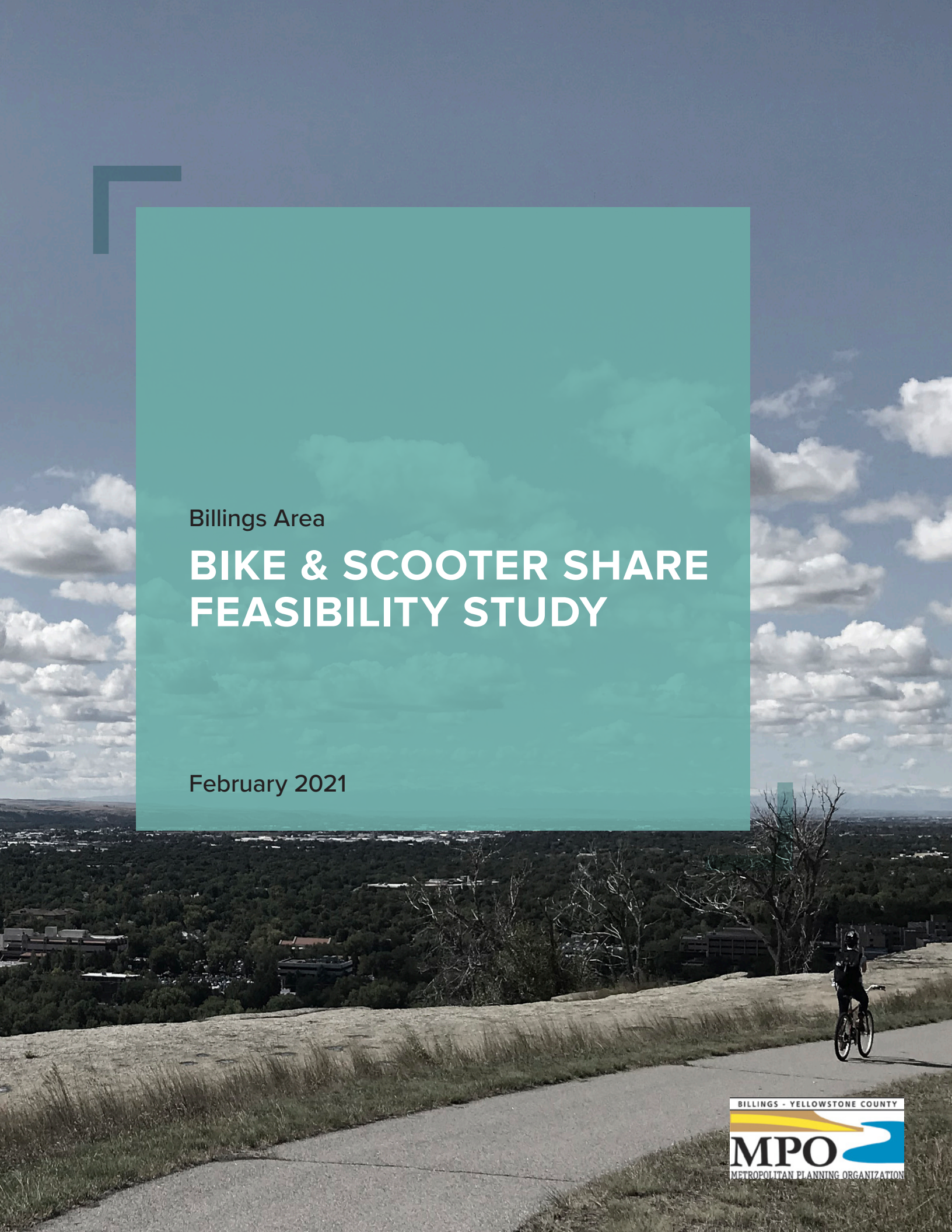

Billings Area

# BIKE & SCOOTER SHARE FEASIBILITY STUDY

February 2021

BILLINGS - YELLOWSTONE COUNTY
MPO
METROPOLITAN PLANNING ORGANIZATION

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# I. EXECUTIVE SUMMARY

# PROJECT PURPOSE

The Billings-Yellowstone MPO is collaborating with local stakeholders to conduct a bike and scooter share feasibility study to define what a successful bike and scooter share program would look like for the Billings area. Over the last ten years around the U.S., bike share systems have shown themselves to be a practical complement to transit and a sustainable, useful way for people to get where they need to go. While scooter share systems are a more recent innovation, they have quickly proven to be a popular option for both transportation and recreation.

The Executive Summary highlights the study's key recommendations.

# WHAT IS BIKE SHARE? WHAT IS SCOOTER SHARE?

A bike and/or scooter share system is a network of shared bicycles or scooters available for short-term use, usually 15 to 45 minute trips. A user can check out a bicycle or scooter from locations around the city, ride to their destination, and then leave the bicycle or scooter for someone else to use. Bike share and scooter share programs are designed to be a cost-effective, environmentally-friendly, convenient travel option for shorter trips. Bike and/or scooter share could serve as an extension of transit and help Billings community members and visitors get around more easily without using a car. **See the Glossary on page 12 for definitions of key words used in the language of bike and scooter share and other shared mobility.**

# COMMUNITY PERSPECTIVES ON BIKE AND SCOOTER SHARE

## KEY TAKEAWAYS

The following key takeaways reflect feedback from community members collected in the survey:

*Mixed community support for bike and scooter share programs; more information requested.* Fifty-three percent of survey respondents are interested in seeing bike and scooter share in Billings, 24 percent of respondents are not interested, and 14 percent need more information. For those who selected "Other," many respondents reported liking the idea of bike share, but not scooter share.

*Most Billings community members have not used bike or scooter share.* Sixty-four percent of survey respondents have not used bike share and 77 percent have not ridden scooter share. However, over one third of survey respondents had used bike share and 30 percent report that they bike at least a few times a year. As shown in **Figure ES-1**, survey respondents believe that bike and scooter share trips could replace car trips and benefit the environment.

*Transit integration is not crucial for bike and scooter share in Billings.* Sixty-three percent of survey respondents reported that access to bike or scooter share for first-mile travel would not increase transit trips. However, 43 percent of survey respondents say that bike or scooter share trips would replace car trips.

*Top concerns related to bike and scooter share included safety, lack of bicycle infrastructure, and vandalism.* Sixty-two percent of survey respondents reported that they had safety concerns about sharing the road and interacting with other vehicles, 51 percent reported having concerns regarding lack of designated bicycle infrastructure, and 40 percent reported concerns regarding bikes or scooters blocking the sidewalk or ending up in inappropriate places. Only 16 percent of survey respondents had no concerns about bike and scooter share in Billings, as shown in **Figure ES-2.**

*Most Billings community members want to access downtown, parks, and restaurants/ coffee shops by bike or scooter share.* Sixty-five percent of survey respondents reported that they would like to access Downtown with bike or scooter share, 48 percent reported that they would like to access parks, and 45 percent would like to visit restaurants or coffee shops. Twenty-seven percent of respondents reported that they didn't want to use bike or scooter share.

**More details about the Bike Share Study outreach process can be found in Chapter 4 on page 39.**

**53%**

**OF RESPONDENTS WOULD BE INTERESTED IN SEEING BIKE/ SCOOTER SHARE IN BILLINGS**

*Figure ES-1.*

**Which of the following statements would support your interest in using a bike/scooter share system? (N=245)**

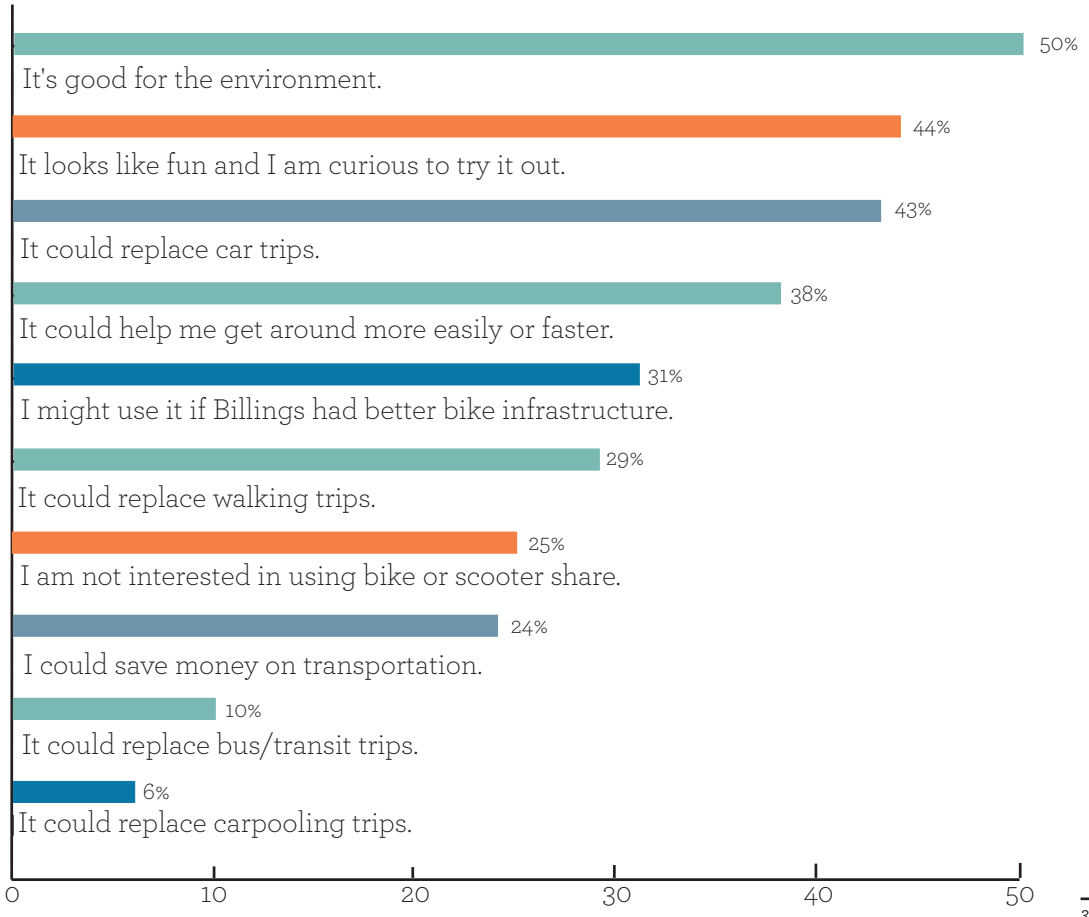
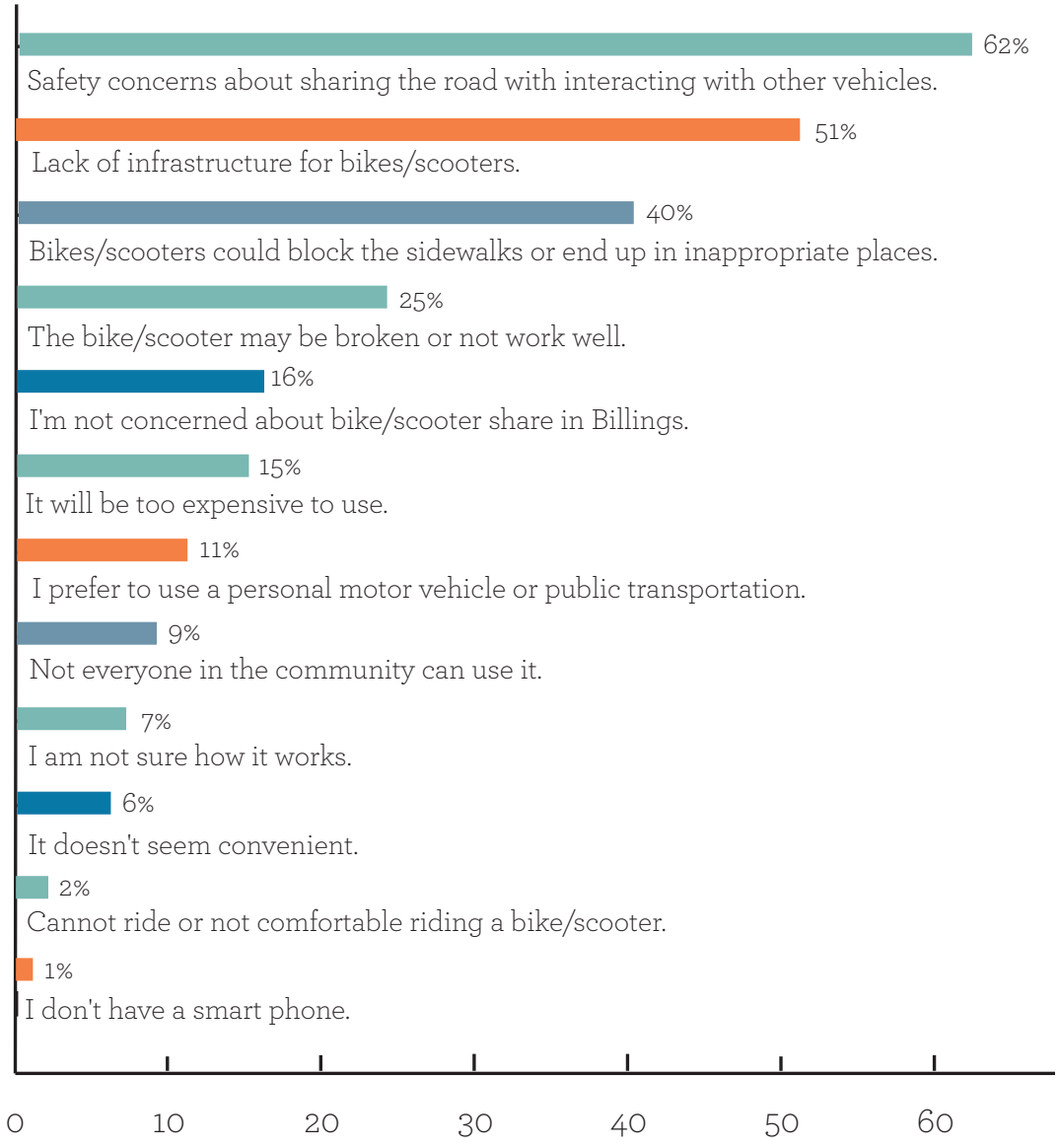


*Figure ES-2.*

**What are your top three concerns related to bike and scooter share in Billings? (N=245)**




*As shown in Figure ES-2, personal safety, lack of safe infrastructure, and inappropriate bike/scooter parking are top concerns. Sixty-two percent of survey respondents are concerned about sharing the roadway with vehicles and 51 percent are concerned about lack of bike-specific infrastructure. Only 16 percent of survey respondents selected that they were not concerned about bike/scooter share in Billings.*

# BIKE SHARE STUDY RECOMMENDATIONS

**Table ES-1** highlights the most significant recommendations identified in the Study.

*Table ES-1.*

| SYSTEM TYPE |
| --- |
| Hybrid Bike Share System |
| Electric-Assist Bikes |
| **SYSTEM GOVERNANCE** |
| Operated by a Private Company |
| Owned by either the private company ("turnkey") or by City of Billings |
| Provide Student Fares |
| **SYSTEM LAUNCH** |
| Launch in Initial Service Area including Downtown and MSU Billings |
| Create Equity Program |
| Establish Strategic Partnerships |

# SYSTEM TYPE

## RECOMMENDATION: HYBRID BIKE SHARE SYSTEM, WITH OPTION FOR SCOOTERS

The recommended system type for bike share in Billings is a hybrid system. To determine the recommended bike share system type for Billings, the project team used a decision matrix to understand opportunities and limitations to three major types of shared micromobility systems: docked and hybrid bike share, and dockless scooter share. The matrix scores each type of micromobility system according to its ability to meet Billing's program goals and other considerations identified as important for the Billings community. Overall, a hybrid system will provide the ideal balance of control and flexibility to meet the needs of the Billings community. **The system type decision matrix (Table 6-2) is shown on page 70.**

Some hybrid bike share system operators have the ability to offer "mixed fleets," or fleets including bike share and other devices, such as scooter share. Although scooter share is not recommended as the sole micromobility option in Billings, the Bike and Scooter Share Study recommends that Billings consider incorporating scooter share as part of a mixed fleet.

## RECOMMENDATION: ELECTRIC-ASSIST BIKES

The Bike and Scooter Share Study recommends the system use a fleet of electric-assist bikes. This will support a number of the program goals and other factors covered in the evaluation matrix, including:

- Providing for wider geographic coverage by increasing the comfortable speed and distance of bike share trips for customers
- Expanding geographic coverage and system usability to better serve vulnerable demographics, including low-income neighborhoods and riders with mobility challenges

With an e-bike share system, riders can cover more ground and navigate topography with ease. E-bikes are more appealing to a larger range of potential users of varying physical abilities. In the past few years, electric assist bike share equipment has become less expensive and easier to use. All models require the rider to pedal the bicycle in order to get an "assist" from the electric motor. The top speed for an e-bike share system is approximately 15 miles per hour, after which the regulator cuts off any additional power. Because e-bikes are powered by a battery, they must be recharged on a regular basis. This creates an additional operations step for vendors/contractors who must either swap the batteries or dock the bikes at a recharging station.

For more information about system types and detailed costs, see the System Type section starting on **page 15**. For system type definitions, see the glossary on **page 12-13**.

## RECOMMENDATION: TURNKEY OR PUBLICLY OWNED/PRIVATELY OPERATED

The Bike and Scooter Share Study recommends that the City either solicit a turnkey bikeshare system (owned and operated by a private company) or that the City own the bike share system in Billings and contract to a private operator.

To implement a **turnkey bike share system,** a city hires a company such as Koloni or DropBike to provide "bike share as a service" for a defined amount of time. Instead of purchasing a full fleet of bikes and designing stations, a city rents equipment and contracts with the company for the full range of operations support, including: installation, operations, sponsorship, customer service, and maintenance.

The turnkey model allows a city to implement bike share with limited staff capacity and capital investment, while maintaining meaningful city control. Typically, turnkey systems have a faster timeline for implementation, and many companies offer mixed fleet options so the City could request to include e-scooters alongside bicycles. Turnkey models are common in smaller cities and on campuses.

Alternatively, the **City's ownership of bike share in Billings** would provide its own benefits. A Billings-owned bike share system would be an innovative method of supporting first-and-last mile connections to and from transit, adding to the geographic range and flexibility of transit trips. In addition to supporting transit service goals, owning the City's bike share fleet and hub infrastructure would offer the City the highest degree of

control over system design, station siting, and pricing/payment policy. With proper coordination with MET Transit and bike share integrated into MET's system, transit riders would experience a bike share system operated in-tandem with traditional bus service, including:

- A bike share pricing structure in-line with standard transit fares
- The option of using MET passes to pay for bike share rides
- A bike share system that shares in MET's branding, high standard of service, and responsiveness to customer needs
- Control over advertising and sponsorship opportunities

In this instance, **the City would select a bike share vendor to manage the operations of the system.** Private operators can bring extensive knowledge and experience from operating in other cities. Hiring a private operator still allows the City to dictate the terms of bike share service level agreements. The City should require prospective bike share operators to submit their plans for routine maintenance and operations during the bid process, as well as provide evidence of high performance in other jurisdictions.

See **Chapter 6** on **page 69** for additional recommendations regarding operations and maintenance, estimated costs, equity programming, strategic partnerships, initial service area, and bike share station locations.

# II. INTRODUCTION

# WHAT IS THIS PROJECT?

The Billings-Yellowstone MPO is collaborating with local stakeholders to conduct a bike and scooter share feasibility study to define what a successful bike and scooter share program would look like for the Billings area. A bike or scooter share system, also known as shared micromobility, is a network of bicycles and/or e-scooters available to the public for short-term use and for one-way (point-to-point) trips. The system's size, coverage, and service model can be tailored to a city or region's needs and context. The following report documents current conditions in Billings that are relevant to a shared micromobility system. The information and analyses contained here will inform further progress in developing recommendations suitable for the context of Billings.

Together with a group of community stakeholders, the planning team established a list of outcomes they hope to see as a result of implementing a bike and scooter share system in Billings. This stakeholder group consisted of representatives from the Billings MPO, MET Transit, City staff, Downtown Billings Alliance, Chamber of Commerce, and Healthy by Design. Potential challenges and desired incomes were discussed. The group showed general consensus around the desire to establish a system that:

- Enhances the transit system by expanding access to existing bus routes and linking the transit system to a broader suite of multimodal options
- Contributes to a more equitable transportation system by reducing the need for personal vehicle ownership
- Promotes greater participation in active transportation
- Increases visibility and awareness of alternative transportation modes
- Provides a new way for visitors to explore Billings
- Connects people to what the city has to offer

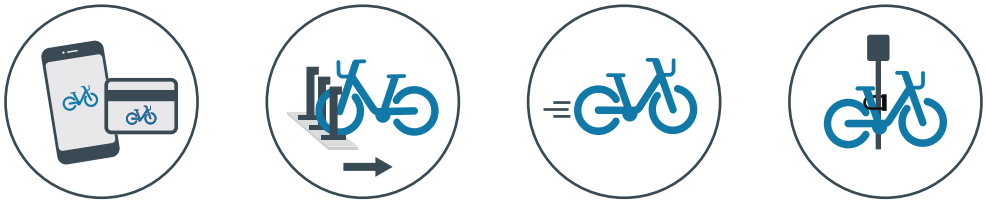
# WHAT IS BIKE AND SCOOTER SHARE?

A bike and/or scooter share system is a network of shared bicycles or scooters available for short-term use, usually 15 to 45 minutes. A user can check out a bicycle or scooter from locations around the city, ride to their destination, and then leave the bicycle or scooter for someone else to use. Bike share and scooter share programs are designed to be a cost-effective, environmentally-friendly, convenient travel option for shorter trips.

Bike and/or scooter share could serve as an extension of transit and help Billings community members and visitors get around more easily without using a car. **See the Glossary on page 12 for definitions of key words used in the language of bike and scooter share and other shared mobility.**

**As of the end of 2019, hundreds of cities and regions in the U.S. have some form of bike or scooter share. Shared micromobility has become a mainstream form of travel across the country.**


## BIKE SHARE In Four Easy Steps



1 Sign Up

2 Check Out

3 Ride

4 Lock

# WHY SHARED MICROMOBILITY?

Bike share has been around for decades. Most of the first generation "systems" were volunteer-led and informally organized in a handful of cities, such as Amsterdam and Portland, Oregon in the 1970s, '80s and '90s. These programs experienced low to moderate success because of theft, vandalism, inefficient technology and insufficient operational oversight.

However, in the past ten years, innovations in technology have increased user accountability and given rise to a new generation of technology-driven bike share and scooter share programs. Advancements in credit card transaction capabilities, WiFi and RFID (radio-frequency identification) chips have allowed operators to introduce accountability and reduce theft and vandalism.

In the last four years, bike and scooter share experienced another rapid phase of evolution as private companies developed new business and operations models. This introduced new ways of implementing bike share that differed from previous systems. Previously, systems required a significant upfront capital investment, were often partially or fully-funded by public investment, and were often procured through exclusive contracts. New systems were primarily funded by venture-backed private companies. This also resulted in innovation around dockless e-scooter sharing that allowed anyone with a smartphone to check out an electric scooter for point-to-point trips.

The current state of the practice is discussed in more detail in **Chapter 3.**

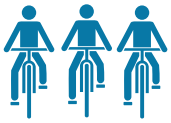
**BENEFITS OF SHARED MICROMOBILITY**

**REDUCES EMISSIONS**

**SUPPLEMENTS THE TRANSIT SYSTEM**

**CONTRIBUTES TO AN EQUITABLE TRANSPORTATION SYSTEM**

**IMPROVED INDIVIDUAL & COMMUNITY HEALTH THROUGH ACTIVE TRANSPORTATION**



**CONTRIBUTES TO THE "SAFETY IN NUMBERS" EFFECT FOR ALL BICYCLISTS**

# QUICK REFERENCE GLOSSARY

**NEW MOBILITY** refers to transportation services enabled, defined, or refined by digital technology.

**SHARED MOBILITY** is the shared use of a vehicle (motorcycle, scooter, bicycle, or other travel mode) to provide users with short-term access for one-way or round trips.

**SHARED MICRO-MOBILITY** encompasses all shared use fleets of small, fully or partially human-powered vehicles; bike sharing and scooter sharing are types of shared micro-mobility.

**BIKE SHARING** is the shared use of a fleet of bicycles (manual or e-bikes) which provides users with on-demand access to bicycles for one-way (point-to-point) or round-trip travel.

**SCOOTER SHARING** is the shared use of a fleet of scooters which allows individuals access to scooters for on-demand for one-way trips. To-date, in the U.S., scooter sharing programs offer electric (rather than manual) scooters, are private sector owned and managed by companies that operate in multiple markets, and are primarily dockless (or free-floating). Some systems have recently begun introducing designated parking areas for scooters, or even designated racks for scooters.

**RIDEHAILING SERVICES** (also known as ridesourcing and transportation network companies (TNC)) are prearranged and on-demand transportation services for compensation in which drivers and passengers connect via digital applications.

**ELECTRIC-ASSIST BIKES (E-BIKES)** are bicycles with an integrated electric motor which propels the bike. Electric-assist bikes have a small motor to assist the rider's pedal-power. They retain the ability to be pedaled by the rider.

**RIDE SHARING** (also known as carpooling and vanpooling) is defined as the formal or informal sharing of rides between drivers and passengers with similar origin-destination pairings. Vanpoolers share the cost of a van and operating expenses, and may share driving responsibility.

