



LIVINGSTON, MONTANA

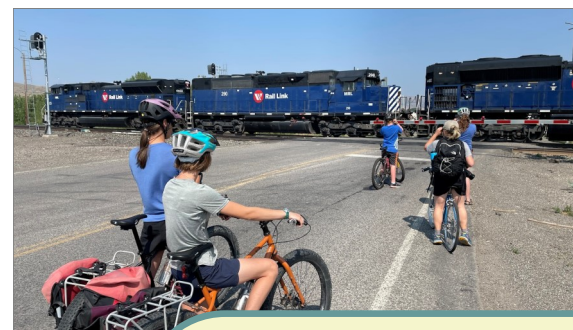
Trails & Active Transportation Plan

FINAL adopted by Resolution No. 5028 as an appendix to Livingston Growth Policy April 2022

Table of Contents

1. Introduction & Call to Action.....	4
2. Livingston’s People & Context	13
3. Public Engagement.....	24
4. Priority Projects	34
5. Other Projects.....	48
6. Trails & Pathway Master Plan.....	54
7. Land Use & Policy Recommendations.....	61
8. Programs	79
9. Health, Equity & Inclusion.....	93
10. Implementation	99

Appendix.....Forthcoming in Separate Document



Make No Small Plans

That is the famous quote of one of the pioneers of urban planning, Daniel Burnham. The Livingston Trails and Active Transportation Plan follows his lead as it is not a small plan. This plan contains big ideas and many projects to help the existing and future residents of Livingston exercise their freedoms to move about their community by whichever mode of transportation and recreation they choose.

The projects, programs, and policies recommended in this plan represent what the Plan’s Steering Committee and people of Livingston told us they desired. Achieving all of those recommendations will take time and energy by not only the City, but the many other organizations around Livingston.

Be bold! Pursue these recommendations with purpose. Yes, it will take time. But the results of this Plan’s recommendations will provide that freedom of mobility and ensure people are safer when exercising those freedoms.



Acknowledgments

This Plan is not possible without the dedication of its Steering Committee members, who met numerous times throughout 2021, attending workshops and the community bike ride, and helped get the word out about the survey and focus groups.

Steering Committee members are:

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Health & Equity



1. Introduction & Call to Action

The human body is designed to move under its own power. We are the most efficient species on Earth when it comes to walking. The bicycle is proven to be one of the world's most efficient machines.

Some of the earliest moments we celebrate in a child's life are those first steps or that first time a parent lets go of the bicycle seat to allow a child to experience that first real sense of freedom.

Unfortunately, as former CDC Director Dr. Richard Jackson said, "We have engineered physical activity out of our lives." Human beings have walked ever since their first days on Earth and the bicycle pre-dates the automobile by more than a hundred years. Yet, these modes have been made inconvenient, uncomfortable, and unsafe due to the ways in which we design our street systems and place many critical destinations along high-speed, auto-oriented routes. It has led to people choosing to drive short distances for trips that could otherwise be made walking or bicycling.

The people of Livingston, Montana, seek to change that. This Trails and Active Transportation Plan sets out the goals and objectives to achieve a new vision for transportation and recreation in this city of more than 8,000 people. The need for this plan was recognized in the *2019 Strategic Plan* with a goal to "Foster community resilience by facilitating access to health & wellness resources, enhancing multimodal connectivity and providing stewardship of our natural environment." It was then supported by numerous elements of the City's 2021 Growth Policy Update.

It is through this lens that the plan is developed, albeit in an era of a global pandemic when humans are rethinking many of the ways in which we move about and interact with friends and neighbors.

Today, Livingston residents are provided a connected and safe road system where they can reach their destination once they leave their home in their automobile. This plan's recommendations would offer that same level of certainty for those who wish to travel or recreate via walking and bicycling.



What's Old is New Again

Walking and bicycling are modes of transportation that pre-date the automobile. Today, Livingston maintains a footprint that can make these modes of travel as prevalent as they were more than a century ago.

Images: Yellowstone Gateway Museum



Achieving this symbolizes true freedom of movement—from that child riding a bike to school with their friends to senior citizens remaining active and able to get around without having to drive.

The geography of Livingston should make walking and bicycling easy. As the crow flies, the widest point between the Yellowstone River and the foothills on the northwest side of town is 1.25 miles. This is a distance—20 minutes of walking—where studies show people are willing to walk for their errands and exercise. From its southwestern tip to its northeastern tip, Livingston is approximately three miles across—a convenient distance for bicycling.

Even with suitable distances, there remain significant barriers. The railroad tracks represent a physical, emotional, and economic barrier for Livingston's people. Park Street is a US Highway that serves as a detour for I-90 during weather-related closures. While expensive to address, overcoming these barriers is vital for the future of Livingston and worth the investment to achieve its goals.

Vision

The Vision for the Trails and Active Transportation Plan was developed to guide how the plan and its recommendations would unfold. A group of eight steering committee members made substantial commitments of time to provide input to the plan. Committee members were asked to think forward to the year 2030 and imagine a magazine report wanting to profile Livingston. The focus of the story was how the town, in just a short time, became one of the most walk- and bike-friendly small towns in the West.

What would the reporter learn? What accomplishments would they showcase? What would the steering committee show and tell them?

The results of that exercise are summarized on the next page in Figure 1-1. They were used to compile the Vision statement and goals for making trails and active transportation a safe, connected system for all of Livingston's people to use in all seasons.

Walk and Bike Sheds

The distances within Livingston are ideal for most people to walk or bike, if given safe and comfortable infrastructure by which to do so.

People often choose to take a trip on foot or by bike based on the most difficult intersection or barrier they have to overcome. This is why finding safe ways to cross major barriers like the railroad tracks and Park Street (US 89) are critical to achieve the goals of the *Trails and Active Transportation Plan*.



Figure 1-1: Vision Statement & Goals

A Vision for the Trails and Active Transportation Plan

The Livingston Trails and Active Transportation Plan is a robust, timeless plan that has staying power beyond all of us, with specific goals, funding options, and commitment to maintenance. Through its implementation, the City, its people, and its partners will:

- Create a city of safe routes for people who walk, bike, and hike,
- Connect all neighborhoods to all schools, important destinations, and community gathering places,
- Construct a system that is safe and accessible for people with assistance needs,
- Prioritize routes for implementing year-round maintenance and management practices,
- Reconfigure streets and overcome major barriers; and
- Develop an extended trail system that connects to county roadways, trails and public lands.

Link Walking and Bicycling Routes to Destinations	Build Context-Appropriate Trails	Invest in a Safe, Year-Round Experience	Overcome Major Barriers	Enact Policies & Incentives
<ul style="list-style-type: none"> • Complete the sidewalks in and around Livingston. • Construct and designate bike facilities to form a network. • Create walking and bicycling routes away from busy roads. • Focus on looping and connecting routes. • Balance what we have with what we can maintain. • Update Safe Routes to School routes, focusing on alternatives to busy roads. • Prioritize decisions around low-income neighborhoods. 	<ul style="list-style-type: none"> • Plan and provide convenient recreational trails, particularly in open spaces. • Consider both short recreational trails as well as longer trails. • Make the trail along the Yellowstone River a highlight for the community. • Refrain from abandoning rights of way that could be used for future trails. • Develop Interpretive Trails through shared spaces. • Build context-sensitive trails that fit the setting—paved vs. unpaved. • Provide landscaping and shelter along trails for year-round use. 	<ul style="list-style-type: none"> • Add fencing or other buffer along sidewalks/trails adjacent to busier roads. • Improve arrival and departure practices around schools for the safety of those accessing them on foot or by bike. • Upgrade sidewalks, ramps and other infrastructures for ADA compliance. • Add or improve lighting along bicycling and walking routes for extra safety at night and in winter afternoons. • Ensure year-round maintenance and enforcement of snow plowing/clearing and sweeping, including partnerships with other organizations. 	<ul style="list-style-type: none"> • Create safe crossings across major traffic arteries. • Make Park Street safe for walking and bicycling along and across. • Create multiple ways to cross the railroad tracks to connect the people of Livingston. • Identify open rights of way for use as micro-path connections and pocket parks. 	<ul style="list-style-type: none"> • Explore downtown parking policies to encourage more people to walk and bike. • Enforce prohibitions on impediments like large RVs and trailers parked on the streets. • Promote proper placement of garbage/recycling cans along routes so they don't impede those walking and bicycling. • Understand the need to maintain what we have combined with what is added. • Ensure that the City's night skies ordinance is considered in any future lighting along paths and roadways. • Work with businesses to make them more bike-friendly.



Seasons Come and Go

Even in its early days as a railroad and ranching town, the Livingston area was not an easy place to live year-round. Winters can be harsh, the winds even harsher. The days are short for many months each year. It's easy to see why a transportation mode like driving can be so appealing, even for short trips.

Making active transportation, as well as year-round recreation, appealing is a major goal of this plan. There are models in larger cities in the United States and in countries across the world of how places can achieve higher rates of walking and bicycling in winter months. This plan outlines practices in design, snow management, and partnerships to make Livingston a safe and accessible city for active modes—at all times!

The notion of “at all times” applies to conditions beyond the weather. People must go to work or school during dark hours of the day. People who walk and bike should not have to overcome long detours or other conditions when navigating construction zones. Making the healthy choice the easy choice despite all these factors will help Livingston change that paradigm to engineer physical activity back into people's lives.

Recent Initiatives

The Livingston Growth Policy Update was finalized as the *Trails and Active Transportation Plan* began. In it are two primary goals that impact this plan:

- Establish Livingston as a community recognized for its parks and trails system.
- Improve pedestrian and bicycle safety within the City.

The Trails and Active Transportation Plan builds upon these goals to give the City and its people more focused direction on how to achieve them. It also links these goals to other Growth Policy Update themes of housing, land use, economy, natural resources, and inter-governmental coordination.

Initiatives at the Park County level also spurred action for the City. The formation of the Park County Active Transportation Coalition to promote these modes was established on the heels of other City and County efforts, most notably the Park County Active Transportation Plan. The Coalition is now incorporated into Park County Environmental Council's structure after being started by the County. A summary of the plans used to inform the Livingston Plan is included in Chapter 2: Livingston's People & Context.

Bad Weather?

There's an old joke among people who bike in winter: “There's no such thing as bad weather, only bad clothing.”

While walking and bicycling during the harshest times may be reserved for those most dedicated, increasing walking or bicycling in Livingston is attainable in all seasons with a combination of infrastructure and maintenance initiatives that can make the healthy choice the easy choice.



Changing Paradigm for Walking & Bicycling

The *Trails & Active Transportation Plan* was developed in the midst of a changing attitude toward transportation. The challenge is, that in the eyes of many, people who walk and bike are viewed as an impediment to traffic instead of a legitimate road users.

A national movement called Vision Zero is emerging to change the paradigm for transportation safety and investments. MDT adopted its Vision Zero initiative in 2014; however it does not fully align with the industry-accepted definition of Vision Zero. MDT’s Vision Zero is primarily an advertising campaign targeting road user behaviors, with engineering as a component rather than the primary focus.

By contrast typical Vision Zero efforts recognize the design of transportation systems either induces user error or can compound the effects of user error. (Figure 1-2)

This is seen when motor vehicle speeds are prioritized over safety, which happens frequently. Many surface streets have travel lanes wider than those on the interstate while sidewalks (if they exist) are built to a minimum widths. People who walk or bike are oftentimes forced to go thousands of feet out of their way to access a safe crossing of major roads. Montana’s roadway design guides and standards still bolster this philosophy despite incorporating other modern features such as protected bike lanes. This Plan looks at active transportation through that Vision Zero lens and provides references to federally-endorsed design guides (see Appendix) to change that approach. A key method is managing motor vehicles speeds and safely incorporating walking and bicycling into transportation infrastructure.

By aligning the recommendations with Vision Zero, the people of Livingston stand to make a better case for its own streets, as well as to MDT about the needs of pedestrians and bicycling wishing to travel along or across MDT-managed routes within Livingston. This Vision Zero philosophy is incorporated into project recommendations (Chapter 4), recommended policy updates (Chapter 7) and other day-to-day practices like snow management and construction zones.

Figure 1-2: Foundational Principles of Vision Zero

Traditional Approach	Vision Zero Approach
Traffic deaths are INEVITABLE	Traffic deaths are PREVENTABLE
PERFECT human behavior	VS Integrate HUMAN FAILING in design
Prevent COLLISIONS	Prevent FATAL AND SEVERE CRASHES
INDIVIDUAL responsibility	SYSTEMS approach
Saving lives is EXPENSIVE	Saving lives is NOT EXPENSIVE

Vision Zero lays out the following tiered levels of responsibility:

FIRST, THE DESIGNERS OF THE SYSTEM ARE RESPONSIBLE for the design, operation and use of the transportation system.

SECOND, ROAD USERS ARE RESPONSIBLE for following the rules of the transportation system.

FINALLY, when some road users inevitably fail to follow the rules due to lack of knowledge, discipline, ability, or understanding of the system, **DESIGNERS MUST TAKE NECESSARY STEPS** to ensure that the resulting crashes do not result in people being killed or seriously injured.

http://visionzeronetwork.org/wp-content/uploads/2017/01/MinimumElements_Final.pdf



The City is Not Alone

While the City of Livingston led this Plan, it does not mean the City is alone in finding and applying the resources necessary to achieve a trails and active transportation network that is safe and accessible at all times. Nor does it mean these recommendations are expected to be implemented at once. The Action Steps for Implementation identified in Chapter 10 provide the game plan for achieving this.

There is great community spirit within the people of Livingston and that same spirit should be engaged to implement the plan, find funding to achieve it goals, and work together to find solutions on a day-to-day basis that keep the sidewalks, bike routes, and pathways usable for everyone.

A goal of the Trails and Active Transportation Plan is to identify the many organizations who can contribute to implementation of the plan. Small towns like Livingston will always be constrained by staff and budget resources. People recognize that and are willing to donate their time and money to overcome limitations.

The themes of the Plan are intended to put Livingston ahead of its peer cities in Montana in funding pursuits by providing insights into the impacts of active transportation on a community's physical, environmental, social, intellectual, and economic health. The data and recommendations should position the City to make a more reasoned argument for increased funding, utilizing existing funding on plan recommendations, and supporting design flexibility from agencies such as MDT on the routes it manages.

By examining the health-specific factors in building a culture of active transportation, the City can broaden its pursuit of funding to health-focused organizations. Instead of simply saying "please give money because walking and bicycling is healthy," this plan outlines how it is healthy, who stands to benefit most among Livingston's population, and how those pursuits are achieved through a lens of equity and inclusiveness to people of all ages, all abilities, all races and ethnicities, and all income levels.

An Active, Interested Community

Volunteers from the Park County Active Transportation Coalition organized to clear snow from the 89-South pathway in March 2021.

Image: Park County Active Transportation Coalition



High Priority Projects

The Plan identifies nearly 32 possible trail, sidewalk, and bikeway projects within the City. These projects were generated through input from Steering Committee members and the public, as well as field review and analysis by the Plan’s consultant. This resulted in a list of 12 top tier priority projects totaling nearly 9 miles of sidewalks, bikeways, and trails. Those projects are listed in Figure 1-3 at right and illustrated in the Figure 1-4 map on the next page. Chapter 4: Priority Projects provides details on these projects and the recommended design options for them.

The combined cost estimate for Livingston’s top tier projects is approximately \$1.7 million, not including 5th Street railroad crossing upgrades currently under consideration by MDT (Project E at right).

Yes, this is a large number for a small city. Implementing these projects will require City leadership and innovative funding policies and pursuits. The City’s partners at Park County, MDT, and local advocacy organizations can assist in providing input on projects and helping the City identify possible state and federal funding sources.

Projects that did not make the list of high priority projects are summarized in Chapter 5: Other Projects, along with recommended street crossing upgrades. Chapter 6: Trails Master Plan includes a map of recommended routes within the City and in unincorporated Park County.

While these lower tier projects are not the City’s highest priority projects, that does not mean the City and its partners should ignore opportunities to complete all or portions of them. New development or special funding sources may emerge that allow for implementation of these projects.

The recommended street crossing upgrades are primarily on MDT-managed routes. Upgrades such as Rectangular Rapid Flashing Beacons and the associated curb ramps and crosswalks can be pursued as individual projects or could be batched together in a grant pursuit, use of federal funds available to the City, or a request to MDT.

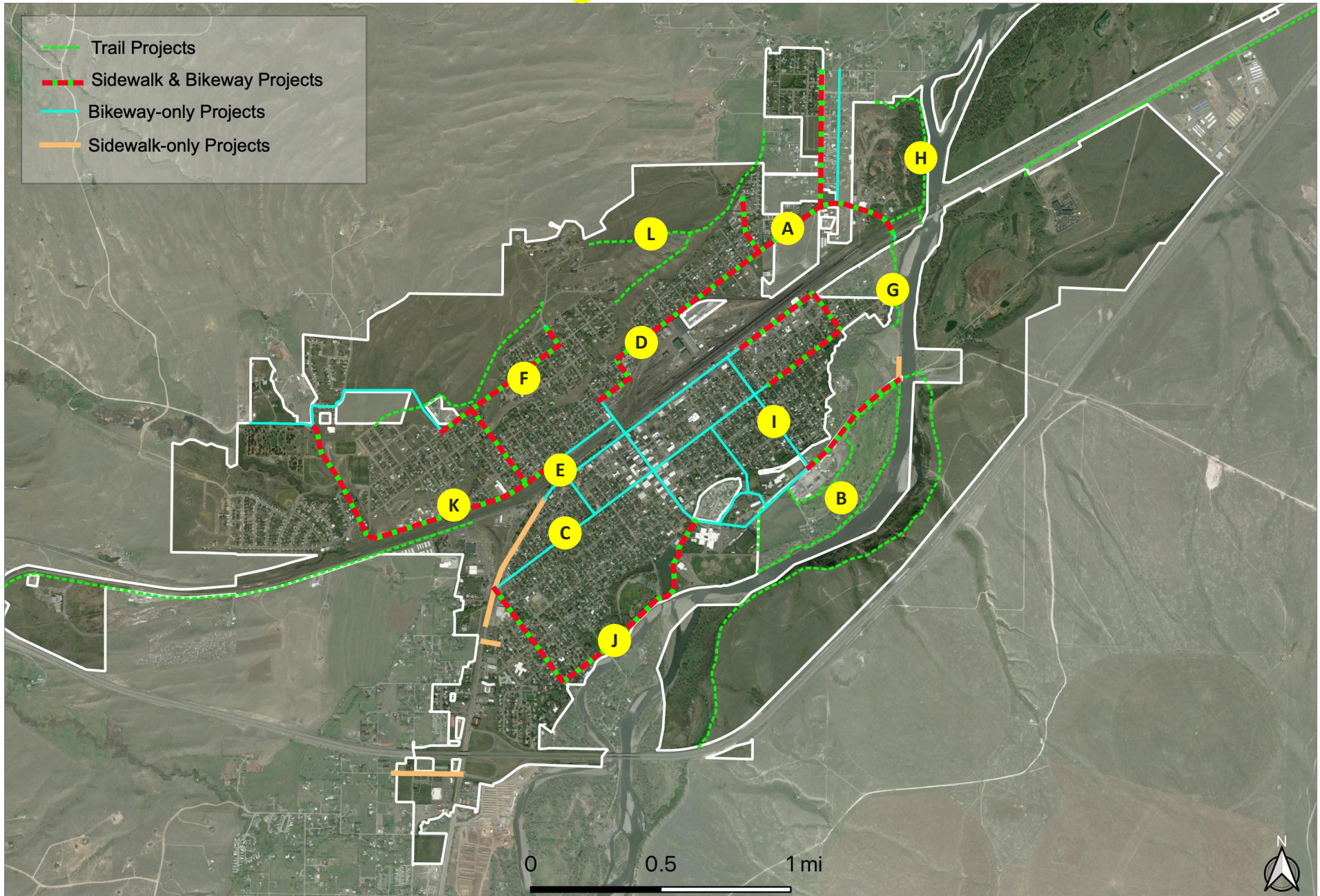
Figure 1-3: Top Tier Projects

Top Tier Projects, in order of priority ranking	Cost Estimate
A. Gallatin/Bennett, N St to Park (0.6 miles) - Sidewalks and bikeway	\$200,000
B. Yellowstone River Trail, north side, Baseball/Softball Complex to Mayor's Landing (0.9 miles) - Shared use pathway	\$90,000 to \$150,000
C. Lewis/O St Crosstown Bikeway, Park to O St (1.7 miles) - Sidewalks and bikeway	\$10,000 to \$150,000
D. Gallatin/C/Chinook, Main to N St (0.8 miles) - Sidewalks and bikeway	\$120,000
E. 5th, Front to Park (0.1 miles) - Widen sidewalk to pathway width	TBD
F. Summit, 7th to Main (0.4 miles) - Sidewalks	\$75,000 to \$90,000
G. Yellowstone River Trail, Mayor's Landing to O Street Connector (0.4 miles) - Shared use pathway	\$140,000+
H. Yellowstone River Trail, north side, US 89 to Whiskey Creek Road (0.6 miles) - Shared Use Pathway and underpass of bridges.	\$250,000
I. H St, Park to Lewis (0.5 miles) - Bikeway with speed management treatments	\$40,000 to \$200,000
J. River Dr, 12th to Main/View Vista (0.8 miles) - Sidewalks and bikeway	\$250,000
K. Front, 5th to Star Road (0.8 miles) - Sidewalks and bikeway	\$150,000 - \$200,000
L. North Hills Trails, East, Green Acres to Summit/Water Tower (1.2 miles) - Hiking/biking trail	\$50,000

Note: Cost estimates are in 2021 dollars and for construction only. The volatility in the construction industry and with materials will also impact costs upon project implementation.



Figure 1-4: All Ranked Projects with Top Tier Projects Listed in Figure 1-3 **X**



Who Walks and Bikes in Livingston?

Throughout this Plan you will find profiles of the people of Livingston who walk and bike. People were asked to tell a short story of why they walk or bike and provide a picture of themselves participating in this mode.

The goal of these profiles is to dispel common myths about the characteristics of those who choose to recreate or travel via active modes. It's not just one type of person who bikes and not every bicyclist wears spandex. Those who walk are a combination of those who may not have other options due to age, disability, or socioeconomic status, as well as those who simply enjoy taking the time to walk for recreation or to nearby destinations.



In their own words

Martha Nawacki

I take my baby son, my dog, and myself for walks *almost* everyday for exercise and to take in some fresh air.

It is about 8 blocks to our nearest park at G Street, and about 11 to downtown. We live in a part of town that does not have many ADA ramps, has missing sections of sidewalk, and has damaged sidewalks where they do exist.

Fortunately, our neighborhood does not have too much traffic. As such, we do a lot of our walking in the streets. It would be safer to walk on a nice sidewalk, but that isn't very feasible with a stroller on the south-east end.



In their own words

Betsy

Not since I was a kid have I lived where I can bicycle or walk to many of the places I need to go. In Livingston, I have come to enjoy biking or walking to do many of my errands—or just to get to the river or the park because, how can you not want to be in a park?

Becoming comfortable on my bike on city streets took a bit, but I soon learned which ones are easier to travel. And, I have discovered that, if I'm not on my bike or my feet, I miss so much: like the sweet dogs fenced in yards looking for a pat, the beautiful flowers blooming in gardens and alleys around town, or the waves and hellos I get from folks sitting on their porches. You just have a different feeling about your town when you see it in slower motion, and not from behind the windshield.



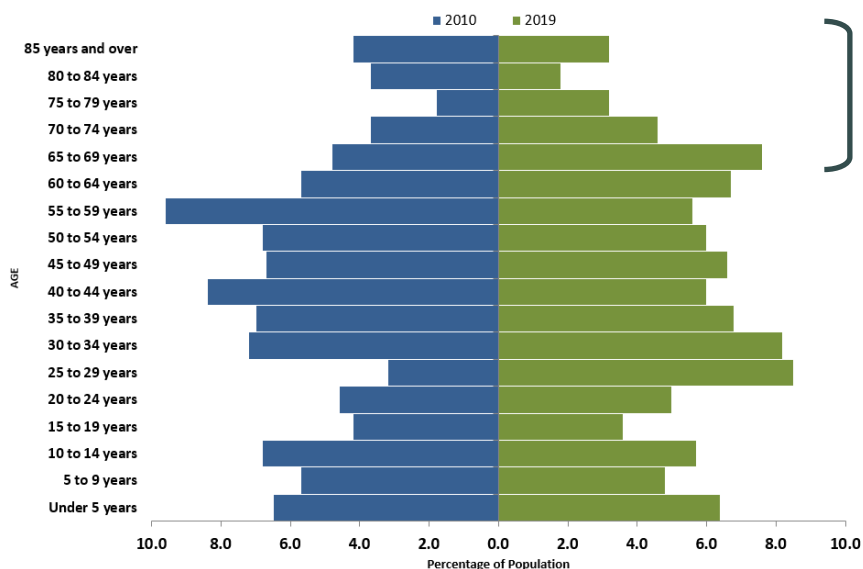
2. Livingston's People & Context

The Trails and Active Transportation Plan is for the people of Livingston—those who live here today and future generations. Census data from 2010 and 2019 indicate Livingston's population is aging. The proportion of the population over age 65 grew from 18.2% of the population to 20.4% in 2019 estimates. The population pyramid below shows the percent of the City's population by age range.

The aging of the population is predicated on the large population sector known as Baby Boomers, who are now in retirement age. This has prompted organizations like AARP to jumpstart initiatives like age-friendly communities to encourage local leaders to implement the types of changes that make communities more livable for people of all ages, especially older adults.

Livingston's working age adult population remained relatively unchanged during that timeframe, comprising just more than 59% of the population.

Figure 2-1: Population Pyramid for Livingston—2010 & 2019



Older Adults (age 65+): 18.2% in 2010; 20.4% in 2019
 Older adults are seeking walkable and bikeable communities because they want to lead an independent lifestyle as they approach retirement age and ultimately retire. Older adults are concerned about their safety while walking and bicycling in terms of self-defense, traffic exposure, and the risk of falling. The isolation that can come from being in a large, rural state during retirement has been shown to have negative physical and mental health effects.

Working Age Adults (age 20-65): 59.2% in 2010; 59.4% in 2019
 The life of a working adult is complicated. They are seeking greater work/life balance while also considering the needs of the family, both elders and offspring. While a daily commute may require driving due to distances and job access in a larger, nearby city, working adults are seeking ways to walk and bike when in their own neighborhood or small city.

Youth (age <19): 23.2% in 2010; 20.5% in 2019
 Youth seek to explore the world around them and express their free will in these years. With increasing demands on the family and most households having both parental units in the workforce, youth are being asked to be more independent. Walkable and bikeable communities allow for this to occur in a safe environment.



46%
 OF LIVINGSTON'S WORKING AGE ADULTS
 COMMUTE LESS THAN 10 MINUTES
 TO GET TO WORK.

**THIS IS A TARGET POPULATION FOR INSPIRING
 MORE WALKING AND BICYCLING TRIPS.**



The growth in percentage of Livingston’s population above age 65 has come at the expense of its youth population, which declined as a percentage of the City’s overall population but still comprises more than 1 in 5 residents.

Demographic Data

Other key demographic data was drawn from the US Census Bureau’s 2019 American Community Survey data for Livingston. The data highlighted at right shows some of the key indicators related to active transportation in Livingston.

A major shortcoming of transportation data and travel modes in the United States is the fact that the Census only asks about a person’s journey to work. On average, a person takes 10 trips throughout a normal day with a commute trip accounting for two of those trips. Nothing is known about mode choice for the other 80% of trips.

Currently, nearly 11% of Livingston’s people commute to work via active modes, with walking being the primary active mode of choice at 8.8% of the population. One notable element of the walk to work mode share is the difference between men and women, with 11.2% of females walking to work compared to 8.0% of men walking to work. Bicycling accounts for 1.8% of commute trips among Livingston’s people.

Other key populations to understand non-motorized transportation and recreation needs are those who are too young to drive (under 15) and those who are reaching an age where driving becomes more difficult (over age 75). This comprises more than 1 in 4 people in Livingston. More than 7% of the City’s population lives in a household with no access to a vehicle.

Nearly 1 in 8 people in Livingston has some type of disability with 57.2% of those reporting a disability over the age of 65. Beyond infrastructure such as curb ramps and sidewalks, the needs of people with disabilities should be considered in all infrastructure. For example, people with disabilities may more easily travel by bike or have an adaptive or recumbent bike to use.

Figure 2-2: Select Census Data for Livingston



Source: US Census, American Community Survey (2019)



Crash Data

Unlike driving, walking and bicycling are experienced through a person’s senses. Because of this, the perception of safety is often-times a more important factor than the actual safety of a system.

The table at right shows Livingston’s history of pedestrian and bicyclist crashes at a rate normalized per 10,000 people for years 2009 through 2018. In comparing Livingston’s data to peer cities in Montana, the City performs very well in terms of crash rate per 10,000 people. Various local factors play into these figures, including presence of major traffic routes through town, driver compliance, tourism, and population demographics.

Just as commute mode share data has its limitations, so does the common crash data used by transportation planners and engineers to inform the design of facilities. The presence or absence of a crash is not the only indicator of safety. Unlike motor vehicle crash data, where it is assumed every road is usable by drivers, emerging studies show the design of transportation infrastructure may suppress walking and bicycling. For example, a road that has high speeds and no facilities or crossings for walking and bicycling may have a low number of crashes or none at all. This isn’t because it’s designed to be safe; rather it’s because few people walk or bike there because it’s not safe to do so.

There is also a documented history of underreporting of bicyclist and pedestrian crashes, per Federal Highway Administration. If a bicyclist is involved in a crash that does not involve a motorist, then that crash is not reported whereas a single motor vehicle crash that causes injury or property damage greater than \$1,000 is reported. A bicyclist who runs into a ditch, breaks a collarbone, and destroys a \$1,100 bicycle will never show up in crash reports compiled by police and MDT and used to inform road design.

Further, people who are hit by a motorist while walking or bicycling but receive only minor injuries may be more likely to prioritize getting to medical care than reporting the crash to local authorities.

Figure 2-3: Crash Data for Montana Cities with Population 4,000 to 10,000

City	Population (2019 5-yr Estimate)	Pedestrian Crashes	Bicyclist Crashes	Total	Crashes per 10,000 pop.
Hamilton	4,723	22	45	67	141.9
Lewistown	5,885	17	15	32	54.4
Sidney	6,416	23	8	31	48.3
Havre	9,786	23	14	37	37.8
Belgrade	8,685	13	17	30	34.5
Glendive	5,126	10	6	16	31.2
Whitefish	7,714	7	17	24	31.1
Dillon	4,261	8	5	13	30.5
Miles City	8,487	20	3	23	27.1
Laurel	6,834	6	11	17	24.9
Columbia Falls	5,429	4	7	11	20.3
Livingston	7,575	6	7	13	17.2
Polson	4,918	6	1	7	14.2

Source: US Census, American Community Survey (2019), MDT Crash Data (2009-2018)

Note: There are limitations to pedestrian and bicyclist crash data. These modes have higher percentages of unreported crashes and state motor vehicle laws prohibit some bicyclist crashes from being reported. Emergency Room admission data, if available, may show the greater magnitude of overall crashes involving pedestrians and bicyclists but will not identify the location of the crash.



What People Say

Past and ongoing planning efforts have consistently pointed to interest among Livingston's people for more robust investment in trails and active transportation.

Growth Policy Update (2020). The Community Survey for the Growth Policy update identified the five most popular transportation policies:

- Build a new separated grade crossing on the west side of town;
- Design improvements for people with disabilities;
- Design pedestrian-friendly transportation improvements; and
- Invest in sidewalk and street improvements in older parts of town.
- Develop a community wide interconnected trail system in town.

Livingston Parks and Trails In Our Community Survey (2019).

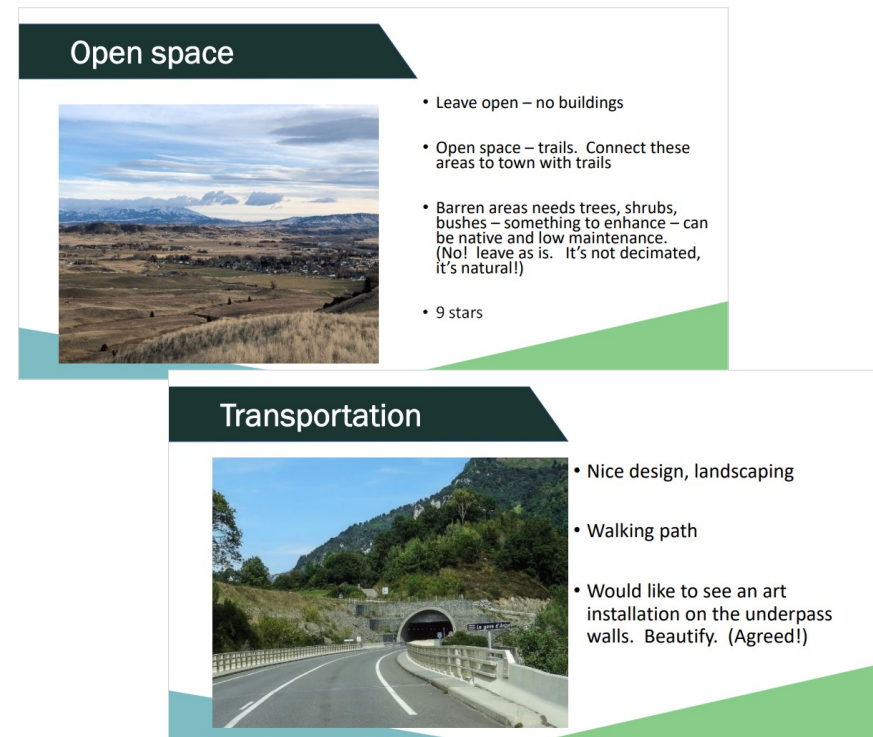
Nearly 350 people completed this survey, which documented attitudes and opinions about parks and trail use. Some notable findings included:

- Widespread use of parks and trails across all seasons, with more than 43% saying they use them weekly during winter;
- The four most popular activities among respondents were: Walking, nature walks/hiking, walking a dog, and bicycling;
- 69% said health, wellness, and fitness is the most important function that should be considered when designing enhancements and/or improvements to the parks and trails system;
- 78% said walkable and bike-friendly development was the most important principle to consider when planning the parks and trails system; and
- Natural surface trails were preferred to paved surface trails.

Park County Active Transportation Plan (2016). For the entirety of Park County, *Active Transportation Plan* was adopted in 2016 and noted broad support for active transportation investments. Survey input was received from 400 people through this plan.

- 59% want to see improved hiking/biking trails, and walking paths;
- 70.4% were satisfied with their access to trails while 49.4% said they were dissatisfied with the number of trails; and
- Increasing the number of trails was the highest rank singular improvement people identified.

Figure 2-4: Sample Results of Growth Policy Update Visual Preferences Survey



How do you define community character?

"The streets are safe, everything is close enough to walk (which needs to be improved), public spaces and 'third places' are enhanced to create more interactions that define our unique community."

- One response to a question on Community Character provided through the public input on the Growth Policy Update



Livingston’s Planning Context

This is not the first time trails and active transportation have been explored through a plan in Livingston, but it is the first time there has been a plan focused on the subject.

A key component of the Trails and Active Transportation Plan is to use past planning efforts to inform the specific projects, programs, and policies for walking and rolling in Livingston. This chapter contains a summary of the existing plans and major projects.

Plans and Projects

Growth Policy Update. Improving pedestrian and bicycle safety and creating a complete and well-maintained transportation network are the two transportation goals in the adopted Growth Policy. They are supported by the recommendations contained in the Trails and Active Transportation Plan.

There are several supportive policy goals beyond the transportation section of the Growth Policy. A primary theme regarding land use is to promote infill and redevelopment of brownfields. These goals, when enacted, take advantage of existing infrastructure such as sidewalks, streets, and pathways. These strategies offer the greatest potential to create active transportation trips and greater return on investment.

Other goals, as identified in Figure 2-5, also expand choices and increase active transportation. Any new employment that is located within Livingston offers a chance for a local resident to reduce commute costs by walking and bicycling to work. The goal for identifying and improving non-motorized gateways means those who enter the City by automobile will recognize the safety and mobility of people using active modes is a higher priority than vehicle speeds.

Chapter 7: Land Use & Policy Recommendations provide specific transportation policies the City of Livingston can adopt to achieve the goals established in the 2021 Growth Policy.

Figure 2-5: Key Growth Policy Goals That Promote Trails & Active Transportation

Goal 8.1: Improve pedestrian and bicycle safety within the City.

Ensure trail and sidewalk connectivity within and around the City.

Make streets safe for all modes of transportation when planning for future developments and rehabilitation of existing transportation infrastructure.

Develop a Safe Routes to School Travel Plan for the City.

Review & update the land use plan to reflect the ability of the transportation system to maintain an acceptable level of mobility.

Goal 8.2: Create a complete and well-maintained transportation network within the City.

Develop additional grade-separated crossings to serve areas of planned growth.

Require road and multi-use trail and/or sidewalk connections to existing and future developments.

Ensure that bicycle, pedestrian, and trail connectivity is evaluated in all requests for modification or abandonment of public rights-of-way or access easements.

Other Sections that Support Trails & Active Transportation

Goal 2.1: Preserve and enhance Livingston’s unique community character

By identifying key non-motorized entry points and investing in them, the City will make it clear that people who walk and bike are a priority.

Goal 3.1: Prioritize infill over expansion

Infill means that existing infrastructure, such as sidewalks and pathways are maximized in terms of usage and return on investment.

Goal 3.5: Encourage the responsible growth of Livingston

If measuring new development according to the principles of Smart Growth, then new development must be walkable and provide a variety of transportation choices.

Goal 3.5: Rehabilitate brownfields for new development

By doing this, Livingston can control how new development occurs in these centrally-located parcel to maximize active transportation opportunities.

Goal 6.1: Strengthen and diversify...employment opportunities

Every job gained within Livingston means a city resident is more likely to be able to walk and bike to work and have additional income to spend locally due to a less burdensome commute.



Livingston Zoning & Subdivision Regulations. An outcome of the Growth Policy Update is likely to be changes to the zoning ordinance and subdivision regulations. The Trails and Active Transportation Plan includes a review and recommendations to the subdivision regulations as the City works toward these updates. A key recommendation is formally adopting the Trails Master Plan map (see Chapter 6) by reference in the City's code so trail easements are made a condition of approval of new development where these future trails are proposed.

The City's existing zoning closely aligns with the growth area map in terms of Livingston identifying undeveloped areas on the east and west sides of town for higher density residential development.

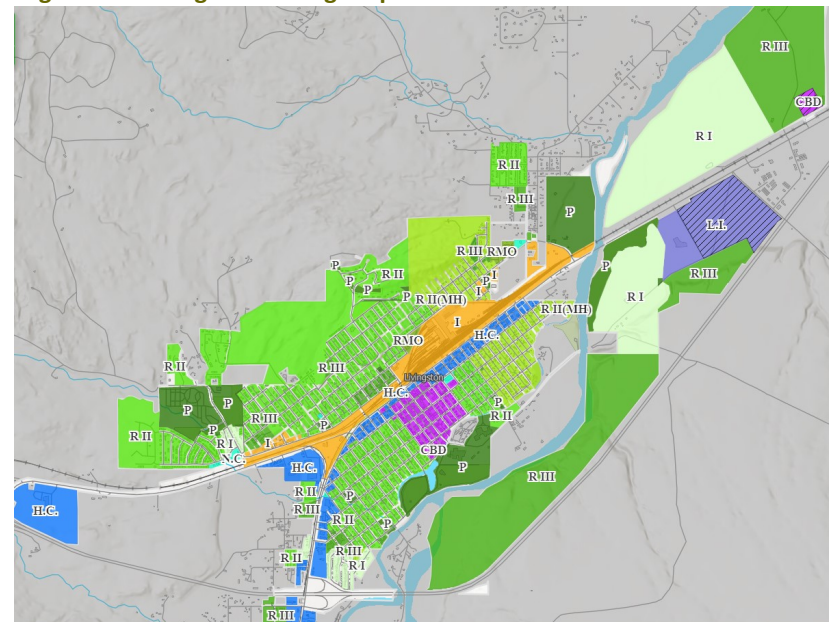
If realized, higher density development would help generate additional demand for trails and active transportation but needs linkages to planned and existing commercial, recreation, and educational land uses. As this growth occurs it is likely that internal sidewalk and bikeway networks will be built in subdivision, but this may still leave gaps connecting to and along major routes.

The City's subdivision regulations provide little direction for walking and bicycling routes. The current policy defines arterials, collectors and local streets strictly from a motor vehicle movement standpoint. Arterials are those main arteries of traffic that typically carry higher volumes of motor vehicles at higher speeds.

These arterials are also where key destinations are located and where people who walk and bike desire to go when traveling by those modes for non-recreational purposes. Collectors work to distribute traffic between arterials and local residential streets but oftentimes serve as a type of arterial for active transportation trips if they are parallel to major routes.

Policy recommendations included in this plan include defining what different types of streets mean for walking and bicycling, in addition to motor vehicle traffic. Through this, the City can better evaluate transportation impacts for all modes, as well as recreational access to trails, when reviewing and approving new subdivisions.

Figure 2-6: Livingston Zoning Map



Parks and Trails Master Plan. The purpose of the Parks and Trails Master Plan (2012) was to assess and inventory park and trails, as well as existing facilities and programs and develop a master plan to guide future development of parks and trails.

Public input sessions were conducted to guide the process. The input included widespread support for additional trails and active transportation.

The plan states that “balanced park systems require space for both active and passive recreation, designed to meet the needs of current and future residents, all tied together by trails and pathways into a cohesive system.”

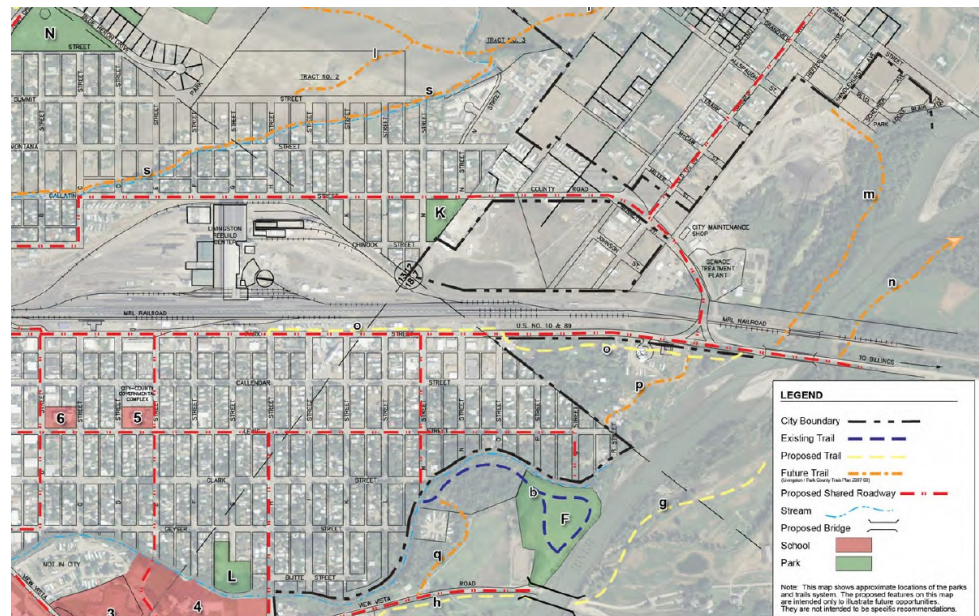
The park facilities identified in the plan are considered primary destinations for active transportation trips. A resident of Livingston should be able to access parks within the City by walking or bicycling instead of driving.

To accomplish this, the plan identifies existing trails, proposed trails, and potential shared roadways for bicycling. These routes form the basis for the assessment of such facilities that are explored in more detail for the Trails and Active Transportation Plan. Major trails identified as existing or planned include:

- Bozeman Trail Connector
- Bozeman Trail/Jondrow Spur Trail
- City Water Plant Trail
- Front Street Trail
- KPRK Trail
- Livingston Ditch Trail
- Livingston Depot Center Trail
- Mayor Landing Myers’ Riverview Trail, Yellowstone Bridge
- Sacajawea-Mayors Landing Levee Trail
- Shared Roadway Connectors

The total estimated costs of these trail and bikeway investments was nearly \$2 million.

Figure 2-7: Sample Trails & Bikeway Assessment in the Parks & Trails Master Plan



Northwest Livingston Infrastructure Project. The Northside Transportation Plan, which focused primarily on vehicular traffic, spawned the initiative to examine and fund major infrastructure projects in northwest Livingston, most notably an underpass of the railroad on this side of town. The cross sections proposed a shared use pathway on only one side of these roads, which may not be adequate to properly provide for safety, mobility, and access for non-motorized users.

If a pathway is built along one side of major arterials, then a sidewalk should be built on the other side along with frequent crossing points for bicyclists and pedestrians to access destinations easily accessible to motorists. A pathway on only one side of an overpass or underpass may be adequate as long as no major trip generators are developed on the opposite side to create out-of-direction travel for people using active modes. Any efforts to move to more detailed design for a railroad underpass or overpass should incorporate design guidance from sources identified in this Plan's Appendix.

ADA Transition Plan. The City completed an Americans with Disabilities Act Transition Plan in February 2019 to meet federal requirements. A Transition Plan and related self assessment is required as part of the 1991 passage of ADA, which is considered Civil Rights Law in the United States.

The goal of the Transition Plan is to identify existing barriers to accessibility for people with disabilities. It's relationship to active transportation is within the public rights of way that contain sidewalks and curb ramps.

Beyond annual investments to upgrade curb ramps, the following improvements are identified in the Transition Plan's Action Log for accessibility improvements to meet ADA requirements:

- O Street Connector Trail
- Increase sidewalk width on 5th Street Railroad Crossing
- Accessible connector trail to Big Hill
- Accessible connector trail to Small Hill
- Accessible crossing to Katie Bonnell Park

Figure 2-8: Northwest Livingston Infrastructure Project Schematic

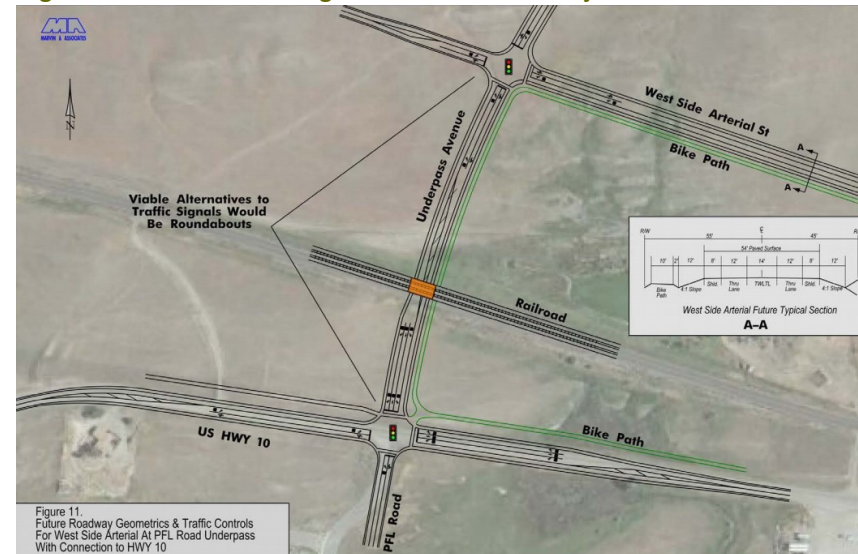
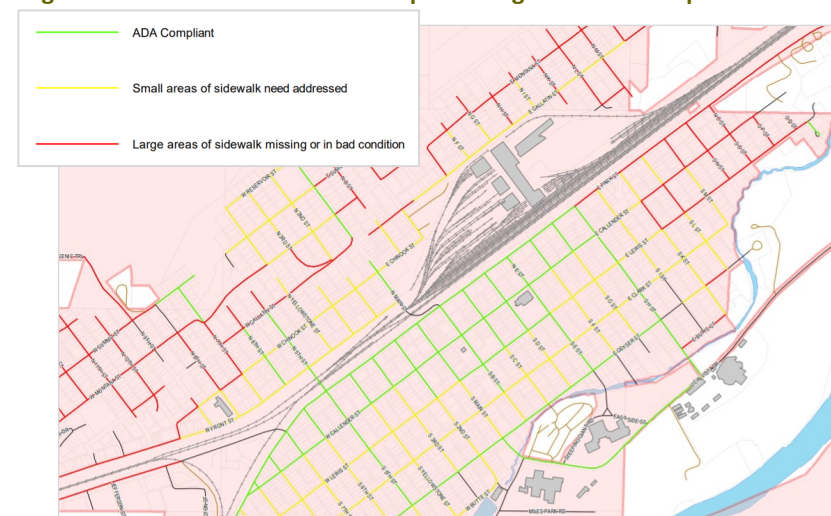


Figure 11. Future Roadway Geometrics & Traffic Controls For West Side Arterial At PFL Road Underpass With Connection to HWY 10

Figure 2-9: ADA Transition Plan Map Showing Sidewalk Compliance Status



Slow Roll Bike Audit. As part of the Growth Policy Update, the Park County Environmental Council partnered with the Livingston Bicycle Club in March 2021 to audit the City's bike routes.

The purpose of a bike audit is to evaluate the level of safety and comfort people feel while pedaling. The audit covered all of Livingston with stops at Lincoln High School, Green Acres, Northside Hill, and the Star addition. The audit leaders documented participants' experience in the realms of overall group reflections, safety, access, and comfort.

The audit report notes participants demonstrated that "neighborhoods (especially the Northside) feel disconnected from one another." It notes that while people generally have positive opinions of bicycling or walking within their neighborhood, "getting to and from each neighborhood (or into town from these areas) does not feel comfortable, convenient, accessible or safe."

Part of a Larger Vision

The Livingston Trails and Active Transportation Plan grew out of a call to action from residents of Livingston as well as momentum created by the 2016 Park County Active Transportation Plan (PCATP) and the Park County Environmental Council's Active Transportation Coalition (ATC)

PCATP. The objective of formalizing the PCATP is to create thoughtful interrelationships with community priorities and opportunities as well as to maximize resources already available. This document serves as an effort to focus on how Park County and the Park County Fairgrounds and Parks Board can function better to serve its population through four priority areas.

- Healthy and Safe Alternative Transportation Promotion
- Parks, Trails and Recreation Network Opportunities
- Effective Collaboration and Management
- Positive Economic Competitiveness

The Plan identifies a 27.6 mile shared use pathway along US 89 from where it currently terminates in Livingston to Miner.



Slow Roll Bike Audit

Volunteers from the Park County Environmental Council's Active Transportation Coalition organized to clear snow from the 89-South Bike Trail in March 2021.

Image: Park County Active Transportation Coalition



Active Transportation Coalition. The ATC is a group of citizens and county officials working to make Park County more walkable, bikeable and transit-friendly. Organized by the Park County Environmental Council, the ATC has spearheaded pop-up demonstration projects to pilot various bicycle and pedestrian infrastructure, programs, and policy improvements.

Examples are the Livingston Farmers Market protected bike lanes, cross-walks, haybale roundabout, and bike valet; Park Street red flag project; and curb extensions. The Park County Environmental Council facilitates the ATC and helps work to enhance safety and sustainability in local transportation.

The ATC leads and participates in local events, such as the Slow Roll Bike Audit, trail clean-up, and hosting special events where nationally-recognized speakers are brought to Park County to help motivate local residents and officials for improved transportation.

Building Active Communities Initiative. More than 30 communities across Montana participated in the Building Active Communities Initiative (BACI), a project of the Montana Department of Public Health and Human Services, from 2012-2018.

The mission of that initiative was to encourage policy and environmental changes to help make communities safer, more accessible, and inviting places for people to walk, bike, or take public transportation (if available).

In 2015, Park County sent a team of five leaders to the BACI Action Institute. Subsequently, the team spearheaded the development of the Park County Active Transportation Plan and the formation of the Active Transportation Coalition.

In 2017, Park County and the City of Livingston sent a joint team of seven leaders to the BACI Action Institute where Vitruvian Planning's Chris Danley was the main speaker. After attending the Institute, the team conducted a series of pop-up demonstration projects aimed at improving unsafe pedestrian environments.

Figure 2-10: Park County Active Transportation Coalition Mission



In 2018, the City of Livingston hosted the BACI Action Institute and sent another team of City-County leaders.

These educational and skill-building opportunities for City leaders, coupled with significant public outreach efforts, have led the City of Livingston to this point; the development of the Livingston Trails and Active Transportation Plan. This is the right time, the right people are engaged, and the public is interested in improving the walking and bicycling environment in Livingston.



The Human Touch

A human curb extension, showcased during the BACI efforts, in Livingston, show how street space can be reallocated for safety to reduce pedestrian crossing distance and increase visibility.

Image: Cathy Costakis



In their own words Laurel Rhodes

I'm obsessed with riding my bike. I ride it everywhere and like riding my bike for a purpose like running errands, getting groceries, and running my business by seeing my veterinary patients in their homes. It's fun because I'm taller, faster and cooler in the breeze I make. I feel good supporting my physical and mental health as well as the environment. One of the joys of living in a small town is I can bike pretty much wherever I need to go.

The biking improvement I hope to see is a paved path all the way to Livingston Healthcare hospital bike rack.

The other place I would really appreciate additional paved paths is at 7th and Park St. Currently the bike path parallel with Park St curves and goes up the railroad side with an option to cross the highway at the top of the hill. It would be so much safer and easier to access Spurline, Woods Rose, Radio Shack and Wispwest if there were paved paths on the opposite sides of Park and 7th.



3. Public Engagement

The Livingston Trails and Active Transportation Plan was not only informed by the public but literally built through public engagement. Having multiple opportunities for public engagement throughout the process, and offering participation in a variety of forms, was implemented to gain ample input in terms of number of inputs via survey responses and diversity of input via focus groups.

Public involvement should focus on the authenticity of the input rather than the volume of input. Instead of fixating on the number of people who attend meetings or take surveys, the goal of the engagement process was to garner authentic input and ensure that the results of surveys and meetings reflects the needs of all people in Livingston. Those who may be most reliant on a safe system of walking and bicycling routes may not have the time or resources to provide input. This is why the plan sought to engage organizations and people who work with vulnerable populations.

Steering Committee

The project garnered the support and direction of an active Steering Committee tasked with making sure the input was authentic and identifying organizations that merited individual outreach.

This group of Livingston Planning Staff and representatives from the public served as a sounding board for the project’s approach and key informants about the community. The Steering Committee met five times throughout the planning process. The Steering Committee participated in a walking meeting in April 2021. They explored different areas of the community and hosted discussions about different barriers to connectivity. Other meetings were held via Zoom. The Steering Committee meetings provided critical direction on the elements of the plan that should be prioritized. These critical issues included connectivity, access for a diversity of users, the railroad barrier, connections for the North side of town and safe routes to school.

Figure 3-1: Building a Plan Through Engagement



STEERING COMMITTEE MEETINGS



ORGANIZATIONS INVOLVED IN
FOCUS GROUP MEETINGS



SURVEY RESPONSES



MILES WALKED AND BIKED BY
CONSULTANT TEAM MEMBERS



PARTICIPANTS IN JULY 2021 PUBLIC MEETING,
COMMUNITY BIKE RIDE & LOOKING GLASS ACADEMY



Focus Groups

The Steering Committee helped identify organizations to participate in focus groups during spring of 2021. Six emphasis areas were identified for discussion among focus groups and one-on-one interviews. Figure 3-2 identifies the interests and representation of participants.

The robust conversations dug into core priorities for the community. They identified the biggest barriers for residents and visitors to safely move throughout the community and access important destinations such as schools, Yellowstone River and commercial districts. When we discussed what the vision of the plan should be, focus group participants shared that all neighborhoods deserve to have safe and easy access to a non-motorized network to access community destinations and services. Participants consistently identified schools as priority destinations and all neighborhoods should be connected, including the North side of the community.

The focus groups emphasized the importance of connectivity with complete infrastructure that is safe and separated from traffic. The network should be comfortable for all abilities and easy for families to navigate. The river was identified over and over again as central to the identity of the town and a huge amenity. Therefore, focus group participants strongly supported connecting and expanding trails along the river as a continuing strategy.

Participants also envisioned barriers like the river and railroad tracks being removed by constructing bridges to safely move walking, biking and rolling citizens to the other side. Finally, focus group participants envisioned an in-town network that would connect to longer routes and loops outside of town.

Perhaps the strongest theme heard across all focus groups was the emphasis on safety. Participants stressed the need to have clear and consistent guidance on standards (width, surface, wayfinding etc.) of trails, pathways, sidewalks and bike lanes so users can safely move through the network. Whenever possible it is preferred that paths are separated from traffic and that crossings are controlled and clearly marked with traffic calming integrated into the design.



