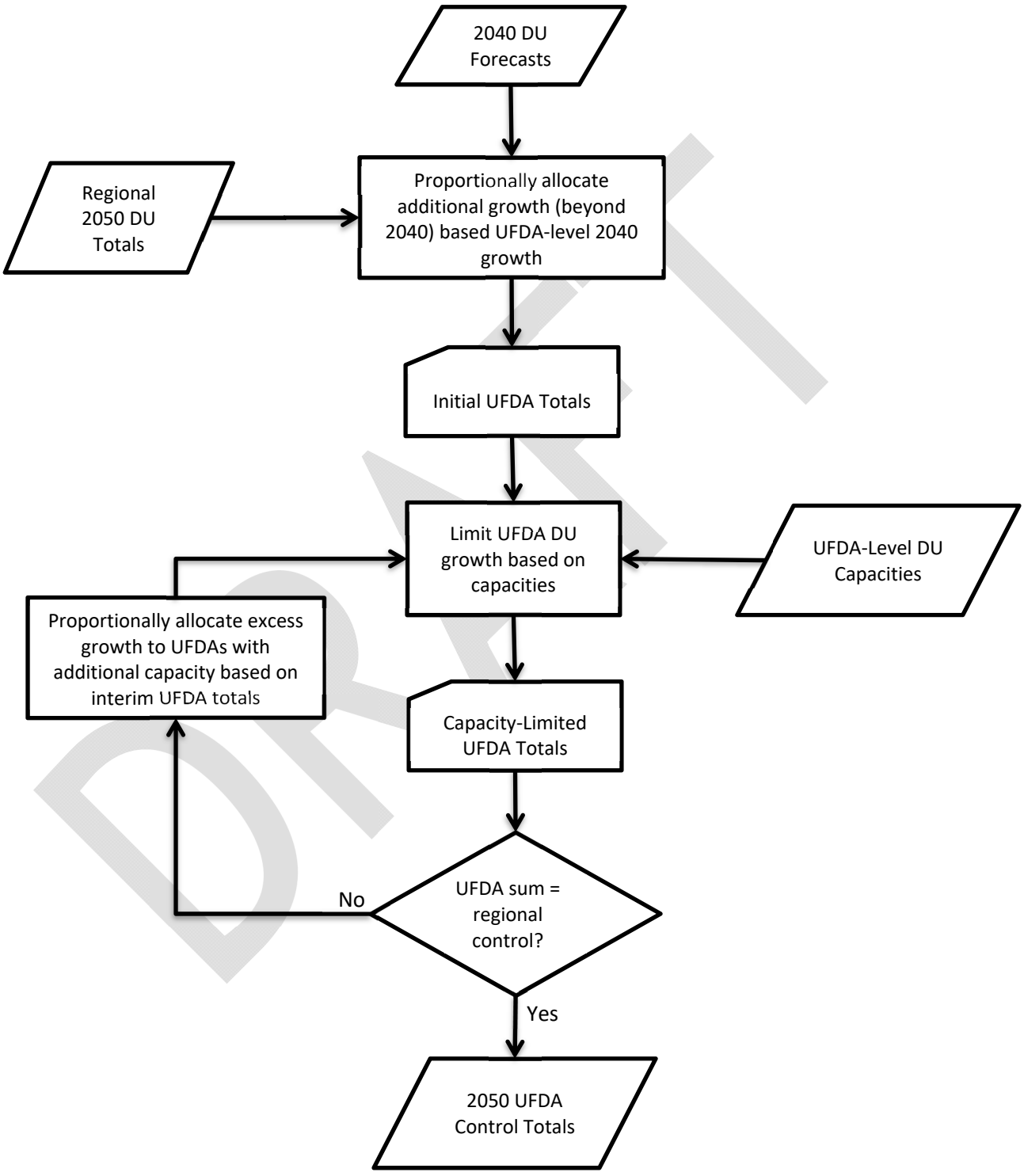
Table 10: UFDA Dwelling Unit Allocation Results

UFDA	Available Capacity	2015 Dwelling Units	Growth through 2040	Growth through 2040
	CAP	A	B	G = B + G1
Wye	8,719	476	3,150	3,300
Grant Creek	3,671	679	0	0
Rattle Snake	3,825	2,595	438	458
East Missoula	1,597	1,681	886	928
Bonner W. Riverside	3,035	808	414	434
Central	23,040	5,805	3,584	3,754
University	2,495	2,766	442	463
South Hills	3,930	4,136	1,106	1,158
Reserve to Russell Corridor	39,268	5,700	3,296	3,452
Brooks Corridor	24,537	5,915	2,986	3,128
East Mullan	32,132	3,273	3,449	3,613
Target Range/Orchard Homes	13,428	2,681	1,378	1,443
Miller Creek	7,563	2,323	1,737	1,819
West Mullan	35,216	2,170	1,066	1,117
Total	**202,456**	**41,008**	**23,932**	**TOT = 25,067**

Table 11: UFDA Dwelling Unit Calculations

UFDA	Iteration 1	
	Allocation Weight W1 = B / ∑B	Allocated Growth G1 = Min(TOT × W1, CAP)
Wye	0.13	150
Grant Creek	0.00	0
Rattle Snake	0.02	20
East Missoula	0.04	42
Bonner W. Riverside	0.02	20
Central	0.15	170
University	0.02	21
South Hills	0.05	52
Reserve to Russell Corridor	0.14	156
Brooks Corridor	0.12	142
East Mullan	0.14	164
Target Range/Orchard Homes	0.06	65
Miller Creek	0.07	82
West Mullan	0.04	51
Total	**1.00**	**1,135**

Figure 2: UFDA Dwelling Unit Allocation Process



UFDA Employment Allocation

A GIS layer containing existing and planned land use designations was provided during the 2045 LRTP, which supported the employment allocation process. Employment capacities were developed by converting the land use layer into a set of employment capacities during 2015 LRTP update. Since the land use forecasts have not changed since last LRTP, no additional analysis was necessary and capacities from 2015 LRTP were used.

Existing employment was then subtracted, resulting in a remaining employment capacity for each TAZ. The TAZ-level capacities were then aggregated to the UFDA level. During this process, employment capacities were also separated into the six different employment types used by the travel model. Table 12 shows the land use to employment conversion factors, along with employment type distributions.

As non-residential growth tends to occur along the areas of residential growth, residential growth estimates for UFDAs were used in the distribution of non-residential/employment growth. Table 13 shows the resulting UFDA employment growth forecasts, with calculations shown in Tables 14 and 15. The employment allocation process is represented graphically in Figure 3. The following manual adjustments were made during the process:

- Central: The employment capacity and control total for this UFDA exclude growth in the downtown area covered by the Missoula Greater Downtown Master Plan. Employment growth within this area is discussed in further detail in a later section.

Table 12: Land Use to Employment Conversion

Land Use Designation	FAR (KSF/Acre)	Employees / KSF	Basic	Retail	Service	Educational	Healthcare	Hospitality/ Amusement
ADP-Light Industrial and Commercial	6.85	0.05	20%	35%	35%	0%	0%	10%
Community and Highway/Heavy Commercial	9.8	3.50	0%	40%	40%	0%	0%	20%
Community Commercial	9.8	3.50	0%	30%	30%	0%	20%	20%
General Commercial	9.8	3.50	0%	30%	30%	0%	20%	20%
Highway/Heavy Commercial	9.8	3.50	0%	40%	40%	0%	0%	20%
Community Crossroads	12.2	3.20	5%	15%	30%	15%	30%	5%
Neighborhood Commercial	12.9	3.50	5%	50%	15%	5%	25%	0%
Special District Commercial	12.2	3.20	10%	15%	30%	10%	30%	5%
Cottage Industrial	8.8	2.00	90%	0%	10%	0%	0%	0%
Heavy Industrial	8.8	1.00	90%	0%	10%	0%	0%	0%
Light Industrial	8.8	2.00	90%	0%	10%	0%	0%	0%

Land Use Designation	FAR (KSF/Acre)	Employees / KSF	Basic	Retail	Service	Educational	Healthcare	Hospitality/ Amusement
Light Industrial and Commercial	6.85	0.05	20%	35%	35%	0%	0%	10%
Mixed-Use 4 dwelling units per acre	11.8	3.50	0%	25%	30%	15%	20%	10%
Mixed-Use 16 dwelling units per acre	11.8	3.50	0%	25%	30%	15%	20%	10%
Mixed-Use	11.8	3.50	0%	25%	30%	15%	20%	10%
Historical Mixed-Use	11.8	3.50	0%	25%	30%	15%	20%	10%
Neighborhood Center	12.9	3.50	5%	50%	15%	5%	25%	0%
Land Use Designation (Residential)	**DU / Acre**	**Emp / DU**						
4 dwelling units per acre	4	0.30	20%	5%	25%	20%	25%	5%
6-8 dwelling units per acre	7	0.30	20%	5%	25%	20%	25%	5%
6 dwelling units per acre	6	0.30	20%	5%	25%	20%	25%	5%
8 dwelling units per acre	8	0.30	20%	5%	25%	20%	25%	5%
10 dwelling units per acre	10	0.30	20%	5%	25%	20%	25%	5%
12-16 dwelling units per acre	14	0.30	20%	5%	25%	20%	25%	5%
16 dwelling units per acre	16	0.30	20%	5%	25%	20%	25%	5%
24 dwelling units per acre	24	0.30	20%	5%	25%	20%	25%	5%
25 dwelling units per acre	25	0.30	20%	5%	25%	20%	25%	5%
36 dwelling units per acre	36	0.30	20%	5%	25%	20%	25%	5%

Note: The data above are generalized conversion factors based on analysis of ITE trip rates, large-scale development proposals, and fee program studies. They are used to allocate regional totals to the TAZ level and may not be consistent with specific or more detailed studies.

Table 13: UFDA-Level Employment Capacities and Control Totals

UFDA	Total Capacity	2018 Employment	Remaining Capacity ECAP	2045 Employment Growth EG = EGNR1 + EGNR2 + EGNR3
Wye	2,579	539	2,040	2,040
Grant Creek	1,250	607	643	625
Rattle Snake	197	676	0	—
East Missoula	2,605	804	1,801	1,801
Bonner W. Riverside	5,498	478	5,020	1,416
Central	17,482	19,356	0	—
University	176	3,391	0	—
South Hills	908	1,258	0	—
Reserve to Russell Corridor	41,080	13,731	27,349	11,261
Brooks Corridor	20,587	16,278	4,309	4,309

UFDA	Total Capacity	2018 Employment	Remaining Capacity ECAP	2045 Employment Growth EG = EGNR1 + EGNR2 + EGNR3
East Mullan	34,020	4,270	29,750	11,786
Target Range/Orchard Homes	2,027	5,794	275	275
Miller Creek	1,824	793	1,031	1,031
West Mullan	39,817	4,446	35,371	3,644
Total	**170,049**	**72,421**	**107,589**	**38,189**

Table 14: UFDA-Level Employment Calculations (Iterations 1 and 2)

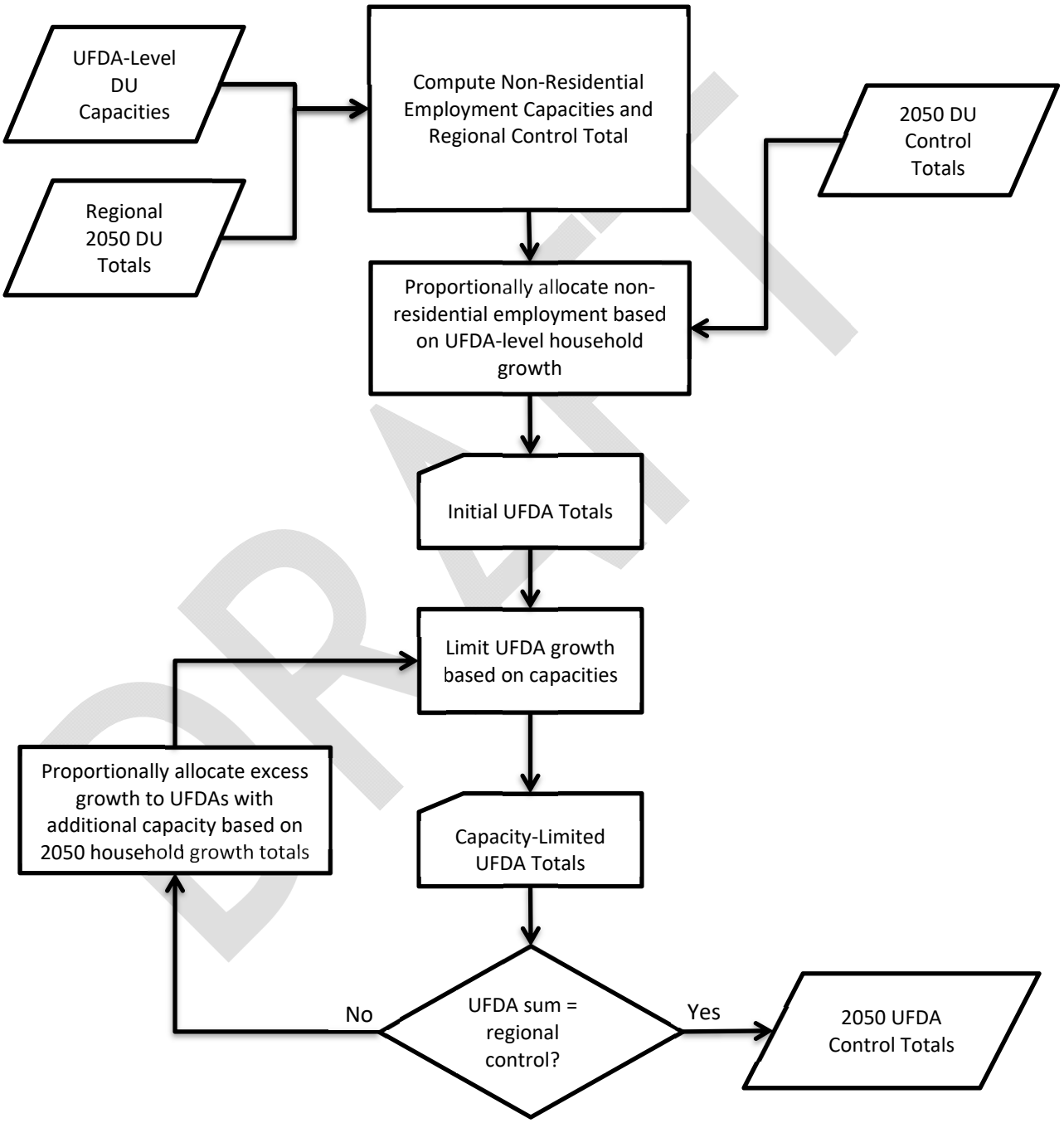
UFDA	Iteration 1		Iteration 2	
	Allocation Weight EW1 = (GADJ / ∑GADJ)	Allocated GrowthN4 EGNR1 = Min(ETOTNR × EW1, CAP)	Allocation WeightN3 EW2 = (GADJ / ∑GADJ)	Allocated GrowthN4 EGNR2 = Min[(ETOTNR – ∑EGNR1) × EW2, CAP]
Wye	0.13	2,040	0.00	0
Grant Creek	0.00	625	0.00	0
Rattle Snake	0.02	0	0.00	0
East Missoula	0.04	1,414	0.10	387
Bonner W. Riverside	0.02	661	0.05	699
Central	0.15	0	0.00	0
University	0.02	0	0.00	0
South Hills	0.05	0	0.00	0
Reserve to Russell Corridor	0.14	5,259	0.36	5,559
Brooks Corridor	0.12	4,309	0.00	0
East Mullan	0.14	5,504	0.38	5,818
Target Range/Orchard Homes	0.06	275	0.00	0
Miller Creek	0.07	1,031	0.00	0
West Mullan	0.04	1,702	0.12	1,799
Total	**1.00**	**22,821**	**1.00**	**14,261**

Table 15: UFDA-Level Employment Calculations (Non-Residential Iteration 3)

UFDA	Iteration 3	
	Allocation WeightN3 EW3 = (GADJ / ∑GADJ)	Allocated GrowthN4 EGNR2 = Min[(ETOTNR – ∑EGNR1-2) × EW3, CAP]
Wye	0.00	0
Grant Creek	0.00	0
Rattle Snake	0.00	0
East Missoula	0.00	0
Bonner W. Riverside	0.05	56
Central	0.00	0
University	0.00	0
South Hills	0.00	0
Reserve to Russell Corridor	0.40	444

UFDA	Iteration 3	
	Allocation WeightN3 EW3 = (GADJ / ∑GADJ)	Allocated GrowthN4 EGNR2 = Min[(ETOTNR – ∑EGNR1-2) × EW3, CAP]
Brooks Corridor	0.00	0
East Mullan	0.42	464
Target Range/Orchard Homes	0.00	0
Miller Creek	0.00	0
West Mullan	0.13	144
Total	**1.00**	**1,107**

Figure 3: UFDA Employment Allocation Process



TAZ-LEVEL ALLOCATION

Total households and employment were allocated to TAZs using a method similar to the UFDA-level allocation. Outside of the URSA, employment and households were first allocated to Census-designated places (CDPs), and then allocated to TAZs. In addition, forecasts for the area covered by the Missoula Greater Downtown Master Plan were manually adjusted for consistency with this planning document.

TAZ-Level Dwelling Unit Allocation in the URSA

As with UFDA-level allocation, dwelling unit allocation to TAZs began with 2040 forecasts. Next, household capacities were developed at the TAZ level based on the dwelling unit capacity GIS layer provided by the MPO and existing households were subtracted from the capacities. The TAZ-level capacities serve a purpose in guiding allocation of household growth at the TAZ level.

After identifying initial household numbers (2040 forecast), new households were proportionally allocated to TAZs within each UFDA. The proportional allocation was based on the forecast growth between 2018 and 2040. Household growth was capped at each TAZ's capacity, with remaining households iteratively allocated to TAZs with remaining capacity. Resulting TAZ-level growth has been provided as a model dataset. Figure 4 shows a graphical representation of the process.

TAZ-Level Employment Allocation in the URSA

Employment within each UFDA was allocated proportionally to TAZs in two steps. First, specific uses such as downtown growth were assigned to individual TAZs similar to the 2045 effort. Next, remaining employment in each UFDA was proportionally allocated to TAZs with the most available employment capacity. Employment allocation was performed by employment type using UFDA-level control totals distributed into employment types based on available capacity.

Resulting TAZ-level growth has been provided as a model dataset. Figure 5 shows a graphical representation of the process.

Downtown Area TAZ Allocation

In the Missoula Downtown Area, both employment and households were allocated based on the 2012 LRTP data, which were developed using Missoula Greater Downtown Master Plan. No changes were identified for the downtown plan between the 2012 LRTP and the current LRTP. The Downtown Plan identifies planned and proposed residential and commercial uses in the downtown area, most of which are expected to be completed within the 2040 timeframe. Dwelling unit assumptions are defined explicitly in the plan, while square footage was converted to employment using the conversion rates discussed previously. Table 16 shows the resulting employment and household totals.

UFDA household capacities and dwelling unit control totals are inclusive of the downtown area, as previous analysis accounted for growth in this area. Conversely, employment capacities and control totals explicitly exclude growth in the downtown area. Employment growth assumptions for the downtown area are in addition to the control total for the Central UFDA, while household growth assumptions for the downtown area are included in the control total for the Central UFDA.