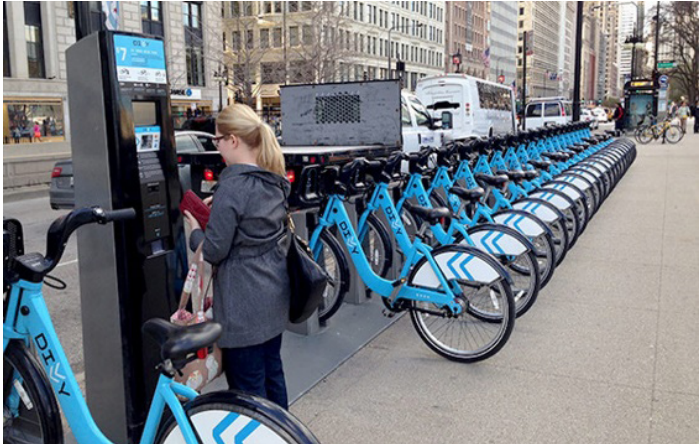
### TYPES OF BIKE SHARING SYSTEMS INCLUDE:

**DOCK-BASED –** a bike can only be retrieved at and returned to a station with technology-enabled docks; user transactions can occur through web, smartphone application, or kiosks; may include manual bikes or e-bikes.

**DOCKLESS –** a bike can be retrieved at or returned anywhere within the service area, and the bike locks to itself (rather than an object) using a rear wheel lock enabled or disabled with a smart phone application; user transactions occur through a smartphone application. May include manual bikes or e-bikes.

**HYBRID –** a bike can be retrieved at and returned to a station which consists of a series of bike racks, or anywhere within the designated service area; bikes are typically referred to as "smart bikes" due to the on-board technology hardware; user transactions can occur through hardware on the bike, web, and/or smartphone application; may include manual bikes or e-bikes.

# III. WHAT WE KNOW ABOUT BIKE AND SCOOTER SHARE



*Docked bike share station with a payment kiosk in the City of Chicago.*

# SYSTEM TYPES

This section outlines a handful of system types that should be considered as potential service options for Billings, and highlights the pros and cons of each. In some cases, bike and scooter options can be mixed and matched (e.g. docked bike share plus dockless scooter share or hybrid bike share plus scooter share with docking capability).

## DOCKED BIKE SHARE SYSTEMS

### *Description*

Also referred to as "smart dock" systems, this bike share system type is based on powered stations with docks that securely lock a bike and kiosks for user payment transactions and information. At the kiosk, casual users can purchase a short-term pass for trips on demand. Bike share bikes must be retrieved from and returned to a station. Because the equipment is relatively expensive, most U.S. agencies use federal transportation grants and large corporate sponsorship deals to cover the capital and operations costs.

### *Feasibility in Billings*

### *Defining Feature*

Station density and visibility are critical to success since the bicycles must be secured at a station. Additionally, the rebalancing of bike share units is a major element of operations for dock-based systems. If station density and rebalancing upkeep is adequate, users of dock-based bike share systems enjoy the reliability of knowing where they can find a bike from day to day. These systems are largely city or agency-owned, giving them control over station locations, level of service, and pricing.

**$ *Estimated Cost***

Typical station with 8-10 bikes: $35,000 to $55,000

Operating fees: $2,000-$2,500 per bike per year.

*Table 3-1.*

| PROS | CONS |
|---|---|
| Station placement can give agencies control over bike locations and parking in the public right-of-way. | Stations with docks often mean higher system costs than dockless or hybrid options. |
| Contracting can establish service level standards including: pricing, maintenance, customer service, usage data, bike quality, and safety. | More upfront work is required to plan and design station locations. |
| Bike locations within dock-based systems can be more predictable for users, which is particularly valuable for commuters and transit riders. | Station placement may require permits and negotiation with adjacent land owners. |
| Stations can create a physical presence for the bike share system and advertise to new users. | Reliance on sponsorship and grants can be difficult to sustain. |
| Status as "infrastructure," can establish a more long-lasting system. | Lack of flexibility limits the geographic reach and access to destinations for users. |
| | Difficult and expensive to upgrade system, as technology evolves. |

## HYBRID BIKE SHARE SYSTEMS

*Description*

Also referred to as a "smart bike" system, this approach houses transactions on the bike rather than at a station. Stations, also called hubs, consist of branded racks for parking bike share bikes. Though stations are available, the program does not require that a bike be left at a station and it is permitted to be parked anywhere within the service area. The racks have no software or technology features (different than the dock-based "smart-docks"). Hybrid systems typically charge a fee to park outside of the stations or offer an incentive to park at the stations to encourage users to use the docks.


*Hybrid bike share bike and docks in Orlando, Florida.*

*Defining Feature*

Offer the reliability and visibility of docked systems with the flexibility of dockless systems. Agency contracts or ownership provide control over implementation, but less ability to manage parking in the right-of-way once launched. Hybrid systems are found in cities of all sizes.

*Estimated Cost*

Typical station with 8-10 bikes: $20,000 to $25,000.

Operating fees: $2,000-$2,500 per bike per year.

*Feasibility in Billings*

*Table 3-2.*

| PROS | CONS |
|---|---|
| Sponsorship opportunities can create community partnerships. | The hardware and software included on the bikes and the need for stations means higher costs than dockless systems, but lower than fully docked. |
| Station placement gives agencies control over bike locations and parking in the right-of-way. | Station placement may require permits and negotiation with adjacent land owners. |
| Stations create a physical presence for the system and advertise to new users. | Bikes or e-scooters can be improperly parked and obstruct the right-of-way. |
| Bike locations are both predictable and flexible for users. | Time and funding for rebalancing bikes. |
| Users can more easily locate a pod of bikes for a group to ride. | Difficult and expensive to upgrade system as technology evolves. |
| Status as "infrastructure," can establish a more long-lasting system. | |

## DOCKLESS ELECTRIC SCOOTER SHARE SYSTEMS

*Description*

Dockless electric scooter share systems are a fleet of self-locking scooters that do not require any fixed stations, docks, or kiosks. Users retrieve or park e-scooters anywhere within the service area using a smart phone app. They offer an appealing level of flexibility and are generally permitted to operate in cities rather than procured.


*Dockless scooter share scooters parked in a designated dockless parking zone.*

*Defining Feature*

Compared to hybrid and docked, dockless systems provide more flexibility for users, but less agency control over bike locations, pricing, and level of service. Because they are privately funded and operated, dockless scooter share systems programs are offered in locations where there is sufficient market demand.


*An electric charging hub with docks for scooters.*

*Dockless Scooter Parking Management*

Improperly parked scooters can be a nuisance to other street users and, in particular, people with disabilities. In addition to clear parking guidelines and rider education, the following physical design features can be used to promote proper parking:

- **Dockless scooter designated parking/ geofenced areas:** Cities can provide designated parking areas that clearly mark areas where scooters should be parked. These are often provided in higher use areas, and places with competing demands on the public right-of-way. Cities can also place designated parking areas throughout the scooter service area and require that all trips end within one. Designated parking area regulations can be reinforced by geofencing the zones, which make it so users cannot end trips outside of geofenced areas.
- **Lock-to requirements:** Cities can require that all scooters come equipped with a cable lock and require that users end trips by securing the scooter to a bike rack or pole. Lock-to requirements have been shown to improve scooter parking compliance and decrease the number of complaints about improper scooter parking.
- **Charging docks:** Electrified docks for scooters can be supplied by the operator or by the city (through a third-party). The benefits of these docks are twofold: they provide a designated space for proper parking and they charge the scooter, reducing the need for operators to retrieve and charge scooters.

*Estimated Cost*

Equipment and operations typically provided to agencies at no cost. Companies are supported by venture capital and user fees.

*Feasibility in Billings*

*Table 3-3.*

| PROS | CONS |
|---|---|
| System can be launched more quickly than docked or hybrid systems. | Agencies generally have much less control over dockless scooter share systems compared to other system types, including the sustainability of the system. |
| Station planning and design is not necessary, which saves time and money. | Dockless companies determine where they operate and are currently focusing on expanding into major markets and contiguous growth. |
| Due to venture capital involvement, little to no public funding is required. | Smaller cities have less leverage to regulate dockless companies than major markets. |
| Less city/agency liability for helmet laws. | Scooters can be improperly parked and obstruct the right-of-way. |
| System is highly flexible for users. | Fleet can suffer higher rates of vandalism and theft. |
| Can be more affordable for single-trip, casual users. | |

# BIKE AND SCOOTER SHARE GOVERNANCE MODELS

Because bike and scooter share are publicly-available fleets, they require a structure for ownership and operations. There are four basic bike and scooter share governance models typically found in the United States:

- Privately owned and operated (permitted or contracted)
- Publicly owned and privately operated
- Publicly owned and nonprofit operated
- Nonprofit owned and operated

This section describes each model and details the pros and cons associated with each.

## PRIVATELY OWNED AND OPERATED

*Description*

An experienced private company brings established skills and credentials in operating bike share programs. The company takes on the risk of funding and operating the program in return for generated revenues. This model is most attractive in markets that support strong returns from advertising. Privately owned and operated systems can either be awarded permits to operate within a city (the company pays the city to operate) or can be awarded a contract to operate within the city (the city pays the company to operate). This is largely dependent on the local market. This model exists for both bike and scooter share and is the current, prevailing model for scooter share systems.

## FEASIBILITY CONSIDERATIONS

*Table 3-4.*

| PROS | CONS |
|---|---|
| Removes financial responsibility and risk from the City and other local partners | Correlated to market demand and highly dependent on private sector interest |
| The private operator is strongly incentivized to ensure program success (e.g. high ridership and profitability) | Due to private operation, agency control and program transparency is limited to what is defined in regulation and permitting |
| Higher likelihood of success due to established skills and experience from private sector operator | Funding options may be limited to what private operator can support |
| | Equity goals are harder to implement |

## PUBLICLY OWNED AND PRIVATELY OR NON-PROFIT OPERATED

*Description*

Ownership and financial responsibility for the system is managed by a government agency (e.g., a City, regional, or transit agency). The agency contracts out operations to a third party (or parties), which manages equipment, sponsorship and advertising, marketing, promotions, etc. This model exists for bike share but there are no known examples for scooter share.

*Feasibility Considerations*

*Table 3-5.*

| PROS | CONS |
|---|---|
| The agency has full program control, including the brand, look, and operating standards | Agency must have both interest and capacity to manage the program |
| Agency can apply for federal, state, and local funding | Agency takes on risk and ongoing financial responsibility |
| Public can hold the agency accountable to a transparent system | There are multiple competing priorities beyond financial and operating performance |
| Agency can include goals such as geographic and social equity in the program | |

## NONPROFIT OWNED AND OPERATED

*Description*

An existing or newly formed nonprofit organization (NPO) takes on ownership and financial responsibility for the program. The NPO can manage any combination of responsibilities, including day-to-day system operations, and can also contract out some services to a third party, e.g., marketing and promotions, sponsorship and advertising, etc. This model exists for bike share but there are no known examples for scooter share.

*Feasibility Considerations*

*Table 3-6.*

| PROS | CONS |
|---|---|
| This option provides the most flexibility in funding, including local, state, and federal funds, sponsorships, advertising, and philanthropic contributions | If NPO is newly-created, building capacity and establishing organization can take time |
| Community-oriented missions of NPOs are well-received by the public | NPO often lacks skills and experience at system launch |
| A Board of Directors made up of a broad range of community stakeholders effectively engages public, private, and community organizations in the system | The NPO's performance standards may not meet public and agency expectations for transit service |

# BIKE AND SCOOTER SHARE SYSTEM FARES

The fare structure for bike or scooter share in Billings will be decided through negotiations with the selected operator. This section details the two common pricing structures of bike and scooter share systems, and other important pricing considerations.

## PER-TRIP FEES VERSUS PER-MINUTE FEES

Bike and scooter share systems either charge by the minute or by the trip (which provides the user a set amount of time to use the vehicle). This amount of time is usually 30 minutes to one hour, but some systems offer longer options such as full day. Systems that charge by the minute also often charge a fee to unlock the bike or scooter (typically $1). Traditionally, bike share systems have used the per-trip model, but systems are increasingly moving to the per-minute fee model. Nearly all scooter share systems use the per-minute fee model.

## CASUAL VERSUS MEMBER PRICING

Most bike and scooter share systems offer significant discounts for users who purchase memberships. Memberships are typically offered as monthly or annual subscriptions. The benefits of membership can come in the form of unlimited free trips or discounts from standard pricing (e.g. waiving unlock fees and/or lowering per-minute costs).

## PRICE INCENTIVES

Prices can be set up to incentivize certain user behaviors and reduce rebalancing expenses. For example, it is typical for hybrid systems to charge a small fee for users to lock bikes at locations outside the designated bike share stations, and a larger fee for bikes that are parked outside of the designated service area. Credits can also be issued to users who return bikes to popular stations, reducing the need to deploy people to rebalance the fleet. The additional parking fees can be removed in certain locations to increase access and usage.

## DISCOUNTED PRICING

Bike and scooter share systems often offer discounts to certain groups. These groups can include students, people with low-incomes, and government employees. For more information on low-income discounts refer to the Advancing Equity Through Bike/Scooter Share section.

# THEFT AND VANDALISM CONSIDERATIONS

For all bike and scooter share system types, theft and vandalism are a potential concern. In a typical scooter share system, theft and vandalism are managed by the private operators to support successful operations. There are different implications for bike share, when local government is a partner in ownership, and may be partially or fully responsible for costs related to theft and vandalism.

To mitigate the costs of theft and vandalism, bike and scooter share vendors have designed the current generation of market available vehicles to be more resistant to vandalism and theft than earlier models. Today's vehicles typically have a number of anti-vandalism and anti-theft features, including:

- **GPS tracking:** GPS technology integrated into bike share units allows for the tracking and recovery of vehicles that have been stolen.
- **Integrated u-locks:** Heavy-duty u-locks integrated into many dockless and hybrid bike share units allow users to securely lock bike share units to a hub or public bike share rack.
- **Encasement of vulnerable parts:** Bike share units today often feature wires, chains, and gears that are partially or entirely encased within the frame of the bike itself. This encasement shields these vulnerable parts from being cut or stolen off of the bike.
- **Anti-theft hardware:** Bike and scooter share vehicles generally feature anti-theft nuts and bolts that cannot be quickly or easily removed using standard hand tools.
- **Accessory integration with frame:** Accessory features on vehicles (such as lights, bells, and baskets) are sometimes integrated into the design of the vehicles rather than being attached as a mountable feature.
- **Solid tires:** Some vehicles feature tires made out of solid rubber rather than inflatable tubes to mitigate risk of flats and slashed tires.
- **Custom design:** Bike and scooter share vehicles are highly customized to the unique demands of shared mobility, and many parts are not compatible with private vehicles. This greatly reduces the street value of bike and scooter share vehicle parts.

Additionally, the encouragement and enforcement of secure parking practices through in-app messaging, user fines, and diligent complaint response times can decrease the risk theft.

# WINTER BIKE SHARE CONSIDERATIONS

Bike share systems become an integral part of a community's transportation system, so the decision about whether or not to operate during winter months should be made with careful consideration. Many bike share programs are seasonal and shut down operations for winter; however, in the 2015-2016 winter season about 15 systems in snow-impacted areas successfully remained operational.[1] Surveys have shown that bike share users are willing to use a bike share program in the winter, especially when bike paths and sidewalks are cleared of ice and snow.[2] Below are considerations for deciding whether to operate a seasonal or year-round system:

- **Reduced ridership and revenue:** Even in cities with an existing winter biking culture, ridership is lower during winter months due to cold and snow. Operators can expect between 10 and 30 percent of peak summer ridership.[3] This may be challenging for systems highly reliant on revenue from ridership.
- **Meet community transportation needs:** Community members that depend on bike share may be left without reliable transportation in winter months. Additionally, many people prefer bike share bikes in the winter because they would prefer to avoid subjecting their own bike to winter elements (snow, salt, etc.). The bikes themselves may be more reliable and safer to ride, with wider tires, an upright position, and internal hub braking systems.
- **Winter bicycling education:** Winter bicycling (especially on snowy days) can be risky, especially for newer riders; education efforts from the bike share service provider or the City may be necessary to make sure all riders know how to ride safely in inclement weather. For example, Bike Share Toronto regularly posts tips for safe winter riding on their blog.[4]
- **Winter bicycling promotion:** To encourage riders during winter months, some bike share systems invest in extensive marketing and winter bike share promotion. This can help increase winter ridership.
- **Station siting:** Station siting for systems planning year-round operation in snowy areas must take into consideration snow plowing needs to ensure that stations do not take up snow storage space, do not become buried under plowed snow, and are not damaged by snow plows. At the same time, stations will need to be located in areas that are regularly plowed and/or shoveled to ensure safe user access to/from the station.
- **Solar stations:** Bike stations powered by solar panels may lose power in winter months due to insufficient sunlight or snow coverage. Bike share operators can mitigate this by cleaning solar panels after snow events and monitoring station batteries to swap out for charged batteries when needed.

[1] Godavarthy, Ranjit Prasad., & Taleqani, Ali Rahim., Winter Bikesharing in US: User Willingness, and Operator's Challenges and Best Practices. Sustainable Cities and Society http://dx.doi.org/10.1016/j.scs.2017.02.006. Accessed December 21, 2020.

[2] Godavarthy & Taleqani, 2017.

[3] Godavarthy & Taleqani, 2017.

[4] Bike Share Toronto. "Winter Cycling: 8 Tips For A Safer Ride." Posted January 28, 2020. Accessed December 23, 2020. https://bikesharetoronto.com/news/winter-biking/

- **Snow events:** In addition to clearing solar panels, bike share stations need to be cleaned of snow and ice after snow events. Operators may need to invest in additional cleaning tools, such as shovels, brooms, brushes, ice scrapers, etc. Operators may also consider proactively pulling bikes from stations ahead of snow events.
- **Bike maintenance:** Bikes will require additional safety inspections to ensure they are ready for winter. This includes lubricating all chains and seat posts to ward off mud, grime, and road salt. Depending on the vehicle specifications, it may be worth replacing tires to be thicker and/or knobby, and reducing tire air pressure for better traction on ice.
- **Winter bike accessories:** Bikes may be customized for winter riding. For example, Lime's (now-defunct) fleet in Calgary, Canada included hand covers on the handlebars during winter months.
- **Storage needs for seasonal systems:** Depending on the type of bike share system, there may be a significant amount of equipment that requires storage through the off-months. This may include: stations, docks, and bicycles. The operator and/or City will need to find a secure storage location for this equipment that may need to be larger than warehouses or storage facilities that are used during the system's operating period.
- **Plowed network of cycling facilities:** In addition to education, a safe network of plowed and salted cycling facilities may assist in maintaining ridership. This may involve coordination with the public agency in charge of snow plowing to ensure that well-used bicycling routes near to stations are maintained clear of snow.


*Lime bikes are equipped with bar mitts in Calgary, Canada. Photo by Tom Babin.*

# ADVANCING EQUITY THROUGH BIKE/ SCOOTER SHARE

## OVERVIEW

It is critical to build shared mobility systems that equitably serves all users of the transportation system. This section looks at research on equity in shared mobility systems. Most of the research to date focuses specifically on bike share systems. However, the barriers to equitable scooter share are similar, and most of the lessons learned from this research should apply to scooter share as well.

Traditionally, the community members most susceptible to experiencing the negative impacts of limited mobility options have been children, senior citizens, people of color, people with limited access to a car, people with limited formal education, lower-income households, or people with limited proficiency with speaking English. Access to transportation can help or hinder a person's ability to get to work, attend school, buy healthy food, visit a doctor, and socialize or otherwise contribute to their community.

Many studies have documented the rapid increase in bike share systems and the fact that certain groups are underrepresented among bike share users, including: people of color, people with lower incomes, women, seniors, and people with less education.[5] [6]

Lack of bike share systems and stations in neighborhoods where higher percentages of people in these groups live and work is one contributing factor.[7] Cost, lack of payment options, lack of credit, language differences and lack of familiarity with bike sharing are other potential barriers.[8] [9] Even with the ability to pay, some people may not want to use bike share for fear of unforeseen charges or bike damage. Additionally, both traffic safety and personal safety fears are preventing people of color and those with lower incomes from trying bike share.[10] Traffic safety concerns, resulting from poor infrastructure or proximity to vehicles, is the biggest barrier across all racial and income categories. People of color have more personal safety concerns, resulting from violence, crime, or being targeted by the police than white bike share users.

It is important for new bike and scooter share services to address these barriers in order to create a successful, sustainable system. Developing specific bike and scooter share equity programs can help these historically marginalized communities gain greater access to public transportation networks and can help foster new opportunities for economic and social inclusion.

Roughly 75 percent of bike share systems larger than 150 bikes have specific equity programs.[11] The following research summarizes best practices in bike share

[5] Buck, D., R. Buehler, P. Happ, B. Rawls, P. Chung, and N. Borecki. (2013). "Are Bikeshare Users Different from Regular Cyclists? A First Look at ShortTerm Users, Annual Members, and Area Cyclists in the Washington, D.C.,Region." Transportation Research Record. No. 2387, pp 112-119.

[6] Shaheen, S., Martin, E., Chan, N.D., Cohen, A.P., and Pogodzinki, M. (2014). "Public Bikesharing in North America During a Period of Rapid Expansion: Understanding Business Models, Industry Trends and User Impacts." MTI Report 12-29. Mineta Transportation Institute.

[7] Ursaki, J. and L. Aultman-Hall. (2016). "Quantifying the Equity of Bikeshare Access in U.S. Cities." Transportation Research Board Annual Meeting, 2016. Paper # 16- 0426

[8] Hoe, N. (2015). "Bike Sharing in Low-Income Communities: Perceptions and Knowledge." April-October 2015. Temple University Institute for Survey Research Report.

[9] MacArthur, J., McNeil, N, Broach, J., Cumings, A., Stark, R., Sanders, R., and Witte, A. (2019). "National Scan of Bike Share Equity Programs: Approaches and Best Practices for Promoting Equity in Bike Share." Transportation Research and Education Center (TREC) pp 1-138.

[10] Schneider, B. (2017). "What Keeps Bike Share White," Citylab. Citylab.org.

[11] MacArthur, J., McNeil, N, Broach, J., Cumings, A., Stark, R., Sanders, R., and Witte, A. (2019). "National Scan of Bike Share Equity Programs: Approaches and Best Practices for Promoting Equity in Bike Share." Transportation Research and Education Center (TREC) pp 1-138.

equity programs, examples from other cities, and lessons learned from the growing body of bike share equity literature. Overall, station location, comprehensive outreach and affordability are pillars of an equitable bike share program. Additionally, bike share program managers have identified the importance of launching a program with equity and inclusion in place from the start, rather than retrofitting equity-focused outreach or expansions to historically-marginalized communities after a program is already established in a high-demand area.

## DEFINING EQUITY

Defining equity in bike share systems is complex and is often contextual to the region it serves. However, defining equity is an important first step in order to successfully introduce bike share to a city, as this vision will inform the bike share's practices and operations. There are as many lenses to view equity as there are barriers to access the system. Some bike share systems define equity in terms of the ability for specific populations of people to access the system; others define equity in terms geographic accessibility. Many use both, as the more ways in which an equity program addresses the barriers for its usage, the more robust and successful it will be. Recently, researchers at Portland State University surveyed 38 bike shares operating in the United States and asked how they approached equity in their systems, shown in the table below.

## EQUITABLE BIKE SHARE SYSTEM DESIGN FEATURES

**Station Locations and Service Area:** Bike share station locations and service area are critical components of an equitable bike share system. While bike share systems typically launch in high demand (and presumed higher revenue) areas, such as downtowns and near tourist destinations, it is important to consider geographic and social equity when deciding where to locate a system. The extent of the service area should be determined with community stakeholders to make sure that the balance between station coverage and station density aligns with community goals. Station sites should consider areas that are currently underserved by public transit, near destinations such as libraries, grocery stores and community or cultural centers. The National Association of City Transportation Officials (NACTO) guidelines recommend that bike share stations be no more than 0.4 miles apart to have truly comprehensive, equitable networks well-integrated with common destinations and existing transit.[12] Research from Portland State University finds that usership drops dramatically if a station is more than a quarter mile walk.[13]

There are strategies to ensure that system coverage and density are met. For example, in Pittsburgh, PA the Healthy Ride bike share system opted to double their number of stations and expand service to serve more neighborhoods by reducing the size of underused stations from 19 docking points to 6-8 docking points per station.[14] One of the results of this innovation has been increased ridership in newly-served communities, particularly for short, everyday bike trips. In Detroit, MoGo bike share is expanding to suburban communities through the creation of satellite bike share hubs for outlying pockets of residents.[15] The purpose of this style of expansion is to cover Detroit border communities who live near

[12] National Association of City Transportation Officials, (2016). "Bike Share Station Siting Guide." Nacto.org.

[13] McNeil, Nathan, Jennifer Dill, John MacArthur, Joseph Broach. Breaking Barriers to Bike Share: Insights from Bike Share Users. NITC-RR-884c. Portland, OR: Transportation Research and Education Center (TREC), 2017

[14] Cox, S. "Pittsburgh Adds Bike Share Density with Small Station Model," Better Bike Share Partnership. Betterbikeshare.org.

[15] Cos, S. "Detroit Provides Adaptive Bikes, Will Expand System," Better Bike Share Partnership. Betterbikeshare.org.

other jurisdictions and may be trying to navigate between multiple transit systems that do not coordinate routes, timetables, or fares. Bike share would provide flexible, predictable service to connect people to different jurisdictions' transit systems. As of December 2018, MoGo is conducting outreach with stakeholders in target areas to build community ownership and drive the process forward. Ultimately, it is important for every bike share provider to determine the extent of the service area with community stakeholders and effectively communicate that extent to its members.

