

# Bozeman Area Alternative Transportation Study

## Phase III Feasibility Report



December 2015

Bozeman Area Alternative Transportation Study in conjunction with Custer Gallatin National Forest

Prepared by:

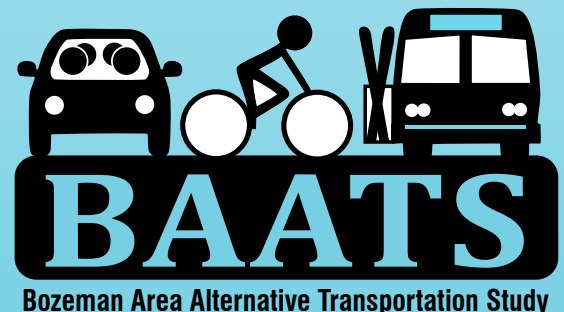
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DJ&A, P.C. Engineers. Planners. Surveyors.  
3203 Russell Street / Missoula, MT 59801  
Ph: 406/721-4320 F: 406/549-6371

[www.djanda.com](http://www.djanda.com)



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## Phase III Feasibility Report

prepared for:  
Paul S. Sarbanes | Transit in Parks Program

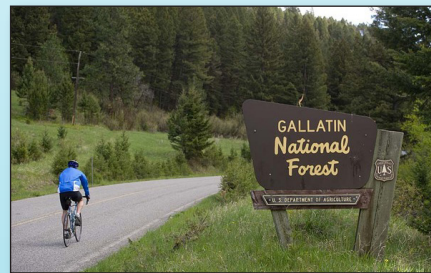
prepared by  
DJ&A, P.C.  
3203 Russell Street  
Missoula, MT 59801  
[www.djanda.com](http://www.djanda.com)

*DJ&A, P.C.*  
since 1973

Alta Planning + Design  
123 W. Main Street  
Bozeman, MT 59715  
[www.altaplanning.com](http://www.altaplanning.com)



Western Transportation  
Institute  
2327 University Way  
Bozeman, MT 59715  
[www.westerntransportationinstitute.org](http://www.westerntransportationinstitute.org)





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\* Member of Technical Advisory Group (TAG)

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## **EXECUTIVE SUMMARY**

### **Overview**

The Bozeman area has stunning recreational areas in all directions; however, access to many of these areas is problematic and demand is steadily increasing. The dominant mode of transportation to these areas consists of private automobiles, roadways and parking areas. Recreationalists are increasingly impacted by the limits of this transportation paradigm: roadways, such as Highway 86 to Bridger Bowl Ski Area, are increasingly congested; trailhead parking areas, such as that at Palisade Falls, are increasingly overflowing; roadway crossings, such as between “M” and Drinking Horse Mountain trailheads, are increasingly unsafe; and heavy use of areas, such as at Leverich Canyon trailhead, lead to increasing levels of conflict with users and adjacent landowners.

The purpose of the Bozeman Area Alternative Transportation Study (BAATS), which has been funded by the U.S. Department of Transportation through the Paul S. Sarbanes Transit in the Parks Program, is ultimately to further develop alternative transportation systems to increase the safety and convenience of accessing these surrounding recreational areas.

This study consists of 4 phases as follows: Phase 1) Data Collection (completed in 2013); Phase 2) Scoping & Reprioritization (completed 2014); Phase 3) Feasibility Study (the focus of this report); and Phase 4) Project Funding (2016). As a part of Phase III, 7 feasible projects have been developed through a collaborative process involving more than 30 public agencies, non-profits, and other entities. Section 1 of this report provides an introduction and background for this study. Sections 2 – 8 provide information on each of the 7 projects that were developed during Phase III. Summaries of each of these projects are presented below (the order is no indication of relative priority or importance).

### **Project Summaries**

#### **Section 2: Shared-use Separated Path**

The primary focus of this project is to design and build a non-motorized, separated path that will provide safe and comfortable access between Bozeman and the Hyalite Canyon recreation area. This path will run along S. 19th Avenue and Hyalite Canyon Road and connect to the Forest boundary and a future Hyalite Canyon Trail. This proposed path runs along one of eight corridors that were considered in a feasibility study. Prior to pursuing project funding it will be important to: demonstrate sufficient user demand; address jurisdictional issues for construction and ongoing maintenance; initiate adjacent landowners along the Hyalite Canyon Road; and gauge user expectations for the route.

Initially, project funding may be pursued for the entire path or for portions of it as dictated by available funding.

Phase IV Focus: The consultant team will document user demand for this trail and coordinate with those who are currently updating the Greater Bozeman Area Transportation Plan to include this project in the updated plan, if possible.

A secondary focus for this project is to pilot the use of advisory bike lanes in Gallatin County. An advisory bike lane is a treatment that is classified as “experimental” by the Federal Highway Administration and that effectively establishes bike lanes on roadways that would otherwise be too narrow (or need to be widened) to accommodate them. There are a number of corridors, including Nash Road, S. 3<sup>rd</sup> Avenue, Sourdough Canyon Road, and Hyalite Canyon Road, that could be suitable candidates for this treatment.

Proposed Phase IV Focus: The consultant team will work with various stakeholders including Gallatin County; the City of Bozeman; Montana Department of Transportation; and other stakeholders to develop a pilot project that would implement advisory bike lanes on at least one corridor that would connect Bozeman to the Gallatin Front. The consultant team will coordinate with those who are currently updating the Greater Bozeman Area Transportation Plan to include this project in the updated plan, if possible. And funding will be sought through various sources including Transportation Alternatives Program (TAP), project stakeholders, and Collin’s Coalition, among others.

### **Section 3: “M” & Drinking Horse Mountain Trailhead Improvements**

This proposed project will improve multi-modal access to three recreational attractions located close to Bozeman including the “M” and Drinking Horse Mountain trails and the Bozeman Fish Technology Center (BFTC). This project, which spans both sides of state highway 86, will provide the infrastructure needed to safely and conveniently receive the high-volume of visitors to these areas. There is an anticipated increase in the numbers of people who will access these areas by bike because of the 2.3-mile Path to the M and Drinking Horse Mountain that is currently in design. The proposed improvements, which will be rural rather than commercial in feel, will target people arriving by bike, shuttle, and automobile and will improve user experience, safety, and circulation for these areas.

Specific recommended improvements include:

- A pedestrian underpass providing safe passage beneath Highway 86;
- Turning bays along Highway 86;
- Increased off-street parking to relieve parking pressure along the highway;

- Circulation planning for those arriving from Path to the M and Drinking Horse Mountain;
- The installation of a web-cam to allow remote viewing of the parking area;
- The addition of a vault toilet;
- Improved and consolidated signing for the trailheads and the BFTC;
- Accommodations for a bus/shuttle turnaround along with drop-off/pickup area; and
- Improve the approaches from the highway to the M and BFTC parking areas.

Phase IV Focus: The consultant team will coordinate with planners for the Greater Bozeman Area Transportation Plan Update for inclusion, if possible. The consultant team will also pursue funding primarily through the Federal Lands Transportation Program (FLTP).

#### **Section 4: Hyalite Canyon Shuttle System**

This proposed project will consist of the *development* of a shuttle system that will transport recreationalists between Bozeman and Hyalite Canyon recreation areas with possible stops at Gallatin Front trailheads such as Leverich Canyon or Sourdough Canyon. The system will target local residents and tourists and will explore both summer and winter options. Next steps include reaching out to more user groups, exploring public/private partnership options, determining shuttle logistics and system governance, and identifying funding sources. The Trail Rider of Helena, which includes a trailer with a 30-bike capacity, serves as a particularly relevant model that can be adapted to meet the needs of the Bozeman community. A primary goal of the proposed shuttle system will be to replace existing driving trips, rather than simply bringing more people to the Canyon, and thereby mitigate the impacts associated with private automobile use.

Phase IV Focus: The consultant team will coordinate with planners for the Greater Bozeman Area Transportation Plan Update for inclusion, if possible. The consultant team will seek funding from Federal Lands Access Program during winter of 2016. This application process will serve as a means of engaging stakeholders and project partners in project development process. Matching funds will be sought from potential project partners. Such fundraising gives these partners an opportunity to demonstrate their commitment to this project.

#### **Section 5: Shuttle to the “M”**

Meeting the needs of the ever increasing user demand at the “M” and Drinking Horse Mountain trailheads and the Bozeman Fish Technology Center is a significant issue for the Forest Service and the US Fish and Wildlife Service. This project will develop a shuttle

system to provide transportation to these destinations. The system will target local residents and tourists. This project will explore public/private partnerships as well as options to integrate these trailheads into Streamline Bus routes.

Phase IV Focus: Same as Hyalite Canyon Shuttle System.

## **Section 6: Bridger Canyon Bus and Carpool Enhancements**

This project will bring together the partners needed to enhance existing bus and carpool options to access Bridger Bowl Ski Area, the busiest winter attraction in Bridger Canyon, and Bohart Ranch Ski Area in five key areas:

- 1) Enhance ski and snowboard gear storage for people that ride the weekend bus;
- 2) Increase weekend bus frequency and capacity;
- 3) Pilot different bus stop locations including Montana State University, the north side of the Fairgrounds off Oak St. and one to serve the west side of Bozeman;
- 4) Continue to encourage people to carpool with frequent carpool promotions, incentives, advertising Bridger's existing carpool parking lot and pursuing ridesharing apps to connect skiers/riders with others that want to carpool; and
- 5) Develop a comprehensive marketing approach to promote bus and carpool options.

This project will initially focus on stakeholder engagement and will evaluate alternative means of delivering these services including public and public/private partnerships.

Phase IV Focus: The consultant team will facilitate stakeholder meetings to develop action plans related to each of the five key areas. Consultant team to ensure action plans have meaningful impact on improving recreational access through bus and carpool options. The consultant team will also identify funding sources for actions, where appropriate.

## **Section 7: Alternative Transportation Information Campaign**

The Bozeman Area has no centralized location to disseminate information about a variety of recreational amenities and transportation to these areas. Such information is currently fragmented, incomplete and scattered across various websites. This project will create an interagency and cross-platform promotional campaign to encourage alternative transportation modes throughout the greater Bozeman area. This project will enhance recreational access with a particular focus on alternatives to the use of single occupancy vehicles. Potential steering committee members include: the Custer Gallatin National Forest; City of Bozeman; the Bozeman Convention and Visitors Bureau; Gallatin Valley Land Trust; Montana Department of Transportation and Montana State University. A



stakeholder group, representing a cross-section of recreational users, will be assembled to provide feedback and key contributions to the steering committee.

This project includes five primary components:

- 1) Assemble recreational data, such as trails, river accesses, park locations, transit and shuttle services and more, from a variety of groups;
- 2) The creation of an interactive, web-based map to display this data. The display will be overlaid with transportation-related information including transit, shuttle and trail linkages;
- 3) Partner with Bozeman Chamber and Visitors Bureau website to provide information on car-free and car-lite travel around Bozeman;
- 4) A media campaign to promote car-free or car-lite travel; and
- 5) A sustainability plan that provides for how the interactive, web-based map will be maintained so that the tool continues to be integrated, complete, and accessible.

Phase IV Focus: The consultant team will facilitate stakeholder meetings to develop action plans related to each of the five key areas. The consultant team will complete a funding application for the Digital Development Grant program through the Montana Office of Tourism and will seek matching funds from potential project partners.

### **Section 8: Alternative Transportation Enhancements at Story Mill Community Park**

This proposed project seeks to improve alternative transportation connections at the 55-acre Story Mill Community Park (SMCP), which is currently under development. Unlike each of the other projects presented in this BAATS Phase III report, this project relates to enhancements to an active project currently in development. Therefore, the specific enhancements will be conceptualized by the team that is currently designing the Park. These enhancements will be aimed at effectively interconnecting the Park infrastructure, operations, and features with the surrounding alternative transportation system with a particular focus on the soon-to-be-built Path to the M and Drinking Horse Mountain and the Shuttle to the M proposed in Section 4. In the event proposed enhancements are beyond the Park scope, the BAATS consultant team may be able to pursue funding.

Phase IV Focus: The consultant team will coordinate with project partners (City of Bozeman and Trust for Public Land) such that the design team can create conceptual designs and planning level cost estimates for enhancements related to alternative transportation. Where design concepts are outside of the overall Park construction scope, the Phase IV consultant team will work to secure additional funding. The Recreational Trails Program is a likely source for funding of the trail connection, and shuttle-related infrastructure could potentially be addressed under the Shuttle to the M Project.

---

### **Next Steps**

As noted above, upon submission and acceptance of this report, Phase III will be complete. The study will then progress to Phase IV, project funding, immediately, as at least two funding sources are expected to be calling for projects as of December 2015. Phase IV will bridge the gap between vetted project concepts and implementation.

Although BAATS is a planning study, the success of this study will ultimately be judged based on the degree to which this study leads to *actual improvements* in the alternative transportation network that facilitate the convenience, comfort and safety associated with accessing recreational areas surrounding Bozeman.

The Technical Advisory Group (TAG) will continue to be called upon throughout Phase IV to provide critical feedback and direction to the consultant team. At the end of Phase IV, the expectation is that the majority of projects identified in this report will be funded and ready for implementation.

# Section 1

## Introduction and Background

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## 1.1 Problem Identification

The Bozeman area has access to stunning recreational areas in all directions; however, access to these areas is limited and demand is steadily increasing. The dominant mode of transportation to these areas consists of private automobiles, roadways and parking areas. These recreationalists are increasingly being impacted by the limits of this transportation paradigm. For example, on a March afternoon in 2015, as shown in Figure 1-1, dozens of people parked along the highway in an effort to access the “M” and Drinking Horse Mountain trailheads. Although the lack of sufficient capacity for accessing recreational areas around Bozeman is not typically so extreme, this example is representative of a larger problem: roadways, such as Highway 86 to Bridger Bowl Ski Area, are increasingly congested; trailhead parking areas, such as that at Palisade Falls, are increasingly overflowing; roadway crossings, such as between “M” and Drinking Horse Mountain trailheads, are increasingly unsafe; and heavy use of areas, such as at Leverich Canyon trailhead, lead to increasing levels of conflict with users and adjacent landowners.



*Figure 1-1 Overflowing parking at subject trailheads, March, 2015 (photo courtesy of GVLТ)*

It is not realistic to expand the existing dominant transportation system at a rate that keeps pace with the steadily increasing levels of use as there is typically limited opportunity for roadway or parking area expansion. For example, the primary access road to the highly popular Hyalite Canyon recreation area is constrained by a narrow canyon for most of its length. It is not practical to add lanes to, or significantly widen, this 2-lane road. Similarly, parking areas are often constrained by topography, adjacent landowners, or other factors. Even where expansion is possible, such as the expansion of the parking area at Sourdough Canyon trailhead, which occurred in 2011 (see [Appendix 1-1: Sourdough Canyon Trailhead Expansion](#)

[Description](#)), such expansion is costly, the coordination required can often take years, and there are impacts to the surrounding resources. Although there are times where an

expansion of the dominant transportation system is warranted, alternatives are often more appropriate.

## 1.2 Study Purpose

This study, dubbed the Bozeman Area Alternative Transportation Study, or BAATS, is a planning study with a pragmatic focus. The purpose of this study is to identify specific projects that will increase access to Bozeman's surrounding recreational areas that are alternatives to an expansion of the existing transportation model. The types of alternative projects that fall within the purview of this study include:

- Development of non-motorized paths;
- Alternatives to single-occupancy vehicles (SOV) including transit, shuttles, and carpooling;
- Off-site recreational parking;
- Mitigation of concerns at recreational parking sites;
- Improved safety for bicycle and pedestrian crossings of motorized roadways; and
- Campaigns that increase access to information regarding such alternatives.

The ultimate purpose of this study has been squarely focused on identifying multiple, feasible alternative transportation projects that could be funded and implemented in the near future. Over the course of this study, seven such projects have been developed. These projects are the product of in-depth stakeholder and public involvement.

## 1.3 Study Area

There were no rigid boundaries for this study area; however, the study area, as defined by the priority projects that emerged over the course of the study extends from Bohart Ranch and Bridger Bowl ski areas, which lie approximately 18 miles to the north of Bozeman, to Hyalite Reservoir, which is approximately 18 miles to the south of Bozeman. The study includes numerous recreational areas in between. The specific locations that were addressed in the study are identified in the description of the evolution of the study during Phase III. Figure 1-2 is a map of the study area that was presented at the September 2015 public meeting.



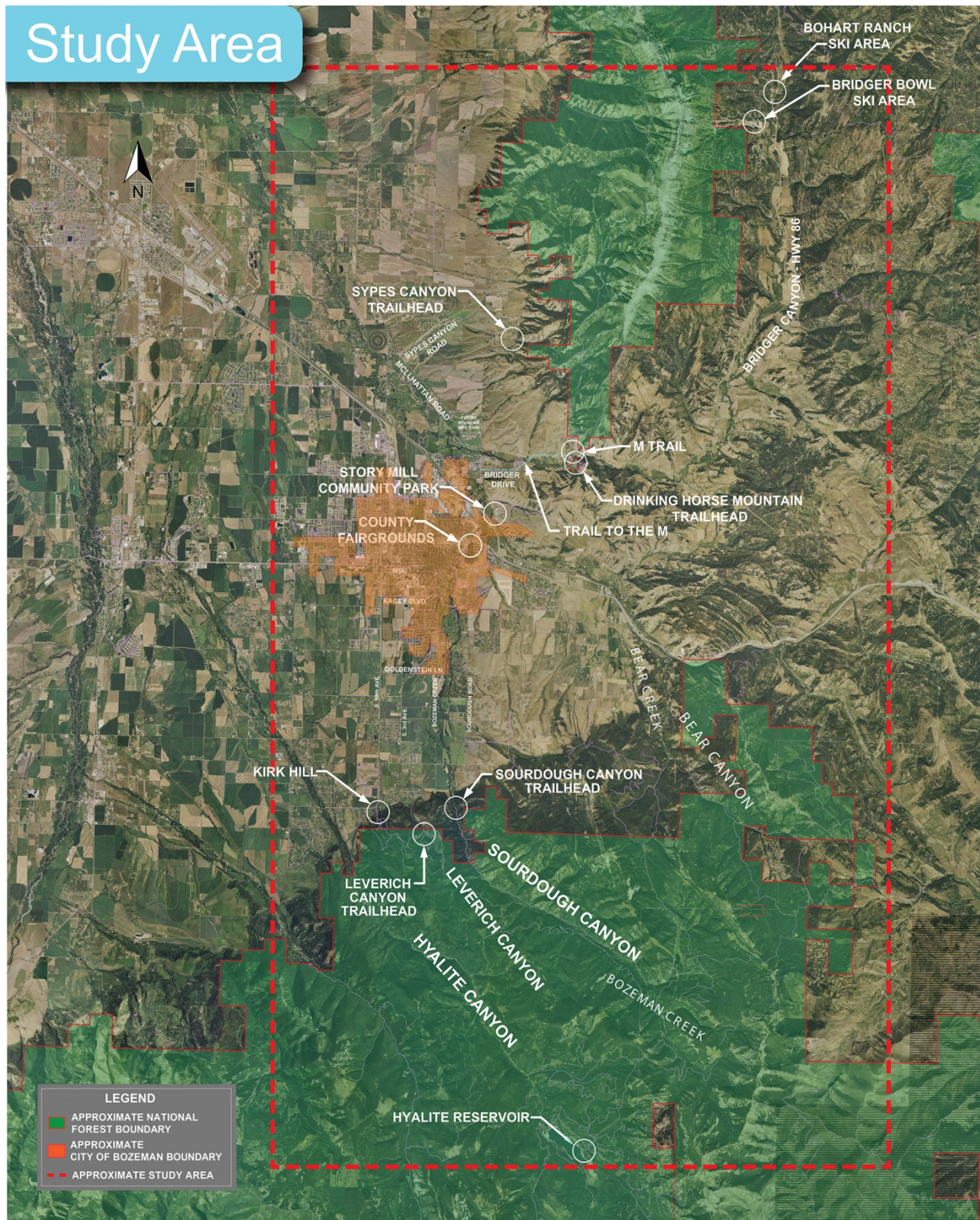


Figure 1-2: BAATS Study Area



## 1.4 Study History

### Summary

The history of BAATS is told graphically in Figure 1-3. There were eleven project sponsors, as shown in the top left corner of the Figure, that teamed together to pursue study funding through the Paul S. Sarbanes Transit in the Parks Program. The Custer Gallatin National Forest (CGNF) (formerly known as the Gallatin National Forest) was the primary project sponsor and served as the funding recipient.

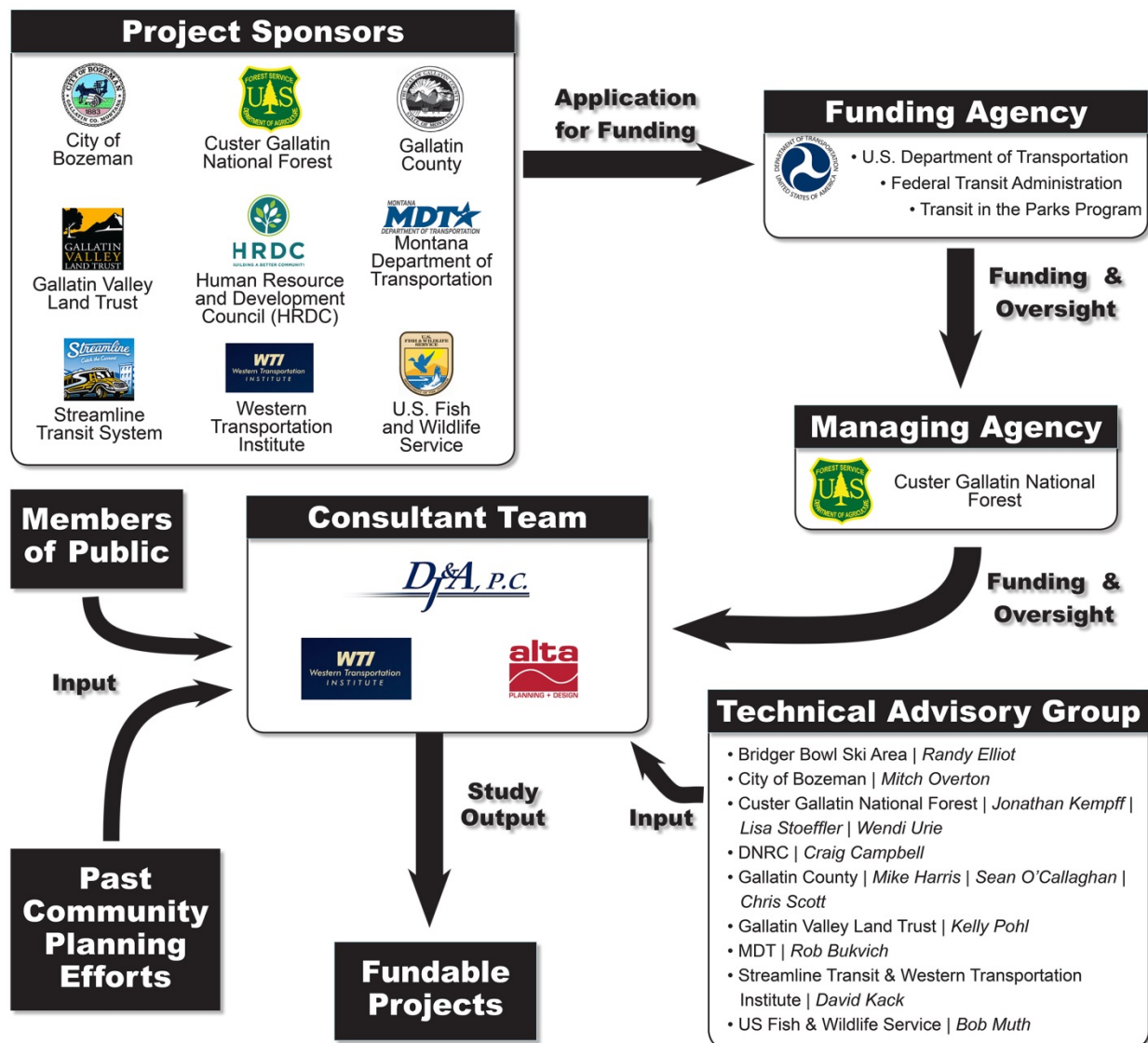


Figure 1-3: BAATS Phase III project flow

Two applications were submitted, one for FY 2009 that targeted areas to the north of Bozeman, and a second one for FY 2010 that targeted areas to the south of Bozeman. Both were successful in securing the funding from the U.S. Department of Transportation.

The CGNF, as the funding recipient, has also served as the managing agency to ultimately oversee the study. Despite their stewardship role for the study funding, the CGNF see itself as one of numerous key stakeholders that the serves to guide the study. As such, the CGNF is one member of a Technical Advisory Group (TAG) that includes 8 other members, as shown in the lower right corner of Figure 1-3.

The CGNF has contracted with the engineering, planning, and surveying firm of DJ&A to serve as lead consultant for this study. DJ&A has teamed with Western Transportation Institute and Alta Planning & Design to form the Consultant Team.

As described next, BAATS is comprised of 4 phases, with this report focusing on the results of Phase III. During Phase III, the Consultant Team, as summarized by the lower left corner of Figure 1-3, has held five TAG meetings, 2 public meetings, consulted with each of the stakeholders listed in the acknowledgement section and reviewed past community planning efforts. All of these efforts during Phase III have had the ultimate purpose of developing fundable projects that can enhance access to surrounding recreational areas via alternative forms of transportation.

### Phase I – Data Collection

Phase I began in 2012 and focused on data collection as indicated by Figure 1-4. DJ&A led this phase and WTI served as a subconsultant. The results of the data collection effort were compiled in a document titled *MT Highway 86 Alternative Transportation Study & Hyalite Canyon Recreation Areas Assessment*. The study was completed in February 2013, is described in greater depth in Section 1.5 Overview of Past Planning Efforts, and was used in the development of several projects included in this report.

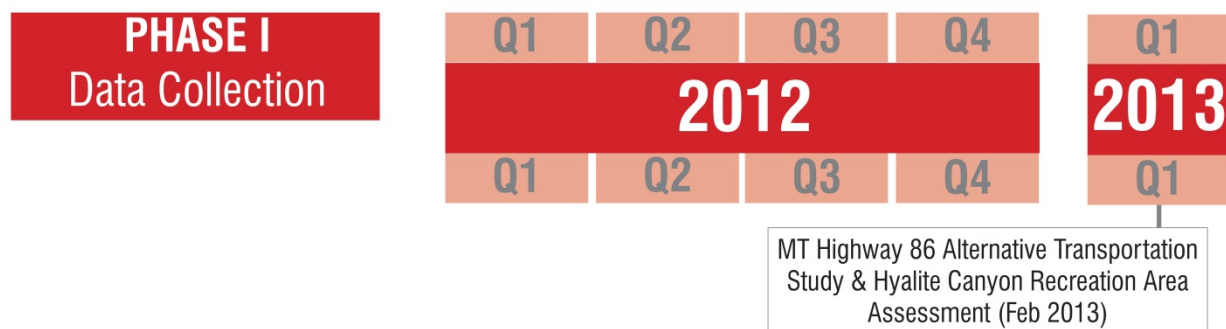


Figure 1-4: Phase I Data Collection Timeline



## Phase II – Scoping & Reprioritization

As depicted in the timeline in Figure 1-5, this short phase was completed during the summer of 2014. The purpose of this phase was to reprioritize the scope for the entire study given the events that had transpired since the grant was originally received. For example, the 2.3-mile Path to the M and Drinking Horse Mountain, a major component of the original funding application for the study, was funded in 2013. The first Technical Advisory Group (TAG) meeting was held in June, 2014 and served to guide the consultant team as they worked to create a Scope of Work (SOW) for Phase III and a draft Scope of Work for Phase IV. DJ&A served as the consultant for this effort.



Figure 1-5: Phase II Study Prioritization & Scoping Timeline

The SOW for Phase III that was developed during Phase II is as follows:

### PHASE III DESCRIPTION

*The Phase III Feasibility Study (Study) will assess, plan and design alternative transportation options for safely accessing recreational sites surrounding Bozeman including Bridger Canyon, Hyalite Canyon, and many other popular destinations. The tasks and associated deliverables identified below have been developed to provide all services to the Gallatin National Forest (NF) in fulfillment of the conditions of the grant. Study will address needs based upon current and anticipated future demand.*

*The Study will culminate with a report that will identify recommended alternatives for improving access to recreational sites surrounding Bozeman (specific sites to be addressed are listed in this SOW). Such alternatives will be evaluated based on the following criteria:*

- 1) *Visitor mobility for a full range of ability and income levels;*
- 2) *Visitor experience both within the target recreational areas as well as transit to those areas;*
- 3) *Environmental impact primarily as measured by wildlife safety, footprint of built environment, and carbon emissions;*
- 4) *Operational efficiency and financial sustainability; and*
- 5) *Technical, political, economic, and administrative feasibility.*

## **PRIMARY TASKS**

*As a result of the initial application effort and as of a workshop held with the Technical Advisory Committee on July 9, 2014, the following primary tasks have been identified in order of priority:*

- 1) Develop plans for shared-use trails from Main St. to recreation areas to the north and south of Bozeman;*
- 2) Develop plan for improving user experience by developing alternative transportation solutions to access Bridger Bowl Ski Area and Bohart Ranch;*
- 3) Develop plan for improving user experience by developing alternative transportation solutions to access Hyalite Canyon recreational areas;*
- 4) Develop plans for strategic locations for parking facilities that will facilitate Park & Ride access to surrounding recreational areas;*
- 5) Develop plans for effectively promoting use of alternative transportation system via marketing, social media, internet applications, etc....*
- 6) Develop plans for mitigating concerns at recreational parking sites regarding parking availability, conflicts with users and neighbors, and environmental impacts;*
- 7) Develop plans for addressing safety concerns regarding bicyclist and pedestrian crossings on major access routes to neighboring recreation areas; plans to relate to signage, crossing locations, and signaling; and*
- 8) Develop plans for expanding transit access to surrounding recreational areas;*
- 9) Develop plans for improving safety for people riding bicycles on Hwy 86 between Story Mill Road and Fairy Lake Road.*

## **Phase III – Feasibility Study**

As depicted in the timeline in Figure 1-6, Phase III began in the fall of 2014 and will be completed upon submission of this report. The purpose of this phase has been to execute the scope of work described above and was designed to position priority alternative transportation solutions for funding. Phase III is the focus of this report and has involved proactively identifying prospective funding sources and developing project concepts that will feed directly into the funding process. Phase III consists of a detailed study to develop plans for specific projects based on the priorities identified by the TAG during the summer of 2014 and based on continued input from the TAG, stakeholders, and public over the course of Phase III. Because Phase III is the focus of this report, a more complete description of this phase is provided in [1.5 Phase III Methodology](#).

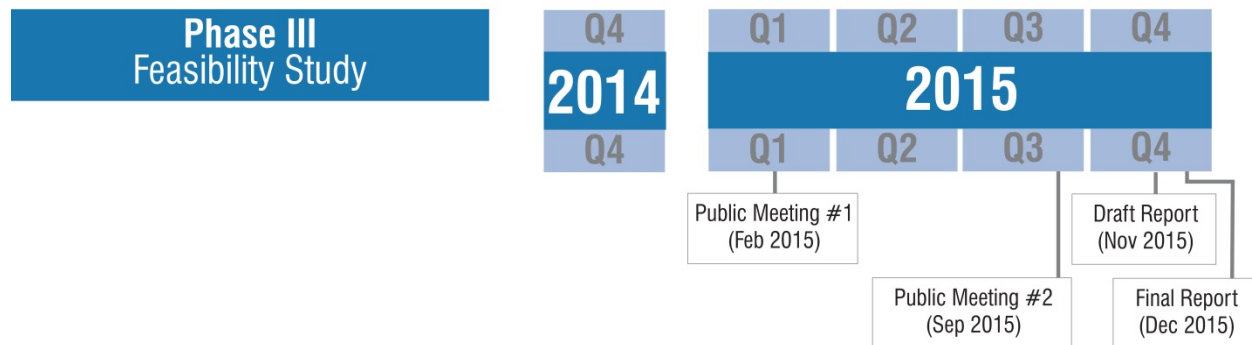


Figure 1-6: Phase III Feasibility Study Timeline

## Phase IV – Funding Applications

Funding Applications: Funding will be pursued for the seven projects identified in this report wherever suitable funding sources are available. Because there is an expected call for two relevant funding sources (Federal Lands Access Program and Recreational Trails Program) in December of 2015, Phase IV will immediately follow Phase III.

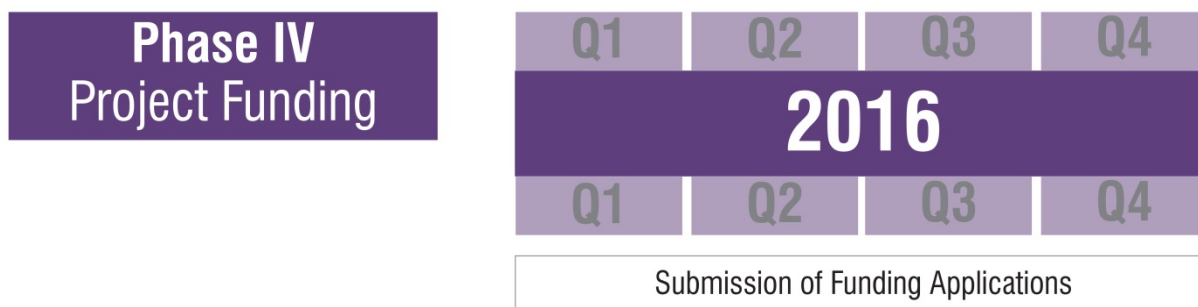


Figure 1-7: Phase IV Project Funding Timeline

## 1.5 Phase III Methodology

Based on the 9 projects identified during Phase II, DJ&A worked with CGNF to refine the scope to accommodate the budget. DJ&A then signed a task order with CGNF to complete in-depth feasibility studies of priority tasks 1, 2, and 3, as identified in the description of Phase II above. In addition, DJ&A would conduct literature reviews for tasks 4 – 9.

The study scope identified 6 primary scope items for Tasks 1, 2, and 3 as follows:

1. Review planning documents;
2. Consult with relevant groups;

3. Perform task-specific data collection and analysis;
4. Identify available funding sources;
5. Conduct a series of public meetings;
6. Complete feasibility studies and report.

As a result of a dynamic and responsive process involving stakeholder interviews, public engagement and guidance from the Technical Advisory Group (TAG), the original 3 tasks and 6 literature reviews evolved into the 7 projects identified in this report along with three additional mini-reports related to Tasks 6, 7 and 9. The consultations with relevant groups (scope item #2) involved conversations with all of the individuals listed in the acknowledgement section of this report. Public meetings (scope item #5) were held in February and September of 2015. Meeting summaries are included in [Appendix 1-2 February 2015 Public Meeting Summary](#) and [Appendix 1-3 September 2015 Public Meeting Summary](#). Four TAG meetings have been held during Phase III including one in February before the first public meeting, one in August, one in September before the second public meeting, and a final one in November prior to completion of the draft report.

The TAG has helped to keep the study squarely focused on identifying feasible projects that have significant benefit to the area's alternative transportation network. The outcomes of Phase III are remarkably well in line with the priority projects identified by the TAG during Phase II. These priority projects are shown side by side with references to relevant sections of this report.

- 1) *Develop plans for shared-use trails from Main St. to recreation areas to the north and south of Bozeman; See “Section 2 Shared-use Separated Path”*
- 2) *Develop plan for improving user experience by developing alternative transportation solutions to access Bridger Bowl Ski Area and Bohart Ranch; See “Section 6 Bridger Canyon Bus and Carpool Enhancements”*
- 3) *Develop plan for improving user experience by developing alternative transportation solutions to access Hyalite Canyon recreational areas; See “Section 4 Hyalite Canyon Shuttle System”*
- 4) *Develop plans for strategic locations for parking facilities that will facilitate Park & Ride access to surrounding recreational areas; this task was explored but did not lead to a developed project.*
- 5) *Develop plans for effectively promoting use of alternative transportation system via marketing, social media, internet applications, etc.... See “Section 8 Alternative Transportation Information Campaign”*
- 6) *Develop plans for mitigating concerns at recreational parking sites regarding parking availability, conflicts with users and neighbors, and environmental impacts; See [Appendix 1.4 Task 6: Recreational Parking Sites](#)*

- 7) *Develop plans for addressing safety concerns regarding bicyclist and pedestrian crossings on major access routes to neighboring recreation areas; plans to relate to signage, crossing locations, and signaling; – See [Appendix 1-5 – Crossing Safety & Best Practices](#)*
- 8) *Develop plans for expanding transit access to surrounding recreational areas; – See “Section 4 Hyalite Canyon Shuttle” and “Section 5 Shuttle to the ‘M’”*
- 9) *Develop plans for improving safety for people riding bicycles on Hwy 86 between Story Mill Road and Fairy Lake Road. – See [Appendix 1-6 – Task 9: Bicycle Safety on Rural Highway](#) [Note: This mini-report identified the use of advisory lanes and helped to inform the recommendation included in Section 2 that such advisory lanes be considered for use in Gallatin County]*

## 1.6 Overview of Past Planning Documents & Studies

The following nine documents, listed in reverse chronological order, were reviewed for relevance to BAATS. A summary and general relevance for each of these documents has been provided below.

- 1) Federal Lands Access Program (FLAP) Application for Bicycle and Pedestrian Path from Bozeman to the Bridger Mountains - 2013
- 2) MT Highway 86 Alternative Transportation Study & Hyalite Canyon Recreation Area Assessment – 2013
- 3) Hyalite Canyon Winter Use Study - 2013
- 4) Draft Gallatin County Park and Trails Plan: Gallatin County Interconnect – 2010
- 5) Paul S. Sarbanes Transit in Parks Program Application – North – 2009
- 6) Paul S. Sarbanes Transit in Parks Program Application – South – 2010
- 7) Greater Area Bozeman Transportation Plan (2007 Update) - 2009
- 8) Bozeman Parks, Recreation, Open Space & Trails Plan (PROST) – 2007
- 9) Gallatin National Forest Travel Management Plan – 2006
- 10) Bozeman Community Climate Action Plan - 2011

Several of these past planning efforts were highlighted at the public meetings as shown in Figure 1-8, which was on display at the public meetings.



## Past Community Planning Efforts


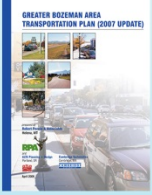
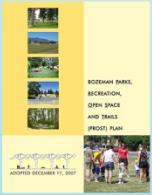
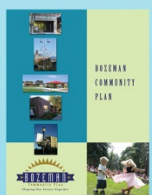

Planning Document	Date	Description	Sponsoring Agency	Relevance to Study
	2006	The Gallatin National Forest Travel Plan, developed over a four year period, established goals, objectives and standards to provide guidance for management activities related to public access to and travel within the Gallatin National Forest.	Gallatin National Forest	Potential projects are evaluated based on compatibility with the Travel Plan.
	2007	The Greater Transportation Plan (2007 Update) addresses existing conditions and future needs for both motorized and non-motorized transportation within the greater Bozeman area	Bozeman Transportation Coordinating Committee	Each studied corridor for multi-use paths to be evaluated based on consistency with subject plan.
	2007	As the name implies, the Bozeman Parks, Recreation, Open Space, and Trails (PROST) Plan addresses trails. The PROST Trail Plan Map serves as a guide for the City to ensure that development within the Bozeman area is consistent with the PROST.	Bozeman Recreation and Parks Advisory Board, Bozeman City Commission	Each studied corridor for multi-use paths to be evaluated based on consistency with subject plan.
	2009	The Bozeman Community Plan represents a growth policy for the City of Bozeman and establishes the over-arching direction for decisions on trails and transportation. The BCP in turn references the PROST and the Greater Transportation Plan as the guiding documents for these two areas.	Bozeman City Commission	This Plan provides further validation for the PROST Plan and the Greater Transportation Plan as guiding documents for the subject study.
	2010	The Draft County Park and Trails Comprehensive Plan (GCPTCP) reflects the county's mission to link communities and recreation areas through a network of parks and trails.	Gallatin County Commissioners (not yet adopted)	Each studied corridor for multi-use paths to be evaluated based on consistency with subject plan.

Figure 1-8: Past Community Planning Efforts

### **Federal Lands Access Program (FLAP) Application for Bicycle and Pedestrian Path from Bozeman to the Bridger Mountains**

**Funding Applicants:** City of Bozeman, Gallatin National Forest and others

**Authored by:** Gallatin Valley Land Trust and Western Transportation Institute

**Date:** February 2013

**Focus Area:** 2.3-mile corridor from Story Mill Road to the “M” and Drinking Horse Mountain Trailheads

Summary: This grant application was used to procure funding for the Path to the M and Drinking Horse Mountain (currently in design) through the Federal Lands Access Program (FLAP). The application sought \$2.8M of federal money to support a total project cost of \$3.3M for the 2.3-mile trail. Funding for the planning of this trail was originally sought as a part of the subject study (Paul S. Sarbanes Transit in the Park Programs application). The criteria addressed for the FLAP application, typical of other federal funding programs, included:

- Safety;
- Preservation;
- Recreation and economic;
- Mobility; and
- Environmental quality.

General Relevance: This grant application is relevant because the funding has been approved and the design phase has begun. This application is also relevant to Tasks 1 & 2 because it is a project that connects downtown folks with high-use recreational areas to the north of Bozeman with an improved non-motorized pathway. This non-motorized pathway increases access and safety, while decreasing congestion and the subsequent negative impacts of congestion. This application serves as an example of a successfully funded project that can help inform future funding applications.

Finally, this grant application provides the following relevant supporting data:

- 2007-2012 MT Highway Patrol Crash Data;
- MDT & Bozeman Daily Chronicle Public Letters of Concern;
- “M” & Drinking Horse Mountain User Information;
- Economic Benefits; and
- Environmental & Wildlife Improvements.

## **MT Highway 86 Alternative Transportation Study & Hyalite Canyon Recreation Area Assessment**

**Authored by:** DJ&A completed this study on behalf of Gallatin National Forest as a part of Phase I of the Bozeman Area Alternative Transportation Study

**Date:** February 2013

**Focus Area:** 18 miles of Hwy 86 corridor from “M” Trailhead to Fairy Lake Road Turnoff and 13 miles of Hyalite Canyon Road from Lower Hyalite Campground to trailheads beyond Hyalite Reservoir

Summary: This study captures traffic data, vehicle classifications and user surveys for the recreational areas north and south of Bozeman, MT. The study area included Hyalite Canyon, Bridger Canyon, “M” / Drinking Horse Mountain trailheads, and the Sourdough trailhead. These recreational areas experience high levels of use, resulting in crowded parking lots, congested roadways, and wildlife/vehicle collisions. The study states that “alternative modes of transportation to access these trailheads, such as transit and pedestrian/bike pathways, have the potential to reduce the negative impacts of the motor vehicles.”

General Relevance: This study is relevant because it confirms the high-use recreational areas by gathering useful data such as traffic volumes and user demographics. The user surveys and the individual comments will be helpful in providing support for funding applications. The survey results also provide insight about the trail user habits and their attitudes towards creating non-motorized connective pathways and alternative transportation options.

### **Hyalite Canyon Winter Use Study**

**Authored by:** L. Gray and B. Haywood (Friends of Hyalite)

**Date:** 2013

**Planning Limits:** Hyalite Canyon

<http://www.hyalite.org/wp-content/uploads/2014/03/Hyalite-Survey-Report.pdf>

Summary: This Study provided the USFS and the partner group, Friends of Hyalite, with concrete winter-use data that was previously unavailable. The data collected in Hyalite Canyon during the 2012 winter season captured user perceptions of road plowing management decisions and use patterns within the Hyalite drainage. A total of 451 surveys were collected in person and online. In addition to the surveys, road counters were placed at five locations throughout the canyon and vehicle movement was captured throughout the survey period. Data revealed that visitation is focused on the upper reaches of the drainage, the reservoir and beyond (67.9% of traffic).



General Relevance: This study identifies the destinations, demographics of users, user activities, frequency of use, user perceptions and modes of transportation to and from recreational sites. The Study helps to identify target populations for the use of Hyalite recreational areas during the winter time.

**Draft Gallatin County Park and Trails Plan: Gallatin County Interconnect**

**Developed by:** Gallatin County Commission, Park Commission and Planning Board

**Adopted by:** Not yet adopted

**Date:** Draft complete July 12, 2010

**Planning Limits:** Gallatin County

[http://www.gallatin.mt.gov/public\\_documents/gallatincomt\\_parkcomm/parkandtrailplan](http://www.gallatin.mt.gov/public_documents/gallatincomt_parkcomm/parkandtrailplan)

Summary: The framework of this Plan is to make better use of land already available and to prioritize the most suitable sites for future dedications or acquisitions. The mission of the planning effort is to link the County's communities and recreation areas through a network of parks and trails for the use and enjoyment of its residents and visitors. The Plan complements the County's previous efforts in open space preservation and recreation planning. It also addresses the community's evolving spectrum of values in relation to healthy living; access to recreation for all; and the protection of natural and cultural resources. The overall intent of the Plan is to provide a framework for the future development of parks and trails so existing recreation infrastructure can be used as efficiently as possible in reaching the long-term goal of creating an interconnected system. The process used to create the Plan was based on public input in the hopes of avoiding a "top-down" process. As discussed in Title I, Chapter 5 of the Plan, an intensive community outreach process was developed through grant assistance to establish priorities and identify implementation practices. Top priority routes and facilities for each region were identified based on public input and the County's priority setting criteria and are presented in Title II, Chapter 3.

General Relevance: The Plan serves as a basis for evaluating potential projects, including potential shared use path corridors as described in [Section 2](#), that are developed through BAATS. Several relevant priority trail routes are identified in the plan as listed below:

- Shared use paved path along South 19th and/or Fowler to Hyalite within ROW;
- Shared use path along Bozeman Trail from Kagy to Mt. Ellis Road connecting to Bear Canyon Road;
- Extend Sourdough Trail from Forest Service trailhead north to Goldenstein;
- Create a Bozeman Creek Corridor Trail System;
- Trail System from Garfield to Kirk Hill between 19th and Fowler;
- Trail Connections from Nash Park to Leverich and Sourdough; and

- Trail Connection from the “M” to Fairgrounds.

Appendix D of the Plan provides lists and maps of the priority routes.

#### **Paul S. Sarbanes Transit in Parks Program Application - North**

**Authored by:** Gallatin National Forest with various support

**Date:** 2009

**Focus Area:** Hwy 86 corridor from Bozeman to USFS and USFWS lands north of town

Summary: This application successfully secured funds for portions of the subject study, specifically those portions related to Task 2 with a focus on improving access to Bridger Bowl and Bohart Ranch Ski Areas. This application was closely examined while developing the scope for Phase III of the subject study.

The application provides a comprehensive overview of the purpose of the proposed study and provides justification. The primary justification for the study consists of the following:

- Traffic impacts along Hwy 86 including:
  - Vehicle-wildlife collisions;
  - Overcrowded parking lots; and
  - Safety concerns for those walking and biking along or to cross highway.

The following primary tasks were identified:

- Traffic data collection;
- Transit feasibility to trailheads, Bridger Bowl and Bohart Ranch;
- Trail connection to “M” and “Drinking Horse Mountain” trailheads;
- Pedestrian crossings/parking/trailhead access plan;
- Designing for wildlife; and
- Bicycle-Pedestrian Safety Assessment.

General Relevance: The subject application was very relevant in shaping the direction of the current study. Due to the significant time lapse between project funding and execution of the subject study, however, the study has some key differences from the original application. Nonetheless the application was carefully studied in developing the scope of study.

#### **Paul S. Sarbanes Transit in Parks Program Application - South**

**Authored by:** Gallatin National Forest with various support

**Date:** 2010

**Focus Area:** Recreational areas along western slope of Bridger Range, the Gallatin Front, Hyalite Canyon & nearby destinations such as Big Sky and Yellowstone NP.

Summary: This application successfully secured funds for portions of the subject study, specifically those portions related to Task 3 with a focus on improving access to Hyalite Canyon recreation areas. This application was closely examined while developing the scope for Phase III of the subject study.

The application provides a comprehensive overview of the purpose of the proposed study and provides justification. The primary justification for the study consists of the following:

- Significant growth in population and tourism;
- Wintertime traffic safety concerns;
- Transit currently limited;
- Trailhead parking issues;
- Need to connect existing urban trails to the mountains; and
- Traffic impacts.

The following primary tasks were identified:

- Conduct long-term recreational type, demand, and needs assessment;
- Evaluate past planning efforts;
- Collect traffic data;
- Evaluate existing transit systems and develop alternatives; and
- Conduct safety assessment.

General Relevance: The subject application shaped the direction of the current study. Due to the significant time lapse between project funding and execution of the subject study, however, the study has some key differences from the original application. Nonetheless, the application was carefully studied in developing the current scope of study.

### **Greater Area Bozeman Transportation Plan (2007 Update)**

**Adopted by:** Bozeman Transportation Coordinating Committee (12/17/2008), Bozeman City Commission (1/20/2009), and Gallatin County Commission (2/10/2009)

**Focus Area:** Area approximately 8 times larger than City of Bozeman Boundary  
[http://www.gallatin.mt.gov/public\\_documents/gallatincomt\\_plandep/Plans&Policies/tp](http://www.gallatin.mt.gov/public_documents/gallatincomt_plandep/Plans&Policies/tp)

Summary: The Transportation Plan (Plan) is intended to document changes and progress since the previous *Greater Bozeman Area Transportation Plan (2001 Update)*. This Plan strives to elevate non-motorized transportation planning in the community from mobility and livability perspectives. The Plan addresses both motorized and non-motorized transportation needs as a result of meaningful dialogue with the public and dozens of stakeholders. The Transportation Coordinating Committee (TCC) is the advisory committee which oversaw the development of this update.

The Plan identified the following four goals:

- 1) Maintain and enhance the functionality of the transportation system;
- 2) Ensure that a variety of travel options exist which allow safe, logical, and balanced transportation choices;
- 3) Encourage transportation options that reduce resource consumption, increase social interaction, support safe neighborhoods, and increase the ability of the existing transportation facilities to accommodate a growing city; and
- 4) Establish and maintain an integrated system of transportation and recreational pathways, including bicycle and pedestrian trails, neighborhood parks, green belts, and open space.

General Relevance: This Plan identified the existing conditions, models future needs and provides recommendations to address those transportation needs. Although the “Top Ten Improvement Projects” are motorized-vehicle based, it is mentioned that non-motorized needs should be addressed with all future projects. *Chapter 5* focuses on the non-motorized transportation system and recommends numerous transportation projects, including shared use paths, to improve the pedestrian / bike transportation system within the study area. These recommended projects include: location, segment length, notes and approximate cost.

Chapter 7 focuses on public transportation. However, none of the content appears to be particularly relevant to the transit-oriented aspects of the subject study.

The final chapter is titled, “Financial Analysis” and provides a list of state and federal funding sources, some of which are relevant potential projects emerging from the subject study. Due to changes at the state and federal levels, much of the information is no longer current. Nonetheless, the list provides yet another set of potential funding sources that will be evaluated. Similarly, there is a list of local funding sources including City, County, and private.

### **Bozeman Parks, Recreation, Open Space & Trails Plan (PROST)**

**Adopted by:** Bozeman City Commission

**Date:** December 17, 2007

**Target Area:** Area approximately 100% larger than and including City of Bozeman  
<https://www.bozeman.net/Smarty/files/78/78215f19-19b9-44c0-8fd9-7df9068aeb0.pdf>

Summary: Most of the PROST Plan focuses on existing and expanded park space. However section 8.9.1 focuses specifically on plans for a shared use path system. The plan notes that there is a desire to provide a shared use path system to provide recreation and transportation opportunities through and around the City. These shared use paths, which

are classified as Class I trails, provide a unique opportunity for people to travel on bike, foot, skateboard, etc. on a facility that is separated from adjacent streets. Shared use paths are available for users such as adults on bikes, skateboarders who are generally restricted from standard sidewalks, and for children and beginner bicyclists who may not feel comfortable using a bike lane.

Because shared use paths require ample street right-of-way, and due to development constraints throughout the City, the system of shared use paths targets a select few street corridors as depicted on the PROST Trail Plan Map.

General Relevance: The PROST Plan is particularly relevant to shared-use paths as it represents a consensus document for the establishment of trail corridors throughout the greater Bozeman area. Shared use paths, as described in the summary, are the ones targeted by the BAATS study because they are the types of paths that appeal to a wide range of users. And one of the objectives of the study is to improve access to recreational sites for a full range of ability and income levels.

The PROST Plan calls out the following relevant objectives:

- Continue to obtain new trail corridors and connectors for existing trails through the development process in compliance with the PROST Trail Plan Map;
- Connect Bozeman trails to Gallatin County and Forest Service trails wherever feasible in accordance with the PROST Trail Plan Map; and
- Provide for adequate connections and access to public parks and trails, including public parking, public transportation and trail connections.

The PROST Plan identifies the following funding sources:

- CTEP Programs;
- Gallatin County Open Space Bonds;
- Local Funding Sources; and
- Private Funding Sources.

The PROST Plan Trail Map identifies specific existing and proposed trails, bike routes, bike lanes, and shared use paths. This map is used by the City primarily in conjunction with proposed subdivisions to ensure plans are consistent with the Trail Map. It is relevant to the study in assessing possible shared use path corridors.

### **Gallatin National Forest Travel Management Plan (Travel Plan)**

**Authored by:** Gallatin National Forest

**Date:** December 8, 2006

**Focus Area:** Gallatin National Forest

<http://www.fs.usda.gov/detail/custergallatin/home/?cid=stelprdb5133658>

**Summary:** The Travel Plan is the culmination of a four year planning and public input and comment process to develop and adopt a management plan for public access and travel within the Gallatin National Forest (GNF). The Travel Plan establishes goals, objectives and standards that provide guidance for management activities related to public access and travel within the GNF.

**General Relevance:** As noted in the summary, the Travel Plan focuses on travel *WITHIN* and not *TO* the GNF. As a result the Travel Plan is only tangentially relevant to the subject study, which focuses on travel *TO* the GNF. Given that GNF personnel are intimately familiar with the contents of the Travel Plan and are available to bring specific areas of relevance to the attention of the consultant team, a limited review of the Travel Plan was conducted by the consultant team.

One particular area of relevance noted by GNF staff is the “time-share” plan that has been evolving since 2006 and involves numerous trail use groups. The following Travel Planning Areas, addressed in Chapter II of the Travel Plan, are relevant to the subject study:

- Bridger Canyon Travel Planning Area; and
- Hyalite Travel Planning Area.

### **Bozeman Community Climate Action Plan**

**Authored by:** City of Bozeman

**Date:** 2011

**Focus Area:** City of Bozeman

<http://www.bozeman.net/Smarty/files/92/92587259-fd07-414e-95cb-8c041f22d8a0.pdf>

The Mayors’ Community Climate Task Force (MCCTF), a 15 member stakeholder group, was appointed in October 2009 to develop recommendations for the Community Climate Action Plan (CCAP). An emission inventory, measuring fossil fuel based sources in Bozeman, was performed for the years 2000 and 2008 and results showed that transportation accounted for a total of 19% and 26% of total emissions for these years respectively. This report made nine recommendations for improvements to Bozeman’s transportation system. The following four recommendations from the Plan are closely related to BAATS projects recommended in this report:

*TSP1 - Expand and improve multi-modal infrastructure* –The CCAP supports incorporating an interconnected network of trails, bike lanes, safe street crossings, transit infrastructure and a grid street system as part of all new development and street construction.

*TSP2 - Allocate a 1 mill levy for Streamline directly* - A reliable public transportation system is an essential component to a carbon footprint reduction portfolio. Streamline bus service depends on local donations and partners for its existence with the majority of funding coming through the state with federal dollars. One mill (\$80,783 in 2011) would provide

the necessary revenue to allow Streamline to expand its coverage and make its services more reliable.

*TSP6 - Interconnect and enhance sidewalk network* - In an effort to reduce vehicle miles traveled (VMT), the fragmented sections of the existing sidewalk network should be better connected. In addition, additional sidewalks, shared-use paths and trails should be added to the network to connect a variety of destinations.

*TSP7 - Support a local option gas tax* - A local gas tax could be used primarily to support alternative fuel vehicles, improved bicycle and pedestrian facilities, and better public transit.

## 1.7 Overview of Potential Funding Sources

### 1.7.1 Introduction:

An expansive list of potential funding sources was developed and reviewed for applicability to BAATS projects. Relevant funding sources are organized below based on funding source including: federal, state, county, city, or private. This overview presents a brief description of each relevant funding source and notes project applicability. Section 1.10.5 provides a list of the additional funding sources that were identified but deemed not relevant to BAATS projects.

### 1.7.2 Federal & State:

#### **FHWA via MDT Federal Lands Access Program (FLAP)**

FLAP was established to improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands. FLAP 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. FLAP was used to fund Path to the M and Drinking Horse Mountain (currently in design) and is a good fit for BAATS projects in general given that the primary purpose of such projects is to increase access to recreational areas (almost all of which are on federal lands). Next call for projects is anticipated December 2015.

BAATS Project Applicability: Multi-use paths and & shuttles

#### **FHWA via MDT Federal Lands Transportation Program (FLTP)**

The FLTP builds upon the structure of the traditional Federal Lands Highway Program. It improves multi-modal access within national parks, forests, wildlife refuges, Bureau of Land Management (BLM) lands, and U.S. Army Corps of Engineers facilities. The FLTP complements the Federal Lands Access Program. Whereas the Access Program provides

funds for State and local roads that access the Federal estate, the FLTP focuses on the transportation infrastructure owned and maintained by Federal lands management agencies or other defined adjacent properties. Call for projects anticipated December 2015.

### **FHWA via MDT Transportation Alternatives Program (TAP)**

TAP provides funding for alternative transportation projects including pedestrian and bicycle facilities, non-motorized enhanced mobility and community improvement. During the most recent funding cycle (2013-2014), 25 projects were funded within Montana, for an average of approximately \$295,000 per project. The next call for projects is anticipated in summer of 2017.

BAATS Project Applicability: Pedestrian / Bike Trails

### **FHWA via MDT Transit Capital & Operating Assistance Funding**

#### **Enhanced Mobility of Seniors & Individuals with Disabilities (Section 5310)**

Section 5310 authorizes capital grants to eligible organizations to assist in providing transportation for the elderly and/or persons with disabilities. Federal Transit Administration (FTA) funds 80% of all costs for equipment, with 20 percent match provided by the local recipient. In Montana this funding is primarily used for capital (equipment). Some of the buses purchased with this funding could be used in a system that services Federal lands. The funding source is worth considering as shuttle/transit projects are developed.

BAATS Project Applicability: Shuttles / Transit

#### **Formula Grants for Rural Areas (Section 5311)**

Section 5311 enhances the access of people in non-urbanized areas by providing public transportation. Public transit services that operate to Federal lands could use this funding.

BAATS Project Applicability: Shuttles / Transit

#### **Bus & Bus Facilities (Section 5339)**

Section 5339 provides capital funding to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities. Vehicles purchased with these funds could be used to operate services to locations such as Bridger Bowl, Hyalite Canyon and other Federal lands.

BAATS Project Applicability: Shuttles / Transit



### **FHWA via MDT Transportation Investment Generating Economic Recovery (TIGER)**

The TIGER Discretionary Grant program provides a unique opportunity for the DOT to invest in road, rail, transit and port projects that promise to achieve national objectives. The eligibility requirements of TIGER allow project sponsors at the State and local levels to obtain funding for multi-modal, multi-jurisdictional projects that are more difficult to support through traditional DOT programs. Some form of TIGER funding has been made available each year since

### **Surface Transportation Program (STP) / Urban Highway System (STPU)**

These urban funds are used primarily for rehabilitation, resurfacing, major street construction, reconstruction of existing facilities, and traffic operation projects on the 430 miles on the State-designated Urban Highway System, but can also be used for any project that is eligible for STP under Title 23 U.S. C. Priorities for the use of these funds are established at the local level through local planning processes with final approval by the Transportation Commission. Non-motorized facility enhancements should be considered anytime these funds are being sought.

BAATS Project Applicability: Pedestrian / Bike Bikeways on S. 19<sup>th</sup> St.

### **Montana Office of Tourism (MTOT) - Infrastructure / Digital Development Grant Program**

MTOT's grant programs are aimed at strengthening Montana's economy through the development and enhancement of tourism. MTOT's Grant Program awards \$1 Million in annual grants to projects that strengthen Montana's economy through the development and enhancement of the state's tourism industry. The Grant Program offers funding in four categories:

- Tourism Digital Development
- Tourism Infrastructure
- Tourism Event Paid Media Advertising
- Tourism Trade Show Assistance

<http://tourism.mt.gov/MarketingDevelopment/GrantProgram>

The Tourism Digital Development and Infrastructure categories are particularly relevant to this BAATS' project. Eligible projects, under Tourism Digital Development include:

- Website development or enhancement
- Responsive website design
- Mobile app development
- Search engine optimization
- Strategic collaborative marketing initiatives that build off the Montana Brand

The Tourism Infrastructure funding is awarded to tourism "bricks & mortar" infrastructure projects. Although the proposed shuttle projects (#4 and #5) are not representative of

typical projects that receive funding from this source, the grant manager has confirmed that a bike shuttle concept would be eligible for the infrastructure grant program provided that there were a marketing outreach component that reached out to visitors outside of Bozeman.

Funding is awarded on a rolling basis with funds being replenished in July of each year.

BAATS Project Applicability: Shuttle / Transit & Web-based Outreach Campaign

### **Recreational Trails Program (RTP)**

RTP provides funds to develop and maintain recreational trails and trail-related facilities in Montana. Average grant is approximately \$25,000. The next funding cycle is anticipated to open December, 2015.

BAATS Project Applicability: Shared-use trails, alternative transportation enhancements at Story Mill Community Park,

### **1.7.3 County & City:**

#### **City of Bozeman General Funds**

One of the primary responsibilities of local government is to properly preserve, maintain, and improve a community's stock of buildings, streets, parks, water and sewer lines, and equipment. The City Parks Director confirms that the general funds may be a possible funding avenue for BAATS projects. Funds would be sought in conjunction with the City's annual funding cycles.

BAATS Project Applicability: Shuttle / Transit, Pedestrian / Bike Trails & Outreach Campaign

#### **City of Bozeman Trails, Open Space, and Parks Program (TOP)**

This program initially consisted of a \$15 million bond that has been applied towards various trails, open space and parks projects, including matching funds for the Path to the M and Drinking Horse Mountain and significant funding for the Story Mill Community Park. As of October 2015, minimal funding, if any, remains.

BAATS Project Applicability: Pedestrian / Bike Trails

#### **Developer Exactions / Cash-in-Lieu of Parkland**

This program provides some funding for parkland including trails. The Recreation and Park Advisory Board, in conjunction with Park staff, make recommendations to City Commission for use of these funds. Typically funds must be dedicated to projects that are within ½ mile of points of origin. The availability of funds needs to be reviewed on a case by case basis.

BAATS Project Applicability: Pedestrian / Bike Trails

### **Gallatin County Open Space Bond**

Grants are awarded for purchase or donation of land or development rights or transaction costs related to conservation easements.

BAATS Project Applicability: Acquiring Shared-use trail corridors or parking areas

#### **1.7.4 Private:**

### **Collin's Coalition**

Collin's Coalition is committed to improving the safety of bicycle and pedestrian transportation as an essential part of healthy communities. This Coalition provided \$20,000 in matching funds in support of the Path to the M and Drinking Horse Mountain.

BAATS Project Applicability: Pedestrian / Bike Safety

### **Downtown Bozeman Partnership and Local Businesses**

The Downtown Bozeman Partnership consists of three member organizations; the Downtown Bozeman Association (DBA), Business Improvement District (BID), and Tax Increment Fund (TIF). These partners work to strengthen downtown as a critical element in the greater community fabric. Partnership Executive Director Chris Naumann has participated in ongoing discussions regarding shuttle systems to access Federal lands. Partnership and/or some of its member organizations, along with additional local businesses, may be interested in providing funding to one or more BAATS projects. Helena's Trail Rider shuttle is partially funded in a similar manner. The partnership budget is approved on an annual basis.

BAATS Project Applicability: Shuttle System, Alternative Transportation Information Campaign

### **Bozeman Tourism Business Improvement District (BTBID)**

The mission of the BTBID Board of Trustees is to promote tourism that generates room nights for lodging facilities in the city of Bozeman by effectively marketing the region as a preferred travel destination. To the extent that BAATS projects can support this mission, BTBID represents a possible funding source.

BAATS Project Applicability: Shuttle System, Bridger Canyon Bus and Carpool Enhancements, Alternative Transportation Information Campaign

### **User groups and mission-driven non-profits**

Funding from specific user groups and non-profits was not investigated because there are so many such groups and such funding is anticipated to represent a minority of funding for most projects. Nonetheless, this category is included as a reminder that such groups represent critical funding that can be used as seed money or matching funds that help to demonstrate grass roots support for projects. For example, a mountain bike organization may contribute to purchasing a trailer and racks to haul bikes behind a shuttle. Such funding would then signal to other funding agencies support for the project.

BAATS Project Applicability: All

#### **1.7.5 Non-Applicable Funding Sources**

A number of additional funding sources were reviewed and determined not to be applicable to BAATS projects at this time. These funding sources, along with the rationale for this determination, are listed below.

- Advocacy Advance Grants (exclusively target advocacy organizations)
- American Hiking Trails Fund (hiking trail focus and grants <\$5,000)
- Building Blocks Program (technical assistance offered not relevant to BAATS projects)
- Citizens' Institute on Rural Design (funding is not offered)
- Community Development Block Grant (BAATS projects are outside of funding priority areas)
- Congestion Mitigation / Air Quality (CMAQ) – (BAATS projects are outside of funding priority areas)
- Congressionally Directed Funds (such funding is always possible but not likely)
- Highway Safety Improvement Program (HSIP) – (no relevant crash clusters to warrant funding)
- IMBA / Cliff Bar Trail Preservation Grants (grants are \$1,000 or less)
- Impact Fees (does not exist for County)
- Land & Water Conservation Fund (BAATS projects not aligned with core purposes of Fund)
- Park Improvement Grants for City of Bozeman (BAATS projects are outside of funding priority areas)
- Peopleforbikes Community Grant Program (BAATS projects are outside of funding priority areas)
- River, Trails, and Conservation Assistance Program – (available funds are planning focused and not implementation focused)
- Rural Community Development Initiative – (not currently relevant because Bozeman is <50,000 people)
- Strong Towns – (no applicable funding sources)

- Surface Transportation Program (STP), Bridge Program (STPB) – (No bridges requiring replacement were identified as a part of this study)
- Surface Transportation Program (STP), Primary Highway System (STPP) & Secondary Highway System (STPS) – (none of the BAATS projects are on the applicable Systems)
- Surface Transportation Program (STP), Urban Pavement Preservation Program (UPP) – (Only applies to on-street facilities)
- Transit Capital & Operating Assistance Funding, Fixed Guideway Capital Investment Grants - Section 5309 – (Applies to light rail and other projects that require significant investment, beyond the regular 5309 capital program)
- Transit Capital & Operating Assistance Funding, Urbanized Area Formula Grants (Section 5307) – (not currently relevant because Bozeman is <50,000 people)

# Section 2

## Shared-Use Paths

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## 2.1 Summary

“Main Street to the Mountains” reflects a community vision that would create a non-motorized transportation network throughout the greater Bozeman area between downtown and the surrounding mountains including public lands in the Bridger Ranger to the north and Gallatin Mountains to the south. When BAATS was first funded, some of the more notable gaps in the system were those final linkages to the mountains. The 2.3-mile Path to the M and Drinking Horse Mountain (currently in design) has since been funded and will connect Bozeman’s existing trail system to the “M” and Drinking Horse Mountain trailheads at the base of the Bridger mountains. Based on a comprehensive feasibility study of eight potential corridors, this project seeks to advance the recommended corridor, a 7.4-mile, separated, shared-use path; this path would run from just north of the intersection of South 19th Avenue and West Kagy Boulevard to the national forest service boundary along Hyalite Canyon Road via S. 19th Avenue and Hyalite Canyon Road. as shown in Figure 2-1. This path would provide access in both directions, helping to meet the needs of recreationalists and also providing a non-motorized option for people to commute or travel towards town.

In addition, as a part of the feasibility study, it was determined that five of the studied corridors are potential candidates for advisory bike lanes, a treatment currently classified as “experimental” by the Federal Highway Administration. These facilities provide bicycle lanes on roads that would otherwise be too narrow for them without the need for shoulder widening. This project identifies next steps for MDT and / or Gallatin County to pilot such a system on an area road. Such a treatment has the potential to significantly improve safety and comfort for non-motorized users for a fraction of the cost associated with shoulder widening or constructing separated paths. These advisory bike lanes are described on the last page of [Appendix 1-6: Task 9: Bicycle Safety on Rural Highways](#).



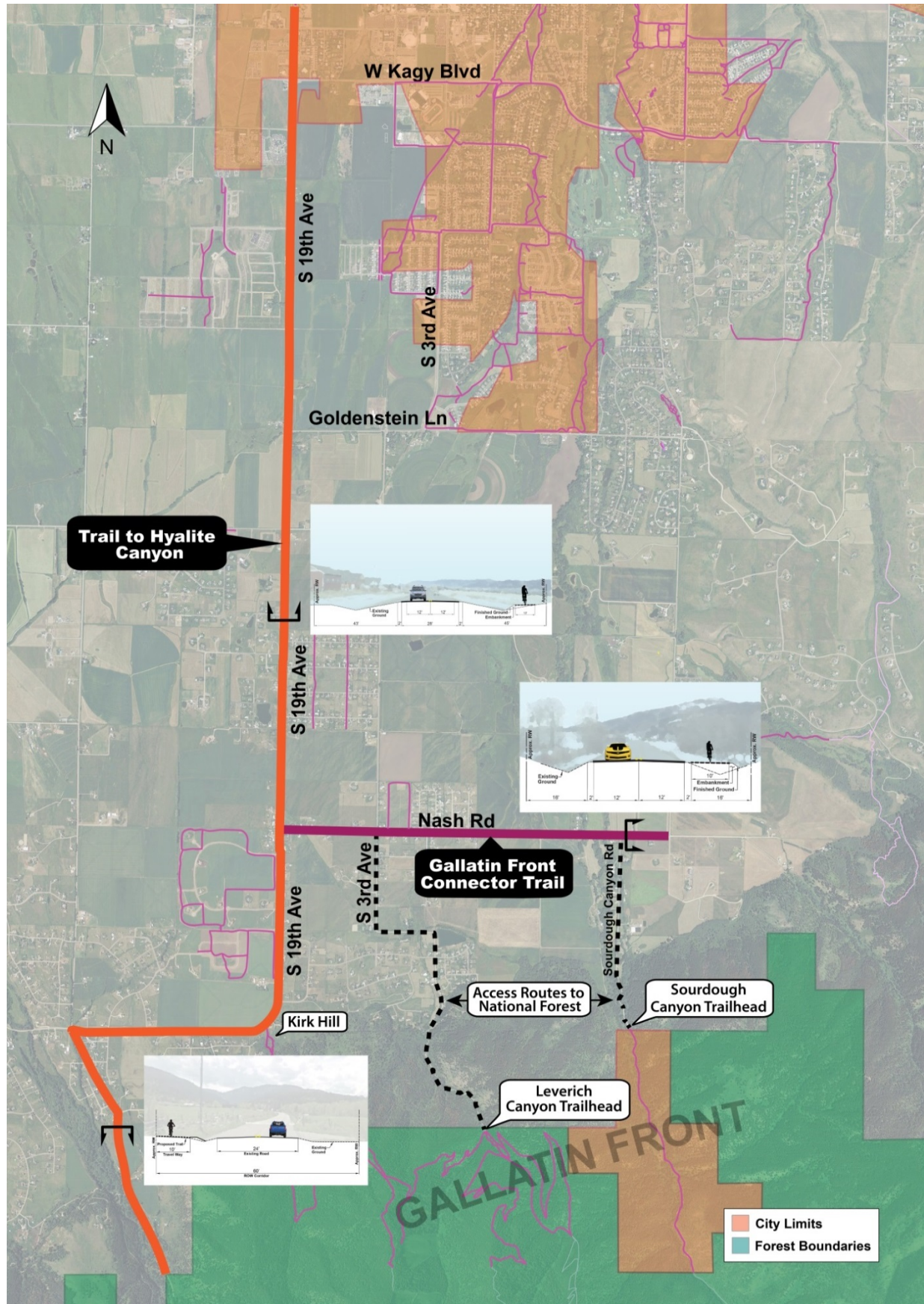


Figure 2-1: Recommended corridor running along S. 19th Avenue and Hyalite Canyon Road



## 2.2 Problem Identification

There are numerous trailheads along the Gallatin Front that are heavily used in all seasons. Such trailheads include Bear Canyon, Sourdough Canyon, and Leverich Canyon. In addition, there are a number of popular trailheads in the Hyalite Canyon recreation area. However, there are significant gaps in the non-motorized facilities that connect Bozeman to public land in the Gallatin Mountains south of Bozeman.

There are indications that many people would ride their bicycles to these recreational areas provided there was a safe and comfortable route to ride. According to a 2012 survey, approximately 55% of the 157 respondents reported they were likely to bike to the Hyalite Canyon area if a bike path were available. The type of bike path was not specified.

Research has shown that the majority of potential bike riders require facilities that are separated from traffic to be comfortable riding their bicycles.

This project seeks to establish a shared-use, separated path that will provide a safe, accessible, non-motorized connection from the core of Bozeman to Hyalite Canyon and to trailheads along the Gallatin Front. Since the 2000 census, the population of the greater Bozeman area has increased by over 47%, putting ever increasing pressure on surrounding recreational areas. This project represents one of several integrated strategies that target alternatives to the automobile for improving access to recreational areas surrounding Bozeman.

This project proposes a 7.4-mile, shared-use path along the S. 19th Avenue and Hyalite Canyon Road corridor as shown in Figure 1. This path would originate at an existing asphalt trail on the east side of S. 19th Avenue, approximately 0.4 miles north of Kagy Boulevard. The trail would then run along the east side of S. 19th Avenue, past Kirk Hill, and all the way to Hyalite Canyon Road. At the intersection of S. 19th Avenue and Hyalite Canyon Road the proposed path would turn south where it would run adjacent to Hyalite Canyon Road (east side) for 1.3 miles to the Custer Gallatin National Forest Boundary. The proposed terminus coincides with the proposed origination of the future Hyalite Canyon Trail, a single track trail identified in the Forest Travel Plan. This trail would run adjacent to Hyalite Canyon Road.

## 2.3 Estimated Project Costs

Design and construction costs for the S. 19th Avenue/Hyalite Canyon Road corridor, including a 30% contingency, are estimated at \$5.1M in 2015 dollars as detailed in Figure 2-2. The relocation of power poles is not included.

DESCRIPTION	QTY	UNIT	UNIT PRICE	AMOUNT
CONSTRUCTION SCHEDULE	1	LPSM	\$10,000.00	\$10,000
CONSTRUCTION SURVEY & STAKING	1	LPSM	\$200,000.00	\$200,000
SOIL EROSION CONTROL	1	LPSM	\$50,000.00	\$50,000
CLEARING AND GRUBBING	28.5	ACRE	\$6,000.00	\$171,000
REMOVAL OF PAVEMENT, ASPHALT	885	SQYD	\$6.00	\$5,310
REMOVAL OF TREES	107	EACH	\$300.00	\$32,100
EARTHWORK	1	LPSM	\$850,000.00	\$850,000
CRUSHED GRANULAR BASE	6,725	CUYD	\$50.00	\$336,250
MINOR HOT ASPHALT PAVEMENT	423,000	SQFT	\$1.35	\$571,050
18-INCH PIPE CULVERT	80	LNFT	\$60.00	\$4,800
24-INCH PIPE CULVERT	140	LNFT	\$70.00	\$9,800
36-INCH PIPE CULVERT	12	LNFT	\$85.00	\$1,020
FLARED END SECTION, FET	6	EACH	\$300.00	\$1,800
CURB AND GUTTER, CONCRETE	320	LNFT	\$20.00	\$6,400
SIDEWALK, CONCRETE	356	SQYD	\$60.00	\$21,333
TRUNCATED DOMES	760	SQFT	\$40.00	\$30,400
BOULDER PLACEMENT	30	EACH	\$500.00	\$15,000
PLACE CONSERVED TOPSOIL	19.0	ACRE	\$8,000.00	\$152,000
SEEDING, DRY METHOD	19.0	ACRE	\$1,000.00	\$19,000
SIGN SYSTEM, PERMANENT TRAFFIC CONTROL	5	EACH	\$500.00	\$2,500
SIGN SYSTEM, PEDESTRIAN SIGNS	19	EACH	\$500.00	\$9,500
REMOVE AND RESET SIGN	10	EACH	\$275.00	\$2,750
REMOVE AND REPLACE MAILBOX	11	EACH	\$260.00	\$2,860
WOOD POST AND POLE FENCE	400	LNFT	\$25.00	\$10,000
4" DIA CONDUIT CROSSING TRAIL	300	LNFT	\$10.00	\$3,000
PAVEMENT MARKINGS, EPOXY	1	LPSM	\$50,000.00	\$50,000
TEMPORARY TRAFFIC CONTROL	1	LPSM	\$175,000.00	\$175,000
RELOCATE EXISTING UTILITIES, OVERHEAD STREET LAMP	1	EACH	\$3,000.00	\$3,000
PUSH BUTTON, PEDESTRIAN, APS WITH VOICE MESSAGING	8	EACH	\$1,750.00	\$14,000
SIGNAL POLE, PEDESTRIAN, TYPE I-100, CONCRETE BASE	8	EACH	\$2,300.00	\$18,400
LED COUNTDOWN SIGNAL INDICATOR	8	EACH	\$630.00	\$5,040
INSTALLATION OF 2" PLASTIC CONDUIT (INCLUDES REMOVE AND RESET ASPHALT AND CURB)	4	EACH	\$3,000.00	\$12,000
PULL BOX, COMPOSITE, TYPE 2	4	EACH	\$300.00	\$1,200
LANDSCAPING	1	LPSM	\$50,000.00	\$50,000
MISCELLANEOUS WORK	50000	EACH	\$1.00	\$50,000
			<b>SUBTOTAL:</b>	<b>\$2,896,513</b>
			Mobilization (10% of Sub-Total)	<b>\$289,651</b>
			Contingencies (30% of Sub-Total)	<b>\$868,954</b>
			<b>TOTAL CONSTRUCTION COST:</b>	<b>\$4,055,119</b>
Preliminary Engineering Costs (Assumed as 15% of Total Construction Cost)				<b>\$608,268</b>
Construction Engineering Costs (Assumed as 10% of Total Construction Cost)				<b>\$405,512</b>
			Right-of-Way Costs	<b>\$0</b>
			<b>TOTAL PROJECT COSTS:</b>	<b>\$5,068,898</b>

Table 2-1: Estimated Project Costs in 2015 Dollars

These costs were generated by DJ&A, P.C., an engineering firm with recent experience in the design and construction of the 8-mile Missoula to Lolo Trail that was bid in February 2015. This trail, with total design and construction costs of \$6.36M, served as the primary basis for the cost estimations.

## 2.4 Study Evaluation Factors

### **Visitor mobility for a full range of ability and income levels**

This project targets a full range of income levels, including those who do not own automobiles. The paths will typically be 10'-wide, asphalt paths that meet ADA requirements and are accessible to numerous forms of non-motorized transportation including walking, running, bicycling, skating and more. Where possible, provisions will be made for those on horseback to ride adjacent to trail.

### **Visitor experience both within the target recreational areas as well as transit to those areas**

This project aims to increase the number of people who access recreational areas without an automobile thereby reducing congestion related concerns at these areas. This project also provides increased modes, in this case non-motorized modes, by which people can access these areas.

### **Environmental impact primarily as measured by wildlife safety, footprint of built environment, and carbon emissions**

Encouraging mode shift from automobiles to non-motorized modes will improve wildlife safety, decrease pressure for increasing footprint of built environment and reduce carbon emissions.

### **Operational efficiency and financial sustainability**

The 20-year life-cycle costs for the on-going operations and maintenance of the proposed trail are estimated to cost approximately \$925,000. For example, \$925,000 would need to be set aside in the near term to pay for all anticipated O&M costs, including asphalt removal and replacement, over the next 20 years. This figure is conservative as pavement replacement may not be needed for 30+ years. Approximately \$10,000 per year would be required to provide sweeping (twice per year); crack cleaning and sealing, every year; and seal coating, every 5 years.

Gallatin County currently has no funding mechanism for trail maintenance. Such funding will need to be addressed so that non-motorized facilities can be maintained. Such funding mechanisms will make funding applications more competitive.

## 2.5 Technical, political, economic, and administrative feasibility

### **Technical Feasibility**

An engineering feasibility study has been completed for this proposed path and concluded that the path is technically feasible.

### **Political Feasibility**

The project has been vetted by key stakeholders including Gallatin County, Montana Department of Transportation (MDT), and Custer Gallatin National Forest and therefore has been deemed politically feasible. The proposed path would lie within MDT right of way along S. 19th Avenue. and within Gallatin County right of way along Hyalite Canyon Road. The terminus of the trail would be at the Forest Boundary.

### **Economic Feasibility**

Assuming funds can be secured for design and construction, a funding source for maintenance would eventually need to be identified. Both S. 19th Avenue and Hyalite Canyon Road are maintained by Gallatin County. With few exceptions, there are currently no County funds for trail maintenance. A county-level levy for parks and trails, or something comparable, would likely be required to fund ongoing maintenance requirements for the Hyalite Canyon Road portion of the proposed project.

### **Administrative Feasibility**

The design and construction of a trail is well within the administrative capabilities of each of the potential lead partners.

## 2.6 Past Planning Efforts

### **PROST Plan**

The Parks, Recreation, Open Space and Trails (PROST) Plan, adopted December 17, 2007, established a master plan for trail and path development throughout the greater Bozeman area. The PROST trails map shows a proposed separated path along S.19th Avenue. that encompasses the entire proposed path along S 19th Avenue. to the north of Nash Road as Nash Road is at the edge of the PROST Plan's study area.

### **Greater Bozeman Area Transportation Plan (2007 Update)**

This Plan takes precedence over the PROST Plan, as stated on page 2-39. Table 5-8 on page 5-37 identifies S. 19th Avenue. from College St. to Goldenstein Lane as a recommended shared-use path. Table 5-5 recommends that bike lanes be added to the remaining portions of S. 19th Avenue. out past Hyalite Canyon Road. The same table recommends a wide shoulder along Nash Road.

## **2006 Forest Travel Plan**

This plan included a future Hyalite Canyon Trail that would parallel Hyalite Canyon Road. The trail would begin at the Forest boundary, located approximately 1.3 miles south of S. 19th Avenue, and run to the south for an undetermined distance. This future trail, listed on Page II-107 of the Travel Plan, would target mountain bikers and hikers and would be open to X-C skiers and snowshoers. Forest personnel have confirmed that this trail remains an integral part of future travel plans, although no specific timelines or funding streams have been established, and that today's transportation planning should account for this future Hyalite Canyon Trail. As a result, the proposed path for this project extends all the way to the planned origination point for the proposed Hyalite Canyon Trail to provide eventual connectivity.

## **2.7 Potential Project Partners**

### **Custer Gallatin National Forest**

Although neither of the subject proposed corridors are on National Forest land, they both provide access to the National Forest. Some federal funding sources, including the Federal Lands Access Program, require a federal partner. The Forest has served this role on the Bozeman Area Alternative Transportation Study and would be the logical partner for the subject project as well.

### **Montana Department of Transportation (MDT)**

S. 19th Avenue is a secondary highway and part of MDT's highway system. Encroachment and construction permits would be required from MDT for those portions of the subject project that lie within the MDT corridor.

### **Gallatin County**

The county owns and/or maintains all of the roadways adjacent to the proposed paths. Although S. 19th Avenue is an MDT highway, it is maintained by Gallatin County, as directed by a maintenance agreement with MDT. As such, a subsidiary maintenance agreement would be required by Gallatin County to designate responsibility for on-going maintenance of the proposed paths. The other applicable roadway, Hyalite Canyon Road, is a County road and would require encroachment and construction permits from the County. County representatives have participated in the planning for this project and are supportive.

### **City of Bozeman**

Limited sections of the proposed project, including approximately 0.4 miles north of Kagy Boulevard along S. 19th Avenue, will lie within the City of Bozeman. This section of path will represent an extension of the City's system. And as Bozeman grows, the City limits will include more of the proposed pathway route. City representatives have participated in the planning for this project and are supportive.

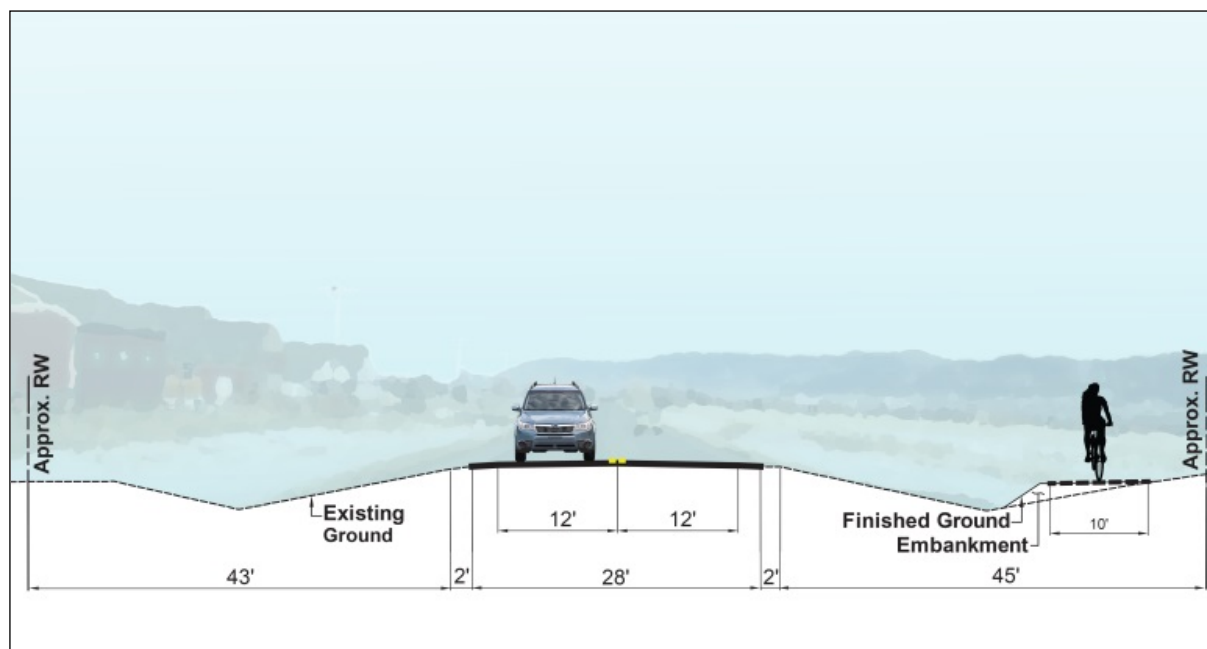
## 2.8 Prospective Funding Sources

- [Federal Lands Access Program \(FLAP\)](#)
- [Transportation Alternatives Program \(TAP\)](#)
- [Recreational Trails Program \(RTP\)](#)
- [Private sources](#)

## 2.9 Project Readiness

### Right of Way Acquisition

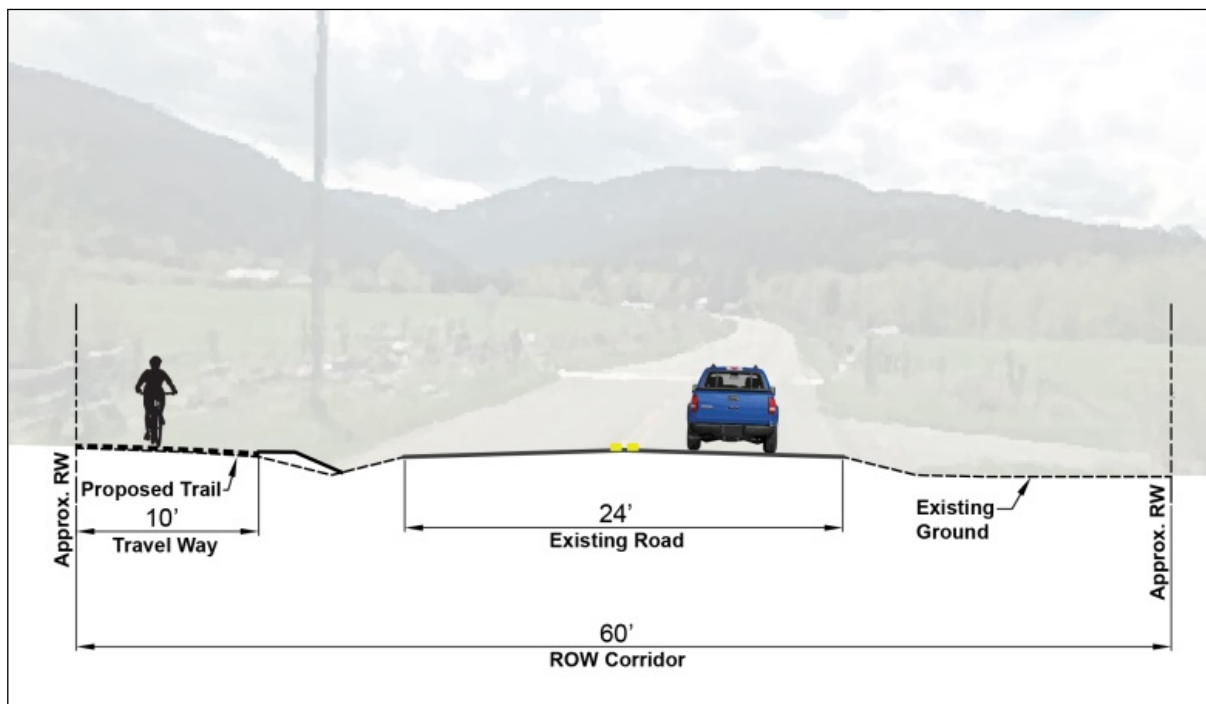
As documented in [Appendix 2-1 - ROW Analysis](#), the existing public ROW for the subject corridor along S. 19th Avenue. varies between 100' and 120' in width. As shown in Figure 2-2, there is ample room to accommodate a separated, shared-use path. Such separation is typical for nearly the entire length of the S. 19<sup>th</sup> corridor.



*Figure 2-2: Typical section along S. 19th Avenue. looking north*

There should also be sufficient existing road ROW along the Hyalite Canyon Road section to the Forest boundary to accommodate the addition of a separated trail. The paved width is approximately 24 feet and the ROW width is 60 feet, as shown in Figure 2-3.

In the case of both sections of road, it does not appear that additional ROW would be needed, although temporary construction easements may be required for trail construction.



*Figure 2-3: Typical section along Hyalite Canyon Road looking south*

## Public, Organizational and Agency Support

The proposed corridors have the support of the Technical Advisory Group, which consists of members representing the following agencies and organizations:

- Custer Gallatin National Forest
- Montana Department of Transportation (MDT)
- Gallatin County
- City of Bozeman
- Gallatin Valley Land Trust (GVLТ)

## Geotechnical Feasibility

A formal geotechnical investigation is recommended prior to design but that there are no known historic problems with the underlying soils. The slopes are gentle throughout this corridor and there are no locations where retaining walls are anticipated.

## Environmental Clearance

The subject trail corridors have been evaluated for environmental impacts. Assuming these trails receive state and/or federal funding, construction would trigger the NEPA / MEPA environmental review process, which may include the following steps:

- 1) Biological Resources Report (BRR);
- 2) Cultural Resources Report
- 3) Floodplain Analysis;
- 4) Creek Crossing Design / Aquatic Organism Passage Compliance (AOP);
- 5) Stormwater Pollution Prevention Plan (SWPPP);



- 6) Environmental Permitting; and
- 7) Resource Mitigation.

No further environmental assessment is anticipated for these corridors as they would all be expected to receive categorical exclusions (CEs). Environmental clearance is discussed in as a part of the feasibility study approach in section 2.12.3 Evaluate Corridors.

## 2.10 Project Risks

Typical risks for such a project, including right of way acquisition, agency opposition, and environmental clearance were determined to be minimal on this project as a result of the feasibility study that was conducted. The remaining risks have been clearly identified and will be mitigated.

### Public Opposition

Although there have been two public meetings associated with this trail and there is no known resistance to it, direct public engagement of adjacent landowners has not been completed.