Figure 3-2: Focus Group Attendees

Focus Group (Attendees)	Organizations / Representation
Conservation & Environment (5)	Montana Freshwater Partners Upper Yellowstone Watershed Park County Environmental Council Gallatin Valley Land Trust
Schools & Youth (5)	Livingston School District Big Brothers Big Sisters Farm to School Community School Collaborative
Community Interests (8)	Fairgrounds and Parks Board Parks and Recreation Board Historic Preservation Board Tree Board Park County Community Foundation Local Resident Integrated Trail Lab Arthur M Blank West Foundation
Local Businesses (8)	Chamber of Commerce / Visitor Center MSU Extension Service Economic and Community Development Downtown Business Owner Health Livingston Depot Real Estate Business Improvement District Business Owner Physical Therapy
Health & Healthcare (7)	Livingston Healthcare Foundation Livingston Healthcare LiveWell49 Park County Health Livingston Food Resource Center Park County Senior Center Learning Partners Community Health Partners
Vulnerable Populations (7)	Livingston Parks and Trails Committee Montana Independent Living Project Human Resource Development Council Stafford Animal Shelter (2) Active Transportation Coalition Counterpoint

The conversations often highlighted the importance the network plays in health and wellness. The benefits are physical, mental and emotional and when these habits are built during youth and they pay lasting dividends. Having access to outdoor places and nature is also an economic engine as many tourists focus trips on the opportunity to explore on bike or foot.

People with disabilities must also benefit from these investments. Ensuring that access and inclusion is open to all users (ability, age etc.) supports all citizen's health and well-being.

The pride of the community and strength of its' partnerships was evident when the participants spoke of creating a brand that reflected the history and uniqueness of Livingston. There was energy to create a wayfinding and amenity theme that would celebrate the community and add to the sense of place.

Community members agreed that one entity cannot create this network alone and it would take public-private partnerships and a diversity of funding streams to implement and maintain the trails and active transportation system year-round. This idea fueled excitement to access grants and volunteers and local government funds and other funding mechanisms to tackle both small and large projects.

One of the key focus group questions was discussing what should the plan prioritize. The participants generated a long list of community priorities, and four overall themes consistently emerged in the conversations. Additionally, two key themes related to health and access emerged. They are highlighted in Figure 3-3.

Health & Wellness. To help emphasize a theme of health, two focus groups were conducted with stakeholders from the health community and organizations representing vulnerable populations. They included representatives from seven different organizations including healthcare, public health, and organizations representing seniors, people with disabilities, and low-income residents (see Figure 3-2). Each group identified themes already discussed above such as safety, connectivity, maintenance of facilities, and wayfinding.

Figure 3-3: Key Priorities from Focus Group Meetings

Youth Need Safe Routes

to school and the ability to use the network from all parts of the community, notably the North side of town.

Provide supportive education and training.

Fill Gaps in Existing Infrastructure

by creating better connections in underserved areas, improving and increasing railroad crossings, and ensuring infrastructure is accessible.

Prioritize Safety

through speed management and traffic safety. Clearly identify spaces for people who walk and bike and provide wayfinding for them.

Prioritize Access to Community Resources

Including food outlets, health services, recreation facilities, downtown business, schools, and open space.

Improve Physical and Mental Health

with investments that provide safe and comfortable access to nature, as well as food, healthcare, and jobs.

Promote Access in All Realms

by identifying not only physical infrastructure needs, but access to things like proper clothing, education, route identification, and restrooms.



Focus group participants agreed there is clear evidence supporting the benefits of “outdoor movement” both for physical and mental health. They felt access to nature and wildlife also has benefits for mental health both for adults and children.

In addition to these benefits, focus group participants also identified the need to access jobs and basic needs, such as food and healthcare, as critical to support health and wellbeing.

Access & Inclusion. Focus group participants were clear on a variety of strategies that would be helpful to make Livingston a more welcoming place for all people. Focus group participants pointed to residents who did not own a car that need to access grocery stores and work at restaurants in southwest Livingston off Park Street.

They said these residents often “walk on the railroad tracks” due to missing sidewalks or lack of maintenance in the winter in order to access needed destinations. Other participants noted that some residents lack access to proper clothing (i.e., warm coats, hats, and gloves) or gear (i.e., bicycle, basket, light etc.) or infrastructure enhancements (i.e., bike repair stations and bike racks) and education on how to maintain a bicycle.

Narrow sidewalks and sidewalks with no curb-cuts make it very difficult for people using assistive devices, such as wheelchairs or walkers, or even child strollers, to get to where they need to go.

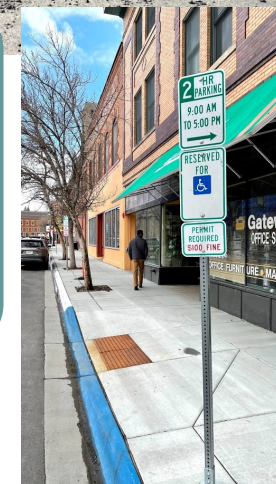
Several focus group participants suggested that informational group walks for individuals that may be more hesitant and need more social support to better understand the safest, most accessible, and connected routes could increase safety and usage of the walking and bicycling network for vulnerable users such as seniors and individuals with disabilities.

Locating public bathroom facilities at key areas in the city would be helpful, especially senior populations wanting to get out and walk or roll. In addition, having clearly identified rules for trails, such as places where dogs need to be on a leash, may improve safety and comfort for more vulnerable users.



Access & Inclusion

Beyond constructing facilities that are accessible for all people, keeping those routes clear of snow and debris makes the space usable instead of forcing people into unsafe situations, such as using the railroad tracks to access destinations.



July 2021 Public Involvement Events

The week of July 26 was identified as a full week of on-the-ground public involvement and field evaluation by the consultant team. By this time a preliminary list of projects had been identified and mapped via input from past plans, the Steering Committee, Focus Groups, and the Public Input Survey (see next section).

Three public involvement events were conducted to bring different perspectives together to inform the Plan's content.

Looking Glass Academy. A two-day workshop on the key design elements of walking and bicycling infrastructure was conducted on July 28 and 29 at Park County High School. Twelve people took part in this workshop, including representatives of the City, Park County, Montana Department of Transportation (MDT), and Park County Environmental Council.

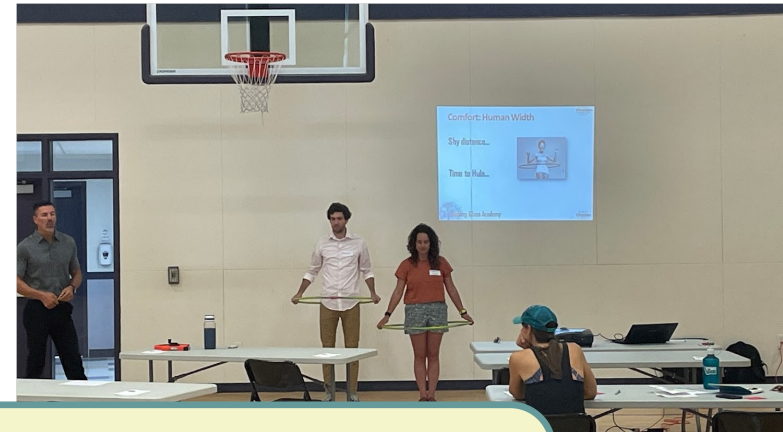
The goal of the workshop was to build local capacity for implementing the Plan once the consultant's efforts are complete. The workshop focused on things like how people who walk and bike experience streets through their senses and in ways not experienced by motorists.

Federal design guidance was highlighted as part of the workshop to help participants gain an understanding of the many tools available, including many that may not be a part of an agency like MDT's design manuals.

The course included formal presentation modules coupled with walk audits around Livingston to evaluate specific streets and identify likely design needs to make them safer for active transportation.

Public Meeting. A public meeting was held at the Civil Center the evening of July 29, 2021. Maps of the draft trails, sidewalks, and bikeways were displayed with participants asked to comment on them and add routes for the Plan to incorporate.

Fifteen (15) people came to the public input meeting, which was



Time to Hula!

The Looking Glass Academy showcases people as the “design vehicle” for walking and bicycling facilities. By using simple tools like a hula hoop, participants begin to understand the human bubble that is present when we walk. Each person's bubble is approximately 3-feet wide, which means a sidewalk that is built to a minimum width of 5-feet is not wide enough for two people to walk side by side.



formatted for drop-in discussions. Much of the focus was on the trails map and identifying linkages in a trails system both within the City and surrounding unincorporated areas of Park County.

Participants provided additional input on where they would like to see safer crossings of various streets in Livingston, including Park Street, Highway 10, Gallatin Street, H Street, and others.

The consultant team utilized this input to conduct additional field evaluations on Livingston’s streets and trails on July 30.

Community Bike Ride. The week culminated in a Community Bike Ride the morning of Saturday, July 31, 2021. The goal of the bike ride was to showcase locations where projects were identified and discuss the opportunities and challenges with each of those locations.

The six-mile ride began at the Yellowstone Gateway Museum and continued to six stops along a route that included Summit Street, Front Street, 5th Street, Lewis Street, River Drive, Park Street, and Gallatin Street.

Participants were asked to summarize their experience while on the ride as well as their daily routines involving these routes. They were asked to identify how projects at these various locations would improve safety and mobility for Livingston residents.

The ride also provided an opportunity for participants to observe other people walking and bicycling around Livingston. This led to discussions about equity, family bonding, health, and economic development.



Multimodal Input

A diverse perspective of people of different ages and abilities was gained by providing three different avenues for input on the Trails and Active Transportation Plan. The Community Bike Ride allowed people to see the exact locations where projects were proposed in addition to the input received on project maps provided at the public meeting.



Input Survey

A public input survey was posted online and in hard copy format. It received 311 responses over a two-month period in summer 2021. It is important to note this is a public input survey and not a statistically-valid survey, which means input priorities may be skewed based on the distribution of the survey. This is why survey results are vetted and combined with input from the Steering Committee, focus groups, and consultant team to validate the responses and represent the needs of those who may not have known or had access to the survey.

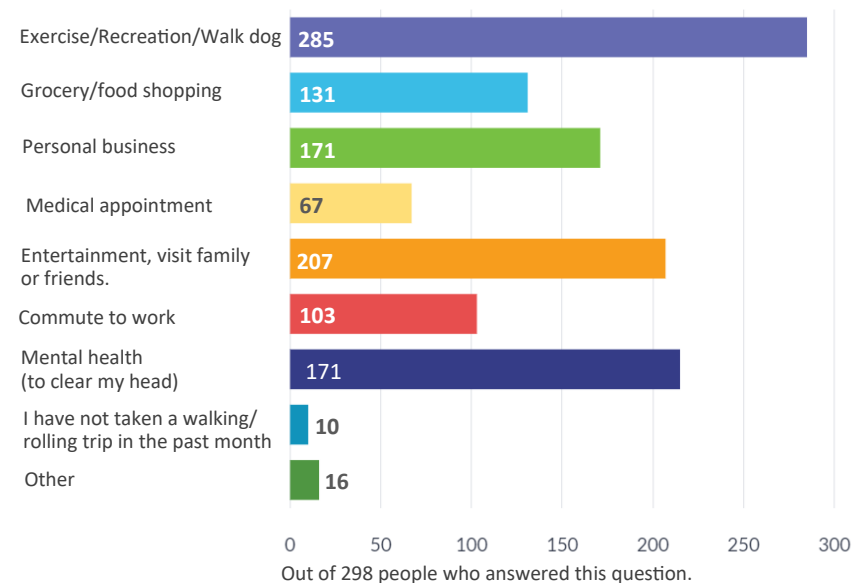
More than 300 responses is considered a strong level of input for a city the size of Livingston. The geographic distribution of those who took the survey was dominated by areas south of the railroad tracks, with southwest having 75 people and southeast with 62 responses. Areas north of the railroad tracts had notably fewer responses, with 48 from the northwest, 16 from the northeast sector, and 16 from the northside hills. Responses from Park County residents living outside City limits accounted for 51 responses.

Other key demographics of those who took the survey include:

- 50.5% of respondents were between the ages of 35 and 54, compared to that age range comprising 25.1% of residents.
- More females took the survey than males, by a 2-to-1 margin.
- 37.0% of respondents work at a location outside their home and in Livingston
- 11.4% telework from their home in town compared to only 3.8% doing so before the COVID-19 pandemic.

A key element of the survey was trying to determine the degree to which people walk or bike for various purposes. Figure 3-4 represents survey responses related to purposes for walking and bicycling. People could choose several options. Nearly every respondent said they walk or bike for exercise, outdoor recreation, and activities like walking their dog. Nearly 2 out of 3 said they walk for mental health and for personal business.

Figure 3-4: Why People Walk and Bike
For what purposes do your walk, roll, or bike in Livingston?
People chose all that applied.



Interest and Confidence. Understanding the type of interest and confidence people have in walking and bicycling helps Livingston understand how facilities are being used. It also reveals how many people may not feel confident taking a trip via active modes. Survey results indicate input was received from a very active and recreation-oriented group of people. More than 70% of respondents noted their interest and confidence in walking at a rapid pace, for recreation. More than 1 in 5 said walking is how they get around.

These inputs point to a need to connect people from their neighborhoods to pathways and trails via sidewalks and safe crossings. Such investments yield greater activity and address the access and safety needs of utilitarian trips and people with disabilities.

For bicycling, it is important to understand the various levels of confidence when it comes to sharing streets with motorists. Understanding the level of interest and confidence by those who are either somewhat confident or interested, but concerned, showcases those who do not desire to share lanes with motorized vehicles.

- **24.1% identified as highly confident bicyclists** who will ride in traffic with limited or no bicycle-specific infrastructure.
- **44.8% of identified as somewhat confident bicyclists**, preferring bicycle-specific infrastructure and trails.
- **18.4% said identified as interested but concerned bicyclists**, preferring to bike on sidewalks and be far away from traffic.

The more than 63% who identified as “somewhat confident” and “interested but concerned” should be the target group of riders on which to focus investments. A limiting factor in Livingston will be the lack of opportunities to retrofit many streets with in-street or separated bike lanes. Therefore, it is important to provide a combination of separated pathways and apply speed management techniques to narrow streets, to ensure motor vehicle speeds and volumes are low enough that people are comfortable sharing that space with motorists.

Figure 3-5: Walking Interest & Confidence
When deciding whether or not to walk or roll (use a wheelchair or other mobility device) in Livingston, how would you describe your level of interest or confidence in that walk?

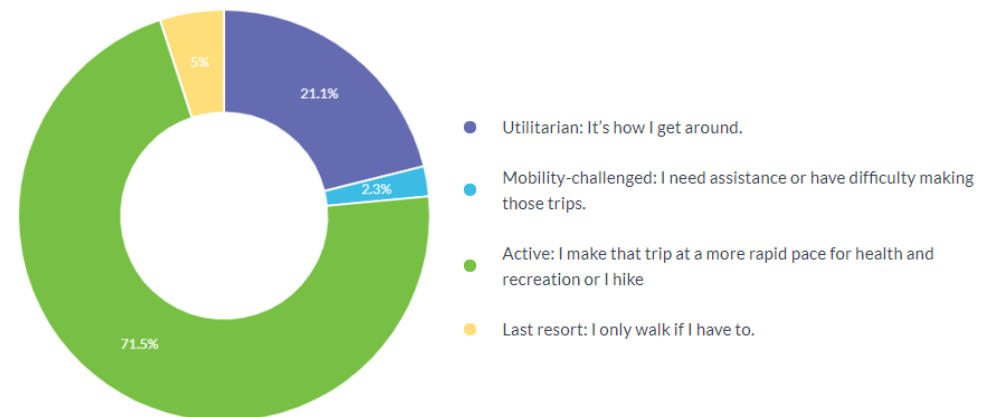
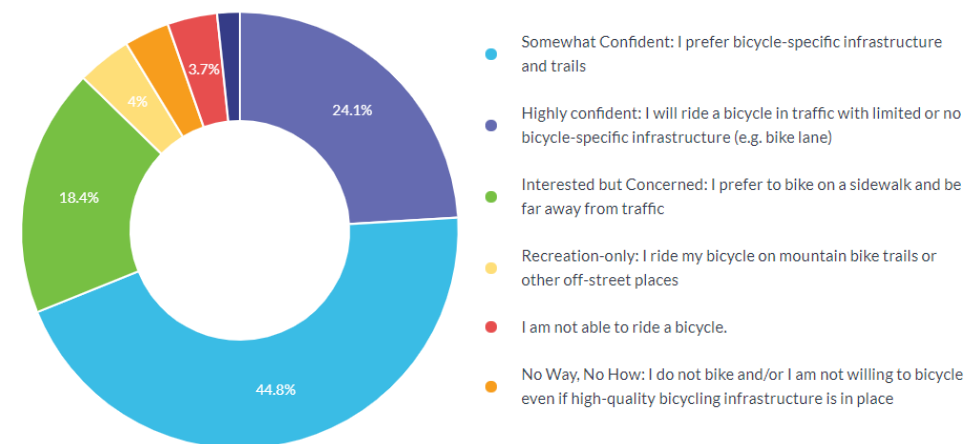


Figure 3-6: Bicycling Interest & Confidence
When deciding whether or not to ride a bicycle in Livingston, how would you describe your level of interest or confidence in taking that trip?



Making Investments. The survey asked people to provide input on specific reasons for walking and bicycling, as well as locations in Livingston where they felt changes were needed to increase comfort, safety, and access. Key inputs in these areas are summarized in Figure 3-7.

The lack of facilities dominated the input on reasons why people chose to not take a trip via an active mode. Many expressed concerns over traffic safety and speeds, as well as barriers like the railroad tracks that are difficult to overcome.

Respondents indicate they felt features such as trees and buildings that provide shade were the most satisfying aspects of walking and bicycling in Livingston. This is important to consider as the City grows and approves new subdivisions. These responses suggest policies for street design should include street trees between the curb and sidewalk, just as they do in the older parts of the City. Research also shows street trees help manage traffic speeds and make streets safer for all modes of transportation.

Figure 3-7: Other Survey Priorities

Top Reasons to Not Take a Trip by Walking or Bicycling

1. Lack of adequate pathways and crossings.
2. Traffic safety or speed concerns.
3. Barriers are too much to overcome.

Most Satisfying Aspects of Walking & Bicycling

1. Shading by trees and buildings.
2. Walking or rolling to retail, restaurants, parks, etc.
3. Personal safety.

Top Priorities for Making it Safer for Children

1. Safe Routes to School program.
2. Street design to promote lower vehicle speeds.
3. More opportunities to walk/role with other children/parents.

For children, respondents support a comprehensive Safe Routes to School program in combination with street design to promote lower motorist speeds. They also desired more opportunities to socialize with other families via active modes.

In terms of the most desired investments for walking, respondents identified the existing 5th Street railroad crossing as one in need of improvements. They also identified filling sidewalk gaps on Front Street north of the railroad tracks and along Park Street through the remainder of downtown.

The most desired places for additional trails and pathways were the north hills area and water tower, as well as filling gaps along the Yellowstone River between Miles Park and Mayor's Landing. People also supported constructing the Mayors Landing Bridge.

Bike routes are desired, along with pathways, along major roads. An additional railroad crossing, as well as pedestrian needs at the 5th Street crossing, received ample support.

Most Desired Walking Infrastructure Investments

1. 5th Street Railroad Crossing Upgrade
2. Front St/Star Road Sidewalks
3. Park St Sidewalks, I St to O St

Most Desired Trail/Pathway Investments

1. Water Tower Area & North Hills
2. Miles Park to Mayor's Landing
3. Mayors Landing Bridge

Most Desired Bike Route Investments

1. US 89/Park Street/Hwy 10 Pathway Connections
2. 5th Street Railroad Crossing Upgrade
3. Another Railroad Crossing



When do people walk, roll, and bike? Figures 3-8, 3-9, and 3-10 reflect input on the times of week and times of year that people that people walk, roll, and bike. Nearly two-thirds of respondents said they engage in active transportation all times of the day and week (Figure 3-8). Weekday afternoons received the most responses when it comes to specific times, which indicates the survey bias toward recreation-based respondents.

A key theme in discussions on goals for the plan is ensuring active transportation routes are safe and accessible at all times of year. As expected and shown in Figure 3-9, more than 50% of survey respondents said they make more than 20 trips per month via active modes during summer. Another nearly 16% said they make between 11 and 19 trips in a typical summer month.

The survey inputs indicate this desire for year-round maintenance to keep routes clear of snow and debris. More than 1 in 4 respondents said they make more than 20 trips via active modes in a typical winter month (Figure 3-10).

Figure 3-8: Active Transportation By Time of Day/Week
When do your walking, rolling or bicycling trips typically occur?

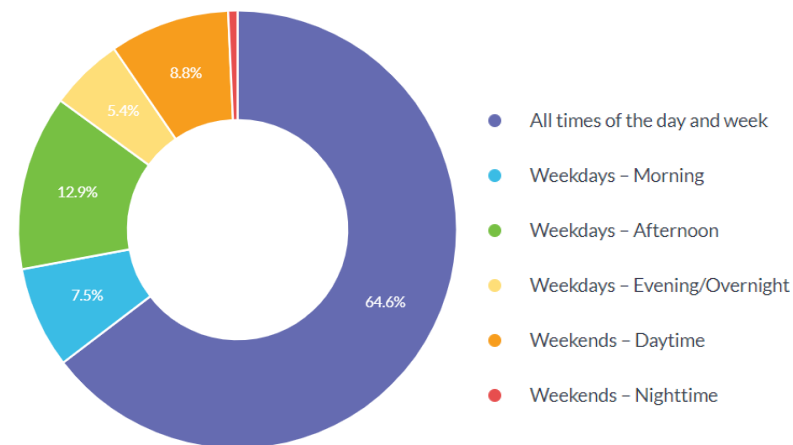


Figure 3-9: Active Transportation in Summer

In an average summer month, how many trips did you make a one-way walking, rolling, or bicycling trip of more than five minutes in Livingston?

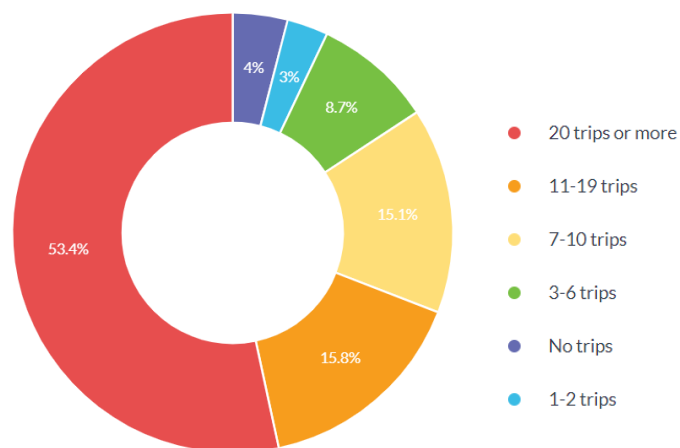
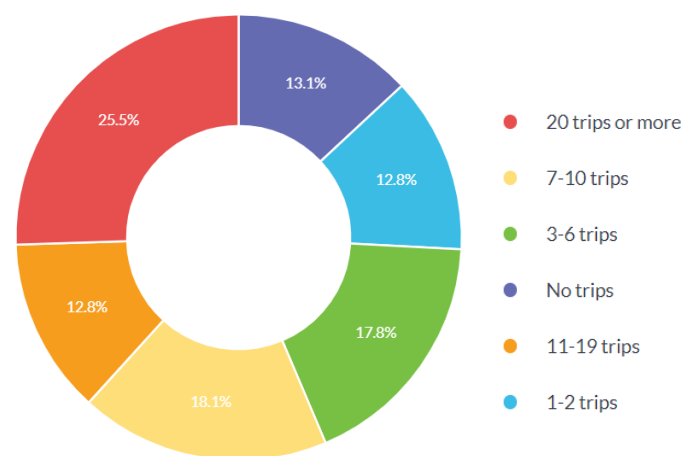


Figure 3-10: Active Transportation in Winter

In an average winter month, how many trips did you make a one-way walking, rolling, or bicycling trip of more than five minutes in Livingston?



4. Priority Projects

There are 23 sidewalk and/or bikeway projects and more than 20 trail and pathway alignments identified through input for the Trails and Active Transportation Plan. In order to streamline the plan implementation and provide the City with a focused list of projects to pursue, the 23 sidewalk/bike projects were prioritized along with nine trail/pathway projects.

This chapter details the 12 projects that were ranked and determined to be in the top tier of 32 projects. Twenty projects that ranked lower are summarized, along with recommendations for specific street crossings, in Chapter 5: Other Projects.

Identifying Projects

The list of 32 projects were identified through past plans, public input, Steering Committee recommendations, and consultant field review. Figure 4-1 at right shows how this occurred. Public input identified places where people would like to walk, roll, and hike as well as the routes that would allow them to do this more often.

Sidewalk projects are intended to fill gaps in the system. Bikeway projects consist primarily of adding signage, pavement markings, and speed management treatments to existing streets. This is due to limited opportunities for full bike lanes. Trails are considered single track routes while pathways are for shared uses and may be paved.

Those suggestions were combined with projects or project-related themes contained in past City and Park County plans and verified through the Steering Committee. Once the consultant team refined the list and identified likely projects and project termini, the projects were mapped and are illustrated in Figure 4-3 (page 36). Note additional trails and pathways were identified through the planning process but were not included in the project ranking due to alignments fully outside City limits or other feasibility constraints. All identified pathways and trails are included on the master plan map contained in Chapter 6: Trails Master Plan.

Figure 4-1: Project Identification



Ranking Projects

The 32 projects were subject to a ranking process that incorporated several criteria identified and weighted by Steering Committee input. The goal of the ranking was to perform a multi-criteria evaluation on the different project types in order to provide a general order of priority for implementation.

The criteria shown in Figure 4-2 illustrate how projects were scored. The maximum number of points available for each criteria ranges from 5 points to 15 points for a maximum possible score of 100 points per project.

Steering Committee members were asked to identify how they would score projects based on several possible criteria. Their inputs were averaged to identify the relative weight of each criterion, which is reflected in the maximum number of points available for that factor.

Projects were scored based on this weighting. Based on the initial ranking, the Steering Committee was allowed to assign up to 5 ad-

ditional points to projects they saw as a priority or where other project intangibles not reflected in the ranking criteria suggested the project warranted a higher score. Full details on project scoring and detailed ranking are included in the Appendix.

Top Tier Projects

The consultant team used the outcomes of this ranking process to identify the top tier of 12 projects that constitute short-term priorities for Livingston and its partners. Those are the projects that have the most detailed information. The remaining 20 projects are more illustrative and identified in the next chapter.

While the 12 top tier projects are listed in order of priority, it does not necessarily mean the top priority project is completed first, as implementing some projects may take more time due to budget and property impacts. The City and its partners should begin pursuing funding for the top priority projects under each project type (sidewalk, bikeway, pathway/trail).

Figure 4-2: Project Ranking Criteria

Sidewalk & Bikeway Criteria	Max. Points
Proximity to Schools	15
Fills Gap in System	15
Population in Need	15
Proximity to Downtown, Healthcare and/or Social Services	15
Proximity to Parks or Natural Areas	10
Bus Route Access	10
Traffic Exposure	5
Access to Food	5
Ease of Implementation	5
Steering Committee Priority	5

Trails & Pathway Criteria	Max. Points
Proximity to Parks, Trails, Natural Areas	15
Fills Gap in System	15
Population in Need	15
Proximity to Downtown, Schools, Food Outlets and other Community Assets	15
Provides Alternative to On-street Route	10
Ease of Implementation	10
Topography & Related Challenges	5
Environmentally-sensitive Area	5
Presence of Existing Parking/Amenities	5
Steering Committee Priority	5



Figure 4-3: Ranked Projects with Top Tier Projects **X**

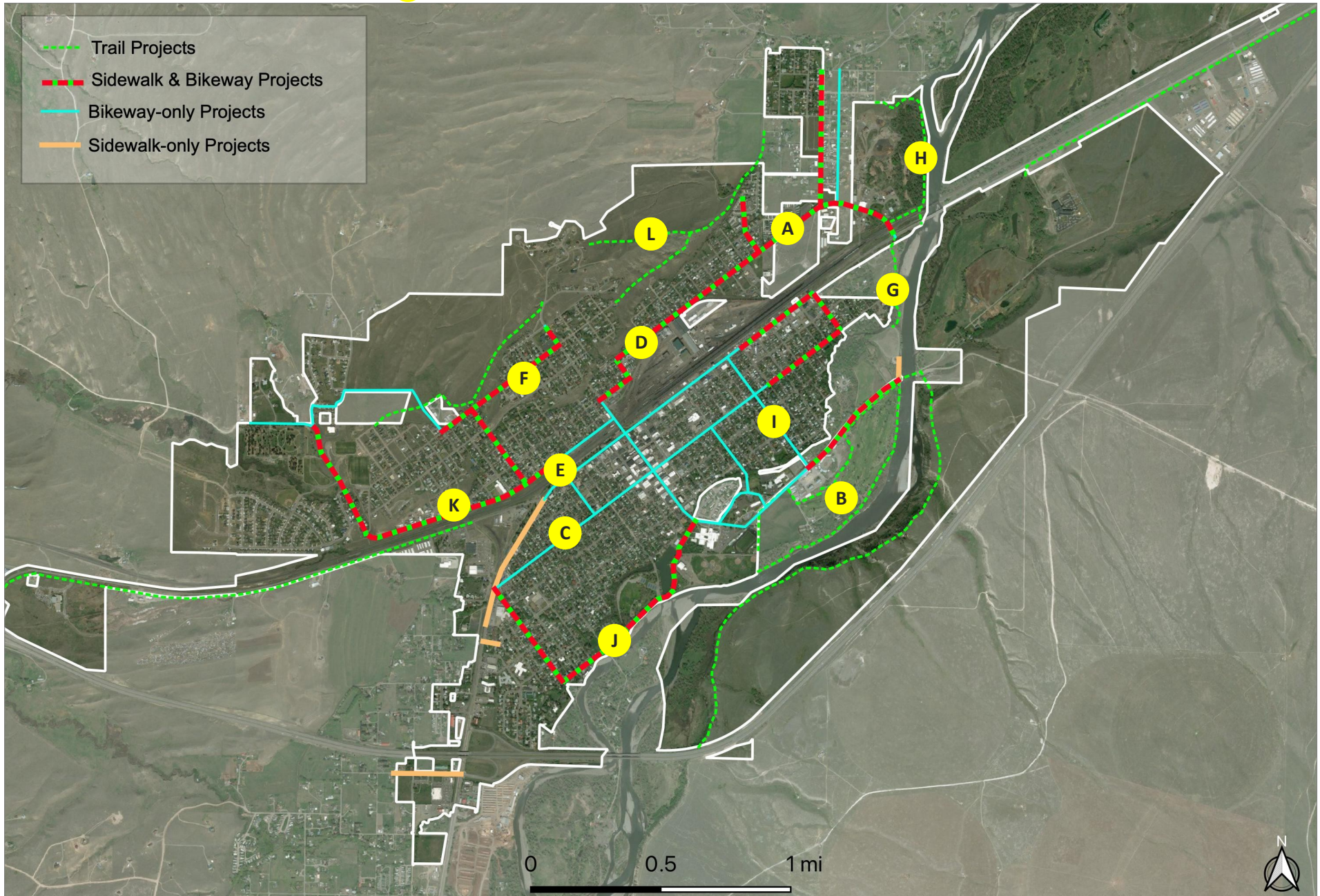


Figure 4-4: Top Tier Projects for Short-Term Implementation

Top Tier Projects, in order of priority ranking	Type	Length	Description	Cost Estimate
A. Gallatin/Bennett, N St to Park	SW+BW	0.6	Add sidewalks on north side, sign as bikeway & consider speed management features.	\$200,000
B. Yellowstone River Trail, north side, Baseball/Softball Complex to Mayor's Landing	PW	0.9	Construct compacted surface shared use pathway. Optional alignments along river or fairgrounds.	\$90,000 to \$150,000
C. Lewis/O St Crosstown Bikeway, Park to O St	SW+BW	1.7	Sign as bikeway, fill sidewalk gaps & apply speed management features.	\$10,000 to \$150,000
D. Gallatin/C/Chinook, Main to N St	SW+BW	0.8	Rebuild sidewalks, sign as bikeway & apply speed management features.	\$120,000
E. 5th, Front to Park	SW+BW	0.1	Rebuild sidewalk to pathway width across railroad.	TBD
F. Summit, 7th to Main	SW+BW	0.4	Add sidewalks on one side, acquire land for link between 5th and 7th.	\$75,000 to \$90,000
G. Yellowstone River Trail, Mayor's Landing to O Street Connector	PW	0.4	Construct compacted surface shared use pathway.	\$140,000+
H. Yellowstone River Trail, north side, US 89 to Whiskey Creek Road	PW	0.6	Construct compacted surface shared use pathway and underpass of bridges.	\$250,000
I. H St, Park to Lewis	BW	0.5	Sign as bikeway, upgrade Geyser to possible mini-roundabout & apply speed management features.	\$40,000 to \$200,000
J. River Dr, 12th to Main/View Vista	SW+BW	0.8	Add sidewalks/walkway on north side, sign as bikeway.	\$250,000
K. Front, 5th to Star Road	SW+BW	0.8	Add sidewalks on north side, sign as bikeway & consider speed management features.	\$150,000 - \$200,000
L. North Hills Trails, East, Green Acres to Summit/Water Tower	TR	1.2	Build single track trails with street connectors.	\$50,000

SW = Sidewalk Project; BW = Bikeway Project; PW = Pathway Project (8-10 feet wide); TR = Trail Project (single track)

Cost estimates are in 2021 figures and include construction estimates only.



A. Gallatin/Bennett, N St to Park - Sidewalks + Bikeway

Construct sidewalk or alternative pedestrian walkway along the north and east side of Gallatin and Bennett to connect to Park Street. Sign and designate as a bikeway. Curbing exists from N Street to Miles Street, which makes sidewalk and curb ramps construction easiest in this section. From Miles Street to Park there are options on the north/east side for an extruded curb walkway that would extend the shoulder and allow for stormwater to flow through breaks in the curbing. This would reduce the cost and improve the ease of implementation through the current section that lacks curbing. A pedestrian signal at Park to link to the O Street Connector presents other traffic challenges and needs to be discussed with MDT. The dotted lines show an option along the railroad, river and Veterans Bridge that would help people avoid the Park intersection altogether.



Project Details

- **N Street:** Consider a Rectangular Rapid Flashing Beacon, with crosswalk and curb extension, to connect to Kate Bonnell Park.
- **Park Street:** This intersection would benefit drivers, pedestrians and bicyclists by adding a full traffic signal. Pedestrian-only signals may introduce other complexities related to speed and sight distance from the east.
- **Railroad/River Connector:** Getting pedestrians and bicyclists through this area may be better served by a pathway along the railroad, under the bridges, and O Street Connector link. Shown as a dotted line, and included as part of project H.
- **Bikeway Designation:** To add bike lanes would require prohibiting on-street parking along the route with existing curb. It is feasible based on limited usage of on-street parking east of G Street. The route may be signed as a bike route before any walkways are built. It may include the addition of shared lane markings and other speed management features such as curb extensions at intersection.
- **Long-term:** If options arise along the railroad property on the south side, then consider a shared use pathway and enhanced crossings at Miles and Garnier.

Cost Estimate: \$ 200,000

Project Length: 0.6 miles



An expanded shoulder with an extruded curb walking on the north/east side may be a short-term option from Miles Street to Park Street.

Influences

- No existing pedestrian access to north side of tracks
- Northside neighborhoods & new housing
- Kate Bonnell Park
- O Street Connector
- Park Street

Challenges

- Railroad crossing (See Project H)
- Lack of curbing east of Miles Street.
- Slopes on north/east side along city property
- MDT coordination on Park St./Bennett intersection



B. Yellowstone River Trail Baseball/Softball Complex to Mayor's Landing - Pathway

NOTE: Pathway alignments are conceptual and do not reflect detailed design or alignments to the degree that impacts to individual properties or structures can be known.

Identified in the 2007-2008 Livingston/Park County Trails Plan, this project fills gaps in the pathway system by acquiring easements and construct a 10-foot wide unpaved shared use pathway to connect Mayors Landing to the existing pathway along the Yellowstone River. When combined with other projects to extend pathways north of Park Street, it would allow a non-motorized, off-street option to get to the various recreational and educational facilities on the western terminus of this project. It would also link to the “festival street” and River Drive route. Two route options can be explored:

- **Option 1** is primarily a public land option along existing properties owned by Park County or School District. A portion of Option 1 may be built alongside View Vista Drive.
- **Option 2** is more ideal as it fills the gap along the Yellowstone River but will require negotiating easements with private property owners.



Project Details

- **Pathway Surface:** Continue with unpaved surface with compacted gravel to ensure ADA compliance. Ideally, a shared use pathway is 10-feet in width but may be 8-feet in constrained sections. A pathway narrower than 8-feet may not be appropriate for bicyclists to use.
- **View Vista Drive:** This route is identified as a sidewalk project, but is ranked in the lower tier. Constructing a walkway along the north side may be part of Option 1 or an interim pathway connection. This would provide for additional safe routes to school, especially when combined with other pathway projects to link areas north of the railroad tracks.
- **Crossings:** If completed along the Option 1 route, then consider enhanced crossings, with features such as Rectangular Rapid Flashing Beacons, crosswalks, and curb ramps at East Side Street. An H Street pathway connection may be considered through the Fairgrounds property.
- **Long-term:** Both options can be considered for implementation as they serve different locations and different purposes. Option 1 may be best-suited as a paved route with Option 2 as an unpaved route to continue the design theme along the river.

Cost Estimate: \$ 90,000 - \$150,000

Project Length: 0.9 miles

Influences

- County Fairground & work with Fair & Parks Board
- River, as well as existing pathways and sidewalks
- Schools, recreation facilities, fairgrounds, dog park
- Planned pathway river crossing
- Civic Center

Challenges

- Private property
- Alignment along the river bank
- Fairgrounds property



C. Lewis/O St Crosstown Bikeway, Park to O St - Bikeway

The Lewis/O Street Crosstown Bikeway is a suitable bicycling alternative to Geyser due to lower volumes of traffic and potential for fewer stops signs. Upgrading this route as a bikeway can begin with special signage, wayfinding, and shared lane markings (low estimate). The City may consider speed management features, such as traffic filters, curb extensions, chicanes, and speed humps at points along the route to help slow traffic and clearly denote it is a bike priority corridor (high estimate). There are sidewalk gaps on Lewis, east of M Street and along O Street from Lewis to Park and prioritized as a separate sidewalk project ranked in a lower tier. The City may pursue sidewalk requirements for property redevelopment or advisory shoulders (see more in the Appendix design guide section). Speed management features can also reduce speeds and make these segments safer for using the street for walking.

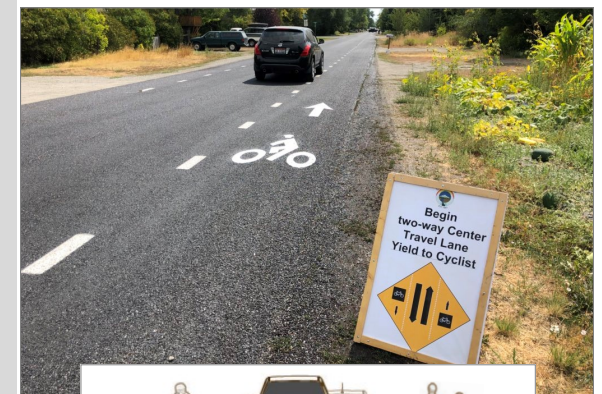


Project Details

- **Park Street (west side):** Coordinate with MDT for enhanced crossing at 12th & Park (existing crosswalk). This may include Rectangular Rapid Flashing Beacon (shown in crossings map, project E).
- **5th Street:** This intersection is a priority to raise visibility for bicyclists and pedestrians and slow speeds for vehicles approaching Lewis on 5th. Consider curb extensions and raised crosswalks.
- **B St to C St:** Consider street enhancements to make this a place for Open Street events and street fairs given the uses at the Lincoln School. Add curb extensions and consider traffic filter at C St.
- **H St:** Place signage on H Street to indicate a bikeway crossing is ahead so motorists are more aware. Install enhanced crossing with Rectangular Rapid Flashing Beacon (crossing map, project N) and street-facing push button for bicyclists. Work with MDT to consider a raised intersection to help slow vehicles on H.
- **Downtown:** Add bike parking or bike corrals in corner areas where parking is not allowed in the street.
- **Long-term:** Explore additional locations for adding curb extensions, Rectangular Rapid Flashing Beacons, and raised crossings as bicyclist use increases or problematic crossings are identified.

Cost Estimate: \$ 10,000 - \$150,000

Project Length: 1.7 miles



Influences

- Residential neighborhoods & nearby schools
- Shopping along Park Street (west)
- Downtown
- 5th Street Crossing & O Street Connector

Challenges

- Park Street crossing and MDT coordination
- H Street speed management techniques
- Advisory lane and other speed management treatments will need education for road users and property owners along Lewis

Advisory shoulders are a federally-endorsed road striping treatment to create a center drive aisle in order to create advisory bike or walking lanes on either side. They can be applied with or without on-street parking.



D. Gallatin/C/Chinook, Main to N St

This project, that when combined with the Gallatin/Bennett walkway project (A), will provide a complete, accessible sidewalk route and bikeway north of the railroad tracks between Main Street and Park Street. Where sidewalks exist, the project includes fixing sidewalk cracks and heaves, constructing ADA-compliant curb ramps, and speed management features. Bikeway improvements include route signage and wayfinding. Bike lanes are an option if on-street parking is prohibited.



Cost Estimate: \$ 120,000 **Project Length: 0.8 miles**

Project Details

- **Main St:** This may include Rectangular Rapid Flashing Beacons.
- **Gallatin/C:** Fill short sidewalk gap on north side at curve.
- Apply speed management techniques, such as curb extensions, median islands, landscaping and public art.
- **Long-term:** Pursue shared use pathway on railroad property side of the street.

Influences

- Residential neighborhoods
- Only continuous route north of railroad tracks

Challenges

- Determining appropriate speed management techniques
- Evaluate Montana St as alternative route option.

E. 5th, Front to Park



This 400-foot segment has existing sidewalk but is commonly used by pedestrians and bicyclists to cross the railroad tracks. MDT is developing a project to upgrade this railroad crossing. It should include a 10-foot pathway on the east side and sidewalks on the west side, with crossing gates for pedestrians and bicyclists.

Cost Estimate: TBD **Project Length: 0.1 miles**

Project Details

- **Sidewalks:** The west side sidewalks are desirable since there is likely to be this one opportunity in a generation to add them. It will provide a more direct route to planned Front Street sidewalks, west to Star Road.
- **Crossing:** Avoid chicanes or similar fencing that forces bicyclists to dismount to cross. This is a challenge, and considered discriminatory, to force bicyclists with disabilities to dismount as they may not be able to dismount and walk their bike through tight turns.

Influences

- Residential neighborhoods & nearby school
- Access to/from northside of tracks

Challenges

- Coordination with railroad and MDT on safe crossing treatments.
- Identifying on-street treatments for bicyclists who prefer road to pathway.



F. Summit Street, 7th to Main - Sidewalk + Bikeway

Summit Street lacks a formal connection between 5th Street and 7th Street even though it is used as a pathway today. If this connection was formalized via acquisition of an alignment and construction of a pathway, it would provide a critical active transportation network linkage to North Hills neighborhoods. The combined bikeway route of 7th and Summit allows for a gentler grade on which to bike. Montana Street does not have sidewalks; constructing them along Montana would create other feasibility issues due to terrain. Sidewalk gaps exist east of 5th Street and along Main Street from Summit Street to Reservoir Street. This connection may warrant additional analysis of the Main/Summit intersection to include enhanced crossings with Rectangular Rapid Flashing Beacons and street-face push buttons for bicyclists.



Project Details

- 5th to 7th Connection:** While pathways exist, land will need to be secured to complete this connection. This does not require the connection to be straight along a conceptual Summit Street alignment, but it must not create major out-of-direction travel for users.
- Main Street:** A short sidewalk gap exists on the west side of Main along the church frontage. This should be filled with the Summit Street project or before.
- Trail Linkage:** With trails planned in the adjoining foothills, consider a north-south single track trail linkage from the cul-de-sac on Summit, east of 7th.
- ADA compliance:** The connection between 5th and 7th should be designated as a shared use pathway (SUP) and a firm and stable surface created for use by people with disabilities.

A SUP running slope may deviate from the 5% running slope requirements for sidewalks. FHWA identifies acceptable grades as:

 - 8.3 percent for a maximum of 200 ft;
 - 10 percent for a maximum of 30 ft; and
 - 12.5 percent for a maximum 10 ft.

Cost Estimate: \$ 75,000 - \$90,000

Project Length: 0.4 miles



Influences

- Residential neighborhoods planned park
- Connection to future trails in North Hills
- Most suitable bicycling route along 7th to Summit to Main.

Challenges

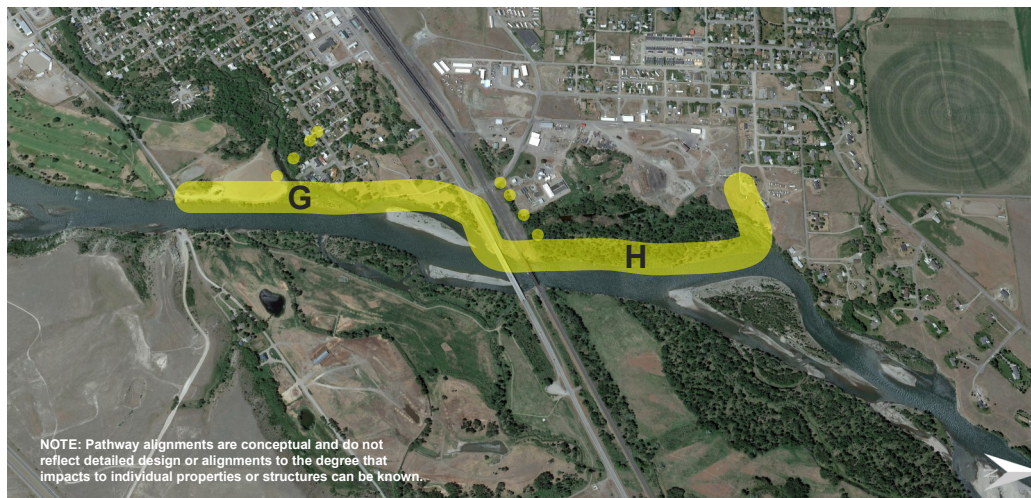
- Property acquisition or easement between 5th and 7th.
- Terrain

The desire lines created by people who walk and bike on the Summit Street alignment between 5th and 7th indicate the demand for it to be a formalized connection. It requires land acquisition and consideration for a paved, ADA-compliant surface as it would be a necessary walking route to connect to North Hills Neighborhoods.



G. Yellowstone River Trail, Mayors Landing to O Street Connector - Pathway

Identified in the 2007-2008 plan, this pathway provides a critical linkage to the O Street Connector for destinations such as Mayors Landing, Schools, and other pathways. This includes access to neighborhoods north of Park St. It is envisioned as an unpaved shared use pathway and should be 10-feet in width. Some land acquisition is required, as is a bridge over Fleshman Creek. There is a City easement along the Q Street alignment that would allow a connection to neighborhoods north of Fleshman Creek (dotted line).



H. Yellowstone River Trail, O Street Connector to Whiskey Creek Rd - Pathway

Also part of the 2007-2008 plan, this pathway represents the most suitable link for northside residents to access the pathway system. It is envisioned as an unpaved shared use pathway and should be 10-feet in width. The City controls the land in this area downstream from the railroad bridge to a border along Whiskey Creek Road. There is ample clearance under the Veterans Bridge and railroad bridge to accommodate pedestrian and bicyclist height. A pathway connection to Bennett St. is desirable to an unsignalized crossing of Park Street.

Cost Estimate: \$ 140,000+ **Project Length: 0.4 miles**

Project Details

- **Creek Crossings:** The alignment closest to the river allows for a single bridge to span Fleshman Creek. If the pathway is moved away from the river banks, it may require two bridges. Detailed design would identify other environmental factors that could influence the one-bridge route.
- **Q Street Alignment:** This connector requires a bridge over Fleshman Creek and an additional footpath to connect to the main pathway. M Street alignment could be pursued, but would require easement.

Influences

- Existing pathways and parks
- KPRK property

Challenges

- Bridges and property acquisition/easement.
- Floodplain

Cost Estimate: \$250,000 **Project Length: 0.6 miles**

Project Details

- **Veterans Bridge:** A pathway along the south side may require additional retaining walls next to the bridge. Work with MDT to determine proper pathway placement between bridge abutments and river.
- **City Property:** The Wastewater Treatment Facility is located off the river and may have influence on the pathway alignment. Notable clearing of foliage and debris is necessary to secure a safe pathway alignment.

Influences

- Pathway link to north side neighborhoods, including Green Acres
- Access to/from northside of tracks

Challenges

- Coordination with MDT and railroad for bridge underpasses
- Floodplain



I. H Street, Park to View Vista - Sidewalks + Bikeway

This project is primarily a bikeway project as it serves as the only connector to View Vista Drive in the east sector of Livingston and provides a linkage to the planned Lewis Street Crosstown Bikeway. There is a sidewalk gap from Butte Street to View Vista.

Speed management techniques, such as curb extensions, should be considered at all intersections with enhanced crossings at Lewis. Other features, such as landscaping and public art can be considered. A mini-roundabout should be explored at the Geyser/H intersection as there is ample right of way. In lieu of a roundabout, the Geyser/H intersection should have curb extensions or other speed management features applied given it has highway-scale turning radii on all four corners while being signed as a school crossing.



Project Details

- **Park Street:** Construct directional instead of diagonal ramps crossing H Street.
- **Lewis Street:** Enhance crossing of H, as identified in the Lewis Street Crosstown Bikeway, to include Rectangular Rapid Flashing Beacons (crossing map, project N) with push buttons curbside facing the street for bicyclists.
- **H St:** Place signage on H Street to indicate a bikeway crossing is ahead so motorists are more aware. Consider enhanced crossing with Rectangular Rapid Flashing Beacon. Work with MDT to consider a raised intersection to help slow vehicles on H Street.
- **Butte St to View Vista:** Fill sidewalk gap on at least one side. Consider extruded curb walkway in lieu of full curb, gutter, and sidewalks.
- **View Vista Dr:** Install enhanced crossing with crosswalks if pathway is built along Fairgrounds route.
- **Long-term:** Explore options for the City to take control of this street from MDT so it can control its own destiny on the route.

Cost Estimate: \$ 40,000 - \$200,000

Project Length: 1.7 miles



High speed turn radii at H Street and Geyser Street create out-of-context conditions for this residential area that is also marked as a school crossing. There is sufficient right-of-way for a mini-roundabout to be evaluated. In lieu of that, the intersection needs speed management features, such as curb extensions or median islands.

Influences

- Residential neighborhoods & school crossings
- East side connection to the river & fairgrounds
- Lewis Street Crosstown Bikeway

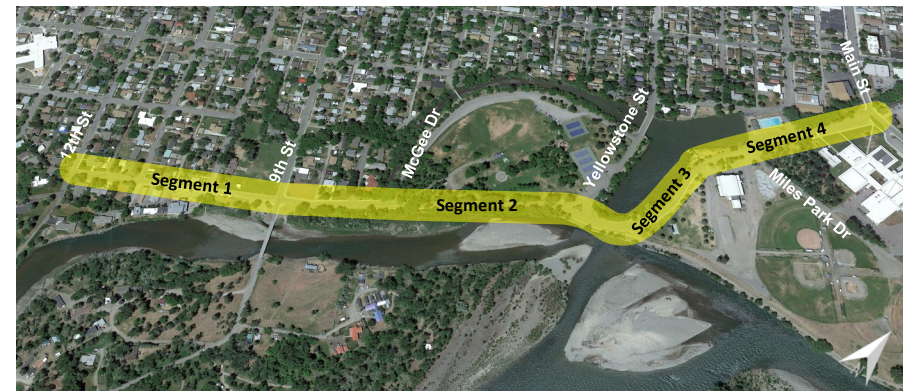
Challenges

- Balancing the needs of pedestrians and bicyclists with special event traffic headed to fairgrounds.
- Determining appropriate speed management techniques.



J. River Drive, 12th to View Vista - Sidewalks + Bikeway

River Drive is a key corridor linking the people of Livingston to the many recreational opportunities along the river, as well as several schools. It can also serve as an alternative route to Geyser. Despite being less than a mile long, this project has four different segments to consider when designing for people who walk and bike. Those descriptions are included below. The most constrained section is along Sacajawea Park where constructing a walking path on the north side may impact parking unless a route can be built behind the trees on the park side. Segment 3 represents a reimagining of this space to be more of a “festival street” with gates or bollards on each end that can close the street for events such as the Farmers Market. This may be incorporated into the site planning for the Civil Center project. Wayfinding should encourage people to access this route and the many destinations along it.



Project Details

- **Segment 1 - 12th St to McGee Drive:** Complete sidewalks (approx. 800 feet) and curb ramps on the north side of the street. This section of the street has curb along the frontage and the most notable sidewalk gap is along the Ninth Street Park frontage.
- **Segment 2 - McGee Drive to Yellowstone Street:** Examine impacts on parking to designate walking path on the south side of the tree line or construct pathway north of the tree line in the park. Path may be a natural compacted surface.
- **Section 3 - Yellowstone Street to Miles Park Rd:** This section could be reimagined as a “festival street” that integrates the north side of the Civic Center

property and the shore along the Sacajawea Park Lagoon. This would create a shared street plaza in this area. Construct a gate or removable bollards on either end would close the streets during events.

- **Segment 4 - Miles Park Rd to Main/View Vista:** Construct pathway on south side along forest and school frontage. May be an extruded curb pathway to lessen impacts on drainage.
- **Long-term:** Explore options for the City to take control of this street from MDT so it can control its own destiny on the route.

Cost Estimate: \$ 250,000+

Project Length: 0.8 miles

Influences

- River, parks and recreation facilities
- Schools and neighborhoods
- Existing pathways and 12th Street sidewalk project.
- Tourism

Challenges

- Changing cross sections on existing streets
- Sacajawea Park Frontage
- Configuring parking during special events, with consideration of pedestrian access and safety.



K. Front Street, 5th Street to Star Road - Sidewalks + Bikeway

The Front Street project fills sidewalk gaps, replaces damaged sidewalks, and upgrades curb ramps along the north side of this nearly one-mile section of street. Sidewalks exist from 5th to 10th, which leaves a 2,300 foot gap in sidewalks between 10th St and Star Road. Curb ramp replacements are needed for ADA compliance from 10th to 5th along Front, as well as a crossing upgrade for people crossing 5th Street. The crossing upgrade should include a curb extension, crosswalk, and Rectangular Rapid Flashing Beacons (RRFB). While right of way exists to construct sidewalks behind the curb ramp 10th to Star, there are currently private properties using that public right of way for landscaping and to store automobiles. Bike lanes are possible with prohibiting on-street parking but may not be feasible due to existing parking utilization. Bikeway upgrades include wayfinding and shared lane markings.



Project Details

- 5th Street:** Construct upgraded crossing of the north leg of 5th due to lack of stop control. Include curb extensions and RRFBs. Project would connect to existing sidewalk across railroad on east side of 5th and possible pathway upgrade with MDT crossing project.
- 7th Street:** Consider raised crosswalk since this is near a school and 7th is a popular vehicle route to neighborhoods to the north.
- Pathway Connection:** There are opportunities for pathway connections up the hill to North 10th Street and the Livingston Ditch.
- Long-term:**
 - Explore options for the City to take control of this street from MDT so it can control its own destiny on the route.
 - The pathways and trails map shows a conceptual shared use pathway along the south side of Front, which is predicated on placing the pathway on railroad right of way.
 - Explore pedestrian underpass or connection across Park Street in vicinity of 10th Street.

Cost Estimate: \$ 150,000 - \$200,000

Project Length: 0.8 miles



Influences

- Only continuous street in this sector of town
- Washington School
- 5th Street railroad crossing
- Neighborhoods in this sector of the City

Challenges

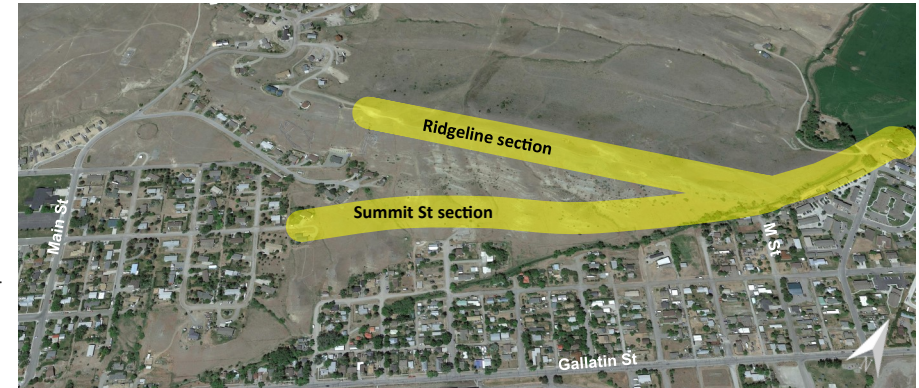
- Determining speed management treatments.
- Property owner use of public right of way where sidewalk gaps exist.
- On-street parking limiting prospects for a bike lane.



L. North Hills Trails, East, Green Acres to Summit/Water Tower - Trail

NOTE: Trail alignments are conceptual and do not reflect detailed design or alignments to the degree that impacts to individual properties or structures can be known.

Single track trails are recommended in this section of the North Hills along two conceptual alignments—the ridgeline that runs east off of Ridgeway Drive and the unimproved Summit Street right of way. The trails would provide linkages to northside neighborhoods and potentially to the Green Acres subdivision area. The Summit Street right of way was platted with the original town site and was not created in consideration of existing terrain. Some of the land is city-owned but private property negotiations are needed to secure easements and identify final alignments. There are informal footpaths at the ends of streets that stub into this area that could be formalized when trails are built. Some may require access agreements with the Livingston Ditch Company. These trails were part of potential routes identified in the 2007-2008 Livingston/Park County Trails Plan.