**Rebalancing:** Bike sharing is a transportation system that is dynamic and fluid. It is important for every bike share provider to ensure the appropriate redistribution of bicycles to its full service area such that no location is over or undersupplied. Without rebalancing efforts, the system may drift away from its original service area and be rendered ineffective or exclusionary to certain communities. Bike share providers can incentivize rebalancing through fee and payment structures, or prioritize certain locations over others to ensure that the system is equitable for all people. For example, the Bike Angels program offered by Citibike in New York City rewards users who take bikes from crowded stations to empty ones. Points earned through this system can be used to redeem free rides, membership deals, gift cards, and merchandise.[16] Cities can also build requirements into bike share permits and contracts specifying the percentage of a fleet that must be rebalanced to low income communities of concern each day.

**Income-based discounts:** The vast majority of bike share systems that pursue equity goals, regardless of size, have plans that address the financial barriers to users.[17] Income based-discount and cash payment options are key strategies to include lower income bike share riders who may not have access to credit or may not be able to afford the transportation service at the standard fare.

Among cities with station-based bike share systems, 32% have an income-based discount program. This represents a 33% increase since 2016.[18] These programs often establish income thresholds or use affordable housing enrollment as qualifiers for discount enrollment. Boston offers an example of a discounted membership program. SNAP cardholders in the Boston metropolitan area can get a $5 monthly bike share pass through the SNAP Card to Ride program.[19] The full system membership cost is $99 per year. The SNAP Card to Ride program offers unlimited 60-minute rides, increased from 30-minute trips previously available. Cities of Boston, Brookline, Cambridge, and Somerville, along with Motivate, the Department of Transitional Assistance, and the public health department work together to verify SNAP program participation efficiently and conveniently in person or online, so that people are not deterred from signing up. Furthermore, the program has removed the financial hold that used to be placed on rider payment accounts, which had been a major deterrent for low income riders.

A survey of bike share users in Chicago, Philadelphia, and New York found that two-thirds of bike share users of color or lower incomes were "very likely" to renew their memberships, and rode just as frequently as higher income, white bike shares users. As described above, survey respondents cited

[16] Citibike, (2019). "Points and Rewards." Citibikenyc.com.

[17] MacArthur, J., McNeil, N, Broach, J., Cumings, A., Stark, R., Sanders, R., and Witte, A. (2019). "National Scan of Bike Share Equity Programs: Approaches and Best Practices for Promoting Equity in Bike Share." Transportation Research and Education Center (TREC) pp 1-138.

[18] National Association of City Transportation Officials, (2017). "Bike Share in the U.S.: 2017," Nacto.org.

[19] Cox, S. "Boston Debuts Regional Discounted Bike Share Memberships," Better Bike Share Partnership. Betterbikeshare.org.

discount memberships as a main reason they joined bike share and reported that they were saving more on transportation overall by using bike share, an encouraging sign for retaining members, even if discounts end.[20]

**Cash Payment:** Over the past couple years, many bike share providers, both public and private, have implemented cash payment options where users can go to designated locations to add cash to their accounts.

[20] McNeil, Nathan, Jennifer Dill, John MacArthur, Joseph Broach. Breaking Barriers to Bike Share: Insights from Bike Share Users. NITC-RR-884c. Portland, OR: Transportation Research and Education Center (TREC), 2017.

Reload locations are often social service providers, bike share offices, and local grocery/convenience stores. Limebike, Capital Bike Share, Portland Biketown, New Orleans Bike Share, and many more offer a cash payment option. MoGo in Detroit offers a similar program called the AccessPass. Six months after implementation, AccessPass sales made up 18% of all long-term pass sales. MoGo also offers a well-used cash-payment membership option which is well used by AccessPass holders, that contributes to fast, flexible, and convenient access to transportation for hundreds of residents.

*Table 3-7.*

| EQUITY APPROACH | % SURVEY RESPONDENTS | EXAMPLES |
|---|---|---|
| Specific Populations | 71% | Low-income/LMI; Racial/Ethnic Groups; Gender; Those in most need; Historically underrepresented and underserved; Local residents; Nation of origin; Transportation option to diverse range of people; Reflect municipality's overall demographic makeup; For all people |
| Equity Goals | 45% | Fosters economic equity; Job creation; Empower; Extension of public transit; Improve public health; Support daily lives; Community asset-exercise, recreation, and alternative transportation; Ensure outcomes and opportunities for all. |
| Affordable and Accessible | 39% | Offering affordable pricing and access; Ensure access for low-income, bike station locations, cash, text-based access; Geographic access, economic access, demographic access, Access locations; Affordability; Anyone who identifies as requiring subsidized access. |
| Geographic Areas | 29% | Neighborhoods; Areas in most need; Growth focused on expanded geographic coverage; Identifying disparities and targeting areas for action, intervention, investment; connect lower-income neighborhoods; Expanding systems coverage to underserved communities; station placement. |
| Addressing Barriers | 26% | Bank-less; credit cards; Economic barriers; Physical; Technological; Language; Cultural relevance; Engages and serves minority and low-income; Community driven; Use investments to reduce racial disparity in access to mobility services, reduce non-financial barriers. |
| For All Abilities | 21% | Accessible bicycles for disabled communities; People of all abilities; Elderly. |
| Operations | 11% | Dependable, convenient, predictable; Services and operate in a manner that is just and free from bias or prejudice; Fair and just operations; Inclusive work environment, diverse staff; Training and hiring staff from underrepresented communities. |

*Source: National Scan of Bike Share Equity Programs, 2019.*

**Alternative Payment Structures:** Beyond income-based discounts and cash payment options, bike share systems should consider other alternative payment structures in order to reduce the financial barriers to entry. For example, rather than offering either a year-long pass or weekly passes, bike share providers could consider offering monthly passes which cater to regular users who can't afford the high total cost of a year-long pass or the high per-trip cost of a weekly pass. Additionally, providing longer rental times can alleviate fears of overage charges. In Pittsburgh, Healthy Ride utilizes a pricing policy that aligns with the cost of public transit, charging a flat rate for 30 minutes with no annual membership or registration costs.[21]

Bike share systems are typically reliant on smartphone access and require a financial account to be linked for use, thus making access challenging or limited for the unbanked or those without a smart phone. Statewide, 4.3 percent of Montana households are considered unbanked, meaning they do not have access to a banking or credit union account. In the Billings Metropolitan Statistical Area, this rises to 5.9 percent of the population (FDIC National Survey of Unbanked and Underbanked Households, 2013- 2017 estimates). American Community Survey data available at the citywide scale estimates that in 2018, 79.8 percent of households in Billings have a smart phone and 9.9 percent of households to not have access to any type of computing device. If this is identified as a barrier to bike share use, considerations for access that do not rely on a smart phone, or programs that provide pre-paid cards or fares to check out a bike, should be considered.

[21] MacArthur, J., McNeil, N, Broach, J., Cumings, A., Stark, R., Sanders, R., and Witte, A. (2019). "National Scan of Bike Share Equity Programs: Approaches and Best Practices for Promoting Equity in Bike Share." Transportation Research and Education Center (TREC) pp 1-138.

**Reduce Liability and Eliminate Hidden Fees:** Some bike share systems require a deposit or have steep fees for lost or stolen bikes. Eliminating these fees across the board or just for lower income users can make people feel more comfortable using the system. For example, Divvy in Chicago set up a loss liability fund to protect people from these high charges.[22]

**Partnerships with Nonprofits and Social Services:** Before a bike share system is implemented, it is important to build community "buy-in" to attract users to a system and build trust in the program. Thoughtful community engagement is essential. Portland State University research found that lack of knowledge about the bike share system is a significant barrier for lower income people of color. Thirty-four percent of low-income respondents of color said that not knowing enough about bike share was a barrier, compared to 19% of higher income respondents of color or 7% of higher income white respondents.[23] The same study found that more personal sources of information, such as talking to a bike share outreach staff person, volunteer, or community center staff were more effective than more passive sources of information at inspiring community members to try bike share.

[22] Ibid.

[23] McNeil, Nathan, Jennifer Dill, John MacArthur, Joseph Broach, Steven Howland. Breaking Barriers to Bike Share: Insights from Residents of Traditionally Underserved Neighborhoods. NITC-RR-884b. Portland, OR: Transportation Research and Education Center (TREC), 2017.

Community engagement should be designed with a feedback loop, so that there are clear ways to incorporate recommendations from the community into the bike share system design and programming. For example, community input can:

- Influence the specific location of a station,
- Help identify nonprofit partners to support program outreach,
- Change crime prevention strategies, and/or
- Guide new investments in bike infrastructure.

NACTO and the Better Bike Share Partnership released a community outreach guide, "Strategies for Engaging Community: Developing Better Relationships through Bike Share" that offers guidance on how cities, advocates, and bike share practitioners can develop programming to address community-oriented mobility goals:

- Increase access to mobility,
- Get more people biking, and
- Increase awareness and support for bike share.[24]

Bike share providers may collaborate and form partnerships with local nonprofits and social service providers who already work directly with historically-marginalized communities. Over 75% of bike share systems report having at least one community partner, and over half report having two.[25] Local nonprofits and social service providers have deep knowledge about community needs and communication channels for additional outreach. Community partners share the trust and history of the people bike share providers need to engage. Bike share providers should look for ways to add capacity and support local groups, such as paying advocates for their time, creating local jobs, and being responsive to community feedback. By tapping local resources, bike share providers can more effectively mitigate the lack of knowledge among community members for how to use the system or how to sign up. Key strategies that bike share systems around the country employ in partnership with nonprofits and social services include: facilitating enrollment, education and skills classes, prescribe-a-bike public health programs, organized rides, and ambassador programs.[26]

For example, Indego bike share system in Philadelphia operates a community ambassador program that pays representatives of local non-profits to serve as links between the Indego Bike Share program and their communities.[27] Indego Ambassadors promote bike share, plan events such as community rides or classes, and serve as a resource for bike share issues or questions from their community. Ambassadors focus on building bike share that is inclusive for the whole community and addressing barriers for specific groups. The bike share ambassador for the Bicycle Coalition of Greater Philadelphia focuses on the Latino community and youth by holding targeted events and creating materials in Spanish.[28]

[24] "Strategies for Engaging Community." NACTO, Better Bike Share. 2018. Betterbikeshare.org.
[25] Ibid.
[26] Ibid.
[27] Indego, (2018). "Meet the Indego 2018 Community Ambassadors," Rideindego.com.
[28] Cox, S. "Philadelphia's Bicycle Coalition is Committed to Bilingual and Youth Outreach," Better Bike Partnership. Betterbikeshare.org.

The ambassador program is one component of the Better Bike Share Partnership, a collaboration between the City of Philadelphia, Bicycle Coalition of Greater Philadelphia, and the National Association of City Transportation Officials (NACTO), funded by the JPB Foundation.[29] The collaboration aims to build equitable and replicable bike share systems—in Philadelphia and offer guidance globally.

**Adaptive Bike Options:** In the past several years, many bike share systems have begun to offer adaptive bikes for people with limited mobility to expand the benefits of bike share beyond the typical able-bodied user and respond to critiques from disability rights advocates. Just this year, the Ford GoBike Share in Oakland, CA piloted five different types of adaptive bicycles: upright handcycles, recumbent handcycles, recumbent leg trikes, recumbent trike tandems, and side-by-side tandems.[30] The mobility, recreation, and inclusion benefits are abundant, but challenges remain. Adaptive bike share bikes require specialized maintenance, are not always intuitive to use, and create logistical challenges for commuting. Pilot projects in several cities in 2017-2018 sought to address these challenges. In the summer 2017, the City of Portland, OR ran a pilot program called Adaptive Biketown, renting out tricycles, hand cycles, and side-by-side tandem bikes.[31]The Adaptive Biketown pilot ran for 14 weeks and matched the low-cost pricing structure of the city's traditional bike share program. The City partnered with a local non-profit to run the Adaptive bike share program out of their office, conveniently located on a main off-street bike path. After a successful pilot launch, the City is working to increase ridership and make the program more like traditional bike share, with additional rental locations and a streamlined rental process.

ACS data indicates that 9.5 percent of Billings residents are living with a disability. Thus, requiring a portion of bike share bicycles to accommodate persons with disabilities or adding a supplementary bike share option may be an important consideration for equity.

**Electric Assist Bikes:** An emerging trend in bike share systems has been the introduction of electric assist bicycles to support a larger service area and provide better bike share access for riders with mobility and fitness challenges. Current electric assist models used by bike share providers require the rider to pedal the bicycle in order to get an "assist" from the electric motor. The handful of systems that employ e-bike share currently cap the top speed at 15 mph at which time the regulator cuts off any additional power. E-assist bicycles make it easier for those not physically able to pedal a standard bike, helps users overcome steep terrain, and extend the trip distances made with bicycles. This has the effect of expanding the bike share system range, as well as the first and last mile usage to 1.5-2-mile trips when connecting to transit and other destinations.

**Targeted Marketing:** Targeted marketing is any content that increases awareness of the bike share among demographics and populations that may benefit from additional outreach. This is a key way providers pursue equity goals. Targeted marketing should reflect the diversity of the area the system serves. It should reinforce the idea that the system is for people who live in Billings, and not just visitors looking for recreational amenities.[32] Successful content is created for

[29] Cox, S, editor. "About Us," Better Bike Share Partnership. Betterbikeshare.org

[30] Baldassari, E. (2019). "The shared bike and scooter industry often leaves out people with disabilities – but Oakland is changing that," The Mercury News. Mercurynews.com.

[31] Cohen, J. (2018). "Portland Says Adaptive Bike-Share Pilot Was a Win," Next City. Nextcity.org.

[32] MacArthur, J., McNeil, N, Broach, J., Cumings, A., Stark, R., Sanders, R., and Witte, A. (2019). "National Scan of Bike Share Equity Programs: Approaches and Best Practices for Promoting Equity in Bike Share."

(and often with the help of) specific groups and communities the bike share hopes to engage. These strategies could include: ambassador photo shoots, press releases, social media, billboards, bus-stop displays, bike station panels, flyers, emails, custom painted or sponsored bikes by community partners. Regardless of marketing strategy, it is recommended that the content is produced in the languages and located in the places that the target population occupies.

A recent study on bike share barriers conducted by Portland State University (PSU) found that people of color and people with lower incomes are more likely to find out about bike share from targeted marketing and outreach than through their networks, highlighting the success and necessity of targeted marketing as part of an equity program. The study featured a robust survey of bike share uses from Chicago, New York, and Philadelphia. Specifically, the study found that typical sources for information about bike share were: talking to someone at an event, information at work or school, or from a newspaper or online source. A large majority of survey respondents said that their eligibility for a discounted membership was very important to their decision to get a bike share membership, compared to other users who primarily joined because of the convenience of using bike share.[33]

Once enrolling in a bike share program, people of color and lower income bike share users ride with similar frequency to white and higher income users. Both groups generally rode more than 11 trips a month, and a third rode more than 20 trips. People of color and those with lower incomes were more likely to ride for fun or for exercise than white, higher income users. Though not a large share of overall trips, bike share users of color and/or lower income were more likely to use bike share for school, daycare or religious-related trips, as well as for trips related to looking for work or job/skill training.[34]

**Hiring Policies:** Nearly 1 in 3 midsized bike share systems (350-750 bikes) have equity programs with a primary focus on internal operations.[35] Equity in internal operations means hiring policies that provide job opportunities for underserved residents. By training employees from disadvantaged communities, the bike share will ultimately be more responsive to servicing the needs of all its residents.[36] By integrating communities directly into the planning, implementation, and continuation of a bike share system, providers can ensure a greater degree of success of the bike share in those same communities.

**Transit Integration:** Among bike shares who have equity programs, half of all medium sized systems (350-750 bikes) report efforts to integrate transit with their bike share.[37]Integrating bike share programs with public transit can be an important step for expanding the geographic range and ease of mobility for low income and transit reliant travelers. Generally, these efforts manifest themselves in three areas: access, pricing and payment methods. While researchers report that linking bike share and public transportation systems is a relatively new practice, integrated transit systems and bike share systems can be mutually reinforcing in their goals to increase connectivity, awareness, and user support.

Transportation Research and Education Center (TREC) pp 1-138.

[33] McNeil, Nathan, Jennifer Dill, John MacArthur, Joseph Broach. Breaking Barriers to Bike Share: Insights from Bike Share Users. NITC-RR-884c. Portland, OR: Transportation Research and Education Center (TREC), 2017.

[34] Ibid.

[35] MacArthur, J., McNeil, N, Broach, J., Cumings, A., Stark, R., Sanders, R., and Witte, A. (2019). "National Scan of Bike Share Equity Programs: Approaches and Best Practices for Promoting Equity in Bike Share." Transportation Research and Education Center (TREC) pp 1-138.

[36] Ibid.

[37] Ibid.

To ensure that a bike share is accessible from public transit, station planners should consider siting stations near or at existing bus stops or transit centers. Researchers at Portland State University note that 80% of Bublr bike share stations overlap with existing bus routes in Milwaukee, WI.[38] Larger scale integration efforts may include changing transit networks to better mesh with the local bicycle infrastructure network, in order to facilitate first and last mile trips. In Pittsburgh, PA, the Port Authority of Allegheny County allows riders a free bike trip (up to 15 minutes) if they are taking a trip to a public transportation stop.[39] Bike shares can become first and last mile solutions if those trips are made easily accessible to and from the existing transit network.

**Pricing:** Pricing models may change depending on what equity targets the bike share provider focuses on. However, when integrating with a transit system, some providers create a payment system that mirrors current transit fares such that the payment is an easily understood extension of the current pricing model, as in the case of Metro in Los Angeles.[40]

**Payment Methods:** Integrating payment methods will depend on the technology being used by the existing transit system. Some systems utilize a single card. Others add a special RFID bike share sticker to existing transit cards that sends a different frequency signal to unlock bikes, as in the case of Milwaukee County Transit System and Bublr Bikes.[41] Alternatively, Fargo's Great Rides bike share allows North Dakota State University student access to both public transportation and bike share systems with their student ID, paid for by student fees.[42] Researchers note that an integrated fare pass requires a debit or credit card on file, especially for pricing models that have a pay-as-you-go option.

Additional strategies to integrate transit systems and bike shares can be learned from the Milwaukee County Transit System's partnership with Bublr Bikes. These include having buses announce when stops are connected to bike share stations, displaying stops with bike stations via a MCTS transit app, co-branding bikes, and exploring joint station maintenance.[43]

[38] Cox, S. Editor. "Pittsburgh and Milwaukee Explain How They Linked Bike Share to Transit." Better Bike Share Partnership. Betterbikeshare.org.
[39] Ibid.
[40] Corbin, A. Editor. "Bike Share or Bus? In Los Angeles, the Price Will be the Same. Better Bike Share Partnership. Betterbikeshare.org.
[41] Davies, J. "MTCS + BUBLR = BUSLR." Bublr Bikes. Bublrbikes.org.
[42] Corbin, A. Editor. "Why the Country's Best Bike Share Might be in Fargo." Better Bike Share Partnership. Betterbikeshare.org.
[43] MacArthur, J., McNeil, N, Broach, J., Cumings, A., Stark, R., Sanders, R., and Witte, A. (2019). "National Scan of Bike Share Equity Programs: Approaches and Best Practices for Promoting Equity in Bike Share." Transportation Research and Education Center (TREC) pp 1-138.

**Metrics for Equity Evaluation:** Using data to inform bike share operations is essential to achieving equity outcomes. Tracking key metrics help bike share providers understand how, where and when the system is being used, and by whom. The insights gained by monitoring specific data metrics inform how best the system can improve, and can help attract additional funding from local officials, grants, and community sponsors. Below is a table written by researchers at Portland State University (MacArthur et.al, 2019) that lists example metrics for particular equity practices implemented by bike shares around the country, with each practice rated for how effective it was at achieving their equity goals, as reported by the bike shares surveyed.

*Table 3-8.*

| EQUITY PRACTICE | EFFICACY RATING | EXAMPLE METRICS |
|---|---|---|
| Electric Bicycles | 4 | # rentals; trip distance, trip duration; bicycle selection when electric and non-electric options are available; monthly use reports; community surveys |
| Hiring Practices | 4 | # of positions held or hours worked by employees in defined categories of a diversity policy and a practice to hire from a diverse pool of candidates |
| Employee Training | 3.75 | % of employees trained on serving equity programs/clients; employee feedback |
| Income-Based Discount | 3.73 | # of sign-ups for discount program membership, % who renew; # of sign-ups; # of sign-ups by location; # of sign-ups by referral method; # of sign-ups by eligibility type; % of discount program members who opt for various program options; % of all members who are discount members; survey data from discount members |
| Adaptive Bicycles | 3.6 | # rentals; # users; surveys with riders after rental period is over; data collected via annual user survey; collect usage info on each bicycle; rentals by bicycle type |
| Cash Payment | 3.6 | # of sign-ups using cash; home location of cash payers; # of rides by cash payers; location of rides by cash payers; # of cash pay enrollees to credit/debit enrollees; # of cash payments; ride characteristics for cash payers; % of cash payers switching to credit payment over time |
| Education Programs | 3.5 | # of attendees; demographics of attendees; # of completed sign-ups; #riders, % of enrollees with rides; # of classes; instruction time; attendee feedback; comfort with process, system, class; % of enrollees who follow program rules |
| Prescribe-a-Bike | 3.5 | Community surveys and partnerships with other researchers; # vouchers handed out and redeemed; # rides; ride time |
| Ambassadors | 3.5 | # of ambassadors recruited, trained; # of workshops/classes; feedback from surveys; # of events attended; # rides completed; # people reached/ enrolled per ambassador; # promo codes distributed and redeemed; growth in ridership/ change in ridership patterns in ambassador focus neighborhoods; exit interviews for ambassadors |
| Facilitated Enrollment | 3.41 | # of people attending workshops; how they heard about program; # of people helped through enrollment process; # sign-ups; # of organizations, agencies helping with enrollment; # of events; # of interactions; membership tracking |
| Fee Reductions | 3.33 | % for whom fees, fear of fees etc. were barrier; feedback on motivations for signing up for program |

| | | |
|---|---|---|
| Alternative Payment Structures | 3.33 | # of sign-ups and @ of trips taken by payment level; # of users receiving credits; # of users with a positive credit balancing bike share account of % having enough credit to cover membership costs; sign-ups by payment type; % of revenue from residents compared to visitors |
| Bike and Station Location | 3.25 | Ranking stations based on trips to and from each station location; conduct community engagement about where to locate stations (surveys, meetings, focus groups, conversations, station location postcards/forms); collect demographic data at sign-up to see what percentage of users are located in target areas; # of (discount) memberships from area near stations; # of sign-ups from affordable housing residents near station; # trip starts/ends per station; # of trips from neighborhood equity stations; # of bikes in target areas; trip patterns; types of trips by station; % of ridership by race, age, and gender by station; # of stations located in communities of concern |
| Organized Rides | 3.2 | # of rides; # of attendees; # sign-ups after rides; attendee and enrollee demographics; feedback from participants and reports from ride organizers |
| Service Area Boundaries | 3 | Demographic analysis of residents living within walking distance of station location (actual or proposed); following ridership in focus neighborhoods; % homes within a 10 min walk of bike share; % of neighborhoods with bike share access; % of employees/ jobs within 10 min walk of bike share; trips, bicycle availability, in target areas; resident feedback |
| Rebalancing Efforts | 3 | Use API data to track and make decisions about balancing efforts; access a data portal to find locations and usage records of each vehicle, which guides the rebalancing process; # bikes in target underserved neighborhoods; # of bikes near transit stations; # empty or full stations; average number of bikes at a station; usage by bike availability; % of service area within access to a bike within 5-10 min walking |
| Non-English Offerings | 3 | # of signups at workshop; # of enrollees by language |
| Transit Integration | 3 | % of rides taken through joint pass; start/stop of rides; trips by station adjacent to transit; surveys sent to people who use transit integration programs; use of bike share for first or last mile trips |
| Marketing Campaigns | 2.9 | Analytics on social media campaigns; track promo codes, college/vocational discounts; survey users: track event attendance; promo redemption; focus group feedback |

*summary of strategies implemented by any of the 70 systems that responded to researchers' survey
**average reported rating from surveyed bike shares. 1 = not effective 2 = minimally effective 3 = somewhat effective 4 = very effective

Source: National Scan of Bike Share Equity Programs, 2019.

***Key Resources:*** While the breadth and depth of equity programs often depend on funding, bike shares of all sizes can benefit from practices that ensure all people have access and the ability to use it. Researchers at Portland State University point out that the effectiveness of an equity program tends to increase when a holistic, broad range of approaches are used.[40] To that end, bike share equity programming is continuously evolving and improving. Below are some fundamental resources recommended for further reading.

*Better Bike Share Partnership (BBSP)*

*National Scan of Bike Share Equity Programs*

*Breaking Barriers to Bike Share: Insights on Equity from a Survey of Bike Share System Owners and Operators*

*Breaking Barriers to Bike Share: Insights on Equity (video)*

# RELEVANT BIKE SHARE AND SCOOTER SHARE INDUSTRY TRENDS

The bike and scooter share industry is rapidly changing. The following three trends are important to consider for bike and scooter share in Billings.

## ELECTRIFICATION

Electric-assist bikes (e-bikes) are becoming increasingly popular, and most new bike share systems include at least some e-bikes. Across the country, the vehicles that have the highest utilization (measured by rides/vehicle/day) are e-bikes. E-bikes can be used with both docked and hybrid systems.