### Costs

DJ&A, P.C., a Missoula based engineering firm, developed the Cost Estimate based on reliable quantity take-offs. Unit costs were based on recent, comparable, competitively bid projects. Conservative mark-ups were provided as follows: 15% for preliminary & final design; 10% for construction engineering; and, 30% for contingency.

## 2.11 Relevant Projects

### Path to the M and Drinking Horse Mountain

Description: This 2.3-mile path connects Story Mill Road to the “M” trailhead and lies within existing MDT ROW along Highway 86. The trail was funded in 2013 and is currently in the development phase by the Western Federal Lands Highway Division. The proposed trail consists of a 10'-wide, asphalt, shared-use path.

Funding Sources: As shown in Table 2-2, the primary funding source was Federal Lands Access Program (FLAP) with key support from the City of Bozeman, Collin’s Coalition, and GVLT.

Funding & Match			
<i>Also see information under question 5 about in-kind support from partners.</i>			
Source	Detail	Amount	Proportion of total project cost
Federal Land Access Program	Provided from the Western Federal Lands Highway Division. GVLТ, WTI, City of Bozeman, and Gallatin National Forest applied for funding in February 2013 and received commitment in July 2013. Program requires at least 13.7% local match.	\$3,402,594	85.8 %
Collin's Coalition	Match committed to improve safety issues	\$20,000	0.5%
GVLТ	Match committed for staff time and installation of trail amenities and infrastructure	\$15,000	0.4%
City of Bozeman TOP Bond request	Requested	\$527,406	13.3 %
TOTAL		\$3,965,000	100%

Table 2-2: Screen shot of funding & match plan included in application for City of Bozeman TOPS funding

### Missoula to Lolo Trail

Description: This U.S. DOT-funded project (TIGER) is an 8-mile trail that is currently under construction. The trail consists of a 10'-wide asphalt, shared-use path that lies within existing public ROW.

Reference: <http://missoula2lolotrail.org/>

Funding Sources: As shown in Table 2-3, the primary funding source was TIGER, a U.S. Department of Transportation program, along with key support from Missoula County, the City of Missoula, and MDT.

DESCRIPTION	COST	% OF TOTAL
Total Project Cost	\$5,480,363	100%
County Contribution	\$400,000	7.3%
City Contribution	\$300,000	5.5%
Additional City Contribution - Community Transportation Enhancement Program <sup>1</sup>	\$100,000	1.8%
MDT Material Contributions	\$100,000	1.8%
TIGER Discretionary Grant Fund	\$4,580,363	85.4%

Table 2-3: Screen shot of funding & match plan included in application for City of Bozeman TOPS funding

## 2.12 Draft Statement of Work

### **Project Management**

Project management includes tasks such as preparing invoices and reports documenting the use of all funds, correspondence with the client, providing updates on project progress, and general project oversight and administration. The efforts of all subconsultants will be coordinated by the prime consultant. Meetings with subconsultants to define their work requirements, submittal reviews, responding to inquiries, and processing of invoices are included in this item. Coordination with the Gallatin County Public Works Department, the Gallatin County Floodplain Administrator, the Montana Department of Transportation (MDT) and the DNRC will be necessary. In addition to email and telephone correspondence, it is anticipated that personal meetings with many of those listed will also be necessary.

### **Preliminary Design and Environmental Clearance**

Preliminary design will include tasks such as survey and mapping of the project corridor; preliminary horizontal and vertical layout and design of the trail; minimal geotechnical investigations to verify the soil characteristics throughout the corridor; traffic studies to be performed at Kagy Boulevard; and performing studies or resource work associated with obtaining environmental clearance (as noted in [Environmental Clearance](#), a categorical exclusion is anticipated but not guaranteed).

### **Final Design and Contract Documentation Preparation**

Final design will include the preparation of construction plans, project specifications, and an engineer's estimate of probable cost for the purpose of bidding and administering the construction contract. Plans will include the design elements necessary to construct a shared use path along the defined corridor. Final plans and specifications will be prepared in a format that is consistent with the standards and practices of the [partnering agency]. Permits that may not reasonably be obtained by the contractor will be obtained by the [partnering agency] prior to awarding the project to a contractor.

### **Construction and Construction Administration**

A contractor will be selected through a competitive bidding process to construct the project as shown in the final design. The contractor will be required to obtain any permits necessary for construction except those obtained by [partnering agency TBD] prior to award of the project. Construction oversight and administration will be required to ensure that the project is built as dictated by the plans and specifications. Assistance will be required to complete project closeout documents and as-built drawings for the project.

## 2.13 Feasibility Study Approach & Findings

### 2.13.1 Identify Study Corridors

As per initial scope of work for Phase III, the consultant team met with relevant groups. Several of these groups were targeted for feedback regarding potential corridors to be studied. The grouping of potential corridors was identified during a working session involving members of the consultant team and GVLTT, the entity that has more experience than any organization with the development of the trail system in Bozeman.

During the working session the following northern corridors were identified:

- Story Mill – Deer Creek – Rolling Hills Corridor
- Story Mill – McIlhattan – Manley Corridor [later revised to route via Sypes Canyon Road]
- Lyman Creek Corridor [later eliminated due to environmental and ROW concerns]

Questions regarding the merits of such connections to the north were raised particularly in light of the recently-funded 2.3-mile Path to the M and Drinking Horse Mountain. Nonetheless, these corridors were advanced for feedback from other groups.

Three corridors were identified to the south:

- S 19<sup>th</sup> Corridor [later revised to include a connection to the Forest boundary]
- S. 3<sup>rd</sup> Corridor
- Bozeman Creek Corridor
- Sourdough Road Corridor
- Nash Road Corridor

In addition, several other possible corridors were discussed including Fowler, which was judged to be too far west of several key biking destinations targeted in this study including Leverich, Sourdough and Bear Canyons. Other corridors were identified that deserved further consideration. Such corridors included: a foothills trail along the Gallatin Front (later dismissed because the Forest, not the consultant team, would be the appropriate party to advance this corridor); and Kagy Boulevard and Goldenstein east-west corridors (both dismissed because such trails, located far from recreational areas, were deemed to be outside the scope of BAATS).

The consultant team vetted the identified corridors with multiple groups including: County staff (Chris Scott and Mike Harris); City staff (Mitch Overton, Carolyn Poissant, Thom White, and Craig Woolard); Bob Wade, chair of the Recreation & Parks Advisory Board; Gallatin Equestrian Partnership (Marianne Amsden and Jen Mohler); Gallatin National Forest (Jonathan Kempff and Lisa Stoeffler); DIRT Concern (Greg Beardslee); Gallatin Valley Bicycle Club (Bill Cochran); Montana Mountain Biking Association (Bob Allen); and ultimately the Technical Advisory Group (TAG) over the course of three meetings held February, August and September 2015.

The 8 studied corridors are shown in Figure 2-4.



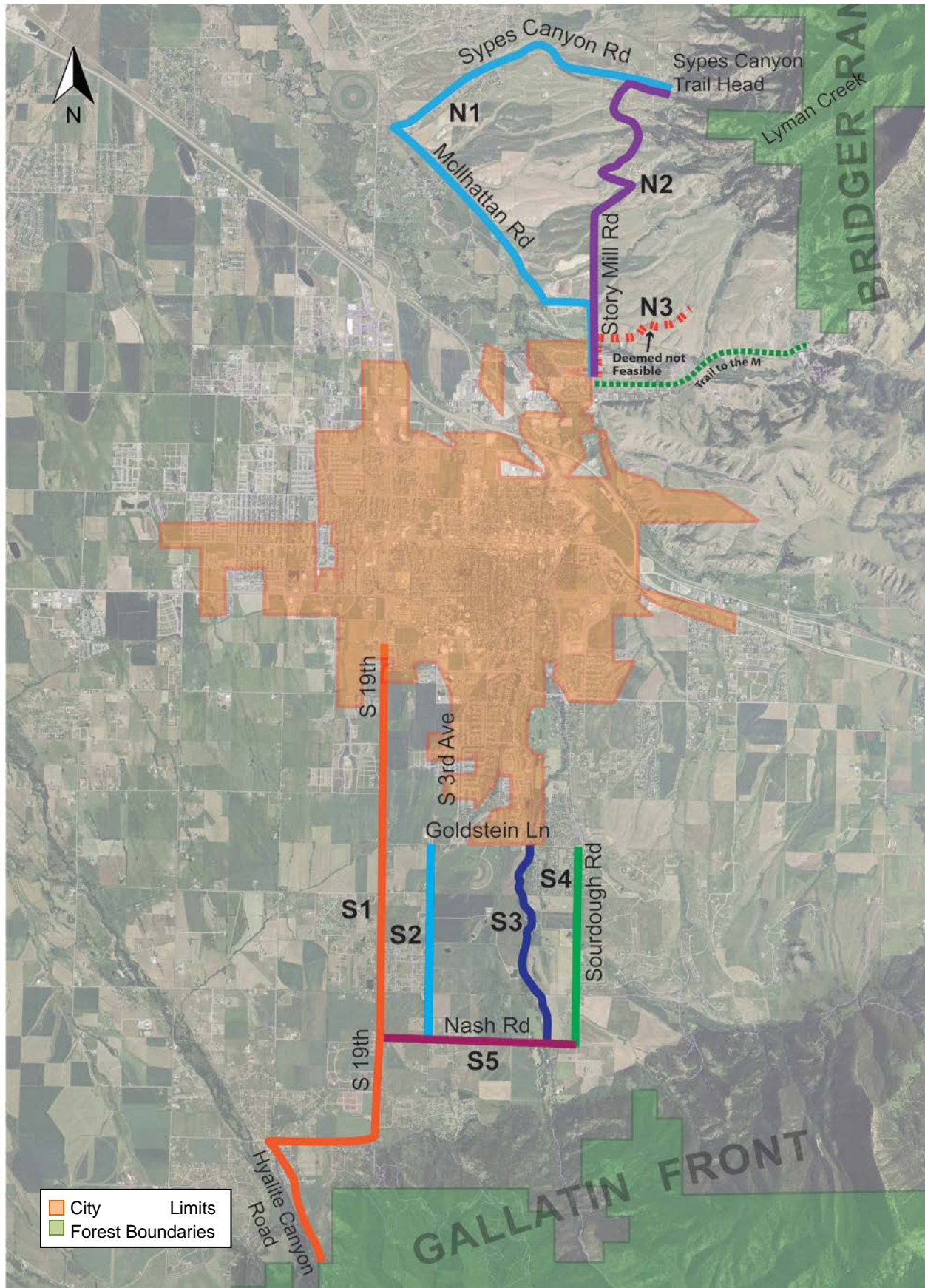


Figure 2-4: Area map of nine shared use path corridors addressed in study

### 2.13.2 Determine Evaluation Criteria

Recommended evaluation factors were presented to the TAG on February 2, 2015; based on feedback from TAG, five factors were identified. These factors were further refined, based on feedback received at the February public meetings, as follows:

- Right-of-way impacts;
- Environmental impacts;
- Comfort and safety;
- Connectivity; and
- Consistency with previous studies and plans.

### 2.13.3 Evaluate Corridors

Each of the corridors, with the exception of Lyman Creek Corridor, was evaluated based on each of the evaluation factors. In the case of the Lyman Creek Corridor, the corridor was deemed not feasible based on right-of-way impacts and environmental impacts, and therefore, further evaluation was not completed. As noted in [Appendix 2-1: ROW Analysis](#), there is no existing public ROW along the Lyman Creek access Road and therefore trail easements would be required from three private parcels along the 1-mile access. Further, concerns were expressed regarding promoting public access to Lyman Creek Canyon, the source of 15% of Bozeman's water supply. Therefore, this corridor is not included in the analysis reported below.

### Evaluate Right of Way Impacts

Studied attributes for this factor include amount of available ROW and amount of additional acquisition required. Such impacts are described in depth in [Appendix 2-1: ROW Analysis](#) and are summarized in [Appendix 2-2: Evaluation Matrix](#).

### Assess Environmental Impacts

A preliminary assessment of environmental impacts for the eight potential trail corridors was conducted. Funding for these trails would very likely involve state and/or federal funding, and therefore, the construction of any one of these trails (assuming such funding is used) would trigger the NEPA / MEPA environmental review process. As of 2015, this process can include the following steps:

- Biological Resources Report (BRR);
- Cultural Resources Report
- Floodplain Analysis;
- Creek Crossing Design / Aquatic Organism Passage Compliance (AOP);
- Stormwater Pollution Prevention Plan (SWPPP);
- Environmental Permitting; and
- Resource Mitigation.

No further environmental assessment is anticipated for any of these corridors as categorical exclusions (CEs) are anticipated. However, such processes are not certain and the need for environmental assessments (EAs) cannot be completely ruled out. A CE, according to 40 Code of Federal Regulations (CFR) 1508.4, reflects "a category of actions

which do not individually or cumulatively have a significant effect on the human environment ... and ... for which, therefore, neither an environmental assessment [EA] nor an environmental impact statement [EIS] is required.” CFR, Title 23, Chapter I, Subchapter H, Part 771.117(c)(3) specifically identifies the “construction of bicycle and pedestrian lanes, paths, and facilities” as activities that meet the criteria for CEs. Further, paragraph (e)(6) clarifies that even the Bozeman Creek Corridor would meet the criteria for a CE. This paragraph clarifies that a CE would also be applicable in the context of floodplain encroachments when such encroachments are in association with a bicycle and pedestrian path that facilitates open space use.

Although all eight corridors are expected to receive CEs, it is anticipated that many of the seven NEPA / MEPA steps identified above would be more rigorous for the Bozeman Creek Corridor project due to the fact that this proposed trail construction would parallel a creek rather than an existing road corridor. MT Fish Wildlife & Parks (MTFWP) was contacted to gather their comments associated with this possible corridor. As included in [Appendix 2-3 – FWP Letter dated July 1, 2015](#), MTFWP biologists Julie Cunningham and Dave Mosher provided a letter that addresses wildlife and aquatic resources along the Bozeman Creek Corridor. Regarding fisheries, the letter states, “there are no specific areas along Bozeman Creek that would be of immediate concern.” Regarding wildlife resources, the letter notes that Bozeman Creek “is a corridor for wildlife movement and we have documented moose, cougar, black bear, and other wildlife along its stretch.” In short, resource mitigation can be anticipated along this corridor. Additionally, much of the trail corridor would be near or within the Bozeman Creek delineated floodplain, requiring additional permitting and mitigation to minimize hydrological and water quality impacts.

Studied attributes for this criterion include: NEPA/MEPA requirements; and likely resource mitigation. Such impacts are summarized in [Appendix 2-2: Evaluation Matrix](#).

### **Evaluate Comfort and Safety**

Studied attributes for this factor include: crash history; number and type of road crossings; traffic volumes and speeds; grades; and separation distances between roadway and trail. Such impacts are summarized in [Appendix 2-2: Evaluation Matrix](#). Ultimately, all corridors were judged to be comparably safe. Therefore, there were no significant advantages of one corridor over another as it related to safety. There were advantages associated with comfort primarily as related to separation distances between roadway and trail and to corridor grades.

### **Evaluate Connectivity**

Studied attributes for this factor include: relation to existing trail networks and recreational areas; and relation to existing populations. Such impacts are summarized in the [Appendix 2-2: Evaluation Matrix](#).



## Evaluate Consistency with Previous Studies and Plans

As described in [Section 1.9 Overview of Past Planning Documents & Studies](#), there are two primary relevant past plans: 1) the Bozeman Parks, Recreation, Open Spaces and Trails (PROST) Plan adopted in December 2007; and 2) The Greater Bozeman Area Transportation Plan (2007 Update) adopted in early 2009. Neither document encompasses the study area of this study however both were useful in validating or checking conclusions made in this study. The consistency with these plans is summarized in [Appendix 2-2: Evaluation Matrix](#).

### 2.13.4 Select preferred alternatives

A Choosing by Advantages (CBA) methodology was used to evaluate the various studied corridors. Under this methodology, the evaluation focuses on advantages. As shown in the [Appendix 2-2: Evaluation Matrix](#), attributes associated with each of the factors were identified for each of the corridors and the importance of various advantages was assessed. The most important advantage was determined to be the advantage associated with not acquiring ROW and therefore this advantage was assigned a score of 100. All other advantages were scored as compared to this 100 point scale. If a different advantage was deemed to be half as important as no ROW acquisition, then the importance of that advantage would be scored as 50. As it turned out, there was no advantage nearly as important as that associated with minimizing ROW acquisition. For example, the second most important advantage was associated with the comfort of the Bozeman Creek Corridor (S3) compared to that of the Story Mill – Deer Creek Corridor (S2). This advantage, which was based on lack of adjacent vehicles and proximity to a pristine setting, was given a score of 25 points, representing just  $\frac{1}{4}$  the importance of not having to acquire all of the ROW associated with the Bozeman Creek Corridor.

The CBA methodology helped the consultant team to analyze the various corridors. In the end, S1 was identified as the highest priority corridor because it was the only corridor that had no ROW acquisition required and that provided adequate separation distance from adjacent roadways. Although the speeds on S1 are as high as 60 MPH, typical separation distance is approximately 30'. Such separation was judged to be significantly more comfortable than lower speed roads, such as 45 MPH on Sourdough Rd, where the separation distance could be as little as 2 feet. Such minimal separation distances would be typical in at least some sections of N1, N2, S4, and S5.

### 2.13.5 Complete conceptual designs and cost estimates for preferred alternatives

Conceptual designs were completed for the S1 corridor as presented previously in Figure 2-1. Cost estimates were presented previously in Table 2-1.

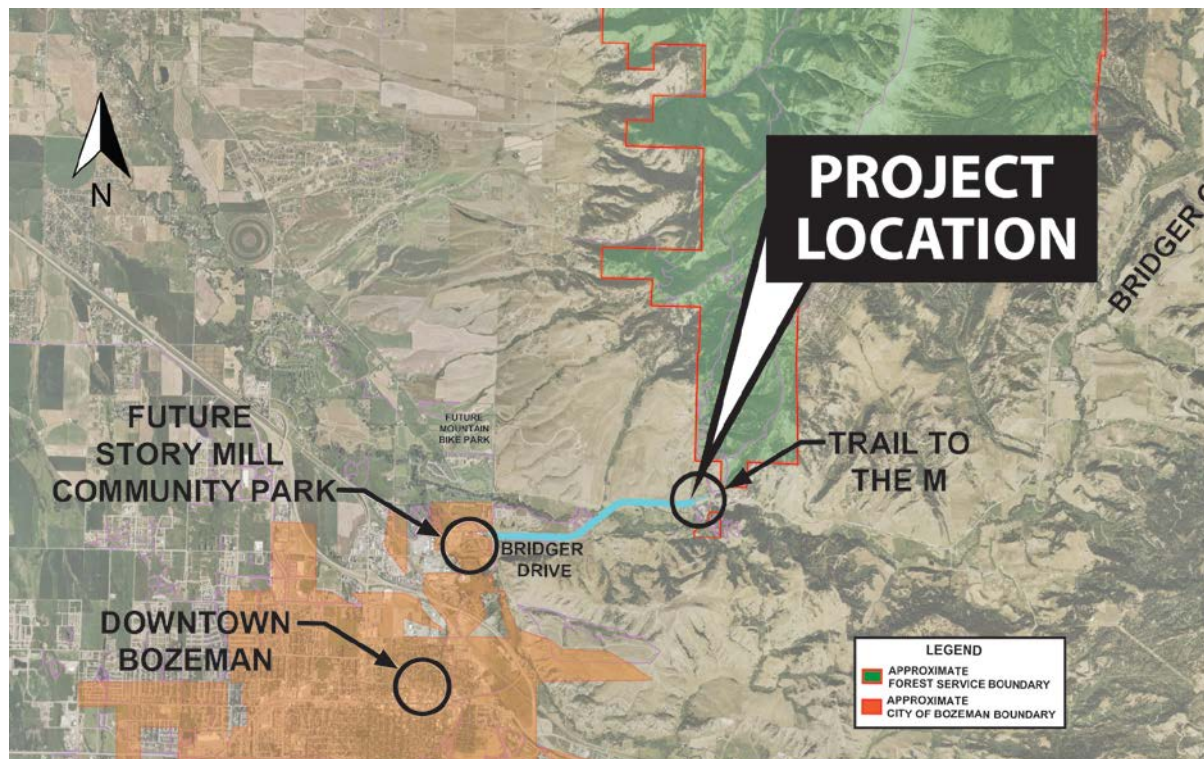
# Section 3

## “M” & Drinking Horse Mountain Trailhead Improvements



### 3.1 Summary

This proposed project will improve multi-modal access to three recreational attractions located close to Bozeman including the “M” and Drinking Horse Mountain trailheads and the Bozeman Fish Technology Center (BFTC). This project will provide the infrastructure needed to safely and conveniently receive the high-volume of visitors to these areas that will arrive by car, shuttle, bike and other modes. There is an anticipated increase in the numbers of people who will access these areas by bike in large part because of the 2.3-mile Path to the M and Drinking Horse Mountain that is currently in design. The proposed improvements will target people arriving by bike, shuttle, and automobile and will impact user experience, safety, and circulation for these areas. The project location is shown in Figure 3-1.



*Figure 3-1: Project Location*

There is a long history of demand exceeding supply at the trailheads of the “M” and Drinking Horse Mountain. As suggested by the pictures of overflow parking in Figures 1-1 and 3-2, both taken in the subject project area in March 2015, this excess demand contributes to a number of trailhead issues including: a lack of safe parking locations; dangerous pedestrian crossings of the highway; and an unpleasant user experience.



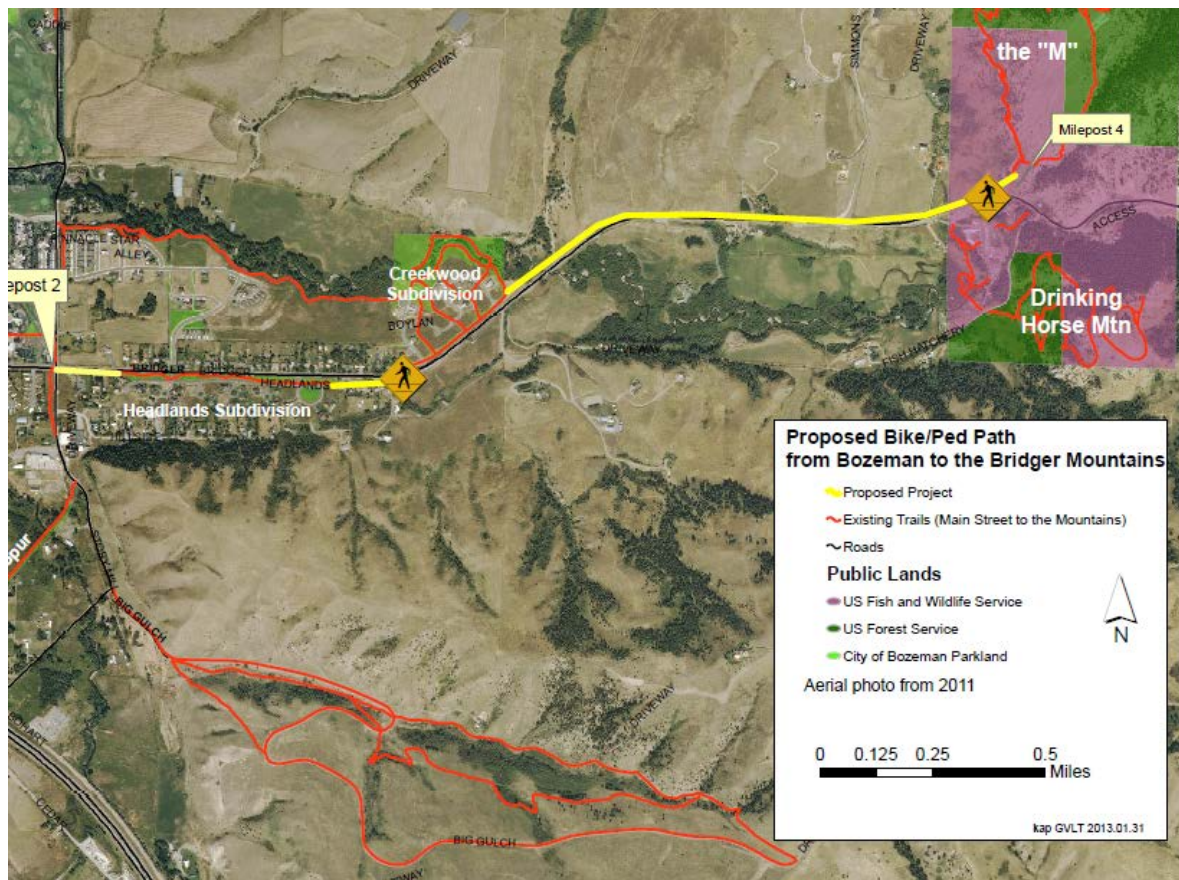


*Figure 3-2: Overflow parking at the "M" trailhead, March 2015 (photo courtesy of GVL T)*

Partly because of this high demand and the need to provide alternative means of access to these trailheads, the Path to the M and Drinking Horse Mountain was recently funded. This proposed and funded 2.3-mile path parallels Bridger Drive (Highway 86), originates at Story Mill Road and terminates at the subject trailheads. This path will provide additional access options to the trailheads, however, this path project does

not address the safety, capacity and user accommodation concerns that exist today and will be exacerbated as a result of ever-increasing user demand to access these areas.

As shown in Figure 3-3, the path, as originally proposed, did not include enhancements to the trailheads. The proposed improvements at the trailheads are needed so that people arriving by all modes of transportation can be safely and conveniently accommodated.



*Figure 3-3: Proposed routing for the Path to the M and Drinking Horse Mountain as included in application to City of Bozeman for funding (image courtesy of GVL T)*

## 3.2 Existing Conditions

### North Side

The “M” trailhead lies to the north of Highway 86 and was designed to accommodate a much lower level of use than it currently experiences. The trailhead consists of an asphalt paved parking lot that can accommodate approximately 53 vehicles as follows: approximately 27 unmarked spaces exist along the external circumference of the loop (if angled parking is observed); approximately 18 unmarked, parallel parking spaces exist near the entrance/exit; and there are approximately 8 spots on the gravel shoulder of the inside circumference of the loop. The level of demand has grown significantly beyond what was envisioned when this parking lot was designed, and significant numbers of vehicles park on the shoulders of Highway 86 regularly.

In addition to the limited parking spaces, there is insufficient maneuvering space for vehicles larger than private passenger vehicles when the lot is full. In other words, the parking area cannot currently reliably accommodate buses or emergency vehicles.

### South Side

On the opposite side of Highway 86, and approximately 350 feet to the west, lie the entrances to the Drinking Horse Mountain trailhead and the BFTC. The Drinking Horse Mountain trail was recently added to the area, and the parking that existed to accommodate visitors to the BFTC was essentially converted into trailhead parking without any significant improvements or changes to the BFTC visitor parking lot. This lot is significantly overburdened with the trailhead user demand and the entrance geometry and approach to Highway 86 is in need of improvement. The current lot consists of approximately 36 parking spaces; the approach can accommodate approximately 10 additional vehicles along its shoulders.

To effectively address the alternative transportation challenges associated with one, two or three of these facilities without addressing the challenges and needs of the others would result in an inadequate solution. Addressing the overall combined challenges and needs associated with the larger context of these three areas of interest in a congruent and robust way will assure success of the overall planning effort, and guide the implementation of improvements that will ultimately work together to provide a safe and effective solution to all transportation modes and all users.

The BFTC and Drinking Horse Mountain trailhead share access to Highway 86 and a parking area. These facilities are not currently connected to the existing “M” trailhead just across Highway 86 to the North. Many visitors to the area would have interest in visiting attractions on both sides of the highway, assuming a safe means for visiting both locations north and south of the Highway are provided [backup required]. These three key public points of interest attract visitors for several reasons including recreational visits, educational visits and field trips, and attract both locals and visitors.

While the user groups for each of these facilities are somewhat unique, there is a great deal of similarity. Both trailheads experience extensive use year-round, through all seasons and all weather conditions. The “M” Trail and Drinking Horse Mountain Trails generally have similar user groups. Surveys indicate that parking availability can dictate the destination for a recreationalist often leading people from the “M” Trail to the Drinking Horse Mountain Trails, as there is less available parking at the “M” Trail parking area. The BFTC does receive some visitation from weekday trail users, but most visits are as a part of scheduled tours. Local elementary and high Schools tour the BFTC facility regularly, and also incorporate use of either the “M” or the Drinking Horse Mountain Trails as part of their visits.

### 3.3 Problem Identification

The demand on the existing facilities at the BFTC/Drinking Horse Springs trailhead and “M” trailhead far exceeds the designed capacity. The demand, including both motorized and non-motorized use, is only expected to increase due to increases in population and the increased accessibility as a result of the soon-to-be-built Path to the M and Drinking Horse Mountain.

#### **Non-Motorized Access**

A significant increase in non-motorized access is anticipated as a result of two upcoming projects that will provide a continuous connection of trails and bike lanes between Main Street and the subject trailheads. One of these projects is the shared-use, separated Path to the M and Drinking Horse Mountain, which is funded and currently in design development. This 2.3-mile trail secured approximately \$4M of funds, indicative of the high demand anticipated for the use of this trail to access the two most-heavily used trails in the area.

The second upcoming project of significance is MDT’s Rouse Avenue reconstruction project. This project, which has been fully designed and is anticipated to be completed within the next four years, will provide bike lanes along Rouse Avenue / Bridger Drive (Highway 86) between Main Street and Story Mill Road, the beginning point for the Path to the M and Drinking Horse Mountain.

Both of these projects are expected to significantly increase the number of users for these subject trails. However, the existing trailheads do not properly accommodate this anticipated increase.

#### **Motorized Access and Highway Safety**

Currently, the capacity issues at the “M” trailhead and the associated parking along the shoulder of Highway 86 are causing a significant capacity and safety issue on Highway 86. Limitations to the Intersection Sight Distance (ISD) for drivers leaving the parking areas at the “M” trailhead and the Drinking Horse Mountain trailhead can be significant, depending

on the amount of overflow parking along the shoulder of the highway. Turning vehicles on Highway 86 block the through movement of highway traffic, and can cause a stopped condition on the highway, increasing the likelihood of a crash.

In addition, the two access points for the parking areas are not opposite from each other, multiplying the potential points of conflict for turning traffic and through traffic on Highway 86.

Expansion of the parking capacity to accommodate the current needs, with an ability to plan for future needs, is an integral part of this project, yet just a component of the overall solution. Parking capacity needs to be increased to safely accommodate vehicular demand in designated parking areas off the highway to mitigate the safety concerns highlighted previously.

### **Shuttle Access**

Shuttle service to the subject trailheads is desired and currently being developed as detailed in this report (see [Section 5 – Shuttle to the “M”](#)). However, the existing configuration of the “M” trailhead parking area has a steep entrance and the width of the existing drive aisle through the loop is insufficient to accommodate shuttle passage during times of high parking demand. This project will correct this deficiency. There is currently no feasible location for a shuttle transfer point within the existing loop trailhead area without negatively affecting other users. This project will address these deficiencies.

### **Pedestrian Movement**

People frequently walk across Highway 86 in the vicinity of the subject trailheads. Such crossings will increase when users of the Path to the M and Drinking Horse Mountain, which will be on the north side of the highway, desire to access Drinking Horse Mountain trailhead and the BFTC on the south side of the highway. With speeds of 45 mph along this stretch of highway and with cars entering and exiting these attractions, at-grade crossings of Highway 86 are becoming increasingly concerning.

## **3.4 Proposed Solution**

The conceptual plan shown in Figure 3-5 illustrates many of the following project components that have been identified for this project including:

- A pedestrian underpass providing safe passage beneath Highway 86;
- Turning bays along Highway 86;
- Increased off-street parking to accommodate parking demand currently met by roadway;



- Integration of the Path to the M and Drinking Horse Mountain so that trail users can safely access their desired destinations;
- The installation of a web-cam to allow remote viewing of the parking area;
- The addition of a vault toilet;
- Accommodations for a bus/shuttle turnaround along with drop-off/pickup areas at each trailhead;
- Dedicated trail information kiosks for each trailhead;
- Adequate bicycle racks;
- Enforceable NO Parking zone on the shoulder of Highway 86;
- Improved pedestrian facility connection between the parking lot and the M Trail, as well as integration of these improvements with the termination of the Path to the M and Drinking Horse Mountain;
- M Trail entrance plaza recognizing funding participation, private donors, and organizational partnerships;
- Relocated and improved access onto Highway 86 to provide access to the trailheads that is opposite from each other for better safety, signing coordination, and Highway 86 operations; and
- Provide for all-season maintenance of the trailhead parking lots commensurate with year-round demand for these recreation areas.

[illegible]

Ultimately, the construction of these improvements will facilitate mode shifts toward non-motorized transportation and light transit/shuttles to and from the trailheads. These mode shifts will in turn lead to improved operational efficiency from a community perspective. These mode shifts will also increase capacity for accessing these recreational areas that are relatively close to the Bozeman core. In short, the proposed improvements improve operational efficiency as it relates to meeting recreational access demand for the Bozeman area.

### 3.5 Estimated Project Costs

#### Trails, Access Improvements, Parking Improvements

##### "M" Trailhead

• Transit/Shuttle facilities: drop-off point and shelter	\$ 100,000
• 1100 LF "Loop" roadway, 28 ft. wide	\$ 400,000
• 300 LF Access Road, 28 ft. wide	\$ 120,000
• Parking: 900*22 + 400*22 = 28,600 SF (~144 total spaces)	\$ 120,000
• 1500 LF paved trail	\$ 40,000
• 800 LF of relocated paved trail	\$ 20,000
<b>Subtotal</b>	<b>\$ 800,000</b>

##### Drinking Horse Mountain/Bozeman Fish Technology Center

• Transit/Shuttle facilities: drop-off point and shelter	\$ 100,000
• 1,000 LF paved trail	\$ 25,000
• 80 LF Box Culvert Underpass	\$ 250,000
• 150 LF Access Road, 28 ft. wide	\$ 8,000
• Parking: 240 x 70 = 16,800 SF (~50 total spaces)	\$ 70,000
• Administrative Access Control improvements	\$ 40,000
<b>Subtotal</b>	<b>\$ 453,000</b>

##### Highway 86

• Turn lanes and associated improvements	\$ 650,000
<b>Subtotal</b>	<b>\$ 1,903,000</b>
<u>Contingency (30%)</u>	<u>\$ 571,000</u>
<b>Subtotal Construction Items</b>	<b>\$ 2,474,000</b>

#### Planning, Preliminary Design, Final Design

• Surveying and Mapping (4% Construction Costs)	\$ 100,000
• Preliminary Design and Public Involvement (5%)	\$ 120,000
• Final Design (5%)	\$ 120,000
<b>Total</b>	<b>\$ 2,814,000</b>

### 3.6 Study Evaluation Factors

#### **Visitor mobility for a full range of ability and income levels**

In order to enable a full complement of users of all abilities, administrative agencies must provide the physical infrastructure necessary to meet the mobility and access needs of all users. A holistic view of the surface transportation and recreation access path and opportunities needs to take these considerations into account, and plan for the ultimate integration of needed infrastructure that accommodates regular use of multiple types of users, even those with mobility challenges.

#### **Visitor experience both within the target recreational areas as well as transit to those areas**

Visitors to the “M” Trail are often affected negatively by the trailhead experience. The congestion at this location is well known, and the subject of local coffee-house discussion. Many regular recreationists have formulated their own ways of attempting to avoid the chaos and overcrowding through their off-peak hour visitation, use of non-recommended parking locations, and car-pooling. Parking duration tends to be longer at this trailhead due to the length of trail system accessed that reaches deep into the Bridger Range.

Visitors to the Drinking Horse Mountain trailhead are also affected by the general lack of adequate facilities and access at the trailhead. Overflow parking from the “M” trailhead is frequently pushed out onto the unpaved shoulder of Highway 86 for up to ¼ mile to the west of the trailhead area. Use of the Drinking Horse Mountain trailhead is increasing, and the recreational parking is impacting the parking for visitors to the BFTC. Many visitors are unaware of the amenities available at the BFTC, and there has been an expressed desire to increase visitor utilization of the Center.

Currently, visitors access these two trailheads in personal vehicles, and some visitors arrive on bicycle. Bicyclists are not provided with adequate bicycle racks, and there are no current transit connections or shuttles that provide service to these trailheads. There is also no public toilet facility at either trailhead.

The proposed improvements will improve visitor experience and accommodate transit to the subject attractions.

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### **Environmental impact primarily as measured by wildlife safety, footprint of built environment, and carbon emissions**

Although increasing the size/footprint of the “M” trailhead will increase the localized impacts to vegetation, minimal wildlife impacts are expected. It is anticipated that improvements to the Drinking Horse Mountain trailhead area can largely be done within the existing footprint.

Encouraging mode shift from automobiles to non-motorized modes and transit will improve wildlife safety, decrease pressure for increasing footprint of built environment and reduce carbon emissions.

Wildlife impacts from high-speed traffic on Highway 86 are known to occur, and the presence of a natural drainage path to the west and to the east of the “M” trailhead locations are areas where animal-vehicle collisions have been known to occur. This project will not specifically address large animal collisions, and will likely have little impact on this type of impact to animals that use this area. Areas that receive significant occupation by the public tend to influence animal behavior, encouraging avoidance behaviors of wildlife to the areas frequented by people. This project will likely have little or no effect on larger wildlife travelling the riparian areas in close proximity to the project, but could have some small benefit to type of wildlife that crosses Highway 86.

The proposed undercrossing that will connect Drinking Horse and the “M” trailheads will provide a safe and efficient connection under Highway 86, and effectively mitigate a very significant hazard to people, pets and some wildlife that are crossing Highway 86 in this area.

### **Operational efficiency and financial sustainability**

The proposed improvements, which will include shuttle loading and unloading areas, transit facilities, bicycle racks, and easy access from the Path to the M and Drinking Horse Mountain to the desired subject attractions, will facilitate mode shifts toward non-motorized transportation and mass transit. These mode shifts will in turn lead to improved operational efficiency from a community perspective. And these mode shifts will also increase capacity for accessing these recreational areas that are relatively close to the Bozeman core. In short, the proposed changes improve operational efficiency as it relates to meeting recreational access demand for the Bozeman area.

Although operational efficiencies are expected to increase, there are concerns regarding funding for long-term maintenance of the improvements. Even though the existing trailheads see a high amount of use, it receives limited maintenance attention, particularly during the winter months. The Drinking Horse Mountain trailhead is not currently plowed



during the winter. The BFTC access road is plowed for employees, but there is no budget for plowing and winter maintenance at the public parking area. The State of MT (MDT) plows Highway 86, and on occasion, the Forest Service, with contracted help, has plowed the “M” trailhead and Drinking Horse Mountain parking area, though the general condition of the “M” trailhead and the Drinking Horse Mountain trailhead is unplowed in the winter.

The current owner-agency for the subject land is the US Fish and Wildlife Service (USFWS). USFWS personnel are supportive of the improvements proposed by this project and anticipate improved service to their visitors. USFWS personnel would seek to clarify maintenance responsibilities for keeping the trail and parking areas maintained.

The “M” trailhead facilities (improvements) are owned and maintained by the US Forest Service, and they will continue to maintain the facilities at the improved Trailhead. Gallatin Valley Land Trust helps to maintain trailhead facilities at Drinking Horse Mountain and will continue to do so.

The use of the Drinking Horse Mountain parking area serves multiple visitation types in addition to the trail users. The BFTC is open to the public 6 days a week (M-Sat) and they receive a significant number of visitors, particularly during the spring and fall of the school year, as many schools coordinate tours with the Center. The Montana Outdoor Science School (MOSS) is co-located during the summer, and the MOSS uses the trailhead parking lot for pick-up and drop-off of students/attendees. For larger groups that bring buses, bus drop-off currently occurs in the BFTC/Drinking Horse Mountain parking lot as well, as this is the only feasible location to do so.

### 3.7 Technical, political, economic, and administrative feasibility

#### **Political and Administrative**

The US Fish and Wildlife Service (USFWS) is a project partner and is the current owner agency for the subject land. The “M” trailhead facilities (improvements) are owned and maintained by the US Forest Service. Both agencies work well together, as evidenced by the long history of these two agencies working together to develop and maintain the existing improvements.

The USFWS has been looking at ways to better integrate the BFTC into the educational and recreational opportunities that exist due to the high recreational use in the area. Integrating the BFTC into the planning phase of the trailhead improvements will providing for organized and proper forum for them to shape the design deliverables, address any budgetary concerns, and help to solve the ongoing maintenance funding and operations budget questions.

The proposed project limits for the trailhead improvements are entirely within the federal ownership of the USFWS, and the improvements and revisions to those improvements are within the jurisdiction of the US Forest Service. The Highway 86 improvements, if needed are within the jurisdiction of the Montana Department of Transportation (MDT). There are three adjacent private properties that are adjacent to the federally-owned lands. All nearby owners will need to be notified of any project scope and intent as it moves forward. It is believed that they are currently at least generally supportive of the project concepts. It is not anticipated that impacts to their properties will be significant in any way, as both the M Trail and the Drinking Horse Mountain trails attract significant numbers of visitors currently. Removal of the allowed parking along the shoulder of Highway 86 will improve safety in the area of these private property accesses, and reduce the overall visual impacts in front of their homes from recreational activities.

Providing proper access geometry, adequate intersection sight distance (ISD) and stopping sight distance (SSD) at a combined single access point for both the “M” trailhead and the Drinking Horse Mountain trailhead (directly across from each other) will significantly improve the safety and operations on Highway 86. Evaluation and possible inclusion of left turn lanes to separate out left-turning traffic from the through movements at this location will also have a direct safety benefit. These access and parking improvements, when combined with parking prohibition along Highway 86, will reduce the on-highway congestion and will have a significant positive safety impact on the overall highway operations.

The administrative agreements for maintenance responsibilities and budgeting are important components of the project. The added maintenance costs associated with plowing/winter maintenance of the trails and parking areas should be addressed in the project funding. Memoranda of Understanding (MOUs) between the partnering agencies may be needed to ensure there is a legacy document that will support the maintenance of these facilities into the future.

The design and construction of the trailhead improvements as envisioned are well within the administrative capabilities of each of the potential lead partners. It is anticipated that the USFS Custer Gallatin National Forest will be the lead partner for the design and construction administration for the project.

### **Technical Feasibility**

A professional engineer has conducted a preliminary review of the technical aspects of the project and minimal challenges are expected. However, detailed technical reviews are recommended as noted below. The terrain lends itself to the proposed layout of the conceptually designed trailhead facilities. The necessary analysis on Highway 86



operations will need to be completed. This would include deceleration and turning lane analysis on Highway 86.

The Highway 86 access geometry, general conceptual layout of the improvements, and design criteria for many of the key elements have been addressed, in part, through this discussion of key elements and operational needs. These criteria and design elements will need to be brought forward through the design in order to reveal any remaining technical challenges as the project development process is followed. Technical evaluations will likely include:

- Geotechnical report with pavement recommendations;
- Geometric design memo addressing the design criteria of the accesses and all circulation and parking elements;
- Integration of trailhead and parking area web cameras into the layout and implementation strategy;
- Parking inventory and needs analysis to address parking demand and needs for parking;
- Trail design of all connections;
- Highway 86 analysis and improvement designs;
- Kiosk design and design of public informational elements;
- Undercrossing design and connection with trail circulation at the BFTC and two trailheads; and
- Environmental evaluation of likely impacts.

### 3.8 Past Planning Efforts

- 1) Federal Lands Access Program (FLAP) Application for Bicycle and Pedestrian Path from Bozeman to the Bridger Mountains - 2013
- 2) MT Highway 86 Alternative Transportation Study & Hyalite Canyon Recreation Area Assessment – 2013
- 3) Draft Gallatin County Park and Trails Plan: Gallatin County Interconnect – 2010
- 4) Greater Area Bozeman Transportation Plan (2007 Update) - 2009
- 5) Gallatin National Forest Travel Management Plan – 2006

### 3.9 Potential Project Partners

- City of Bozeman Parks Department (City is a primary stakeholder in the Path to the M and Drinking Horse Mountain)
- Custer Gallatin National Forest (owner of facilities and improvements at “M trailhead)
- Gallatin County (project is located in Gallatin County)
- Gallatin Valley Land Trust (GVLTL is currently the responsible part for maintaining trailhead facilities at Drinking Horse Mountain)
- Montana Department of Transportation (Highway 86 is MDT corridor)
- Montana Outdoor Science School (MOSS – a major user of the BFTC facility that runs lots of youth programs throughout the year)
- Streamline (improvements to accommodate bus/shuttle service)
- US Fish & Wildlife Service (landowner at trailheads and for BFTC)

### 3.10 Prospective Funding Sources

- [Federal Lands Access Program \(FLAP\)](#)
  - Matching funds to be targeted from City of Bozeman, Gallatin County and user groups)
- [Federal Lands Transportation Program \(FLTP\)](#)
- [Transportation Alternatives Program](#)

### 3.11 Draft Statement of Work

DRAFT Statement of Work (SOW) is contained in Appendix 3-1. This SOW generally follows the US Forest Service format for professional services agreements, and is intended to be a starting point for the development of the ultimate SOW, that will be carried forward to facilitate completion of the design phase of this project.

### 3.12 Feasibility Study Approach and Findings

#### 3.12.1 Evaluation of Existing Deficiencies

There is a history of demand exceeding supply at the trailheads of the “M” and Drinking Horse Mountain. The excess demand contributes to a number of trailhead issues including:

- Lack of adequate and safe parking facilities (lighting, quantity, access)
- No ability to facilitate shuttle or public transportation delivery or pick-up of passengers

- No provision for pedestrian crossings of the highway
- Unpleasant user experience due to disorganization of the trailhead and inadequate facilities
- NO public toilet facility
- Uncoordinated pathways with respect to users at the Drinking Horse Mountain trailhead and the BFTC – there is no clear path to each potential destination from the parking lot.

### **3.12.2 Development of Conceptual Plan**

The conceptual plan was developed through an inventory of the existing conditions, and applying the understanding of what is needed at this location, the available land and the natural lay of the lands to the west of the existing “M” trailhead. Also, the USFWS had mentioned to Jonathan Kempff the desire to have a more integrated and logical connection to the public visitation areas of focus on their campus.

### **3.12.3 Conduct Technical Review of Conceptual Plan**

The conceptual plan was reviewed according to the identified needs that are associated with the BAATS study needs as identified for the “M” trailhead and Drinking Horse Mountain trailhead. These needs are directly a product of the public information and input gathered through user surveys collected on the Gallatin NF and at each of these trailheads.

The evaluation of the preliminary plan as presented appears to be appropriate in scale and scope. The exact layout, type and size of the planned facilities may need to be adjusted during the preliminary design phase to maximize the construction efficiency, and material balance. Context sensitivity, or how the design lays on the land, will be a large part of the design, and improvements at each trailhead location will consider the overall context of the facility and users that the improvements are meant to serve.

The relocation of the access point to be opposite each other is a logical and sound element of the design that will provided improved safety, as the access to these two facilities will be at one point on centerline. The grade and alignment of the access will necessarily follow current access guidance in accordance with MDT guidelines.

Increasing the connectivity of the trail system and integrating it with the two trailhead areas is not technically difficult, and the appropriate level of design attention to the geometry and location of each design element will help ensure that this is a key element that ties the projects at each site together.

The addition of a web camera at each trailhead may have the most technically difficult elements due to power and communication requirements. Utility coordination and

installation design may be necessary to accommodate this element. Power and communications infrastructure will need to be accounted for in the plans.

#### **3.12.4 Conduct Right of Way Analysis**

The proposed improvements lie completely within federally-owned properties. The project area is adjacent to three private land owners, and several public entities including:

- Montana Department of Transportation (MDT), owns deeded Right-of-Way along Highway 86;
- USFWS owns the three trailhead areas and the BFTC administrative site.

There are three private parcels that are adjacent to the west side of the USFWS property and these parcels will not be impacted.

#### **3.12.5 Evaluate Environmental Impacts**

Increasing the size/footprint of the “M” trailhead will increase the localized impacts to vegetation, minimal wildlife impacts are expected. It is anticipated that improvements to the Drinking Horse Mountain trailhead area can largely be done within the existing footprint. It is anticipated that a categorical exclusion will be sufficient for the environmental review. This would likely be conducted by the USFS as a project partner.

Encouraging mode shift from automobiles to non-motorized modes and transit will improve wildlife safety, decrease pressure for increasing footprint of built environment and reduce carbon emissions.

Wildlife impacts from high speed traffic on Highway 86 are known to occur, and the presence of a natural drainage path to the west and to the east of the “M” trailhead locations are areas where animal-vehicle collisions have been known to occur. This project will not specifically address large animal collisions, and will likely have little impact on this type of impact to animals that use this area. Areas that receive significant occupation by the public tend to influence animal behavior, encouraging avoidance behaviors of wildlife to the areas frequented by people. This project will likely have little or no effect on larger wildlife travelling the riparian areas in close proximity to the project, but could have some small benefit to type of wildlife that crosses Highway 86.

The proposed undercrossing, which will connect Drinking Horse Mountain and the “M” trailheads, will provide a safe and efficient connection under Highway 86, and effectively mitigate a very significant hazard to people, pets and wildlife that are crossing Highway 86 in this area.

### **3.12.6 Assess Agency Support**

This project is supported strongly by the Custer Gallatin National Forest, the BFTC, and Gallatin County. The USFS has been an integral partner in the development of the conceptual plan for this project.

Other agencies, including the Montana Department of Transportation and the City of Bozeman, are anticipated to be supportive based upon participation of agency representatives during project development.

# Section 4

## Hyalite Canyon Shuttle System

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## 4.1 Summary

Hyalite Canyon, located south of Bozeman, is one of the most popular recreation areas in Montana. A large number of local residents and tourists alike are drawn to the many outstanding recreation opportunities in the Canyon including hiking, biking, fishing, camping, boating, motorcycling, skiing and ice climbing. Visitor use continues to increase as Bozeman and Gallatin County experience rapid growth leading to overcrowded parking areas in the Canyon. Forest Service (FS) staff report that the three most problematic parking areas in Hyalite Canyon are:

- Hyalite Reservoir day use parking area (at dam)
- Grotto Falls/Hyalite Creek parking area
- Palisades Falls parking area

It is common for these parking areas to fill up on busy days, causing overflow parking outside designated parking lots. However, traffic congestion along the main road generally does not appear to be an issue in Hyalite Canyon at this time.

The purpose of this project is to develop a shuttle system that could provide transportation to Hyalite Canyon from Bozeman, with a goal of reducing parking pressure at the busiest trailheads. This system will be designed to replace existing driving trips where possible, rather than simply bringing more people to the Canyon. In addition to eliminating car use for some, a shuttle system could help reduce number of cars used by others by transporting people between drainages, trails and recreation sites without the need to shuttle personal automobiles. Target users for this shuttle are both tourists and local residents.

During a July 24th focus group meeting with recreational shuttle stakeholders, there was significant interest in a Hyalite Canyon shuttle. There was broad agreement that there likely is demand for a shuttle from a wide range of users. Clarifying the primary initial target group for the shuttle will help steer this project towards appropriate funding sources.

## 4.2 Estimated Project Costs

Project development tasks consist of stakeholder outreach, creating a Hyalite shuttle committee, developing shuttle vision and funding strategies and developing a strategy for trail connections between Hyalite Canyon and Bozeman. These tasks are described in more detail in the Section 4.9 Draft Statement of Work. Project development costs are estimated between \$15,000 and \$18,000.



It is anticipated that project development will be followed by project implementation. Implementation costs are dependent on the specific shuttle schedule and equipment (rolling stock and trailer options) that are targeted. General costs for a range of shuttle implementation options are provided here. This estimate does not include trail improvement costs. A summer weekend service with three roundtrips, for example, is estimated to cost \$390/day or \$10,140 for the summer (13 weekends). A daily summer shuttle with four roundtrips per day is estimated at \$520/day or \$48,360 for the summer (93 days). These costs assume an existing 35 passenger Streamline bus is available at \$65 per hour to cover driver time, fuel and maintenance. Bike trailer expenses for Helena's Trail Rider system included purchase of a flatbed trailer (\$3,000) and improvements including straps/pads (\$500) and ramps (\$300). Total trailer costs are \$3,800 for a trailer that can haul 30 bikes.

### 4.3 Study Evaluation Factors

#### **Visitor mobility for a full range of ability and income levels**

A shuttle (bus service) to local trailheads would increase mobility options for people of all abilities and income levels to reach these beautiful places. It is anticipated that all vehicles would be ADA accessible.

#### **Visitor experience both within the target recreational areas as well as transit to those areas**

Bus service has potential to reduce overcrowded parking lots and reduce the number of vehicles on Hyalite Canyon Road, which will improve the experience of all people traveling that road and those navigating the trailhead parking lots.

#### **Environmental impact primarily as measured by wildlife safety, footprint of built environment, and carbon emissions**

Reducing the need for ever increasing parking needs at popular trailheads will reduce the impact on the natural environment. Reducing vehicle traffic on Hyalite Canyon Road has potential to reduce wildlife vehicle collisions, parking lot size and carbon emissions.

#### **Operational efficiency and financial sustainability**

More information is needed to determine project champions, system details and funding sources to understand operational efficiency and financial sustainability. Similar recreational shuttle systems in other similar size communities, such as Helena, MT, have demonstrated success.

#### **Technical, political, economic, and administrative feasibility**

One technical issue that will need to be addressed is shuttle access at trailheads. Another issue is trail connectivity between Hyalite and Bozeman. If a one-way shuttle drop off is desired, similar to Helena's system where people bike back to town, trail system improvements, maintenance and wayfinding are needed. Outreach is needed to more stakeholders to ensure the project is politically feasible. Past survey results indicate some concerns that "mass transit" will overwhelm the capacity of trails. A bus system to access already busy trailheads will need to be thoughtfully designed with input from relevant stakeholders to ensure it meets local needs.

#### 4.4 Past Planning Efforts & Findings

##### **MT Highway 86 Alternative Transportation Study & Hyalite Canyon Recreation Area Assessment – 2013**

Visitor surveys were conducted at various Hyalite trailheads in 2012 as part of [Phase I](#) of BAATS. Survey results indicated that 53% of respondents (out of 153 in total) reported they were somewhat likely, likely or very likely to use bus service between Bozeman and Hyalite Canyon if it were available. 60% of respondents (out of 138 in total) indicated they would consider riding a bus that had hourly service. MSU and downtown Bozeman were the two most popular locations where people would like to catch a bus.

##### **Hyalite Canyon Winter Use Study – 2013**

This Study provided the USFS and the partner group, Friends of Hyalite, with concrete winter-use data that was previously unavailable. The data collected in Hyalite Canyon during the 2012 winter season captured user perceptions of road plowing management decisions and use patterns within the Hyalite drainage. A total of 451 surveys were collected in person and online. In addition to the surveys, road counters were placed at five locations throughout the Canyon and vehicle movement was captured throughout the survey period. Data revealed that visitation is focused on the upper reaches of the drainage, the reservoir and beyond (67.9% of traffic). This study identified the destinations, demographics of users, user activities, frequency of use, user perceptions and modes of transportation to and from recreational sites. The study helps to identify target populations for the use of Hyalite recreational areas during the winter time.

The study team is not aware of other planning efforts specific to bus service to Hyalite Canyon.

## 4.5 Potential Project Partners

The following entities are potential partners that may support this project in various ways such as participating in a shuttle advisory committee, marketing a shuttle system and/or contributing funds. The following organizations would be well-suited to participate on a Hyalite Shuttle steering committee:

- HRDC/Streamline (non-profit organization managing Streamline bus service);
- Friends of Hyalite (non-profit organization promoting stewardship and support for year round recreation in Hyalite Canyon);
- Custer Gallatin National Forest (agency in charge of Hyalite Canyon federal lands);
- Tourism Business Improvement District (consider how shuttle system may serve needs of visitors and enhance tourism marketing efforts);
- Downtown Bozeman Partnership (consider how shuttle system may benefit downtown and how businesses may support a system); and
- City of Bozeman (the City is updating the transportation master plan and has a vested interest in transportation issues).

Other potential stakeholders include: Gallatin County, MSU/ ASMSU, Gallatin Valley Land Trust, local hotels and Karst Stage. In addition, user groups such as the Montana Mountain Bike Alliance, Dirt Concern, Wind Drinkers and the Bridger Ski Foundation may be interested in providing specific input such as trailhead locations, schedules, etc.

Local businesses, such as bicycle and outdoor retailers, may have an interest in opportunities for a shuttle system that supports bike, kayak, paddleboard or other equipment rentals. They may be part of discussions about public/private partnership options. Partner interest for all of these entities has not yet been confirmed.

## 4.6 Prospective Project Lead(s)

While there is significant interest in a Hyalite Canyon shuttle from several groups, including the Forest Service, Friends of Hyalite, GVLT, BTBID and HRDC/Streamline, there is not a clear project leader at this time. It is recommended that Western Transportation Institute (WTI), the primary party to have developed the project to date, lead the development phase of this project and facilitate meetings with various groups to further develop initiatives and identify a leader for implementation.

## 4.7 Prospective Funding Sources

Prospective funding sources for project development may include:

- BAATS Phase IV Funding
- [Bozeman Tourism Business Improvement District](#) (provided funding contributes to “increased heads in beds”)
- [Downtown Bozeman Partnership and local businesses](#) (provided the shuttle brings more people downtown)

Prospective funding sources for implementing a shuttle system include the above mentioned funds plus the following three funds.

- [FHWA via MDT Transit Capital & Operating Assistance Funding](#) (provided that Streamline public transit system was used)
- [Federal Lands Access Program](#) (applicable to purchase of new buses).
- User fees (Survey results indicate that a user fee to ride the bus may be feasible as well).

## 4.8 Relevant Projects

Four regional shuttle systems were researched as a part of this project development. The system most relevant to the proposed Hyalite service is the Trail Rider Shuttle, described below. All four systems are described in greater depth in [Appendix 4-1 Recreational Shuttle Systems](#).

### **Trail Rider Community Shuttle (Helena, MT)**

Description: The Trail Rider Shuttle delivers passengers from downtown Helena to the top of the Mt. Helena Ridge Trail, part of the South Hills trail system. The primary system users are hikers, runners, and mountain bikers. The shuttle can accommodate up to 30 passengers and bicycles. It operates from May through September and has evening runs Wednesday through Friday and morning runs on Saturday and Sunday.

References: <http://downtownhelena.com/explore/new-trail-rider/>

Funding: Provided by local business sponsors, the Helena Business Improvement District, the Helena Tourism Business Improvement District, and Bike Helena.

## 4.9 Draft Statement of Work

### **Task 1: Stakeholder outreach**

Conduct up to three focus group meetings to gather input from Hyalite Canyon stakeholders that were unable to attend the July 2015 focus group. Meetings will aim to determine local needs of different users (runners, skiers, climbers, bikers...) and shuttle system goals and to identify a project lead.

### **Task 2: Initiate Hyalite Shuttle Committee**

Present results and recommendations of the BAATS study and the additional information gathered in Task 1 to potential project partners with the goal of forming a Hyalite Shuttle Committee. This Committee must include sufficient representation from the prospective list of project partners identified previously.

### **Task 3: Hyalite Shuttle Visioning Session**

The goal of the visioning session will be to discuss and develop potential shuttle system structures. Visioning should focus on shuttle logistics including: destinations, pick up locations, schedules (summer/winter), vehicles, bus access at the trailhead parking lots, and system leadership. Potential barriers to implement each system should be identified along with ideas for overcoming barriers. Funding should not be part of this visioning to allow for all ideas to be considered. Outcomes of this visioning session will be potential frameworks for a Hyalite Shuttle system and shuttle committee membership.

### **Task 4: Hyalite and “M” Shuttle Funding Session**

The goal of this session is to develop ideas for funding the shuttle system structures developed in the previous visioning sessions. This session should focus on identifying costs to initiate and operate the systems as well as identifying sources for the required funds. Outcomes of this meeting will be a funding strategy to implement a Hyalite and/or “M” Trail Shuttle system.

### **Task 5: Hyalite Shuttle Implementation**

The Hyalite Shuttle Committee will hold additional meetings as needed to identify the best potential system structure and the associated costs and sources of funding. The outcome of these additional meetings will be a recommended shuttle system. The recommendation should identify the system leadership, the funding sources, the timeframe for implementation, and any needed agreements or contracts between the system partners.

### **Task 6: Hyalite Bicycle Trail Connections**

Organize and facilitate up to four meetings to identify the key aspects needed to develop a high quality network of trails and roads that connect Hyalite with Bozeman. Main concepts that will be covered include: the identification of key connections; identification of 2 to 6 mountain bike loop trails linking Hyalite Canyon to the Bozeman Creek and Cottonwood Creek drainages; discussion of potential connections at Kirk Hill; and discussion of trail development and maintenance responsibilities.

Meeting participants should include representatives from Custer Gallatin National Forest, GVLTA, Wilderness Recreation Partners, Friends of Hyalite and local mountain bike groups such as the Dirt Concern and the Montana Mountain Bike Alliance. For Kirk Hill discussions, Montana State University and Montana DOT must be included. Participation may also include other trail users, such as hiking, running and skiing groups.

## 4.10 Feasibility Study Approach & Findings

### 4.10.1 Evaluate Existing Data

The study team evaluated available traffic data on Hyalite Canyon Road to identify average daily traffic for both summer and winter weekend/ weekday use. A review of available traffic data shows that summer traffic (June -August 2013) near the Hyalite entrance kiosk ranged from 477 to 589 average daily traffic (ADT) on weekdays and from approximately 900 to 1,000 ADT on weekends. Winter data from December through March 2012 near the entrance to Hyalite Canyon ranged from 130 to 173 ADT on weekdays, and 359 to 390 ADT on weekends. Hyalite Canyon Road was not designed for the high use that it is currently receives.

The team reviewed 2012 visitor survey results and had conversations with Forest Service staff to identify parking and other transportation issues that may inform potential shuttle access to Hyalite canyon recreation areas. A summary of available data for Hyalite Canyon is provided in [Appendix 4.2 – Hyalite Canyon Data](#).

### 4.10.2 Conduct a Mode Shift Analysis

A “mode shift” analysis was completed to consider potential schedules and costs associated with shifting some people from driving personal automobiles to riding a bus or shuttle. Shifting some people from automobile to bus trips has potential to reduce traffic and alleviate overcrowded parking lots in Hyalite Canyon. This analysis, shown in [Appendix 4-3: Hyalite Mode Shift Analysis](#), presents potential bus schedules and cost estimates for shifting various numbers of people from driving to riding a bus to Hyalite Canyon.



#### **4.10.3 Research recreational shuttle systems in other communities**

This task researched recreational shuttle systems in other communities to understand how the systems work, what types of vehicles they use, how they are funded and what their goals are. The results of this research are synthesized in [Appendix 4-1: Recreational Shuttle Systems](#), which contains the following information:

Part I- results from a 2012 survey of visitors to Bozeman area trailheads related to bus/shuttle use.

Part II- Summarizes the following community shuttle systems:

- Helena, Montana Trail Rider Community Shuttle – summer hike/bike shuttle
- Jackson, Wyoming Southern Teton Area Rapid Transit (START) public transportation system – winter ski area and summer trail access
- Aspen, Colorado Roaring Fork Transportation Authority (RFTA) shuttle
- Park City, Utah Transit System
- Reds Meadow/ Devils Postpile Shuttle - This mandatory shuttle service is mentioned here primarily because it allows dogs on the shuttles.

Part III- potential schedule and cost estimate for options to access Hyalite Canyon and trailheads along the Gallatin Range south of Bozeman.

#### **4.10.4 Assess Hyalite Canyon Bicycling Connections**

This task identifies potential connections from existing mountain biking areas in Hyalite Canyon back to town and discusses some issues with the existing trail network. There are a number of dirt roads and trails that connect Hyalite Canyon to adjacent drainages, allowing people to bike from Hyalite Canyon back to Bozeman. Providing a well-connected, well maintained and well signed network of trails and roads has the potential to disperse people and take pressure off of heavily used parking areas and trails in Hyalite Canyon. Support for biking trail connections in the Hyalite area are demonstrated in the 2006 Gallatin National Forest Travel Management Plan. Objective 1-2 states “Provide a system of 2 to 6 mountain bike loop trails linking Hyalite Canyon to the Bozeman Creek and Cottonwood Creek drainages”. More details on potential route connections are provided in [Appendix 4.4 – Hyalite Bicycling Connections](#).

# Section 5

## Shuttle to the “M”



## 5.1 Summary

The “M” and Drinking Horse Mountain Trails are extremely popular trails. Servicing the ever increasing demand at these trailheads is a significant issue for the Forest Service. Additionally, the demand at these trailheads is a concern for the Montana Department of Transportation (MDT) as parking often spills onto Highway 86 and turning vehicles is a growing safety issue. The popularity of these trails is in part due to their proximity to Bozeman coupled with the views of the Bozeman and the Gallatin Valley accessible via a relatively short hike. These trails are popular with local residents and tourists/visitors. The trailhead parking is approximately four miles from downtown Bozeman, a 10-15 minute drive. During a July 24, 2015 focus group meeting with recreational shuttle stakeholders, there was strong agreement that there is significant unserved demand for access to these trails. Many of the local hotels have shuttle buses that they use to pick guests up at the airport and to provide service to locations within the city limits. It is noted that occasionally, these shuttles do take guests to the trailhead. This service is provided when a driver and shuttle are available.

The purpose of this project is to develop a summer recreation shuttle system that could serve the “M” and Drinking Horse Mountain Trails and improve visitor experience. Target users for this shuttle are tourists and local residents. A few options exist for the development of a shuttle to these trailheads.

One option is for the Bozeman Tourism Business Improvement District (BTBID) and local hotels to form a partnership and use existing vehicles and drivers to provide a regular shuttle service. This system could be limited to hotel patrons or could be available for use by a broader population or the general public. Funding for this option would most likely be provided directly by the participating hotels with the BTBID potentially providing support.

A second option would be to develop a Streamline Route that would serve as a shuttle to the trailhead. This option would be open to the public. Funding for this option could involve a much broader range of partners including the Bozeman Downtown Business Association, the BTBID, City of Bozeman, Gallatin County, individual hotels, local businesses, and potentially the Associated Students of Montana State University (ASMSU). The existing Streamline system is well used and supported by the community. There has been recent discussion of opportunities to develop a Streamline Route that would service North 7th Avenue and the Main St corridor. The Downtown Bozeman Partnership and the North Seventh Urban Renewal Board (NSURB) have indicated possible interest in developing and funding such a route. It is conceivable that The “M” trailhead could be part of a route that serves N 7th Avenue and Main St downtown.

## 5.2 Estimated Project Costs

There are two components to project costs. The first component consists of stakeholder outreach, creating an “M” shuttle committee, and developing shuttle vision and funding strategies. These tasks are described in more detail in Section 5.9 Draft Statement of Work. This cost will vary depending on the number of meetings and who facilitates them and is estimated to range from \$5,000 to \$7,000.

The second cost component will be implementing a shuttle system. Costs will vary depending on the strategy chosen. The cost of a shuttle system developed and run by the hotels and the BTBID would be dependent on the structure of system. In this case the vehicles and drivers already exist and the cost could potentially only be dependent on the hourly cost to operate and maintain the vehicles.

The estimated cost for a shuttle seven days a week, Memorial Day to the end of September (20 weeks), and 6 hours a day would be approximately \$55,000. This cost assumes the availability of an existing 35 passenger Streamline bus and is based on a rate of \$65 per operating hour to cover driver time, fuel and vehicle maintenance. This sample schedule, while targeted primarily at serving tourists, would likely serve a large number of local users as well.

The cost of an additional Streamline Route would be directly related to the days and hours of operation. The existing Monday through Friday, 6:30 am – 7:15 pm routes cost approximately \$196,000 annually to operate.

## 5.3 Study Evaluation Factors

### **Visitor mobility for a full range of ability and income levels**

A shuttle service to local trailheads would increase mobility options for people of all abilities and income levels to reach these beautiful places.

### **Visitor experience both within the target recreational areas as well as transit to those areas**

Bus service has potential to reduce overcrowded parking lots and reduce the number of vehicles on Bridger Canyon Road, which will improve the experience of all people traveling that road and those navigating the trailhead parking lots.

### **Environmental impact primarily as measured by wildlife safety, footprint of built environment, and carbon emissions**

Reducing the need for ever increasing parking needs at these popular trailheads will reduce the impact on the natural environment. Reducing vehicle traffic on Bridger Canyon Road has potential to reduce wildlife vehicle collisions, parking lot size, and carbon emissions.

### **Operational efficiency and financial sustainability**

More information is needed to determine project champions, system details, and funding sources to understand operational efficiency and financial sustainability. Similar recreational shuttle systems in other similar size communities, such as Helena, MT, have demonstrated success.

### **Technical, political, economic, and administrative feasibility**

One technical issue that will need to be addressed is shuttle or bus access at the trailheads. The existing configuration of the “M” Trail parking area has a very steep entrance and the existing drive aisle is narrow with insufficient space to ensure that a shuttle would always be able to get through. The parking area for the Drinking Horse Mountain trailhead has sufficient space to accommodate a shuttle but the existing access locations from MT Highway 86 have limited site distance and grades that pose safety risks for a shuttle. Outreach is needed to more stakeholders to ensure the project is politically feasible. Past survey results indicate some concerns that “mass transit” will overwhelm the capacity of trails. A bus system to access already busy trailheads will need to be thoughtfully designed with input from relevant stakeholders to ensure it meets local needs.

## **5.4 Past Planning Efforts & Findings**

### **MT Highway 86 Alternative Transportation Study & Hyalite Canyon Recreation Area Assessment – 2013**

Visitor surveys were conducted at the “M” and Drinking Horse Mountain and other local trailheads in 2012 as part of a related Forest Service study. Survey results indicated that 40% of respondents (out of 248 in total) reported they were somewhat likely, likely or very likely to use bus service between Bozeman and the “M”/Drinking Horse Mountain Trails if it were available. 40% of respondents indicated they would consider riding a bus that stopped by every hour. 59% of respondents indicated the ability to transport a pet is important or very important.

## 5.5 Potential Project Partners

The following organizations would be well suited to participate on an M shuttle steering committee to develop details of schedule and routes:

- HRDC/Streamline (non-profit organization managing Streamline bus service);
- Custer Gallatin National Forest (agency in charge of M trail) ;
- Tourism Business Improvement District (consider how shuttle system may serve needs of visitors and enhance tourism marketing efforts);
- Downtown Bozeman Partnership (consider how shuttle system may benefit downtown and how businesses may support a system);
- North Seventh St. Urban Renewal Board (NSURB) (shuttle could serve N. 7<sup>th</sup>)
- City of Bozeman Office of Economic Development (a shuttle ties into City economic development and transportation issues);

The following entities are proposed as members of a stakeholder group that may support this project in various ways such as marketing a shuttle system or contributing funds.

- US Fish and Wildlife Service (a shuttle could serve the Bozeman Fish Technology Center)
- Montana Outdoor Science School (co-located at the Bozeman Fish Technology Center)
- Gallatin Valley Land Trust, hotels, Karst Stage, Big Sky Wind Drinkers, and businesses adjacent to potential routes and stops.

Partner interest for all of these entities has not yet been confirmed.

## 5.6 Prospective Funding Sources

Prospective funding sources for project development may include:

- BAATS Phase IV Funding
- [Bozeman Tourism Business Improvement District](#) (provided funding contributes to “increased heads in beds”)
- [Downtown Bozeman Partnership and local businesses](#) (provided the shuttle brings more people downtown)

Prospective funding sources for implementing a shuttle system include the above mentioned funds plus the following four funds.



- [FHWA via MDT Transit Capital & Operating Assistance Funding](#) (provided that Streamline public transit system was used)
- [Federal Lands Access Program](#) (applicable to purchase of new buses).
- User fees (Survey results indicate that a user fee to ride the bus may be feasible as well).
- North Seventh Urban Renewal District (A possible funding source given evidence that transit routes increase property value, an additional Streamline Route that serves the N 7th Avenue corridor)

## 5.7 Relevant Projects

Four regional shuttle systems were researched as a part of this project development. The most relevant system to the M is described briefly below. All four systems are described in greater depth in [Appendix 4-1: Recreational Shuttle Systems](#).

### **Trail Rider Community Shuttle (Helena, MT)**

Description: The Trail Rider Shuttle delivers passengers from downtown Helena to the top of the Mt. Helena Ridge Trail, part of the South Hills trail system. The primary system users are hikers, runners, and mountain bikers. The shuttle can accommodate up to 30 passengers and bicycles. It operates from May through September and has evening runs Wednesday through Friday and morning runs on Saturday and Sunday.

References: <http://downtownhelena.com/explore/new-trail-rider/>

Funding: Provided by local business sponsors, the Helena Business Improvement District, the Helena Tourism Business Improvement District, and Bike Helena.

## 5.8 Prospective Project Lead(s)

The Tourism Business Improvement District or the City Office of Economic Development would be natural leaders for this project. The existing networks of either of these entities would provide a solid framework for the development of a shuttle system. The North Seventh Urban Renewal Board (NSURB) would be a good fit for the leadership of this project, but as a volunteer board, they may lack the capacity to undertake this on top of the other projects they have ongoing. It is anticipated that WTI will facilitate meetings with various groups to further develop initiatives and identify a leader for implementation.

## 5.9 Draft Statement of Work

### **Task 1: Initiate “M” Shuttle Committee**

Present results and recommendations of the BAATS study to potential project partners with the goal of forming an “M” Shuttle Committee. This Committee must include key stakeholders in the development of the shuttle. Membership should include representation from the following businesses and organizations: HRDC/Streamline, BTBID, Downtown Business Partnership, City of Bozeman Office of Economic Development, Custer Gallatin National Forest, GVLТ and NSURB. Additional members could include: hotels, Karst Stage, Big Sky Wind Drinkers, USFWS, and businesses adjacent to potential routes and stops. If there is sufficient interest, a committee should be created to develop a shuttle system vision and structure.

### **Task 2: “M” Shuttle Visioning Session**

The goal of the visioning session will be to discuss and develop potential shuttle system structures. Visioning should focus on shuttle logistics including: destinations, pick up locations, schedules (summer/winter), vehicles, bus access at the trailhead parking lots, and system leadership. Potential barriers to implement each system should be identified along with ideas for overcoming barriers. Funding should not be part of this visioning to allow for all ideas to be considered. Outcomes of this visioning session will be potential frameworks for a Hyalite Shuttle system and shuttle committee membership.

### **Task 3: Hyalite and “M” Shuttle Funding Session**

The goal of this session is to develop ideas for funding the shuttle system structures developed in the previous visioning sessions. This session should focus on identifying costs to initiate and operate the systems as well as identifying sources for the required funds. Outcomes of this meeting will be a funding strategy to implement a Hyalite and/or “M” trail shuttle system.

### **Task 4: “M” Shuttle Implementation**

The “M” Shuttle Committee will hold additional meetings as needed to identify the best potential system structure and the associated costs and sources of funding. The outcome of these additional meetings will be a recommended shuttle system. The recommendation should identify the system leadership, the funding sources, the timeframe for implementation, and any needed agreements or contracts between the system partners.

## 5.10 Feasibility Study Approach & Findings

### 5.10.1 Evaluate Existing Data

WTI conducted surveys to learn about trail user attitudes regarding alternative transportation options to access the M and Drinking Horse Mountain trails. Trail users completed a total of 250 surveys at these trailheads in August 2012.

The 250 individuals surveyed reported their groups contained 404 adults (87%) and 61 children (13%) representing a total of 465 people. 224 respondents (89%) reported that they used their own vehicle/car to access the M or Drinking Horse Trailheads, 10 rented a vehicle and 8 rode their bikes.

One survey question asked “If a transit (bus) service existed between Bozeman and the M/Drinking Horse Trails area, how likely is it that you would use such a service?” Approximately 40 percent of respondents (98) reported they were somewhat likely, likely or very likely to use transit. Another question asked “What stops (locations) should the bus serve?” Montana State University and downtown Bozeman were the two most popular responses. Other locations included: 4-Corners, none, The Daily Coffee Shop, Highland, Oak, Rouse, Laurel Glen, Belgrade, NE Bozeman, Fairgrounds, 8th & Koch, and East Main/Hospital.

Another question asked “What days of the week do you normally use the M/ Drinking Horse area?” Results show that respondents use this trail every day, with the highest use reported on Fridays. More details on the survey may be found in the report in Appendix A of Montana Highway 86 Alternative Transportation Study & Hyalite Canyon Recreation Area Assessment, DJ&A 2013.

### 5.10.2 Identify potential funding sources for shuttle systems

A focus group meeting was held on July 24, 2015 to introduce recreational shuttle concepts to local stakeholders and identify potential funding options for a recreational shuttle system in the Bozeman area. The meeting was attended by representatives from the Gallatin Valley Land Trust, Friends of Hyalite, the Bozeman Tourism Business Improvement District Board and local hotel, the Custer Gallatin National Forest and the Human Resource and Development Council’s (HRDC) Streamline bus system. The meeting was initially intended to discuss options for shuttle access to Hyalite Canyon. As the discussion evolved, there was much interest in bus access to the “M” and Drinking Horse Mountain trailheads. [Appendix 5-1 Shuttle Focus Group Summary](#) provides minutes for this meeting.

### **5.10.3 Research recreational shuttle systems in other communities**

The study team researched recreational shuttle systems in other communities to understand how the systems work, what types of vehicles they use, how they are funded and what their goals are. [Appendix 4-1: Recreational Shuttle Systems](#) provides overview of four regional and relevant shuttle systems.

# Section 6

## Bridger Canyon Bus and Carpool Enhancements

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## 6.1 Summary

Bridger Bowl ski area, located just 16 miles north of Bozeman, is the area's most heavily used winter-time recreation area. The ski area attracts over 4,000 skiers on peak days and is the major contributor to winter traffic along Highway 86, the sole access route between the ski area and Bozeman. Increased traffic has led to overcrowded parking lots; increased wildlife/vehicle collisions; more traffic noise; traffic congestion on "powder" days; increased crash rates on Bridger Canyon Road; and degraded air and water quality. Such concerns in Bridger Canyon are particularly common on busy weekends and days when there is new snow.

Bridger Bowl, in partnership with Bohart Ranch Cross Country Ski Center, has implemented a number of programs to help shift users towards alternatives to single occupancy vehicles including:

- Weekend bus service between Bozeman and Bridger Bowl (plus school holidays for the Kid's bus)
- Designated carpool lot at Bridger Bowl for vehicles with 3 or more passengers.
- Carpool and bus park and ride lot at the Gallatin County Fairgrounds (Tamarack and N. Rouse). This park and ride lot will be moved to the north side of the County Fairgrounds near Oak St. for the 2015-2016 ski season.
- Carpool incentives "3 on a wheel to get the deal" to qualify for discounted lift tickets.

This project, based on survey data collected during the 2014-2015 ski season and stakeholder meetings, recommends options to enhance existing bus service and carpool programs as follows:

1. *Address concerns about ski and snowboard gear storage for people that ride the bus.* Many people that ride the bus would like better ski/board gear storage options as it can be cumbersome to manage gear on a crowded bus and the space needed for gear reduces bus capacity. Although no incident has yet occurred, bus operators have expressed concerns about potential accidents/injuries due to unsecured ski gear on the bus. Other concerns include the security of expensive skier/rider gear.
2. *Increase weekend bus frequency and capacity.* This may include earlier buses from town, later buses from Bridger and mid-morning buses as well as using larger 50-person motor coaches. (Increased weekend frequency is planned via hourly busses to depart from MSU at 8 am, 9 am, 10 am, 11 am 12 noon and 1pm for the 2015-16 ski season. Bus schedule may be found at <http://bridgerbowl.com/mountain-and-town/mountain-services> ).
3. *Try out different bus stop locations.* This may include Montana State University, the north side of the Fairgrounds off Oak St., and one to serve the west side of Bozeman.



Consider an alternative to the “K Mart” stop, as this pickup location is less than a mile from the Fairgrounds pick up location. Note that K Mart closed recently, though the stop is still located near Oak St and N. 7<sup>th</sup>. (An MSU pickup is planned for the 2015-16 ski season and the K-mart location will be eliminated.)

4. *Continue to promote carpooling in various ways such as more frequent promotions and a variety of new incentives.* Pursue opportunities to use ridesharing apps to connect skiers that want to carpool.
5. *Develop a comprehensive marketing approach for bus and carpool options.* Utilize appropriate media (website, mobile app, phone message) to target users and deliver the information at the key time to maximize the opportunity to affect travel decisions. Create a culture around not driving alone. Connect to the culture and social aspects of skiing. Ideas might include a logo/catch phrase contest or tying to the idea of “no empty chair”.

The purpose of this project is to continue to build on existing bus and carpool options to access Bridger Bowl/ Bohart Ranch with a goal of reducing traffic on Bridger Canyon road in the winter and improving the experience of ski area users. Target user groups are people that travel to Bridger Bowl and Bohart Ranch in the winter. Given the unpredictable nature of powder days, scheduled bus service alone cannot address the huge increase in traffic on those days. Carpooling has the potential to reduce traffic that causes congestion and parking issues on these days. To be successful these efforts require partners in addition to Bridger Bowl. Next steps for the five tasks above will depend on discussion and outcomes of meetings with stakeholders.

## 6.2 Estimated Project Costs

There will be two components to project costs as follows. The first component consists of convening meetings with stakeholders on each of the five tasks, which are described in Section 6.10 Draft Statement of Work. This cost will vary depending on the number of meetings and is estimated to range from \$3,000 to \$6,000.

The second cost component will be implementing strategies determined in the meetings. These costs will vary depending on what level of implementation is chosen. Bus options presented below assume 35-passenger buses (e.g. “Streamline”) or larger 50-passenger buses (e.g. “Karst”). Increasing the frequency of weekend buses may range from about \$23,000 to over \$79,000 depending on frequency and bus type. Bridger Bowl spent \$12,950 on Streamline and \$29,200 on First Student buses during the 2014-2015 ski season. The Streamline’s 4 bus trips up and 5 down, was capable of moving up to 140 skiers

to the mountain, assuming all buses were full. It is anticipated that Bridger will spend about \$18,000 for increased weekend Streamline bus service for the 2015-2016 season. This new Streamline service will have 6 bus trips up and 9 down, which will be capable of moving up to 210 people to the mountain, assuming all buses are full. Carpooling costs may include cost for advertising and incentives and will vary depending on the frequency and level of programs. Cost estimates are shown in Table 6-1 for different levels of mode shift.

Percent Shift	Streamline		Karst Stage	
	Daily Cost	Annual Cost (Weekends)	Daily Cost	Annual Cost (Weekends)
<b>5% (200 skiers)</b>	\$780	\$28,080	\$640	\$23,040
<b>10% (400 skiers)</b>	\$1,560	\$56,160	\$1,280	\$46,080
<b>15% (600 skiers)</b>	\$2,210	\$79,560	\$1,920	\$69,120

*Table 6-1: Estimated project implementation costs*

### 6.3 Study Evaluation Factors

#### **Visitor mobility for a full range of ability and income levels**

Enhancing weekend bus service and carpool opportunities would increase mobility options for people of all abilities and income levels.

#### **Visitor experience both within the target recreational areas as well as transit to those areas**

Bus service improvements such as gear storage, increased frequency, and more convenient stops will improve visitor experience. Reducing the number of vehicles on Bridger Canyon Road will improve the experience of all people traveling that road.

#### **Environmental impact primarily as measured by wildlife safety, footprint of built environment, and carbon emissions**

Reducing the need for ever-increasing parking area at Bridger Bowl will reduce the impact on the natural environment of the Forest. Reducing vehicle traffic on Bridger Canyon Road

has the potential to reduce wildlife vehicle collisions, parking lot size, and carbon emissions.

### **Operational efficiency and financial sustainability**

More information is needed to determine what level of enhancements will be operationally efficient. A small fee on day tickets and season passes could be financially sustainable if Bridger Bowl season pass sales and day ticket sales continue to reach recent levels (8,000 and 217,000 respectively for 2014-15 season). For example, a fifty cent fee on day ticket sales could result in over \$100,000 and a \$4 fee on season passes could result in \$32,000. If we assume that one in three day-ticket sales represents a single occupant vehicle, then charging \$1 to park would generate \$70,000.

### **Technical, political, economic, and administrative feasibility**

Weekend bus enhancements and carpooling promotions are feasible in all of the above ways. The options proposed are building on existing services and programs that have demonstrated success.

## **6.4 Past Planning Efforts**

The following local planning and survey documents support increased bus and carpool travel.

- Two goals of the Greater Bozeman Area Transportation Plan (2001) and the Bozeman 2020 Community Plan support bus and carpool travel as follows:
  - Ensure that a variety of travel options exist which allow safe, logical, and balanced transportation choices.
  - Encourage transportation options that reduce resource consumption, increase social interaction, support safe neighborhoods, and increase the ability of the existing transportation facilities to accommodate a growing city.
- A goal of the Bozeman Area Transportation Plan (2007 update) supports increased bus and carpool travel as follows:
  - Make transit and non-motorized modes of transportation viable alternatives to the private automobile for travel in and around the community.”
- The transportation chapter of the Bozeman Community Climate Action Plan (2011) calls for policies supporting multi-modal transportation.
- Results from the two surveys that were conducted as part of this study support bus and carpool enhancements.

## 6.5 Potential Project Partners

The following entities are potential partners that may support this project in various ways such as marketing bus and carpool options or contributing funds for increased bus service. Potential partners include:

- Local hotels (interest in service to Bridger/ funding or promoting bus)
- Bridger Canyon Property Owners Association (interest in minimizing traffic in the canyon)
- Gallatin County Fairgrounds (has agreement for park and ride lots for Bridger Bowl skiers)
- HRDC/Streamline, Karst Stage and First Student (provide local bus service)
- City of Bozeman (the City is updating the transportation master plan and has a vested interest in transportation issues)
- Gallatin County (Bridger Canyon is located in the County jurisdiction),
- Custer Gallatin National Forest (manages lands in Bridger Canyon)
- Chamber of Commerce, Bozeman Tourism Business Improvement District, Downtown Business Partnership (interest in how project impacts tourism),
- MSU, ASMSU (Outdoor Rec Program), MSU Office of Sustainability, and local marketing firms (interest in promoting more sustainable transportation options)

Partner interest for all of these entities has not yet been confirmed.

## 6.6 Prospective Project Lead(s)

There are a number of stakeholders that may lead one or more bus and carpool enhancement initiatives that include Bridger Bowl, HRDC/Streamline, Bohart Ranch and Bozeman Tourism Business Improvement District. It is anticipated that WTI will facilitate meetings with these groups to further develop initiatives and identify a leader for implementation.

## 6.7 Prospective Funding Sources

It is anticipated that BAATs phase IV funds will be used to facilitate meetings for developing the various projects for enhancing Bridger Canyon bus and carpool options.

There are numerous potential funding sources for increasing transit service to Bridger Bowl, including: Bridger Bowl, Federal Transit Administration funds administered by the Montana Department of Transportation (MDT), Associated Students of Montana State University (ASMSU), Tourism Business Improvement District, FHWA Federal Lands Access Program, City of Bozeman and Gallatin County. Other potential sources include tourism grants and possible funding from private entities such as motels, ski shops, etc.

Many of the entities noted above already contribute to the Streamline (and Galavan) transit system. Major funding partners to Streamline include: MDT/FTA, ASMSU, MSU, City of Bozeman, and Bridger Bowl. Gallatin County provides funding for Galavan, which is part of the overall public transportation service. Ultimately, the amount of additional funding that can be secured for increased service to Bridger Bowl will depend upon how the entities view perceived benefits, and what they can afford.

Additional meetings with all the various partners will clarify the additional amount of service desired, including details such as route timings and stop locations, and what funding is available to implement the new service.

## 6.8 Relevant Projects

Four regional shuttle systems were researched as a part of this project development. The most relevant system to Bridger Canyon winter use is described briefly below. All four systems are described in greater depth in [Appendix 4-1: Recreational Shuttle Systems](#).

### **Jackson, Wyoming Southern Teton Area Rapid Transit (START)**

Description: The START bus is a public transportation system that operates in the greater Jackson, Wyoming area and currently gives approximately 900,000 rides per year. The START system provides service to many areas in Jackson, including both the Snow King Mountain (in Jackson) and Jackson Hole Mountain Resort (Teton Village) ski area approximately 12 miles from Jackson. A key factor that leads to strong ridership is the fact that Teton Village charges for parking in the winter, providing a strong financial incentive for people to use transit to get to the area.

## 6.9 Draft Statement of Work

**Task 1: Facilitate up to two meetings to address concerns about ski and snowboard gear storage on the buses.**

Hold meetings to identify the various concerns regarding gear storage on the buses, potential solutions to these concerns, and how the solutions can be implemented. Meetings need to be attended by representatives from Bridger Bowl, Karst Stage, First Student, and Streamline. Additional attendees could include Gallatin County Fairgrounds and a representative number of bus users. Specific items for discussion should include: racks on the outside of the bus, storage under the bus (if larger motor coaches were used), dedicated space on the bus, and more locker options at Bridger Bowl. Outcomes of the meeting should include proposed solutions as well as who will lead the implementation of changes.

**Task 2: Facilitate up to two meetings to discuss options to increase weekend bus frequency and capacity.**

This may include earlier buses from town, later buses from Bridger, and mid-morning buses as well as using larger, 50-person motor coaches. This task will include determining appropriate system goals, coordination amongst Bridger Bowl and bus providers. It should consider bus departure times that may allow people to arrive at Bridger in time for ski lessons and buses departing Bridger later than 4:15, which may reduce drinking and driving. Other considerations include availability and scheduling of Streamline 35-passenger and Karst 50-passenger buses, at what point might user fees help defray costs and advertising needs to ensure new service is used. This group may also discuss strategies to keep kids riding the Kid's bus, rather than riding the nicer Streamline buses.

[It should be noted that Bridger is increasing weekend Streamline service for the 2015-16 season to include MSU departures at 8 am, 9 am, 10 am, 11 am, noon and 1 pm. The new schedule will have 9 bus trips from Bridger to Bozeman, with the last bus at 4:45. The current schedule may be found at: <http://bridgerbowl.com/mountain-and-town/mountain-services>.]

**Task 3: Facilitate up to four meetings to revise bus stop locations**

Meetings will focus on the options below:

- There are already plans to relocate the Fairgrounds stop to the new north parking lot with access from Oak St. for the 2015-2016 season. Ensure the pick-up locations for the different buses are easy to identify. Consider benches, signage, ski holder, and shelter components. Consider allowing coffee and/or food vendors to create an inviting gathering place.
- There are already plans to add a stop location at Montana State University for the 2015-16 ski season. Consideration should be given to finding a location that is located adjacent to residence halls, as this will make getting to the bus stop with ski or snowboard gear more convenient.



- Add a stop location that can serve the residential neighborhoods in the western region of Bozeman. Potential locations include: Rosauers, REI, or Meadowlark Elementary School
- Consider the following ideas for all bus stop locations:
  - Organize waiting area/benches, where people that arrive first may wait and then expect to board the bus first. A systematic approach is especially important for ski days when there is new snow and bus drivers have to turn riders away. Discuss the idea of training for bus drivers on methods to manage people on busy days when there may be a “powder frenzy” to reach the ski hill.

#### **Task 4: Facilitate up to three meetings to continue to promote carpooling**

Meetings will focus on the ideas below.

- Increase the frequency of events that promote carpooling such as “Three on a Wheel get the Deal” and add new incentives.
- Pursue opportunities to use ridesharing apps to connect skiers that want to carpool. Free internet is already available at the lodges. Enable data usage for ShareLift or other ride matching app users in the Bridger Bowl base area. There is currently very spotty cellular coverage at Bridger Bowl.

#### **Task 5: Facilitate up to three meetings to develop a comprehensive marketing approach for bus and carpool options**

Meetings will focus on the ideas below.

- Develop a comprehensive marketing approach to provide information on bus and carpool options. Utilize appropriate media (website, mobile app, phone message) to target users and deliver the information at the key time to maximize the opportunity to affect travel decisions.

## **6.10 Feasibility Study Approach & Findings**

### **6.10.1 Assess Current Bus Service**

The study team documented the nature of the transit service currently provided to Bridger Bowl. There are three bus types, all funded by Bridger Bowl and Bohart Ranch, as follows.

- 1) *Kid's bus to Bridger Bowl* – This yellow school bus is provided by First Student, which operates the buses for the Bozeman School District, and includes exterior-mounted ski racks. This bus operates on weekends and school holidays. It leaves the Hasting's parking lot at 8:10 am, stops at the Fairgrounds at 8:30 am, and arrives

at Bridger Bowl at 9:00 am. The bus then departs Bridger Bowl at 4:00 pm, arriving at the Fairgrounds at 4:30 pm and the Hasting's parking lot at 4:40 pm.