Figure 4: TAZ-Level Household Allocation Process

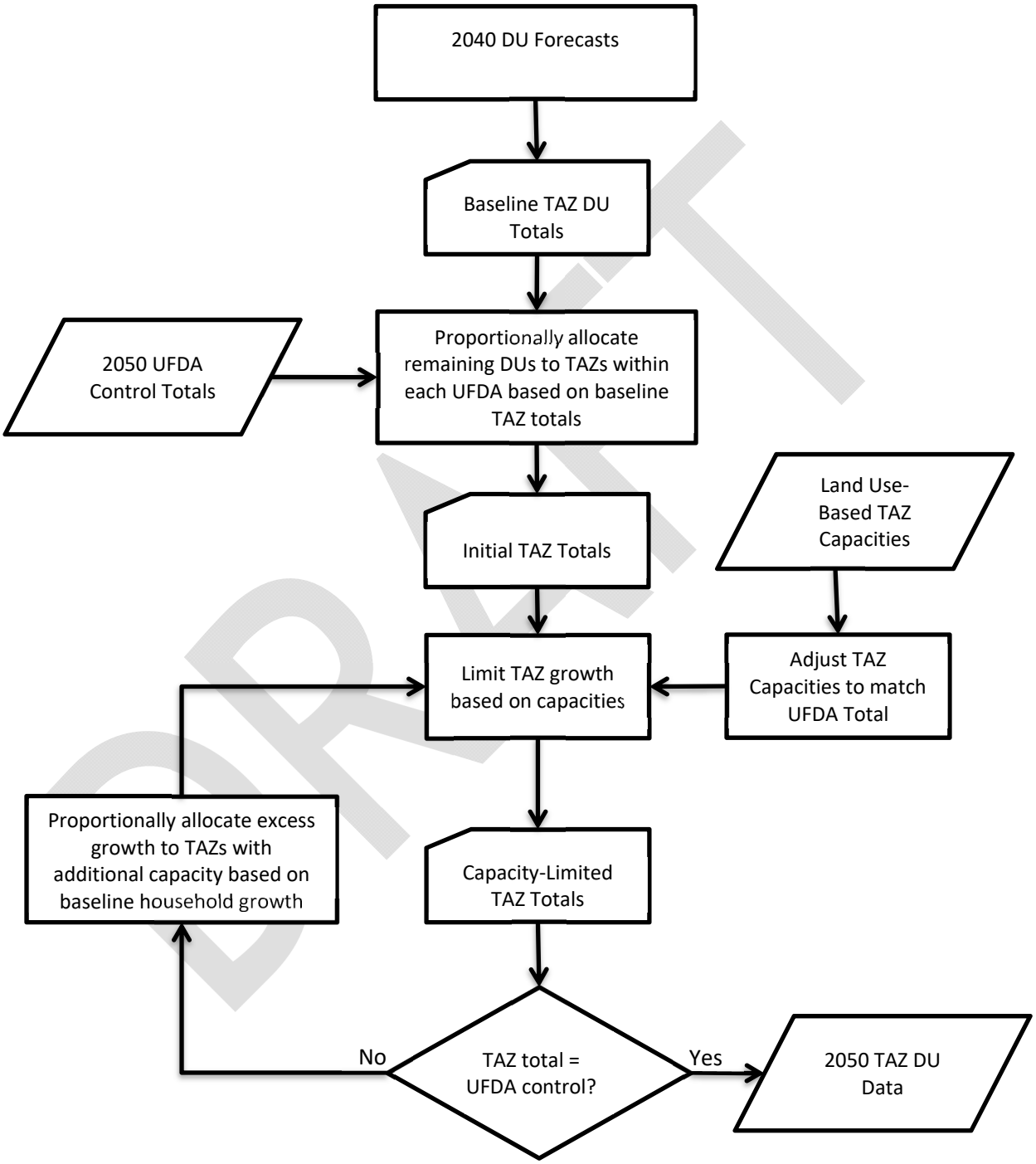


Figure 5: TAZ-Level Employment Allocation Process

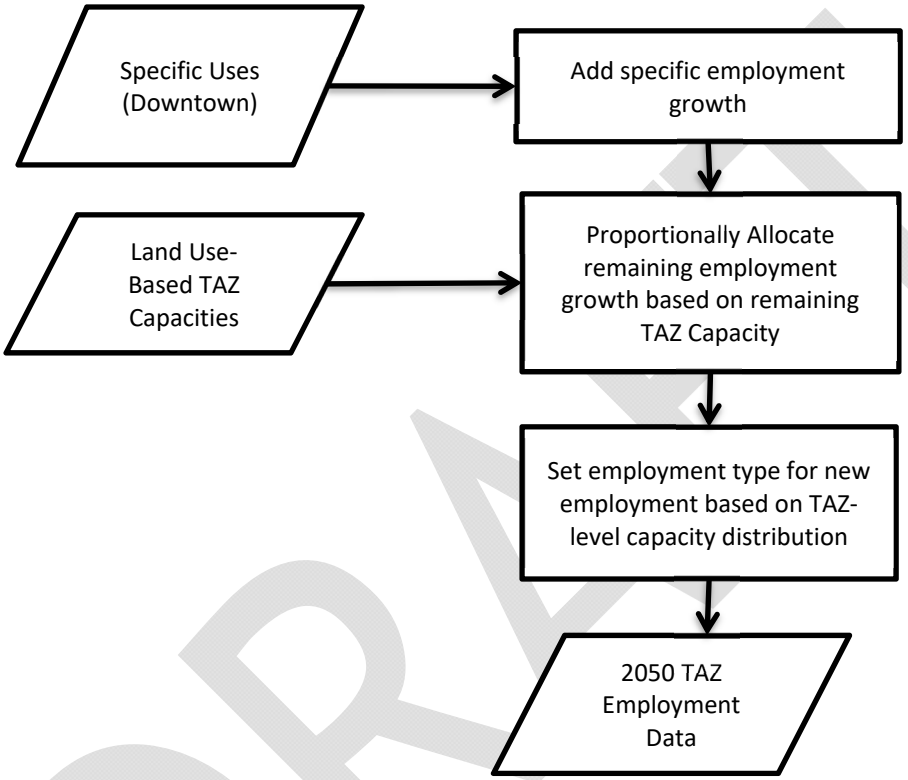


Table 16: Downtown Growth Assumptions

Development Name	TAZ	Retail	Service	Basic	Health-care	Leisure/ Hospitality	Total Emp.	DU	DU (Initial)
West Broadway	392	53	40	4	4	11	112	0	380
	393	53	40	4	4	11	112	7	
	394	71	53	5	5	15	149	0	
	395	71	53	5	5	15	149	0	
	402	0	0	0	0	0	0	103	
	403	53	40	4	4	11	112	0	
	407	0	0	0	0	0	0	210	
	408	53	40	4	4	11	112	7	
	418	0	0	0	0	0	0	7	
Government Center	822	0	0	0	0	0	0	5	0
	828	0	205	0	0	0	205	0	

Development Name	TAZ	Retail	Service	Basic	Health-care	Leisure/ Hospitality	Total Emp.	DU	DU (Initial)
1st Avenue Commercial	317	25	4	2	0	5	35	0	0
Triangle Employment Anchor	836	34	307	2	34	7	385	0	0
	857	51	461	4	50	11	578	11	
Depot Square	825	153	256	25	34	42	511	62	75
Roundhouse Park	317	0	0	0	0	0	0	0	0
Railyard	317	0	0	0	0	0	0	357	1300
North Higgins	826	29	4	2	0	6	42	5	0
139 E Main St	851	123	18	15	0	79	234	0	0
Madison Employment Anchor	788	10	250	1	28	2	290	43	0
	790	15	375	1	41	3	435	25	
Triangle Housing	835	190	27	23	0	129	369	288	350
Mill Site	1128	55	40	4	4	12	115	632	540
Orange & Main Retail Anchor	841	123	18	9	0	26	175	58	70
Orange & Main Pkg. Structure	843	118	17	8	0	25	168	24	0
New Infill Retail Sites	842	81	12	6	0	17	116	2	0
Caras Park Expansion	839	0	0	0	0	0	0	0	0
Macy's Anchor & Front Street Parking Structure	797	0	0	0	0	0	0	15	0
	798	0	0	0	0	0	0	0	
	851	61	9	4	0	13	88	0	
Hip Strip	1170	77	11	6	0	17	110	103	125
	1171	33	5	2	0	7	47	0	
	1154	0	0	0	0	0	0	5	
Cultural District	796	2	22	2	0	22	49	3	0
	794	2	22	2	0	22	49	16	
Total		**1,537**	**2,324**	**144**	**214**	**523**		**1,988**	**2,840**

Non-URSA Dwelling Unit and Employment Allocation

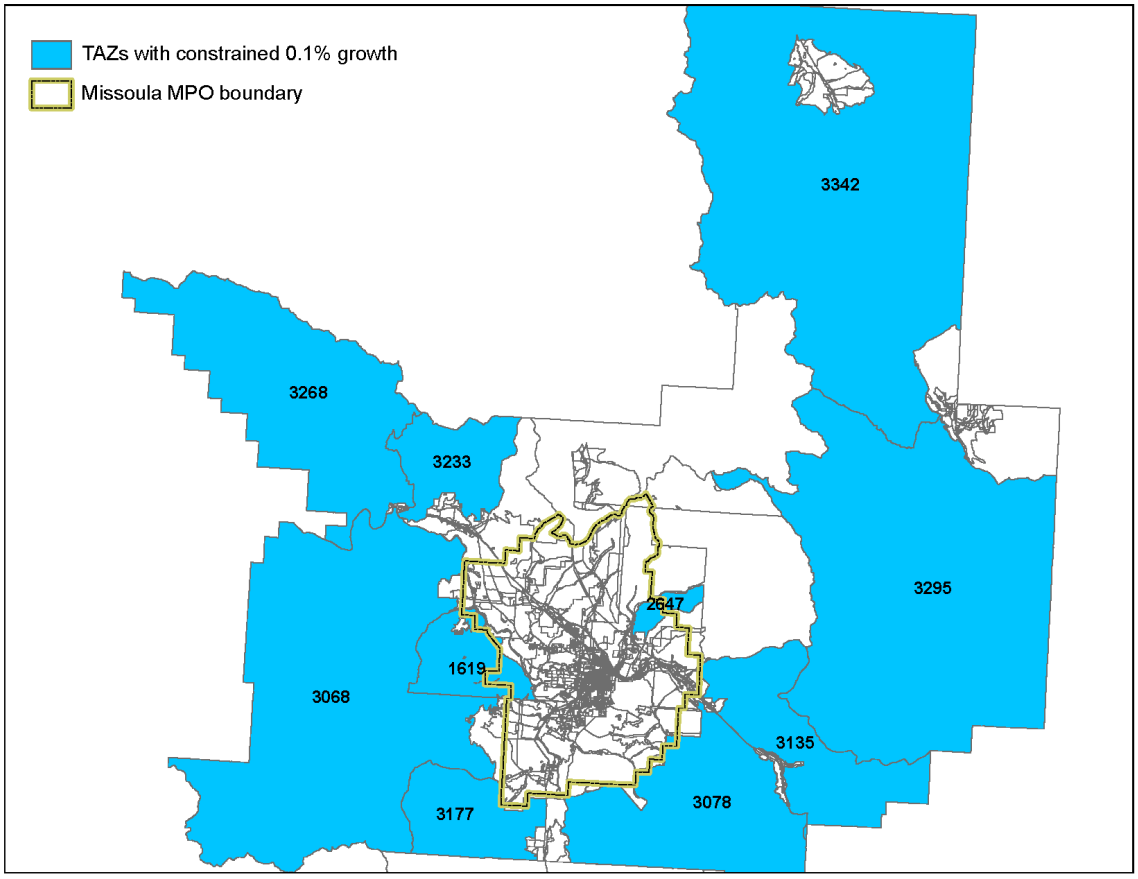
Outside of the URSA, forecast growth was primarily focused on CDPs. Each CDP in Missoula County was identified and 10-year growth rates were identified from 2000 to 2010 during the 2012 LRTP. Those 10-year compound annual growth rates were prorated to reflect the forecast CAGR for dwelling units and employees for the non-URSA County as whole during 2045 LRTP. However when 2018 dwelling units for CDPs were compared with 2015, most CDPs indicated a negative growth rate. This is possibly due to the different data sources used in the development of base conditions dwelling unit totals. Since individual CDPs were indicating a negative growth rate, the same growth rates identified during the 2045 LRTP were adopted for the 2050 update as well. The growth rates were then applied directly to the base year dwelling unit. After CDP growth had been allocated, the remaining non-URSA County growth was allocated to the remaining TAZs outside of CDPs. Growth in large TAZs consisting

primarily of public lands was constrained to 0.1 percent per year. Table 17 lists non-URSA County and CDP growth rates, with rural constrained zones identified in Figure 6.

Table 17: Growth Rate Assumptions for Non-URSA CDPs

CDP/Area	2000–2010 DU CAGR	Prorated DU CAGR
Non-URSA County	0.38%	1.30%
Huson CDP	1.50%	1.05%
Frenchtown CDP	2.11%	1.48%
Evaro CDP	1.21%	0.85%
Piltzville CDP	0.64%	0.45%
Turah CDP	2.13%	1.49%
Clinton CDP	3.58%	2.51%
Lolo CDP	1.85%	1.30%
Carlton CDP	1.22%	0.85%
Condon CDP	1.62%	1.14%
Seeley Lake CDP	2.89%	2.03%
Non-CDP County	2.00%	1.40%

Figure 6: TAZs with Growth Rates Constrained to 0.1% per Year



FINAL EMPLOYMENT TOTALS BY TYPE

The process of allocating employment to UFDAs and TAZs based on land use data results in final employment type distributions as shown in Table 18.

Table 18: 2050 Employment by Type

	Final Values based on Employment Allocation	
	Employees	**%**
Retail	16,425	13%
Service	35,734	29%
Basic	19,287	16%
Educational	8,497	7%
Healthcare	27,217	22%
Leisure/Hospitality	15,517	13%
Total	**122,677**	**100%**

FINAL HOUSEHOLD AND POPULATION FORECASTS

The above discussion focuses on employment, which is used directly in the travel model, as well as dwelling units, which must be converted to household data prior to use in the travel model. In addition, the forecast dataset assumes that household size decreases over time. This decrease must be reflected in the regional household size distribution as well as in TAZ-level average household size values.

Household totals by TAZ were developed by applying the 2050 vacancy rate assumptions discussed previously. These assumptions are repeated in Table 19 for reference.

Table 19: 2050 Vacancy Rate Assumptions

	2018 Vacancy Rate	2050 Vacancy Rate
Missoula County	8.34%	8.34%
Urban Services Area (URSA)	4.98%	4.75%
Non-URSA County	18.48%	19.03%

Regional household size is input to the model in the form of a regional distribution of households by both size and income. The model forecast assumes that real income (i.e., income adjusted for inflation) will stay constant over time. However, the trend of decreasing household sizes is forecast to continue, although at a slower rate. The 2045 average household size assumption of 2.25 has been used to develop an updated distribution of households by size using the travel model's household size disaggregation curves, shown in Figure 7, during 2015 LRTP update, which was retained for this update as well. The average household size was not reduced from the 2045 estimate and thus this decision was made to retain the disaggregation curves from 2045. Table 20 shows the 2018 and 2050 household size distributions. The resulting 2050 bivariate (size and income) distribution shown in Table 21 was computed by proportionally factoring the 2018 distribution.

At the TAZ level, forecast year household sizes were adjusted to reflect the lower regional average household size by factoring base year average household sizes. In TAZs without existing households,

the average household size was set to the regional average. Average households sizes were also set to the regional average in TAZs with fewer than five existing households and 10 or more forecast year households.

Figure 7: Household Size Disaggregation Curves

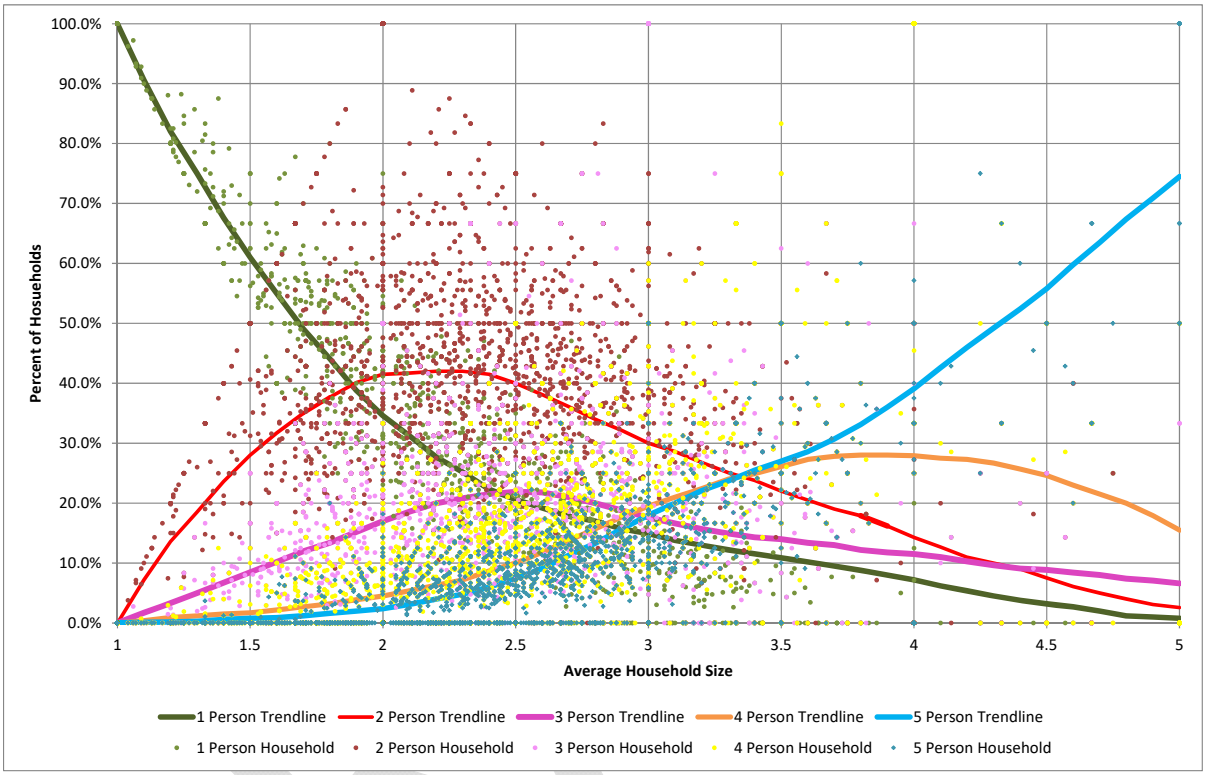


Table 20: Household Size Distributions

Household Size	2018	2018 (%)	2050	2050 (%)
1 Person Households	14,526	29%	23,319	29%
2 Person Households	19,188	39%	31,121	39%
3 Person Households	7,302	15%	11,792	15%
4 Person Households	4,945	10%	7,656	10%
5+ Person Households	3,707	7%	5,641	7%
Total	**49,668**	**100%**	**79,529**	**100%**
Average Household Size	**2.28**	**—**	**2.25**	**—**

Table 21: 2050 Household Bivariate Distribution

	HH SIZE 1	HH SIZE 2	HH SIZE 3	HH SIZE 4	HH SIZE 5	Total
Low Income	13,210	5,696	729	356	773	**20,764**
Medium Income	9,303	17,709	6,297	4,215	1,104	**38,629**
High Income	806	7,716	4,765	3,085	3,764	**20,136**
Total	**23,319**	**31,121**	**11,792**	**7,656**	**5,641**	**79,529**

EXTERNAL TRAVEL FORECASTS

The 2050 forecast year model run also requires growth assumptions for travel at external stations. However, little growth was observed at external stations between 2015 and 2018. Therefore, 2045 forecasts developed during 2015 LRTP were retained for 2050 as well. Previous 2045 external station forecasts are based on growth rates provided by MDT. After application of growth rates, the split between EE and IE/EI trips was computed using the methodology documented for the base year model. All remaining assumptions, such as the distribution of IE/EI trips by direction and purpose, identified for the base year remain.

Ravalli County Adjustments

While the link that crosses the Missoula/Ravalli County line is not a special generator, Ravalli County is modeled with considerably less detail than Missoula County. Ravalli County did not experience any growth during 2015 to 2018 based on Census data. For this reason, 2045 forecasts for Ravalli County were adopted as 2050 forecasts for this LRTP effort. During 2015 LRTP, the overall Ravalli County growth rate was set to 0.5 percent per year and data in Ravalli County were simply increased uniformly across all zones using this compound annual growth rate. The same forecast growth was retained for 2050.

SPECIAL GENERATOR FORECASTS

Forecast data for the University of Montana main campus were developed based on historical growth rates at the university during 2012 LRTP. Special generator values from 2045 were adopted for 2050 forecasts. University enrollment did not show any growth between 2015 and 2018. Due to the stagnation in the magnitude of enrollment, no additional growth was assumed from 2045 to 2050. During 2012 LRTP, based on discussions with MPO and MDT Staff, the 2040 forecast enrollment is based on the average of the compound and linear growth extrapolations using 1969 as a base year. Rounded to the nearest thousand students, the 2040 enrollment forecast assumes 21,000 students, which was retained for forecast year 2050 as well. See Table 22.

Table 22: 2050 Special Generator Values

Trip Purpose	Trip Rate	Unit	Base Year Trips	2050 Trips
HBW Productions	0.22	On Campus Students	821	1,155
HBW Attractions	1.6	FTE Employment	3,314	4,664
HBS Productions	0.2	On Campus Students	746	1,050
HBS Attractions	n/a	n/a	0	0
HBU Productions	n/a	n/a	0	0
HBU Attractions	3.8	Off Campus Students	36,586	59,852
HBO Productions	0.5	On Campus Students	1,865	2,625
HBO Attractions	n/a	n/a	0	0
WBO Production	0.37	FTE Employment	766	1,078
WBO Attractions	0.19	Off Campus Student	1,829	2,992
OBO Productions	0.25	Off Campus Student	2,407	3,938
OBO Attractions	0.25	Off Campus Student	2,407	3,938

APPENDIX G

Air Quality Conformity Analysis

missoula connect
2050 Long-Range Transportation Plan

Missoula County - City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

Conformity Determination

An emissions analysis of the Recommended Projects listed in the Long Range Transportation Plan (LRTP) shows that the Plan conforms to the emissions budgets for CO. Missoula has recently been designated as the Limited Maintenance Plan (LMP) area for PM-10, so no regional emission analysis is required to demonstrate conformity.

The VMT data were obtained in the form of Highway Performance Monitoring System (HPMS) data for the base year 2018. The VMT data were disaggregated by arterial and vehicle classification using 2012 HPMS VMT data. Speed estimates from the travel model were used for CO boundary area for the years 2019 and 2050. VMT estimates for interim years were estimated using linear interpolation for the purpose of conformity analysis.

Carbon monoxide emissions were determined using the U.S. Environmental Protection Agency's (EPA) MOVES 2014b (Motor Vehicle Emission Simulator model). MOVES 3 is the latest version available from EPA. However, use of MOVES 2014b is allowed to conduct conformity analyses during the transition period and hence 2014b was used for the analysis. Total emissions (inventory analysis) were estimated using MOVES instead of deriving emission rates.