Cities that added e-bikes to their station-based fleets report that, on average, e-bikes are used twice as frequently as pedal bikes. For example, in New York City, e-bikes are used up to 15 times a day during high ridership months (compared to around 5 times a day for pedal bikes). Bike share systems around the country are rapidly adding e-bikes to their fleets.[44]

## E-SCOOTER SHARE

E-scooter share use continues to rise. After scooters debuted on North American streets in 2018, the number of shared e-scooter trips rose rapidly with 88 million trips taken in 2019. In cities under 200,000 people there were 34 scooter share systems with an average of 130 scooters.[45]

[44] Citi Bike in New York City. Shared Micromobility in the U.S.: 2018. NACTO. https://nacto.org/shared-micromobility-2018/

[45] Shared Micromobility: State of the Industry Report 2019. NABSA. https://nabsa.net/about/industry/

## CHANGING OPTIONS FOR SMALL AND MIDSIZE CITIES

While 9 million trips were taken on dockless bike share in 2017, this number decreased by 2019 due to the disappearance of most dockless shared bikes across the U.S[46]. Driven by the need to show profitability, the private companies offering dockless bike share left smaller cities and focused their efforts in major urban centers. Even though private dockless companies may have shown interest in Billings in the past, it is highly unlikely to expect a private dockless company to launch in Billings in the near future.

However, dockless scooters may still enter small and midsize cities. For example, HOWL has enjoyed successful deployment in the Redding, CA market. Dockless scooters may also be launched as part of a "mixed fleet" alongside docked or hybrid bike share.

## BIKE AND SCOOTER SHARE IS INCREASINGLY LINKED TO TRANSIT

Nationwide, 72 percent of docked bike share stations are within one block of a scheduled public transportation mode.[47] Connections to transit are increasingly important for successful bike share systems. People are using bike share to connect to transit across vastly different system types and contexts. For example, over half of the users of the dockless Mountain View, CA system and the docked Los Angeles, CA reported using bike share to connect to transit.

Scooter share is also used to access transit. In a recent e-scooter survey from Portland, OR, nearly a third of respondents primarily use e-scooters to go to or from a transit stop.

[46] Shared Micromobility in the U.S.: 2018. NACTO. https://nacto.org/shared-micromobility-2018/

[47] U.S. Department of Transportation, Bureau of Transportation Statistics. Intermodal Passenger Connectivity Database, available at https://data-usdot.opendata.arcgis.com/ November 2019.

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# IV. WHAT WE HEARD

# OVERVIEW

For a bike and scooter share in Billings to be successful, it must be responsive to community needs. This chapter describes the study's public outreach process and key takeaways. Through a survey and interactive webmap, the project team asked community members to consider what a bike and scooter share system could look like in Billings.

From mid-September through late October, the project team heard feedback from community members via an online survey and interactive webmap. The Billings MPO advertised these platforms to the general public, local businesses, and university and college campuses.

## SURVEY + PUBLIC INPUT WEB MAP

The project team developed an online interactive map and survey to collect information about the travel habits and desires of the Billings community as they relate to bike and scooter share. The online public input tool contained an origin and destination interactive map to help identify potential bike and scooter share station locations and service areas. The survey presented background information on the study and collected data on perceptions and preferences regarding bike and scooter share, as well as respondent travel behavior. Both tools were available in English and Spanish. Key public participation numbers include:

- 259 online survey respondents
- 62 comments on the online public input map

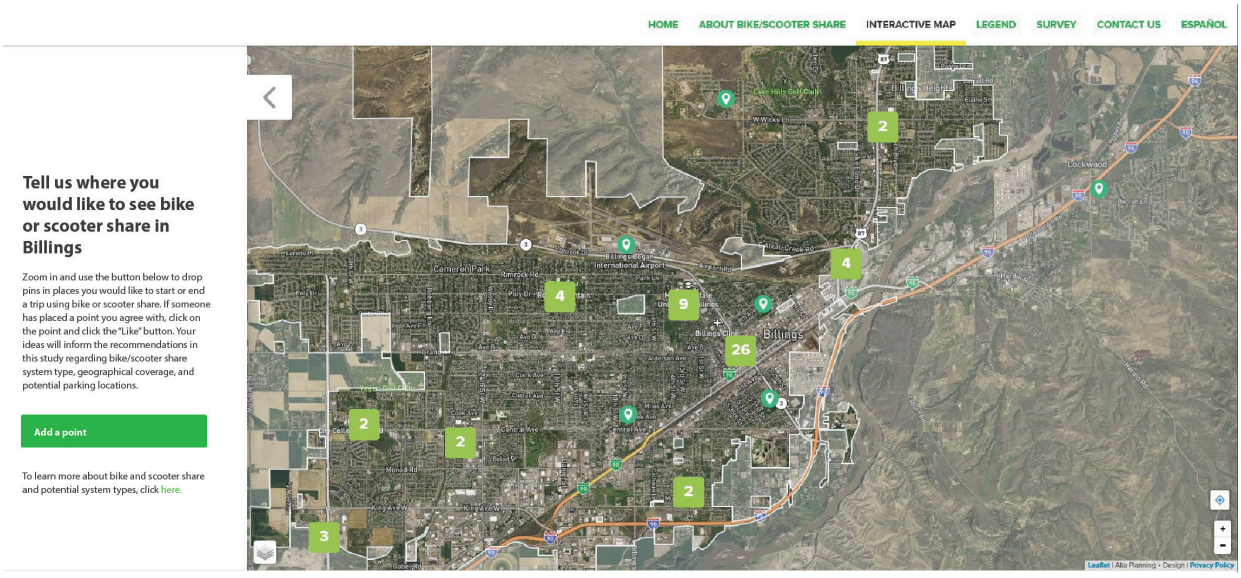



*Figure 4-1 Screenshot of the online interactive map. Participants were able to place points to indicate locations they would like to access bike or scooter share*

# BILLINGS SNAPSHOT

## WHO LIVES IN BILLINGS?

With a population of 109,544, Billings is the largest city in Montana. The population is 52 percent female, with 84 percent of the population identifying as white. The two largest non-white populations are Native and Hispanic, comprising five and seven percent of the population, respectively. The city's median age is just over 37, with 60 percent of the population between the ages of 18-64.

The city is also economically diverse with a median household income of $57,692. Forty-four percent of households make under $50,000, 35 percent between $50,000-100,000, 17 percent between $100,000 – 200,000 and four percent over $200,000.

The City's current mode breakdown for transportation to work is 81 percent drive alone, 10 percent carpool, one percent public transit, 1.1 percent bicycle, three percent walk, and one percent other; three percent of the population works from home (ACS 2018 1-year estimates).

## WHO DID WE HEAR FROM?

Most respondents live and work in Billings (68 percent), while 41 percent live in Billings but work elsewhere and six percent work in Billings but live elsewhere. Other groups represented among survey respondents included business owners (10 percent) and students (three percent). **Figure 4-2** illustrates the race and ethnicity of survey respondents and **Figure 4-3** shows the reported income level of respondents.

When asked how they typically get to work or school, respondents indicated that "car or truck" is the most common means (73 percent). A substantial number of respondents also use a bicycle (19 percent) or walk (12 percent) to get to work or school. Nearly 23 percent of respondents reported that they work from home or do not go to work or school (e.g. retired, primary caregiver, etc.). (Note: this survey was conducted during the COVID-19 pandemic, resulting in increased numbers of respondents selecting that they work at home.)

Survey respondents between the ages of 25 and 46 made up the majority of respondents, followed closely by those between the ages of 46 and 64 years old. Fifteen percent of survey respondents reported that they were 65 or more years old and only three percent of survey respondents reported that they were under 24 years old.

Overall, survey participants generally reflect the demographics of the Billings community. However, people of color were underrepresented in the findings. Only six percent of survey respondents identified as Hispanic or Latino, Black, Asian/Pacific Islander, American Indian or Alaska Native, Middle Eastern, or another race. According to the 2018 American Community Survey, nearly 13 percent of the Billings community identify as one or more of these races or ethnicities. Additionally, people who walk or bike to work were overrepresented in the survey.

*Figure 4-2.*

**What is your race or ethnicity? (N=240)**

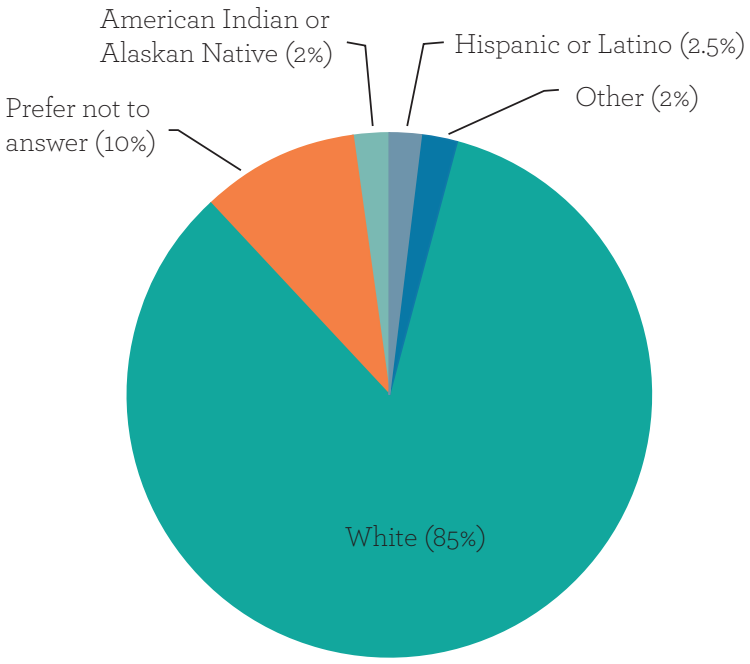
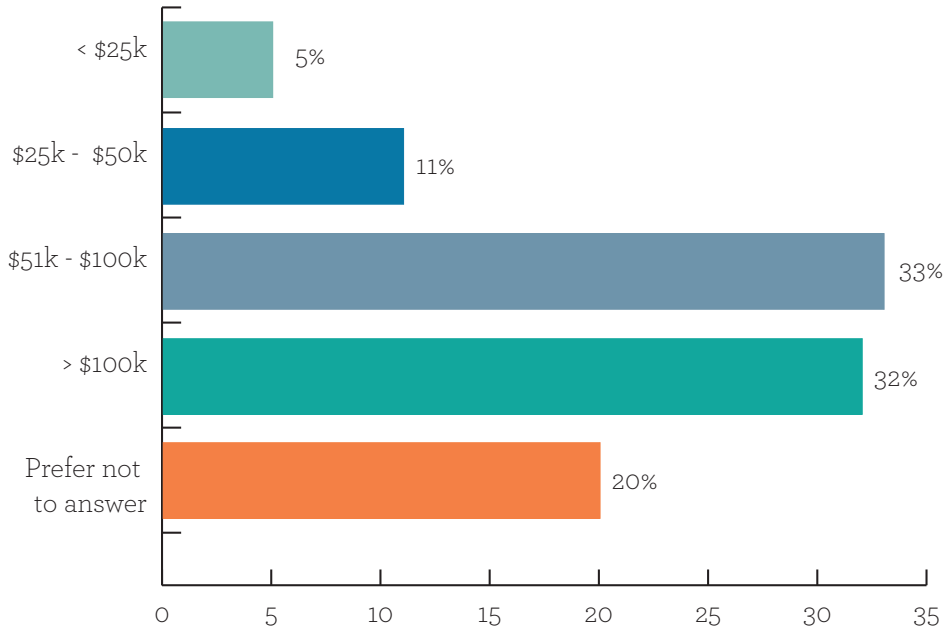



*Figure 4-3.*

**What was your approximate household income last year? (N=243)**



# COMMUNITY PERSPECTIVES ON BIKE AND SCOOTER SHARE

## KEY TAKEAWAYS

The following key takeaways reflect feedback from community members collected in the survey:

*Mixed community support for bike and scooter share programs; more information requested.* Fifty-three percent of survey respondents are interested in seeing bike and scooter share in Billings, 24 percent of respondents are not interested, and 14 percent need more information. For those who selected "Other," many respondents reported liking the idea of bike share, but not scooter share.

*Most Billings community members have not used bike or scooter share.* Sixty-four percent of survey respondents have not used bike share and 77 percent have not ridden scooter share. However, over one third of survey respondents had used bike share and 30 percent report that they bike at least a few times a year. As shown in **Figure 4-4**, survey respondents believe that bike and scooter share trips could replace car trips and benefit the environment.

*Transit integration is not crucial for bike and scooter share in Billings.* Sixty-three percent of survey respondents reported that access to bike or scooter share for first-mile travel would not increase transit trips. However, 43 percent of survey respondents say that bike or scooter share trips would replace car trips.

*Top concerns related to bike and scooter share included safety, lack of bicycle infrastructure, and vandalism.* Sixty-two percent of survey respondents reported that they had safety concerns about sharing the road and interacting with other vehicles, 51 percent reported having concerns regarding lack of designated bicycle infrastructure, and 40 percent reported concerns regarding bikes or scooters blocking the sidewalk or ending up in inappropriate places. Only 16 percent of survey respondents had no concerns about bike and scooter share in Billings, as shown in **Figure 4-5**.

*Most Billings community members want to access downtown, parks, and restaurants/ coffee shops by bike or scooter share.* Sixty-five percent of survey respondents reported that they would like to access Downtown with bike or scooter share, 48 percent reported that they would like to access parks, and 45 percent would like to visit restaurants or coffee shops. Twenty-seven percent of respondents reported that they didn't want to use bike or scooter share.

**53%**

**OF RESPONDENTS WOULD BE INTERESTED IN SEEING BIKE/ SCOOTER SHARE IN BILLINGS**

*Figure 4-4.*

**Which of the following statements would support your interest in using a bike/scooter share system? (N=245)**

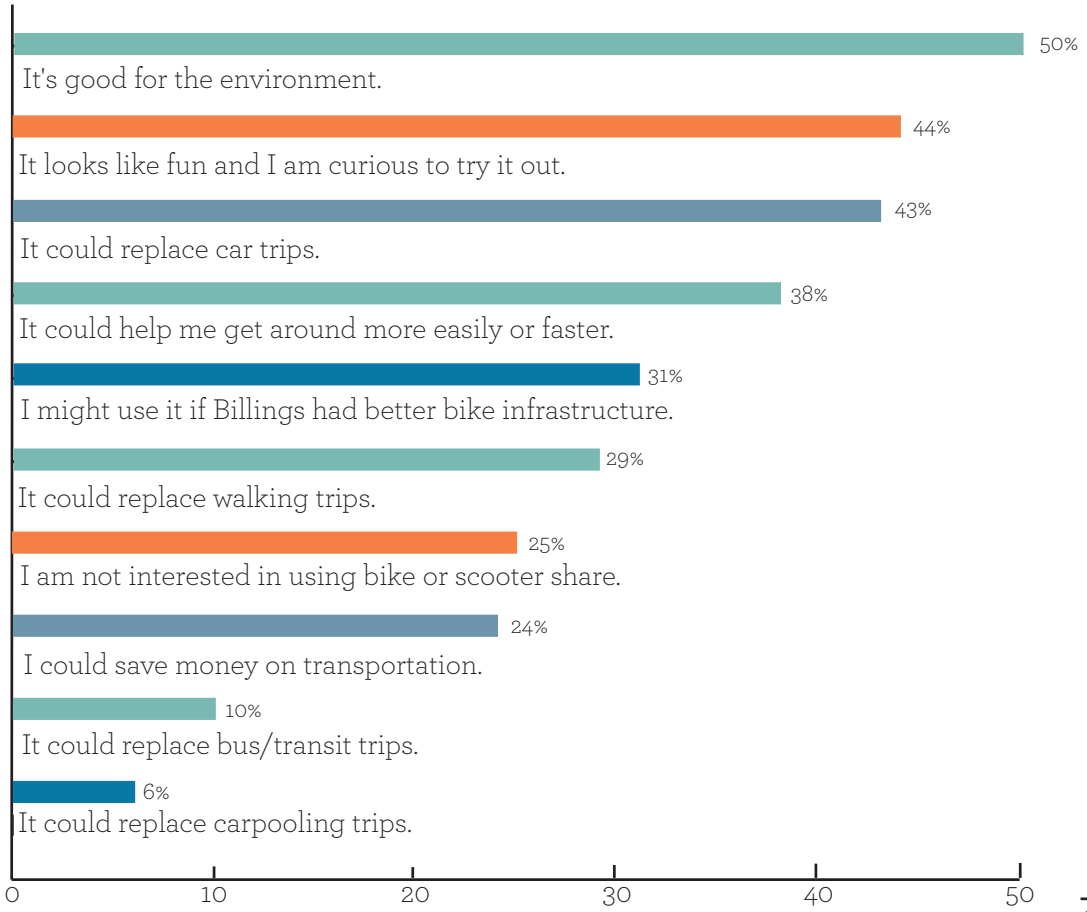
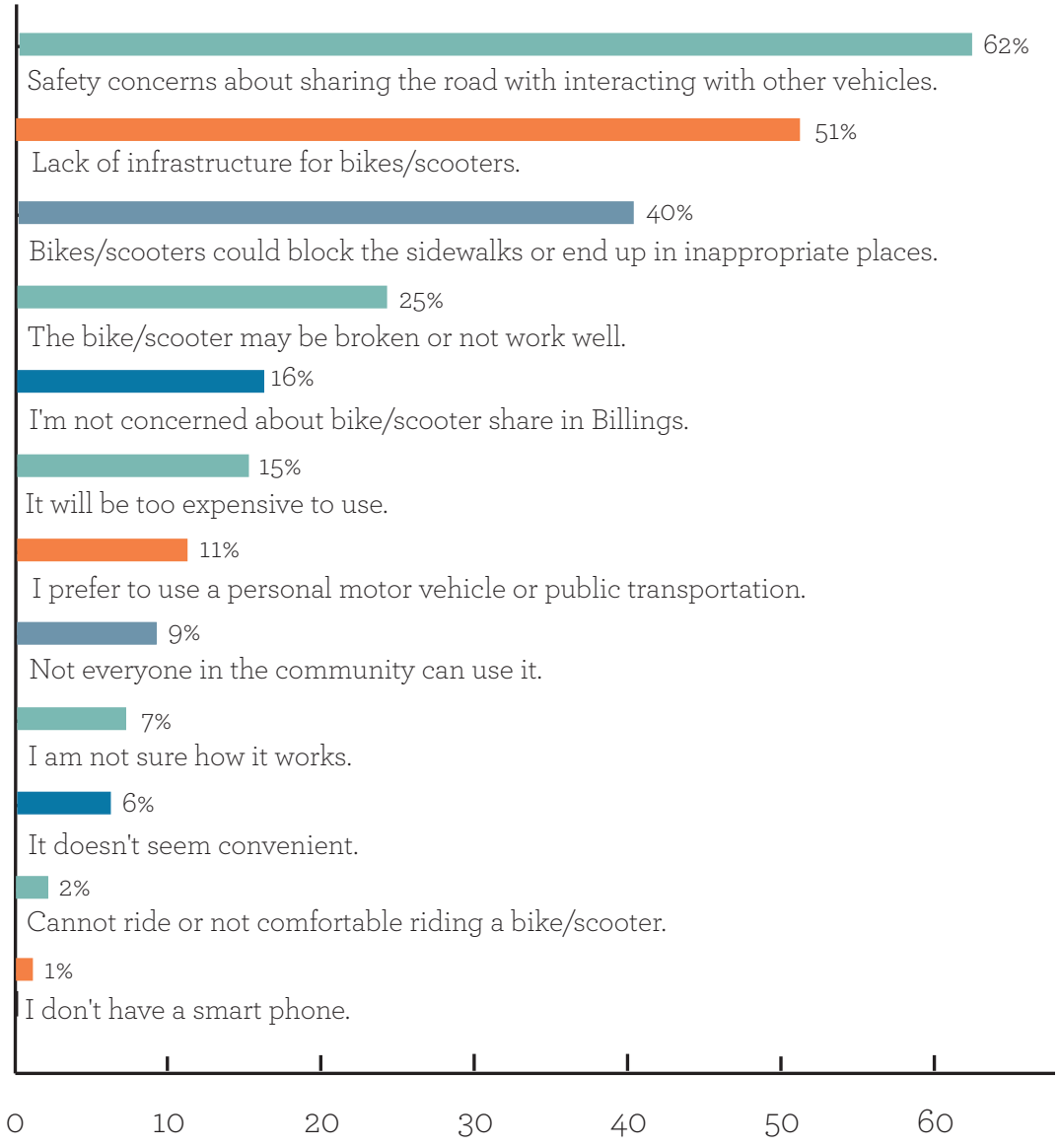


*Figure 4-5.*

**What are your top three concerns related to bike and scooter share in Billings? (N=245)**




*As shown in Figure 4-4, personal safety, lack of safe infrastructure, and inappropriate bike/scooter parking are top concerns. Sixty-two percent of survey respondents are concerned about sharing the roadway with vehicles and 51 percent are concerned about lack of bike-specific infrastructure. Only 16 percent of survey respondents selected that they were not concerned about bike/scooter share in Billings.*

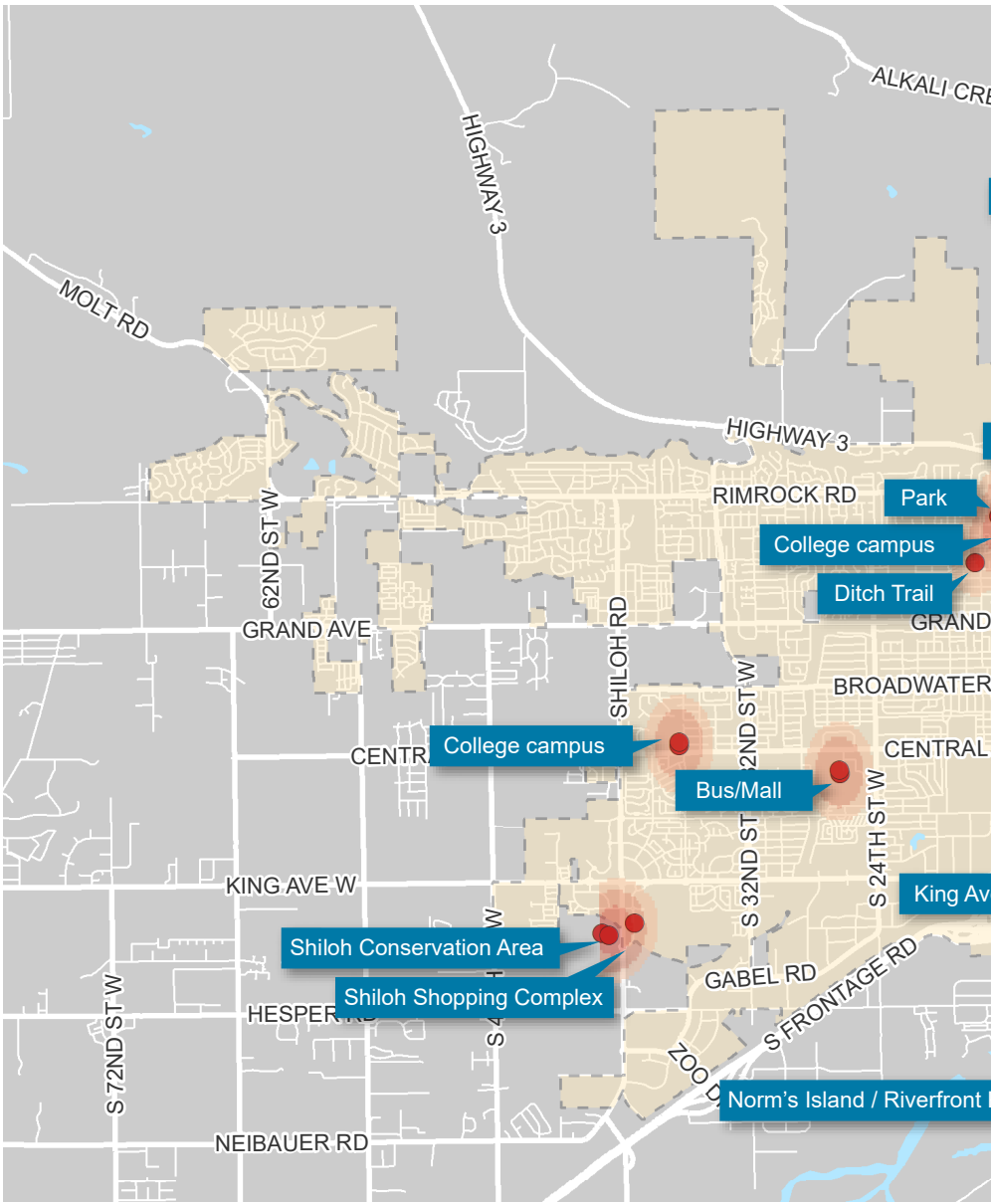
# WHERE WOULD COMMUNITY MEMBERS LIKE TO SEE BIKES AND SCOOTERS?

Community members shared desired bike and scooter share locations via the online survey and online interactive public input map made available through websites and social media outlets managed by the City of Billings, the Billings-Yellowstone County MPO, and other local organizations. These public outreach tools enabled greater participation than is typically seen during in-person events and allowed residents to give input on their own time.

During the six-week window that the interactive map was publicly available, 62 suggestions were made by community members for locations where they would like to see future bike and scooter share. Common themes among these suggestions were downtown destinations, college campuses, parks, and trail systems. These suggestions are shown in **Figure 4-6** on the following page.