- 2) *Employee Bus to Bridger Bowl* – This bus is also provided by First Student and comparable to the Kid's Bus. Service includes one daily roundtrip that arrives to Bridger Bowl between 7:30 and 8 am and departs Bridger Bowl around 5 pm. While the schedule does not accommodate the needs of all employees, the schedule is set to accommodate the greatest number of employees. The purpose of this bus is to provide a benefit to employees (free transportation) and to reduce parking impacts resulting from employee automobiles. There was an average of approximately 225 employees working each day at Bridger Bowl in the 2014/15 season.
- 3) *Streamline Bus to Bridger Bowl and Bohart* – During the 2014-15 season, the Streamline bus had a weekend service to Bridger Bowl and Bohart Ranch that included pickups/drop-offs at the old K-mart parking lot on North 7<sup>th</sup> Avenue and the Fairgrounds, near N. Black and Tamarack. The bus departed from the fairgrounds at 8:00 am, 8:45 am, 12:00 pm, and 1:25 pm. The bus had five return trips from Bridger, with the first bus leaving at 11:20 and the last bus leaving at 4:15. Bohart Ranch noted that some of their 20 employees ride the bus and others do a pretty good job of carpooling. There are plans for the 2015-16 ski season for 6 weekend Streamline trips to Bridger and Bohart, leaving MSU at 8am, 9am, 10am, 11 am, 12 noon and 1pm and 9 return trips, starting at 8:45 am and ending at 4:45 pm. Details may be found at <http://bridgerbowl.com/mountain-and-town/mountain-services>.

Table 6-2 shows available ridership data for bus service to the ski areas. Although data exists for 2010 – 2013, it is not shown in the table because it was never processed. Riders shifted slowly between the Kid's bus and the Streamline service as kids figured out that the Streamline buses are nicer to ride. The employee bus ridership increased because Bridger started using a larger bus on weekdays (a school bus instead of a 20-passenger bus) and it has become more popular with employees over time.

Year	Kids bus	Employee bus	Streamline bus	Total Rides
2007-2008	5,110	2,720	2,190	10,020
2008-2009	4,247	2,804	2,855	9,906
2009-2010	4,550	2,731	2,745	10,026
2013-2014	3,434	5,259	3,712	12,405

Table 6-2: Bridger Bowl bus ridership data

Parked vehicles were counted at the Fairgrounds parking lot for a few days in 2015 to document how many vehicles typically use the park and ride lot.

- Saturday January 31, 2015 – 29 employee vehicles before 8 am, 34 at 8:40 and 44 at 11 am
- Sunday February 1, 2015 – 18 employee vehicles before 8 am, 28 at 11:20 am (Super Bowl Sunday)
- Saturday February 14, 2015 – 350 cars at 11:45, with a lot of traffic coming and going for the Winter Fest event at the fairgrounds.
- Saturday February 21, 2015 – 39 vehicles at 11:45.

### 6.10.2 Evaluate Existing Data

The study team compiled and assessed available data including parking lot capacity, Bridger Canyon Road traffic data, and skier-visit data. In July 2014, Bridger Bowl reported its parking lot had capacity for approximately 1,500 vehicles. Bridger expanded the upper parking lot in late summer of 2014 to construct a 280-space carpool-only lot, bringing total parking capacity to 1,780. Details on available data for Bridger Canyon Road and Bridger Bowl skier visits is provided in [Appendix 6-1 Bridger Canyon Traffic Data](#).

### 6.10.3 Conduct Bus/Carpool Transportation Surveys

The study team conducted a survey of people that rode the Streamline bus to Bridger Bowl and Bohart on weekends in January, February, and March 2015. The purpose of the survey was to learn more about weekend bus riders' experience and opinions regarding the bus service and gather suggestions for improvements. Survey results from 111 bus riders are provided in the Bus Rider Survey Report in [Appendix 6-2: Bus Rider Survey](#). Key results indicate that bus riders are generally satisfied with the weekend Streamline bus service. Common requested improvements are:

- Ski and snowboard gear storage
- More frequent bus schedule
- More bus stop locations (MSU)

One WTI employee attempted to ride the 9 a.m. bus from the Fairgrounds on a day with new snow, Saturday, February 21, 2015. She observed there were about 12 people standing on the bus because all seats were full. These people refused to leave when the driver explained the rules did not permit her to drive while people are standing. Eventually people did leave the bus, though many people were angry they were unable to ride. It appeared that the more aggressive people boarded the bus and were able to catch a ride, not necessarily the people that arrived at the Fairgrounds earliest and waited. One idea to address situations like this is to organize a first come/ first ride system via benches or a waiting area, where people that arrive first may wait and then board the bus first. Another idea is to offer training to bus drivers on methods to manage people on these busy days when there may be a "powder frenzy" to reach the ski hill.

A different survey was administered more broadly in April 2015 to people that go to Bridger Bowl or Bohart Ranch ski areas. This survey was intended to better understand Bridger Bowl and Bohart users' opinions about bus, shuttle and ridesharing to Bridger Bowl/Bohart. Survey results from over 1300 people are provided in [Appendix 6-3: Carpool and Bus Survey](#). Some key results are that 39% of respondents traveled to ski areas by driving/riding with one other person and 34% with two or more other people. Over 50% of respondents said the following incentives/disincentives are important to encourage carpooling:

- A chance to win a \$10-25 or \$26-50 gift card;
- A designated location to meet others that want to share a ride;
- Having to park far away from the ski hill if driving alone; or
- Having a parking fee for non-carpoolers.

#### **6.10.4 Assess Bridger Bowl Demographic Data**

Bridger Bowl Central Reservations estimates that 30% of skier-visits are "destination skiers" that come from outside of Montana. Annual skier visits from the 2013-2014 season averaged about 200,000. Therefore, approximately 60,000 of these skier-visits are from destination-skiers. Given an average stay of 2.5 days per destination-skier, an estimated 24,000 unique individuals came to Bridger Bowl from out of state during the 2013-2014 season.

These destination skiers likely translate to a significant number of overnight guests in area hotels and, therefore, present an opportunity to provide transportation for these people. Bridger Bowl's records indicate there are 3 regions from which most out-of-state skiers come: 29% (6,960) come from Minnesota, 17% (4,080) from Saskatchewan, Canada and 13% (3,120) from North Dakota. Bridger Bowl, local hotels, and other tourism entities may consider reaching out to these groups to understand their transportation needs and opportunities to promote bus or ridesharing options to these groups.

#### **6.10.5 Assess Transportation Demand Management (TDM) Strategies**

This part of the study looked at ways to use Transportation Demand Management strategies to decrease the use of single occupant vehicles to access the recreation opportunities afforded by the federal lands that surround Bozeman. The study team researched TDM strategies being used across the country with a focus on strategies being successfully implemented for transportation to recreation activities and areas. TDM strategies work best when used in concert with each other. It is rare to find a single strategy that alone will result in any significant mode shift away from single occupant vehicles. TDM strategies for Bridger Canyon include:

- Improve shuttle/transit options
- Improve carpool/ride share opportunities and usage. This includes mobile applications (apps) that would allow for dynamic ridesharing (carpooling) to link drivers with riders.
- Re-assign costs of providing parking

Bridger Bowl has been researching the Near Field Chips (NFC's) found in smartphones, and that it may be a way to provide incentives to people who use alternative modes. More details are provided in [Appendix 6-4: TDM Strategies](#).

#### **6.10.6 Conduct a Mode Shift Analysis**

A “mode shift” analysis was completed to consider potential schedules and costs associated with shifting some people from driving personal automobiles to riding a bus or shuttle. Shifting some people from automobile to bus trips has potential to reduce traffic on Bridger Canyon Road and to alleviate overcrowded parking lots. An analysis presents potential bus schedules and cost estimates for shifting various numbers of people from driving to riding a bus to Bridger Bowl/ Bohart (see [Appendix 6-5: Bridger Canyon Mode Shift Analysis](#)).

#### **6.10.7 Research recreational shuttle systems in other communities**

This task researched recreational shuttle systems in other communities to understand how the systems work, what types of vehicles they use, how they are funded, and what their goals are. One of the systems reviewed was Jackson, Wyoming’s Southern Teton Area Rapid Transit (START) public transportation system. It is relevant because it provides access to and from winter ski areas from Jackson. It provides information on winter bus service to a nearby ski hill and discusses how parking fees at the ski hill support the bus service. See [Appendix 4-1: Recreational Shuttle Systems](#) for more details.

# Section 7

## Promotion of Alternative Transportation

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## 7.1 Summary

This proposed project will create a broad-reaching, interagency and cross-platform data integration and information campaign to facilitate car-free and car-lite travel to recreational sites throughout the greater Bozeman area. Such a campaign will also serve to enhance the recreational experience of accessing these sites. For many residents and visitors it is hoped that improved information management and dissemination will not only open up opportunities for alternative forms of transportation, but enable new kinds of experiences with Bozeman and its surrounding recreational areas. An interactive tool will be created that compiles maps and other relevant data thereby allowing users to readily locate accurate information related to trails, buses, shuttles, rideshares and other alternative transportation information. Additional project components include: updates of key websites so that the interactive tool can be easily accessed from a number of primary websites; and a media campaign that will increase awareness of the tool amongst locals and will appeal to prospective visitors.<sup>1</sup>

## 7.2 Problem Identification

Bozeman is a year-round haven for a wide variety of outdoor enthusiasts. As a result, outdoor recreational pursuits are a big part of life for many locals and, not surprisingly, attract people from across the country and around the world. In recent years, information regarding local transportation and recreational attractions has been developed and disseminated by a variety of local groups and agencies; however, none are comprehensive or oriented with the intent of encouraging car-free or car-lite transportation. There is a tremendous opportunity to pull together key stakeholders to provide coordinated transportation and recreational information that will benefit both locals and visitors.

### Issues Facing Residents

Long-time residents and recent transplants have located in Bozeman for a variety of reasons, but common among them is the local proximity and access to a variety of multi-season outdoor recreational activities. Currently there are a variety of websites, publications, and local businesses that disseminate information about a variety of recreational activities. Information about bird watching, hiking, running, mountain biking or Nordic skiing can be found in different places, with in some instances, multiple resources offering different information about the same activity. Similarly, there is no centralized informational resource that provides bike route, trail, transit or shuttle information that

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<sup>1</sup> Note: any media campaigns conducted to external markets are considered outside of the BAATS scope. Nonetheless, a project partner, such as Bozeman Convention and Visitors Bureau may want to champion this component of the project.



can act as a source of alternative transportation planning to link any of the recreational activities to Bozeman as a potential car-free journey. There are existing efforts, including hard copy maps published by the Bozeman Area Bicycle Advisory Board and the Gallatin Valley Land Trust; however, there is no comprehensive information available on how to travel to recreational areas and public lands from the City of Bozeman without a vehicle.

### Issues Facing Visitors

Bozeman is a year-round jumping off point for a wide variety of outdoor enthusiasts, both national and international. Visitors can currently create car-free vacation packages all over the greater Yellowstone region; however these individuals are typically on scheduled tours, such as that shown in *Figure 7-1*, which do not allow for self-directed experiences. In 2015, Bozeman Yellowstone International Airport handled over one million passengers for the first time in a 12 month period. The Bozeman area also welcomes tourists who enter the state through other Montana airports, rail service (Amtrak) and intercity bus service. There are currently a number of experiences that are marketed nationally and internationally to prospective visitors. Guided fishing tours, ice climbing, ski packages, bicycle touring; however, there is little existing information to encourage visitors to the Bozeman area to visit, or extend their trip car-free.



*Figure 7-1: Karst Stage motor coaches pick up “car- free” visitors at Bozeman Yellowstone International Airport*

Many of the potential partners for this proposed project were recently engaged in the Greater Gallatin Trails Visioning process which concluded that because there was no centralized planning process or resource regarding trails and recreation that the region essentially “lacks a comprehensive community vision for a multi-user trail system that integrates a full spectrum of jurisdictions, recreation types and a variety of other needs into a single plan. In the view of many trails stakeholders in the region, this lack means the

Greater Gallatin area lags behind other Western amenity-based communities...”<sup>2</sup> While this statement is focused on planning it also applies to information about recreational amenities. The subject project would help to fill a critical void regarding access to relevant information about how to get around the Bozeman area, including surrounding recreational areas, without a private automobile.

### 7.3 Scope & Purpose

The following proposed project components will facilitate alternative transportation access to recreational areas surrounding Bozeman:

#### **Interactive Access Tool**

The first step would involve gathering relevant data from a variety of groups. Data will include trail locations, river accesses, park locations, transit and shuttle service information and more. An interactive, web-based tool would then be created to display this data;

#### **Website Updates**

Multiple websites, including the Chamber and Visitors Bureau (CVB), will be updated to include car-free and car-lite visitation information. Comparable updates could be completed for other websites that attract target user groups;

#### **Media Campaign**

Existing campaigns targeting both locals and visitors could be leveraged to reach these two groups. The “Only in Bozeman” campaign is one such existing campaign.

### 7.4 Prospective Project Partners

- Bozeman Convention and Visitors Bureau (current mission well aligned with outreach to prospective visitors);
- City of Bozeman (City has momentum for compatible initiatives);
- Custer Gallatin National Forest (steward of many of the applicable recreational areas);
- Gallatin County (most recreational areas and access routes would lie within or adjacent to the county);

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<sup>2</sup> MIG, 2014, *Greater Gallatin Trails Visioning*, retrieved from:  
<http://www.montanamountainbikealliance.com/static/GGTV.pdf>

- Gallatin Valley Land Trust (GVLTL is the primary trails organization in the Bozeman area; embarking on interactive trail map and subject project is consistent with GVLTL's mission);
- Montana Department of Transportation (MDT is a primary stakeholder in all things related to transportation); and
- Montana State University (the student population would likely primary users of this system).

## 7.5 Estimated Project Costs

Proposed Project Steps	Anticipated Cost
Data Gathering	\$10,000-\$15,000
Interactive Mapping	\$15,000-\$20,000
Website Updates	\$10,000-\$15,000
Media Campaign	Unknown
<b>Approximate Total Set-up Cost</b>	<b>\$35,000-\$50,000 +</b>

*Table 7-1: Approximate Total Set-up Costs*

Proposed Annual Expenses	Approximate Cost
Collect mapping updates from partners and upload to interactive map	\$2,500
Website hosting	\$1,500
<b>Approximate Annual Expenses</b>	<b>\$4,000</b>

*Table 7-2: Approximate Annual Expenses*

## 7.6 Study Evaluation Factors

### Visitor mobility for a full range of ability and income levels

Promoting and providing information that will allow residents and prospective visitors to enjoy expanded transportation choices that will have a positive impact on the experience and mobility for the full range of ability and income levels. This type of information may be particularly valuable to those who do not have cars in Bozeman.

### Visitor experience both within the target recreational areas as well as transit to those areas

Interactive online resources will encourage and provide detailed information for the use of alternative transportation for residents and may facilitate car-free or car-lite visitation to

the Bozeman area. For visitors, the resources will allow the most appropriate mode of transportation to be chosen for access to local and regional recreational locations. These modes include bike, walk, car, transit, shuttle, taxi and carpool.

**Environmental impact primarily as measured by wildlife safety, footprint of built environment, and carbon emissions**

There is no physical infrastructure associated with this project, however this project could result in fewer vehicle trips to many of the area's impacted recreational destinations. Reduced vehicle trips translates to improved wildlife safety, decreased pressure for expanding footprint of build environment and reduced carbon emissions.

**Operational efficiency and financial sustainability**

Once established, this project requires limited annual maintenance to sustain. Annual maintenance may include website hosting fees, domain registration and content updates. There could optionally be additional media campaigns to drive interest and visitation to the Bozeman Area.

**Technical, political, economic, and administrative feasibility**

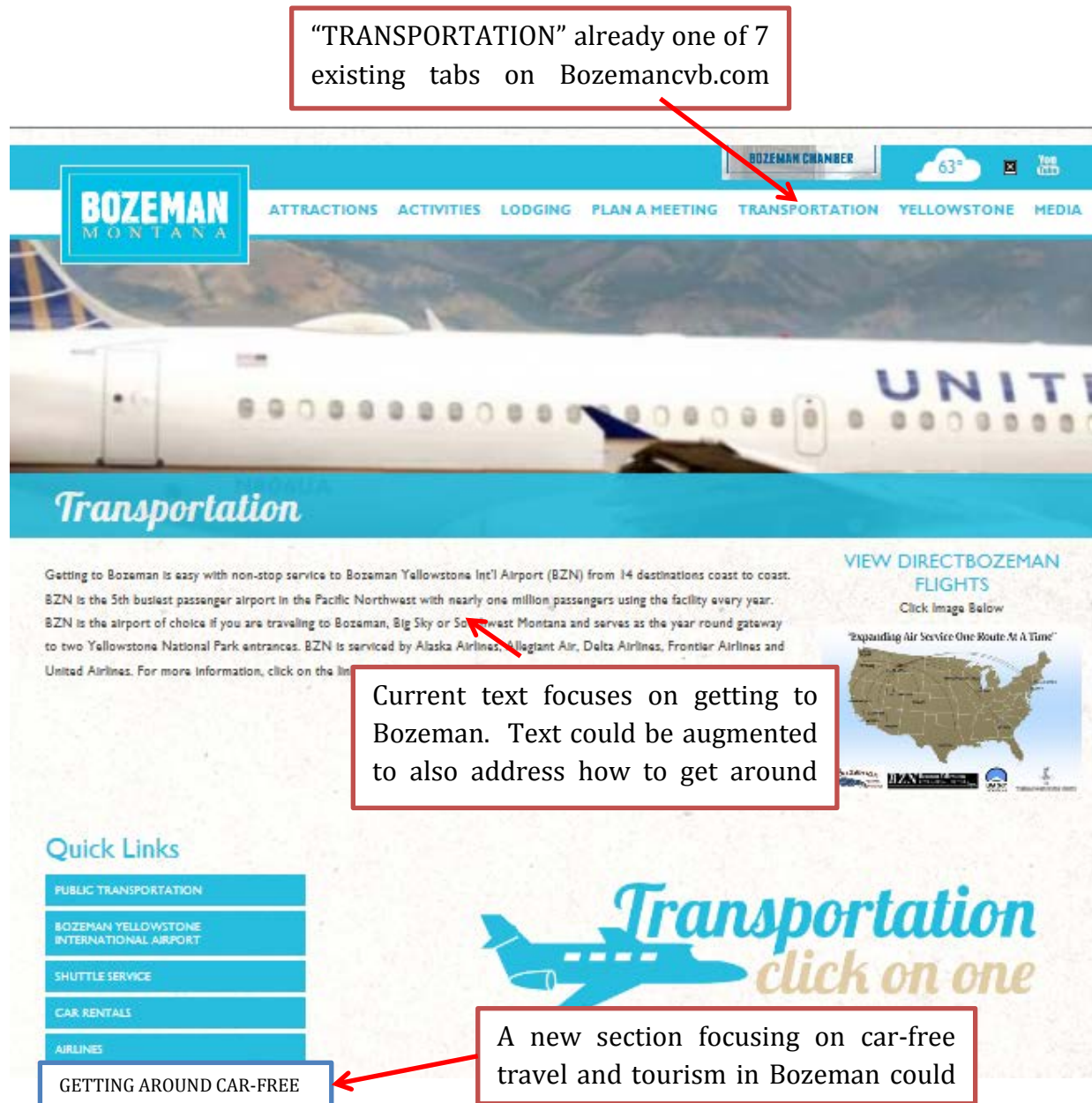
The project is sound from a technical, political, economic and administrative feasibility perspective. This effort seeks to build on existing local efforts by a variety of organizations including the City of Bozeman, the Convention and Visitor's Bureau (CVB) and the Gallatin Valley Land Trust.

## 7.7 Past Planning Efforts

While there have been no significant efforts to date geared specifically towards attracting car-free or car-lite visitation to the Bozeman area, there have been significant and multiple independent efforts to collect and disseminate mapping and other visitor related information for a variety of different activities. From a planning perspective, many of the objectives of this project have previously been identified. For example, the Greater Gallatin Trails Visioning plan (Access component of vision on page 5 and Goal 4 on pages 6 and 16) highlights the need to address fragmented recreational information. Additionally, the 2007 Greater Bozeman Area Transportation Plan, section 6.5, identified the need for the development of bike and walking maps and a centralized website to disseminate information.

In 2015, the Bozeman CVB has updated its website to include some of this information, as shown in Figure 7-2, and it has launched a broad-reaching media campaign, with "Only in

Bozeman” as its tag line, as shown in *Figure 7-3*. Both of these programs appear to be compatible with a wider focus that could accomplish the objectives of this project.



*Figure 7-2: The Bozeman Chamber of Commerce has a useful website that could be used as a base for an expanded portal*





Figure 7-3: The “Only in Bozeman” campaign could be expanded to encourage car-free visitation to the area

## 7.8 Potential Project Partners

The potential number of project partners is significant; however, it should be led and guided by a single entity, this would ideally be the City of Bozeman with support from GVLTT, or GVLTT with support from the City of Bozeman. Additional partners would include the Bozeman Chamber of Commerce, and potentially the Bozeman Tourism Business Improvement District, Gallatin County, and the Custer Gallatin National Forest.

### City of Bozeman

The City of Bozeman owns and maintains much of the spatial data that would be needed to create an interactive mapping portal. In fact, the City of Bozeman is planning the launch of an app that would provide a mapping resource to disseminate information on city parks and their amenities as well as serving as a way for residents to submit maintenance requests for city infrastructure and pay city utility bills. This City project receives approximately \$12,000 of city funding per year and has several internally focused technology elements specific to city government and operations that are not applicable to

this recreational access mapping project. This City project indicates the City understands the advantages of map-based internet applications. The City could act as the organizing entity for this project, serve as the conduit for funding, and administer a contract with a selected consultant while balancing the needs of residents and visitor stakeholders in the process.

### **Gallatin Valley Land Trust (GVLТ)**

A significant component of GVLТ's mission is the creation of trails in the greater Bozeman area and this organization has been responsible for a significant portion of Bozeman's 80+-mile system of trails. GVLТ is a logical partner as it relates to providing current data regarding the area's trail system. The subject project could expand upon an upcoming GVLТ project. GVLТ recently received \$10,000 for the purpose of establishing an interactive, mobile friendly website to disseminate trail information for the Main Street to the Mountains Trail System. GVLТ intends to partner with the City of Bozeman to make the trail information available as a web enabled map using the City's ESRI software. GVLТ will create and maintain the data while the City will offer hosting.

A major motivating influence for GVLТ in producing the new web map is to promote use of local trails. At this time, GVLТ feels user demand is highest for trail-focused data targeting local users. There is less demand for the additional data considered in this BAATS study and from tourist/visitor audiences. GVLТ's current project is focused on Bozeman's Main Street to the Mountains system and closing the gaps to the National Forest boundaries. GVLТ has stated that if there were a larger group to create a singular visitation-focused website that GVLТ would be interested in contributing to the effort, and their current project (beginning in the winter of 2015-2016) could help advance this proposed effort.

### **Bozeman Chamber and Visitors Bureau (Bozeman CVB)**

The Bozeman CVB has multiple priorities including tourism development, economic development, business community membership, and training / education / Community development. Initial conversations suggest the Bozeman CVB would potentially be open to merging the goals and objectives of the subject project with the existing chamber website. The Chamber has a branded campaign to attract tourism to Bozeman entitled "Only in Bozeman," which can be viewed at [www.onlyinbozeman.com](http://www.onlyinbozeman.com). This website is in addition to the chamber website. It is possible that the Only in Bozeman campaign could be leveraged to attract car-free or car-lite tourism.

The chamber's website ([www.bozemanchamber.com](http://www.bozemanchamber.com)) was overhauled within the last year and was launched alongside the tourist-focused website ([www.bozemancvb.com](http://www.bozemancvb.com)). Prime Incorporated, a Bozeman-based design firm, created, and has a two-year contract to update, the websites with an \$80,000+/- contract. Current media strategy focuses mainly



on search engine optimization. A new media campaign targets cities where excitement is being built for limited direct airline service to Bozeman, including Newark, Houston, Minneapolis, San Francisco, and Seattle. A similar campaign targeting Minneapolis included wrapping a train by VisitMT.com with advertising as shown in *Figure 7-4*.

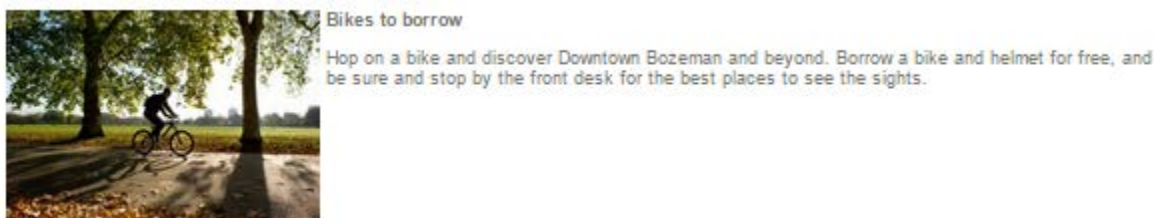


*Figure 7-4: VisitMT.com campaign in Minneapolis, MN- light rail trains and billboards downtown.*

### **Downtown Hotels**

Downtown and North 7<sup>th</sup> Avenue Hotels may gain the most from car-free or car-lite visitation to the Bozeman area. 2015 has seen the opening of both the Lark (38-room) and the Element (104-room) hotels downtown with a potential third hotel, the ETHA (102-rooms), in store for 2016 or 2017. The Element sits across from the downtown Streamline bus transfer center and the hotel advertises connections to Streamline transit and weekend bus service to Bridger Bowl on its website. The Element also provides decent quality bicycles to its guests to borrow free of charge.

The Lark Hotel in Downtown Bozeman is interested in being involved in the project as a stakeholder. Even with its downtown location and constrained parking supply there has not been a noticeable amount of car-free travel. The owner speculates that most visitors are linking Bozeman with larger regional trips to Yellowstone and Glacier National Parks and are bringing cars. The Lark offers a significant amount of information for its guests and would welcome additional resources. According to the owner of the Lark, Bozeman has not been observed to be a large component of many of the visitor's itineraries with the average length of stay at 1.7 nights. Many visitors have expressed regret over not spending more time in Bozeman.



*Figure 7-5: Bozeman's New "Element" hotel offers free bike rental to guests to explore the area.*

## 7.9 Prospective Project Lead(s)

The City of Bozeman is the logical project lead due to several factors:

- Ability to easily contract production work with consultants and act as a conduit for other external sources of funding;
- Information Technology resources including GIS;
- Interest in providing services for residents through multiple departments;
- Interest in providing services for visitors through Community/Economic Development Departments;
- Good relationships with key project partners; and
- The City is in initial scoping for providing a similar app, and is also working with GVLT for a web-based trails map.

GVLT could also act as the project lead if funding were identified. The overall objective of the interactive web mapping does fit GVLT's mission particularly if it were focused specifically on residents accessing recreational amenities.

## 7.10 Prospective Funding Sources

- [Montana Office of Tourism \(MTOT\) Grant Program – Tourism Digital Development](#)
- [Bozeman Tourism Business Improvement District](#)
- [Local Foundations](#)

A request to fund this project could be made to the Gallatin Community Foundation, Gallatin Foundation (associated with the Chamber and CVB) or other local foundations. Each foundation funds worthy projects that align with the foundation objectives. Project applications are continually accepted; however, funding is based on available resources and interest.

## Existing Pooled Funding Sources

As part of the investigation for this project, various existing efforts and funding have been identified. As described previously, GVLT has a \$10,000 grant to create a locally-focused web map. In addition, according to an attendee at the September public meeting, the Montana Wilderness Association has funding for the purposes of mapping recreational trails. As of the publication of this report, efforts to reach this person have been unsuccessful. These efforts, if combined, could accomplish a great deal of the project scope.

### 7.11 Project Readiness

The fact that both GVLT and the City of Bozeman are in the preliminary/scoping stages of interactive mapping projects and that there is some existing funding for these initiatives indicates an immediate need for a project of this type. Similarly, projects like BAATS, the Greater Gallatin Trails Visioning project and other individual projects have recently brought together many of the relevant agencies, non-profits, and other groups. These efforts have effectively ‘primed the pump’ and may indicate an immediate readiness for many of these groups to see the benefit to centralizing resources and reducing the appearance of distributed resources. This project needs to move forward in the near term to realize the goal of creating a singular, integrated, comprehensive resource that will serve the needs of numerous stakeholders.

### 7.12 Project Risks

Minimal risks are anticipated with this project; however, it is recommended that the project be led by a single entity with the cooperation of others in the area. There have been disagreements regarding trail access and permitted uses in the past between some of the potential project stakeholder groups; this project should focus on disseminating existing information regarding existing resources and not focus on planning access to minimize any potential issues.

### 7.13 Relevant Projects

#### Case Study #1: Helena, MT

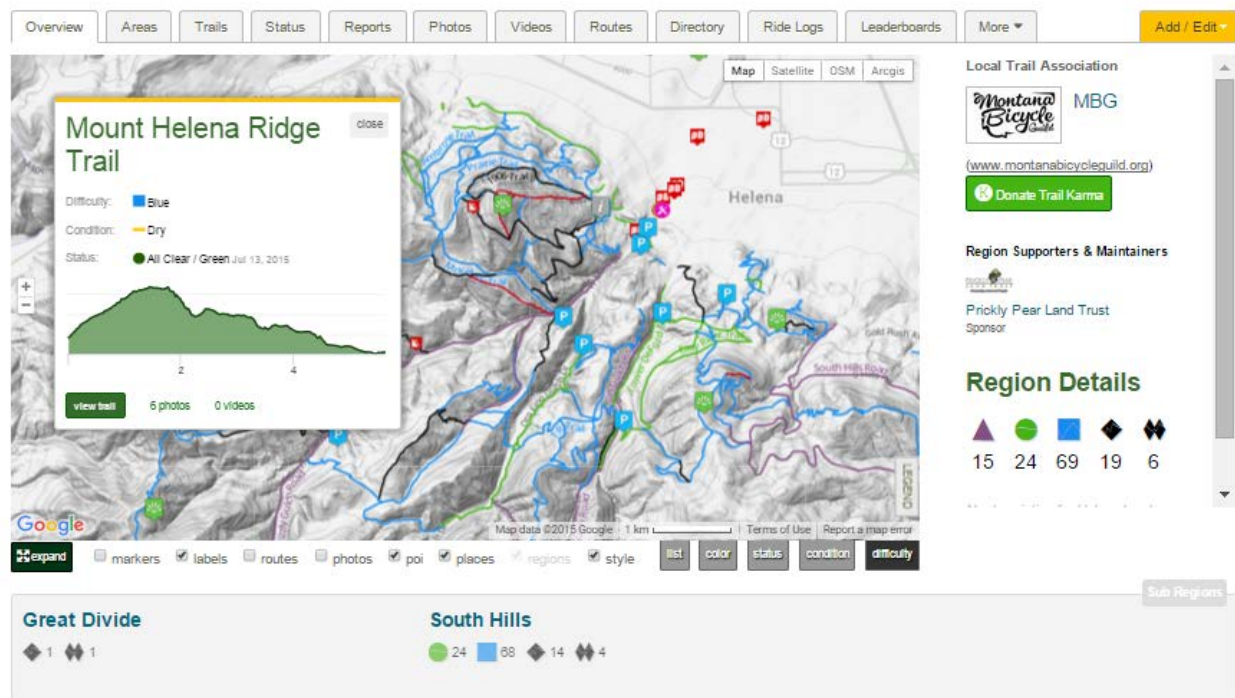
Description: Helena has been designated one of the International Mountain Biking Association’s (IMBA) ‘Ride Centers.’ A ride center is a large-scale mountain biking

destination that offers something for every rider. This status, as well as the 20 trailheads and 75 miles of single track trail, which can be accessed from Downtown Helena, have made the system a significant amenity for residents and an attractor for tourists seeking mountain biking activities. Recognizing this, Bike Helena, a "cycling community resource, for locals and visitors alike," and the City of Helena have made trail information and shuttle information easy and user-friendly through a series of web-enabled maps. This effort has manifested from both the City's GIS system and through a third party web mapping application for mountain biking called trailforks.com. The Trailforks interface provides greater user friendliness than the City's system.

<http://www.bikehelena.com/index.php/helena-trail-maps/>

Funding Sources: Prickly Pear Land Trust and Bike Helena in Partnership

### Helena / city region



*Figure 7-6: This is the [www.trailforks.com](http://www.trailforks.com) map of Helena's single-track trails and trailheads. The map also has area bike shops and organizations highlighted within the map*

### Case Study #2: Mississippi National River & Recreation Area, MN

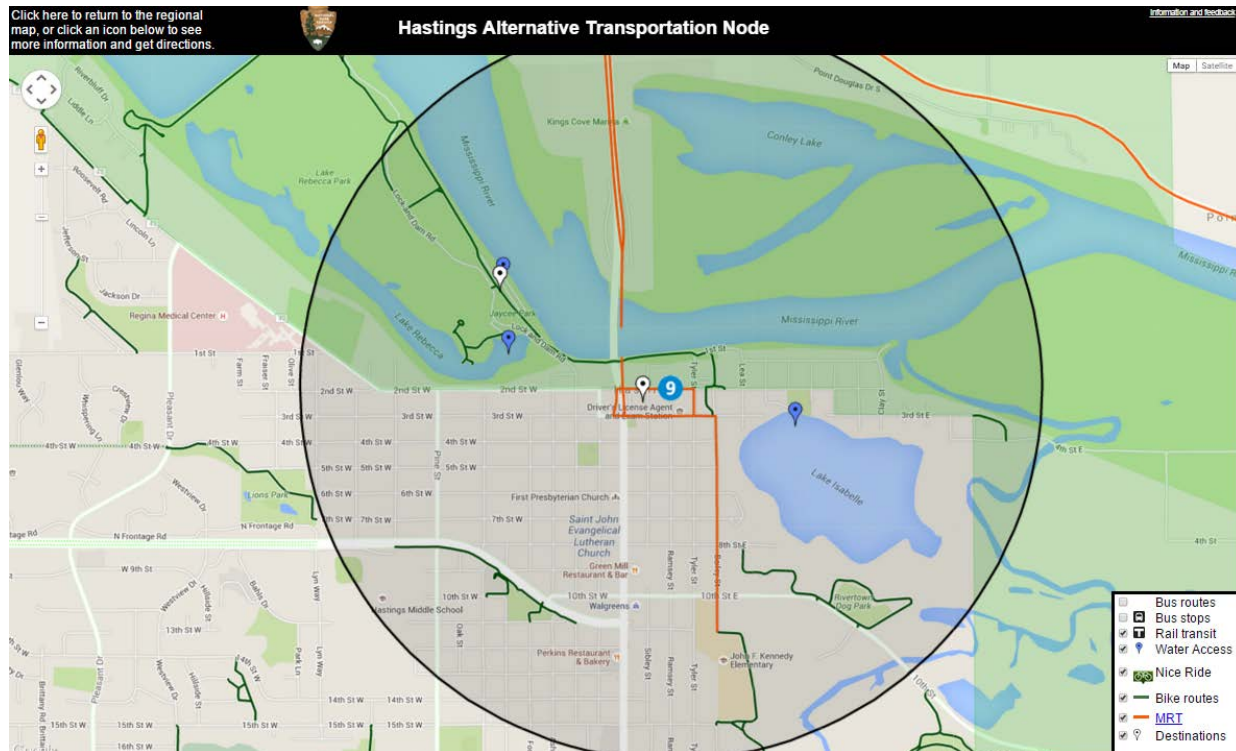
Description: The Mississippi National River and Recreation Area is located between the urban areas of Minneapolis and St. Paul. Visitors enjoy an array of car-free access options, including rail, light rail, bus service, bicycle share and bicycle routes. The interactive Mississippi River Trip Planner provides a valuable resource for visitors to plan their adventures as depicted in Figure 7-7.

<http://www.nps.gov/miss/planyourvisit/directions.htm>



<http://rivertripplanner.org/>

Funding Sources: Public/Private



*Figure 7-7: This is one in a series of interactive alternative transportation planning maps offered by the National Park Service along the Mississippi River near Minneapolis, MN <http://rivertripplanner.org/>*

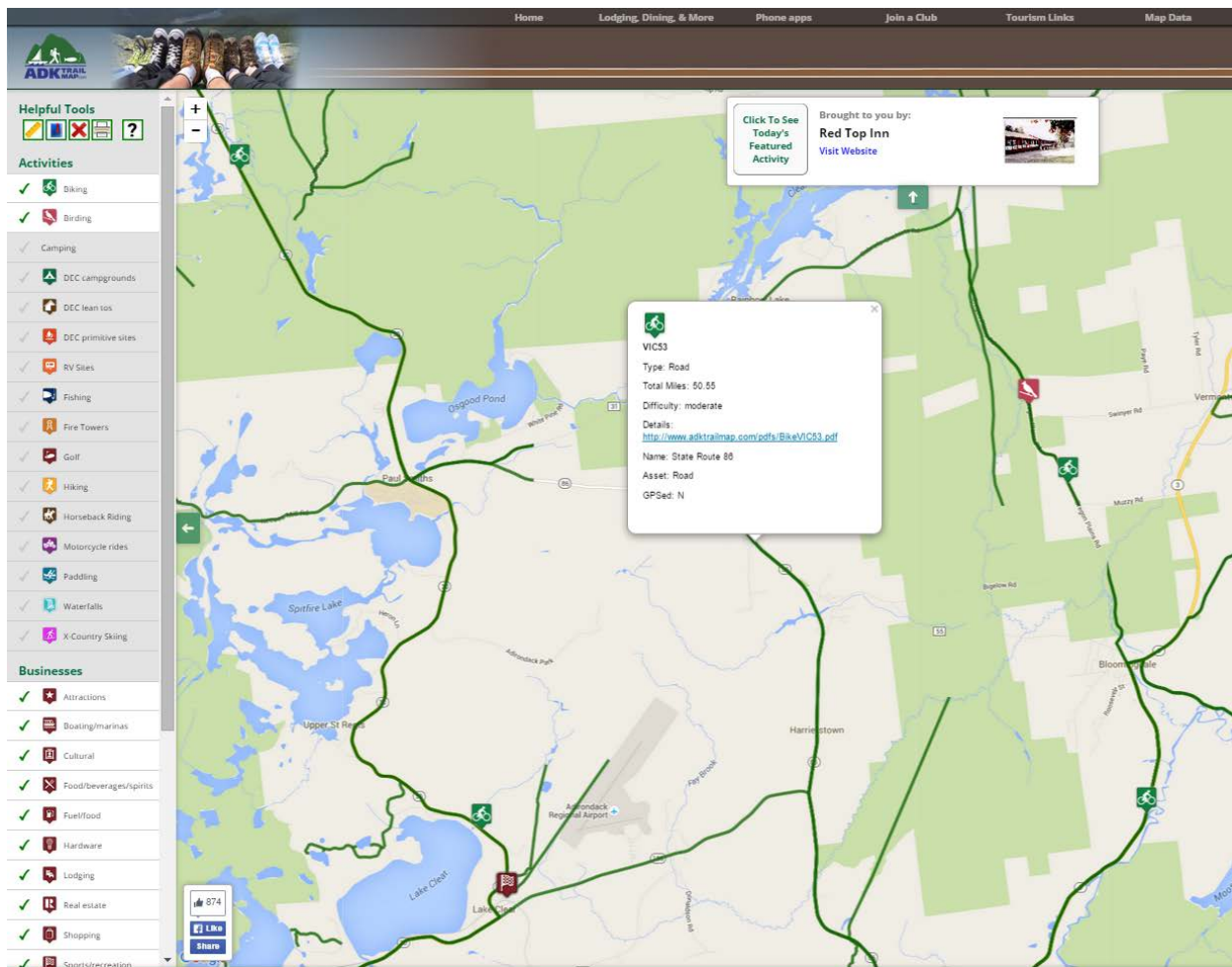
### Case Study #3: Adirondack Trail

Description: The Adirondack Trail Interactive Map Planner contains many of the features and attributes that are proposed and applicable to the Bozeman Area. Attributes range from numerous outdoor recreation opportunities to transit. There are search options to find activity locations and businesses as well. This case study platform is a good analogue to use as a benchmark for any future effort in Bozeman. The information is also available through a mobile app for smartphones.

Main Site: <http://www.adktrailmap.com/>

Interactive Map Link: <http://www.adktrailmap.com/webmap/index.php>

Funding Sources: Private funding. Company has developed app in house. Web map is available for no cost, the app, available for iOS and Android, is a pay app and businesses pay to advertise within it.



*Figure 7-8: This is the Adirondack trail interactive map, which displays activities like bicycling, birding, camping, hiking, golf, fishing, paddling, and horseback riding.*

## 7.14 Draft Statement of Work

### Task 1: Project Initiation

#### Task 1.1 Committee Formation

The selected consultant will form two project committees. The first will be a “project steering committee” made up of the City of Bozeman, the Gallatin Valley Land Trust, the Custer Gallatin National Forest, the Bozeman Chamber of Commerce and potentially Gallatin County. These entities will provide oversight to the project and be frequently involved in decision making. A second committee, called the “project stakeholder committee,” will be more expansive and will include a large range of agencies and organizations including interested area hotels, Bridger Bowl, Bohart Ranch, and activity focused groups like the Gallatin Valley Bicycle Club, Big Sky Wind Drinkers, Sacajawea

Audubon and the Bridger Ski Foundation, among others. The Project Steering Committee will meet monthly during the project, while the Project Stakeholder Committee will be convened twice as described in Tasks 2.1 and 3.2.

#### Task 1.2 Project Kick-off Meeting

The Project Steering Committee will meet to confirm the direction of the project and to formally launch major work.

### Task 2: Data Gathering

#### Task 2.1: Outreach Meeting

The first Project Stakeholder Committee meeting should be organized to welcome the various stakeholder groups to the project and summarize the project's goals and objectives. This meeting should be used by the Project Steering Committee and selected consultant to identify and solicit existing data regarding recreational activities of varying types and request that the stakeholder organizations organize and share this data to be utilized in a common resource. Ideally, when complete, the recreational interactive mapping described in Task 3 should take precedence to the smaller and more piecemeal data currently found on a variety of stakeholder websites. The map should be developed such that project stakeholders could embed the map in their own websites making it accessible from a large variety of portals. Such a system would make it more likely that individuals seeking information about recreational amenities would encounter the same up-to-date data. Stakeholders should be encouraged to remove or limit conflicting or duplicative information from their respective websites. This will reduce future confusion and make the collaboration more effective.

#### Task 2.2: Data Collection

The selected consultant should follow up with each stakeholder to collect data (in GIS if possible, or as another georeferenced file type such as a google earth .kmz file). There should be an assumed amount of data creation from non-georeferenced information such as hand drawn maps or other resources. This level of effort may be significant and should be accurately anticipated during project scoping. As data is collected, the consultant should create procedures for updating data from the project stakeholders in a way that minimizes future effort.



### **Task 3: Interactive Mapping**

#### **Task 3.1: Map Creation**

The interactive map will ultimately be a resource that can be utilized by any of the project stakeholders within their respective websites. This task may be undertaken in conjunction or separately from Task 4 depending on available funding. The map should, if possible, exist as an embedded feature, which would be embedded in a multitude of area websites. The selected consultant should include an experienced cartographer on the team. The consultant shall incorporate the mapping data collected in Task 2 to create a single user-customized mapping portal that will allow the user to turn off or on various layers that are relevant to their interests. For example, a visitor or resident could overlay area trails with bird watching locations to ride a bicycle from a downtown hotel location. A different user could overlay Streamline transit or recreational shuttle routes with trailheads. If installed, this resource should incorporate other BAATS projects including proposed webcams showing parking occupancy at popular trailheads. Wherever possible, attribute information should highlight area amenities. Such information could include user difficulty, hours of operation, amenities, use restrictions or other useful properties. The Bozeman-Yellowstone International Airport should also be tagged with ground transportation information.

This resource should be mobile-friendly if possible.

#### **Task 3.2: Review meeting**

The Project Stakeholder Committee should be provided a link to and be assembled to view the draft interactive mapping resource and website. The organizations should be allowed to view and manipulate the resource prior to the meeting and should provide feedback from their group's perspective if further enhancements could be made. Contacts should be established or confirmed so that new facilities or data can be shared and eventually incorporated into future versions of the map.

#### **Task 3.3: Final Map**

The selected consultant should incorporate feedback (if relevant and technically feasible) into a final version of the interactive map. Once complete the map should be available to any of the project stakeholders to include in their respective websites. The map should also be featured on the Custer Gallatin National Forest website, the City of Bozeman, Gallatin County and Bozeman Convention and Visitor's Bureau websites.

### **Task 4: Website Updates/Modifications**

#### **Task 4.1: Scoping Meeting**

The selected consultant will meet with the Project Steering Committee to determine areas where improved visitor information can be provided with the intent within several local

websites. It is anticipated that the greatest number of desired features will be focused on the Bozeman CVB or 'Only in Bozeman' websites. A draft list of features includes:

- Ground Transportation Information for those arriving at Bozeman Yellowstone International Airport (similar or expanded from those posted on <http://bozemancvb.com/activities>).
- Activities (similar to those posted on <http://bozemancvb.com/activities>) that fully match those found in the Interactive Mapping Tool in Task 3.
- Travel Car-Free – page to encourage visitors to arrive car-free. List downtown hotels and other businesses which cater to this type of travel. This could also include links to tour companies that can create packages of experiences while also offering some independent travel.
- Interactive Mapping Tool (see map from Task 3).

#### Task 4.2: Website Production

Based on the results of the Project Steering Committee Meeting, the selected consultant will prepare a draft website incorporating the agreed upon items. This will be presented at a second meeting (Task 3.2) or a separate meeting if Tasks 3 and 4 are not part of the same contract and feedback will be accepted.

### Task 5: Media Campaign

#### Task 5.1: Scoping Meeting

The selected consultant will meet with the Project Steering Committee to determine the desired vision and reach of an updated 'Only in Bozeman' media campaign that promotes the ability to travel car-free in Bozeman. The media campaign could include online or print advertising at selected venues and targeted at specific audiences. This task is not an essential part of the project, however it would have value in raising the profile of the Bozeman area as a car-free or car-lite destination.

## 7.15 Feasibility Study Approach & Findings

This project was initially identified as one of the nine priority tasks (Task 5) for Phase III of BAATS, as described in the evolution of [Phase III](#). However, the project was not initially identified as one of the three priority projects. Nonetheless, a mini-report was completed on developing “plans for effectively promoting use of alternative transportation systems via marketing, social media, internet applications, etc...” This mini-report, the predecessor of this feasibility study, was presented to the Technical Advisory Group at the August 2015 meeting. The need for this project was evident and the TAG gave direction to further develop this project. Discussions regarding potential new trail connections, trailhead improvements and shuttle/transit service improvements all indicated a clear need for

better information surrounding existing and proposed alternative transportation information that would be available to area residents and to visitors.

#### **7.15.1 Review of Past Planning Documents**

As described in Section 1, numerous past planning documents were reviewed. Of particular relevance to this study were the Greater Gallatin Trails Visioning plan and the 2007 Greater Bozeman Area Transportation Plan.

#### **7.15.2 Review of Relevant Projects**

This effort proved that other communities around the country have experimented and developed a diverse assortment of internet based mapping tools that display a variety of information suited to the project objective. It should be stated that the scope of this particular informational resource will combine a larger variety of data than many of the reviewed resources. The Bozeman area has a somewhat unique concentration of recreational activities that are available to residents and visitors and combines them with close proximity to city amenities and transportation infrastructure. From a technical standpoint, merging the volume of available data is not a problem as much as it is a user interface challenge to intuitively allow users to access the specific information that interests them.

#### **7.15.3 Conduct Stakeholder Interviews**

There are a myriad of likely and possible project stakeholder groups. Some groups emerged as essential to a successful project such as participation by City of Bozeman, Gallatin County, the Custer Gallatin National Forest, the Gallatin Valley Land Trust and the Bozeman Convention and Visitors Bureau. Other groups, such as Bridger Bowl, area hotels, and local activity-based non-profits, are important to provide the project with valuable information that has been collected, created and distributed individually.

Stakeholder interviews were conducted with representatives of each of the primary stakeholders and several other groups. Overall, the interviews indicated a keen interest in seeing comprehensive recreational-based information available to residents and visitors via an online mapping format. As mentioned previously, both the City and GVLТ already have compatible efforts underway.

From the visitation perspective, stakeholders recognized both the potential to attract new car-free or car-lite trips to Bozeman, but also to provide attractive ways for existing visitors to extend their visitation options, specifically within the Bozeman area. This could represent a portion of a trip to Montana done without the expense of a car, which would focus additional lodging and sales revenue in the core of Bozeman.

# Section 8

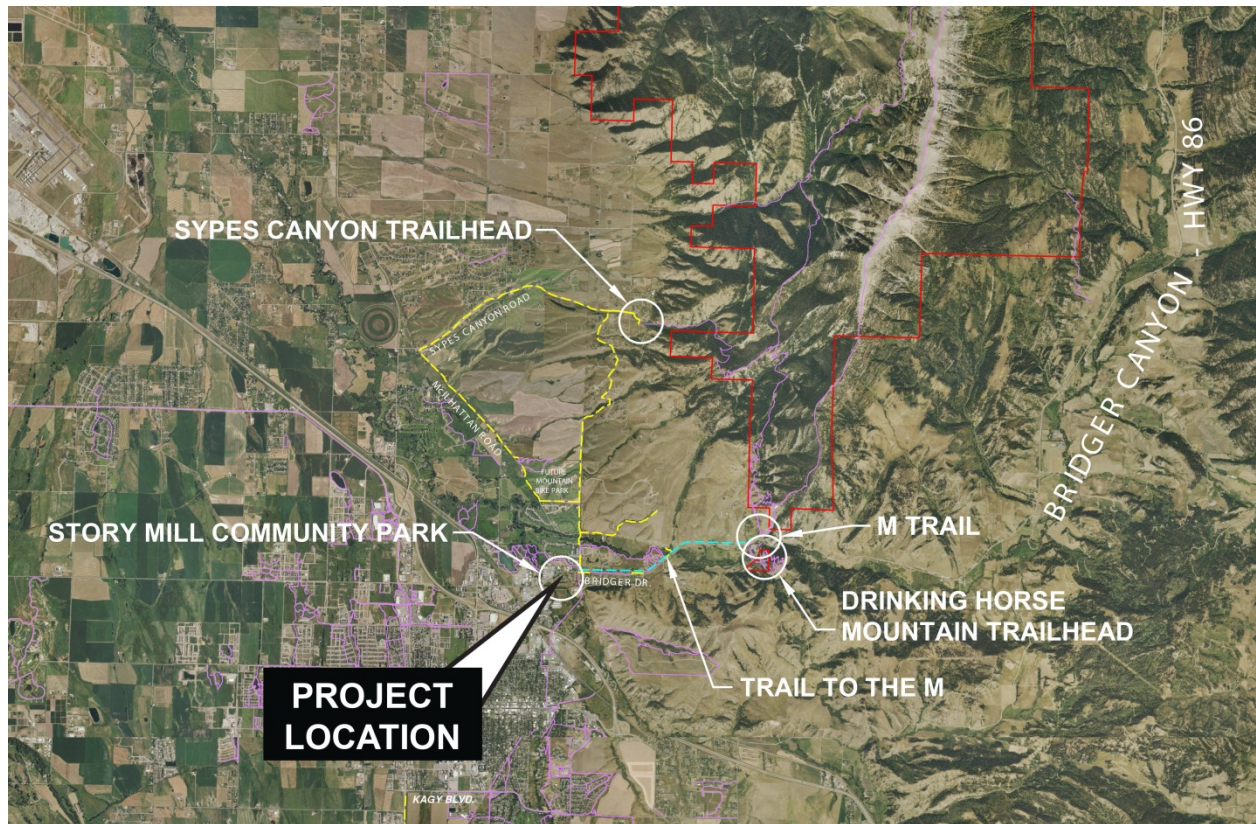
## Alternative Transportation Enhancements at Story Mill Community Park

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## 8.1 Summary



*Figure 8-1: Project Location*

This proposed project seeks to improve alternative transportation connections at the 55-acre Story Mill Community Park (SMCP), which is currently under development. Project location is shown in Figure 8-1. Unlike each of the other projects presented in this BAATS Phase III report, this project relates to enhancements to an active project currently in development. Therefore, the specific enhancements will be conceptualized by the team that is currently designing the Park. Example enhancements could include: 1) connect the Park to the beginning of the soon-to-be constructed Path to the M and Drinking Horse Mountain via a 10'-wide, shared-use path; 2) Construct a 10' path between Park and Bridger drive, instead of a standard sidewalk as currently proposed by the Montana Department of Transportation as part of the Rouse Avenue reconstruction project; 3) construct "trail-access parking" that would facilitate easy transfer from the Park's parking area to the Path to the M and Drinking Horse Mountain; 4) consider how people will access the Park from the Path to the M and Drinking Horse Mountain; and 5) accommodate shuttle service to and from the park. In the event proposed enhancements are beyond the Park scope, the BAATS consultant team may be able to pursue funding for such enhancements.

## 8.2 Background

The SMCP is being developed through a partnership involving The Trust for Public Land and the City of Bozeman and includes significant funding from both parties. The City's funding comes primarily from the Trails, Open Space, and Parks bond that was approved by City of Bozeman voters in November of 2012; funding for the Park was authorized in 2014. The Trust for Public Land will match the City's contribution via a multi-million dollar capital campaign. The funding sources are significant because they represent a commitment on behalf of both of these partners to direct these funds towards the Park and ancillary purposes consistent with the mission of the Park. The following three guiding principles have been identified for the Park: 1) community gathering; 2) outdoor play; and 3) healthy habitats.

In July 2015, Design Workshop ([www.designworkshop.com](http://www.designworkshop.com)), a nationally-recognized park design firm, along with 3 local teaming partners (Design5, Stahly Engineering, and RESPEC) were selected through a competitive public process to lead the park planning process. The 16-month design process will culminate in December of 2016, park construction will be completed in 2017 and 2018, and a ribbon cutting is planned for fall of 2018.

As a part of the design team's scope, the design team will undoubtedly seek to integrate the Park with the surrounding community including connectivity with all modes of transportation. The design team already knows a great deal about aspects of the existing and proposed alternative transportation network that surrounds the Park. For example, the design team is well aware of the Path to the M and Drinking Horse Mountain, which will originate at Story Mill Road, as shown in Figure 8-2, and will continue to the trailhead of the "M" Trail. However, some members of the design team may not be aware of more recent developments such as the Shuttle to the "M" project that is proposed in this report or the opportunities for additional funding that may be available for alternative transportation enhancements at the Park. This project write-up aims to provide the design team and Park project partners with this additional information.



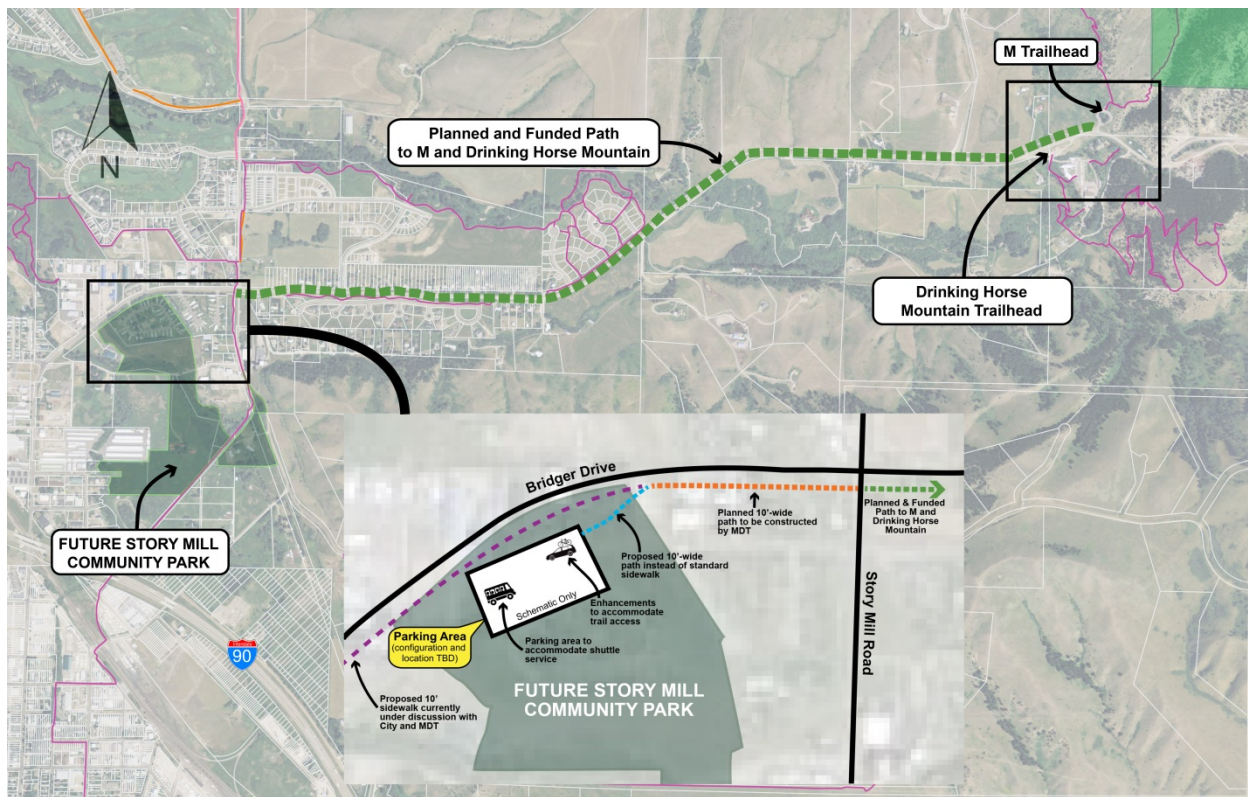


Figure 8-2 Detailed view of Project

### 8.3 Summary of Relevant Project

#### Section 5: Shuttle to the “M”

Meeting the needs of the ever increasing user demand at the “M” and Drinking Horse Mountain trailheads is a significant issue for the Forest Service. This project will develop a shuttle system to provide transportation to these trailheads. The system will target local residents and tourists. This project will explore public/private partnerships as well as options to integrate these trailheads into Streamline Bus routes. It may be in the best interest of the community that the Shuttle also provides service to the SMCP. The City of Bozeman is a proposed member of the steering committee for this shuttle system and can help to coordinate service, if appropriate, to SMCP.

## 8.4 Potential Project Partners

City of Bozeman (a primary stakeholder for both Path to the M and Drinking Horse Mountain to and SMCP projects)

Trust for Public Land (a primary stakeholder in SMCP project)

Montana Department of Transportation (Bridger Drive is MDT corridor)

Streamline (improvements to accommodate bus/shuttle service)

## 8.5 Prospective Funding Sources

In the event that alternative transportation enhancements are outside of the design team's scope it is anticipated that the BAATS consultant team can help to identify additional funding during Phase IV. Two likely funding sources include:

- [Transportation Alternatives Program](#), TAP (administered by MDT) – the next call for projects is anticipated in summer of 2017.
- [Recreational Trails Program](#), RTP (administered by FWP) – the next call for projects is anticipated December of 2015.

## 8.6 Proposed Approach

It is recommended that the City of Bozeman direct the design team to develop conceptual designs for alternative transportation enhancements. Wherever such designs are for enhancements that are outside of the Park project scope, the City can pass along such concepts to the BAATS consultant team for support in the pursuit of project funding.

# Section 9

## Recommended Next Steps

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## 9.1 Overview

The purpose of Phase III, the focus of this report, has been to develop feasible and fundable alternative transportation projects that will enhance access to recreational areas surrounding Bozeman. The purpose of Phase IV, the next phase in this study, will be to secure funding for these projects. To this end, the consultant team will work to incorporate these projects into long-range planning documents, where appropriate; to complete specific funding applications; and to continue to engage the Technical Advisory Group (TAG).

## 9.2 Incorporate Projects into other Planning Documents

In general, these projects become better positioned for funding by incorporating them into long-range planning documents. The Greater Bozeman Area Transportation Plan (Plan), which is currently being updated, is one such planning document. It is recommended that the consultant team coordinate with those leading the Plan update to facilitate the inclusion of BAATS projects into the Plan where appropriate. The TAG will be consulted to help identify additional planning documents that should also be targeted.

## 9.3 Pursue Funding

The pursuit of a particular funding source can often be an excellent means to catalyze stakeholders in the work needed to increase the competitiveness of a project and ideally to secure funding. Through the process of completing a specific funding application, project weaknesses will be identified and addressed. Therefore the primary focus of Phase IV is completing applications for applicable funding sources. As identified in Table 9-1, there are four primary funding sources, all of which are expected to have a call for projects in 2016, that will be pursued.

Funding Source	Timing	Target Projects
FLAP	Proposals due Apr 1, 2015	<ul style="list-style-type: none"><li>• Advisory Bike Lane Pilot</li><li>• “M” &amp; Drinking Horse Mountain Trailhead Improvements</li><li>• Hyalite Canyon Shuttle System</li><li>• Shuttle to the “M”</li></ul>
FLTP	Call for Projects Dec 2015	<ul style="list-style-type: none"><li>• “M” &amp; Drinking Horse Mountain Trailhead Improvements</li></ul>
RTP	Call for Projects Dec 2015	<ul style="list-style-type: none"><li>• Alternative Transportation Enhancements at Story Mill Community Park</li></ul>
Digital Development Grant	Ongoing, program funds replenished July 2016	<ul style="list-style-type: none"><li>• Alternative Transportation Information Campaign</li></ul>
TBD	TBD	<ul style="list-style-type: none"><li>• Bridger Canyon Bus and Carpool Enhancements</li></ul>

*Table 9-1: Funding Sources*

Three of these funding sources are expected to issue a call for projects in December 2015: [Federal Lands Access Program \(FLAP\)](#); [Federal Lands Transportation Program \(FLTP\)](#); and [Recreational Trails Program \(RTP\)](#). In addition, the [Digital Development Grant](#), which is administered by the Montana Office of Tourism (MTOT), accepts applications on a rolling basis and is expected to have replenished funds in July of 2016.

These four funding sources will target each of the 7 projects with the exception of Bridger Canyon Bus and Carpool Enhancements project. It is anticipated that Phase IV funds will be used to facilitate the meetings that will be required to develop specific action plans for this project. Based on the specific action plans that are developed during this process, additional funding sources will be identified.

The consultant team will review the funding guidelines once they are made public to assess relevance to the 7 BAATS projects. Depending on the specific funding criteria, projects may be combined or adjusted as appropriate.

## 9.4 Continue to Engage TAG

It is recommended that the TAG continue to meet to guide the consultant team through Phase IV. The following meetings are anticipated:

- 
- Funding Strategy Session (Jan 2016) – The consultant team will review applicable funding applications and organize a workshop involving TAG that helps to clarify strategic approaches to funding applications. TAG will also help to identify long-range planning documents, in addition to the Greater Bozeman Area Transportation Study, that should be targeted for project inclusion.
  - Pre-Submission Sessions (various) – Prior to submitting funding applications, the consultant team will meet with TAG for critical feedback to finalize applications.



# Appendix 1-1

## Sourdough Canyon Trailhead Expansion Description

**- Case Study -**  
**Sourdough Canyon Trailhead**  
**Parking Improvements**

**Background & Overview**

Located just 15 minutes south of downtown Bozeman, the Sourdough Canyon Trailhead is one of the most heavily used trailheads in the region, providing access for hikers, bikers, skiers, and horseback riders. The trail meanders next to Sourdough (Bozeman) Creek for many miles into the Gallatin National Forest, linking with other trails in the Gallatin Range, a journey that can take you all the way to Yellowstone National Park without ever crossing a road. More than just a popular recreation destination, Sourdough Canyon feeds Bozeman's water supply and provides important habitat for elk, moose, deer, bear, mountain lion, and other wildlife.

A local treasure, Sourdough Canyon receives thousands of user-visits a week. However, until recently, the trailhead was in danger of being "loved to death." It consisted of a primitive, 18-car dirt parking lot at the end of a narrow, winding road with blind curves. Without any buffer between the road and the creek, the road flooded annually and sediment from the road and sliding vehicles polluted the creek. With overflow parking exceeding 80 cars on the heaviest days, the trailhead was dysfunctional, dangerous, and causing damage to the natural resources. Private landowners on either side of the narrow trailhead property experienced trespass and dumping on their land. In addition to a lack of parking capacity, the site was also characterized by nuisance behaviors including pallet bonfires, drinking parties, and littering with local law enforcement having to be called several times each year.

In 2007, the 4.6-acre private trailhead property was donated to the Gallatin Valley Land Trust (GVLT) by Michael Delaney and Ileana Indreland. For three years, GVLT led efforts to plan, fundraise, and design a new trailhead in collaboration with neighbors and partners including Gallatin National Forest, Gallatin County, and the City of Bozeman.

In 2011, GVLT completed a series of vital improvements to improve public safety, enhance recreational uses, and protect wildlife habitat. The improved trailhead features more than three times the available parking, a turn-around for emergency and large vehicles, a vault toilet, signage, boulder stepping-stones for safe and sustainable access to Sourdough Creek, and a new vegetative buffer to protect the creek from the road and improve habitat. A new, custom entry gate was created, welcoming users to the trail. Once the improvements were complete, GVLT donated the trailhead property to the Gallatin National Forest.

Since the trailhead was redesigned and improvements installed, the instances of trespass, calls to law enforcement, and general nuisance behavior has nearly disappeared. Only one pallet fire has occurred since 2010, and adjoining private landowners report no trespassing, dumping, or other problems. The quality of the trailhead site improved considerably and was accompanied by substantial improvement in the respect paid to the site.

### Role of GVLТ

Gallatin Valley Land Trust facilitated the real estate transaction to bring the trailhead into public ownership, catalyzed partners, raised funds, and executed the design and installation of trailhead improvements.

### Role of the Forest Service

Gallatin National Forest helped create the trailhead design and worked with GVLТ and neighboring private landowners to take on ownership and long-term maintenance of the site.

### Role of Other Primary Partners

The City of Bozeman, Gallatin County, Montana Fish, Wildlife & Parks, and adjoining private landowners each owned adjoining property and helped create the trailhead design. They also partnered with GVLТ to adjust common boundary lines so that the parking area could be expanded and the road could be realigned for safety.

### Funding

The total project cost was approximately \$180,000, including design, engineering, legal and transactional fees, construction, and project management. GVLТ secured approximately \$34,000 through in-kind support and raised approximately \$146,000 in cash for the project through various public and private sources, including the Gallatin Resource Advisory Committee, Montana Recreational Trails Program, the National Forest Foundation, local businesses and private donations from individuals in the community.

Project Component	Approximate Cost
Engineering & Design	\$27,000
Road and Parking Construction	\$78,000
Site infrastructure (toilet, signage, gate, dog stations)	\$35,000
Real estate transactions	\$10,000
Project management & GVLТ interim ownership costs	\$30,000
<b>Total</b>	<b>\$180,000</b>

### Lessons Learned

- 1) Physical improvements beget behavior improvements. Although some stakeholders feared that improving the parking area would just attract more users and thus more instances of vandalism, parties, or other nuisance behavior, the opposite was true at Sourdough Canyon Trailhead. Physical improvements to the site considerably improved the appearance of the trailhead. In turn, visitors behave more respectfully and care for the site with more diligence. It is likely that visitor use has increased due to the additional parking capacity, but because the parking lot is more logical and ordered, the increase in use is not overwhelming, and users spread out on the trail quickly.

- 2) Have patience. When the project was first developed, GVLТ and partners had a goal of completing the improvements to the trailhead and handing it off to Gallatin National Forest within three years. In reality, the entire project took just over seven years and the scope of the project grew over time. The complex nature of real estate transactions, working with cross-jurisdictional agencies (in this case, city, county and federal governments), and having diverse trail user groups involved (including skiing, biking, dog owners, and equestrian users), the design and planning phase took longer than anticipated. Because of this, the project management and interim ownership costs exceeded budgets, but the end result is one that generates pride and support from across the community.
- 3) Rely on nimble and visionary leadership. In the case of Sourdough Canyon Trailhead, a key component of success was having GVLТ at the helm. Able to be nimble, responsive, and dynamic, GVLТ helped catalyze partners, respond to fundraising opportunities, and negotiate real estate transactions in ways that no local, state or federal government agency could have done.

# Appendix 1-2

## February 2015 Public Meeting Summary

# Memo

To: Jonathan Kempff  
Cc: Lisa Stoeffler, Wendi Urie, Chris Anderson, Gary Stephens  
From: Peter Walker-Keleher, PE  
Date: 4/24/2015  
Enclosures: Compilation of Public Comment Sheets  
**Re: BAATS Public Meeting #1 Summary**

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## PUBLIC MEETING OVERVIEW

Public meetings were held on February 18<sup>th</sup> and 19<sup>th</sup> at the Best Western Gran Tree Inn and Sourdough Fire Station respectively. In addition to the consultant team and members of the Technical Advisory Group (TAG), fifteen members of the public attended and provided comments. Turn-out was likely low due to a lack of controversy or contentious issues.

The public meetings were designed to address three primary goals of the study. Each of the goals is listed below along with some comments based on the outcomes of the public meetings.

- 1) Provide transparency throughout the process – Although turnout was low, the public meetings did provide transparency in that all people contacted to date about the project were notified of the meetings via email;
- 2) Generate public support for the project – The public meetings did not serve to generate public support as few people came. It is important that a way is found to attract more people to the next round of public meetings; and
- 3) Solicit feedback to ensure outcomes of study align with needs and expectations of community – Between comment sheets received and conversations held, the public meetings were successful in soliciting desired feedback.

## OUTCOMES



As described in the public involvement plan, there were three stations: 1) Study Overview; 2) Task 1; and 3) Tasks 2 & 3. The consulting team and TAG members were distributed amongst the three stations. There were comment sheets at stations 2 and 3.

### Summary of Comments for Task 1:

#### Questions Regarding Corridor Preferences

The tallies of how people voted on these comment sheets is less important than their comments given that we were not conducting a statistically valid survey. The primary purpose of the comment card was to determine whether we were using the right criteria to evaluate these corridors and to identify other issues we were not considering. All of the comments related to two criteria: comfort and safety; and level of use as compiled below.

EVALUATION CRITERIA	Northside Comments	Southside Comments
Right of Way Impacts		
Environmental Impacts		
Comfort & Safety	More direct, hills and less traffic, shortest, more scenic, least steep	Quieter, more scenic, less traffic, better sight lines, 60 mph too dangerous, too much noise,
Level of Use	More access points, Sydes to M Trail does not attract people, direct access to trailheads, easiest to get to	Direct access to Hyalite, link up best with existing trails, most direct to Leverich and Sourdough,
Consistency w/ Previous Studies and Plans		

A full listing of comments received is on the attached document.

This short analysis makes it evident that “level of use” is likely not the appropriate title as it is closely linked with “comfort & safety.” A better name may be, “Connectivity,” which can be defined as, “the state or extent of being connected or interconnected.”

#### “How would you most likely use these trail corridors?”

The answers to this question suggest that there would be a wide range of uses including at a minimum: skiing, biking, running, and walking.

“Would you most likely use the trail corridor for...?”

The answers to this question suggest a wide range of uses for the trail.

Ranking of Priority Access Locations to GNF

This limited sample size suggests Sourdough Canyon Trailhead and Leverich Canyon Trailheads would

**Summary of Comments for Tasks 2 & 3:**

The most important aspect of the comment cards was the “Other Ideas” portions. These ideas will be helpful in the development of the Bridger Bowl Transportation Survey.

Comments card show that a mix of incentives and disincentives are likely to affect the numbers of people that drive alone to Bridger Bowl. Nearly all of the ideas listed, with the exception of offering free refreshments, were rated as likely or very likely to impact behavior.

**LESSONS LEARNED**

- One public meeting would have been sufficient
- Attendance would have likely increased if there was something that people could emotionally support or oppose. For example, more people might have been drawn to the meetings if there were a pending decision such as specific park and ride location or a recommended corridor that people could rally behind or against.

# Bozeman Area Alternative Transportation Study

February 2015

Total Number of Comment Cards: 15

## Which Northside Trail corridor do you like best/least?

<u>McIlhattan-Sypes Canyon Corridor</u>		<u>Story Mill- Rolling Hills Corridor</u>	
Best	1	Best	12
Least	6	Least	1

## Why?

- ~Either- slightly prefer McIlhattan- Sypes only because it is longer and probably will have more access points
- ~Because Sypes to M trail doesn't attract people- this concept isn't really viable
- ~Story Mill is more direct to trailhead
- ~hills & less traffic
- ~Toss up. I live on S side of town I might not use these much

## McIlhattan- Sypes Canyon

## Story Mill- Rolling Hills (These comments were specific to Story Mill- Rolling Hills and preference)

- ~Shortest
- ~More Scenic, Less Traffic
- ~Lower overall traffic volumes & speeds- more concentrated climbing could be an issue
- ~Less traffic, better views
- ~Direct access to trailheads
- ~easiest to get to
- ~proximity to my home; which is the least steep

## Which Southside trail corridor do you like best?

<u>South 19th Ave Corridor</u>		<u>South 3rd Ave Corridor</u>	
Best	4	Best	6
Least	8	Least	0

<u>Bozeman Creek Corridor</u>		<u>Sourdough Road Corridor</u>	
Best	10	Best	6
Least	0	Least	1

## Why?

- ~I like them all
- ~Bozeman Creek quieter, more scenic. S. 19th traffic
- ~S. 19th has the most direct access to Hyalite

- ~(S. 3rd) easiest to accomplish- less traffic/better sight lines than Sourdough Rd. Bozeman creek is not likely to happen
- ~Proximity to my personal access. I think 60mph speed limit on 19th makes it too dangerous for nearby recreation
- ~S. 3rd already heavily used by bicycles- traffic volumes are low so S. 19th is more in need of a separate trail
- ~19th way too much noise/Bozeman creek is really nice
- ~It's all needed
- ~Sourdough most direct to Leverich & Sourdough
- ~These (Bozeman Creek & Sourdough Road) would link up the best with existing trails
- ~19th traffic too fast
- ~Along the creek
- ~Traffic but need to continue trail end at Goldstein to Nash or along Sourdough
- ~Right now, S. 3rd and Sourdough don't have much traffic, so okay for biking. 19th very busy. Bozeman Creek would be a great walking/running etc.

#### How would you most likely use these trail corridors?

Biking	15
Running	5
Walking	10
Skate Skiing	4
Horseback Riding	0
Other*	2
* Classic Skiing	

#### Would you most likely use the trail corridor for:

Getting to the National Forest	12
Recreating within Town	13
Commuting for Work/School	3
Other**	3
**Exercise with leashed dog where have great views	
Biking	
Ski maybe	
Errands	

Please rank the following entry point to the Gallatin National Forest in order of priority (1-5) for access via a multiuse trail. 1 represents the highest priority

Ranking	1	2	3	4	5
Kirk Hill	1	0	1	6	2
Sourdough Canyon Trailhead	10	3	0	1	0
Leverich Canyon Trailhead	1	8	2	1	0
Sypes Canyon Trailhead	0	2	9	1	0
Other***	2	1	1	0	2

\*\*\* Hyalite- would be great if S. 19th trail connect to Hyalite as well

M

Hyalite  
 Busses to Hyalite  
 Hyalite  
 Hyalite Canyon

**Which of the following access roads would you be most comfortable accessing by bike or other alternative mode under current conditions? Check all that apply**

**Road to Leverich Trailhead south of Nash Road**

Comfortable	13
Can't Say	1

**Road to Sourdough Canyon Trailhead south of Nash Road**

Comfortable	14
Can't Say	0

**Sypes Canyon Road**

Comfortable	9
Can't Say	4

**Rolling Hills Drive**

Comfortable	6
Can't Say	8

**Additional Comments**

- ~Not comfortable biking on S. 3rd or Nash or Sourdough- narrow roads without much shoulder. Always drive to trail access
- ~Good recommendations- would love to see them implemented!
- ~Busses to Hyalite that stops at South 3rd or Kirk Hill on the way
- ~Consider including Sourdough Road in plan. Kage to Goldstein
- ~Least trafficked
- ~Parking area construction on COBL at corner of S. 3rd bypass. Would be nice to have construction from Goldstein
- ~Nice to have a paved trail on Patterson from S. 3rd to Fowler.

# Bozeman Area Alternative Transportation Study

February 2015

Total Number of Comment Cards: 12

**How likely are the following incentives to encourage you to carpool to Bridger Bowl?**

	Very Likely	Likely	Not Sure	Unlikely	Very Unlikely
Raffle for Season Pass	4	4	1	1	0
Free coffee/tea/cookie/pastry	3	1	3	2	2
Better Parking Location	5	3	1	1	0
First Chair Priority	5	2	1	1	1

## Other Ideas

- ~Charge for parking: money from parking goes to more busses
- ~Hourly busses/pay parking (8:15-11 to big of a gap)
- ~Incentivize carpooling by making singles pay to park- HOV's get priority
- ~More options to set downhill 12:00-3:00pm

**How likely are the following restrictions to discourage you from driving alone to Bridger Bowl?**

	Very Likely	Likely	Not Sure	Unlikely	Very Unlikely
Parking fee for non-carpools	4	6	0	0	1
Limit on non-carpools	2	8	1	0	0
Further restrictions on parking loc.	2	7	2	0	0

## Other Ideas

- ~For shuttle to work it would have to be frequent. I often have only a couple of hours to ski in the middle of the day
- ~Charge for parking, reduce smog, set example, mark people hike, make them pay!
- ~How about a bus on weekdays!!
- ~Pay for parking if you don't carpool
- ~Can't ski anymore trashed knees- summer I would use public transportation.

**When going to Bridger Canyon, I would most likely use a ride share/carpool parking lot near:**

The Fairgrounds	7
Bozeman H.S.	1
Gallatin Valley Mall	0
MSU	2
Downtown	0



Other	1
Would not use	0

- ~ Needs to be a place with good parking. Downtown wouldn't work
- ~Bus stop at Bridger Canyon & Story mill that connects with regular streamline routes
- ~New park on Rouse
- ~Story Mill Park
- ~REI parking lot

**When going to Hyalite Canyon, I would most likely use a ride share/carpool parking lot near:**

Kirk Hill	1
Bozeman H.S.	0
MSU	3
Downtown	1
Other	0
Would not use	2

- ~Mostly ride my bike up there.
- ~Fairgrounds- connect from N. side!
- ~Anywhere!
- ~Live closer to Hyalite Canyon than any of those locations
- ~I usually bike from Nash/our house but I would use ride share/bus

**Additional Comments:**

- ~I live near Bridger Canyon but there's no bus service nearby. Can you combine service to the M with daily/hourly service from the mouth of Bridger Canyon & Griffin/Story Mill that connects to the regular workday bus service?
- ~Bus punch cards- ride the bus 10 times get \$50 off next years season pass. Busses with bike racks running to Hyalite Canyon.

# Appendix 1-3

## September 2015 Public Meeting Summary

# Memo

To: Jonathan Kempff  
Cc: Lisa Stoeffler, Wendi Urie, Chris Anderson, Gary Stephens  
From: Peter Walker-Keleher, PE  
Date: 11/03/2015  
Enclosures: Compilation of Public Comment Sheets  
Re: **BAATS Public Meeting #2 Summary**

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## **PUBLIC MEETING OVERVIEW**

A public meeting was held on September 29, 2015 to gather input for the Bozeman Area Alternative Transportation Study at the Lindley Center in Bozeman. In addition to the consultant team and members of the Technical Advisory Group (TAG), 17 members of the public attended and provided comments.

The public meetings were designed to address three primary goals of the study. Each of the goals is listed below along with some comments based on the outcomes of the public meetings.

- 1) Provide transparency throughout the process – Although turnout was low, the public meetings did provide transparency in that all people contacted to date about the project were notified of the meetings via email;
- 2) Generate public support for the project – The public meeting played a minor role in achieving this goal; and
- 3) Solicit feedback to ensure outcomes of study align with needs and expectations of community – Between comment sheets received and conversations held, the public meetings were successful in soliciting desired feedback.

## **OUTCOMES**

A questionnaire (attached to end of memo) was provided to meeting participants to get feedback on the five proposed projects. The information below provides a summary of responses from the 17 questionnaires that were returned by meeting participants. Not all

questions were answered by each participant, so the total number of responses for each question varied and is reported below.

There were 2 questions that pertained to all 5 projects.

1. Rate the relative importance of this project to you.
2. Rate the relative importance of this project to the Bozeman community.

The scale ranged from 1 to 10, with 1 being “not at all important” to 10 being “of utmost importance.” Figures 1 and 2 show a summary of the responses to these two questions. Figure one indicates that these projects are important at varying levels to the people who attended the meeting. A comparison of Figures 1 and 2 indicates that people who attended the meeting believe these projects are of greater importance to the community as a whole than they are to themselves individually. It should be noted that these results represent a small number of people and do not represent a statistically valid sample of the Bozeman community.

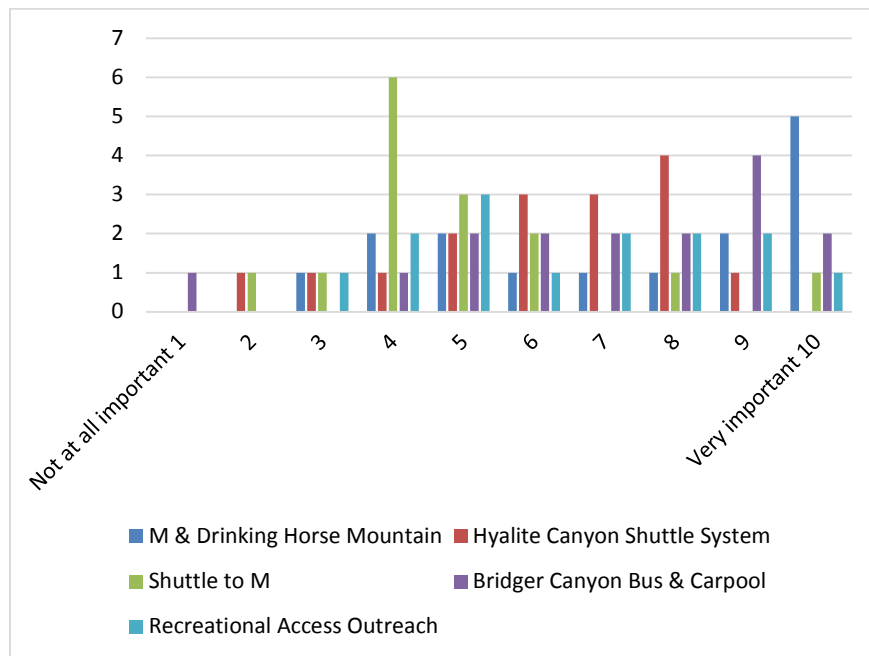


Figure 1: Rate the relative importance of this project to you

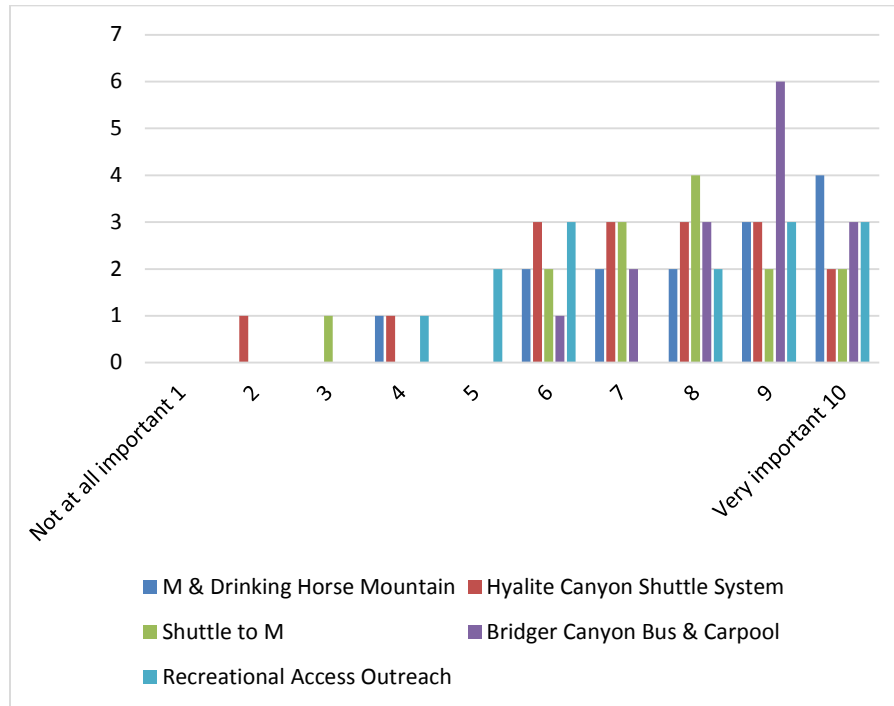


Figure 2: Rate the relative importance of this project to the community

In addition to the two questions above, there were specific questions pertaining to each project, which are described in the following sections for each of the five projects.

### **“M” and Drinking Horse Mountain Trailhead Improvements / Improved Connections to Story Mill Community Park**

*How often do you anticipate using Drinking Horse Mountain or M Trails in the future?*

Never	2
1-5 times per year	3
6-20 times per year	4
>20 times per year	6

*How useful would you find a webcam positioned at the M Trailhead parking area?*

Not useful	5
Minimally useful	3
Somewhat useful	6
Very useful	0

*How often do you anticipate using the forthcoming 2.3-mile Trail to the M to access these trailheads?*

Never	0
Some of the time	7
Most of the time	3
All of the time	4

*How often would you anticipate accessing the Trail to the M from the Story Mill parking lot?*

Never	0
Some of the time	5
Most of the time	2
All of the time	1

*Additional comments summary:* Two of three respondents who added additional comments about this project stated that they would use the trail as a safer path to the trailheads or while passing by on the way to a nearby destination.

### **Hyalite Canyon Shuttle System**

*If a shuttle ran from downtown Bozeman and MSU to Hyalite Canyon on summer weekends, how likely would you be to use it?*

Unlikely	3
Somewhat unlikely	1
Somewhat likely	12
Very likely	1

14 respondents answered the following question:

*Check all activities for which you would anticipate using a Hyalite shuttle.*

Hiking or Running	12
Mountain Biking	9
Road Biking	1
Boating or Paddle Boarding	4
Climbing	1
Skiing	9
I would not use shuttle to Hyalite	0
Other	2

The “other” responses included backpacking/overnight camping and fishing.





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*Additional comments summary:* 3 of the 4 four additional comments related to logistics of a shuttle service, including questions about seasons in which it will run (just summer or winter too?), shuttle frequency and about the comfort and number of stops (trailheads) in Hyalite. The fourth comment reiterated the importance of this project to the community. It should be noted that this question was confusing (as indicated in the comments) because it referenced a summer shuttle and then listed skiing, a winter sport, as one of the activities.

### **“M” and Drinking Horse Shuttle**

*If a summer shuttle ran between downtown Bozeman and the M trailhead at convenient times for you, how likely would you be to use it?*

Unlikely	4
Somewhat unlikely	3
Somewhat likely	7
Very likely	0

*Please circle the most desired shuttle times for you.*

Weekday mornings	3
Weekday afternoons	2
Weekday evenings	2
Weekend days	2
Weekend evenings	0

*Additional comments summary:* Three of the four comments indicated that they would either bike or drive rather than use the shuttle. One comment suggested a regular schedule for the shuttle, including weekends and to include it in the Streamline system.

### **Bridger Canyon Bus and Carpool Enhancements**

While there were no specific questions for this proposed project, there was a space for respondents to write additional comments.

*Additional comments summary:* Two of the four comments mentioned the need for weekday buses, and one mentioned more frequent trips on weekends.

### **Recreational Access Outreach Campaign**

*How often would you utilize an interactive web map as proposed?*

Never	0
1-2 times per year	2
Monthly	0
Weekly	4



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*How important is it to you to be able to access the interactive web map from your mobile device?*

Not important	3
Minimally important	2
Somewhat important	4
Very important	6

*How likely is it that increased information regarding alternative transportation to area recreational activities would motivate you to find alternatives to driving?*

Not likely	0
Minimally likely	1
Somewhat likely	8
Very likely	5

*How easy is it for you today to access information on the internet regarding recreational amenities surrounding Bozeman?*

N/A	2
Very difficult	2
Somewhat difficult	4
Somewhat easy	3
Very easy	3

*Do you think Bozeman can attract car-free or car-lite tourism?*

Not likely	0
Minimally likely	1
Somewhat likely	7
Very likely	6

*Additional comments summary:* Two of the four comments gave suggestions about the information that should be included on the website, including information on water quality, location of natural-water swimming holes, and trail conditions. One respondent stated that he/she really likes the idea of providing car-free or car-lite options on a website and within the community. Another respondent commented on the challenge of finding alternative transportation for those who live outside of town – once in a vehicle to start a trip, it is likely the people will stick with that mode of transportation.



# Bozeman Area Alternative Transportation Study (BAATS)

September 29, 2015

## Contact Information

Name (optional): \_\_\_\_\_ Email (optional): \_\_\_\_\_

## M & Drinking Horse Mountain Trailhead Improvements / Improved Connections to Story Mill Community Park

Rate the relative importance of these projects to you: (Circle One)

not at all important —1—2—3—4—5—6—7—8—9—10→ of utmost importance

Rate the relative importance of these projects to the Bozeman community: (Circle One)

not at all important —1—2—3—4—5—6—7—8—9—10→ of utmost importance

How often do you anticipate using Drinking Horse Mountain or M Trails in the future? (Circle One)

Never 1-5 times per year 6-20 times per year >20 times per year

How useful would you find a webcam positioned at the M Trailhead parking area? (Circle One)

not useful minimally useful somewhat useful very useful

How often do you anticipate using the forthcoming 2.3-mile Trail to the M to access these trailheads? (Circle One)

never some of the time most of the time all of the time

How often would you anticipate accessing the Trail to the M from the Story Mill Parking lot? (Circle One)

never some of the time most of the time all of the time

Additional comments: \_\_\_\_\_

## Hyalite Canyon Shuttle System

Rate the relative importance of this project to you: (Circle One)

not at all important —1—2—3—4—5—6—7—8—9—10→ of utmost importance

Rate the relative importance of this project to the Bozeman community: (Circle One)

not at all important —1—2—3—4—5—6—7—8—9—10→ of utmost importance

If a shuttle ran from downtown Bozeman and MSU to Hyalite Canyon on summer weekends, how likely would you be to use it? (Circle One)

unlikely somewhat unlikely somewhat likely very likely

Check all activities for which you would anticipate using a Hyalite Shuttle?

☐ Hiking or running

☐ Mountain biking

☐ Road biking

☐ Boating or paddle boarding

☐ Climbing

☐ Skiing

☐ Other \_\_\_\_\_

☐ I would not use a shuttle to Hyalite

Additional comments: \_\_\_\_\_

☐ Please check this box if you would like to participate in a visioning session to discuss Hyalite Shuttle system goals and logistics and confirm you have provided name and email address at top of this form.

## Shuttle to the M

Rate the relative importance of this project to you: (Circle One)

not at all important —1—2—3—4—5—6—7—8—9—10→ of utmost importance



# Bozeman Area Alternative Transportation Study (BAATS)

September 29, 2015

Rate the relative importance of this project to the Bozeman community: (Circle One)

not at all important —1—2—3—4—5—6—7—8—9—10→ of utmost importance

## Specific “M” and Drinking Horse Shuttle

If a summer shuttle ran between downtown Bozeman and the M trailhead at convenient times for you, how likely would you be to use it? (Circle One)

unlikely      somewhat unlikely      somewhat likely      very likely

Please circle the most desired shuttle time(s) for you: (Circle One)

weekday mornings      weekday afternoons      weekday evenings      weekend days      weekend evenings

Additional comments: \_\_\_\_\_

## Bridger Canyon Bus and Carpool Enhancements

Rate the relative importance of this project to you: (Circle One)

not at all important —1—2—3—4—5—6—7—8—9—10→ of utmost importance

Rate the relative importance of this project to the Bozeman community: (Circle One)

not at all important —1—2—3—4—5—6—7—8—9—10→ of utmost importance

Additional comments: \_\_\_\_\_

## Recreational Access Outreach Campaign

Rate the relative importance of this project to you: (Circle One)

not at all important      1      2      3      4      5      6      7      8      9      10      of utmost importance

Rate the relative importance of this project to the Bozeman community: (Circle One)

not at all important      1      2      3      4      5      6      7      8      9      10      of utmost importance

How often would you utilize an interactive web map as proposed? (Circle One)

never      1-2 times per year      monthly      weekly

How important is it to you to be able to access the interactive web map from your mobile device? (Circle One)

not important      minimally important      somewhat important      very important

How likely is it that increased information regarding alternative transportation to area recreational activities would motivate you to find alternatives to driving? (Circle One)

not likely      minimally likely      somewhat likely      very likely

How easy is it for you today to access information on the internet regarding recreational amenities surrounding Bozeman? (Circle One)

N/A      very difficult      somewhat difficult      somewhat easy      very easy

Do you think Bozeman can attract car-free or car-lite tourism? (Circle One)

not likely      minimally likely      somewhat likely      very likely

Additional comments: \_\_\_\_\_

# Appendix 1-4

## Recreational Parking Sites- August 2015

## Task 6: Recreational Parking Sites

The purpose of this task was to identify relevant tools that could be applied when developing plans for “mitigating concerns at recreational parking sites regarding parking availability, conflicts with users and neighbors, and environmental impacts.”