Project Details

- Summit Street Alignment:** As noted, the Summit Street right of way is in line with the existing street, irrespective of terrain. Identifying the most suitable trail route along this general alignment would inform where the trail is feasible and inform any potential land swap with private property owners.
- Ridgeline:** Following the ridgeline from the end of Ridgeway Drive creates the most accessible and scenic route for this trail. It is in private ownership and easements would need to be negotiated and secured.
- Lettered Streets:** Identify most suitable streets to provide connections from their terminus to these trails.
- Trailheads:** Management of trailheads is important as use grows to reduce conflict with neighboring properties. Identifying a trailhead for parking access is recommended.
- Long-term:** Work with Livingston Ditch Company to formalize existing informal footpaths and stub street connections to these trails. This could be done in conjunction with a grant to help upgrade the ditch for maintenance and safety reasons. The City and/or County would likely pursue an indemnification agreement for this public access so the ditch company is not held liable for actions related to public access.

Cost Estimate: \$ 50,000

Project Length: 1.2 miles

Influences

- North Hills neighborhoods
- Need for recreational opportunities on north side
- Growth pressures
- Irrigation ditch

Challenges

- Private property along portions of or within potential alignments.
- Terrain



5. Other Projects

The 20 projects that ranked in the middle and lower tier of projects are identified in Figure 5-1 (next page) along with conceptual design considerations. They are part of the overall project network shown in Figure 4-2 in the previous chapter. These may be considered long-term projects for implementation. Since less analysis was done on these projects due to their lower ranking, there are no cost estimates. Coordination with Montana Department of Transportation (MDT) is required for improvements along or across streets under their control.

Livingston will have a network of trails and active transportation facilities once this full system is upgraded or gaps addressed. The map of these 32 projects shows connections that will allow people to reach destinations and existing pathways in a safer manner.

Be Opportunistic. Just because a project is ranked in the middle or lower tier does not mean a chance to complete the project should be ignored. New development along these routes, along with sound growth policies, should ensure developers construct new or upgrade existing facilities along their frontage.

Projects to fill sidewalk gaps along Park Street may be prompted by MDT projects related to corridor changes or maintenance. The City can begin working with MDT to identify crossing upgrades as shown later in this chapter in Figure 5-6.

Livingston may consider a citywide bikeway signage and marking project that could address basic recommendations on the bikeway routes before implementation of other speed management features. These routes may also be candidates for temporary installation of things like curb extensions created with tubular markers or pop-up projects.

Trails included in this list, as well as on the Trails Master Plan map should have easements or construction of pathways and trails as a condition of new development (see Chapter 6. Trails Master Plan).



Be Opportunistic

Just because a project is considered a lower priority doesn't mean opportunities won't arise to fill gaps in the system or require incremental upgrades as properties redevelop.

Projects like Park Street sidewalks (above) will require MDT coordination and the City, as well as advocates, can help prompt MDT to incorporate sidewalks or other alternative pedestrian walkways into Park Street when there is a resurfacing or other major project.

Projects like the Loves Lane sidewalk (left) were once thought to be a City-led project but now may come about as a result of development.



Figure 5-1: Other Projects. Middle and Lower Tier

Projects, Alphabetical By Tier		Type	Length	In Past Plans?	Description
Middle Tier	12th, River Rd to Park	SW+BW	0.4	No	Add sidewalks on both sides, designate bikeway & apply speed management features
	E St/Sleeping Giant, Lewis to View Vista	BW	0.5	Yes	Designate bikeway & apply speed management features
	Highway 89 Pathway, Myers View Trailhead to I-90 (MDT)	PW	1.8	Yes	Build paved shared use pathway
	Yellowstone River Crossing, Meyers Alignment	PW	0.1	Yes	Construct pathway bridge over Yellowstone River
	Lewis, H St to O St, and O St, Lewis to Park	SW+BW	0.6	Yes	Add sidewalks on north side east of M, designate bikeway
	North Hills Trails (West) Scenic Trail Rd to High Ground Av	TR	0.6	Yes	Build single track trails, including HRDC Ravine, to access existing city/county land.
	Park St, Hwy 10 to Geyser (MDT)	SW	0.6	Yes	Add sidewalks on north/west side
	Park St, I St to O St (MDT)	SW+BW	0.4	Yes	Add sidewalks on south side, designate bikeway & consider speed management features
Lower Tier	Park St, 7th to I St (MDT)	BW	1.3	Yes	Designate bikeway & consider speed management features
	5th, Park to Lewis	BW	0.2	Yes	Designate bikeway & apply speed management features
	7th, Front to Montana	SW+BW	0.3	Yes	Add sidewalks on east side, designate bikeway & apply speed management features
	Garnier/Old Clyde Park, Gallatin to City Limit	BW	0.7	Yes	Designate bikeway
	Highway 10 Pathway, Park to Printing for Less complex (MDT)	PW	1.6	Yes	Build paved shared use pathway, could be unpaved
	Miles, Gallatin to Maple	SW+BW	0.4	No	Add sidewalks on one side, designate bikeway & apply speed management features
	N St, Gallatin to Wineglass Ln	SW	0.2	No	Add sidewalks on east side
	Loves Lane, Pronghorn to Park	SW	0.1	No	Add sidewalk on south side
	Scenic Trail/Prairie Dr, Summit to Star	BW	0.7	No	Designate bikeway & apply speed management features
	Star, Front to Prairie	SW+BW	0.5	Yes	Add/replace sidewalks on east side, designate bikeway
View Vista, H St to Mayor's Landing	SW+BW	0.5	Yes	Add walkway on north side, designate bikeway & apply speed management features	
Yellowstone River Trail, South side, Meyers Lane to I-90	PW	2.1	Yes	Build unpaved single track trail	

SW = Sidewalk Project; BW = Bikeway Project; PW = Pathway Project (8-10 feet wide); TR = Trail Project (single track)



Street Crossings

Creating safe crossings of major roads and along walk and bike to school routes should be pursued independently of corridor-level projects identified previously in this chapter. Crossing upgrades generally require a more detailed level of analysis as it is unwise to simply stripe crosswalks without considering other factors.

While the top tier projects must have crossing needs included in their design and construction, Figure 5-2 shows where enhanced crossings should be considered independent of these routes.

Several are recommended across MDT-managed routes and require that agency's approval. Existing school crossings on Park Street would be the first place MDT should upgrade to provide children more than paint and signs. Downtown crossings of Park Street, especially at Main Street and 2nd Street, are also needed.

Crossing Gallatin to provide access to Katie Bonnell Memorial Park is another crossing to increase safety for people going to the park is worthy of short-term consideration by the City. Additionally, crossings of Main at River near the schools and the school crossing on View Vista between the schools are worthy of short-term attention. Designated school crossings along Geyser are also candidates, as is the north leg of 5th Street at Front.

Rectangular Rapid Flashing Beacons (RRFBs). Most pedestrian crossing upgrades identified for Livingston can be addressed through use of an RRFB. Shown on the next page, an RRFB contains a push button that activates yellow flashing LED lights to warn drivers of a pedestrian's intention to cross.

They are most suitable along two- or three-lane roadways at speeds of 30 mph or less. Federal Highway Administration (FHWA) research shows RRFBs can reduce pedestrian crashes by 47%. A pair of RRFBs at a crossing can cost \$10,000 to \$15,000.

Park Street, from Mountain View lane to Bennett, has conditions that make RRFBs a suitable option for intersections that lack full traffic signals. Intersections like Bennett and four/five-lane sections



Crossing Upgrades

People decide to walk or bike based on the worst situation they have to overcome. This is oftentimes the crossing of a major road.

Streets in Livingston where pedestrians are most at-risk crossing are Park Street, Gallatin Street, and Geyser Street, as these are the routes with some of the highest volumes of traffic. Upgrades can include Rectangular Rapid Flashing Beacons and Pedestrian Hybrid Beacons.



of Park Street are not recommended for RRFBs.

RRFBs are also used for pathway and bikeway crossings with those used at on-street bikeway crossings having a connected push button facing the street from the curb for bicyclists.

Currently RRFBs require what's known as "interim approval" from FHWA because they are not yet formalized in traffic engineering standards. Luckily, MDT has received interim approval from FHWA for their use in Montana and this interim approval covers local agencies. This means the City of Livingston is allowed to use them on City-managed streets and they are approved for use on MDT-managed streets.

Pedestrian Hybrid Beacons (PHBs). These signals are a step up from RRFBs in that they require a full stop by motorists when pedestrians have the "WALK" signal and corresponds with solid red lights. Once pedestrians get the countdown signal, the red lights flash for motorists and they may proceed if the crosswalk is clear and they come to a complete stop.

FHWA studies show PHBs reduce pedestrian crashes by 55%. Because most types of PHBs require more complex signal control devices and signal pole and mast arms, their costs can be \$50,000 and higher. The image shown in the bottom right is a more economical example that's on a single pole but is not appropriate for streets wider than two lanes.

In Livingston's context, PHBs are most suitable for areas of routes like Park Street where it is more than two lanes wide. The general threshold for justifying a PHB is 20 pedestrians or bicyclists per hour willing to cross without protection of a signal device. Traffic engineers are allowed more leeway within federal guidance to deviate from these recommended thresholds when compared to the thresholds that are required to be met with full traffic signals.

Figure 5-2 on the following page shows where RRFB and PHB crossings may be considered, along with recommended signage treatments for pedestrian crossings, bicyclist and pedestrian crossings, and school crossings.

Rectangular Rapid Flashing Beacons

Reduce pedestrian crashes by

47%

Source: FHWA



Pedestrian Hybrid Beacons

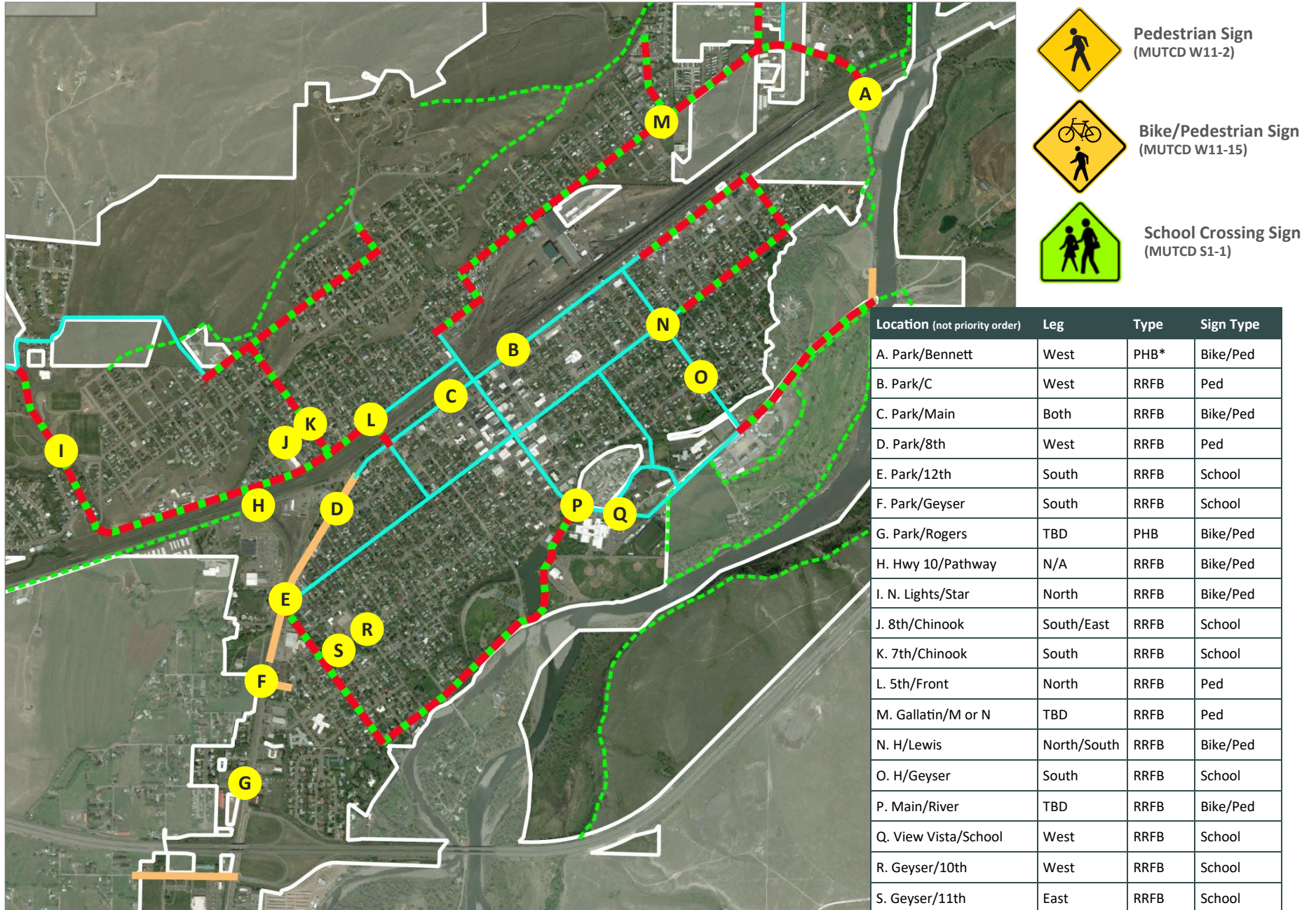
Reduce pedestrian crashes by

55%

Source: FHWA



Figure 5-2: Enhanced Crossing Recommendations



* Full signal preferred or consider PHB if pathway link under bridges is not a short-term option.



Railroad Crossings

Whatever the timeline for the construction of an additional railroad crossing in Livingston, the design considerations for active transportation should recognize these investments occur infrequently. There's only one chance to get it right. A common design approach is to first layout all the needs for motorists, then add bicyclist and pedestrian facilities to the side. The result of this is frequently a maximizing of space for drivers and minimizing of space for pedestrians.

Any new or upgraded railroad crossings should be designed as a shared use pathway with a width of at least 14 feet on any bridge structure that includes railings. The shared use pathway may be 10-feet wide in other areas and include either a five-foot buffer from the curb or a vertical barrier if there is less than a five-foot buffer from the curb. Additional crossings may be considered for active transportation uses only and do not have to include automobile use.

The design needs identified above are consistent with the AASHTO *Guide for the Development of Bicycle Facilities* (2012) that was developed with input from agencies like MDT. The 14-foot width on a structure with railings is to account for shy distance from the railing as such vertical elements results in a reduction of effective width by 18 inches per side.

Given a major structure like a railroad crossing will likely have active transportation infrastructure on one side, design considerations must be given to how people who walk and bike will cross this road on either side of the structure in order to access their destinations. These crossings, whether full signals for all road users or treatments such as RRFBs and PHBs, should be designed into the project.

Regarding existing railroad crossings, recommendations for the 5th and Bennett crossings are included previously in this section. Any future rebuild of the Main Street crossing will be costly and may involve some tradeoffs. The goal should be a shared use pathway width as noted above, but narrower dimensions may be necessary to account for various realities associated with this crossing.



Pathway Width & Vertical Barriers

Vertical barriers reduce the effective width of a pathway. This is why bridges like those in Missoula (top) and Pocatello, Idaho (middle), are 14-feet in width to account for shy distance from these railings.

Additionally, when there is not horizontal separation of at least 5-feet from a road, a vertical barrier is needed to provide safe separation from motor vehicles (bottom).



6. Trails & Pathways Master Plan

The trails planning effort is intended to merge the findings of Livingston's City Parks & Trails Master Plan with Park County's Active Transportation Plan and Trails Plan into a combined map of potential trail routes. A systems-level approach includes on-street active transportation linkages to these trails that comprise the full Livingston Trails and Active Transportation Plan. The City and County should update land use policies to adopt this map by reference to ensure easements are secured when land develops or redevelops.

Trails are a general term for off-road facilities but may constitute a single track unimproved route or a shared use pathway. Typically trails are typically unimproved routes in a natural setting while pathways can be paved or unpaved and are typically wide enough for people to walk and bike side-by-side.

Figure 6-1 on the following page shows the pathways and trails identified through this Plan for both the City and County to officially adopt as part of their policies to secure easements. The pathways and trails are labeled as follows:

- **Existing trails.**
- **Priority trails**, which are those that were ranked as projects for short-term implementation.
- **Illustrative trails**, which are identified for both long-term implementation and to secure easements along their general alignments.
- **Outside City Jurisdiction trails**, which link to trails within Livingston but are fully outside existing city limits.

As noted on the map, these alignments are conceptual and do not reflect detailed design or alignments to the degree that impacts to individual properties or structures can be known. The City and County should be flexible in securing alignments when properties develop to allow for site plans to serve both the public and private needs of the development. While this flexibility is inherent to the process, alignments should not deviate greatly from their intended

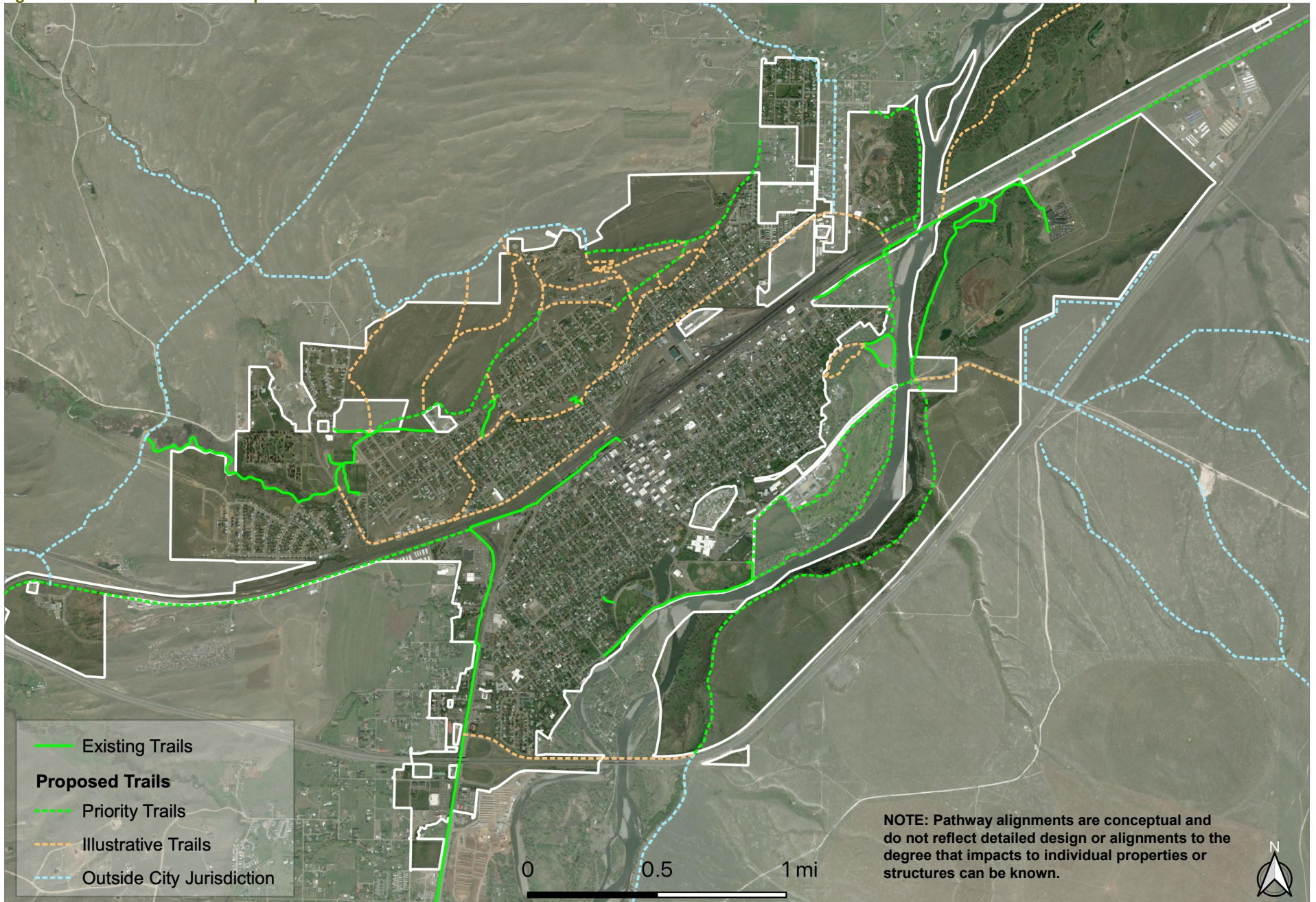


Trails & Pathways

The plan for trails in and around Livingston is based on the premise that an interconnected system of trails, sidewalks, and bike routes will allow people to walk, roll, and bike for recreation and transportation. Trails and pathways range from traditional single tread trails (top) to wider shared use pathways along rivers and streams (middle) to paved sidepaths along major roads such as Highway 89 (bottom).



Figure 6-1: Trails Master Plan Map



purpose. For example, a pathway planned along the Yellowstone River should not be allowed to be routed away from the river in order for housing lots to front the river. Additionally, the City and County should work with developers to secure trailhead locations within some developments for people to access the trail.

Types of Pathways & Trails

The design of trails and pathways is more complex and nuanced than the design of sidewalks and bikeways. This is because these facilities may exist in natural areas or along roadways. They may be paved, left in a natural state, or improved with natural but engineered surfaces. Widths may vary based on context, topography, and function.

The City and County may pursue development of specific pathway and trail design standards to ensure consistency across jurisdictions and provide consistent expectations for the public and developers.

Shared use pathways (SUP). These pathways provide for people who walk, hike, or bike. Due to that, they must be at least 10-feet in width (eight-feet in constrained areas). SUPs may be paved or unpaved. If unpaved, the surface must be firm and stable with gravel no larger than 3/8-inch aggregate gravel on a compacted surface in order to be compliant with ADA requirements. Pathways along the Yellowstone River are considered SUPs.

Sidepaths. Sidepaths are shared use pathways along roadways. The same width requirements apply, as does AASHTO design guidance that states a vertical barrier should be included if a SUP is adjacent to a major road (Park Street/US 89, Highway 10) but is not separated by five feet or more from the top of the curb. Intersections with streets require curb ramps and marked crosswalks that match the width of the pathway, as well as ADA-related treatments.

Trails. Trails are used for hiking or biking and are typically built in natural areas and are sometimes referred to as footpaths. They may be of a single or double tread width. These trails are typically three-

Single Tread Trail



Double Tread Trail or SUP



Sidepath with Buffer



Sidepath with Vertical Barrier



ft (single tread or track) to six-ft (double tread or track) and surfaces are comprised of dirt, gravel, soil, mulch, leaf litter, etc. Routes such as the Hopa Mountain Trail are considered single tread trail. The Bitterroot Trail may be considered a double tread trail and could be classified as a SUP.

The tread width of trails is oftentimes dictated by the context in which they exist. More natural or constrained environments often dictate a single tread design while areas along gentle streams and rivers may be double tread.

City/County Collaboration

In order to avoid duplication of resources, Livingston and Park County should pursue a Memorandum of Agreement (MOA) to define roles and responsibilities for pathway and trail management. There is no need to buy two pieces of the same equipment for trail maintenance if one jointly-held piece of equipment can address current needs.

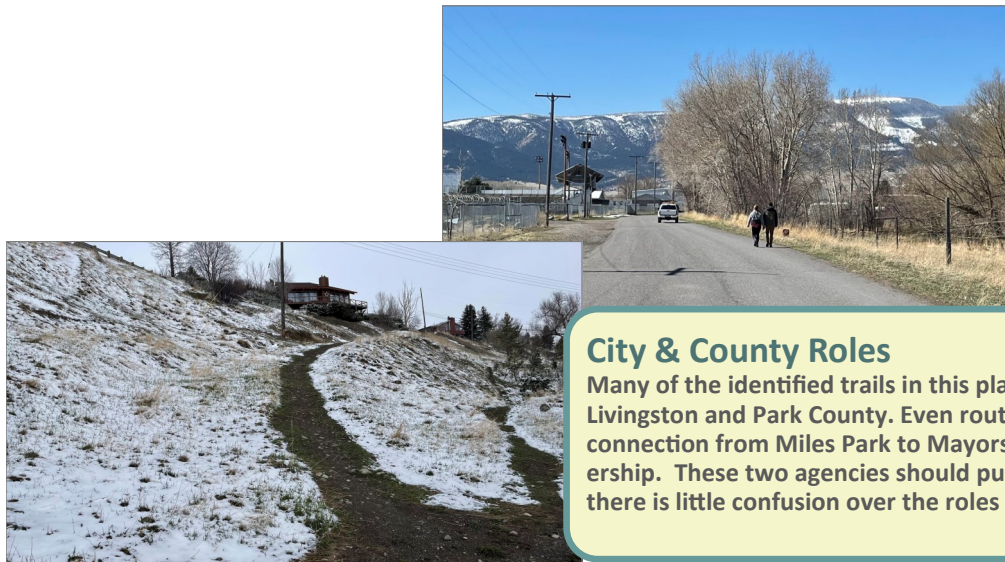
Additionally, identifying which jurisdiction is best suited to pursue and handle indemnification agreements for trails and pathways

along or through private property is also advised. Generally, the liability insurance a public agency holds for parks and recreation facilities will apply to pathways and trails. Determining roles for individual pathway and trail alignments that are located within both jurisdictions is also advised so there is a clear expectation of responsibilities for maintenance and public communication.

Funding a full-time position for a regional trails and active transportation coordinator may be considered for continued City and County collaboration. This role could also be defined within an existing or future city or county staff member's job description if these duties did not warrant dedicating a full-time employee. The job duties could include project management, pursuing easements, and identifying grant opportunities.

Development Policies

Chapter 7. Land Use Policy & Recommendations addresses ways in which the City and County can adopt the trails plan map by reference in subdivision regulations as a way to require dedication of constructed trails or easements as a condition of approval of devel-



City & County Roles

Many of the identified trails in this plan require joint efforts between the City of Livingston and Park County. Even routes that are primarily within the City, such as the connection from Miles Park to Mayors Landing, have a county influence due to land ownership. These two agencies should pursue joint agreements and formalize other roles so there is little confusion over the roles and responsibilities of each.



opment.

It is advised that the City and County policies are similar in their requirements in order to keep development interests from choosing one over the other if one agency happened to have a more lenient policy.

Stairs

The 2nd Street right-of-way between Gallatin and Chinook, along the west side of the Yellowstone Gateway Museum, could be an ideal location for a public stairway to provide pedestrian and bicyclist access along this route. These public stairways are common features in cities with terrain like Livingston's where full street connections were not built. Cities with similar stairways include Juneau, Alaska; Wallace, Idaho; and Lewiston, Idaho.

A public stairway would provide a more suitable option for walkers than the current walking trail and constructing the stairway with a "bike channel" (see images at right) would allow bicyclists to more easily walk their bikes up the stairway.

These projects are often overlooked due to concerns about ADA compliance. It is not the expectation of ADA that a grade be made fully compliant with switchback ramps next to the stairway. The designation of a comparable accessible route rather than an accompanying series of ramps fits within the intent of ADA. The City may pursue connections like the 7th Street and Summit Street sidewalks/pathway projects as suitable comparable routes for people using mobility devices, then sign and designate them as such.

MDT Right of Way & Bridge Underpasses

Montana Department of Transportation's (MDT) right of way along Highway 10 and Highway 89 is wide enough to accommodate the shared use pathways identified along those routes. As with the development policies, adopting this plan helps formalize the City's intent to pursue pathways within this right of way and for MDT to incorporate that into future project considerations.

Stairway to Gallatin

The 2nd Street right of way provides an opportunity for a public stairway to improve pedestrian and bicyclist access to the neighborhoods atop the hill.

Stairways can be built with bike channels that allow bicyclists to easily walk their bikes up stairway. There are several examples, including the two shown below. The one at right is in Missoula.



Figure 6-2: Pathway Concepts for MDT Right of Way

Pathways within State DOT Right of Way: Opportunities in Livingston & Examples from Other States

Meyers Lane Underpass



I-90 Bridge



I-90 off-ramp right of way



Highway 10 Right of Way

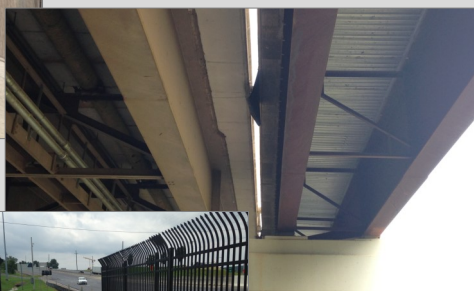


Veterans Bridge



Shared Use Pathway alongside I-15 over the Snake River in Blackfoot, ID.

Shared Use Pathway added to existing Hwy 129 expressway bridge over the Tennessee River in Knoxville, TN.
Top Image: Underside of structure;
Bottom Image: Pathway view.



Shared Use Pathway retrofit under Highway 55 bridge over the Boise River in Eagle, ID.

Shared Use Pathway within interstate right of way along off-ramp in Linthicum Heights, MD.



Singletrack Sidewalks

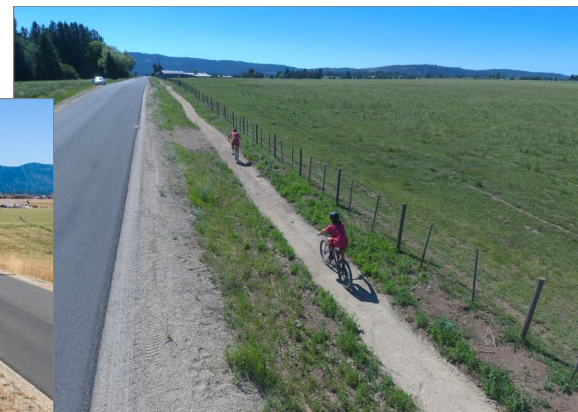
Eagle, Colorado, and Valley County, Idaho, have programs to construct what are known as singletrack sidewalks—typically unpaved non-motorized pedestrian and bicycling trails constructed next to public roads. These facilities are located within existing right-of-way as a way to provide an active transportation option to destinations that are not linked by traditional sidewalks and pathways.

The images below are from recent construction of singletrack sidewalks by the non-profit organization, Valley County (ID) Pathways. They are designed to withstand weather conditions and stormwater runoff and avoid impacting existing stormwater facilities. The surface is 3/8-inch compacted gravel, which can be used by people who use mobility devices such as wheelchairs.

Additionally, the right of way along the I-90 corridor, including the

In 2019, Valley County, Idaho, amended its Code of Ordinances to include a section on Singletrack Sidewalks. The ordinance require a Memorandum of Understanding with a local organization for maintenance of these pathways and liability insurance. It includes the following design stipulations:

- Trails will generally be 24 to 48 inches in width.
- Should meander within the right-of-way around drainage, and obstacles, etc.
- Shall not inhibit roadway drainage or obstruct operability of the road.
- Constructed of a permeable natural surface but can be paved where appropriate.



Singletrack Sidewalks

Roads in Livingston and Park County that lack sidewalks but have enough right-of-way to consider other options can benefit from singletrack sidewalks. These pathways run within existing roadway right-of-way to create an active transportation option for rural areas. They can be used to connect existing trails, sidewalks, and bikeways.

Images: Valley County Pathways



7. Land Use & Policy Recommendations

Infrastructure is a singular, though essential, element of a comprehensive approach to active transportation. In this plan there are a number of identified projects that, when implemented, will create more complete network for walkers and bicyclists. However, these projects will take considerable time to fund, design, and construct. As the City and its community partners work to address the identified infrastructures needs, other efforts can further improve Livingston streets and trails by making changes and improvements through land use strategies and related policies.

The first section of this chapter focuses on big picture land use strategies that can be discussed among Livingston's leaders and citizens. The second section provides detailed recommendations for updating existing City code to align with goals of the Growth Policy Update and improve conditions for people who walk, bike, and use trails.

Sometimes a land use decision does more for active transportation access than infrastructure. The City and Park County control decisions on the location of offices, recreation facilities, and social services.

These infrastructure investments can be made through a lens of how the most people can access them without having to use a motor vehicle. Other public agencies, such as the school district, can also consider these factors with support from the City and County.

Other policies, such as zoning, help steer desirable land uses to areas that are walkable and bikeable. Mixed-use and dense development create more market demand for walkable and bikeable destinations and can shorten trip lengths.

Street design policies can ensure new streets have the same safe features as the original streets of Livingston and include speed management features such as curb extensions built by new development.

This first section of Chapter 7 explores both the big picture facets of land use and policy, as well as specific recommendations for updating the City's subdivision regulations and street design policies.



Back to the Future

Livingston's most walkable and bikeable streets didn't come about as a result of profound policy and strict zoning ordinances. They were built the way they were because people had to get around without a motorized vehicle.

The United States has spent more than 100 years making such historic streets practically illegal by eliminating trees, mandating excess street widths, and promoting free or subsidized parking.

Livingston's street design policies should be organized to ensure new streets are built with the same features as historical streets.



The Livingston Food Resource Center is a testament to how land use decisions can influence walkability as much as infrastructure investments. The profile below explains. While many land use decisions come about due to influences external to city policies, the City of Livingston can help promote and sometimes incentivize decisions like those the Food Resource Center made in its location decision.

Land Use Strategies

Ensuring the Growth Policy Goals and Objectives become actual policies is crucial to achieving the City's vision. The specific Growth Policy goals pertaining to active transportation are identified in Chapter 1.

Unlike goals and objectives, policies are oftentimes the behind-the-scenes instructions and requirements that define how a city grows, manages, maintains, and operates. By amending and strengthening Livingston policies, many of the existing infrastructure shortfalls identified in the Active Transportation Plan can be prevented in other parts of the City as it grows. The themes identified in this first section help understand how the City can accomplish some of its Growth Poli-



A Profile in Walkability

Livingston Food Resource Center

The original Livingston Food Pantry, established in 2006, was housed in a converted automobile repair garage located on North M Street in Livingston. Like food pantries in many towns, it was in a rather depressed part of town and difficult to access. There was no public transportation, no sidewalks nor marked crosswalks, and no traffic control such as stop lights. It was an unsafe location that had many barriers to anyone on foot, on a bicycle, or in a wheelchair. Even if you had automotive transportation, there was no place to park.

When the decision was made to pursue the development of a new food pantry facility in Livingston it was quickly decided that accessibility was a key determinate of its location. A high percentage of the food pantry's clients—people in need—do not own cars, or are not able to drive. This made "walkability" an important factor in identifying a new location.

A study was conducted to determine how many people, who the pantry served in the prior 12-month period, lived close enough to reach the pantry on foot, within five minutes. A circle was drawn around the old pantry location and the preferred location for the new pantry; anyone living inside the circle could walk to the site within five minutes. At the old site there were 25 people living inside the circle. At the new location there were 115. Plus, the new location had sidewalks, safe crosswalks, and traffic control.

When the new food pantry was completed in January 2015, the number of people visiting the pantry for assistance more than doubled – and included many people in need who had never used the pantry before, just because they couldn't get to it.

Images: Livingston Food Resource Center



cy goals while the specific policy changes identified in the next section help make those goals the law through changes adopted by the Planning Board and City Commission.

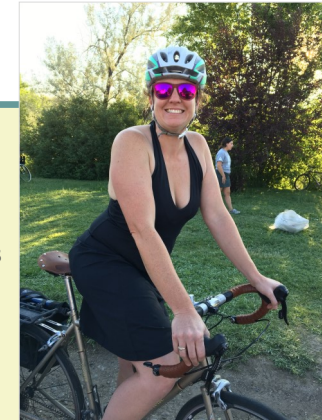
Policies can generate an interest in active transportation by matching daily needs of residents to land uses and through strategic planning and investment in particular locations within the city. Examples include goals pertaining to infill and brownfields.

Further, some policies lead to faster, tangible changes in walking and bicycling habits of residents and begin to build momentum towards a city where residents walk and bike for utility purposes as much as for recreation. Others will require patience and time as implementation will be gradual and benefits therefore delayed.

The following section is intended to illustrate policy actions that if taken can improve active transportation participation rates among Livingston residents.

Each of the policies are presented as suggestions to pursue as sidebars to the street infrastructure and design changes enacted by the City, MDT, and other community partners. If the policies are implemented, the results should include:

- Land uses that stimulate walking and bicycling trips due to appeal and proximity;
- Significant increases in students and parents walking and bicycling trips;
- Reduction of local vehicle trips and peak hour congestion, particularly at key intersections and rail crossings;
- Reduced household expenses resulting from fewer vehicle trips
- Improved local air quality resulting from fewer vehicle trips and idling;
- Numerous health benefits gained from walking and bicycling; and
- General heightened awareness among drivers of the presence of pedestrians and bicyclists.



In their own words

Alison Shannon

I live just a mile from work and love my 5-minute ride. Our community is small, often times biking is faster when getting across town during those busy morning commuting hours, and I get a little pick me up before getting to the office.

My husband (boyfriend since high school) has a similar story: Biking was the affordable option and he fell in love with it like I did.

I grew up just outside Boston, MA. Commuting by bike is a lifestyle. As a kid I either had to take the bus or bike to school, once I could drive my dad made it clear I could bike or buy my own car, well I already enjoyed biking so I kept it up.

We take long overnight bike trips, once even from Boston, MA to Hamilton, Ontario, for my husband's grandmother's 90th birthday. But we mostly did it because it was more affordable. Our son Emmett quickly fell in love with it as well, first being toted around in a trailer, then a trainer bike attached to ours and now his own.

We purchased a car at 28 years old. It still is used, mostly for adventuring on weekends. My husband uses the commuter bus from Livingston to Bozeman to get to work and when the weather is nice he bikes the 37 miles home.



School Operations. A city the size of Livingston typically sees above average walk and bike rates to and from schools. This is due to the general scale of the city and lower volumes of traffic, which contribute to a feeling of safety, and central location of campuses.

Transporting kids to school means choosing one of the few rail crossings or paying an additional fee for bussing. Essentially, for many students living in Livingston, walking or bicycling to school is simply not an option due to the distance, limited and potentially hazardous crossings, and lack of existing infrastructure.

Fortunately this can be changed by revisiting and reversing how elementary schools are organized. As has been the policy of the school district for a generation, elementary schools do not serve traditional Kindergarten through 5th grades. Instead, the three elementary schools serve two to three grades only with Washington Early Foundations Center serving Pre-K and Kindergarten (blue

dot), BA Winans Elementary serving 1st-2nd grades (red dot), and Eastside Elementary serving 3rd-5th grades (yellow dot). This policy is set by the Livingston School District.

Such a policy means that unless a child lives near the campus for the two to three years they would attend, attending three different schools from Kindergarten through the 5th grade is typical.

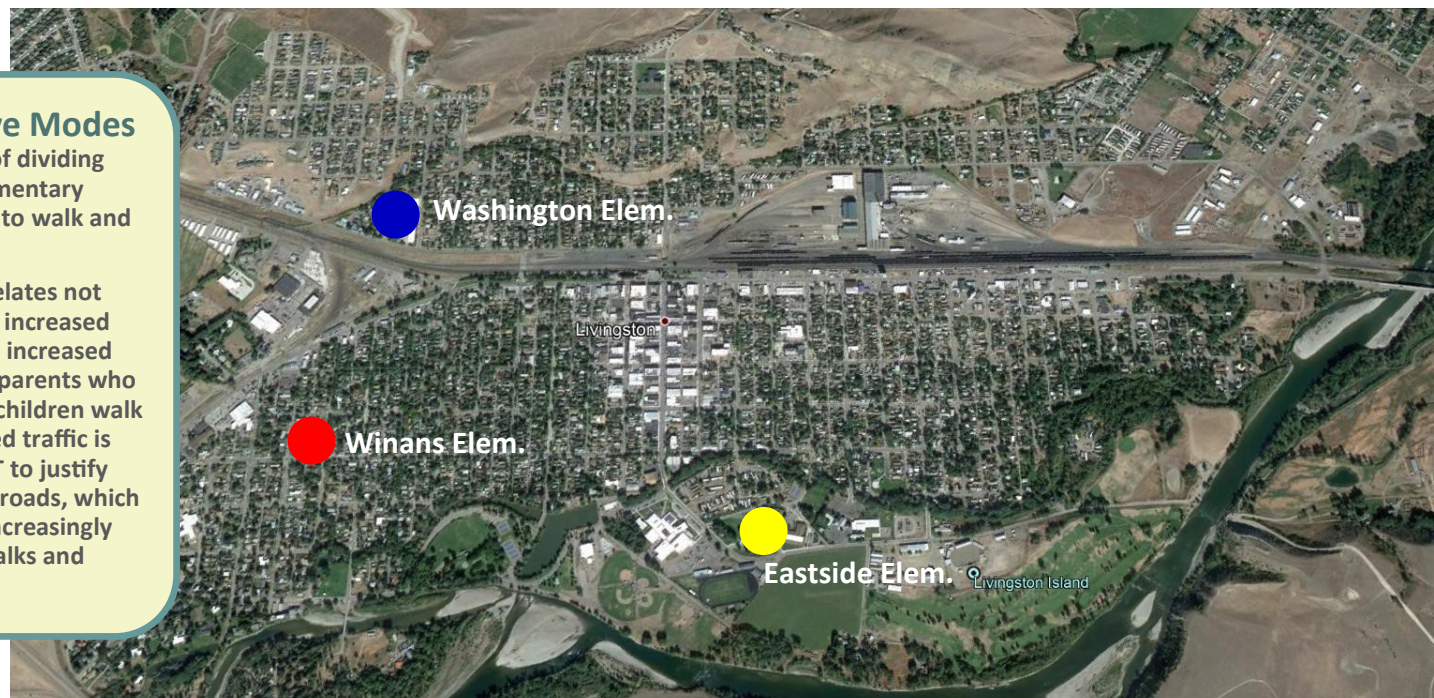
As currently configured, many Livingston students are required to travel more than a half-mile to school and in some instances, required to cross an active rail crossing or use the Main Street underpass which is limited for bicyclists and subject to flooding.

If children are allowed to do that, students then need to cross Park Street, which is a heavily-trafficked state highway. All of these factors contribute to limited few students participating in active transportation to and from school.

Schools Limit Active Modes

The long-standing policy of dividing children among three elementary schools limits their ability to walk and bike to school.

The other effects of this relates not only to health, but also to increased motor vehicle traffic. That increased traffic raises fears among parents who might otherwise let their children walk or bike to school. Increased traffic is used by agencies like MDT to justify widening intersections or roads, which oftentimes makes them increasingly unsafe for anyone who walks and bikes.



Beyond limited walking and bicycling rates, the issue has additional implications. For parents, transportation to each campus can be arduous, particularly for those living on the north side of the rail corridor. In households with children enrolled in the 1st grade or above and located in north Livingston, all schooling takes place on the south side of town. These frustrations were expressed when Park County Environmental Council conducted school surveys in fall 2021.

By reverting the three elementary schools back to Pre-K through 5th grade, or some similar version, students will instantly be closer to the school campuses for up to seven years rather than two to three.

Simply stated, local school policy is causing negative direct traffic and active transportation effects that can be reversed. That's not to say it's an easy policy change, as other factors and politics are involved. But it is likely the single-most important policy change that could be made to reduce reliance on automobile trips to and from schools.

Other Impacts of School Policy. The proximity to school matters and is a fundamental element of a successful walking or bicycling environment. If students are not walking and bicycling, it means they are being driven to school or bussed. With bussing costing families additional fees, many choose to drive their kids themselves.

This action adds significantly to morning traffic. Many vehicle trips are occurring in Livingston unnecessarily, which induces congestion and vehicle miles traveled, and increases household costs. Such traffic also registers in vehicle counts and intersection delay, both being used to determine capital improvement projects for roadway widening.

Students typically walk at a pace of 3 miles per hour. This translates into a 10-minute walk to cover a half-mile of distance. While some students and their parents or guardians are willing to walk farther than such a distance, using this as a guide demonstrates an im-



Traffic Inducing Traffic

Cartoon by Ian Lockwood, PE



important fact in the city: If the school district reverted back to having three conventional elementary schools, the vast number of students would be within the half-mile walk shed, as illustrated below.

Furthermore, by doing so, the vehicle congestion seen at the limited rail crossings and Park Street intersections should decline as travel behaviors change and the need to make a crosstown trip is eliminated. With the likely increase in active transportation trips made by students, household incomes could see a modest increase as vehicle trips or bussing fees are reduced.

Health impacts derived from walking and bicycling would also occur bringing additional physical activity into the lives of participants. This is important since most US children do not meet daily physical activity recommendations set forth by the CDC and walking or bicycling is one way to help attain that activity.

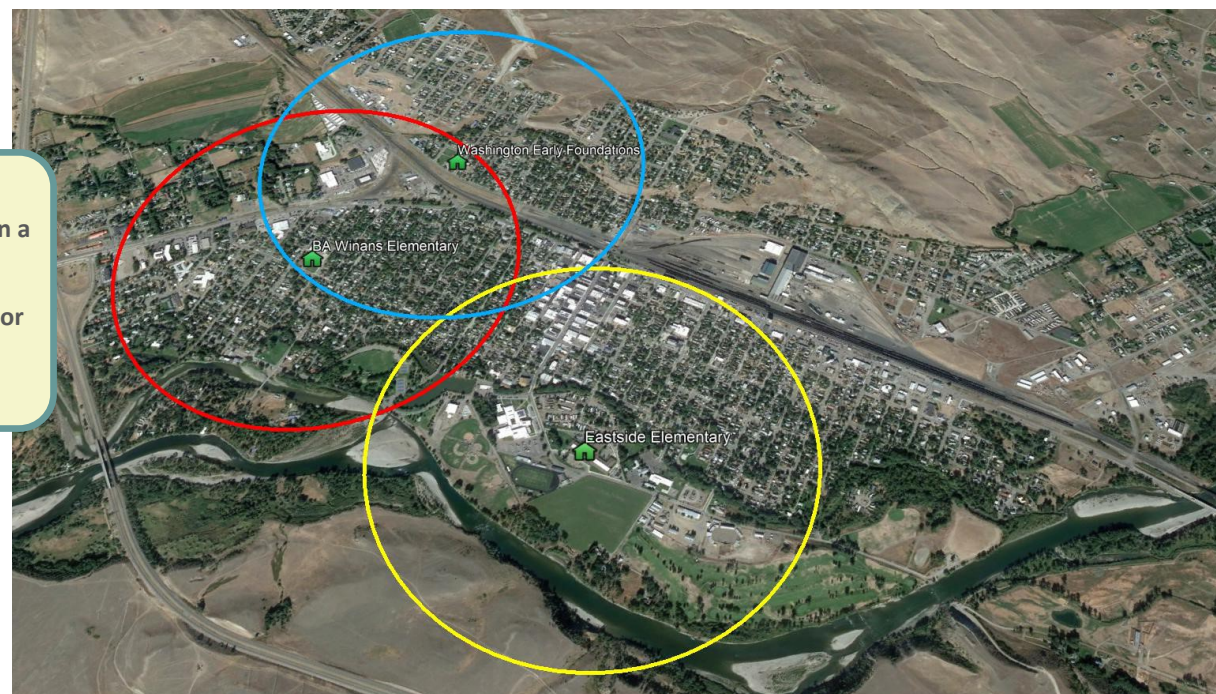
According to the US Census, approximately 600 children live in Livingston and are Pre-K through 5th grade age. With residential land use patterns being what they are, it appears roughly two-thirds of students live within the half-mile radius of one of the three schools.

Walking and bicycling rates among students living within this distance can reach between 25-50%. This translates into a possible raw number of 100-200 (25% of 400 and 50% of 400) students who could regularly participate in active transportation.

If combined with improved infrastructure, the rates of walking or bicycling to school could increase substantially. As the city grows, the northeast portion of Livingston will likely need an elementary school. If such a campus is built, the proximity to the neighborhood will further reduce families' need to drive to school and high participation rates among K-5 students realized.

School Walksheds

A change in school policies could mean a majority of Livingston's elementary school age children would be within what is considered a suitable walking or bicycling distance from their school campus.



Land Uses North of the Railroad. The current land uses north of the railroad tracks in Livingston are dominated by residential neighborhoods. With few exceptions for light industrial, municipal, or religious institutions, commercial and retail outlets do not exist.

This reality, coupled with the school issue, mean most walking and bicycling trips generated from the north are due to lack of vehicle access or recreation. To generate a greater interest in walking or bicycling, a combination of infrastructure improvements and land uses that attract users is necessary.

The number of residents on the north side may not meet requirements of grocers but could meet demand for owners of a smaller footprint market. Other land uses such as small restaurants, social club like a brewery or coffee shop, or other neighborhood-scale businesses may be feasible. This type of development would most likely succeed in a single planned development rather than piecemeal one-off structures and parcels.

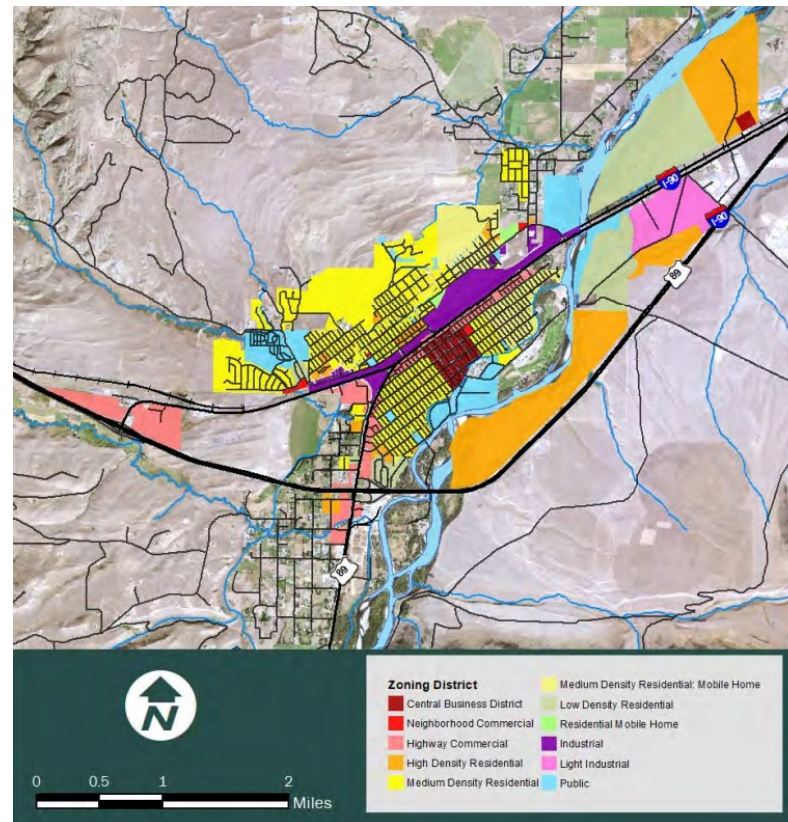
As noted earlier in this chapter, there are some decisions that are directly controlled by the City, County, and school district. Private land use decisions will be either market-driven or require incentives.

New development could spur utilitarian walking and bicycling trips and give residents on the north side of the city reasons beyond recreation to participate in active transportation.

Zoning for and promoting this type of a development could lead to reduced demand for crossing the railroad tracks. The current zoning map (Figure 7-1) shows limited pockets for such development north of the railroad tracks.

Sidewalk Requirements. While every motorist in Livingston enjoys the convenience of pulling out of their driveway and having a road to connect them to their destination, the same cannot be said for someone wishing to use a sidewalk from their home.

Figure 7-1: Livingston Zoning Map



Source: 2021 Growth Policy Update



Sidewalks were not constructed with the new development in several areas of Livingston. If sidewalks are not required at the time of development, especially with larger projects, the opportunity is lost and the public is left to address the shortfall at a later date, likely costing even more money and more complexities as residents may be less supportive of sidewalks after the fact.

In the pictured examples in Figure 7-2, both developments were built between 2005 and 2007. Sidewalks were not mandated or were granted a waiver by either the City or the County. Fast forward to today, and these neighborhoods have residents now asking for safe walking infrastructure.

Now, instead of the developer funding the sidewalks up front, it is Livingston residents and current decision makers who need to determine how to pay for this infrastructure. This may be done through policy mechanisms such as sidewalk utility fees, but those take more political action and are not without controversy.

While sidewalks add to the overall costs of a project, without them being required by land use policies the system is left incomplete. The convenience of connected system that every motorist enjoys is denied for those who wish to travel by walking or rolling. Safety is compromised when such gaps are in place as people are forced to use unprotected shoulders or move within mixed traffic.

Recent development projects in Livingston do not reflect the previous policies and projects are being built with solid sidewalk systems from the outset. The neighborhoods pictured below serve as reminders for current and future generations of what can result without implementation of walking infrastructure from the development stage.

These decisions are not made in a vacuum, as adding costs for new development via sidewalks that are buffered from the street and have trees like they do in older parts of Livingston, may be viewed as policies that conflict with affordability goals.

Figure 7-2: Recent Developments or Individual Parcels Lacking Sidewalks



This is why other methods, such as fee in lieu programs or a sidewalk utility fee may be explored, in addition to land use policy changes. In some cases, the city may incentivize developers who are meeting goals for affordable housing by contributing to certain infrastructure costs, such as sidewalks.

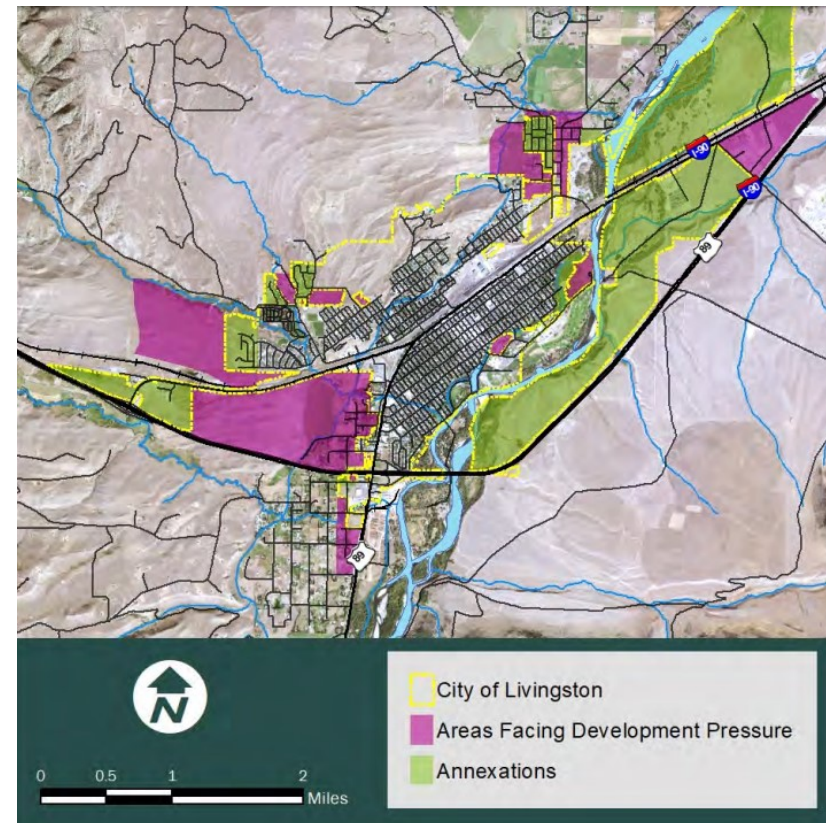
Future Growth Areas. Most of the land uses needed by everyday residents of Livingston are concentrated in a few key locations. These are on the south side of the railroad tracks and Park Street. Furthermore, as was expressed in many discussions, the City is currently facing a void of needed business types such as apparel stores, general department stores and the like, after the shuttering of Shopko. The transition of downtown over many years has led to few businesses offering everyday wares for residents. Accessing current businesses is a challenge for those living north of Park Street and the railroad as well as on the far east side of town.

Not only is travel by foot or wheel difficult from existing north side residents, future growth is largely taking place in the north or slated to occur east of the river, which presents another obstacle. With new neighborhoods comes greater demand to cross at key intersections until the non-residential land uses are developed in closer proximity. The two largest pockets of areas facing development pressure and recent annexations are south of the railroad tracks (Figure 7-3).

To mitigate this reality, improving the crossings of the rail corridor and Park Street will be imperative and north-south infrastructure connecting neighborhoods to city centers is vital. Zoning for mixture of land uses within currently zoned residential areas is another method worth considering as reducing the crossing demand and shortening travel distances from homes to needed services, ideal.

In addition to zoning tools, the City could explore public/private partnership opportunities to attract such land uses sooner than what the general development market may bear. An example could be a rental agreement using City owned land. Such an agreement could significantly reduce monthly costs to a retailer in exchange

Figure 7-3: Recent Annexations and Areas Facing Development Pressure



Source: 2021 Growth Policy Update



for the potential for reduced revenues possible in comparison with other more predictable locations. Some degree of City involvement may be necessary to attract retailers to the north side of Livingston given the distance from the highway and bulk of rooftops that exist on the south part of the city.

Promote Recreation While Growing Utility. Livingston is a community with numerous trails, paths, and recreational opportunities. These attractions and facilities translate into many residents taking advantage of them and regularly participating in active transportation. The input survey appeared to showcase this.

This foundation of active transportation trips for recreational purposes is viewed as an opportunity to grow participation in utilitarian trips. As policy and land use changes occur over time and infrastructure improvements completed, a correlating increase in people walking and bicycling for purposes other than recreation should follow.

A walk to the grocery store or market, a bike ride to a local employment center, or using any active mode for an evening meal with friends, are all examples of what is to come in Livingston with the natural and pursued changes sought by residents.