APPENDIX H

Complete Project List

missoula connect
2050 Long-Range Transportation Plan

Missoula County - City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

Financially Constrained Projects

Project ID	Phase	Type	Federal	Functional Class	Funding	Category	Project Name	To	From	Project Description	2020 Estimated Cost	Recommended Plan Cost	Total Score (Equal Weighting)
152	Near-Term*	Intersection	NI-NHS	Arterial	RD / IF	Safety	Russell St and Fairview Ave Crossing Improvements	N/A	N/A	Install crossing safety countermeasures	$150,000	$153,000	18
127	Near-Term*	Corridor	NI-NHS	Arterial	STPU/ NH	Roadway	Russell Street Reconstruction	Multiple	Multiple	Reconfigure roadway and install bicycle and pedestrian facilities on Russell St and Broadway St	$47,200,000	$15,810,000	24
41	Near-Term*	Corridor		Local	CMAQ / Road District / Gas Tax	Active Transportation	Ivy/Franklin Neighborhood Greenway	S 3rd St	Plymouth St	Install neighborhood greenway	$1,085,000	$1,106,700	25
44	Near-Term*	Corridor		Local	CMAQ / TIF / Road District	Active Transportation	Burton Neighborhood Greenway	Stoddard St	Riverfront Trail	Install neighborhood greenway. Includes intersection improvements at Toole and Broadway	$202,637	$206,690	26
55	Near-Term*	Corridor		Local	CMAQ / TIF / Road District	Active Transportation	Westside Area Mobility Enhancements	Multiple	Multiple	Install greenway, bicycle, pedestrian, and streetscape improvements	$1,800,000	$1,836,000	25
101	Near-Term*	Corridor		Arterial	STPU / HSIP / TIF / RD / IF	Complete Streets	Higgins Ave Multimodal Improvements	Broadway St	Brooks St	Create complete street with transit, bicycle, pedestrian, and streetscape improvements	$2,115,623	$2,157,935	29
182	Near-Term*	Corridor		Collector	CMAQ / TA / RD / IF / GT	Complete Streets	Eaton St Sidewalk/Complete Streets Improvements	7th St	South Ave	Install pedestrian, streetscape, and transit improvements	$1,500,000	$1,530,000	23
183	Near-Term*	Corridor		Collector	CMAQ / RD / IF / GT	Complete Streets	Turner St/Worden Ave/N 5th Complete Street	Scott St	Orange St	Install pedestrian, traffic calming, and bicycle improvements	$1,000,000	$1,020,000	24
128	Near-Term*	Corridor	Off-System	Collector	BR	Bridge	Bitteroot River Crossing (South Ave Bridge - MacClay Bridge)	South Ave	River Pines Rd	Construct bridge	$18,488,500	$0	8
130	Near-Term*	Corridor		Collector	BUILD / IF	Roadway	BUILD Grant Roads - Wye/Mullan Plan Collector Routes	Multiple	Multiple	Extend roadways	$29,788,710	$2,040,000	21
180	Near-Term*	Corridor		Collector	BUILD / IF	Active Transportation	BUILD Grant Trails - Wye/Mullan Plan Collector Routes	Multiple	Multiple	Install trail connections	$3,429,000	$1,020,000	20
129	Near-Term*	Corridor	NI-NHS	Arterial	NH	Roadway	US 93: North of Desmet Interchange	Waldo Rd	Evaro Rd	Widen and improve roadway	$10,351,100	$0	12
N/A	Near-Term*	Corridor	Interstate	Arterial	IM	Maintenance	Interstate Epoxy Striping	N/A	N/A	Epoxy paint striping	$145,200.00	$0	N/A
UPN 9699	Near-Term*	Corridor	Interstate	Arterial	IM	Maintenance	Missoula to Bonner (I-90)	N/A	N/A	Pavement preservation	$4,377,500.00	$0	N/A
UPN 9700	Near-Term*	Interchange	Interstate	Arterial	IM	Maintenance	Bonner Interchange - East	N/A	N/A	Pavement preservation and mill/fill in passing lane	$2,004,100.00	$0	N/A
UPN 9492	Near-Term*	Corridor	NI-NHS	Arterial	NH	Maintenance	Reserve Street - Missoula	N/A	N/A	Pavement preservation including joint seal and grinding	$681,200.00	$0	N/A
UPN 9705	Near-Term*	Interchange	NI-NHS	Arterial	NH	Maintenance	US-93 North of I-90 Interchange	N/A	N/A	Pavement preservation, mill/fill, seal/cover	$377,500.00	$0	N/A
UPN 9863	Near-Term*	Corridor	NI-NHS	Arterial	NH	Maintenance	West Broadway to Old Highway 10	N/A	N/A	Pavement preservation, mill/fill, seal/cover	$37,200.00	$0	N/A
UPN 9825	Near-Term*	Intersection		Local	RRS	Safety	Railroad Crossing - Deschamps Rd	N/A	N/A	Upgrade RR crossing signal equipment and add gates	$282,600.00	$0	N/A
UPN 9526	Near-Term*	Corridor	NI-NHS	Arterial	HSIP	Safety	SF179 Stephens Orange Safety Improvement	N/A	N/A	Safety study	$591,600.00	$0	N/A
UPN 9839	Near-Term*	Corridor	NI-NHS	Arterial	HSIP	Safety	SF199 MSLA HT MEDIAN CABLERAIL	N/A	N/A	Install High Tension Cable Rail	$251,500.00	$0	N/A
UPN 9896	Near-Term*	Corridor	NI-NHS	Arterial	HSIP	Safety	SF189 Russell St Lighting	39th St	Brooks St	Install lighting	$558,300.00	$0	N/A
UPN 9920	Near-Term*	Interchange	NI-NHS	Arterial	HSIP	Safety	SF199 Mary Jane Blvd and Broadway St Intersection	Mary Jane Blvd	Broadway St	Intersection improvements at 2 areas	$703,500.00	$0	N/A
UPN 8886	Near-Term*	Bridge	NI-NHS	Arterial	BR	Maintenance	Steel BR Rehab - Corrosion 1	N/A	N/A	Bridge rehabilitation at multiple bridge sections	$149,300.00	$0	N/A
UPN 9569	Near-Term*	Intersection	NI-NHS	Arterial	MACI	Maintenance	Broadway St and Toole Ave	Broadway St	Toole Ave	Intersection and signal improvements	$209,900.00	$0	N/A
UPN 9939	Near-Term*	Corridor	NI-NHS	Arterial	NH	Maintenance	US-93 Pavement Preservation Missoula to Lolo	N/A	N/A	Pavement preservation, mill/fill, seal/cover	$6,700,000.00	$0	N/A
UPN 9977	Near-Term*	Corridor	NI-NHS	Arterial	HSIP	Safety	US-93 Lolo to Florence Safety Study	N/A	N/A	Safety study	$1,000,000.00	$0	N/A
UPN 9557	Near-Term*	Corridor	Secondary	Collector	STPX/STPS/SFCN	Maintenance	Pulp Mill Road Slope Stabilization	N/A	N/A	Landslide stabilization along Pulp Mill Road near railroad overpass structure and guardrail replacement	$1,206,000.00	$0	N/A
UPN 9642	Near-Term*	Corridor	State Highway	Arterial	STPX/STPS/SFCN	Maintenance	Old MT 200 Retaining Wall Repair	N/A	N/A	Repair retaining wall	$5,000,000.00	$0	N/A
107	Near-Term	Corridor	Urban	Collector	CMAQ / TIF / RD / GT	Complete Streets	Front/Main 2-Way Conversion and Multimodal Improvements	Madison St	Orange St	Reconfigure roadway and install bicycle, pedestrian, and streetscape improvements	$3,916,629	$3,994,961	29
121	Near-Term	Corridor	Urban	Arterial	CMAQ / TA / RD / IF / GT	Complete Streets	South Ave Complete Street and Shared-Use Path	36th St	Reserve St	Create complete street with bicycle, pedestrian, and streetscape improvements	$4,372,476	$4,459,926	25
42	Near-Term	Corridor		Local	CMAQ / TA / RD / GT	Active Transportation	4th St Neighborhood Greenway	Schilling St	Toole Park	Install neighborhood greenway	$409,282	$417,468	27
37	Near-Term	Corridor		Local	CMAQ / TA / RD / GT	Active Transportation	Sherwood Neighborhood Greenway	Russell St	Pine St	Install neighborhood greenway	$109,040	$111,221	28
39	Near-Term	Corridor		Local	CMAQ / RD / GT	Active Transportation	Gerald Neighborhood Greenway	4th St	South Ave W	Install neighborhood greenway	$105,923	$108,042	27
36	Near-Term	Corridor		Local	CMAQ / TIF / RD / GT	Active Transportation	Grant St Neighborhood Greenway	3rd St	North Ave W	Install neighborhood greenway	$105,033	$107,134	24
13	Near-Term	Corridor	Urban	Arterial	CMAQ / TIF / GT	Active Transportation	3rd St Bike Lane Extension	Ash St	Higgins Ave	Install on-street bicycle facilities	$3,251	$3,316	26
106	Near-Term	Corridor	Urban	Collector	CMAQ / GT	Active Transportation	Mount/S 14th Ave Bike Lane	Reserve St	Higgins Ave	Install on-street bicycle facilities	$10,066	$10,267	26
79	Near-Term	Corridor	NI-NHS	Arterial	CMAQ / GT	Active Transportation	Russell St Bike Lanes	Railroad	Broadway St	Install on-street bicycle facilities	$3,306	$3,372	23
137	Near-Term	Intersection	NI-NHS	Arterial	CMAQ / TIF / GT	Active Transportation	Stephens Bike Lane Intersection Improvements	Stephens Ave	Mount Ave	Address bicycle facility gaps through intersection	$75,000	$76,500	19
40	Medium-Term	Corridor		Local	CMAQ / TIF / RD / GT	Active Transportation	Schilling Neighborhood Greenway	3rd St	Benton Ave	Install neighborhood greenway	$407,812	$440,437	25
188	Medium-Term	Corridor		Local	CMAQ / TA / RD / GT	Active Transportation	Park Neighborhood Greenway	Plymouth St	SW Higgins Ave	Install neighborhood greenway	$518,000	$559,440	18
43	Medium-Term	Corridor		Local	CMAQ / TA / RD / GT	Active Transportation	Pattee Creek Neighborhood Greenway	S Higgins Ave	Reserve St	Install neighborhood greenway	$303,711	$328,008	21
22	Medium-Term	Corridor		Local	CMAQ / TA / RD / GT	Active Transportation	Regent St Greenway	Mount Ave	Kent Ave	Install neighborhood greenway	$100,898	$108,970	22
38	Medium-Term	Corridor		Local	CMAQ / TA / RD / GT	Active Transportation	Benton Neighborhood Greenway	Higgins St	Bancroft St	Install neighborhood greenway	$102,489	$110,688	18
49	Medium-Term	Corridor	NI-NHS	Arterial	NH / CMAQ / TA / RD / GT	Active Transportation	Reserve St Protected Bike Lanes	US Hwy 93	S 3rd St	Install on-street bicycle facilities	$125,431	$135,465	26
95	Medium-Term	Corridor			TIF / TA	Active Transportation	Milwaukee Trail Lighting	Reserve St	Catlin St	Install lighting	$350,000	$378,000	25
3	Medium-Term	Corridor			CMAQ / TIF / IF	Active Transportation	Kiwanis Park Trail Widening	Ron's River Trail	Front St	Extend and widen multi-use trail	$260,082	$280,888	22
72	Medium-Term	Corridor			CMAQ / TA / TIF	Bridge	Bitterroot Trail Bridge at Clark Fork River	McCormick Park/Ogren Field	Broadway St	Construct bicycle/pedestrian bridge	$3,500,000	$3,780,000	19
192	Medium-Term	Corridor	State Highway	Arterial	HSIP / STPU / TA / IF	Complete Streets	Hwy 200 Complete Street	Highton St	Staple St	Construct protected bike lanes, sidewalks, curb, gutter, transit access, and safe crossings	$7,000,000	$7,560,000	18
114	Medium-Term	Corridor		Collector	TIF / IF / RD / GT	Roadway	Johnson Street Extension	South Ave	Brooks St	Extend roadway and install transit, bicycle, and pedestrian improvements	$2,440,000	$2,635,200	27
118	Medium-Term	Corridor	Off System	Collector	CMAQ / RD / GT / IF	Complete Streets	Curtis St Complete Street	S 3rd St	River Rd	Create complete street with bicycle, pedestrian, and streetscape improvements	$2,000,504	$2,160,544	24
119	Medium-Term	Corridor	Off System	Collector	CMAQ / RD / GT / IF	Complete Streets	River Rd Complete Street	Reserve St	Russell St	Create complete street with bicycle, pedestrian, and streetscape improvements	$2,693,673	$2,909,167	24
103	Medium-Term	Corridor		Local	CMAQ / TIF / RD / GT	Complete Streets	California St Complete Street	S 3rd St	River St	Create complete street with bicycle, pedestrian, and streetscape improvements	$5,000,000	$5,400,000	23
86	Medium-Term	Corridor	State Highway	Arterial	STPU / CMAQ / TA / IF	Active Transportation	Hwy 200 Shared-Use Path	Tamarack Rd	Staple St	Construct shared-use path	$3,285,572	$3,548,418	19
122	Medium-Term	Corridor	NI-NHS	Arterial	STPU / CMAQ / TIF / GT	Complete Streets	Broadway Complete Street	Van Buren St	Toole Ave	Create complete street with bicycle, pedestrian, and streetscape improvements	$5,760,000	$6,220,800	29
60	Medium-Term	Corridor			STPU / CMAQ / TIF / IF	Active Transportation	Ron's River Trail Extension	Burton St	Orange St	Extend multi-use trail	$923,344	$997,211	24
191	Medium-Term	Corridor	State Highway	Arterial	STPU / IF / GT	Bridge	Hwy 200 Railroad Bridge Replacement	Easy St	Highton St	Replace and widen RR bridge, construct roundabout at I-90 interchange, add connection of non-motorized facilities along Hwy 200	$14,000,000	$15,120,000	18
82	Medium-Term	Corridor			CMAQ / TIF / IF	Active Transportation	Ron's River Trail Widening, Reconfiguration and Relocation	Madison St	Orange St	Relocate, widen, and extend multi-use trail	$2,000,000	$2,160,000	24
84	Medium-Term	Corridor			CMAQ / TIF	Active Transportation	Bitterroot Trail Lighting	Reserve St	Milwaukee Trail	Install lighting	$1,600,000	$1,728,000	25
164	Medium-Term	Intersection		Local	TIF / RD / GT	Safety	Shakespeare St and Otis St Intersection Improvements	N/A	N/A	Install traffic safety countermeasures	$75,000	$81,000	16
146	Medium-Term	Intersection	NI-NHS	Arterial	HSIP / TIF	Safety	Owen St and Broadway St Enhanced Crossing	N/A	N/A	Install crossing safety countermeasures	$300,000	$324,000	23
52	Medium-Term	Corridor		Local	CMAQ / RD / GT / IF	Complete Streets	N 2nd St Complete Street	Madison St	A St	Create complete street with bicycle, pedestrian, and streetscape improvements	$2,080,431	$2,246,865	27
141	Medium-Term	Intersection	Urban	Arterial	TIF / GT / IF	Safety	Catlin St and 3rd St Intersection Improvements	N/A	N/A	Install pedestrian/bicycle crossing to connect to trail	$200,000	$216,000	20
53	Medium-Term	Corridor			CMAQ / TA / TIF / IF	Active Transportation	Northbank Riverfront Trail	Easy St	Van Buren St	Extend multi-use trail	$2,318,467	$2,503,944	20

**Committed projects*

Financially Constrained Projects

Project ID	Phase	Type	Federal	Functional Class	Funding	Category	Project Name	To	From	Project Description	2020 Estimated Cost	Recommended Plan Cost	Total Score (Equal Weighting)
4	Medium-Term	Corridor		Local	CMAQ / TIF / RD / GT	Complete Streets	Levasseur St Complete Street	Clay St	Dead End	Install pedestrian and streetscape improvements and extend trail	$296,415	$320,128	23
132	Medium-Term	Corridor	NI-NHS	Arterial	STPU / CMAQ / TA / TIF / IF	Active Transportation	Broadway Protected Bike Lanes	Mullan Rd	Mary Jane Blvd	Install on-street bicycle facilities and improved crossings	$548,484	$592,363	20
134	Medium-Term	Corridor		Local	STPU / CMAQ / TA / IF	Active Transportation	Union Pacific and Palmer Protected Bike Lanes	Clark Fork Ln	Broadway St	Install on-street bicycle facilities and improved crossings	$4,000,000	$4,320,000	22
170	Medium-Term	Intersection	Urban	Arterial	STPU / CMAQ / HSIP / TA	Active Transportation	Clements Rd Intersection Improvements	Multiple	Multiple	Install crossing safety countermeasures	$200,000	$216,000	15
98	Long-Term	Corridor	Urban	Arterial	STPU / RD / GT / IF	Roadway	Mullan Rd Complete Street	Mary Jane Blvd	Reserve St	Reconfigure roadway and create complete street with bicycle, pedestrian, and	$3,122,115	$3,652,874	22
169	Long-Term	Intersection	NI-NHS	Arterial	HSIP / TA / STPU	Active Transportation	Reserve St Intersection Improvements	Multiple	Multiple	Install crossing safety countermeasures	$450,000	$526,500	19
125	Long-Term	Corridor	NI-NHS	Arterial	STPU / TIF / GT / IF	Complete Streets	Brooks St Complete Street and Transit Improvements	Stephens Ave	Paxson St	Create complete street with bus rapid transit, bicycle, pedestrian, and streetscape improvements	$30,000,000	$35,100,000	26
124	Long-Term	Corridor	NI-NHS	Arterial	STPU / TIF / GT / IF	Complete Streets	Brooks St Complete Street and Transit Improvements	Paxson St	Reserve St	Create complete street with bus rapid transit, bicycle, pedestrian, and streetscape improvements	$20,000,000	$23,400,000	25
102	Long-Term	Corridor	Urban	Arterial	STPU / CMAQ / RD / GT / IF	Complete Streets	S 3rd St Complete Street	Hiberta St	Reserve St	Create complete street with bicycle, pedestrian, and streetscape improvements	$1,986,743	$2,324,490	22
120	Long-Term	Corridor	NI-NHS	Arterial	STPU / CMAQ / TA / TIF /	Complete Streets	Brooks St Complete Street	Mount Ave	Stephens Ave	Reconfigure roadway and install bicycle facilities	$1,122,684	$1,313,540	22
104	Long-Term	Corridor	Urban	Arterial	STPU / CMAQ / TA / RD /	Complete Streets	Rattlesnake Dr Complete Street	Creek Crossing	Missoula Ave	Create complete street with bicycle, pedestrian, and streetscape improvements	$5,217,848	$6,104,883	22
91	Long-Term	Corridor			STPU / CMAQ / TA / IF	Active Transportation	Milwaukee Trail River Crossing	Mullan Rd (via Schmidt Rd)	Grove St	Extend multi-use trail and construct bicycle/pedestrian bridges	$8,518,009	$9,966,070	19
8	Long-Term	Corridor	Off System	Collector	RD / GT / IF	Complete Streets	Lower Miller Creek Rd Complete Street	Linda Vista Blvd	Bigfork Rd	Create a complete street, including bicycle, pedestrian, and streetscape improvements	$1,696,000	$1,984,320	19
7	Long-Term	Corridor		Collector	STPU / CMAQ / TIF / RD / GT	Roadway	Howard Raser Ave Complete Street	Old Grant Creek Rd	Scott St	New complete street with pedestrian and streetscape improvements	$8,032,170	$9,397,639	23
131	Long-Term	Corridor		Collector	STPU / CMAQ / TA / TIF	Active Transportation	England Blvd Protected Bike Lanes	Mary Jane Blvd	Great Northern Ave	Install on-street bicycle facilities and improved crossings	$3,456,000	$4,043,520	22
112	Long-Term	Corridor	NI-NHS	Arterial	STPU / CMAQ / TIF / RD / GT	Complete Streets	Russell St Complete Street	Fairview Ave	Mount Ave	Create complete street with transit, bicycle, pedestrian, and streetscape improvements	$2,201,600	$2,575,872	24
145	Long-Term	Intersection	NI-NHS	Arterial	HSIP / TIF	Safety	E Broadway St and N Van Buren St Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$450,000	$526,500	21
157	Long-Term	Intersection	NI-NHS	Arterial	HSIP / TIF	Safety	California St/Toole Ave/Broadway St Intersection Improvements	N/A	N/A	Reconfigure roadway and install roundabout	$450,000	$526,500	18
87	Long-Term	Corridor		Local	CMAQ / TA	Active Transportation	Hawthorne School to Milwaukee Trail Shared-Use Path	S 3rd St/Hawthorne School	Grove St	Construct shared-use path	$1,084,836	$1,269,258	19
168	Long-Term	Intersection	NI-NHS	Arterial	HSIP / STPU / GT	Safety	South Ave and Reserve St Intersection Improvements	N/A	N/A	Address bicycle facility gaps through intersection	$150,000	$175,500	18
159	Long-Term	Intersection		Local	RD / GT / IF	Safety	Philips St and Scott St Intersection Improvements	N/A	N/A	Install traffic safety countermeasures	$450,000	$526,500	18
19	Long-Term	Corridor		Local	STPU / CMAQ / TA / IF	Active Transportation	W Riverside and 1st St Shared-Use Path	US 200	W Riverside Dr	Construct shared-use path	$351,184	$410,886	17
69	Long-Term	Corridor	Urban	Arterial	CMAQ / TA / IF	Active Transportation	Clements Rd Shared-Use Path	North Ave	Mount Ave	Construct shared-use path	$443,453	$518,840	15
81	Long-Term	Corridor		Local	CMAQ / TA / RD / GT	Active Transportation	Mountain View Drive Multimodal Improvements	Duncan Dr	Rattlesnake Dr	Install pedestrian, bicycle, and streetscape improvements to create Safe Route to School	$352,316	$412,210	21