As the Bozeman Area grows, increased pressure is applied to existing recreational facilities. This pressure is particularly apparent at parking facilities for many of the most popular trailheads including:

- Sypes Canyon
- The 'M' Trail
- Drinking Horse
- History Rock
- Mount Blackmore
- Leverich Canyon
- Sourdough Canyon/Bozeman Creek
- Emerald & Heather Lakes
- Palisade Falls
- Grotto Falls/Hyalite Peak
- Kirk Hill
- Painted Hills Trail
- Stone Creek (access to Bangtail Divide Trail)
- Olson Creek (access to Bangtail Divide Trail)
- Bracket Creek (access to Bangtail Divide Trail)
- Fairly Lake
- Cottonwood Creek

One strategy to alleviate parking impacts is to increase parking capacity at such locations. Although this strategy has been successfully implemented in recent years at numerous locations, including Sourdough Canyon, History Rock, Mount Blackmore, Drinking Horse, Moser Creek and Grotto Falls trailheads, such a strategy is not always possible or desirable. In addition to typically being expensive, such expansions often expand the footprint of the trailhead, create additional impervious surfaces, remove vegetation and attract greater numbers of vehicles. While this strategy may be a preferred option for some trailheads, it is not a feasible option for other trailheads.

A primary purpose of the Bozeman Area Alternative Transportation Study (BAATS) is to increase access to recreational areas surrounding Bozeman via alternatives to the use of private automobiles. This document presents a toolkit with the following 4 primary strategies that are alternatives to increasing parking capacity at trailheads:

- 1) Outreach to property owners & trail users
- 2) Agency partnerships
- 3) Shuttle service
- 4) Alternative access through additional trail linkages

One or more of these tools could be used to address parking availability, reduce conflicts with neighbors and lessen environmental impacts.

### Tool #1: Outreach to property owners & trail users

**Potential Partners:** Gallatin County, USFS, City of Bozeman, GVLT, Gallatin Valley Bike Club

**Target Area:** Wherever feasible

**Cost:** Low



### Summary

Some trailheads lack the ability to expand and may be located in proximity or accessed through neighborhoods. Such conditions at numerous trailheads (e.g. Sypes and Leverich Canyon trailheads) can lead to friction between neighbors and trail users over issues including parked vehicles, noise, and trash.

By itself, or in concert with any or several of the above treatments, it may be beneficial to do outreach to the neighborhood and institute signage or other campaigns targeted at trailhead users to mitigate impacts to the neighborhood. There are a couple of local examples, including a small regulatory sign on the Leverich Canyon access road through private property that the road is not public and parking is prohibited. It is unclear how effective these signs are.

### Examples

**Hudson River Valley, NY:** The Greenway Conservancy for the Hudson River Valley and Parks & Trails New York teamed up to produce a handbook inviting land owners, or “potential trail partners,” as they call them, to proactively participate in trail planning rather than trying to mediate conflicts down the road. The handbook acknowledges that the success of an extensive and welcoming trail system for “family, friends, and neighbors” depends on the support of adjacent landowners. It offers information about the non-recreational benefits of trails, namely, connecting residents (including the landowners themselves) to downtowns, schools, waterfronts, parks, open spaces, other neighbors and historic sites; linking neighboring communities; and strengthening local and regional economies through increased tourism, property values, and new business investment. The handbook is divided into several parts: 1) landowner opportunities; 2) improved quality of life; 3) financial issues and potential tax benefits; 4) case study regarding permission for trails to cross private land; and 5) addressing property owner and tenant issues. It also includes sample access agreements and sample perpetual trail right-of-way easement contracts.

**State of Missouri:** The State of Missouri revised statutes in Chapter 258, “Outdoor Recreation”, Section 258.100 in 2005 to improve the definition of a trail and provide immunity from civil liability for those who owned property adjacent to a trail. This type of official language at the state, county, or city level can ease tensions between trail users and adjoining landowners as well as improved the likelihood of expanding the trail system in the future. This strategy could only help in any jurisdiction that it is applied, and would work best at the state level as Bozeman, Gallatin County and other public lands vary in jurisdiction.

**Ontario, Canada:** The Bruce County, Ontario, Canada *Trailbuilding Toolkit* has a chapter that offers guidance, keys to success, and other tips about landowner relations when building trails, including:

- Select community trail member(s) to talk face-to-face with landowners in the proposed trail area;
- Hold public meetings and open discussions with all parties involved;
- Educate landowners and trail users by bringing in guest speakers, produce management agreements between all parties involved;
- Host liability, risk management and mapping workshops for landowners and trail users to attend in order to discuss areas of concern, trouble spots, and exchange ideas;
- Encourage trail groups to share specific details with landowners so that they can get an idea of what to expect;
- Point out the benefits of trails and focus on the positive;
- Respect agricultural lands, cattle crossings, and towns;
- Recognize landowner involvement and in-kind contributions; and

- Discuss liability, maintenance, privacy and recognition and remain honest when dealing with these 4 main areas.

## References

Bruce County Trail Network, Bruce County, Ontario, Canada (2003). *Trailbuilding Toolkit: Landowner Relations*. (Retrieved from: <http://www.brucecountytrails.com/downloads/kit-section3.pdf?phpMyAdmin=63Xh8p8IMbIK5PrBAC8oXjXKlza>)

<http://www.brucecountytrails.com/trailmanager.php?page=trailkit>

Go Columbia, MO (2005). *Trail Information for Property Owners*. (Retrieved from: [https://www.gocolumbiamo.com/ParksandRec/Trails/documents/trail\\_brochure.pdf](https://www.gocolumbiamo.com/ParksandRec/Trails/documents/trail_brochure.pdf))

Greenway Conservancy for the Hudson River Valley, Park & Trails New York. *Getting Involved: A Community Trail Handbook for Landowners*. (Retrieved from: <https://www.ptny.org/pdfs/greenways/publications/LandownersGuide.pdf>)

Rails to Trails Conservancy. *Developing Trails in Sensitive Areas: Farms and Ranches*. (Retrieved from: <http://www.railstotrails.org/build-trails/trail-building-toolbox/trail-building-and-design/developing-trails-in-sensitive-areas/>)

Rails to Trails Conservancy. *Liability and Trail Insurance*. (Retrieved from: <http://www.railstotrails.org/build-trails/trail-building-toolbox/trail-building-management/liability-and-trail-insurance/>)

Snowmobile Maine. "Our Landowners". (Retrieved from: <http://www.mesnow.com/MaineLandowners.html>)

Three Rivers Park District, Twin Cities, Minnesota (2015). *Bassett Creek Regional Trail Frequently Asked Questions*. (Retrieved from: <http://www.threeriversparks.org/about/planning-and-construction/planning-projects/current-initiatives/~media/planning-and-construction/bassett-creek-rt/FAQ%20Bassett%20Creek%20RT%202015.ashx>)

## Tool #2: Agency Partnerships

**Potential Partners:** Gallatin County, USFS, Gallatin Valley Bicycle Club, City of Bozeman, MDT, others.

**Target Area:** Area wide

**Cost:** Varies

### Summary

Partnerships are an efficient way to pool resources to provide facilities, messaging, or coordination across multiple jurisdictions. The Gallatin Valley has a well-established history of multiple partner organizations with user bases that are encouraged to be sensitive to private property and courteous to other trail users. Many of these organizations have collaborated to create new programs and improvements to the trail system for the good of all users. Continuing into the future, partnerships will remain essential to accomplish most programs and improvements due to the fact that multiple agencies have jurisdiction

between the average Bozeman resident's home and area recreational amenities. Most people traveling from Bozeman to one of these recreational areas would most likely travel along trails or roads that are owned and maintained by a variety of agencies including the City of Bozeman, Gallatin County, and Montana Department of Transportation. In addition, there are private organizations, such as Gallatin Valley Land Trust, that are helping to develop and maintain some of these facilities. Finally, there are often private property owners, including homeowner associations, that own critical real estate that affects access to these areas.

In 2014, a Greater Gallatin Trails Visioning project was conducted that was designed to involve multiple trail user groups with the vision of:

*"Diverse users of outdoor recreational resources in the Greater Gallatin area aspire to improve mutual understanding, respect and cooperation accommodate a growing number of trail users and uses; and ensure development and maintenance of an interconnected trail network that is sustainable for generations."*

The outcome of this project to date has resulted in a document with a lengthy list of goals that can only be achieved through the cooperation of local partnerships.

### **Example**

**Sourdough Canyon Trailhead:** Although this report is not focusing on increased parking capacity as a strategy for addressing issues at parking sites, the experience at Sourdough Canyon is relevant to many other projects where interagency cooperation is required. Interagency partnerships were essential to successfully addressing the parking challenges that, up until seven years ago, had plagued the parking lot area for the trailhead to Sourdough Canyon/Bozeman Creek. The trailhead was previously on private land and later donated to GVLT as a result of successful landowner outreach. GVLT then worked with two adjacent property owners to do a lot line adjustment to better configure the parking area configuration. Previously the property boundary had been on the centerline of the road. As a result of the lot line adjustment, the trailhead was fully on property owned by GVLT before being donated to the USFS. Parking capacity was subsequently tripled, environmental conditions were improved by moving the road away from the creek and relationships have been improved. This project, involving GVLT, the Gallatin National Forest, private property owners and others was successful as a result of the interagency coordination over approximately 7 years.

In addition to this example, GVLT has partnered with USFS, Friends of Hyalite, Bridger Ski Foundation, Wilderness Society, Gallatin Valley Bicycle Club, and Big Sky Wind Drinkers. Partners have contributed in-kind support with maps, materials, etc. Volunteers are also replenishing trailhead supplies like restroom toilet paper, dog bags, leashes, etc. Such partnerships are essential to addressing recreational parking site issues.

### **References**

AASHTO Standing Committee on Planning (2009). *Innovative Transportation Planning Partnerships to Enhance National Parks and Gateway Communities*. (Retrieved from: [http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP08-36%2883%29\\_FR.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP08-36%2883%29_FR.pdf))

Ad Council, U.S. Forest Service (2014). "Discover the Forest" Campaign and National Get Outdoors Day. (Retrieved from: <http://www.adcouncil.org/News-Events/Press-Releases/New-Public-Service-Advertising-from-U.S.-Forest-Service-and-Ad-Council-to-Encourage-Families-to-Reconnect-with-Nature-Launches-in-Advance-of-National-Get-Outdoors-Day-on-June-14th>)

Farmington Trails Committee Patches Program, Farmington, Utah. (Retrieved from: [http://www.farmington.utah.gov/trails\\_committee.patches\\_progam.html](http://www.farmington.utah.gov/trails_committee.patches_progam.html))

Federal Transit Administration (FTA) (2012). *Cape Cod National Seashore Alternative Transportation Partnership*. (Retrieved from: [http://www.fta.dot.gov/documents/Cape\\_Cod\\_CS\\_final\\_1.pdf](http://www.fta.dot.gov/documents/Cape_Cod_CS_final_1.pdf))

MIG (2014). *Greater Gallatin Trails Visioning*. (Retrieved from: <http://www.montanamountainbikealliance.com/static/GGTV.pdf>)

Nature Valley Trail View (Retrieved from: <http://naturevalleytrailview.com/>)

### Other References and Useful Information

FHWA, FTA, National Park Service, BLM, U.S. Fish & Wildlife (2001). *Federal Land Alternative Transportation Systems Study* and supplement "Summary of Forest Service Alternative Transportation System Needs". (Retrieved from: [http://www.fta.dot.gov/documents/3039\\_study.pdf](http://www.fta.dot.gov/documents/3039_study.pdf))

## Tool #3: Shuttle Service

**Potential Partners:** Gallatin County, City of Bozeman, Streamline, USFS

**Target Area:** Wherever feasible

**Cost:** Low to Moderate

### Summary

Appropriately planned and executed shuttle services can provide recreational area users with a flexible and competitive option that is an attractive alternative to driving. Locations that benefit from shuttle services typically include; areas that are already highly impacted by individual driving; areas with restricted access; or recreational amenities, such as trails or rivers, where people might often shuttle personal vehicles in the absence of a shuttle system. An example would be a backpacking or mountain biking trek where the finish would be at a different point than the start.

A feasibility study for a shuttle system has been a core focus of BAATS and is not covered in greater detail in this task 6 document.

## Tool #4: Encourage alternative access through additional trail linkages

**Potential Partners:** Gallatin County, City of Bozeman, GVL, USFS, MDT

**Target Area:** Area wide

**Cost:** Moderate to high

### Summary

The majority of trips to some trailheads are currently via personal vehicles. Attracting trail users to trail heads by bike or walking could allow greater use of the recreational facilities with the same or fewer private vehicles. Anecdotally, an improved road with bike lanes or shoulders could help attract some users, however it is clear that a fully separated trail will appeal to a wider range of potential active transportation users. There are many factors which might influence an individual's choice to bicycle or walk to an existing trailhead. These factors might include:

- Distance to trailhead
- Intended use of trail (dog walking, mountain biking, skiing, running, hiking, etc)
- Quality of connection (exposure to traffic, trail surface, intersection accommodations)
- Character of connection (is trail through natural setting in effect making the transportation journey to the trailhead part of the recreational trail experience rather than a more transportation focused experience along a roadway?)

### Example

**Bozeman Area:** Federal Lands Access Program (FLAP) funding is providing a total of \$3.4M (with a local match from the City's Parks and Trails Bond) for a new paved trail paralleling Highway 86 to the 'M' Trail and Drinking Horse trailheads. This project is expected to increase the capacity at these trailheads by providing a comfortable alternative to driving that will be attractive to a portion of trail users.

The 'Main Street to the Mountains' trail system, which is over 80 miles as of 2015, is incrementally expanding with the ultimate vision of providing access on a trail from the City to recreational areas to the north and south of Bozeman.

A feasibility study for multi-use path connections to Sypes, Leverich and Sourdough Canyon trailheads, as well as more generally to the Hyalite Canyon Recreation Area, has been a core focus of BAATS and is not covered in greater detail in this document.

### References

Gallatin Valley Land Trust (2015). *Trails*. (Retrieved from: <http://www.gvlt.org/trails/>)

Greater Philadelphia Regional Trail Network, The Circuit. Philadelphia, Pennsylvania. (Retrieved from: <http://connectthecircuit.org/>)

PATH Foundation. Atlanta DeKalb System Master Plan and the Arabia Mountain Greenway Trail. (Retrieved from: <https://pathfoundation.org/trails/atlanta-dekalb-system/>)

# Crossing Safety & Best Practices Mini- Report

# Task 7: Crossing Safety & Best Practices

The purpose of this task was to conduct a literature review to identify best practices that would be relevant to the development of plans “for addressing safety concerns regarding bicyclist and pedestrian crossings on major access routes to neighboring recreation areas.” This document includes national references and studies and presents best practices in a variety of roadway contexts. Each best practice scenario includes a list of typical applications and key design features including signage, markings and other features. This literature review and best practices summary can be used in selecting and designing safe, comfortable and effective trail crossings for the Bozeman Area Alternative Transportation Study, as well as other projects throughout the City of Bozeman, Gallatin County and on National Forest Lands.

**Note:** The graphics and renderings included are shown for conceptual purposes only and should not be used for the purposes of design. Please refer to cited references for additional design guidance.

## This report includes discussion regarding:

- Crossing Treatment Selection
- Selection of a crossing location
- Uncontrolled Unmarked Crossings
- Uncontrolled Marked Crossings
- Parallel Sidepath Crossings for minor streets and some types of driveway
- Uncontrolled Marked Non-Intersection Crossings
- Signalized Intersections
- Pedestrian Hybrid Beacons
- Signalized Non-Intersection Crossings
- Overpasses
- Underpasses



This trail crossing at Highland Blvd in Bozeman includes a median refuge and is regarded as safe and comfortable by trail users.



## CONTEXT

## REFERENCES

The following standards and guidelines are referred to in this guide.

## Key References

American Association of State Highway and Transportation Officials (**AASHTO**) **Guide for the Development of Bicycle Facilities (2013)**, updated in June 2013 provides guidance on dimensions, use, and layout of specific bicycle facilities. The matching guide focused on pedestrians is the **AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004)**.

FHWA's **Manual on Uniform Traffic Control Devices (MUTCD) (2009)** defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic.

Crossing treatments can have a significant influence on user safety. The Federal Highway Administration's (FHWA) **Crash Modification Factor Clearinghouse** is a web-based database of Crash Modification Factors (CMF) to help transportation engineers identify the most appropriate countermeasure for their safety needs. Where available and appropriate, CMF IDs or similar study results are included for each treatment.

## Reference List

AASHTO. Guide for the Planning, Design, and Operation of Pedestrian Facilities. 2004.

AASHTO. Guide for the Development of Bicycle Facilities. 2013.

FHWA. Pedestrian and Bicycle Information Center. (<http://www.pedbikeinfo.org/>)

USDOJ. 2010 ADA Standards for Accessible Design. 2012.

Uniform Vehicle Code (UVC). National Committee on Uniform Traffic Laws and Ordinances. 2000.

Knoblauch, R., M. Nitzburg, and R. Seifert. Pedestrian Crosswalk Case Studies: Sacramento, CA; Richmond, VA; Buffalo, NY; Stillwater, MN. Publication FHWA-RD-00-103. Federal Highway Administration, McLean, VA, 2001.

Mitman, M. F., Ragland, D. R., and C. V. Zegeer. The Marked Crosswalk Dilemma: Uncovering Some Missing Links in a 35-Year Debate. Presented at the 87th Annual Meeting of the Transportation Research Board, Washington, D. C., 2008.

ITETENCTechnical Committee 109-01. Pavement Marking Patterns Used at Uncontrolled Pedestrian Crossings. Publication No. IR-131. Institute of Traffic Engineers, Washington, DC, 2010.

Mitman, M. F. and D. R. Ragland. More Evidence Why Pedestrian and Driver Knowledge of the Vehicle Code Should Not Be Assumed. Transportation Research Record: Journal of the Transportation Research Board, No. 2002. Transportation Research Board of the

National Academies, Washington, DC, 2007.

Zeeger, C., J. Stewart, and H. Huang. Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations. Publication FHWA-RD-01-142, FHWA, U.S. Department of Transportation, 2001.

National Association of City Transportation Officials (NACTO). Urban Bikeway Design Guide. 2012.

National Association of City Transportation Officials (NACTO). Urban Streets Design Guide. 2013.

FHWA. Manual on Uniform Traffic Control Devices for Streets and Highways. Washington, D. C., 2009.

FHWA. An Overview and Recommendation of High-Visibility Crosswalk Markings Styles. 2013.

FHWA. Interim Approval for Optional Use of a Bicycle Signal Face (IA-16). Washington, D. C., 2013

Fitzpatrick, K., S. Chrysler, V. Iragavarapu, and E. S. Park. Detection Distance to Crosswalk Markings: Transverse Lines, Continental Markings, and Bar Pairs. Transportation Research Record: Journal of the Transportation Research Board, No. 2250. Transportation Research Board of the National Academies, Washington, DC, 2011.

## CONTEXT

## CROSSING TREATMENT SELECTION

## Crossing Treatments

The specific type of treatment at a crossing may range from a simple marked crosswalk to full traffic signals or grade separated crossings. Crosswalk lines should not be used indiscriminately, and appropriate selection of crossing treatments should be evaluated and an engineering study should be performed before a marked crosswalk is installed. The engineering study should consider the number of lanes, the presence of a median, the distance from adjacent signalized intersections, the pedestrian volumes and delays, the average daily traffic (ADT), the posted or statutory speed limit or 85th-percentile speed, the geometry of the location, the possible consolidation of multiple crossing points, the availability of street lighting, and other appropriate factors.

PEDESTRIAN CROSSING CONTEXTUAL GUIDANCE At unsignalized locations	Local Streets 15-25 mph		Collector Streets 25-30 mph			Arterial Streets 30-45 mph							
	2 lane	3 lane	2 lane	2 lane with median refuge	3 lane	2 lane	2 lane with median refuge	3 lane	4 lane	4 lane with median refuge	5 lane	6 lane	6 lane with median refuge
FACILITY TYPE													
Crosswalk Only (high visibility)	✓	✓	EJ	EJ	X	EJ	EJ	X	X	X	X	X	X
Crosswalk with warning signage and yield lines	EJ	✓	✓	✓	✓	EJ	EJ	EJ	X	X	X	X	X
Active Warning Beacon (RRFB)	X	EJ	✓	✓	✓	✓	✓	✓	X	✓	X	X	X
Hybrid Beacon	X	X	EJ	EJ	EJ	EJ	✓	✓	✓	✓	✓	✓	✓
Full Traffic Signal	X	X	EJ	EJ	EJ	EJ	EJ	EJ	✓	✓	✓	✓	✓
Grade separation	X	X	EJ	EJ	EJ	X	EJ	EJ	EJ	EJ	EJ	✓	✓

LEGEND	
Most Desirable	✓
Engineering Judgement	EJ
Not Recommended	X

**Note:**

This table presents simplified guidance consolidated from a variety of sources. Practitioners seeking to implement these treatments in conditions not covered here, or conditions not specified as “Most Desirable” should refer to the primary sources listed below for more detailed application guidance.

**Marked only crosswalks** guidance is based on the 2002 report by Zeeger, et al's Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations. The use of **warning crossing assembly signs** are recommended at mid-block locations.

**Active warning beacon** guidance is included in the 2006 NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Crossings. Rectangular rapid flash beacons are specifically covered by the 2008 FHWA Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (1A-11).

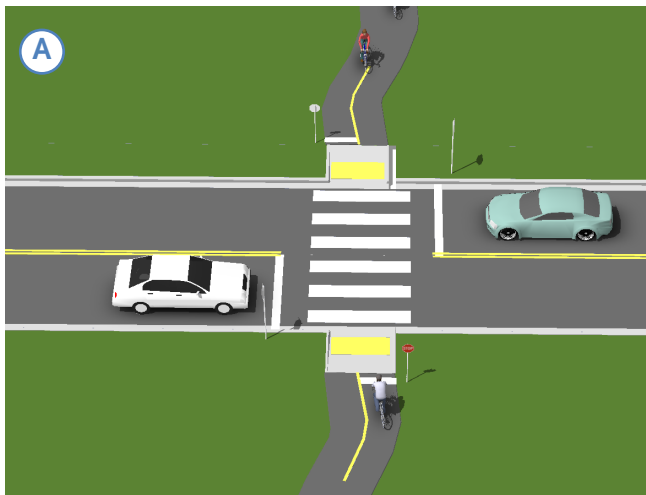
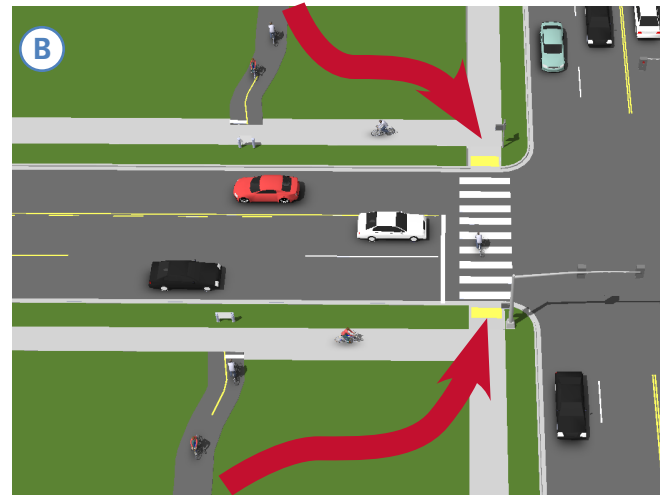
**Pedestrian hybrid beacons** are covered comprehensively in the 2014 FHWA report Pedestrian Hybrid Beacon Guide, Recommendations and Case Study, and in the 2006 NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Crossings.

**Full traffic signals** should meet the necessary warrants outlined in the 2009 FHWA Manual on Uniform Traffic Control Devices.

## CONTEXT

**CROSSING LOCATION SELECTION****Crossing Locations**

The approach to designing path crossings of streets depends on an evaluation of vehicular traffic, line of sight, pathway traffic, use patterns, vehicle speed, road type, road width, and other safety issues such as proximity to major attractions or existing signals.

**Midblock Crossing****Route Users to Signal****Typical Application****A MIDBLOCK CROSSINGS**

- Appropriate on a two lane road with  $\leq 9,000$ -12,000 Average Daily Traffic (ADT) volume and  $\leq 35$  mph speed.
- Crossings of streets with higher speeds, higher volumes, and additional lanes requires additional enhancements such as median islands or active warning beacons.

**B ROUTE USERS TO SIGNAL**

- Path crossings should not be provided within approximately 400 feet of an existing signalized intersection. If possible, route path directly to the signal.
- Barriers and signing may be needed to direct shared use path users to the signalized crossings

**Midblock Crossings**

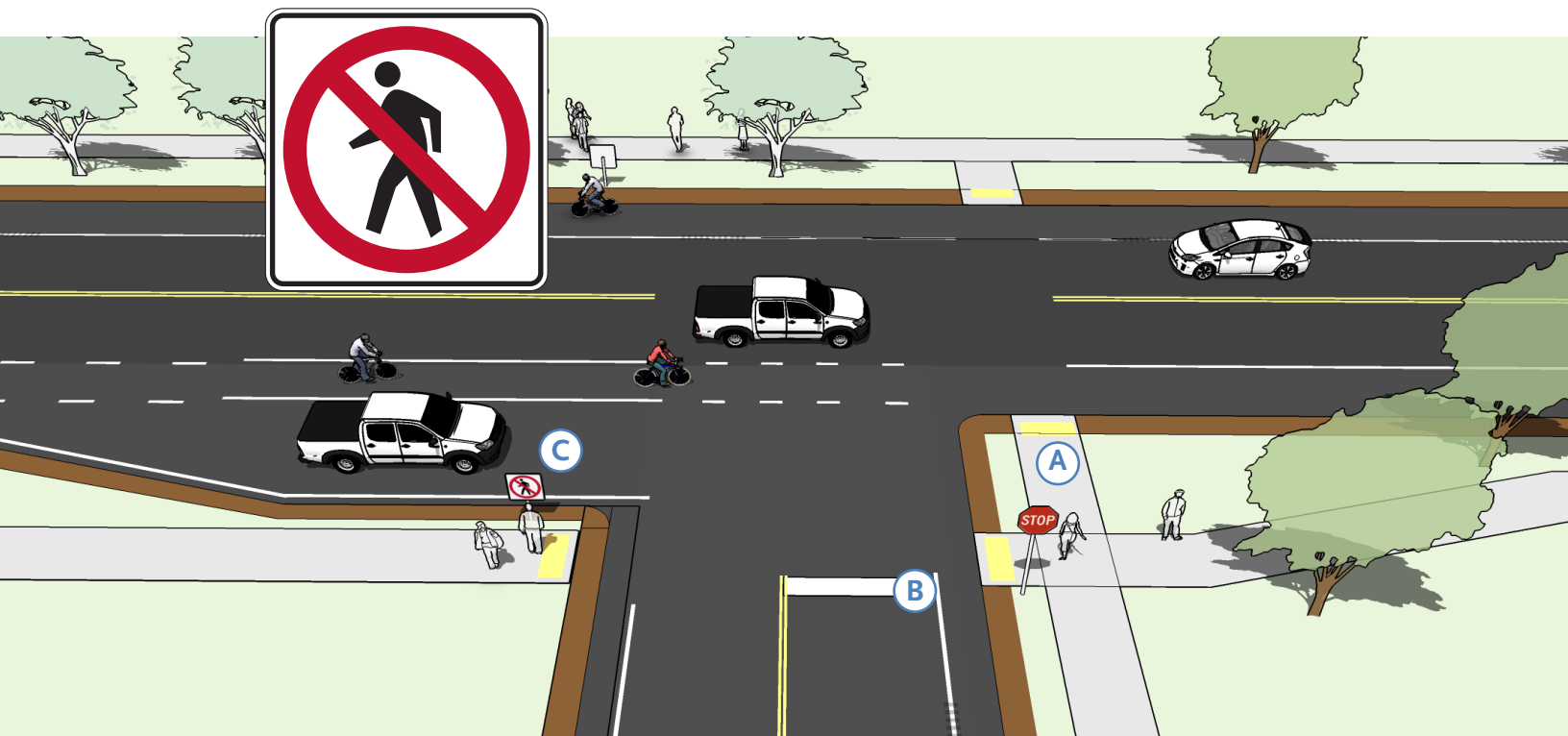
Locations where mid-block crossings should be considered include:

- long blocks (longer than 600 ft) with destinations on both sides of the street;
- locations with heavy pedestrian traffic, such as schools, shopping centers and shared use path crossings; and
- at transit stops, where transit riders must cross the street on one leg of their journey.

## UNCONTROLLED CROSSINGS

**UNMARKED CROSSINGS**

Crosswalks exist at the intersection of roadways even if they lack specific crosswalk markings. Pedestrians have right-of-way at these locations, just as they do at locations with crosswalk markings.

**Typical Application**

- Low speed, low volume intersections, where frequent acceptable gaps in traffic and high yielding rates prevail.
- If a crossing is desired at a non-intersection location, it must be marked. (Uniform Vehicle Code)

**Design Features**

- A** Tactile warning surfaces and ADA compliant curb ramps should be present to support accessibility of the crosswalk.
- B** At intersections with stop or yield control, the appropriate stop or yield marking should be used, located in advance of the unmarked crosswalk area.
- C** If use of an otherwise legal crosswalk is not desired. A No Pedestrian (R9-3) or No Pedestrian Crossing (R9-3a) sign may be used.

### Unmarked Path Crossing



This unmarked path crossing offers a refuge island and warning signing, but no crosswalk markings.

### Further Considerations

- A lack of knowledge of right-of-way laws regarding unmarked crossings may result in inconsistent motorist yielding behavior at unmarked crosswalks. **(Mitman 2007)**

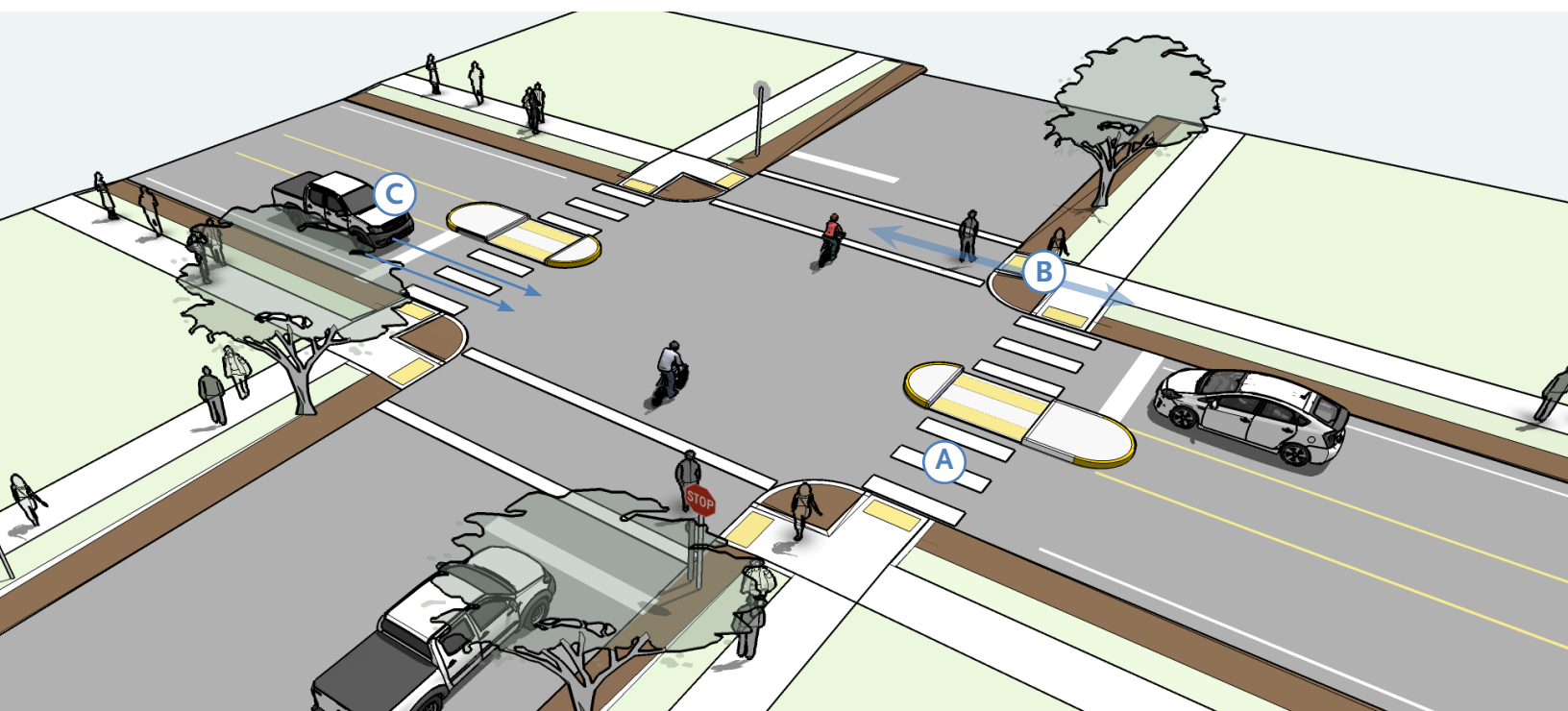
### Safety

On multi-lane streets with high volumes (greater than 12,000 ADT or 15,000 ADT with a median) locations with marked crosswalk alone resulted in a higher rate of crashes than locations with unmarked crosswalks. If a marked crosswalk is desired in these conditions, additional enhancement should be provided. **(Zeeger 2001)**

## UNCONTROLLED CROSSINGS

**MARKED CROSSING**

Crosswalks exist at the intersection of roadways, whether they are marked or unmarked. The Uniform Vehicle Code requires that motorists yield right-of-way to pedestrians within crosswalks. Marked crosswalks draw attention to the crosswalk area and may remind motorists of the requirement to yield.

**Typical Application**

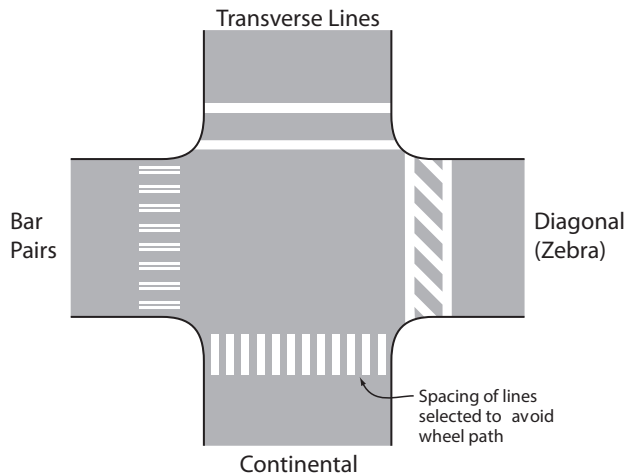
- At the intersection of streets, where increased awareness of a crossing location is desired.
- Where paths intersect with a street in close proximity to an existing signalized intersection, and path users are expected to travel within the crosswalk.

**Design Features**

- A** High-visibility crosswalk markings are the preferred marking type at uncontrolled marked crossings. **(FHWA 2013)**
- B** Crosswalk markings should be located to provide a straight pedestrian path in line with the connecting sidewalk. Crosswalk markings should be located so that the curb ramps are within the extension of the crosswalk markings.
- C** Continental or Pair Bar style marking should be placed to avoid the wear path of motor vehicle tires.



### Crosswalk Markings



There is no standard crosswalk marking style or application. A variety of pavement markings are used at crosswalks throughout the United States.

Transverse lines are particularly difficult for motorists to see at fast speeds, and an ITE study determined that they were “essentially not visible” when viewed from a standard approaching vehicle. **(ITE 2010)**

Suitable high-visibility markings include continental or bar pairs markings. **(Fitzpatrick 2011)**

Source: FHWA Manual on Uniform Traffic Control Devices. 2009.

### Further Considerations

On roadways with high speed and high volumes of motor vehicles, or multiple lanes, crosswalk markings alone are often not a viable safety measure. This should not discourage the implementation of crosswalks, but should rather support the creation of more robust crossing solutions. **(Zeeger 2001)** This includes: measures designed to reduce traffic speeds, shorten crossing distances, enhance driver awareness of the crossing, and/or provide active warning of pedestrian presence.

On roadways with more than two consecutive lanes without a median refuge island, a marked crosswalk alone is not a viable safety measure. Continuous center turn lanes with no median islands are not considered adequate pedestrian refuge areas. **(Zeeger 2001)**

Studies have shown that motorists were statistically more likely to yield right-of-way to pedestrians in a marked crosswalk than an unmarked crosswalk. **(Mitman 2008)**

Motorists decrease speed in the vicinity of marked crosswalks, indicating an increased awareness of pedestrians. Crosswalk usage increases with the installations of crosswalk markings. **(Knoblauch 2001)**

Pedestrians are particularly sensitive to out of direction travel and undesired crossing may become prevalent if the distance to the nearest formal is too great.

### Safety

A study of the installation of a marked crosswalk on the minor approach of a 4-legged stop-controlled intersection showed a 65% decrease in crashes. **(CMF ID: 3019)**

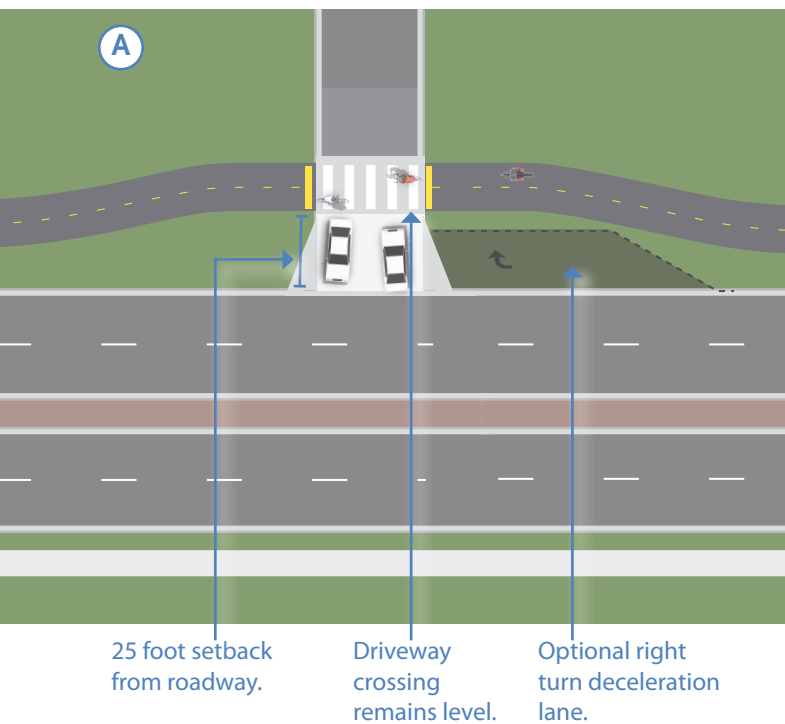


## UNCONTROLLED CROSSINGS

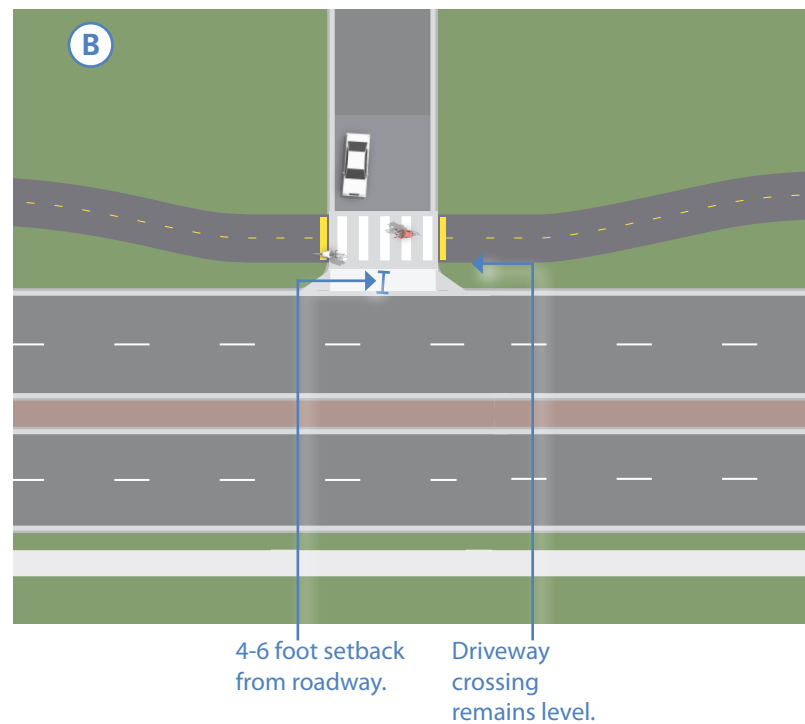
**PARALLEL SIDEPATH CROSSING**

Shared Use Paths along roadways, also called Sidepaths, are a type of path that run adjacent to a street.

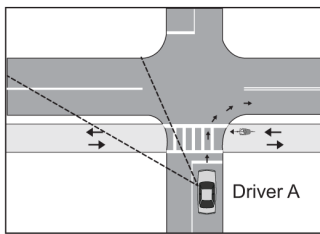
Because of operational concerns it is generally preferable to place paths within independent rights-of-way away from roadways. However, there are situations where existing roads provide the only corridors available.

**Typical Application**

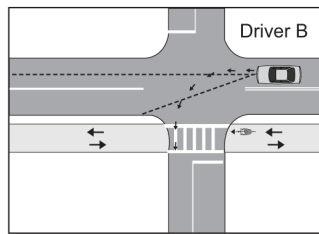
- Guidance for sidepaths should follow that for general design practices of shared use paths.
- Crossing design should emphasize visibility of users and clarity of expected yielding behavior. Crossings may be STOP or YIELD controlled for motor vehicles depending on sight lines and bicycle motor vehicle volumes and speeds.

**Design Features**

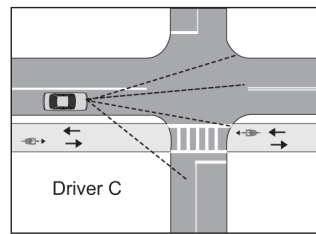
- In general, there are two approaches to driveway crossings: setback crossings and adjacent crossings, illustrated above.
- A Setback Crossing** - A set back of 25 feet separates the path crossing from merging/turning movements that may be competing for a driver's attention.
- B Adjacent Crossing** - A separation of 6 feet emphasizes the conspicuity of riders at the approach to the crossing.

**Sidepath Conflicts (AASHTO 2013)**

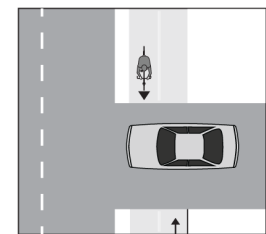
Right turning Driver A is looking for traffic on the left. A contraflow bicyclist is not in the driver's main field of vision.



Left turning Driver B is looking for traffic ahead. A contraflow bicyclist is not in the driver's main field of vision.



Right turning Driver C is looking for left turning traffic on the main road and traffic on the minor road. A bicyclist riding with traffic is not in the driver's main field of vision.



Stopped motor vehicles on side streets or driveways may block the path.

**Further Considerations**

- Sidepaths running for long distances in suburban areas with many driveways or street crossings can create operational concerns. See the figure above for potential conflicts associated with sidepath crossings. **(AASHTO 2013)**
- Along roadways, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where bicyclists enter or leave the path.
- The provision of a shared use path adjacent to a road is not a substitute for the provision of on-road accommodation such as paved shoulders or bike lanes, but may be considered in some locations in addition to on-road bicycle facilities.
- To reduce potential conflicts in some situations, it may be better to place one-way sidepaths on both sides of the street. **(AASHTO 2013)**

**Safety**

A study of the provision of a bicycle path 2-5 m from the side of the roadway reduces crashes 45% compared to roads with no bicycle facilities. **(AASHTO 2013)**

## UNCONTROLLED CROSSINGS

**MARKED NON-INTERSECTION CROSSINGS**

At non intersection areas, markings must be used to establish a legal crosswalk. When convenient and manageable crossing points are not identified, most path users cross at random, unpredictable locations. Well-designed midblock crossings can provide many safety benefits to path users when placed appropriately.

**Typical Application**

- Where shared use paths intersect with high volume or high speed streets.
- Path crossings should not be provided within approximately 400 feet of an existing signalized intersection. If possible, route path directly to the signal.
- Across long blocks (longer than 600 ft) with destinations on both sides of the street.
- At locations with heavy pedestrian traffic, such as schools, shopping centers.
- At midblock transit stops, where transit riders must cross the street on one leg of their journey.

**Design Features**

- Ⓐ Crosswalk markings legally establish midblock shared use path crossing. **(FHWA 2009)**
- Ⓑ Detectable warning strips help visually impaired pedestrians identify the edge of the street.
- Ⓒ Crossing assemblies draw attention to the crossing and active warning beacons are warning motorists of a path user's presence.
- Ⓓ Passive detection technology can automatically activate warning beacons for oncoming path users.
- Ⓔ Speed management features such as speed humps may improve yielding.

### Active Warning Beacons



Active warning beacons may lead to increased yielding rates at path crossings.

### Further Considerations

High-visibility crosswalk markings are the preferred marking type at uncontrolled marked crossings. **(FHWA 2013)**

On roadways with high speed and high volumes of motor vehicles, crosswalk markings alone are often not a viable safety measure. This should not discourage the implementation of crosswalks, but should rather support the creation of more robust crossing solutions. **(Zeeger 2001)**

Unsignalized crossings of multi-lane arterials over 15,000 ADT may be possible with features such as sufficient crossing gaps (more than 60 per hour), median refuges, and/or active warning devices like rectangular rapid flash beacons or in-pavement flashers, and excellent sight distance. **(FHWA 2009)**

### Safety

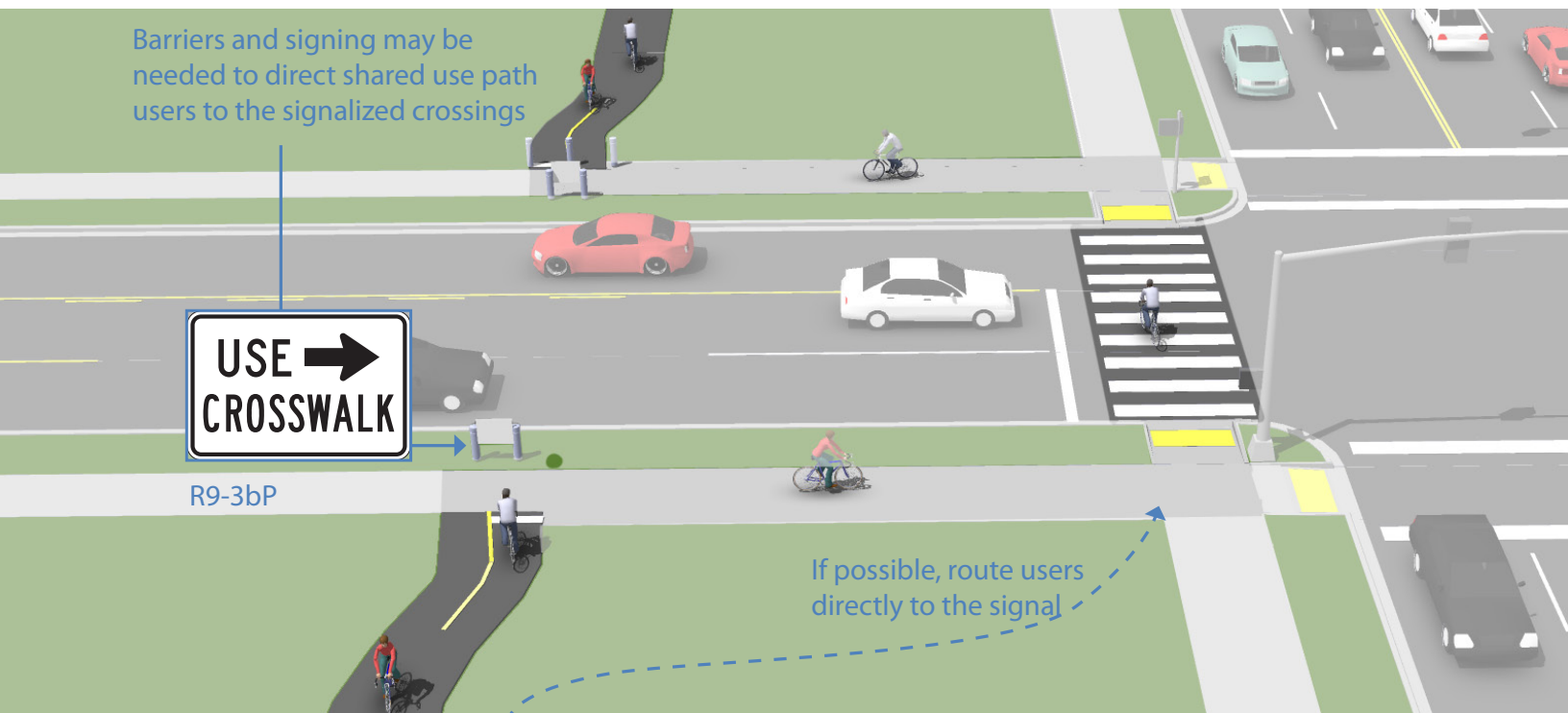
On two-lane roads, the presence of a marked crosswalk alone at an uncontrolled location was associated with no difference in pedestrian crash rate. On multilane roads with traffic volumes above about 12,000 vehicles per day, additional crossing improvements may be necessary to prevent an increase in pedestrian crash rate. **(Zeeger 2001)**



## CONTROLLED CROSSINGS

**SIGNALIZED INTERSECTIONS**

Path crossings within approximately 400 feet of an existing signalized intersection with pedestrian crosswalks are typically diverted to the signalized intersection to avoid traffic operation problems when located so close to an existing signal. For this restriction to be effective, barriers and signing may be needed to direct path users to the signalized crossing.

**Typical Application**

- Countdown signals should be used at all new and rehabbed signalized intersections, except where pedestrian crossing is prohibited by signage.
- Manual pushbuttons are installed at intersections operating on actuated signal timing and fixed timing.
- Audible pedestrian signals are either directly requested by individuals, or installed based on observed conditions at specific locations, such as low-traffic volumes, or complex signal operations.

**Design Features**

- A** The pedestrian signal phase should provide sufficient time for a pedestrian to safely cross the street. The MUTCD recommends a walking speed of 3.5 ft per second, with a minimum walk interval of 7 seconds. **(FHWA 2009)**
- B** The walk and pedestrian clearance times may be adjusted down to 2.5 - 3.0 ft per second to account for the elderly, wheelchair users, and visually-disabled people who typically need more time to cross.
- C** Pushbuttons should be easy to identify and access and be user-responsive.

### ***Pedestrian Signals***



This crossing of W Kagy Boulevard offers pedestrian signal heads on all approaches and legs.

### **Further Considerations**

A variety of signalization enhancements may be beneficial for path users at signalized crossings:

- **Pedestrian recall** is a traffic signal controller setting that automatically provides a pedestrian walk phase during every cycle. Since Pedestrian recall does not require detection or actuation, it eliminates the need for push buttons or other costly detection equipment. This works well in busy areas, however if few pedestrians or bicyclists are present it can cause unnecessary delay.
- **Passive pedestrian detection** devices save pedestrians the trouble of having to locate a push button. They are also capable of tracking pedestrians as they cross the intersection, and can be configured to extend the walk/flashing don't walk interval when pedestrians are still in the intersection, and/or not dedicate walk time in the absence of pedestrians. These work best at non-intersection locations as the intent of pedestrians is more clear.
- **Leading Pedestrian Intervals (LPI)** are used to reduce right turn and permissive left turn vehicle and pedestrian conflicts. The through pedestrian interval is initiated first, effectively offsetting the otherwise fully concurrent through/right/permissive left turn interval. The LPI minimizes vehicle-pedestrian conflicts because it gives pedestrians a head start into the intersection, thereby making them more visible, and reducing crossing exposure. Audible cues should be given for visually-impaired pedestrians. This feature is always a positive improvement at signalized intersections and can be limited to actuated pedestrian phases.

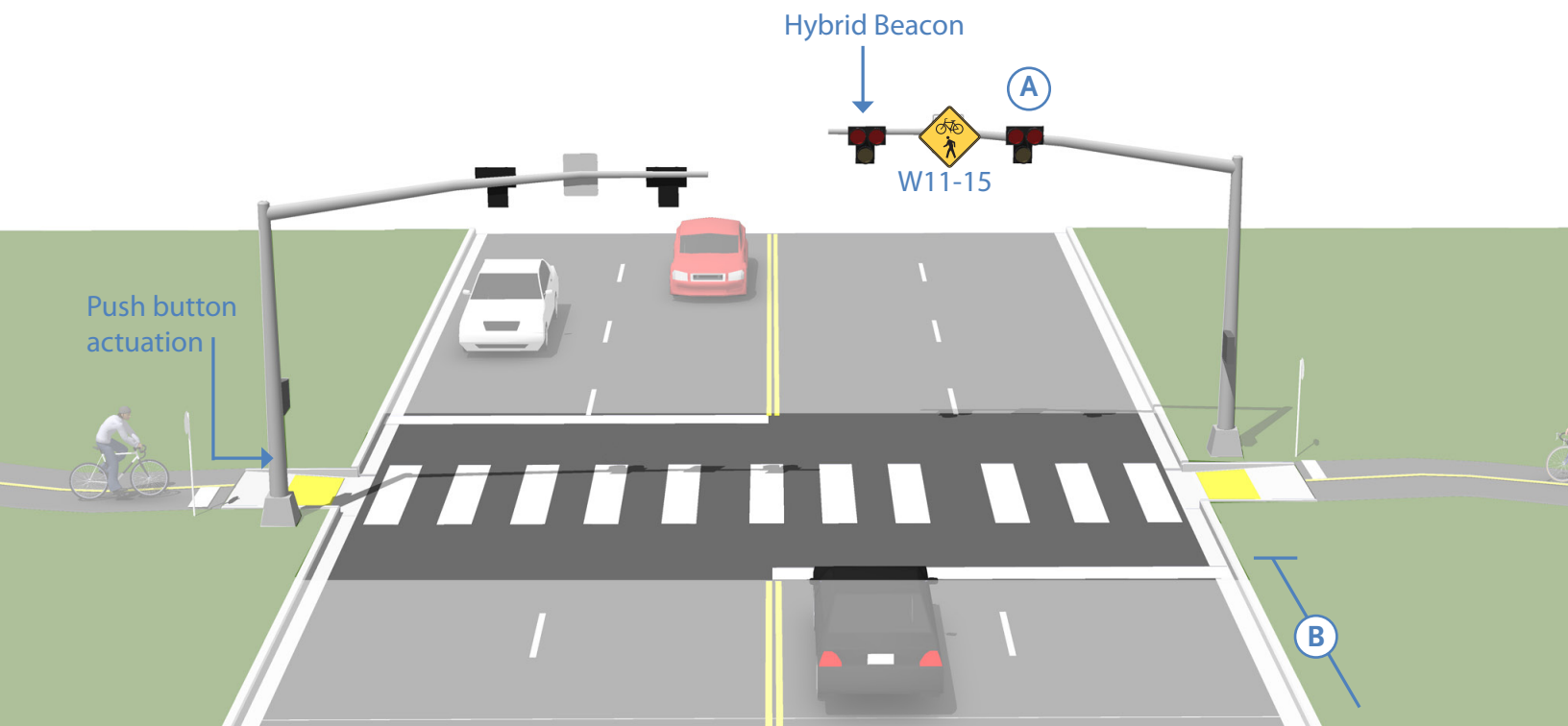
### **Safety**

The installation of a pedestrian countdown timer at intersections has been shown to lead to a 70% decrease in vehicle/pedestrian collisions. **(CMF ID: 5272)**

## CONTROLLED CROSSINGS

**PEDESTRIAN HYBRID BEACON**

Pedestrian Hybrid Beacons (PHBs) are used to improve non-motorized crossings of major streets in locations where a traffic analysis does not support installation of a conventional traffic signal. Hybrid beacons may also be used at intersections with minor streets.

**Typical Application**

- Hybrid beacons may be installed without meeting traffic control signal warrants if roadway speed and volumes are excessive for comfortable pedestrian crossing. **(FHWA 2009)**

**Design Features**

- A** A pedestrian hybrid beacon consists of a signal-head with two red lenses over a single yellow lens on the major street, and pedestrian and/or bicycle signal heads for the minor street. There are no signal indications for motor vehicles on the minor street approaches. **(FHWA 2009)**
- B** Parking and other sight obstructions such as vegetation or street furnishings should be restricted for at least 100 feet in advance of and at least 20 feet beyond the marked crosswalk to provide adequate sight distance. **(FHWA 2009)**



### ***Pedestrian Hybrid Beacon***



Pedestrian hybrid beacons are particularly effective on multi-lane streets that would otherwise have a multiple-threat risk if no active indication of pedestrian presence were provided.

#### **Further Considerations**

- If installed within a signal system, signal engineers should evaluate the need for the hybrid signal to be coordinated with other signals.
- The hybrid beacon can significantly improve the operation of a bicycle route, particularly along neighborhood greenway corridors. Because of the low traffic volumes on these facilities, intersections with major roadways are often unsignalized, creating difficult and potentially unsafe crossing conditions for bicyclists. **(NACTO 2012)**
- Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity and safety.
- Hybrid beacons are subject to the same maintenance needs and requirements as standard traffic signals. Signing and striping need to be maintained to help users understand any unfamiliar traffic control.

#### **Safety**

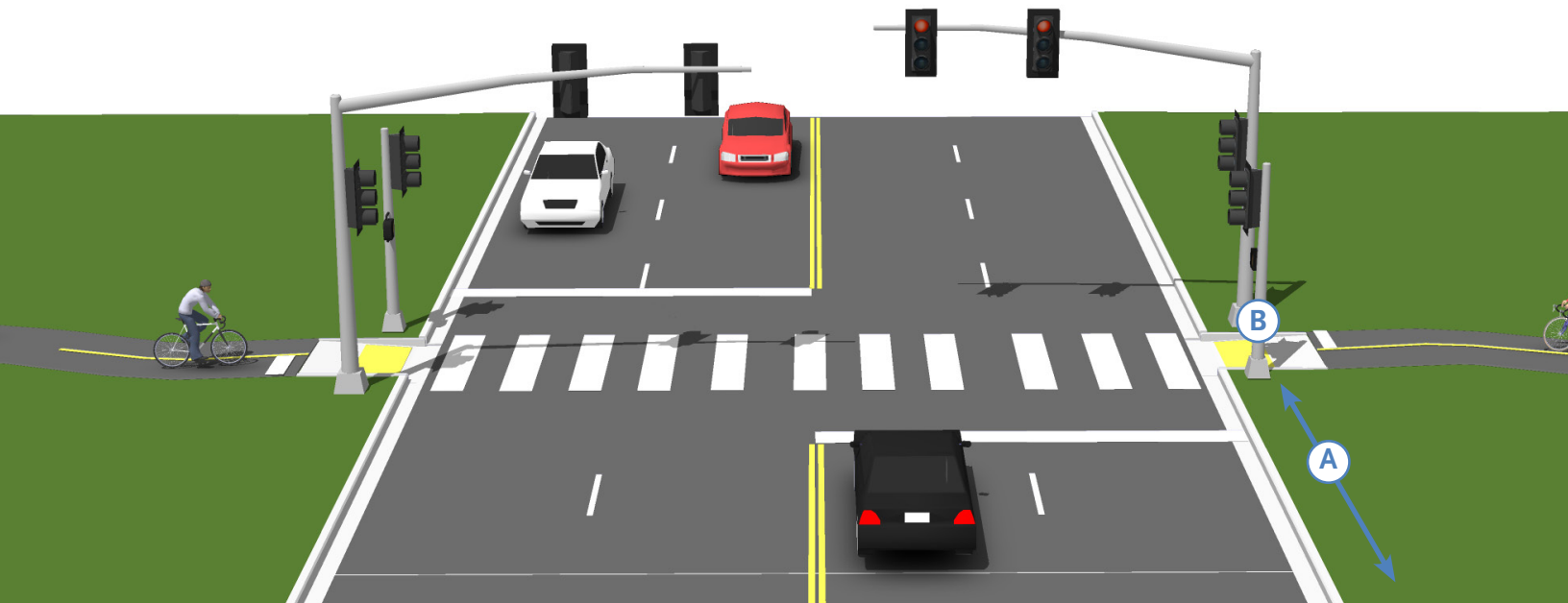
A before and after study found that the installation of a hybrid beacon at an intersection resulted in a reduction of crashes involving vehicles and pedestrians by 69% and a reduction in total crashes by 29% **(CMF ID: 2911)**.

## CONTROLLED CROSSINGS

**SIGNALIZED NON INTERSECTION CROSSINGS**

Signalized crossings provide the most protection for crossing path users through the use of a red-signal indication to stop conflicting motor vehicle traffic.

A full traffic signal installation treats the path crossing as a conventional 4-way intersection and provides standard red-yellow-green traffic signal heads for all legs of the intersection.

**Typical Application**

If traffic and roadway characteristics make crossing difficult for the path user, the need for a signal or active warning device (such as a beacon) should be considered based on traffic volumes, speed, number of lanes, and availability of a refuge. **(AASHTO 2013)**

Full traffic signal installations must meet MUTCD pedestrian, school or modified warrants.

- Where shared use paths intersect with a high volume, high speed street.
- Roadway travel speeds of 40 MPH and above
- Roadway ADT exceeds 15,000 vehicles

**Design Features**

- (A) Signalized shared use path crossings should be operated so the slowest user type likely to use the path will be accommodated. This will typically be the pedestrian.
- (B)
  - Located more than 300 feet from an existing signalized intersection
  - Push button actuation for shared use path users. Bicyclists should not have to dismount to activate the signal.

---

***Traffic Signal Controlled Path Crossing***

This signalized crossing of a midblock path crossing provides two adjacent crosswalks to separate directional flows through the intersection.

**Further Considerations**

Shared use path signals are normally activated by push buttons but may also be triggered by embedded loop, infrared, microwave or video detectors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street.

In locations where motor vehicle traffic delay is a concern, a pedestrian hybrid beacon or active warning beacon may be considered.

Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity and safety.

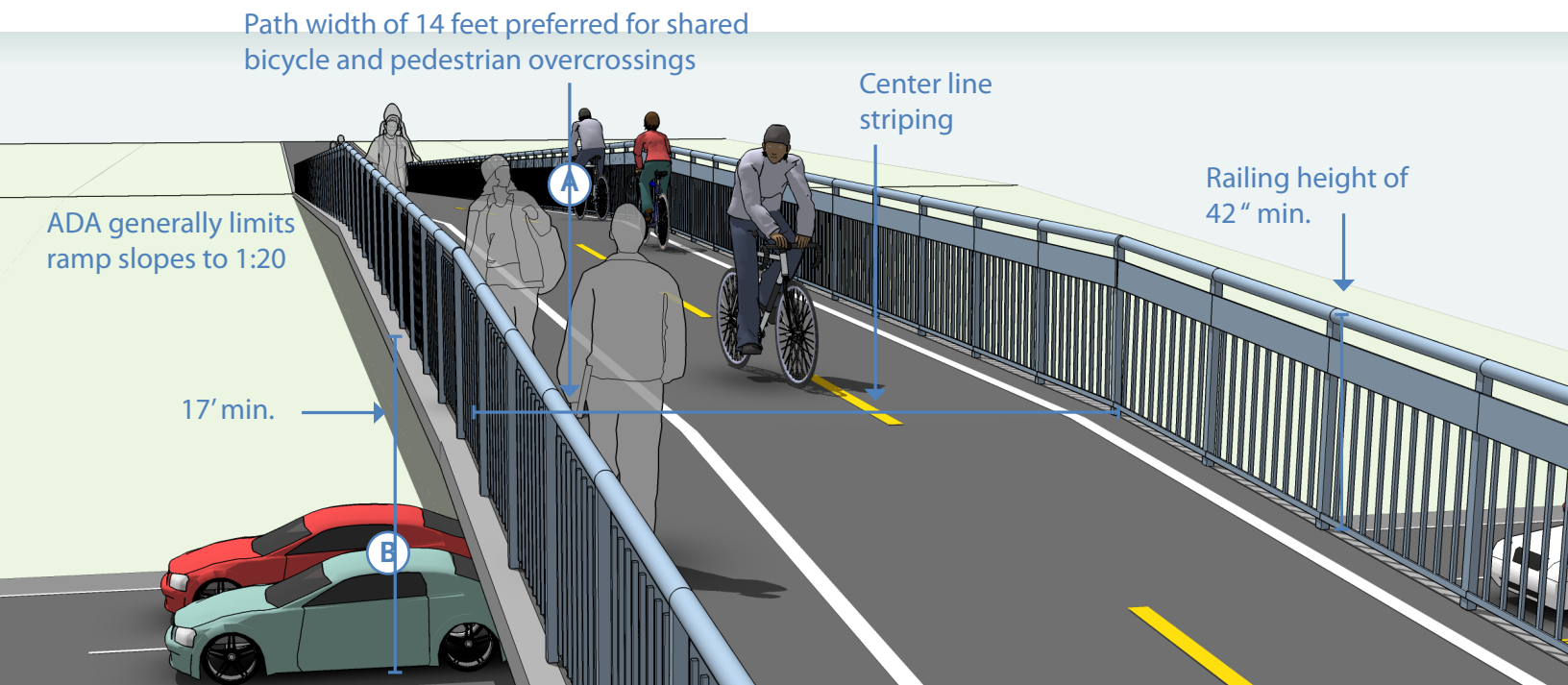
**Safety**

Traffic control signals that are properly designed, located, operated, may reduce the frequency and severity of certain types of crashes, especially right-angle collisions. **(FHWA 2009)**

## GRADE-SEPARATED CROSSINGS

**OVERPASS**

Shared use path overpasses provide critical non-motorized system links by joining areas separated by barriers such as deep canyons, waterways or major transportation corridors. In most cases, these structures are built in response to user demand for safe crossings where they previously did not exist.

**Typical Application**

- There are no minimum roadway characteristics for considering grade separation. Depending on the type of facility or the desired user group grade separation may be considered in many types of projects.
- Overpasses require a minimum of 17 feet of vertical clearance to the roadway below versus a minimum elevation differential of around 12 feet for an underpass. This results in potentially greater elevation differences for overpasses and much longer ramps for bicycles and pedestrians to negotiate.

**Design Features**

- (A)** The receiving clear width should allow 2 feet of clearance on each side of the pathway. Under constrained conditions, the bridge may taper to the pathway width (8 feet). **(AASHTO 2013)**
- (B)** 10 foot headroom on overpass; clearance below will vary depending on feature being crossed.
  - Roadway: 17 feet
  - Freeway: 18.5 feet
  - Heavy Rail Line: 23 feet



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**Pedestrian/Bicycle Overpass**

This overpass helps children cross a busy street at a midblock location.

**Further Considerations**

- A separate pedestrian area may be provided for facilities with high bicycle and pedestrian use.
- If overpass has any scenic vistas additional width should be provided to allow for stopping.
- Overpasses for bicycles and pedestrians typically fall under the Americans with Disabilities Act (ADA), which strictly limits ramp slopes to 5% (1:20) with landings at 400 foot intervals, or 8.33% (1:12) with landings every 30 feet. **(USDOJ 2010)**
- Overpasses pose potential concerns about visual impact and functional appeal, as well as space requirements necessary to meet ADA guidelines for slope.

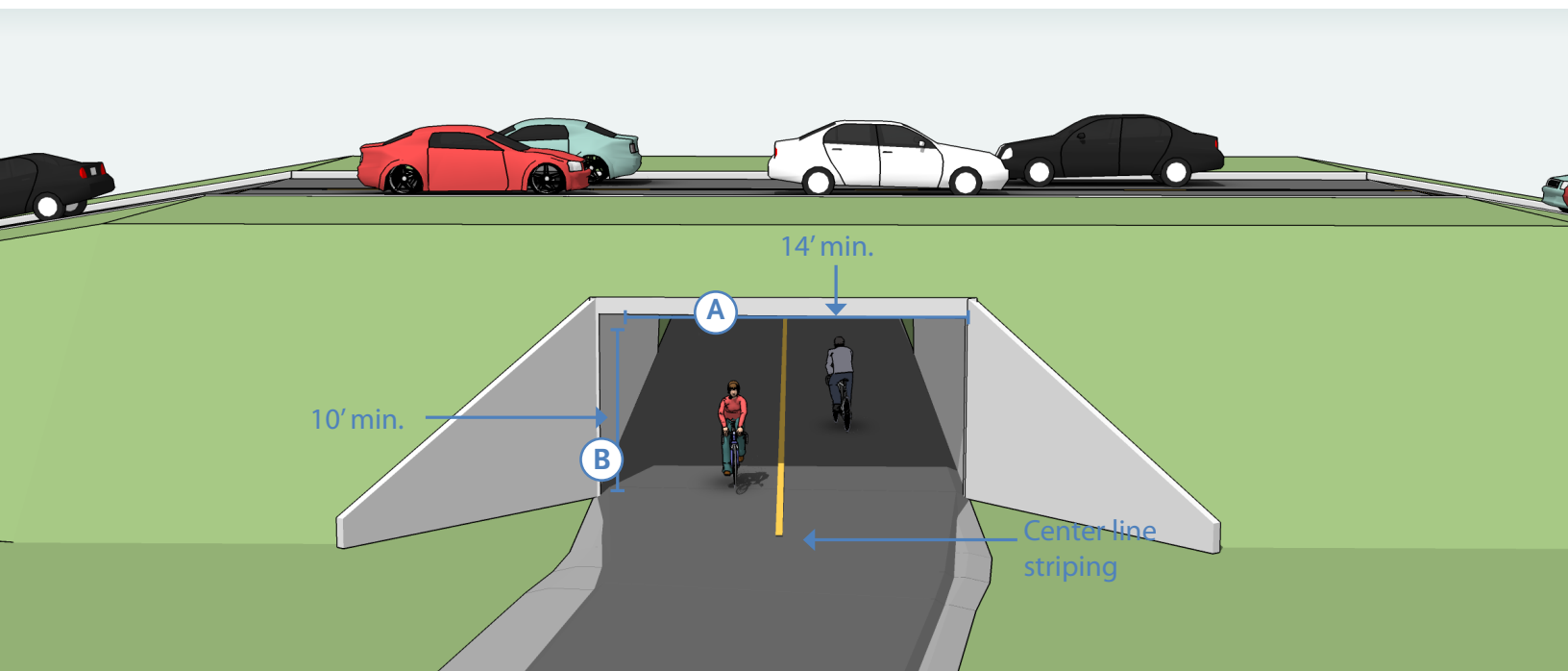
**Safety**

Grade separated crossings, when used, eliminate conflicts between users that would be present at at-grade crossing locations.

## GRADE SEPARATED CROSSINGS

**UNDERPASS**

Bicycle/pedestrian underpasses provide critical non-motorized system links by joining areas separated by barriers such as railroads and highway corridors. In most cases, these structures are built in response to user demand for safe crossings where they previously did not exist.

**Typical Application**

- To provide continuity of a shared use path where a barrier exists. **(AASHTO 2013)**
- There are no minimum roadway characteristics for considering grade separation. Depending on the type of facility or the desired user group grade separation may be considered in many types of projects.

**Design Features**

- A** 14 foot minimum width, greater widths preferred for lengths over 60 feet. In constrained conditions
- B** 10 foot minimum height.
  - A balanced proportion of 1.5:1 width to height is desired.
  - The underpass should have a centerline stripe even if the rest of the path does not have one.

---

**Shared Use Path Underpass**

A well-proportioned underpass feels open and safe.

**Further Considerations**

Safety is a major concern with underpasses. Shared use path users may be temporarily out of sight from public view and may experience poor visibility themselves. To mitigate safety concerns, an underpass should be designed to be spacious, well-lit, equipped with emergency cell phones at each end and completely visible for its entire length from end to end. **(AASHTO 2013)**

**Safety**

Grade separated crossings eliminate conflicts between users that would be present at at-grade crossing locations.



## Task 9: Bicycle Safety on Rural Highways

## Task 9: Bicycle Safety on Rural Highways

The purpose of this task was to identify relevant tools that could be applied when developing plans for “improving safety for people riding bicycles” along Bridger Canyon Road (MDT Highway 86), or any canyon or rural two-lane highway. While this report was created with the approximately 20 miles of roadway running between Story Mill Road and Fairy Lake Road as the impetus, most if not all of the concepts are equally applicable to other local rural highways such as Springhill Road, Hyalite Canyon Road, Bozeman Trail Road, etc.

### Highway 86 Existing Conditions

In April 2015, MDT completed a corridor study of Hwy 86 that included the subject section of roadway. Bicycle and pedestrian safety was a small component of the study. As a part of the “existing and projected conditions” section the study noted the following for the bicycle and pedestrian facilities along this corridor.

*There are no dedicated bicycle or pedestrian facilities directly adjacent to MT 86 in the study area. Shoulder widths vary throughout the corridor, ranging in width from zero to five feet, providing limited opportunity for non-motorized usage along the edge of the traveled way. The first 2.5 miles of the corridor provide connections to the Bozeman “M” Trail System and the Drinking Horse Mountain Trails. The Gallatin Valley Bicycle Club hosts weekly bicycle rides within the study area including traveling to the top of Battle Ridge Pass and to Wilsall, MT. Numerous cycling and outdoor websites promote the corridor as a destination for cycling. Multiple bicycle races and events are held in the corridor annually.*

*MDT staff reports that parking sometimes overflows onto the highway near the “M” trail and fish hatchery parking lots (RP 4.2), and at Bridger Bowl (RP 15.8), leading to pedestrians walking along MT 86.*

- p. 8 of MDT’s Bridger Canyon Corridor Planning Study, April 2015

Most concerns regarding bicycle safety along the lower reaches of Hwy 86 will be relieved by the soon to-be-built Bridger Drive Trail as seen in the study area shown in Figure 1. This trail has been funded primarily by the Federal Lands Access Program (FLAP) and the City of Bozeman’s Trails, Open Space and Parks (TOP) bond. This paved, off-highway, shared-use path will run approximately 3 miles and link these popular trailheads with the City of Bozeman.

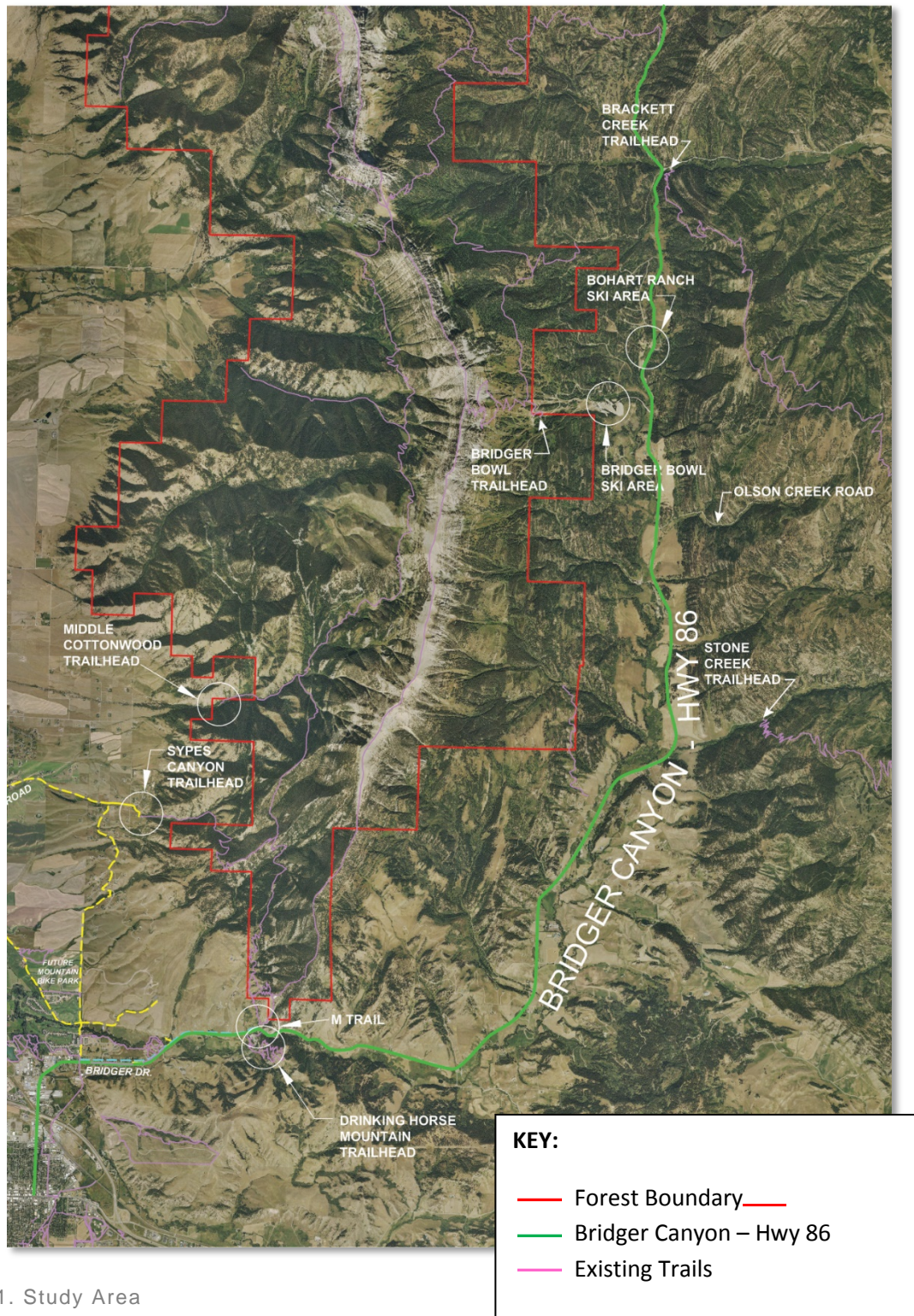


Figure 1. Study Area



Just east of the M and Drinking Horse Mountain trailheads is a narrow canyon opening where the highway becomes windy and narrow with guardrails as shown in Figure 2.



Figure 2. Highway 86 just east of the 'M' trailhead looking west

The paved width of Hwy 86 varies but is generally 27 to 32 feet wide. Some sections of the highway lack shoulders completely and other sections contain narrow paved shoulders that a bicyclist or pedestrian could use with varying degrees of comfort. In many locations there is an unpaved section of the shoulder currently used by pedestrians. The majority of the highway is posted at 60 mph with several advisory speed reductions at sharp curves. Due to the high speeds along the corridor narrow urban travel lane widths are not appropriate. 11 feet (with 12 feet desired) should be considered the minimum potential lane width associated with any of the included tools.

Bridger Canyon is popular with recreational bicyclists, some using the highway as the recreational ride in and of itself, and some using the highway as access to numerous adjacent trails. Bridger Canyon Road (Hwy 86) can be used by road bicyclists as an out and back route, or combined into loops with Kelly Canyon Road, Jackson Creek Road, Bracket Creek Road, or other routes including Flathead Pass or US 89. These roads, along with the following popular trailheads, are shown on Figure 1.

Popular trailheads for mountain bikers include:

- Stone Creek (access to Bangtail Divide Trail)
- Olson Creek (access to Bangtail Divide Trail)
- Bracket Creek (access to Bangtail Divide Trail)
- Bridger Bowl
- Bohart Ranch (summer mountain biking trails)
- Fairy Lake

Bicyclists can be observed frequently by themselves, riding in small groups, or, on occasion, in large groups. The Gallatin Valley Bicycle Club and other local teams utilize the canyon as part of a rotation of group rides. The canyon is also occasionally utilized as part of a road race.



Figure 3. Bicyclists compete in the 2011 Tour de Bozeman (as seen on: <https://gonebouldering.wordpress.com/2011/07/13/tour-de-bozeman-2011/>)



### Description of Tools

This document represents a toolkit of strategies that could improve the bicycling experience in Bridger Canyon and make the highway a safer and more comfortable place for those in cars, on foot or on bikes to coexist.

## Tool # 1: Increased Signage

**Potential Partners:** Gallatin County, MDT, USFS, Gallatin Valley Bike Club

**Target Area:** Overall Corridor

**Cost:** Low (\$800 +/- per sign)

### Summary

If the message and intent of the sign is clear, roadway signage can be effective in helping to educate motorists and establish the legitimacy of bicyclists using the roadway. Counties across the nation have been using 'Share the Road' signage, as illustrated in Figure 4, for years with mixed results. This sign combination is widely recognized as ambiguous and many agencies have ceased installation due to confusion by motorists that bicyclists must 'share the road' by getting out of their way. The W11-1 bicycle warning sign, also shown in Figure 4, has been the

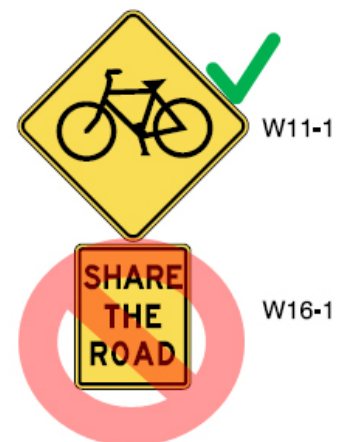


Figure 4. A W11-1 sign is recommended and a W16-1 sign is not recommended on Hwy 86.

preferred sign as a warning that bicyclists are in the roadway. While this sign is allowed for use by the Manual of Uniform Traffic Control Devices (MUTCD), many agencies recommend supplemental messaging to accompany W11-1.

Some agencies have experimented using the R4-11 “Bicycles May Use Full Lane” sign, as shown in Figure 5, on rural highways with typically poor results. The sign is generally considered to be incompatible with higher speed operations and is more suited to lower speed roadways (i.e. local or downtown streets). The R4-11 is not recommended for use in Bridger Canyon.

Other states, including Delaware, have experimented with modifying or supplementing the W11-1 bicycle warning sign, as shown in Figure 6, with a message that conveys that motorists should expect to encounter bicyclists on the roadway, rather than taking the full lane. Bicycle advocates have generally been pleased with this approach.

Should Gallatin County or MDT install bicycle W11-1 warning signs, they should be placed at frequent intervals, ideally every 1-2 miles in both directions in Bridger Canyon. Fewer signs can be accommodated by placing signs immediately upstream and downstream of intersecting roads such as Story Mill Rd., Jackson Creek Rd., etc... Modified W11-1 or custom supplemental ‘ON ROADWAY’ messages, such as that shown in Figure 6, would make the intended message clearer to motorists who could potentially confuse the signs for crossing warnings.

In 2015, during the Montana State legislature, HB-394, which would have created a 4-foot safe passing law as a minimum distance when passing a bicyclist, was not passed. 26 other states have similar laws, with most requiring a minimum of 3-feet separation. If Montana is successful at passing such a law, additional signage, similar to that shown in Figures 7 and 8, could be installed to remind motorists of this law.



R4-11  
Figure 5. The R4-11 sign is not recommended on Hwy 86 due to high vehicular speeds.



Figure 6. A W11-1 sign with text can be used to avoid confusion with bicycle crossing signs.



Figure 7. Minimum separation sign in Harvey County, Kansas



Figure 8. Minimum separation sign in Napa County, CA



## References

ITE Bicycle and Pedestrian Council Newsletter (2014), *Why “Share the Road” is Gone in Delaware*, (Retrieved from: <http://www.bikede.org/2014/04/07/why-share-the-road-is-gone/>)

Pein, W. (2006), *The Share the Road Sign* (Retrieved from: [http://www.humantransport.org/bicycledriving/library/Share\\_Road.pdf](http://www.humantransport.org/bicycledriving/library/Share_Road.pdf))

## Tool #2: Flashing Beacon

**Potential Partners:** Gallatin County, MDT

**Target Area:** Narrow canyon area east of ‘M’ Trailhead

**Cost:** Low (\$5,000 +/- per sign)

### Summary

The narrowest part of Bridger Canyon occurs just east of the ‘M’ trailhead and presents a significant comfort challenge to bicyclists as they enter or exit the canyon. Other agencies have installed flashing beacons to indicate the presence of bicyclists in a constrained section of roadway such as tunnels, over narrow bridges or in canyons.

Signs can be push-button actuated, as shown in Figure 9, or rely on passive detection through the use of loops (requires a shoulder or bike lane) or through microwave detection that can distinguish bicycle from car. While the push-button may be the simplest solution, the speeds that bicyclists will be entering the canyon from the east may make this solution difficult and dangerous to use as most bicyclists will be travelling fast and using the center of the travel lane. This treatment may be most beneficial in the uphill direction where bicyclists are travelling more slowly and could be expected to push the button.



Figure 9. “Bikes on Road When Flashing” sign

## References

Oregon Department of Transportation (2001), *Active Bicycle Warning Signs*, (Retrieved from: [http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/docs/pdf/active\\_warning.pdf/](http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/docs/pdf/active_warning.pdf/))



## Tool #2: Uphill Bike Lane

**Potential Partners:** MDT, Gallatin County, Gallatin Valley Bicycle Club

**Target Area:** Wherever feasible

**Cost:** Moderate

### Summary

Ideally there would be dedicated bike lanes on both sides. But the reality is that such improvements require shoulder widening (see tool #3) can be costly and, in some cases, not feasible due to constricted roadway sections. A more cost-effective alternative, if adequate pavement width is to locate bike lanes on the uphill section of roadway only where the benefit is greater. Why? One reason is that the speed differential between passing vehicles and bicyclists is a significant factor in overall comfort it is obviously slower going uphill. Cyclists travelling uphill typically ride at between 7 and 15mph and have a much higher speed differential with overtaking traffic than downhill travelling bicyclists who may be travelling 20 to 40 mph. An uphill bike lane, as shown in Figure 10, or wider shoulder could potentially be created during routine resurfacing or restriping operations.



Figure 10. Uphill bike lane in France

The cross-section of Hwy 86 varies, however it typically affords 28-32 feet. If vehicle travel lanes were kept at 12 feet there would be potentially 4-8 feet of additional pavement to designate as an uphill bikelane or shoulder. Additional study is required to determine feasibility. Many urban cities have uphill bike lanes designated on steep gradients where there is only physical roadspace to designate a bike lane in one direction. Other countries have utilized this treatment frequently on popular recreational routes on mountain roadways such as the photo from France shown in Figure 10.

### References

Oregon Department of Transportation (2001), *Active Bicycle Warning Signs*, (Retrieved from: [http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/docs/pdf/active\\_warning.pdf/](http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/docs/pdf/active_warning.pdf/))

## Tool #3: Shoulder Widening

**Potential Partners:** Gallatin County, MDT, USFS

**Target Area:** Wherever feasible

**Cost:** High

### Summary

Shoulders have a variety of benefits to a number of different user types. Adding shoulders to an existing roadway is typically standard practice when upgrading or redesigning rural roads and highways. Shoulders provide a variety of benefits, both for non-motorized users and for vehicles. The reasons to

add them for vehicles alone are typically enough to justify adding shoulders to upcoming projects. According to FHWA:

*Paved shoulders provide numerous safety benefits for motorists and pedestrians. Installing or widening paved shoulders has the following benefits:*

- *Provides a stable surface off of the roadway for pedestrians to use when sidewalks cannot be provided.*
- *Reduces numerous crash types including the following:*
  - *Head on crashes (15%–75% reported reduction)*
  - *Sideswipe crashes (15%–41%)*
  - *Fixed object crashes (29%–49%)*
  - *Pedestrian (walking along roadway) crashes (71%)*
- *Improves roadway drainage*
- *Increases effective turning radii at intersections*
- *Reduces shoulder maintenance requirements*
- *Provides emergency stopping space for broken-down vehicles*
- *Provides space for maintenance operations and snow storage*
- *Provides space for variable message signs*
- *Provides an increased level of comfort for bicyclists*

Shoulders provide bicyclists a space to travel outside of the vehicle travel lanes. AASHTO recommends 4 feet as the minimum rideable shoulder. Shoulders are beneficial in both uphill and downhill directions, however the uphill direction has greater utility due to the larger speed differential between bicyclists and motor vehicles, as noted previously. Shoulder widening should be considered during any structural repairs or roadway projects scheduled for Hwy 86. Additionally, it may be desirable to create a new capital project specifically to improve the safety characteristics of the highway.

The Bridger Canyon Corridor Planning Study recommends “horizontal and vertical curve improvements with shoulder widening” at numerous locations throughout the subject corridor at an average reconstruction cost of \$360,000 to \$390,000 per 0.1 miles. The potential implementation timeframe is listed as 3 – 20 years.

Such shoulder widening is shown along Highway 287 in Grand Teton National Park in Figure 11. Once the shoulders were striped, bicyclists and motorists benefited significantly from this project, one whose purpose was not necessarily meant to improve conditions for those riding bicycles. Such widening and striping significantly improves the ability for cars and bikes to safely and comfortably share the road.



Figure 11. Shoulder widening on Highway 287 in Grand Teton National Park (2012)

## References

FHWA (2010), *Safety Benefits of Walkways, Sidewalks, and Paved Shoulders* (Retrieved from: [http://safety.fhwa.dot.gov/ped\\_bike/tools\\_solve/walkways\\_trifold/](http://safety.fhwa.dot.gov/ped_bike/tools_solve/walkways_trifold/))

Lindley, J., 2008, *Guidance Memorandum on Consideration and Implementation of Proven Safety Countermeasures* FHWA, Washington D.C.

Florida Department of Transportation, 2005, *Update of Florida Crash Reduction Factors and Countermeasures to improve the Development of District Safety Improvement Projects*.

## Tool #4: Rumble Strip Placement

**Potential Partners:** MDT, Gallatin County, USFS, Gallatin Valley Bicycle Club

**Target Area:** Corridor-wide

**Cost:** None

### Summary

Rumble stripes have measurable safety benefits for vehicles by providing a tactile and audible warning that they are leaving the traveled way. For the last decade, states and counties have been installing rumble strips on a variety of highway and rural roadways. Unfortunately the implementation of these strips can ignore how the changes will impact other modes of travel. For example, rumble strips can be uncomfortable for bicyclists to ride over and cause loss of control of the bicycle, a serious safety issue.

AASHTO's Guide for the Development of Bicycle Facilities states:

*Rumble strips are not recommended on shoulders used by bicyclists unless there is a minimum clear path of 4 ft (1.2 m) from the rumble strip to the outside edge of a paved shoulder, or 5 ft (1.5 m) to the adjacent curb, guardrail, or other obstacle. If existing conditions preclude achieving the minimum desirable clearance, the length of the rumble strip may be decreased or other*

*alternative solutions considered. Placing a rumble strip under the edge line is one way to reduce its impact on the adjacent shoulder, while providing the additional advantage of increasing the visibility of the edge line at night.*

FHWA supports this guidance by referencing it and states:

*It is preferred to allow at least four feet beyond the rumble strips to the edge of the paved shoulder. Designers should be familiar with the FHWA design guidance found at <http://www.fhwa.dot.gov/environment/bikeped/design.htm>, which recommends states not install rumbles on new construction and reconstruction projects where shoulders are used by bicyclists unless this condition is met. Where guardrail, curb, or other continuous obstructions exist, additional width may be needed to provide adequate clearance for bicyclists."*

If a rumble strip is used on a highway it is recommended that a skip (or gap) in the rumble strip be provided to allow bicyclists to cross from the shoulder to the travel lane when encountering debris. The skip width is recommended to be 12 feet in length with intervals of 40-60 feet between skips.



An example of a poorly placed rumble strip is shown in Figure 12 where the rumble strip renders even the small available shoulder useless to bicyclists forcing them to ride in the travel lane with high speed traffic.

Figure 12. Poorly placed rumble strip (courtesy of Iowa DOT)



The rumble strip shown in Figure 13 represents best practices by providing gaps in the rumble strip and a 4-foot minimum rideable shoulder on US 89 just south of Clyde Park, MT.