In the meantime, bolstering the momentum that exists in the recreational space can help persuade residents to take active transportation trips for other purposes. To do this, the community as a whole can examine and augment offerings at the existing parks, improve access to trails and trailheads, invest in wayfinding to depict the sense of time to reach destinations, organize events like walks or bike rides through town, and possibly expand recreational opportunities into locations where such facilities are at a minimum.

These relate to decisions within the control of the City and County. Questions that should be answered are:

- Are the park sites distributed equitably in all parts of the City?
- Do the offerings at park sites match the desires of adjacent populations?
- Are the recreational outlets dated or are new forms of recreation sought?
- How do the facilities at schools address the needs of the community?
- If a person wanted to ride a bike to a park or other facility, can they safely lock up the bike or are they left without such necessities?

Advance Recreation, Equitably

In the short term, promoting active transportation for recreation or to reach recreation destinations is the key to creating a willingness for utilitarian trips.

Increasing walking and bicycling trips can be gained by ensuring park sites and trails are equitably located through Livingston and are accessible to nearby residents.



Upgrade Gateway Corridors. In an ideal world, corridor projects like those MDT may pursue on Park Street and Highway 10 would be evaluated like any other land use decision. There are other policy limitations to that, but that mindset should drive Livingston’s elected leaders, staff, citizens, and advocates to strongly suggest MDT design these routes in consideration of MDT’s 2015 Context-Sensitive Solutions guide, City policies and adopted plans.

The Growth Policy Update chapter on Population and Community Character includes the following:

- Strategy 2.1.1.1: Identify key roadway and non-motorized entry points – or Gateways – into Livingston.

A zoning overlay district for gateway corridors is something the City can pursue for all identified gateway routes. The gateway to Livingston off of US Highway 89 and I-90 on the southwest side of the City generally lacks refined design treatments to suggest it is a key gateway to the City and Yellowstone National Park. There is a great amount of visual clutter from highway signs, utilities, and

other roadway infrastructure. The effects of this are amplified for people walking and bicycling, as they are subject not only to these visual detractors, but also noise and emissions from motorized traffic.

The City should work to ensure other entry points to Livingston along US Highway 89 to the northeast and Highway 10 to the west are not subject to transportation engineering and land use decisions that create a gateway similar to US Highway 89 around Exit 333.

Additionally, the City should pursue coordination with Park County, MDT, and the National Park Service to reimagining the Exit 333 area as a safer and more attractive entry point for Yellowstone National Park-based travelers and visitors to Livingston.

Converting interchange ramps to roundabouts at Exit 333 would provide opportunities to enhance visual appeal and safety, as well as providing context-appropriate public art in the interior circle island of the roundabouts.

Gateway Corridors

The Exit 333 area of Highway 89 can be reimagined to remove visual clutter and enhance the safety and aesthetics for people who walk, bike, and drive. The roundabout outside Grand Canyon National Park on Arizona Highway 64 in Tusayan (below) is a great example of how roundabouts can include public art and make a gateway more inviting and fit the context of a community.

Image: Tusayan, Arizona - National Park Service



Subdivision & Zoning Policies

The first section of this chapter addresses larger, overarching approaches to align land use and school policies to promote walking and bicycling, this section includes specific policy-based recommendations for the City of Livingston to include in its Code of Ordinances. Documents such as the Trails and Active Transportation Plan, as well as the Growth Policy Update, are only as good as the policy changes that occur once they are adopted.

Growth Policy Update. The overall content of the Growth Policy Update, when implemented, will support greater trails and active transportation opportunities for the people and visitors of Livingston. Goals to promote infill and compact development, address climate change, enhance air quality, and promote a mix of housing are supported through the recommended policy changes.

The proposed ordinance changes included in this chapter are focused on implementing the goals, objectives, and strategies contained in the Transportation chapter of the Growth Policy Update. The key elements of that chapter related to ordinances are shown in Figure 7-4 at right.

Figure 7-6 on pages 75 through 78 outline specific policy-based changes for the City to enact to achieve these and other goals. Historically, zoning and subdivision ordinances focus on the movement and needs of motor vehicle traffic and do little to put people who walk and bike on equal footing.

The recommendations contained in this chapter are generated to put Livingston at a leading edge of policies for small cities to ensure a balanced assessment occurs when land develops.

The railroad and MDT are major influences on the safe movement of pedestrians and bicyclists in Livingston. It is desirable that any redevelopment or zoning actions on railroad parcels be subject to the requirements set forth for other private landowners as it pertains to pathways and sidewalks.

Figure 7-4: Growth Policy Update Strategies

Ordinance-based Recommendations
Strategy 8.1.1.1: Adopt an ordinance requiring sidewalks on new developments within City limits.
Strategy 8.1.1.4: Create a process to explore connectivity between City trails and parks to the larger outlying trails network.
Strategy 8.1.1.5: Consider installing outlets for pedestrians and bicyclists in cul-de-sacs and dead-end streets.
Strategy 8.1.2.1: Explore developing roadway standards that accommodate bike/auto/pedestrian and transit.
Strategy 8.2.3.1: Ensure zoning ordinance and subdivision regulations require multi-use trail and/or sidewalk connections to existing and future development.
Strategy 8.2.3.2: Require that right-of-way is dedicated to the City during the subdivision review approval process.
Objective 8.2.4: Ensure that bicycle, pedestrian, and trail connectivity is evaluated in all requests for modification or abandonment of public rights-of-way or access easements.
Strategy 8.2.7.2: Ensure that all transportation modes are provided for when constructing new roadways, including: sidewalks, bikeways, and vehicular and public transit rights-of-way.



Recommended Ordinance Changes. Several Growth Policy Update strategies show the need for bolstered policies in the City’s subdivision and zoning ordinance language. A lesson learned from recent history is that when developers do not build sidewalks with their properties, it is Livingston residents and current decision makers that are left to determine how to pay for the infrastructure.

While sidewalk costs as part of development do add to the overall costs of a project, omitting them as part of a development puts a greater burden on taxpayers in future years. When sidewalk segments are built along the frontage of new development it makes it easier for a public agency to fill the gaps.

Recent development projects in Livingston do not reflect the previous policies and projects are being built with solid sidewalk systems from the outset. However, the current Livingston subdivision regulations are ambiguous about sidewalk requirements. The policy recommendations found on the following pages include recommendations for this and other active transportation

needs. If properties subject to these ordinances already have sidewalks, then they should be required to upgrade the sidewalks to meet current policies for width, fix any driveway crossings that have cross slopes greater than 2%, and upgrade curb ramps to meet current ADA requirements.

Additionally, Livingston’s current ordinances make no reference to the need for new development to dedicate an easement or construct pathways. The Trails and Active Transportation Plan includes a Trails Master Plan map that can be adopted by reference in the City’s and County’s ordinance so policies related to requiring sidewalk construction also apply to trails.

For bikeways, the City should reserve the right to designate new routes if proposed public streets provide connectivity from arterials, collectors, or other bikeways to pathways or other generators within the development.

Addressing policy with block length maximums will promote greater active transportation. Shorter block lengths typically lead to

Mind the Gaps

The Trails and Active Transportation Plan recommends filling the sidewalk gaps on along River Drive. The City’s policies should reflect these identified needs by either requiring new development, like shown at left, to construct sidewalks along the frontage or provide a fee in lieu deposit for the cost of sidewalks that can be used by the city to fill gaps in the system at a later date. Requiring properties to upgrade curb ramps as a condition of approval is also advised, like was done in the redevelopment of the hospital site (below).



greater accessibility throughout an area for pedestrians and bikers. Shorter block lengths increase opportunities for crossings and provide more direct routes for pedestrians – and they limit traffic speed. Shorter block lengths also tend to disperse traffic, resulting in fewer roads that are congested by automobiles.

Connectivity requirements are advised in the form of regulating block lengths in new developments to be consistent with the original street grid patterns established in Livingston. These policies are already in the process of being updated to require blocks that are 366 feet by 466 feet to match the original townsite. Policies should also be added to specify maximum block lengths and conditions under which blocks may be longer than 466 feet.

Where block lengths are longer, the City should examine individual development applications for recommended mid-block crosswalks. In addition, we recommend that culs-de-sac and dead end streets be strongly discouraged unless required by topography and other constraints. When that occurs, micropaths should be required to provide active transportation access and may serve as secondary emergency service access points. Micropaths should also be required on lot lines if there is a nearby trail or pathway connections.

Other Policy Pursuits. Create a Special Improvement District in which the costs of building sidewalks in the existing gaps are distributed across the properties that front the new sidewalk. The City then assesses the property owners their share annually, for a period of up to 20 years. This spreads the costs of sidewalk construction, as opposed to the property owner paying the entire cost at the time of construction.

Allow new developments to pay a fee-in-lieu of building sidewalks on only one side of the street. Those fee in lieu funds would then be used to complete the existing sidewalk gaps.

Figure 7-5: Traditional Street Grid vs. Suburban Street System

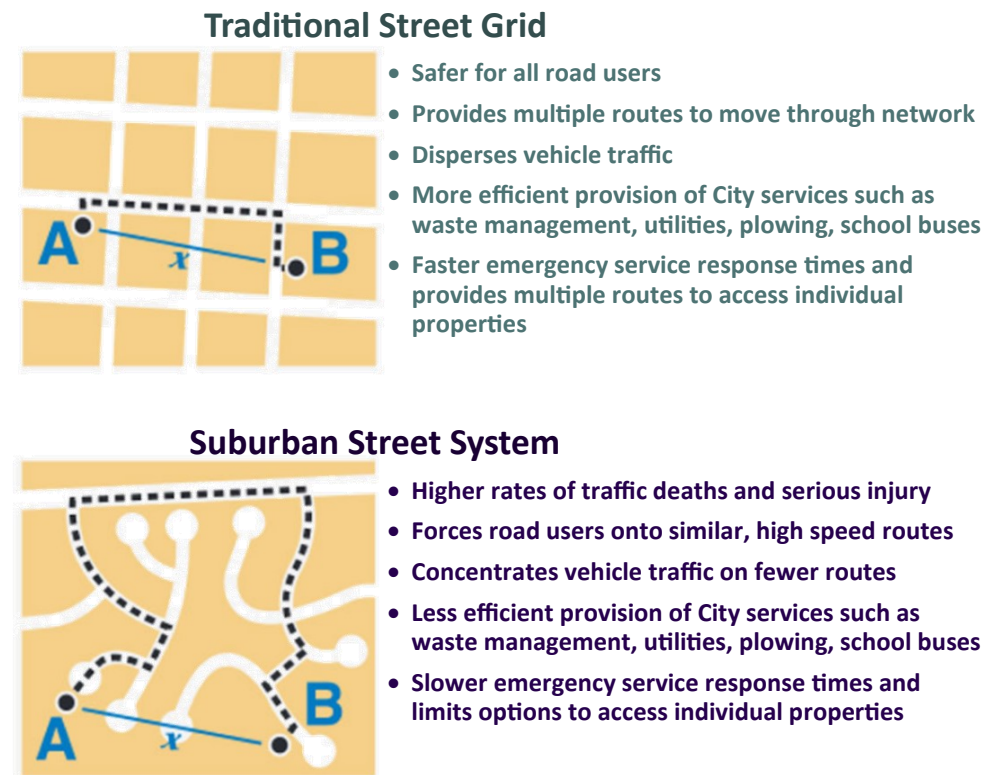


Figure 7-6: Ordinance Recommendations

Section of Ordinance	Assessment
Chapter 26 - Streets and Sidewalks	
Section 26-6. - Marking or painting on sidewalks, curb or pavement.	This policy may come in conflict with pop-up projects and other demonstration projects recommended in this plan. Consider revising to clarify purpose of marking a sidewalk for valid transportation uses.
Section 26-10. - Permit for sidewalk installation or repair.	Add requirements to comply with the Manual on Uniform Traffic Controls Devices, Section 6, for pedestrian circulation and accessibility. Sidewalks must have signed detour routes and the detour route must be comparable to the closed sidewalk from an accessibility standpoint (e.g. if the closed sidewalks has curb ramps, then the detour route must have ramps). In general, sidewalks closed for repairs should have barricades that cover the full width of the sidewalk and are detectable to people who are blind or vision-impaired.
Section 26-11. - Ice, slush and snow upon a public sidewalk is a nuisance.	State that publicly-operated plows will not plow sidewalks from streets onto sidewalks or block curb ramps. Amend to state property owners are responsible for the natural snowfall on sidewalks. Specify that property owners who are clearing parking lots shall not deposit snow so that it blocks sidewalks, curb ramps, and walkways that provide access within the property.
Article VI—Bicycle/Pedestrian Path. Section 26-93. - Definitions.	Update definition for “bicycle/pedestrian path” for new pathways or a general description of them. Consider adding electric-assisted bicycles to definitions, as well as e-scooters, specifying which types of e-bikes are allowed. Ones with throttles are typically prohibited and speed limits are established for all e-bikes. Add definitions for pathways and trails with reference to Trails Master Plan map contained in this plan, once adopted.
Article IX. - Construction and Repair—Public Rights-of-Way. Section 26-102. - Design standards for existing rights-of-way.	Repeat this language in the Subdivision Ordinance to define street cross sections for new streets.
Section 26-107. - Driveway construction—permit and supervision.	Add that driveways along streets where sidewalks are present or planned shall provide a Pedestrian Access Route (PAR) of at least four-foot wide with a cross slope no greater than 2%. Exceptions may be granted for 3-foot wide PAR within a driveway crossing if constraints exist with regard to other site-specific factors. Existing driveways subject to reconstruction must conform to these requirements.
Sec. 26-111. - Width of sidewalks.	Extend expectations for Park Street sidewalk widths to be 10 feet wide from 12th Street to N Street and may be granted 8 feet in width as an exception due to site-specific constraints. Add language for 10-foot wide sidewalk along the south side of Front Street/Gallatin Street corridor, including of segments on Main, Chinook, C, Bennett etc. Add language for pathway expectations along Highway 89 and Highway 10 (10 feet, paved, within existing right-of-way). Repeat sidewalk width language in the Subdivision Ordinance to define sidewalk expectations for new streets.
Section 26-114. - Sidewalk construction—cost borne by owner of abutting property.	Consider adding language to spell out options for citizens to apply for a hardship case, recognizing that incomes vary and a person’s individual ability to pay for such improvements will vary. This will ensure equitable application of the policy. A sidewalk utility fee would nullify this policy, if enacted.



Figure 7-6, continued: Ordinance Recommendations

Section of Ordinance	Assessment
Chapter 28 - Subdivision Regulation	
Definitions: STREET TYPES	Add language for each street type as to their use by pedestrians and bicyclists. Arterial streets also serve as arterials for people who walk and bike due to connectivity and land uses along them. Collectors also serve as arterials for people who walk and bike as they also contain land uses they desire and may provide alternative routes to arterials.
Section I. General Provision - I-C. Purpose.	“The purposes of these regulations are to promote the public health, safety, and general welfare by regulating the subdivision of land...to lessen congestion in the streets and highways.” Recommend changing that component of the Purpose statement to read: “to provide safe and efficient transportation for all modes.” The public health and safety component is important to address the needs of pedestrians and bicyclists. However, the purpose to “lessen congestion” can be counter to that goal. Congested traffic, while not seen as desirable, is safer for all road users due to lower speeds associated with it.
Section III. Major Subdivisions	Requirements for multi-modal transportation analysis should be included in this section, stipulating that such traffic studies evaluate level of service and/or quality of service for pedestrians, bicyclists, motorists, and public transit. The software packages used by traffic engineering firms to perform these analyses have level of service measures for all modes. Avoid prescribing a motorist level of service as improved motorist level of service is detrimental to the safety of pedestrians and bicyclists. Level of service should be considered as a measure to debate the pros/cons of transportation features. For example, if achieving motorist level of service “C” corresponds to level of service “F” for a pedestrian, then it may not be deemed desirable in consideration of the Growth Policy Update.
Section III. Major Subdivisions - III -B-6 Governing Body Decision and Documentation	Impacts on public health and safety are identified here. Add language about conditions and safety for pedestrians and bicyclists, as well as trail users.
Section VI. Design and Improvement Standards - VI-A-8. Streets and Roads	<p>A. Design, part (vi) notes “local streets must be designed so as to discourage through traffic.” This can result in lack of connectivity and is counter to present-day research showing that well-connected streets are safer for all road users and reduce motor vehicle congestion. Suggest changing this language to say “local street must be designed so as to discourage motor vehicle traffic speeds greater than 20 mph, then stipulate in a separate table what these features may include, such as curb extensions, chicanes, speed humps, raised intersections, etc.</p> <p>B. Improvements, part (i) does not identify pathways and trails. Add these features to this section.</p> <p>Table 1: Street Design Standards for Subdivisions stipulates a 64 foot street versus historic streets that have 66 feet of right-of-way. The curb-to-curb dimensions are the same with each at 38 feet but sidewalk space is reduced. If a curb-to-curb section is reduced to 36 feet it would provide for two, 8-foot wide parking lanes and two, 10-foot wide motor vehicle or general purpose lanes. These 10-foot lane widths are adequate for local, residential streets, according to federal design guidance from AASHTO. This would reduce impervious surface and the City’s long-term maintenance burdens due to less asphalt to maintain. It would also provide more land for private development. A more aggressive approach would reduce curb-to-curb sections to 34 feet in width, providing for two, 7-foot travel lanes and two, 10-foot travel lanes, which would reduce impervious surfaces even more.</p>



Figure 7-6, continued: Ordinance Recommendations

Section of Ordinance	Assessment
Chapter 28 - Subdivision Regulation	
Section VI. Design and Improvement Standards - Add Section/Subsections on Sidewalks	<p>“City standard sidewalks (including a concrete sidewalk section through all private drive approaches) must be constructed in all developments on all public and private street frontages, except for alleys. Sidewalks on both sides of the streets must be installed by the owner of the subdivided property concurrent with installation of streets, curbs, and gutters. The developer shall install sidewalks adjacent to public lands, including, but not limited to, parks, open space, and the intersection of alleys and streets or street easements. New subdivisions shall provide connections between the subdivision existing or proposed primary trails. In addition, those subdivision regulations should include a reference to the sidewalk specifications included in Section IV of the City of Livingston Public Works Design Standards and Specifications Policy. If sidewalks exist along the property, they must be upgraded to meet current policy and ADA standards.”</p>
Section VI. Design and Improvement Standards - Add Section/Subsections on Trails and Pathway	<p>The current regulations lack language pertaining to dedication of pathways and trails. Reference Trails and Active Transportation Plan’s Trails Master Plan map (once adopted) as the guide. Ideally, developers would be required to construct these pathways through their subdivisions in the same way they do streets. This could be left to discussions with the City on preferred alignments and adjustments to the trails master plan map to help provide for suitable development options without deviating for the intended purpose of the pathway or trail (e.g. a pathway along the river should not deviate from the river unless other major factors or constraints exist).</p> <p>Stipulate desired widths for trails as 5-foot wide footpaths and shared use pathways as 10-foot wide paved or unpaved routes with at least two-feet of prepared shoulder to facilitate drainage and preserve pavement life (if paved). Actual easement widths may be greater and can be evaluated on a case-by-case basis.</p> <p>Identify a desire for “micropath” connections linking streets to arterials where motor vehicle access controls is more rigorous. Micropaths may also provide connections between properties or at the end of streets to pathways, parks, and other active transportation generators.</p>
Section VI. Design and Improvement Standards - Add Section/Subsections Bikeways	<p>Developments that extend streets identified in this plan as a bikeway should be built to continue the same type of treatments, where applicable. The City may evaluate streets proposed within subdivisions as new bikeways, especially if some streets provide connections from other pathways to new pathways or other activity generators (e.g. trailhead, park).</p>
Section VI. Design and Improvement Standards - Add Section/Subsection on Block Lengths	<p>Block lengths on the original Livingston streets are 366 feet by 466 feet. This pattern should be reinforced for new streets to align with the Growth Policy Update. Language, derived from Missoula and Bozeman codes, would read: “Blocks must be designed to assure traffic safety and ease of circulation, to accommodate the special needs of the use contemplated to accommodate pedestrians, bicyclists and transit users as well as motor vehicles. Block length must not be designed, unless otherwise impractical, to be more than 466 feet in length or less than 366 feet in length. Block lengths may be longer than 466 feet if necessary due to topography, the presence of critical lands, access control, or adjacency to existing parks or open space. In no case may a block exceed 1,320 feet in length.”</p>
Section VII. Mobile Homes - VII-D-2. Streets	<p>Add language stating streets must be designed to provide safe pedestrian and bicyclist access and circulation. This may not always mean sidewalks are required but street design treatments should work to self-enforce speeds no greater than 20 mph given people using all modes may share the same space. Features such as speed humps and narrower street widths can promote this desired target speed.</p>



Figure 7-6, continued: Ordinance Recommendations

Section of Ordinance	Assessment
Chapter 30 - Zoning	
Article II—Definitions: “Street”	Definitions under “street” acknowledge it “as a public way for motor vehicle traffic.” Revise to identify legal use of streets for pedestrians and bicyclists, with the sidewalk being part of the street right-of-way. Remove “fast or heavy traffic” from arterial street definition as there is no requirement that an arterial route be fast or include heavy traffic; add what functions the various street types serve for pedestrians and bicyclists.
Article II—Definitions: Bikeways, Pathways, and Trails Pedestrian Access & Circulation Routes	Add definitions for these features as zoning ordinances are updated to require consideration or improvements of these facilities (<i>or reference Section 26-93</i>). Add definitions for pedestrian access routes (PAR) and pedestrian circulation routes (PCR) to align with ADA requirements. PAR are walkways where a minimum of 4-feet (5-feet preferred) is clear of obstacles and has a cross slope no greater than 2%. PCR’s are any prepared area for pedestrians and should be kept clear of protruding objects and ensure signs have bottom edges no lower than 80 inches.
Section 30.46. - Building design standards.	“Promote Buildings that Reflect Pedestrian Scale. Human scale shall be an integral part of all buildings.” This is a great acknowledgment of how the history of Livingston is centered on people and their needs. Add language to address how the pedestrian interacts with buildings facing the street in terms of restricting doors that open onto sidewalk space. Suggest that sidewalk-level windows provide visual appeal and prohibit the “blacking out” of windows by tinting or other advertisements.
Section 30.50 - Signs: “Projecting signs”	Consider adding language about pedestrian-oriented signage that is perpendicular to the building space and hangs over a sidewalk so people who use sidewalks can easily identify the business. This would not prohibit signs on the façade of buildings that face motor vehicle traffic, but would be in addition to those in identified districts (e.g. downtown).
Section 30.50 - Signs: Height	Sign heights must not overhang a pedestrian access route and pedestrian circulation route must lower than 80 inches off the surface of the sidewalk or other type of walkway/path. This mostly applies to traffic signs. Permanent business signs will adhere to this due to other features of the code restricting permanent signs to 8’ minimum height.
Section 30.74 - Variances	Stipulate that variances related to sidewalks and upgrades for ADA compliance will not be considered on properties abutting arterials and collectors.
Other Sections to Add (Ordinance Chapter TBD)	
Abandonment of Public Rights of Way	Create a policy on methods to evaluate proposed right-of-way abandonment to ensure opportunities for trail, pathway, or micropath linkages are considered. In lieu of full abandonment, a defined process could assess a reduction in the width of the existing open right of way or a land swap of that right-of-way to help provide a more suitable or desirable connection.
Gateway Corridor Treatments	Gateway corridor regulations that promote greater aesthetics for transportation corridors should also enhance the experience and safety for people entering Livingston by bike and on foot. Treatments such as frequent, safe pedestrian crossings at gateway corridors showcase that Livingston is a town that values safety and wants motorists to slow down when moving through the City. Pathway corridors can include signage and other features similar to what roadways typically include to help promote bicycle tourism.



8. Programs

A variety of programs will help promote more walking and rolling in Livingston in combination with infrastructure investments. While the City of Livingston can support some of the recommended programs, other community partners may be better positioned to manage them. This chapter outlines several programs the City and its partners should pursue. They were identified through a combination of public input, the project steering committee, and the plan's consultants.

Several organizations help communities with resources and tools to organize events or programs. More can be obtained through their websites than can be documented in a single plan.

Sidewalk & Pathways Maintenance

Keeping sidewalks and pathways clear and accessible year-round is an expressed goal of the Livingston Trails and Active Transportation Plan. This can be done through a combination of public and private efforts that focus on priority routes, such as crossing the railroad tracks, accessing grocery stores, school walk routes, and paved shared-use pathways.

Winter Maintenance. With an average annual snowfall of 53 inches, the presence of snow blocking curb ramps, sidewalks, and pathways creates mobility challenges and accessibility issues for people walking and rolling on the sidewalks. It is common practice for cities to require property owners to remove snow from sidewalks.

Livingston's current code of ordinances states:

- Chapter 26, Section 11: "Ice, slush or snow remaining upon a public sidewalk is hereby declared to constitute a public nuisance and shall be abated by the owner or tenant of the abutting private property within twenty-four (24) hours after such ice, slush or snow has been deposited."

Where there are buffers between sidewalks and the curb, this is a valid expectation since the snow can be shoveled to the buffer or



Active in All Seasons

If walking and bicycling are to be viewed as transportation modes vital to the people of Livingston, the City and its partners must work to ensure sidewalks, bikeways, and pathways are maintained throughout the year. Keeping major routes clear of snow is key in winter, as is conducting neighborhood clean-up days to clear seasonal obstructions like leaves and overgrown shrubs from sidewalks.



onto a person's front yard. Where there are no sidewalk buffers, this can become a challenge as Livingston only allows snow to be placed in the street in the downtown area.

While there is not an expectation that the City clear snow from every sidewalk, there are some adjustments that could be made to City policies and snow management practices to ensure a safer, more accessible sidewalk system in winter. Several recommended approaches are outlined below to improve conditions during winter.

- **Amend Ordinance for Plowed Snow:** Moscow, Idaho, has similar annual snowfall amounts as Livingston and modified its ordinance that requires property owners to remove snow to state, "This duty applies to natural snowfall; it does not extend to snow displaced onto sidewalks by City snowplows after an owner has removed natural snowfall." This recognizes that snow plowed onto sidewalks is difficult to remove by property owners and the City's plowing crews should not be plowing snow from streets onto sidewalks.

- **Curb Ramp Access:** When plowing operations on the streets have ceased, the City should begin clearing snow that was plowed to block access to curb ramps. This is a duty under the Americans with Disabilities Act, as Federal Highway Administration states: "Public agencies' standards and practices must ensure that the day-to-day operations keep the path of travel on pedestrian facilities open and usable for persons with disabilities, throughout the year. This includes snow removal."
- **Priority Routes:** Cities have met the above requirement through identifying priority routes that they, or partners, actively clear of snow regardless of property owner responsibility or action. The City may work with the schools, downtown businesses, and others, to identify a priority network of routes that the City will work to keep clear of snow to ensure access. All sidewalks and pathways that are not adjacent to public property (e.g. Veterans Bridge, 5th Street Railroad crossing, I-90 interchange underpass) should be cleared by a public agency.

Snow Management & Equity

Cities are required by law, under the Americans with Disabilities Act (ADA), to keep sidewalks clear and accessible. This includes snow removal and snow management policies and practices.

Snow plowed from city street to sidewalks creates safety issues that force people into the street. Snow that is plowed so it blocks access to curb ramps and crosswalks should be removed from those locations once main plowing operations have ceased.

The City may create a program to remove snow from high priority sidewalk routes, such as school walk routes. Outreach to business organizations can help keep commercial area sidewalks clear of snow.



- **Highway 89 Pathway:** The pathway serves as both a walking and bicycling route to key destinations within the city limits. Park County Environmental Council organizes volunteers to clear the pathway. The City may assist in moving heavier amounts of snow, especially those that may be mounded at street crossings due to plowing.
- **Ponding & Icing:** Other sidewalk and pathway access issues emerge after a snow event occurs. Curb ramps may become blocked by ponding water and ice due to snow build-up in gutters that keeps water from flowing to storm drain inlets. City crews can inventory locations that are routinely problematic and address these locations once the snow begins melting.
- **Property Owners:** Messaging to property owners should state snow cannot be shoveled or plowed from driveways and parking lots in a manner that results in it blocking sidewalks, crosswalks, pedestrian push buttons, or curb ramps. Policies may be updated to specify this expectation.

Other Seasonal Maintenance. The end of the winter season often means debris is left covering sidewalks and pathways due to snow management. It was noticed during field work in April 2021 that the sidewalks along Highway 89 near I-90 and the Veterans Bridge pathway had notable build-up of debris. These should be cleared by a combination of City, MDT, and volunteer forces.

Springtime also means new growth of shrubs that may impede the functional sidewalk width. Sidewalk passage can become difficult or uncomfortable as shrubs and trees grow on private property abutting sidewalks. Tree branches should be trimmed to minimum heights of at least 80 inches and shrubs kept from encroaching into the sidewalk space.

Code enforcement of these items is primarily complaint-driven, but clearing of these sidewalk obstructions could be a volunteer-based program with City endorsement. Oftentimes, a property owner's failure to clear shrubs or trim tree branches is due to other



Cleanup

The after effects of winter weather mean sidewalks and pathways are often-times impacted by debris from snow plowing and ice buildup. Spring cleanup days can work to clear sidewalks and major pathways of this debris. To comply with ADA, public agencies such as MDT and the City should clear debris from sidewalks and pathways that are along public property such as bridges and interchanges.



circumstances in life—such as age or income—that limit their abilities to effectively address these. Service clubs, scouts, and other non-profit groups may organize seasonal sidewalk clearing events to address priority routes and help those areas in need. These efforts would bolster the City’s existing Adopt-A-Trail program, which has seven teams that have adopted parks or trails in the City.

Wayfinding

A comprehensive wayfinding strategy for Livingston is recommended for all modes of transportation to and within Livingston, as well as for trail and pathway users. Visitors to Livingston are looking for key destinations, while those staying in town and wishing to walk the city may not know the most direct or suitable routes. Ideally, a coordinated system of wayfinding signage that establishes a clear, recognizable brand for signage directing people to key destinations within Livingston should be developed

in coordination with downtown merchants, the chamber of commerce, and other key partners.

There are several options to coordinate wayfinding for sidewalks, bikeways, pathways, and trails.

- Welcome visitors to the community;
- Guide visitors and residents to businesses, attractions and other destinations;
- Direct visitors and residents to trailheads and other recreational spots; and
- Establish a clear, positive, unique and recognizable sign design, elements of which are included in every sign installed through the program to establish a common theme or brand.

Pedestrian and Bicyclist Wayfinding. Where wayfinding for active modes differ from wayfinding for drivers is that time is more relatable than distance for people who walk and bike. Many do not know how long it takes to walk or bike two miles, but if you can put



Wayfinding Strategies

Wayfinding is as much about helping people find their way as it is branding for a community. Motorist-scale wayfinding helps drivers find key destinations, such as downtown, historic districts, and public parking. Oftentimes, the same branding is used for pedestrian wayfinding that helps people reach more specific locations once they have arrived.

The images at left show these types of wayfinding sign families at a pedestrian or bicyclist scale. Changeable panels or lettering allows the signage to evolve as a community changes.



that in terms of 40 minutes of walking and 6 minutes of bicycling, then the choice on which mode to use becomes more intuitive.

The images in this section show various types of time-based wayfinding for active modes. These signage types are generally placed at key junctions on designated bikeways and key walking routes. Their design theme may be consistent with other vehicular wayfinding or may be viewed more as a traffic control sign.

Pathway and Trail Wayfinding. Wayfinding is a key component of complete and effective trails and trail networks and should be part of the planning process when new trails are designed and constructed. Proper signage along a trail maintains user safety, cuts down on user conflict, and keeps users informed and connected while they utilize the trail.

Signage features in a pathway or trail setting can be designed to be consistent with local context and character, as existing signage along Livingston’s trails already reflects. Trail junctions should be clearly marked with signs and distances so people can make the right decision on how to proceed. It is advisable that the City work with Park County and other cities within the county to develop a consistent set of trail and pathway wayfinding signs as the area’s system grows.

Bicycling and Walking Audits

Bicycling and walking the routes planned for improvements are a key element of a project design process as well as a way to better engage the community. Walk and bike audits are popular events by advocacy groups to assess conditions, introduce people to the best routes for walking and bicycling, and assess policy outcomes. Park County Environmental Council conducts bike audits and did them most recently as part of the Growth Policy Update to assess the city’s bicycling network. These recreational audits should continue. Additionally, the City is recommended to incorporate formal road safety audits into project design processes and ask MDT for those same audits on state-managed routes.



Distance-Based Wayfinding

Another type of wayfinding is focused on providing information to pedestrians and bicyclists as they travel along sidewalks, bikeways, and pathways. They can complement other types of wayfinding but these are oftentimes designed to be traffic control-type signs so they are easily recognizable to road users.

Putting an approximate time is more valuable to people who walk and bike than distance alone since those who do not routinely walk or bike may not know how fast they move via those modes.



Safety Audits. Road safety audits are a routine part of a project planning, design, and construction process and it is advised for the City of Livingston to incorporate such audits into future projects led by the City, MDT, and private consultants. In 2020, the Federal Highway Administration published its *Pedestrian and Bicyclist Road Safety Audit (RSA) Guide and Prompt List*. As FHWA notes in this guide, “An independent and multi-disciplinary team conducts the assessment with the intent of improving safety—and may be focused particularly on pedestrian and bicyclist safety. The RSA Team considers how roadway, traffic, environmental, and human factors impact safety, within the context of mobility, access, surrounding land use, and aesthetics.”

By conducting a formal RSA, the team can document more subtle elements of the built environment and examine concepts before they are fully designed. A typical RSA process involves collecting data on traffic volumes and crashes, as well as in-the-field assessment of things like sidewalk widths, crossing needs, crosswalk design, ADA compliance, design users, bike lane widths, trail crossings/connections, and other features.

Potential RSA members should include city, county, state maintenance and engineering staff with jurisdictional authority; local transit and school transportation officials; local health department representatives to ensure safe passage of non-motorized users of all ages from children, seniors, and mobility assisted; traffic enforcement; and city government officials.

Community Audits. Audits like those conducted by PCEC also help inform overall community needs and project specifics. A formal RSA can be complemented by a community-based audit to gain other perspectives on the proposed investments. Taking elected officials for walks or bike ride is also a valuable tool to help them relate to the conditions pedestrians and bicyclists experience on the street.

For example, a community bike ride was held as part of the public engagement for the Trails and Active Transportation Plan. The



Safety Audits & Community Audits

Safety audits are conducted by public agencies as they plan or design a project. They typically include subject-matter experts, planners, engineers, and community advocates to measure and assess features in the road environment.

Community audits can serve a similar purpose but may be more qualitative in their outcomes and outreach. They can be used to assess general conditions and understand how people feel using a facility.

The two methods can be combined to create a more inclusive involvement process and design outcomes.

FHWA Pedestrian and Bicyclist Road Safety Audit Guide and Prompt List:
https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa20042.pdf



purpose of the ride was to take people to the locations of key project recommendations, discuss the specific recommendation, and gain feedback on how to refine that recommendation. Seasonal audits may also be desirable to assess conditions like seasonal maintenance needs and observe user behavior.

Trail Orientation & Ambassador Program

Trail usage will increase both as population and trail mileage grow in the region. Non-profits, with support from the City and Park County, can consider various types of trail education campaigns aimed at helping users understand trail etiquette and leave no trace principles. School programs can build capacity for trail usage and ambassador organizations can help lead field trips for city schoolchildren on the area's trail. Trail Ambassador programs allow volunteers to station at trailheads on busy dates to help visitors and others learn about trail opportunities, how trails are built, and how trails can be properly maintained by users.

Counting Program & Intercept Surveys

While motor vehicle counts are common part of a City or MDT's processes, the counting of people using sidewalks, bikeways, and trails is often left to volunteers. The City should work toward requiring development-based traffic studies to include counts for all modes of transportation, as well as evaluation of the quality of service or level of traffic stress for pedestrians and bicyclists to be included with motorist level of service analysis.

Knowing how many people are using a sidewalk or bikeway before and after an investment is important to track so decisionmakers know the impacts of their investment decisions.

To supplement these actions, volunteers groups can be organized to conduct counts and intercept surveys at various locations throughout Livingston. This will help understand both the volume of users and why they are using the active transportation network.

For example, current counts for pedestrians along Gallatin/Bennett where there are no sidewalks may be limited due to a lack of



Trail Usage

Helping people know how to be good stewards of trails and pathways helps keep them in safe condition and builds respect for the system. Counting trail users and understanding their needs, desires, and reasons for using the trails informs decisionmakers, public agencies, and other organizations on how to improve or expand trail systems. Permanent counters (outlined with the yellow box below) can be installed on paved pathways and provide year-round user data.



facilities. But there are worn paths adjacent to the curbs showing demand. It would be expected that pedestrian usage would increase when sidewalks are completed between N Street and Park Street.

Nationally, organizations conduct counts of pedestrians and bicyclists at intersections during the same week each year in September. This time of the year is chosen because it reflects suitable weather conditions and prevailing transportation patterns during the school year. Counts are typically done during two-hour peak period times and the day of the week can vary based on anticipated usage. For example, pedestrian and bicyclist trips to parks and trailheads are highest on weekends, while school walk/bike trips are highest during morning arrival periods.

Similarly, counts at trailheads can occur on peak weekends to

understand seasonal variations in use. Peak periods of arrival are chosen and may include an intercept survey to understand where people are coming from and how they are using trails.

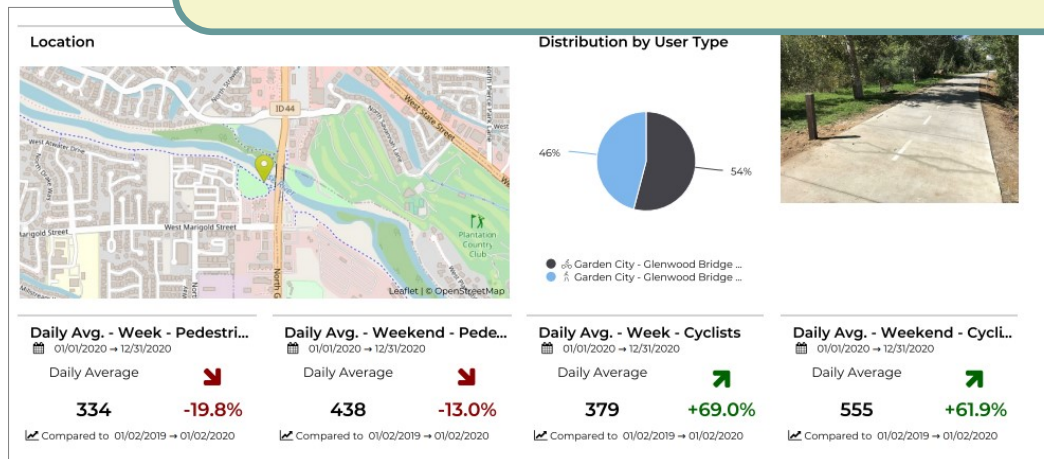
The City, County and other local partners may seek funding for automated trail counters that can be placed at entry points to popular trails. These infrared counters are portable so they can be moved to different locations throughout the year. Automated counters may be useful in some select sidewalk environments but are not as accurate in those settings.

Safe Routes to School

The policy section of this plan addresses the challenges in increasing rates of walking and bicycling to school in Livingston due to school zone attendance policies. That does not mean that programs to promote safe routes to school should be abandoned.

Counting People

Automated counters link to software programs that allow for detailed analysis on trail usage, as shown below. Additionally, on-street counts can be taken through the use of publicly-accessible forms through the National Bicycle and Pedestrian Documentation Project. People sit at key locations for two hours and count users by mode and sometimes the direction they are traveling. These counts can be used to provide data on existing usage as well as before/after counts to understand increased usage due to investments.



STANDARD SCREENLINE COUNT FORM

Name: _____ Location: _____
Date: _____ Start Time: _____ End Time: _____
Weather: _____

Please fill in your name, count location, date, time period, and weather conditions (fair, rainy, very cold). Count all bicyclists and pedestrians crossing your screen line under the appropriate categories.

- Count for two hours in 15 minute increments.
- Count bicyclists who ride on the sidewalk.
- Count the number of people on the bicycle, not the number of bicycles.
- Pedestrians include people in wheelchairs or others using assistive devices, children in strollers, etc.
- People using equipment such as skateboards or rollerblades should be included in the "Other" category.

	Bicycles		Pedestrians		Others
	Female	Male	Female	Male	
00-15					
15-30					
30-45					
45-1:00					
1:00-1:15					
1:15-1:30					
1:30-1:45					
1:45-2:00					
Total					



The Safe Routes to School National Partnership and National Center for Safe Routes to Schools have several resources available to school districts, cities, and non-profits to help promote safer walking and bicycling to and from school. The Safe Routes to School approach consists of what known as the 6-E's:

Engineering. The degree to which Livingston's streets provide direct or sole access to a school was considered in how projects were ranked. By creating physical improvements to streets and neighborhoods, it makes walking and bicycling safer, more comfortable, and more convenient.

Engagement. All Safe Routes to School initiatives should begin by listening to students, families, teachers, and school leaders and working with existing community organizations, and build intentional, ongoing engagement opportunities into the program structure. Bike rodeos, art contests, and other interactive engagements can help build knowledge of what it means to walk and bike to school. This engagement also helps identify specific walk and bike routes that parents feel are safest or problematic when deciding to let their children walk or bike to school.

Equity. Ensuring that Safe Routes to School initiatives are benefiting all demographic groups is important so the focus is not on those neighborhoods or schools with greater means. Particular attention must be paid to ensuring safe, healthy, and fair outcomes for low-income students, students of color, students of all genders, students with disabilities, and others, are part of the effort.

Encouragement. Closely tied with engagement, generating enthusiasm and increased walking and bicycling for students through events, activities, and programs helps build momentum. Having classes track how far they walk or bike (to/from school or just through course of a routine week) helps them understand the possibilities and freedom that comes with traveling and having fun using these modes.

Education. Providing students and the community with the skills to



Walking School Buses & Bike Trains

A strategy to get parents comfortable with letting their kids walk or bike to school is to form walking school buses or bike trains. These are where parents organize set times and routes for kids to go to school together.

The diagram on the left is the walking school bus route in Dillon, Montana. They conduct it three days a week and pickup times are listed on the diagram. Bike Trains are a similar strategy to get kids used to biking to school. Kids ride single file in a group along a bike route or a sidewalk with parents or volunteers chaperoning them.



walk and bicycle safely helps them navigate those situations in all aspects of life. Educating them about benefits of walking and bicycling, and teaching them about the broad range of transportation choices can help build greater stewards of a safe transportation system for future generations.

Evaluation. Knowing which methods are working is important to make the case to decision makers and grant funding sources. By assessing which approaches are more or less successful, ensuring that programs and initiatives are supporting equitable outcomes, and identifying unintended consequences or opportunities to improve the effectiveness of each approach, Livingston and its partners can make sure a safe routes program is successful and sustainable.

Bike/Walk to School and Work Events

The National Center for Safe Routes to School is the coordinating organization for Walk to School Day held every October and Bike to

School Day held each May. These events are used to encourage families to celebrate the benefits of walking and biking and to increase local leader commitment and visibility for traffic safety and community quality of life. The center provides resources and tips for conducting these events and tracks participation in the program across the United States.

Each May, the League of American Bicyclists organizes Bike Month and Bike to Work Day. For bike to work day, employers are encouraged to promote people commuting by bike and some communities station people along popular routes to provide coffee and breakfast to commuters. Places like Missoula have commuter challenge weeks or months to work with employers to see which ones have the most participation in commuting to work via active modes.

Safe Routes for Seniors

Safe Routes for Seniors (SR4S) programs develop a series of neighborhood route maps that links older adults to destinations for



The Needs of Older Adults

Older adults have different concerns when deciding whether or not to take a walk. The risk of a fall and related hip injury can be at the top of mind for some and may deter them from being active. Sidewalk cracks and heaves, as well as icy surfaces, create unstable conditions.

The City, Park County Senior Center, and local non-profits can work with Livingston's older adult population to identify safe routes and conduct community audits with them to identify senior-specific needs when the City is planning infrastructure upgrades.



groceries, recreation, and socializing. Identifying gaps in the routes or problem locations, such as sidewalk trip hazards and lack of curb ramps, can help with input to city projects and implementation of its ADA Transition Plan. SR4S programs help increase the number of walking and bicycling aging adults, improve health outcomes for aging adults, and empower aging adults to self-identify transportation needs, program elements, and routes that connect to improved quality of life activities. A SR4S program can be coordinated with other Senior Center activities, as well as Fit and Fall Proof classes that take place in the area or through the Park County Senior Center.

Kidical Mass Ride

Kidical Mass is a play on words of the critical mass bike rides that occur in many larger cities to raise awareness of bicyclists. A Kidical Mass ride is a family-friendly event, much like a bike parade, that promotes bicycling as a fun, family-friendly activity. Families are encouraged to be creative in decorating their rides and wearing costumes (ones that are safe to bike in) on a short route around a community. They are typically organized to start at school or parks and may include police escorts, particularly across major street crossings.

Kidical Mass rides are often organized to celebrate a holiday or the opening of a new trail or bikeway. Participating organizations may create stations along the route for kids to engage in art contests and other interactive features to help them enjoy the ride.

Pop-Up Demonstration Projects

Pop-up demonstration projects are a way to introduce safety projects to a neighborhood before full-scale investments are made. Another term for this is “tactical urbanism.” Pop-up demonstration projects can include things like temporary bike lanes protected by hay bales or planter boxes, as well as using temporary materials like tubular markers to create curb extensions or neighborhood traffic circles. This straw-then-sticks-then bricks approach allows projects to be tested, evolve, and proven worthy before final investment.



Popsicles & Pop-Ups

A Kidical Mass ride (above) around Livingston is a way for kids and parents to engage in becoming more active and understand the safe routes that families can use to access places within Livingston.

Traffic safety improvements, such as curb extensions and protected bike lanes, can be tested on the streets before full implementation. As shown below, the possible dimensions for a curb extension at an uncontrolled crossing are evaluated for dimensions in consideration of how large vehicles pass by them.



At one level, these projects allow neighborhoods to dream about the improvements they would like to see on their streets to make them safer for walking and bicycling. Because they are temporary, timelines can be set for application and the City can help conduct pre/post speed studies, traffic counts, and other evaluations.

At another level, it's a way for the City to test options for projects before investing in permanent materials. Creating curb extensions, protected bike lanes, or neighborhood traffic circles with temporary materials can help determine final dimensions for the design of a permanent project.

For example, curb extensions built with temporary materials allow a City to test turn radius for large vehicles like emergency services.

Pop-up demonstration projects can also be used to apply a traffic safety treatment to a road if funding the full-scale improvement

may take a year or more to implement. The Tactical Urbanism Guidebook, referenced in the Appendix section on Design Guides, showcases several options.

Open Streets

Open Streets events are street festivals that close a street or combination of streets to allow for free movement of pedestrians and bicyclists; staging of events such as concerts, yoga, and in-street skate parks; and food vendors to celebrate a particular neighborhood or provide a locally-focused event to help promote walking and bicycling.

Missoula's Sunday Streets are a great Montana example and their 2021 Sunday Streets events were held along several blocks of the Franklin to the Fort neighborhood to highlight a pop-up demonstration project that was done to erect temporary traffic



Open Streets Open Minds

Open Streets can take many forms, from street festivals to showcasing community investments. Missoula's Sunday Streets events in 2021 were a combination of both. With streets closed to motor vehicles, Sunday Streets Missoula put activity stations, food trucks, and in-street skateboarding on the streets of a 6-square block neighborhood that is the recent recipient of temporary neighborhood traffic circles and curb extensions. Volunteers kept look out at crossings of main roads and allowing local residents access to their property during the event.



circles and curb extensions in a neighborhood that lacks full-scale sidewalks and other traffic safety features.

Bicycle Tourism

Livingston is located along two designated bicycle tourism routes: Adventure Cycling's Lewis and Clark Trail and the Rails to Trails Conservancy's Great American Rail-Trail. The Depot could become the hub for these efforts, along with rebuilding sections of the rail-trail in town where it is currently narrow and meandering.

The Lewis and Clark Trail was created to celebrate the anniversary of the Corps of Discovery's 1804-1806 historic journey. The designation of this route provides bicyclists the opportunity to follow the path of the explorers Lewis and Clark. The trail is part of a 4,500 mile network of mapped routes stretching from Washington to Illinois. This economic opportunity potential could be strengthened by mentioning that Park County has a 12-stop Lewis and Clark interpretive driving tour that extends from Bozeman Pass through Livingston to Sheep Mountain Fishing Access Site just east of town.

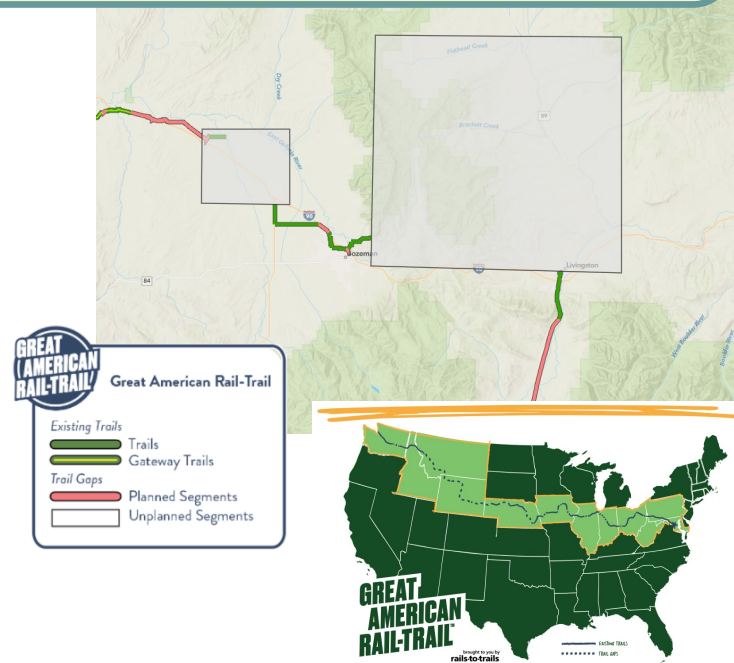
The Great American Rail-Trail is in its early planning and designation stages, but is envisioned as a coast-to-coast pathway that connects more than 145 existing rail-trails, greenways and other multiuse paths spanning more than 3,700 miles. The Depot Center Trail and US 89 Pathway are designated along the route with the section between Livingston and Gardiner identified as an existing gap. The segment between Bozeman and Livingston is shown as an unplanned section and the Highway 10 pathway identified in this plan is conceptualized as a linkage toward Bozeman for this segment of the planned rail-trail.

These designations indicate the potential for bicycle tourism potential in Livingston and there are several programs that can be organized to take advantage of it. These include:

- Bike Trail-Friendly Businesses that cater to long distance travelers by providing access to water, supplies, bike repair, and lodging/camping options.

Gateway to Bike Tourism

The route of the proposed Great American Rail-Trail between Bozeman and Livingston is designated as an unplanned segment. The Highway 10 pathway identified in this plan can help fill a portion of that unplanned route. The Great American Rail-Trail, as well as Adventure Cycling's Lewis & Clark Trail that passes through Livingston, indicate the City could become a hub for bicycle tourism and related programs.



- Branding Livingston as a bicycle tourism destination, particularly as the gateway to Yellowstone National Park.
- Publishing other bike ride itineraries (e.g. one-day, three-day, five-day) rides along paved and unpaved roads.
- Identifying the existing impacts of bicycle tourism on Livingston through a bike tourism-specific study.

These actions not only provide a greater experience for bicyclists and help with the local economy, such actions are also great for positioning Livingston for grants to fund implementation of things like the Highway 10 pathway section of the Great American Rail-Trail.

Bicycle-Friendly & Walk-Friendly Community Status

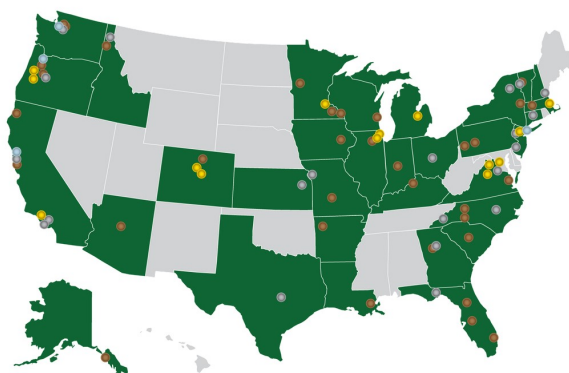
The League of American Bicyclists and the Highway Safety Research Center each have application-based designation programs for communities hoping to receive official status as bicycle-friendly and walk-friendly communities. These organizations have open application windows each year and communities are asked to fill out a survey to gauge their level of bike- or walk-friendliness. Designations are given at the Bronze, Silver, Gold, and Platinum levels. Some communities receive honorable mention.

Pursuing bicycle-friendly and walk-friendly status constitutes a

values statement by Livingston’s leaders to indicate their commitment. The organizations that review these applications provide feedback to cities on next steps to improve their rankings. Obtaining this status is also a positioning action that can be used to bolster Livingston’s standing when it pursues grants to implement projects or programs identified in the Trails and Active Transportation Plan.

Missoula (Gold), Bozeman (Silver), and Billings (Bronze) are designated Bicycle-Friendly Communities in Montana. There are no designated walk-friendly communities in Montana. Sandpoint and Coeur d’Alene, Idaho, are the closest walk-friendly communities to Livingston.

Businesses may pursue Bicycle-Friendly Business status through the League of American Bicyclist and they are not required to be in a Bicycle-Friendly Community. Billings has three Bicycle-Friendly Businesses and Bozeman has one. The City of Missoula is a Bicycle-Friendly business and both the University of Montana and Montana State University are designated as Bicycle-Friendly Universities.



9. Health, Equity & Inclusion

Over the past 30 years there has been increased interest in the connection between health and place. As the City of Livingston looks for ways to improve the wellbeing of its residents and the vitality of the community, it's essential to take a closer look at this connection and explore the wide range of design elements and tools that will lead to a more healthy, equitable, and connected community.

While increasing physical activity is a key outcome of a connected active transportation system, there are other impacts to a person's health when they are able to be more physically active. Mental health outcomes are improved, as are other dimensions of health such as social health, intellectual health, and economic health.

Montana Department of Transportation's (MDT) statewide Pedestrian & Bicycle Plan cites Montana Department of Public Health and Human Services data that "three in every four adults and seven in ten children in Montana did not meet physical activity recommendations." MDT's plan also states, "Walking and bicycling for transportation are part of a healthy lifestyle, which can help people stay at a healthy weight or lose weight."

Local data suggest similar trends. Data from the 2019 Park County Community Health Needs Assessment (CHNA) Summary Report and the 2019 Park County Youth Risk Behavior Survey (YRBS) show that both adults and youth in Park County are far from meeting recommended levels of physical activity.

The data in Figure 9-1 are derived from the two Park County Census tracts that include Livingston residents. The Centers for Disease Control and Prevention (CDC) aggregates health data to the Census tract level in its PLACES map.

The data show nearly 1 in 3 residents in Livingston's tracts have high blood pressure or obesity, while approximately 1 in 6 report their physical health and/or mental health as "not good."

Figure 9-1: Select Health Data for People in Livingston



REPORT HAVING POOR OR FAIR HEALTH



REPORT THEIR PHYSICAL HEALTH AS "NOT GOOD"



REPORT THEIR MENTAL HEALTH AS "NOT GOOD"



ARE DIAGNOSED WITH HIGH BLOOD PRESSURE



ARE DIAGNOSED WITH OBESITY

Source: CDC PLACES data for Park County Census Tracts 3 & 4



Main Street is the dividing line between the two Census tracts, with Tract 3 including Livingston residents northeast of Main Street and Tract 4 containing residents southwest of Main Street. In general, residents in Tract 3 show indicators of poorer health than those in Tract 4, with rates of poor physical health, obesity, and poor mental health being higher. These sectors include some of the lower income areas of Livingston and such health challenges are commonly more prevalent in lower income areas.

Given this data, projects identified in this plan within Tract 3 are more likely to have an impact on people's health as it would provide them with more active transportation and recreational options for walking and bicycling.

Health, Safety & General Welfare

Promoting the health, safety and general welfare of a population is one of the most important and codified roles for a City to plan. This role is clearly indicated within Livingston's Zoning Ordinance, quoted below.

The meaning of these words within city codes has evolved over time. At the turn of the 19th century, the environment made people sick. It was during this Industrial Age that professions like public

health, planning, public works, social work and architecture collaborated to solve the myriad of public health issues related to unhealthy living conditions. These conditions were overcrowding, lack of sanitation, contaminated water and air pollution. The result was a widespread outbreak of infectious disease and multiple disciplines came together to solve it.

Projects like the development of sanitation and water systems were only part of the strategies developed to improve health; there were also policy solutions such as building and zoning laws. The words "public health, safety, and welfare" were written into community codes giving cities the legal authority to regulate private property for public health reasons.

These words stem from the roles states are afforded in the 10th Amendment to the United States Constitution. The 10th Amendment gives states all powers not specifically given to the federal government, one of which has been determined by case law to make laws relating to public health.

Montana's State Constitution reflects these themes in its section on Inalienable Rights, stating the people have "the right to a clean and healthful environment...and seeking their safety, health and



"The purpose of this ordinance is to promote the health, safety, and general welfare of the community by regulating the height and size of buildings and structures, the percentage of lots that may be occupied, the size of setbacks and open space, the density of population and the location and use of buildings, structures and land for trade, industry, residence, or other purposes within the city limits."