Illustrative Projects

Project ID	Phase	Type	Category	Project Name	To	From	Project Description	2020 Estimated Cost	Recommended Plan Cost	Total Score (Equal Weighting)
83	Illustrative	Corridor	Active Transportation	S 3rd St Bicycle and Pedestrian Facilities	Clements Rd	Hiberta St	Construct shared-use path	$2,862,611	N/A	20
31	Illustrative	Corridor	Active Transportation	Mullan Rd Shared-Use Path	Deschamps Ln	Cote Ln	Construct shared-use path	$3,304,449	N/A	15
33	Illustrative	Corridor	Complete Streets	Scott St Area Complete Street	Otis St	Turner St	Create complete street with traffic calming, bicycle, pedestrian, and streetscape improvements	$1,920,000	N/A	19
6	Illustrative	Corridor	Active Transportation	North Reserve/Scott St I-90 Trail Connection	Grant Creek Rd	Scott St	Construct multi-use trail	$2,525,489	N/A	19
46	Illustrative	Corridor	Active Transportation	Milwaukee Trail Extension	Deschamps Ln	Mullan Rd	Extend multi-use trail	$5,759,611	N/A	14
11	Illustrative	Corridor	Active Transportation	Mullan Rd - Frenchtown Trail	Deschamps Ln	Hamel Rd	Construct multi-use trail	$13,062,052	N/A	19
1	Illustrative	Corridor	Active Transportation	Deer Creek Rd/Speedway Ave Trail	Canyon River Rd	US Hwy 200	Construct multi-use trail	$718,454	N/A	19
2	Illustrative	Corridor	Active Transportation	Northside Riverfront Trail Extension	Madison St	Van Buren St	Extend multi-use trail and construct footbridge over Rattlesnake Creek	$750,000	N/A	21
5	Illustrative	Corridor	Complete Streets	Burlington Ave Complete Street	Margaret St	Reserve St	Create complete street with pedestrian and streetscape improvements	$543,148	N/A	23
9	Illustrative	Corridor	Safety	Brooks St and Regent St Enhanced Crossing	Brooks St	Regent St	Install pedestrian crossing	$125,000	N/A	21
10	Illustrative	Corridor	Safety	Brooks St and Holburn St Enhanced Crossing	Brooks St	Holborn St	Install pedestrian crossing	$125,000	N/A	22
12	Illustrative	Corridor	Active Transportation	North Ave Bike Lanes	Johnson St	Bitterroot Trail	Install on-street bicycle facilities	$5,548	N/A	24
14	Illustrative	Corridor	Active Transportation	Mullan Rd Connection Trail	Mullan Rd	Schmidt Rd	Extend multi-use trail	$424,358	N/A	13
15	Illustrative	Corridor	Active Transportation	I-90 Trail (Alternative 2)	Grant Creek Rd	Oliver Rd	Construct multi-use trail	$11,777,152	N/A	17
16	Illustrative	Corridor	Active Transportation	Deschamps Ln Shared-Use Path	Laflesch Ln	Bruin Ln	Construct shared-use path	$4,397,402	N/A	13
17	Illustrative	Corridor	Active Transportation	Butler Creek Rd Trail	Angus Ln	Covenant Rd	Extend multi-use trail	$3,271,740	N/A	13
18	Illustrative	Corridor	Active Transportation	Great American Trail	Loiselle Ln	Deschamps Ln	Construct multi-use trail	$7,948,589	N/A	15
20	Illustrative	Corridor	Active Transportation	West Riverside Trail	Anaconda St	Cowboy Trail Rd	Construct multi-use trail	$1,143,382	N/A	15
21	Illustrative	Corridor	Active Transportation	Cowboy Trail Rd Shared-Use Path	Cowboy Trail Rd	Hellgate Lions Park	Construct shared-use path	$988,272	N/A	16
23	Illustrative	Corridor	Active Transportation	Blue Mountain Rd Trail	Forest Hill Ln	Future Bridge	Construct multi-use trail	$425,388	N/A	12
24	Illustrative	Corridor	Active Transportation	Miller Creek Shared-Use Path (Lower Miller Creek Connection)	Linda Vista Blvd	Bear Run Creek Rd	Construct shared-use path	$13,041,042	N/A	15
26	Illustrative	Corridor	Active Transportation	7th St Shoulder Improvements	Clements Rd	Tower St	Install roadway improvements to create a shoulder pathway	$952,028	N/A	16
27	Illustrative	Corridor	Active Transportation	North Ave Shoulderway Improvements	Clements Rd	Edward Ct	Install roadway improvements to create a shoulder pathway	$480,587	N/A	16
28	Illustrative	Corridor	Active Transportation	North Ave Trail Connection	37th Ave	Tower St	Extend multi-use trail	$1,424,950	N/A	18
29	Illustrative	Corridor	Active Transportation	Mount Ave Trail Connection	27th Ave	Tower St	Extend multi-use trail	$1,190,134	N/A	15
30	Illustrative	Corridor	Active Transportation	Spurgin Rd Trail Connection	Hibertha St	Maverick Ln	Extend multi-use trail	$263,187	N/A	15
32	Illustrative	Corridor	Active Transportation	Lewis & Clark Dr Shared-Use Path	Hwy 93	Lakeside Dr	Construct shared-use path	$625,807	N/A	16
34	Illustrative	Corridor	Roadway	Deschamps Ln Re-Surfacing	Rollercoaster Rd	Mullan Rd	Improve pavement condition	$1,275,000	N/A	7
35	Illustrative	Corridor	Bridge	Higgins Pedestrian Bridge	Ron's River Trail	Milwaukee Trail	Construct pedestrian bridge	$6,000,000	N/A	21
45	Illustrative	Corridor	Active Transportation	Kent/Central Neighborhood Greenway	Maurice Ave	Reserve St	Install neighborhood greenway	$1,212,489	N/A	26
46	Illustrative	Corridor	Active Transportation	Milwaukee Trail Extension	Deschamps Ln	Mullan Rd	Extend multi-use trail	$5,759,611	N/A	14
47	Illustrative	Corridor	Active Transportation	Fort Missoula to McClay Shared-Use Path and Bridge	Blue Mountain Rd	South Ave	Construct shared-use path and pedestrian/bicycle bridge	$2,216,364	N/A	16
48	Illustrative	Corridor	Complete Streets	Whitaker Dr Complete Street	Ben Hogan Dr	Higgins Ave	Create complete street with bicycle, pedestrian, and streetscape improvements	$5,716,819	N/A	20
50	Illustrative	Corridor	Active Transportation	Rattlesnake Dr Shared-Use Path	USFS Trailhead	Tamarack St/Fox Hollow	Construct shared-use path	$1,579,269	N/A	16
51	Illustrative	Corridor	Active Transportation	Duncan Dr Shared-Use Path	Duncan Dr Trailhead	Mountain View Dr	Construct shared-use path	$1,883,539	N/A	16
54	Illustrative	Corridor	Active Transportation	Northside Greenway Connector	Scott St	Northside Park	Construct multi-use trail	$1,083,392	N/A	20
56	Illustrative	Corridor	Active Transportation	Spurgin Rd Shared-Use Path	Clements Rd	Reserve St	Construct shared-use path	$4,805,294	N/A	19
57	Illustrative	Corridor	Bridge	Mullan Rd Bicycle and Pedestrian Bridge	Monroc	Cooper St/Riverfront Trail	Construct bicycle/pedestrian bridge	$8,000,000	N/A	22
58	Illustrative	Corridor	Active Transportation	Lincoln Hills Dr Bicycle and Pedestrian Improvements	Rattlesnake Dr	Applehouse Ln	Install bicycle and pedestrian improvements	$188,911	N/A	16
59	Illustrative	Corridor	Active Transportation	Lincoln Hills Dr Bicycle and Pedestrian Improvements	Contour Ln	Applehouse Ln	Install bicycle and pedestrian improvements	$612,301	N/A	18
61	Illustrative	Corridor	Active Transportation	Northside 1st St Shared-Use Path	Madison Ave	Northside Pedestrian Bridge/Grand Ave	Construct shared-use path	$1,076,396	N/A	25
62	Illustrative	Corridor	Active Transportation	Strand Ave to Burlington Ave Shared-Use Path	Strand Ave	Burlington Ave	Construct shared-use path	$91,537	N/A	20
63	Illustrative	Corridor	Active Transportation	Madison St Underbridge to Arthur Street Shared-Use Path	Southside Riverfront Trail	S 5th St E	Construct shared-use path	$170,823	N/A	21
64	Illustrative	Corridor	Active Transportation	Inverness Pl Shared-Use Path	Inverness Place cul-de-sac	N Johnson St/Montana St	Extend shared-use path	$140,645	N/A	20
65	Illustrative	Corridor	Active Transportation	Johnson St Shared-Use Path Connection	Johnson St	Curtis St	Construct shared-use path	$270,859	N/A	24
66	Illustrative	Corridor	Active Transportation	Northside Shared-Use Path Connection	Defoe St	Otis St	Construct shared-use path	$898,964	N/A	23
67	Illustrative	Corridor	Active Transportation	Rattlesnake Dr Bicycle and Pedestrian Facilities	Tamarack St/Fox Hollow	Creek Crossing Rd	Install bicycle and pedestrian improvements	$500,470	N/A	17
68	Illustrative	Corridor	Active Transportation	Tamarack St Bicycle and Pedestrian Improvements	USFS Trailhead	Rattlesnake Dr	Install bicycle and pedestrian improvements	$148,927	N/A	16
70	Illustrative	Corridor	Complete Streets	River Rd Complete Street	California St	Russell St	Create complete street with bicycle, pedestrian, and streetscape improvements	$688,615	N/A	19
71	Illustrative	Corridor	Active Transportation	Pedestrian Undercrossing Connecting Downtown to Northside	Railyard/B St/N 1st St	Higgins Ave	Install pedestrian improvements	$29,344	N/A	22
73	Illustrative	Corridor	Active Transportation	Northside Bikeway	RUX Trail	Toole Ave/Bitterroot Trail	Install on-street bicycle facilities	$1,678,731	N/A	28
74	Illustrative	Corridor	Active Transportation	Northbank Riverfront Trail	Reserve St	Russell St	Construct multi-use trail	$1,614,753	N/A	24
75	Illustrative	Corridor	Active Transportation	Southbank Riverfront Trail Extension	Reserve St	Russell St	Extend multi-use trail	$1,532,236	N/A	21
76	Illustrative	Corridor	Active Transportation	Westside Greenway Trail	Owen St	Bitterroot Railroad Spur Line	Construct multi-use trail	$390,502	N/A	22
77	Illustrative	Corridor	Active Transportation	Lincoln Hills Shared-Use Path	Rattlesnake Ct	Lincoln Hills Dr	Construct shared-use path	$400,371	N/A	17
78	Illustrative	Corridor	Active Transportation	Hiberta St Bike Lanes	Spurgin Rd	S 3rd St	Install on-street bicycle facilities	$2,504	N/A	20
85	Illustrative	Corridor	Active Transportation	Kim Williams Trail Extension and Bridge	Milltown State Park	Kim Williams Trail End	Extend multi-use trail and construct bicycle/pedestrian bridge	$8,998,075	N/A	13
88	Illustrative	Corridor	Bridge	Riverfront Triangle Non-Motorized Bridge	Riverfront Triangle	McCormick Park	Construct bicycle/pedestrian bridge	$8,000,000	N/A	21
89	Illustrative	Corridor	Bridge	Missoula College Non-Motorized Bridge	Missoula College	Kim Williams Trail	Construct bicycle/pedestrian bridge	$8,000,000	N/A	14
90	Illustrative	Corridor	Active Transportation	Kim Williams Trail Connector	Canyon River Rd	Bandmann Trail	Extend multi-use trail	$1,179,578	N/A	14
92	Illustrative	Corridor	Active Transportation	Grant Creek Trail Phase II	Snowbowl Rd	Mellot Ln	Construct multi-use trail	$1,000,000	N/A	12
93	Illustrative	Corridor	Active Transportation	Miller Creek to Lolo Trail Connection	Lolo/Lakeside Dr	Lower Miller Creek Rd	Construct shared-use path	$5,685,537	N/A	14
94	Illustrative	Corridor	Active Transportation	Blue Mountain Rd Shared-Use Path	Bitterroot Trail	Area	Construct shared-use path	$866,189	N/A	16
96	Illustrative	Corridor	Active Transportation	Post Siding Rd Shared-Use Path	Old Hwy 93	Fort Missoula Rd	Construct shared-use path	$1,036,001	N/A	18
97	Illustrative	Corridor	Active Transportation	People's Way Trail Phase 1	Evaro	I-90	Construct multi-use trail	$11,875,407	N/A	13
99	Illustrative	Corridor	Complete Streets	Duncan Dr/Greenough Dr Complete Street	Mountain View Dr	Minckler Loop	Create complete street with bicycle, pedestrian, and streetscape improvements	$3,850,202	N/A	17
100	Illustrative	Corridor	Roadway	Mullan Rd Widening	Cote Ln	Flynn Ln	Widen roadway	$10,692,243	N/A	17
105	Illustrative	Corridor	Complete Streets	Old Grant Creek/Cemetery Rd/Rodgers St Multimodal Improvements	Shakespeare St	Howard Raser Ave	Create complete street with bicycle, pedestrian, and streetscape improvements	$6,800,000	N/A	22

Illustrative Projects

Project ID	Phase	Type	Category	Project Name	To	From	Project Description	2020 Estimated Cost	Recommended Plan Cost	Total Score (Equal Weighting)
108	Illustrative	Corridor	Complete Streets	Johnson St Extension and Complete Street	River Rd	S 3rd St	New complete street with bicycle, pedestrian, and streetscape improvements	$2,060,525	N/A	25
109	Illustrative	Corridor	Roadway	Carousel Dr Reconfiguration	Front St	Higgins Ave	Reconfigure roadway and install open space	$1,674,160	N/A	25
110	Illustrative	Corridor	Roadway	Railyard St Grid Construction	Ryman St	Madison St	Construct new streets	$2,312,464	N/A	19
111	Illustrative	Corridor	Safety	Clay St Streetscaping and Intersection Control	Levasseur St	Front St	Install streetscape and traffic safety countermeasures	$200,000	N/A	23
113	Illustrative	Corridor	Complete Streets	Grant Creek Rd Complete Street	Snowbowl Rd	I-90	Reconfigure roadway and install traffic safety countermeasures	$12,170,864	N/A	15
115	Illustrative	Corridor	Roadway	Russell St Extension	New I-90 interchange	Railroad St	Extend roadway and construct bridge	$55,000,000	N/A	20
117	Illustrative	Corridor	Complete Streets	South Ave Complete Street	Hanson Dr	36th St	Create complete street with bicycle, pedestrian, and streetscape improvements	$4,779,096	N/A	19
135	Illustrative	Corridor	Roadway	England Blvd Extension	Latimer St	I-90	Extend roadway and construct bridge	$70,000,000	N/A	18
138	Illustrative	Intersection	Safety	Russell St and 4th St Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$200,000	N/A	20
139	Illustrative	Intersection	Safety	Russell St and 7th St Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$200,000	N/A	18
140	Illustrative	Intersection	Safety	14th St and Eaton St Intersection Improvements	N/A	N/A	Install roundabout	$450,000	N/A	16
142	Illustrative	Intersection	Safety	Russell St and 6th St Intersection Improvements	N/A	N/A	Install pedestrian/bicycle crossing to connect to trai	$200,000	N/A	19
143	Illustrative	Intersection	Safety	Madison St and Front St Intersection Improvements	N/A	N/A	Reconfigure roadway and install roundabout	$450,000	N/A	24
144	Illustrative	Intersection	Safety	Park St and Mount Ave Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$125,000	N/A	16
147	Illustrative	Intersection	Safety	Clark Fork Ln and Mullan Rd Intersection Improvements	N/A	N/A	Improve turning movements	$450,000	N/A	15
148	Illustrative	Intersection	Safety	California St and River St Intersection Improvements	N/A	N/A	Install traffic circle	$450,000	N/A	20
150	Illustrative	Intersection	Safety	Russell St and Ernest Ave Enhanced Crossing	N/A	N/A	Install crossing safety countermeasures	$200,000	N/A	18
153	Illustrative	Intersection	Safety	George Elmer Dr and Mullan Rd Intersection Improvements	N/A	N/A	Install traffic signal	$450,000	N/A	15
154	Illustrative	Intersection	Safety	Brooks St and Stephens Ave Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$125,000	N/A	19
155	Illustrative	Intersection	Safety	Greenough Dr and Vine St Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$200,000	N/A	16
156	Illustrative	Intersection	Safety	Great Northern Ave and Palmer St Intersection Improvements	N/A	N/A	Install roundabout	$450,000	N/A	15
158	Illustrative	Intersection	Safety	McDonald Ave and Russell St Intersection Improvements	N/A	N/A	Install roundabout	$450,000	N/A	17
163	Illustrative	Intersection	Safety	Ryman St and Front St Intersection Improvements	N/A	N/A	Install traffic safety countermeasures	$450,000	N/A	21
165	Illustrative	Intersection	Safety	6th St and Ronan St Enhanced Trail Crossing	N/A	N/A	Install pedestrian/bicycle crossing to connect to trai	$125,000	N/A	19
166	Illustrative	Intersection	Safety	14th St and Mount Ave Intersection Improvements	N/A	N/A	Reconfigure roadway and install traffic safety countermeasures	$75,000	N/A	15
167	Illustrative	Intersection	Safety	4th St and Orange St Enhanced Crossing	N/A	N/A	Install crossing safety countermeasures	$200,000	N/A	18
181	Illustrative	Corridor	Roadway	Coal Mine Road/I-90 Interchange	I-90	Howard Raser Dr	Construct new I-90 interchange	$15,000,000	N/A	12
185	Illustrative	Corridor	Roadway	Christian Dr Extension	Old Bitterroot Rd	Lower Miller Creek Rd	Extend roadway	$2,512,000	N/A	12
186	Illustrative	Corridor	Roadway	Wyoming Connector	River Rd	Wyoming St	Construct connector street	$1,366,800	N/A	21
190	Illustrative	Corridor	Complete Streets	East Broadway Complete Street	Van Buren St	Easy St	Construct shared-use path, bus stop improvements, lighting, on-street bike lanes, and added parking	$5,600,000	N/A	26
201	Illustrative	Corridor	Active Transportation	Wylie Neighborhood Greenway	Lolo St	Wylie Ave	Install neighborhood greenway	$5,000	N/A	16
202	Illustrative	Corridor	Active Transportation	Jackson/Holly Neighborhood Greenway	Van Buren St	Monroe St	Install neighborhood greenway	$5,000	N/A	17
203	Illustrative	Corridor	Active Transportation	Alvina Path Neighborhood Greenway	Duncan Dr	City Dr	Install neighborhood greenway	$5,000	N/A	17
206	Illustrative	Corridor	Active Transportation	University Road Greenway	S Higgins Ave	Arthur Ave	Install neighborhood greenway	$305,000	N/A	20
207	Illustrative	Corridor	Active Transportation	Rollins Neighborhood Greenway	W Florence St	Mount Ave	Install neighborhood greenway	$105,000	N/A	22
208	Illustrative	Corridor	Active Transportation	Florence/Cottonwood Neighborhood Greenway	River St	Plymouth St	Install neighborhood greenway	$305,000	N/A	24
209	Illustrative	Corridor	Active Transportation	Myrtle/Woodford Neighborhood Greenway	S 3rd St W	Mount Ave	Install neighborhood greenway	$105,000	N/A	26
210	Illustrative	Corridor	Active Transportation	Grove Neighborhood Greenway	S 3rd St W	River Rd	Install neighborhood greenway	$5,000	N/A	21
212	Illustrative	Corridor	Active Transportation	Waverly Neighborhood Greenway	Turner St	Defoe St	Install neighborhood greenway	$5,000	N/A	22
213	Illustrative	Corridor	Active Transportation	Grand Neighborhood Greenway	N 1st St	N 5th St	Install neighborhood greenway	$5,000	N/A	23
214	Illustrative	Corridor	Active Transportation	Holmes Neighborhood Greenway	Charlo St	Phillips St	Install neighborhood greenway	$105,000	N/A	19
215	Illustrative	Corridor	Active Transportation	Speedway Neighborhood Greenway	Highton St	Hwy 200	Install neighborhood greenway	$6,250	N/A	19
216	Illustrative	Corridor	Active Transportation	Sommers Neighborhood Greenway	Discovery Way	Sommers St	Install neighborhood greenway	$5,000	N/A	19
217	Illustrative	Corridor	Active Transportation	Spurgin Rd/12th Neighborhood Greenway	S Reserve St	Bitterroot Branch Trail	Install neighborhood greenway	$105,000	N/A	23
218	Illustrative	Corridor	Active Transportation	Garfield/Agnes Neighborhood Greenway	Ernest Ave	Brooks St	Install neighborhood greenway	$5,000	N/A	25
219	Illustrative	N/A	Transit	Passenger Rail Depot	N/A	N/A	Restore passenger rail depot	N/A	N/A	N/A
220	Illustrative	N/A	Transit	Relocated Mountain Line Facility	N/A	N/A	Relocate the Mountain Line (MUTD) central dispatch facility	$30,000,000	N/A	N/A
221	Illustrative	Corridor	Roadway	Sawmill Gulch Rd Roadway Improvements	Rattlesnake Dr	Russian Joe Rd	Roadway improvements including paving, on-street parking, turn-around, and widening to 20-foot width	$1,600,000	N/A	N/A
222	Illustrative	Corridor	Active Transportation	South Ave to Bitterroot Trail Connection	Old Fort Rd	Reserve St	Connect the South Ave path to the main Bitterroot Trai	$1,706,360	N/A	N/A
223	Illustrative	Corridor	Bridge	Orange St Tunnel	N 1st St W	Railroad St	Rehabilitation of reinforced concrete tunnel elements to extend useful life of structure and maintain safe operations for state maintained roadway under the tunnel.	$11,000,000.00	N/A	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future Interstate Maintenance (IM) projects	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future National Highway (NH) projects	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future Bridge projects	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future Urban Pavement Preservation (UPP) projects	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future Montana Air and Congestion Initiative (MACI) projects	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future Surface Transportation Program Off System (STPX), Secondary (STPS), State Funded Construction (SFCN) projects	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Placeholder	Multiple	Safety	Placeholder for future Highway Safety Improvement Program (HSIP) projects	N/A	N/A	N/A	N/A	N/A	N/A