Key numbers from the online public input map include:

- 62 total suggestions
- 24 unique respondents
- 10 “votes” on suggestions, all of them likes




# City of Billings

## Public Input Suggestions

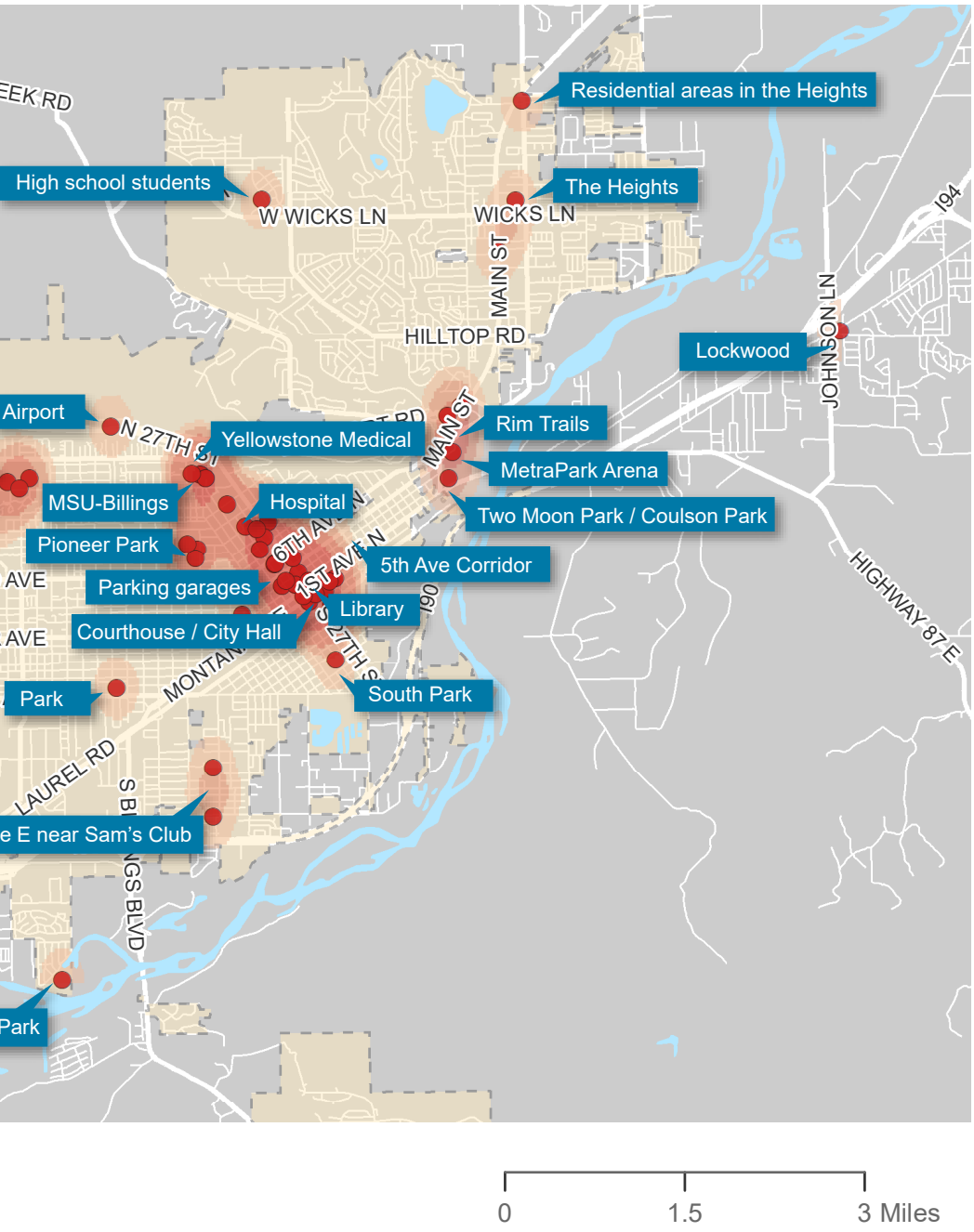
Density of Suggested Locations

Low

High

Suggested Locations

*Source: US Ce*
*Billings-Yellows*
*Map Created J*




*ensus Bureau,*
*stone County MPO*
*uly 2020*

*Figure 4-6.*

**What locations would you like to visit with bike and scooter share? (N=62)**

# V. WHAT WE LEARNED ABOUT BILLINGS AND BIKE/SCOOTER SHARE

# CITY OF BILLINGS CONTEXT

Billings is the county seat for Yellowstone County and Montana's largest city in terms of population, with around 135,000 residents in the Billings Urban Area as of 2017 and a projected population growth of over 30 percent by 2040.[1] The Yellowstone River separates the downtown, West End, and Southside parts of the city from the Heights to the north and Lockwood to the east. Sandstone cliffs, or rimrocks, frame the northern edge of the city. These geographical features influence development and transportation patterns in Billings. For example, the city has multiple east-west corridors that connect to the downtown area, but a significant pinch point exists near Metra Park Arena, where northern neighborhoods are primarily connected to downtown via Main St/SR 87. This creates a de facto barrier to active transportation access to the downtown area.

Downtown Billings is home to a growing medical corridor, which is one of Billings' primary industries and employment centers, the campus of Montana State University-Billings, and a number of other employment and activity hubs generating trips to and from the downtown area. The area is served by the City of Billings Metropolitan Transit System (MET), with 18 fixed bus routes and complementary paratransit service that run through two transfer centers at Stewart Park and Downtown. In addition to expanding transit offerings, Billings continues to grow its network of on- and off-street bikeways and trails with around 30 miles of existing on-street bikeways and more than 40 miles of paved, multi-use trails.

[1] Population statistics are cited from the 2018 Long Range Transportation Plan

## DEMOGRAPHICS OF THE COMMUNITY

With a population of 109,544 Billings ranks as the largest city in Montana. The population is 52 percent female, 48 percent male, with 84 percent of the population identifying as white. The two largest non-white populations are Native and Hispanic, comprising 5 and 7 percent of the population respectively. The city's median age is just over 37 with 60 percent of the population between the ages of 18-64.

The city is also economically diverse with a median household income of $57,692. Forty-four percent of households make under $50,000, 35 percent between $50,000-100,000, 17 percent between $100,000 – 200,000 and 4 percent over $200,000.

The City's current mode breakdown for transportation to work is 81 percent drive alone, 10 percent carpool, 1 percent for public transit, 1.1 percent for bicycle, 3 percent for walk, 1 percent other; 3 percent of the population work from home (ACS 2018 1-year estimates).

## BICYCLING IN BILLINGS

In 2017, Billings undertook a comprehensive update to their Bikeway and Trails Master Plan, led by Alta Planning + Design. That process included documentation of existing facilities, safety concerns and considerations, extensive public outreach, and the development of a backbone network of low-stress bicycle facilities.[2] A product of this plan update includes a short list of priority

[2] The Level of Traffic Stress (LTS) evaluation allows for planning of bicycle networks that are comfortable for riders of all ages and abilities, including young bicyclists and those who may be new to bicycling. This methodology seeks to measure how much stress is experienced by bicyclists across a street network due to various characteristics of roads and bicycle facilities. A Level of Traffic Stress (LTS) methodology was developed by Merkuria, Furth, and Nixon in Low-stress Bicycling and Network Connectivity (2012). LTS rankings range from 1 (very low-stress; tolerable by all) to 4 (very high-stress; tolerable to only a few).

projects to be implemented in the next 5-10 years, and overall proposes over 400 miles of additional on- and off-street bikeways that will add to the nearly 70 miles of existing bicycle facilities in the Billings area.

Bicycling generally comprises a small share of existing trips in Billings. According to the American Community Survey (ACS, 2018), an estimated 1.1 percent of commute trips in Billings occur via bicycle, which exceeds the national average of 0.5 percent, and is in line with the statewide estimated average of 1.2 percent.

These results illustrate the small existing role of bicycling within Billings' transportation system. The ACS has limitations as a data source in that it only counts commute trips. It also only considers a "primary" mode of travel and does not count trips made in combination with a second mode, and may not count all populations equally. Nevertheless, ACS data can serve as a benchmark for existing bicycle ridership and changes over time.

## EXISTING AND PROPOSED BICYCLE FACILITIES

Existing bicycle facilities in Billings consist of intermittent bike lanes, signed on-street routes, and a fairly extensive paved trail network. Though formal bikeways are disconnected, the 2017 Billings Area Bikeway and Trails Master Plan Update proposes over 400 miles of additional facilities, both on- and off-street, many of which intersect or run along some of MET's most popular routes. Several of these routes that connect with existing transit patterns are slated for early implementation (5-10 years). Some notable projects include:

- **6th Ave N shared use path**: makes a critical connection for cyclists traveling to/from the Heights
- **Wicks Ln shared use path**: Wicks Ln is one of MET's major transit corridors in the Heights
- **Annandale/St Andrews bike lanes**: enhances bike access to Wicks Ln
- **15th St W bike lanes**: intersects Grand Ave and Broadwater Ave bus routes
- **Monad Rd bike lanes**: enhances access to Stewart Park Transfer Center
- **Central Ave shared use path**: runs along a portion of the Grand Ave bus route and connects to Shiloh Rd shared use paths

Several non-infrastructure policy and programmatic recommendations were also made, including assessing the feasibility of a city-wide bike and scooter share system, implementing a wayfinding program (this Study, completed Febra), and updating bicycle parking guidelines and requirements (current guidelines have been updated to reflect this recommendation).

## EXISTING LOAN-A-BIKE PROGRAMS

The Downtown Billings Alliance (DBA) currently operates a low-capacity bike rental program out of their downtown office located at 116 N 29th Street. The Loan-a-Bike program makes a bicycle available for use, free of charge due to sponsorship from the Downtown Billings Business Improvement District (BID). Typically utilized by people visiting Billings, people can rent a bike by showing up to DBA's office and providing a photo I.D. and credit or debit card (in case of equipment damage). Typically, only a handful of bikes are available for use at any given time. Similarly, the Billings Chamber of Commerce maintains a limited assortment of bicycles that are loaned out to visitors.

Many visitors want to explore Billings' beautiful trail network and see the city by bike. Partnering with the DBA and Chamber of Commerce should be a priority in implementing a bike and scooter share system in Billings.

# EQUITY ANALYSIS

A major factor in assessing a study area for bike and scooter share is striving for a system that is accessible to people from all walks of life; a person's access to transportation options either enables or hinders their ability to get to work, buy healthy food, see a doctor, go to school, or socialize with their community. Many communities rely on a variety of modes to connect to basic services and opportunities that are necessary to live productive, fulfilling,and healthy lives. However, convenient, safe, and affordable transportation options are not always available to those who need them the most. These communities, commonly labeled as vulnerable, are vulnerable because of a history of disinvestment, which has led to poor financial, health and housing circumstances, and/or physical or communication limitations. Without appropriate transportation, vulnerable individuals and communities are prevented from fulfilling basic needs.

Often, traditionally vulnerable populations, such as children, older adults, people of color, people with limited English proficiency, and low-income families rely heavily on affordable transportation options, specifically walking, biking and transit.[3] [4] [5] A lack of high-quality walking, biking, and transit facilities can result in unsafe and/or long travel. Uneven distribution of active transportation infrastructure can also result in health, safety, mobility, and economic benefits accruing to those who are more fortunate, while increasing hardships for vulnerable populations. Transportation facilities are essential components in creating communities of opportunity and reducing the disproportionate economic and health burdens of vulnerable communities.[6]

The terms "equity" and "equality" are sometimes used interchangeably, which can lead to confusion. In this analysis, equity is defined as trying to understand and provide disadvantaged communities with what they need to live healthy and productive lives. These needs include access to jobs, housing, and other critical services. Equity recognizes that different people experience different barriers to securing their needs. In contrast, equality aims to ensure that everyone gets the same things to live healthy and productive lives, regardless of need. Working towards equity may mean that active transportation funding is prioritized for areas with greater concentrations of disadvantaged populations instead of being distributed equally based on geography.

**Across the country, bike and scooter share program managers have identified the importance of launching a program with equity and inclusion in place from the start, rather than retrofitting equity-focused outreach or expansions to historically-marginalized communities after a program is already established in a high-demand area.** Alta's Bike and Scooter Share Equity Analysis utilizes the most current Census data typically associated with underserved populations to identify equity priority areas.

[3] Dannenberg A, Frumkin H, Jackson R. Making Healthy Places. 1st ed. Washington D.C.: Island Press; 2011.

[4] International City/County Management Association. Active Living for Older Adults: Management Strategies for Healthy & Livable Communities.; 2003. http://www.ca-ilg.org/sites/main/files/file-attachments/resources__Active_Living.pdf. Accessed February 11, 2011

[5] Mckenzie B. Modes Less Traveled—Bicycling and Walking to Work in the United States: 2008–2012. Am Community Surv Reports. 2014.

[6] Center for Infrastructure Equity. Transportation Equity. PolicyLink. 2016. http://www.policylink.org/focus-areas/infrastructure-equity/transportation-equity.

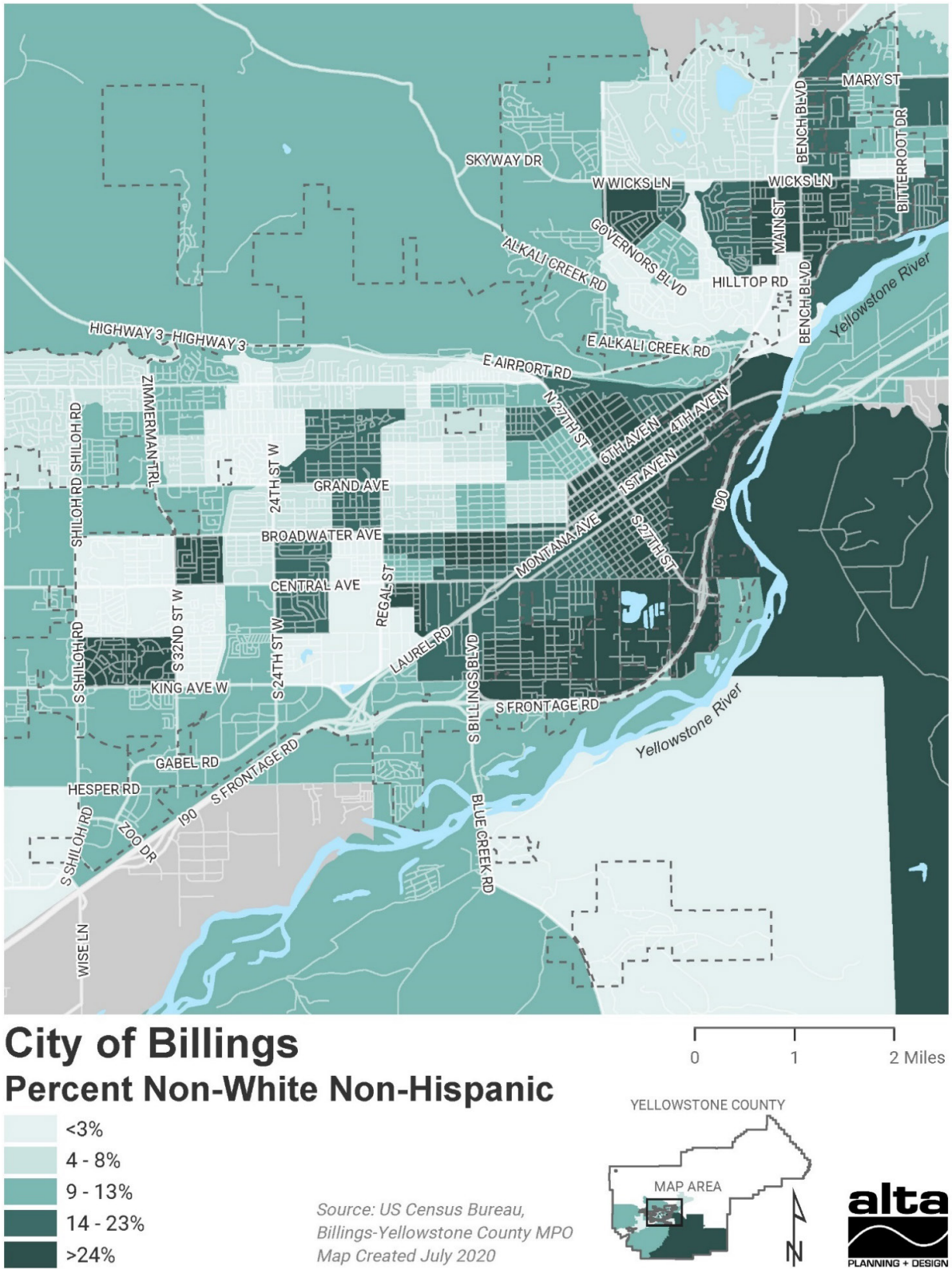
## EVALUATION CRITERIA

The project team conducted an equity analysis using readily available demographic information from the US Census Bureau. All data was obtained from the 2018 American Community Survey (ACS) 5-year estimates and was analyzed at the census block group level. For Billings, the following indicators were used:

**Race:** This was measured using the percent of the population that identifies as non-white, non-Hispanic. Racial or ethnic minorities are more likely to live in areas with poor or limited active transportation facilities, educational opportunities, job resources, and healthy food outlets.[7] [8] Black individuals are over four times and Hispanics are three times as likely to not have access to a household car compared to their white counterparts, regardless of income.[9] Additionally, communities of color are more likely to experience low social cohesion within their residential area because of limited activated public spaces.[10] The deficits of active transportation facilities are consequences of social and institutional marginalization, including job and housing discrimination. In turn, these deficits exacerbate the disproportionate health burdens communities of color experience. Lastly, communities of color experience a greater proportion of pedestrian crashes and have increased risk of mortality after pedestrian injury.[11] [12] Therefore, increasing active transportation facilities and connectivity may promote physical activity, enhance economic opportunities, and increase transportation safety.

[7] Dannenberg A, FrumkinH, Jackson R. Making Healthy Places. 1st ed. Washington D.C.: Island Press; 2011.
[8] Rubin V. Sustainable Communities Series: Regional Planning for Health Equity. PolicyLink. 2015
[9] Berube A, Deakin E, Raphael S. Socioeconomic Differences in Household Automobile Ownership Rates: Implications for Evacuation Policy. Brookings Inst. 2006.
[10] Cutts B, Darby K, Boone C, Brewis A. City Structure, Obesity, and Environmental Justice: An Integrated Analysis of Physical and Social Barriers to Walkable Streets and ParkAccess. Soc Sci Med. 2009;69:1314-1322.
[11] Maybury RS, Bolorunduro OB, Villegas C, et al. Pedestrians struck by motor vehicles further worsen race-and insurance-based disparities in trauma outcomes: The case for inner-city pedestrian injury prevention programs. Surgery. 2010;148(2):202-208. doi:10.1016/j.surg.2010.05.010.
[12] Equity. Vis Zero SF. 2015. http://visionzerosf.org/equity/.

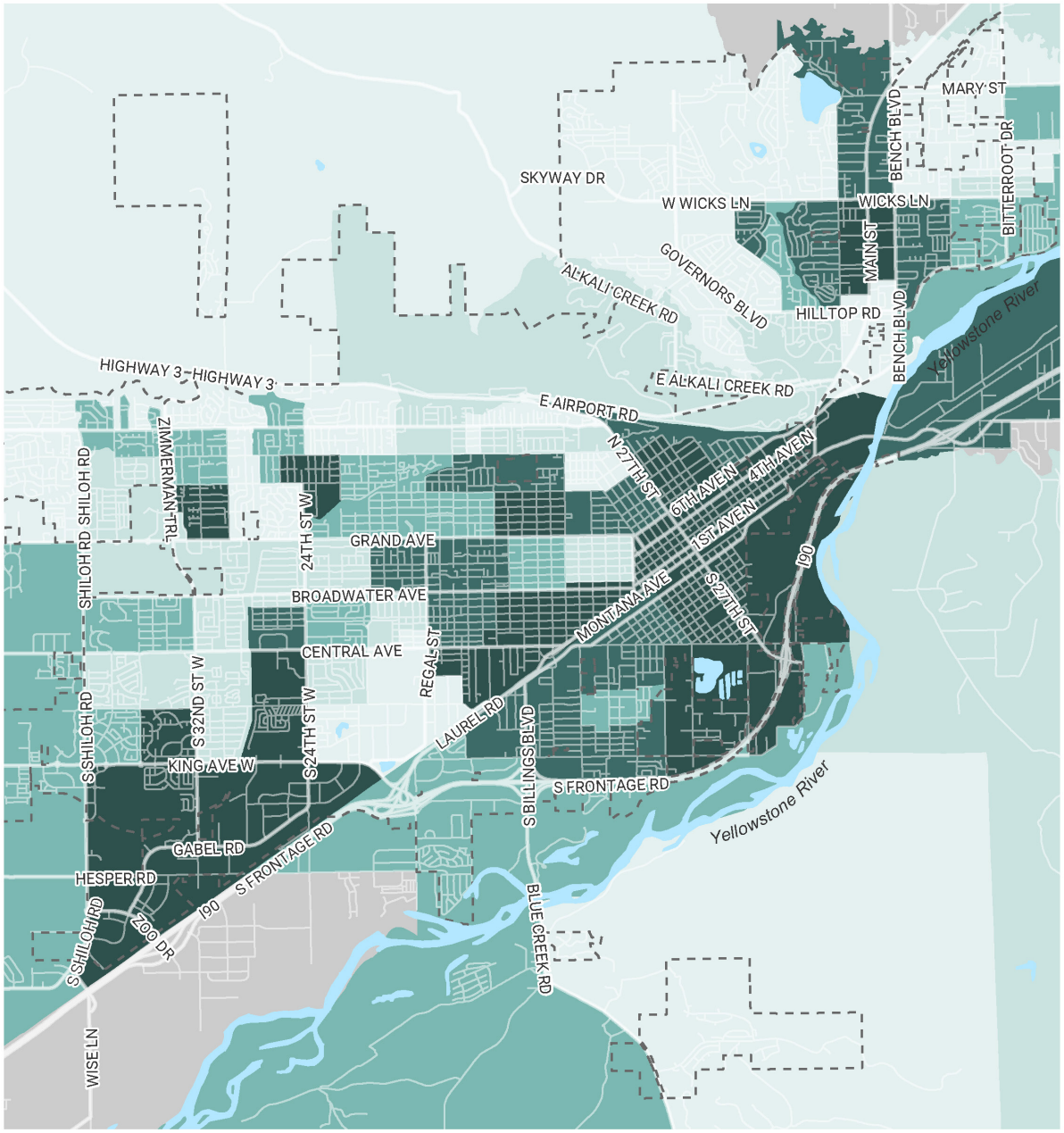
*Figure 5-1.*


SKYWAY DR
W WICKS LN
WICKS LN
MARY ST
BENCH BLVD
BITTERROOT DR
MAIN ST
GOVERNORS BLVD
ALKALI CREEK RD
HILLTOP RD
BENCH BLVD
Yellowstone River
HIGHWAY 3 - HIGHWAY 3
E ALKALI CREEK RD
E AIRPORT RD
N 27TH ST
6TH AVE N
4TH AVE N
1ST AVE N
I90
S 27TH ST
MONTANA AVE
ZIMMERMAN TRL
SHILOH RD
SHILOH RD
24TH ST W
GRAND AVE
BROADWATER AVE
CENTRAL AVE
REGAL ST
S 32ND ST W
S 24TH ST W
LAUREL RD
S BILLINGS BLVD
S SHILOH RD
KING AVE W
S FRONTAGE RD
Yellowstone River
GABEL RD
HESPER RD
S FRONTAGE RD
I90
S SHILOH RD
ZOO DR
BLUE CREEK RD
WISE LN
City of Billings
Percent Non-White Non-Hispanic
<3%
4 - 8%
9 - 13%
14 - 23%
>24%
0
1
2 Miles
YELLOWSTONE COUNTY
MAP AREA
N
Source: US Census Bureau,
Billings-Yellowstone County MPO
Map Created July 2020
alta
PLANNING + DESIGN

**Household Income:** The median household income in Billings is $57,692. This is slightly higher than the median household income for Montana statewide, at $55,328. Nationwide, households with incomes less than $50,000 have the highest rates of walking and the second highest rates of biking to and from work.[13] These individuals may depend on walking and biking due to financial constraints and lack of adequate and/or convenient transportation options. And although this population is most likely to walk to work, people with lower incomes tend to live in areas without adequate biking and walking facilities and increased exposure to environmental hazards. Boosting active transportation resources in areas where these individuals reside could promote increased access to educational resources and job opportunities, and enhance residents' physical activity.

[13] Mckenzie B. Modes Less Traveled—Bicycling and Walking to Work in the United States: 2008–2012. Am Community Surv Reports. 2014.