- Livingston Zoning Ordinance: Sec. 30.11. - Purpose.



happiness in all lawful ways.” The state then grants powers for health, safety, and general welfare to cities through its allowance of zoning, specifically in Title 76, Chapter 2, Section 301 on authorizing municipal zoning, “for the purpose of promoting health, safety, morals, or the general welfare of the community.”

While such policies have largely solved the health issues facing people more than 100 years ago, today the leading causes of death are chronic diseases such as heart disease, cancer, diabetes and mental health issues such as suicide. Disability, an aging population, and social isolation are also escalating public health concerns.

Health outcomes related to chronic and infectious disease in the 21st century are causing communities to redefine what “public health, safety, and welfare” means in our modern world. It is becoming well-understood that a person’s zip code may be a stronger predictor of their health than their genetic code.

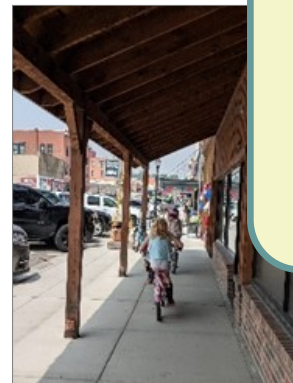
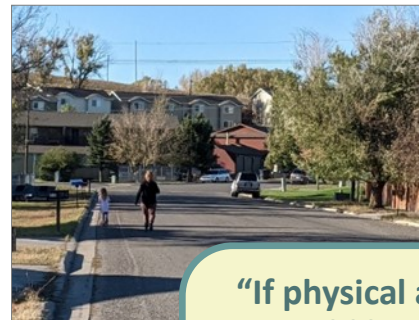
The Livingston Trails and Active Transportation Plan is a roadmap for creating modern-day policies and investments in the built environment to continue to promote the health, safety, and general welfare of the people of Livingston.

Physical Activity

Being physically active is one of the most important things a person can do to improve health and wellbeing. For adults, as little as three 10-minute brisk walks, five days a week, can be enough to reduce the risk for developing a life-altering chronic condition such as diabetes.

Biking to work, a walk to have lunch, and then perhaps an after dinner walk with the family to the neighborhood park: each of these outings could be done in a car, reducing the opportunities for improving health and adding to traffic congestion and air-pollution. Even if a person never plans to walk or bike, it is better for that person and the community to have safe and convenient non-motorized options for those that need and want them.

Children need 60 minutes a day of activity to support health.



“If physical activity were a pill every doctor would be prescribing it, every insurance company would be happy to pay for it, and every American would be taking it on a daily basis. The breadth of physical and mental health benefits is breathtaking.”

- Kenneth E. Powell, MD, MPH



Walking to and from school are important times for them to get that activity. Being able to walk to a nearby park, to meet friends for an ice-cream cone, or bike to the soccer fields are all activities that not only give kids the physical activity they need but also are important activities to help develop navigation and decision-making skills, while building confidence and age-appropriate independence. Unfortunately, Park County is not alone. This is why the Surgeon General of the United States issued a 2015 Call to Action to Promote Walking and Walkable Communities.

Mental Health

There is strong evidence that physical activity improves brain health. These benefits are outlined in the Physical Activity Guidelines for Americans and include improved cognition, improved quality of life, reduced risk of depression and anxiety, and improved sleep. Notably, the research shows children who are physically active perform better on academic achievement tests, have improved executive function (skills that enable children to control impulses, make plans, and stay focused), and have increased processing speed and memory, and reduced risk of depression.



In the 2019 CHNA Summary Report, 16% of Park County adults reported “fair or poor mental health” and nearly a quarter of adults reported “diagnosed depression”. Sadly, the 2019 Park County YRBS found that many youths are also suffering from mental health issues. High schoolers and middle schoolers were asked the question, “During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?.” The result was 39% of high schoolers and a quarter of middle schoolers answered “yes.” When asked if they had “seriously considered attempting suicide” in the past year, 22% of high schoolers and nearly 24% of middle schoolers responded by saying “yes”.

Equity & Inclusion

MDT’s Pedestrian and Bicycle Plan recognizes the need for more equitable and inclusive investments in active transportation. It states, “these modes serve a key function in expanding the social and educational opportunities available to the state’s vulnerable populations who are frequently transportation disadvantaged, including senior citizens, children, the disabled community, minority populations, and low-income individuals and families.”

“We are unable to operate a car for the first 16 years of our lives, yet we still build cities that require it. By giving children a way to travel independently, we liberate them, and liberate their parents from the role of chauffeur thwarted upon them.”

**- Chris and Melissa Bruntlett,
*Curbing Traffic: The Human Case for Fewer Cars in Our Lives***



MDT states further that providing pedestrian and bicycle facilities in communities where these populations are prevalent helps ensure mobility and promotes transportation equity.

Focus group participants and steering committee members said they wanted the Trail and Active Transportation Plan to prioritize areas of town where low-income residents live, which coincides with where there is a lack of sidewalks and other pedestrian and bicycle infrastructure.

As a result, projects in low income Census tracts were given more points and Steering Committee bonus points were applied to some projects north of the railroad tracks.

Researchers have also found that individuals in rural communities tend to have higher rates of chronic disease, more poverty, and more mental health concerns, including substance abuse, than urban residents. When researchers looked for the reasons to explain higher rates of chronic disease in rural areas, obesity was found to be a major contributing factor. When researchers tried to explain the mechanisms behind why obesity was higher in rural areas, one of those mechanisms was the built environment.

Given the health issues related to physical inactivity, weight, and mental health present in Park County, creating places that encourage people of all ages, incomes, and abilities to be more physically active is important.

Activity-Promoting Places

Health is influenced by a variety of factors including our individual knowledge and skills, our family and social connections, our work and school environments, our neighborhoods and communities and the policies that affect our living conditions.

Livingston has made great strides in making the downtown core more walkable, however, there are significant gaps in connectivity and accessibility in other parts of town, particularly on the north and east side, along Park Street, and crossing the railroad tracks.

Making it safer, easier, and more convenient for all people to walk or bicycle for utilitarian and recreational trips is important for the “public health, safety, and welfare” of Livingston residents and visitors and should be considered when any new plan, project, or policy is developed.



“Downtown is nice but as soon as you go to the outskirts—Albertsons, Town and Country—it is a problem.”

- Focus Group Participant



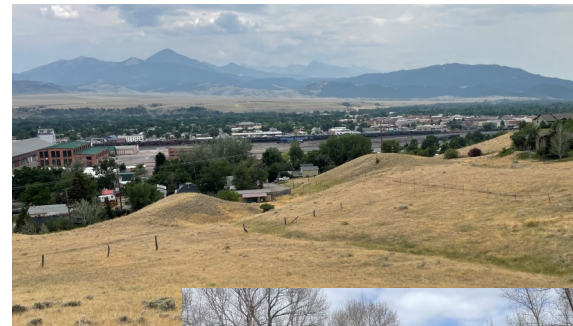
Adopting healthy behaviors, such as physical activity, is easier if our environment is built to support us in making healthy choices.

Nature & Social Connectedness

Two important areas of research related to physical and mental health are: time spent in nature and time spent being socially connected. Although more research is needed, in many studies, particularly involving children and youth, researchers have found that time spent in nature positively influences mental health.

Researchers have also found that persons living in walkable, mixed-use neighborhoods have higher levels of social capital compared with those living in car-oriented suburbs.

Those living in walkable neighborhoods were more likely to know their neighbors, participate politically, trust others, and be socially engaged. People-to-people connectedness and neighborliness comes from creating a built environment which allows people to come in contact with one another. Spending time in nature, with people you enjoy, while being physically active is the trifecta for mental and physical health. Creating close to home environments where people can safely do that...priceless.



Ridge to River

Formalizing trails on property and open right-of-way already under the control of the City of Livingston can help provide connections to nature and address equity concerns on the north side of Livingston. The North Hills trails (top) offer great vistas and unique opportunities for all people in the City but with easy access from neighborhoods on the north side. Expanding the pathway along the Yellowstone River within the City's Wastewater Treatment facility property (bottom) provides an opportunity to connect these neighborhoods to the existing pathway system south of the railroad tracks.



10. Implementation

Completion of the *Livingston Trails and Active Transportation Plan* is one step in creating a community that is accommodating to people who walk, roll, and hike. The implementation of the Plan requires a coordinated effort among officials from the City, Park County, non-profit organizations, community leaders, and citizen volunteers. Follow-up plans and studies, particularly for pathways, are often needed to refine design and alignments, as is occurring with Park County and the pathway bridge across the Yellowstone River.

This chapter identifies action steps for moving forward with the recommendations of the Plan, as well as potential funding sources and partners for proposed projects.

10 Action Steps for Implementation

Completing the 10 Action Steps identified in this chapter will help ensure development of the proposed trails and active transportation network in Livingston meets the goals of the plan, while providing the community assurance that it is a priority for the City.

The 10 Action Steps for Implementation are intended to serve as a barometer for short-term accomplishments related to this plan. The City and its partners should review these steps each year or two to determine the best approach to achieving them and celebrate successes. Some efforts will take several years to accomplish but the effort can begin in the first couple of years after adoption of the Plan.

The Action Steps also show that Livingston is not alone in its efforts to implement the plan, as many program and project efforts will require partnerships from agencies like Park County, and Montana Department of Transportation (MDT).

The City staff may wish to provide an annual report or update to the City Commission and others on its progress to implement the Plan to showcase progress as it occurs.



Exhibit 10-1: Action Steps for Implementation

Action	Partners	Timeframe
1 Adopt the Plan		
Adopting the plan via resolution shows commitment to implementing it. Share it with the county and other partners in the area, including MDT so they can incorporate its recommendations into corridor plans. These Action Steps should be incorporated into the City's Strategic Plan.	City of Livingston	Immediately
2 Update Policies		
On the heels of the Growth Policy Update, the City should update its zoning and subdivision regulations to promote safer streets for all users and ensure trails identified in this plan are dedicated when development occurs along planned routes.	City of Livingston Park County (for adoption of trails map)	2022-2023

Exhibit 10-1, continued: Action Steps for Implementation

Action	Partners	Timeframe	Action	Partners	Timeframe
<p>3 Begin design of top priority trail, sidewalk, and bikeway projects</p> <p>The City begins pursuing implementation of the highest ranking trail, sidewalk, and bikeway project. This entails identifying funding or pursuing grants, conducting concept or full design, and identifying a construction year when funding is confirmed.</p>	<p>City of Livingston MDT</p>	<p>2022-2023</p>	<p>4 Pursue safer crossings, starting with Park Street.</p> <p>Work with MDT to create safer crossings of Park Street, as identified in the Plan. Crossing treatments include Rectangular Rapid Flashing Beacons or Pedestrian Hybrid Beacons, high visibility crosswalks, crosswalk lighting, accessible curb ramps and push buttons, and a pedestrian underpass of the bridges east of Bennett.</p>	<p>City of Livingston MDT</p>	<p>Immediately</p>
<p>5 Organize maintenance programs</p> <p>City-based maintenance programs may take time to identify appropriate budget and staffing needs. The City should immediately begin efforts to clear crosswalk and curb ramp access when snow plowing occurs on the streets. The City can work with local partners to continue snow removal efforts on pathways and seasonal maintenance.</p>	<p>City of Livingston Non-profit partners</p>	<p>2022-2024</p>	<p>6 Create Wayfinding along City Streets</p> <p>Developing a wayfinding plan, complete with recommended locations and a sign family template is the first step, followed by pursuing funding through various organizations such as health-based foundations.</p>	<p>City of Livingston Park County Other Park Co. cities Non-profit partners Health organizations</p>	<p>2023-2025</p>



Exhibit 10-1, continued: Action Steps for Implementation

Action	Partners	Timeframe
7 Organize a landscaping, greenspace, and public art program		
Develop a strategic plan and related policies for enhancing existing sidewalk buffers, streetside spaces, trails, and trailheads with additional trees, landscaping, and public art.	City of Livingston Park County PCEC	2023-2025

Action	Partners	Timeframe
8 Update and publish new route maps		
Create a new map showing the integrated network of existing trails and sidewalks (bikeways when designated) so people know how they can reach trails and pathways by active modes. Include future trails so people get an idea of the full vision for an interconnected system. Update as new project come online.	City of Livingston Park County	Annually, or as-needed.

9 Create dedicated funding programs		
Build up dedicated funding programs for sidewalk, bikeway, and trail implementation over a series of years. This may include a reserve fund to build up a fund balance over 3 or 4 years in order to amass enough money to implement a full project.	City of Livingston	2023-2027

10 Formalize partnership for trails with Park County		
An interconnected pathway system in and around Livingston requires organizational commitments by the City and County. A cooperative agreement or a memorandum of understanding (MOU) outlining expected roles and responsibilities creates consistent expectations for the public, reduces redundancy in trail management efforts such as equipment and human resources, and ensures trail routes are preserved through development.	City of Livingston Park County	2023-2024



Other Recommendations

The 10 Action Steps for implementation were identified by the Steering Committee as the highest priority near-term actions. There are other actions the City and its partners can pursue. They are listed in Figure 10-2 at right.

It is advised that the City revisit this list every one- to two-years to see if conditions have changed to warrant advancement of other strategies to implement the plan.

An update to the Trails and Active Transportation should occur in approximately 10 years. This will provide a re-examination of priorities and account for emerging trends in trail and active transportation given how quickly the field is evolving in terms of design treatments.

Funding

The primary sources of funding available beyond the City of Livingston's budget come from a variety of federal programs, many of which are housed in federal transportation funding allocations from Congress. The programs below are existing within the federal programs and their future is contingent upon them remaining within existing federal funding programs.

Securing and managing federal funds for active transportation projects can be challenging for small cities given the extra requirements placed on these funds. Due to the additional requirements, projects funded with federal funds typically cost 15 to 20% higher than if local funds were used. They also take longer to develop in terms of design and construction approvals via MDT. The City should automatically increase any existing estimates by this 15 to 20% when pursuing federal grants and secure consultants who are accustomed to navigating the federal process.

Surface Transportation Block Grant Urban Program. Cities over 5,000 population are considered urban areas under federal transportation policy. This allows Livingston access to these funds that are distributed to the City from MDT for use on the urban routes

Figure 10-2: Other Recommended Action Steps

Other Recommended Action Steps

- Identify methods to enact a sidewalk fee-in-lieu program and a sidewalk utility fee.
- Work with MDT for a joint agreement on plan recommendations and crossings on MDT-managed streets.
- Pursue Bicycle-Friendly and Walk-Friendly Community Status.
- Work with School District to discuss possible alterations to school zone policies to help increase walking and bicycling and reduce traffic crossing the railroad tracks.
- Conduct safety audits and community audits when new projects are developed.
- Identify possible Open Streets and Pop-Up Demonstration projects for bikeway and walkway routes prior to full-scale implementation.
- Develop trail and pathway design standards in cooperation with Park County.
- Endorse, via resolution, the use of FHWA-approved design guidance for pedestrian and bicyclist facilities. See Appendix.
- Develop a fee-in-lieu or similar program to help fund projects to fill sidewalk gaps along main routes.
- Work with Park County and others to hire consider a full-time or part-time equivalent role for a jointly-funded trails and active transportation coordinator.



within the City. They can be used for a variety of street upgrades and changes, including the addition of sidewalks, speed management, and bikeway investments. The City also uses them for other critical maintenance and utility needs on those same urban-designated streets. The City has begun programming projects from the Trails and Active Transportation Plan into its CIP to utilize these funds to implement the plan's recommendations.

Surface Transportation Block Grant Transportation Alternatives Program (TAP). TAP is the most common federal funding program for active transportation facilities and administered through Montana Department of Transportation. In 2021, MDT received 41 applications for these federal funds, totaling approximately \$28 million. Only 15 of those projects were funded, totaling \$5.8 million. Individual project costs ranged from \$300,000 to \$1.1 million.

TAP requires a 13.42% match, meaning a \$100,000 project requires \$13,420 of that amount from the local jurisdiction. State match is available for pavement preservation or ADA-related upgrades on roadways under MDT's jurisdiction. The application deadline is typically in June of each year.

Recreational Trails Program (RTP). Montana State Parks administers RTP, which is a federally-funded grants program to support trails. Like TAP, it stems from federal transportation funds derived from fuel taxes collected from nonhighway recreational fuel use: fuel used for off-highway recreation by snowmobiles, all-terrain vehicles, off-highway motorcycles, and off-highway light trucks.

RTP applicants can include federal, tribal, state, county or city agencies, private associations and clubs. Examples of eligible projects include: urban trail development, basic front and back-country trail maintenance, restoration of areas damaged by trail use, development of trailside facilities, and educational and safety projects related to trails.

The application process is typically opened in November. In 2021, there were 42 projects funded for a total of \$1.6 million. Match is typically between 20-25% of project costs and the program may grant full or partial funding for applications (not including match).

Federal Lands Access Program (FLAP). FLAP is established to improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands. The Access Program supplements State and local resources for public roads, transit systems, and other transportation facilities, with an emphasis on high-use recreation sites and economic generators. Pedestrian and bicyclist facilities are eligible under this program.

FLAP also requires a 13.42% match on funding from applicants. The application process occurs in spring each year and information is available through Montana's FLAP program office, which is within the Federal Highway Administration division office in Helena.

Montana Trail Stewardship Program (MTSGP). This program is administered with through Montana Fish, Wildlife, and Parks with state funds derived from light vehicle registration funds. In 2021, approximately \$1.2 million was distributed among 41 projects. Unlike federal funds, which are restrict to public agencies, non-profits are eligible for MTS GP and project awards may be full or partial. Eligible funding areas include:

- New trail and shared-use path construction;
- Rehabilitation and maintenance of existing trails and shared-use paths, including grooming of trails for motorized and nonmotorized winter recreation; and
- Construction and maintenance of trailside and trailhead facilities, including but not limited to bridges, fencing, parking, bathrooms, latrines, picnic shelters, interpretation, trail signs, and trailside weed management.



Appendix

<u>Table of Contents</u>	<u>Page</u>
Appendix A: Design Guidance	2
Appendix B: Trails & Active Transportation Design Gallery	21
Appendix C: Detailed Project Rankings.....	39
Appendix D: Public Input Survey Results	45
Appendix E: MDT Routes Within Livingston.....	60



Appendix A: Design Guidance

There is no single design manual that comprehensively covers the spectrum of trails and active transportation facilities. Additionally, it is challenging for small cities to have the staff resources to know the intricate details of the many design guides and plans that exist. This leads to project design results that may fall short of desired goals or limits what a city considers when it designs a project. This section summarizes the prevailing state and federal publications that the City of Livingston should use when designing the various trails, bikeways, sidewalks, and street crossing projects.

Project consultants who do general civil engineering work or focus primarily on highway projects may not be aware of the many design manuals they have at their disposal. Incorporating other design manuals helps them design the safest possible project for the people of Livingston, in consideration of many factors and tradeoffs.

Even statewide agencies like MDT do not have a full library of the federally-endorsed design guides that pertain to trails and active transportation projects. While MDT's Roadway Design Manual for pedestrian and bicyclist facilities is pretty solid and reflects many modern design treatments, it does not address every situation within a small city like Livingston.

It is important to note that very few design manuals consist of actual "standards," as there is plenty of flexibility built into how streets are designed. Even the design guide commonly referred to as the AASHTO Green Book (formal title: *A Policy on the Geometric Design of Highways and Streets*) is only guidance and contains no mandated standards.

This is important to understand when retrofitting existing streets to provide safer conditions for people who walk and bike. The Green Book contents are often referred to as "AASHTO standards" and used to imply there is no flexibility contained within it. The opposite is true. For example, there is no AASHTO standard that motor vehicle travel lanes be 12-feet wide (a common design outcome). The AASHTO Green Book states that arterials within cities may have motor vehicle travel lanes ranging from 10-feet wide to 12-feet wide. Additionally, there is not AASHTO standard for motorist level of service, which is oftentimes cited as a requirement to ensure a certain level of motorist convenience and may be used to deny safer conditions for people who walk and bike (e.g. a pedestrian signal for crossing a major street).

Cities and agencies like MDT may take elements of publications like the Green Book and other documents and create their own policies or design standards. Even within those, there is ample flexibility for engineering judgment to deviate from such policies or standards when local conditions require a unique approach to solve a design problem. When this occurs, engineers should document their reasoning, as the case law pertaining to road design places a higher emphasis on engineers documenting why designs may have deviated from an adopted policy or standards than they on an engineering strictly adhering to a standard.

Most of the Design Guides cited in this Appendix are available for free download. Links are provided.

AASHTO's design guides must be ordered from that organization and are available in both hard copy and PDF format. The City should acquire a copy of these guides and local non-profits may work with the Library to buy them for their reference desk.




Montana Pedestrian and Bicycle Plan


The MDT statewide plan for pedestrians and bicyclists was completed in 2019. While not a formal design guide, the plan serves as a launching point for working with MDT to get pedestrian and bicyclist crossings of Park Street and MDT urban routes within the City. Many of the design guides referenced in this Appendix section are identified as resources in the MDT Pedestrian and Bicyclist Plan.

A key component of the plan is *Goal 1: Reduce pedestrian and bicyclist fatalities and serious injuries in support of Vision Zero*. Supportive statements that help Livingston achieve the goals of the Trails and Active Transportation include:

- Advanced crossing treatments (e.g. RRFBs, PHBs) at unsignalized intersections along major roadways where appropriate.
- Intersection designs such as roundabouts and protected intersections where appropriate.
- Curb extensions, where appropriate, to reduce crossing distance and improve visibility of pedestrians.
- Sidewalk and bike lane widths greater than minimum standards when feasible and appropriate to meet demand.
- Provide boulevards when feasible between sidewalks and the roadway.
- Consider latent demand of pedestrian and bicycle crossings in addition to the number of people willing to cross at an unsafe condition.
- Consider user comfort in design. Treatments that have higher yielding performance or stop traffic will yield a more comfortable crossing.
- Provide appropriate treatments for crossings of major roadways.
- Plow bike lanes and shoulders as part of overall plowing operations.
- Enforce local sidewalk snow removal by property owners.
- Design and construct pedestrian and bicycle facilities to minimize long-term maintenance including locating them outside snow plow debris zones and constructing shared use paths using durable materials.



Goal 1: Reduce pedestrian and bicyclist fatalities and serious injuries in support of Vision Zero.



Strategy 1A: Improve safety at intersections through applicable design standards and new technologies.

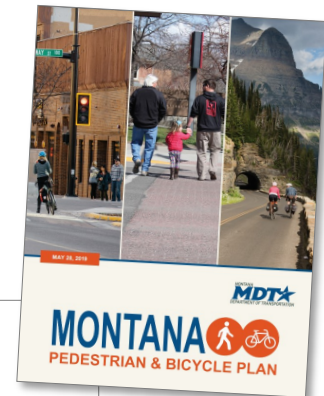
PURPOSE:
Intersections are locations where roadway users travel in different directions and have the most potential for conflict. Statewide crash data show that 40 percent of severe pedestrian and bicycle crashes occur at intersections and are most likely to occur in urban areas. Each intersection is unique in terms of traffic volumes, context, crash history, and pedestrian and bicyclist needs. Intersections should be examined on a case-by-case basis to determine if improvements to design can mitigate safety concerns.

ROLES AND RESPONSIBILITIES:
City, county, and tribal governments, as well as MDT, all have a role in intersection safety. The public and stakeholders can and should bring perceived issues to the attention of the relevant agency. Improvements may be simple and low-cost efforts such as signing, striping, or adjustments to signal timings. Others may be large capital efforts which may need to be evaluated through transportation and capital improvement planning processes. Agencies may consider less expensive interim projects in advance of more costly reconstruction. The following ideas can be employed, when applicable, by any agency considering intersection design and safety improvements:

- Consider use of leading pedestrian intervals at urban signalized intersections with pedestrian crash history.
- Consider automatic pedestrian phases and/or radar detection as appropriate.
- Consider signal timing analysis when planned work is commensurate with performing signal timing changes.
- Utilize perpendicular curb ramps as a default unless conditions necessitate otherwise.
- Consider curb extensions, where appropriate, to reduce crossing distance and improve visibility of pedestrians.
- Carry bike lanes up to and through intersections using proper design and treatments.
- Consider advanced crossing treatments at unsignalized intersections along major roadways where appropriate.
- Consider intersection designs such as roundabouts and protected intersections where appropriate.
- Update design guidance periodically to incorporate the latest technology and treatments. (See Strategy 1B)
- Consider feasibility of "No Right On Red" signage at urban signalized intersections with a history of non-motorized crashes and/or where high volumes of pedestrians and bicycles are present.

RESOURCES:

- PROWAG
- MUTCD
- AASHTO Guide for Planning, Design and Operation of Pedestrian Facilities
- AASHTO Guide for the Development of Bicycle Facilities
- National Cooperative Highway Research Program (NCHRP) Guide for Reducing Collisions at Signalized Intersections
- NACTO Urban Bikeway Design Guide
- FHWA Design Guidance Accommodating Bicycle and Pedestrian Travel: A Recommended Approach



https://www.mdt.mt.gov/pubinvolve/pepbike/docs/MontanaPedestrianandBicyclePlan_2019.pdf



MDT Road Design Manual: Chapter 7 Multimodal Design Considerations

MDT’s chapter on multimodal design contains the majority of design considerations of people who walk and bike. It states, “Roadway facilities should be designed and operated to enable safe access for various users, including pedestrians, bicycles, motorists, and transit riders of all ages and abilities.

A fundamental consideration in establishing a multimodal improvement project is an overall vision for the facility tailored toward the specific users, project context, and desired outcome. “

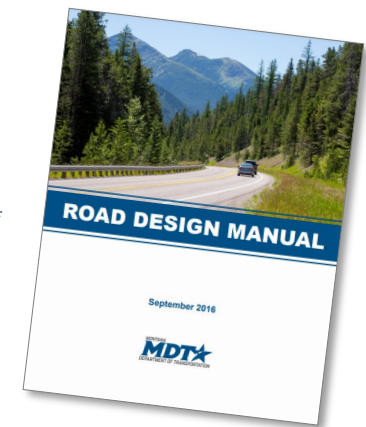
This reflects the process in the Trail and Active Transportation Plan as specific users, context, and desired outcomes, were components of the identification and ranking process.

The chapter contains general descriptions for street treatments for walking and bicycling. It is a good starting point to gain ideas for what treatment may occur along a street and what conditions may point toward a specific treatment.

Additionally, the chapter includes references to other federally-endorsed design guides contained in this Appendix. This helps bolster the City’s pursuits of funding from federal sources or working with MDT on state-managed routes. They include AASHTO’s *Guide for the Planning, Design, and Operation of Pedestrian Facilities* (2004 & 2021) and *Guide for the Development of Bicycle Facilities* (2012), each of which MDT is signatory.

7.1 INTRODUCTION

The explicit design for all modes of travel is an integral part of a roadway project and has an impact on the safety and operational performance for various road users, as well as construction and maintenance costs. This chapter presents the basic design principles and approach for designing multimodal design elements, including pedestrian facilities, bicycle facilities, shared used paths, crossing treatments, and transit facilities. The *Montana Department of Transportation (MDT) Geometric Design Standards* provides specific cross sectional dimensions relative to a roadway’s functional classification (1). The design team should also coordinate with the Traffic and Safety Bureau and Planning Division to obtain an understanding of local plans, operational and safety aspects, as well as the traffic engineering design elements for signing and pavement markings associated with the multimodal design.



Separated Pedestrian Pathway



Bozeman, MT

Buffered Bike Lane



US 287
Townsend, MT

Separated Bike Lane



Higgins Ave
Missoula, MT

Raised Pedestrian Crossing



Missoula, MT

Bulbout/Curb Extension



Bozeman, MT

Pedestrian Hybrid Beacon



Belgrade, MT



MDT Geometric Design Standards

MDT's Geometric Design Standards contain more specific information on the design characteristics of various streets under MDT's authority. The tables shown in this section pertain to the most prevalent streets in Livingston.

A major concern within these design standards is a default to minimum widths for bicyclist and pedestrian facilities. As shown at right under urban minor arterials and urban collectors, a bike lane width is shown as 4 ft. and the footnotes in the MDT document state that this is measured from the face of curb, meaning the typical 12" to 18" gutter pan can be counted in bike lane width even though it is not counted when determining motor vehicle lane width.

Appendix B: Active Transportation Design Gallery has illustrations showing why the gutter must not count when determining bike lane width. See page 25. The reason, supported by the AASHTO Green Book, is there is a seam between the concrete gutter and the asphalt travel lane and that seam poses problems for bicyclist stability.

Design speeds are also dangerously high on these routes, with 35 mph for arterials and 30 mph for collectors in urban settings. Both equate to a high likelihood that a pedestrian or bicyclist will die or be severely injured if hit by a motorist at these speeds.

When working with MDT, through its agreement, to retrofit urban streets within Livingston, the City should be adamant about the need for exceptions to these standards when federal design guidance suggests otherwise.

3.2 Sidewalks

The installation of all new sidewalks will comply with the standards outlined in Exhibit 6. Additional design considerations for pedestrian facilities are provided in Chapter 7 and Chapter 8 of the RDM.

Minimum Width^(a)	60 inches (for passage) 36 inches (minimum continuous clear width) – See additional note below
Cross Slopes	1V:50H (maximum)
Gradient^(b)	5-percent (maximum)
Buffer^(c)	18 inches

Note: A minimum sidewalk width of 48 inches is recommended by the AASHTO Guide for Planning, Design and Operation of Pedestrian Facilities⁽⁶⁾

Minimum widths are not recommended. Per FHWA, sidewalks that lack buffers or have building or retaining walls result in a reduced functional width of 18 inches per side where these conditions exist. Design should account for that.

3.5 Urban Minor Arterials⁽¹⁾

Design Element	RDM Section			
	Curbed	Shouldered		
Design Control	Design Speed ⁽²⁾ 2.5 35 mph 35 mph			
Roadway Elements	Travel Lane Width ⁽³⁾	5.2	11 ft	
	Minimum Roadway Width	5.2	26 ft ⁽⁴⁾ 30 ft	
	Shoulder Width	Outside	varies	4 ft
		Inside	N/A	
	Cross Slope	Travel Lane	2% Typical ⁽⁵⁾	2%
Shoulder		2% Typical ⁽⁵⁾	2%	
Minimum Median Width	5.3	Raised: 4 ft ⁽⁶⁾		
TMTL Width ⁽⁷⁾	5.2	11 ft		
Cut Section	Bicycle Lane Width ⁽⁸⁾	5.2	4 ft	
	Parking Lane Width ⁽⁹⁾	5.2	10 ft ⁽¹⁰⁾ N/A	
Alignment Elements⁽¹⁶⁾	Ditch Slope ⁽¹¹⁾	5.4	4:1	
	DESIGN SPEED	2.5	35 mph	
	Stopping Sight Distance ⁽¹²⁾	2.8	250 ft	
	Intersection Sight Distance ⁽¹³⁾	2.8	165 ft	
	Minimum Radius	3.2	371 ft	
	Superelevation Rate ⁽¹⁴⁾	3.3	e _{max} = 4.0%	
	Vertical Curve Length	Crest	See Chapter 4, Section 4.4 of the RDM	
Sag				
Level		6%		
Maximum Grade	Rolling	7%		
	Mountainous	9%		
	Minimum Vertical Clearance ⁽¹⁵⁾	4.5	17.0 ft	

Design speed equated to 50% or higher risk of death for a pedestrian or bicyclist hit at this speed.

4-feet inclusive of gutter does not provide adequate space for a bicyclist to operate next to traffic using a road with a design speed of 35 mph. Bike lane should be 5-feet minimum, exclusive of gutter; wider or buffered, if possible, next to on-street parking. Parking lanes of 8 ft are suitable in most situations.

3.6 Urban Collector Streets⁽¹⁾

Design Element	Manual Section	Design Criteria		
		Curbed	Shouldered	
Design Control	Design Speed ⁽²⁾ 2.5	30 mph	30 mph	
Roadway Elements	Travel Lane Width	5.2	10 ft ⁽³⁾	
	Shoulder Width	Outside	0 ft 4 ft ⁽⁴⁾	
		Inside	N/A	
	Cross Slope	Travel	2% Typical ⁽⁵⁾	2%
		Shoulder	2% Typical ⁽⁵⁾	2%
Minimum Median Width	5.3	Raised: 4 ft ⁽⁶⁾		
Earth Cut Section	Bicycle Lane Width ⁽⁸⁾	5.2	4 ft	
	Parking Lane Width ⁽⁹⁾	5.2	8 ft	
Alignment Elements⁽¹⁵⁾	Ditch Slope ⁽¹⁰⁾	5.4	4:1	
	DESIGN SPEED	2.5	30 mph	
	Stopping Sight Distance ⁽¹¹⁾	2.8	200 ft	
	Intersection Sight Distance ⁽¹²⁾	2.8	140 ft	
	Minimum Radius (@ e _{max} = 4%)	3.2	250 ft	
	Spiral Curve Selection	See Chapter 3, Section 3.2		
	Superelevation Rate ⁽¹³⁾	3.3	e _{max} = 4.0%	
Vertical Curve Length	Crest	See Chapter 4, Section 4.4		
	Sag			
Maximum Grade	Level	9%		
	Rolling	10%		
	Mt	10%		
Minimum Vertical Clearance ⁽¹⁴⁾	4.5	16.5'		

Design speed equated to 50% or higher risk of death for a pedestrian or bicyclist hit at this speed.

4-feet exclusive of gutter is the minimum preferred width on a street like this, especially in a retrofit. Getting a 5-foot bike lane, exclusive of gutter is preferred, especially when adjacent to on-street parking. Parking lanes of 8 ft are suitable in most instances.



MDT Context Sensitive Solutions Guide

Context Sensitive Solutions (CSS) is a federally-endorsed approach to understanding there is inherent flexibility in road design treatments to align with local interests and the needs of all road users. MDT states that CSS “puts project needs and both agency and community values on a level playing field and considers all trade-offs in decision making based on available funding.” MDT’s CSS guide includes the following policy statements:

- **Involve local government and citizens.** To help the process get off to the best possible start, include all affected parties (e.g. local government) and those with a partnership interest.
- **Think “outside the box”- innovation is key.** No “cookie cutter” approach is available on exactly how to approach CSS.
- **Listen and keep an open mind.** Be willing to listen to our customers – some of our best solutions come from them. Individuals and communities will have different ideas on what constitutes the ideal context sensitive solution in any given situation.

MDT ADA Transition Plan

MDT’s ADA Transition Plan contains several references to federal laws pertaining to ADA compliance. It also contains recommendations that will benefit Livingston in its application of ADA requirements. These include statements on maintaining accessibility during construction and conducting winter maintenance that keeps curb ramps and sidewalks clear of snow plowed from the streets.

MDT’s ADA Transition Plan includes an inventory and scoring of curb ramp needs on MDT routes within Livingston. It identifies 142 ramps in need of upgrade on the MDT system within the City, with 106 of these along Park Street. The others are on other urban system routes within Livingston. These ramps are likely to be replaced and upgraded when resurfacing occurs along these routes, as such is required by law. The City should work with MDT to define the safest curb ramp applications that can be applied, especially along Park Street, to avoid diagonal ramps and incorporate design that accounts for future crossings of Park Street.

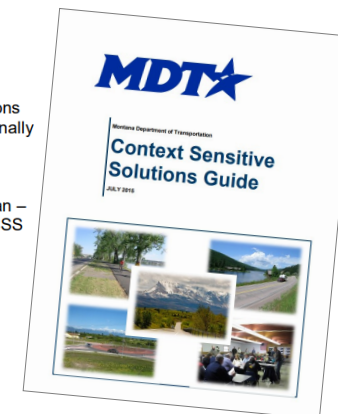
I. Introduction and Background

Context Sensitive Solutions (CSS) begins early; it is a process needing involvement from citizens and local elected officials; it balances community desires, needs, funding and the law; and it often results in innovative solutions derived from keeping an open mind and a collaborative approach both internally and externally.

A context sensitive solution is grounded in the Montana Department of Transportation mission and vision. Montana’s long-range transportation plan – TranPlan21 – supports the CSS process and spotlights the importance of CSS outcomes.



https://www.mdt.mt.gov/other/webdata/external/cadd/report_templates_guidance/css_guide.pdf



Method 27 Strive to maintain accessibility during construction.

Method 29 Conduct winter maintenance, coordinate with local jurisdictions, and enforce maintenance agreements.

<https://www.mdt.mt.gov/other/webdata/external/civilrights/ADA-TRANSITION-PLAN.pdf>



AASHTO A Policy on the Geometric Design of Highways and Streets (2018; 7th Edition)

This document, also called The Green Book, is developed by the national organization that represents all state DOTs. AASHTO (American Association of State Highway and Transportation Officials) has numerous committees tasked with developing this and other design guides. The Green Book is oftentimes mistakenly referred to as “AASHTO standards,” which leads to an interpretation by some designers that the values included in it are mandated. The word “shall” is not used in the more than 1,000 pages of The Green Book, meaning nothing in it represents a standard. The preface to this design guide states:

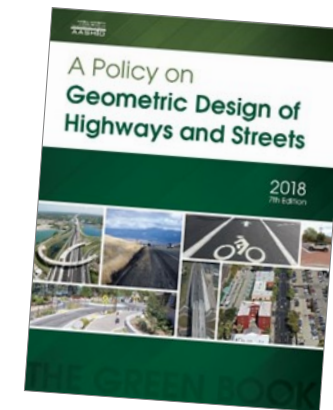
- “Designers should recognize the joint use of transportation corridors by motorists, pedestrians, bicyclists, public transit, and freight vehicles. Designers are encouraged to consider not only vehicular movement, but also the movement of people, distribution of goods, and provision of essential services...This policy is not intended to be a prescriptive design manual that supersedes engineering judgment by the knowledgeable design professional.”

One notable element incorporated into this version of the Green Book is the concept of a “target speed” as a method of determining design speed. This is based on Vision Zero concepts for the “self-enforcing road” that recognizes design elements regulate and manage speed greater than enforcement efforts. Instead of using methods like the 85th percentile to determine a speed limit, a target speed approach recognizes that “lower speeds are desirable in walkable, mixed-use urban areas and this desire for lower speeds should influence the selection of the design speed...The target speed is the highest speed at which vehicles should operate...consistent with the level of multimodal activity generated by adjacent land uses, to provide both mobility for motor vehicles and a desirable environment for pedestrians, bicyclists and public transit users. The target speed is intended to be used as the posted speed” (page 2-24).

The Green Book also recognizes that expectations placed upon pedestrians the same as we place on motorists is not a valid approach. Section 2.6.2 General Characteristics of Pedestrians states:

- “Pedestrian actions are less predictable than those of motorists. Many pedestrians will cross roadways when and where they perceive it is safe to do so. Pedestrians tend to walk in a path representing the shortest distance between two points. Therefore, pedestrian crossings at mid-block locations may be appropriate to supplement those at intersections.” (page 2-50).

For bicyclists, The Green Book dispels a common myth that the gutter pan of roads is allowed to be counted as part of the bike lane width. A common treatment is to build a bike lane on the asphalt section of the road and then count the width of the concrete gutter pan as additional bike lane width. Page 4-22 of The Green Book states “a gutter of contrasting color and texture should not be considered part of the traveled way.”



Price: \$310 PDF; \$388 hard copy

<https://store.transportation.org/item/collectiondetail/180>



AASHTO Guide for the Planning, Design, and Operations of Pedestrian Facilities (2004)

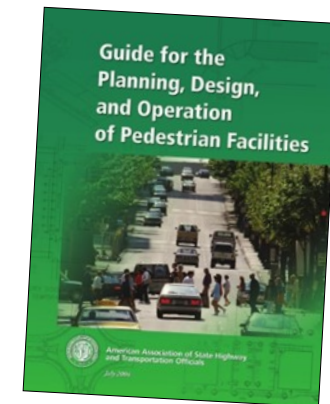
AASHTO's pedestrian guide is referenced more than 30 times in The Green Book and serves as a more detailed reference guide for proper pedestrian accommodations. It has sections on how pedestrians differ from motorists in how they experience the roadway environment:

- Unlike motorists, pedestrians' slower speeds mean that they prefer more, rather than less, detail in their environment...Since pedestrians travel more slowly and are not surrounded by the protective environment of a motor vehicle, their immediate physical environment has a profound effect on their level of comfort.

Some notable elements of the pedestrian guide are sections on pedestrian factors when it comes to the characteristics of pedestrians.

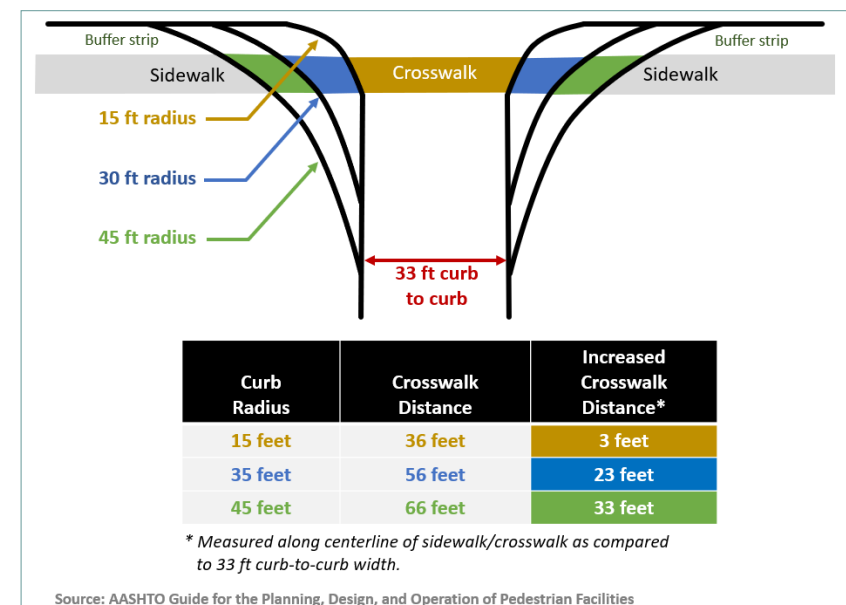
- **Continuity:** Connectivity of the walking environment is just as important for pedestrian as a completely developed roadway network is for motorists.
- **Assumptions:** Assume that pedestrians want and need safe access to all destinations that are accessible to motorists. Additionally, pedestrians will want to have access to destinations not accessible to motorists, such as trails and parks.
- **Generators and Destinations:** All transit stops require that pedestrians be able to cross the street.
- **Frequency:** Pedestrians must be able to cross streets and highways at regular intervals. Unlike motor vehicles, pedestrians cannot be expected to go a quarter mile or more out of their way to take advantage of a controlled intersection.

Regarding vehicle speed and speed management, the AASHTO Pedestrian Guide notes that "absent 24-hour enforcement," reducing travel speeds via enforcement efforts "usually have only a temporary effect." Correspondingly, "if the anticipated 85th percentile speed of vehicular traffic is inconsistent with the anticipated level of pedestrian activity or other factors in the roadway environment, then an effective method to reduce prevailing speeds may be to reduce the roadway design speed and modify the roadway geometrics accordingly."



Price: \$143 PDF; \$145 hard copy

<https://store.transportation.org/Item/CollectionDetail?ID=131>



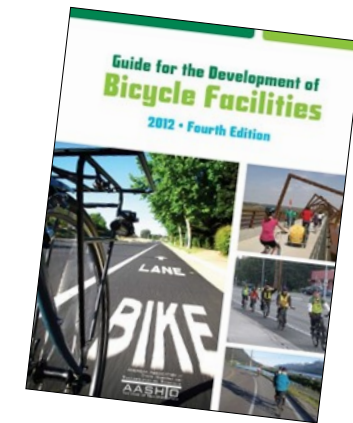
AASHTO Guide for the Development of Bicycle Facilities (2012)

With rapid development of bikeway design guides emerging from NACTO and FHWA, the AASHTO Bike Guide is becoming increasingly outdated. A new edition to the AASHTO bicycle guide is under review and should be published in 2022 to reflect the latest knowledge on this topic. The notable elements of the AASHTO Bike Guide that can be considered pertain to design elements such as separation from vehicle traffic and intersection treatments for shared use pathways. Some other elements of this guide include:

- **Snow clearance:** Many bicyclists ride year-round, especially for utilitarian or commute trips. Snow stored in bike lanes impedes bicycling in winter. The following recommendations apply:
 - * On streets with bike lanes and paved shoulders that are used by bicyclists, remove snow from all travel lanes (including bike lanes) and the shoulder, where practical.
 - * Do not store snow on sidewalks where it will impede pedestrian traffic.
- **Chipsealing:** Where a chip seal is used on a roadway shared with bicyclists, a fine mix chip seal (3/8 in. or finer) should be used. Where shoulders or bike lanes are wide enough and in good repair, apply the chip seal only to the main traveled way.
- **Work Zones:** At the onset of planning for temporary traffic controls, it should be determined how existing bicycle facilities will be maintained during construction. Accommodation in the work zone may result in the need for the construction of temporary facilities including paved surfaces, structures, signs, and signals.

Pathways. The chapter on shared use pathway design remains relevant and may not always be consulted when agencies lead pathway design simply because they may not know this guide exists. Some notable sections on shared use path design are:

- **Width:** The minimum width for a two-directional shared use path is 10 ft. Wider pathways, 11 to 14 ft, are recommended in locations that are anticipated to serve a high percentage of pedestrians (30% or more of total pathway volume) and higher user volumes (more than 300 total users in the peak hour).
- **Sidepaths:** The minimum recommended distance between a path and the roadway curb (i.e., face of curb) or edge of traveled way (where there is no curb) is 5 ft. Where a paved shoulder is present, the separation distance begins at the outside edge of the shoulder. Thus, a paved shoulder is not included as part of the separation distance. Similarly, a bike lane is not considered part of the separation; however, an unpaved shoulder can be considered part of the separation. Where the separation is less than 5 ft, a physical barrier or railing should be provided between the path and the roadway.
- **Curb Ramps:** The opening of a shared use path at the roadway should be at least the same width as the shared use path itself. If a curb ramp is provided, the ramp should be the full width of the path, not including any side flares. Detectable warnings should be placed across the full width of the ramp.



Price: \$162 PDF; \$203 hard copy

<https://store.transportation.org/Item/CollectionDetail?ID=116>

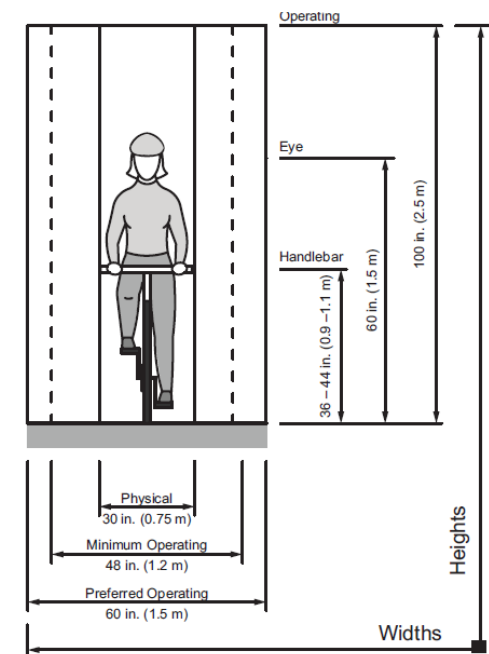


Figure 3-1. Bicyclist Operating Space

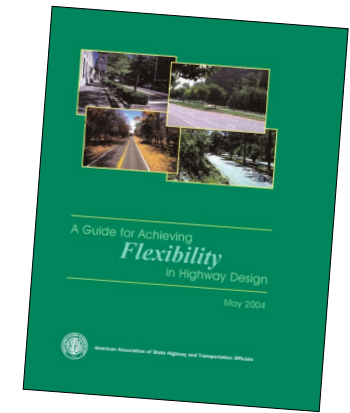


AASHTO Achieving Flexibility in Highway Design (2004)

The Flexibility Guide was developed in 2004 as the concept of Context Sensitive Solutions advanced in road design circles. The intent of the flexibility guide was to bolster the already-flexible elements of The Green Book and further highlight how things such as motor vehicle lane widths and level of service guidelines were not intended to be sacred design doctrine.

The Flexibility Guide states in section 1.3.3 Intended Use of the AASHTO Green Book that the Green Book “does not prescribe or even favor one value over another,” noting that two different states or cities may use the same road design features differently, yet “both would be following the AASHTO ‘policy.’” The Flexibility Guide also addresses concerns that designers have with concerns over legal liability from what may be perceived as a deviation from The Green Book. Some notable sections include:

- 1.4.5 Level of Service:** Vehicle level of service is oftentimes confused for or advertised as a safety measure, which it is not. The AASHTO Flexibility Guide helps dispel this commonly-held myth, stating “Failure to achieve a level of service indicated [in the Green Book] does not constitute a non-standard design decision...Recognizing the impracticality of constructing a highway or highway network to accommodate all potential future traffic demand...the Green Book includes discussion of the implications of and recommendations for designing for congestion.”
- 1.5.2 Design in the Lower Speed Environment:** Context-sensitive solutions for the urban environment often involve creating a safe roadway environment in which the drive is encouraged by the roadway’s features and the surrounding area to operate at low speeds.
- 3.6.1 Lane Width:** The normal range of design lane width is between 9 ft and 12 ft. AASHTO Green Book values for lower-speed urban street lane widths are less rigorously derived. Narrower lane widths for urban streets lessen pedestrian crossing distances, enable the provision for on-street parking and transit stops. Lesser widths also tend to encourage lower speeds, an outcome that may be desirable in urban areas. There is less direct evidence of a safety benefit associated with incrementally wider lanes in urban areas, compared with other cross-sectional elements.
- 4.9 Importance of Fully Evaluating and Documenting Design Decisions:** In order to reduce exposure to losses due to liability claims, it is essential that the planning and design process be thoroughly documented. It is unfortunately the case that design agencies lose or settle claims not because the staff actions were inappropriate, but because the project files are incomplete or missing key documentation, and staff responsible are no longer available to explain what was done and why.



Price: \$27 PDF; \$34 hard copy

<https://store.transportation.org/Item/CollectionDetail?ID=31>

1.3.3 Intended Use of the AASHTO Green Book

Design guidance published in the AASHTO Green Book [1] reflect the consensus of AASHTO’s member departments regarding what constitutes good design practice nationally. In arriving at a consensus, AASHTO recognizes that each region or state has different conditions, constraints, and needs.

The AASHTO Green Book [1] is not intended, and never was intended, to be used solely as a standard upon which to base the design of every highway improvement. Rather, as is noted in the foreword of the Green Book [1], “sufficient flexibility is permitted to encourage independent designs tailored to particular situations.” Such flexibility may be appropriate for a state wishing to use a different basis for design from that indicated in the AASHTO Green Book [1], or for an individual designer working on a range of different projects.

3.6.1.2 Flexibility in the AASHTO Guidelines

The AASHTO Green Book [2] recognizes the need for flexibility and provides that flexibility, citing how lane width can be tailored, to a degree, to fit the particular environment in which the roadway functions (e.g., low-volume rural roads or residential areas versus higher volume rural or urban facilities). The formulation of these values demonstrates considerable flexibility.

For lower speed, lower volume rural roads and highways with little or no truck traffic, lane widths as low as 9 ft (2.7 m) may be acceptable; lane widths substantially less than 12 ft (3.6 m) are considered adequate for a wide range of volume, speed, and other conditions.

For the reconstruction of rural two-lane highways, the AASHTO Green Book [2] notes that less than 12-ft or 3.6-m lane widths may be retained “where alignment and safety record are satisfactory.” In other words, widening a narrow existing highway is not mandated if its safety performance is acceptable. Flexibility is also evident for lower-class roads and streets, with recommended narrower lane widths consistent with lower design speeds on such roads.

The discussion of lane width in the AASHTO Green Book [2] for urban areas also reflects a high degree of flexibility. It is noted that lane widths “may vary from 10 to 12 ft (3.0 to 3.6 m) for arterials.” For lower classification facilities, similar flexible language encourages the tailoring of an urban street cross section to site-specific conditions.



FHWA Memo on Bicycle & Pedestrian Design Flexibility (2013)

USDOT passed a 2010 policy on bicycle and pedestrian accommodations that states the organization “encourage transportation agencies to go beyond the minimum requirements, and proactively provide convenient, safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities.” To bolster that policy, the 2013 memorandum issued by FHWA provided federal support and justification for agencies to use the AASHTO Guides summarized above, as well as the NACTO guides and ITE guides summarized below, to accomplish this policy directive. FHWA says it “support the use of these resources to further develop nonmotorized transportation networks, particularly in urban areas.”


More specifically, this memorandum states:

- “The vast majority of treatments illustrated in the NACTO Guide are either allowed or not precluded by the Manual on Uniform Traffic Control Devices (MUTCD).”
- In its support of the ITE Designing Walkable Urban Thoroughfares: A Context Sensitive Approach, the FHWA memorandum states the “guide is useful in gaining an understanding of the flexibility that is inherent in the AASHTO ‘Green Book.’”
- FHWA’ memorandum summary states the agency “encourages agencies to appropriately use these guides and other resources to help fulfill the aims of the 2010 USDOT Policy Statement.”

FHWA Memo on Level of Service (2016)

In May 2016, FHWA issued a memorandum on Level of Service on the National Highway System. It notes that the Level of Service recommended values in the AASHTO Green Book “are regarded by FHWA as guidance only” and FHWA “does not have regulations or policies that require specific minimum LOS values for projects on the [National Highway System.] FHWA states that while they concur with the LOS guidance, “the recommended LOS values in [The Green Book] may not be reasonably attainable in some situations.”

The purpose of the memo was to state that traffic forecasts focused solely on motorist desires are just one factor to consider in the design of projects and that context and other road users need to be considered and not just a secondary consideration after level of service goals for motorists were first accounted for in projects.



Memorandum
U.S. Department of Transportation
Federal Highway Administration

PDF Version (1.7 MB)

Subject: Bicycle and Pedestrian Facility Design Flexibility

From: Gloria M. Shepherd
Associate Administrator for Planning, Environment and Realty

Date: August 20, 2013

Reply to: HEPH-10


Walter C. (Butch) Waidelich, Jr.
Associate Administrator for Infrastructure

Jeffrey A. Lindley
Associate Administrator for Operations

Tony T. Furst
Associate Administrator for Safety

To: Division Administrators
Directors of Field Services

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_flexibility.cfm



U.S. Department of Transportation
Federal Highway Administration

Memorandum

Subject: **INFORMATION:** Level of Service on the National Highway System

Date: May 6, 2016

From: Signed by: Jerry Yakowenko
Robert B. Mooney
Acting Director, Office of Program Administration

In Reply Refer To: HIPA-20

To: Director of Field Services
Director of Technical Services
Division Administrators
Federal Lands Highway Division Engineers

<https://www.fhwa.dot.gov/design/standards/160506.cfm>



FHWA Bikeway Selection Guide (2019)

FHWA's Office of Safety published this new guide in February 2019:

- “This guide focuses on safety, but it also emphasizes the importance of comfort to appeal to a broad spectrum of bicyclists. This will encourage more people to choose to bike and in doing so will help FHWA meet its goal to increase the number of short trips made by bicycling and walking to 30 percent by the year 2025.”

It is intended to be a support tool to help guide design decisions. The Bikeway Selection Guide makes important distinctions from past bicycling infrastructure decisions.

An important component of recognizing the safety needs of bicyclists and incorporating Vision Zero themes into facility design is in Table 2 of the guide under “Forgiveness (Safety)” where it denotes that shared lanes, traditional bike lanes, bikeable shoulders, and bike boulevards rely on “perfect user (driver and bicyclist) behavior to avoid crashes.”

Because of that, the safety ratings for these treatments receive only minimal to moderate grades whereas one-way separated bike lanes and separated bike lanes and sidepaths have moderate to high ratings.

The other key component of this guide is Figure 9: Preferred Bikeway Type for Urban, Urban Core, Suburban, and Rural Town Contexts. That figure is shown in the Park Street assessment in this Appendix.

Note that it indicates roadways with 7,000 or more vehicles per day and/or speed limits of 35 mph or higher necessitate separated (protected) bike lanes or shared use pathways.



	Shared Lanes	Boulevards	Shoulders	Bike Lanes	One-Way Separated Bike Lanes with Mixing Zones	Separated Bike Lanes and Sidepaths with Protected Intersections
Functionality (Comfort) - Roads can be categorized by their function						
Lowest at higher vehicle speeds and volumes	✓	✓	✓	✓		
Highest at lower vehicle speeds and volumes	✓	✓	✓	✓		
Moderate to High due to separation from traffic and constrained entry point					✓	
High due to separation from traffic and constrained conflict point						✓

	Shared Lanes	Boulevards	Shoulders	Bike Lanes	One-Way Separated Bike Lanes with Mixing Zones	Separated Bike Lanes and Sidepaths with Protected Intersections
Forgiveness (Safety) - Infrastructure can be designed to accommodate human error						
Relies upon perfect user (driver and bicyclist) behavior to avoid crashes	✓	✓	✓	✓		
Minimal: bicyclists operating in shared space with vehicles	✓					
Moderate: application of traffic calming treatments and lower operating speeds can improve safety		✓				
Moderate: bicyclists operate in separated space from vehicles, however vehicles can encroach into the facility at any location			✓	✓		
Moderate: bicyclists operate in separated space from vehicles except for defined entry point, followed by shared operating space					✓	
High: bicyclists operate in separated space from vehicles except for defined conflict point which can be designed to reduce motorist speed, but contraflow movement from two-way operation can increase risk						✓

https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf



FHWA Small Town & Rural Multimodal Networks Guide (2017)

The Small Town and Rural Multimodal Networks Guide was released in 2017. Beyond the intent underlying its title, this guide is a useful resource for resource-challenged cities no matter their context. The goal of the guide is to provide a bridge between existing design guidance for bicyclists and pedestrians that identifies lower-cost, but high impact, infrastructure upgrades for the safety of these modes.