All Projects - By Category

Project ID	Phase	Type	Category	Project Name	To	From	Project Description	2020 Estimated Cost	Recommended Plan Cost	Total Score (Equal Weighting)
41	Near-Term*	Corridor	Active Transportation	Ivy/Franklin Neighborhood Greenway	S 3rd St	Plymouth St	Install neighborhood greenway	$1,085,000	$1,106,700	25
44	Near-Term*	Corridor	Active Transportation	Burton Neighborhood Greenway	Stoddard St	Riverfront Trail	Install neighborhood greenway. Includes intersection improvements at Toole and Broadway	$202,637	$206,690	26
55	Near-Term*	Corridor	Active Transportation	Westside Area Mobility Enhancements	Multiple	Multiple	Install greenway, bicycle, pedestrian, and streetscape improvements	$1,800,000	$1,836,000	25
180	Near-Term*	Corridor	Active Transportation	BUILD Grant Trails - Wye/Mullan Plan Collector Routes	Multiple	Multiple	Install trail connections	$3,429,000	$1,020,000	20
42	Near-Term	Corridor	Active Transportation	4th St Neighborhood Greenway	Schilling St	Toole Park	Install neighborhood greenway	$409,282	$417,468	27
37	Near-Term	Corridor	Active Transportation	Sherwood Neighborhood Greenway	Russell St	Pine St	Install neighborhood greenway	$109,040	$111,221	28
39	Near-Term	Corridor	Active Transportation	Gerald Neighborhood Greenway	4th St	South Ave W	Install neighborhood greenway	$105,923	$108,042	27
36	Near-Term	Corridor	Active Transportation	Grant St Neighborhood Greenway	3rd St	North Ave W	Install neighborhood greenway	$105,033	$107,134	24
13	Near-Term	Corridor	Active Transportation	3rd St Bike Lane Extension	Ash St	Higgins Ave	Install on-street bicycle facilities	$3,251	$3,316	26
106	Near-Term	Corridor	Active Transportation	Mount/S 14th Ave Bike Lane	Reserve St	Higgins Ave	Install on-street bicycle facilities	$10,066	$10,267	26
79	Near-Term	Corridor	Active Transportation	Russell St Bike Lanes	Railroad	Broadway St	Install on-street bicycle facilities	$3,306	$3,372	23
137	Near-Term	Intersection	Active Transportation	Stephens Bike Lane Intersection Improvements	Stephens Ave	Mount Ave	Address bicycle facility gaps through intersection	$75,000	$76,500	19
40	Medium-Term	Corridor	Active Transportation	Schilling Neighborhood Greenway	3rd St	Benton Ave	Install neighborhood greenway	$407,812	$440,437	25
188	Medium-Term	Corridor	Active Transportation	Park Neighborhood Greenway	Plymouth St	SW Higgins Ave	Install neighborhood greenway	$518,000	$559,440	18
43	Medium-Term	Corridor	Active Transportation	Pattee Creek Neighborhood Greenway	S Higgins Ave	Reserve St	Install neighborhood greenway	$303,711	$328,008	21
22	Medium-Term	Corridor	Active Transportation	Regent St Greenway	Mount Ave	Kent Ave	Install neighborhood greenway	$100,898	$108,970	22
38	Medium-Term	Corridor	Active Transportation	Benton Neighborhood Greenway	Higgins St	Bancroft St	Install neighborhood greenway	$102,489	$110,688	18
49	Medium-Term	Corridor	Active Transportation	Reserve St Protected Bike Lanes	US Hwy 93	S 3rd St	Install on-street bicycle facilities	$125,431	$135,465	26
95	Medium-Term	Corridor	Active Transportation	Milwaukee Trail Lighting	Reserve St	Catlin St	Install lighting	$350,000	$378,000	25
3	Medium-Term	Corridor	Active Transportation	Kiwanis Park Trail Widening	Ron's River Trail	Front St	Extend and widen multi-use trail	$260,082	$280,888	22
86	Medium-Term	Corridor	Active Transportation	Hwy 200 Shared-Use Path	Tamarack Rd	Staple St	Construct shared-use path	$3,285,572	$3,548,418	19
60	Medium-Term	Corridor	Active Transportation	Ron's River Trail Extension	Burton St	Orange St	Extend multi-use trail	$923,344	$997,211	24
82	Medium-Term	Corridor	Active Transportation	Ron's River Trail Widening, Reconfiguration and Relocation	Madison St	Orange St	Relocate, widen, and extend multi-use trail	$2,000,000	$2,160,000	24
84	Medium-Term	Corridor	Active Transportation	Bitterroot Trail Lighting	Reserve St	Milwaukee Trail	Install lighting	$1,600,000	$1,728,000	25
53	Medium-Term	Corridor	Active Transportation	Northbank Riverfront Trail	Easy St	Van Buren St	Extend multi-use trail	$2,318,467	$2,503,944	20
132	Medium-Term	Corridor	Active Transportation	Broadway Protected Bike Lanes	Mullan Rd	Mary Jane Blvd	Install on-street bicycle facilities and improved crossings	$548,484	$592,363	20
134	Medium-Term	Corridor	Active Transportation	Union Pacific and Palmer Protected Bike Lanes	Clark Fork Ln	Broadway St	Install on-street bicycle facilities and improved crossings	$4,000,000	$4,320,000	22
170	Medium-Term	Intersection	Active Transportation	Clements Rd Intersection Improvements	Multiple	Multiple	Install crossing safety countermeasures	$200,000	$216,000	15
169	Long-Term	Intersection	Active Transportation	Reserve St Intersection Improvements	Multiple	Multiple	Install crossing safety countermeasures	$450,000	$526,500	19
91	Long-Term	Corridor	Active Transportation	Milwaukee Trail River Crossing	Mullan Rd (via Schmidt Rd)	Grove St	Extend multi-use trail and construct bicycle/pedestrian bridges	$8,518,009	$9,966,070	19
131	Long-Term	Corridor	Active Transportation	England Blvd Protected Bike Lanes	Mary Jane Blvd	Great Northern Ave	Install on-street bicycle facilities and improved crossings	$3,456,000	$4,043,520	22
87	Long-Term	Corridor	Active Transportation	Hawthorne School to Milwaukee Trail Shared-Use Path	S 3rd St/Hawthorne School	Grove St	Construct shared-use path	$1,084,836	$1,269,258	19
19	Long-Term	Corridor	Active Transportation	W Riverside and 1st St Shared-Use Path	US 200	W Riverside Dr	Construct shared-use path	$351,184	$410,886	17
69	Long-Term	Corridor	Active Transportation	Clements Rd Shared-Use Path	North Ave	Mount Ave	Construct shared-use path	$443,453	$518,840	15
81	Long-Term	Corridor	Active Transportation	Mountain View Drive Multimodal Improvements	Duncan Dr	Rattlesnake Dr	Install pedestrian, bicycle, and streetscape improvements to create Safe Route to School	$352,316	$412,210	21
83	Illustrative	Corridor	Active Transportation	S 3rd St Bicycle and Pedestrian Facilities	Clements Rd	Hiberta St	Construct shared-use path	$2,862,611	N/A	20
31	Illustrative	Corridor	Active Transportation	Mullan Rd Shared-Use Path	Deschamps Ln	Cote Ln	Construct shared-use path	$3,304,449	N/A	15
6	Illustrative	Corridor	Active Transportation	North Reserve/Scott St I-90 Trail Connection	Grant Creek Rd	Scott St	Construct multi-use trail	$2,525,489	N/A	19
46	Illustrative	Corridor	Active Transportation	Milwaukee Trail Extension	Deschamps Ln	Mullan Rd	Extend multi-use trail	$5,759,611	N/A	14
11	Illustrative	Corridor	Active Transportation	Mullan Rd - Frenchtown Trail	Deschamps Ln	Hamel Rd	Construct multi-use trail	$13,062,052	N/A	19
1	Illustrative	Corridor	Active Transportation	Deer Creek Rd/Speedway Ave Trail	Canyon River Rd	US Hwy 200	Construct multi-use trail	$718,454	N/A	19
2	Illustrative	Corridor	Active Transportation	Northside Riverfront Trail Extension	Madison St	Van Buren St	Extend multi-use trail and construct footbridge over Rattlesnake Creek	$750,000	N/A	21
12	Illustrative	Corridor	Active Transportation	North Ave Bike Lanes	Johnson St	Bitterroot Trail	Install on-street bicycle facilities	$5,548	N/A	24
14	Illustrative	Corridor	Active Transportation	Mullan Rd Connection Trail	Mullan Rd	Schmidt Rd	Extend multi-use trail	$424,358	N/A	13
15	Illustrative	Corridor	Active Transportation	I-90 Trail (Alternative 2)	Grant Creek Rd	Oliver Rd	Construct multi-use trail	$11,777,152	N/A	17
16	Illustrative	Corridor	Active Transportation	Deschamps Ln Shared-Use Path	Laflesch Ln	Bruin Ln	Construct shared-use path	$4,397,402	N/A	13
17	Illustrative	Corridor	Active Transportation	Butler Creek Rd Trail	Angus Ln	Covenant Rd	Extend multi-use trail	$3,271,740	N/A	13
18	Illustrative	Corridor	Active Transportation	Great American Trail	Loiselle Ln	Deschamps Ln	Construct multi-use trail	$7,948,589	N/A	15
20	Illustrative	Corridor	Active Transportation	West Riverside Trail	Anaconda St	Cowboy Trail Rd	Construct multi-use trail	$1,143,382	N/A	15
21	Illustrative	Corridor	Active Transportation	Cowboy Trail Rd Shared-Use Path	Cowboy Trail Rd	Hellgate Lions Park	Construct shared-use path	$988,272	N/A	16
23	Illustrative	Corridor	Active Transportation	Blue Mountain Rd Trail	Forest Hill Ln	Future Bridge	Construct multi-use trail	$425,388	N/A	12
24	Illustrative	Corridor	Active Transportation	Miller Creek Shared-Use Path (Lower Miller Creek Connection)	Linda Vista Blvd	Bear Run Creek Rd	Construct shared-use path	$13,041,042	N/A	15
26	Illustrative	Corridor	Active Transportation	7th St Shoulder Improvements	Clements Rd	Tower St	Install roadway improvements to create a shoulder pathway	$952,028	N/A	16
27	Illustrative	Corridor	Active Transportation	North Ave Shoulderway Improvements	Clements Rd	Edward Ct	Install roadway improvements to create a shoulder pathway	$480,587	N/A	16
28	Illustrative	Corridor	Active Transportation	North Ave Trail Connection	37th Ave	Tower St	Extend multi-use trail	$1,424,950	N/A	18
29	Illustrative	Corridor	Active Transportation	Mount Ave Trail Connection	27th Ave	Tower St	Extend multi-use trail	$1,190,134	N/A	15
30	Illustrative	Corridor	Active Transportation	Spurgin Rd Trail Connection	Hibertha St	Maverick Ln	Extend multi-use trail	$263,187	N/A	15
32	Illustrative	Corridor	Active Transportation	Lewis & Clark Dr Shared-Use Path	Hwy 93	Lakeside Dr	Construct shared-use path	$625,807	N/A	16
45	Illustrative	Corridor	Active Transportation	Kent/Central Neighborhood Greenway	Maurice Ave	Reserve St	Install neighborhood greenway	$1,212,489	N/A	26
46	Illustrative	Corridor	Active Transportation	Milwaukee Trail Extension	Deschamps Ln	Mullan Rd	Extend multi-use trail	$5,759,611	N/A	14
47	Illustrative	Corridor	Active Transportation	Fort Missoula to McClay Shared-Use Path and Bridge	Blue Mountain Rd	South Ave	Construct shared-use path and pedestrian/bicycle bridge	$2,216,364	N/A	16

** Committed projects*

All Projects - By Category

Project ID	Phase	Type	Category	Project Name	To	From	Project Description	2020 Estimated Cost	Recommended Plan Cost	Total Score (Equal Weighting)
50	Illustrative	Corridor	Active Transportation	Rattlesnake Dr Shared-Use Path	USFS Trailhead	Tamarack St/Fox Hollow	Construct shared-use path	$1,579,269	N/A	16
51	Illustrative	Corridor	Active Transportation	Duncan Dr Shared-Use Path	Duncan Dr Trailhead	Mountain View Dr	Construct shared-use path	$1,883,539	N/A	16
54	Illustrative	Corridor	Active Transportation	Northside Greenway Connector	Scott St	Northside Park	Construct multi-use trail	$1,083,392	N/A	20
56	Illustrative	Corridor	Active Transportation	Spurgin Rd Shared-Use Path	Clements Rd	Reserve St	Construct shared-use path	$4,805,294	N/A	19
58	Illustrative	Corridor	Active Transportation	Lincoln Hills Dr Bicycle and Pedestrian Improvements	Rattlesnake Dr	Applehouse Ln	Install bicycle and pedestrian improvements	$188,911	N/A	16
59	Illustrative	Corridor	Active Transportation	Lincoln Hills Dr Bicycle and Pedestrian Improvements	Contour Ln	Applehouse Ln	Install bicycle and pedestrian improvements	$612,301	N/A	18
61	Illustrative	Corridor	Active Transportation	Northside 1st St Shared-Use Path	Madison Ave	Northside Pedestrian	Construct shared-use path	$1,076,396	N/A	25
62	Illustrative	Corridor	Active Transportation	Strand Ave to Burlington Ave Shared-Use Path	Strand Ave	Burlington Ave	Construct shared-use path	$91,537	N/A	20
63	Illustrative	Corridor	Active Transportation	Madison St Underbridge to Arthur Street Shared-Use Path	Southside Riverfront Trail	S 5th St E	Construct shared-use path	$170,823	N/A	21
64	Illustrative	Corridor	Active Transportation	Inverness Pl Shared-Use Path	Inverness Place cul-de-sac	N Johnson St/Montana St	Extend shared-use path	$140,645	N/A	20
65	Illustrative	Corridor	Active Transportation	Johnson St Shared-Use Path Connection	Johnson St	Curtis St	Construct shared-use path	$270,859	N/A	24
66	Illustrative	Corridor	Active Transportation	Northside Shared-Use Path Connection	Defoe St	Otis St	Construct shared-use path	$898,964	N/A	23
67	Illustrative	Corridor	Active Transportation	Rattlesnake Dr Bicycle and Pedestrian Facilities	Tamarack St/Fox Hollow	Creek Crossing Rd	Install bicycle and pedestrian improvements	$500,470	N/A	17
68	Illustrative	Corridor	Active Transportation	Tamarack St Bicycle and Pedestrian Improvements	USFS Trailhead	Rattlesnake Dr	Install bicycle and pedestrian improvements	$148,927	N/A	16
71	Illustrative	Corridor	Active Transportation	Pedestrian Undercrossing Connecting Downtown to Northside	Railyard/B St/N 1st St	Higgins Ave	Install pedestrian improvements	$29,344	N/A	22
73	Illustrative	Corridor	Active Transportation	Northside Bikeway	RUX Trail	Toole Ave/Bitterroot Trail	Install on-street bicycle facilities	$1,678,731	N/A	28
74	Illustrative	Corridor	Active Transportation	Northbank Riverfront Trail	Reserve St	Russell St	Construct multi-use trail	$1,614,753	N/A	24
75	Illustrative	Corridor	Active Transportation	Southbank Riverfront Trail Extension	Reserve St	Russell St	Extend multi-use trail	$1,532,236	N/A	21
76	Illustrative	Corridor	Active Transportation	Westside Greenway Trail	Owen St	Bitterroot Railroad Spur Line	Construct multi-use trail	$390,502	N/A	22
77	Illustrative	Corridor	Active Transportation	Lincoln Hills Shared-Use Path	Rattlesnake Ct	Lincoln Hills Dr	Construct shared-use path	$400,371	N/A	17
78	Illustrative	Corridor	Active Transportation	Hiberta St Bike Lanes	Spurgin Rd	S 3rd St	Install on-street bicycle facilities	$2,504	N/A	20
85	Illustrative	Corridor	Active Transportation	Kim Williams Trail Extension and Bridge	Milltown State Park	Kim Williams Trail End	Extend multi-use trail and construct bicycle/pedestrian bridge	$8,998,075	N/A	13
90	Illustrative	Corridor	Active Transportation	Kim Williams Trail Connector	Canyon River Rd	Bandmann Trail	Extend multi-use trail	$1,179,578	N/A	14
92	Illustrative	Corridor	Active Transportation	Grant Creek Trail Phase II	Snowbowl Rd	Mellot Ln	Construct multi-use trail	$1,000,000	N/A	12
93	Illustrative	Corridor	Active Transportation	Miller Creek to Lolo Trail Connection	Lolo/Lakeside Dr	Lower Miller Creek Rd	Construct shared-use path	$5,685,537	N/A	14
94	Illustrative	Corridor	Active Transportation	Blue Mountain Rd Shared-Use Path	Bitterroot Trail	Blue Mountain Recreation	Construct shared-use path	$866,189	N/A	16
96	Illustrative	Corridor	Active Transportation	Post Siding Rd Shared-Use Path	Old Hwy 93	Fort Missoula Rd	Construct shared-use path	$1,036,001	N/A	18
97	Illustrative	Corridor	Active Transportation	People's Way Trail Phase 1	Evaro	I-90	Construct multi-use trail	$11,875,407	N/A	13
201	Illustrative	Corridor	Active Transportation	Wylie Neighborhood Greenway	Lolo St	Wylie Ave	Install neighborhood greenway	$5,000	N/A	16
202	Illustrative	Corridor	Active Transportation	Jackson/Holly Neighborhood Greenway	Van Buren St	Monroe St	Install neighborhood greenway	$5,000	N/A	17
203	Illustrative	Corridor	Active Transportation	Alvina Path Neighborhood Greenway	Duncan Dr	City Dr	Install neighborhood greenway	$5,000	N/A	17
206	Illustrative	Corridor	Active Transportation	University Road Greenway	S Higgins Ave	Arthur Ave	Install neighborhood greenway	$305,000	N/A	20
207	Illustrative	Corridor	Active Transportation	Rollins Neighborhood Greenway	W Florence St	Mount Ave	Install neighborhood greenway	$105,000	N/A	22
208	Illustrative	Corridor	Active Transportation	Florence/Cottonwood Neighborhood Greenway	River St	Plymouth St	Install neighborhood greenway	$305,000	N/A	24
209	Illustrative	Corridor	Active Transportation	Myrtle/Woodford Neighborhood Greenway	S 3rd St W	Mount Ave	Install neighborhood greenway	$105,000	N/A	26
210	Illustrative	Corridor	Active Transportation	Grove Neighborhood Greenway	S 3rd St W	River Rd	Install neighborhood greenway	$5,000	N/A	21
212	Illustrative	Corridor	Active Transportation	Waverly Neighborhood Greenway	Turner St	Defoe St	Install neighborhood greenway	$5,000	N/A	22
213	Illustrative	Corridor	Active Transportation	Grand Neighborhood Greenway	N 1st St	N 5th St	Install neighborhood greenway	$5,000	N/A	23
214	Illustrative	Corridor	Active Transportation	Holmes Neighborhood Greenway	Charlo St	Phillips St	Install neighborhood greenway	$105,000	N/A	19
215	Illustrative	Corridor	Active Transportation	Speedway Neighborhood Greenway	Highton St	Hwy 200	Install neighborhood greenway	$6,250	N/A	19
216	Illustrative	Corridor	Active Transportation	Sommers Neighborhood Greenway	Discovery Way	Sommers St	Install neighborhood greenway	$5,000	N/A	19
217	Illustrative	Corridor	Active Transportation	Spurgin Rd/12th Neighborhood Greenway	S Reserve St	Bitterroot Branch Trail	Install neighborhood greenway	$105,000	N/A	23
218	Illustrative	Corridor	Active Transportation	Garfield/Agnes Neighborhood Greenway	Ernest Ave	Brooks St	Install neighborhood greenway	$5,000	N/A	25
222	Illustrative	Corridor	Active Transportation	South Ave to Bitterroot Trail Connection	Old Fort Rd	Reserve St	Connect the South Ave path to the main Bitterroot Trail	$1,706,360	N/A	N/A
128	Near-Term*	Corridor	Bridge	Bitteroot River Crossing (South Ave Bridge - MacClay Bridge)	South Ave	River Pines Rd	Construct bridge	$18,488,500	$0	8
72	Medium-Term	Corridor	Bridge	Bitterroot Trail Bridge at Clark Fork River	McCormick Park/Ogren Field	Broadway St	Construct bicycle/pedestrian bridge	$3,500,000	$3,780,000	19
191	Medium-Term	Corridor	Bridge	Hwy 200 Railroad Bridge Replacement	Easy St	Highton St	Replace and widen RR bridge, construct roundabout at I-90 interchange, add connection of non-motorized facilities along Hwy 200	$14,000,000	$15,120,000	18
35	Illustrative	Corridor	Bridge	Higgins Pedestrian Bridge	Ron's River Trail	Milwaukee Trail	Construct pedestrian bridge	$6,000,000	N/A	21
57	Illustrative	Corridor	Bridge	Mullan Rd Bicycle and Pedestrian Bridge	Monroc	Cooper St/Riverfront Trail	Construct bicycle/pedestrian bridge	$8,000,000	N/A	22
88	Illustrative	Corridor	Bridge	Riverfront Triangle Non-Motorized Bridge	Riverfront Triangle	McCormick Park	Construct bicycle/pedestrian bridge	$8,000,000	N/A	21
89	Illustrative	Corridor	Bridge	Missoula College Non-Motorized Bridge	Missoula College	Kim Williams Trail	Construct bicycle/pedestrian bridge	$8,000,000	N/A	14
223	Illustrative	Corridor	Bridge	Orange St Tunnel	N 1st St W	Railroad St	Rehabilitation of reinforced concrete tunnel elements to extend useful life of structure and maintain safe operations for state maintained roadway under the tunnel.	$11,000,000.00	N/A	N/A