*Figure 5-2.*



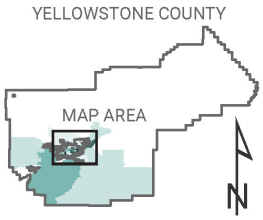

# City of Billings

## Median Household Income

- >$73,000
- $62,000 - $73,000
- $49,000 - $62,000
- $39,000 - $49,000
- <$39,000

0 1 2 Miles

*Source: US Census Bureau,*
*Billings-Yellowstone County MPO*
*Map Created July 2020*

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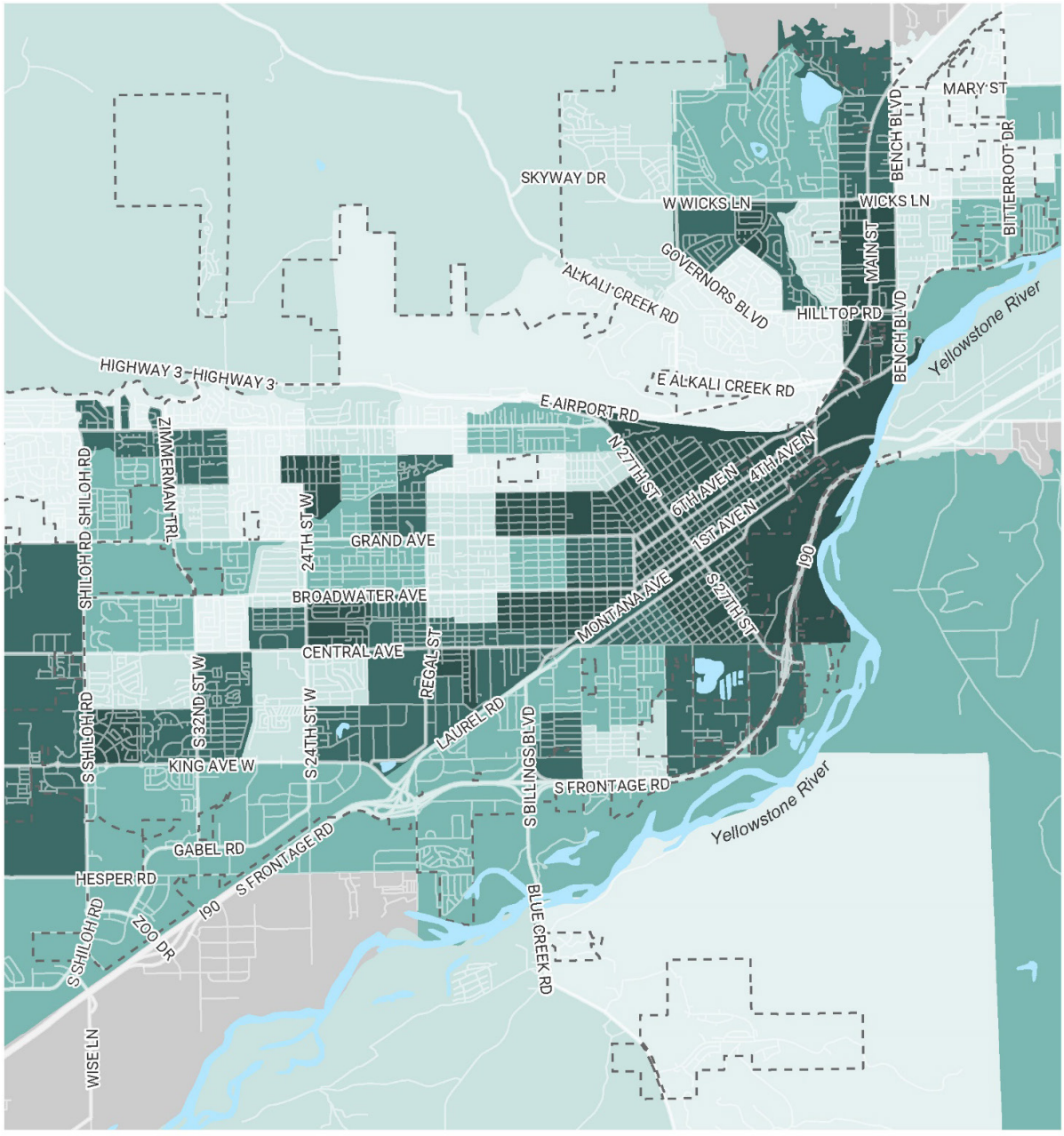
**Housing Tenure:** That housing and transportation costs make up the largest portions of working households' budgets is a well-known reality.[14] Additionally, it has been found that lower-income groups in the rental multi-family market tend to spend higher proportions of their income on transportation costs than their higher-income counterparts. Even in the most location-efficient areas, the lowest income households are still cost burdened, with a high proportion of household income committed to housing and transportation.[15] This analysis therefore compares the distribution of renter-occupied housing units in the city of Billings (**Figure 5-3**).

[14] Center for Housing Policy. "Something's Gotta Give: Working Families and the Cost of Housing". New CenturyHousing, Volume 5, Issue 2, 2004..

[15] City of Portland Bureau of Planning and Sustainability. Housing and Transportation Cost Study. 2010. https://www.portland.gov/sites/default/files/2019-08/housing-and-transportation-cost-study.pdf. Accessed August 3, 2020.

*Figure 5-3.*

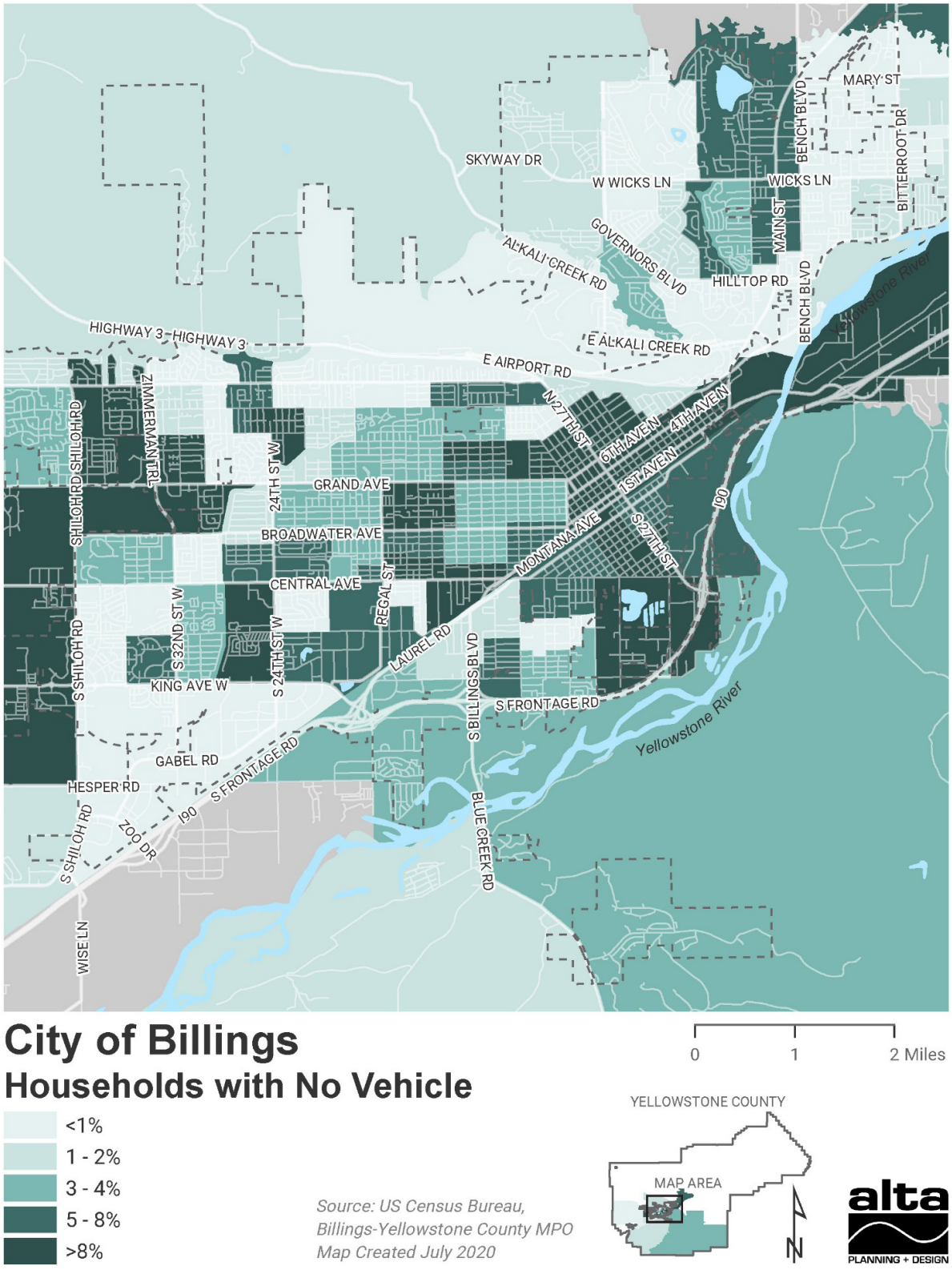



*Source: US Census Bureau, Billings-Yellowstone County MPO*
*Map Created July 2020*

**Access to a Vehicle:** This indicator measures the percentage of household who do not have regular access to a vehicle. In less urbanized locations, specifically those with limited transit access and coverage, access to a motor vehicle carries strong implications for one's ability to reach employment, access healthy foods, and reach basic services.[16] A diverse transportation system that offers multiple modes, including transit, bicycling, and walking, reduces reliance on automobiles and can provide for more equitable access to services.[17] Providing access via quality walking and bicycling infrastructure is one method for increasing equity in access for locations with limited vehicle availability.[18] Studies have also found that access to a motor vehicle improves employment rates, as it provides a reliable means to commute to work.[19] The addition of safe and comfortable walking and biking routes, as well as developing improved connections to transit, have the ability to also serve as a reliable means to commute to work. This has the potential to alleviate the necessity of a motor vehicle to reach employment opportunities.

[16] National Association of City Transportation Officials, (2016). "Bike Share Station Siting Guide." Nacto.org.
[17] Liu R, Schachter H. Emergency Response Plans and Needs of Communities with Limited English Proficiency. Transp Res Rec J Transp Res Board. 2007;2013:1-7. doi:10.3141/2013-01.
[18] Ibid.
[19] National Association of City Transportation Officials, (2016). "Bike Share Station Siting Guide." Nacto.org.

*Figure 5-4.*




*Source: US Census Bureau,*
*Billings-Yellowstone County MPO*
*Map Created July 2020*

## COMPOSITE EQUITY

The composite equity map (**Figure 5-5**) displays the sum of the results from each of the indicators explored above. Each of the four indicators received equal weight in determining the composite equity score. Areas that represent higher need are numbered below:

1. West of S 32ndSt and North of King Ave W in the West End neighborhood

2. Montana Ave –Broadwater Ave –12thSt W triangle in the Central-Terry neighborhood

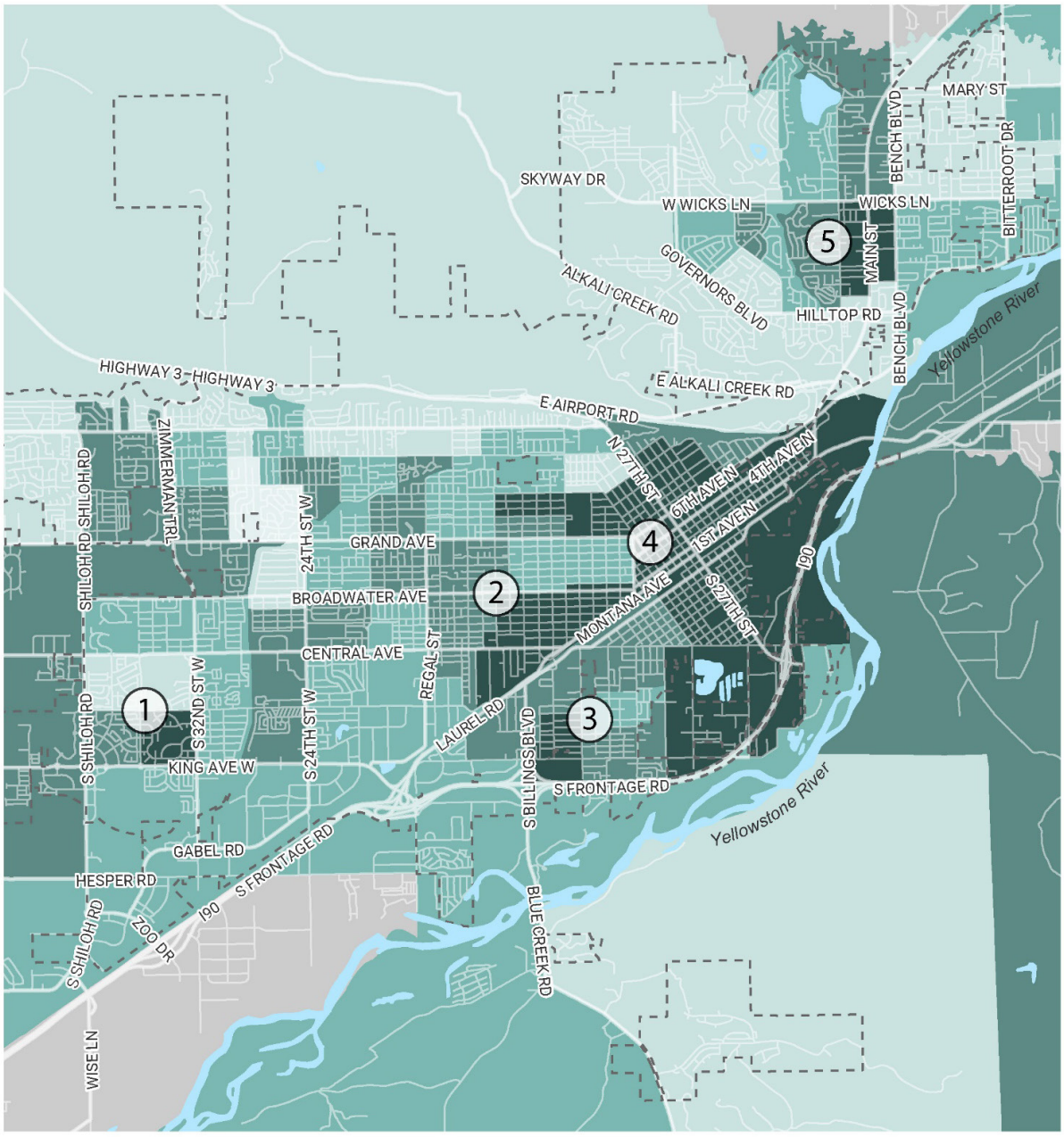
3. East of S Billings Blvd and North of S Frontage Rd in the Southwest Corridor neighborhood

4. Downtown Billings including much of the South Side, North Park and North Elevation neighborhoods

5. Adjacent to Main St north of Hilltop Rd and South of Wicks Ln

Higher relative need is found in the downtown neighborhoods of North Park and South Side. Investing in active transportation facilities in these areas of highest need will likely yield the most benefit for residents' health and access to resources and economic opportunities.

*Figure 5-5.*




# City of Billings
## Equity Analysis

Higher Equity Needs

Lower Equity Needs

0 1 2 Miles

YELLOWSTONE COUNTY

MAP AREA

N

alta PLANNING + DESIGN

*Source: US Census Bureau, Billings-Yellowstone County MPO*
*Map Created July 2020*

## EQUITY ANALYSIS RESULTS & DISCUSSION

In this section, we discuss the observed trends in Billings for each of the four evaluation criteria and offer indicator-specific recommendations. **The data for each evaluation criteria were grouped into five categories by percentile in order to compare the magnitude of differences across Billings' census block groups. Each category represents a 20-percentile range. Therefore, the darkest color represents data that are in the 80th percentile and higher (among all census block groups in Billings).** First, the non-white populations range from 0 percent of a census block group to 66 percent in Billings. Higher concentrations of non-white populations are located west of 32ndSt W and north of King Ave W, near Main St south of Wicks Ln and north of Hilltop Rd, and in downtown Billings in the North Park and South Side neighborhoods. Next, median household incomes tended to be further from the downtown core of Billings, with notable pockets of lower income households in the Central-Terry, Southside, North Park, and Heights neighborhoods. The highest concentrations of renter-occupied housing units follow a similar distribution, with more renting households located north of King Ave W, Central Ave, and Grand Ave to the west of downtown, in the North Park and South Side neighborhoods, and adjacent to Highway 87 N north of downtown. Finally, vehicle access appears to be most limited in the downtown core, along with sections north and south of Grand Ave to the west, and north of King Ave west of 24thAve.

## RECOMMENDATIONS

Investing in a well-connected biking and walking network should stand as a leading priority for the City of Billings in order to establish an equitable, well-utilized bike and scooter share system. Interventions to enable safe, convenient personal mobility such as sidewalks, separated bike lanes, crossing treatments, speed limit reductions, lighting, etc. should be focused around large employers and key services, such as health care and quality food outlets.[20] Facility planning, designing and implementation should be done with special attention to input and ideas from communities of color.[21]

Additionally, active transportation networks should be considered in areas with limited access to vehicles. Implementation of safe walking and bicycling connections to transit centers can facilitate transit access, while low-stress facilities, such as separated trails, may better connect more rural locations to employment centers, schools, and quality food centers.

[20] Dannenberg A, Frumkin H, Jackson R. Making Healthy Places. 1st ed. Washington D.C.: Island Press; 2011.
[21] Rubin V. Sustainable Communities Series: Regional Planning for Health Equity. PolicyLink. 2015.

# BIKE AND SCOOTER SHARE DEMAND ANALYSIS

The Alta Demand Analysis methodology quantifies and visualizes demand for bicycle travel within a specified geography. The planning team conducted an analysis which resulted in a composite demand map (**Figure 5-5**) representing bicycling demand in the Billings area. The analysis is an objective tool and data-driven process that estimates the cumulative demand based on where people live, work, play, learn, and access transit by quantifying origins and destination factors. By utilizing Geographic Information Systems (GIS) to overlay these locations, the model creates a sketch of demand in the study area. This analysis helps to prioritize capital investments, placement of new stations, and identify potential bicycling campaign event sites such as bike to work or open street events. The analysis uses demographic information and urban context data to understand the areas of Billings where bike and scooter share use is likely to garner the highest usage (in terms of trips per device per day). This analysis will help define the optimal bike and scooter share service area and system size for the Billings area.

## DEMAND ANALYSIS METHODOLOGY

Bike and scooter share demand incorporates data available from the US Census and is made up of five major inputs:

- Residential density (where people live) [22] [23]
- Employment density (where people work)
- Transit use (where people catch the bus)
- Higher education (where people learn)[24]
- Recreation (where people recreate)[25]

These categories are based on research that looked at the factors influencing bike share ridership, and by proxy, scooter share ridership. In three separate studies, researchers found that population density, employment density, transit commuters, proximity to institutional, commercial, and recreational land uses had a statistically significant correlation with and positive influence on bike share ridership.[26] [27] [28] High demand areas were identified through a heat mapping exercise that allocated points based on where people live, work, take transit, and recreate within Billings. College campuses

[22] Residential, employment, and recreational density was calculated using 2018 data provided by the US Census Bureau's LEHD Origin-Destination Employment Statistics, at the census block level.

[23] It should be noted that residential density does not take into account temporary residents, i.e. those staying in hotels, inns and motels. Hotel, inn and motel employees are included in the recreation density analysis, however, and serve as ade factoproxy for the increased demand that hotels—especially large hotels in walkable, commercial centers—create for bike and scooter share ridership.

[24] This input included the Montana State University-Billings and Rocky Mountain College campuses.

[25] Based on the location of employment specifically related to arts and recreation, restaurants, hotels and retail establishments.

[26] Rixey, R. Alexander. Station-Level Forecasting of Bike Sharing Ridership: Station Network Effects in Three U.S. Systems. 2012. 2013 TRB Annual Meeting <https://nacto.org/wp-content/uploads/2015/07/2012_Rixey_Station-Level-Forecasting-of-Bike-Sharing-Ridership.pdf>

[27] Kim, DJ., Shin, HC, Im, H., and J. Park. Factors Influencing Travel Behaviors in Bikesharing. 2011. 2012 TRB Annual Meeting. <https://nacto.org/wp-content/uploads/2012/02/Factors-Influencing-Travel-Behaviors-in-Bikesharing-Kim-et-al-12-1310.pdf>

[28] Faghih-Imani, A., Eluru, N., El-Geneidy, A. M., Rabbat, M., & Haq, U. (2014). How Land-Use and Urban Form Impact Bicycle Flows: Evidence from the Bicycle-Sharing System (BIXI) in Montreal. Journal of Transport Geography, 41, 306-314.

were also allocated points. A "heat map" was developed to determine where demand for bike and scooter share exists. Colors are set at threshold levels to indicate relative demand within a 1000' by 1000' grid overlaid onto the City of Billings. The accompanying map (**Figure 5-5**) indicates the relative demand for bike and scooter share throughout the city. Areas with the highest potential demand are taken into consideration for deployment of bike and scooter share. These locations will generate the most users and attract the highest value sponsorships, and as a result are the most likely to be financially sustainable.

## DEMAND ANALYSIS RESULTS

The map on the following page (**Figure 5-5**) illustrates the results of the Bike and Scooter Share Demand Analysis. Annotations on the map correspond to the notes below.

1. One of the areas with the highest relative demand is the Montana State University-Billings campus. The university provides a combination of high residential density, jobs and transit access. Four bus routes in particular are accessible from the university: the Poly (Rte 24), Crosstown (Rte 3), Met Link (Rte 1), and the Lewis and Clark (Rte T4).

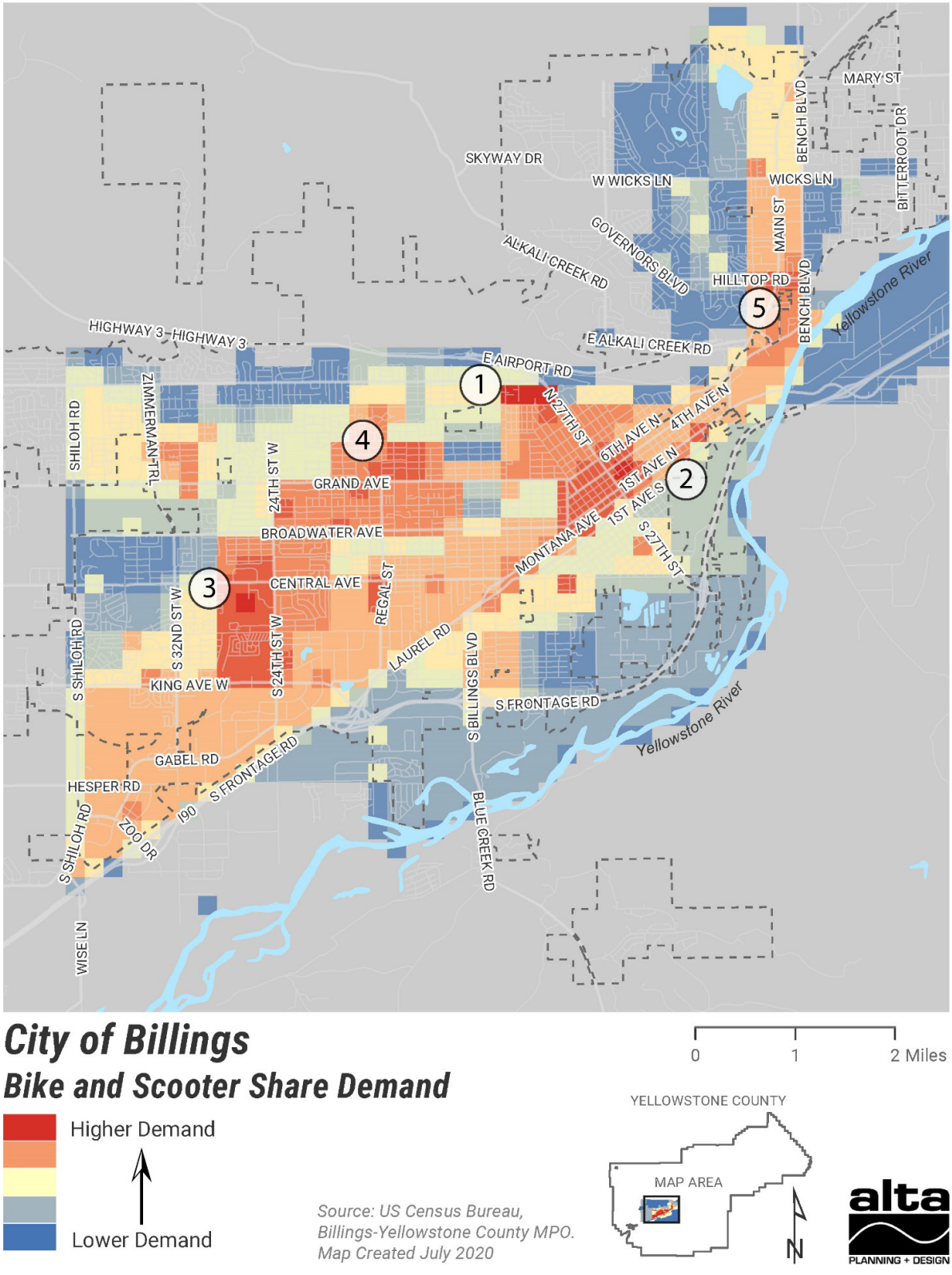
2. Another major source of demand is located in downtown Billings in an area bounded by 4thAve N and 1stAve N to the north and south, and N 27th St and N 23rd St. MET's Downtown Transfer Center falls within this area and is the driving force, in addition to land use and population density, behind the high demand result, as all bus routes are channeled through this transfer center.

3. Next, a high demand area west of downtown is located at Rimrock Mall due to its high employment density. Adjacent to the mall is Stewart Park, which offers significant recreational opportunities for surrounding neighborhoods and is home to MET's second transfer center where most routes converge.

4. The areas adjacent to the intersection of Grand Ave and 15thSt W stand out as another place where bike and scooter share demand is relatively high. The estimated demand score is largely driven by the employment and recreational opportunities near the West Park Promenade and a concentration of bus route time points serving the Grand (Rte 5), Crosstown (Rte 3), and Lewis and Clark (T4) lines.

5. Finally, another region with the City of Billings with a relatively high demand for bike and scooter share is near the intersection of Hilltop Rd and Main St in the Heights. This intersection is the nexus for six bus routes and offers access to a high number of jobs within walking distance.