The guide recognizes that many residents in small cities reside within just a couple miles of major destinations like downtown, grocery stores, and parks. Trips to these destinations and of these distances can easily be taken by bike or in choosing to walk a slightly longer distance than normal if people feel safe and comfortable doing so.

The guide provides diagrams and speed/volume tables to help designers identify the appropriate context for the various applications in the guide. They range from things like painting pedestrian lanes on streets to lower-cost sidepaths that do not require full scale stormwater management systems. It also includes case studies from various cities to help designers understand how it could be applied in their context.

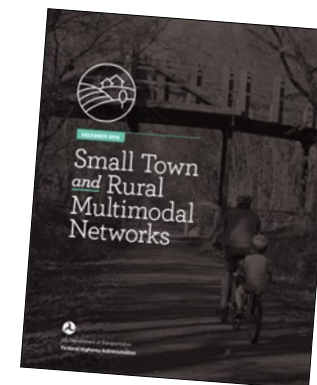
FHWA PEDSAFE and BIKESAFE Countermeasures Selection System

These two countermeasures selection systems are easy-to-use online tools to guide practitioners and citizens to the appropriate engineering, education, or enforcement tools to help address a particular concern for the safety of people who walk and bike.

For pedestrians, the tool includes various countermeasures organized by theme:

- Along the Roadway;
- At Crossing Locations;
- Transit;
- Roadway Design;
- Intersection Design;
- Traffic Calming;
- Traffic Management;
- Signals and Signs; and
- Other Measure

For bicyclists, the tool has sections for shared roadways, on-road bike facilities, intersections, and maintenance, and trails, among others.



https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/



<http://www.pedbikesafe.org/pedsafe/>



<http://www.pedbikesafe.org/bikesafe/>

Roadway Classification and Land Use	Sidewalk/Walkway
Rural Highways (< 400 ADT)	Shoulders preferred, with minimum of 0.9 m (3 ft).
Rural Highways (400 to 2,000 ADT)	1.5-m (5-ft) shoulders preferred, minimum of 1.2 m (4 ft) required.
Rural/Suburban Highway (ADT > 2,000 and less than 1 dwelling unit (d.u.) / .4 hectares (ha) [1 d.u. / acre])	Sidewalks or side paths preferred. Minimum of 1.8-m (6-ft) shoulders required.
Suburban Highway (1 to 4 d.u. / .4 ha [1 to 4 d.u. / acre])	Sidewalks on both sides required.
Major Arterial (residential)	Sidewalks on both sides required.
Urban Collector and Minor Arterial (residential)	Sidewalks on both sides required.
Urban Local Street (residential – less than 1 d.u. / .4 ha [1 d.u. / acre])	Sidewalks on both sides preferred. Minimum of 1.5-m (5-ft) shoulders required.
Urban Local Street (residential – 1 to 4 d.u. / .4 ha [1 to 4 d.u. / acre])	Both sides preferred.
Local Street (residential – more than 4 d.u. / .4 ha [4 d.u. / acre])	Sidewalks on both sides required.
All Commercial Urban Streets	Sidewalks on both sides required.
All Streets in Industrial Areas	Sidewalks on both sides preferred. Minimum of 1.5-m (5-ft) shoulders required.

1 acre=0.4 hectares (ha)



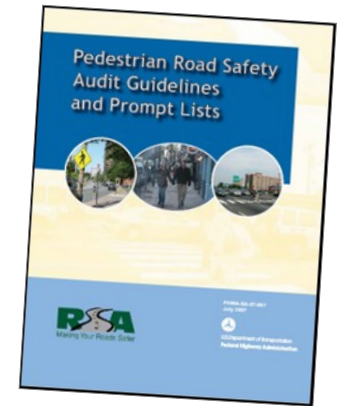
FHWA Pedestrian (2007), Bicycle (2012) Road Safety Audit Guidelines & Prompt Lists

FHWA developed these guides to help planners and designers evaluate how projects addressed the needs of pedestrians and bicyclist. (Note, a new combined version of these was released in 2020, but is not as comprehensive and useful). These safety audit guidelines can be used in the planning, design, construction, and post-construction phases and include several prompt lists to be used in the field as projects are evaluated. Some notable elements of the Pedestrian Guidelines include:

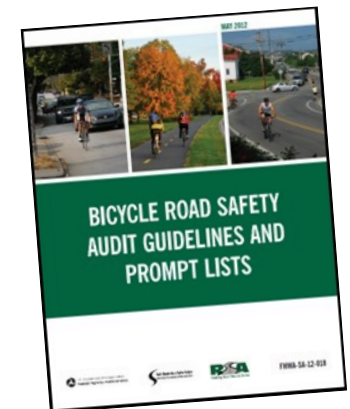
- **Barriers to Walking:** Physical, social and perceptual, and organizational issues may discourage people from walking. Physical barriers consist of unprotected street crossings, lengthy crossings, crossings that are spaced too far apart, interchanges, partial or nonexistent walking paths, poor quality walking surfaces, nonexistent or inappropriate crossing treatments, and high speed traffic.
- **System Connectivity:** All pedestrian facilities should be continuous, consistent, and connected along direct routes to major pedestrian traffic generators. Pedestrians of all ability levels should have continuous pedestrian routes through or around construction areas.
- **Width:** When assessing the width of a sidewalk, the RSA team should consider its usable width. Pedestrians rarely use the foot and a half of the sidewalk closest to the roadway or a building face. The RSA team should also pay attention to “choke points” that narrow the effective sidewalk width (e.g., street furniture, utility poles, etc.).
- **Behavior:** Do pedestrians cross at uncontrolled locations because marked or controlled crossings are dangerous, inconvenient, or not placed appropriately?
- **Buffers:** Often bridges and other sidewalks are designed with only a curb separating pedestrians on the sidewalk from vehicular traffic. This measure alone is often inadequate as the curb does not form an adequate barrier between vehicular and pedestrian traffic. Vehicles traveling at speeds over 25 mph can mount a curb at relatively flat impact angles.

Notable elements of the **Bicycle Audit Guidelines** include:

- **Design treatments:** Do accommodations for cyclists conform to the state of practice, guidelines, and relevant standards, or are there more advanced designs that would better support and enhance conditions for cycling? Here is where FHWA provides support for use of NACTO and other modern guides to help influence design.
- **Comfort:** Is the type of cycling accommodation appropriate for the primary or intended users? Bicycle accommodations should match the needs of the intended users. Cyclists, particularly less-experienced cyclists, may prefer greater separation from vehicular traffic, especially as speeds and volumes increase. Particular attention should be given to routes that access schools, parks, and other public spaces that will be frequented by children and families.
- **Continuity:** A network of bicycle-friendly roadways and paths is critical to provide cyclists with continuous and direct access to destinations. Gaps, lack of facilities, or facilities inappropriate for the context may result in indirect routes to destinations and possibly illegal or undesirable behaviors, such as riding against traffic and riding on sidewalks.
- **Vertical clearance:** Bicyclists may change their position on the road or path to maintain comfortable operating space from bridge railings or tunnel walls. Recommended height and shy distance for railings are detailed in the *AASHTO Guide for the Development of Bicycle Facilities*, but many variations may occur, especially at locations where ornamental railings may be used.



https://rosap.ntl.bts.gov/view/dot/42593/dot_42593_DS1.pdf



https://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa12018/



FHWA Designing Sidewalks & Trails for Access (1999 & 2001)

Though more than 20 years old now, this publication helps practitioners understand technical concepts of ADA and illustrates how they are applied to sidewalks and trails. Additionally, since there are few federally-endorsed design guides for trails, this resource provides useful information on how to design them to maximize accessibility and ADA compliance.

An example is shown at right as it relates to driveway crossings that present cross slope challenges. The guide illustrates common problems and several possible solutions to help designers create an accessible route across the driveway while also account for the transition for drivers from the street to the top of the driveway.

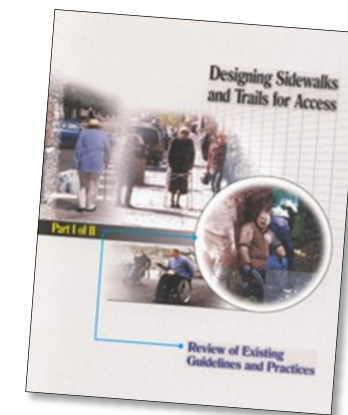
There are similar illustrations on curb ramp design options for constrained areas.

Trails and Pathways. This guide is useful when cities pursue federal grants for trails and may receive pushback or incorrect feedback on ADA compliance in a natural setting.

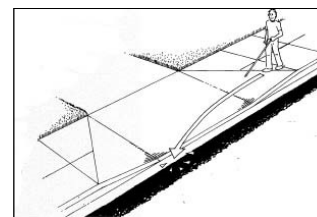
For example, ADA stipulates that the running slope of a sidewalk shall be no greater than 5%, with exceptions for natural terrain. The same rule does not apply as strictly to shared use pathways but other considerations apply.

- “If steeper segments are incorporated into the shared-use path, the total running grade that exceeds 8.33 percent should be less than 30 percent of the total trail length. In addition, it is essential that the lengths of the steep sections are minimized and are free of other access barriers. Negotiating a steep grade requires considerable effort. Users should not be required to exert additional energy to simultaneously deal with other factors, such as steep cross slopes and change in vertical levels. When designing maximum grade segments, the following recommendations should be used:

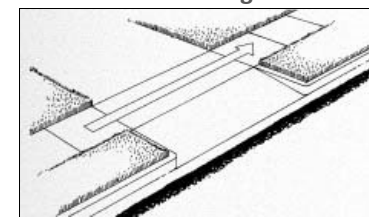
- 8.3 percent for a maximum of 61.0 m (200 ft);
- 10 percent for a maximum of 9.14 m (30 ft); and
- 12.5 percent for a maximum of 3.05 m (10 ft).”



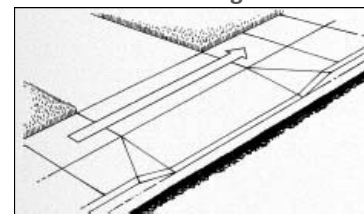
Problematic Design



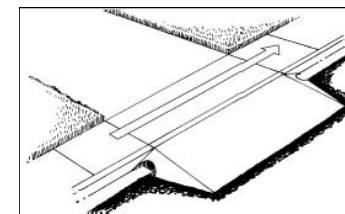
Good Design



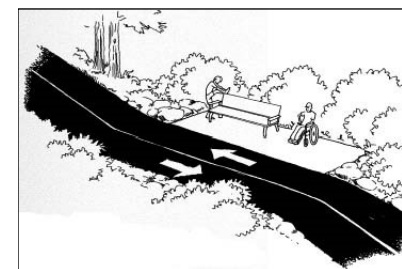
Good Design



Good Design



Shared Use Pathway landing and Rest Area on a steep running slope.



Part 1: https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalks/

Part 2: https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/contents.cfm



FHWA Manual on Uniform Traffic Control Devices (2009)

This design guide, commonly referred to as MUTCD, provides standards and guidance for engineering of traffic control devices. It is important to note that traffic control devices are narrowly defined as those roadway features that attempt to control traffic. MUTCD includes the standards agencies follow to evaluate whether or not a traffic signal is warranted. They also use MUTCD to guide how to stripe roadways, place signage, and evaluate speed limits.

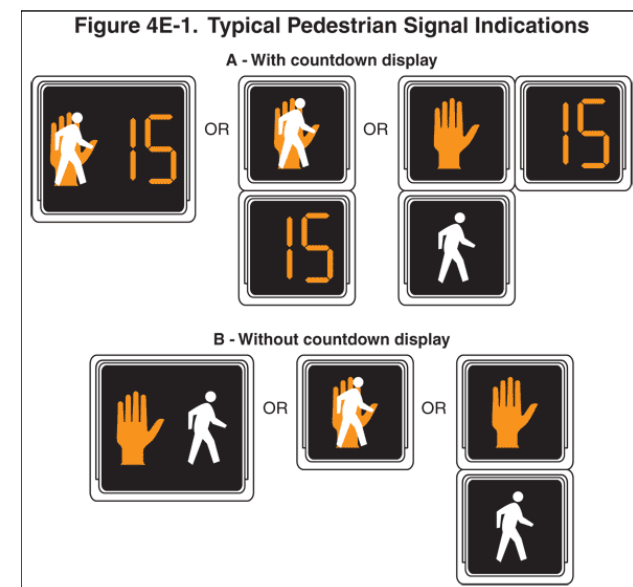
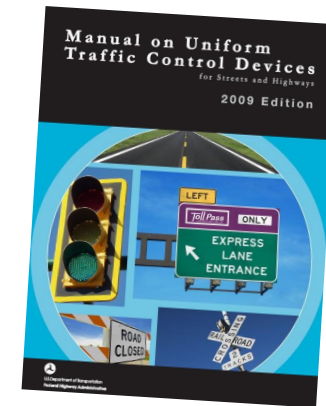
MUTCD is often widely misunderstood and misrepresented by some designers. MUTCD may sometimes be referred to as “MUTCD standards,” which is incorrect. While MUTCD does include several standards that are accompanied by “shall” statements, the majority of its contents are guidance or options for engineers to consider. The elements of MUTCD that are labeled as standards and include use of the word “shall” are viewed as compulsory and require substantial documentation and engineering judgment when deviated from.

An example of this is the installation of a full, traditional traffic signal for use by pedestrians. In order to justify the signal, MUTCD requires certain “warrants” be met with strict thresholds on how many pedestrians must be crossing in a certain time period to justify the signal. In contrast, a Pedestrian Hybrid Beacon (PHB) is identified when these strict warrants are not met and the determination on whether or not a PHB can be installed is only guidance, leaving more leeway for an engineer to approve it based on other prevailing conditions, such as land uses that generate pedestrian traffic.

In the pedestrian and bicyclist realm, traffic control devices include signage, pedestrian or bicycle signals, crosswalks, school zone treatments, and construction zone practices. Common civil engineering features, such as sidewalks, curb ramps, and protected bike lanes are not considered traffic control devices and, therefore, are not addressed in MUTCD.

The most relevant sections of MUTCD that relate to pedestrians and bicyclists are:

- Section 3B: Pavement and Curb Markings;
- Section 4C.05: Pedestrian Signal Warrants
- Section 4E: Pedestrian Control Features
- Section 4F: Pedestrian Hybrid Beacons
- Sections 6A, 6D, and 6G: Temporary Traffic Controls for Pedestrians, Bicyclists, People with Disabilities (work zones or construction zones)
- Part 7: Traffic Control for School Areas
- Part 9: Traffic Control for Bicycle Facilities



https://mutcd.fhwa.dot.gov/htm/2009r1r2/html_index.htm



ITE Designing Walkable Urban Thoroughfares (2010)

This design guide is sponsored and endorsed by FHWA for use by state and local agencies. It was developed in response to widespread interest for improving both mobility choices and community character aligned with goals for walkable communities. It states that “retail and social transactions have occurred along most urban thoroughfares throughout history. It is only in the 20th century that streets were designed to separate the mobility function from the economic and social functions.” The guide cites that it follows the flexibility principles inherent in the AASHTO Green Book, noting that it supplements the Green Book and other AASHTO publications. MDT’s Pedestrian and Bicycle Plan cites ITE as having suitable resources to make such design decisions.

A key tenet of this publication is that “walkable thoroughfare design is encapsulated in the phrase ‘one size does not fit all,’ which means the function of a thoroughfare and its design should complement the context that it serves.” Perhaps the most important component of this is how the guide stresses the need to provide frequent spacing of pedestrian crossings on major thoroughfares:

Pedestrian facilities should be spaced so block lengths in less dense areas (suburban or general urban) do not exceed 600 ft (preferably 200 to 400 ft) and relatively direct routes are available. In the densest urban areas (urban centers and urban cores), block length should not exceed 400 ft (preferably 200 to 300 feet) to support higher densities and pedestrian activity.

Conventionally, design speed—the primary design control in the AASHTO Green Book—has been encouraged to be as high as is practical. In this report, design speed is replaced with target speed, which is based on the functional classification, thoroughfare type and context, including whether the ground floor land uses fronting the street are predominantly residential or commercial. Target speed then becomes the primary control for determining the following geometric design values:

- Minimum intersection sight distance;
- Minimum sight distance on horizontal and vertical curves; and
- Horizontal and vertical curvature.

The latest AASHTO Green Book now includes a target speed section that reflects these approaches. ITE notes “the practitioner should be careful not to relate speed to capacity in urban areas, avoiding the perception that a high-capacity street requires a higher target speed.”

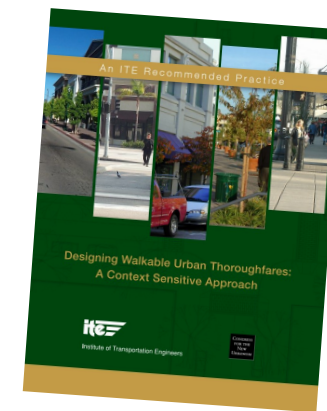


Table 6.4 Design Parameters for Walkable Urban Thoroughfares

	Thoroughfare Design Parameters for Walkable Mixed-Use Areas								
	Suburban (C-3)						General Urban (C-4)		
	Residential			Commercial			Residential		
	Boulevard [1]	Avenue	Street	Boulevard [1]	Avenue	Street	Boulevard [1]	Avenue	Street
Context									
Building Orientation (entrance orientation)	front, side	front, side	front, side	front, side	front, side	front, side	front	front	front
Maximum Setback [2]	20 ft.	20 ft.	20 ft.	5 ft.	5 ft.	5 ft.	15 ft.	15 ft.	15 ft.
Off-Street Parking Access/Location	rear, side	rear, side	rear, side	rear, side	rear, side	rear, side	rear	rear, side	rear, side
Streetside									
Recommended Streetside Width [3]	14.5–16.5 ft.	14.5 ft.	11.5 ft.	16 ft.	16 ft.	15 ft.	16.5–18.5 ft.	14.5 ft.	11.5 ft.
Minimum sidewalk (throughway) width	6 ft.	6 ft.	6 ft.	6 ft.	6 ft.	6 ft.	8 ft.	6 ft.	6 ft.
Pedestrian Buffers (planting strip exclusive of travel way width) [3]	8 ft. planting strip	6–8 ft. planting strip	5 ft. planting strip	7 ft. tree well	6 ft. tree well	6 ft. tree well	8 ft. planting strip	8 ft. planting strip	6 ft. planting strip
Street Lighting	For all thoroughfares in all context zones, intersection safety lighting, basic street lighting, and pedestrian-scaled lighting is recommended. See Chapter 8 (Streetside Design Guidelines) and Chapter 10 (Intersection Design Guidelines).								
Traveled Way									
Target Speed (mph)	25–35	25–30	25	25–35	25–35	25	25–35	25–30	25
Number of Through Lanes [5]	4–6	2–4	2	4–6	2–4	2	4–6	2–4	2
Lane Width [6]	10–11 ft.	10–11 ft.	10–11 ft.	10–12 ft.	10–11 ft.	10–11 ft.	10–11 ft.	10–11 ft.	10–11 ft.
Parallel On-Street Parking Width [7]	7 ft.	7 ft.	7 ft.	8 ft.	7–8 ft.	7–8 ft.	7 ft.	7 ft.	7 ft.
Min. Combined Parking/Bike Lane Width	13 ft.	13 ft.	13 ft.	13 ft.	13 ft.	13 ft.	13 ft.	13 ft.	13 ft.
Horizontal Radius (per AASHTO) [8]	200–510 ft.	200–330 ft.	200 ft.	200–510 ft.	200–510 ft.	200 ft.	200–510 ft.	200–330 ft.	200 ft.
Vertical Alignment	Use AASHTO minimums as a target, but consider combinations of horizontal and vertical per AASHTO Green Book.								
Medians [9]	4–18 ft.	Optional 4–16 ft.	None	4–18 ft.	Optional 4–18 ft.	None	4–18 ft.	Optional 4–16 ft.	None
Bike Lanes (min./preferred width)	5 ft./6 ft.	5 ft./6 ft.	5 ft./6 ft.	5 ft./6 ft.	5 ft./6 ft.	5 ft./6 ft.	5 ft./6 ft.	5 ft. / 6 ft.	5 ft. / 6 ft.
Access Management [10]	Moderate	Low	Low	High	Moderate	Low	Moderate	Low	Low
Typical Traffic Volume Range (ADT) [11]	20,000–35,000	1,500–25,000	500–5,000	20,000–50,000	1,500–35,000	1,000–10,000	10,000–35,000	1,500–20,000	500–5,000
Intersections									
Roundabout [12]	Consider urban single-lane roundabouts at intersections on avenues with less than 20,000 entering vehicles per day, and urban double-lane roundabouts at intersections on boulevards and avenues with less than 40,000 entering vehicles per day.								
Curb Return Radii/Curb Extensions and Other Design Elements	Refer to Chapter 10 (Intersection Design Guidelines)								

<https://www.ite.org/pub/?id=e1cff43c%2D2354%2Dd714%2D51d9%2Dd82b39d4dbad>



NACTO Urban Bikeway Design Guide & Urban Street Design Guide

The National Association of City Transportation Officials (NACTO) is an association of 84 major North American cities and transit agencies formed to exchange ideas, insights, and practices and cooperatively approach national transportation issues. It is led by licensed engineers, planners, and urban designers. It is referenced extensively in the MDT Pedestrian and Bicycle Plan.

The bikeways proposed in this plan may utilize features of the NACTO bike guide pertaining to bicycle boulevards (see right).

The purpose of the NACTO Design Guides is to provide agencies with state-of-the-practice design concepts that are based on the best and safest bicycling and walking cities in the world and represent a set of combined treatments already present in many AASHTO and MUTCD applications. FHWA has endorsed the NACTO Bike Guide as a reference manual to use in designing safe bicycling infrastructure.

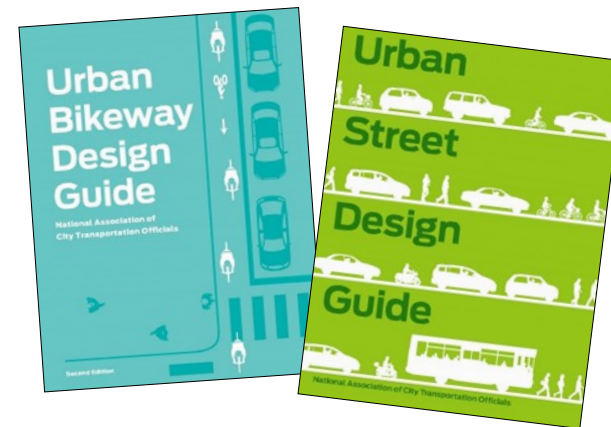
Many small and medium sized cities have officially endorsed NACTO as an acceptable design guide. Nine state DOTs have also endorsed NACTO's guide as acceptable solutions, the closest to Montana being Utah, Oregon, and Washington.

The Urban Bikeway Design Guide includes sections on:

- Cycle tracks;
- Bike lanes;
- Intersection treatments;
- Bicycle signals;
- Bikeway signing and marking;
- Bicycle boulevards; and
- Designing for all ages and abilities.

The Urban Street Design Guide includes sections on:

- Street design elements;
- Interim design strategies;
- Intersections; and
- Design controls.



<https://nacto.org/publications/#design-guides-design-guidance>



Tactical Urbanist's Guide to Materials and Design

This guidebook identifies proper treatments and materials for tactical urbanism projects, also referred to as “pop-up” or “demonstration” projects. The guide had input from organizations such as NACTO, the Vision Zero Network, and city DOTs from across the United States.

The guide was developed in response to the growing traffic safety crisis in the United States, particularly for pedestrians and bicyclists. The goal of the guide is to help cities “create streets and public spaces that are safe and accessible for everyone.” The guide provides materials and design guidance for projects that advance street safety and enhance place-making for both short- and long-term goals. Using the guide on tactical urbanism efforts helps break down the oftentimes drawn-out process of project development and allows communities to test alternatives with temporary materials before committing to formal application with full-scale design. In some cases, places are finding that semi-permanent materials work just fine and can allow resources to be devoted to other locations that need permanent applications.

The guide includes a listing of the types of temporary treatments that can be applied, many of which are materials common to construction and work zone treatments that contractors use in other street applications.

Cities like Bozeman and Missoula have utilized this guide for their own pop-up or demonstration projects. The bottom right photo is from a statewide effort conducted by the North Dakota Department of Transportation, which illustrates that these treatments are viewed as acceptable by highway agencies. The DOT provided project planning, design, and installation; workshops to guide communities in project selection, planning and design; and creation of project plans outlining design, materials, schedule and roles. A link to the presentation NDDOT provided for AASHTO is below to show examples in communities similar to Livingston.

- <https://www.dot.nd.gov/plans/statewide/docs/AASHTO-Presentation-NDDOT-Pop-up-Demonstrations.pdf>



Surface Treatments
Traffic paint is used to add high-visibility crosswalk striping.

Barrier Elements & Landscaping
Flexible delineators provide low-cost visual and physical barrier to the curb extension and pedestrian refuge island. Heavy, water-filled Sybertech plastic planters are highly effective physical barriers. Flowers and greenery improve aesthetics and calm traffic.

Signs
MUTCD compliant Rectangular Rapid Flashing Beacons are added as an upgrade to the existing crosswalk signs.



<http://tacticalurbanismguide.com/>



US Access Board Public Right of Way Accessibility Guidelines (PROWAG)

Although PROWAG is yet to be adopted as ADA standards for public right of way, both FHWA and the US Department of Justice have deemed them a best practice for agencies to use in the design of sidewalks, curb ramps, pedestrian push buttons, and other features of walking environment.

It is recommended that Livingston use PROWAG, especially when situations arise where common curb ramp design standards are not appropriate for a given situation. MDT has adopted PROWAG as the foundation for which the design of its accessibility-related improvements are based and PROWAG is referenced extensively in the MDT Pedestrian and Bicycle Plan.

US Access Board Accessible Public Rights-of-Way: Planning and Designing for Alterations (2007)

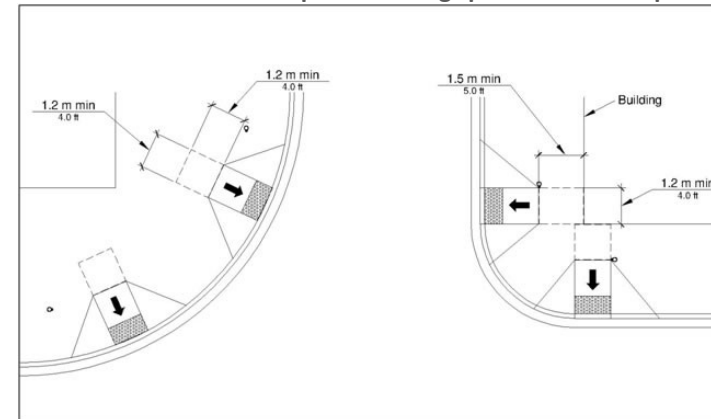
This publication uses PROWAG and puts its concepts in illustrations to help public agencies address common context issues that may challenge how ADA compliance is achieved.

The guide walks designers through the thought process of how to access a constrained environment, such as a downtown corner with a tight radius, to design for compliance. It includes several design solutions to address various complex situations and shows how the ADA requirements can be met as they relate to curb ramps, landing areas, push button placement, and other pedestrian access route features.

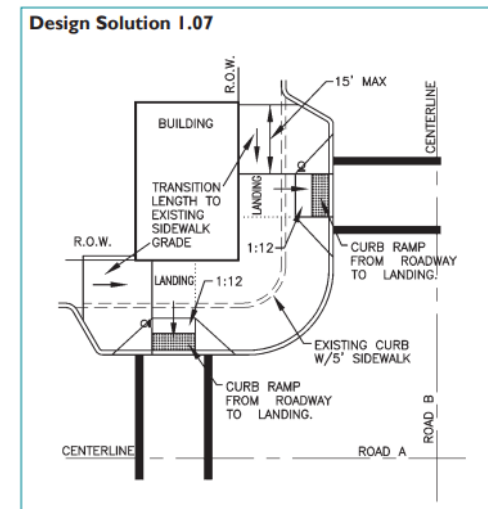
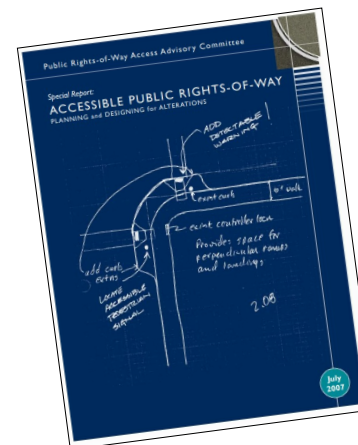
Adopting it by reference in city codes can help guide developers and others to it when they have a challenging situation and the prevailing design standards do not adequately address the situation.



PROWAG illustration of compliant turning space at curb ramp landings.



<https://www.access-board.gov/prowag/>



<https://www.access-board.gov/files/prowag/planning-and-design-for-alterations.pdf>



Appendix B: Trails & Active Transportation Design Gallery

While design manuals provide the technical specifications for active transportation facilities, they don't always provide real-world examples of how they are implemented in places like Livingston. It can be difficult for elected officials and the public to conceptualize some treatments because they may be new or different.

Further, in colder climates there can be resistance from public works officials responsible for programs like snow plowing and street sweeping. Oftentimes, the challenges faced by these operators in navigating things like curb extensions and speed humps has to do with improper design of those features and not the features themselves.

The two-lane streets throughout Livingston offer a prime opportunity to retrofit them with some of these design treatments. Coordination on MDT's urban routes will require their buy-in and this section showcases some known treatments on MDT's routes in other Montana cities.



Effective Sidewalk & Pathway Width

The effective width of sidewalks and pathways is reduced 18 inches (per side) when vertical elements such as buildings, retaining walls, and barriers are adjacent to the sidewalk or pathway. This is rarely accounted for in the design of active transportation facilities. The FHWA Office of Safety’s research has concluded that sidewalks that lack horizontal buffer from the street also have a reduced effective width of 18 inches. The top image at right shows a sidewalk on Livingston’s Main Street that has an effective width of less than 3 feet due to the vertical elements and lack of buffer from the street. This does not allow space for someone in a wheelchair to comfortably pass by another sidewalk user. Sidewalks like this should be at least 7 feet in width with vertical elements and/or lack of buffer.

The diagram below is from the federal Highway Capacity Manual (HCM), which agencies like MDT routinely use in project analysis and design. It illustrates this concept of reduced effective width. The pathway on Highway 89 shows the reduced effective width of the pathway due to vertical barriers (image at right, middle). The presence of a vertical barrier on both sides reduces the pathway width to only 7 feet—a foot less than AASHTO’s constrained minimum width for a shared use pathway. Vertical barriers next to the traveled way are not considered clear zone obstructions, per AASHTO. Note that agencies like MDT provide for this reduce effective width in the design of shoulders for motorists; they do not put the travel lane right next to the vertical barrier. The image at the bottom right shows the proper design of a pathway to account for this effective width, accounting for the “shoulder” that is needed for pathway users. The 14-foot tread width of the pathway results in 11 feet of effective width. This is what should be built in future Livingston projects that have vertical elements and lack horizontal buffer from the street.

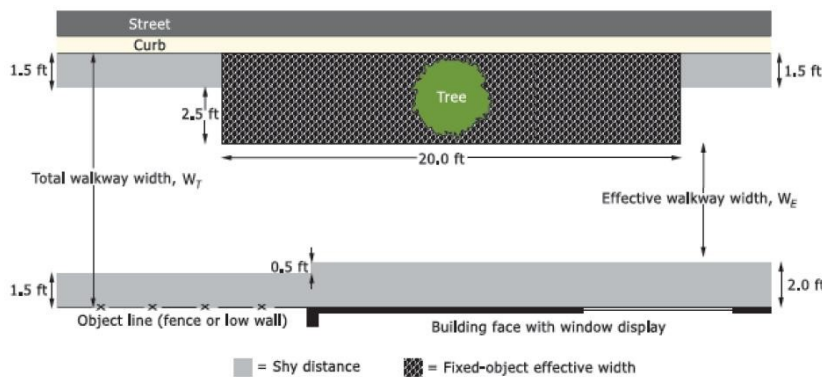
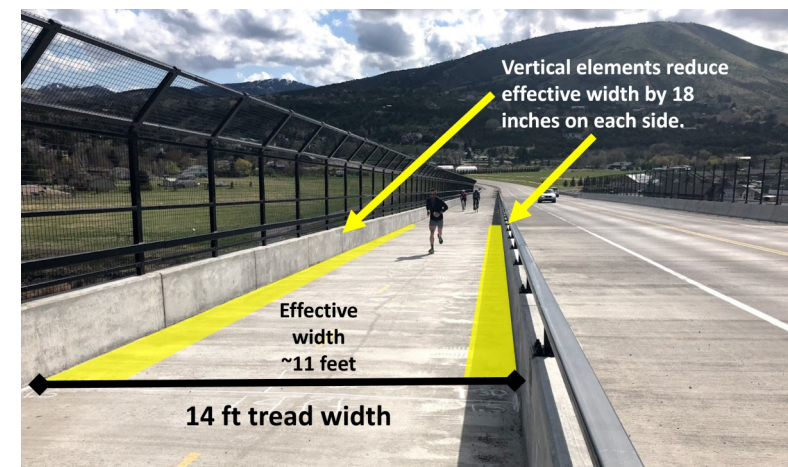
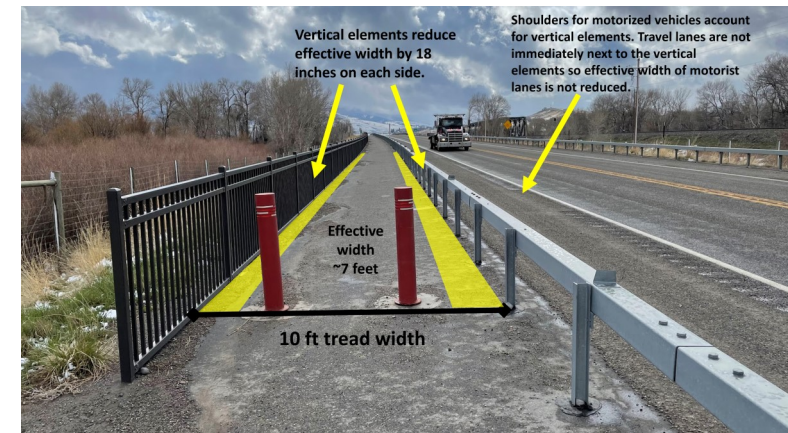
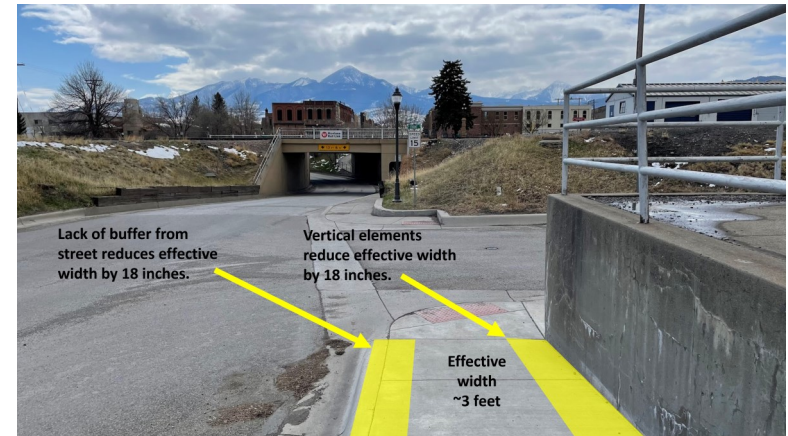


Figure 9: Instructions for calculating effective sidewalk width. Source: HCM Exhibit 17-17.



Shared Use Pathways & Sidepaths

The previous section on effective widths shows how the design of shared use pathways can easily result in a lack of consideration of user needs. The effective width of shared use pathways is crucial to consider given these pathways have the most diverse set of users—from bicyclists to children to people with disabilities.

AASHTO's Guide for the Development of Bicycle Facilities states that 10-foot is the minimum width of a shared use pathway. Pathways of 8-feet can be used in constrained situations or where pedestrian volumes are expected to be low (e.g. Highway 89 pathway in rural settings).

When shared use pathways are not adjacent to roadways, a 10-foot pathway width constitutes 10 feet of effective width unless there are features such as retaining walls adjacent to steep slopes or vertical barriers across bridges.

Shared use pathways do not have to be paved to comply with the Americans with Disabilities Act. A firm and stable surface is required, which usually consists of some type of compacted gravel surface with aggregate of 3/8-inch or less to allow for use by people in wheelchairs.

Much like a rural road has soft shoulders, preparing a 2-ft wide soft shoulder on either side of a paved shared use pathway helps facilitate drainage and prevents the edge of pavement along the pathway from cracking as easily. The 2-ft shoulder also provides a place for joggers who prefer an unpaved surface.

Sidepaths The AASHTO Guide for the Development of Bicycle Facilities has a chapter dedicated to Shared Use Pathways, including when they are adjacent to streets. These are called sidepaths. As noted in the Design Guidance section of this Appendix, sidepaths that lack at least 5-feet of buffer from the top of curbing along a street need a vertical barrier to help separate pathway users from moving vehicles. Curbing provides minimum deflection of vehicles at speeds greater than 25 mph and people using sidepaths are moving in a contraflow direction next to moving traffic.



The shared use pathway bridge on Higgins Avenue in Missoula is a great example of both effective width and high volume use by pedestrians and bicyclists being a key part of its design.



Sidepaths that lack at least 5-feet of horizontal buffer from moving motor vehicle traffic are recommended by AASHTO to have a vertical, longitudinal barrier, to prevent motorized traffic from encroaching on the pathway. Making these barriers crashworthy helps prevent severe injuries to motorists who hit them while protecting pathway users, as shown above in a sidepath along State Highway 21 in Idaho.



A crashworthy longitudinal barrier, such as a jersey rail, is preferred to keep both pathway users from accidentally entering the street and to prevent errant motorists from encroaching on the sidepath.

Some agencies and engineers do not like to use these vertical barriers for fear of them restricting the clear zones they design for errant motorists. AASHTO is clear on this: **Longitudinal barriers like jersey rails are not considered clear zone obstructions**, as they are recommended for use for pedestrian and bicyclist safety in these sidepath and sidewalk setting in AASHTO's *Roadside Design Manual*.

Shared Use Pathway Crossings. Shared use pathway crossings of streets, either at mid-block locations or at intersections, must be designed to be more than an extra wide sidewalk. The width of the pathway needs to be carried through the crossing in terms of both curb ramp and crosswalk width. The images at right from a mid-block pathway crossing in Missoula show several best practices:

- Use of the trail crossing sign to alert motorists that both pedestrians and bicyclists are crossing.
- Curb ramps and crosswalks are the same width as the pathway to help safely facilitate bi-directional use by people who walk and bike, especially those with disabilities.
- Push buttons to activate the RRFB that are placed on the right side of the crossing since pathway users will approach the crossing on the right side.

Other treatments to make pathway crossings safer include raised crosswalks; upgrading of signals to Pedestrian Hybrid Beacons in places with higher volumes; and eliminating movements such as right turn on red and flashing yellow arrows at intersections with pathway crossings.



Missoula's pathway crossing of 6th Ave SW along the Bitterroot Branch Trail has several features for Livingston to emulate in its future pathway crossings of streets. These include adequate width to carry pathway users across the street, as well as properly-placed push buttons for pathway users to activate the signal from buttons placed on the right side of the pathway as they approach the crossing.



Bike Lane Widths

A common mistake in the design and application of bike lanes is counting the gutter pan as part of the bike lane. This is a common mistake that stems from an error in the AASHTO *Guidelines for the Development of Bicycle Facilities*. That guide states that bike lane width is measured from the face of the curb and that 4 feet is the minimum. MDT's design standards repeat this error. It fails to state that the measurement from the face of the curb should exclude the gutter pan. AASHTO's Green Book provides clarification on counting the gutter to measure both bike lanes and motor vehicle lanes:

- “A gutter of contrasting color or texture (black asphalt vs gray concrete) should not be considered part of the traveled way.”

The seam created when asphalt meets a concrete gutter is enough to destabilize a bicyclist, especially one riding on a bike with narrow tires or someone who is a less confident rider. The images at right show other conditions that indicate why the gutter is not usable space for a bicyclist.

While a brand new road may have a flush transition from the gutter to the asphalt travel lane, that condition does not remain for very long. Brand new roads tend to settle and create small vertical offsets at that joint. The images at right show other conditions that indicate why the gutter is not usable space for a bicyclist.

Street maintenance practices like chipseals and overlays create lips at the gutter. Rarely are contractors inspected so closely to ensure a flush joint is preserved when a fresh layer is applied on a resurfacing project. This is when the top layer of asphalt is removed and replaced. Chipseals add height to the asphalt roadway and often-times lack smooth lines at the gutter due to difficulties in applying straight lines on the edges when roads are chipsealed.

Further, the gutter is designed into streets for the conveyance of stormwater and is not intended to be a traveled way. During rain events, stormwater is flowing in the gutter. Other road debris, such as leaves and snow collect in the gutter pans.

There are many reasons why the gutter doesn't count as bike lane width. First, the gutter is for stormwater conveyance and is not usable when it rains. Second, gutters are where debris like leaves and snow collect from the road. Finally, the bottom image shows the lip created when a road is resurfaced or chipsealed.



Curb Extensions

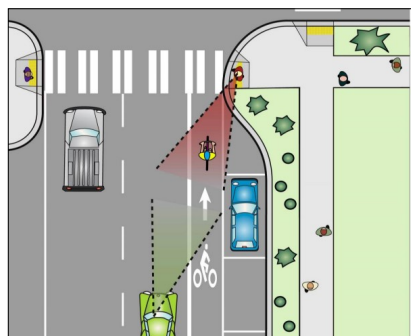
Curb extensions, sometimes called “neckdowns,” are a crosswalk visibility enhancement use when on-street parking is present. They increase the visibility of pedestrians crossing streets as they are not screen by parked cars. They also reduce pedestrian exposure by limited crossing times.

Places to prioritize curb extensions include busier roadways with high volume pedestrian crossings, school crossings, park crossings, and areas with senior services.

Concerns arise from public works equipment operators and emergency services, which can be mitigated by proper design. The bullets below from FHWA identify some common considerations.

- Curb extensions are only appropriate where there is an on-street parking lane and where transit and bicyclists would be traveling outside the curb edge for the length of the street. They should not extend more than 6 feet from the curb.
- The turning needs of larger vehicles, such as school buses and emergency vehicles, need to be considered in curb extension design, especially at intersections with significant truck or bus traffic. However, speeds should be relatively slow in a pedestrian environment so all vehicles should be traveling at speeds conducive to tight turns.
- Emergency access is often improved using curb extensions if intersections are kept clear of parked cars. Fire engines and other emergency vehicles can climb a curb where they would not be able to move a parked car. At midblock locations, curb extensions can keep fire hydrants clear of parked cars and make them more accessible.

Curb extensions allow drivers and pedestrians to be more visible to each other and reduce crossing distances for pedestrians.



Existing Curb Extensions in Livingston



Curb Extensions & Street Operations. The abrupt angles created by poorly-designed curb extensions cause challenges for snow plow and street sweeper operators. The top image at right shows this abrupt transition that creates areas where a street sweeper misses debris and a snow plow cannot easily follow the line of the curb.

Designing more curvilinear transitions, along with placing other treatments like cast iron curb edging and reflective delineators assists snow plow operators in identifying the curb line and reducing damage to the curbing.

Other Curb Extension Treatments. Changing the curb line at corner to accommodate curb extensions can change stormwater flows along the curb line. As Livingston reaches a population where it must create a stormwater system, this will provide an opportunity to retrofit corners with curb extensions designed with this in mind.

There are other treatments, shown below, that allow existing stormwater flows to be maintained while achieving similar benefits that come with curb extensions.

Abrupt angles are what impacts plow and sweeper operators as they create corners that are hard to follow with their equipment



Curvilinear transitions create a better edge for street equipment operators to follow.

Mountable curb extensions like this one preserve drainage flows and allow larger vehicles to move over them when turning.



Bozeman uses reflective delineators at curb extensions to help plow operators identify edges when snow is covering the street.



Sandpoint, ID, affixes cast iron edging to curb to help avoid chipping by snow plows.



Bridging the gutter to allow water to flow under allows for curb extensions that don't impact drainage. It does require routine checks to avoid clogging with debris.

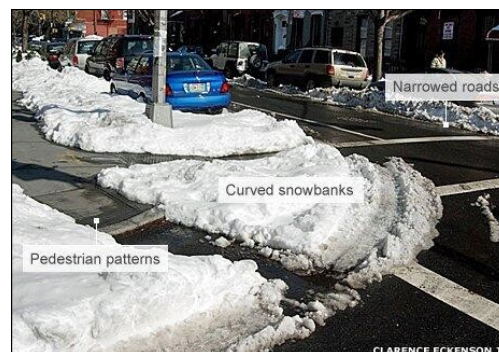


Temporary Curb Extensions. There are several treatments that can create curb extensions without substantial infrastructure investment. Pop-up projects often use tubular markers to outline curb extensions and some cities use temporary planters and a combination of other treatments to create curb extensions but allow for street features to be moved for winter operations or other reasons.

Piloting curb extensions with temporary materials allows cities to test how narrow they can make a motor vehicle travel lane or how to best design the final curb extension to allow for turning of school buses, emergency vehicles, and trucks.

The images at right show different temporary treatments.

“Sneckdowns.” Snowfall reveals the areas at street corners where curb extensions could be installed. The snow creates the neckdown (hence, sneckdown) and illustrates the unused portion of the street that can form the footprint for future curb extensions. The images below show how images can be taken and then lines drawn to show existing curb lines versus the sneckdown the snow created.



Raised Crosswalks

FHWA identifies raised crosswalks as part of a comprehensive pedestrian safety program. Raised crosswalks are ramped speed tables spanning the entire width of the roadway, often placed at midblock crossing locations, but also used at intersections. In their safety publications FHWA states raised crosswalks can reduce pedestrian crashes by 45%.

The crosswalk is demarcated with paint and/or special paving materials. These crosswalks act as traffic-calming measures that allow the pedestrian to cross at grade with the sidewalk. In addition to their use on local and collector streets, raised crosswalks can be installed in campus settings, shopping centers, and pick-up/drop-off zones (e.g., airports, schools, transit centers).

Raised crosswalks are flush with the height of the sidewalk. The crosswalk table is typically at least 10 feet wide and designed to allow the front and rear wheels of a passenger vehicle to be on top of the table at the same time. Detectable warnings (truncated domes) and curb ramps are installed at the street edge for pedestrians with impaired vision.

These may be done in combination with other pedestrian visibility treatments like curb extensions.

The images at right, middle and bottom, are in Bend, Oregon, and Moscow, Idaho—both cities in which there is notable snowfall.

Raised crosswalks at a shared use pathway crossing of a right turn slip lane.



Mid-block raised crosswalk examples showing a bridging of the gutter (top) and in combination with a curb extension (middle).



Raised crosswalk at a T-intersection and in front of a high school.



https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_RaisedCW2018.pdf



Curb or Outside Truck Aprons

Sweeping right turn lanes that are commonly referred to as “slip lanes” present challenges for pedestrian safety. They promote high speed turns and drivers are not always looking both ways for people crossing as they try to identify gaps in traffic. Interstate off-ramps are prime locations for these.

One way to narrow these slip lanes and make them safer is to install a truck apron on the outside of the lane. This creates a tighter turning radius for the majority of vehicles while allowing larger vehicles, like trucks and emergency service vehicles, to mount the apron as they would the interior of a roundabout. Examples shown are from US and state highways in Eugene and Bend, Oregon.

Ensuring there is an ADA-compliant pedestrian access route across the apron is important to include in the design. Additional treatments for these areas can be installed of Rectangular Rapid Flashing Beacons at the crossings.



Speed Humps

Speed humps are paved vertical traffic control measures that tend to have the most predictable speed reduction impacts. They can also be used to enhance the pedestrian environment at pedestrian crossings. Speed humps are approximately 3 to 4 in. high at their center, and extend the full width of the street with height tapering near the drain gutter to allow unimpeded bicycle travel. Speed humps should not be confused with the speed “bump” that is often found in mall parking lots.

There are several designs for speed humps. The traditional 12-ft hump has a design speed of 15 to 20 mi/h, 14-ft hump a few mph higher, and a 22-ft table has a design speed of 25 to 30 mi/h. The longer humps are much gentler for larger vehicles.

Speed humps can also be designed with two, 1-ft slots to allow for vehicles with wide wheelbases such as buses and emergency vehicles to pass through them without having to go over the measure. These are typically called speed cushions. These gaps, as shown at right, also allow bicyclists to pass through them.



http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=35



Rectangular Rapid Flashing Beacons (RRFBs)

RRFBs are a relatively low-cost treatment to raise the visibility of pedestrians at street crossings that do not have other types of traffic controls like traffic signals or stop signs. FHWA data shows RRFBs can reduce pedestrian crashes by 47%. FHWA notes “RRFBs are particularly effective at multilane crossings with speed limits less than 40 mph.”

The yellow flashing lights are in a rectangular format below a traditional pedestrian, school zone, or shared use pathway crossing sign. The lights flash when the button is pushed, with LED flashers set at a frequency similar to emergency service vehicles. The studies find that this frequency prompts a yield response from drivers as they are accustomed to reacting to similar flashing from emergency vehicles.

RRFBs can be equipped with solar panels so they don't require a power source. This makes them cheaper and easier to move if their installation doesn't have the desired effect or is upgraded to other treatments.

A frequently overlooked design treatment with RRFBs is putting the pushbutton on the same pole as the signal. While this is more cost-effective, designers must then ensure that the button is ADA-compliant. This means it must be at an appropriate height and reach from a flat landing area at least 4-feet by 4-feet.

If this means the RRFB flasher and sign is placed on the backside of a sidewalk, it may be out of the vision triangle of an approaching motorist. This may require construction of a separate pole, as shown in the trail crossing example at right, which is in Missoula. For pathway crossings, it is important to put the push button on the right side of the crossing since that's where people will be approaching the crossing. Curbside push buttons for bicyclists using the street may also be installed in combination with a typical crosswalk button.

RRFBs currently have interim approval status from FHWA, which means they are not an official part of MUTCD and require special permissions. MDT has obtained this permission and it is applicable for every city in Montana to use.



https://safety.fhwa.dot.gov/ped_bike/step/docs/TechSheet_RRFB_508compliant.pdf



Pedestrian Hybrid Beacons (PHBs)

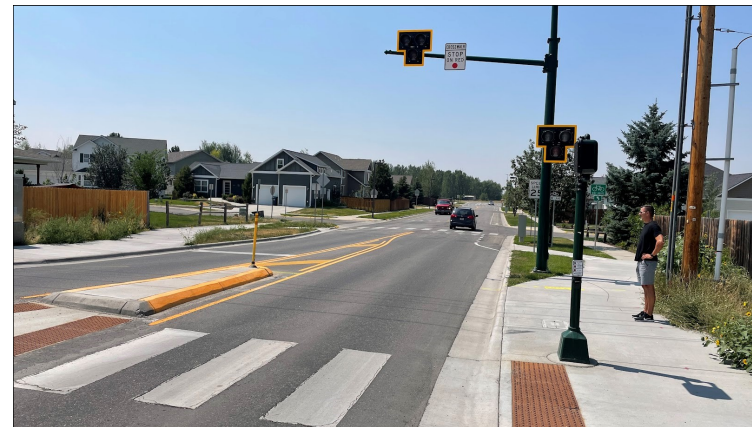
PHBs are a signal type that prompts a stop from motorists. The signal head is comprised of flashing red lights and yellow lights. The yellow lights begin flashing when the signal is activated to alert approaching motorists.

The red lights then activate and are solid when motorists must stop as the pedestrian has the walk signal. Once the countdown phase begins, the red lights begin alternating (called a wig-wag) like a railroad crossing signal. This means a driver can then proceed if after coming to a complete stop and if the crosswalk is clear. This reduces motorist delay when compared to a full traffic signal where the red light would remain through the entire walk and countdown phase of the signal.

FHWA notes PHBs can reduce pedestrian crashes up to 50%. The PHB is often considered for installation at locations where pedestrians need to cross and vehicle speeds or volumes are high, but traffic signal warrants are not met. PHBs are a candidate treatment for roads with three or more lanes that generally have annual average daily traffic (AADT) above 9,000. PHBs should be strongly considered for all midblock and intersection crossings where the roadway speed limits are equal to or greater than 40 miles per hour (mph).

PHBs are typically installed at the side of the road or on mast arms over midblock pedestrian crossings. The mast arms and signal controls increase the cost when compared to a RRFB, however, the image at right-middle shows a PHB application that does not include a mast arm and is cheaper to install.

PHBs may be used with the pedestrian crossing sign, a school crossing, or a combined bicycle and pedestrian (typically a trail crossing) sign. If the crossing is not for a pathway but includes a bikeway, then a curbside side push button is used so bicyclists using the street can activate the PHB.



https://safety.fhwa.dot.gov/ped_bike/step/resources/docs/fhwasa18064.pdf



Traffic Filters & Chicanes

Traffic Filters a traffic diversion technique that reduce traffic volumes on residential neighborhood streets when traffic calming or other measures are in need of additional measures to make a route safer for walking and bicycling. Traffic filters reduces traffic volume by discouraging or preventing traffic from cutting through a neighborhood and restricts access to a street without creating one-way streets. On-street bikeways benefit the most from traffic filters when they are on routes parallel to busier streets as they help divert motorized traffic to other preferred routes.

The prime beneficiaries of traffic diversion are bicyclists, pedestrians, and those who live on the treated streets, but local residents are also most negatively affected by traffic diversion as they may have to deviate from routes they traditional use. Traffic filters consist of islands or other temporary treatments that may allow motor vehicles to proceed in only one direction while allowing bicyclists to pass through an intersection in both directions.

Chicanes are a horizontal traffic control measures used to reduce vehicle speeds on local streets. A secondary benefit of chicanes installation is the ability to add more landscaping to a street. (images at bottom right)

Chicanes create a horizontal diversion of traffic and can be gentler or more restrictive depending on the design. Shifting a travel lane has an effect on speeds as long as the taper is not so gradual that motorists can maintain speeds. For traffic calming, the taper lengths may be as much as half of what is suggested in traditional highway engineering. The taper lengths should reflect the desired speed which should be posted prior to the chicane.

Shifts in travelways can be created by shifting parking from one side to the other (if there is only space for one side of parking) or by building landscaped islands (islands can also effectively supplement the parking shift).

Traffic filters help reduce cut-through traffic on local streets and make conditions safer and more comfortable for people using these streets as bikeways. Traffic may proceed in one direction while bicyclist can operate in both directions through an intersection.



Chicanes create a forced diversion of motor vehicle traffic to help slow speeds (top). They are a combination of street side curb islands and median islands that can include landscaping (right).
 Images: PedBikeImages.com/Dan Burden



Mini-Roundabouts & Neighborhood Traffic Circles

Mini-roundabouts and neighborhood traffic circles differ from traditional roundabouts in order to apply them to smaller or existing street sections.

Mini-roundabouts have a circular center island that, unlike regular roundabouts, has a flat, mountable island so larger vehicles can make the turns. The Wallace Street mini-roundabout is part of a full suite of traffic calming or speed management treatments.

Mini-roundabouts may have median islands for pedestrians if right-of-way exists to do so. The example at right from Coralville, Iowa, resembles more of a traditional roundabout with pedestrian islands but with the flat island in the middle.

Neighborhood traffic circles are similar but less formalized than mini-roundabouts. They have similar features but are commonly placed on lower volume residential streets as a traffic calming feature. Missoula recently placed neighborhood traffic circles in their Franklin to the Fort neighborhood using tubular markers and paint. They are raising funds for putting planter boxes in these features.



Mini-roundabouts on Wallace St in Bozeman (left) and Wyoming St in Missoula (below).



Mini-roundabout in Coralville, IA (right) and a neighborhood traffic circle in Lewiston, ID (below).



Missoula's temporary neighborhood traffic circles.



Bicycle Boulevards

Given the limited ability to create dedicated in-street or separated bike lanes in Livingston, the bicycle boulevard treatment is recommended for those routes identified for bikeways.

The main goal of bicycle boulevard treatments is to incorporate design features that manage the speed of vehicles. Both the NACTO *Urban Bikeway Design Guide* and the FHWA *Small Town and Multimodal Networks Guide* contain sections on design for bicycle boulevards.

Many of the design features outlined in previous sections can be combined to create bicycle boulevards, which is shown below from the FHWA guide. A combination of curb extensions, chicanes, traffic filters, speed humps, and median islands along a route help keep drivers attentive to these road features and can result in speeds where bicyclists are comfortable sharing the travel lanes.

At major intersections that lack stop signs or traffic signals, treatments such as curbside push buttons for bicyclists to activate RRFBs and PHBs are desired treatments.

At major street crossings with RRFBs or PHBs, place push buttons atop the curb racing the street so bicyclists can activate the signals.