All Projects - By Category

Project ID	Phase	Type	Category	Project Name	To	From	Project Description	2020 Estimated Cost	Recommended Plan Cost	Total Score (Equal Weighting)
101	Near-Term*	Corridor	Complete Streets	Higgins Ave Multimodal Improvements	Broadway St	Brooks St	Create complete street with transit, bicycle, pedestrian, and streetscape improvements	$2,115,623	$2,157,935	29
182	Near-Term*	Corridor	Complete Streets	Eaton St Sidewalk/Complete Streets Improvements	7th St	South Ave	Install pedestrian, streetscape, and transit improvements	$1,500,000	$1,530,000	23
183	Near-Term*	Corridor	Complete Streets	Turner St/Worden Ave/N 5th Complete Street	Scott St	Orange St	Install pedestrian, traffic calming, and bicycle improvements	$1,000,000	$1,020,000	24
107	Near-Term	Corridor	Complete Streets	Front/Main 2-Way Conversion and Multimodal Improvements	Madison St	Orange St	Reconfigure roadway and install bicycle, pedestrian, and streetscape improvements	$3,916,629	$3,994,961	29
121	Near-Term	Corridor	Complete Streets	South Ave Complete Street and Shared-Use Path	36th St	Reserve St	Create complete street with bicycle, pedestrian, and streetscape improvements	$4,372,476	$4,459,926	25
192	Medium-Term	Corridor	Complete Streets	Hwy 200 Complete Street	Highton St	Staple St	Construct protected bike lanes, sidewalks, curb, gutter, transit access, and safe crossings	$7,000,000	$7,560,000	18
118	Medium-Term	Corridor	Complete Streets	Curtis St Complete Street	S 3rd St	River Rd	Create complete street with bicycle, pedestrian, and streetscape improvements	$2,000,504	$2,160,544	24
119	Medium-Term	Corridor	Complete Streets	River Rd Complete Street	Reserve St	Russell St	Create complete street with bicycle, pedestrian, and streetscape improvements	$2,693,673	$2,909,167	24
103	Medium-Term	Corridor	Complete Streets	California St Complete Street	S 3rd St	River St	Create complete street with bicycle, pedestrian, and streetscape improvements	$5,000,000	$5,400,000	23
122	Medium-Term	Corridor	Complete Streets	Broadway Complete Street	Van Buren St	Toole Ave	Create complete street with bicycle, pedestrian, and streetscape improvements	$5,760,000	$6,220,800	29
52	Medium-Term	Corridor	Complete Streets	N 2nd St Complete Street	Madison St	A St	Create complete street with bicycle, pedestrian, and streetscape improvements	$2,080,431	$2,246,865	27
4	Medium-Term	Corridor	Complete Streets	Levasseur St Complete Street	Clay St	Dead End	Install pedestrian and streetscape improvements and extend trail	$296,415	$320,128	23
125	Long-Term	Corridor	Complete Streets	Brooks St Complete Street and Transit Improvements	Stephens Ave	Paxson St	Create complete street with bus rapid transit, bicycle, pedestrian, and streetscape improvements	$30,000,000	$35,100,000	26
124	Long-Term	Corridor	Complete Streets	Brooks St Complete Street and Transit Improvements	Paxson St	Reserve St	Create complete street with bus rapid transit, bicycle, pedestrian, and streetscape improvements	$20,000,000	$23,400,000	25
102	Long-Term	Corridor	Complete Streets	S 3rd St Complete Street	Hiberta St	Reserve St	Create complete street with bicycle, pedestrian, and streetscape improvements	$1,986,743	$2,324,490	22
120	Long-Term	Corridor	Complete Streets	Brooks St Complete Street	Mount Ave	Stephens Ave	Reconfigure roadway and install bicycle facilities	$1,122,684	$1,313,540	22
104	Long-Term	Corridor	Complete Streets	Rattlesnake Dr Complete Street	Creek Crossing	Missoula Ave	Create complete street with bicycle, pedestrian, and streetscape improvements	$5,217,848	$6,104,883	22
8	Long-Term	Corridor	Complete Streets	Lower Miller Creek Rd Complete Street	Linda Vista Blvd	Bigfork Rd	Create a complete street, including bicycle, pedestrian, and streetscape improvements	$1,696,000	$1,984,320	19
112	Long-Term	Corridor	Complete Streets	Russell St Complete Street	Fairview Ave	Mount Ave	Create complete street with transit, bicycle, pedestrian, and streetscape improvements	$2,201,600	$2,575,872	24
33	Illustrative	Corridor	Complete Streets	Scott St Area Complete Street	Otis St	Turner St	Create complete street with traffic calming, bicycle, pedestrian, and streetscape improvements	$1,920,000	N/A	19
5	Illustrative	Corridor	Complete Streets	Burlington Ave Complete Street	Margaret St	Reserve St	Create complete street with pedestrian and streetscape improvements	$543,148	N/A	23
48	Illustrative	Corridor	Complete Streets	Whitaker Dr Complete Street	Ben Hogan Dr	Higgins Ave	Create complete street with bicycle, pedestrian, and streetscape improvements	$5,716,819	N/A	20
70	Illustrative	Corridor	Complete Streets	River Rd Complete Street	California St	Russell St	Create complete street with bicycle, pedestrian, and streetscape improvements	$688,615	N/A	19
99	Illustrative	Corridor	Complete Streets	Duncan Dr/Greenough Dr Complete Street	Mountain View Dr	Minckler Loop	Create complete street with bicycle, pedestrian, and streetscape improvements	$3,850,202	N/A	17
105	Illustrative	Corridor	Complete Streets	Old Grant Creek/Cemetery Rd/Rodgers St Multimodal Improvements	Shakespeare St	Howard Raser Ave	Create complete street with bicycle, pedestrian, and streetscape improvements	$6,800,000	N/A	22
108	Illustrative	Corridor	Complete Streets	Johnson St Extension and Complete Street	River Rd	S 3rd St	New complete street with bicycle, pedestrian, and streetscape improvements	$2,060,525	N/A	25
113	Illustrative	Corridor	Complete Streets	Grant Creek Rd Complete Street	Snowbowl Rd	I-90	Reconfigure roadway and install traffic safety countermeasures	$12,170,864	N/A	15
117	Illustrative	Corridor	Complete Streets	South Ave Complete Street	Hanson Dr	36th St	Create complete street with bicycle, pedestrian, and streetscape improvements	$4,779,096	N/A	19
190	Illustrative	Corridor	Complete Streets	East Broadway Complete Street	Van Buren St	Easy St	Construct shared-use path, bus stop improvements, lighting, on-street bike lanes, and added parking	$5,600,000	N/A	26
N/A	Near-Term*	Corridor	Maintenance	Interstate Epoxy Striping	N/A	N/A	Epoxy paint striping	$145,200.00	$0	N/A
UPN 9699	Near-Term*	Corridor	Maintenance	Missoula to Bonner (I-90)	N/A	N/A	Pavement preservation	$4,377,500.00	$0	N/A
UPN 9700	Near-Term*	Interchange	Maintenance	Bonner Interchange - East	N/A	N/A	Pavement preservation and mill/fill in passing lane	$2,004,100.00	$0	N/A
UPN 9492	Near-Term*	Corridor	Maintenance	Reserve Street - Missoula	N/A	N/A	Pavement preservation including joint seal and grinding	$681,200.00	$0	N/A
UPN 9705	Near-Term*	Interchange	Maintenance	US-93 North of I-90 Interchange	N/A	N/A	Pavement preservation, mill/fill, seal/cover	$377,500.00	$0	N/A
UPN 9863	Near-Term*	Corridor	Maintenance	West Broadway to Old Highway 10	N/A	N/A	Pavement preservation, mill/fill, seal/cover	$37,200.00	$0	N/A
UPN 8886	Near-Term*	Bridge	Maintenance	Steel BR Rehab - Corrosion 1	N/A	N/A	Bridge rehabilitation at multiple bridge sections	$149,300.00	$0	N/A
UPN 9569	Near-Term*	Intersection	Maintenance	Broadway St and Toole Ave	Broadway St	Toole Ave	Intersection and signal improvements	$209,900.00	$0	N/A
UPN 9939	Near-Term*	Corridor	Maintenance	US-93 Pavement Preservation Missoula to Lolo	N/A	N/A	Pavement preservation, mill/fill, seal/cover	$6,700,000.00	$0	N/A
UPN 9557	Near-Term*	Corridor	Maintenance	Pulp Mill Road Slope Stabilization	N/A	N/A	Landslide stabilization along Pulp Mill Road near railroad overpass structure and guardrail replacement	$1,206,000.00	$0	N/A
UPN 9642	Near-Term*	Corridor	Maintenance	Old MT 200 Retaining Wall Repair	N/A	N/A	Repair retaining wall	$5,000,000.00	$0	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future Interstate Maintenance (IM) projects	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future National Highway (NH) projects	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future Bridge projects	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future Urban Pavement Preservation (UPP) projects	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future Montana Air and Congestion Initiative (MACI) projects	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Placeholder	Multiple	Maintenance	Placeholder for future Surface Transportation Program Off System (STPX), Secondary (STPS), State Funded Construction (SFCN) projects	N/A	N/A	N/A	N/A	N/A	N/A

All Projects - By Category

Project ID	Phase	Type	Category	Project Name	To	From	Project Description	2020 Estimated Cost	Recommended Plan Cost	Total Score (Equal Weighting)
127	Near-Term*	Corridor	Roadway	Russell Street Reconstruction	Multiple	Multiple	Reconfigure roadway and install bicycle and pedestrian facilities on Russell St and Broadway St	$47,200,000	$15,810,000	24
130	Near-Term*	Corridor	Roadway	BUILD Grant Roads - Wye/Mullan Plan Collector Routes	Multiple	Multiple	Extend roadways	$29,788,710	$2,040,000	21
129	Near-Term*	Corridor	Roadway	US 93: North of Desmet Interchange	Waldo Rd	Evaro Rd	Widen and improve roadway	$10,351,100	$0	12
114	Medium-Term	Corridor	Roadway	Johnson Street Extension	South Ave	Brooks St	Extend roadway and install transit, bicycle, and pedestrian improvements	$2,440,000	$2,635,200	27
98	Long-Term	Corridor	Roadway	Mullan Rd Complete Street	Mary Jane Blvd	Reserve St	Reconfigure roadway and create complete street with bicycle, pedestrian, and streetscape improvements	$3,122,115	$3,652,874	22
7	Long-Term	Corridor	Roadway	Howard Raser Ave Complete Street	Old Grant Creek Rd	Scott St	New complete street with pedestrian and streetscape improvements	$8,032,170	$9,397,639	23
34	Illustrative	Corridor	Roadway	Deschamps Ln Re-Surfacing	Rollercoaster Rd	Mullan Rd	Improve pavement condition	$1,275,000	N/A	7
100	Illustrative	Corridor	Roadway	Mullan Rd Widening	Cote Ln	Flynn Ln	Widen roadway	$10,692,243	N/A	17
109	Illustrative	Corridor	Roadway	Carousel Dr Reconfiguration	Front St	Higgins Ave	Reconfigure roadway and install open space	$1,674,160	N/A	25
110	Illustrative	Corridor	Roadway	Railyard St Grid Construction	Ryman St	Madison St	Construct new streets	$2,312,464	N/A	19
115	Illustrative	Corridor	Roadway	Russell St Extension	New I-90 interchange	Railroad St	Extend roadway and construct bridge	$55,000,000	N/A	20
135	Illustrative	Corridor	Roadway	England Blvd Extension	Latimer St	I-90	Extend roadway and construct bridge	$70,000,000	N/A	18
181	Illustrative	Corridor	Roadway	Coal Mine Road/I-90 Interchange	I-90	Howard Raser Dr	Construct new I-90 interchange	$15,000,000	N/A	12
185	Illustrative	Corridor	Roadway	Christian Dr Extension	Old Bitterroot Rd	Lower Miller Creek Rd	Extend roadway	$2,512,000	N/A	12
186	Illustrative	Corridor	Roadway	Wyoming Connector	River Rd	Wyoming St	Construct connector street	$1,366,800	N/A	21
221	Illustrative	Corridor	Roadway	Sawmill Gulch Rd Roadway Improvements	Rattlesnake Dr	Russian Joe Rd	Roadway improvements including paving, on-street parking, turn-around, and widening to 20-foot width	$1,600,000	N/A	N/A
152	Near-Term*	Intersection	Safety	Russell St and Fairview Ave Crossing Improvements	N/A	N/A	Install crossing safety countermeasures	$150,000	$153,000	18
UPN 9825	Near-Term*	Intersection	Safety	Railroad Crossing - Deschamps Rd	N/A	N/A	Upgrade RR crossing signal equipment and add gates	$282,600.00	$0	N/A
UPN 9526	Near-Term*	Corridor	Safety	SF179 Stephens Orange Safety Improvement	N/A	N/A	Safety study	$591,600.00	$0	N/A
UPN 9839	Near-Term*	Corridor	Safety	SF199 MSLA HT MEDIAN CABLERAIL	N/A	N/A	Install High Tension Cable Rail	$251,500.00	$0	N/A
UPN 9896	Near-Term*	Corridor	Safety	SF189 Russell St Lighting	39th St	Brooks St	Install lighting	$558,300.00	$0	N/A
UPN 9920	Near-Term*	Interchange	Safety	SF199 Mary Jane Blvd and Broadway St Intersection	Mary Jane Blvd	Broadway St	Intersection improvements at 2 areas	$703,500.00	$0	N/A
UPN 9977	Near-Term*	Corridor	Safety	US-93 Lolo to Florence Safety Study	N/A	N/A	Safety study	$1,000,000.00	$0	N/A
164	Medium-Term	Intersection	Safety	Shakespeare St and Otis St Intersection Improvements	N/A	N/A	Install traffic safety countermeasures	$75,000	$81,000	16
146	Medium-Term	Intersection	Safety	Owen St and Broadway St Enhanced Crossing	N/A	N/A	Install crossing safety countermeasures	$300,000	$324,000	23
141	Medium-Term	Intersection	Safety	Catlin St and 3rd St Intersection Improvements	N/A	N/A	Install pedestrian/bicycle crossing to connect to trail	$200,000	$216,000	20
145	Long-Term	Intersection	Safety	E Broadway St and N Van Buren St Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$450,000	$526,500	21
157	Long-Term	Intersection	Safety	California St/Toole Ave/Broadway St Intersection Improvements	N/A	N/A	Reconfigure roadway and install roundabout	$450,000	$526,500	18
168	Long-Term	Intersection	Safety	South Ave and Reserve St Intersection Improvements	N/A	N/A	Address bicycle facility gaps through intersection	$150,000	$175,500	18
159	Long-Term	Intersection	Safety	Philips St and Scott St Intersection Improvements	N/A	N/A	Install traffic safety countermeasures	$450,000	$526,500	18
9	Illustrative	Corridor	Safety	Brooks St and Regent St Enhanced Crossing	Brooks St	Regent St	Install pedestrian crossing	$125,000	N/A	21
10	Illustrative	Corridor	Safety	Brooks St and Holburn St Enhanced Crossing	Brooks St	Holborn St	Install pedestrian crossing	$125,000	N/A	22
111	Illustrative	Corridor	Safety	Clay St Streetscaping and Intersection Control	Levasseur St	Front St	Install streetscape and traffic safety countermeasures	$200,000	N/A	23
138	Illustrative	Intersection	Safety	Russell St and 4th St Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$200,000	N/A	20
139	Illustrative	Intersection	Safety	Russell St and 7th St Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$200,000	N/A	18
140	Illustrative	Intersection	Safety	14th St and Eaton St Intersection Improvements	N/A	N/A	Install roundabout	$450,000	N/A	16
142	Illustrative	Intersection	Safety	Russell St and 6th St Intersection Improvements	N/A	N/A	Install pedestrian/bicycle crossing to connect to trail	$200,000	N/A	19
143	Illustrative	Intersection	Safety	Madison St and Front St Intersection Improvements	N/A	N/A	Reconfigure roadway and install roundabout	$450,000	N/A	24
144	Illustrative	Intersection	Safety	Park St and Mount Ave Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$125,000	N/A	16
147	Illustrative	Intersection	Safety	Clark Fork Ln and Mullan Rd Intersection Improvements	N/A	N/A	Improve turning movements	$450,000	N/A	15
148	Illustrative	Intersection	Safety	California St and River St Intersection Improvements	N/A	N/A	Install traffic circle	$450,000	N/A	20
150	Illustrative	Intersection	Safety	Russell St and Ernest Ave Enhanced Crossing	N/A	N/A	Install crossing safety countermeasures	$200,000	N/A	18
153	Illustrative	Intersection	Safety	George Elmer Dr and Mullan Rd Intersection Improvements	N/A	N/A	Install traffic signal	$450,000	N/A	15
154	Illustrative	Intersection	Safety	Brooks St and Stephens Ave Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$125,000	N/A	19
155	Illustrative	Intersection	Safety	Greenough Dr and Vine St Intersection Improvements	N/A	N/A	Install crossing safety countermeasures	$200,000	N/A	16
156	Illustrative	Intersection	Safety	Great Northern Ave and Palmer St Intersection Improvements	N/A	N/A	Install roundabout	$450,000	N/A	15
158	Illustrative	Intersection	Safety	McDonald Ave and Russell St Intersection Improvements	N/A	N/A	Install roundabout	$450,000	N/A	17
163	Illustrative	Intersection	Safety	Ryman St and Front St Intersection Improvements	N/A	N/A	Install traffic safety countermeasures	$450,000	N/A	21
165	Illustrative	Intersection	Safety	6th St and Ronan St Enhanced Trail Crossing	N/A	N/A	Install pedestrian/bicycle crossing to connect to trail	$125,000	N/A	19
166	Illustrative	Intersection	Safety	14th St and Mount Ave Intersection Improvements	N/A	N/A	Reconfigure roadway and install traffic safety countermeasures	$75,000	N/A	15
167	Illustrative	Intersection	Safety	4th St and Orange St Enhanced Crossing	N/A	N/A	Install crossing safety countermeasures	$200,000	N/A	18
N/A	Placeholder	Multiple	Safety	Placeholder for future Highway Safety Improvement Program (HSIP) projects	N/A	N/A	N/A	N/A	N/A	N/A
219	Illustrative	N/A	Transit	Passenger Rail Depot	N/A	N/A	Restore passenger rail depot	N/A	N/A	N/A
220	Illustrative	N/A	Transit	Relocated Mountain Line Facility	N/A	N/A	Relocate the Mountain Line (MUTD) central dispatch facility	$30,000,000	N/A	N/A

APPENDIX I

Projected Revenue Estimates

missoula connect
2050 Long-Range Transportation Plan

Missoula County - City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

MPO Projected Revenues	Near-term FY21-FY25 (5 years)	Medium-term: FY26-FY35 (10 years)	Long-term: FY36-FY50 (15 years)	LRTP Horizon
IM*	$9,816,053	$18,798,807	$30,304,261	
NH*	$38,212,121	$49,413,824	$79,656,618	
MACI*	$1,282,254	$2,244,902	$3,618,852	
STPS/SFPX/SFCN	$4,749,899	$12,136,670	$19,564,688	
HSIP*	$2,721,836	$6,394,184	$10,307,623	
TA*	$42,159	$430,485	$693,955	**$1,166,599**
UPP*	$365,794	$3,735,088	$6,021,078	
Bridge*	$22,690,557	$44,725,349	$72,098,652	
Federal/State Misc.	**$79,880,673**	**$137,879,308**	**$222,265,726**	
CMAQ Carryover	$3,081,600			
CMAQ Programs	$1,745,627	$3,707,453	$5,976,542	
CMAQ Maintenance	$1,341,990	$5,199,995	$9,777,609	
CMAQ Transit	$2,630,161	$4,538,449	$7,815,433	
CMAQ Total Revenue	**$10,074,306**	**$14,621,049**	**$23,569,585**	
CMAQ Discretionary Funds (assuming programs & bus purchases through 2050)	$4,356,527	$1,175,153	$1	**$5,531,681**
STP	**$9,039,685**	**$18,901,077**	**$30,469,122**	**$58,409,884**
Total Federal & State Discretionary $	**$13,438,371**	**$20,506,714**	**$31,163,078**	**$65,108,164**
FTA Carryover (5339+5307)	$7,340,000			
FTA	$21,376,065			
FTA Total	**$28,716,065**	**$29,640,126**	**$47,878,817**	
TIF (includes URDs)	**$5,925,807**	**$12,390,270**	**$20,014,472**	**$38,330,549**
MUTD - Mill	$43,049,269	$96,330,416	$155,606,166	
MUTD - Other	$1,383,250	$2,892,237	$4,671,941	
MUTD - Total	**$44,432,519**	**$99,222,654**	**$160,278,107**	
City Gas Tax - CIP (including LOFT)	$7,604,908	$17,090,494	$27,606,921	
City Road District - CIP	$3,130,000	$6,544,517	$10,571,606	
CIP Total	**$10,734,908**	**$23,635,011**	**$38,178,527**	
CIP - adjusted (without Local Option Fuel Tax)	**$9,359,908**	**$20,885,011**	**$34,053,527**	**$64,298,446**
City Gas Tax - Maintenance	$8,651,600	$18,089,630	$29,220,865	
City Road District - maintenance	$21,629,000	$45,224,076	$73,052,161	
City Maintenance Total	**$30,280,600**	**$63,313,707**	**$102,273,026**	
City Impact Fee%	**$6,887,515**	**$12,284,038**	**$19,842,871**	**$32,126,908**
County Gas Tax	$2,468,815	$5,162,044	$8,338,446	
County Gas Tax - CIP	**$617,204**	**$1,290,511**	**$2,084,611**	**$3,992,326**
County Gas Tax - Maintenance	$1,851,611	$3,871,533	$6,253,834	
Total Local Discretionary $	**$22,790,434**	**$46,849,829**	**$75,995,481**	**$145,635,744**
Total Discretionary $	**$36,228,805**	**$67,356,544**	**$107,158,559**	**$210,743,908**
Total Federal Capital $	$64,906,768	$102,778,259	$165,681,745	$333,366,771
Total Local Maintenance $	$32,132,211	$67,185,240	$108,526,860	$207,844,311
State/Federal Maintenance $ (non-MPO)	$14,931,747	$34,670,565	$55,890,027	$105,492,338
Federal Maintenance (MPO - CMAQ)	$1,341,990	$5,199,995	$9,777,609	$16,319,594
Federal Transit $ (FTA & CMAQ)	$31,346,226	$34,178,575	$55,694,251	$121,219,051
Local Transit $	$44,432,519	$99,222,654	$160,278,107	$303,933,279
Federal Program $ (CMAQ)	$1,745,627	$3,707,453	$5,976,542	$11,429,622
Total Projected Revenues	**$227,065,892**	**$414,299,283**	**$668,983,699**	**$1,310,348,874**
Green rows indicate discretionary sources eligible to fund LRTP capital projects				

APPENDIX J

Federal Performance Measures

missoula connect
2050 Long-Range Transportation Plan

Missoula County - City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

Federal Performance Measures

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 to monitor the performance of the system for eventual use of future resources. The Missoula MPO supports the Montana Department of Transportation (MDT) targets for applicable performance measures for safety, pavement and bridge condition, system performance, freight, and congestion mitigation and air quality (CMAQ), and supports the transit performance targets and measures established by the Missoula Urban Transportation District (MUTD).