*Figure 5-5.*


City of Billings
Bike and Scooter Share Demand
Higher Demand
Lower Demand
0
1
2 Miles
YELLOWSTONE COUNTY
MAP AREA
N
Source: US Census Bureau, Billings-Yellowstone County MPO. Map Created July 2020
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PLANNING + DESIGN
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WICKS LN
MARY ST
BENCH BLVD
BITTERROOT DR
MAIN ST
ALKALI CREEK RD
GOVERNORS BLVD
HILLTOP RD
Yellowstone River
HIGHWAY 3
E ALKALI CREEK RD
E AIRPORT RD
N 27TH ST
6TH AVE N
4TH AVE N
1ST AVE N
1ST AVE S
S 27TH ST
MONTANA AVE
SHILOH RD
ZIMMERMAN TRL
24TH ST W
GRAND AVE
BROADWATER AVE
CENTRAL AVE
REGAL ST
S 32ND ST W
S 24TH ST W
LAUREL RD
S BILLINGS BLVD
KING AVE W
S FRONTAGE RD
GABEL RD
HESPER RD
I90
ZOO DR
BLUE CREEK RD
WISE LN

# OPPORTUNITIES AND CHALLENGES ANALYSIS

This section outlines some of the current conditions and relevant efforts that have a potential impact on the development and implementation of Billings' bike and scooter share system. Information below is informed by previous planning efforts and conversations with stakeholders such as the Downtown Billings Alliance and MET Transit, and highlights opportunities for a bike and scooter share system to succeed and challenges that may need to be considered.

## OPPORTUNITIES FOR BILLINGS

The Steering Committee identified multiple desired outcomes and opportunities for a potential bike and scooter share program in Billings, including a shift to more active modes, progress towards a more equitable and accessible transportation system, and connecting residents and visitors to what the city has to offer. The following are opportunities identified for a potential bike and scooter share program in realizing some of these outcomes:

**Enhanced access to transit.** MET's fixed route bus system of over 18 routes is a flag stop system, meaning designated bus stops do not exist, and the bus can be flagged down at any corner along the route. Going through the process of identifying the best locations for bike and scooter share stations as part of this study could influence future decisions as to where bus stops are located should MET make plans for designated stops. Combining bus stops with bike and scooter share stations is an effective way to make multimodal trips convenient. Additionally, a strong partnership with MET presents opportunities for fare integration and a convenient platform for users to access both the bus and bike/scooter share systems.

**MET involvement in the bike and scooter share system.** Other opportunities for bike and scooter share with regards to transit is the potential for transit agency involvement in the funding and operations of the system. Recently distributed funds as part of the 2020 CARES Act should be assessed, along with other MET goals, to see if investment in a bike and scooter share system makes sense. Additionally, it's important to note that currently under review is a House of Representatives Bill H.R. 4001 (as part of the Bikeshare Transit Act of 2019) that would allow Federal Transit Administration (FTA) funds to be used by transit agencies for the purchase of bike share vehicles as well as operations and maintenance of the system.

**Downtown daytime trip mode shift.** With the Medical Corridor and MSU-Billings in such close proximity to Downtown, a bike and scooter share system presents opportunities for 1) converting short, daytime trips in and around Downtown to active modes and 2) enhancing connectivity to Downtown that might encourage more trips for Downtown retail or dining that otherwise feel too far for walking.

**Expanding tourism opportunities.** With a growing trail and on-street bikeway network, an effective bike and scooter share system can be leveraged to get visitors out and exploring the city and surrounding natural features, building on efforts already being made by the Downtown Billings Alliance and Billings Chamber of Commerce.

**Increasing transportation equity.** A well-planned bike and scooter share system presents opportunities for Billings to make its transportation system more equitable for

residents who would benefit the most from choices beyond just personal vehicles and fixed transit. Bike and scooter share also has the potential to provide access to transit for residents who currently live outside the range of MET's transit service by providing another way to make the first/last mile trip that gets them to/from MET transit service.

## CHALLENGES FOR BILLINGS

Like any city, elements of Billing's unique character and context may present a challenge to implementing a successful bike and scooter share system. Challenges identified in the study process not only inform the assessment of feasibility, but also shape the decision-making process for a potential system type, service area, and program structure. Key challenges include:

**Limited infrastructure for micromobility users.** Micromobility users will generally operate like a bicyclist. While the city is making investments in the network of bicycle infrastructure, gaps exist, which may limit the micromobility service area or user access and comfort when traveling in Billings.

**Funding limitations.** City staff and stakeholders indicated limited capacity to secure funding for both capital and operational costs associated with a bike and scooter share system. Though privately funded, dockless systems started arriving in many cities across the U.S. in late 2017, the companies offering these programs have reduced their footprint significantly over the last several years. During this evolution of the micromobility industry, business models have changed and many companies have narrowed their criteria for desirable markets, shifting resources toward major metro markets. Concurrently, new companies continue to develop within the industry, testing varying approaches to public and private partnerships and serving small and mid-sized markets. Within this context, Billing's population size suggests that public investment will have an important role and that potential private sector operators are limited to a subset of the larger industry.

**Community priorities.** Secondly, the Steering Committee recognized that there is no existing consensus among residents and elected officials related to the potential value of a bike or scooter share program. Achieving some level of consensus and broadening understanding of bike and scooter share will be important for securing funding in the future and successful implementation.

**Climate.** Lastly, as Billings is a place that experiences severe weather conditions, especially in the winter, consideration for operations and maintenance will need to be made based on seasons and climate.


# VI. RECOMMENDATIONS

# OVERVIEW/ SUMMARY OF RECOMMENDATIONS

Chapter 6 includes the Billings Bike and Scooter Share Study recommendations that will inform bike share implementation in Billings. These recommendations build on the community outreach, current conditions analyses, and research conducted over the course of the study. **Table 6-1** highlights the key Bike and Scooter Share Study recommendations regarding system type, governance, and system launch.

*Table 6-1.*

*Key Bike and Scooter Share Study Recommendations*

| SYSTEM TYPE |
| --- |
| Hybrid Bike Share System |
| Electric-Assist Bikes |
| **SYSTEM GOVERNANCE** |
| Operated by a Private Company |
| Owned by either the private company ("turnkey") or by City of Billings |
| Provide Student Fares |
| **SYSTEM LAUNCH** |
| Launch in Initial Service Area including Downtown and MSU Billings |
| Create Equity Program |
| Establish Strategic Partnerships |

# SYSTEM TYPE

## RECOMMENDATION: HYBRID BIKE SHARE SYSTEM, WITH OPTION FOR SCOOTERS

The recommended system type for bike share in Billings is a hybrid system. To determine the recommended bike share system type for Billings, the project team used the decision matrix illustrated in **Table 6-2** to understand opportunities and limitations to three major types of shared micromobility systems: docked and hybrid bike share, and dockless scooter share. **Table 6-2** scores each type of micromobility system according to its ability to meet Billing's program goals and other considerations identified as important for the Billings community. Overall, a hybrid system will provide the ideal balance of control and flexibility to meet the needs of the Billings community.

Some hybrid bike share system operators have the ability to offer "mixed fleets," or fleets including bike share and other devices, such as scooter share. Although scooter share is not recommended as the sole micromobility option in Billings, the Bike and Scooter Share Study recommends that Billings consider incorporating scooter share as part of a mixed fleet.

*Table 6-2.*
*System Type Analysis Matrix*

| GOAL | DOCKED BIKE SHARE | HYBRID BIKE SHARE | DOCKLESS SCOOTER SHARE | DESCRIPTION |
|---|---|---|---|---|
| Enhances the transit system by expanding access to existing bus routes and linking the transit system to a broader suite of multimodal options | 3 | 3 | 2 | All versions of bike and scooter share systems can support transit, but dockless systems limit the City's ability to link device availability to specific locations (such as transit stops). |
| Contributes to a more equitable transportation system by reducing the need for personal vehicle ownership | 3 | 3 | 2 | All versions of bike and scooter share can support equity goals if properly implemented; however, geographic equity has been shown to be the best indicator in improving access to underserved communities. A dockless scooter share system without physical hubs or stations would require the operator to manually rebalance the scooters into underserved communities. |
| Promotes greater participation in active transportation | 3 | 3 | 2 | Assuming thoughtful planning and implementation has occurred, all versions of bike share systems are shown to increase bicycle ridership. Studies of scooter share show that scooters replace some driving trips, but they primarily tend to replace walking and biking trips. |

| | | | | |
|---|---|---|---|---|
| Increases visibility and awareness of alternative transportation modes | 3 | 3 | 2 | While all versions of a bike and scooter system will engender a positive public perception through usage, a dockless scooter system may experience some negative feedback based on difficulties locating the free-floating scooters. |
| Provides a new way for visitors to explore Billings | 3 | 2 | 1 | All versions of bike share systems are shown to support tourism through improved convenience in accessing visitor destinations. Docked bike share systems are generally easiest for tourists to use because bikes can be rented using the station infrastructure. Hybrid bike systems and dockless scooter systems require downloading an app and linking a credit card, which could be hard for less tech-savvy tourists. Dockless scooter systems without stations also limit the City's ability to link device availability to specific tourism-based locations. |
| Connects people to what the city has to offer | 1 | 3 | 2 | All versions of micromobility systems are shown to support economic development through improving convenience and user experience in accessing business destinations. Docked bike share systems do not offer full flexibility for users to directly access their destinations. Dockless scooter share systems without stations limit the City's ability to link device availability to specific business-based locations (such as business districts); however, scooters tend to be ridden for longer distances than bikes, which allows users to connect to a higher number of destinations. |
| Relative cost | 1 | 2 | 3 | Docked bike share systems are the most expensive due to purchasing, permitting, and installing docking infrastructure. Hybrid bike share systems incur some costs for setting up the stations but are cheaper than docked systems. Dockless scooter share systems have very low infrastructure costs. Operations costs of all three types remain relatively similar. |
| Long-term Sustainability/ Adaptability | 2 | 3 | 3 | Docked bike share systems are more expensive to adjust within a city if demand changes, but the model has proven successful even as the micromobility space has changed over the past decade. Hybrid bike share systems and dockless scooter systems are newer so the model is less-proven, but have less up-front infrastructure costs, which give them more flexibility to introduce new models of bicycles as technology changes. |
| **TOTAL** | **19** | **22** | **17** | |

### RECOMMENDATION: ELECTRIC-ASSIST BIKES

The Bike and Scooter Share Study recommends the system use a fleet of electric-assist bikes. This will support a number of the program goals and other factors covered in the evaluation matrix, including:

- Providing for wider geographic coverage by increasing the comfortable speed and distance of bike share trips for customers
- Expanding geographic coverage and system usability to better serve vulnerable demographics, including low-income neighborhoods and riders with mobility challenges

With an e-bike share system, riders can cover more ground and navigate topography with ease. E-bikes are more appealing to a larger range of potential users of varying physical abilities. In the past few years, electric assist bike share equipment has become less expensive and easier to use. All models require the rider to pedal the bicycle in order to get an "assist" from the electric motor. The top speed for an e-bike share system is approximately 15 miles per hour, after which the regulator cuts off any additional power. Because e-bikes are powered by a battery, they must be recharged on a regular basis. This creates an additional operations step for vendors/contractors who must either swap the batteries or dock the bikes at a recharging station.

# SYSTEM GOVERNANCE

### RECOMMENDATION: TURNKEY OR PUBLICLY OWNED/PRIVATELY OPERATED

The Bike and Scooter Share Study recommends that the City either solicit a turnkey bikeshare system (owned and operated by a private company) or that the City own the bike share system in Billings and contract to a private operator.

To implement a **turnkey bike share system**, a city hires a company such as Koloni or DropBike to provide "bike share as a service" for a defined amount of time. Instead of purchasing a full fleet of bikes and designing stations, a city rents equipment and contracts with the company for the full range of operations support, including: installation, operations, sponsorship, customer service, and maintenance.

The turnkey model allows a city to implement bike share with limited staff capacity and capital investment, while maintaining meaningful city control. Typically, turnkey systems have a faster timeline for implementation, and many companies offer mixed fleet options so the City could request to include e-scooters alongside bicycles. Turnkey models are common in smaller cities and on campuses.

Alternatively, **the City's ownership of bike share in Billings** would provide its own benefits. A Billings-owned bike share system would be an innovative method of supporting first-and-last mile connections to and from transit, adding to the geographic range and flexibility of transit trips. In addition to supporting transit service goals, owning the City's bike share fleet and hub infrastructure would offer the City the highest degree of

control over system design, station siting, and pricing/payment policy. With proper coordination with MET Transit and bike share integrated into MET's system, transit riders would experience a bike share system operated in-tandem with traditional bus service, including:

- A bike share pricing structure in-line with standard transit fares
- The option of using MET passes to pay for bike share rides
- A bike share system that shares in MET's branding, high standard of service, and responsiveness to customer needs
- Control over advertising and sponsorship opportunities

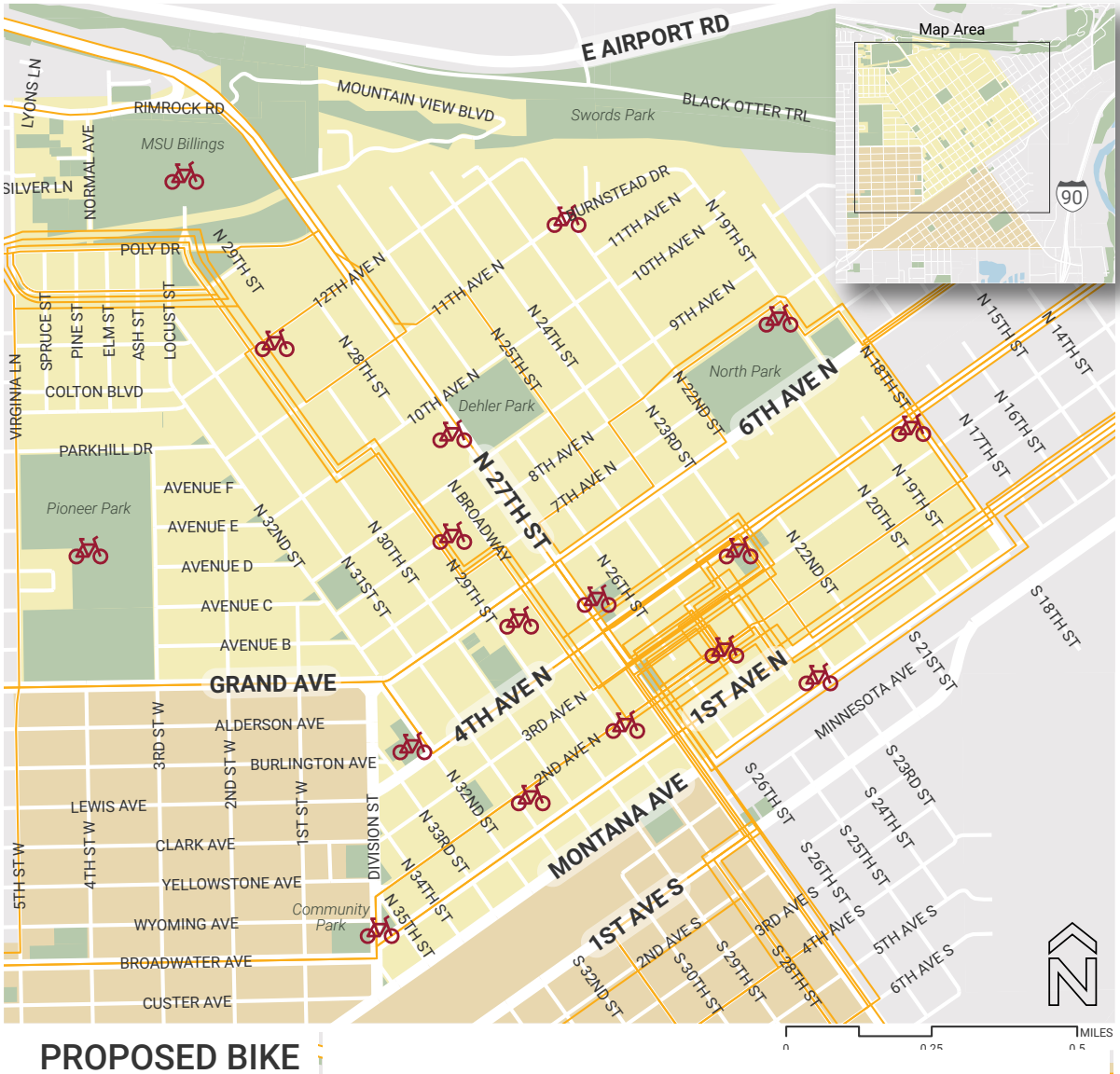
In this instance, **the City would select a bike share vendor to manage the operations of the system.** Private operators can bring extensive knowledge and experience from operating in other cities. Hiring a private operator still allows the City to dictate the terms of bike share service level agreements. The City should require prospective bike share operators to submit their plans for routine maintenance and operations during the bid process, as well as provide evidence of high performance in other jurisdictions.

*Operations, Maintenance, and Customer Service*

The following contains a list of the major factors to consider when selecting an operator.

- **Re-balancing:** This is a critical aspect of any successful bike share system, as it ensures that people have bikes where and when they want them. The system operator should be able to demonstrate how they will maintain bicycle availability throughout the service area on a daily basis. Additionally, e-bikes necessitate battery charging, so it will be important that the operator is experienced with charging a fleet of electric vehicles.
- **Maintenance:** Ongoing maintenance of bicycles and stations is required for a bike share system to operate smoothly. Maintenance protocols should be included within service agreements between the City and a bike share vendor. Penalties for noncompliance should be included within the agreement to empower public agencies to enforce maintenance procedures.
- **Customer Service:** Operators are responsible for bike share customer service and should have a call center, online portal, and service center to help resolve technical and mechanical issues. The City should request operators meet customer service levels comparable to the City's customer service.

*Figure 6-1.*




## PROPOSED BIKE SHARE STATION LOCATIONS

### CITY OF BILLINGS

- Proposed Station Location
- Bus Routes
- Initial Service Area
- Expansion Area
- Parks
- Water Body

BILLINGS - YELLOWSTONE COUNTY MPO METROPOLITAN PLANNING ORGANIZATION

alta

Map Created Dec 2020

# SYSTEM LAUNCH

## RECOMMENDATION: SERVICE AREA

This section defines an initial service area for system launch and an expansion service area. Introduction of bike share service in the expansion service area can be accomplished either as a single large-scale system expansion or incremental installation of hubs as funds become available.

As shown in Figure 6-1 on the following page, this plan recommends an initial service area that includes Downtown, MSU Billings, and Pioneer Park. The expansion area expands the service area to the west and south of the initial area. Starting in the initial service area provides the opportunity for residents and visitors to get comfortable with small-scale shared mobility on city streets and build support for bike and/or scooter share and bike infrastructure before it expands to other neighborhoods.

*Initial Service Area*

The initial bike share launch, illustrated at left in **Figure 6-1**, is recommended to include 140-200 electric-assist smart bikes spread between 17 stations of 5-15 bikes each, depending on the demand and available space within the right of way. The initial service area includes Downtown Billings (north of Montana Ave, west of N 18th St, east of Division Street and east of Virginia Lane), including MSU Billings. The entirety of the initial service area includes areas of high demand and/or high equity scores.

Stations are recommended initially in the following areas (listed approximately from north to south):

- MSU Billings
- Highland Apartments
- Yellowstone Medical Center
- North Park
- Billings Clinic/Dehler Park
- Pioneer Park
- Greyhound Station
- 8th Ave N & N 29th St
- Billings Community Center
- Yellowstone Art Museum
- Billings Public Library
- MET Downtown Transfer Center
- Skypoint (2nd Ave N & Broadway)
- Commercial area along Montana Avenue
- Billings YMCA
- Wise Wonders Science Museum
- Community Park

Some of these proposed station locations are along National Highway (NH) routes maintained by the Montana Department of Transportation (MDT). Should these facilities be located within NH right-of-way, MDT will need to be involved to approve the encroachment.

Additionally, station locations may be adjusted as bicycle facilities — particularly protected facilities — are built. It is preferable to locate bike share stations near bicycle facilities to facilitate safe and comfortable

bike trips. Stations may also be added in cases where trails or routes are built and high ridership is expected; for example, there is a proposed trail north of downtown below the Rimrocks. Construction of this trail may warrant the addition of another station in the northern portion of the initial service area.

*Expanded Service Area*

The proposed expansion service area would expand the system outward from its initial service area. Key destinations in the expanded service area would include:

- Residential areas south and west of downtown, including areas with high equity scores
- South Park
- Terry Park
- Highland Park
- Moss Mansion Museum

It is not necessary to expand all at once. The timing and size of the expansion should consider the following factors:

- **Ridership:** High system ridership may indicate the system is ready to expand.
- **Funding:** Identifying additional funding from sponsorships, grants, or operational funding will be necessary to determine the timing and size of system expansions.
- **Infrastructure:** as new bike infrastructure is implemented, system expansions could be coordinated with the arrival of new facilities that provide safe connections for people bicycling.
- **New Indicators of Demand:** Bike share system expansion could be implemented to respond to new development, changes in land use, or expansion of transit service.

## ESTIMATED SYSTEM COSTS & REVENUES

The following section estimates the costs and revenues of a bike share system based on the recommended system type and size **(see Table 6-3)**. The actual costs and revenues of the bike share system will vary depending on the selected vendor, specific equipment, pricing structure and usage. These figures provide conservative estimates using current data from the industry. Though the events of the 2020 year have brought major change and uncertainty, the direct costs of bike share system equipment and operations are not expected to shift significantly. The following section describes the two major types of costs associated with bike share systems: start-up costs and operating costs.

*Start-Up Costs*

This category includes both capital and launch costs.

- **Capital costs** are the costs associated with the purchase of equipment including bikes, transaction kiosks (if present), map frame panels and docks.
- **Launch costs** are mostly one-time costs that include up-front costs such procuring a service center and storage warehouse, purchasing bike and station assembly tools, station installation, website development, communications and IT set-up and pre-launch marketing.

*Operating Costs*

Operating costs include those required to operate and maintain the system. This

includes staff (may be a combination of City and/or vendor staff) and equipment related to:

- **Station maintenance:** Including troubleshooting any technology problems with the kiosk or docking points, cleaning and clearing the station, removing litter and graffiti, etc.
- **Bike maintenance:** Including regular inspection and servicing of bikes as well as maintaining equipment inventory, etc.
- **Re-balancing:** Staff time and equipment associated with moving bikes from full to empty stations and vice versa. This is typically a problem associated with peak demand at commute periods and during events. Re-balancing costs can be mitigated through the use of pricing that encourages riders to return bikes to priority stations or to stations low on bikes.
- **Customer service:** Providing a responsive customer interface for inquiries and complaints as well as performing marketing and outreach to new and existing customers.
- **Direct expenses:** Such as maintaining an operations facility, purchasing tools and spare parts, upkeep of software, communications and IT, administrative oversight, and general administrative costs such as insurance and membership database management.

*Estimated System Cost*

Most vendor/operators price out a system with a per-bike cost for launch, capital costs, and operations. Based on current industry data, Alta estimates bike share costs for an electric-assist hybrid bike share system in Billings to be:

- Capital: $3,000/bike
- Launch: $2,000/bike
- Operations: $2,000/bike/year

Using this data, the conservative estimate for a bike share system in Billings with 17 stations and 150 electric-assist bikes would require $300,000 in launch costs, $450,000 in capital costs, and an annual operating cost of $300,000. The system would cost $1.6 million to purchase, launch, and operate for three years.

*Revenue: User Fees*

The revenue sources for bike share come from user fees, sponsorship, advertising and public funding. User fees include the fees bike share patrons pay for memberships, along with any overtime fees. A key factor to determine revenue through user fees is the "Farebox Recovery Rate" (FRR). The FRR is the percentage of the system's operating costs expected to be covered by user fees.

In bike share systems similar to the recommended system and in cities of similar sizes to Billings, the FRR ranges from 20 - 40 percent. Assuming an FRR of 30 percent, the user fees for bike share in Billings are expected to be approximately $90,000 in the first year of operation. The FRR is expected to grow over the first three years as more users join the system.

Considering the FRR, the annual operating gap (costs minus revenues) can be estimated at around $200,000 per year. This funding

*Table 6-3.*

*Hybrid Electric Bike Share 3-Year Cost Estimate Without Phase 2 Expansions*

| YEAR | 0 | 1 | 2 | 3 | 0-3 |
|---|---|---|---|---|---|
| # of Stations | 17 | 17 | 17 | 17 | 17 |
| # of Bikes | 150 | 150 | 150 | 150 | 150 |
| Launch Costs ($2,000/bike, est.) | $300,000 | $0 | $0 | $0 | $300,000 |
| Capital Costs ($3,000/bike, est.) | $450,000 | $0 | $0 | $0 | $450,000 |
| Operations Costs ($2,000/bike/year, est.) | $0 | $300,000 | $300,000 | $300,000 | $900,000 |
| **Costs Sub-Total** | **$750,000** | **$300,000** | **$300,000** | **$300,000** | **$1,650,000** |
| **Costs Cumulative** | **$750,000** | **$1,050,000** | **$1,350,000** | **$1,650,000** | |
| Estimated "Farebox Recovery" Rate | N/A | 30.00% | 32.50% | 35.00% | N/A |
| User-fees | $0 | $90,000 | $97,500 | $105,000 | $292,500 |
| Annual Need | ($750,000) | ($210,000) | ($202,500) | ($195,000) | ($1,357,500) |
| Cumulative Need | ($750,000) | ($960,000) | ($1,162,500) | ($1,357,500) | |

may be secured through a variety of sources, including a combination of sponsorship revenue, and state and federal grants. See the Funding Sources section of this report for more information on funding opportunities.