Figure 13. Best practices for use of rumble strip

Rumble strip placement and design by MDT has been a key focus over the past two years for Bike Walk Montana, a statewide non-profit dedicated to making biking and walking safe and accessible for all. Bike Walk Montana was pleased to announce that on July 8, 2015 MDT issued updated policy and design guidance on rumble strips. In this guidance, any rumble strips to be placed on roadways with shoulders

greater than or equal to 4 feet should maximize the usable portion of the shoulder for bicyclists. For narrower shoulders, ranging from 1 and 4 feet in width, rumble strip placement is to be determined by a committee. A drawing of the proposed placement must be included in the design submitted to the committee. This policy change allows MDT to examine each location on a case by case basis; however, it still allows for ultimate rumble strip installation that is inconsistent with best practices for accommodating bicycles.

An alternative placement worth mentioning is that of placing rumble strips along road centerlines, such as is the practice of Idaho Department of Transportation. Centerline rumble strips are worth evaluating as a good tool in general and specifically to be considered where there may not be sufficient shoulder width to accommodate both an edge rumble strip and a traveled way for a bike (available shoulder less than 4'). MDT is currently evaluating the use of such rumble strips.

## References

Satterfield, Cathy (2011). *Bicyclists and Things that Go Bump on the Road*, FHWA (Retrieved from: [http://safety.fhwa.dot.gov/roadway\\_dept/pavement/rumble\\_strips/concerns\\_bike.cfm](http://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/concerns_bike.cfm) )

Bachman, Dave (2001), *Rumble Strips – Finding a Design for Bicycles and Motor Vehicles*, TRB (Retrieved from: <http://onlinepubs.trb.org/onlinepubs/trnews/rpo/rpo.trn215.pdf> )

AASHTO (2012), *Guide for the Development of Bicycle Facilities*

FHWA Technical Advisory T 5040.31, (2011), *Shoulder and Edge Line Rumble Strips* (Retrieved from: [http://safety.fhwa.dot.gov/roadway\\_dept/pavement/rumble\\_strips/t504039/t504039.pdf](http://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/t504039/t504039.pdf) )

Montana Department of Transportation, Kailey (2015), *Rumble Strip Guidance* (Retrieved from: [http://www.mdt.mt.gov/other/roaddesign/external/design\\_memos/2015-07-08\\_RUMBLE\\_STRIP-4.pdf](http://www.mdt.mt.gov/other/roaddesign/external/design_memos/2015-07-08_RUMBLE_STRIP-4.pdf))

Daniel E. Karkle , Margaret J. Rys, and Eugene R. Russell (2011), *State-of-the-Art: Centerline Rumble Strips Usage in the United States*

## Tool # 5: Educational Campaigns

**Potential Partners:** City of Bozeman, Gallatin County, USFS, Gallatin Valley Bicycle Club, MDT

**Target Area:** Corridor-wide

**Cost:** Low

### Summary

Many motorists, bicyclists and pedestrians do not know the rules of the road, where to walk or ride or how to safely pass. A marketing campaign that highlights these elements, as well as safety and other support programs (existing and recommended in this plan), is an important



Figure 14. Bike Pittsburgh's SAFE media campaign



part of creating awareness of bicycling and walking in the Bozeman area. A high-profile campaign is an effective way to reach the general public, highlight bicycling and walking as viable and normal forms of transportation, and reinforce safety for all road users. Campaigns are particularly effective when kicked off in conjunction with other bicycling/walking events, back to school in the fall, major community events, baseball games, or other related initiatives.



Campaigns are typically media driven and can be contained within radio, TV, print media, or outdoor advertising. Sample graphics are shown in Figures 14 and 15.

Figure 15. Utah DOT's "Road Respect" campaign

## References

- UDOT, (2014) *Road Respect Campaign* (Retrieved from: <http://roadrespect.utah.gov/> )
- BikeWalk Mississippi, (2014) *I share the Road Campaign* (Retrieved from: <http://www.bikewalkmississippi.org/BWMS/isharetheroad/> )
- Bike PGH, (2014) *Someone you care about rides a bike campaign* (Retrieved from: <https://bikepgh.org/care/> )



## Tool # 6: Advisory Bike Lanes

**Potential Partners:** Gallatin County, MDT

**Target Area:** Select roadways within the Study Area

**Cost:** Low

### Summary

While still classified as an ‘experimental’ treatment by FHWA, Advisory Bike Lanes could be a tool that could be implemented on select roadways within the Bozeman area. These facilities provide bicycle lanes on roads that would otherwise be too narrow for them without the need for shoulder widening. This is accomplished by dashing the bike lanes to make them encroachable by vehicles if needed. This results in a single bi-directional travel lane where motorists cannot pass each other in both directions without crossing into the advisory bike lane. Motorists may enter the bicycle lane only when no bicyclists are present. Motorists must overtake with caution due to potential oncoming traffic. Advisory bike lanes create designated space for bicyclists in what would otherwise be a shared roadway condition.

According to FHWA, this treatment may be appropriate on roadways where many or all of the following conditions are present:

- Traffic volume is less than 6,000 ADT.
- Minimum lateral width of 16 feet of the center space between dashed bicycle lanes.
- The roadway is not a designated truck or bus route, nor would the street be expected to facilitate these vehicle types to and from other facilities.

Advisory bike lanes have been implemented in both urban and rural contexts, and with and without on-street parking. On higher speed roadways it has been observed that most installations have few sight obstructions due to landscaping or horizontal/vertical roadway curvature. It is unclear if this treatment would be suitable for roadways in the Bozeman Area; additional study should be conducted as more experience is developed within the United States.

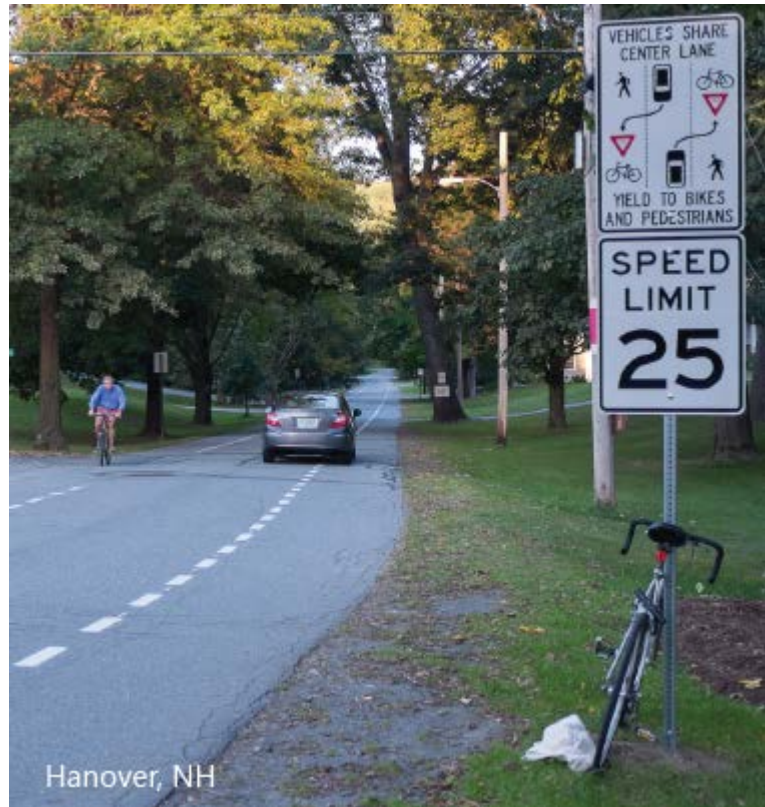


Figure 16. Rural context advisory bike lane in Hanover, NH

There are approximately 10 locations in the United States that are experimenting with this treatment.

#### **References**

UDOT, (2014) *Dashed Bike Lanes* (Retrieved from:  
[https://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/guidance/mutcd/dashed\\_bike\\_lanes.cfm](https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/mutcd/dashed_bike_lanes.cfm))

Bertulis, (2014) *Advisory Bike Lanes Examples* (Retrieved from:  
[http://c.ymcdn.com/sites/www.apbp.org/resource/resmgr/files/adv\\_bike\\_lanes\\_bertulis.pdf](http://c.ymcdn.com/sites/www.apbp.org/resource/resmgr/files/adv_bike_lanes_bertulis.pdf) )

SWOV (Netherlands), (2013) *New Type of Layout for 60 km/h Rural Roads*. (Retrieved from:  
[http://www.swov.nl/rapport/Factsheets/UK/FS\\_Driving\\_strips.pdf](http://www.swov.nl/rapport/Factsheets/UK/FS_Driving_strips.pdf) )

# Appendix 2-1

## Right -of-Way Analysis

# Memo

**To:** Jonathan Kempff  
**Cc:** Lisa Stoeffler, Chris Anderson  
**From:** Kyle Gauthier  
**Date:** 7/1/15  
**Re:** BAATS - Analysis of Existing Right-of-Way and Expected Land Acquisitions

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## INTRODUCTION

As part of Task 1, DJ&A explored multiple trail corridors from Main Street to the Gallatin Front and Bridger Range. These corridors consist of five (5) trail corridors to the south of Bozeman and three (3) trail corridors to the north of Bozeman. A corridor is defined as a belt of land through which a trail could be placed. Seven of the eight corridors lie along existing roadways and the eighth corridor lies across private land along a creek. This memorandum outlines the findings from analyzing the existing right-of-way (ROW) for each of these subject corridors. These corridors are shown in Figure 1.

This analysis is used as part of a comprehensive feasibility study for each of the subject corridors. The final evaluation of these corridors is based on five evaluation criteria, including availability of right-of-way, as listed below:

- Right-of-way impacts;
- Environmental impacts;
- Comfort and safety;
- Connectivity; and
- Consistency with previous studies and plans.

This analysis did not include a ROW survey for any of the subject corridors. Such a survey would be required before proceeding with trail design for a particular corridor. However, such a survey was outside the scope of this study.



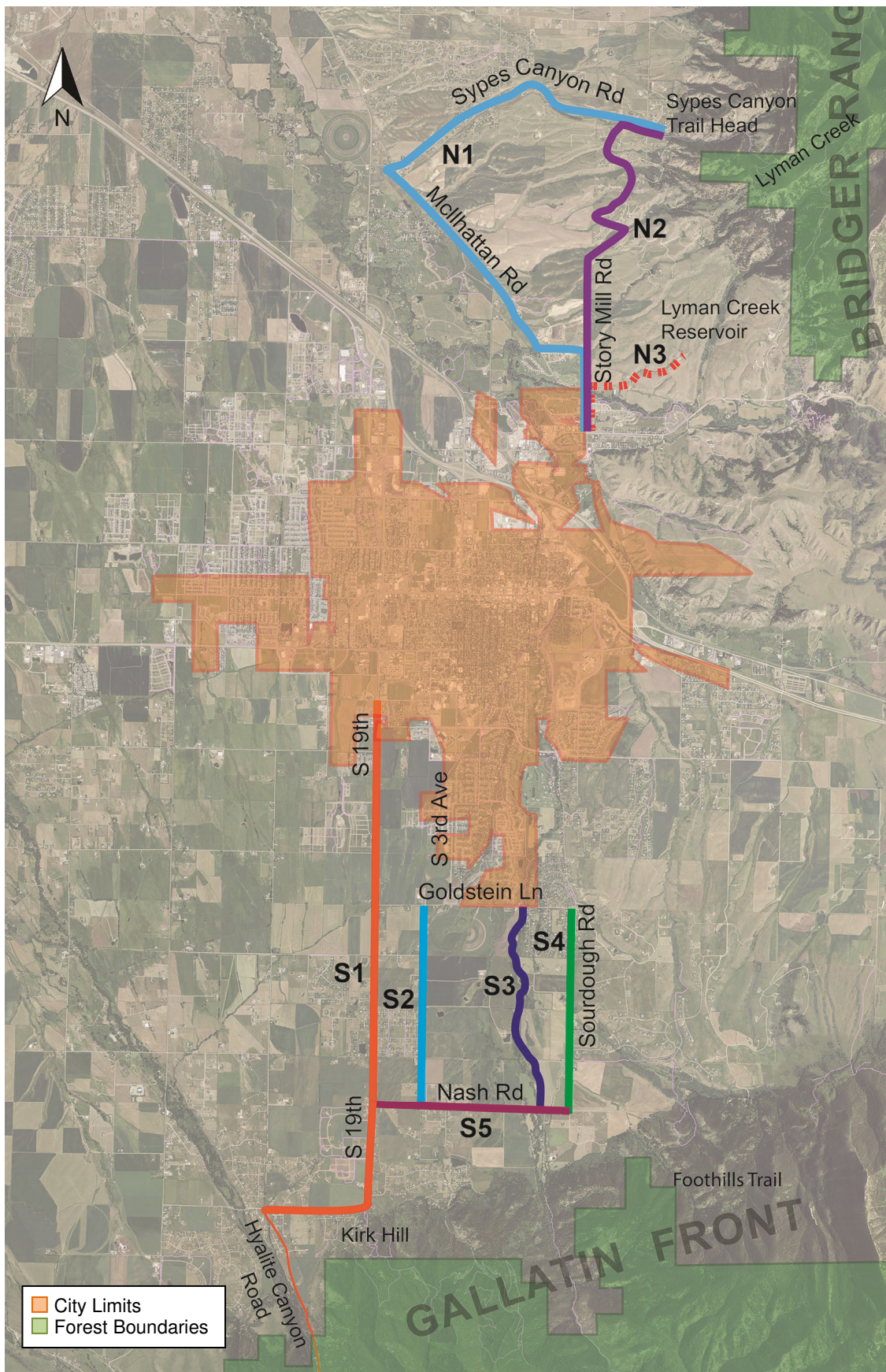


Figure 1. Area map of nine shared use path corridors addressed in study



## METHODOLOGY

For each corridor we have analyzed the following categories:

1. **DESCRIPTION OF CORRIDOR** - This category provides a description of the physical limits of the corridor along with a description of adjacent parcels.
2. **EXISTING RIGHT-OF-WAY CONDITIONS** - This category describes any existing public ROW along the corridor including documented widths as well as those factors, such as topography, existing utilities, and road crossings that would influence where a trail alignment would go within a given corridor (i.e. which side of the roadway).

To determine existing ROW dimensions, archived ROW plans from the Montana Department of Transportation (MDT) were researched for the trail corridors adjacent to state routes. In addition, road petitions and road maps were obtained from Gallatin County. To supplement this county and state data, parcel line data from the Gallatin County GIS database and individual Certificate of Survey documents were investigated for documented road and trail easements.

3. **ASSUMED LOCATION OF TRAIL WITHIN CORRIDOR** - This category presents an assumption regarding the location of a trail within a given corridor. This assumption is based on several factors that include availability of ROW; locations of existing utilities, irrigation and drainage ditches; numbers and types of roadway/driveway crossings; and connectivity to other non-motorized facilities and recreational destinations. This assumption is needed to inform the analysis of additional ROW requirements. However, it is expected that this assumption will be further evaluated during the design phase for any of these trails.
4. **ADDITIONAL RIGHT-OF-WAY REQUIREMENTS** - This category provides a high-level assessment of the amount and types (residential, agricultural, commercial, etc...) of lands outside of the public ROW that would be needed for the construction of a multi-use path<sup>1</sup> along the assumed trail location. If ROW acquisition from a particular parcel were deemed necessary, the amount (square feet) required is estimated. In addition, the required land acquisition associated with each corridor was characterized by number of parcels, total area, and type of land to be acquired (residential, commercial, or agricultural).

The three trail corridors to the north of town, as shown in Figure 2, are presented first and are followed by the five corridors that connect to the south.

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<sup>1</sup> Unless noted otherwise, these multi-use paths are assumed to be Class IB trails as designated by the City of Bozeman and listed on page 6-3 of the Bozeman Parks, Recreation, Open Space and Trails (PROST) Plan (dated December 17, 2007). Class IB trails are characterized by 10'-wide hard paved surfaces. Asphalt paving is assumed for this study. Such trails with shoulders and varying constructed slopes are assumed in determining the anticipated impact area and therefore how much ROW area may be needed. Such shared-use paths are also recommended for mixed-use paths (including pedestrian and bicycle traffic traveling in both directions on the trail) according to the AASHTO *Guide for the Development of Bicycle Facilities*. This guide was referenced on page 9-32 of the Greater Bozeman Area Transportation Plan (2007 Update).

It is worth noting assumptions that differ from those included in the Bozeman Parks, Recreation, Open Space and Trails (PROST) Plan (dated December 17, 2007); there are differences regarding 1) surface type; 2) direction; and 3) design. Regarding 1) surface type, page 8-14 notes a lack of consensus regarding whether the surface of shared use paths should be asphalt or concrete. Asphalt is assumed for the purposes of this study primarily because of initial costs. Actual surface should be further evaluated during design. Regarding 2) direction, page 8-15 clarifies that, "safety concerns dictate that shared use paths should be installed on both sides of the street wherever possible" in contrast to the assumption in this study that initially there will be a path on just one side of the street; constructing a shared use path on one side of the street does not prohibit the subsequent construction of a shared use path on the opposite side of the street at a later date. Finally, regarding 3) design, the PROST Plan, on page 8-15, identifies "meanders" as "desirable" and notes that such meanders may necessitate additional acquisition from adjacent land owners. However, for the purposes of this study, paths are not assumed to meander unless such meanders can be accommodated without additional ROW acquisition.



# NORTHERN CORRIDORS

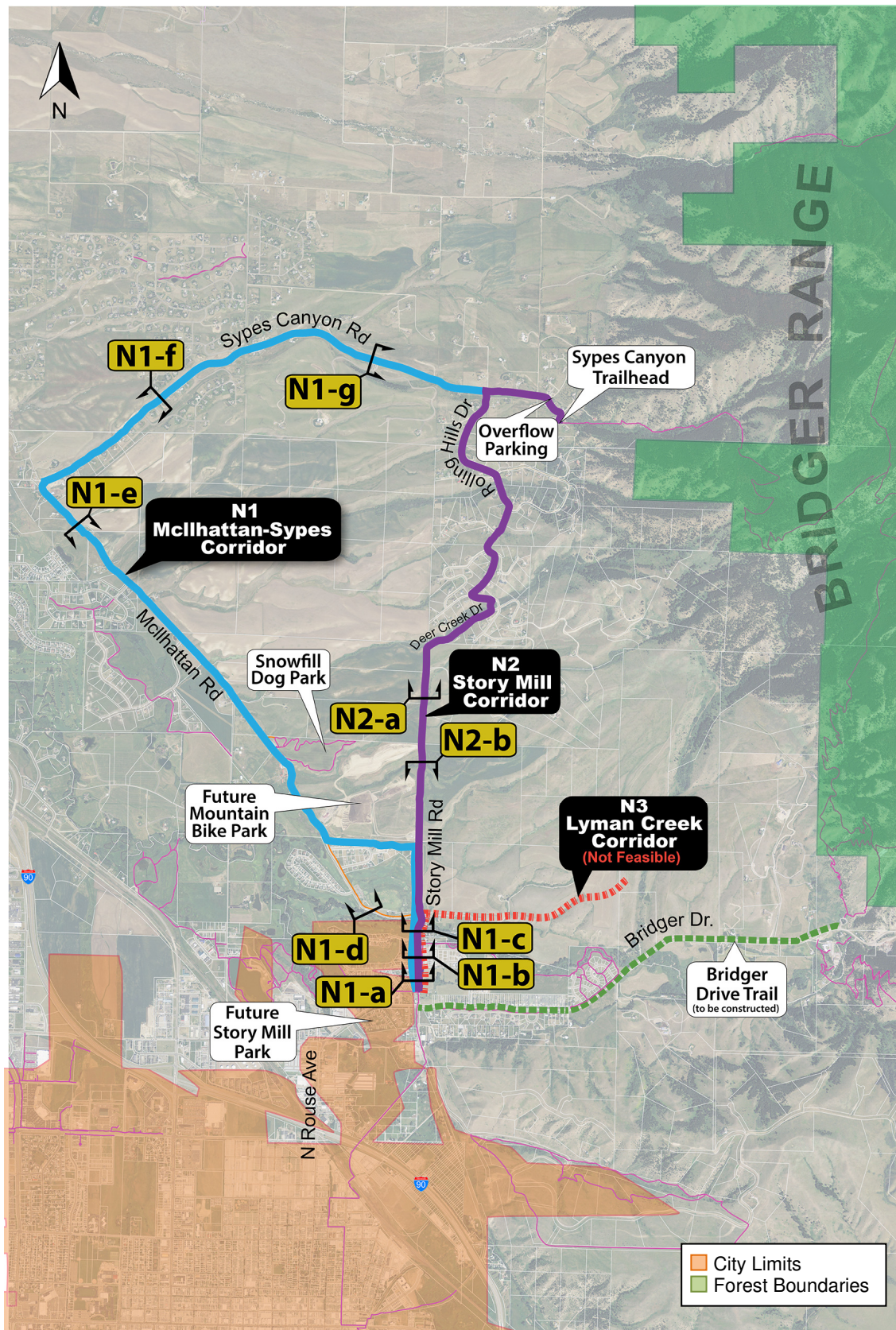


Figure 2. Area map of shared use path corridors accessing Bridger Range

Civil Engineering - Municipal - Environmental - Structures - Irrigation - Transportation - Planning  
Bridges - Surveying and Mapping - GIS - Construction - Control Subdivisions - Feasibility Studies

## MCLlhATTAN ROAD – SYPES CANYON ROAD CORRIDOR (N1)

### 1. DESCRIPTION OF CORRIDOR

This corridor runs from the intersection of Story Mill Road and Bridger Drive to the Sypes Canyon trail head via the following route: north along Story Mill Road (county road) for approximately 0.8 miles; west for approximately 0.5 miles along an existing trail corridor owned by the City of Bozeman that runs along the north boundary of the Bridger Creek Golf Course; northwest for approximately 2.3 miles along McIlhattan Road (county road); and northeast for approximately 3.1 miles along Sypes Canyon Road (county road) to the trailhead. Neighbors along the corridor include golf courses, commercial uses, some farming and/or open space parcels and existing subdivisions with larger lots. Approximately 43% of the corridor is adjacent to residential parcels.

### 2. EXISTING RIGHT-OF-WAY CONDITIONS

**Lower Portion of Story Mill Road:** This portion of the N1 corridor has an existing total ROW width of 60', 30' wide on each side of the road centerline, as determined by investigating multiple filed subdivision plats. For example, this width was found in the Bridger Creek Subdivision Plat and The Legends at Bridger Creek Subdivision Plat. Survey monuments have been set along Story Mill Road in many of these more developed areas.

Story Mill Road crosses Bridger Creek near the Bridger Creek Golf Course. The crossing is via an existing MDT maintained bridge. Based on a phone conversation with Ken Barnes of MDT, the existing bridge is a pre-stressed concrete structure that was constructed in 1978. The bridge is in good structural condition and would likely accommodate the additional infrastructure needed for a pedestrian/bicycle crossing.

**Existing Trail:** The existing gravel trail that runs east-west between Story Mill Road and McIlhattan Road runs along the corridor that is owned by the City and is a minimum of 30'-wide. This corridor was dedicated in 2000 as part of the creation of Bridger Creek Subdivision. As per the final plat of Bridger Creek Subdivision Phase 3, the subject corridor was designated as "park" and donated to the City of Bozeman for "public use and enjoyment." The intended purpose of this corridor is for a multi-use trail. Conversations with GVLt confirm that the conversion of the existing trail to a 10'-wide paved trail would be consistent with the intended use of that corridor. City approval for such a use would be required.

**McIlhattan Road:** Similar to Story Mill Road, McIlhattan Road has an existing total ROW width of 60', including 30' on each side of the road centerline, as determined by investigating multiple filed subdivision plats and Certificates of Surveys. For example, this width is shown in COS 1186 and the Manley Meadows Subdivision Plat.

The lower stretch of McIlhattan Road was also analyzed as a possible routing of this corridor; however, there was insufficient ROW. As shown in Figures 3 and 4, the roadway is located between Bridger Creek to the south and a steep cut slope to the north, leaving a less-than-desirable separation between the roadway and trail. The location of the residential parcel near the top of the cut slope would necessitate ROW acquisition and/or significant retaining walls. However, along the stream side of the road there is an approximately 900-foot stretch with guardrail adjacent to Bridger Creek due to the steep stream bank. Such conditions would likely require costly retaining walls if construction within existing ROW were even possible. It is assumed therefore that this corridor would be routed along the existing trail mentioned previously.



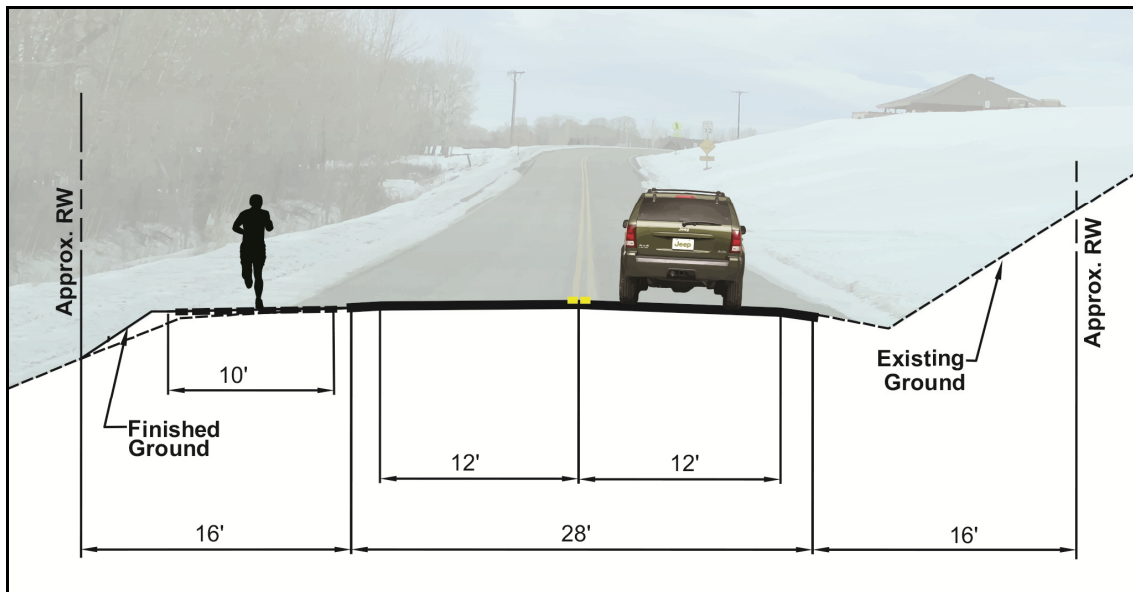


Figure 3. Lower section of McIlhatten Road looking west (typical section N1-d) showing Bridger Creek Golf Course club house on the right and creek on the left



Figure 4. Aerial view showing lower section of McIlhatten Road

**Sypes Canyon Road:** The ROW width for this roadway is typically 60' with some sections as wide as 80' as detailed here. As per Road Petition No 25, Sypes Canyon Road has an existing ROW width of 60'. This existing ROW width was confirmed to be 60' as identified in the Sypes Canyon Subdivision Plat and the Amended Minor Subdivision 121A. However, in select locations the existing ROW is wider. For example, the Amended Minor Subdivision 121A shows a ROW width that increases to 80' total width along Lots 1 thru 5. In addition, the Sypes Canyon Subdivision plat shows a parking area easement and park access at the end of Churn Road. The N2 corridor would terminate at Churn Road allowing access to the Sypes Canyon Trail network.

### 3. ASSUMED LOCATION OF TRAIL WITHIN CORRIDOR

**Story Mill Road:** The trail is assumed to run along the east side of Story Mill Road largely due to the location of the existing separated path on that side of the road. As shown in Figures 5, 6, and 7, a trail can be constructed along the east side of Story Mill Road within existing ROW; however, an 8'-width may be required to achieve sufficient separation.

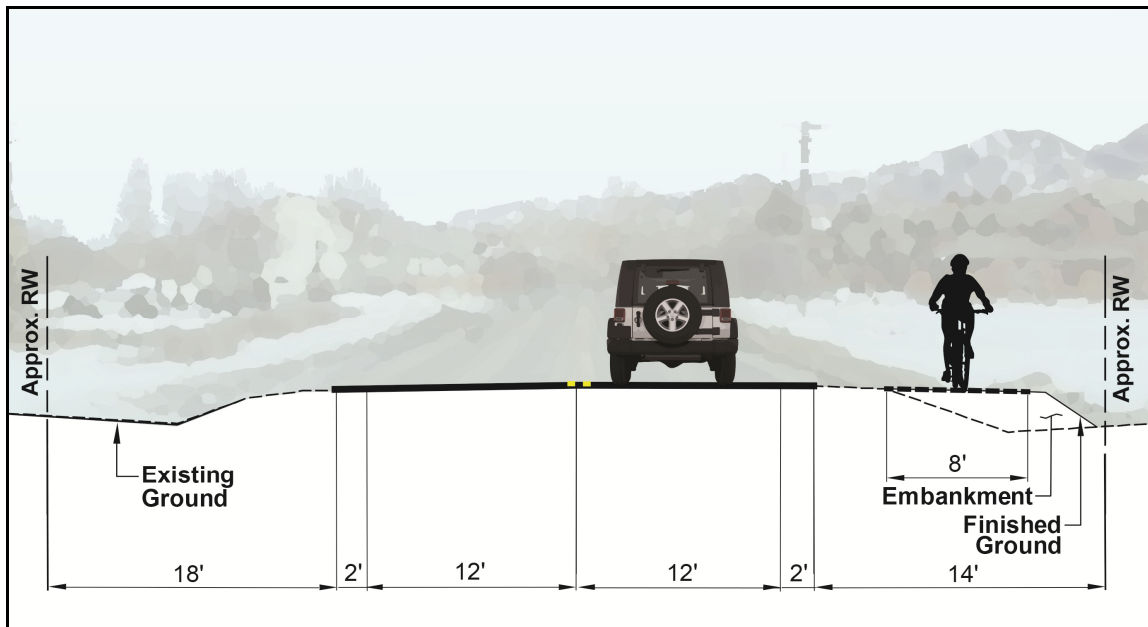


Figure 5. Story Mill Road looking north (typical section N1-a)

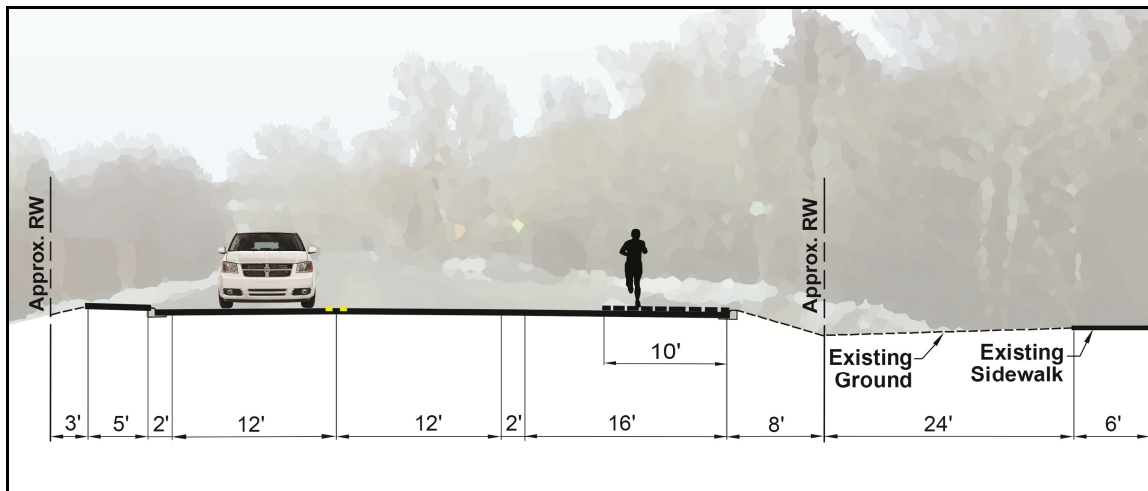


Figure 6. Story Mill Road looking north (typical section N1-b)

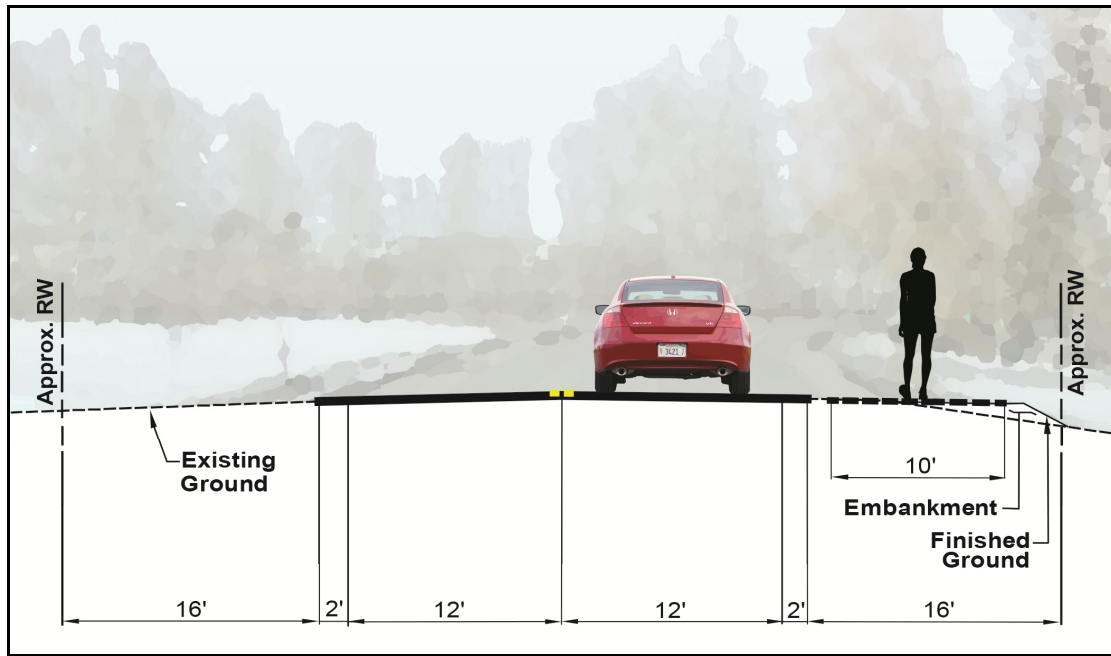


Figure 7. Story Mill Road looking north (typical section N1-c)

**McIlhattan Road:** The trail is assumed to be on the east side of McIlhattan Road to match up with the Hedvig's Trail system and the existing trail in the Bridger Creek Subdivision. There are conflicts with existing utilities, which are currently primarily located on the east side.



Figure 8. McIlhattan Road looking southeast (section N1-e). Primary utilities on the east side.

**Sypes Canyon Road:** The trail may need to alternate sides of Sypes Canyon Road pending further detailed study. There are two primary factors that would influence the alignment of the trail; as depicted



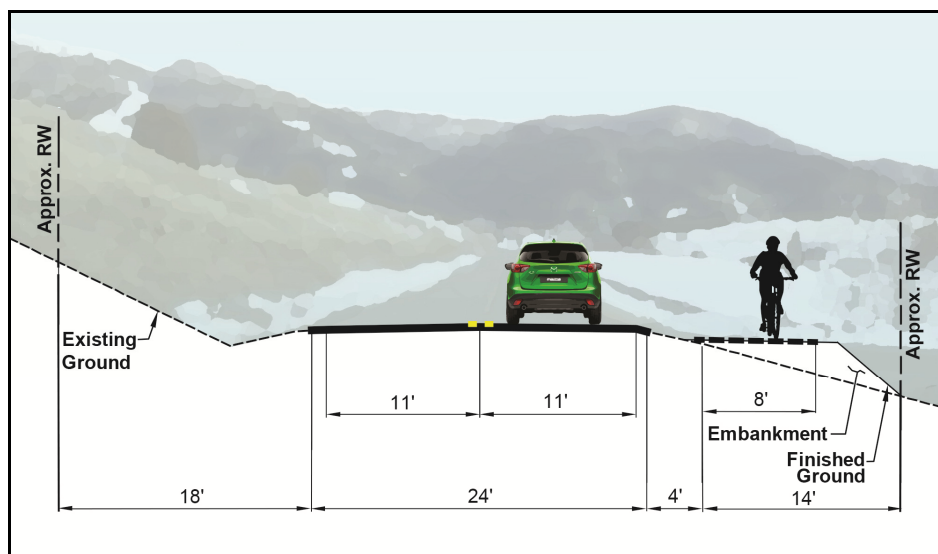
in Figure 9, there are steep cut slopes and narrow ditches in sections along the north side of the road that would make trail construction difficult within existing ROW; and 2) there are power lines that meander back and forth across the roadway at several locations. Utility relocation can be very expensive and therefore would point towards the trail being located on the opposite side from the power lines.

It is worth noting that the local access road that appears on the left side of Figure 9 and is adjacent to The Ranch Subdivision runs parallel to Sypes Canyon Road for approximately 0.6 miles; this access road, which is dedicated as a “30’ access and utility easement” on the plat, could serve as a low-volume route for a portion of this corridor. The subdivision plat indicates that all roadways are dedicated to the public use and so it appears that the access easement would be included in that description. Such use would need to be confirmed as part of a ROW survey.



*Figure 9. Sypes Canyon Road looking west (section N1-f) paralleling local access road*

Figure 10 presents a typical section showing the path on the south side of the road.



*Figure 10. Sypes Canyon Road looking east (typical section N1-g).*



#### 4. ADDITIONAL RIGHT-OF-WAY REQUIREMENTS

Given that the lower stretch of McIlhattan Road was avoided and ample ROW widths exist elsewhere, no additional ROW acquisition is anticipated for this corridor.

Other alternatives for this corridor, including shoulder-widening or advisory bike lanes, as documented in Task 9: Bicycle Safety on Rural Highways, should also be considered. A separated path, which requires more ROW, was assumed for this analysis because it requires the most ROW of these alternatives.

### STORY MILL ROAD - DEER CREEK DRIVE CORRIDOR (N2)

#### 1. DESCRIPTION OF CORRIDOR

The N2 trail corridor would run adjacent to four Gallatin County roadways: Story Mill Road; Deer Creek Drive; Rolling Hills Drive; and Sypes Canyon Road. This corridor would be adjacent to Story Mill Road for approximately 1.8 miles; adjacent to Deer Creek Drive for approximately 0.4 miles; adjacent to Rolling Hills Drive for approximately 1.4 miles; and finally run along Sypes Canyon Road for 0.5 miles. Adjacent properties along this corridor include a golf course, minimal commercial lands, some farming and/or open space parcels, and existing subdivisions with larger lots. Approximately 68% of the corridor is adjacent to residential parcels.

#### 2. EXISTING RIGHT-OF-WAY CONDITIONS

**Story Mills Road, Rolling Hills Drive, and Deer Creek Drive:** As documented previously for N1, the lower portions of Story Mill Road has a total ROW width of 60', 30' wide on each side of the road centerline. This width was confirmed for the upper portions of Story Mill Road as well by reviewing the Grandview Heights Subdivision Plat. Survey monuments have been set along Story Mill Road in many of these developed areas. This same plat also shows that the existing easements on Rolling Hills Drive and Deer Creek Drive have a total width of 60', 30' wide on each side of the road centerlines.

**Sypes Canyon Road:** Sypes Canyon Road, in the area of the subject corridor, has an existing ROW width of between 60' and 65' as determined from examining multiple subdivision plats filed with the Gallatin County Clerk and Recorder's Office; these plats include Sypes Canyon Subdivision, Minor Subdivision 115, and COS 1890.

#### 3. ASSUMED LOCATION OF TRAIL WITHIN CORRIDOR

The trail is assumed to run along the east side of Story Mill Road south of Bridger Creek largely due to the location of the existing separated path on that side of the road. The trail would then cross to the west side of the road to avoid the power poles that lie primarily along the east side of the corridor. An analysis of road crossings suggests that both sides of Story Mill Road are comparable and essentially a non-factor.

A typical section along this corridor is shown in Figure 11.

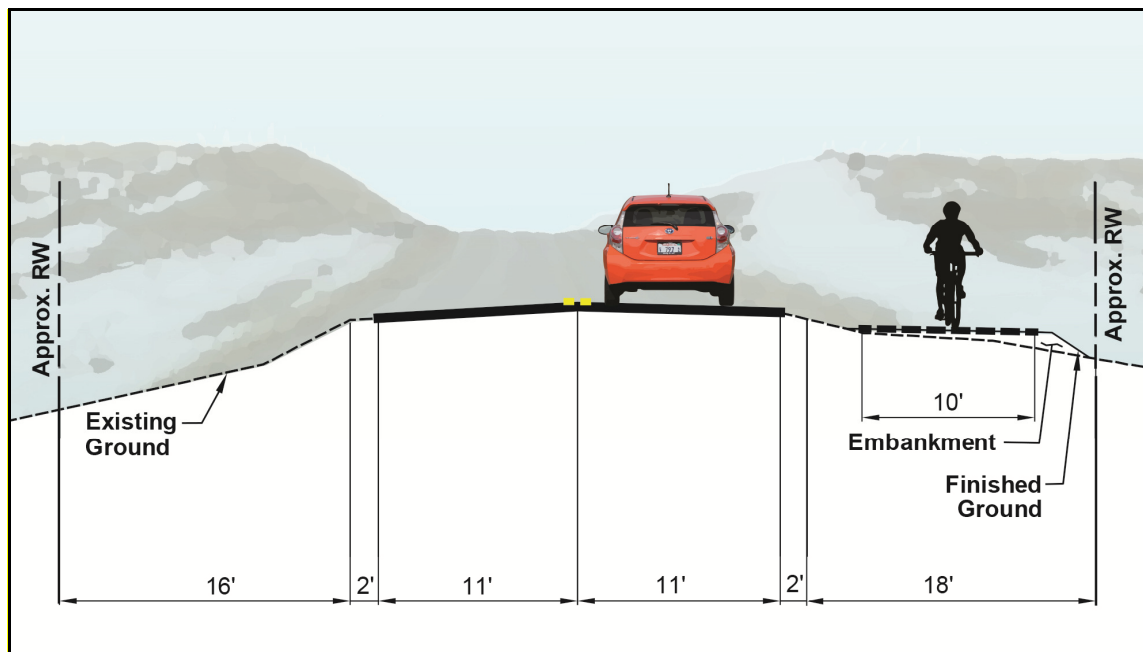


Figure 11. Story Mill Road looking north (typical section N2-a)

#### 4. ADDITIONAL RIGHT-OF-WAY REQUIREMENTS

The existing 60' wide minimum ROW along this corridor allows for approximately 96% of the proposed trail to be accommodated within the existing road ROW.

Assuming Bridger Creek Bridge on Story Mill Road can accommodate expansion for pedestrians and bicyclists as documented previously, no additional ROW will be required at this location. However, additional ROW is likely needed further north on Story Mill Road in the vicinity of the street view shown in Figure 12. In this vicinity, the topography constraints, such as steep cuts and fills and other smaller creek crossings, may warrant additional ROW. Some of these potentially challenging areas are within the Grandview Heights subdivision. The need for additional ROW could be minimized or eliminated with a combination of retaining walls, reduced separation of the trail from the roadway, and decreased trail width. However, the acquisition of additional ROW should definitely be considered to balance costs and comfort. While it is anticipated that the trail could be constructed within the 60' ROW width, full ROW impacts would need to be identified during the design phase once a complete existing ground survey is obtained. The grades are steep in some locations which would eliminate ADA compliance for the trail.

Other alternatives for sections of this corridor, including shoulder-widening or advisory bike lanes, as documented in Task 9: Bicycle Safety on Rural Highways, should also be considered. A separated path, which requires more ROW, was assumed for this analysis because it requires the most ROW of these alternatives.



*Figure 12. Story Mill Road looking south (section N2-b). Ditches are very small and there are several areas of thru-cuts and steep slopes.*

## **LYMAN CREEK CORRIDOR (N3)**

### **1. DESCRIPTION OF CORRIDOR**

The proposed trail corridor would run adjacent to Story Mill Road for approximately 0.5 miles before turning off to the east and running adjacent to an unnamed private road for the remainder of the corridor. The unnamed road serves as an access to the City of Bozeman's parcel containing a water tank system; this location collects water from Lyman Creek and is one source of drinking water for the City of Bozeman. The corridor would follow the Lyman Creek access road for approximately one mile.

### **2. EXISTING RIGHT-OF-WAY CONDITIONS**

As discussed previously, Story Mill Road has a total ROW width of 60', 30' wide on each side of the road centerline.

Existing ROW for the Lyman Creek access road could not be located. Certificates of Survey for the three parcels that the access road crosses through do not document an existing road. Kelly Pohl, Associate Director of the Gallatin Valley Land Trust (GVLТ), confirmed that the Lyman Creek access road is indeed private with an administrative easement granted to the City for the purposes of accessing the reservoir. In addition, Kelly said that one of the properties has a new owner and the City is in the process of renegotiating the easement. The property is in a conservation easement held by the Montana Land Reliance.

### 3. ASSUMED LOCATION OF TRAIL WITHIN CORRIDOR

The trail is assumed to run along the east side of Story Mill Road south of Bridger Creek largely due to the location of the existing separated path on that side of the road. No assumptions were made regarding trail location along the private access road.

### 4. ADDITIONAL RIGHT-OF-WAY REQUIREMENTS

As documented under N1 and N2, there is sufficient ROW along the Story Mill Road portion of this corridor.

However, where the trail corridor is adjacent to the Lyman Creek access road, there is no existing public ROW. As a result, trail easements would be required from three private parcels along the access road for this corridor alternative to be feasible. These anticipated parcels are outlined below.

Location	Type of Property	Est. Length of Easement	Est. Area of Easement (SF)	Remarks
1380 Story Mill Road	10.6 acre parcel with house	30'	900 sf	Small section needed in order to make the connection to Story Mill Road
Adjacent to 1380 Story Mill Road	2.72 acres of open space	1,205'	48,200 sf	Open-sloped area adjacent to Lyman Creek access road
1404 Story Mill Road	Large agricultural parcel with house & miscellaneous structures	4,230'	84,600 sf	Existing 274± acre agricultural parcel with the Lyman Creek access road running through the property

Without the willingness of the landowners identified above to grant the needed trail easements this corridor is not feasible. While the proposed N3 corridor does run adjacent to an existing road, the existing road is a private road that sees very little use and the landowners may be hesitant to encourage access across their property.

The likelihood of obtaining these easements was not investigated primarily because of the City's reluctance to pursue this corridor due to environmental concerns. Lyman Creek provides approximately 15% of the drinking water for the City and increased use of Lyman Creek canyon poses threats to this water source.



SOUTHERN CORRIDORS

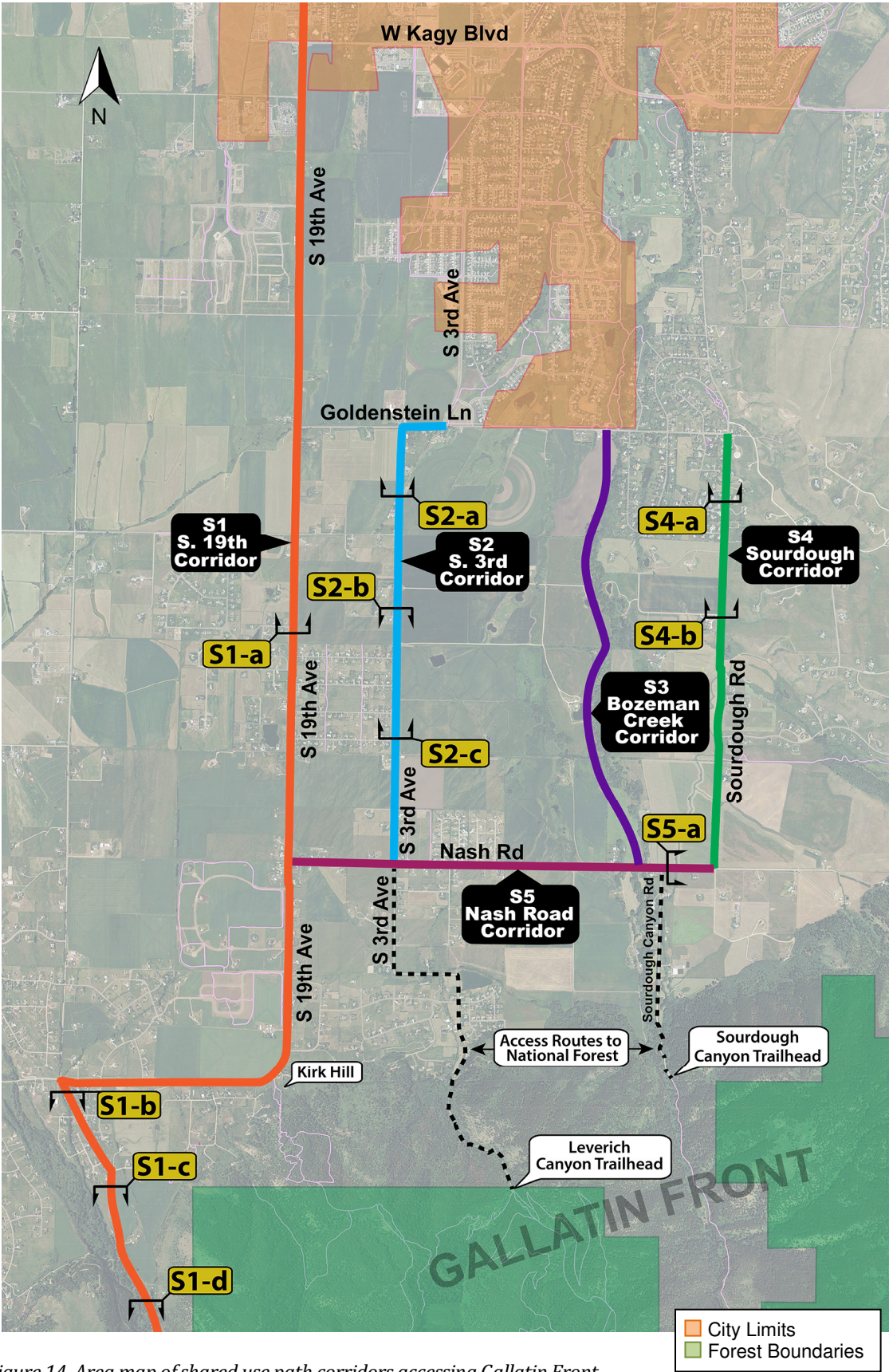


Figure 14. Area map of shared use path corridors accessing Gallatin Front



## SOUTH 19TH CORRIDOR (S1)

### 1. DESCRIPTION OF CORRIDOR

This corridor runs from just north of the intersection of South 19<sup>th</sup> and West Kagy Boulevard to the national forest service boundary along Hyalite Canyon Road via the following route: south along South 19<sup>th</sup> for approximately 6.1 miles to the intersection with Hyalite Canyon Road; and south along Hyalite Canyon Road for approximately 1.3 miles to the Forest boundary. Neighbors adjacent to the S. 19<sup>th</sup> section of the corridor include large farm parcels and subdivisions. Approximately 60% of the adjacent parcels are agricultural farm land or open space and the balance are residential or commercial properties. Gallatin County has identified the South 19<sup>th</sup> Street corridor as an area of expected growth and further subdivision development.

The Hyalite Canyon Road section of this corridor transitions from adjacent residential parcels to agricultural land to wooded land. This roadway provides access to the numerous recreation sites within Hyalite Canyon.

### 2. EXISTING RIGHT-OF-WAY CONDITIONS

**S. 19<sup>th</sup> Ave:** According to MDT's, *Right-of-Way Plan of Federal Aid Project No. S-243(1) Hyalite Road South of Bozeman*, dated 03/15/1963, the existing public ROW varies between 100' and 120' in width. The paved width varies from 30' to 80' and therefore there is abundant ROW throughout this section of the corridor.

**Hyalite Canyon Road:** This road has a total ROW width of 60', 30' wide on each side of the road centerline based on the Forest Creek and Hyalite Canyon Estates Subdivision plats and associated COS plats. As shown in Figure 15, it appears that the fences at the beginning of the roadway are located on the ROW line and may require construction easements for the proposed trail due to the tight constraints in this section.



Figure 15. South 19<sup>th</sup> Ave and Hyalite Canyon Road looking south (section S1-b) with fences on ROW line at intersection



### 3. ASSUMED LOCATION OF TRAIL WITHIN CORRIDOR

#### S. 19<sup>th</sup> Ave:

While both sides of South 19<sup>th</sup> could accommodate a trail and should be explored further, the east side of South 19<sup>th</sup> is the assumed location at this point for several reasons:

- Lack of utilities along the east side (utilities are predominantly along the west side);
- More agricultural land on the east side with development appearing to be focused more on the west side;
- Fewer residential road crossings;
- Better connections to existing trail networks to the east and to Montana State University, a connection point for a large number of prospective trail users;
- Kirk Hill recreation area is accessed off the east side of South 19<sup>th</sup> Street; and
- Connection to Hyalite Canyon Road is best accessed from the east side as the proposed location for the trail along this road is also along the east side.

As shown in Figure 16, a typical section for this corridor, there is ample room to accommodate a trail.

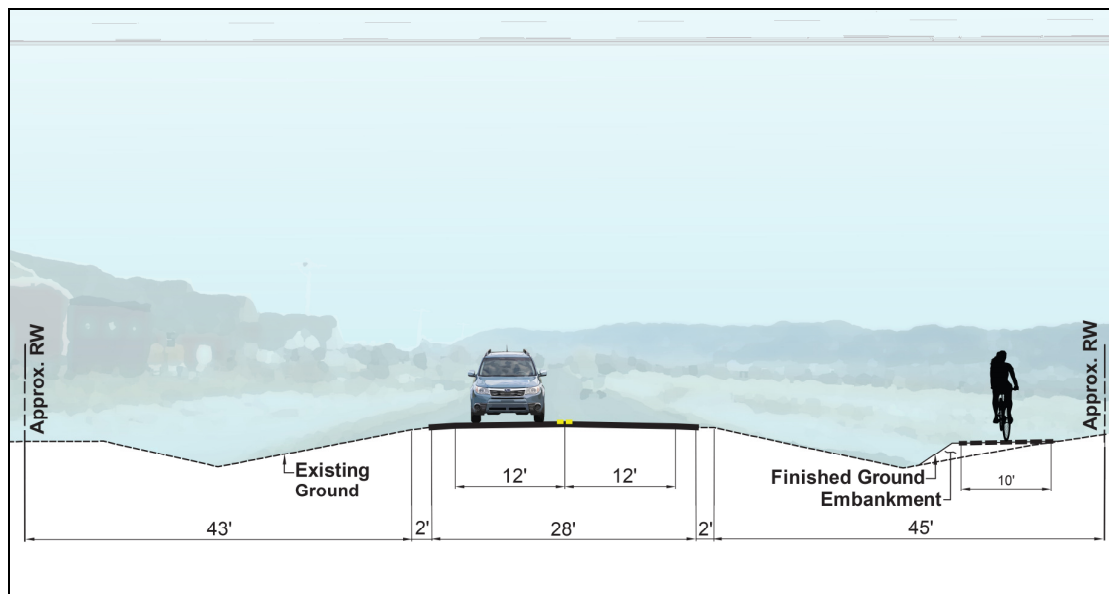


Figure 16. South 19<sup>th</sup> Street corridor looking north (typical section S1-a)

#### Hyalite Canyon Road:

The east side of Hyalite Canyon Road is the assumed location for the trail for several reasons:

- Connectivity with the assumed location for the trail along S. 19<sup>th</sup> Ave;
- The entire east side of the Hyalite Canyon Road section is gently rolling with limited cut/fill sections where the topography is suitable to trail construction; and
- A steep embankment adjacent to the creek at the southern end of this corridor precludes a trail on the west side of the corridor.

There is an approximately 2,200-foot boulder row (see Figure 17) that parallels the roadway on the east side. This row appears to be sufficiently separated from the roadway, as indicated by the typical section

shown in Figure 18, to allow for the construction of the trail and could possibly be used as part of the trail construction should short walls be required.



Figure 17. Hyalite Canyon Road looking south (section S1-c) with row of boulders along the east side of the roadway

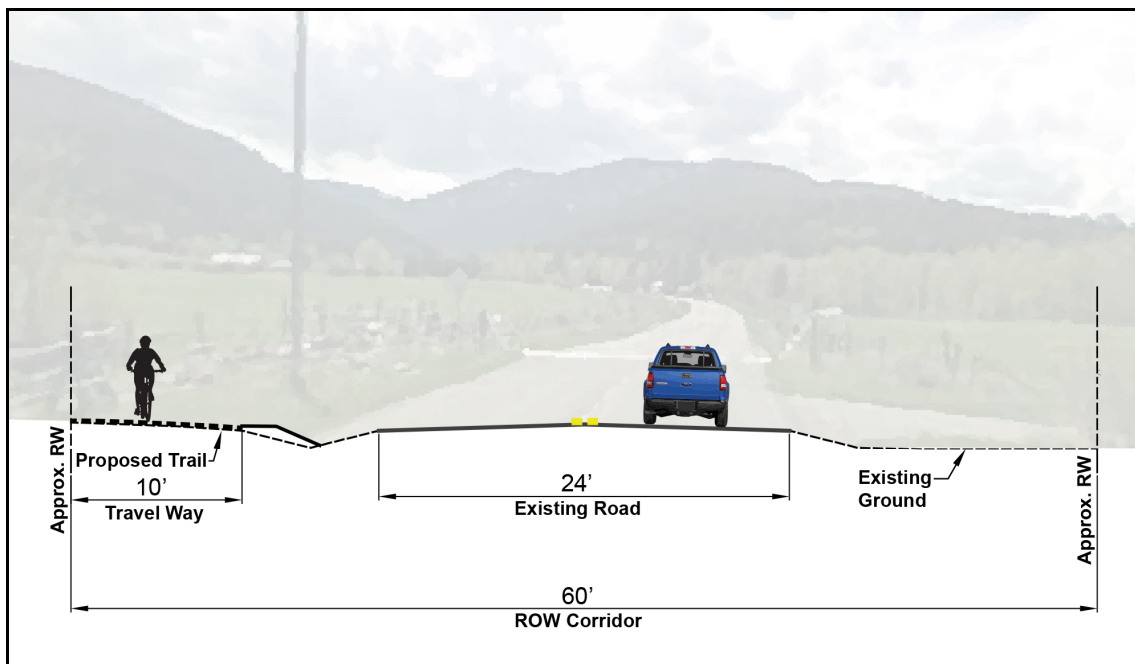


Figure 18. Hyalite Canyon Road looking north (typical section S1-c)



Of particular note is the section of roadway located approximately 1.1 miles south of S. 19<sup>th</sup> Ave. The last 1,600 feet of the roadway appears to have an abandoned roadway on the east side (see Figure 19), which would be ideal for the construction of the trail as it moves further from the roadway. However, additional ROW acquisition would be needed and may not be feasible.



*Figure 19. Hyalite Creek looking south (section S1-d) next to steep embankment*

In the same vicinity, Hyalite Creek approaches the roadway corridor on the west side and creates a very steep embankment immediately adjacent to the roadway. This embankment is also shown in Figure 19 and can be seen in plan view in Figure 20. This section of roadway would normally have a guardrail along this section due to the steep nature of the cut section. Such a guardrail would preclude a trail from being constructed on the west side in this area without the use of high retaining walls.



*Figure 20. Plan view of constricted area on Hyalite Canyon Road*

#### 4. ADDITIONAL RIGHT-OF-WAY REQUIREMENTS

**S 19<sup>th</sup> Ave:** The existing roadway (paved width) varies between approximately 80' in limited locations and 30' for the majority of the analyzed corridor. Therefore, it is anticipated that there is sufficient existing ROW along the entire corridor to accommodate the addition of a bicycle/pedestrian trail. It is not anticipated that any new permanent easements would need to be acquired from adjacent property owners although a limited number of temporary construction easements may be required for trail construction.

**Hyalite Canyon Road:** There should also be sufficient existing road ROW along the Hyalite Canyon road section to the Forest boundary to accommodate the addition of a separated trail. The paved width is approximately 24 feet and the ROW width is 60 feet. It does not appear that additional ROW would be needed although temporary construction easements may be required for trail construction.

Other alternatives for the Hyalite Canyon Road section of this corridor, including shoulder-widening or advisory bike lanes, as documented in Task 9: Bicycle Safety on Rural Highways, should also be considered. A separated path, which requires more ROW, was assumed for this analysis because it requires the most ROW of these alternatives.

### SOUTH 3<sup>RD</sup> AVENUE CORRIDOR (S2)

#### 1. DESCRIPTION OF CORRIDOR

This trail corridor begins at the eastern intersection of South 3<sup>rd</sup> Ave and Goldenstein Lane and runs west for approximately 0.2 miles along Goldenstein Lane. The corridor then turns south along South 3<sup>rd</sup> Ave for 2.0 miles to the intersection with Nash Road. Neighbors along the corridor include large farm parcels or open space (approximately 60%) and some existing subdivisions with larger lots (approximately 40%).

There is a potential alternative routing near the north end of this corridor that could run from near the existing Sourdough Rural Fire House and connect to Goldenstein Lane diagonally running behind a group of 11 residential parcels. This portion of the corridor would follow the abandoned Gallatin Valley Railroad corridor as shown on Sheet No 5 of Gallatin County's road maps, dating back to the late 1800's. However, the abandoned railroad corridor may have substantial challenges for ROW acquisition as the corridor has transferred over to four separate adjacent property owners. Therefore, for the purposes of this study, the corridor is assumed to run as described in previous paragraph.

#### 2. EXISTING RIGHT-OF-WAY CONDITIONS

**Goldenstein Lane:** The Chesnover subdivision plat shows that there is a 59.5 foot ROW south of the section line at the connection of South 3<sup>rd</sup> Ave and Goldenstein Lane and so there should be sufficient ROW for a connection to the proposed trail system.

**South 3<sup>rd</sup> Ave:** According to Gallatin County Clerk & Recorder's Office documents, South 3<sup>rd</sup> Ave is recorded as Road Petition No. 10 and was established in the late 1800's. While ROW monuments have not been established on the ground, supporting documents confirm that the existing ROW along South 3<sup>rd</sup> Ave is 66' in width from Goldenstein Lane to Johnson Road. Between Johnson Road and Nash Road, the existing ROW is 44' in width. There was an old 50-foot railroad easement that has been abandoned and returned to the adjacent landowners at the north end connection with Goldenstein Lane. These ROW widths are shown in Gallatin County Clerk & Recorder's Office road map for Township 3 South, Range 5 East, Sheet No 1. If this trail corridor is ultimately selected for trail development, it is recommended that



Gallatin County definitively establishes the South 3<sup>rd</sup> Ave ROW by completing a Certificate of Survey (COS) of the road prior to trail design and construction.

There are irrigation ditches adjacent to this corridor. Some sections of these irrigations ditches are within the existing ROW; as a result, there may be areas where the irrigation ditch will need to be moved, placed within a pipe, and/or be crossed. In addition, some areas of the corridor have fence lines within the existing ROW. If this corridor is chosen, the irrigation ditch and fencing impacts should be further examined. The ditches along both sides of the roadway are relatively deep with steep side slopes. As shown in Figure 21, there are power poles with guy wires and other utilities along the entire length on the west side of this corridor.



*Figure 21. South 3<sup>rd</sup> Ave looking south (section S2-b)*

### **3. ASSUMED LOCATION OF TRAIL WITHIN CORRIDOR**

The trail is assumed to be on the east side of the corridor due to both the location of utilities and road crossing. The majority of adjacent utility poles and other utilities are located along the west side of the roadway. As for crossings, the majority of them are also located on the west side of the roadway; there are few residential crossings and no collector or local road crossings on the east side as it is all agricultural land. A trail located on the east side would allow for very few traffic interactions with the trail users until such time as the east side becomes more developed.

As shown in Figures 22 and 23 there is sufficient room to accommodate a trail along the majority of this corridor.

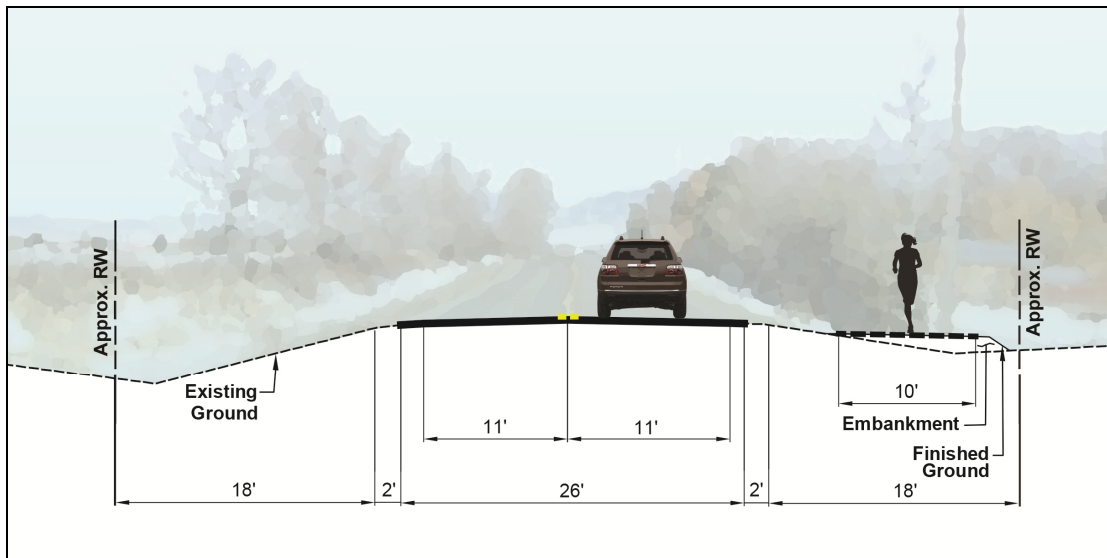


Figure 22. South 3<sup>rd</sup> looking north (typical section S2-a)

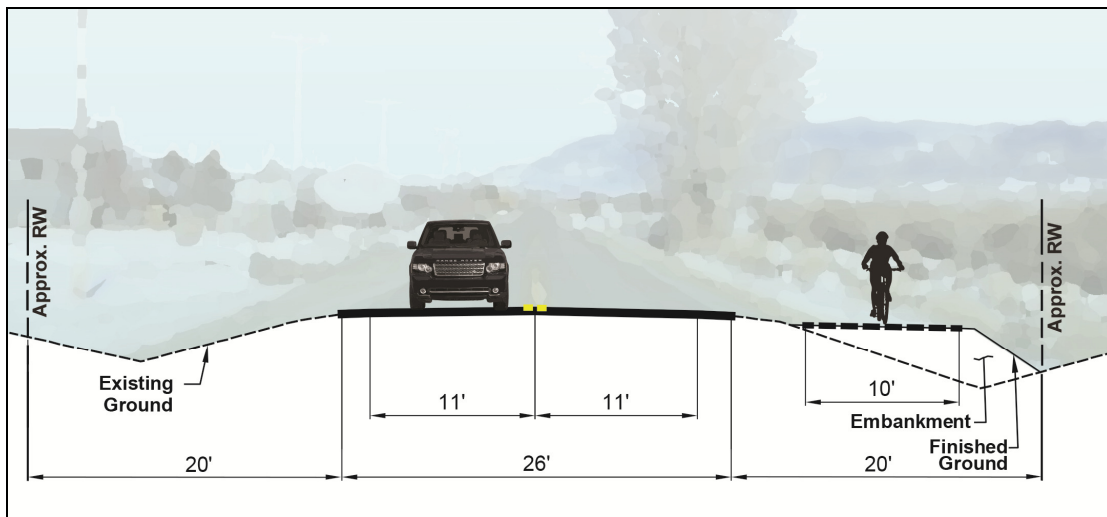


Figure 23. South 3<sup>rd</sup> Ave looking north (typical section N2-c)

#### 4. ADDITIONAL RIGHT-OF-WAY REQUIREMENTS

While approximately 88% of the proposed corridor appears to have sufficient existing ROW to accommodate the addition of a separated trail, it is anticipated that there will be a need to acquire new trail easements along that section of corridor south of Johnson Rd. For those sections of the corridor with 66' of ROW, there is approximately 20' of available ROW within which to construct the proposed 10'-wide trail as shown in the plan view in *Figure 24*. While not ideal, because of minimal separation between roadway and trail (approximately 5'), as well as the deep ditches, this 20' available width is deemed sufficient.



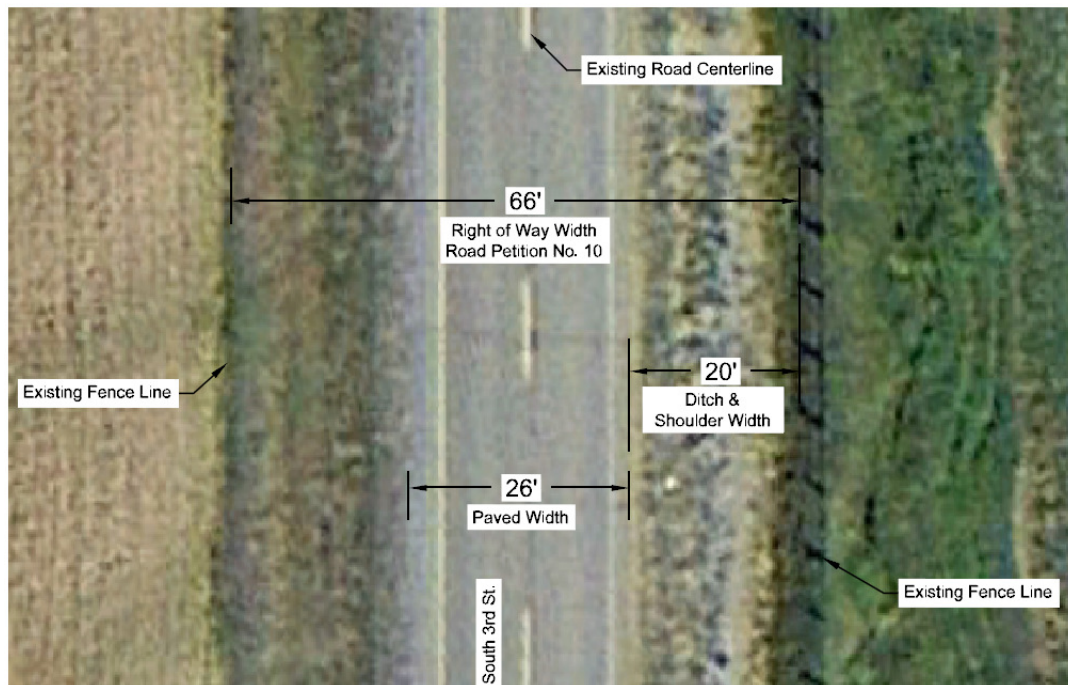


Figure 24. Representative plan view of the existing road conditions along South 3<sup>rd</sup> Ave.

Easement acquisition for that section of corridor south of Johnson Road is detailed in table below. This table does not include ROW acquisition that would be required if the corridor were to be routed along the abandoned Gallatin Valley Railroad corridor referenced previously.

Location	Type of Property	Est. Length of Easement	Est. Area of Easement (SF)	Remarks
Johnson Road to Nash Road	Irrigated agricultural land, residential parcels	2640'	29,040 sf	11' strip of land acquisition assumed so that available construction area is compatible with rest of corridor. Half the acquisition would be from an agricultural parcel and the rest from 3 residential parcels

Other alternatives for this corridor, including shoulder-widening or advisory bike lanes, as documented in Task 9: Bicycle Safety on Rural Highways, should also be considered. A separated path, which requires more ROW, was assumed for this analysis because it requires the most ROW of these alternatives.

## BOZEMAN CREEK CORRIDOR (S3)

### 1. DESCRIPTION OF CORRIDOR

This trail corridor would tie into an existing trail system at the intersection of Goldenstein Lane and Bozeman Creek and then be routed south for approximately 2.1 miles to Nash Road roughly following Bozeman Creek. There are no adjacent public roadways for this corridor. The proposed corridor is assumed to primarily parallel Bozeman Creek. However, there are some areas where it makes sense for the corridor to divert from the creek and follow property lines in an effort to minimize impacts to landowners and farming operations. Approximately 65% of the corridor directly parallels Bozeman Creek while the remainder borders property lines away from the creek. The need for two new

pedestrian bridges crossing Bozeman Creek was assumed; however, crossings could be reduced or eliminated pending corridor alignments

## 2. EXISTING RIGHT-OF-WAY CONDITIONS

After researching adjacent parcel Certificate of Survey documents it was determined that 100% of this proposed trail corridor would require public easements to be acquired. No existing public access is available along the proposed corridor.

One private trail easement in the area already exists within the subdivision development known as the Abigail Ranch. One parcel (Tract 2A-1 of Minor Subdivision No. 236J) includes a private easement between neighbors for recreational access and explicitly allows for a 10' wide private trail. This easement runs for approximately 2,600' along the proposed corridor; however, it is a private and not a public access easement.

In addition, the right-of-way for an east-west trail connection is possible, owing to a 2004 settlement agreement related to the creation of the Abigail Ranch subdivision. Through this agreement, the owners consented to allowing a 14' easement for a non-motorized trail along the northern section line boundary of the Abigail Ranch (Sections 36 and 31, T2S R5E), which would connect from South 3rd Ave east to Bozeman Creek. This trail easement can only be recorded when one of two conditions is met: 1) a trail is constructed from Goldenstein Road to the Abigail Ranch property boundary; or 2) a trail is constructed through the Abigail Ranch property paralleling Bozeman Creek. This east-west connection would help to further connect this corridor for an improved transportation network.

## 3. ASSUMED LOCATION OF TRAIL WITHIN CORRIDOR

As described previously, the trail alignment would be dictated by existing property boundaries, landowner willingness to grant easements and the location of the creek. Easement widths are assumed to be 30' wide in order to accommodate a 10'-wide paved trail with shoulders and finished fill/cut slopes. In addition, pedestrian bridge crossings over Bozeman Creek were assumed at two potential locations. Wider easements would be required at bridge crossing locations to allow for abutment construction and future bridge maintenance.

## 4. ADDITIONAL RIGHT-OF-WAY REQUIREMENTS

As noted above, 100% of the proposed corridor would require the acquisition of trail easements because there are no existing public road or trail easements along the proposed corridor.

Six private parcels, owned by five different landowners, were identified as needing a trail easement for this corridor alternative to be feasible. These anticipated parcels are outlined in table below.

Legal Descriptions	Type of Property	Est. Length of Easement	Est. Area of Easement (SF)	Remarks
S06, T03 S, R06 E, ACRES 129, FRAC NW4 LESS 20 ACRE TR	Agricultural land with house	2,600'	78,000 sf	Existing farm property, easement would parallel the east property boundary. Potential creek crossing likely on this property.
S31, T02 S, R06 E, MINOR SUB 236J TRACT 2A-1 33.2699 AC	Open space with creek frontage	3,190'	96,000 sf	Open space. Potential creek crossing likely on this property.
S31, T02 S, R06 E, MINOR SUB 236J LOT 3A 37.7812AC	Open space with creek frontage	1,100'	33,000 sf	Open space. Not currently being used for farming.
MINOR SUB 236G, S36,	Agricultural land			Existing farm, easement

T02 S, R05 E, Lot 1A, ACRES 295.001	with barn/shop structure	2,050'	61,500 sf	would parallel property boundary & creek to the east.
S30, T02 S, R06 E, C.O.S. 2825, ACRES 41.15, SE4SW4	Agricultural land with no structure	1,600'	48,000 sf	Existing farm property, easement would likely parallel creek down the middle of property.
S30, T02 S, R06 E, C.O.S. 2825, ACRES 35.77, TRACT 3	Agricultural land with house and multiple structures	1,460'	43,800 sf	Existing farm, easement would run near the property boundary & creek to the east

Right-of-way acquisition in this corridor may be difficult and costly. Challenges include the high cost of land in this part of the Gallatin Valley; desires for privacy and seclusion by private landowners; and impacts to viability of agricultural production on the private land. However, the proposed trail corridor is near the boundary of larger agricultural farm properties and it would likely be nearer the creek and not impact cultivated land. Residences are also set back from the creek corridor so privacy issues could be mitigated.

While landowners in this corridor have historically been willing to discuss trail connections, little progress has been made toward acquiring right-of-way. However, there has been recent turnover in ownership on three of the six parcels, and those new landowners have not yet been approached. This study may present an opportunity to reinvigorate discussions. It is worth noting that most discussions have centered on narrower easements (15-20') for recreational, gravel fines trails, not paved pathways. Even if landowners are not open to paved, 10' pathways that does not necessarily rule out the potential for a future, narrower, recreational, gravel trail corridor.

## **SOURDOUGH CORRIDOR (S4)**

### **1. DESCRIPTION OF CORRIDOR**

This corridor would tie into the existing trail system at the intersection of Goldenstein Lane and Bozeman Creek and run east for approximately 0.5 miles. The corridor would then head south paralleling Sourdough Road from Goldenstein Lane to Nash Road for approximately 2.0 miles. Sourdough Road is a county road. Adjacent landowners include large farm parcels and existing subdivisions with larger sized residential lots.

There is a potential alternative for this corridor near the intersection of Goldenstein and Sourdough Road that would route the trail through the county's Buckskin Park. Gallatin Valley Land Trust initiated conversations with the adjacent landowners and county staff in 2015. Initial conversations have been positive.

### **2. EXISTING RIGHT-OF-WAY CONDITIONS**

According to Gallatin County Clerk & Recorder's Office historical road map for Township 2 South, Range 6 East, Sheet No 6, Sourdough Road was established as a county road in 1878. While ROW monuments have not been established on the ground, the road map and supporting documents confirm the existing Sourdough Road ROW is 66' in width from Goldenstein Lane to Johnson Road.

The ROW width appears to have since been expanded to 80' for the first 0.5 miles of Sourdough Road south of Goldenstein Lane. This 80' width is documented in plats associated with Sour Dough Creek Subdivision and Sourdough Hill Subdivision.



However, there is an inconsistency between the historical road map referenced previously and other documents including Certificate of Survey No. 1103 and the amended plat for Minor Subdivision No. 117B. These later documents show a 60' ROW width. Because of these discrepancies, if this trail corridor is ultimately selected for design, it is our recommendation that Gallatin County definitively establishes the Sourdough Road ROW by completing a Certificate of Survey (COS) of the road prior to trail design and construction.

As can be seen in Figure 25, the ditches along the roadway are relatively deep with steep slopes and the east side is predominantly roadway cut slopes and the west side is mostly roadway fill slopes. The utility poles are located along the west side and, in many areas; the poles are in the middle of the ditch. This would preclude the placement of a trail on the west side without the relocation of the power poles which would be cost prohibitive.



*Figure 25. Sourdough Road looking north (section S4-a) with power poles in the ditch line on west side*

### 3. ASSUMED LOCATION OF TRAIL WITHIN CORRIDOR

**Sourdough Road:** For the majority of the corridor it is assumed the trail would be located on the east side of the corridor. The primary reason for this assumption is that utilities are located within the ditch section on the west side through much of this corridor. The east side also provides better access to the Triple Tree Trailhead area and trail system. Further, although there are twice as many residential access roads on the east side, there are only two local road crossings compared to four on the west side. Most of the subdivision development is located on the west side and so placing the trail on the east side will provide for the least amount of traffic interaction with the trail users. The primary downside of locating the trail on the east side is the costs associated with constructing the pathway through cut slopes that would require either additional ROW acquisition or retaining walls or a combination. Additional analysis, beyond the scope of this study, would be required to identify the best alignment for this corridor.

Figure 26 shows a typical section along Sourdough Road where the trail is located on the east side of the road.

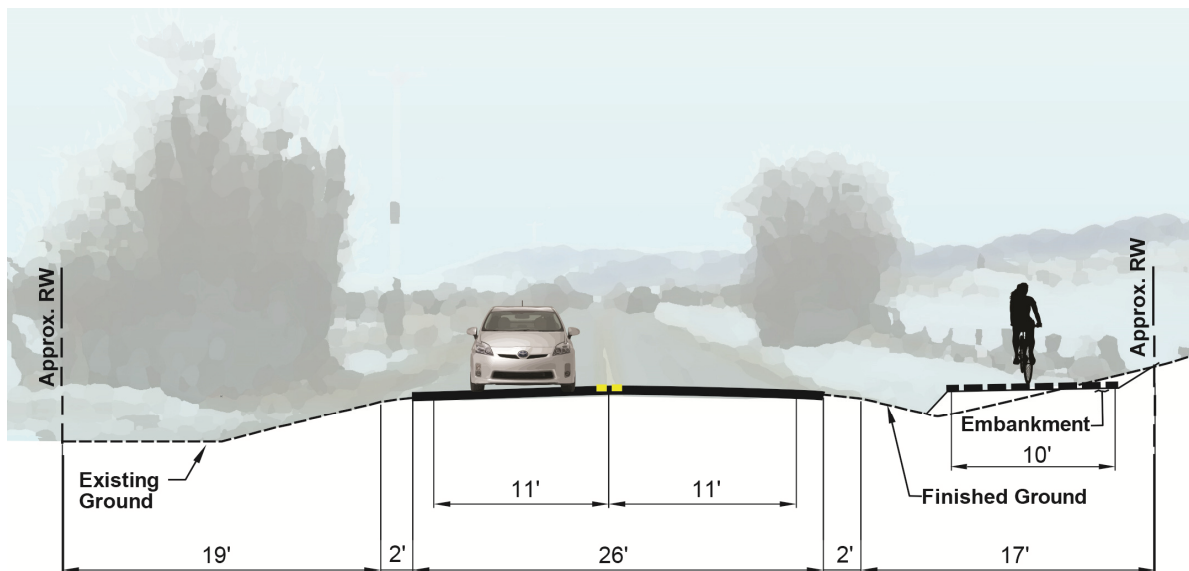


Figure 26. Sourdough Road looking north (typical section S4-b)

#### 4. ADDITIONAL RIGHT-OF-WAY REQUIREMENTS

The existing Nash Road roadway (paved width) varies and is approximately 24' – 26' wide for the majority of the analyzed corridor. The ROW width is a minimum of 60' (or possibly 66', depending on resolution of conflicting information). Therefore, there should be sufficient existing ROW along this corridor to accommodate the addition of a bicycle/pedestrian trail. While the trail separation may not be ideal in some locations and the paved trail width may need to be reduced to 8'-wide, it should still be feasible to construct the trail without having to acquire new ROW. Separation distance from edge of trail to edge of roadway asphalt would likely be as little as 2 feet along the majority of the corridor.

It is not anticipated that any new permanent easements would need to be acquired from property owners adjacent to Sourdough Road. However, because the available ROW is so limited, temporary construction easements will likely be required for trail construction.

Other alternatives for this corridor, including shoulder-widening or advisory bike lanes, as documented in Task 9: Bicycle Safety on Rural Highways, should also be considered. A separated path, which requires more ROW, was assumed for this analysis because it requires the most ROW of these alternatives.

## NASH CORRIDOR (S5)

### 1. DESCRIPTION OF CORRIDOR

This corridor runs east-west for 2.0 miles along Nash Road between South 19<sup>th</sup> Ave and Sourdough Road. Nash Road is maintained by Gallatin County. This corridor intersects both Leverich Canyon and Sourdough Canyon trailhead access routes and could provide good connectivity to these areas in conjunction with one or more of the proposed southern north-south corridors (S1, S2, S3, or S4). Neighbors along the corridor include larger farm and open space parcels (approximately 70%) along with some existing subdivisions with larger lots.

### 2. EXISTING RIGHT-OF-WAY CONDITIONS

The majority of this corridor has an existing total ROW width of 60', 30' wide on each side of the road centerline, as determined by investigating multiple filed subdivision plats and certificate of surveys. For



example, this width was documented as 60' wide in each of the following documents: Amended Plat Minor Subdivision No. 263A; COS No. 392A; COS No. 1103J; and COS No. 1236. Other sections of this corridor have an existing ROW width of 90' with 45' on each side of the road centerline. This 90' width is shown in both the Crossroads Subdivision plat and the Mountain Shadows Estates Subdivision plat. Survey monuments have been set along Nash Road in many of these more developed areas. COS No. 2403 indicates that Nash Road has a 66' ROW based on a petitioned road.

If this trail corridor is ultimately selected for design it is our recommendation that Gallatin County definitively establishes the Nash Road ROW by completing a Certificate of Survey (COS) of the road prior to trail design and construction.

The ditches along both sides are relatively deep with steep side slopes. The utilities are predominantly on the north side providing service to the large subdivisions.

### 3. ASSUMED LOCATION OF TRAIL WITHIN CORRIDOR

The trail is assumed to be on the south side of Nash Road for several reasons including minimizing vehicular and utility conflicts and improving connectivity. Although there are twice as many residential access roads on the south side of the road, there are twice as many local access roads on the north side because the majority of the development is on the north side. Therefore, the south side is preferable from the standpoint of limiting conflicts between trail users and vehicles. The south side also largely avoids utility conflicts because the utilities are primarily on the north side. Finally, the south side provides improved connectivity to the Sourdough Canyon and Leverich Canyon trailheads located on the south side of Nash Road.

Figure 25 shows a typical section along Nash Road looking east with the trail located on the south side of the road.

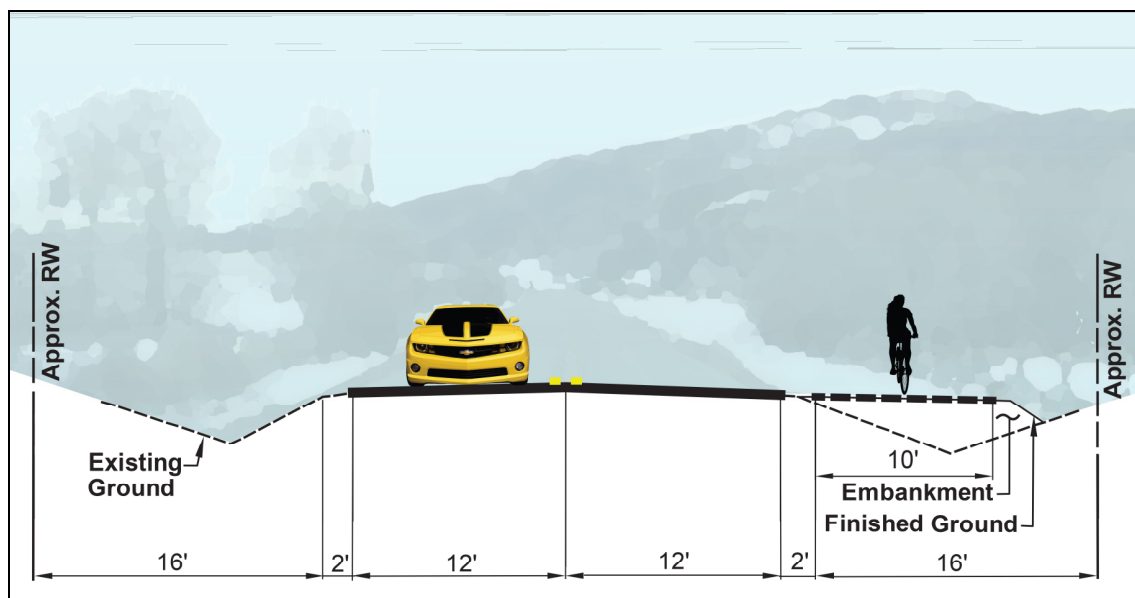


Figure 27. Nash Road looking east (typical section S5-a), a section with minimum ROW width of 60'

### 4. ADDITIONAL RIGHT-OF-WAY REQUIREMENTS

The existing Nash Road roadway (paved width) varies and is approximately 24' wide for the majority of the analyzed corridor. Therefore, it is anticipated that there should be sufficient existing ROW along Nash Road to accommodate the addition of a bicycle/pedestrian trail. Given an assumed 10'-wide paved trail, it

is anticipated that in most areas there will be sufficient space to fit the trail between the edge of roadway and the edge of ROW. While the trail separation may not be ideal in some locations and the paved trail width may need to be reduced to 8'-wide, it should still be feasible to construct the trail without having to acquire new ROW. Separation distance from edge of trail to edge of roadway asphalt would likely be as little as 2 feet along the majority of the corridor.

It is not anticipated that any new permanent easements would need to be acquired from property owners adjacent to Nash Road. However, because the available ROW is so limited in some areas, temporary construction easements will likely be required for trail construction.

Other alternatives for this corridor, including shoulder-widening or advisory bike lanes, as documented in Task 9: Bicycle Safety on Rural Highways, should also be considered. A separated path, which requires more ROW, was assumed for this analysis because it requires the most ROW of these alternatives.

# Appendix 2-2

## Evaluation Matrix

Primary Criterion	Attribute	N1		N2		S1		S2		S3		S4		S5	
Right of Way & Utility Impacts	Acquisitions Required	No ROW Acquisition anticipated		Approximately 4% of corridor, or roughly 900 linear feet, would require a combination of ROW acquisition, retaining walls, and/or reduced trail width.		No ROW Acquisition anticipated		2600 linear feet (28,600 SF) anticipated needing to be aquired from 4different landowners		100% of the proposed corridor would require ROW acquisition (12,000 LF and over 8 acres) involving 5 landowners		No ROW Acquisition anticipated		No ROW Acquisition anticipated	
	Advantages	8 acres less ROW acquisition	100	Nearly 8 acres less ROW acquisition	85	8 acres less ROW acquisition	100	Nearly 8 acres less ROW acquisition	70	No advantage	0	8 acres less ROW acquisition	100	8 acres less ROW acquisition	100
Environmental Impacts	NEPA/MEPA Triggers & Resource Mitigation	CE, little to no resource mitigation		CE, little to no resource mitigation		CE, little to no resource mitigation		CE, little to no resource mitigation		CE, moderate resource mitigation		CE, little to no resource mitigation		CE, little to no resource mitigation	
	Advantages	Minimally less resource mitigation	2	Minimally less resource mitigation	2	Minimally less resource mitigation	2	Minimally less resource mitigation	2	No advantage	0	Minimally less resource mitigation	2	Minimally less resource mitigation	2
Comfort & Safety <sup>1</sup>	Separation distances	2' +/-		2' +/-		30' +/- for majority of trail		5' +/-		No adjacent roadway		2' - 5'		2' +/-	
	Traffic Volumes and Speeds	35 & 50 MPH 2013 AADT = 830 (at busiest section)		35 & 50 MPH 2013 AADT = 830 (at busiest section)		50 & 60 MPH 2013 AADT = 4,430		35 & 50 MPH 2013 AADT = 2,120		N/A		35 & 45 MPH ADT of 1,260			
	Grades	2% - 5%		>5% in sections		<2%		<2%		<2%		<2%		<2%	
	Advantages	Slightly more comfortable	5	No advantage	0	Significantly more comfortable	15	Slightly more comfortable	10	Significantly more comfortable	25	Slightly more comfortable	10	Moderately more comfortable	10
Connectivity	Relation to existing trail network and recreational areas	Connects to Hedvig's existing trail system.		Connects to existing trail network		Connects to existing trail network		Connects to existing trail network		Connects to existing trail network		Provides connection to Triple Tree trail system		Adjacent to access routes to Triple Tree, Sourdough Canyon and Leverich Canyon	
	Relation to existing populations	Good		Good		Good		Good		Good		Good		Low	
	Advantages	No advantage	0	No advantage	0	No advantage	0	Slightly more connectivity	5	Slightly more connectivity	5	Slightly more connectivity	5	Slightly more connectivity	5
Consistency w/ Previous Studies and Plans	PROST Plan status	Proposed bike lane and trail corridor		Proposed trail corridor for approximately half of N2		Proposed bike land and shared us path		Proposed bike land and trail corridor		Proposed trail corridor		Proposed bike land and shared us path		Outside study area	
	Greater Bozeman Area Transportation Plan	Wide shoulder for corridor within study area		Not addressed		Shared use path to Goldenstein and bike lane to south		Wide shoulder south of Goldenstein		Not addressed		wide shoulder south of Goldenstein		Outside study area	
	Advantages		n/a		n/a		n/a		n/a		n/a		n/a		n/a

<sup>1</sup> Note that accident data for bicycle and pedestrians was requested from the Montana Highway Patrol and they provided all of these types of accidents for 2014 in the Bozeman valley. There was only a single reported accident on the subject corridors included in this study during this period. Therefore it does not appear that crash history is a relevant consideration in the selection of one corridor over another. It does not appear that there are any locations along the designated corridors where accidents would be a controlling factor in the design of a bicycle/pedestrian trail. Therefore crash history was eliminated as an attribute from this analysis. Road crossings were also analyzed as detailed in the ROW Impacts Memo. However, relative to other considerations, these crossing are relatively insignificant and were eliminated as an attribute from this analysis.