The MPO plans and programs projects that contribute toward relevant targets for the stated performance measures. Missoula Connect builds on previous plans and the current 2020-2024 Transportation Improvement Program (TIP) to provide projects, programs, and policies that will further our region's transportation system with projected improvements across all State and Federal performance measures.

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 guide the Highway Safety Improvement Program (HSIP) funding source within our region's Transportation Improvement Program (TIP).

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 Missoula MPO supports the State targets for applicable safety performance measures. The MPO has also developed localized goals and objectives through a Community Transportation Safety Plan (CTSP). In the CTSP, adopted in 2013 and updated in 2018, the MPO adopted "Vision Zero" and a goal to reduce the 5-year average of fatal and serious injuries by 25% by 2023. This means reducing the 5-year rolling average to less than or equal to 67 fatalities and serious injuries by 2023.

Missoula Connect builds on the goals established in the CTSP to inform our project selection, programs, and policies. The CTSP identified the following trends for the Missoula Region:

- The majority of crashes involved 2 vehicles (86%).
- Nearly 60% of drivers were age 25-64.
- Crashes were more common on weekdays during the peak travel times (AM, Noon, PM).
- The majority of crashes occurred in an urban setting (97%).
- Rear end (38%) and right-angle crashes (27%) were the most common crash types at intersections. They were also the most common in severe intersection crashes, at 17% and 40%, respectively.
- Inclement road (28%) and weather conditions (15%) were not a common factor in the crashes.
- Inattentive driving (48%) and failing to yield (30%) were the top driver-contributing factors in the crashes.

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% (5 fewer fatalities per year)
Rate of fatalities per 100 million vehicle miles traveled (VMT)	No more than 1.28 fatalities per 100 million VMT by 2020 (reduction of 4.3% per year)
Number of serious injuries	No more than 796 serious injuries by 2020 (3.6% annual reduction)
Rate of serious injuries per 100 million VMT	No more than 5.9 serious injuries per 100 million VMT (reduction of 5.1% per year)
Number of non-motorized fatalities and non-motorized serious injuries	No target

Missoula Connect's first goal, informed by public input, is to improve safety and promote health to enhance quality of life. The objectives associated with that goal are the following:

- Eliminate traffic-related fatalities and serious injuries
- Improve safety for people walking and biking
- Enhance active transportation and transit linkages to lower-income neighborhoods
- Increase physical activity and human connections by making walking and biking convenient modes of travel
- Improve access to recreational facilities and trails to support healthy lifestyles

This goal has informed the plan's project list, programs and policies through data-driven decision making, using crash trend and location data. More information regarding the state's safety performance targets established by MDT can be found within the Montana Comprehensive Highway Safety Plan.

INFRASTRUCTURE CONDITION

The Federal Highway Administration (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 and ensure it remains functional and in good repair. The

Missoula MPO aims to strategically address pavement condition on local, state, and federal facilities using findings from the 2020 Pavement Management Report. This report provides the MPO with a current basis of our whole network's Pavement Condition Index.

Functional Class / Paver Designation	# of Miles	# Square Yards	% of Total by # of Square Yards	Weighted Average PCI
Arterial	8.63	211,764	31.0	81
Collector	107.54	1,841,246	26.8	75
Local	284.84	4,811,393	70.1	67
Total	**401.01**	**6,864,403**	**100**	**70**

The table below from our 2020 Pavement Management Report displays a five-year scenario for arterials and collectors as well as local streets. The information in this table shows the spending required to address improvement to the infrastructure in our system at all present PCI levels.

Road Classification	PCI Range	# of Miles	# of Square Yards	Unit Cost per SY	Total Cost
Arterial / Collector	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**	**N/A**	**$25,492,353**
Local	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**	**N/A**	**$90,256,812**

The table below lists the performance measures established by 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	40%
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%

The project list is informed by the plan's goal to maintain assets and invest strategically to boost economic vitality, which includes the following objectives:

- Bring existing infrastructure and transit assets into a state of good repair to support the regional economy, local industry, and goods movement
- Balance cost-effective, implementable projects with high-impact projects
- Plan for a transportation system that makes the best use of public financial resources
- Provide a network that targets growth inward to support existing centers and mixed-use development
- Support access to businesses and commercial and industrial centers to enhance economic recovery and growth
- Explore more equitable and sustainable funding sources for transportation projects and programs

This goal will not only be supported by capital projects but also our Pavement Maintenance and Asset Management Program. This program will provide a system to continuously gather pavement condition data and develop a mechanism to prioritize fixing our infrastructure before more costly decay occurs. 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. FHWA established performance measures that pertain to the performance of the 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%

Missoula Connect takes a holistic approach to system performance through the plan's goal to expand mobility choices to improve efficiency and accessibility for people and goods. This goal includes the following objectives:

- Build complete streets and increase access to multimodal options
- Increase street, trail/greenway, and sidewalk network connectivity for all ages and abilities
- Optimize the efficiency and accessibility of the transportation system
- Reduce person hours of delay for people driving and improve freight movement
- Improve access to high-quality and high-frequency transit stops and routes

To achieve this goal, the plan includes a project list aimed at addressing travel reliability through implementation of new connections, investing in infrastructure that yields mode shift away from single-occupancy vehicle trips and introduces an intelligent transportation system (ITS) program to improve traffic signal timing.

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. 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.

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

Missoula Connect has a diverse, multimodal transportation project list that is projected to increase efficiency across our transportation system by shifting our mode-share to reduce single-occupancy vehicle trips. Key corridors included in our region's freight routes are Brooks Street (Brooks Street Corridor Study) and Reserve Street.

In addition to these projects, Missoula Connect includes two programs to improve efficiency of the freight network. The Freight and Goods Delivery Management Program will offer a framework to analyze existing freight routes and re-envision the infrastructure that service local freight delivery and through-travel. The Intelligent Transportation Systems and Signal Coordination Program would offer the opportunity to integrate adaptive signal timing technology to improve congestion along key corridors.

More information regarding freight-related performance measures and metrics can be found in the Montana Freight Plan.

AIR QUALITY ANALYSIS

The Missoula Connect committed and recommended project list is vetted for air quality conformity using modeled results from the current travel demand model and further analyzed through the Environmental Protection Agency's (EPA) Motor Vehicle Emission Simulator (MOVES14b) software. This analysis allows the MPO to estimate future automobile use and associated

vehicular emissions within in our region to demonstrate that the committed and recommended projects conform to regional EPA transportation-related air quality conformity requirements. The full air quality conformity analysis is available in Appendix G of Missoula Connect, and the travel demand model results are available in Appendix F.

The MPO has achieved emission levels well below federal standards since 2004, for both carbon monoxide and particulate matter (PM_{10}). This has resulted in carbon monoxide being maintained at or below the maintenance level, and recently PM_{10} status being reduced from non-attainment to maintenance level. The MPO will continue to monitor vehicular emissions regardless of changes to the federal air quality designation.

CONGESTION MITIGATION AND AIR QUALITY (CMAQ)

Establishing performance measures related to the CMAQ program is integral to the Missoula region's goal of environmental sustainability. These measures will help 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

Missoula Connect provides a multimodal approach to improving air quality and compliance with CMAQ performance targets by prioritizing projects and programs that are projected to reduce area VMT. Our project list contains 21 Complete Streets, 20 Urban Active Transportation Improvements, and 12 Shared-Use Paths and Trail Extensions projects. Improvements to CMAQ air quality measures are confirmed through the Air Quality Analysis methods and Travel Demand Model described above.

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. FHWA has established four transit performance measures, three of which are applicable to 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 TAM. 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%

Working with Mountain Line to improve our region's public transit system is essential to achieving three of the Missoula Connect goals:

- Advance sustainability and community resilience to protect natural resources and address climate change
- Expand mobility choices to improve efficiency and accessibility for people and goods
- Connect and strengthen communities to create a more equitable region

The Missoula MPO works to improve specific transit asset management measures by implementing corridor redesigns that support Mountain Line transit routes and providing funding for improved fare-free services. A key corridor improvement that will improve efficiency of much of Mountain Line's transit system is the Brooks Street Transit-Oriented Development Corridor Study. Missoula Connect will also support improvements to transit services through multiple programs. The Transit Amenities Program will improve transit stop amenities on a priority basis. The Safe Routes to Transit Program will help to provide safe connections to transit stops and improve transit riders' experience.

APPENDIX K

Disposition of Comments on Draft Long-Range Transportation Plan

missoula connect
2050 Long-Range Transportation Plan

Missoula County - City of Missoula
MPO
METROPOLITAN PLANNING ORGANIZATION

Page/Location	Comment	Source	Resolution
51	What I notice and appreciate about the near term priorities is that they are guided by a commitment to providing complete streets to areas that do not have existing infrastructure, enhancing neighborhood greenways used by multi-modal transit, and respond to study results and grant awards as seen in the two way conversion of streets downtown and by the BUILD Grant roads and improvements.	Konveio	No action needed.
51	If this project (121) extends the multi-use path to Reserve Street, I think it would be nice to see a section of path added from South Ave to Dearborn Ave (only one block) to connect the South Ave path to the main Bitterroot Trail which already has a section of path that ends at Dearborn.	Konveio	Added new illustrative project--#222 South Ave to Bitterroot Trail Connection--to map on pg. 73, list on pg. 78, and Appendix H.
51	These enhancements are so important for this area of our community. Through conversations with residents, it sounds like Flynn Lane is already backed up with people using it as a detour for Reserve Street. When the anticipated development of the area west of Flynn Lane starts adding households, these improvements will be so important for supporting people choosing to walk and bicycle, and manage automotive traffic.	Konveio	No action needed.
59	The Highway 200 project is transformative and I support its inclusion in the mid term. This project will provide a shared use path for students and staff to get to Missoula College and beyond. The most dangerous area for cyclists heading to East Missoula is addressed by widening the underpass. East Missoula's core is transformed with tree-filled boulevards, sidewalks, and an elevated cycle track. Floaters will be delighted with enhanced connections to Sha-Ron with a shared use path, bus facility, and additional parking facilities. This project is very, very important and will increase safety and opportunity for bicyclists, pedestrians, and floaters.	Konveio	No action needed.
61	I'm very excited about this project!	Konveio	No action needed.
67	I suggest that project ID no. 91 (Milwaukee Trail River Crossing) have more near-term priority. I recognize that this is the transportation plan, but the current existing bridge (which needs refurbishment for nonmotorized travel) would provide access to a fantastic parcel of City-owned open space. I suggest that refurbishing this bridge should have priority even if building the second bridge should wait until later. Refurbishing the first bridge would provide access to first class open space and would be an important step to completing the trail later on.	Konveio	No change made. There is insufficient funding in the near-term or medium-term, and there are other feasibility issues (e.g., floodplain) that must be addressed before the project is funded and constructed.
67	I am so glad to see the shared use path that will connect people who live in the Mullan area and beyond to the Milwaukee Trail and Hawthorne students to the Milwaukee Trail. With the automobile congestion and lack of bicycle facilities leading from the Mullan area and crossing Reserve St. this plan provides a way for people to easily and safely bicycle commute to the downtown core and University of Montana. I worry about this being a long term project. The development in the Mullan area is already beginning, and this path will be needed sooner than 30 years from now. It may not be a short term project need, but it is certainly a mid term project need because that will coincide with the addition of many, many households to the Mullan area. To me, it makes sense to focus on the BUILD grant road development in the short term, and then the Milwaukee Trail connection to the Mullan area in the mid term.	Konveio	No change made. There is insufficient funding in the near-term or medium-term, and there are other feasibility issues (e.g., floodplain) that must be addressed before the project is funded and constructed.
69	I think this is a clever idea. It is particularly important for the new households that are planned for Grant Creek and the Scott Street area. If this is a complete street for all modes, then I am in support.	Konveio	No action needed.
71	WOW! What a great long term project! This graphic represents the various modes a person might choose and how they can be evenly supported through infrastructure.	Konveio	No action needed.
89	I love this idea because it can be piloted and then duplicated in different areas of the city and city gateways depending on their needs. I particularly like the idea of a mobility hub at the Missoula airport with an associated car share and bike storage/share.	Konveio	No action needed.
105	This is critical to having infrastructure for pedestrians and cyclists. We need expectations that are clear so that the streets can be built accessible for all modes from the beginning.	Konveio	No action needed.
119	Where does the Road District money that we pay as part of our City property taxes come into play? Is that a source of financing for these projects? It would be nice to know what portion of the estimated 145 million to be financed locally over the entire time period of the plan is going to be financed by which possible local funding sources. Great to have a wish list but where is the money going to come from? My property taxes are plenty high already.	Konveio	No change made. Road District is a City-levied property tax that goes to roadway maintenance and construction. It is included in the projected revenues, and it is a big part of our available discretionary funding. However, the Long Range Transportation Plan does not dictate the rate at which the Road District is levied--that is a City responsibility.
General	Sorry to be late to the conversation here. I was wondering if we ever considered a shared use path from Higgins up Pattee Canyon Drive. I ride my mountain bike up there almost every day in summer and it is treacherous. Many bikers choose to drive because of this, I suspect. I'm guessing we could alleviate traffic and parking congestion and street maintenance with a trail. Connecting the trail heads would also make it easier for people to park and walk between the trails, right now they must walk on the side of the roadway. Maybe this could be a good use for the trails Mill levy money allocated to the County?	email	No action needed. This project should be explored in more detail during the County's Trail and Active Transportation Planning process. It could be included in the next update to the LRTP if the preferred facility is transportation focused.
General	1. Please plan for a bike/pedestrian route along the south side of the Clark Fork River. It should be possible to bike (without getting in the street with cars) from Milltown state park (south side of the river), along the Kim Williams trail all the way to UM, and then along the river trail to River Road and out to the Tower Street Conservation area. The river front needs to be protected from development that interfere with public access and bike/ped routes.	email	No action needed. The plan currently includes improvements that will make the desired connections. Some projects are not fully funded due to limited revenues and other priorities throughout the region. However, the plan contains enough detail to ensure we can take advantage of development or opportunistic financing in the future.
General	2. Also it would be great to have a bike/pedestrian bridge over the river where the old rail road bridge crossed the river (near Milwaukee trail), and then bike route could follow the old RR tracks to cross Mullan road and join Hiawatha Road over to Grant creek. And then be able to bike along Grant Creek along the park proposed along Grant Creek when the Sx̌tpqyen (Mullan) area is developed.	email	No action needed. Project #91, which is recommended for funding in the plan, provides this connection.
General	3. Create bike routes off of the main car routes, instead of trying to squeeze a bike lane into a busy car route. Example – the bike lane added to S 5th street W actually puts bikers at risk when cars make right turns from the left lane, crossing the bike lane. Better to send bikes to less used streets like S 4th St W.	email	No action needed. The various recommended Neighborhood Greenways provide a network of low-stress local streets connecting neighborhoods.
General	4. Please urge street department to fix potholes and not just paint over them to make them less obvious – that just makes them more dangerous. Example – where Daly Street deadends at Arthur Street. A failed experiment in paving crosswalks left Arthur street with potholes in the cross walk. Instead of fixing them, they were painted over. Result has been bike and pedestrian accidents when crossing this rough but disguised area.	email	No action needed. Will pass this comment along to City Streets.
General	No. 86. Would connect Tamarack Road with the Canyon River Trail. I was involved with prior unsuccessful efforts to obtain funding for this trail. The portion at Marshall Canyon is well understood to be problematic. However, this trail would complete a connection that now exists east as far as the I-90 Turah interchange and, from Missoula, east along the Kim Williams Trail to Deer Creek Road. The proposed No. 86 would add a critical element of safety to what is now a dangerous route from East Missoula eastward and should remain a "do-able" priority in the search for funding. Any other connection from the existing terminus at Tamarack Road would require the building of a bridge across the Clark Fork.	email	No action needed.
General	No. 19. Would connect Hwy 200 at Town Pump with West Riverside neighborhoods. Construction of this section would be a major contribution to community safety along this route well-traveled by residents. Space is available both east and west of First Street. The West Riverside neighborhoods are the most densely populated of any in the state, per unit area.	email	No action needed.
General	Why not just refer to Sqwypteqn as Sqwptyen (pronunciation) instead of with (Mullan). You're using parentheses either way.	Agency - CPDI, Long Range Planning	Pronunciation has added throughout the plan (S-wh-tip-KAYN). Mullan has been removed throughout the plan when referring to the area.