<https://nacto.org/publication/urban-bikeway-design-guide/bicycle-boulevards/>

<https://ruraldesignguide.com/mixed-traffic/bicycle-boulevard>



Advisory Shoulders or Advisory Lanes

Advisory shoulders are a tool endorsed by FHWA in its Small Town and Rural Multimodal Networks Guide to create usable shoulders for bicyclists on a roadway that is otherwise too narrow to accommodate one.

The shoulder is delineated by pavement marking and optional pavement color. Motorists may only enter the shoulder when no bicyclists are present and must overtake these users with caution due to potential oncoming traffic. Cities must file for experimental use with the state FHWA office in order to apply advisory shoulders on their streets.

These can be used on low speed, low volume streets intended to become city bikeways. The examples at right show two applications of advisory shoulders:

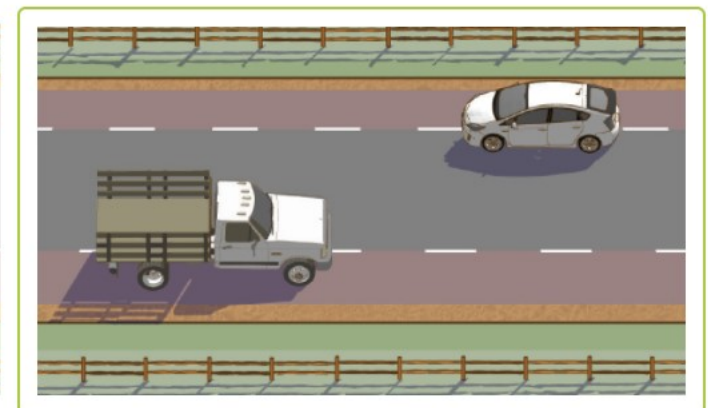
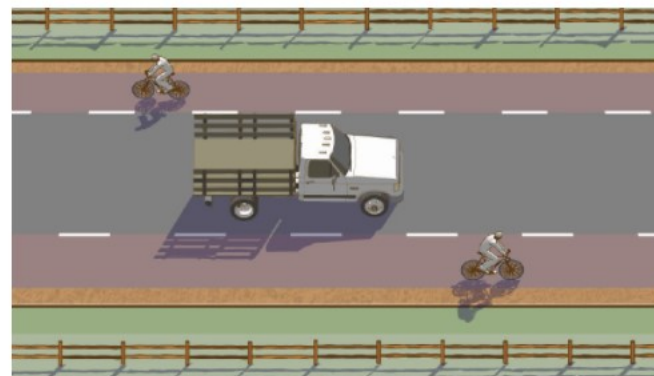
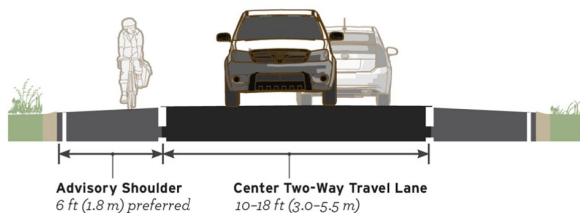
- Top—With on-street parking, which is suitable for residential streets in Livingston.
- Bottom—This was done one in lieu of a dedicated bike lane on a street between a middle school and elementary school. There are no curbs and residential parking is beyond the pavement in this neighborhood.

The diagrams below from FHWA show lane width considerations and how vehicles function to use the center drive aisle and merge into the advisory shoulders when another motorist approaches from the opposite direction.

Advisory shoulders can be used on bikeways with on-street parking (right) or without (below).



Motorists use the center drive aisle, and yield to bicyclists in the shoulder as they merge into the shoulder to pass an oncoming driver.



Work Zone Treatments

Pedestrians and bicyclists must be treated with the same care and attention in work zones as motorists. The Manual on Uniform Traffic Control (MUTCD) addresses how pedestrians and bicyclists must be accommodated. Section 6 of MUTCD addresses what are known as Temporary Traffic Controls (TTC), which are the features used in work zones to safely guide all road users through or around a work zone. MUTCD states (emphasis added):

- The needs and control of all road users (motorists, **bicyclists, and pedestrians** within the highway, or on private roads open to public travel, including persons with disabilities **in accordance with the Americans with Disabilities Act** of 1990 through a TTC zone **shall be an essential part of highway construction**, utility work, maintenance operations, and management of incidents.

Pedestrians & ADA Compliance. Providing for the needs of pedestrians, especially those with disabilities, is a key element of work zones that impact sidewalks, curb ramps, crosswalks, and pathways that are alongside streets. MUTCD requires that temporary pedestrian access routes be included when sidewalks and related pedestrian features are closed for construction.

A city, state DOT, or developer, cannot close a sidewalk without designating a detour route or constructing a bypass of the work on-site. The detour route must be comparable in terms of accessibility features as the route that is disturbed. For example, if the route had curb ramps with truncated domes prior to construction, the detour route must also have those features.

The diagram below shows what's known as an "on-site detour" where a corner is disturbed construction and a temporary pedestrian route is erected by closing the adjacent motor vehicle travel lane. The diagram outlines the features of this detour route.

If barricades and channelizing devices do not have bottom edges detectable to people who are blind or vision impaired, they may enter unsafe situations such as open trenches or motor vehicle travel lanes. If routes are not accessible to people using wheelchairs or other mobility devices, they may be forced to use the street and be subject safety threats from moving vehicles.

This is why it is crucial to properly review and permit utility companies, developers, and other contractors who do work in City or MDT right-of-way.

Sample Construction Zone Treatments to Comply with ADA and MUTCD

Construction zone access that is compliant with ADA and MUTCD Section 6 has been an emphasis of the Federal Highway Administration in recent years. The example below shows a temporary ramp, detectible sidewalk barricade, and channelized pedestrian route provided for a curb ramp replacement project on two nearby street corners. Additionally, a parking lane, bike lane, or general purpose travel lane may need to be closed to provide compliant access.



1. Pedestrian detour routes should be thought of the same as roadway detour routes. They should be signed to designate a route comparable to the accessibility features that existed pre-construction.
2. Cane-detectable barricades must be present so they provide a cue to blind or visually-impaired pedestrians that there is a sidewalk closure. Barricades must cover the full tread width of the sidewalk and be no more than 2 inches off the surface.
3. Temporary ramps may be needed to provide access off the curb. Landing areas, cross slope, and running slope requirements are the same as standard ramps.
4. A protected pedestrian access route may be necessary to provide safe, protected movement. Cones and tape or rope between cones is not an accessible barrier. The route must be free of trip hazards and protruding objects.



Bicyclists. Managing bicyclists in work zones has fewer resources than pedestrians and is not subject to ADA requirements unless the work zone impacts a pathway. If a pathway next to a road is impacted, it must be treated as a sidewalk and is required to have the same comparable accessibility measures.

If on-street bikeways that lack dedicated bike lanes are subject to a work zone obstruction or full closure, the bicyclists may be detoured to another comparable route or given the most suitable accommodations on the existing street. Work zone traffic conditions are typically slow enough for bicyclists to share the lanes with motorists.

Safety issues arise when there are abrupt edges in the pavement that can cause a pinch flat for a bicyclist. Grooves in the pavement due to resurfacing can create unstable conditions for bicyclists using narrow tires.

For routes with bike lanes, a dedicated bike lane should be included through the work zone or work zone conditions created to make the speeds of motorists conducive to a bicyclist sharing the lane. Bike lane closures should be given advance warning so bicyclists can make a decision on how to proceed and bike lanes cannot be blocked by other work zone signage.

Pathways. As noted, pathways adjacent to roadways must be treated like sidewalk and ADA requirements adhered to. If a pathway exists on only one side of a road and there is no sidewalk on the other side, then a full closure of the pathway is not allowed.

Shared use pathways in other settings, such as along rivers or in parks, should be carefully evaluated to determine if a full closure is necessary. Designating and marking a detour route of a pathway can occur through the use of parallel sidewalk routes or dedicating a motor vehicle travel lane to pathway use, using vertical barriers along the route, if the pathway is of high usage.

Providing advance warning of a bike lane closure is proper, but the advance warning sign should not block the bike lane.



Closing a pathway for construction may necessitate a detour route for users, the same as done for motorists when a road is closed. The detour should be similar to the pathway that is closed, in terms of width and safety.

Temporary pathway detours can be constructed by converting existing on-street lanes to a pathway using jersey rails and other types of barricades.



Appendix C: Detailed Project Rankings

The projects identified as part of the Livingston Trails and Active Transportation Plan are generated from the following efforts:

- Previous plans and studies;
- Public input;
- Steering committee input;
- City staff input; and
- Consultant evaluation.

The projects were ranked using a multi-criteria evaluation method with factors generated by the top preferences of the Steering Committee. In May/June 2021, the Steering Committee was asked to determine which factors should be the highest priority when ranking projects.

They are identified in Figure C-1. The ranking factors are divided into two sets for project types—sidewalk/bikeway projects and trail/pathway projects. They were divided into two sets since sidewalk and bikeway projects occur along streets while trail and pathway projects occur primarily in natural areas or separated from streets.

Figure C-1 shows the average score for each proposed factor based on how the Steering Committee weighted each factor in its evaluation. These factors were used to develop a multi-criteria evaluation, based on a 100-point maximum scale, to then rank projects to determine the top tier projects for Livingston.

Once projects were ranked according to these factors, Steering Committee members were asked which projects they felt had intangibles that should be considered in granting up to 5 additional points to the project through the Steering Committee Priority.

The following pages contain the detailed rankings of projects and how points were assigned based on the factors in Figure C-1. The detailed ranking tables for the sidewalks and bikeways projects, and the trail and pathway projects, were combined into the final ranking to determine high, medium, and low priority tiers.

Figure C-1 Project Ranking Factors

Sidewalk/Bikeway Factors	Score
Primary Factors	
Proximity to Schools	5.0
Proximity to Downtown/Other Key Destinations	4.8
Access to Population in Need	4.7
Fills Gap in System	4.7
Proximity to Health & Social Services	4.5
Proximity to Parks/Trails/Natural Areas	4.3
Secondary Factors	
Bus Route & Other Transportation Access	3.8
Potential for New Development to Build	3.7
Access to Food Outlets	3.5
Traffic Exposure	3.3
Steering Committee Priority	3.2
Ease of Implementation	3.0

Trail/Pathway Factors	Score
Primary Factors	
Proximity to Other Parks/Trails/Natural Areas	5.0
Access to Population in Need	4.8
Fills Gap in System	4.8
Environmentally Sensitive Area	4.7
Prox. to Community Assets (Schools,Food,Downtown)	4.5
Secondary Factors	
Ease of Implementation	3.8
Current Property Owner Status (Public/Private)	3.8
Topography & Related Challenges	3.7
Provides Alternative to On-Street Sidewalk/Bikeway	3.7
Steering Committee Priority	3.5
Presence of Existing Parking & Other Amenities	2.8



Figure C-2: Combined Project Rankings, Ordered by Total Points and Tier

Project Ranking	Project Name	Project Type (SW, SW+BW, BW, P, T)	Length (in Miles)	Recommended Investment	Total Points	
					100	
Top Tier	1	Gallatin/Bennett, N St to Park	SW+BW	0.6	Add sidewalks on north side, designate bikeway & consider speed mgmt	83
	2	Yellowstone River Trail, north side, Baseball/Softball Complex to Mayor's Landing	P	0.9	Unpaved shared use pathway	78
	2	Lewis/O St Crosstown Bikeway, Park to O St	BW + SW	1.7	Designate bikeway & apply speed management investments	78
	2	Gallatin/C/Chinook, Main to N St	SW+BW	0.8	Rebuild sidewalks, designate bikeway & apply speed management	78
	5	Summit, 7th to Main	SW+BW	0.4	Add sidewalks on one side, acquire land for pathway link	76
	5	5th, Front to Park	SW+BW	0.1	Rebuild sidewalk to pathway width across Railroad	76
	5	Yellowstone River Trail, Mayor's Landing to O Street Connector	P	0.4	Unpaved shared use pathway	76
	5	Yellowstone River Trail, north side, US 89 to Whiskey Creek Road	P	0.6	Unpaved shared use pathway (WWTP)	76
	9	H St, Park to View Vista	BW	0.5	Designate bikeway & apply speed management investments	75
	10	River Dr, 12th to Main/View Vista	SW+BW	0.8	Add sidewalks/walkway on north side, designate bikeway	74
	10	Front, 5th to Starr Road	SW+BW	0.8	Add sidewalks on north side, designate bikeway & consider speed mgmt	74
	12	North Hills Trails, East, Green Acres to Summit/Water Tower	T	1.2	Single track trails	73
Middle Tier	13	12th, River Rd to Park	SW+BW	0.4	Add sidewalks on both sides, designate bikeway & apply speed mgmt	72
	14	E S/Sleeping Giant, Lewis to View Vista	BW	0.5	Designate bikeway & apply speed management investments	71
	14	Yellowstone River Crossing, Meyers Alignment	P	0.1	Bridge over Yellowstone River	71
	16	Park, I St to O St	SW+BW	0.4	Add sidewalks on south side, designate bikeway & consider speed mgmt	69
	17	Lewis, H St to O St, and O St, Lewis to Park	SW+BW	0.6	Add sidewalks on north side east of M, designate bikeway	67
	18	Hwy 89 Pathway, Myers View Trailhead to I-90	P	1.8	Paved shared use pathway	65
	19	Park, Hwy 10 to Geyser	SW	0.6	Add sidewalks on north/west side	60
	20	North Hills Trails, West, Scenic Trail Rd to High Ground Ave	T	0.6	Single track trails	58
	21	Park, 7th to I St	BW	1.3	Designate bikeway & consider speed management investments	56
Bottom Tier	22	7th, Front to Montana	SW+BW	0.3	Add sidewalks on east side, designate bikeway & apply speed mgmt	55
	22	N St, Gallatin to Wineglass	SW	0.2	Add sidewalks on east side	55
	22	Highway 10 Pathway, Park to PFL	P	1.6	Paved shared use pathway	55
	25	5th, Park to Lewis	BW	0.2	Designate bikeway & apply speed management investments	53
	26	View Vista, H St to Mayor's Landing	SW+BW	0.5	Add walkway on north side, designate bikeway & apply speed mgmt	44
	27	Starr, Front to Prairie	SW+BW	0.5	Add/replace sidewalks on east side, designate bikeway	40
	28	Loves, Pronghorn to Park	SW	0.1	Add sidewalk on south side	38
	29	Yellowstone River Trail, South side, Meyers Lane to I-90	P	2.1	Unpaved single track trail (shared use pathway long-term?)	35
	30	Scenic Trail/Prairie Dr, Summit to Starr	BW	0.7	Designate bikeway & apply speed management investments	33
	30	Miles, Gallatin to Maple	SW+BW	0.4	Add sidewalks on one side, designate bikeway & apply speed mgmt	33
	32	Garnier/Old Clyde, Gallatin to City Limit	BW	0.7	Designate bikeway	30

Project Type:

- SW - Sidewalk;
- BW - Bikeway;
- P - Pathway/Double Track;
- T- Trail/Single Track



Figure C-3: Sidewalk and Bikeway Projects Ranking

Project Ranking	Project Name	Project Type (SW, SW+BW, BW)	Length (in Miles)	Recommended Investment	Total Points	Proximity to Schools	Fills Gaps in System	Population in Need	Proximity to Downtown, Healthy Social Services	Proximity to Parks/Natural Areas	Bus Route & Other Transp Access	Traffic Exposure	Access to Food	Ease of Implementation	Steering Committee Priority
						15	15	15	15	10	10	5	5	5	5
1	Gallatin/Bennett, N St to Park	SW+BW	0.6	Add sidewalks on north side, designate bikeway & consider speed mgmt	83	15	15	15	5	10	7	5	3	3	5
2	Lewis/O St Crosstown Bikeway, Park to O St	BW	1.7	Designate bikeway & apply speed management investments	78	10	10	10	15	10	10	3	5	5	
2	Gallatin/C/Chinook, Main to N St	SW+BW	0.8	Rebuild sidewalks, designate bikeway & apply speed management	78	5	5	15	15	10	10	5	3	5	5
4	Summit, 7th to Main	SW+BW	0.4	Add sidewalks on one side, acquire land for pathway link	76	15	15	10	10	10	10	5	0	1	
4	5th, Front to Park	SW+BW	0.1	Rebuild sidewalk to pathway width across Railroad	76	15	10	15	5	7	10	5	3	1	5
6	H St, Park to View Vista	BW	0.5	Designate bikeway & apply speed management investments	75	15	5	15	10	7	10	5	5	3	
7	River Dr, 12th to Main/View Vista	SW+BW	0.8	Add sidewalks/walkway on north side, designate bikeway	74	15	15	10	5	10	10	1	3	5	
7	Front, 5th to Starr Road	SW+BW	0.8	Add sidewalks on north side, designate bikeway & consider speed mgmt	74	15	15	10	5	4	7	5	3	5	5
9	12th, River Rd to Park	SW+BW	0.4	Add sidewalks on both sides, designate bikeway & apply speed mgmt	72	10	10	15	10	7	7	3	5	5	
10	E St/Sleeping Giant, Lewis to View Vista	BW	0.5	Designate bikeway & apply speed management investments	71	15	10	15	5	10	7	1	3	5	
11	Park, I St to O St	SW+BW	0.4	Add sidewalks on south side, designate bikeway & consider speed mgmt	69	0	15	10	15	10	10	5	1	3	
12	Lewis, H St to O St, and O St, Lewis to Park	SW+BW	0.6	Add sidewalks on north side east of M, designate bikeway	67	5	10	10	15	4	10	3	5	5	
13	Park, Hwy 10 to Geyser	SW	0.6	Add sidewalks on north/west side	60	10	5	0	15	10	10	5	5	0	
15	7th, Front to Montana	SW+BW	0.3	Add sidewalks on east side, designate bikeway & apply speed mgmt	55	10	10	0	5	7	7	3	3	5	5
17	5th, Park to Lewis	BW	0.2	Designate bikeway & apply speed management investments	53	10	5	0	5	10	10	3	5	5	
14	Park, 7th to I St	BW	1.3	Designate bikeway & consider speed management investments	56	0	0	10	15	10	10	5	3	3	
15	N St, Gallatin to Wineglass	SW	0.2	Add sidewalks on east side	55	0	10	15	0	10	7	3	0	5	5
18	View Vista, H St to Mayor's Landing	SW+BW	0.5	Add walkway on north side, designate bikeway & apply speed mgmt	44	15	10	0	0	10	3	3	0	3	
19	Starr, Front to Prairie	SW+BW	0.5	Add/replace sidewalks on east side, designate bikeway	40	0	15	0	0	10	7	5	0	3	
20	Loves, Pronghorn to Park	SW	0.1	Add sidewalk on south side	38	0	15	0	0	0	10	3	5	5	
21	Scenic Trail/Prairie Dr, Summit to Starr	BW	0.7	Designate bikeway & apply speed management investments	33	0	5	0	0	10	10	3	0	5	
21	Miles, Gallatin to Maple	SW+BW	0.4	Add sidewalks on one side, designate bikeway & apply speed mgmt	33	0	5	15	0	4	3	3	0	3	
23	Garnier/Old Clyde, Gallatin to City Limit	BW	0.7	Designate bikeway	30	0	0	15	0	4	3	3	0	5	



Figure C-4: Sidewalk and Bikeway Factors and Possible Points per Project

Sidewalk & Bikeway Factors	Possible Points
Proximity to Schools: Project will connect a school to neighborhoods and other destinations.	15: Project has direct connection, is only suitable route, or is within ¼-mile of a school. 10: Project is within ¼-mile of a school but has no direct connection. 5: Project is within ½-mile of a school but has no direct connection. 0: Project is beyond ½-mile of a school.
Fills Gap in System: Project will connect to existing facilities by filling the gap between them.	15: Project fills gaps in existing sidewalk or pathway system along a high volume traffic route where no sidewalk exists. 10: Project fills a gap in the system along secondary routes with notable connectivity to destinations/other routes. 5: Project fills a gap in the system along a secondary route with limited connectivity to destinations/other routes. Or along a major route where sidewalks exist only on one side. 0: Project does not address a gap in the system.
Population in Need: Project is within a Census Block Group identified as having socioeconomic needs based on income.	15: Project is within or spans a block group showing median household income less than \$40,000. 10: Project is within a block group showing medium household less than \$55,000. 0: Project is within a block group with median income greater than \$55,000.
Proximity to Downtown, Healthcare, and/or Social Services: Project will connect downtown, healthcare and social services to neighborhoods.	15: Project is a direct connection or is within ¼-mile of downtown or health/social services. 10: Project is within ¼-mile of downtown or health/social services but is not a direct connection. 5: Project is within ½-mile of downtown or health/social services but is not a direct connection. 0: Project is beyond ½-mile
Proximity to Parks or Natural Areas: Project will connect parks, recreation areas or recreational trails to neighborhoods.	10: Project has direct connection or is within ¼-mile of a park or natural/rec area. 7: Project is within ¼-mile of a park or natural/rec area but has no direct connection. 4: Project is within ½-mile of a park or natural/rec area but has no direct connection. 0: Project is beyond ½-mile
Bus Route & Other Transportation Access:	10: Project upgrades sidewalks to streets along existing bus route 7: Project is within ¼-mile of streets along existing bus route. 3: Project is within ½-mile of streets along existing bus route. 0: Project is beyond these limits.
Traffic Exposure: Based on function of the roadway project is along.	5: Project is along a MDT highway route or or MDT urban route 3: Project is along a local street that connects directly to a MDT route 1: Project is along a local street that does not connect to a MDT route.
Access to Food: Project will connect major food outlets to neighborhoods.	5: Project is within 1/4-mile of a major food outlet (grocery store or food pantry) 3: Project is within ½-mile of a major food outlet (grocery store or food pantry) 1: Project is within ¼-mile of a minor food outlet (convenience store) 0: Project is beyond these limits.
Ease of Implementation: Measures the likelihood that project can be easily implemented based on available right-of-way and other constraints.	5: Project has no evident right-of-way constraints or other feasibility issues. 3: Project has limited right-of-way constraints or few other feasibility issues. 1: Project has a right-of-way or feasibility issue but not both. 0: Project has major right-of-way constraints or feasibility issues.
Steering Committee Priority: Points assigned by the steering committee.	Steering committee was asked to identify project where intangibles exist that would justify an additional 5 points for a project.



Figure C-5: Pathways and Trails Projects Ranking

Project Ranking	Project Name	Project Type (T or P)	Length (in Miles)	Recommended Investment	Total Points	Proximity to Parks/Trails/Natural Areas	Fills Gaps in System	Population in Need	Proximity to Downtown, Healthy Social Services	Alt. to On-Street Route	Ease of Implementation	Topography Or Similar challenges	Enviro-Sensitive Area	Existing Parking/ Amenities	Steering Committee Priority
					100	15	15	15	15	10	10	5	5	5	5
1	Yellowstone River Trail, north side, Baseball/Softball Complex to Mayor's Landing	P	0.9	Unpaved shared use pathway	78	15	15	15	10	10	0	5	3	5	
2	Yellowstone River Trail, Mayor's Landing to O Street Connector	P	0.4	Unpaved shared use pathway	76	15	15	15	5	10	5	5	3	3	
2	Yellowstone River Trail, north side, US 89 to Whiskey Creek Road	P	0.6	Unpaved shared use pathway (WWTP)	76	15	10	15	0	10	10	5	3	3	5
4	North Hills Trails, East, Green Acres to Summit/Water Tower	T	1.2	Single track trails	73	10	10	15	5	5	10	3	5	5	5
5	Yellowstone River Crossing, Meyers Alignment	P	0.1	Bridge over Yellowstone River	71	15	15	0	15	10	1	5	5	5	
6	Hwy 89 Pathway, Myers View Trailhead to I-90	P	1.8	Paved shared use pathway	65	15	15	0	10	10	0	5	5	5	
7	North Hills Trails, West, Scenic Trail Rd to High Ground Ave	T	0.6	Single track trails	58	15	10	10	0	5	5	3	5	5	
8	Highway 10 Pathway, Park to PFL	P	1.6	Paved shared use pathway	55	15	15	0	5	10	0	5	5	0	
9	Yellowstone River Trail, South side, Meyers Lane to I-90	P	2.1	Unpaved single track trail (shared use pathway long-term?)	35	15	10	0	0	0	5	0	0	5	



Figure C-6: Pathways and Trails Factors and Possible Points per Project

Trail/Pathway Factors	Possible Points
Property Owner Status	Used as screening criteria. Pathways not already in public ownership or easement not prioritized unless other information suggests it's a possible project.
Proximity to Parks, Trails or Natural Areas: Project will connect parks, recreation areas or recreational trails to neighborhoods.	15: Project has direct connection or is within ¼-mile of a park, existing trail, or natural/rec area. 10: Project is within ¼-mile of a park, existing trail, or natural/rec area but has no direct connection. 5: Project is within ½-mile of a park or natural/rec area but has no direct connection. 0: Project is beyond ½-mile
Population in Need: Project is within a Census Block Group identified as having socioeconomic needs based in income	15: Project is within or spans a block group showing median household income less than \$40,000. 10: Project is within a block group showing medium household less than \$55,000. 0: Project is within a block group with median income greater than \$55,000.
Fills Gap in System: Project will connect to existing facilities by filling the gap between them.	15: Project fills a gap in the existing sidewalk or pathway system along a high volume traffic route. 10: Project fills a gap in the system along secondary routes with notable connectivity to destinations/other routes. 5: Project fills a gap in the system along a secondary route with limited connectivity to destinations/other routes. 0: Project does not address a gap in the system.
Proximity to Community Assets, Schools, Food Outlets, Downtown: Project will connect a community asset to neighborhoods and other destinations.	15: Project has direct connection or is within ¼-mile of multiple assets (school, downtown or food outlet). 10: Project is within ¼-mile of a one asset. 5: Project is within ½-mile of community assets. 0: Project is beyond ½-mile from community assets.
Provides Alternative to On-Street Sidewalk/Bikeway:	10: Project provides direct alternative to an on-street route that directly serves destinations such as downtown, schools, parks, and other destinations. 5: Project provides direct alternative to an on-street route that indirectly serves destinations. 0: Project does not provide alternative to existing on-street route.
Ease of Implementation: Measures the likelihood that project can be easily implemented based on available right-of-way and other constraints.	10: Project has no evident right-of-way constraints or other feasibility issues. 5: Project has limited right-of-way constraints or few other feasibility issues. 1: Project has a right-of-way or feasibility issue but not both. 0: Project has major right-of-way constraints or feasibility issues.
Topography & Related Challenges	5: No substantial topographical challenges 3: Notable topographical challenges 0: Major topographical challenges
Environmentally sensitive area	5: No known environmental constraints. 3: Possible environmental constraints. 0: Major environmental constraints.
Presence of Existing Parking or Amenities:	5: Project termini have existing parking or other amenities. 3: Parking or amenities nearby. 0: No parking or amenities.
Steering Committee Priority: Points assigned by the steering committee.	Steering committee was asked to identify project where intangibles exist that would justify an additional 5 points for a project.




Appendix D: Public Input Survey Results

This section contains the detailed survey results taken in spring 2021. The survey used SurveyPlanet.com and had 304 responses.

Note: “_archived_” in the response field means either the question was unanswered or there was another error coded by the survey service in the result.

Livingston Trails & Active Transportation Plan



Thank you for taking the time to provide input to the Trails and Active Transportation Plan. These questions help us understand how people in Livingston get around by walking and rolling. Rolling may mean using a bicycle, wheelchair, or other mobility device. We want to know your level of comfort and safety when walking or rolling and what influences whether or not you choose to take a trip via an active mode. Think of this in terms of both using streets and using trails in and around Livingston. Your input helps us define which priorities the city should invest in to implement the plan.

It is important to have a diverse range of people provide input on this survey. Feel free to work with a youth or elder to fill out this survey. And, we would appreciate your passing the link to this survey to your social/work networks.

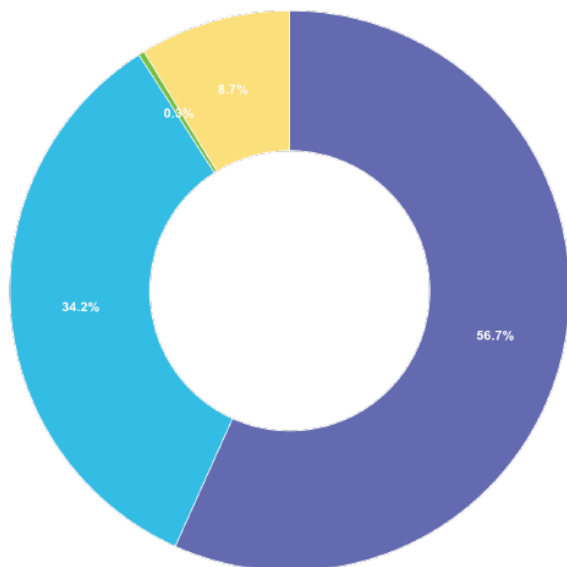
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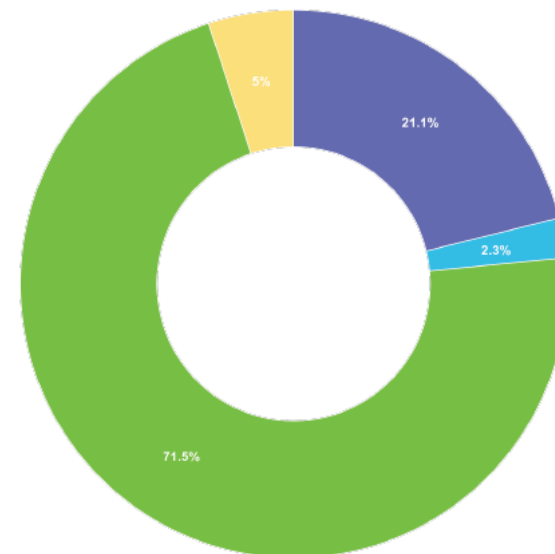
Q1 1\.. When you choose to take a trip—for transportation, recreation, or just having fun—using something other than a motor vehicle, which is the primary mode you use?



Answered: 298 Unanswered: 6

Choice	Total
Walk or hike	169
Ride a bicycle	102
Use a wheelchair or other mobility device	1
Other:	26

Q2 2\.. When deciding whether or not to WALK or ROLL (use a wheelchair or other mobility device) in Livingston, how would you describe your level of interest or confidence in that walk?

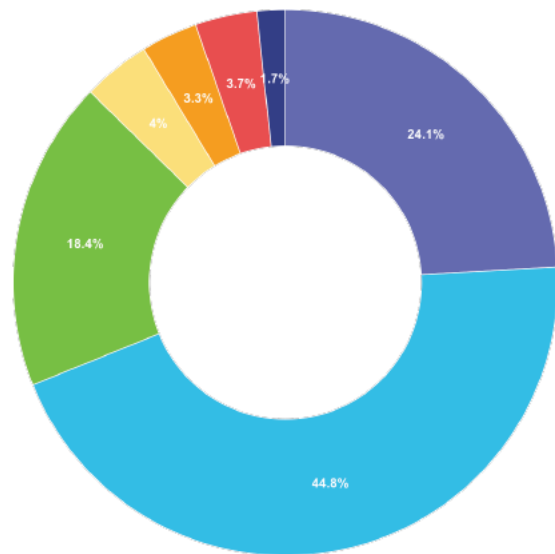


Answered: 298 Unanswered: 6

Choice	Total
Utilitarian: It's how I get around.	63
Mobility-challenged: I need assistance or have difficulty making those trips.	7
Active: I make that trip at a more rapid pace for health and recreation or I hike	213
Last resort: I only walk if I have to.	15



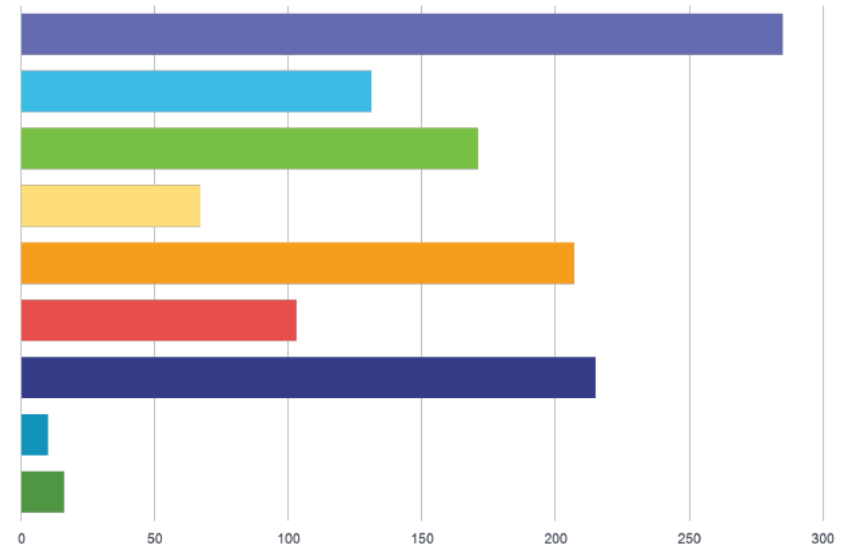
Q3 3\. When deciding whether or not to RIDE A BICYCLE in Livingston, how would you describe your level of interest or confidence in taking that trip?



Answered: 299 Unanswered: 5

Choice	Total
Highly confident: I will ride a bicycle in traffic with limited or no bicycle-specific infrastructure (e.g. bike lane)	72
Somewhat Confident: I prefer bicycle-specific infrastructure and trails	134
Interested but Concerned: I prefer to bike on a sidewalk and be far away from traffic	55
Recreation-only: I ride my bicycle on mountain bike trails or other off-street places	12
No Way, No How: I do not bike and/or I am not willing to bicycle even if high-quality bicycling infrastructure is in place	10
I am not able to ride a bicycle.	11
__archived__	5

Q4 4\. For what purposes do your walk, roll, or bike in Livingston? Choose all that apply:

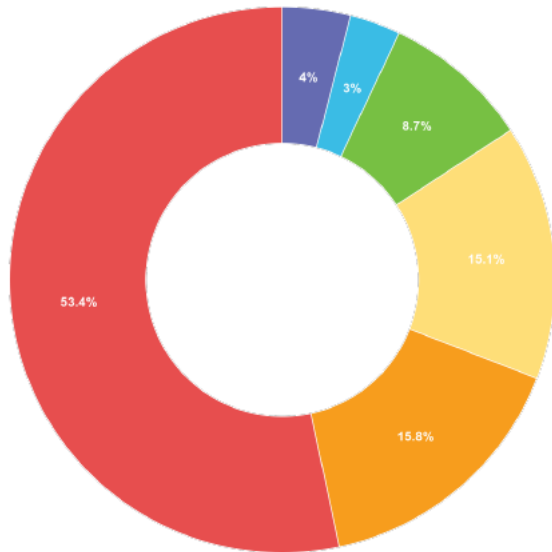


Answered: 298 Unanswered: 6

Choice	Total
Exercise/Outdoor recreation/Walk the dog	285
Grocery/food shopping	131
Personal business (e.g. pharmacy, post office)	171
Medical appointment	67
Entertainment, visit friends or family	207
Commute to work	103
Mental health (to clear my head)	215
I have not taken a walking/rolling trip in the past month.	10
Other:	16



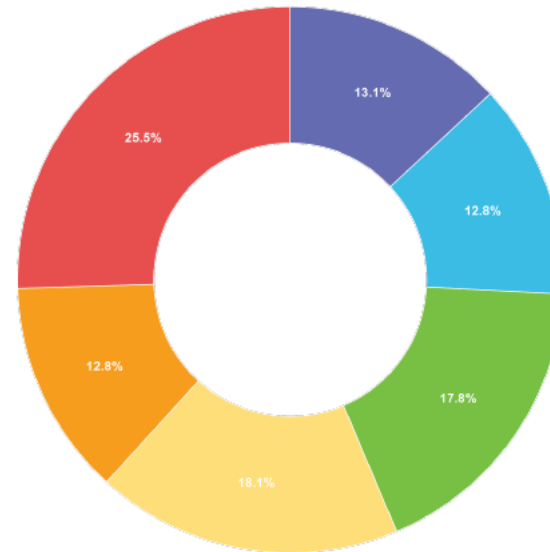
Q5 5\ In an average SUMMER month, how many trips did you make a one-way walking, rolling, or bicycling trip of more than five minutes in Livingston? Include trips along trails in your answer.



Answered: 298 Unanswered: 6

Choice	Total
No trips	12
1-2 trips	9
3-6 trips	26
7-10 trips	45
11-19 trips	47
20 trips or more	159

Q6 6\ In an average WINTER month, how many days did you make a one-way walking, rolling, or bicycling trip of more than five minutes in Livingston? Include trips on trails in your answer.

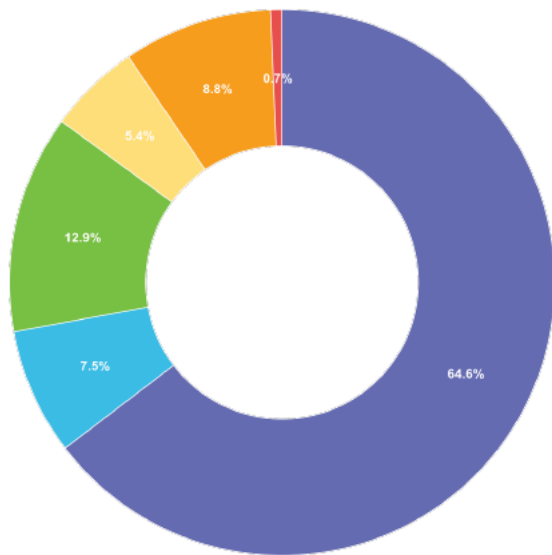


Answered: 298 Unanswered: 6

Choice	Total
No trips	39
1-2 trips	38
3-6 trips	53
7-10 trips	54
11-19 trips	38
20 trips or more	76



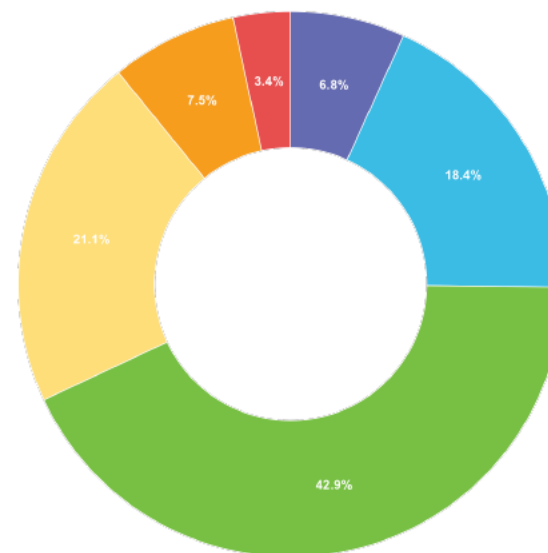
Q7 7\ When do your walking, rolling or bicycling trips typically occur?



Answered: 294 Unanswered: 10

Choice	Total
All times of the day and week	190
Weekdays – Morning	22
Weekdays – Afternoon	38
Weekdays – Evening/Overnight	16
Weekends – Daytime	26
Weekends – Nighttime	2

Q8 8\ Generally, how long are your one-way trips when walking, rolling, or bicycling? Include trips along trails, even if for recreation.

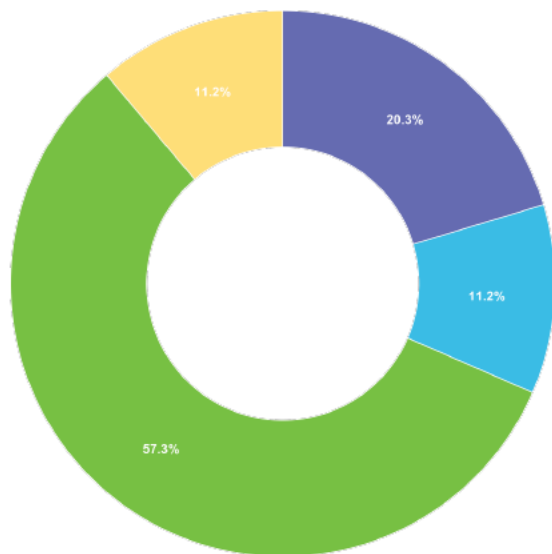


Answered: 294 Unanswered: 10

Choice	Total
5-10 minutes	20
10-20 minutes	54
20-40 minutes	126
40-60 minutes	62
60-90 minutes	22
Greater than 90 minutes	10



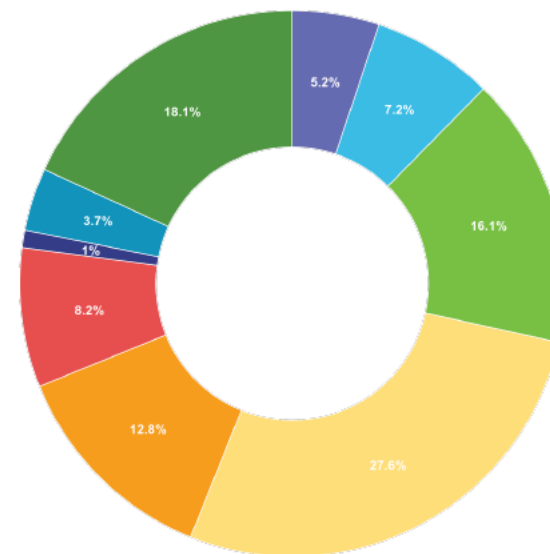
Q9 9\. Compared with pre -COVID-19 pandemic conditions (mid-March 2020), how often are you making walking, rolling or bicycling trips?



Answered: 295 Unanswered: 9

Choice	Total
More trips, mostly due to getting outside for recreation	60
More trips, because I have found I enjoy doing it more often	33
About the same number of trips	169
Fewer trips	33

Q10 10\. Why have you NOT taken a walking, rolling or bicycling trip in the past several months? Pick up to 3.

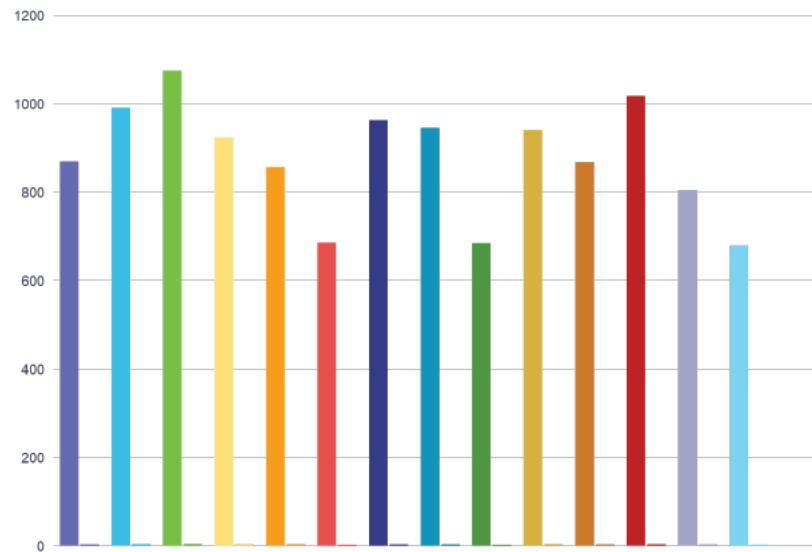


Answered: 264 Unanswered: 40

Choice	Total
COVID-19 restrictions or concerns	25
Personal safety concerns	35
Traffic safety or speed concerns	78
Lack of adequate pathways and crossings	134
Barriers are too much to overcome (railroad, highway, waterways)	62
Lack of amenities (such as shopping, school, park) within a comfortable distance	40
Don't like walking or rolling	5
A disability or injury prohibits me from walking or rolling	18
Other:	88



Q11 11\. How satisfied are you with each of the following aspects regarding walking or rolling in Livingston?

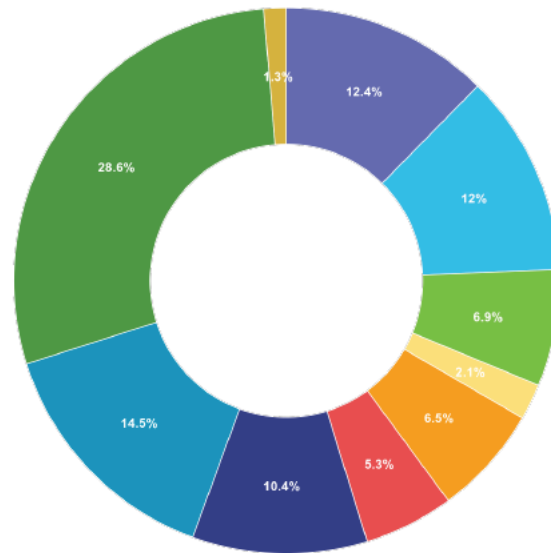


Answered: 293 Unanswered: 11

Choice	Score	Average	Choice	Score	Average
Speed of moving cars along sidewalks, paths, and streets.	869	2.97	Amount of bicycling infrastructure on your ride	685	2.34
Personal safety while walking or rolling	991	3.38	Width of sidewalks and pathways	963	3.29
Shading by trees and buildings	1074	3.67	Overhead lighting	945	3.23
Amount of sidewalks on your route	923	3.15	Snow and debris removal	684	2.33
Curb ramps on your pedestrian or bicycling route	856	2.92	Drivers stopping for me when I cross the street	940	3.21
			Number of marked crosswalks	867	2.96
			Walking or rolling to retail, restaurants, parks, etc.	1017	3.47
			Being able to walk or roll to a pathway or trailhead from home	805	2.75
			Number of trails in natural settings	679	2.32



Q12 12\. Which measures would make walking or rolling safer for children in Livingston? Choose up to 3.



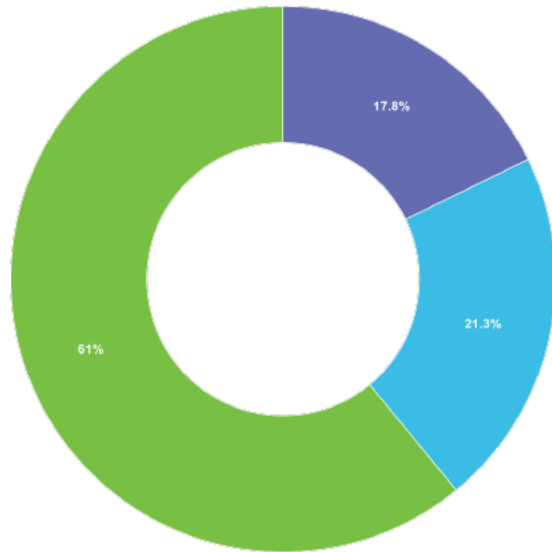
Answered: 288 **Unanswered:** 16

Choice	Total
Safe Routes to School Program	93
Street design to promote slower vehicle speeds near schools and parks	90
More opportunities to walk/roll with other children and parents	52
More crossing guards near schools	16
Safety training at schools	49

Choice	Total
Better enforcement of traffic laws	40
Intersection improvements and narrower crossings	78
Expand sidewalk network	109
Build more pathways and trails separated from traffic	215
__archived__	10



Q13 13\ Have you seen and/or experienced visual, verbal, or physical harassment/ violence when walking or rolling in Livingston? Choose all that apply.



Answered: 294 Unanswered: 10

Choice	Total
I have seen harassment/violence toward others when walking/rolling	56
I have experienced harassment/violence when walking/rolling	67
I have not seen or experienced harassment/violence when walking/rolling	192

The following questions had location-specific open responses that were used to identify projects.

Q14 14\.

Which roadway corridors or intersection are in most need of improvements for walking and rolling?

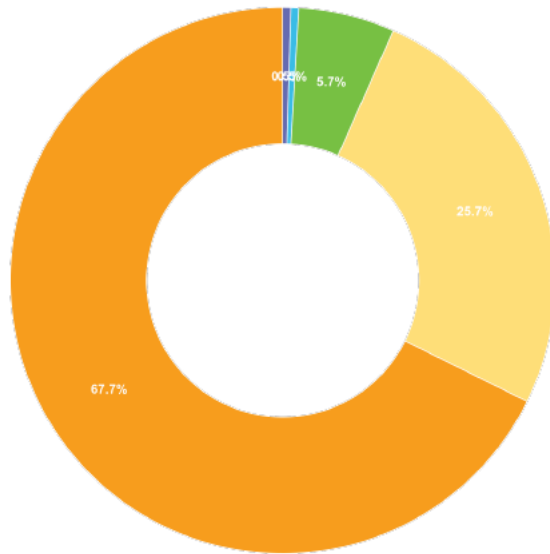
Q15 15\ Are there specific locations in Livingston with hazards or barriers to walking/rolling that make it feel unsafe or inconvenient?

Q16 16\ Which natural areas in and around Livingston would be best to plan for additional trails and pathways?

Q17 17\ Which areas or destinations would benefit from additional pathways and trails (not on or next to a street)?



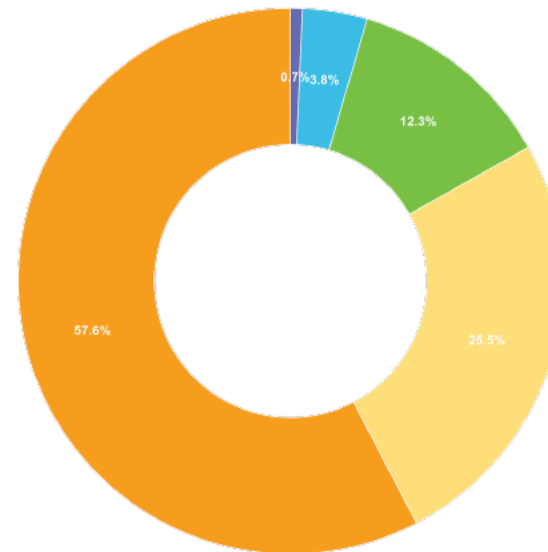
Q18 18). How do you feel about designing streets and sidewalks to make it safer for walking, rolling, and bicycling even if this means driving slower?



Answered: 285 Unanswered: 19 Average Rating: 4 - Favor

Choice	Total	Rating
1 - Strongly Oppose	6	6
2 - Oppose	3	6
3 - Don't Know	24	72
4 - Favor	81	324
5 - Strongly Favor	171	855

Q19 19). How do you feel about designing communities so that more stores and other places are within walking or bicycling distance of homes, even if this means building homes closer together?

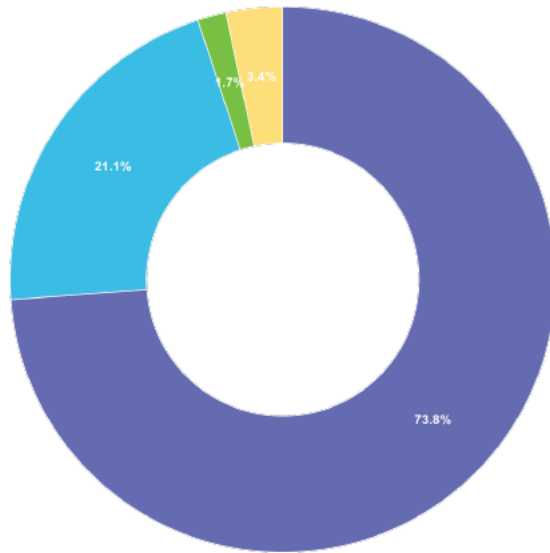


Answered: 282 Unanswered: 22 Average Rating: 4 - Favor

Choice	Total	Rating
1 - Strongly Oppose	8	8
2 - Oppose	22	44
3 - Don't Know	47	141
4 - Favor	73	292
5 - Strongly Favor	132	660



Q20 20\. How would you rate your level of physical activity?

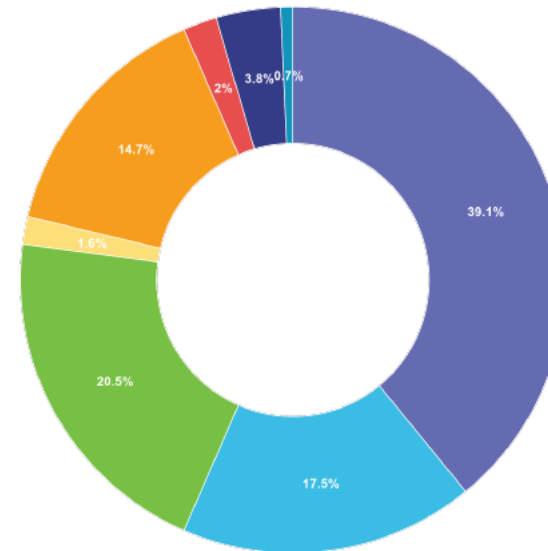


Answered: 298 Unanswered: 6

Choice	Total
Frequently active (every day or most days)	220
Sometimes active (some days)	63
Rarely active (hardly ever or never)	5
__archived__	10

Q22 22\. If you have children, please describe how the answers you provided may be different when walking, rolling or bicycling along compared to doing the same activity with children.

Q21 21\. Which investments would most benefit the health and well-being of your household if access via walking, rolling and bicycling were improved? Pick up to 2.

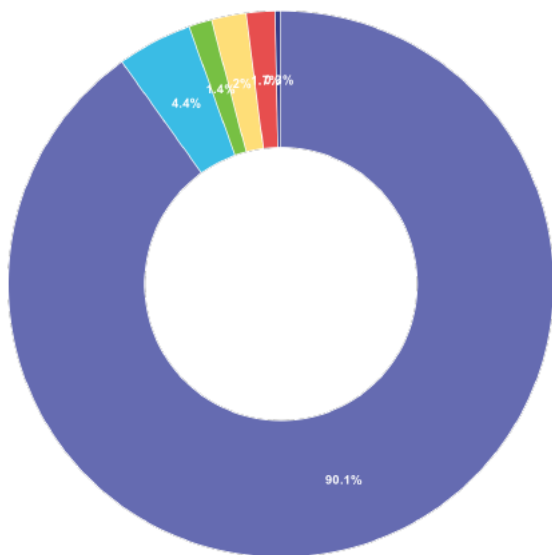


Answered: 292 Unanswered: 12

Choice	Total
Accessing outdoor places	215
Fresh, local food	96
A community center within walking distance where I can take classes or recreate	113
Access to healthcare (e.g. doctor's office, urgent care)	9
Places for people of all ages to socialize and interact	81
A spiritual place to worship or meditate	11
Other:	21
__archived__	4



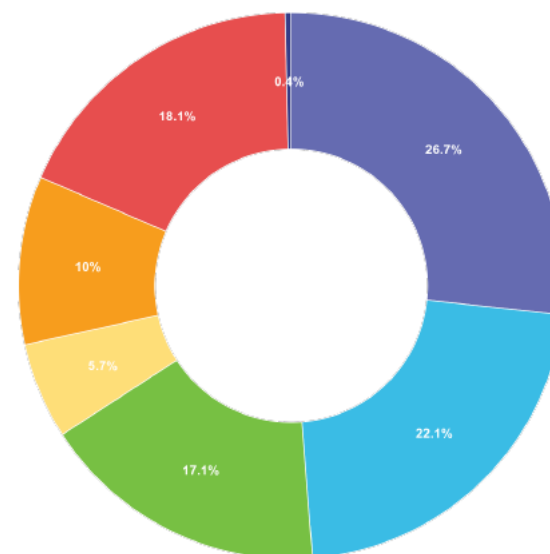
23\.. What type of place is your current residence?



Answered: 293 Unanswered: 11

Choice	Total
Single-family house (detached house)	264
Townhouse or duplex (attached house)	13
Building with 4 or fewer apartments or condos	4
Building with more than 4 apartments or condos	6
Retirement or senior housing	0
Mobile home/trailer	5
Other (e.g. RV, van)	1

Q24 24\.. In which quadrant of Livingston do you live? Knowing this is important for us to understand the barriers you may encounter in reaching other areas of town.

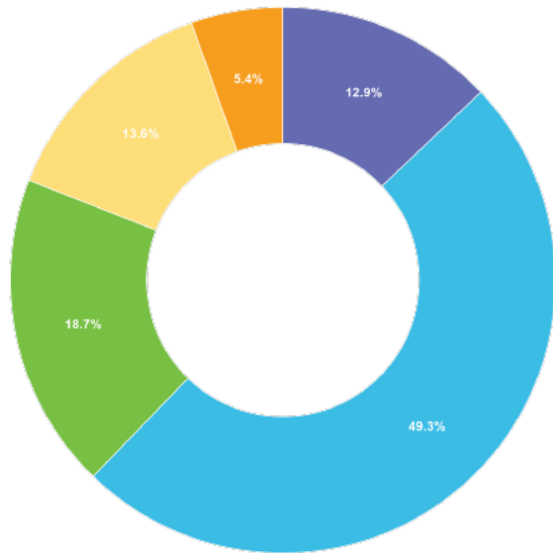


Answered: 281 Unanswered: 23

Choice	Total
Southwest	75
Southeast	62
Northwest	48
Northeast	16
Northside Hills	28
Park County, outside the City	51
Outside Park County	1



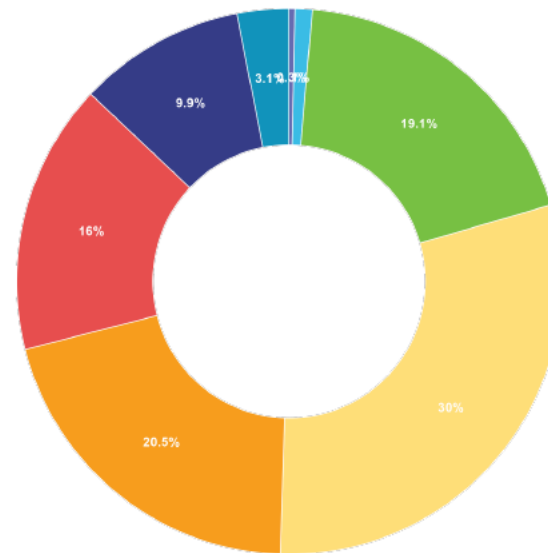
Q25 25\ How many people live in your household?