# Appendix 2-3

## FWP Letter Dated July 1, 2015





**Montana Department  
of  
Fish, Wildlife & Parks**

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Region 3 Headquarters

1400 S 9th

Bozeman, MT 59718

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July 1, 2015

Martin Oakland  
DJ & A P.C.  
3203 Russell Street  
Missoula, MT 59801

Re: Bozeman Area Alternative Transportation Study – Bozeman Creek Corridor

Dear Mr. Oakland,

Thank you for the opportunity to comment on the proposed transportation study. Our principle fisheries focus would be on routes that cross or parallel streams. One of the proposed routes is along parts of Sourdough Creek. I believe providing a greenway is an excellent way for people to enjoy stream resources and associated riparian areas. Moreover, Sourdough Creek supports two trout species - Rainbow Trout and Brook Trout. If the route along Sourdough Creek is chosen, Montana Fish, Wildlife & Parks would like to be involved in the process in some way. Protection of riparian areas – buffers, prevention of stream bank damage will be important considerations during planning. There are no specific areas along Sourdough Creek that would be of immediate concern.

Of the four proposed trail corridors, the only area of concern for wildlife is along Bozeman Creek. Even though proximate to the city, Bozeman Creek is a corridor for wildlife movement and we have documented moose, cougar, black bear, and other wildlife along its stretch. This area could present some conflict and should be carefully discussed and evaluated with our staff before significant plans are made. The other routes (South 19<sup>th</sup>, South 3<sup>rd</sup>, and Sourdough) all fall along major roadways so adding a trail corridor adjacent to it would have little additional impact to wildlife.

We look forward to working cooperatively in the future.

David C Moser  
Fisheries Biologist

Julie Cunningham  
Wildlife Biologist

# Appendix 3-1

## Draft Statement of Work for Project #2

**Draft Statement of Work**  
**Fish Technology Center access, M Trailhead**  
**and Drinking Horse Springs Trailhead Improvements**

Sections 34, T01S, R06E  
 NW<sup>1</sup>/<sub>4</sub> Nw<sup>1</sup>/<sub>4</sub>, S<sup>1</sup>/<sub>2</sub> NW<sup>1</sup>/<sub>4</sub> (less tract), NW<sup>1</sup>/<sub>4</sub> SW<sup>1</sup>/<sub>4</sub>  
 Task Order No.

**General Project Description:**

This project includes preparation of a Preliminary design, holding Public Meetings, Final Design and Final PS&E package for the Fish Technology Center access, M Trailhead and Drinking Horse Springs Trailhead Improvements project based on the anticipated funding available for construction of approximately \$1,400,000. This project utilizes the conceptual design work and preliminary planning work performed as part of the BAATS study, (cite).

Prepare the preliminary design to include:

- Transit facility design at each trailhead to allow for shuttle operations, and bus operations
- Bicycle/pedestrian amenities including bicycle racks, and shelters
- Trail maps and trail signing at trailheads
- Improved pedestrian access, circulation and signing at Drinking Horse Springs and the Fish Technology Center
- Highway 86 Improvements coordinated and approved by MDT
- Highway 86 Trail undercrossing design coordinated and approved by MDT
- Revised access for both trailhead areas to share a single point of access (on centerline) directly across Highway 86 from each other
- Traffic signing and pavement marking plans
- Circulation roadway typical section and circulation roadway alignments
- Hydraulic/Drainage design
- Trail connections to Trail to the M, M Trail,
- Trail connections to Drinking Horse Springs Trails, Fish Technology Center
- Trail connections to Highway 86 undercrossing
- Conduct turn lane warrant analysis for left turns into both The M trailhead and Drinking Horse Springs trailhead
- Conduct deceleration lane/right turn lane analysis for both The M trailhead and Drinking Horse Springs trailhead
- Design internal trailhead circulation for M Trailhead loop roadway for M Trailhead
- Complete parking assessment to determine adequate parking facilities for trailhead users
- Transit Stop/Shelter design
- Shuttle unloading area design
- Design trail connections to Drinking Horse Springs trail, M Trail and Trail to the M
- Design pedestrian undercrossing of Highway 86 with circulation trails that connect Drinking Horse Springs trailhead area and M Trail trailhead to the Trail to the M.
- Re-configure Drinking Horse Trailhead parking area to enable shuttle and transit operations

- Improved administrative access and visitor access circulation and the Fish Technology Center

### **Public Involvement**

Conduct Public two Open-House meetings to take public input on project goals at each milestone.

### **Final Design**

Prepare the final PS&E package to include Base and Additive Options as determined during the public involvement process and funding availability. Elements will include the following:

- Transit facility design at each trailhead to allow for shuttle operations, and bus operations
- Bicycle/pedestrian amenities including bicycle racks, and shelters
- Trail maps and trail signing at trailheads
- Improved pedestrian access, circulation and signing at Drinking Horse Springs and the Fish Technology Center
- Highway 86 Improvements coordinated and approved by MDT
- Highway 86 Trail undercrossing design coordinated and approved by MDT
- Revised access for both trailhead areas to share a single point of access (on centerline) directly across Highway 86 from each other
- Traffic signing and pavement marking plans
- Circulation roadway typical section and circulation roadway alignments
- Hydraulic/Drainage design
- Trail connections to Trail to the M, M Trail,
- Trail connections to Drinking Horse Springs Trails, Fish Technology Center
- Trail connections to Highway 86 undercrossing

Other information specific to this project is as follows:

- The existing trailheads will need to be maintained for recreational access during construction, so the design must be able to be phased in a way to minimize impacts to the users of these facilities.
- All Highway 86 impacts will need to be reviewed and approved by the Montana Department of Transportation.
- Traffic shall be maintained on Highway 86 except for 20 minute delays. Single-lane detours will be allowed.
- Assume construction Schedule to be from Month 1, 201X through Month 30, 201X.
- Material Sources: Aggregate/Asphalt – commercial; select backfill – (Identify available Sources as relevant)

### **Design Reviews:**

The project design shall include the following reviews:

- 50% Preliminary Design Review and PIH
- 85% Design Review and PIH with MDT participation
- 100% Final Package Review by the Forest and the Region

**Design Specifications:** Construction specifications shall be the Standard Specification For Construction of Roads and Bridges on Federal Highway Projects, **FP-03**. Drawings and specifications shall be in English units.

**Deliverables:**

1. Final PS&E stamped package – 2 paper copies (11”x17” format) and one CD with digital PDF files of design and design support documentation

**Government Furnished Items:**

1. New Visitor Map .tiff files for use as vicinity maps

**Schedule:** Construction funding is likely to be available for **201X**. The project schedule is to have public meetings arranged to correlate with 50% and 85% reviews.

The project schedule is attached to the cost proposal.

The final design package completed by (    Date    ) or sooner.

**Quality Control / Quality Assurance:** Contractor is responsible for the quality and accuracy of their work.

**Forest Service Review:** Forest Service review of the work at the various submittals shall be for overall conformance with the project scope of work, design criteria, and generally accepted practices of design and drawing preparation.

**Price Proposal:** Consultant shall submit a lump sum price proposal as follows:

**M Trailhead and Drinking Horse Springs Trailhead**

**Improvements PS&E Package**

\$                      **Lump Sum**

# Appendix 4-1

## Recreational Shuttle Systems





## Memorandum

To: Peter Walker-Keleher, DJA

From: Rebecca Gleason and David Kack, WTI

Date: 7/24/15

RE: Bozeman Area Alternative Transportation Study: Task 2.5 Recreational Shuttle Research

This work is one part of an alternative transportation study to assess shuttle options to access recreation sites on public lands near Bozeman, Montana. Benefits of a shuttle may include:

- Reduce need for additional parking spaces at trailheads, thus reducing costs and preserving green space;
- Attract visitors and stimulate downtown business;
- Provide options to access National Forests to people without an automobile; and
- Potential to reduce congestion and wildlife vehicle collisions.

This memo is intended to provide information on shuttle systems that might assist land managers in balancing parking needs, trail access, carrying capacity and visitor experience.

The first part of this memo highlights results from a 2012 survey of visitors to trailheads (WTI, 2013).

The second part summarizes community shuttle systems that access ski areas in the winter and/or trails for biking and hiking in the summer.

1. Helena, Montana | “The Trail Rider, Helena’s Free Community Bike Shuttle” –serves as summer hike/bike shuttle
2. Jackson, Wyoming | “Southern Teton Area Rapid Transit (START)” – public transportation system provides winter ski area and summer trail access
3. Aspen, Colorado | Roaring Fork Transportation Authority (RFTA) shuttle – provides full transit services including “Bike Express”
4. Park City, Utah | “Park City Transit”– provides fare-free, year round service with access to the surrounding ski areas
5. Reds Meadow/Devils Postpile Shuttle | “Eastern Sierra Transit Authority (ESTA)” runs a seasonal (summer) shuttle service from Mammoth Mountain to the Devils Postpile National Monument. This mandatory shuttle service is mentioned here primarily because it allows dogs on the shuttles.

The third part provides a potential schedule and cost estimate for options to access Hyalite Canyon and trailheads along the Gallatin Range south of Bozeman.

## Part I – Summary of 2012 Visitor Survey & Transit Information

Three of the highest visitor use areas on public lands near Bozeman are Hyalite Canyon, Sourdough Canyon and the “M”/Drinking Horse trailheads. Surveys were conducted at each of these areas and results relevant to shuttle service are summarized here.

### Hyalite Canyon Trailheads

The turnoff to Hyalite Canyon Road is located approximately seven miles south and west of Bozeman; Main Street, and it is another 10 miles up the canyon to reach Hyalite Canyon Reservoir. Trail users completed 158 surveys at various Hyalite Canyon trailheads in August 2012. Results from Hyalite Canyon users indicated:

- Approximately 53 percent of respondents (81) reported they were somewhat likely, likely or very likely to use transit if service existed between Bozeman and the Hyalite Canyon Reservoir (Figure 1);
- MSU and downtown Bozeman were the two most popular locations where people want to catch the bus;
- Weekends were the most popular days of the week for visits to Hyalite Canyon; and
- People reported they are willing to pay for a round trip ride from Bozeman to Hyalite Canyon (Figure 2).

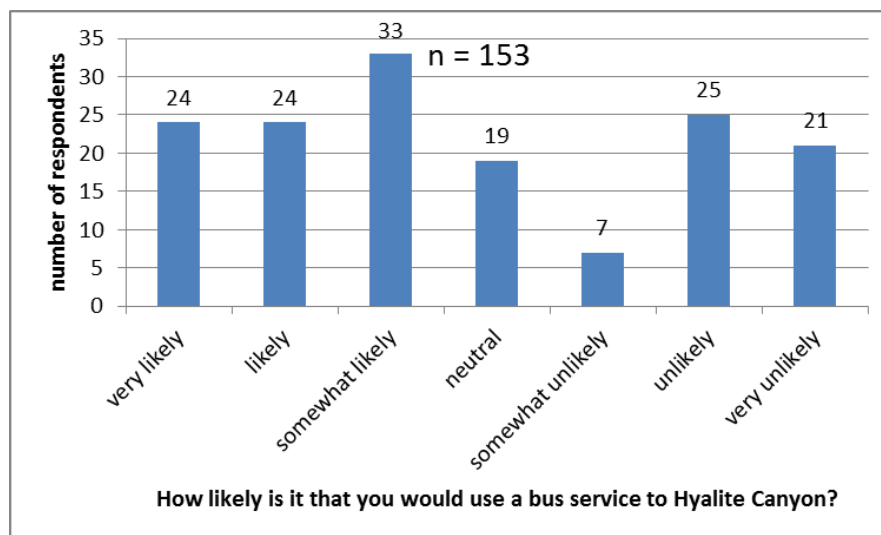


Figure 1: Likelihood to use a shuttle to Hyalite Canyon

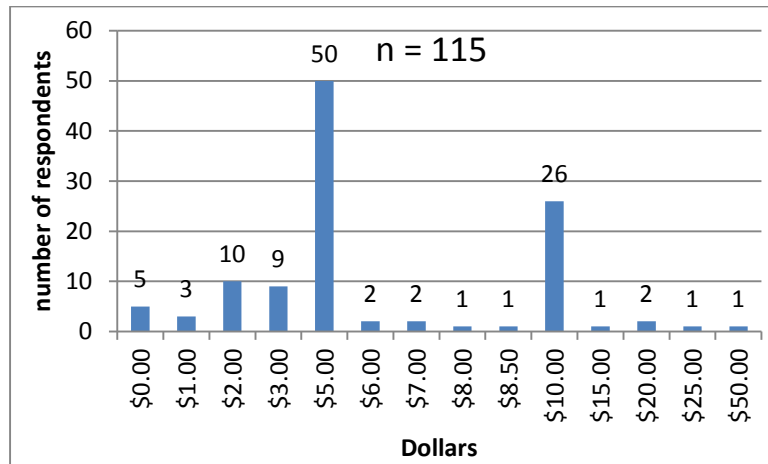


Figure 2: How much would you be willing to pay, per person, for a roundtrip ride from Bozeman to the Hyalite Canyon area?

### Sourdough Canyon Trailhead

Trail users completed 66 surveys at the Sourdough Canyon trailhead located about six miles south of Bozeman's Main Street in August 2012. About 40% of respondents reported they were somewhat likely, likely or very likely to use transit to access the trailhead. 39 of the people who took the survey reported their willingness to pay for a round trip ride from Bozeman to Sourdough Canyon (Figure 3).

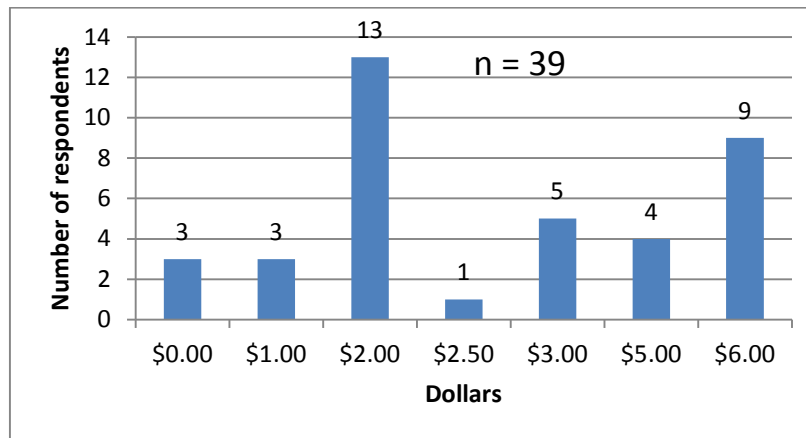


Figure 3: How much would you be willing to pay, per person, for a roundtrip ride from Bozeman to Sourdough trailhead?

### "M" and Drinking Horse Mountain Trailheads

The "M" and Drinking Horse trailheads are located about four miles north and east of Bozeman's Main Street. Trail users completed a total of 250 surveys at these trailheads in August 2012. Approximately 40% of people reported they were somewhat likely, likely or very likely to use transit. These survey results show there is an interest in some form of transit/shuttle system to access recreation areas near Bozeman.



The following sections describe transit or shuttle systems from other communities.

## **PART II – Community Bus/Shuttle Systems**

**Bozeman, Montana Streamline Bus Service** – A brief overview of Streamline is provided here for comparison purposes with the other transit systems profiled here. Streamline is a rural general public transportation system (FTA Section 5311) established in 2007 and has an annual operating budget of \$1.5 million. Streamline provides approximately 325,000 rides per year, with students from Montana State University comprising nearly 50 percent of the riders. While Streamline does operate five roundtrips per day between Bozeman and Belgrade (a one-way distance of about 8 miles) and one roundtrip per day between Bozeman and Livingston (a one-way distance of about 30 miles), the majority of service is within the Bozeman city limits. During the winter, weekend service, consisting of five roundtrips per day, occurs between Bozeman and the Bridger Bowl ski area (a one-way distance of about 16 miles).

### **Helena, Montana Trail Rider Community Shuttle**

**Background:** The South Hills trail system, with over 70 miles of single track trail, is situated adjacent to the town of Helena, Montana’s capital city of nearly 30,000 residents. In 2001, a free weekend trolley service was established to deliver passengers from downtown Helena to the top of the Mt. Helena Ridge Trail, part of the South Hills trail system. The service operated from June through August and enabled recreationists to bike or hike the eight miles downhill back to downtown Helena. Due to wear and tear from dirt roads, the trolley was replaced in 2013 with a retired city bus and the program expanded service to five days per week, operating Wednesday through Sunday. Known as the “Trail Rider,” the bus can accommodate up to 30 passengers and is equipped with a 30-bike trailer. The Trail Rider shuttle is a free service.



*Figure 4: Trail Rider bus (photo from BikeHelena.com courtesy of Bob Allen images)*

**How it works:** Trail Rider service begins in downtown Helena on weekend mornings at 8:00, 8:40, and 9:20 am, June through mid-September; and on Wednesday, Thursday, and Friday evenings at 5:30 and 6:10 pm, June through August. The shuttle typically provides a one way trip, dropping people off at a nearby trailhead, where they can enjoy biking or hiking downhill to town. Trail Rider will occasionally drop passengers off further out of town at MacDonald Pass, where it also provides a return ride back to town. Shuttle schedule and trail maps may be found online at <http://www.bikehelena.com/index.php/trail-rider/> or <http://downtownhelena.com/explore/new-trail-rider/>.

The South Hills trail system is open for use by hikers, bikers, and horseback riders but is closed to motorized travel. Trail Rider is a truly collaborative effort between the Helena Business Improvement District (HBID), Helena Area Transit System (HATS), Helena Tourism Business Improvement District (TBID), and Bike Helena. Bike Helena, a TBID member, markets the shuttle, tracks ridership, and meets with partners - including the Helena biking community - each year to set the schedule. The shuttle is just one effort in promoting Helena as a mountain biking destination. The International Mountain Biking Association (IMBA) recognized Helena as a Bronze level National Ride Center in 2013 <https://www.imba.com/ride-centers/current/helena>.

A Memorandum of Understanding (MOU) was established between the Helena BID and the Helena Area Transit System (HATS) to lease the bus and provide services. Most of the drop off points are located on County road pull-offs, as there is not always space to turn the bus and trailer around at trailheads.



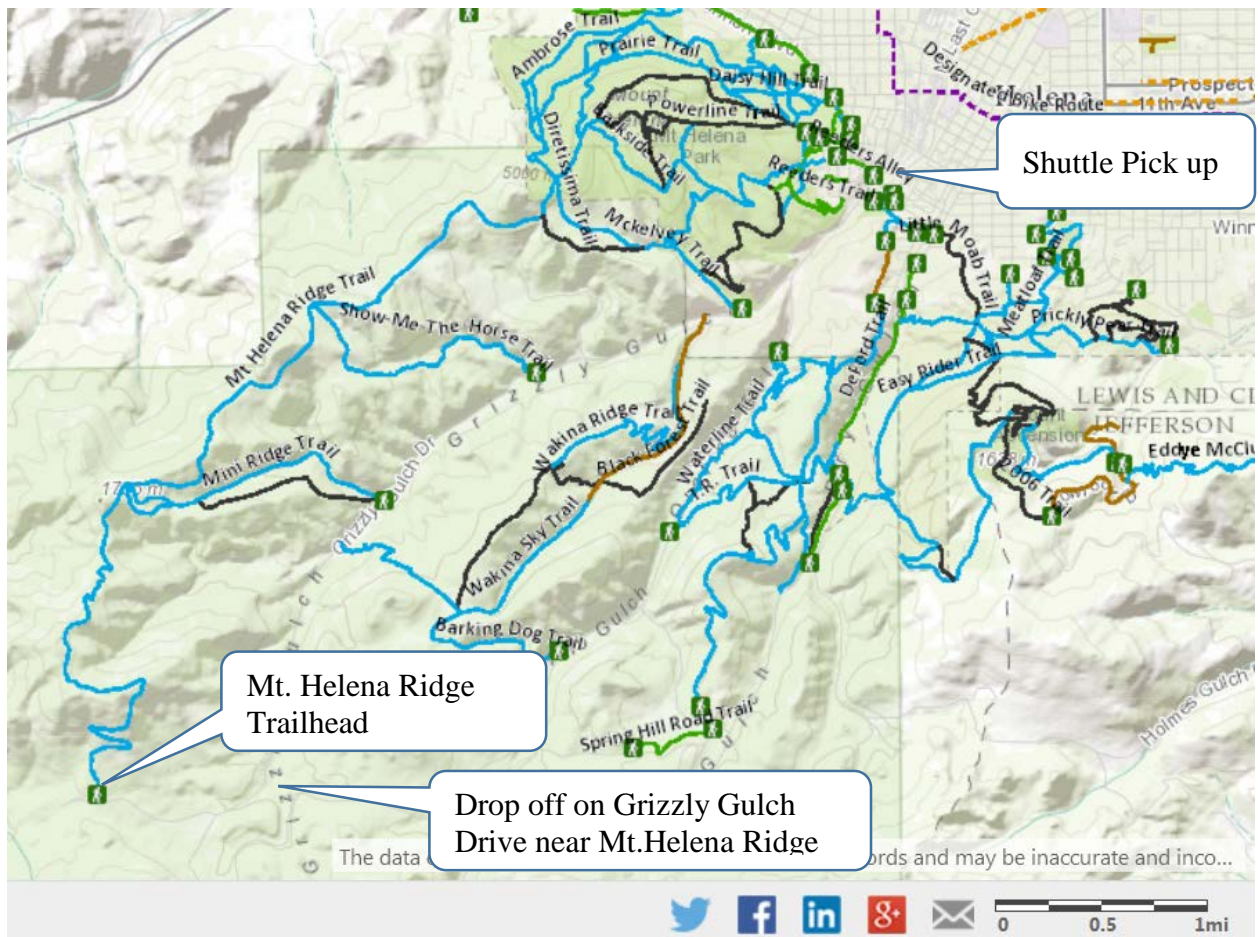


Figure 5: Helena's South Hills Trails and Shuttle Downtown Pick-up Location (map courtesy Google)

#### System Goal/ Community Benefits:

The goal of the Trail Rider shuttle is to make it easier for people to access Helena area trails for hiking, running, and biking. Program leaders say that about half of the riders are from Helena and half are visitors. Trail Rider benefits downtown Helena businesses by bringing people downtown to catch the shuttle. The weeknight routes make it convenient to ride or hike, then partake in one of the many summer weeknight downtown events. In 2014, over 1,700 people attended a brew fest combined with a shuttle fest. The shuttle helps disperse people to lesser known trails and reduces parking demand at trailheads. Organizers planned Trail Rider to first meet the needs of community members, and then made sure it worked well for visitors.

**Costs/ Business Model:** The system consists of one 30 passenger bus and a flatbed trailer that holds up to 30 bikes. The bus was retired from the City of Helena fleet, but is still owned by the City of Helena/Helena Area Transit system (HATS). The bike trailer expenses included purchase of a flatbed trailer (\$3,000) and improvements including straps/pads (\$500) and ramps (\$300).





Total trailer costs were \$3,800. Annual costs to operate the shuttle are in the ballpark of \$10,000, which covers drivers, fuel, bus/trailer maintenance and trailer insurance.

Downtown Helena businesses, HATS, the Helena BID, Tourism BID, and Bike Helena serve as Trail Rider sponsors. The Helena BID pays the City to operate the shuttle under an MOU with HATS. The City assumes driver insurance/liability and no dogs are allowed on the bus. Bike Helena and the TBID pay 50 percent of annual costs and the other 50 percent come from local businesses and the HBID. TBID is funded through Helena bed tax dollars. HBID is funded primarily through an additional tax that property owners in the district pay.

**Key Factors for Success:**

1. Passengers access the shuttle downtown, where they are likely to patronize local businesses. Approximately 30 downtown businesses sponsor the shuttle to help defray costs, keeping it free to users. Donations are encouraged to help with costs, as well.
2. Bike Helena organizers spent about a year reaching out to various stakeholders, land managers, and local groups before launching the system. The shuttle is a very successful example of a public/private partnership between the TBID, HBID, and local businesses.
3. A well maintained trail system adjacent to town was in place, in large part due to the Prickly Pear Land Trust. South Hills trails are located on a mix of City of Helena and U.S. Forest Service lands and provide a link to the Continental Divide. The Prickly Pear Land Trust has been hired by the city for the past 13 years to maintain existing trails and build new trails on city property. They have been contracted by the Forest Service to coordinate trail management activities in the South Hills and Continental Divide Trail ([www.pricklypearlt.org/trails/](http://www.pricklypearlt.org/trails/)).
4. This system was designed to meet the needs of the local community first and then to accommodate visitors. This approach encourages strong community support.

**Challenges:** Managers of the system say a common complaint is that the shuttle does not allow dogs.

In addition to online resources, Helena Trail rider information was provided by: Heidi O'Brien - Bike Helena; Pat Doyle - Montana State Parks (previously Bike Helena) and Tracy Reich - Helena Tourism BID.



## Jackson, Wyoming Southern Teton Area Rapid Transit (START)

**Background:** The START bus is a public transportation system that operates in the greater Jackson, Wyoming area. Since 1987, the system has operated as a Federal Transit Administration (FTA) Section 5311 provider (a rural, general-public, transit provider), and currently gives approximately 900,000 rides per year. The START system provides service to many areas in Jackson, including both the Snow King Mountain and Jackson Hole Mountain (Teton Village) ski areas. While the Snow King Mountain ski area is in the town of Jackson, the Jackson Hole area (Teton Village) is located approximately 12 miles outside of Jackson.

**How it works:** Transit service within Jackson, known as the “Town Shuttle,” provides service to Snow King Mountain ski area, among other places, and is fare-free. Service from Jackson to Teton Village (Jackson Hole Mountain Resort) is \$3 (one-way), and a season pass for the service costs \$125. Michael Wackerly, the General Manager for START, noted that employers at the Jackson Hole Mountain Resort pay for bus passes for their employees. In addition, when a person purchases a season pass for the Jackson Hole Mountain Resort ski area, they have the option to receive a bus pass, which is included in the price of their season ski pass. The “Grand Pass,” the season pass for the 2015-2016 ski season for an adult, is priced at \$1,760. If people choose not to ride the bus, they must pay fees to park a vehicle. Note that a 2015-2016 season pass at Bridger Bowl is \$599 if purchased before October 15 and \$749 if purchased at a later date. One reason why locals and employees ride the START bus to Teton Village is that there is limited parking, and people have to pay to park at the Jackson Hole Mountain Resort.

While the Teton Village route starts in Jackson, many people board the bus at the Village Road Transit Center, which is a park & ride facility at the intersection of WY-22 and WY-390, approximately 6.5 miles from Teton Village. This is due to the fact that many employees commute to work from places such as Hoback, Alpine and other communities that are more affordable than Jackson. The buses do not have provisions to carry ski and snowboard gear, people must carry their gear on the bus.

**System Goal/Community Benefits:** The Town of Jackson has a relatively small year-round resident population of about 10,000 residents, but the overall population is significant with the number of tourists and seasonal residents who come to ski in the winter, and/or bike (hike and raft) and visit Grand Teton National Park in the summer. The bus service acts as both an affordable commute for locals, and helps reduce congestion by getting visitors to where they want to go.

Commuter routes include the Star Valley route, which goes to Etna, WY, approximately 47 miles to the south-southwest of Jackson; and the Teton Valley route, which goes as far as Driggs, ID (about 33 miles to the northwest of Jackson).

**Costs/ Business Model:** START is a “joint powers authority,” as it was created by the Town of Jackson and Teton County. As noted previously, it is an FTA Section 5311 provider, and has a total of 30 buses of varying sizes. START has an overall annual operating budget of about \$3.5 million per year, with funding coming from the Federal Transit Administration (administered by the Wyoming Department of Transportation), Teton County, Town of Jackson, and fares.

**Key Factors for Success:** Factors that contribute to START’s success include strong local support, including both individual support and support from employers and County and City government. Additional factors include a population that is willing to use public transportation to get to the various destinations served by START.

An additional factor that leads to strong ridership is the fact that Teton Village (location of the Jackson Hole Mountain Resort) charges for parking in the winter (the peak season). Parking is managed by the Teton Village Association, and the pay parking provides a strong financial incentive for people to use transit to get to the area. Figure 5 shows the various parking lots at Teton Village.



*Figure 5: Parking Areas in Teton Village (Jackson Hole Mountain Resort), Wyoming*

Lot #1 is known as the Ranch Lot, and parking there was recently increased from \$5 per day to \$10 per day. A person with the Teton Village Association said that this change greatly increased the number of people carpooling to the Village, as those with three or more people in a car can park in the Ranch lot for free. The Ranch lot is the only lot that provides a discount or free parking depending upon the number of people in the vehicle. A person can also purchase a winter season parking pass in the Ranch lot for \$450.

Lot #2 is the Village lot, and it costs \$15 per day to park in this lot. Lot #3 is the Crystal Springs lot (also known as the “lower lot”) and it also costs \$15 per day to park there. Lot #4 is the Cody



lot (or “upper lot”) and the cost to park there is also \$15 per day. A person can purchase a winter season parking pass for Lots #2, #3 or #4 for \$750. It was noted that the prices charged for the various parking lots are reviewed on an annual basis. Finally, while there is a study underway investigating automated options for the pay parking lots, money is currently collected using parking lot attendants who collect cash or credit card payments from those parking in the lots.

**Challenges:** Transporting bikes during the summer is an issue. Buses have bike racks capable of carrying two bikes. Drivers are given the ability to allow bikes on the bus if there are not many people on the bus. Michael noted that they are trying to figure out how best to address the growing demand for bringing bikes on to the buses.

### **Aspen, Colorado (Roaring Fork Transportation Authority)**

**Background:** The Roaring Fork Transportation Authority (RFTA) has been in operation since 1983, and functions as a Regional Transportation Authority. The RTA includes the communities of Aspen, Snowmass Village, Pitkin County, Basalt, a portion of Eagle County, Carbondale, Glenwood Springs and New Castle.

**How it works:** RFTA provides year-round service, which provides access to the ski areas (mountains) surrounding Aspen, as well as access to camp sites, hiking trails and bike paths in the summer. RFTA currently operates a fleet of over 82 vehicles and gives about 4.5 million rides annually. Many of the riders on RFTA work in Aspen, although they commute from towns as far away as Rifle, which is about 70 miles (one-way) from Aspen.

In an effort to try to accommodate the number of cyclists during the summer, RFTA created the Bike Express in 2008, a system that uses buses that are capable of carrying a total of 14 bikes, 12 within the bus and two on the bike rack on the front of the bus. There have been several iterations of the service, and for summer 2015, the service provides seven one-way scheduled runs between Aspen and Carbondale, a one-way distance of approximately 30 miles. Figure 6 provides detailed information about the Bike Express service, and Figure 7 provides information on how the bikes fit within the bus.

**Community Benefits:** RFTA benefits two distinct groups, the “locals” who live in the greater Aspen area, including those who commute from distances of nearly 70 miles away, and tourists who ride the bus to the various ski areas and other recreational sites near Aspen. RFTA provides an affordable commute for those who use the system to get to and from work, and reduces congestion by getting both commuters and tourists out of their cars and on the bus.

**Costs/ Business Model:** The overall budget for RFTA’s transit operations is just over \$30 million per year. The majority of funding for RFTA comes from sales and use taxes from the eight

jurisdictions that are members of the Regional Authority and service contracts (these funds equate to about 75% of the budget). The balance comes from operating revenue (fares, etc.) which are about 12% of the budget, grant revenue (Federal and State grants), other local government contributions, as well as miscellaneous revenue (each of the three sources being approximately 4% each of the revenue).

**Key Factors for Success:** RFTA's success is based on support from local governmental entities (the counties and towns it serves), local residents, and tourists. RFTA also has support from large employers, whose employees use the service to commute between their homes and jobs.

**Challenges:** Carrying bikes on buses is an issue, as RFTA's newer buses have capacity for just two bikes on an exterior bike rack and demand frequently exceeds capacity. RFTA staff report that they have not yet found the "sweet spot" with the Bike Express service, and that more input is needed from bicyclists, bike shops and other constituents to create a service that meets user needs.

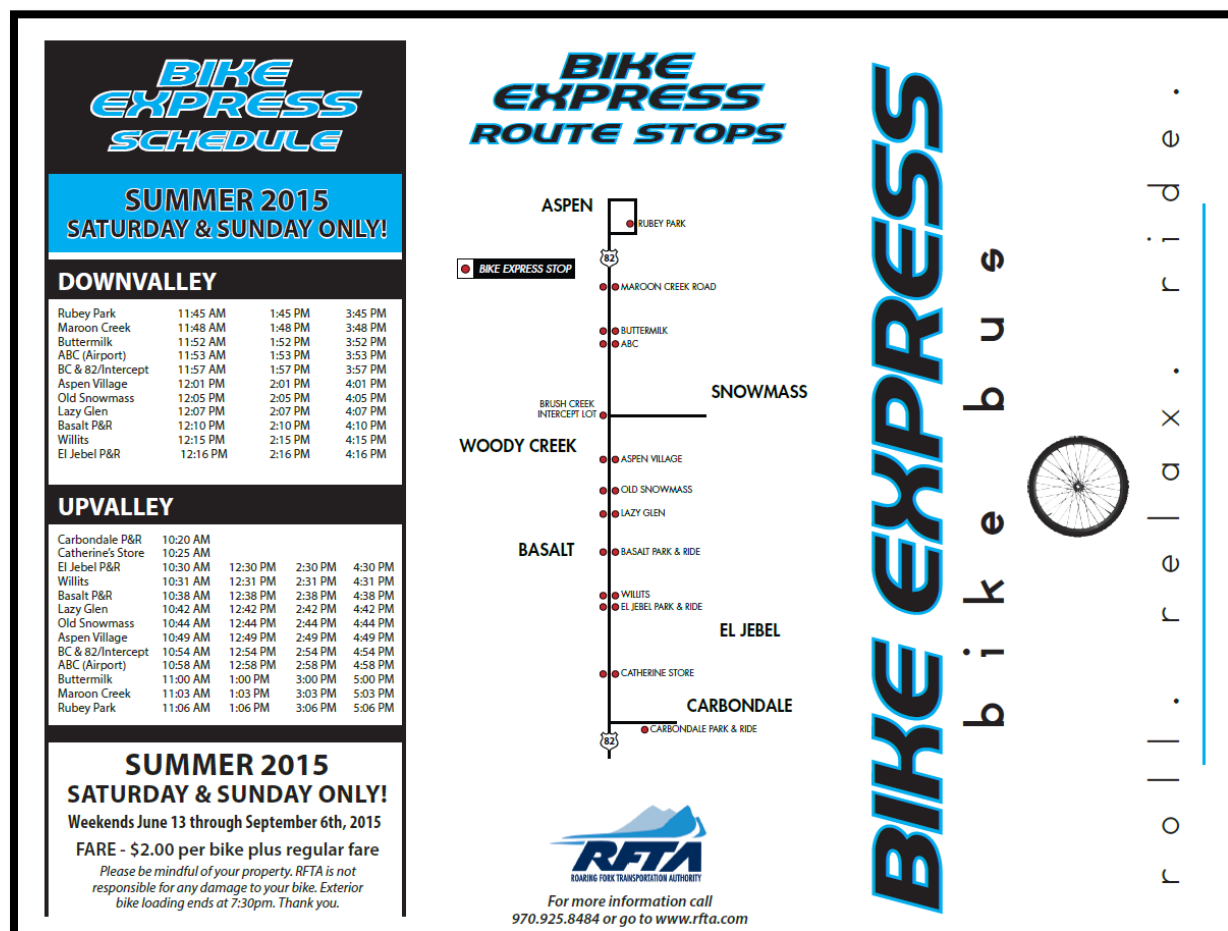


Figure 6: Information on RFTA's Bike Express Service (Source: RFTA website)



As noted on the Bike Express schedule (Figure 6), in addition to paying a regular fare, people who bring their bikes on the bus, must pay an additional \$2. The additional fee of \$2 is also paid for any person who wants to put their bike on any of RFTA's buses/routes. RFTA's website provides the following information about using the bike racks on buses, "Only people capable of loading and unloading their own bikes will be allowed to use the bike racks, unless accompanied by an adult who is capable of assisting. The driver is not in a position to assist."

## BIKE EXPRESS

RFTA IS VERY EXCITED to introduce our Bike Express! This bus is specially designed for bike riders wishing to travel up and down the Roaring Fork Valley. Half of the bus contains seats for bike commuters and the other half provides special racks for the secure transport of your bike. We are confident that the Bike Express will allow you to safely and quickly transport your bike up and down our valley so that you can commute to work or enjoy the many miles of the Rio Grande Trail.

### LOADING INSTRUCTIONS

- Enter the bus through the front door.
- Pay fare
- Proceed to the rear most available rack
- Use CAUTION at all times when moving down the aisle



1. Raise rack by pressing on the release button.



2. Raised position.



3. Place front wheel of bike in rack.



4. Slide rack down firmly on front tire.



5. Move rear tire and place on yellow line.



6. Properly position your bike.

- After securing your bike, find a seat in the rear of the bus
- RFTA is not responsible for any damage or loss of personal item on the bus

### AT YOUR DESTINATION

*Simply lift slide to release your bike.*

- Exit through the rear of the bus
- Use caution when stepping down to the curb.
- Move at least 5 feet away from the bus quickly after unloading.

Figure 7: RFTA's Bike Express Brochure

## Park City, Utah Transit System

**Background:** Park City is a ski town with about 7,600 residents located 32 miles southeast of downtown Salt Lake City. The tourist population typically greatly exceeds the number of permanent residents. In 2011, the town was awarded a Gold-level Ride Center designation, one of only four Gold-level centers in the country, from the International Mountain Bicycling Association.





**How it works:** Park City Transit provides a fare-free year-round service, with access to the ski areas surrounding Park City, as well as to hiking trails and bike paths in the summer. The front of the buses are equipped with racks that can hold up to 3 bikes. Bikes are allowed inside the buses as well, at the drivers' discretion.

**Challenges:** Recently, due to articles in mountain biking magazines and other press, more people are bringing mountain bikes on these free buses to access local trails. The demand is exceeding capacity. Some bus drivers allow a few bikes on the bus, while other drivers allow many bikes onto the bus. Park City Transit is figuring out how to deal with increased interest in bikes on buses. This case study did not appear to have any more unique aspects that would inform this project, thus researchers did not pursue further information.

### **Reds Meadow/Devils Postpile Shuttle**

The Eastern Sierra Transit Authority (ESTA) runs a seasonal (summer) shuttle service from Mammoth Mountain to the Devils Postpile National Monument. This is a mandatory shuttle service, similar to the system at Zion National Park. This mandatory system works primarily due to the fact that there is only one road (a dead-end road) at Devils Postpile, so visitors must return through the same location where they entered the Park. Shuttle bus tickets are \$7.00 for adults, \$4.00 for children over the age of 3, and children 2 and under are free.

The distance from the main boarding area (stop) at Mammoth Mountain to the furthest stop at Reds Mountain Resort is approximately 10 miles. However, due to sharp turns and steep terrain, it takes 45 minutes for the bus to travel that distance. The service operates from 7 am to 7 pm, with hourly headways from 7 am to 9 am, then 20 minute headways from 9 am to 5 pm, and then 30 minute headways from 5 pm to 7 pm. During peak service, 9 to 10 buses may be in service on the route.

There are bike racks on the front of the buses that can hold up to three bikes. If there is room inside the bus, a driver can allow someone to bring a bike on the bus. However, if the bus is full of people, a person with a bike will have to wait for the next bus if the bike rack on the front of the bus is full. In addition to bringing bikes on the bus, this shuttle and all of ESTA's services are unique in that they allow dogs on the buses. Dogs must either be in a kennel/carrier that fits on the riders lap, or must be leashed and *muzzled*. The person at ESTA noted that allowing dogs on the bus requires additional training for the drivers, and that riders need to be educated about the rules regarding having their dogs muzzled and leashed while on the bus.

The seasonal shuttle service typically begins in mid-June, subject to the road opening (clearing of snow), and runs until three days after the Labor Day holiday.

### PART III – Potential Shuttle Schedule and Cost Estimate

Table 1 presents a possible schedule for transit access to trailheads in Hyalite/Gallatin Front. Table 2 provides a cost estimate for the potential service that assumes a program would use an existing 35 passenger Streamline Bus at the standard rate of \$65/hour, which covers driver and fuel costs. The cost estimate does not include costs for a trailer to haul bikes or other gear.

*Table1: Possible Schedule for Hyalite Shuttle Service*

			<b>Trip 1</b>	<b>Trip 2</b>	<b>Trip 3</b>
<b>Location</b>	<b>Distance</b>	<b>Travel time (minutes)</b>	<b>Time</b>	<b>Time</b>	<b>Time</b>
<b>From Town</b>					
Downtown Transfer (Mendenhall and Black)	0	0	8:45 AM	11:20 AM	2:20 PM
MSU Strand Union	1.5	5	8:55 AM	11:30 AM	2:30 PM
Sourdough Trailhead	5.9	15	9:15 AM	11:50 AM	2:50 PM
Hyalite Reservoir	14.6	35	9:55 AM	12:30 PM	3:30 PM
<b>From Hyalite</b>					
Hyalite Reservoir	0	0	10:00 AM	12:40 PM	3:40 PM
Sourdough Trailhead	14.6	35	10:40 AM	1:20 PM	4:20 PM
MSU Strand Union	5.9	15	11:00 AM	2:00 PM	4:40 PM
Downtown Transfer (Mendenhall and Black)	1.5	5	11:10 AM	2:10 PM	4:45 PM

*Table 2: Cost Estimate for Potential Hyalite Shuttle Service*

<b>Hyalite Sat/Sun Shuttle Service (mid-June- early Sept)</b>	<b>Assume 13 weekends/ 26 days in season</b>
<b>Item</b>	<b>Streamline 35 passenger bus</b>
Cost per hour	\$65.00
Bus Capacity (passengers)	35
Round trip downtown Transfer to Hyalite Reservoir (minutes)	120
Round trip to Hyalite Reservoir (hours)	2
<b>Cost Analysis</b>	
<b>1 trip per day (35 people)</b>	
hours per day	2.25
# of buses	1
Cost per Day	\$146.25
Cost per Season (26 days)	\$3,802.50
<b>2 trips per day (70 people)</b>	
hours per day	4.5
# of buses	1
Cost per Day	\$292.50
Cost per Season (26 days)	\$7,605.00
<b>3 trips per day (105 people)</b>	
hours per day	7
# of buses	1
Cost per Day	\$455.00
Cost per Season (26 days)	\$11,830.00



## References

WTI, 2013. Alternative Transportation Survey for Visitors to federal Lands near Bozeman, Montana, 2012. This report is Appendix A within the DJA Report - MT Highway 86 Alternative Transportation Study & Hyalite Canyon Recreation Area Assessment.

## Appendix 4-2

### Hyalite Canyon Data



## Memorandum

To: Peter Walker-Keleher, DJA

From: Rebecca Gleason, WTI

Date: 8/28/15

RE: Bozeman Area Alternative Transportation Study: Task 3.1 Existing Hyalite Canyon Data

This work is one part of an alternative transportation study to assess bus or shuttle options to access public lands near Bozeman, Montana. This task evaluates existing traffic data to identify trends for summer weekend/ weekday traffic on Hyalite Canyon Road. It reviews 2012 visitor survey results and other relevant documents. It is intended to identify parking and other transportation issues for accessing Hyalite canyon recreation areas and summarizing available data.

### **Hyalite Canyon parking/transportation areas of concern**

Based on conversations with the Forest Service (FS), the three most problematic parking areas in Hyalite Canyon are:

1. Hyalite Reservoir day use parking area (at dam)
2. Grotto Falls/Hyalite Creek parking area
3. Palisades Falls parking area

FS staff have observed that it is common for these parking areas to fill up on busy days, causing overflow parking outside designated parking lots. While researchers are not aware of any formal parking studies on the area, some anecdotal information exists. A WTI researcher who spent two days at the Palisades Falls trail observed that on Saturday, August 11, 2012, trail-users didn't arrive until 10:00 am, and by 12:30 PM the parking lot was full with limited turnover thereafter. When he left at 3:00 pm, people were parking out toward the road, though no one was actually parked on the road. Traffic congestion generally does not appear to be an issue along Hyalite Canyon Road at this time.

### **Alternative Transportation Survey for Visitors to Federal Lands near Bozeman, Montana – August 2012.**

Some visitor information exists for Hyalite Canyon. WTI conducted surveys in the summer of 2012 to learn about trail user attitudes on alternative transportation options to access Hyalite canyon. Hyalite Canyon users completed 158 surveys, representing groups with 435 adults (71%) and 179 children (29%) for a total of 615 people. Surveyors approached every group when possible at each trailhead and asked if one member from each group would complete a survey. Most respondents (65%) reported they did not travel with a pet. 49% of groups consisted of three or more people, 34% had two people, and 16% had one person. Almost all groups (95%) used a motor vehicle to access Hyalite Canyon. 33% of respondents reported they arrived with 2 people per vehicle, 20% reported 3 people and 18% reported one person per vehicle. Hyalite Reservoir was reported as the most frequently used location in the Hyalite Canyon area followed by Hyalite Creek/Grotto Falls, History Rock and East Fork Hyalite



Creek/Emerald Lake trail. One survey question asked “If there were a bike path available from Bozeman to the Hyalite Canyon Reservoir, how likely is it that you would bike to the Hyalite Canyon area?” Approximately 55% of 157 respondents reported they were likely to bike if a bike path were available to Hyalite Canyon. If a transit (bus) service existed between Bozeman and the Hyalite Canyon Reservoir, approximately 53% of respondents reported they were at least somewhat likely to use it. Saturday and Sunday are the most popular days for Hyalite Canyon visits. More details on the survey may be found in the report in Appendix A of *Montana Highway 86 Alternative Transportation Study & Hyalite Canyon Recreation Area Assessment*, DJ&A 2013.

#### Existing Motorized Traffic Data on Hyalite Canyon Road

DJ&A collected average daily traffic (ADT) volume data using pneumatic tubes, as shown in Table 1. Data collection methods may be found in *Montana Highway 86 Alternative Transportation Study & Hyalite Canyon Recreation Area Assessment*, DJ&A 2013. It should be noted that traffic data gives an indication of the number of visitors, though not an exact number due to factors such as multiple people in a car or overnight car stays. The ADT values shown below are for vehicles heading up the canyon.

Table 1: July, October and December Average Daily Traffic 2012

Location	ADT July		ADT October		ADT February	
	7/11/12- 7/16/12		10/03/12-10/08/12		2/16/12-2/17/12	
	weekday	weekend	weekday	weekend	weekday	weekend
1. Hyalite Road after entrance kiosk	536	923	189	508	81	478
2. Hyalite Road after Langhor Road	459	795	139	340	na	na
3. Hyalite Road after day -use area at Dam	334	555	95	219	250	630
4. Hyalite Road after fork/ Palisades Road intersection	102	223	42	90	na	na
5. Palisades Road after fork/ Hyalite Road intersection	118 up	185	33	77	na	na
6. Horsetail Falls/ Emerald Lake Road	45	64	15	35	na	na

It should be noted that this data represents only a few days of traffic per season and may not be indicative of actual traffic volumes over time. The Forest Service and Friends of Hyalite



collected continuous data over a longer time period (various periods in various location between June 2013 and August 2014) using TRAFx counters. Tables 2 through 5 show average daily traffic (ADT) in summer and winter at various locations based on this continuous data. Fall data was not available, due to calibration issues. April and May motorized traffic data were not collected, because the road is closed to motorized use for much of the spring.

Table 2 shows that summer traffic near the Hyalite entrance kiosk ranges from 477 to 589 on weekdays up to about 1,000 vehicles on weekends. This is consistent with DJ&A data in Table 1, showing summer weekday ADT of 536 and weekend ADT of 923.

**Table 2: Summer daily average traffic June 2013 through August 2013 (after entrance kiosk)**

Location	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Hyalite Road after entrance kiosk	477	504	517	537	589	892	1008

Table 3 shows that winter traffic is lower than summer traffic near the entrance to Hyalite Canyon. Winter weekday ADT ranges from 130 to 173, while weekend ADT ranges from 359 to 390. In comparison, DJ&A winter data in Table 1 has a lower weekday ADT at 81 and a higher weekend ADT at 478. It should be noted that the winter data in Table 1 is based on only 2 days, February 16 and 17, 2012. The winter data in Table 3 is based on weekends over a four month period.

**Table 3: Winter average daily traffic Dec 2012 through March 2013 (after entrance kiosk)**

Location	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Hyalite Road after entrance kiosk	137	137	130	142	173	390	359

Table 4 shows traffic volumes further up Hyalite Canyon above the dam. Traffic volumes generally decrease the further one drives into the drainage, but are still relatively high at over 700 on weekends. In comparison, DJ&A summer data from Table 1 shows weekday ADT at 334 and weekend ADT at 555 near the dam.

**Table 4: Summer average daily traffic June, July and August 2014 (above the dam)**

Location	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Hyalite Road above the dam	338	361	371	388	490	726	712

Table 5 shows traffic volumes further up the Canyon on the Grotto Falls/Hyalite Lake Trailhead Road past where the road forks. In comparison, DJ&A summer data from Table 1 shows weekday ADT at 102 and weekend ADT at 223 on Hyalite Road past the fork.

**Table 5: Summer average daily traffic June 14-30, July and August 2014 (Grotto Falls Road)**

Location	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Hyalite/Grotto Falls Road after intersection	183	166	182	188	227	386	360

#### **Non-motorized Traffic Data on Hyalite Canyon Road**

WTI set up a video camera on Hyalite Canyon Road near the entrance kiosk in May 2015 for a week when the gate is closed and there is no access to motorized vehicles. Video was reviewed to count the number of people biking and walking up the roadway, a short distance uphill from the gate. Results are shown in Table 7. These counts occurred during daylight hours. They demonstrate there is a lot of interest in walking and biking on the road when it is closed to motorized use. Wednesday had higher use than other days, which is likely due to nice weather with clear skies and warm temperatures.

**Table 6: Bicycles and Pedestrians on Hyalite Canyon Road May 9-15, 2015**

	Sat 5/9/15	Sun 5/10/15	Mon 5/11/15	Tues 5/12/15	Wed 5/13/15	Thurs 5/14/15	Fri 5/15/15
# of pedestrians and cyclists	155	147	127	48	237	84	100
High temp (degrees F)	54	57	63	59	69	61	61
Low temp (degrees F)	32	27	24	42	40	39	40
Precipitation	0	0	0	0.44	.02	.07	.13

**2013 Hyalite Canyon Winter Use Study (conducted by Lacy Gray and Bryan Haywood)**

This study was intended to understand user perceptions of road plowing management decisions and use patterns in Hyalite Canyon in the winter. Hyalite Canyon road has been plowed in the winter since 2007. This study summarizes data from traffic counters at five locations in Hyalite Canyon between January and March 2013. Table 6 shows the continuous winter traffic counts. This winter traffic data is summarized by weekday and weekend ADT in the previous sections.

**Table 7: Total Traffic on Hyalite Canyon Road in January, February and March 2013**

Location	January 2013	February 2013	March 2013
1. Hyalite Road after entrance kiosk	6,397	6,503	5,865
2. Hyalite Road after Langhor Campground and Moser Trailhead	5,775	5,625	5,335
3. Hyalite Road after Blackmore Parking area	4,545	3,865	4,332
4. Hyalite Road after Hood Creek Campground	2,283	2,013	2,449
5. Hyalite Road after East Fork Gate	1,687	1,548	1,328

# Appendix 4-3

## Hyalite Mode Shirt Analysis



## Memorandum

To: Peter Walker-Keleher, DJA

From: Rebecca Gleason and David Kack, WTI

Date: 10/13/15

RE: Bozeman Area Alternative Transportation Study: Task 3.2 Hyalite Mode Shift Analysis

This work is one part of an alternative transportation study to assess shuttle options to access recreation sites on public lands near Bozeman, Montana. This memo provides a mode shift analysis to consider how bus service may reduce traffic and help mitigate parking issues in Hyalite Canyon. The analysis presents potential schedules and cost estimates to shift people from driving to riding a bus. This analysis is focused on weekend service, and makes the following assumptions:

- There are a maximum of approximately 1,000 motor vehicles driving to Hyalite on a peak summer weekend day with an average of approximately two people per car (2,000 people). This estimation is consistent with recent summer traffic counts and vehicle occupancy observations in Hyalite Canyon [see Task 3.1 Memo for more information].
- The hypothetical schedules below allow for bus service that would reduce car traffic by 3.5% (35 cars, 70 people), 5.2% (52 cars, 105 people), or 7% (70 cars, 140 people)
- Schedules assume a 35-passenger Streamline bus that is full. If buses ran at 75% capacity with the schedule below, car traffic would be reduced by 2.6% (26 cars, 52 people), 3.9% (39 cars, 78 people), or 5.2% (52 cars, 104 people).

The potential schedules for the trips both up to and back from Hyalite are as follows:

<b>3.5% (35 cars, 70 people) to Hyalite</b>	<b>5.2% (52 cars, 105 people) to Hyalite</b>	<b>7% (70 cars, 140 people) to Hyalite</b>
8:30 AM	8:30 AM	8:30 AM
10:30 AM	10:30 AM	10:30 AM
	12:30 PM	12:30 PM
		2:30 PM
<b>Return to Bozeman</b>	<b>Return to Bozeman</b>	<b>Return to Bozeman</b>
11:30 AM	11:30 AM	11:30 AM
1:30 PM	1:30 PM	1:30 PM
	3:30 PM	3:30 PM
		5:30 PM

This schedule does not show the trips when the bus returns empty to Bozeman or Hyalite. For example, for the first schedule, the bus would deadhead (return empty) from Hyalite at 9:30 am in order to be back in Bozeman to pick people up at 10:30. Then at 12:30 pm, the bus would deadhead from Bozeman to Hyalite in order to be at Hyalite for the last pickup at 1:30. When using a cost factor of \$65 per hour for Streamline, and estimating a one-way trip from Bozeman





to the Hyalite Canyon Reservoir at one hour, the cost estimates to shift people driving cars to riding a bus are as indicated in the following tables.

Percent Shift	Daily Cost	Summer Season Cost (13 Weekends)
3.5% (35 cars, 70 people)	\$390	\$10, 140
5.2% (52 cars, 105 people)	\$520	\$13,520
7% (70 cars, 140 people)	\$650	\$16,900

Weekend service assumes 13 weekends or 26 days of service. It should be noted that Streamline may not have enough buses for this type of service/schedule, and actual costs may be higher than noted. The table below provides more details of the analysis.

**Car to Bus Mode Shift Cost Analysis (Weekend Service)**

Item	Streamline
Cost per hour	\$65.00
Bus Capacity (passengers)	35
Round trip (hours)	2
Assumes 1,000 cars/day with 2 people per car	
<b>3.5% (30 cars, 70 people)</b>	
# of one-way trips needed	6
hours per day	6
# of buses needed	1
Cost per Day	\$390.00
Cost per summer Season (26 weekend days)	\$10,140.00
Cost per person per day	\$5.57
<b>5.2% (52 cars, 105 people)</b>	
# of one-way trips needed	8
hours per day	8
# of buses needed	1
Cost per Day	\$520.00
Cost per summer season (26 weekend days)	\$13,520.00
Cost per person per day	\$4.95
<b>7% (70 cars, 140 people)</b>	
# of one-way trips needed	10
hours per day	10
# of buses needed	1
Cost per Day	\$650.00
Cost per summer season (26 weekend days)	\$16,900.00
Cost per person per day	\$4.64

# Appendix 4-4

## Hyalite Biking Connections



## Memorandum

To: Peter Walker-Kelleher, DJA

From: Rebecca Gleason and Taylor Lonsdale WTI

Date: 12/9/15

RE: Bozeman Area Alternative Transportation Study: Task .3.3 Identify Biking Connections from Hyalite.

## Background

This task identifies potential connections from existing mountain biking areas in Hyalite Canyon back to town and discusses some issues with the existing trail network. There are a number of dirt roads and trails that connect Hyalite Canyon to adjacent drainages, allowing people to bike from Hyalite Canyon back to Bozeman. It is not uncommon for mountain bikers to park a vehicle at Hyalite and bike existing roads and trails back to town, then drive back up to pick up their vehicle. The road over Hyalite Reservoir is at about 6700 feet above sea level. Bozeman is about 1900 feet lower at about 4800 feet, making it primarily a downhill ride.

This section identifies potential connections from existing mountain biking areas in Hyalite Canyon back to town and discusses some issues with the existing trail network. There are a number of dirt roads and trails that connect Hyalite Canyon to adjacent drainages, allowing people to bike from Hyalite Canyon back to Bozeman. It is not uncommon for mountain bikers to park a vehicle at Hyalite and bike existing roads and trails back to town, then drive back up to pick up their vehicle. The road over Hyalite Reservoir is at about 6,700 feet above sea level. Bozeman is about 1900 feet lower at about 4800 feet, making it primarily a downhill ride.

Support for biking trail connections in the Hyalite area are demonstrated in the 2006 Gallatin National Forest Travel Management Plan. Objective 1-2 states "Provide a system of 2 to 6 mountain bike loop trails linking Hyalite Canyon to the Bozeman Creek and Cottonwood Creek drainages". Goal number 2 stated in the Greater Gallatin Trails Visioning document (February 2014) is to "Plan, fund and develop trails and amenities for the Greater Gallatin area to meet the demand of targeted users and visitors while respecting and conserving natural resources, systems and processes." Improving the existing system of trail and dirt road connections between Hyalite and Bozeman for mountain bikers that want to ride back to town is consistent with these goals.

This report includes a case study highlighting the success of the Helena Trail Rider Shuttle. When analyzing how a similar model could be implemented for mountain biking in Hyalite Canyon it is important to recognize the differences between the South Hills Trails in Helena and the system of trails in Hyalite Canyon. The following list characterizes Hyalite area trails and presents some differences between the Helena area and Hyalite area trail systems.

- One key factor for Helena's Trail Rider Shuttle success, is the presence of a well maintained trail system adjacent to town. This allows a one-way shuttle, where

people are dropped off at trailheads and can hike, run or bike approximately 8 miles back to Helena. The Prickly Pear Land Trust actively maintains existing trails and builds new trails in public lands near Helena.

- The distance from Hyalite Canyon Reservoir back to Bozeman is about 20 miles, significantly longer than Helena's S. Hills shuttle.
- While there are volunteer organizations that work on various local trails, there is not a designated organization that manages and maintains Hyalite area trails. Some of the trails in Hyalite are overgrown, have drainage/erosion issues, and lack wayfinding signage to ensure successful navigation of the sometimes confusing network of trails and roads.
- There are high elevation mountain peaks reaching over 9400 feet, between Hyalite, Bozeman and S. Cottonwood Cr. Drainages, so it is not all a downhill ride.
- There is a greater chance that people will encounter bear, moose and other potentially dangerous wildlife in areas between Hyalite and Bozeman than on Helena area trails.
- Some Hyalite area trails and roads are near areas where recreational shooting is common, which may pose potential safety issues for people hiking and biking on nearby trails.
- Some Hyalite area trails and roads have illegal trash dumping making them unattractive places to ride.
- The speed difference between people hiking and biking can make hikers nervous and could result in collisions. Having more stacked loop trails and various options can provide opportunities for better accommodate different types of users.

Visitors new to the area and others that are dropped off by a shuttle to bike back to town need to be aware of the above mentioned issues, so they can be prepared for a safe and fun experience.

### **Opportunities**

Based on stakeholder input on Hyalite area shuttles and to align with intent of the Bozeman Area Alternative Transportation Study there is reason to identify opportunities to connect the mountain biking areas in Hyalite to Bozeman. There are several potential benefits to improving on the existing system of dirt roads and trails between Hyalite Canyon, Bozeman Creek and S. Cottonwood Cr. Providing a well-connected, well maintained and well signed network of trails and roads has the potential to disperse people and take pressure off of heavily used parking

areas and trails in Hyalite Canyon. It can provide high quality routes that would allow people dropped off by a shuttle to bike on trails back to town.

#### **Potential Routes between Hyalite Canyon and Bozeman Creek**

There are three main corridors connecting Hyalite Canyon to Bozeman Creek that could be considered for shuttle drop off points for a one-way bike ride back to town. From the Bozeman Cr. trailhead, downtown Bozeman is a 6 mile ride downhill on existing roads.

1. Moser Creek Road is the closest to town, located approximately 5.5 miles from South 19th along Hyalite Canyon Road. From Moser Cr. Road there are several existing roads and trails that can be linked to connect back to town. Using existing roads to Bozeman Cr. trailhead from Moser is an approximately 11 mile ride.
2. Lick Creek Road is located about 8.5 miles from South 19th along Hyalite Canyon Road.
3. Hyalite Reservoir is located 10 miles from South 19th . From the Reservoir, bikers could ride Hood Creek connecting to Lick Creek and Wild Horse trails, which all connect to Bozeman Creek. Parts of these trails are very steep and extremely difficult to ride.

#### **Potential Routes between Hyalite Canyon, Leverich Canyon and Kirk Hill**

Moser Creek road has connections via FS roads to both Leverich Canyon and Kirk Hill areas. While the Kirk Hill trail system is not located on Forest Service lands and is not open to bicycles, trails could be better integrated with FS lands to the south. Kirk Hill trailhead is about 7.5 miles from downtown (E. Main and Black). Leverich Canyon trailhead is about 9 miles from downtown.

#### **Potential Routes between Hyalite Canyon and S. Cottonwood Creek**

Trail connections exist from Langhor Campground and History Rock to S. Cottonwood Creek that could be improved. The current trail from History rock to S. Cottonwood is very steep and rocky in places, which means the trail is only bike-able in the downhill direction. One or two loop trails that allow for 2-way travel between these two drainages would improve connectivity. A portion of the existing History Rock trail is within the wilderness study area boundary. The S. Cottonwood Creek trailhead is 14 miles from downtown Bozeman, most of it a downhill ride.

# Appendix 5-1

## Shuttle Focus Group Summary





## Memorandum

To: Peter Walker-Keleher, DJA

From: Rebecca Gleason and Taylor Lonsdale, WTI

Date: 8/13/15

RE: Bozeman Area Alternative Transportation Study: Task 2.6 Shuttle System Funding Options

This work is one part of an alternative transportation study to assess shuttle options to access recreation sites on public lands near Bozeman, Montana. This memo is intended to provide information on potential funding options for a recreational shuttle system in the Bozeman area. WTI organized a focus group meeting to discuss potential options and funding sources for a recreational shuttle to access public lands near Bozeman. The following people attended the meeting from noon to 1:30 on Friday, July 24, 2015.

1. Kelly Pohl- Gallatin Valley Land Trust
2. Joe Josephson – Friends of Hyalite
3. Carl Solvie- member of the Bozeman Tourism Business Improvement District Board and representative of the Best Western GranTree Inn
4. Wendi Urie- Custer-Gallatin National Forest Recreation Planner
5. Lee Hazelbaker- HRDC, Director Streamline/Galavan
6. Taylor Lonsdale - WTI
7. Rebecca Gleason – WTI

Several other people were invited, but were unable to attend as listed at the end of this memo.

WTI gave a 20 minute presentation that covered the following topics:

1. Background and purpose of the Bozeman Area Alternative Transportation Study;
2. 2012 Visitor Survey results related to shuttle use;
3. Helena Trail Rider Community Shuttle Case Study; and
4. Sourdough Canyon- Hyalite Shuttle Service –potential schedule/ cost estimate. (Attachment A was given to the group for reference during this topic).

After the presentation, Rebecca and Taylor led an hour-long discussion based on the following questions:

1. What are your thoughts on the need for a summer recreational shuttle in the Bozeman area?
2. What do you think should be goals for a Bozeman area Recreational Shuttle System?
3. Who would a shuttle benefit?
4. Who might take a lead role to create a shuttle system?
5. Who might be key stakeholders in developing a shuttle system?
6. What do you think about the proposed schedule and route? (Would people want a one way ride to Hyalite? Would they bike back to town? )
7. What are your thoughts on a business model similar to the Helena Shuttle? What other options might work?
8. How might you or your business support a shuttle?
9. What are next steps?



The following notes summarize the discussion.

**What are your thoughts on the need for a summer recreational shuttle in the Bozeman area?**

Carl asked if a shuttle might pick people up at hotels. The GranTree currently has 2 vans that are busy around town, mostly in city limits and do not have time to drive people to trailheads. Airline crews and other hotel guests often do not have cars and would like to access trailheads. He often hears requests to reach the “M” Trail. Carl noted that he thought the demand probably exists for a shuttle and that weekday and weekend days are no different from the tourist perspective.

Joe thinks there is demand for a Hyalite area shuttle. He estimates 80,000 people per month use Hyalite in the summer. Many of them are tourists that seek out the waterfalls. Palisades and Grotto Falls are popular tourist destinations. Many locals park at Hyalite reservoir on hot weekends and participate in water sports. They are unlikely to take a shuttle with all of their gear. People with access to a car will drive, it will be difficult to get them on a bus as they likely want to go to Hyalite, do their thing, and return on their schedule.

Wendi mentioned the Madison River shuttle run by Bill Zell at Montana Whitewater is very successful at getting people to ride a shuttle rather than drive.

What happens if the weather is bad or someone gets left up Hyalite Canyon by the bus? There is currently no cell phone service in Hyalite Canyon. Will people have to sign a waiver before getting on the bus? Lee mentioned that with the Livingston Streamline route, people guarantee themselves a ride home from Bozeman by leaving their phone number with the bus driver. There could be a similar system where people have to sign in and leave a contact number.

Another concern about a bus is concentrating too much use in one place. It was discussed that dropping people at the Reservoir allows access to many different activities (water, Mt. Blackmore and other nearby trailheads, bike road back to town...).

**What do you think should be goals for a Bozeman area Recreational Shuttle System?**

Wendi would like to see a system to minimize parking issues at Palisades Falls and other busy lots (Hyalite Reservoir). Wendi expressed that the goal should be to replace existing personal vehicle trips and not focus on adding users that are not currently accessing Hyalite.

There was a brief discussion about how bus use has steadily grown for Bridger Bowl each year. Could a summer trailhead bus start small and adjust to needs to grow in a similar way?

What about winter use? Joe estimated Hyalite winter use at 20,000 people per month. The people are not concentrated in one place, but spread out in various locations. He thinks ice climbers would love to fly into Bozeman and be able to access Hyalite in winter without having to rent a car.

Shooting is popular in Hyalite. Could people bring guns on bus?



Lee thinks dogs could be allowed on Streamline. Kelly hears many complaints about dogs on trails system. There are many dog/dog, dog/bike conflicts. Dogs on the bus could lead to more conflict.

Carl indicated that the demand is high for access to The “M” and Drinking Horse trails.

### **Who would a shuttle benefit?**

Tourists? What do we know about the different groups and how they are using Hyalite? Which group might be adding to congestion? Consider how to target groups that are already driving and shift them to a bus, rather than having a bus that simply brings more people. A shuttle must appeal to local residents to ensure community support and funding. Campgrounds are 90% locals. Waterfalls are biggest tourist draws.

A bus system may work for families with kids if it could be part of an adventure that is cool and fun. To address the needs of families with kids, the bus schedule would need to be flexible- so there are options to head home if 2 year old has a meltdown.

Would it cause problems to have more bikers riding down Hyalite Canyon road? Possibly, especially if they are inexperienced riders.

What if a shuttle caters to bikes? Weekend one-way use might work.

What if a shuttle caters to hotel guests? A certain number of hotel guests would be interested, though 2 days a week would not likely work for tourists in the summer. Tourists would need more regular service 7 days a week. Weather is still an issue. Tourists may not be prepared for quick weather changes.

### **Who might take lead role?**

Hotels and tourism may contribute, but would not be likely to organize a system. Friends of Hyalite might facilitate use with different users, though does not necessarily have capacity to lead effort. Would access to trailheads be popular for marketing for a hotel? The M and Hyalite may be the biggest tourist draws.

### **Who might be key stakeholders in developing a shuttle system?**

Many are at the table now (Tourism, Streamline, trails groups...) More input needed from various user groups (hikers, bikers, water sports, hotel guests...).

### **What do you think about the proposed schedule and route? (Would people want a one-way ride to Hyalite? Would they bike back to town? )**

People that are hiking will need a ride back to town, thus there must be round trip options. It is further from town than Helena trailheads. Hyalite Reservoir to S. 19th is about 10 miles. S. 19th/Hyalite Rd to S. 19th/W. Main is about 7 miles. People on bikes might ride into town.



### **What other funding options might work?**

Ask people to pay for a shuttle. Slightly different model than Helena. The current Skyline Bus System has fare cards that may be purchased at convenient locations around town (like grocery stores). Bus drivers simply punch the cards when people ride.

Carl indicated he felt that the Tourism Business Improvement District would be a potential sponsor if tourists were the focus of the shuttle.

What about a downtown to M shuttle back and forth? Evenings after work, mornings before work? – tourists and locals. Streamline – what would be additional costs to go to M?

What about online app to buy ticket?

### **People invited to meeting that did not attend:**

Chris Naumann- Downtown Bozeman Partnership (interested, unable to attend)

Daryl Schliem- Chamber of Commerce (interested, unable to attend)

Keith Comiso - Lark Hotel- (interested, unable to attend)

Curt Smith- Downtown business- Schnees – (no response)

Casey Jermyn- Bozeman Running Company (interested, unable to attend)

Chris Saboda- Bangtail Bike and Ski (interested, unable to attend)

Jill Brewster -Element Hotel (interested, unable to attend)

Cyndy Andrus- City commissioner (interested, unable to attend)

Mason Griffin and Steve Bretson - Alter Cycles bike shop (interested, unable to attend)

Teresa Larson - REI – (interested, unable to attend)

Associated Students of Montana State University (ASMSU) – Marianne Brough (no response)

Bob Allen - mountain bike groups (no response)

Estela Vilasenor - mountain bike groups (no response)

Greg Beardsley – mountain bike group (no response)

Ryan Diehl- ASMSU recreation (no response)

## **Potential Funding Sources**

### Hyalite Canyon Shuttle:

The focus group meeting provided perspective from several well informed and important stakeholders. Much of the discussion focused on Hyalite Canyon and who the users of a shuttle might be and what might limit the usage by existing Hyalite Canyon users. There was broad agreement that it is likely that there is demand for a shuttle from a wide range of users. Identification of an initial target group for the shuttle will be a key aspect to determine potential funding sources. The Forest Service indicated that the main demand at the waterfall trailheads (Grotto and Palisades Falls) is from visitors to the Bozeman area. There was indication that the Tourism Business Improvement District (TBID) would be a possible funding partner if the shuttle targeted tourists. The group agreed that the shuttle should have a fare component to the funding. Further exploration of how to best serve other user groups is needed to identify additional potential funding partners.

### The “M” and Drinking Horse Mountain Trailhead Shuttle:

The “M” and Drinking Horse Mountain trails are extremely popular with local residents and visitors. The trailhead parking is approximately 4 miles from downtown Bozeman, a 10-15 minute drive. During the focus group, there was strong agreement that there is significant unserved demand for access to these trails. Many of the local hotels have shuttle busses to pick guests up at the airport and to provide rides within the city limits. Occasionally, these shuttles do take guests to the M trailhead when a driver and shuttle are available. Several options exist to fund a shuttle to the trailhead for The “M” and Drinking Horse Mountain.

One option is for the TBID and local hotels to form a partnership and use existing hotel vehicles and drivers to provide a regular shuttle service. Funding for this option would most likely be provided directly by the participating hotels with the TBID potentially providing support.

A second option would be to develop a Streamline Route that would serve as a shuttle to the trailhead. This option would be open to the public. Funding for this option could involve a much broader range of partners including the Downtown Business Association, the TBID, individual hotels, local businesses, and potentially ASMSU. The existing Streamline system is well used and supported by the community. There has been recent discussion of opportunities to develop a Streamline Route that would service N 7<sup>th</sup> Avenue and the Main St corridor. It is conceivable that The “M” trailhead could be part of a route that serves N 7<sup>th</sup> Ave and Main St downtown. The Downtown Bozeman Partnership and the North Seventh Urban Renewal Board (NSURB) have indicated possible interest in providing funding for such a route. The M parking lot would likely need to be reconfigured to handle a larger vehicle, such as a Streamline bus.

## **Attachment A - Focus Group Potential Shuttle Schedule and Cost Estimate 7/24/15**



The table below presents a possible schedule for transit access to trailheads in Hyalite/Gallatin Front.

#### Potential Schedule

			Trip 1	Trip 2	Trip 3
Location	Distance	Travel time (minutes)	Time	Time	Time
<b>From Town</b>					
Downtown Transfer (Mendenhall and Black)	0	0	8:45 AM	11:20 AM	2:20 PM
MSU Strand Union	1.5	5	8:55 AM	11:30 AM	2:30 PM
Sourdough Trailhead	5.9	15	9:15 AM	11:50 AM	2:50 PM
Hyalite Reservoir	14.6	35	9:55 AM	12:30 PM	3:30 PM
<b>From Hyalite</b>					
Hyalite Reservoir	0	0	10:00 AM	12:40 PM	3:40 PM
Sourdough Trailhead	14.6	35	10:40 AM	1:20 PM	4:20 PM
MSU Strand Union	5.9	15	11:00 AM	2:00 PM	4:40 PM
Downtown Transfer (Mendenhall and Black)	1.5	5	11:10 AM	2:10 PM	4:45 PM

#### Cost Estimate Assumptions:

Use an existing 35 passenger Streamline Bus

\$65/hour covers driver and fuel costs.

This estimate does not include costs for a trailer to haul bikes or other gear.

#### Cost Estimate

Hyalite Sat/Sun Shuttle Service (mid-June- early Sept)	Assume 13 weekends/ 26 days in season
Item	Streamline 35 passenger bus
Cost per hour	\$65.00
Bus Capacity (passengers)	35
Round trip downtown Transfer to Hyalite Reservoir (minutes)	120
Round trip to Hyalite Reservoir (hours)	2
<b>Cost Analysis</b>	
<b>1 trip per day (35 people)</b>	
hours per day	2.25
# of buses	1
Cost per Day	\$146.25



Cost per Season (26 days)	\$3,802.50
<b>2 trips per day (70 people)</b>	
hours per day	4.5
# of buses	1
Cost per Day	\$292.50
Cost per Season (26 days)	\$7,605.00
<b>3 trips per day (105 people)</b>	
hours per day	7
# of buses	1
Cost per Day	\$455.00
Cost per Season (26 days)	\$11,830.00

# Appendix 6-1

## Bridger Canyon Traffic Data



## Memorandum

To: Peter Walker-Keleher, DJA

From: Rebecca Gleason, WTI

Date: 8/14/15

RE: Bozeman Area Alternative Transportation Study: Task 2.1 Evaluate Existing Bridger Canyon Data

This work is one part of an alternative transportation study to assess bus or shuttle options to access recreation sites on public lands near Bozeman, Montana. People in the Bozeman area that drive on Bridger Canyon Road (Hwy 86) during the winter have likely observed that the road can be very crowded at times, especially on “powder” days. Hwy 86 is the only road that connects skiers and snowboarders in Bozeman to the Bridger Bowl and Bohart ski areas. This memo evaluates available traffic data on Hwy 86 to better understand how traffic volumes vary throughout the day during the winter ski season and at what times peak volumes occur. This data may inform future bus and/or ridesharing planning, which has potential to alleviate congestion during peak winter traffic times.

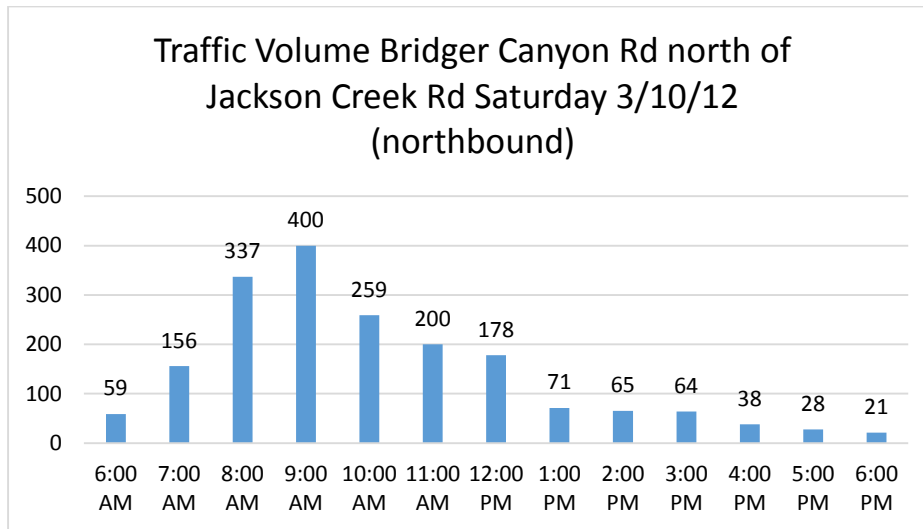
DJ&A collected traffic data along Bridger Canyon Road (Hwy 86) in 2012 and 2013, which is shown as average daily traffic (ADT) volumes in a February 2013 report titled *Montana Highway 86 Alternative Transportation Study & Hyalite Canyon Recreation Area Assessment*. Traffic counts were limited during ski season due to snow fall and ongoing snow plowing. Data collected just north of the intersection with Hwy 86 and Jackson Creek Road, the closest traffic count location to Bridger Bowl Ski Area, revealed the following ADT counts for Hwy 86:

- March 7-12, 2012: weekday ADT 2,533, weekend ADT 3,377
- February 16 and 17, 2013: weekday ADT 1,128, weekend ADT 3,647

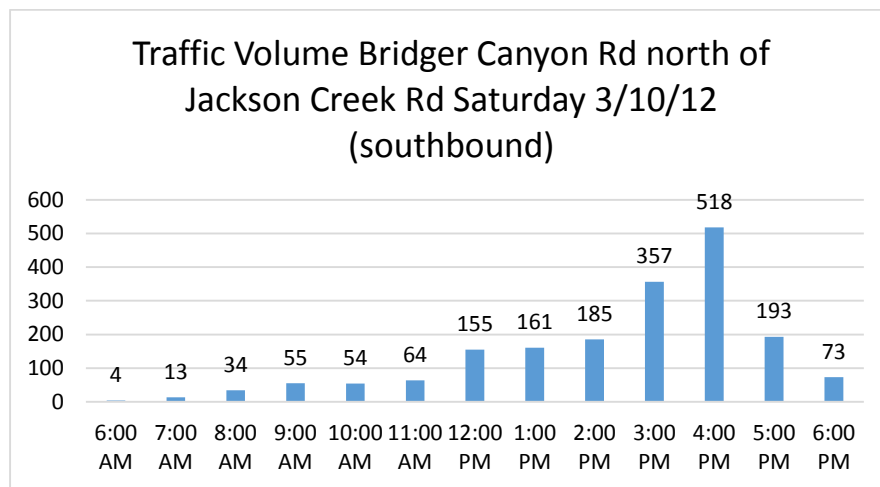
WTI compiled the available traffic data on Bridger Canyon Road from this report and evaluated hourly volumes as presented in the next section.

## Presentation of March 2012 Data

Figure 1 shows a peak of 400 vehicles at 9 am for traffic in the northbound lanes, where people drive to Bridger Bowl. Figure 2 shows a peak of 518 vehicles at 4 pm in the southbound lane, where people drive back toward Bozeman. Note that in the figures below, the column labeled “6:00 am” refers to traffic data collected between 6:00 and 7:00 am, the “7:00 am” column refers to data collected between 7:00 and 8:00 am and all of the data follows this pattern.



*Figure 1: Saturday 3/10/12 northbound traffic volumes*

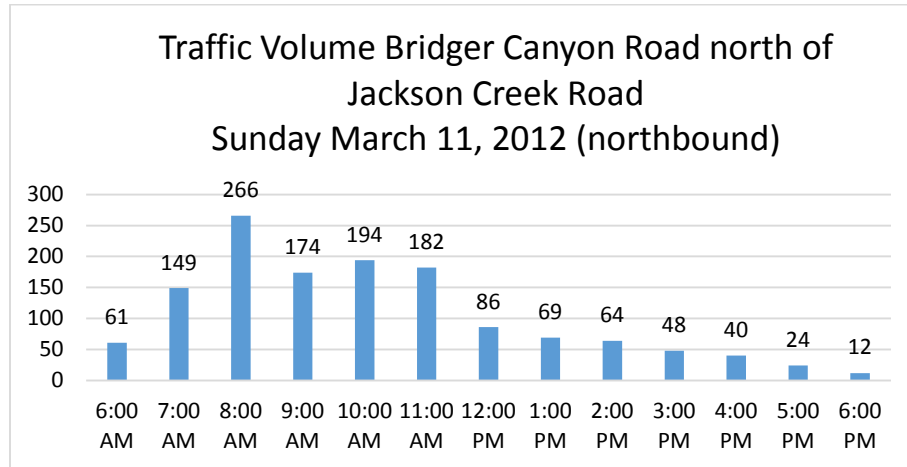


*Figure 2: Saturday 3/10/12 southbound traffic volumes*

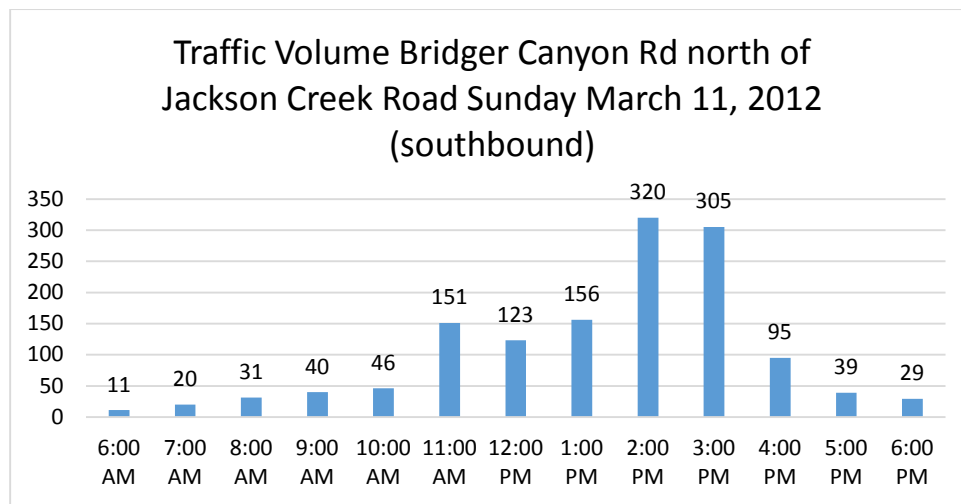
Bridger Bowl records show the following data for Saturday and Sunday March 10 and 11, 2012 where skier visits refer to the total number of people skiing that day. Of the total skier visits, day tickets refers to how many of them purchased a day ticket and season passes refer to how many used a season pass that day.

Date	Skier Visits	Day Tickets	Season Passes	New Snow	Settled Base	Temperature
3/10/2012	2782	1783	999	0	56	45
3/11/2012	1703	1136	567	0	55	43

Figures 3 and 4 show that traffic peaks for Sunday March 11 are lower than Saturday, which corresponds to lower skier visits on Sunday.

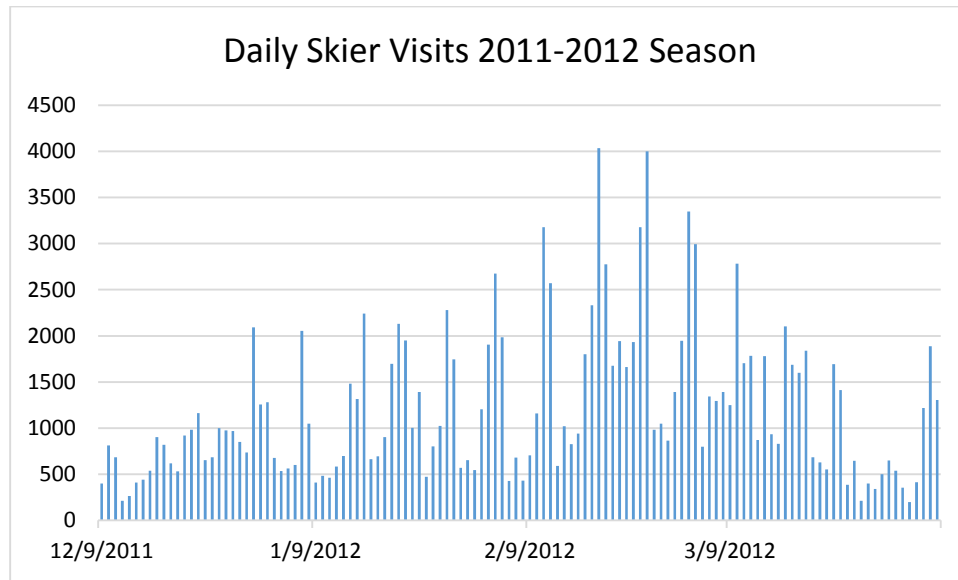


*Figure 3: Sunday 3/11/12 northbound traffic volumes*

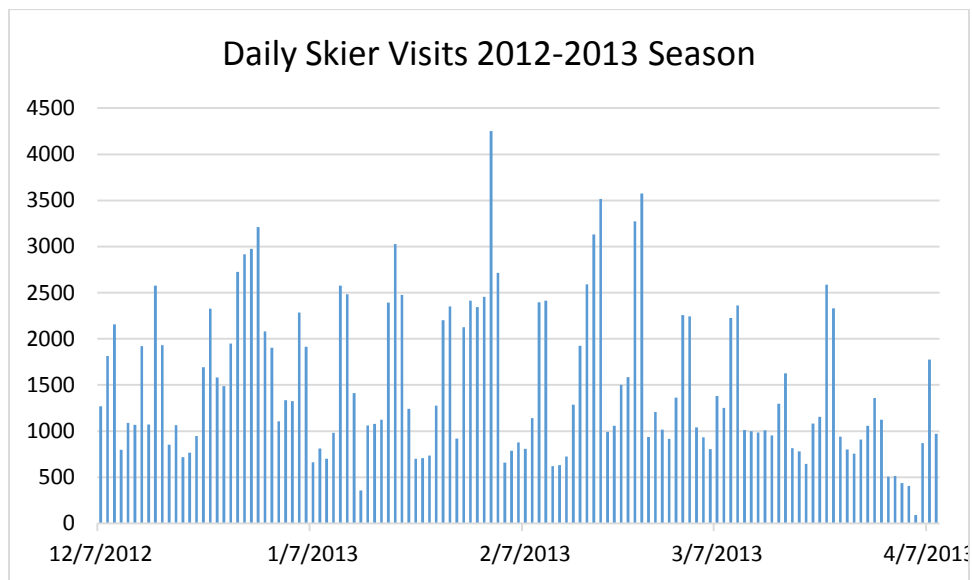


*Figure 4: Sunday 3/11/12 southbound traffic volumes*

Although there was no new snow on these data collection dates, the number of skier visits on Saturday (2,782) was relatively high compared to historical data from 2011-12, 2012-13 and 2013-14 ski seasons as shown in Figures 5-7. This data reveals that there were 6 days of the 2011-12 season, 9 days of the 2012-13 season and 20 days of the 2013-14 season that had over 2,782 skier visits. Bridger Bowl has had over 4,000 skier visits only 5 times in the past 3 years.

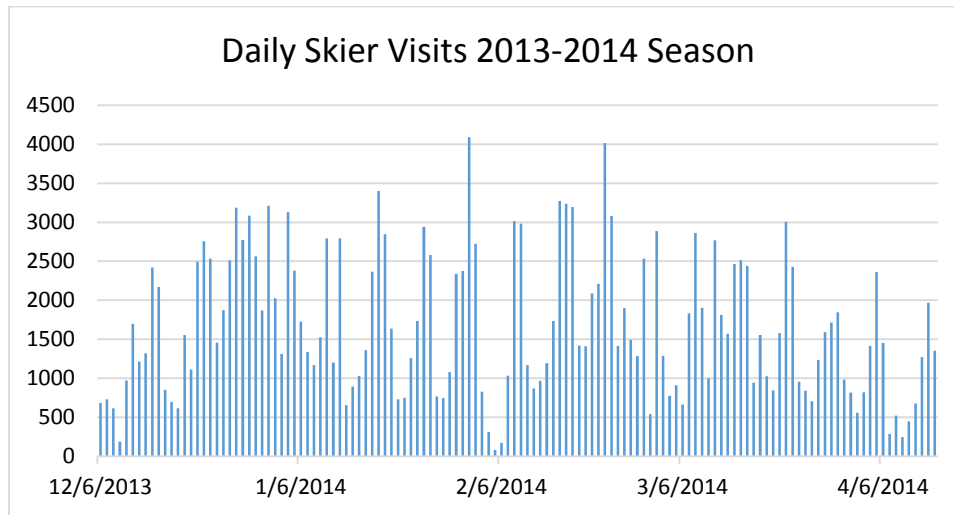


*Figure 5: Bridger Bowl daily skier visits 2011-2012*



*Figure 6: Bridger Bowl daily skiers 2012-2013*



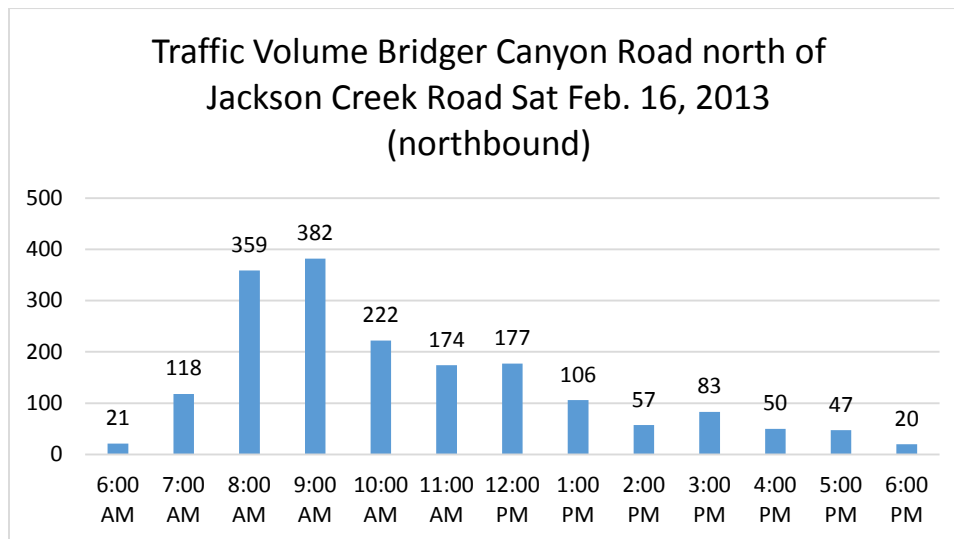


*Figure 7: Bridger Bowl daily skiers 2013-2014*

### Presentation of February 2013 Data

Figures 8 and 9 show traffic volumes on Saturday February 16, 2013 and the table below shows skier visit data corresponding to that date.

Date	Skier Visits	Day Tickets	Season Passes	New Snow	Settled Base	Temperature
2/16/2013	2589	1576	1013	0	50	30



*Figure 8: Saturday 2/16/13 northbound traffic volumes*

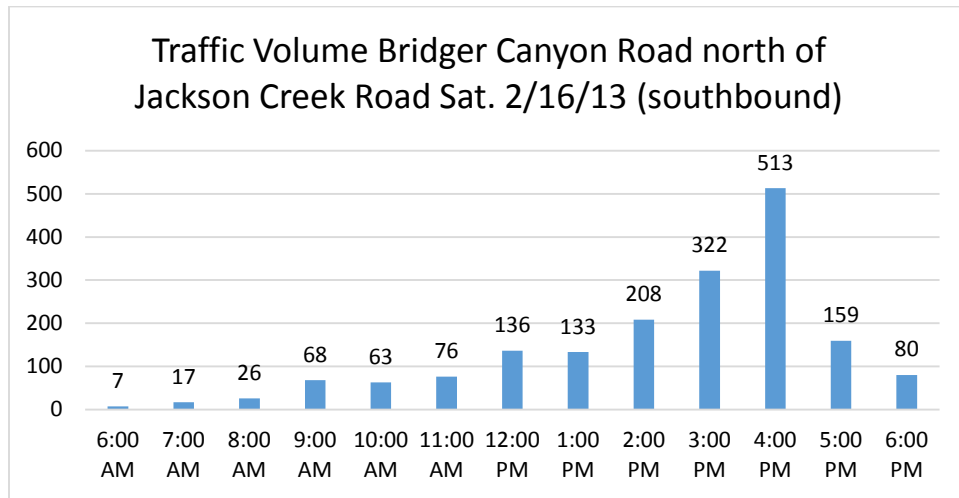


Figure 9: Saturday 2/16/13 southbound traffic volumes

Review of the Montana Department of Transportation’s Highway 86 Corridor Study and a follow up call revealed that MDT does not have winter hourly traffic data available for Hwy 86. Therefore, the data contained herein is the best data available for analysis.