Page/Location	Comment	Source	Resolution
91-92, 135	Related to Mountain Line: the plan seems to list things that Mountain Line is already planning for as what they should plan for. What about new transfer stations, routes (i.e. to Sqypwten), etc, that would expand their capacity in a way that complements focusing growth along their routes. Is the current vision that Mountain Line has robust enough to support the 'strategic growth' scenario that the plan recommends. Is the plan comfortable with the extent of the direction that Mountain Line is aiming for? If not, what else do we need to see from our bus system to be the foundational alternative mode of transportation to support goals for TDM and TOD? As well as focus inward, Design Excellence, Brooks st BRT, etc...	Agency - CPDI, Long Range Planning	Added content to "Build a Great Transit System" spotlight on pg. 91-92 to describe the 2022 Mountain Line Strategic Plan Update as the appropriate opportunity to explore these questions. Also added new bullet to "Upcoming Mountain Line Priorities" on pg. 136 to highlight the 2022 Strategic Plan Update. The role of the LRTP is to amplify the recommendations in Mountain Line's current plans rather than establish a new direction for the agency.
135	If the Higgins Ave study is included here, should the Brooks St BRT be as well?	Agency - CPDI, Long Range Planning	Revised to include Brooks Corridor throughout near-term action on pg. 135, including new final sentence: "The City should continue to advance the Brooks BRT Corridor through evaluation of right-of-way and environmental impacts; coordination with businesses, property owners, and MDT; environmental compliance analysis; and pursuit of RAISE and FTA Small Starts funding."
51-52	The list of Recommended Projects doesn't seem to include many enhancements of pedestrian street crossings, is that right? Weren't providing those a key part of the BRT/Brooks St project, and a goal for that area? I know it's late for adding input on which projects to recommend, but seems like ped crossing facilities should be included in this more, but maybe they are in other project types as well. Or maybe more under purview of MDT?	Agency - CPDI, Long Range Planning	No action needed. The LRTP includes planning-level project lists; crossings and specific intersection improvements will be addressed within corridor projects as they are designed. Breaking out specific intersections is beyond the scope of this LRTP update.
87-90	Are mobility hubs similar to TOD nodes? If that is the idea, would be helpful to have language that ties the siting of hubs to be complementary and work together with areas that promote high density development (ie Brooks, Sqwptyen, midtown, South Crossing, etc). Also, maybe mention how these could tie in to park'ride' type program/vanpool programs?	Agency - CPDI, Long Range Planning	Added second sentence to second column of "Mobility Hubs Program" on pg. 87 to explain the value of mobility hubs in many contexts, including TOD/dense places as well as less urban locations. Also added this information as a new first sentence to the second paragraph of "Create a Mobility Hubs Program" spotlight on pg. 89. Included mention of TOD in "Transit First Community" (second sentence of first column) on pg. 101.
105-108	Street Typology Standards: It would be helpful if the language describing this project included the important connection between street design and adjacent land use and design. Potentially could reference a goal or interest in considering including street design with form based codes if/when those are implemented.	Agency - CPDI, Long Range Planning	Revised second sentence in first paragraph on pg. 107 to make a stronger connection to land use. Added mention of form-based code as a tool--referencing the Sxwtpqyen Neighborhoods Master Plan and Form-Based Code--as a new second sentence in the second paragraph on pg. 107.
106	Street Typology Standard: Add CPDI as Key Partner	Agency - CPDI, Long Range Planning	Added "Community Planning, Development, & Innovation" as a key partner.
103-104	Encourage Compact Growth: This is directly tied to Focus Inward, should probably reference Growth Policy, maybe include recommendations to be included/addressed in next Growth Policy Update.	Agency - CPDI, Long Range Planning	Revised fourth sentence on pg. 103 as follows (new text in italics): "To support the existing regional *'focus inward' approach promoted by the Our Missoula Growth Policy,* Missoula Connect..."
15	Clarify what you mean by the Missoula area. Is that the entire county or the study area?	Agency - CPDI, Long Range Planning	Revised population growth chart to "Missoula Urbanized Area" to more accurately reflect analysis completed. Text refers to "Missoula area," which is appropriate for describing the MPO area.
40	This map is confusing. I'd suggest showing the scenarios in separate maps. The description of Business as Usual should be clarified.	Agency - CPDI, Long Range Planning	Added new second sentence to Business as Usual Growth description on pg. 39 to further explain the scenario. Retained map with no changes.
example - page 32	Remove reference to "Mullan." It kind of defeats the purpose Sxwtpqyen (Mullan)	Agency - CPDI, Long Range Planning	Pronunciation has added throughout the plan (S-wh-tip-KAYN). Mullan has been removed throughout the plan when referring to the area.
51	As projects go - has improvements to Scott Street, especially the bridge, been identified? I've heard frustration by the neighborhood (Invest health) that while many new affordable housing projects are occuring in the area the feeling is that it's not safe to expect students to walk across the bridge to go to their local school.	Agency - CPDI, Long Range Planning	No change made. Additional infrastructure and circulation planning for the Scott Street area is needed to accommodate planned growth and identify projects for inclusion in the next LRTP update.
67	I'm surprised that the Brooks Corridor BRT project is considered long term (16 to 30 years out). Is this something we shouldn't get too stuck on because, if money drops in our lap (through another BUILD perhaps) the project can get funded that way? It's just seems odd to have had the MRA invest in so many studies and there be an expression of how terrible the pedestrian crossing issues are now, to not expect any funding for the area for a long time out. There remains a lot of untapped development potential along this corridor. Additionally the idea of connecting this planning with the north end of the Higgins study is very intreguing.	Agency - CPDI, Long Range Planning	No change made. There is insufficient funding in the near-term or medium-term to advance the Brooks Corridor. We anticipate advancing this project sooner if grants or other additional funding sources become available.
90	I like the idea of Mobility Hubs but agree with Ben that the relationship to TOD should be explained and explored (see page 104 for TOD)	Agency - CPDI, Long Range Planning	Added second sentence to second column of "Mobility Hubs Program" on pg. 87 to explain the value of mobility hubs in many contexts, including TOD/dense places as well as less urban locations. Also added this information as a new first sentence to the second paragraph of "Create a Mobility Hubs Program" spotlight on pg. 89. Included mention of TOD in "Transit First Community" (second sentence of first column) on pg. 101.
95	Residential slow streets program (office of neighborhoods as key partner) - suggest also including PWM.	Agency - CPDI, Long Range Planning	Added "Public Works & Mobility" as a key partner.
101	Transit first community - this should involve other partners (CPDI) and include consideration of sufficient transit into growing areas to develop proactive transit oriented development consistent with the Strategic Scenario	Agency - CPDI, Long Range Planning	Added "Community Planning, Development, & Innovation" as a key partner. Revised second sentence of first column to focus transit improvements on priority corridors and areas of growth. Revised second sentence of second column to reiterate importance of focusing in areas of growth.
92	This list is what Mountain Line is doing now and not necessarily any new direction responsive to new information/strategic scenario	Agency - CPDI, Long Range Planning	Added content to "Build a Great Transit System" spotlight on pg. 91-92 to describe the 2022 Mountain Line Strategic Plan Update as the appropriate opportunity to address this comment. Also added new bullet to "Upcoming Mountain Line Priorities" on pg. 136 to highlight the 2022 Strategic Plan Update. The role of the LRTP is to amplify the recommendations in Mountain Line's current plans rather than establish a new direction for the agency.
103	Regarding Encouraging Compact Growth - much of the examples provided describe what is already done and in the works. I'd suggest changing the last sentence of the first paragraph to say: To encourage inward growth and infill development, the Missoula region ~~could enhance or~~ should continue to implement, enhance or expand existing policies, such as the following: Also include reference to the Our Missoula Growth Policy. There's a lot of implementation ideas in that document that support compact growth and is the foundation for the compact development.	Agency - CPDI, Long Range Planning	Revised final sentence of first paragraph as recommended. Added mention of Our Missoula Growth Policy to fourth sentence of first paragraph.

Page/Location	Comment	Source	Resolution
104	Commentary on TODs; general observation is that TOD doesnt occur in this chapter as a recommended policy specifically. Should it also be included on the list of recommended policies? What's the relationship to the mobility hub? What does a major other transit station look like for Missoula? When will the city be ready for more than 1 hub? This has to come with the need to be transit-ready (transit first community) and in conjunction with the strategic scenario; the growth policy ideas for nodes could also help here.	Agency - CPDI, Long Range Planning	Added connection to Transit First Policy within "Transit-Oriented Development" section of pg. 104.
105	Street typology and design standards; Key partner should also include CPDI. How do the standards relate to the idea of streed design guidelines (pg 107)? It would be great to create a link to the spotlight item (if it exists) so we understand terms and relationships more. I'm also wondering whether some mention of support for establishing a unified development ordinance to house the updated and aligned standards would be helpful?	Agency - CPDI, Long Range Planning	Revised name of policy to "Street Typology and Street Design Guidelines" to provide a clear link to the spotlight. Added Community Planning, Development, & Innovation as a key partner. Replaced "Transfer of Development Rights Program" on pg. 104 with "Supportive Zonign and Implementation Tools" to describe the value of a unified development ordinance.
106, 109	Transportation Options Policy - the spotlight page does a great job of spelling out steps without presuming the outcome, however the description of the policy (on page 106) seems to get ahead of the analysis by stating that it would "add regulatory teeth to current programs." Are we too early in this process to know that? Why it matters could say that the TOP **could** amplify . . ., or the statement could strike the "add regulatory teeth . . . As a few suggestions. There's also more to this policy project - I think it will be linking some of the other policy efforts together like work related to bike and car share and code reform related to parking.	Agency - CPDI, Long Range Planning	Changed second sentence in second column on pg. 106 to read as follows: "A Transportation Options Policy could amplify investments identified in Missoula Connect by linking private development to programmatic initiatives in addition to infrastructure."
3	Text refers to "Missoula's growth policy" - this could be wrong but I feel like it would be preferable if it were referred to by name: "Our Missoula Growth Policy" or the City of Missoula's growth policy or plurize the phrase to refer to two growth policies	Agency - CPDI, Long Range Planning	Revised first sentence of second paragraph on pg. 3 to refer to "Missoula's City and County growth policies..."
15	Graph refers to population of Missoula County but the numbers seem low to represent the county (and high for the city). Is this the MPO area? If so, I'd recommend labeling it as such more clearly	Agency - CPDI, Long Range Planning	Revised population growth chart to "Missoula Urbanized Area" to more accurately reflect analysis completed. Text refers to "Missoula area," which is appropriate for describing the MPO area.
15, 16, 17, perhaps others	Citation refers to 2014-2019 ACS data, should probably either be 2014-2018 or 2015-2019 since these are time spans in which 5-year estimates were calculated	Agency - CPDI, Long Range Planning	Revised citations to "2015-2019 ACS 5-year Estimates" to reflect data used in the analysis.
23	Reference under "Integrating Land Use and Transportation" box refers to "Our Missoula" - I think this is referring to OMDG but could be the Growth Policy as well. Is "Our Missoula" a generic name for all city plans during a particular time period? Anyway, I think it could use some differentiation	Agency - CPDI, Long Range Planning	Added "Growth Policy" after "Our Missoula" in two locations within this box.
34	Typo in 2nd box down title - "Communitites" should be "Communities"	Agency - CPDI, Long Range Planning	Fixed typo.
44	chart on this page comments: These groupings seem a little forced. Also, the color scheme is not super intuitive.	Agency - CPDI, Long Range Planning	No action needed.
Appendix E, pg. 2	Reference to "Scenario Planning Approach and Proposed Scenarios" memo - where is this memo? Is it an attachment to the document?	Agency - CPDI, Long Range Planning	Added reference to Appendix D for Scenario Planning Approach & Proposed Scenarios to first paragraph.
General	General: Some of the type, specifically the page numbers, are very difficult to read. Please consider revising to appropriately accommodate people with sight impairments.	MDT	Enlarged text wherever feasible.
vii	Suggest adding a blank page between Page vii and Page 1. There are quite a few graphics that extend over two pages, however, in all of these instances the file currently doesn't group the two pages together that are supposed to go together. Page 1 needs to start on the left side of the Page 1 / Page 2 grouping. This will fix all of the subsequent grouping problems throughout the document.	MDT	No action needed.
8	Should this section include a "however..." regarding the 2-cent gas tax?	MDT	Revised second and third sentences of the first paragraph on pg. 8 to acknowledge repeal of the gas tax.
11	There's no reference to Appendix A in the report.	MDT	Revised the order of appendices to make the Community Engagement Summary Appendix A and Existing Conditions Appendix B. Adjusted references to the appendices throughout the plan, including adding a reference to Appendix B in Chapter 2 on pg. 13.
12	Remove extra "Community Councils" (LRTP Citizen's Advisory Committee)	MDT	Fixed typo.
32	2nd paragraph: Activate	MDT	Fixed typo.
53	Maintenance: Add Old MT 200 Retaining Wall Repair	MDT	Added project on pg. 53 and to Appendix H.
53	Change to West Broadway to Old Highway 10	MDT	Changed project name on pg. 53 and in Appendix H.
53	Change to US 93 North of I-90 Interchange	MDT	Changed project name on pg. 53 and in Appendix H.
53	Change to US-93 Pvmt. Preservation Missoula to Lolo	MDT	Changed project name on pg. 53 and in Appendix H.
53	Please remove Orange Street Tunnel Rehabilitation and replace with Pulp Mill Rd. Slope Stabilization	MDT	Changed project name on pg. 53 and in Appendix H.
53	Change from US-90 Safety Study to "US-93 Lolo to Florence Safety Study"	MDT	Changed project name on pg. 53 and in Appendix H.
79	3rd Paragraph: Please update to reflect the correct name of the project, which is "West of Missoula - Northwest." A rewording of this section is suggested: per an agreement with the County, finding funding to complete the shared use path is the County's responsibility	MDT	Changed project name in first sentence of third paragraph. Revised final sentence of third paragraph to better explain responsibility for identifying funding: "...however, the County and the MPO will need to work together to identify funding for the path."
81	2nd paragraph: remove extra "model"	MDT	Fixed typo.
Chpt 7	Many of the tables inlcude a "key partners" column and most of them do not include MDT. If any programs will affect State maintained roadways, coordination with MDT is needed	MDT	Added final sentence to first paragraph on pg. 83: "For example, the Montana Department of Transportation (MDT) would be a critical partner for programs or policies that affect State-maintained roadways."
Chpt 8	Chapter 8 as a whole (and how it correlates to Appendix H & I) how is fiscal constraint demonstrated? They are projecting adequate revenue to cover the list of committed and recommended projects but they aren't detailing the specific funding sources or combination of funding sources for each project.	MDT	**WILL BE COMPLETE BEFORE TPCC:** Added eligible funding sources (but not specific dollars) to all recommended projects in Appendix H.

Page/Location	Comment	Source	Resolution
113	The statement "Beyond maintenance and preservation funds, MDT also programs National Highway (NH) funds, Bridge Program funds, …" is not accurate. Based on how "maintenance and preservation" projects are previously defined in this report, MDT uses NH funds, Bridge Program funds, and other funding sources to fund these projects. NH funds and Bridge Program funds (and other funding sources) are being used to fund all of the projects in the Maintenance project list on Page 53. Based on how they've currently defined "maintenance and preservation" projects, there is no separate funding source for these projects outside of NH, Bridge, etc. From MDT's standpoint, this report is actually very confusing when it comes to the term "maintenance and preservation" projects. When MDT talks about maintenance projects, we are talking about state-funded work administered through MDT Maintenance, which is completely different than the federal-aid funding that is funding all of the MDT projects that they've listed in this report. Prefer to see the whole report revised to fix this discrepancy in terminology, but this will likely be too difficult. Therefore, change this first sentence to "In addition to the funding that goes towards maintenance and preservation projects, MDT also programs National Highway (NH) funds, Bridge Program funds, Transportation Alternatives funds, and many other funding sources towards other types of projects as well that are critical for our local area."	MDT	Changed first sentence of second paragraph as follows: "In addition to the funding that goes toward maintenance and preservation projects, MDT also programs National Highway (NH) funds, Bridge Program funds, Transportation Alternatives funds, and many other funding sources that are critical for different types of projects in the Missoula region."
115	Please also list the National Highway Performance Program (which includes Interstate Maintenance (IM), National Highway (NH) and National Highway System Bridge Program), seeing as this Program contributes far more funding to the area than the four that are currently listed combined.	MDT	Revised final sentence of first paragraph as follows: "FHWA funds are disseminated through the National Highway Performance Program--which includes Interstate Maintenance, National Highway, and the National Highway System Bridge Program--as well as four statewide programs:"
115	Remove extra "primarily for"	MDT	Fixed typo.
115	STP: This paragraph is only true for STPU funds. Surface Transportation Block Grant Program (STP) funds are federally apportioned to Montana and allocated by the Montana Transportation Commission to various programs including the Surface Transportation Program Primary Highways (STPP), Surface Transportation Program Secondary Highways (STPS), the Surface Transportation Program Urban Highways (STPU), Surface Transportation Program Bridge (STPB), Surface Transportation Program for Other Routes (STPX), and Urban Pavement Preservation Program (UPP).	MDT	Revised description of Surface Transportation Program to reflect "Urban STP funds."
116	The statement "Federal funds for transportation projects have declined over the last decade …" is not correct. Federal funds have been increasing every year. The problem is that the increase in funding hasn't kept pace with the increase in demand for funding and the project cost inflation. Please revise this sentence accordingly.	MDT	First sentence of first paragraph revised to read as follows: "Although federal funds for transportation projects have increased over the last decade, the increase has not kept pace with the demand for funding and project cost inflation. This leaves jurisdictions to fill the gap in available funding with local sources."
116	Callout box: last sentence, typo. Change "area" to "are"	MDT	Fixed typo.
125	On graphic: change Missoula to Montana	MDT	Fixed typo.
135	Is this effort outside of the CMAQ-funded Transportation Option program? If no, suggest renaming to avoid confusion.	MDT	Changed TDM Policy to "Transportation Options Policy."
App K	No reference to Appendix K in the report. Seems to be most relevant in Chapter 3; which would require relabeling/reordering appendices.	MDT	Changed title of Appendix K to "Disposition of Comments on Draft Long-Range Transportation Plan". No change made to reference Appendix K in the plan chapters, as in-text references to comments on the draft plan would be inappropriate.
Ch 2	Appendix A - not reference in report	MDT	Revised the order of appendices to make the Community Engagement Summary Appendix A and Existing Conditions Appendix B. Adjusted references to the appendices throughout the plan, including adding a reference to Appendix B in Chapter 2 on pg. 13.
App B	Appendix B - Page 3 Update April/May Dates for CAC/TAC/TPCC	MDT	Changed TBD to May 13, 2021 on pg. 3 of Appendix B.
App E	Appendix E - Figures 65-72 don't have legends. A sentensce in the text describing what the colors mean would be helpful.	MDT	Added legends Figures 65-72 in Appendix E.
App F	Appendix F - Will MDT have a chance to review this prior to submittal to FHWA for approval?	MDT	**WILL BE COMPLETE BEFORE TPCC:** Appendix has been reviewed by MDT and revisions are underway.
App G	Appendix G - Will MDT have a chance to review this prior to submittal to FHWA for approval?	MDT	**WILL BE COMPLETE BEFORE TPCC:** Appendix has been reviewed by MDT and revisions are underway.
App H	Suggest a breakout in the table to clearly define where the fiscally constrained project list ends and the illustrative project list begins. The phase column of the table indicates where the break is but it is easy to miss; perhaps separating into two tables would be easy solution? Same comment for the committed projects, the asterisk noting which projects are committed is easy to miss.	MDT	Inserted page break between Fiscally-Constrained Project list and Illustrative Project list in Appendix H.
App I	Appendix I - CMAQ discretionary funds for long-term is $1. Is this correct?	MDT	Reviewed revenue projections and confirmed amount. No further action needed.
App J	Appendix J - MDT in the title is misleading as the appendix provides MDT as well as MPO and Mountain Line PMs. Suggest deleting MDT in the title. Tables on page 3 list the functional class of roadways. Is this the local or federal functional class? Suggest providing that clarification. Page 4: 1st sentence under PM table delete that.	MDT	Changed "MDT Performance Measures" to "Federal Performance Measures". Deleted first sentence under performance measures table on pg. 4 of Appendix J.
General	General Comment: Prioritize Spurgin Road improvements before North Ave and S 7th Street W. Target Range HOA and Maclay Bridge Alliance are interested partners for South Ave bridge project Supportive of projects #30, 47, 142, 102 #160 – 7th/ Reserve safety improvement - dangerous location for enhanced crossing due to hill/ blind spot #69 – existing path, drainage improvements are necessary Requested project list by category	Citizens Advisory Committee	No action needed.
55	Add potential transit routes to map.	Project Team	Added 2043 transit routes to Reserve St Area Projects map on pg. 55.
48	I think having a dockless bike share would increase the number of people who are using bicycles to see the city, go out to eat, and ride for leisure. It will decrease single person vehicle trips.	Konveio	No action needed.
48	Love this idea and have seen it function very well in other cities.	Konveio	No action needed.
52	Traffic calming and speed management will go a long way toward decreasing pedestrian/bike versus car serious accidents.	Konveio	No action needed.
55	This is the shift in values and guiding principles that has to occur to meet this moment. Clearly establishing these principles for mobility tells everyone what our priorities as a city are.	Konveio	No action needed.
55	Converting the city fleet to electric vehicles will help us meet our community climate goals.	Konveio	No action needed.
55	This policy reflects the shift to multi-modal transportation goals. We must ask it to be considered for the built environment.	Konveio	No action needed.
58	This is essential to developing the built environment for all modes.	Konveio	No action needed.
Throughout	Add phoenetic pronunciation of Sxwtpqyen throughout document.	Citizens Advisory Committee	Added phonetic pronunciation to all instances of Sxwtpqyen in document.
Throughout	Address minor grammatical, typographical, and graphics errors/changes.	Project Team	Addressed minor changes--no substantive changes included in this comment--throughout document.
Pg. 17, 2nd paragraph, end of 1st sentence	Add content to end of first sentence to refect national comparision: "…rest of the state and among the highest rates in the country."	Project Team	Added content to end of 1st sentence in the 2nd paragraph on pg. 17: "…rest of the state and among the highest rates in the country."
Pg. 26 text box	Add live link to survey.	Project Team	Added link to 2019 Missoula Area Transportation Survey: https://d7ba6011-da51-4bae-a077-13473a100b22.filesusr.com/ugd/31250b_821e8707fa3045959d7413e7fc5f1afe.pdf.
Appendix H	Add MDT maintenance and safety projects.	Project Team	Added three MDT projects from pg. 53 of plan to Appendix H.
Pg. 73	Add Sawmill Gulch Road as new Illustrative project.	Transportation Technical Advisory Committee	Added Sawmill Gulch Road (#221) to pg. 73, pg. 78, and Appendix H.

Page/Location	Comment	Source	Resolution
Pg. 80	Add Project #97 to map.	Project Team	Added Project #97: People's Way Trail - Phase 1 to map.
Ch 7 Introduction	Add description of role of key partners.	Technical Advisory Committee	Added new second sentence to second paragraph on pg. 83 to describe role of key partner(s).
Ch 8 Introduction	Explain that all projects benefit people traveling by all modes.	Transportation Technical Advisory Committee	Added final sentence to second paragraph on pg. 111 to stress the value of Missoula Connect projects for people traveling by all modes.
Pg. 134	Change "TDM" to "Transportation Options."	Project Team	Changed all instances of TDM or Transportation Demand Management to Transportation Options in near-term action "Establish an Expanded TDM Policy."
Ch 7	Plan does not address autonomous vehicles and emerging mobility as explicitly as needed.	Project Team	Added new policy spotlight on Emerging Mobility Guiding Principles (after pg. 102) to address the future of transportation.
Appendix H	Provide project lists by project type.	Citizens Advisory Committee	**WILL BE COMPLETE BEFORE TPCC:** Added project lists by type following Illustrative Projects in Appendix H
Throughout	Write out Native American name and pronounciation for Beartracks Bridge.	Citizens Advisory Committee	No change made; this bridge is not named in the LRTP.
Ch 7	Change organization of programs and policies for clarity. Or move policies ahead of programs.	Technical Advisory Committee	No change made; organization is based on similar program/policy type.