## RECOMMENDATION: ESTABLISH STRATEGIC PARTNERSHIPS

Community buy-in is important for long-term bike share stability in Billings. Establishing collaborative partnerships with other agencies, community-based organizations, universities, and other relevant groups will help build support for the system, increase ridership, raise funding, and more.

The role of a partner organization varies based on that organization's role in the community, but may include:

- Direct sponsorship
- Assist with sponsorship solicitations
- Provide subsidized memberships
- Education, marketing & promotion
- Assist with enrollment (particularly into a low-income program)
- Creation and distribution of tourism materials
- Assist with station siting
- Coordinating bike infrastructure upgrades
- Data sharing

The types of organizations that a bike share program will partner with can vary, but may include:

- Local and regional municipalities
- Local and regional transportation agencies
- Parks districts
- Public health agencies
- Universities and colleges
- Tourism bureaus
- Chambers of commerce
- Business improvement districts
- Community-based organizations that serve marginalized communities
- Religious organizations
- Bicycle advocacy organizations
- Environmental organizations
- Hospitals, clinics, and other healthcare facilities

## RECOMMENDATION: CREATE AN EQUITY PROGRAM

The Bike and Scooter Share Study researched bike share equity initiatives from bike share systems across North America. The City should include the following elements in the Billings bike share system:

- **Income-based Discounts:** The vast majority of bike share systems that pursue equity goals, regardless of size, have plans that address the financial barriers to users. Income based-discount and cash payment options are key strategies to include lower income bike share riders who may not have access to credit or may not be able to afford the transportation service at the standard fare.
- **Cash Payment:** Over the past couple years, many bike share providers, both public and private, have implemented cash payment options where users can go to designated locations to add cash to their accounts. Reload locations are often social service providers, bike share offices, and local grocery/convenience stores.
- **Alternative Payment Structures:** Beyond income-based discounts

and cash payment options, bike share systems should consider other alternative payment structures in order to reduce the financial barriers to entry. For example, rather than offering either a year-long pass or weekly passes, bike share providers could consider offering monthly passes which cater to regular users who can't afford the high total cost of a year-long pass or the high per-trip cost of a weekly pass. Additionally, providing longer rental times can alleviate fears of overage charges.

- **Reduce Liability and Eliminate Hidden Fees:** Some bike share systems require a deposit or have steep fees for lost or stolen bikes. Eliminating these fees across the board or just for lower income users can make people feel more comfortable using the system.

- **Targeted Marketing:** Targeted marketing is any content that increases awareness of the bikeshare among demographics and populations that may benefit from additional outreach. This is a key way providers pursue equity goals. Targeted marketing should reflect the diversity of the area the system serves. It should reinforce the idea that the system is for people who live in Billings, and not just visitors looking for recreational amenities. Successful content is created for (and often with the help of) specific groups and communities the bike share hopes to engage. These strategies could include: ambassador photo shoots, press releases, social media, billboards, bus-stop displays, bike station panels, flyers, emails, custom painted or sponsored bikes by community partners. Regardless of marketing strategy, it is recommended that the content is produced in the languages and located in the places that the target population occupies.

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# VII. NEXT STEPS

# FUNDING SOURCES

Funding from both public and private sources have been used to fund bike and scooter share systems across North America. Numerous public funding options are available for bike sharing in the United States, but the most common are federal grants issued by agencies such as FHWA, FTA, or CDC, state grants, and local transportation funds. The FHWA provides a summary of public funding sources in its guide to Bike Sharing in the United States (Federal Highway Administration, 2012). Additionally, various state and regional funding opportunities exist for bicycle and pedestrian infrastructure in Montana, for which bicycle and scooter share could be eligible **(Table 7-1).**

*Table 7-1.*

*Potential Bikeshare Funding Sources*

| FUNDING OPPORTUNITY | ELIGIBLE PROJECT TYPES | LEAD AGENCY | FUNDING SOURCE DETAIL |
|---|---|---|---|
| Surface Transportation Block Grant Program (STBGP) | Bicycle and Pedestrian improvements, among others. | MDT and MPO | With the passage of the 2016 Federal Transportation Bill, Fixing America's Surface Transportation Act (FAST Act), the former Surface Transportation Program (STP) has become the Surface Transportation Block Grant Program (STBGP), which now includes Transportation Alternatives Program funding. The State is required to allocate Transportation Alternative funds through a competitive process which allows eligible applicants an opportunity to submit projects for funding. MDT's process emphasizes safety, ADA, relationships to State and community planning efforts, existing community facilities, and project readiness. |
| Congestion Mitigation and Air Quality Improvement Program (CMAQ) | Funds may be used for a transportation project or program that is likely to contribute to the attainment or maintenance of a national ambient air quality standard | MPO | CMAQ funding is apportioned by the federal government to state governments, which can then fund projects either in an MPO's current transportation plan and transportation improvement program (TIP) or the current state transportation improvement program (STIP). Allocating CMAQ funds to bike/scooter share would ensure bike/scooter share is included in the TIP/ STIP |
| National Highway Performance Program (NHPP) | Bicycle transportation associated with a National Highway System (NHS) facility | MDT and MPO | NHPP funds support goals such as improving infrastructure condition, safety, congestion reduction, system reliability, or freight movement on the NHS. Projects must be identified in the STIP/TIP and be consistent with the Long-Range Statewide Transportation Plan and the Metropolitan Transportation Plan(s). Bike share or bike facilities may be eligible for funds in association with a project on an eligible rodeway in Billings (e.g. I-90/Montana Ave). |

| | | | |
|---|---|---|---|
| Transportation Alternatives Program (TAP) | Bicycle and pedestrian improvements only | MDT and MPO | The FAST Act combines the former TAP (which included the former Recreational Trails and the Safe Routes to School programs) into the STBGP (above). Though program requirements will stay roughly the same, total funding has been slightly increased. Most projects have an 80/20 federal/local match split, and can include sidewalks, paths, trails (including Rails-to-trails), bicycle facilities, signals, traffic calming, lighting and safety infrastructure, and ADA improvements. Unless a state opts out, it must use a specified portion of its TA funds for recreational trails projects. Since the Billings Urban Area is less than 200,000 people, the Billings Area competes with other Montana communities for this source to fund projects. Funds are distributed by MDT. |
| Better Utilizing Investments to Leverage Development (BUILD) | Shovel ready, surface transportation projects | MDT, MPO or City of Billings | Typically funds capital projects with exceptional benefits that make needed investments in infrastructure of national importance, though bike share is a qualified project. Detailed application must be completed. Projects are highly competitive, and require a minimum 20 percent local match funding. |
| Community Transformation Grants | Bicycle and Pedestrian Infrastructure and Programs. Projects and programs aimed at increasing physical activity | CDC | Community Transformation Grants, administered through the Center for Disease Control (CDC), support community–level efforts to reduce chronic diseases such as heart disease, cancer, stroke, and diabetes. Active transportation infrastructure and programs that promote healthy lifestyles are a good fit for this program, particularly if the benefits of such improvements accrue to population groups experiencing the greatest burden of chronic disease. |
| Federal Transit Administration (FTA) Funding | Bicycle and Pedestrian infrastructure. Project must enhance or be related to public transportation facilities | FTA | Multiple FTA funding sources exist. Most FTA funding can be used to fund pedestrian and bicycle projects "that enhance or are related to public transportation facilities." |
| Maintenance Districts | Maintenance, Capital Improvements List projects | City of Billings | Street and park maintenance districts are used to pay for maintenance expenses, which could potentially include bike share facilities. |

| | | | |
|---|---|---|---|
| Montana Tourism Grant | Projects that enhance the non-resident visitor experience and increase expenditures | City of Billings or MPO | The Tourism Grant Program awards approximately $750,000 annually to tourism- and recreation-related projects across the state. The program has previously funded bike infrastructure; in 2019, it awarded $6,627 to Billings-Yellowstone County MPO to install branded bike racks. While this is not likely a long-term source of funding, it may fund upfront capital costs. |
| Montana Main Street Program | Infrastructure or promotion | City of Billings | The Montana Main Street Program provides awards of up to $10,000 (higher amounts awarded on rare occasion) to fund projects that focus on downtown revitalization and support coalition-building, creating a positive image, building an inviting environment, and diversifying the economic base. |

## ADVERTISING AND SPONSORSHIP REVENUES

There is a subtle difference between advertising and sponsorship. Advertising includes a contract with a company to provide a regularly changing graphic display and message, which could be independent of the bike and scooter share station or other street furniture. The advertiser or message may not be associated with bike sharing or bicycling in general. Sponsorship typically involves a longer-term relationship between the sponsor and the vendor, where stickers are put on the infrastructure (bikes, stations, or website) with a logo or statement that "Company X supports Billings bike/scooter share".

Sponsorship provides a significant funding opportunity in Billings. Potential major partners include MSU-Billings, St Vincent Healthcare Center, or the Billings Clinic. Experience in other cities has shown that companies are generally interested in sponsorship for its positive impression and "good corporate citizen" benefits as much as for its media exposure.

These entities may also gain value from subsidizing memberships for their employees or students. In particular, this presents a good opportunity for MSU-Billings or Rocky Mountain College. Experience in other cities has shown that rates of bike and scooter share use by college students are significantly higher when the membership fee is included in student tuition and fees.

In Billings, advertising and sponsorships within the City's right-of-way are regulated by the Public Works division. While obtaining permission from Public Works to allow advertising and sponsorship on the bike and scooter share system seems likely, it is important to note the nuances of sponsorships. Specifically, if the City were to take on full responsibility for the operations of a bike and scooter share system and sponsorships were to be permitted, the City would then be liable to allow any interest group to act as a sponsor. Conversely, if a third party were to operate the system, sponsorship applicants can be rejected by said third party.

The value of sponsorship will vary significantly between cities and the level of branding. It is possible that sponsorship in the range of $5,000 to $15,000 per station per year is achievable in Billings based on experience in other cities:

- Nice Ride Minnesota obtained approximately $5,500 per station per year for presenting sponsorship from BlueCross BlueShield (this does not include additional station sponsorship sales that would increase this rate).
- Denver B-cycle reported sponsorship of approximately $11,700 per station in 2011.
- Citibank paid approximately $13,500 per station per year for exclusive sponsorship of New York's bike share system.
- Hubway in Boston obtained over $16,500 per station per year for station sponsorship from various sources ranging from New Balance to Harvard University to individual developers.
- CoGo in Columbus OH received $8,333 per station per year for station sponsorship by the Medical Mutual company
- GREENbike in Salt Lake City received $25,000 per station for a three-year term ($8,333/year) and received sponsorship for 8 of the inaugural ten stations

There are generally four approaches to sponsorship described on the following page in **Table 7-2**.

It should be noted that most systems have not been able to procure enough sponsorship dollars through title sponsor arrangements to cover the up-front capital costs of bike and scooter share (New York and London are the notable exceptions). Some systems have secured sponsor dollars to match government grants, while others have found success by launching first, then bringing in sponsors to help sustain or expand. Examples are Chicago's Divvy Bike Share (after one year, they secured sponsorship from Blue Cross Blue Shield of Illinois) and Columbus Ohio's CoGo Bike Share (after one year, they secured sponsorship from Mutual Medical.) Denver B-cycle and numerous other B-cycle systems have been successful at bringing in numerous small-scale and station sponsors to supplement user revenues, grants, and government funding. All of these have involved high-level political leadership to procure the sponsorships.

Nonprofits such as the Indianapolis Cultural Trail (which manages the 250-bike Indiana Pacers Bike Share system which launched in 2014) have been very successful at using a combination of sponsor dollars and foundation grants to both launch and help fund operations. The key to success is having deep-pocketed, community-connected foundations, high-level political support, and local leadership.

*Table 7-2.*

*Common Bike and Scooter Share Sponsorship Models in the United States*

| SPONSORSHIP MODEL | DESCRIPTION | ADVANTAGES | DISADVANTAGES |
|---|---|---|---|
| Title Sponsor | This can be a single sponsor that pays for full branding of system infrastructure (e.g., London or New York) or multiple sponsors that split the cost in exchange for proportional branding (e.g., Boston or Toronto). **Commitment is typically a 3-5 year period.** | Title: One-time sale of sponsorship<br>Known timeline and full "occupancy"<br>Consistent and recognizable branding | Often difficult to secure sponsor given the large investment<br>Less opportunity for smaller businesses to get involved<br>Competing brands can conflict certain tenants or nearby businesses |
| Presenting Sponsor(s) | Sponsor(s) pays for branding of certain parts of the infrastructure e.g., Hubway (Presented by New Balance), Nice Ride (Presented by Blue Cross Blue Shield of Minnesota), Pronto Emerald City Bike Share (Presented by Alaska Airlines.) **Commitment is typically a 3-5 year period.** | System branding with sponsors allows for future flexibility<br>A strong, active sponsor adds marketing and outreach value<br>Opportunities for businesses of all sizes to be involved<br>Solid funding stream to complement user fees and government investment<br>Can bring in multiple sponsors | Significant effort required to secure and retain sponsors<br>Not enough money to fully fund system, typically |
| Station/Hub Sponsors | This model sells sponsorship opportunities on system infrastructure, e.g., Denver Bike Share sells logo placement on a station kiosk plus 10 bikes for $30,000 per year or discounted for multiple years. **Commitment is typically a 3 year period.** | Opportunities for businesses of all sizes to be involved<br>Opportunity to value sponsorship by station demand | Income relies on uptake of a certain amount of sponsorship each year<br>Significant effort required to secure and retain sponsors |
| Other sponsors | Numerous options available, such as one-time sponsors (e.g., Volkswagen paid for day-passes in Chattanooga for a weekend), product partners, media sponsors, and other ideas. **Commitment is typically a 1-3 year period.** | Opportunities for businesses of all sizes to be involved<br>Builds strength in community by valuing bike and scooter share | Significant effort required to secure and retain sponsors |

# FUTURE CONSIDERATIONS

## ADAPTIVE BIKES

Offering alternate bicycle types could expand the number of people who are interested in utilizing bike share in Billings. The system's mobile application should indicate the presence of these types of bikes and their roll-out should be accompanied by a minimum of one email newsletter to system users. Additional press leading up to and following the launch is recommended. Adaptive bike share is often provided as a complementary program managed by additional partners and is available from staffed locations where bikes are checked out for round-trip use (returned to the same location).

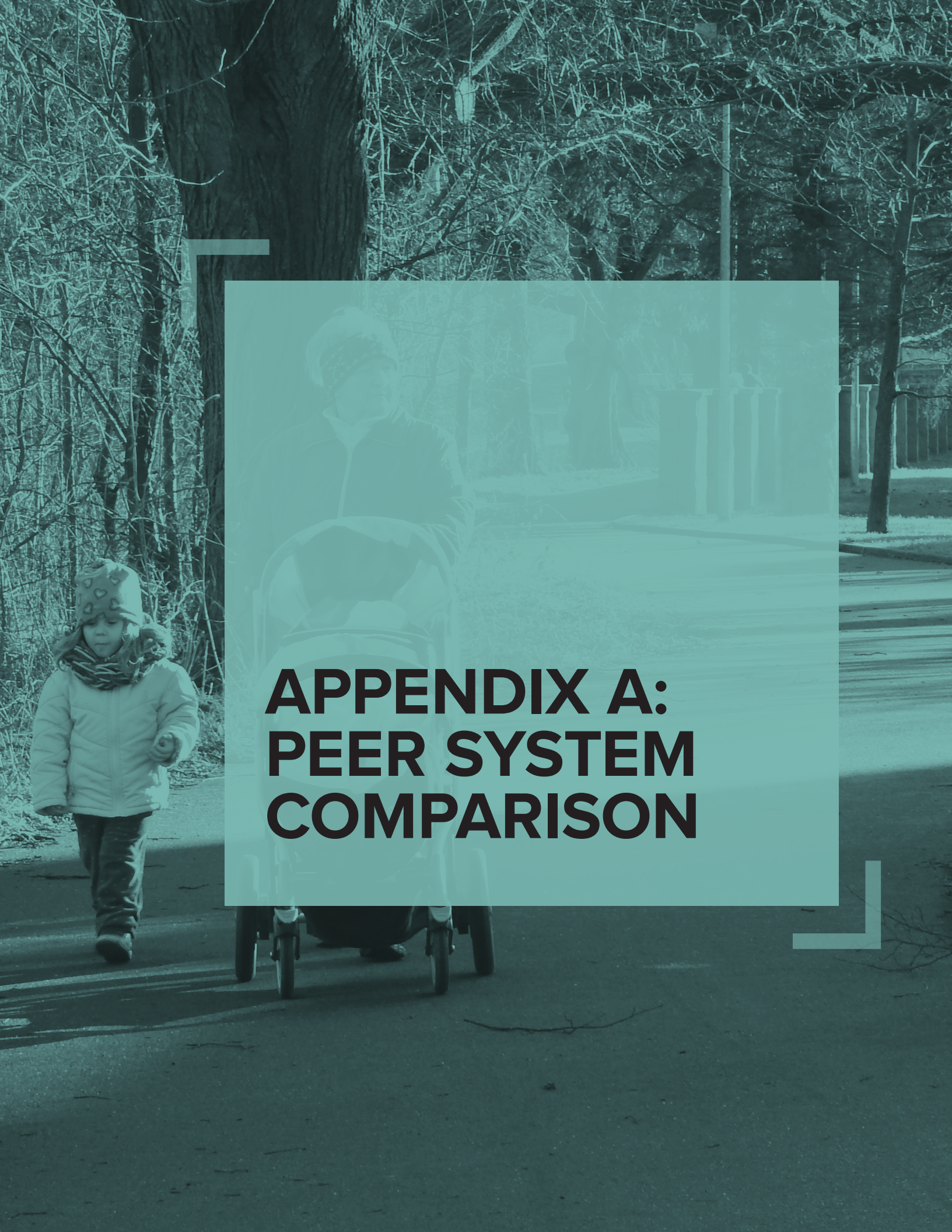
- **Cargo bikes:** Two- or three-wheeled cargo bikes could improve the system's functionality, since most bike share models offer relatively limited carrying capacity. They could also present a sponsorship opportunity for local hardware, garden, or similar retail establishments.
- **Adaptive cycles:** Including upright leg tricycles, recumbent leg tricycles, hand pedal cycles, or side-by-side tandem bike share units can improve the accessibility of bike share for riders with mobility challenges and disabilities.

## DATA COLLECTION AND EVALUATION

Bike share data collection has the potential to improve user experience by providing information about where bikes are available throughout the system. Data collected from users also has the potential to improve overall system delivery by allowing public agencies or private vendors to analyze usage trends and respond to customer desires and needs. Despite these benefits, data collection should be anonymized to protect users' privacy. User data should not be shared with third parties.

Raw ridership data provided to public agencies should, at minimum, include trip date and time, point of origin/destination, length of trip (in miles), and duration of trip (in minutes). Data aggregated on a monthly basis should, at a minimum, include average number of trips per day, origin and destination locations (presented in a mapped format), average trip distance, average trip duration (in minutes), average number of unique riders per day, average number of trips per unique rider per day, location and details of all reported crashes involving bikes, location of each complaint, nature of each complaint, description of vendor response, and vendor response time for each complaint.

Using data to inform bike share operations is essential to achieving successful outcomes for program goals. Tracking key metrics help bike share providers understand how, where and when the system is being used, and by whom. The insights gained by monitoring specific data metrics inform how best the system can improve, and can help attract additional funding from local officials, grants, and community sponsors. Analyze the data at regularly scheduled intervals to understand patterns in usage, what is working well, and what needs to be improved.



# APPENDIX A: PEER SYSTEM COMPARISON

The following tables summarize a variety of implemented bike share systems in communities similar to Billings in population size, geographic region, or climate. Listed in order of population size from smallest to largest, these systems have been adapted to best serve the unique communities they operate in.

## Boulder B-Cycle

| LOCATION: | BOULDER, CO (POPULATION 107,355) |
|---|---|
| **OWNER/OPERATOR:** | Boulder Bike Sharing |
| **START OF SERVICE:** | 2011 |
| **SYSTEM TYPE:** | Docked |
| **NUMBER OF STATIONS/HUBS:** | 47 stations |
| **NUMBER OF BIKES:** | 300 bikes |

Boulder's BCycle system is dedicated to providing residents, commuters and visitors with an affordable, convenient and sustainable transportation option. The system is owned and operated by Boulder Bike Sharing, a nonprofit founded for the purpose of implementing and operating the program. Boulder Bike Sharing utilizes BCycle as its equipment vendor and software provider via licensing agreement. Boulder Bike Sharing purchased the initial equipment using capital grants secured by the City of Boulder, and receives annual funding from the City that funds a portion of the annual operating costs. The remainder of the costs are paid for by user fees, sponsors, and grants.

Since the system's inception in 2011, annual trips in Boulder have steadily increased from under 20,000 trips per year to more than 108,000 trips in 2018. The docked system has stations located throughout the city, and offers four pass varieties to meet the needs of a wide range of users.

## Great Rides Bike Share, Fargo

| LOCATION: | FARGO, NORTH DAKOTA (POPULATION 122,359) |
|---|---|
| **OWNER/OPERATOR:** | Great Rides Bike Share Inc. (BCycle system) |
| **START OF SERVICE:** | 2014 |
| **SYSTEM TYPE:** | Docked |
| **NUMBER OF STATIONS/HUBS:** | 11 stations |
| **NUMBER OF BIKES:** | 100 bikes |

Fargo's Great Rides Bike Share system operates seasonally with aims of serving North Dakota State University's student population. System design and management heavily prioritizes reducing barriers to entry for NDSU students, who are automatically enrolled in program membership through mandatory student fees. Students activate bikes with their student ID cards. This integration and partnership with the University has led to system success, with students taking 90% of all bike share trips and each bike averaging 6-7 rides per day. Similar to Billings, Fargo experiences extreme winter weather.

## Topeka Metro Bikes, Topeka

| LOCATION: | TOPEKA, KANSAS (POPULATION 126,597) |
|---|---|
| **OWNER/OPERATOR:** | Topeka Metro (Social Bicycles system) |
| **START OF SERVICE:** | 2015 |
| **SYSTEM TYPE:** | Hybrid |
| **NUMBER OF STATIONS/HUBS:** | 143 hubs, 17 main stations |
| **NUMBER OF BIKES:** | Unknown |

Topeka Metro Bike manages its bike share system through Social Bicycles, a service by JUMP that offers hardware and software services to communities seeking to implement and manage bike share systems. Topeka Metro Bike expanded to over 300 units in 2018. Bikes feature integrated locks that allow riders to park at standard bike racks. The system also utilizes bike share hubs of varying capacity. The system offers a $2 reward for returning bikes to a hub and a $3 out of hub fee for parking bikes away from a hub location. Users who park bikes outside of the service area are charged a $20 fee. The highest density of hubs is located in downtown Topeka (where all bus routes eventually converge at Quincy Street Station) and at Washburn University's campus. Affiliates of the university and employees of the City may use the system for free, while other users have the option of paying 5 cents per minute, $5 per month (for 2 hours of daily time), or $25 annually (for 2 hours of daily time).

While Metro Bike's system does offer hubs near high boarding/alighting stops, the mobile app and payment options do not integrate transit routes, schedules, or fares. Topeka Metro's 2019 budget summary indicates that funding for the administration, maintenance, and operation of Metro Bikes comes from the same revenue pools dedicated to the provision of bus service. This has created a funding conflict between bus service enhancements and bike share provision, which costs roughly $284,000 a year for Metro to operate and brings in only around $108,000 in revenue annually. Metro has voted to end bike share service in December of 2019 in favor of using funds to expand transit service hours and frequency.

## Bike Chattanooga

| LOCATION: | CHATANOOGA, TN (POPULATION 179,139) |
|---|---|
| **OWNER/OPERATOR:** | Owners: Chattanooga Area Regional Transportation Authority and the City of Chattanooga. Operator: Shift Transit |
| **START OF SERVICE:** | 2012 |
| **SYSTEM TYPE:** | Docked |
| **NUMBER OF STATIONS/HUBS:** | 42 stations |
| **NUMBER OF BIKES:** | 400 total bikes, 55 e-bikes |

Though greater in population size than Billings, the City of Chattanooga shares a close landscape resemblance. The downtown area is nestled along the Tennessee River with numerous surrounding parks. The system seeks to enable users to save money, save time, go green and have fun. In order to launch the program, the City first secured $100,000 in funding from the local Lyndhurst Foundation. Combined with an additional partnership with the local transit system, CARTA, the City was able to secure federal air-quality funds as well for a successful implementation. Today, the City operates the system with bikes provided by PBSC Urban Solutions. Funding is an ongoing process, and the City has developed creative ways to expand and progress the system. Similar to advertisements on buses, local companies can have a bike adorned in their colors and logos. In 2019, Bike Chattanooga experienced record high ridership with 74,409 annual trips. The program also offers Free Ride Days on Wednesdays during the summer months to encourage users and lower barriers to entry.

## Madison B-Cycle

| LOCATION: | MADISON, WI (POPULATION 258,054) |
|---|---|
| **OWNER/OPERATOR:** | B=Cycle |
| **START OF SERVICE:** | 2011 |
| **SYSTEM TYPE:** | Docked |
| **NUMBER OF STATIONS/HUBS:** | 45 stations |
| **NUMBER OF BIKES:** | 300 e-bikes |

Madison BCycle is owned and operated by BCycle and Trek. It was the first docked bike share system in the country to convert to 100 percent electric bikes in mid-2019. Since then, ridership has more than doubled. The program offers free memberships to low-income residents.