# Appendix 6-2

## Bus Rider Survey

# **Streamline Bus to Bridger Bowl and Bohart Ranch: Bus Rider Survey Results (January - March 2015)**

by

Rebecca Gleason  
Research Engineer

Tiffany Allen  
Research Scientist

Taylor Lonsdale  
Research Engineer

Western Transportation Institute  
College of Engineering  
Montana State University

A report prepared for

DJ&A, P.C. Engineers. Planners. Surveyors.  
3203 Russell Street / Missoula, MT 59801

September 9, 2015

## **DISCLAIMER**

The opinions, findings and conclusions expressed in this publication are those of the author and not necessarily those of the Western Transportation Institute, Montana State University-Bozeman; DJ&A, P.C. Engineers, Planner, Surveyors; Custer Gallatin National Forest or U.S. Forest Service.

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## **EXECUTIVE SUMMARY**

This work is one part of the Bozeman Area Alternative Transportation Study to assess, plan and design alternative transportation options for accessing popular recreation sites on United States Forest Service and United States Fish and Wildlife Service lands near Bozeman, Montana. Bridger Bowl Ski Area and Bohart Ranch Cross Country Ski Area are two popular recreation areas located on Forest Service lands near Bozeman, Montana.

In addition to a “Kid’s Bus” that services Bridger Bowl Ski Area on the weekends and school holidays, both areas are served by a 35 passenger Streamline bus on Saturdays and Sundays during the winter ski season. This report outlines the results of a survey that was completed by 111 riders of the Streamline bus from January through March 2015. The purpose of the survey was to learn more about weekend bus riders’ experience and opinions regarding the bus service and gather suggestions for improvements. The bus survey questionnaire is shown in Appendix A. An introduction, survey methods and detailed results are presented in the following chapters.

Results indicated that riders generally have high satisfaction levels with the Streamline bus service to Bridger/Bohart. This executive summary highlights some key results and requested improvements, with the understanding that it may not be feasible to implement improvements due to economic or other reasons.

Question 8 was an open-ended question, “How could the bus service to Bridger/ Bohart be improved?” A total of 93 people answered this question. Comments frequently related to one or more of the following categories: 1) ski and snowboard gear storage 2) bus schedule/ bus capacity and 3) stop locations.

### **Ski and Snowboard Gear Storage**

Approximately a third (33%, n=110) of respondents reported being somewhat, mostly or completely dissatisfied with the Streamline bus’s ability to carry ski and snowboard gear. Further, 41% of all of the open-ended comments related to this topic. Improved gear storage, such as ski racks on the outside of the bus, storage under the bus (if larger motor coaches were used), dedicated space on the bus and/or more locker options at Bridger Bowl could help address gear storage concerns.

### **Bus Schedule**

Although the vast majority of riders (78%) are either somewhat, mostly or completely satisfied with the bus departure times, 32 of the 93 open ended question responses addressed concerns regarding schedule. The most common request was for increased frequency in the mornings, especially mid-morning on the weekends. Another common request was for a weekday bus. Other comments included adjusting bus departure times to allow people to arrive at Bridger in time for ski lessons and to have a bus departing Bridger later than 4:15 in the afternoon.

During the 2014–2015 ski season 18% of respondents reported being turned away once, and 9% reported having been turned away two or more times because the bus was full. Just over half (51%) of riders reported they would be willing to pay for the bus service. Of those willing to pay 54% reported they would be willing to pay \$1.00 to \$2.99 per person per round trip.

### **Bus Stop Locations**

Of those who preferred an additional stop location, the most common request was for a stop at the MSU campus. Other requests included bus stops in Belgrade, Manhattan, and various locations on the west and south sides of Bozeman.

## 1. INTRODUCTION

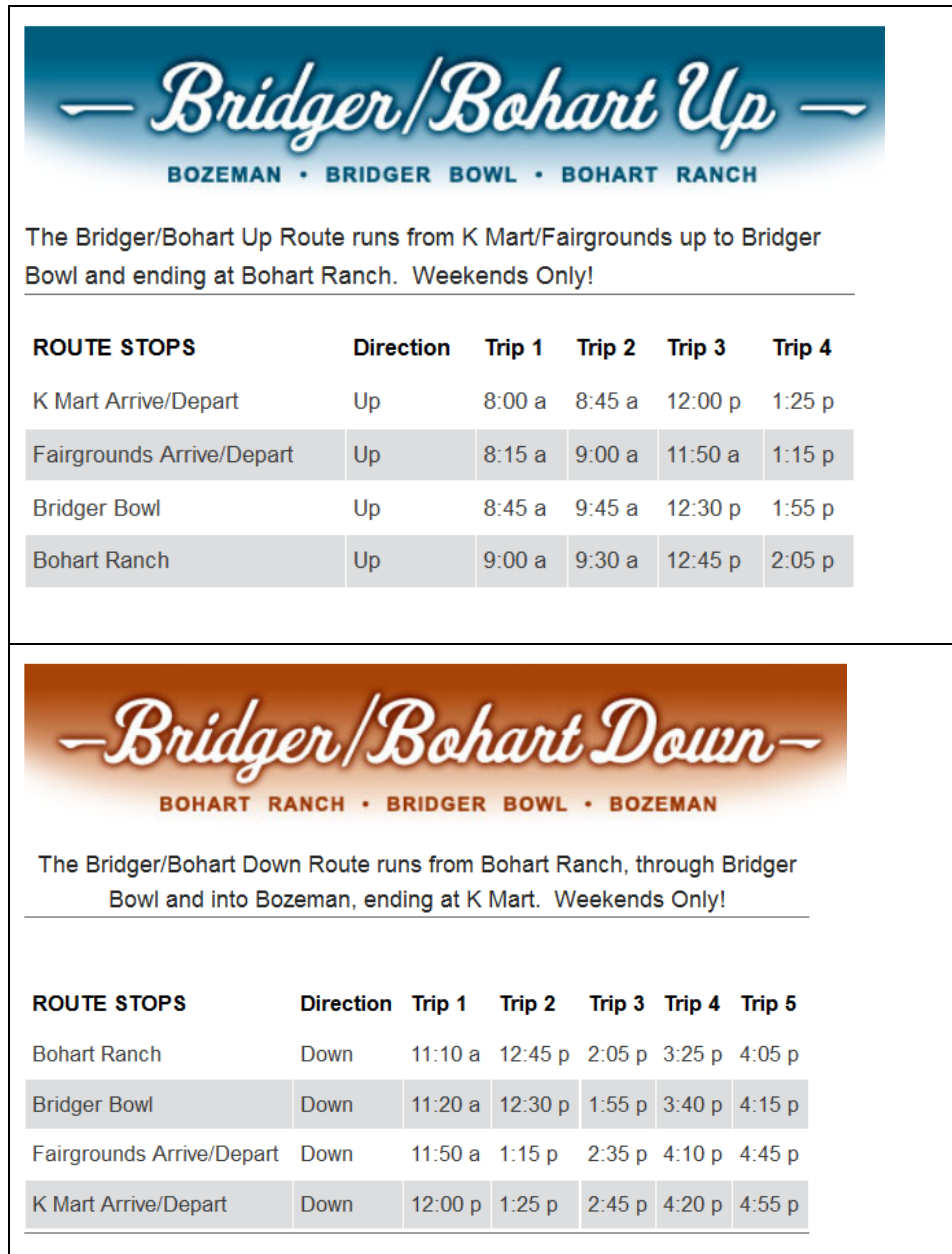
This work is one part of the Bozeman Area Alternative Transportation Study to assess, plan and design alternative transportation options for accessing popular recreation sites on United States Forest Service and United States Fish and Wildlife Service lands near Bozeman, Montana. These surveys will contribute to planning efforts for improvements to the existing transit services that serve these Bridger Canyon destinations.

Bridger Bowl Ski Area and Bohart Ranch Cross Country Ski Area are two popular recreation areas located on Forest Service lands near Bozeman, Montana. The Streamline bus service takes people between Bozeman and Bridger Bowl/ Bohart ranch on Saturdays and Sundays during the winter ski season. The Western Transportation Institute developed a survey on behalf of DJ&A and the Custer Gallatin National Forest to learn more about weekend bus riders' experience and opinions regarding bus service. The survey instrument is located in Appendix A. Researchers administered surveys to bus riders in January, February and March 2015. This report contains the results of the surveys and is organized as follows:

- Chapter 2 describes the survey methodology.
- Chapter 3 presents survey results.
- Appendix A contains the survey instrument.
- Appendix B contains a list of comments from the bus rider surveys.

## 2. METHODOLOGY

A Streamline bus departs the Gallatin County Fairgrounds four times each weekend day during the winter ski season and returns to town 5 times per day as shown in Figure 1 below.



**Figure 1. Bridger / Bohart winter bus schedule.**

Surveys were administered on the bus using paper surveys on a clipboard with a pen. Figure 2 shows the locations of the K-Mart and Fairgrounds parking lots where the bus stopped. K-Mart closed in 2015 and it is unknown if that location will be available for a bus stop in the future. Surveys were distributed on the following buses to represent various times of the day and based on researchers' availability.

- Saturday 1-24-15: 8:15, 9:00 from Fairgrounds, 3:40, 4:15 pm return (30 surveys)
- Sunday 1-25-15: 9:00, 11:50 from Fairgrounds, 3:40, 4:15 pm return (23 surveys)
- Saturday 1-31-15: 9:00 from Fairgrounds, 1:55, 3:40 pm return (14 surveys)
- Saturday 2-14-15 11:50 from Fairgrounds (8 surveys)
- Saturday 3-21-15: 8:15, 11:50 from Fairgrounds, 4:15 return (20 surveys)
- Sunday 3-22-15: 11:50 from Fairgrounds, 4:15 return (8 surveys)
- Saturday 3-28-15: 4:15 return (8 surveys)

For this survey, the target population was estimated to consist of 271 individuals that rode Streamline to Bridger/ Bohart at some time during the 2014-2015 season (early December through early April). This estimate is based on rider frequency data collected for 2013-2014 and total ridership of 3,712 as provided by Bridger Bowl Ski Area.

Based on a population of 271 riders and 111 surveys, results reflect a 95% confidence level with a margin of error plus or minus 7.16. For example, if 30% of our sample pick an answer, we can be 95% certain that if we had asked the question of the entire rider population, between 23% (30-7.16) and 37% would have picked that answer. Varied response rates from the total sampled population of 111 surveys mean that the margin of error will vary from question to question.

Researchers had a captive audience on the 20+ minute bus ride, and were typically able to collect surveys from most of the adult riders. There were many children that were too young to take the survey. By late March, after researchers rode the buses several times, most of the adults indicated they had taken the survey already. In summary, survey results provide general descriptive statistics that are intended to lend insight into perceptions of the bus service, rather than provide exact percentages. Results are described in the following section.



**Figure 2. 2014-2015 Streamline weekend bus stop locations (map courtesy of Google).**

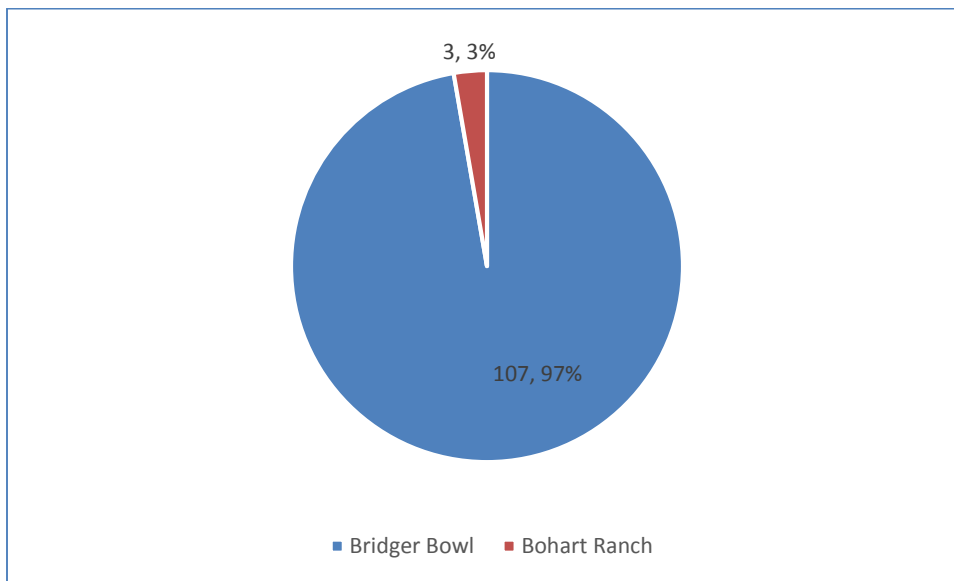


### 3. RESULTS

Streamline Bridger Bowl bus service riders took a total of 111 surveys. Respondents were not required to answer every question, so some respondents did not answer every question. The results are presented in the same order as the survey questions, with demographic questions at the end.

#### 3.1. Questions 1–2

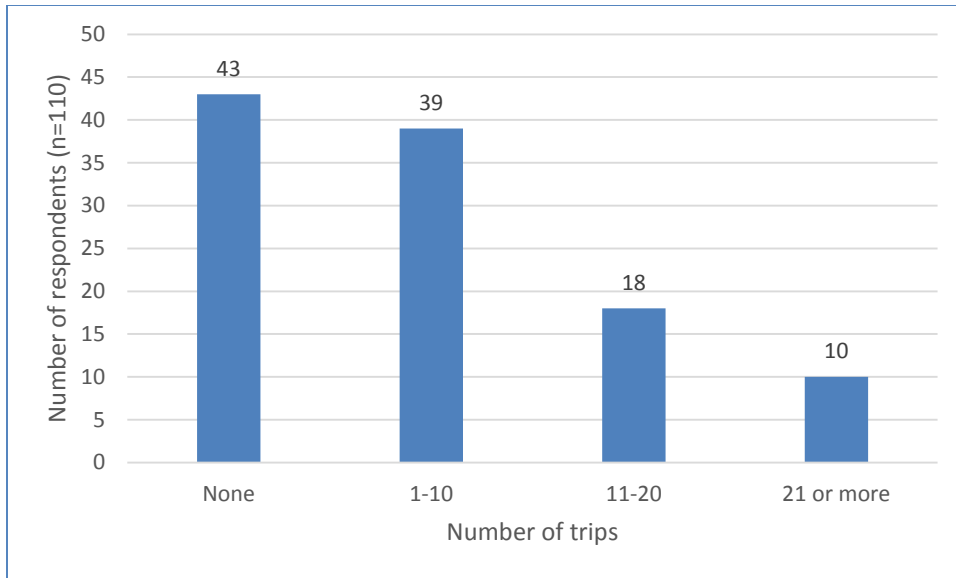
The bus service travels to two destinations, Bridger Bowl and Bohart Ranch. Nearly all (97%, n=110) of the respondents were traveling to Bridger Bowl on the day they took the survey (Figure 3).



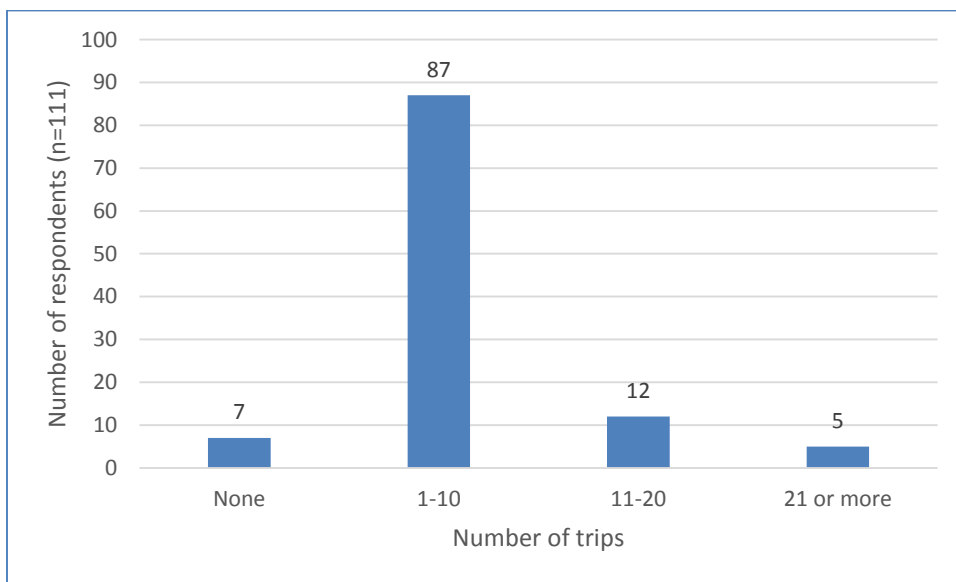
**Figure 3. Destination the day of survey.**

A relatively large number (39%, n=110) of the survey respondents did not ride the bus during the previous ski season (2013–2014), and many (36%) reported riding the bus one to ten times (Figure 4). Whereas a majority (78%, n=111) of respondents reported having used the bus service one to ten times to date in the current ski season (2014–2015) (Figure 5).

It is important to note that the surveys were distributed in January, February and March of the 2014–2015 season, and therefore, the number of bus rides during the 2014–2015 season is not directly comparable to the number of rides during the 2013–2014 season. It is also important to note that while the respondents that reported “none” were clearly not counting the trip on which they were taking the survey, it is unclear how many responding “1–10” were including the trip on which they took the survey.



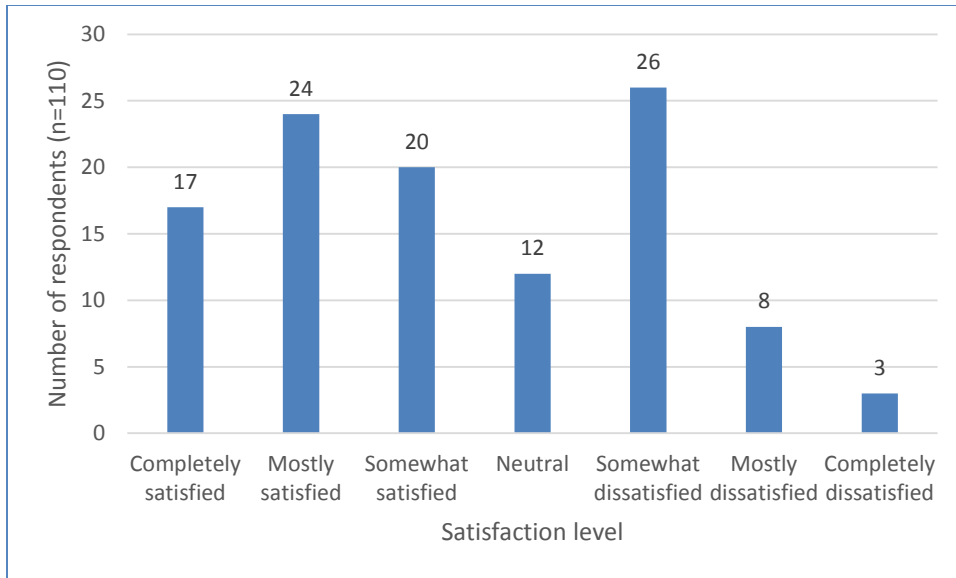
**Figure 4. Number of bus trips reported during the previous 2013–2014 ski season.**



**Figure 5. Number of bus trips reported during 2014–2015 ski season.**

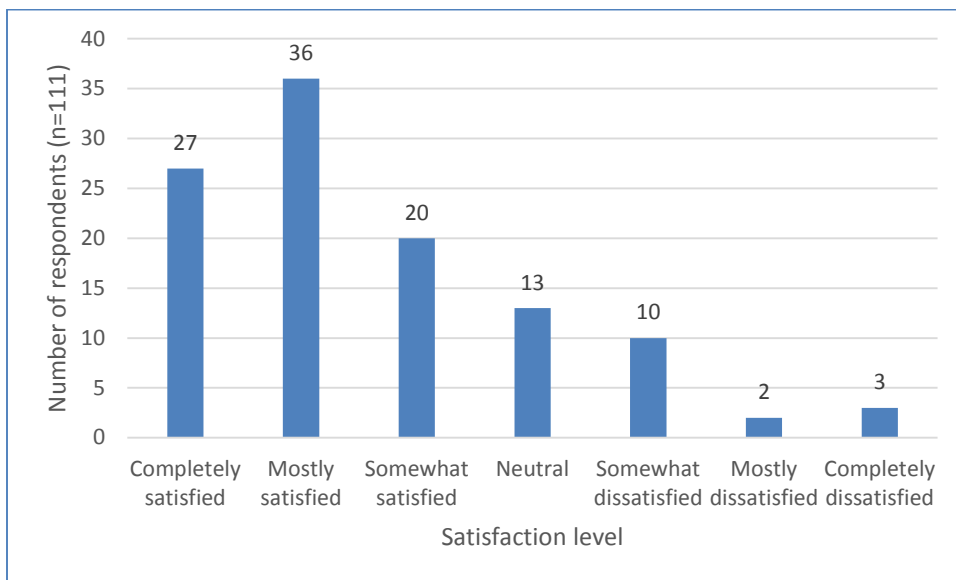
### 3.2. Questions 3–8

Approximately a third (34%, n=110) of respondents reported being somewhat, mostly or completely dissatisfied with the Streamline bus's ability to carry ski and snowboard gear. However, 22% reported being mostly satisfied and just over a third (37%) were mostly or completely satisfied (Figure 6).

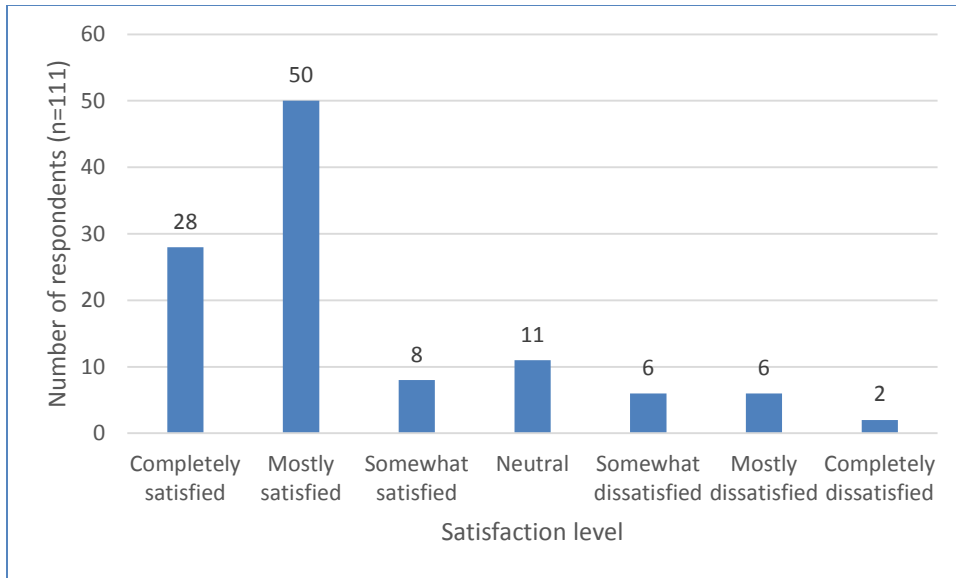


**Figure 6. Satisfaction with Streamline bus ability to carry ski and snowboard gear.**

About one-third (32%, n=111) of respondents answered that they were mostly satisfied with the Streamline bus's frequency, and just over half (57%) were mostly or completely satisfied (Figure 7). Nearly one half (45%) of the respondents (n=111) reported being mostly satisfied with the Streamline bus's departure times, and a majority (70%) were mostly or completely satisfied (Figure 8).

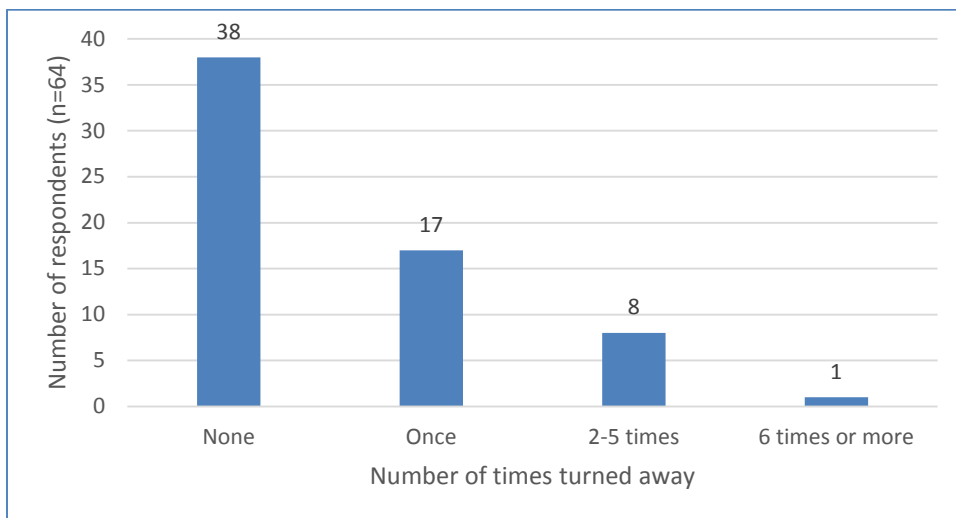


**Figure 7. Satisfaction level with Streamline bus frequency.**

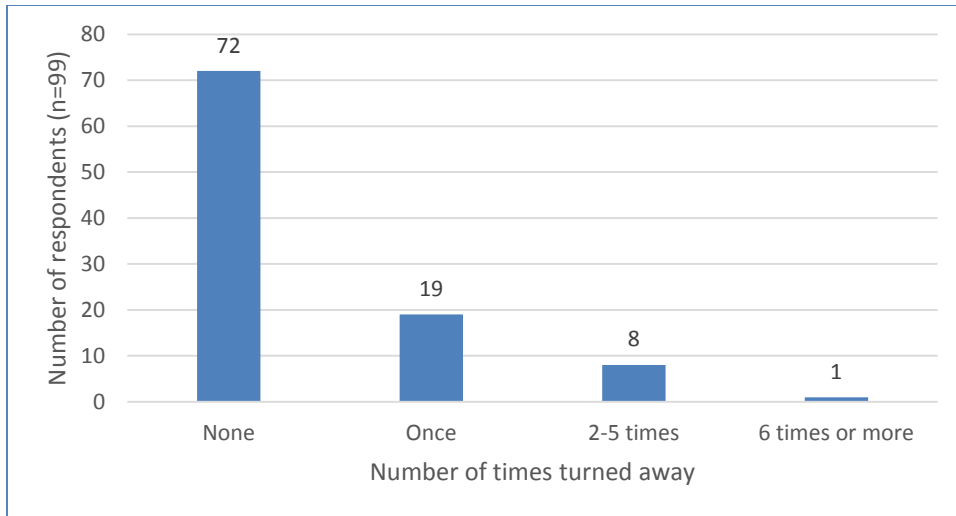


**Figure 8. Satisfaction level with Streamline bus departure times.**

During the 2013–2014 ski season, a majority (75%, n=103) of respondents were not turned away because the bus was full. While 17% reported being turned away once, and 9% reported having been turned away two or more times (Figure 9). During the 2014–2015 ski season, a majority (73%, n=105) of respondents were not turned away because the bus was full. While 18% reported being turned away once, and 9% reported having been turned away two or more times (Figure 10). It is important to note that the surveys were distributed in January, February and March of the 2014–2015 season, and therefore, the number of times respondents were turned away during the 2014–2015 season is not directly comparable to the number of times during the 2013–2014 season.

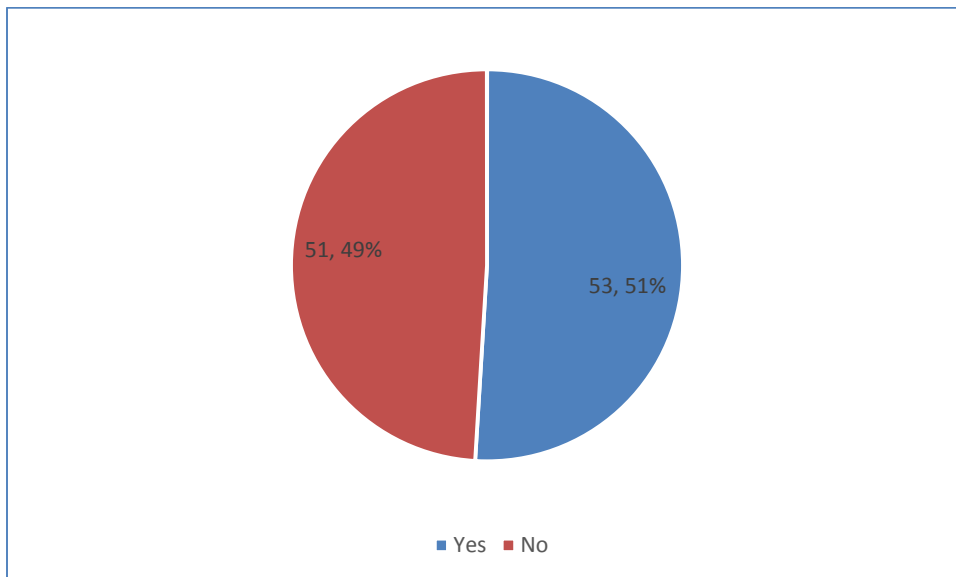


**Figure 9. Number of times turned away from bus during 2013–2014 ski season.**

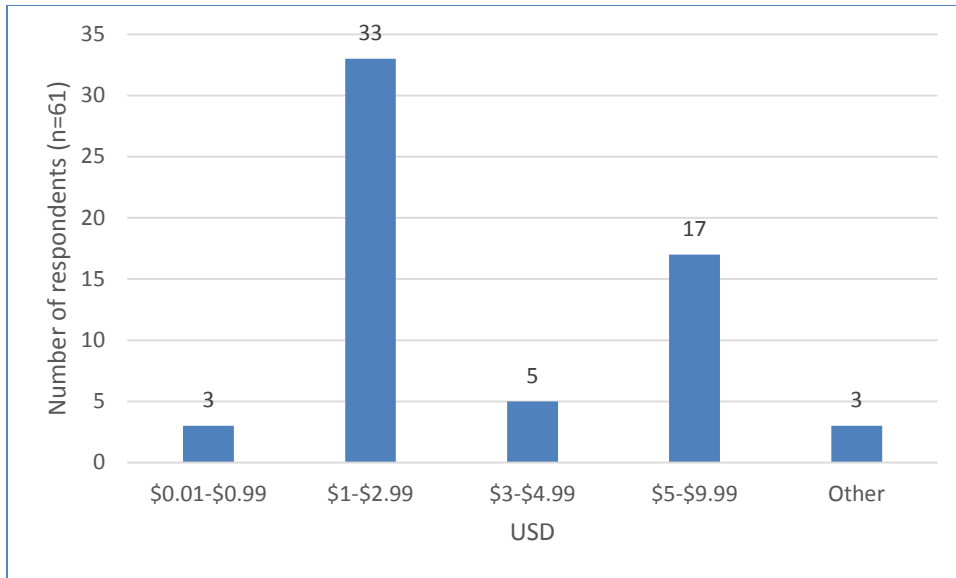


**Figure 10. Number of times turned away from bus during 2014–2015 ski season.**

When asked if they would be willing to pay for the bus service, only slightly more respondents replied “yes” (51%) than “no” (49%) (Figure 11). There was a follow-up question for those who answered yes, though some who responded “no” also answered. This was a “fill in the blank” response, thus the following results summarize the information by categories, providing an estimate of how much people are willing to pay. It should be noted that the ranges shown in the chart were not provided as answer choices on the survey. Including all responses, most (54%, n=61) reported being willing to pay \$1.00 to \$2.99 per person per round trip (Figure 12).



**Figure 11. Percent willing to pay for Streamline bus to Bridger/Bohart.**



**Figure 12. Amount willing to pay for a round trip bus between Bozeman and Bridger/ Bohart.**

Question 8 asked respondents an open-ended question, “How could the bus service to Bridger/ Bohart be improved?” A total of 93 people answered this question. Comments frequently related to one or more of the following categories: 1) gear storage 2) bus schedule/ bus capacity and 3) stop locations. Given that this was an open-ended question, respondents could give more than one suggestion, so the total numbers add to more than the total number of respondents.

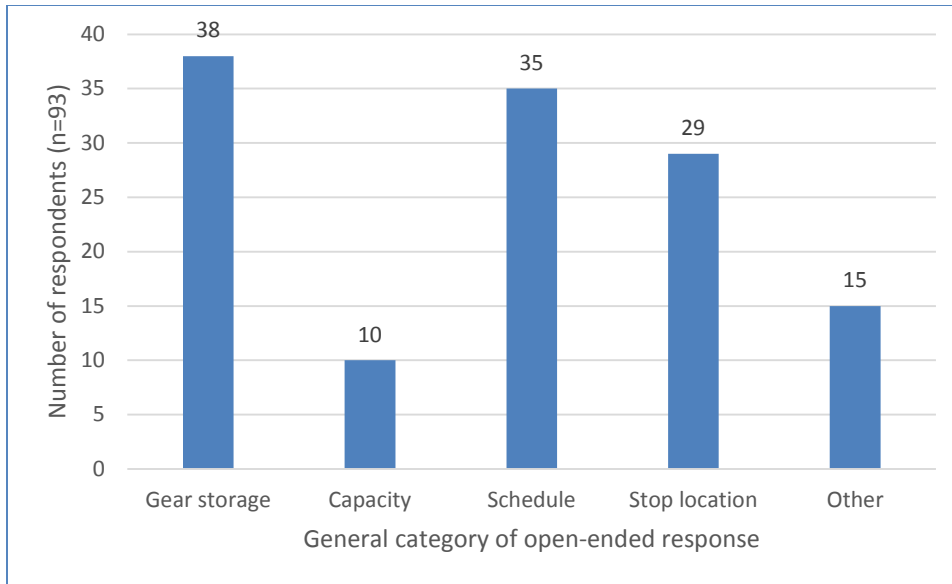
The most common (41%) response was to improve gear storage capacity, such as racks on the outside of the bus. This was followed by bus schedule comments and stop locations (38% and 31%, respectively).

Regarding bus schedule/ capacity, the most common request was for increased frequency in the mornings, especially mid-morning on the weekends. Another common request was for a weekday bus. Other comments included adjusting bus departure times to allow people to arrive at Bridger in time for ski lessons and to have a bus departing Bridger later than 4:15 in the afternoon. Bus capacity comments included more capacity on Saturday mornings and on return trips from Bridger.

Regarding Bus stop locations, the most common request was for a stop at the MSU campus. Other requests included bus stops in Belgrade, Manhattan, and various locations on the west and south sides of Bozeman.

Several people had other suggestions in a variety of categories (Figure 13). All responses are shown in Appendix B.

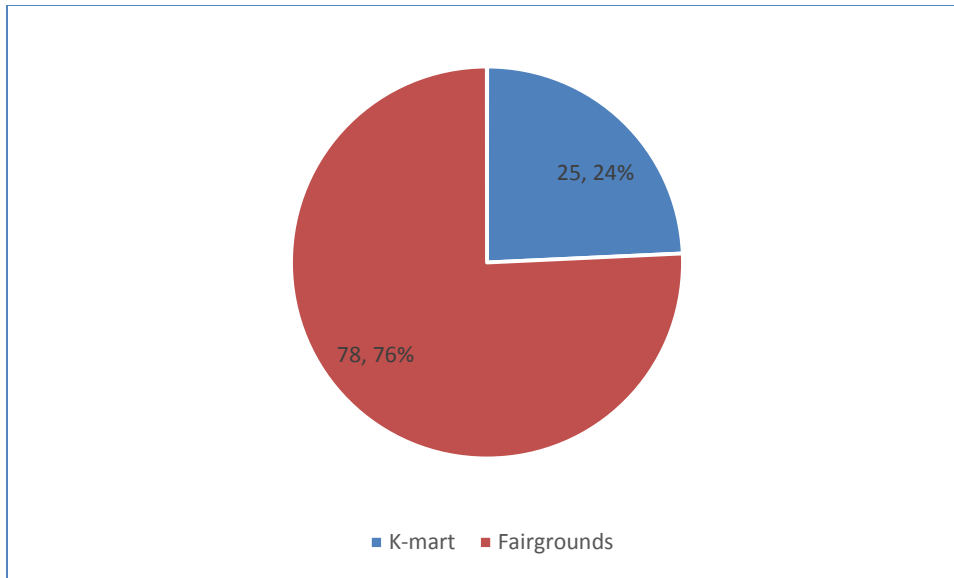




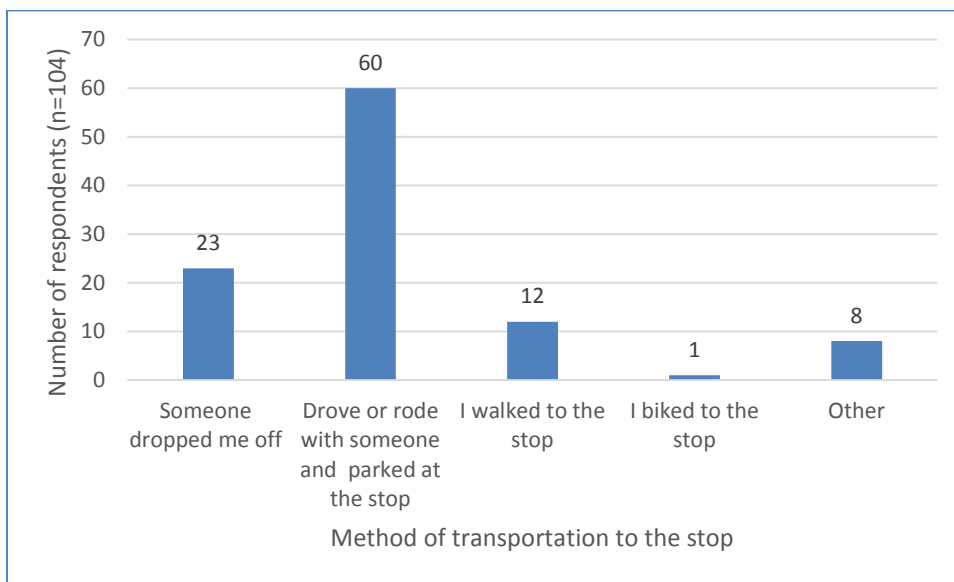
**Figure 13. Ways the bus service could be improved.**

### 3.3. Questions 9–12

There are currently two stop locations, both located within the Bozeman, MT city limits. About three-fourths (76%, n=103) of the respondents boarded the bus at the Gallatin County Fairgrounds. The remainder (24%) boarded the bus at K-mart (Figure 14). Most (58%, n=104) respondents got to their respective stop location by driving, either alone or with others, to the stop and parking. Nearly a quarter (22%) drove but had someone drop them off and did not park. 13% of respondents used a non-motorized mode of transportation (i.e. biking or walking), and the remainder (8%) responded “other.” Those responding “other” indicated that they had arrived at the stop by means of the Streamline or other bus, a taxi, or hotel shuttle (Figure 15).



**Figure 14. Location where respondents caught bus the day of survey.**

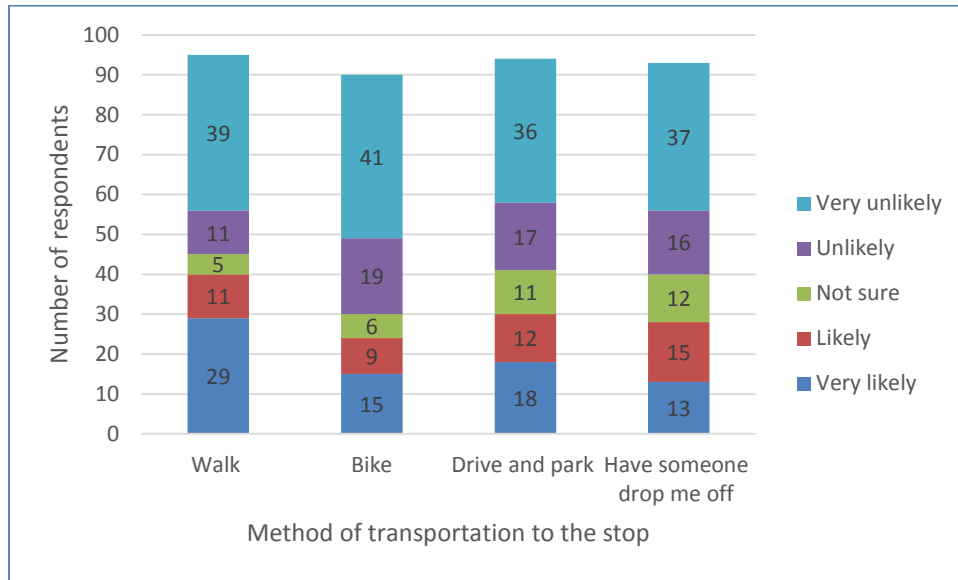


**Figure 15. Method of transportation to the bus stop the day of survey.**

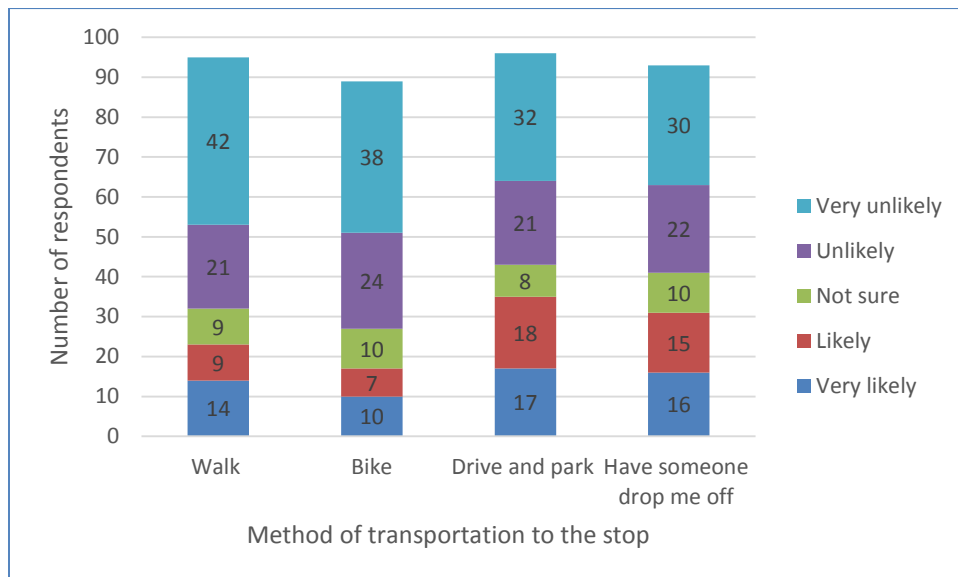
In question 11, respondents were asked, “If the weekend Streamline bus to Bridger stopped at the following locations (in addition to the existing Kmart and Fairgrounds stops), how likely is it that you would travel to each of the stops noted by the various modes?” For each potential stop location (Montana State University, the downtown parking garage, and the future parking lot on the east side of Bridger Canyon Rd., near the proposed Story Mill Park), there were four modes of transportation listed, “walk”, “bike”, “drive and park”, and “have someone drop me off.” Respondents were asked to circle one choice (very likely, likely, not sure, unlikely, or very unlikely) for each mode of transportation at each potential stop. However, not all respondents

circled a choice for all 12 mode–stop combinations. Thus, the number of respondents (n) ranged from 87 to 95.

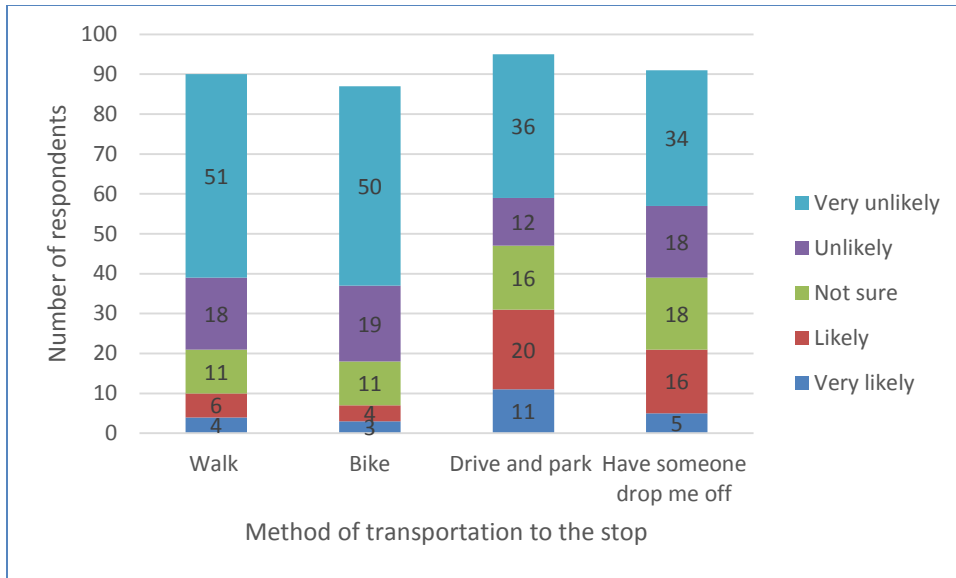
Depending upon the mode of transportation and the stop, between 51% (drive and park at the proposed Story Mill development) and 79% (bike to the proposed Story Mill development) of respondents reported being either unlikely or very unlikely to use the three potential new stops listed. MSU was the location in which respondents reported they would be very likely to walk or bike to the stop (31% and 17%, respectively) (Figure 16, Figure 17, and Figure 18).



**Figure 16. If bus stopped at MSU, likelihood to travel to it by various modes of transportation.**

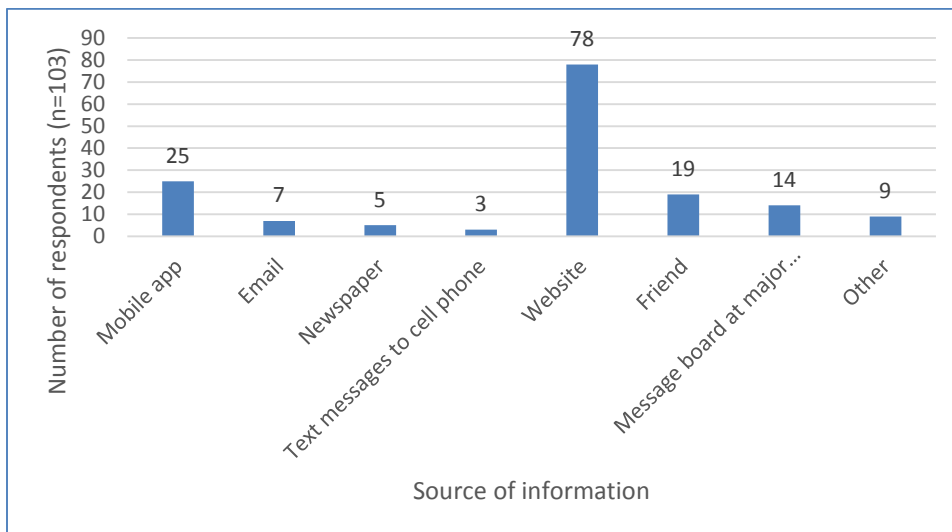


**Figure 17. If bus stopped at downtown parking garage, likelihood to travel to it by various modes of transportation.**



**Figure 18. If bus stopped at proposed Story Mill Park, likelihood to travel to it by various modes of transportation.**

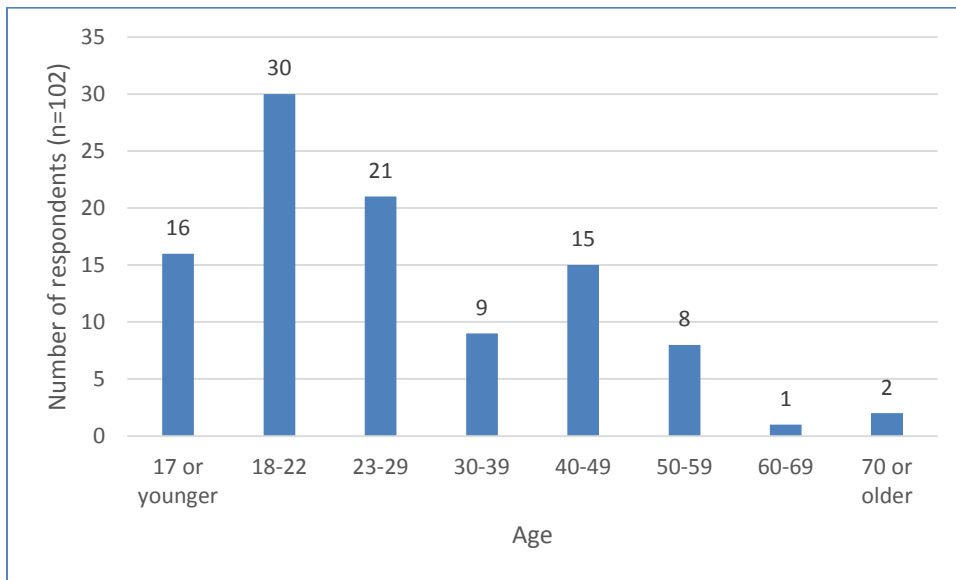
The majority (76%, n=103) of respondents reported that they are most likely to get information about Streamline from the website. Fewer (24%) respondents indicated that they are likely to get information from a mobile app, and even fewer, ranging from 3% to 18%, reported that they are likely to get information from the other sources listed on the survey (e-mail, newspaper, text messages to cell phone, friend, message board at major stops, other) (Figure 19). Because each respondent may have checked more than one answer, the numbers add to more than the total number of respondents (103).



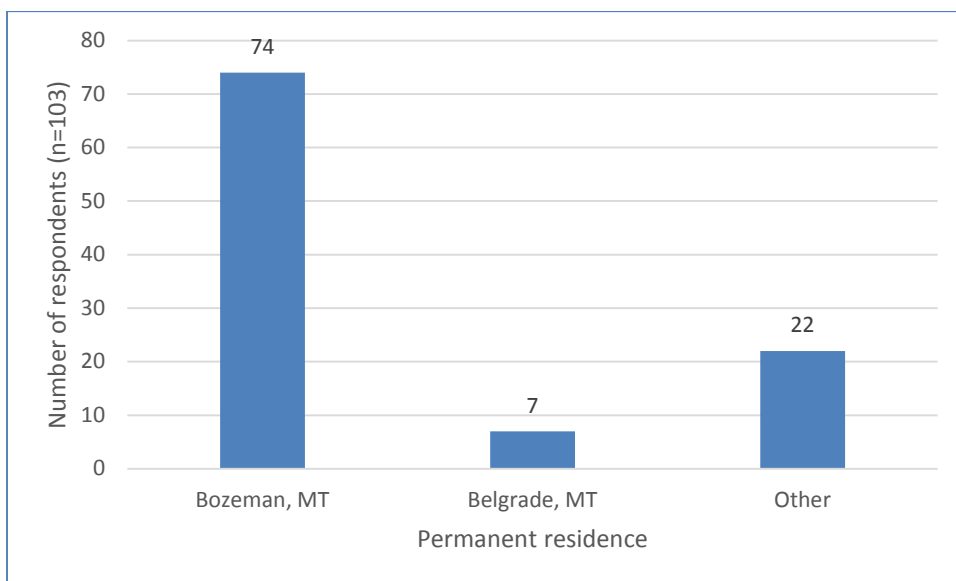
**Figure 19. Source of information about Streamline.**

### 3.4. Questions 13–15

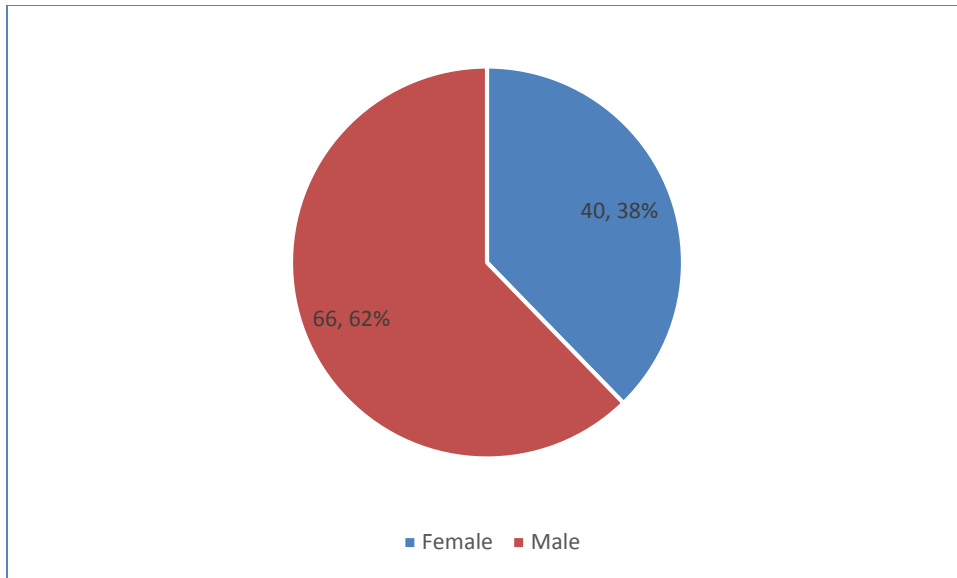
To understand general demographics, respondents were asked to provide their year of birth, zip code of their permanent address, and indicate their gender (male or female). Half (n=102) of the respondents were 18–29 years old as of 31 December 2014 (Figure 20), and most (72%, n=103) live in Bozeman, MT (Figure 21). A majority (62%, n=106) of respondents were male (Figure 22).



**Figure 20. Age as of 31 December 2014.**



**Figure 21. Location of permanent residence, based on zip code.**



**Figure 22. Gender of respondents.**



## 4. APPENDIX A: SURVEY INSTRUMENT

### Streamline Bridger Bowl/ Bohart Ranch Weekend Bus Rider Survey

*This Survey is being conducted by the Western Transportation Institute on behalf of DJ&A and the Gallatin National Forest. It is intended to better understand your opinions about the weekend Streamline Bus to Bridger Bowl/ Bohart Ranch. Your participation is voluntary, you can choose to stop at any time, and you can choose to not answer any question that you do not want to answer.*

1. What is your destination for this trip?

- ☐ Bridger Bowl Ski Area  
☐ Bohart Ranch Area

2. About how many times did you ride Streamline bus to Bridger Bowl/ Bohart Ranch? (*Ski season typically runs from early December to April for about 18 weeks*).

A) Last year during the 2013-2014 ski season:

- ☐ none      ☐ 1-10      ☐ 11-20      ☐ 21 or more

B) Thus far during the 2014-2015 ski season:

- ☐ none      ☐ 1-10      ☐ 11-20      ☐ 21 or more

3. How satisfied are you with the Streamline bus's ability to carry ski and snowboard gear? (please circle a number)

1	2	3	4	5	6	7
Completely satisfied	Mostly satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Mostly dissatisfied	Completely dissatisfied

4. How satisfied are you with the Streamline bus's frequency (4 trips up to ski areas and 5 trips down)? (please circle a number)

1	2	3	4	5	6	7
Completely satisfied	Mostly satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Mostly dissatisfied	Completely dissatisfied

5. How satisfied are you with the Streamline Bridger bus departure times (leave fairgrounds at 8:15, 9:00, 11:50, 1:55 and return at 11:20, 12:30, 1:55, 3:40, 4:15)? (please circle a number)

1	2	3	4	5	6	7
Completely satisfied	Mostly satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Mostly dissatisfied	Completely dissatisfied

*More questions on back of page* ➡

6. How many times have you been turned away from the Streamline Bridger bus because it was already full on the way up to the ski areas? (please check one answer per question)

A) Last year during the 2013-2014 ski season:

- ☐ none      ☐ Once      ☐ 2-5 times      ☐ 6 times or more

B) Thus far during the 2014-2015 ski season:

- ☐ none      ☐ Once      ☐ 2-5 times      ☐ 6 times or more

7. Would you be willing to pay for Streamline's service between Bozeman and Bridger Bowl or Bohart?

- ☐ Yes      ☐ No

If "Yes" how much would you be willing to pay (per roundtrip)? \$ \_\_\_\_\_

8. How could the bus service to Bridger/ Bohart be improved? (for example, pick/up drop off locations, arrival/departure times, frequency, ski/snowboard gear storage options...)

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9. Where did you get on the bus today (which bus stop)?

- ☐ K-Mart      ☐ Fairgrounds

10. How did you get to the bus stop? (choose one)

- ☐ Someone dropped me off  
☐ I drove or rode with someone and parked at the stop  
☐ I walked to the stop  
☐ I biked to the stop  
☐ Other \_\_\_\_\_

11. If the weekend Streamline bus to Bridger stopped at the following locations (in addition to the existing Kmart and Fairgrounds stops), how likely is it that you would travel to each of the stops noted by the various modes: (please circle one for each row)

A) Montana State University

Walk	Very likely	likely	Not sure	unlikely	Very unlikely
Bike	Very likely	likely	Not sure	unlikely	Very unlikely
Drive and park	Very likely	likely	Not sure	unlikely	Very unlikely
Have someone drop me off	Very likely	likely	Not sure	unlikely	Very unlikely

B) Downtown parking garage (see map for location)

Walk	Very likely	likely	Not sure	unlikely	Very unlikely
Bike	Very likely	likely	Not sure	unlikely	Very unlikely
Drive and park	Very likely	likely	Not sure	unlikely	Very unlikely
Have someone drop me off	Very likely	likely	Not sure	unlikely	Very unlikely

C) Future parking lot on east side of Bridger Canyon Rd near proposed Story Mill development (see map for location)

Walk	Very likely	likely	Not sure	unlikely	Very unlikely
Bike	Very likely	likely	Not sure	unlikely	Very unlikely
Driving and parking	Very likely	likely	Not sure	unlikely	Very unlikely
Having someone drop you off	Very likely	likely	Not sure	unlikely	Very unlikely

12. I am most likely to get information about Streamline from: (check all that apply)

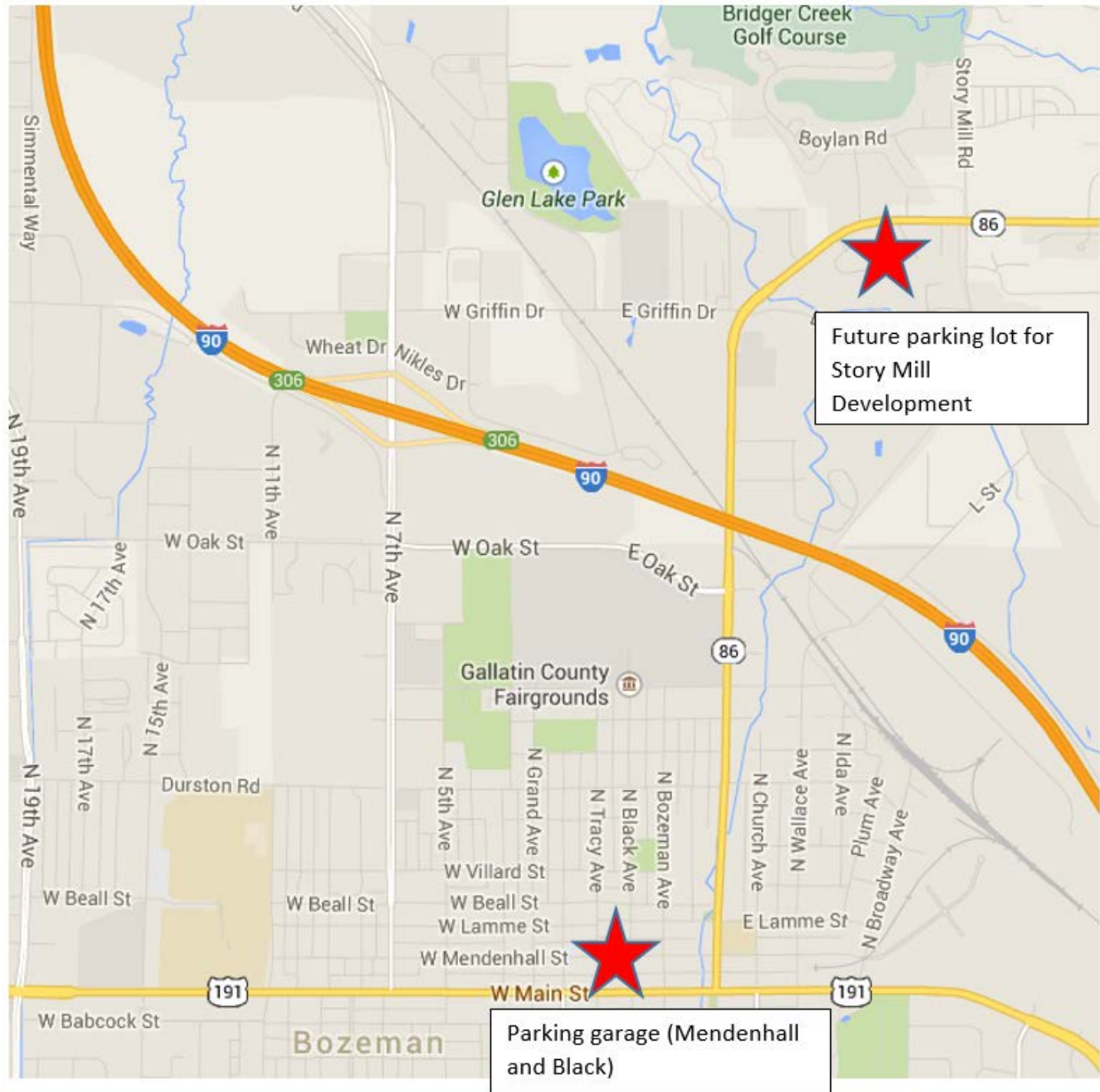
- ☐ Mobile app    ☐ Email    ☐ Newspaper    ☐ Text messages to cell phone  
☐ Website    ☐ Friend    ☐ Message board at major stops  
☐ Other (please describe) \_\_\_\_\_

13. What year you were born? \_\_\_\_\_

14. What is the zip code of your permanent residence? \_\_\_\_\_

15. What is your gender?    ☐ Female    ☐ Male

**Thank you for completing this survey!**



Parking area map distributed with survey.

## 5. APPENDIX B: SURVEY COMMENTS

Comments to Question 8: How could the bus service to Bridger/ Bohart be improved?	Categories
1. Although using one of the smaller buses at 8:15 am going up, on powder days is not enough capacity, 4:30 would be better, we make sure we're early because we have seen people turned away many times	capacity, schedule
2. They are often full so, maybe more buses?	capacity
3. The young adults are rude and make awful sexist remarks. Throw them off the bus, maybe charging to ride would help. I started driving because I work at Bohart and twice the bus stop was full.	capacity, other
4. Additional buses to Bridger Sat AM, enough Bridger to Bozeman capacity so you do not have to worry about getting a seat on the way back to Bozeman, add MSU location, add a 4:30 bus so I can catch the last chair and still make the bus	capacity, stop location
5. gear storage options	gear storage
6. Storage options to put your gear	gear storage
7. ski racks	gear storage
8. Another a.m. bus up would be ideal for workers; 8:05 bus. Ski /snowboard racks	gear storage, schedule
9. It would be great to have an outside ski rack. Would love to have a departure between 9 and 12. Maybe 10:30?	gear storage, schedule
10. would be great to have a gear rack. Have 2 busses available for departure in AM to mountain to accommodate amount of riders.	gear storage, capacity
11. more storage space	gear storage
12. more room for ski equipment	gear storage
13. you could potentially fit more people with external ski/board storage. Otherwise, this service is awesome! What a great resource.	gear storage
14. a dedicated space up front to pile skis	gear storage
15. gear storage options, 4:30 buses would be better	gear storage, schedule
16. ski/snowboard storage options could be expanded, though I'm not sure how. Also, a pick up time from bozeman between 9-11:50 could be nice and popular. Also, maybe one from MSU?	gear storage, schedule
17. gear storage, as a single mom w/2 kids it's rough gabling to juggle their gear-however, I completely appreciate the ride! It's much easier than hauling their gear through the parking lot at Bridger. Also, would you consider a Belgrade location?	gear storage, stop location
18. snowboard/ski storage, more trips	gear storage, schedule
19. ski racks on outside of bus	gear storage
20. baskets outside bus/under carriage boxes	gear storage
21. a rack to carry skis and board, more stops on south side	gear storage, stop location
22. ski rack on side, pickup downtown, weekday service	gear storage, stop location

23. gear storage on outside of bus would be nice and pick up location should be more accurately described on website (Bridger site)	gear storage, other
24. ski racks on outside of bus	gear storage
25. ski racks on the outside especially since some buses have overload storage and you can't get your ski's underneath them	gear storage
26. add ski racks to the outside of the bus	gear storage
27. ski/snowboard storage, powder days more buses, something in between 9 & 11 departure	gear storage, capacity
28. outside racks, bigger bus	gear storage, capacity
29. outdoor storage for boards and skis	gear storage
30. some storage would be nice	gear storage
31. ski storage	gear storage
32. ski/snowboard racks would be nice; however, room is still on the bus. More trips from streamline would be good	gear storage, schedule
33. a place to store/hang skis	gear storage
34. ski and snowboard equipment should have storage other than inside the bus- it takes up room and could be dangerous	gear storage
35. could use ski/snowboard racks	gear storage
36. ski and snowboard storage on side of bus	gear storage
37. better way to carry gear	gear storage
38. ski racks might help free up room on the bus	gear storage
39. The adult rule is not enforced. This is not a problem unless bus is full which seems to happen about 30% of time	other
40. improved bus stop location destination at kmart	other
41. I really like the buses. It's nice because I can go up and not have to drive and look for parking as well as save on gas.	other
42. have kids ride kid bus	other
43. I think the fairgrounds is the best for me	other
44. each driver should have experience with children. Niceness.	other
45. make fairgrounds first and last stop	other
46. don't miss scheduled stop, waited for bus at 11:20 and bus never showed until 12:30. I missed an appointment in town and now I am less likely to use the bus	other
47. It would be nice if times more correlated w/ski lessons times. (group times too, not just the multi-week kids- small group classes are different); would be nice if there was an early bus for those who have to get there early to set up for ; would be nice if last bus was later	schedule
48. a 10:00 o'clock departure time	schedule
49. add more stops in addition to the regular stops	schedule
50. another bus leaving at 10 am!	schedule
51. add another bus going up to Bridger at some time between the 9 am and 11:50 am, maybe at 10-10:30 am	schedule



52. add departure time between 9 and 11:50- 10:30 would be great. It is a great service and I ski quite a bit and tell others about it. No one that I know rides the bus. It would be nice if junior high boys were turned away when bus gets full of adults at end of the day. I t would be nice to have service at least once a day during week days- 9am departure would be great.	schedule, other
53. more times go up between 8 and 12. next to that, during the week the buses don't go to Bridger bowl. Students have to hitch hike there. So maybe this can be improved.	schedule
54. the bus should also run in the weekdays	schedule
55. have limited bus service during the week, increase frequency in the morning, change 11:50 and 12 departure times to be 15 minutes earlier, so families with kids can make it in time for 1 PM ski lessons, and still eat lunch	schedule
56. arrival/departure time: maybe have one more bus between 9 AM and 11:50 AM	schedule
57. Although it may not be economically feasible, weekday routes would be awesome. Maybe have an AM and PM trip that you pay for and keep weekend free?	schedule
58. all one more trip at 10:00 AM, send extra buses for more riders if needed	schedule, capacity
59. more arrival/departure times, would appreciate more coordination with the other lines, thank you for considering our opinions!	schedule, other
60. 10 Am departure times from fairgrounds	schedule
61. more frequent buses, larger buses during peak time, ability to carry gear safely, weekday service?	schedule, capacity
62. more departure times after 4:15 from Bridger	schedule
63. every day during ski season!	schedule
64. bus trips during this week	schedule
65. more pick up times	schedule
66. more frequent times- once an hour?	schedule
67. daily during ski season	schedule
68. have them run more frequently on weekends, etc. have an 8:39 AM bus to go to Bridger	schedule
69. I already filled out a survey, but I would like to add last bus leave at 4:30 instead of 4:15. Thanks	schedule
70. I wish there was a pick up in Belgrade	stop location
71. Pick up location at MSU SUB. More pick up times, especially earlier	stop location, schedule
72. More pick up locations, more than 1 bus doing the pick up (2 busses at the same pickup time w/ 5 minutes between)	stop location, capacity
73. A college location, strap for skis, maybe take out back 4 seats	stop location, gear storage
74. It would be nice for MSU students without cars if there was a pick up/drop off on campus (direct to Bridger) I would like more consistency in the order of stops (Fairgrounds before Kmart, Bohart before Bridger)	stop location, other
75. only one pick-up in town, not both kmart and fairgrounds, better storage, better on-time	stop location, gear storage
76. come to campus to pick up skiing students	stop location

77. depart directly from MSU campus	stop location
78. one from campus, a bit worried about catching a ride home	stop location
79. msu campus	stop location
80. you could probably add a few more stops on the south side of town	stop location
81. pickup/dropoff locations- near MSU?, more frequent runs, improve signage at Bridger Bowl, awareness about bus times	stop location, schedule
82. possibly more pickup/dropoff locations	stop location
83. have a stop at Msu at the early times (8 am & 8:45)	stop location
84. the connections from MSU could be better, especially an earlier one	stop location
85. pick ups on campus/south side of town	stop location
86. we are from Manhattan area so a pickup/drop off might be nice	stop location
87. pick up on the west side of town	stop location
88. lindley park location drop off, four corners pickup, west town pump gas station	stop location
89. possible campus locations	stop location
90. MSU SUB location seems most obvious	stop location
91. More pick up locations	stop location
92. stop at k mart would help	stop location
93. pick up/drop off MSU campus, ski racks	stop location, gear storage

# Appendix 6-3

## Carpool and Bus Survey

# **Bridger Bowl and Bohart Ranch Carpool and Bus Transportation Survey Results (April 2015)**

by

Rebecca Gleason  
Research Engineer

Tiffany Allen  
Research Scientist

Taylor Lonsdale  
Research Engineer

Western Transportation Institute  
College of Engineering  
Montana State University

A report prepared for the

DJ&A, P.C. Engineers. Planners. Surveyors.  
3203 Russell Street / Missoula, MT 59801

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## **DISCLAIMER**

The opinions, findings and conclusions expressed in this publication are those of the author and not necessarily those of the Western Transportation Institute, Montana State University-Bozeman; DJ&A, P.C. Engineers, Planner, Surveyors; Custer Gallatin National Forest or U.S. Forest Service.

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## Executive Summary

This report is part of the Bozeman Area Alternative Transportation Study to assess, plan, and design alternative transportation options for accessing popular recreation sites on United States Forest Service and United States Fish and Wildlife Service lands near Bozeman, Montana. Specifically, this report contains results from 1,399 surveys administered in March and April of 2015 to people who traveled to Bridger Bowl and/or Bohart Ranch ski areas.

The purpose of the survey was to learn more about peoples' experiences and opinions regarding bus and carpooling options to and from these ski areas. The survey questionnaire is shown in Appendix A. An introduction, survey methods, and detailed results are presented in the following chapters. This executive summary highlights some key results and suggestions, with the understanding that it may not be feasible to implement all of the suggestions due to economic or other reasons.

### Carpooling

Results indicate that most respondents traveled to these ski areas during the 2014–2015 ski season by driving/riding with one other person (39%) or with two or more other people (34%). Bridger Bowl expanded the “upper” parking lot this season for use only by vehicles with 3 or more people. About 42% of respondents reported that the designated lot was either somewhat or very effective in encouraging them to carpool (3 or more people per vehicle). When asked about other options that may encourage carpooling, over 50% of respondents reported that the following incentives and disincentives are all somewhat or very important:

- a chance to win a \$10-25 or \$26-50 gift card,
- a designated location to meet others that want to share a ride,
- having to park far away from the ski hill if driving alone, or
- having a parking fee for non-carpoolers.

Question 4, which inquired how the above incentives and disincentives may influence people's choice to carpool also, had a comment section which received 334 comments. While disincentives may be a motivating factor to carpool, many comments indicate people are strongly opposed to paying a fee or having to park farther away from the ski hill if driving alone. The following comment is one of many expressing similar sentiments: *“You've got to think of positive ways to do this, not negative. No point in generating bad karma just because you're a popular destination.”* These survey results support continuing to promote the existing carpool lot, increasing carpooling incentives (such as 3 on a wheel deal or more up close parking) and exploring other incentives to reward carpoolers.

### Bus Schedule

A majority (85% and 83%, respectively) of respondents did not use the Streamline bus service to Bridger Bowl/ Bohart during the 2013–2014 or 2014–2015 ski seasons. However, 57% reported that they would consider riding the bus in the future. When asked what would encourage them to ride a bus to Bridger/Bohart, 48 percent of people indicated that weekday busses would be helpful. Many also indicated that having a stop near their residence (39%) and more frequent busses on the weekends (39%) would encourage them to ride a bus to the ski areas.

In various comments throughout the survey, people had many suggestions to modify the bus schedule, including more frequent stops, weekday service, and greater capacity for both

passengers and gear on the busses. Several people also mentioned that a locker area at Bridger Bowl designated for bus riders would be nice and would increase their willingness to ride the bus. Related to the desire for a different bus schedule, several respondents commented on the desire/need for a sober ride home from Bridger. These comments typically mentioned needing later departure times. These survey results support increased frequency of weekend busses.

**Bus Stop Locations**

The fairgrounds, an existing stop, was the most popular location (58%) that people said they would be likely or very likely to use, followed by the future Story Mill parking area (43%) and Montana State University (42%). In addition to the choices given on the survey, many people suggested other locations they'd like to have a bus stop or park and ride. These include a stop along Bridger Canyon Road, at or near the fire station or at Jackson Creek Road, for example. Many people suggested a stop on the south side of Bozeman, e.g. Sacajawea Middle School, south Willson, or MSU. The area near the hospital was also suggested several times, including Bogart Park, Lindley Park, the library, Peet's Hill, and the hospital. Several other comments suggested out of town stops, specifically Belgrade and Livingston. These survey results support exploring other bus stop locations.

## 1. INTRODUCTION

Bridger Bowl ski area and Bohart Ranch Cross Country Ski Center are two popular recreation areas located on Forest Service lands near Bozeman, Montana. These two areas are typically open to skiers from early December to early April. The Western Transportation Institute developed a survey on behalf of DJ&A and the Custer Gallatin National Forest to learn more about the experiences and opinions of skiers and other interested individuals regarding transportation to and from these ski areas. The survey instrument is located in Appendix A. Researchers administered surveys in March and April, 2015. This report contains the results of the surveys and is organized as follows:

- Chapter 2 describes the survey methodology.
- Chapter 3 presents survey results.
- Appendix A contains the survey instrument.
- Appendix B contains a sample of comments from the surveys.

This work is one part of the Bozeman Area Alternative Transportation Study to assess, plan, and design alternative transportation options for accessing popular recreation sites on United States Forest Service and United States Fish and Wildlife Service lands near Bozeman, Montana.

## 2. METHODOLOGY

Surveys were distributed both in person and online using SurveyMonkey®. Researchers administered surveys at the Jim Bridger Lodge and Deer Park Chalet using paper surveys on a clipboard. A total of 83 paper surveys were completed over two weekends, March 21 and 22 and March 28 and 29 during typically busy mid-day lunch time at the lodges. A link to the online survey was distributed via Bridger Bowl's e-mail list serve on April 3, 2015 and the survey was closed on April 7, 2015, resulting in responses from more than 1300 people.

The target population for this survey were people who traveled to Bridger Bowl/Bohart during the 2014-2015 winter season (early December through early April), estimated at 43,000 people. This number is based on 8,363 season pass holders and the assumption that up to 35,000 individuals purchased day tickets. This assumes day ticket purchasers averaged three tickets per season ( $102,516 \text{ day tickets} / 3 = 34,172$ ).

Based on a population of 43,000 people and 1300 surveys, results reflect a 95% confidence level with a margin of error plus or minus 2.86. For example, if 30% of our sample pick an answer, we can be 95% certain that if we had asked the question of the entire relevant population, between 27% (30-2.86) and 33% would have picked that answer. Varied response rates from the total sampled population mean that the margin of error will vary from question to question.

While the large sample size for this survey results in a low margin of error, results may be biased, because people that chose to take the survey may not be representative of the target population. People that chose to respond may be more interested in transportation, carpooling, and/or bus travel than the target population. Results are described in the following section.

### 3. RESULTS

There were a total of 1,399 surveys completed, with 83 paper surveys completed in person and 1,316 surveys completed online. Respondents were not required to answer every question, so some respondents did not answer every question.

#### 1.1. Questions 1–2

More than 40 percent of respondents (n=1,378) skied at Bridger Bowl and/or Bohart Ranch more than 20 times during the 2014–2015 ski season (Figure 1). Most respondents reported that they most often travelled to the ski area by driving/riding with one other person (39%, n=1371) or with two or more other people (34%, Figure 2).

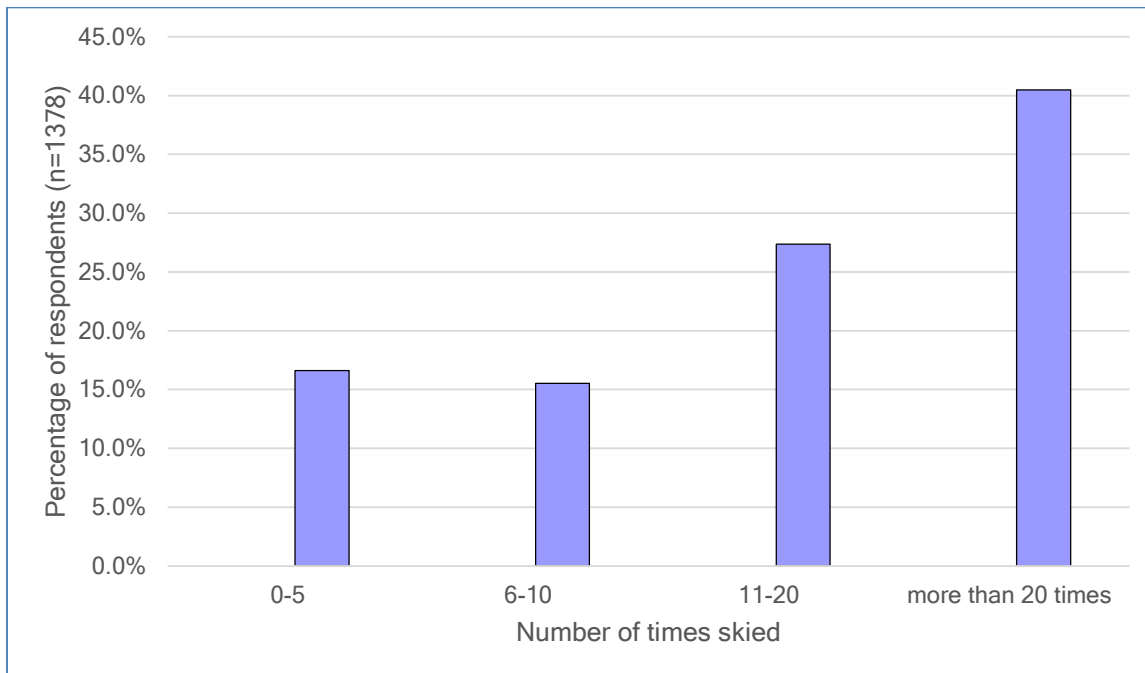


Figure 1. Number of times the respondent skied at Bridger Bowl and/or Bohart Ranch during the 2014–2015 ski season.



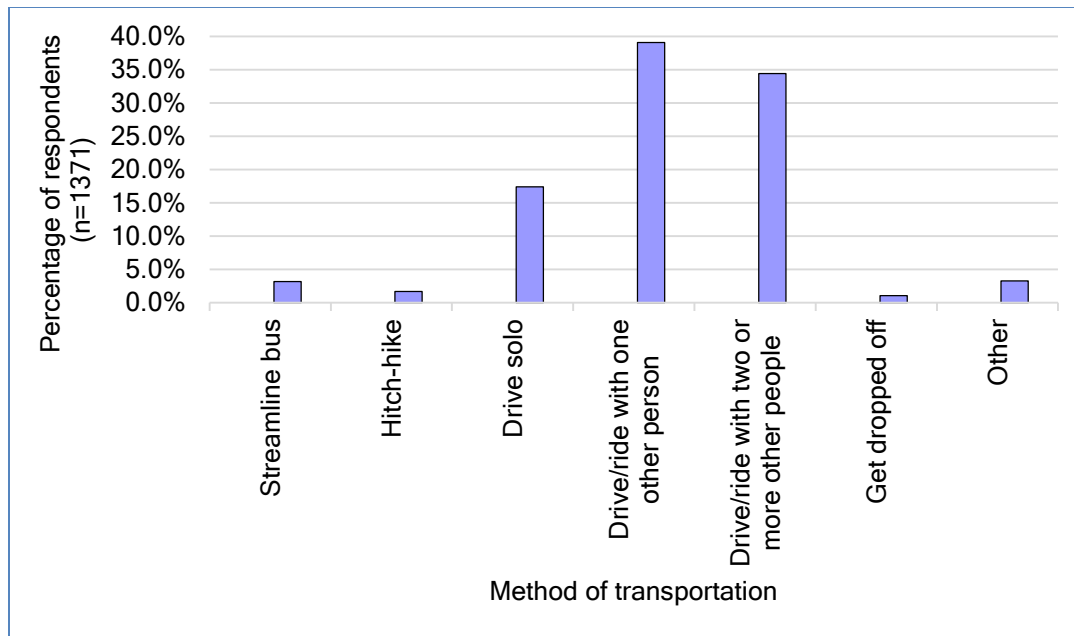


Figure 2. Method of transportation that each respondent reported using to travel to Bridger Bowl or Bohart Ranch most often during the 2014–2015 ski season.

## 1.2. Questions 3–4

When given a prompt, “Bridger Bowl designated the upper carpool lot for use only by vehicles with 3 or more people this season” and asked the question “How effective has this been to encourage you to drive/ride to Bridger with 3 or more people?”, 42 percent reported that it was somewhat or very effective, 27 percent were neutral, and 22 percent reported that it was not very effective or not effective at all (Figure 3).

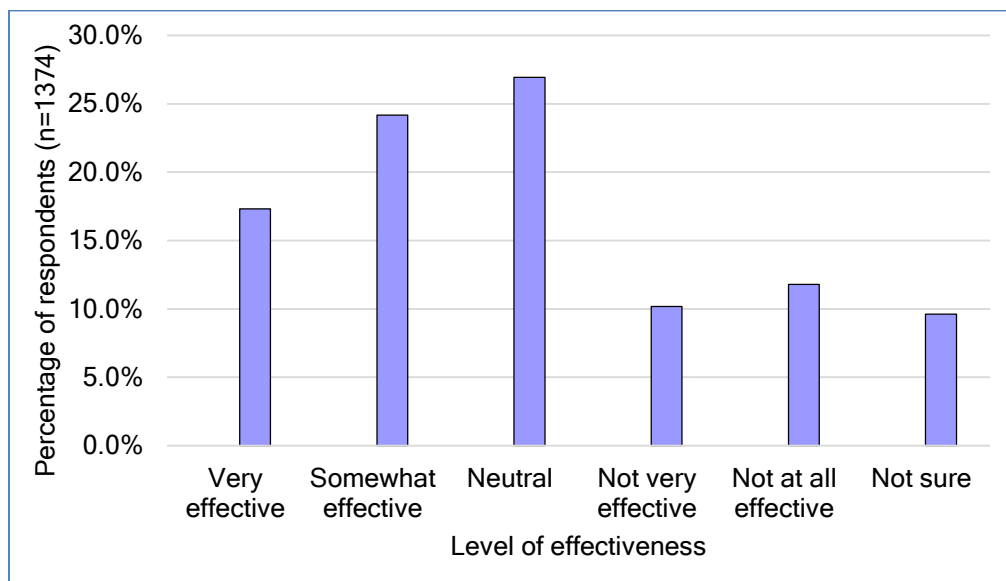


Figure 3. Reported level of effectiveness of the carpool lot in encouraging respondents to drive/ride to Bridger Bowl with 3 or more people per vehicle.

Most respondents would be motivated by a chance to win a \$26-50 gift card (64%, n=1,322), a chance to win a \$10-25 gift card (58%, n=1,327), a designated location for ride share (56%, n=1,346), having to park far away from the ski hill if driving alone (55%, n=1,330), or by a parking fee for non-carpoolers (50%, n=1,318) (Figure 4). This question had a comment section that received 334 comments, the most of any question. Based on the comments, people may prefer ‘positive’ incentives for carpooling or a means to make it easier, such as a chance to win a gift card or a designated ride share lot. One comment suggested “*Print T-shirts Car Pool Powder Hound or Bus rides for the cold smoke.*” Many comments strongly stated that, while it may be a motivating factor to carpool, a fee for not carpooling is not preferred and neither is having to park far away from the ski hill. A sample of question 4 comments are shown in Appendix A.

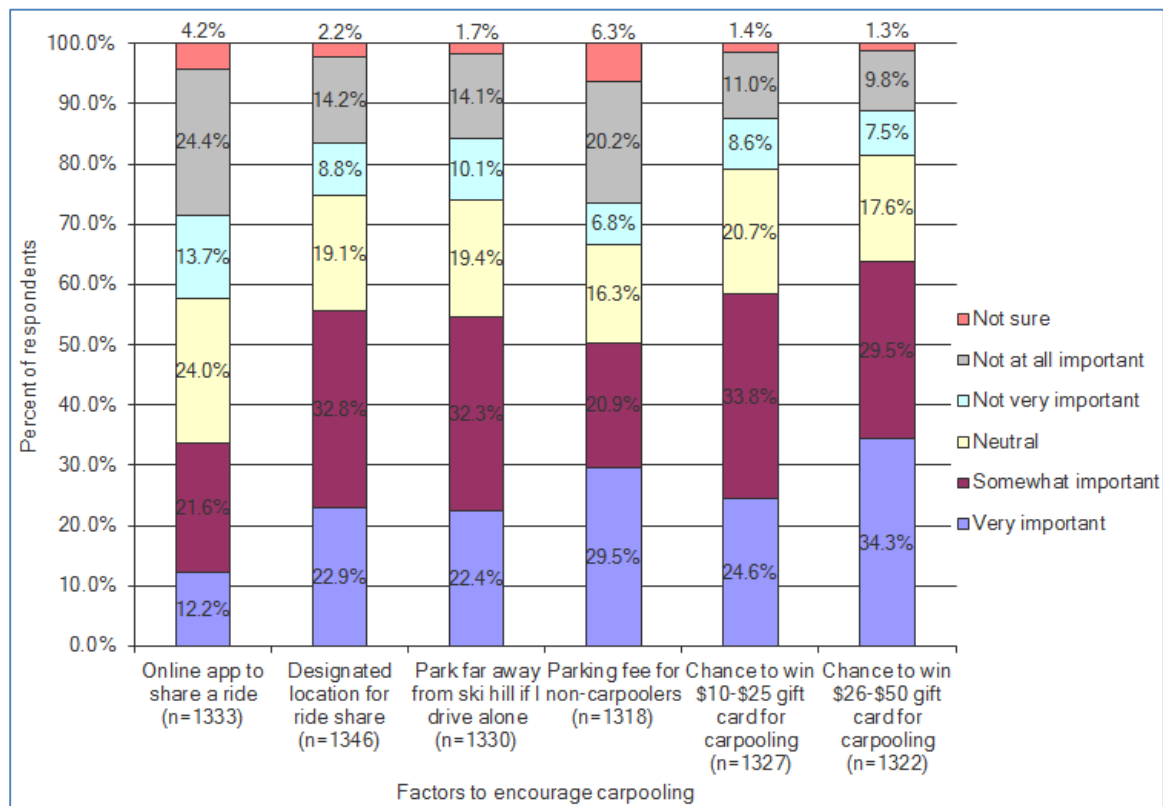


Figure 4. Importance of factors to encourage carpooling to Bridger Bowl and Bohart Ranch.

### 1.3. Questions 5–15

A majority (85%, n=1,353) of respondents did not use the Streamline bus service to travel to Bridger Bowl and/or Bohart Ranch during the 2013–2014 ski season (Figure 5), and 83 percent (n=1,353) did not use the bus during the 2014–2015 season (Figure 6).

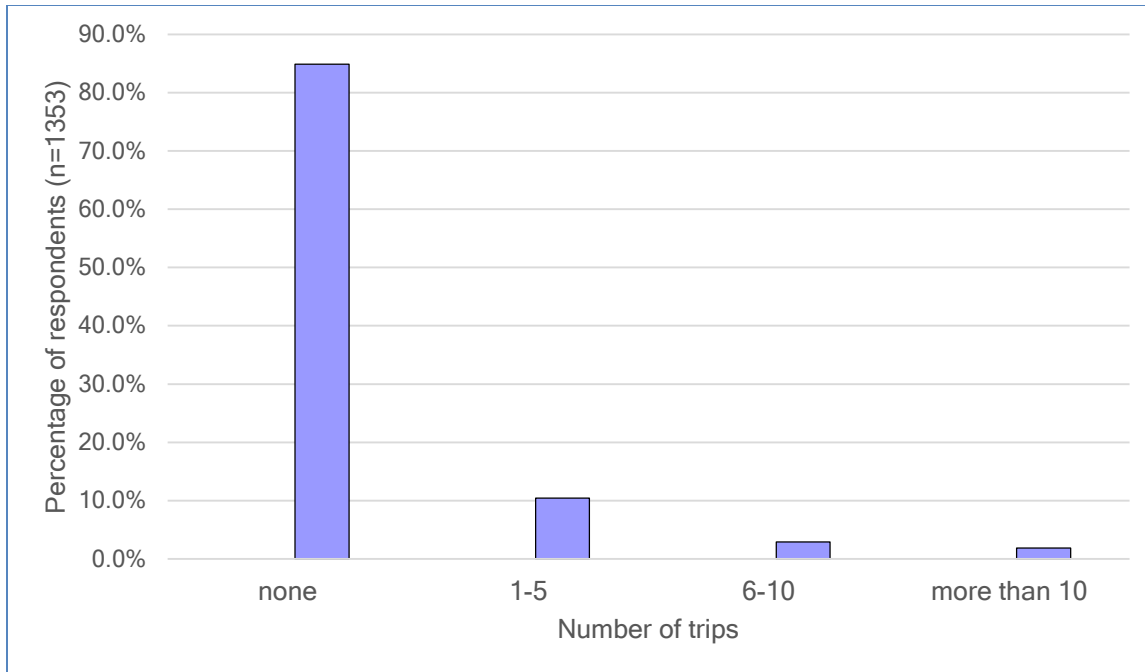


Figure 5. Number of bus trips reported during the 2013–2014 ski season.

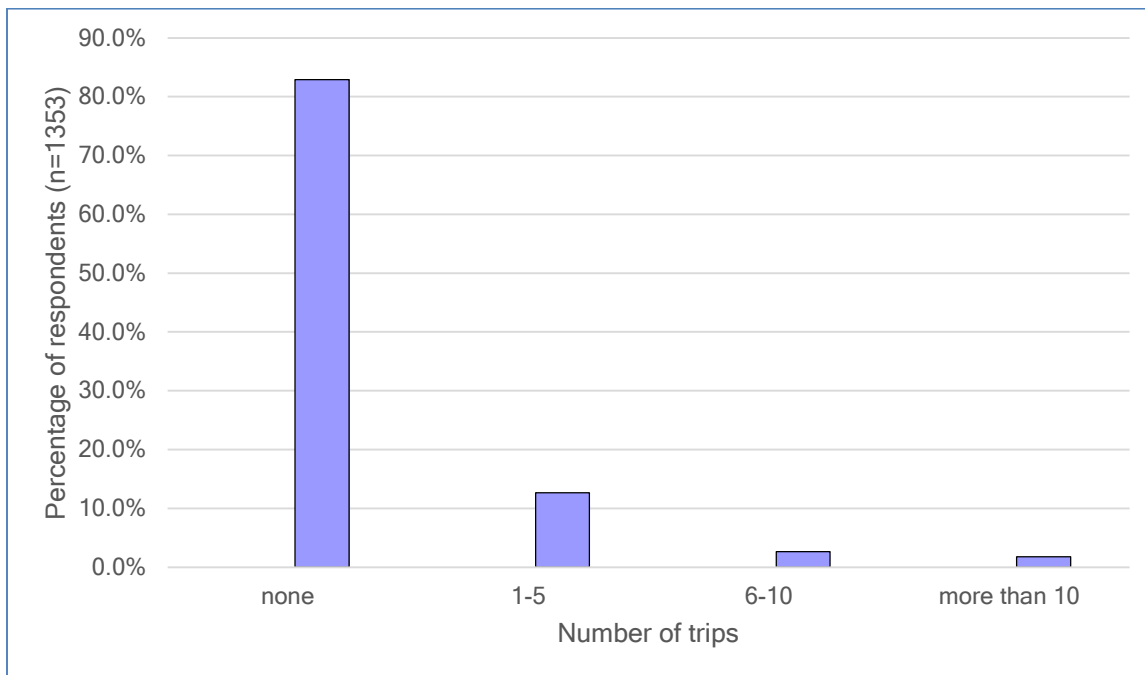


Figure 6. Number of bus trips reported during 2014–2015 ski season.