Answered: 294 Unanswered: 10

Choice	Total
1 (I live alone)	38
2	145
3	55
4	40
5 or more people	16

Q26 26\ What is your age?

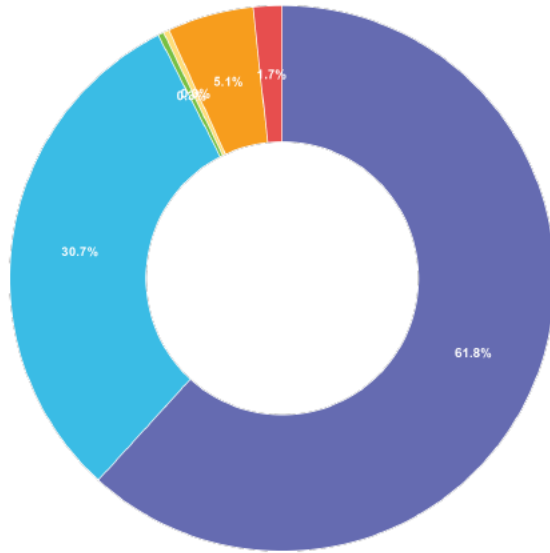


Answered: 293 Unanswered: 11

Choice	Total
Under 18	1
18-24	3
25-34	56
35-44	88
45-54	60
55-64	47
65-74	29
75 or older	9



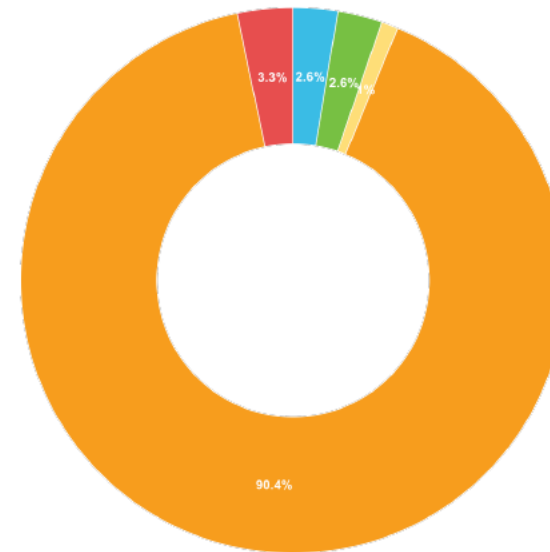
Q27 27\ What is your gender identity?



Answered: 293 Unanswered: 11

Choice	Total
Female	181
Male	90
Nonbinary	1
Other	1
Prefer not to answer	15
__archived__	5

Q28 28\ Do you have a physical condition that limits or prevents you from doing any of the following? Select any that apply.

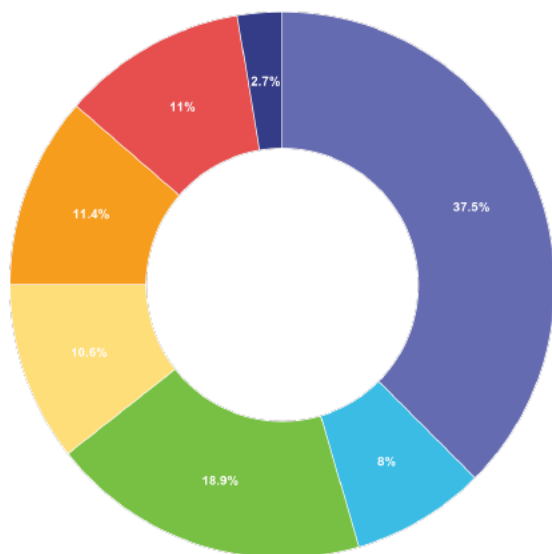


Answered: 294 Unanswered: 10

Choice	Total
Driving a vehicle.	0
Walking or rolling outside the home	8
Riding a bicycle.	8
Using regularly scheduled bus service.	3
No, I do not have a physical conditions that limits these activities.	274
__archived__	10



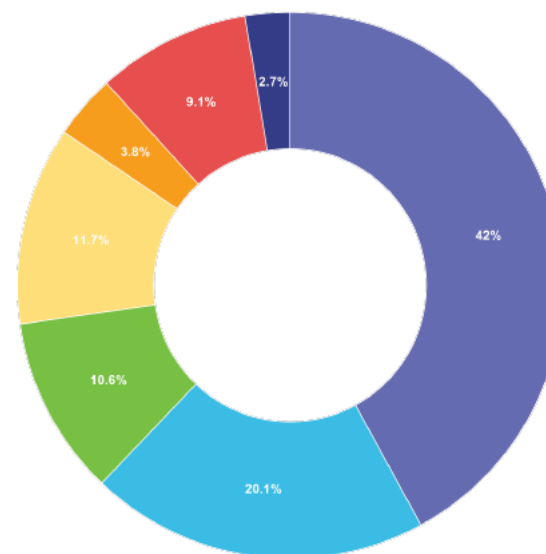
Q29 29%. AS OF TODAY, which of the following best describes your current work location?



Answered: 264 Unanswered: 40

Choice	Total
Work ONLY at a single location outside of home WITHIN LIVINGSTON	99
Work ONLY at a single location outside of home and OUTSIDE OF LIVINGSTON	21
Work ONLY from home or remotely (telework, self-employed)	50
Work location regularly varies	28
Telework some days and travel to a work location WITHIN LIVINGSTON for the remainder	30
Telework some days and travel to a work location OUTSIDE LIVINGSTON for the remainder	29
Drive or travel for work (driver, sales, deliveries)	7

Q30 30%. BEFORE COVID-19 (mid-March 2020), which of the following best describes your current work location?



Answered: 264 Unanswered: 40

Choice	Total
Work ONLY at a single location outside of home WITHIN LIVINGSTON	111
Work ONLY at a single location outside of home and OUTSIDE OF LIVINGSTON	53
Work ONLY from home or remotely (telework, self-employed)	28
Work location regularly varies	31
Telework some days and travel to a work location WITHIN LIVINGSTON for the remainder	10
Telework some days and travel to a work location OUTSIDE LIVINGSTON for the remainder	24
Drive or travel for work (driver, sales, deliveries)	7



Appendix E: MDT & Urban Routes in Livingston

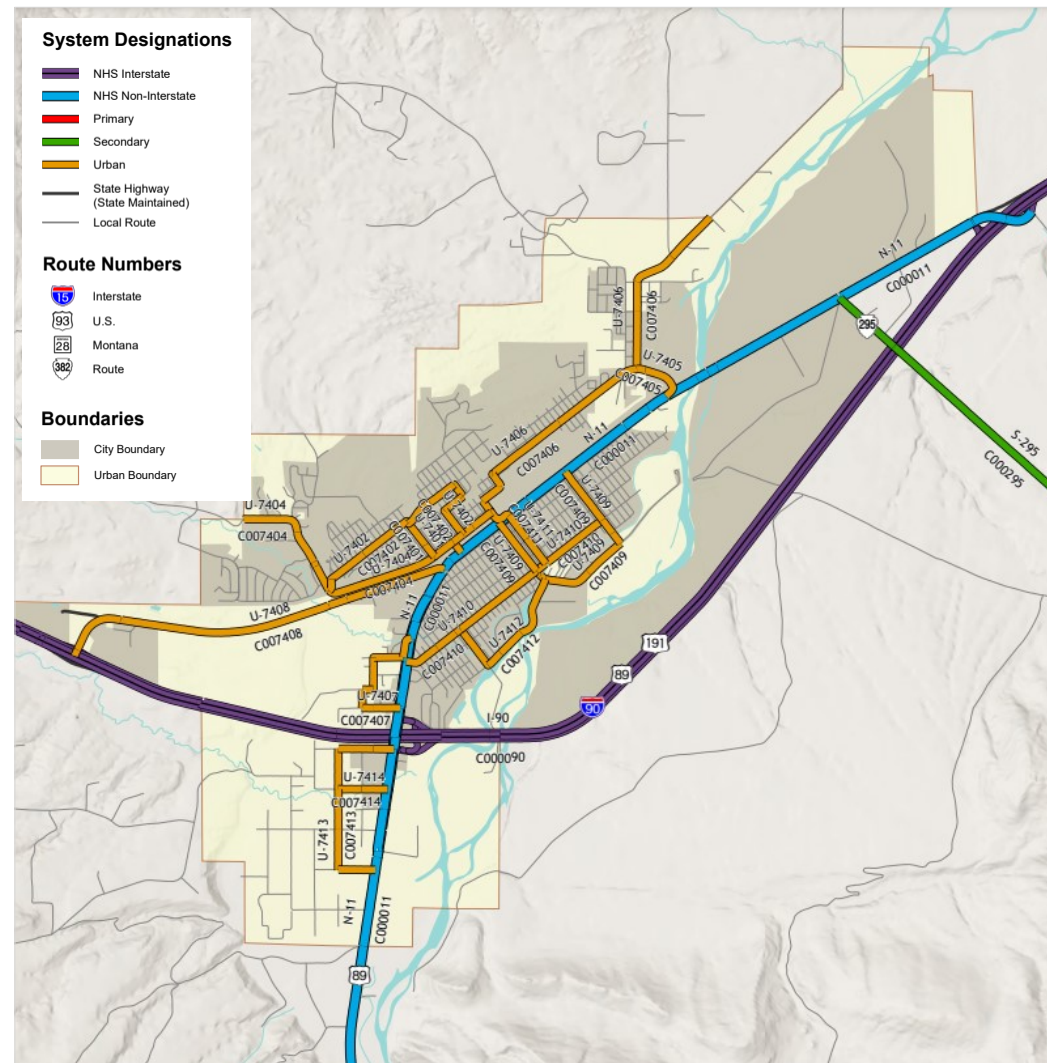
The Montana Department of Transportation controls major routes like Park Street and Highway 10. A significant number of the streets that are identified in the Trails and Active Transportation Plan to become safer for walking and bicycling are designated as urban routes. The color-coded map at right shows the MDT and urban routes in blue and orange. MDT’s agreement with the City to manage the urban routes relates to maintenance, as well as physical changes that could be subject to approval of the MDT Commission. This chapter highlights some key considerations on these routes, with a detailed analysis of option for Park Street.

A universal challenge of state DOT’s managing routes through cities is that it is sometimes difficult to make the case for safer conditions for people walking and bicycling. This is particularly evident when it comes to things like narrower motor vehicle travel lanes to accommodate bike lanes, installing federally-endorsed speed management treatments like raised crosswalks and curb extensions, and completing sidewalk networks using the state’s or federal funds that come to Montana. Livingston has a suballocation of federal funds to address the urban streets under its control, which will help fund the projects recommended on these routes.

Sidewalk gaps remain on long stretches of MDT-controlled Park Street, as well as along urban routes on Gallatin/Bennett/C/Chinook, Front Street, and River Drive. Urban routes identified as top tier bikeway treatments include those listed already, as well as H Street.

City coordination with MDT should highlight the MDT documents summarized in Appendix A to help showcase how the prevailing MDT plans and design guidance, as well as the federally-endorsed design guidance from AASHTO and others supports measures to fill sidewalk gaps, slow traffic speeds, and create safe street crossings on the routes designated as “Urban” in Figure E-1. This is particularly important when MDT is reviewing urban route changes that may or may not have to go before the MDT Commission for approval.

Figure E-1: MDT Urban System Map of Livingston



https://www.mdt.mt.gov/other/WebData/external/Planning/maps/urban/simple_urban/SYSTEMS_LIVINGSTON.PDF



Park Street has additional challenges because it is a US Highway and a designated detour route when I-90 is closed. Given MDT wants to preserve vehicle flow as best as possible, completing the sidewalks on at least one side and making unsignalized crossings safer with RRFB treatments across Park Street improves safety without impacting traffic flows.

Traffic Counts on Major Routes

Figure E-2 shows MDT’s traffic counts on major and minor routes in Livingston. Park Street has the highest volumes of any street in Livingston, as would be expected. Both Highway 10 and the 5th Street railroad crossing have volumes in the 5,000s. Highway 10 and 5th Street volumes were relatively stable over the years of data that is available. Park Street volumes show slight increases over the five-year timeframe of the count, with the most notably increases occurring south of I-90. Counts at Loves Lane were 11,700 in 2016 and were shown at nearly 15,000 in 2019.

In general, traffic volumes decreased in 2020 due to COVID. Every street in the graphs has between a 7% and 9% drop from 2019 figures to 2020. The fact that these were consistent may indicate MDT performed estimates on these routes instead of conducting actual counts. For example, every secondary street (bottom graph) shows the exact same decrease of 7.0% when comparing 2020 volumes to 2019.

Traffic Volumes and Sidewalks. The Federal Highway Administration (FHWA) denotes that sidewalks are “required” on almost every designated urban route and MDT-controlled street within the City. Figure E-3 on the following page shows how FHWA defines where sidewalks are required and preferred based on street classifications and land uses. The brackets indicate which types of routes in Livingston fall under each category.

This table provides ample support for the City and its partners to ask MDT to complete sidewalk networks on routes like Park Street, recognizing it may be limited to one side due to the railroad right-of-way on the north side.

Traffic Volumes and Bicyclist Facilities. Figure E-4 is from FHWA’s Bikeway Selection Guide. It is a matrix of what type of bike facility is justified based on a combination of the traffic volumes and posted speeds on a street. The streets in Figure E-2 are plotted on this matrix for reference.

Figure E-2: MDT Traffic Counts, 5 –year Average (2016-2020)

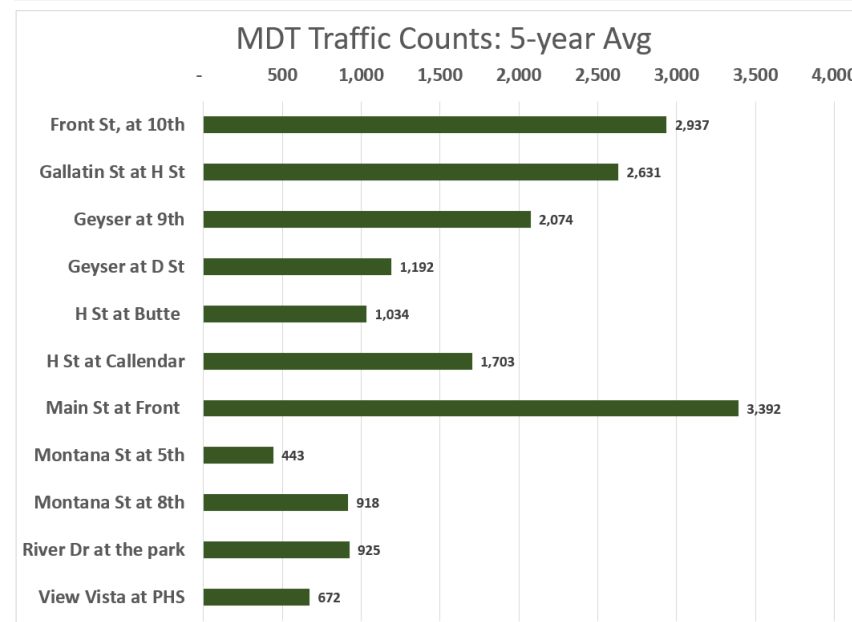
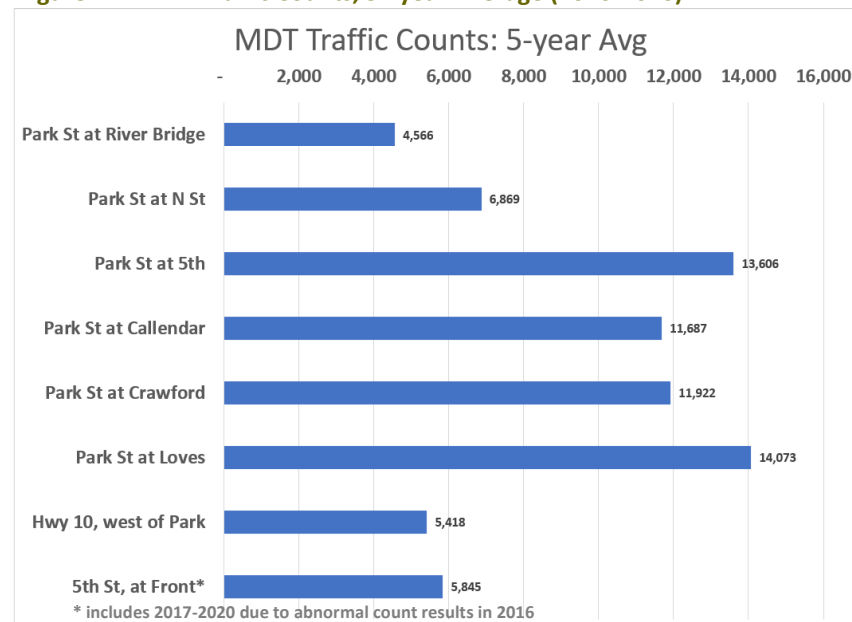


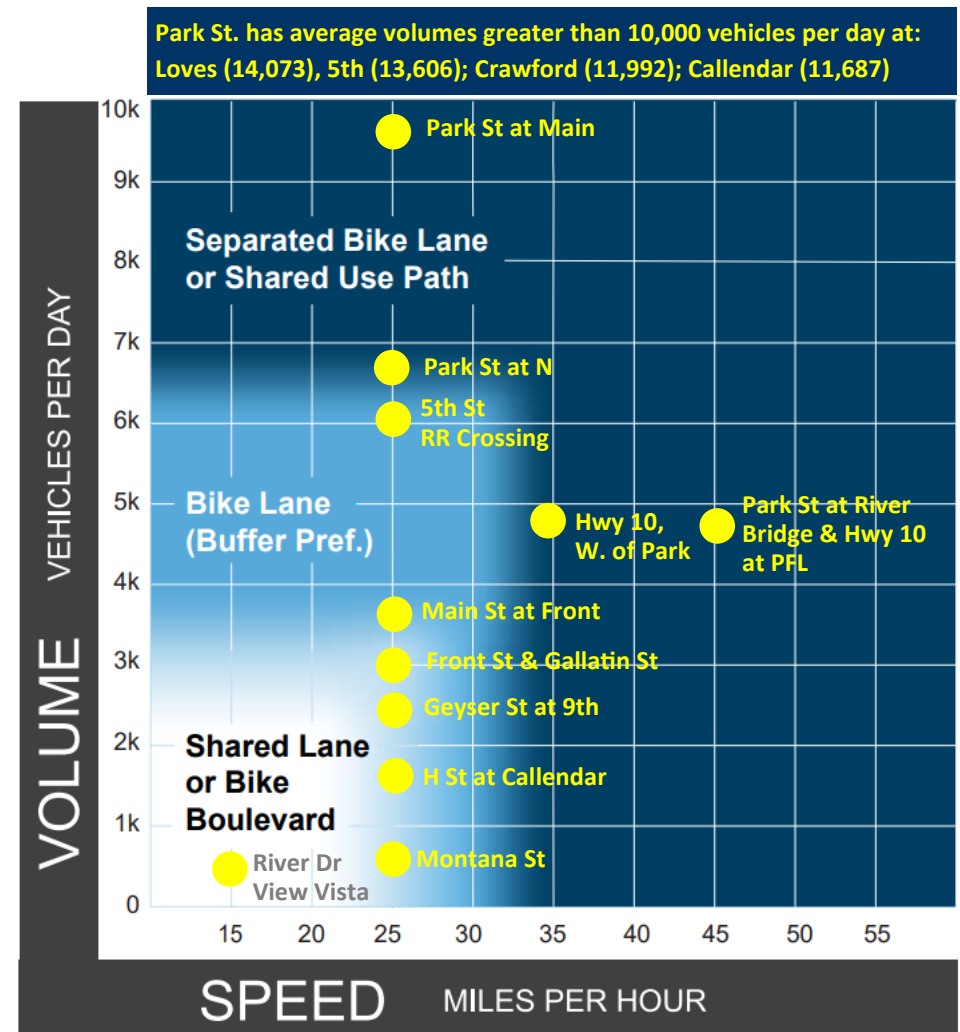
Figure E-3: FHWA Sidewalk Needs by Roadway Classification & Land Use

Roadway Classification and Land Use	Sidewalk/Walkway	
Rural Highways (< 400 ADT)	Shoulders preferred, with minimum of 0.9 m (3 ft).	
Rural Highways (400 to 2,000 ADT)	1.5-m (5-ft) shoulders preferred, minimum of 1.2 m (4 ft) required.	
Rural/Suburban Highway (ADT > 2,000 and less than 1 dwelling unit (d.u.) / .4 hectares (ha) [1 d.u. / acre])	Sidewalks or side paths preferred. Minimum of 1.8-m (6-ft) shoulders required.	Highways 89 and 10 are in this range.
Suburban Highway (1 to 4 d.u. / .4 ha [1 to 4 d.u. / acre])	Sidewalks on both sides required.	
Major Arterial (residential)	Sidewalks on both sides required.	All MDT urban streets in Livingston are in this range.
Urban Collector and Minor Arterial (residential)	Sidewalks on both sides required.	
Urban Local Street (residential – less than 1 d.u. / .4 ha [1 d.u. / acre])	Sidewalks on both sides preferred. Minimum of 1.5-m (5-ft) shoulders required.	Local streets managed by the City fall in this range.
Urban Local Street (residential – 1 to 4 d.u. / .4 ha [1 to 4 d.u. / acre])	Both sides preferred.	
Local Street (residential – more than 4 d.u. / .4 ha [4 d.u. / acre])	Sidewalks on both sides required.	
All Commerical Urban Streets	Sidewalks on both sides required.	Park Street, Downtown Streets
All Streets in Industrial Areas	Sidewalks on both sides preferred. Minimum of 1.5-m (5-ft) shoulders required.	

1 acre=0.4 hectares (ha)

Source: Federal Highway Administration PEDSAFE

Figure E-4: FHWA Bicycle Facility Selection Matrix with MDT Posted Speed & Volume



Source: Federal Highway Administration Bikeway Selection Guide



The volumes on major routes like Park Street and Highway 89 are clearly in the range of needing sidepaths, as this Plan recommends. Highway 10 and 5th Street are borderline for bike lanes with buffer preferred but a separated pathway is more suitable given the railroad constraints. Streets where the preferred facility is infeasible should have speed management features applied for a target speed.

Design Standards

MDT’s Geometric Design Standards could be challenging for the City of Livingston to achieve its goals for active transportation, depending on how the state interprets geometric and operational changes that could occur on the urban routes and Park Street. Shown on page 5 of the Appendix, applying these design standards could result in maximum horizontal design dimensions for motorist features of the roadway, including travel lanes and on-street parking, while assigning minimum and suboptimal dimensions for facilities for people who walk and bike. Further, the design speeds of 35 mph for urban arterials and urban collectors are conditions that create deadly consequences for a majority of pedestrians and bicyclists who are hit at those speeds. Fortunately, many of the existing streets in Livingston do not have these maximum motorist elements (11 or 12-ft lanes) and efforts should be made to preserve narrower dimensions while building safer pedestrian and bicyclist routes along them.

The image at right illustrates the research findings on death risk to pedestrians at varying speeds. Figure E-5 also illustrates how higher speeds narrow the driver’s field of vision, causing them to focus on a point farther down the road. This results in a driver being unable to see someone approaching a crosswalk or street crossing on a bike.

While streets like Gallatin have posted speed limits of 25 mph, the actual design speed of these routes is higher, which prompts motorists to drive faster. The motor vehicle travel lanes are striped at 12-feet in width, which is wider than MDT’s urban street standards recommend. The parking lanes are 7.5-ft in width, which is narrower. Striping the travel lanes to be 11-ft in width (or even 10-ft, which is acceptable per the AASHTO Green Book) would be a first step in helping to narrow the field of vision along this route. Front Street is very similar.



Figure E-5: Speed and Risk to Pedestrians



Speed is especially lethal for vulnerable users like people walking or riding a bicycle. The risk of severe injury or death increases as a driver’s field of vision narrows.

Figure E-6: AASHTO Green Book (2018) Section 2.3.6.3 Design Speed—Target Speed

Lower speeds are desirable for thoroughfares in walkable, mixed-use urban areas and this desire for lower speeds should influence the selection of the design speed. For design of such streets, a target speed should be selected ⁽²⁹⁾. The target speed is the highest speed at which vehicles should operate on a thoroughfare in a specific context, consistent with the level of multimodal activity generated by adjacent land uses, to provide both mobility for motor vehicles and a desirable environment for pedestrians, bicyclists, and public transit users. The target speed is intended to be used as the posted speed limit. In some jurisdictions, the speed limit is established based on measured speeds. In these cases, it is important for the design of the thoroughfare to encourage an actual operating speed that equals the target speed ^(16, 35).

A simple re-striping, however, will not likely result in the target speed of 25 mph being achieved, which is why this plan recommends other speed management treatments along Gallatin and Front Street, as well as H Street. The AASHTO Green Book includes a segment on designing streets for a Target Speed, shown at right in Figure E-6. It notes that by identifying a target speed and designing for it, the posted speed can be achieved.

Accommodating bike lanes on streets like Gallatin, Front, and H, would require eliminating parking from one or both sides. While this is not always easy in these residential settings, examining the use of on-street parking along these routes may inform future projects. Ultimately, if parking cannot be removed, it bolsters the City’s position to consider speed management techniques so the routes operates at a target speed that is safe for bicyclists to share lanes with motorists. The FHWA Bikeway Selection Guide, profiled in Appendix A, includes the matrix shown in Figure E-4 for existing volumes and speed. The City and MDT can plot forecasted volumes and expected posted speeds to determine if the street meets the guidance for shared lanes, bike lanes, or protected lanes.

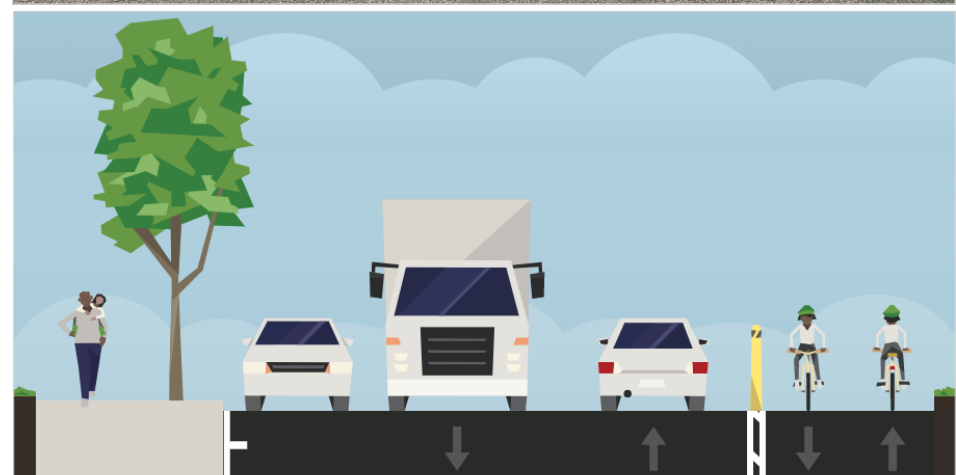
In some cases, existing conditions may be suitable for shared lanes that are bolstered with other speed management treatments and bikeway striping/signage when the preferred facility is not feasible.

Front Street Assessment

In an ideal world, the railroad right-of-way behind the curb on the south side of Front Street would make a great shared use pathway. Until the railroad is ready to discuss that option, Front Street could be reimagined with an in-street pathway or what is sometimes called a “cycle track.” The curb-to-curb width of 38-ft would allow for 7-ft parking lanes, an 11-ft westbound travel lane, a 10-ft eastbound lane, a 1-ft buffer with flexposts, and a 9-foot two-way cycle track. Figure E-7 shows current and possible conditions.

The challenge in working all of these functions into a street of this width is the parking lane, the 10-ft travel lane, and 9-ft cycle track that includes the gutter pan, are all minimum dimensions and could

Exhibit E-7: Reimagining Front Street



Sidewalk + Buffer Varies	7' parking lane	11' travel lane	10' travel lane	10' cycletrack, including flexpost buffer
-----------------------------	-----------------------	--------------------	--------------------	---

Image: Created with Streetmix



be seen as less than ideal for any road user.

Eliminating parking on the north side would provide enough room to consider other options, but would likely be met with resistance from property owners.

The advantageous part is the existing road does not have any striping and the City could pursue a pilot project to stripe the road with water-based highway marking paint, erect low-costs flexposts in the buffer, and test it during a season.

The water-based paint will wear off quickly if the pilot project is not considered a success or needs to be adjusted for final application. Pre- and post-conditions studies on speed, usage, and other factors should be examined. Special consideration should be given at the intersection with 5th Street to allow for crossing to the sidewalk on the east side of 5th that crosses the tracks.

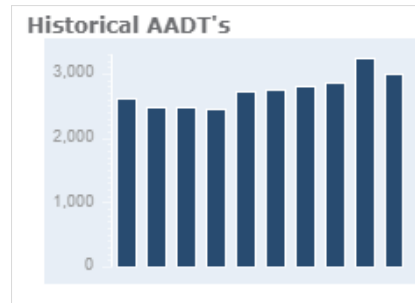
The images at right show the FHWA Bikeway Selection Guide matrix with historical traffic counts from MDT plotted for Front Street and Gallatin Street. Both streets have hovered around 3,000 average annual daily traffic (ADT), or vehicles per day—an average from the past five years. Both are posted for a 25 mph speed limit. When plotting the traffic volumes and speed limit on this matrix, each street sits at the borderline between needing a shared lane or dedicated bike lane.

While Front Street doesn't show the need for a separated bike lane, like shown on the previous page, fitting a bike lane on Front Street in each direction would create more conflict between parked cars and the motor vehicle travel lane. This is due to each lane designation having to be hovering around a minimum width, which can create conflicts with bicyclists having to use a bike lane that is in the door zone of parked cars.

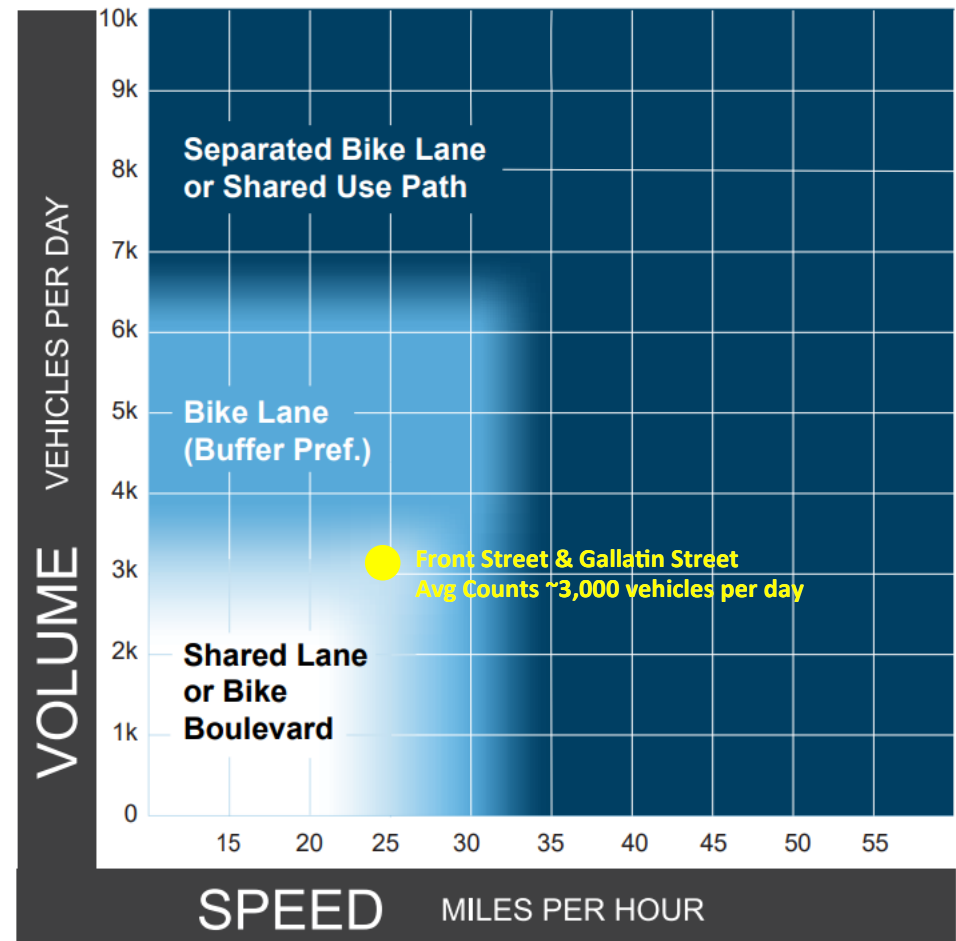
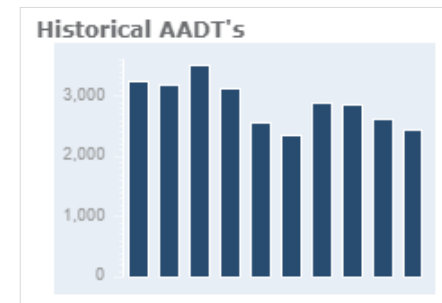
Gallatin Street Assessment

Gallatin Street (and it's other names between Main St and Park St) has similar features as Front Street where there is street curbing. Incorporating a bike lane on this segment is somewhat more chal-

Front Street Traffic Counts



Gallatin Street Traffic Counts



allenging due to more access points on the south side of the street. Incorporating curb extensions, raised crosswalks, and other speed management techniques to self-enforce the 25 mph speed will make people who bike more comfortable using this route.

Sidewalk gaps exist on the north side and should easily be accommodated within existing right-of-way on this route. Where Gallatin turns into Bennett Street, and lacks curbing, presents other challenges to completing a sidewalk connection.

The Plan’s recommendations include an expansion of the shoulder on Bennett east of Miles to include an extruded curbing to create a walkway without requiring full-scale drainage upgrades.

Addressing the Bennett St railroad crossing, and providing a safe crossing of Park Street to the O Street Connector pathway, is another challenge that could be remedied with MDT and railroad involvement to construct a pathway underneath the railroad and Highway 89 bridges next to the Yellowstone River. This would require a connection along city property or railroad right-of-way from Bennett, but may be cheaper, safer, and more feasible than building a connection over the railroad tracks.

Given those complexities, having MDT take the lead on such a project might yield more productive results as MDT is more seasoned in dealing with challenges such as railroad right-of-way and bridges.

MDT Overpasses & Interchanges on I-90

Chapter 6: Trails Master Plan includes images that compare existing MDT facilities and others across the United States where shared use pathways have been incorporated into existing interstate right of way and on interstate bridges. There are likely similar scenarios elsewhere in Montana where these partnerships have allowed pathways on interstate right-of-way and FHWA is accepting of these creative approaches.

Other opportunities for hiking trails exist on the underpasses of I-90 at Meyers Lane and Swingley Road. Expanding paved shoulders to create a place for people to walk or allowing natural surface trails or singletrack sidewalks to be erected behind the bridge piers can also be considered.

Bennett Crossing of Railroad Tracks



Swingley Road Underpass of I-90



River Drive Assessment: A Festival Street

The City should view a redesign of this street in a way reflect the land uses and recreational opportunities around it. Too many other activities occur along River Drive to think of it as only a motor vehicle way, especially with traffic counts under 1,000 vehicles per day.

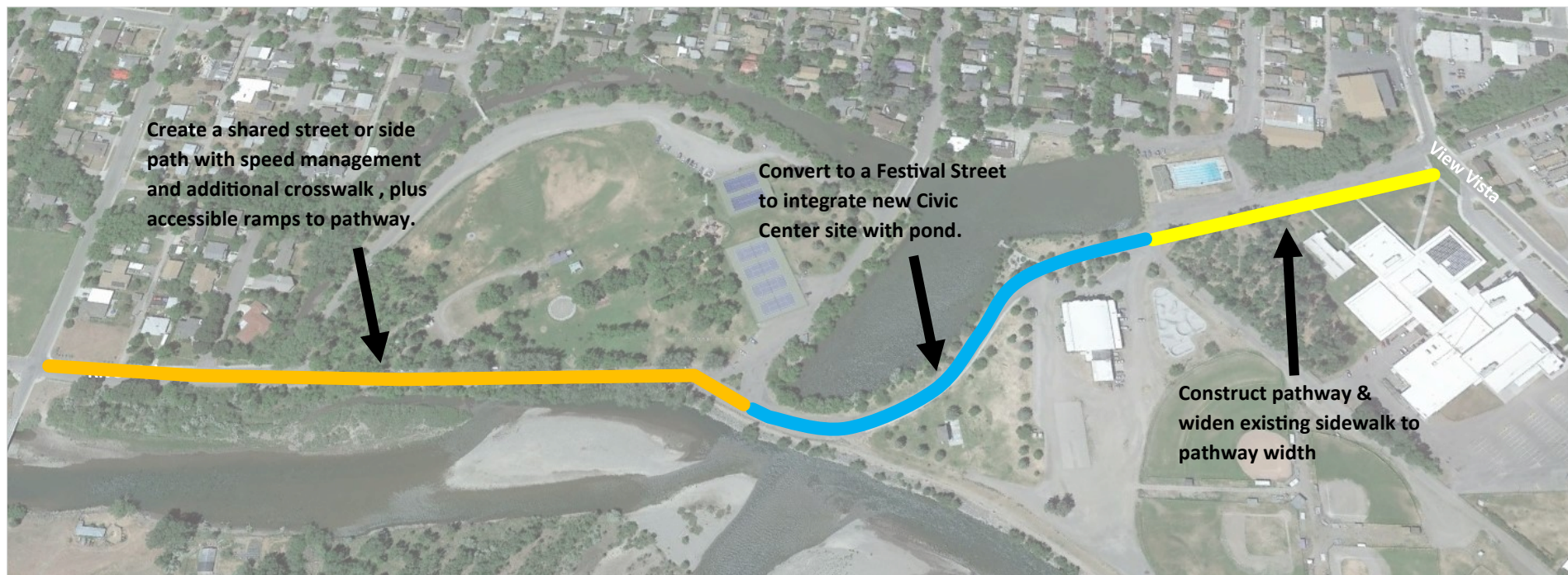
The concept emerge during the Looking Glass Academy to create a Festival Street in the section between Yellow Stone Street and River Street (blue line below). A reimagining of the street frontage of the new Civil Center complex would integrate the Civil Center’s site into a promenade that could extend to the pond and tie these features together. This section is already subject to a temporary street closure when the Farmer’s Market is in session.

A raised street section with hydraulic bollards on either end would allow for the street to be closed for more events and serve as an economic, cultural, and recreational engine for the City and County. This section includes only concepts as such a reimagining this street

would need to go through a separate visioning session.

On either end of the Festival Street section would be a connecting pathway to link to View Vista to the east and a re-design of the street to 9th Street along the Park Frontage to create a more polished setting that allows for motorists, pedestrians, and bicyclists to use the street. Additional crosswalks from the park to the pathway, along with one or two accessible ramps to access the pathway are desired.

The following page contains images of other Festival Streets or similar applications where streets are integrated with other features around them, shared by all users, and subject to frequent closures for events. Imagine high school dances, outdoor concerts, art shows, beer festivals, and Old West re-enactments occurring on Livingston’s Festival Street: River Drive.



River Drive: Livingston, MT

It functions like a festival street on some occasions, with people walking in the road. Closing it to vehicles during these times and integrating the street with its surrounding natural and civil land uses would create a unique space for the people of Livingston.



Boise, ID: 8th Street



Two blocks of 8th Street between Main St and Bannock St are designated as a festival street with hydraulic bollards at the end of each block. Limited curbing allows people to freely move between sidewalks and the street. 8th Street is now being closed to vehicles permanently due to the success of restaurant expansion onto the sidewalks due to COVID-19. Even when open to cars, the street design projects an image that the drivers are guests in this environment.

Image: Capital City Development Corporation

Kirkland, WA: Park Lane



A shared environment for pedestrians and passing vehicles is created by 36,000 square feet of pavers. The surface design promotes walking and biking over driving with its woonerf-style design and 100 percent paver surface, abundant street furniture, and parking hoops for cyclists, as well as multiple art plinths for rotating art exhibits. Local business owners have offered unanimous praise for the new design and reported a surge of new customers as the project came to completion.

Image & Text: American Planning Association



Park Street Assessment

Park Street is the main motor vehicle thoroughfare in Livingston and is managed by MDT. It is designated as a principal arterial and the Interstate 90 Business route. It serves as a detour route when I-90 is closed due to high winds.

These multiple functions are a challenge alone, which are compounded by right-of-way that's constrained by buildings and the railroad's property. In some ways, these constraints have saved Livingston from being bisected by a four- or five-lane arterial through the heart of the city. In other ways, it has prevented the inclusion of dedicated space for bicyclists and limits opportunities for sidewalks on both sides.

The posted speed limit is 25 mph from Yellowstone Street to N Street—a distance of 5,500 feet. The traffic counts obtained from MDT indicate volumes between 7,140 and 13,640 vehicles per day. Sidewalks are continuous along the south side of Park Street in the entire 25 mph zone but do not exist on the north side due to the railroad right-of-way.

The Trails and Active Transportation Plan provides some options for making the corridor safer for pedestrians and bicyclists wishing to travel along or across Park Street. Any changes must be coordinated through MDT.

The options contained in this section are derived from prevailing design guidance endorsed by the Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO). Beyond MDT's jurisdiction, Park Street's status as I-90 Business means FHWA has some oversight and would be a party to any federal funding expended on the corridor. MDT is a member of AASHTO and MDT's Director sits on AASHTO's Board of Directors. MDT is signatory to AASHTO design guides cited in this section.

The first goal for Park Street, given its limitations, should be to first do no harm when it comes to the safety of people walking and bicycling, as well as motorists. What does this mean? It means not raising the speed limit in the existing 25 mph section and not making

Park Street Traffic Characteristics

- 25 mph speed limit between Yellowstone St & N St.
- 2 lanes wide east of 5th St.
- Traffic volumes between 7,140 and 13,640 (2019, MDT)

Image: Google Earth



the general purpose travel lane dimensions wider than their current configuration (12 feet). The parking lanes are 10- and 11-foot wide in the sections that contain curbs. Sidewalks vary in width, but are generally 10-foot wide in the downtown core where there are no landscaped buffers, and 5-foot wide where buffers exist. The 45-foot wide curb-to-curb section of Park Street is shown in the typical section at right with the 10' sidewalk space behind the curb. Note these widths may vary slightly by section due to inconsistencies in striping applications.

Bike Lanes. Can Park Street be re-striped to include dedicated bicycle lanes? The short answer is: It's complicated.

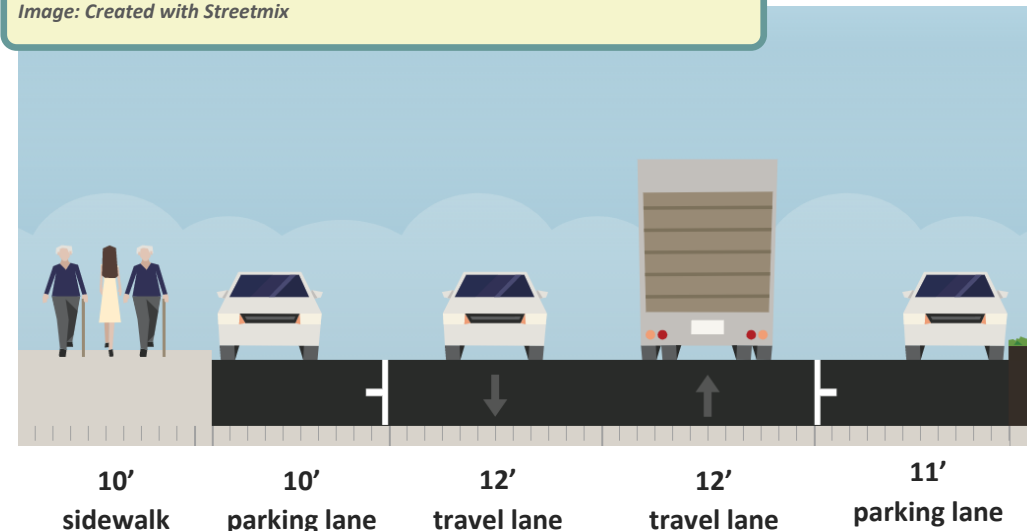
The image shown on the bottom right uses the same 45-foot section and reconfigures the space for a hypothetical bike lane. In theory, the space is there to provide a 5-foot wide bicycle lane but that's where the justification becomes more difficult. AASHTO's *A Guide for the Development of Bicycle Facilities* guidance on bicycle lane width designates a 5-foot wide bicycle lane as the minimum acceptable width where on-street parking is present. Parking lanes are typically 7-feet to 9-feet in width.

AASHTO's *A Policy on the Geometric Design of Highways and Streets* (aka *The Green Book*) includes guidance for travel lane widths for motor vehicles on a principal arterial like Park Street, which ranges from 10-feet to 12-feet in width. State DOTs like MDT prefer 12-foot lane widths and may be amenable to 11-foot wide lanes in certain situations. This is typically due to the width of trucks. It is compounded by Park Street being a designated I-90 detour route.

Therefore, reconfiguring Park Street to include a minimum width 5-foot wide bike lane requires the minimum width for the parking lane and a near-minimum width for travel lanes, which may not be deemed acceptable by MDT. The centerline striping would be at least one-foot in width and the bike lane striping at least six inches in width for both sides. This leaves little room for error by both the bicyclist and the operator of a large vehicle.

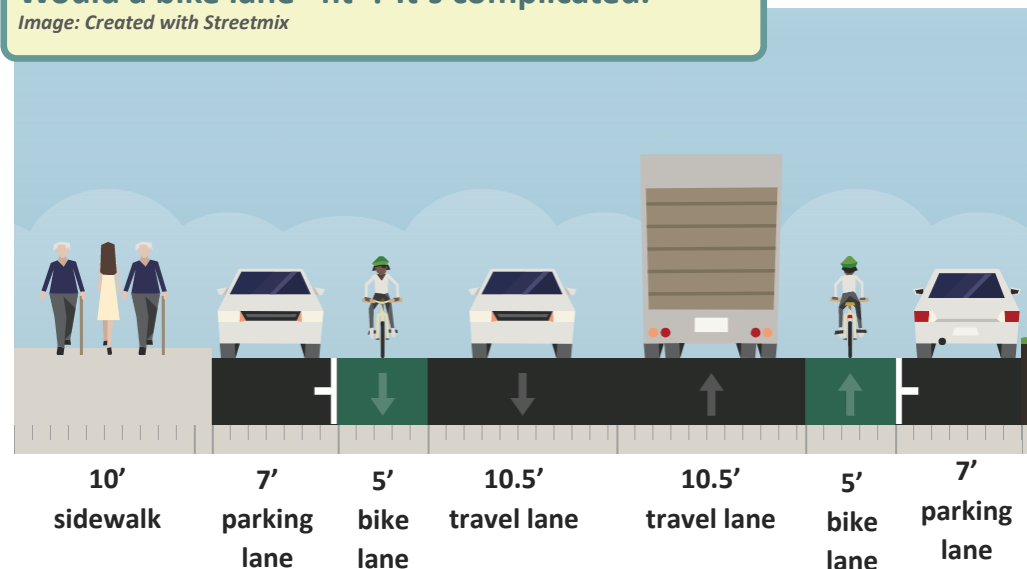
Current Typical Section

Image: Created with Streetmix



Would a bike lane "fit"? It's complicated.

Image: Created with Streetmix



The problem with a 5-foot wide bicycle lane adjacent to a 7-foot wide parking lane is it puts the bicyclist in the door zone of a vehicle—meaning the safety of the bicyclist could be compromised if a driver opens the door into the bike lane as a bicyclist travels by. Dooring crashes can be severe and sometimes fatal. The image at right shows a minimum width parking lane next to a 5-foot wide bicycle lane and the door zone that it creates.

The other option is to prohibit parking on the north side of Park Street. This would provide ample space for a bike lane and a painted buffer, while maintaining a 12-foot travel lane and reducing the parking lane on the south side to 8-feet wide but with a 2-foot wide buffer to keep bicyclists out of the door zone.

In the sections of Park Street that lack curbing on the north side (east of B Street), extruded curbing could be installed or an outside line striped at the edge of pavement with signs to help keep people from parking on the bike lane. The bike lane may be reduced to 4-feet in width in those sections to accommodate the curbing and/or striping.

This still creates challenges at the signalized intersection of Park Street and B Street at the railroad underpass. The presence of a center left turn lane, combined with no on-street parking, provides no space for a bicycle lane in its current configuration. Removal of the turn lane would allow the space for a bicycle lane, but may not be seen as desirable due to traffic volumes and queues at the signal. Removal of the turn lane would likely require a “split phase” of the signal where only one direction of travel at a time is given the green light along Park Street.

Design Justification. The engineering justification for removal of parking to allow for a bike lane with a buffer is contained in the FHWA *Bikeway Selection Guide*, which was published by FHWA’s Office of Safety in 2019.

The contents of the guide are based on prevailing AASHTO and FHWA design guides and policies, as well as FHWA-endorsed design

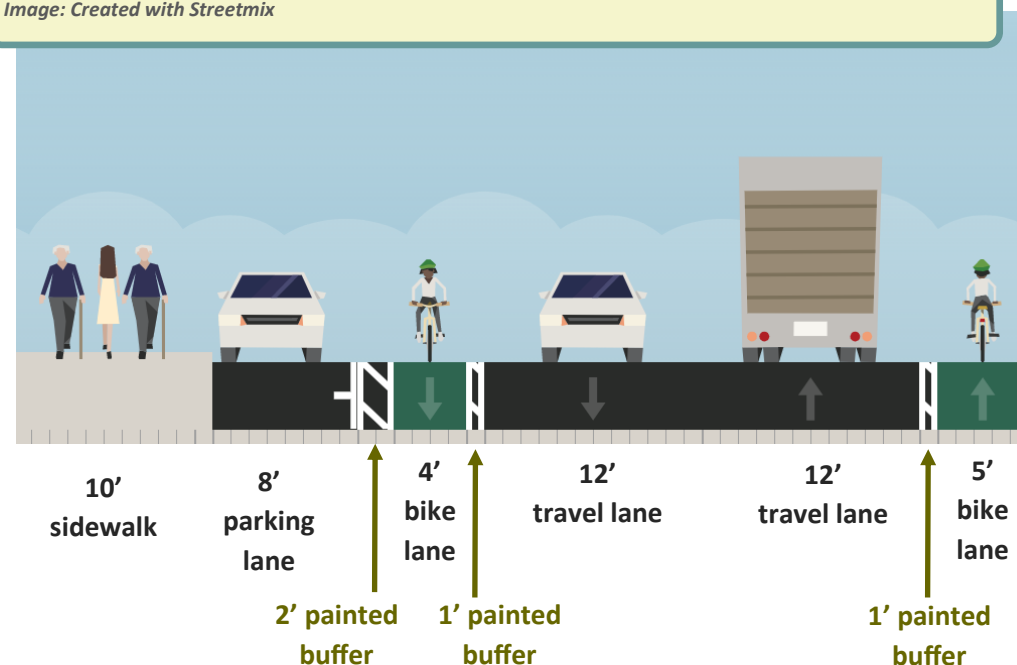


Door Zone Bike Lanes

Constrained spaces can create unsafe conditions for bicyclists if parking lanes and bike lanes are configured to minimum widths.

Bike Lane with Buffers & Removal of North Side Parking

Image: Created with Streetmix



guides produced by NACTO and ITE (see Appendix page 11).

The *Bikeway Selection Guide* represents the emerging science and engineering that indicate typical in-street bike lanes that lack separation or protection are viewed as safe by the most confident bicyclists, which represent only 4-7% of the population.

Providing separation from travel lanes—in combination with low motor vehicle speeds—is proven to attract the “interested but concerned” population. This group wants to try to bike more but has fears for safety when asked to ride alongside high-speed traffic. Buffered bike lanes are the next level of treatment when full separation is not possible.

Park Street has a posted speed limit of 25 mph and traffic volumes of approximately 9,400 at Main Street and 7,400 at N Street. When these speed limits and volumes are plotted on the FHWA *Bikeway Selection Guide* matrix, it shows Park Street in the category that would justify full separation.

Given full separation is not practical due to various constraints, the next level of treatment is a bike lane with buffer preferred. The section of Park Street near N Street is closest to this threshold.

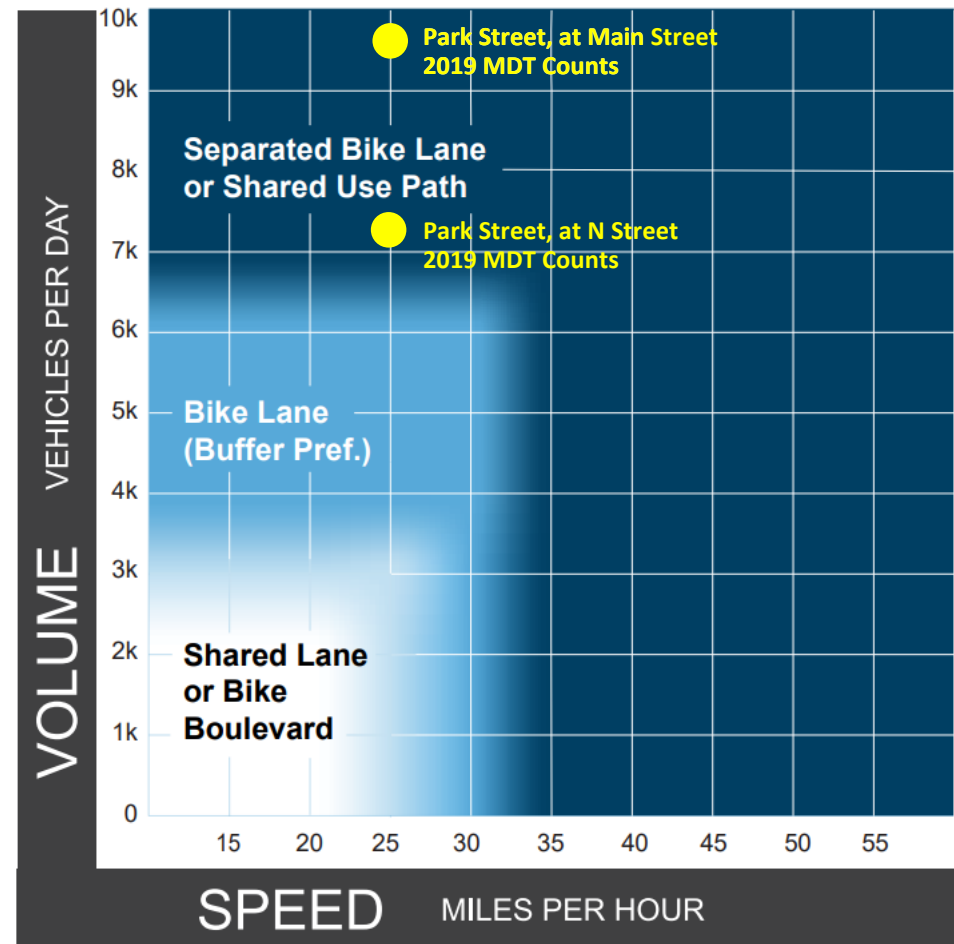
Therefore, this matrix appears to justify, at minimum, consideration of the buffered bike lane. If that treatment proceeds, other efforts should be made by the City and MDT to ensure that the posted and operating speeds of Park Street are maintained at 25 mph.

The existing configuration (a shared lane) is only suitable with traffic volumes below approximately 3,000 vehicles per day and speeds below 25 mph.

Depot Sidewalks. The proposed addition of sidewalks along the north side of Park Street along the Depot frontage (at 2nd Street) would impact the future viability of the Park Street bike lanes if the sidewalk is placed in the existing shoulder on the north side without reconfiguring the road on the south side.

Park Street & Bikeway Selection Guide Matrix

The speed and traffic volumes for Park Street (at its intersection with Main Street) are plotted on the FHWA’s *Bikeway Selection Guide* matrix. This shows clear justification for separated treatments instead of an in-street buffered bike lane, however, full separation is not feasible along the current route.



Source: FHWA Bikeway Selection Guide, Preferred Bikeway Type for Urban, Urban Core, Suburban and Rural Town Contexts; https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf



Configuring a bike lane through this section in combination with the addition of sidewalk on the Depot's frontage would require removal of on-street parking on the south side of Park Street. This would likely be between 3rd Street and Main in order to allow for proper tapering of the roadway striping.

The image at right was provided by Steering Committee members to show what MDT is proposing along the Depot frontage. The white area labeled as "new sidewalk" is where current road space would be reconfigured to allow for a sidewalk adjacent to the current stairs that access the street side of the Depot.

Accommodating the sidewalk and future bike lanes would require prohibiting on-street parking in the areas marked with the orange lines (subject to engineering study) and removal of the planned curb extension at 2nd (marked with a circled, red X).



Sidewalks along Depot Frontage of Park St.
 The illustration shows a crude mock-up of where the sidewalks and proposed curb extension are planned. The orange lines are added to show where parking would need to be prohibited in order to shift the center line of the road to allow for a future bike lane and the proposed sidewalk on the north side. A curb extension would not be possible at this location if this shift occurred.