Many (36%, n=1,267) respondents reported being 'neutral' with the Streamline bus departure times, and 43 percent reported the departure times were either very or somewhat convenient

(Figure 7). Most (57%, n=1,345) indicated they would consider riding the bus to Bridger Bowl and/or Bohart Ranch in the future (Figure 8).

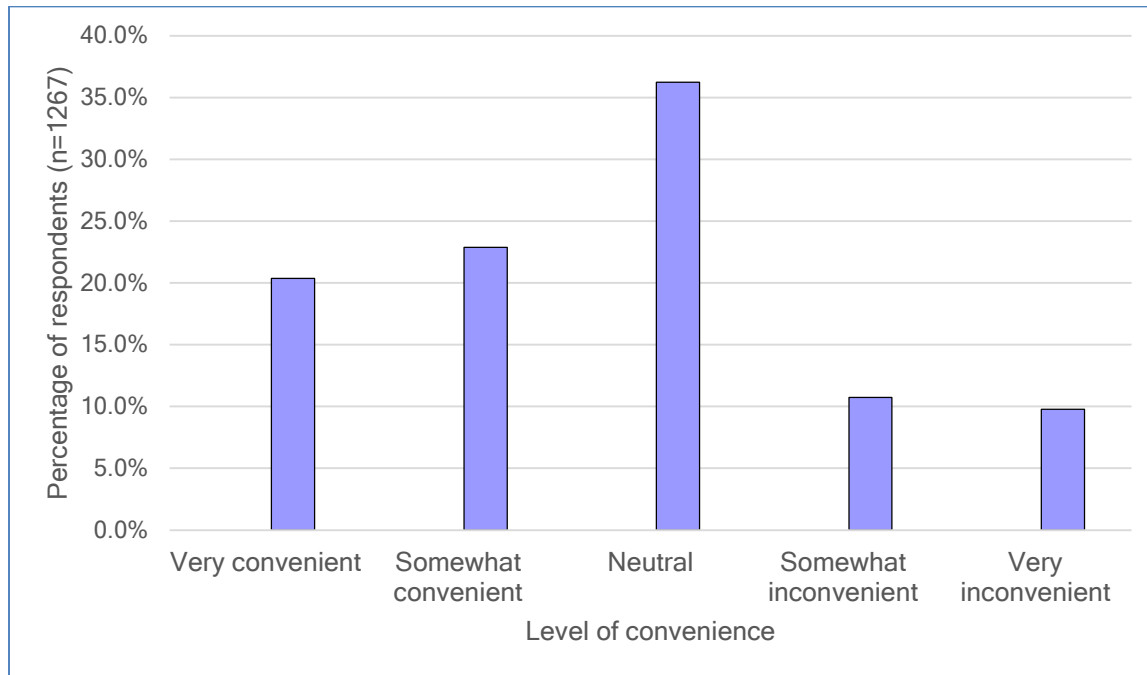


Figure 7. Reported convenience of Streamline bus departure times.

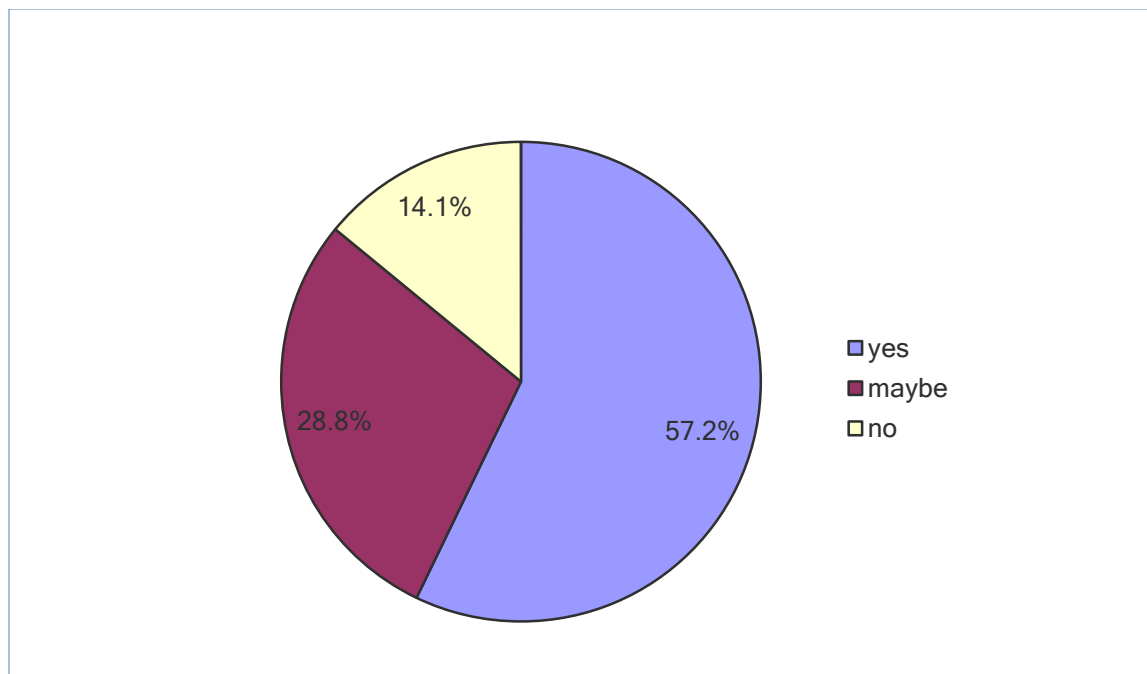


Figure 8. Percentage of respondents who would (yes) or would not (no) consider riding the bus to Bridger Bowl and/or Bohart Ranch in the future.

When asked to choose the top two reasons that would cause them to consider riding a bus to Bridger/Bohart, a majority of respondents indicated that convenience (57%, n=1,320) and reducing transportation impacts to the environment (53%) are important reasons. Forty percent indicated that saving money is also a reason that would cause them to consider taking a bus (Figure 9).

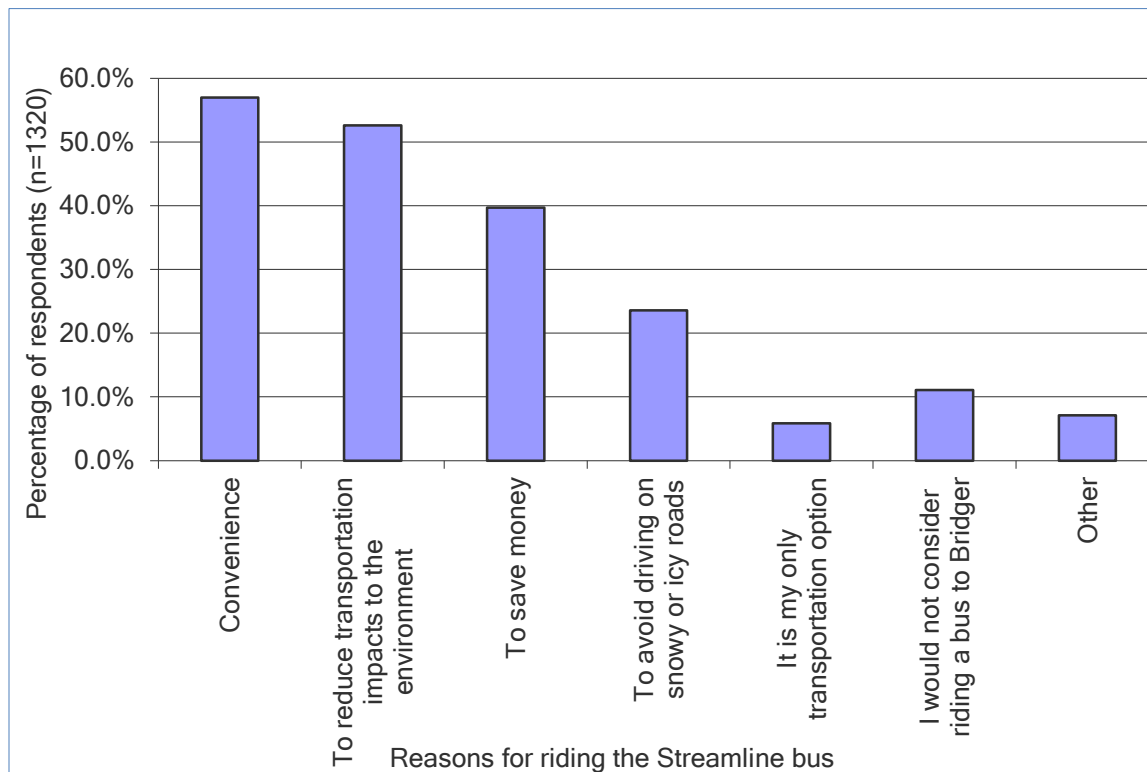


Figure 9. Reasons respondents would consider riding a bus to Bridger Bowl and/or Bohart Ranch. Note: Respondents could each choose two reasons.

When asked to choose the top two items that would encourage them to ride a bus to Bridger/Bohart, 48% (1,285) indicated that weekday busses would be helpful. Many also indicated that having a stop near their residence (39%) and more frequent busses scheduled on the weekends (39%) would encourage them to ride a bus to Bridger/Bohart (Figure 10).

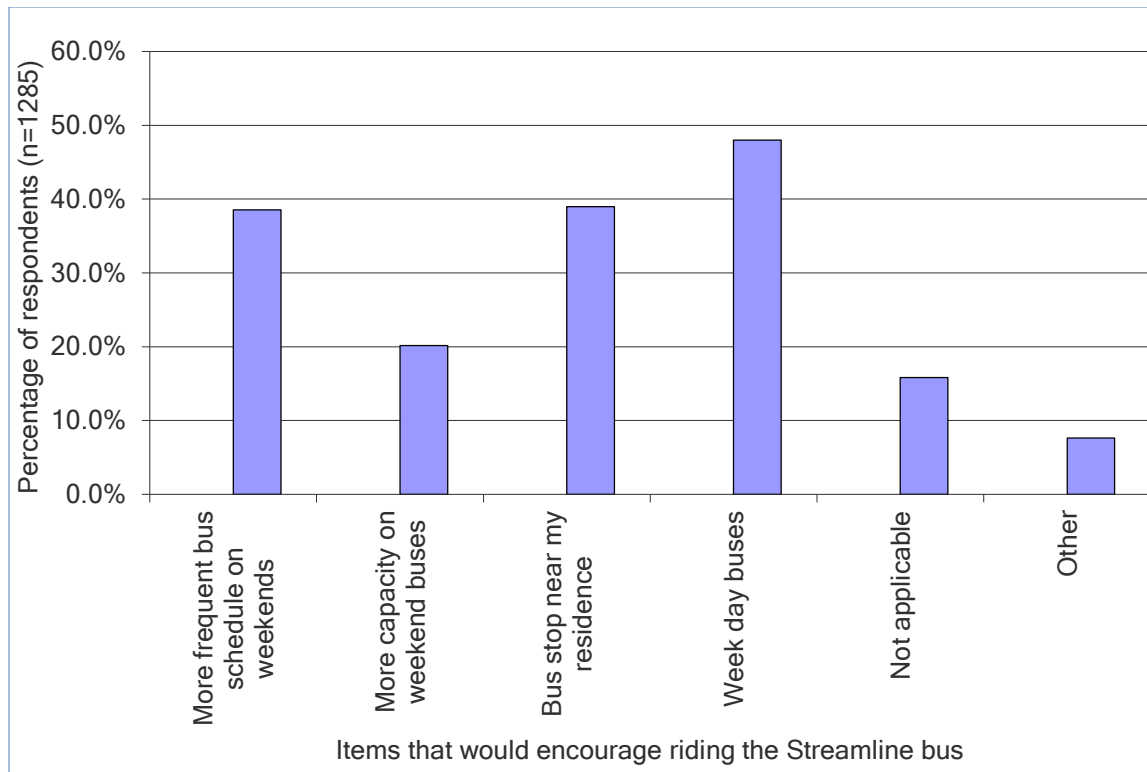


Figure 10. Items that would encourage respondents to ride a bus to Bridger Bowl and/or Bohart Ranch. Note: Respondents could each choose two items.



When asked if they would be willing to pay for the bus service, 54% replied “yes” and 46% replied “no” (n=1,309, Figure 11). There was a follow-up question for those who answered yes, though some who responded “no” also answered. This was a “fill in the blank” response, thus the following results summarize the information by categories, providing an estimate of how much people are willing to pay. It should be noted that the ranges shown in the chart were not provided as answer choices on the survey. Including all responses, 42% (n=557) reported being willing to pay \$1.00 - \$2.99 per person per round trip (Figure 12). Many respondents also suggested a season pass, punch card, family or children’s price. And some suggested a discounted or free fare if the rider has a season ski pass.

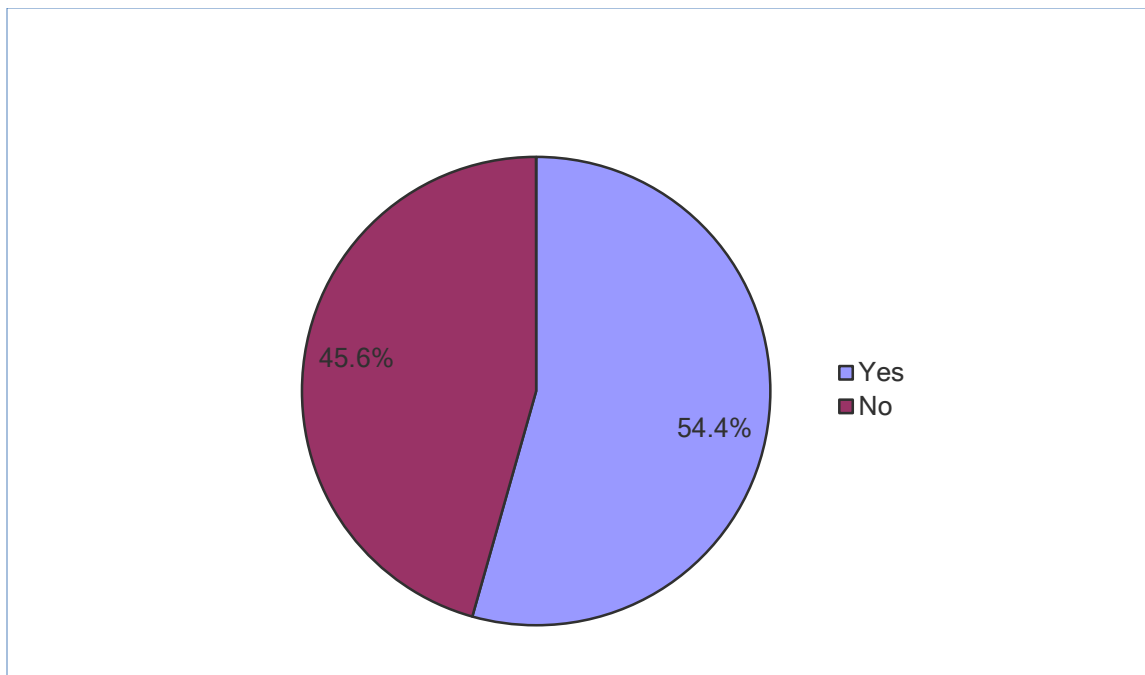


Figure 11. Percentage willing to pay for Streamline bus to Bridger/Bohart.

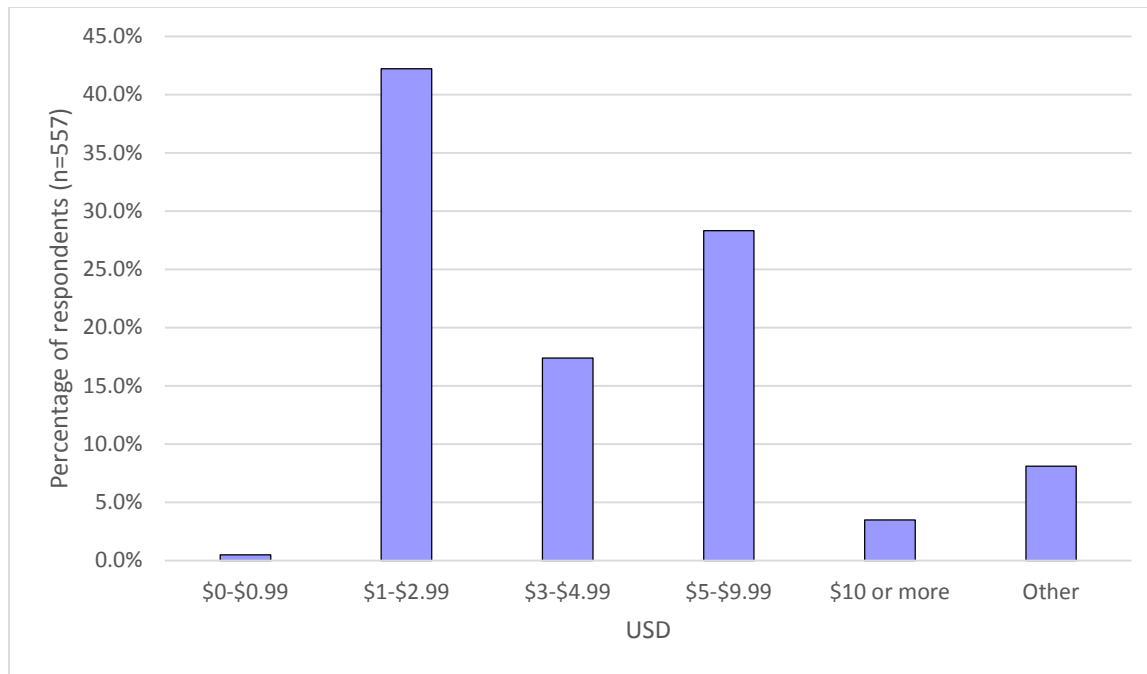


Figure 12. Amount willing to pay for a round trip bus between Bozeman and Bridger/ Bohart.

In one question, respondents were asked, “How likely are you to use each of the following locations to catch the bus or park and ride (carpool)?” The fairgrounds, an existing stop, was the response for which the most respondents (58%) indicated they would be likely or very likely to use. Many respondents also reported that they would be likely or very likely to use the future Story Mill parking area (43%) and Montana State University (42%, Figure 13). A majority (62%, n=1,312) of respondents reported that they would drive to the stop where they would get on the bus or carpool location and park there (Figure 14).

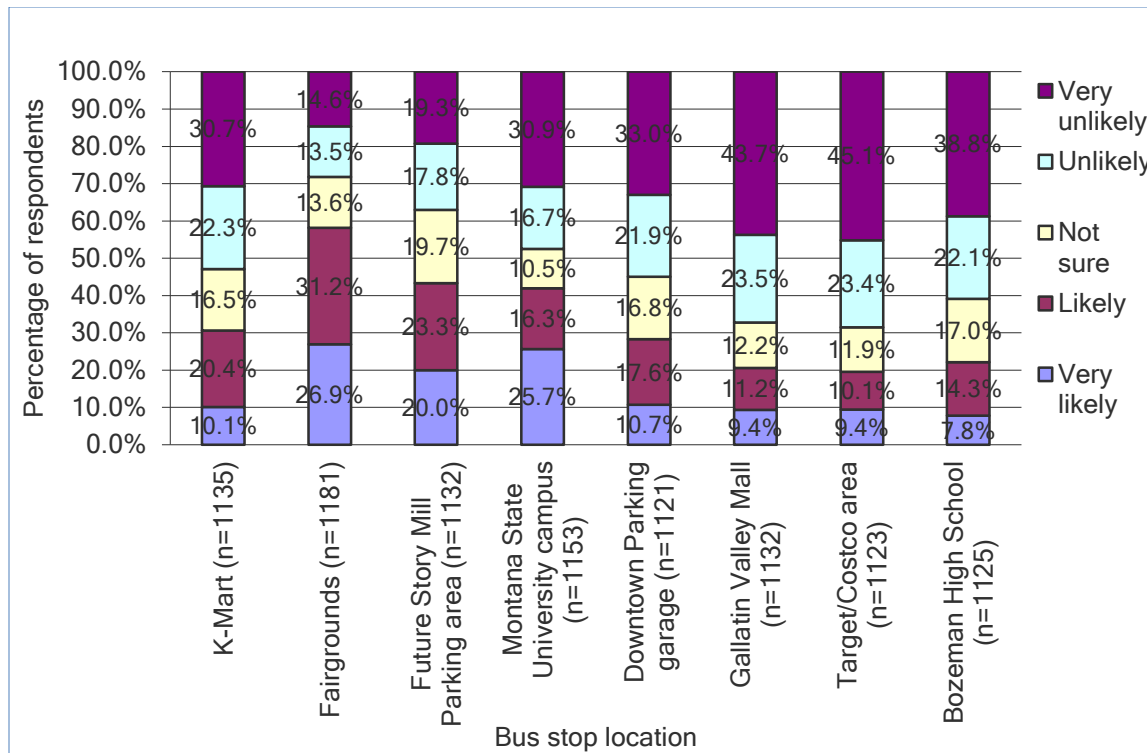


Figure 13. Likelihood of respondents using each of the existing or proposed bus stop locations.

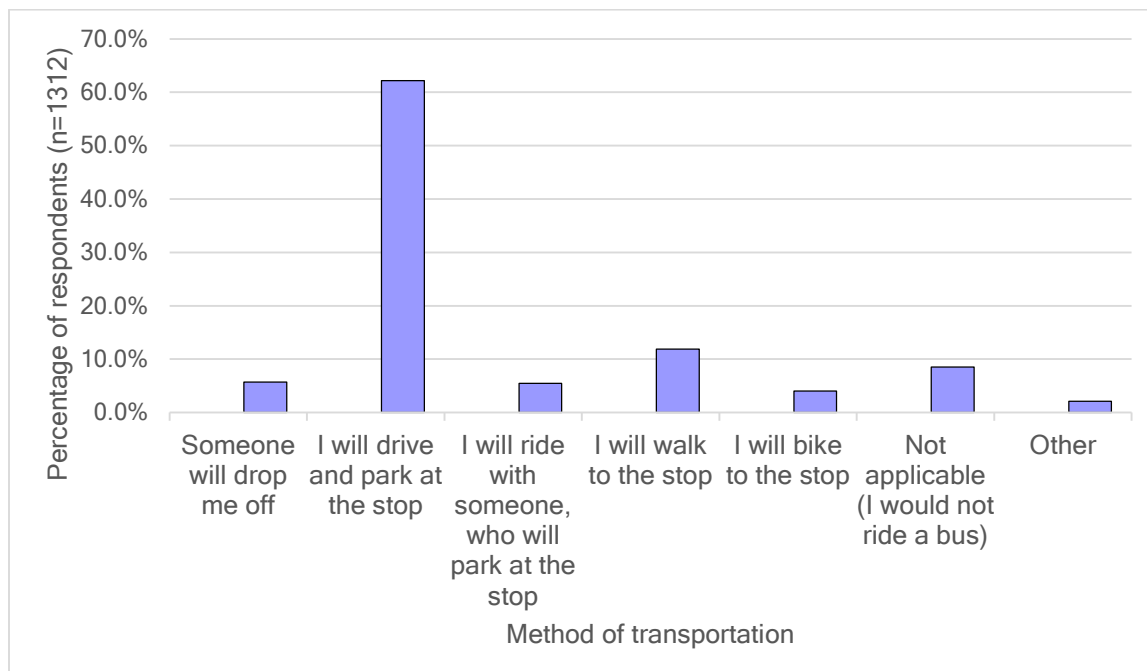


Figure 14. Most likely method of transportation for traveling to the bus stop or park and ride lot.

In addition to the choices given on the survey, many people added suggestions or reiterated locations they'd like to have a bus stop or park and ride location. Some of the most common locations suggested include a stop along Bridger Canyon Rd, for example at or near the fire station or at Jackson Creek Rd. Many people suggested a stop on the south side of Bozeman, e.g. Sacajawea Middle School, south Willson or MSU. The area near the hospital was also suggested several times, including locations such as Bogart Park, Lindley Park, the library, Peet's Hill, and the hospital. Several others suggested out of town stops, specifically Belgrade and Livingston.

Many (35%) reported that they are most likely to get information about transportation options to the ski areas from a website. Fewer (20%) respondents indicated that they are likely to get information via e-mail, and even fewer, ranging from one percent to 17%, reported that they are likely to get information from the other sources listed on the survey (mobile app, newspaper, text messages to cell phone, friend, message board at major stops, other) (Figure 15). Of those who responded "other," several respondents indicated that social media (e.g. Facebook or Instagram) or KGLT (a local radio station) are preferred sources of information. Note that because each respondent may have checked more than one answer, the percentages add to more than 100%.

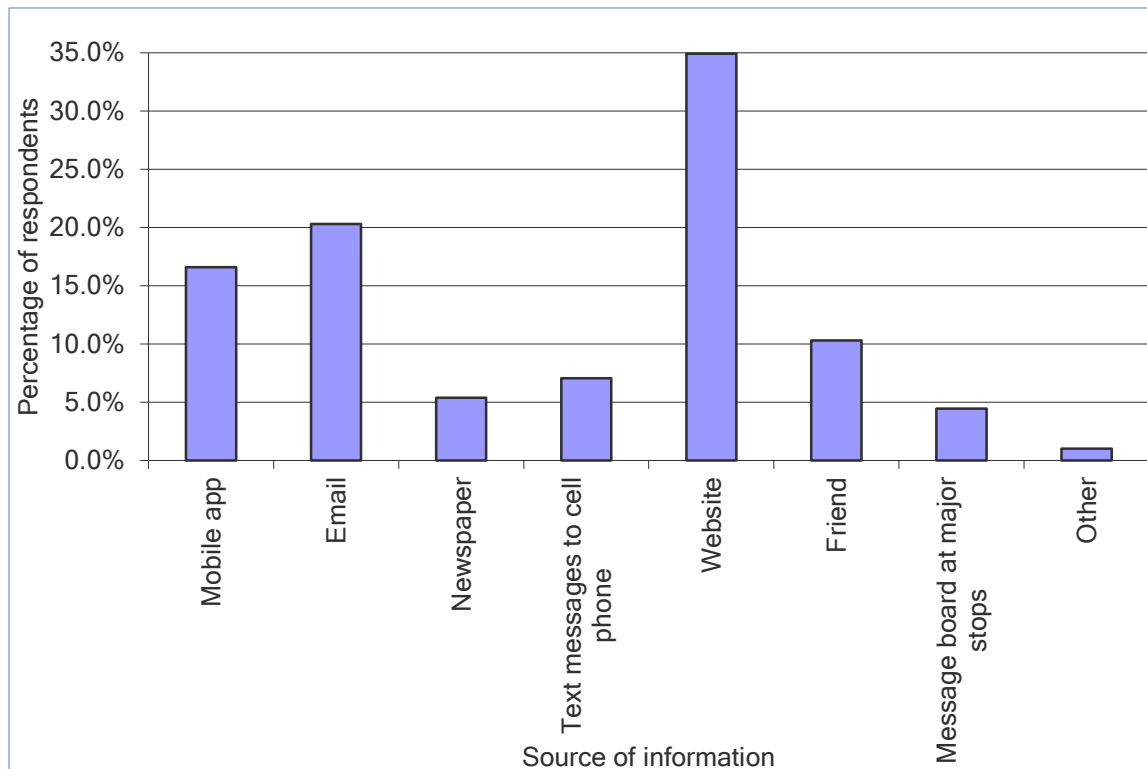


Figure 15. Source of information about transportation options to Bridger/Bohart.

A majority (57%, n=1,308) of survey respondents reported that it is very important to them that they not be restricted by someone else's schedule for going or coming from Bridger Bowl on a "powder day." Many (29%) others indicated that it is somewhat important to not have their schedule restricted, and only 14% reported that they are neutral to feeling it is not very important or not at all important to have their schedule restricted on a "powder day" (Figure 16).

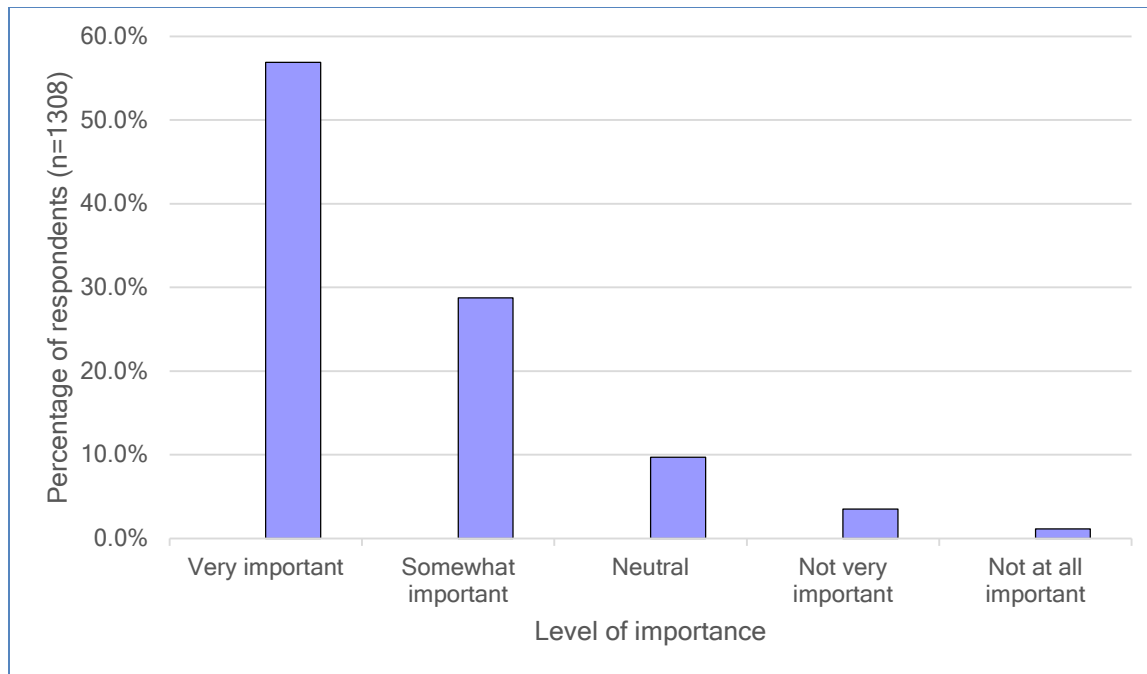


Figure 16. Level of importance for respondents to not be restricted by someone else's schedule for going to or coming from Bridger Bowl on a "powder day."

## 1.4. Question 16 Comments

Question 16 was open-ended and asked "Do you have any other comments regarding bus or carpool options to Bridger Bowl or Bohart ski areas?" Though no formal analysis of the comments was done, researchers noted several themes that came up in question 16 and other comments throughout the survey.

There were many comments regarding motivation to carpool. One common response indicated that people feel strongly they do not want to pay a parking fee, though the overall survey results suggest that this would be a motivating factor. Another common response was that families of 3 or more would be traveling together in the same car anyway, so the carpool lot was not necessarily a motivating factor for them to carpool. However, most of these comments also indicated that they appreciate being able to park close, particularly when driving with young children.

With respect to motivation to take the Streamline bus to the ski areas, there were many comments suggesting that if the bus schedule were "better" then respondents would likely ride more often. To make the bus schedule "better," there were many suggestions to increase the frequency of trips/pick-ups. There were also many comments suggesting a weekday bus, and several comments suggesting a schedule that is easier to follow. One respondent succinctly stated what many suggested: "A simple, continuous shuttle schedule - leave Fairgrounds every hour 8, 9, 10...depart from Bridger every bottom of the hour 8:30, 9:30, 10:30...."

Related to the desire for a different bus schedule, several respondents commented on the desire/need for a sober ride home from Bridger. These comments typically mentioned needing later departure times so there is time to drink after lifts stop running.

In addition to modifying the schedule, many respondents commented on the need for more capacity for both passengers and gear on the busses. Several people also mentioned that a locker area at Bridger Bowl designated for bus riders would be nice and would increase their willingness to ride the bus.

Regarding motivation and practicality of people both carpooling and taking the bus, there were a number of comments from those who live near Bridger/Bohart and from those who live far away. People who live close (e.g. in Bridger Canyon) stated that they have trouble finding 3 or more people to carpool, and it is a shorter drive to the ski area than to town to take a bus. For those who are from outside of Bozeman, many said that in addition to not being able to gather 3 or more people per vehicle, they do not take the bus for one of two reasons: 1) they do not pass through Bozeman on their trip, so it is shorter to stop at the ski area than to drive to Bozeman and take the bus (e.g. skiers traveling from Livingston); 2) they were driving far anyway and believe the mileage the bus would save them was short in comparison to the rest of their trip.

Quite a few respondents mentioned the need to enforce the 3-person rule for the carpool lot, though it is already enforced at least part of the time. Several people also mentioned the fact that people often park far apart in all the lots at Bridger Bowl and waste parking space; some think parking attendants (paid or volunteer) could help this. One person suggested that these attendants need to be well-trained to be effective. Also from the comments, there is some indication, though not strong, that both the carpool lot and Streamline need to be advertised more so people know about it.

Several people suggested that there should be a way to guarantee a ride on the bus in either or both directions. Respondents' concerns included not wanting to wait for a bus to the ski area only to be turned away because it is full and not wanting to worry about being stranded at the ski area if the bus is full on the way back to Bozeman. Some suggested a call ahead or other reservation service to help avoid such cases.

There are a few other ideas mentioned at least once that the authors believe are worth noting. Some people were concerned about various impacts of traffic to Bridger Bowl, including delays for residents, safety (e.g. drivers leaving Bridger Bowl under the influence), and environmental impacts. This comment, in particular, summarizes the concerns of some other respondents as well: "Residents in Bridger Canyon experience impacts from BB traffic, especially on powder days or weekends: long, uninterrupted lines of traffic during commuting hours morning and afternoon, increased exhaust and particulate pollution. The worst is some drivers' behavior: speeds too fast for road conditions, unsafe passing, and worst of all, road rage. Well, maybe not worse; the worst is worry of drunk drivers after the lifts close. Anything to reduce BB traffic would be greatly welcomed by us BC residents."

Some comments suggest there may be a need/desire for senior citizen parking. There were also suggestions that on mid-week, non-powder days, perhaps the carpool lot could be open to vehicles with 2 or more people.

### **1.5. Questions 17–19**

To understand general demographics, respondents were asked to indicate their gender, provide their year of birth, and the zip code of their permanent address. While both surveys (paper and online) offered the choices of "male" and "female," it should be noted that only the online survey offered the choice "prefer not to answer."



The age distribution was relatively even (Figure 17). A majority (58%, n=1,313) of respondents were male (Figure 18), and most (74%, n=1,201) live in Bozeman, MT (Figure 19).

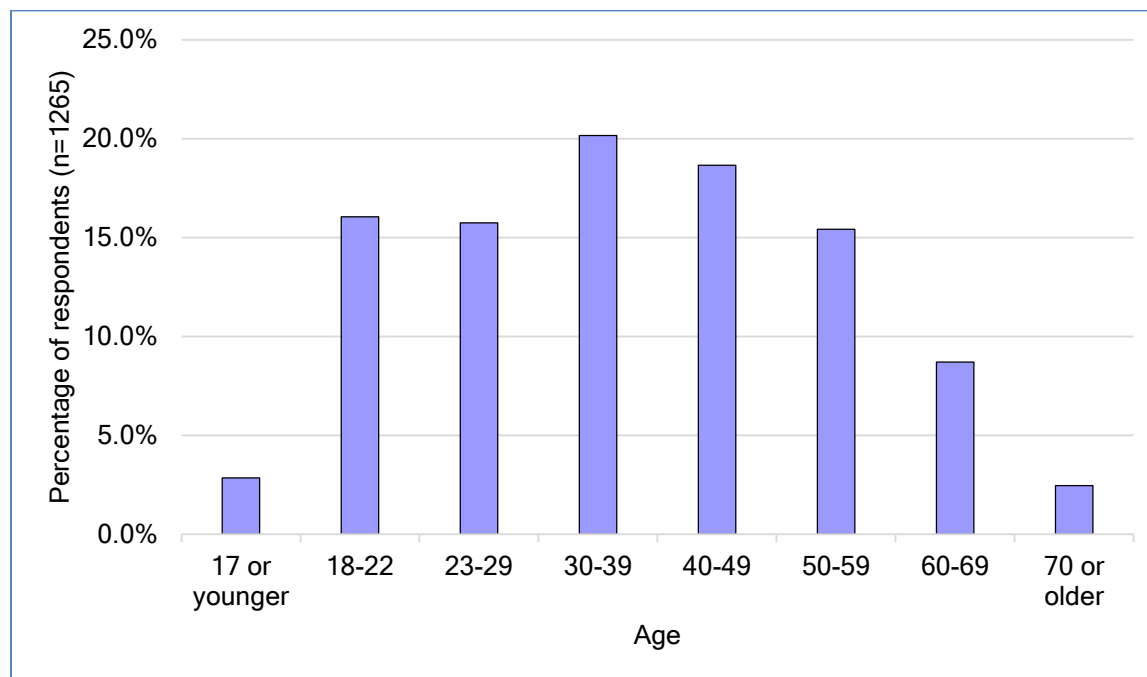


Figure 17. Age as of 31 December 2014.

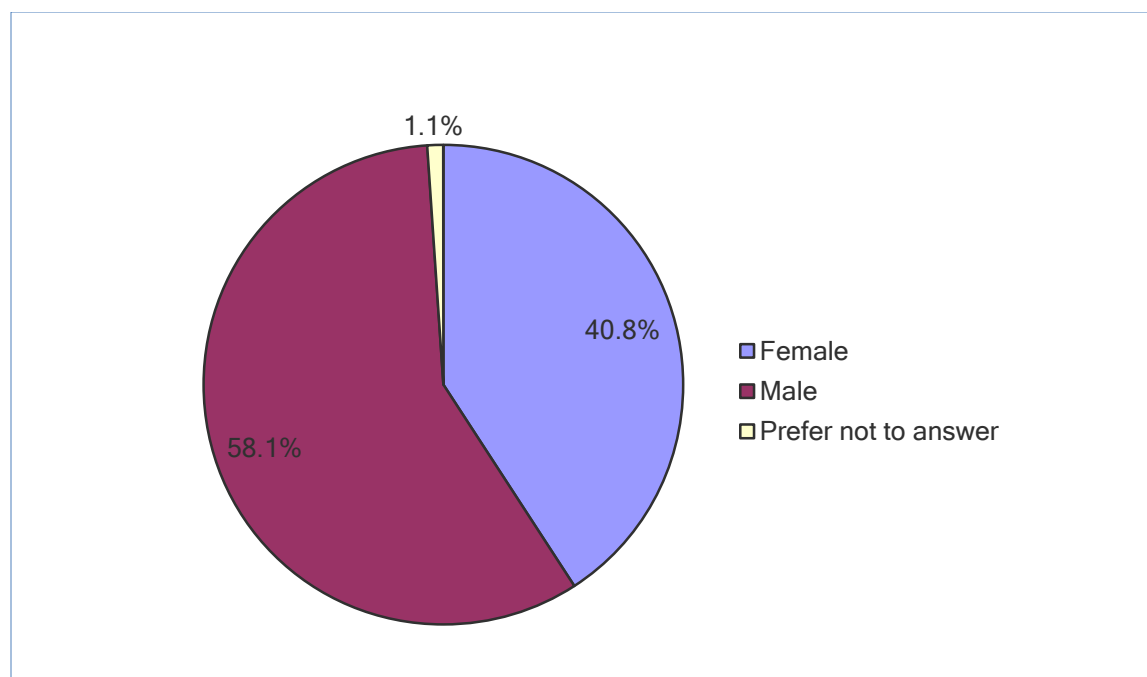


Figure 18. Gender of respondents.

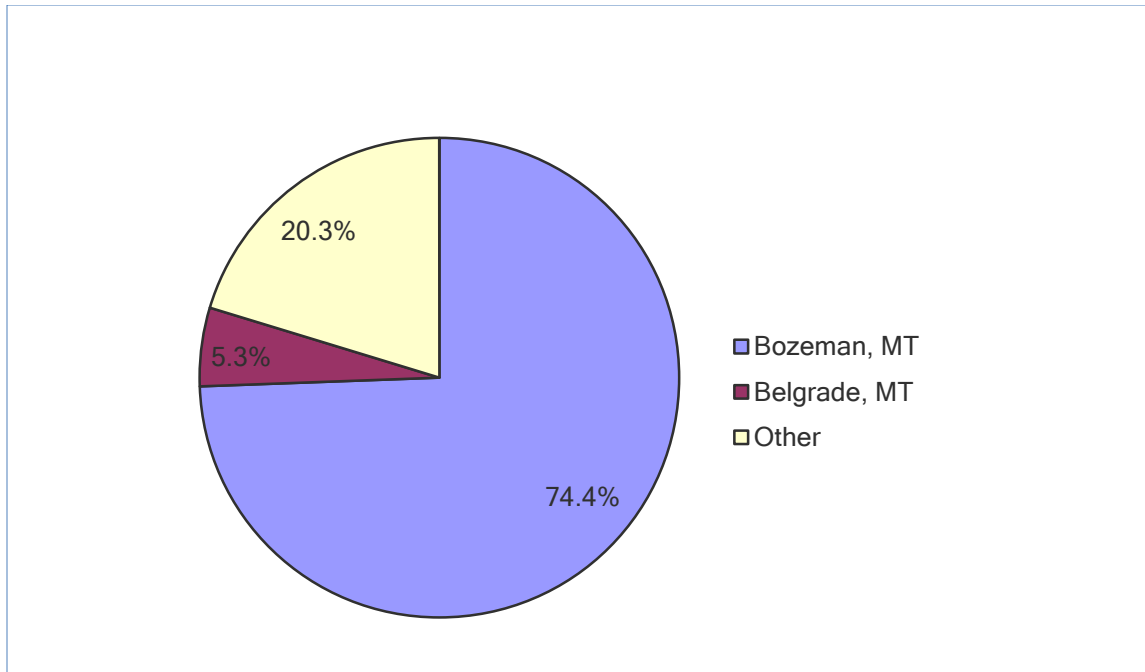


Figure 19. Location of permanent residence, based on zip code.

## 4. APPENDIX A: SURVEY INSTRUMENT

### Bridger Bowl Transportation Survey

*Increased visitation to public lands near Bozeman, including Bridger Bowl and Bohart ski areas, has led to more driving trips to trailheads and ski areas. This has led to overcrowded parking lots, increased wildlife/vehicle collisions, more traffic noise, traffic congestion on "powder" days, increased crash rates on Bridger Canyon Road, and degraded air and water. The Gallatin National Forest is exploring ways to reduce these impacts of driving to Forest Service lands.*

*This survey is intended to better understand your opinions about bus, shuttle and ridesharing to Bridger Bowl/Bohart. This Survey is being conducted by the Western Transportation Institute on behalf of DJ&A and the Gallatin National Forest.*

*Your participation is voluntary, you can choose to stop at any time, and you can choose to not answer any question that you do not want to answer.*

1. How many times did you ski at Bridger Bowl and/or Bohart Ranch during the 2014-2015 ski season? (choose one)

☐ 0 to 5 times      ☐ 6-10 times      ☐ 11-20 times      ☐ More than 20 times

2. How did you most often get to Bridger/ Bohart during the 2014-2015 ski season?

- ☐ Streamline bus  
☐ Hitch-hike  
☐ Drive solo  
☐ Drive/ride with one other person  
☐ Drive/ride with two or more other people  
☐ Get dropped off (driver does not park at Bridger Bowl)  
☐ Other \_\_\_\_\_

3. Bridger Bowl designated the upper carpool lot for use only by vehicles with 3 or more people this season. How effective has this been to encourage you to drive/ride to Bridger with 3 or more people? (circle one number)

1	2	3	4	5	6
Very effective	Somewhat effective	Neutral	Not very effective	Not at all effective	Not sure. This is the first I've heard of 3-person rule

4. How important are the following items to influence you to carpool to Bridger/Bohart more often? (choose one for each item)

	Very important	Somewhat important	neutral	Not very important	Not at all important	Not sure
Online app to find others that want to share a ride	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Designated location to meet others that want to share a ride	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have to park far away from ski hill if I drive alone (carpoolers park close)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parking fee for non-carpoolers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chance to win \$10-\$25 gift card for local business or ski area for carpooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chance to win \$26-\$50 gift card for local business or ski area for carpooling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4a. If there is something that would influence you to carpool to Bridger more often that is not listed above, please write it here. \_\_\_\_\_

Currently a 35 passenger Streamline Bus travels to Bridger Bowl and Bohart on Saturdays and Sundays throughout the ski season. The Streamline bus is fare free and leaves the fairgrounds at 8:15, 9:00, 11:50 and 1:15 and returns at 11:20, 12:30, 1:55, 3:40, and 4:15.

5. How many times have you ridden the Streamline bus to Bridger/Bohart during the 2014-2015 season?  
☐ none      ☐ 1-5      ☐ 6-10      ☐ More than 10
6. How many times did you ride the Streamline bus to Bridger/Bohart during last season (2013-2014)?  
☐ none      ☐ 1-5      ☐ 6-10      ☐ More than 10
7. How convenient are the existing Saturday/Sunday Streamline Bridger bus departure times for you? (bus leaves fairgrounds at 8:15, 9:00, 11:50, 1:15 and returns at 11:20, 12:30, 1:55, 3:40, 4:15)? (check one box)  
☐ Very convenient      ☐ Somewhat convenient      ☐ Neutral      ☐ Somewhat inconvenient      ☐ Very inconvenient
8. Would you consider riding a bus to Bridger/Bohart in the future?  
☐ yes      ☐ maybe      ☐ no

9. What are the top two reasons you would consider riding a bus to Bridger/ Bohart? (check only two)

- ☐ Convenience (get dropped off at ticket office, no search for parking...)
- ☐ To reduce transportation impacts to the environment
- ☐ To save money
- ☐ To avoid driving on snowy or icy roads
- ☐ It is my only transportation option
- ☐ I would not consider riding a bus to Bridger
- ☐ Other \_\_\_\_\_

10. What are the top two items that would encourage you to ride a bus to Bridger/Bohart? (check only two)

- ☐ More frequent bus schedule on weekends
- ☐ More capacity on weekend busses
- ☐ Bus stop near my residence
- ☐ Week day busses
- ☐ Not applicable
- ☐ Other \_\_\_\_\_

11. Would you be willing to pay to ride a bus between Bozeman and Bridger Bowl or Bohart?

- ☐ Yes      ☐ No

If "Yes" how much would you be willing to pay (per roundtrip)? \$ \_\_\_\_\_

12. How likely are you to use each of the following locations to catch the bus or park and ride (carpool)?  
(please circle one for each row)

K-Mart (North 7 <sup>th</sup> St. and Oak) –existing stop	Very likely	likely	Not sure	unlikely	Very unlikely
Fairgrounds (near Tamarack and Black St.)-existing stop	Very likely	likely	Not sure	unlikely	Very unlikely
Future Story Mill Parking area on east side of Bridger Canyon Rd. (N and E of Griffin Dr.)	Very likely	likely	Not sure	unlikely	Very unlikely
Montana State University campus	Very likely	likely	Not sure	unlikely	Very unlikely
Downtown Parking garage (E. Mendenhall between N. Tracy and N. Black St.)	Very likely	likely	Not sure	unlikely	Very unlikely
Gallatin Valley Mall	Very likely	likely	Not sure	unlikely	Very unlikely
Target/Costco area	Very likely	likely	Not sure	unlikely	Very unlikely
Bozeman High School	Very likely	likely	Not sure	unlikely	Very unlikely

3

12a. Let us know if there is another location not listed above where you would be likely to catch a bus.

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13. How would you most likely get to the bus or park and ride lot? (choose one)

- ☐ Someone will drop me off
- ☐ I will drive and park at the stop
- ☐ I will ride with someone, who will park at the stop
- ☐ I will walk to the stop
- ☐ I will bike to the stop
- ☐ Not applicable (I would not ride a bus)
- ☐ Other \_\_\_\_\_

14. I am most likely to get information about transportation options to Bridger Bowl/ Bohart from: (check all that apply)

- ☐ Mobile app      ☐ Email      ☐ Newspaper      ☐ Text messages to cell phone
- ☐ Website      ☐ Friend      ☐ Message board at major stops
- ☐ Other (please describe) \_\_\_\_\_

15. On a "powder day" how important is it to you that you NOT be restricted by someone else's schedule for going to or coming from Bridger Bowl?

- |                   |                       |         |                       |                         |
|-------------------|-----------------------|---------|-----------------------|-------------------------|
| 1                 | 2                     | 3       | 4                     | 5                       |
| Very<br>important | Somewhat<br>important | Neutral | Not very<br>important | Not at all<br>important |

16. Do you have any other comments regarding bus or carpool options to Bridger Bowl or Bohart ski areas?

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17. What year you were born? \_\_\_\_\_

18. I am:      ☐ Female      ☐ Male

19. What is the zip code of your permanent residence? \_\_\_\_\_

Thank you for completing this survey

## 5. APPENDIX B: SURVEY COMMENTS

Question 4 comments. “How important are the following items to influence you to carpool to Bridger/Bohart more often?” This question had a comment section that received 334 comments, the most of any question. A sample of these comments follow.

1	I hope you do NOT add a parking fee for non-carpoolers!!! A LOT of carpoolers park in the lower lots and choose not to use the specific carpool lot!!!
2	I think there should be an area close to the lodge for people with children under 2. It is difficult enough to get the family ready to go to the hill, but having to park so far away is very difficult with young kids... just a thought.
3	I already carpool whenever I can. Charging for single riders would probably do it, but it's punitive and you guys are going to be seen as jerks if you do it. It might even keep some people away who would otherwise be buying tickets. I think the ticket here is better bus service -- I suspect that question is still coming on this survey.
4	Ticket window discounts
5	Incentive for lower season pass prices/ ticket prices.
6	Bridger needs to have a remote parking area similar to other crowded ski areas (e.g. Snowbird, Alta, Grand Targhee). This could occur with development towards Bohart or the intended beginner area. Fees for all parking would help reduce traffic on powder days, however pass sales could also be affected. Raise all pass costs. Bridger has had too many urban problems with the extensive growth of Bozeman. Fights in the lift lines, over full parking, are problems that shouldn't occur at our local non-profit ski hill that was once symbolized by red riblet chairs and easy going folks.
7	Print T-shirts Car Pool Powder Hound or Bus rides for the cold smoke
8	I can tell you that penalizing people for not carpooling is foolish and the backlash if such a thing will be warranted. While I personally carpool and pick people up as much as I can, my schedule to ski isn't always conducive to carpooling. Having flexibility to get up for a few hours in the middle of the day is a big reason why I support Bridger.
9	Paying to park would influence my decision
10	i think it's great that you're considering ways to give incentives and disincentives for driving. thank you! somethings that stop me: being a woman and picking up unknown men, thinking that if i drive someone up, i'll need to drive them down, so clarity about the idea that carpooling up and down are separate and that there's a way to do both or either.
11	Anything that would bring together groups. Maybe a senior bus would encourage folks like us.
12	a list of skiers my age and ability, that would like to car pool and ski together
13	A bus from Livingston would be nice! One that offers a mid day option 3-4 hours of skiing. Just finding people who are going is important
14	I strongly feel that a parking attendant would double the capacity of your lot. Right now the biggest problem I see as an avid skier who is there multiple times a week is the lack of respect in peoples parking practices. If we all parked closer I bet we could fit a ton more vehicles. I think this is a cheaper more viable option than handing out gift certificates.
15	Positive Incentives, i.e. discounts. Better yet: Beer!
16	Cheaper pass price for those who carpool!
17	A better schedule for the streamline bus
18	A B C lots for 3 or more



19	a bus pick up between fairgrounds & Bridger. Bridger Dr. & Story Mill rd area? This would service the area who live in the Creekwood, Headlands, & Legends neighborhoods
20	if there was a way to get someone there but not have to take the same person back. Would pick up someone but don't want to have to coordinate with a "stranger" when to leave or where to meet, etc
21	A parking fee would turn away those that are in midweek lessons that do not have other options. Allowing people to ride the employee bus might help. The app and designated locations are good, but this is not too much different than hitch hiking. It would give a designated place for creeps to pick up the innocent.
22	We have used the bus streamline and kids bus which is helpful. We like having those options.
23	Discount days
24	Shuttle from Livingston
25	A ride share location much closer to the main route to bbowl, say behind the Sinclair or somewhere else in that business park. Getting a raffle ticket every time you carpool for a drawing at the end of the year would be awesome. Parking fees for solo drivers should only be on pow days when it is absolutely necessary.
26	Great idea having a designated car pool meet up area
27	Bus that picks up on Bridger drive.
28	Family options for those with kids.
29	If the bus stopped and picked me up at the corner of Jackson Creek Road and Bridger Canyon Road. I live just off Jackson Creek Road.
30	Bus from Livingston!
31	Bus for parents and children in ski lessons that were more in line with the schedule would encourage me not to drive at all
32	I usually go just for a couple hours. Connecting with people for short trips would help me to carpool more
33	A parking fee for non car poolers would be a terrible idea. Sometimes it is just not possible to car pool, and an additional fee just for parking would completely sour the bridger bowl experience. I think that many people would be extremely frustrated if they had to pay to park.
34	Carpooling up to the mountain isn't always a difficulty, but coordinating with others on when to leave the ski hill can get tricky. A part of the group might want to leave early and others will want to stay all day. This has influence who we carpool with.
35	A parking fee would encourage me not to go to Bridger at all.
36	If there was a meeting place on trail creek or Jackson creek to meet up with others or a bus. I live 10 miles up trail creek road.
37	Flexibility! Just having drop-off and pick-up spots would make getting to and from town easier on those days I can only come for 3 hours
38	\$\$\$ off your lift tickets  We use ledgend cards and free ski days!!
39	I'm not sure what would influence me but I'm coming from Gardiner so maybe a transport system from Livingston as I usually take the Jackson Creek Road and do not always come all the way to Bozeman.
40	Add ride wanted/shared info to your web/facebook page.
41	an app on the phone would help or some easy way with my phone

42	I ski during the week, am a 'senior' skier and often ski short days, making it difficult to share rides unless others have the same 'schedule' or I have time to plan to stay in the lodge with other activities until my car-poolers are ready to leave.
43	A bus that stopped at various spots to pick up/drop off riders i.e stop on bridger canyon by story mill. Driggs has a stop just on the outskirts of town and it seems to work well. We would take the bus everyday if this was the case AND if there was a bus that left 4:45 or 5pm from BB.
44	Discounted lift tickets/credit for season pass next year/discount for lessons/chance to win family ski locker
45	Develope a boot/ski/board storage place to keep gear on the hill. That way, all I need to do is catch a ride, and not worry about loading my gear in someone's vehicle.
46	I would love a meeting place to pick up others or catch a ride. I did pick up a hitchhiker once. I go only on weekdays and do not stay all day. Most handy would be Buses at 9 and at 11 going up. And coming back at 2 (to get kids from school) or at 4 on days when I can stay later. Would love a bus. But how many bus riders are needed to negate the footprint of the bus?
47	When my kids take bus at fairgrounds it's usually not the greatest experience. Kids are rowdy and disrespectful.
48	Do not charge to park
49	I feel very strongly against a parking fee at Bridger Bowl!!! Please keep this ski area local and user friendly
50	My kids did Saturday program and I did women's Thurs. I really appreciated being able to use the lot with (2-3) kids. If you could get connections for the women's and men's days that could help, I carpoled with a neighbor but would have been open to carpooling with a bigger group.
51	I think an app or message board would be awesome. As someone who usually drives, I would be willing to pick other people up at their houses before heading to the hill.
52	Better bus transportation
53	I'm from Livingston & most people that ski are in service industry. So people drive at different times to meet work schedules. I think more people would car pool or ride public transportation if rides were available more than once a day.
54	If there was a way to get from the MSU campus area to the Fairgrounds parking lot on Sundays I would have doubled the number of times I skied. Please look into adding a short bus trip to get MSU students without any other mode of transportation up to your mountain via Streamline
55	Jackson Hole does it. Free parking for "3 on a wheel" or something like that. People will get it. It's to reduce vehicle numbers, increase shared rides, and it's a simple concept.
56	It would need to be a carpool lot on Bridger Canyon road.
57	Ride board on the Bridger bowl web site
58	I would rather take a bus than carpool
59	For me it is the getting home that is the hard part. Some ski long days, others not so much. Bus service would encourage me to leave my car in the valley.
60	It would be great to know about ways to find people to carpool with, a fun way to meet new friends to ski with and more efficient than packing the lot with solo artists. If I had known of a way to find people during the week and at varying times/days of the week, I definitely would have taken advantage.

61	Where I live, carpooling is just not an option. Because of the upper lot policy, I did not ski this year and probably will not again. I was tempted to drive up and see if that policy was being enforced, but decided I would be too upset if I found it was not.
62	Free fries? Yum!
63	I travel from Madison County. It would be nice to connect with other MC skiers to carpool.
64	I use oak street to drive to bridger about 98% of the time. I've never seen a place to park and ride. There needs to be a parking area in a more convenient location...perhaps somewhere on the east side of the track. And the buses need to be much for environmentally friendly.
65	Options in Livingston
66	If you instituted a parking fee for non-carpoolers I would be infuriated
67	more bus times throughout the weekend
68	More stream line busses from the college campus
69	Bus from Livingston
70	Better place to park and meet in town.
71	My husband and I work inconsistent hours and often can't plan ahead for times and hours to car pool. I would be quite angry if I was penalized for this by being forced to park a long way away or paying for parking.
72	Paved lots for carpoolers
73	Streamline bus on weekdays
74	Better bus service! Bus that operates all days and has multiple trips per day! I would be happy to pay for such a service too.
75	I marked "very important" because a "parking fee for non-carpoolers" would adversely effect my decision to ski Bridger Bowl.
76	while the traffic in the canyon and on the way to bridger Bowl is a concern, Bridger Bowl needs to employ parking attendants that make all vehicles park closer together maximizing the capacity of the existing lots. All too often you see two cars parked about 8' apart and that is just wasted space. Take a note from Snowbird in Utah, they have parking attendants that fill the lots with cars not extra room to have two doors and room for two to pass through at the same time.
77	I REALLY like the Fairgrounds as a location to meet up to carpool. A place to meet is VERY important. And I like having the Streamline THANK-YOU very much for providing this service.
78	We carpool as we come with neighbors from the Shields Valley. We are always impressed at how well traffic flow is handled, especially when it is very crowded. Bridger Bowl does such a great job all around helping people...
79	Instead of penalizing locals who drive up on their own ... perhaps increase the size of your parking lot?!!
80	If you charge for non carpool parking I will ski big sky. My family spends over \$3500 annually at bbridger including passes lockers lessons repairs and tunes and Good and beverage. I'm not kidding.
81	I usually drive up with one or two other people. More than that, and our gear and skis don't fit. Plus, unless all of them are family, I can't count on others wanting to leave at the same time, so the need for flexibility precludes finding others to ride with me. When I go with friends, we use Drinking Horse parking lot, but it gets crowded, so another place to meet would be good...but I wouldn't carpool with strangers.
82	Form carpool "teams" of people who ski about the same days. Or carpool age categories to sign up.

83	Carpool Nazi was a pain in the Arse, but effective for the most part. There were days where he just isn't needed and actually slows up the parking process by confirming 3+ in the cars. I would rather that hourly be spent on making sure lift lines move with fully loaded chairs and no skipped chairs.
84	Livingston bus? Bus on powder days?
85	If you start charging people who drive up solo I will stop skiing bridger
86	not allowed in parking lot unless 2 or more people in vehicle
87	Please don't institute a required fee....

Question 16 comments. "Do you have any other comments regarding bus or carpool options to Bridger Bowl or Bohart ski areas?" 323 comments were received. A sample of comments follow.

1	Residents in Bridger Canyon experience impacts from BB traffic, especially on powder days or weekends: long, uninterrupted lines of traffic during commuting hours morning and afternoon, increased exhaust and particulate pollution. The worse is some drivers' behavior: speeds too fast for road conditions, unsafe passing, and worst of all, road rage. Well, maybe not worse; the worst is worry of drunk drivers after the lifts close. Anything to reduce BB traffic would be greatly welcomed by us BC residents.
2	I think expanded bus options would be great. More bus stops
3	Need week day service
4	Make the information easy to read and accesible on both the streamling and the Bridger Bowl site. I can't remember how many times this year I heard Bridger Bowl (vias snow phone, email etc) urging people to ride the bus or carpool, yet the information was buried on the website. It need to be front page every day to further get the information to the community
5	Thanks for thinking about our environment!
6	The bus has been hectic to deal with with my preschooler in tow. Waiting for fairground stop means we might not get on! Boarding at K-Mart is much better. We can board quickly, but with time to manage our gear without a lot of competition for seats. Its too hard to board with little kids at fairground stop because of crowd/competition for seats.
7	A message board for folks coming from Livingston/Gardiner would help. A bus on weekdays from Livingston would be awesome.
8	Charge for parking! Parking is not a right, it is a limited resource. Parking fees could then be used to subsidize expanded, more convenient bus service.
9	Have a bus that leaves town at 7:30 am.
10	If you want to attract more tourists (like me), better not introduce a fee for the car park. Provide a shuttle from car park to ticket office (like Big Sky).
11	Make pickups for the buses closer to campus!
12	Part of convenience of driving is changing out of ski boots and into shoes. Having locker options at Bridger is very helpful in storing items that do not need to be carried on the hill. Are these options available?
13	We, like many other BB skiers bring our dog with us when we ski vs leaving him at home. Consequently at this time we would not consider riding a bus to & from BB.
14	They should be better advertised, especially the carpool lot.

15	Carpooling to Bridger is a good idea but the parking situation would be much better if there were parking attendants who showed people how and where to park. The current situation leaves many people parking with almost an entire car width between them and tons of wasted parking space that could fit many more cars.
16	Thank you for providing this option. As a family of four who all have season passes, we will likely be using the bus for many years to come! If a departure on the west end of Bozeman is possible, we would use even more.
17	I think both are good options in order to reduce traffic levels. I support restricting parking in lot A to those who carpool but am adamantly opposed to parking fees.
18	Again, if you start charging for parking, my entire family will no longer ski Bridger. There are other ski areas nearby.
19	We would love weekday buses!!
20	The bus is a great idea. Mostly it is used by kids whose parents drop them off. Not sure how to get more adults to use it. Maybe you could educate them on the real cost (IRS 57 cents a mile x 32 miles = \$18.24) every time you drive to Bridger.
21	Weekday routes would be great!!!
22	I think it would be a drag if you charged for parking for a single driver with no passengers. Sometimes that's life. Perhaps parking further away for a single would be an incentive to carpool. If there was a designated place to park cars at the bottom of the canyon, or on Rouse I could carpool more often.
23	Just keep doing the great work with your improvements for a fantastic family ski that you are.
24	It is a difficult issue as easy access for short periods at random times is an appeal of skiing Bridger while maintaining a job.
25	the bus gets there too late, leaves too early and frankly I don't want to ride with a bunch of kids
26	Good times just need more busses in general
27	It would be much easier if there were more lockers available for rent, so I wouldn't have to schlep my skis on the bus.
28	PLEASE continue to operate the kids' ski bus and the Streamline bus to Bridger! and Streamline to Bohart... it is a very valuable option for people who want to ski and do not want to or cannot drive up there!!!
29	1 bus earlier like 7:45
30	Please organize bus rides specifically for MSU dorm residents on the weekends
31	I would gladly take the bus if there were early weekday options to Bridger and noon-12:30 return options.
32	Something for Belgrade residents
33	Parking attendants on powder days. i saw them once this year but they were only working the last few lots and did not really know what they were doing.
34	Start charging \$5 for solo parking above F lot. That will grab some attention. Have enough busses on weekends so bus experience stays positive.
35	Paying a fee for those who cannot carpool is unjust; penalizing those who are new to the area or do not have friends who ski only discourages participation in the sport
36	I love the bus, I just wish it ran on weekdays, thanks and keep up the good work!
37	Have a run through hotel alley
38	The carpool options ignores the needs of skiers who come through Livingston, Fort Ellis, or Wilsall.
39	I don't ski at Bridger on the weekends and go up early on powder days, and thus almost never encounter parking problems. I'm glad, though, that Bridger and Bozeman are thinking about the parking problem, because it's going to get worse.

40	Streamline provides an excellent service. Drivers are great.
41	It seems to be busiest for driving and parking (other than on powder days) when mitey mite lessons are going on. So many parents come up and just sit while their kids have lessons- is there some way to get kids into lessons that go on the bus with instructors up and back from the fairgrounds?
42	I seriously doubt that I would stop driving to Bridger. The bus is crowded and inconvenient for my family. On days when I ski alone, the bus schedule is simply too restrictive.
43	The larger impact for parking is related to all of the events and lessons at Bridger Bowl. I believe we should find alternative options for parking for some of those events. I understand that the carpool lot was available for adults with kids in lessons, there could/should be more signage and information about where to park at signup for lessons.
44	Disappointed that the 9 am bus often ran behind and also went to Bohart first even when no one was going to Bohart. Not sure how that schedule is determined. Also there is no communication with Bridger so when the bus broke down no one would no and I waited for long periods with children outside then having to wait inside while trying to check and then sprint with kids to make it when it showed. If the pass office could be updated with that info and put up on an outside board or something that would be helpful for family's and others.
45	More frequent bus times and changing how the kids bus is advertised would help yo get more people to ride. I have taken the kids bus and don't see why more don't do the same
46	I think the hardest part of carpooling is finding others to carpool with especially if you ski at non-peak times (i.e., mid-week afternoons or mid-week mornings). A carpool app would be great
47	It would be hard to get a family of 4 out the door and to a bus stop. Kind of like loading up twice!
48	thanks for doing this survey. Shows forward thinking.
49	Some of us have to drive alone. Please do not penalize us for that.
50	Need more and later return times
51	Current buses leave too late. First bus should leave in time to arrive at Bridger by 815. I like to go early an leave around 100. Also need buses during the week. Since I have to drive during the week, I don't think about the bus on the weekend. Also, if I am going to take the bus, I need a free, secure area to store my gear, including an extra pair of skis.
52	I think I would have taken advantage of the bus transportation option more in the past if I had known more details! I thought it only left once per day and came back per day. Maybe advertise this a bit more around town? THANK YOU!
53	Bus voucher for discount on sodas or meals might be a good incentive.
54	My kids ride it frequently - thank you for the service!!
55	Parking attendants, earlier bus schedule on powder days, more parking lots.
56	What about a bus from livingston
57	I really like the carpool parking!!!
58	Frequency (More accurately lack of) seems to be a big obstacle to getting folks to ride the bus
59	Love that there is work being done to develop and promote options. will do my best to take advantage.
60	more safety cones are needed at the lot....vision of walking skiers is somewhat restricted as people park carelessly blocking view along the main road...use safety cones to prevent that type of parking
61	I was thoroughly disappointed with trying to get my snowboard in the racks on the buses. My bindings don't squish down like normal ones do so if there are even a couple skis in the rack I can't get my board in. So if anything make it bigger or have more racks. This is VERY important to me if I want to continue using the buses.

## Bridger Bowl/ Bohart Ranch Bus Survey

## Appendix B

62	Having the last bus leave so early really makes it difficult to take the bus. Also, many times I've wanted to take the bus and it's been full
63	Again, the reliability of the bus needs to be improved. That includes excellent bus drivers. 2 out of 5 times I skied on the weekend, the bus experienced mechanical problems.
64	Week day buses! Those are the days I primarily drive myself. I would definitely participate in riding a week day bus. Additionally, "powder buses" that would run if, say, 6" snowed that night to reduce the Bridger Train and parking mayhem.
65	It was great to Bridger Bowl!
66	You could make it mandatory to ride a bus (and put on a lot more buses and routes) or pay a fee...or give pass holders special privileges and make more \$ selling passes...or impose a surcharge on major powder days...cuz they are going to come because of the snow but they might carpool to save the surcharge
67	This is awesome! Thanks for doing this.
68	During the week on a powder day, I like to get up to Bridger by 8:30 and depending on conditions be to work by noon-1. I would need more options or better advertised rides back to town. I'm always willing to provide someone a ride, an app would be a great option!!
69	I want to ride the streamline next year--a better schedule would help me do this!
70	Bridger bowl needs to crest their own shuttle. It should leave at 7 8 9 10 11 and 12 from town and 11 12 1 2 3 4 and 5 from the hill. This is not brain science. Employee some people and save our environment.
71	I am very much in favor of increased bus service to Bridger! Thank you!!
72	Would love a bus to pick up East of town, like at Mt Ellis
73	It is very slow and the methods available to go from Montana State University to the fairgrounds, then transfer to the bus to Bridger Bowl is very inconvenient and poorly timed.
74	I drop my wife, daughter, and equipment at Saddle Peak Lodge, then go and park the car wherever I can, usually in E or beyond. I have no problem walking to Saddle Peak and then back to get the car later.
75	My daughters (ages 11 and 13) take the bus sometimes. My 11 year old is very uncomfortable doing this because of the older teens and riders cussing non-stop, and the drivers being rude and raising their voices at the children. It is definitely not a family-friendly service and not a PG-rated experience. And we are not a goody-two-shoes family at all. She now refuses to take the bus.
76	Would be great to have more bus options for kids during Christmas break
77	A bus going directly from a place with parking, like the Stadium, would be perfect. If small shuttles transported customers from two central locations on/near campus to somewhere like the stadium parking lot, that would be VERY convenient.
78	I am thrilled Bridger Bowl has adopted this policy.  We carpool as a family, and appreciate the designated lot for parking. Plus, the kind gentleman that worked the gate to the carpool lot is awesome, friendly, and funny. He is great.
79	Advertise the taking the bus!!!! Most people don't know about it or forget about it.
80	Lots of people from Livingston ski Bridger and Bohart it would be helpful to have a stop in Livingston and at Jackson Creek road
81	It is a great option and we appreciate your effort to learn more and make improvements!
82	If there was a stop around the high school area and on weekdays (I get a mid week pass and never ride on weekends). If I am driving to fairgrounds or Kmart I am just going to drive to the mountain.
83	I am 81 and would appreciate reserved senior parking



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84	We ski on weekdays and live East of town, so unless there is an end of Jackson Creek pickup we won't be taking the bus.
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# Appendix 6-4 TDM Strategies

**Memorandum****To:** Peter Walker-Keleher, DJA**From:** Taylor Lonsdale and Rebecca Gleason, WTI**Date:** 9/21/15**RE:** Bozeman Area Alternative Transportation Study: Task 2.3 Assess Transportation Demand Management (TDM) Strategies

This work is one part of an alternative transportation study to identify strategies to increase access to recreation sites on public lands near Bozeman, Montana. Benefits of pursuing TDM Strategies may include:

- Reduce need for additional parking;
- Provide options to access National Forests to people without an automobile; and
- Potential to reduce congestion and wildlife vehicle collisions.

This memo is organized in two sections. Part I provides an overview TDM along with of common TDM strategies and goals. Part II provides ideas for implementation of strategies relevant to the project.

**PART I - Summary of Transportation Demand Management**

Transportation Demand Management (TDM) is a term used to describe policies, programs, and approaches to reduce the use of single-occupant vehicles (SOV) for a given location or region. In many places in the US, the transportation system has evolved such that the use of the SOV is extremely convenient. The extensive network of roads, free parking, and broad access to automobiles has created a transportation system where many people simply rarely think about transportation alternatives. Additionally, much of the cost of creating and maintaining this transportation system has been externalized. Simply stated, the costs of accommodating the almost exclusive use of the SOV are not paid directly at the time and place of use. The SOV enables many people to travel where they want, when they want. TDM strategies aim to change individual choices and behaviors regarding how people travel. TDM strategies target ways to “compete” with the convenience of SOV transportation. The impetus for these strategies is often a reaction to increasing congestion and travel delays. TDM strategies are often employed in large urban areas to avoid the extreme expense of increasing the capacity of the roadway network to accommodate the ever growing demand.

TDM is most successful where the convenience of SOV transportation is reduced due to congestion, meaning TDM is often viewed as a “big city” issue. TDM is most effective when a broad approach is utilized and many options to SOV travel are employed. TDM strategies target choices regarding mode and/or time of transportation. These efforts most often focus on work trips. Common examples of TDM strategies include: congestion pricing; parking management; park and ride; carpool/vanpool/ridesharing programs; modified work schedules; telecommuting; promoting transit usage; and improving bicycle and walking options. TDM

strategies are often viewed as either incentive or disincentive policies or programs. The implementation of the various strategies often complement each other, leading to increased success in changing transportation choices.

## **PART II – TDM Strategies for Bozeman and Bridger Bowl**

As discussed, TDM is most frequently discussed in the context of the urban environment where peak-hour congestion is often a significant consideration in transportation planning. In the context of this project, TDM strategies were investigated as a way to reduce the use of single-occupant vehicles in accessing the recreation areas and opportunities on the public lands that surround Bozeman. The goal of this section is to identify opportunities to build on existing efforts. The discussed strategies and opportunities seek to further increase the use of complementary transportation modes: bus, carpool/rideshare, and biking and walking.

Much of the focus of the TDM discussion has been and remains on Bridger Canyon and specifically Bridger Bowl. While this focus on recreation areas north of Bozeman is understandable given Bridger Bowl's existing bus and carpool programs and winter traffic issues in Bridger Canyon, most of the recommended TDM Strategies have applicability for recreation areas south of Bozeman as well.

### **Increase and Improve Transit Options**

In order to successfully “compete” with SOV travel, complementary modes must offer similar or improved convenience. A critical aspect of this strategy is ensuring that bus schedules and routes provide the frequency and destinations most desired by riders. In general, the more frequent the service, the more convenient it is to use. The results of weekend Streamline Bus Rider surveys (conducted January-March 2015) indicate a desire for additional service times, particularly weekend and mid-morning departures to Bridger Bowl. Based on the survey results, one factor in the likelihood of someone riding the bus is having a stop near their residence. The addition of one or more stop locations could provide the convenience necessary for more people to ride the bus for their trip to Bridger Bowl.

In addition, survey results indicate that gear storage on the buses is something that riders would like to see improved. Other opportunities to improve bus riders' experience include improvements at the stop locations, such as ski racks, benches, or a shelter. These items will not only provide clear identification of where the bus will pick up but increase user comfort while waiting for the bus.

### **Increase and Improve Rideshare and Carpooling Options**

A promising opportunity exists to increase the use of carpooling/ridesharing through the use of emerging technology. The growth of the share economy is fostering the growth of such businesses as Lyft and Uber. These companies use mobile phone technology to offer ride matching services. Additionally, the broad use of social media such as Facebook and FourSquare that allow users to “check in” at a specific location provide additional opportunities to use

emerging technology to facilitate ridesharing and carpooling. Currently, none of these companies or applications specifically target recreational users. Significant opportunity likely exists in providing a ride sharing app that targets recreational users, especially skiers. Such a business and mobile app are currently in development. LiftShare was conceptualized by several people in Bozeman. LiftShare has indicated that they anticipate having a test version of the mobile app ready during the 2015-16 ski season. This will be a significant opportunity to leverage emerging technology to promote ridesharing/carpooling.

### **Existing Ridesharing Apps**

Listed below are a sample of existing ridesharing/ride matching businesses and apps. This research did not yield any ridesharing mobile apps that specifically target skiing or other recreation trips.

#### Zimride ([www.zimride.com](http://www.zimride.com))

“Backed by Enterprise Rent-A-Car, Zimride offers a complementary solution to our existing car sharing, vanpooling, and car rental services as part of our total transportation solution for universities, companies and organizations.”

#### Lyft ([www.lyft.com](http://www.lyft.com))

“Need a ride? Take Lyft for a welcoming, affordable, and memorable ride. Request a ride in the Lyft app, and get picked up by a reliable community driver in minutes.”

#### Uber ([www.uber.com](http://www.uber.com))

“Uber is evolving the way the world moves. By seamlessly connecting riders to drivers through our apps, we make cities more accessible, opening up more possibilities for riders and more business for drivers. From our founding in 2009 to our launches in hundreds of cities today, Uber's rapidly expanding global presence continues to bring people and their cities closer.”

### **Existing Web-based Ridesharing Programs**

There are some web-based ride matching programs that are aimed specifically at recreational use, skiing in particular. These programs have not been as popular as mobile phone-based apps, likely due to the inconvenience of logging onto a computer.

#### Mountain Rideshare ([www.mountainrideshare.com](http://www.mountainrideshare.com))

“Mountain Rideshare was born of the need to get to and from Chamonix, France at the first sight of a snowstorm. ...in the shortest time and most cost effective way.”

Mountain Rideshare is a web-based ride board that helps skiers and snowboarders connect with others to share rides to various mountain ski resorts. There is no mobile app available. The website is mobile friendly but not optimized for mobile phone use.



SkiCarpool ([www.skicarpool.org](http://www.skicarpool.org))

“SkiCarpool is a nonprofit organization that facilitates carpooling to Colorado resorts”

This website offers an online ride board to facilitate people that are looking for carpool opportunities for skiing in Colorado. There is no mobile app available but the website is optimized for mobile phone use.

The Ski Lift (<http://www.theskilift.org>)

“The co-owners of The Ski Lift – Rich, Mike, Cabell, and Chini have a vision for people all around the world to come together to ski and ride.”

This website offers rideshare opportunities through an online ride board. The Ski Lift also promotes opportunities to find ski partners and friends. There is no mobile app available. The website is mobile phone friendly but not optimized for mobile phone use.

### **Incentives**

Incentives are usually part of promoting alternatives to single occupant vehicle trips. A significant hurdle to changing someone’s travel choices is breaking the routine that has been established. It is possible that carpooling or riding the bus to Bridger Bowl is a truly great option for many people that have never tried it. Using incentives can entice people to try something new like riding the bus. Offering a chance to win a prize or running a competition to see who can log the most carpool or bus trips can be a very effective way to encourage people to ride the bus and establish a new habit. Respondents to the transportation survey indicated that incentives such as opportunities to win gift certificates would likely encourage them to ride the bus. Other simple examples of prize type incentives include discounts on lift tickets or passes, free coffee or discounts/coupons from local businesses.

Other common incentives for carpooling and ridesharing often take the form of transportation advantages for vehicles with more than 2 occupants. High Occupancy Vehicle (HOV) lanes and preferred parking lots are such examples. Bridger Bowl currently offers several such incentives. Bridger has an active carpool lot that reserves parking for vehicles with three or more occupants. Additionally Bridger Bowl holds a special event where people arriving in vehicles with three or more receive a discount on the purchase of their lift ticket. Opportunity exists to expand on these incentives by increasing the number of reserved parking spaces or having a graduated system where increased numbers of people in the vehicle corresponds with increased proximity.

### **Disincentives**

As mentioned previously, many times the costs associated with providing a transportation network that accommodates the broad use of SOV travel is externalized. This refers to

situations where the associated costs are not paid directly at the time of use. The most frequent example of this is fare-free parking. There are real and often significant costs associated with building and maintaining parking facilities. Charging a fee for parking removes the externalization of these costs. In a fee-for-parking arrangement, the user pays directly for the parking spot at the time of use. Parking fees fall into the disincentive category and can be a very difficult transition for the users. It is important to ensure the existence of adequate and accessible alternatives to SOV use prior to the implementation of parking fees. Jackson, WY serves as an excellent example of how the parking fee strategy worked in concert with providing transit options. The Start Bus system in Jackson saw a significant increase in ridership when Jackson Hole Mountain Resort instituted parking fees. More details of this case study are available in the memo on Recreational Shuttles.

### **Marketing and Advertising**

Transportation Demand Management is most successful when the strategies work together to provide options. There is significant opportunity to increase the access to information about the existing options through a unified marketing campaign.

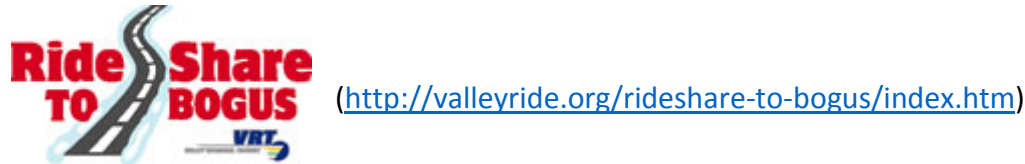
While it may seem well known that there is a bus that serves Bridger Bowl on the weekends, ensuring that the service is well advertised and promoted is vital to increasing ridership. Ensuring that the schedule is broadly available must be a high priority. Additionally, it must be obvious and clear where to catch the bus. Ensuring that this information is available with the schedule and at the stops is an important part of marketing the bus service.

Marketing plays a vital role in promoting ridesharing. Potential marketing efforts should target connecting ski culture with ridesharing. The idea of “No Empty Chair” is one example that has been discussed in the context of Bridger Bowl. Linking to the social aspect of ski culture could also be connected with ridesharing. Identifying and promoting specific rideshare/carpool locations will help to establish the viability of these sites for ride matching. Survey results indicated that a well-established and promoted location would encourage people to carpool.

The marketing efforts must target users via appropriate media, at the appropriate time, with the appropriate message. Bridger Bowl has a well identified brand and opportunities to link with this brand should be explored. Bozeman is home to a number of savvy marketing firms that have created recognizable campaigns. A simple contest to develop a logo or catch phrase might engage this local talent in capturing these connections and bringing together a unified message that will promote alternatives to SOV use.



## Ridesharing and Bus Promotion Examples



"Purpose: We'd like to make it easier for people to car-pool to Bogus Basin Mountain Recreation Area.

Incentives: "Be sure to document your activities on our scorecard for a chance to win awesome monthly prizes, such as a GoPRO HD video camera, or BCA Tracker avalanche beacon."



(<https://www.waytogovt.org/>)

"We want you to ditch your car for two weeks and bus, bike, walk, telecommute, or carpool and recapture your time. You'll log miles, compete to win cool prizes, and have fun—all while saving money and helping the environment!"

The Huffington Post Alberta posted "Edmonton Transit's 'Cool Bus' Video Is The Hippest Ad For The Bus Ever" highlighting an ad campaign to change the public's perception of riding the bus. The Cool Bus video shows excited passengers taking advantage of some of the transit system's "membership privileges," including personal climate control, extra leg room, and the "freedom to text...safely." [http://www.huffingtonpost.ca/2015/08/17/edmonton-transit-cool-bus\\_n\\_7999230.html](http://www.huffingtonpost.ca/2015/08/17/edmonton-transit-cool-bus_n_7999230.html)

## Hitchhiking Ordinances

Research on hitchhiking codes and ordinances revealed a Bozeman ordinance as well as Montana Code.

### City of Bozeman Code

Sec. 36.11.040. - Walking along roadways; conditions; soliciting rides prohibited.

A. Where sidewalks are provided, it is unlawful for any pedestrian to walk along and upon an adjacent roadway.

B. Where sidewalks are not provided, any pedestrian walking along and upon a highway shall, when practicable, walk only on the left side of the roadway or its shoulder, facing traffic which may approach from the opposite direction.

C. No person shall stand in a roadway for the purpose of soliciting a ride from the driver of any vehicle.

### Montana Code Annotated

61-8-507. Pedestrian soliciting rides, business, or contributions.

(1) A person may not stand on a roadway for the purpose of soliciting a ride.

(2) A person may not stand on a highway for the purpose of soliciting employment, business, or contributions from the occupant of a vehicle unless the solicitation is authorized by the proper jurisdictional authority.

61-1-101(66) "Roadway" means that portion of a highway improved, designed, or ordinarily used for vehicular travel, exclusive of the berm or shoulder.

Based on these code sections, soliciting a ride (hitchhiking) is legal given that the person stands in the shoulder.

## **Focus Group Meeting**

WTI held a focus group meeting on September 2, 2015 to discuss TDM strategies. WTI presented the results of the transportation surveys as well as information on TDM and the specific strategies discussed above. Following the presentation there was a discussion of the opportunities for improving the existing efforts to provide options to SOV travel to Bridger Bowl. Key items of the discussion included:

- Relocating the location of the bus stop at the Fairgrounds and ensuring there is an specific and identifiable location where the bus picks up riders;
- The critical nature of providing information about the bus at the time when skiers are making plans, potentially along with the snow report;
- Addressing concerns regarding gear storage on the buses;
- Ensuring there is capacity on the buses for everyone at the end of the day;
- Addition of other stop locations and the potential of eliminating the stop at Kmart given the proximity to the Fairgrounds;
- Providing "front row" parking as an incentive for carpooling; and
- Opportunity to provide setaside Wi-Fi bandwidth for users of ridesharing apps

## Recommendations

The following is a brief outline of our recommendations for increasing the use of transit and carpool and rideshare.

1. Add mid-morning bus trips

A recognizable part of the culture of skiing at Bridger Bowl is the ability to go up and ski for a few hours. The addition of mid-morning departures would serve skiers wishing to leave later and still catch a few hours.

2. Add departure location at MSU

3. Address gear storage concerns

4. Enable data usage for ShareLift or other ride matching app users in the Bridger Bowl base area

There is currently very spotty cellular coverage at Bridger Bowl. Providing access to the internet is key to enabling the use of these emerging technologies for ride matching.

5. Develop a comprehensive marketing approach

- a. Provide information on options in a timely manner via the appropriate media (website, mobile app, phone message)

- b. Tie to the culture of skiing

- i. No empty chair

- ii. Social aspect

- iii. Create culture around not driving alone

1. Logo/catch phrase contest

- c. Engage community partners

- i. To be successful this effort can't rely only on Bridger Bowl

# Appendix 6-5

## Bridget Canyon Mode Shift Analysis

## Memorandum

To: Peter Walker-Keleher, DJA

From: David Kack and Rebecca Gleason, WTI

Date: 8/13/15

RE: Bozeman Area Alternative Transportation Study: Task 2.4 Mode Shift Analysis

This memo provides a mode shift analysis to consider how bus service may reduce traffic on Bridger Canyon Road. This analysis is one part of an alternative transportation study to assess shuttle options to access recreation sites on public lands near Bozeman, Montana. The analysis presents potential schedules and cost estimates to shift people from driving to riding a bus to Bridger Bowl and Bohart Ranch ski areas. Simply providing the bus service will likely be insufficient to get people out of their cars. Other incentives, such as raffles for prizes, or disincentives, such as charging for parking, may be required to obtain the desired behavior shift from driving to taking a bus. This analysis makes the following assumptions:

- There are a total of 4,000 people driving to Bridger Bowl per day with two people per car (2,000 cars). This corresponds to the approximate number of skiers on peak days at Bridger Bowl.
- The hypothetical schedules below allow for bus service that would reduce car traffic by 5% (100 cars, 200 people), 10% (200 cars, 400 people) or 15% (300 cars, 600 people).
- Schedules assume people are equally distributed among the various buses, and each bus is full. If buses ran at 75% capacity (9 empty seats on Streamline/13 empty seats on Karst), with the schedule below, car traffic would be reduced by 3.75% (75 cars, 150 people), 7.5% (150 cars, 300 people) or 11.25% (225 cars, 450 people).

Two options are presented, one using 35-passenger buses ("Streamline") and the other using larger 50-passenger buses ("Karst"). The potential schedules are as follows:

Potential Bus Schedule from Bozeman to Bridger Bowl & Bohart Ski Areas					
5% (100 cars, 200 people)		10% (200 cars, 400 people)		15% (300 cars, 600 people)	
Streamline	Karst	Streamline	Karst	Streamline	Karst
8:00 AM	8:00 AM	8:00 AM	8:00 AM	8:00 AM	8:00 AM
8:30 AM	8:30 AM	8:10 AM	8:15 AM	8:10 AM	8:10 AM
9:00 AM	9:00 AM	8:20 AM	8:30 AM	8:20 AM	8:20 AM
9:15 AM	9:30 AM	8:30 AM	8:45 AM	2@ 8:30 AM	8:30 AM
9:30 AM		8:40 AM	9:00 AM	8:40 AM	8:40 AM
10:00 AM		8:50 AM	9:15 AM	8:50 AM	8:50 AM
		9:00 AM	9:30 AM	2@ 9:00AM	9:00 AM
		9:10 AM	9:45 AM	9:10 AM	9:10 AM
		9:20 AM		9:20 AM	9:20 AM
		9:30 AM		9:30 AM	9:30 AM
		9:40 AM		9:40 AM	9:40 AM

		9:50 AM		9:50 AM	9:50 AM
				3@ 10:00 AM	

Potential Return Schedule from Bridger Bowl & Bohart to Bozeman					
5% (100 cars, 200 people)		10% (200 cars, 400 people)		15% (300 cars, 600 people)	
Streamline	Karst	Streamline	Karst	Streamline	Karst
2:30 PM	3:00 PM	2:40 PM	3:00 PM	2:30 PM	2:40 PM
3:00 PM	3:30 PM	2:50 PM	3:15 PM	2:40 PM	2:50 PM
3:30 PM	4:00 PM	3:00 PM	3:30 PM	2:50 PM	3:00 PM
4:00 PM	4:30 PM	3:10 PM	3:45 PM	3:00 PM	3:10 PM
4:30 PM		3:20 PM	4:00 PM	3:10 PM	3:20 PM
5:00 PM		3:30 PM	4:15 PM	3:20 PM	3:30 PM
		3:40 PM	4:30 PM	2@ 3:30 PM	3:40 PM
		3:50 PM	4:45 PM	3:40 PM	3:50 PM
		4:00 PM		3:50 PM	4:00 PM
		4:10 PM		2@ 4:00 PM	4:10 PM
		4:20 PM		4:10 PM	4:20 PM
		4:30 PM		4:20 PM	4:30 PM
				3@ 4:30 PM	

These schedules consider that people can begin riding the lift at Bridger Bowl at 9:00 am, and that the last ride up the chairlift is at 4:00 pm. These schedules attempt to maximize efficiency of the buses, by minimizing the number of buses that need to be used. These schedules do not account for people that may want to ski for a half-day (1/2 day), starting at 12:30 pm.

When using a cost factor of \$65 per hour for “Streamline” and \$80 per hour for “Karst” and estimating a one-way trip from Bozeman to Bridger Bowl at 30 minutes, the cost estimates to shift people driving cars to riding a bus are as follows:

Percent Shift	Streamline			Karst Stage		
	Daily Cost	Annual Cost (Weekends)	Annual Cost (7 days/week)	Daily Cost	Annual Cost (Weekends)	Annual Cost (7 days/week)
<b>5% (100 cars, 200 people)</b>	\$780	\$28,080	\$94,380	\$640	\$23,040	\$77,440
<b>10% (200 cars, 400 people)</b>	\$1,560	\$56,160	\$188,760	\$1,280	\$46,080	\$154,880
<b>15% (300 cars, 600 people)</b>	\$2,210	\$79,560	\$267,410	\$1,920	\$69,120	\$232,320

Annual costs for weekends assumes 36 days of service. Annual costs for 7 days/week assumes Bridger Bowl's full season at 121 days per the 2014/2015 ski season. It should be noted that depending on which schedule is selected, Streamline and/or Karst may not have enough equipment (buses). At this point in time, it is likely that Streamline would have 3 buses available on winter weekends and Karst may have one bus available. It is possible they may request a higher cost per hour for dealing with split service (split shift) issues. The table below provides more details of the analysis.

**Car to Bus Mode Shift Cost Analysis**

Item	Streamline	Karst
Cost per hour	\$65.00	\$80.00
Bus Capacity (passengers)	35	50
One-way trip (minutes)	30	30
Assumes 4,000 people/day with 2 per car		
<b>5% (100 cars, 200 people)</b>		
# of one-way trips needed	6	4
hours per day	12	8
# of buses needed	3	2
Cost per Day	\$780.00	\$640.00
Cost per Ski Season (36 weekend days)	\$28,080.00	\$23,040.00
Cost per person per day	\$3.90	\$3.20
<b>10% (200 cars, 400 people)</b>		
# of one-way trips needed	12	8
hours per day	24	16
# of buses needed	6	4
Cost per Day	\$1,560.00	\$1,280.00
Cost per Ski Season (36 weekend days)	\$56,160.00	\$46,080.00
Cost per person per day	\$3.90	\$3.20
<b>15% (300 cars, 600 people)</b>		
# of one-way trips needed	17	12
hours per day	34	24
# of buses needed	7	6
Cost per Day	\$2,210.00	\$1,920.00
Cost per Ski Season (36 weekend days)	\$79,560.00	\$69,120.00
Cost per person per day	\$3.68	\$3.20