

Appendix D

Bicycle Share Feasibility Study

BICYCLE SHARE FEASIBILITY STUDY

DECEMBER 2014

Northwest Corridor
Bicycle/Pedestrian Accessibility Study





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Attachment A - Bike Share Feasibility Workshop Summary

Introduction

The state of Colorado and the Regional Transportation District (RTD), along with its local jurisdiction partners, have made significant transportation investments in the Northwest Corridor (the Corridor) in recent years. Along with the Colorado Department of Transportation (CDOT) US 36 Express Lanes Project, which includes the US 36 Bikeway, RTD is currently constructing two FasTracks projects in the corridor: the US 36 bus rapid transit (BRT) Line and a segment of the Northwest Rail Line (from Denver Union Station to Westminster Rail Station), both scheduled to open in 2016. Together, these transportation projects will improve multimodal mobility and access between Denver and Boulder and points in between.

In order to maximize investments that have been made in the Corridor, the Denver Regional Council of Governments (DRCOG), through its Sustainable Communities Initiative (SCI), hosts a partnership of Corridor public and private sector organizations whose goals include enhancing bicycle and pedestrian access and mobility within the first and last mile of new transit stations. The Northwest Corridor Bicycle/Pedestrian Accessibility Study (NW Corridor Study) is charged with the same goal. The project builds upon the 2013 US 36 First and Final Mile (FFM) Study by 36 Commuting Solutions and advances the top priorities identified in that study.

This report is a presentation of one of six NW Corridor Study tasks: a Bicycle Share Feasibility Study. The report includes a description of different bicycle share technologies, inter-system compatibilities, and station area analyses. This memo includes recommended bicycle share technologies for each station area and other implementation considerations.

Study Area

The study area for this project, shown in **Figure 1**, consists of the following seven transit stations that comprise the Corridor:

- Table Mesa BRT Station
- McCaslin BRT Station
- Flatiron BRT Station
- Broomfield BRT Station
- Church Ranch BRT Station
- Westminster Center BRT Station
- Westminster Rail Station

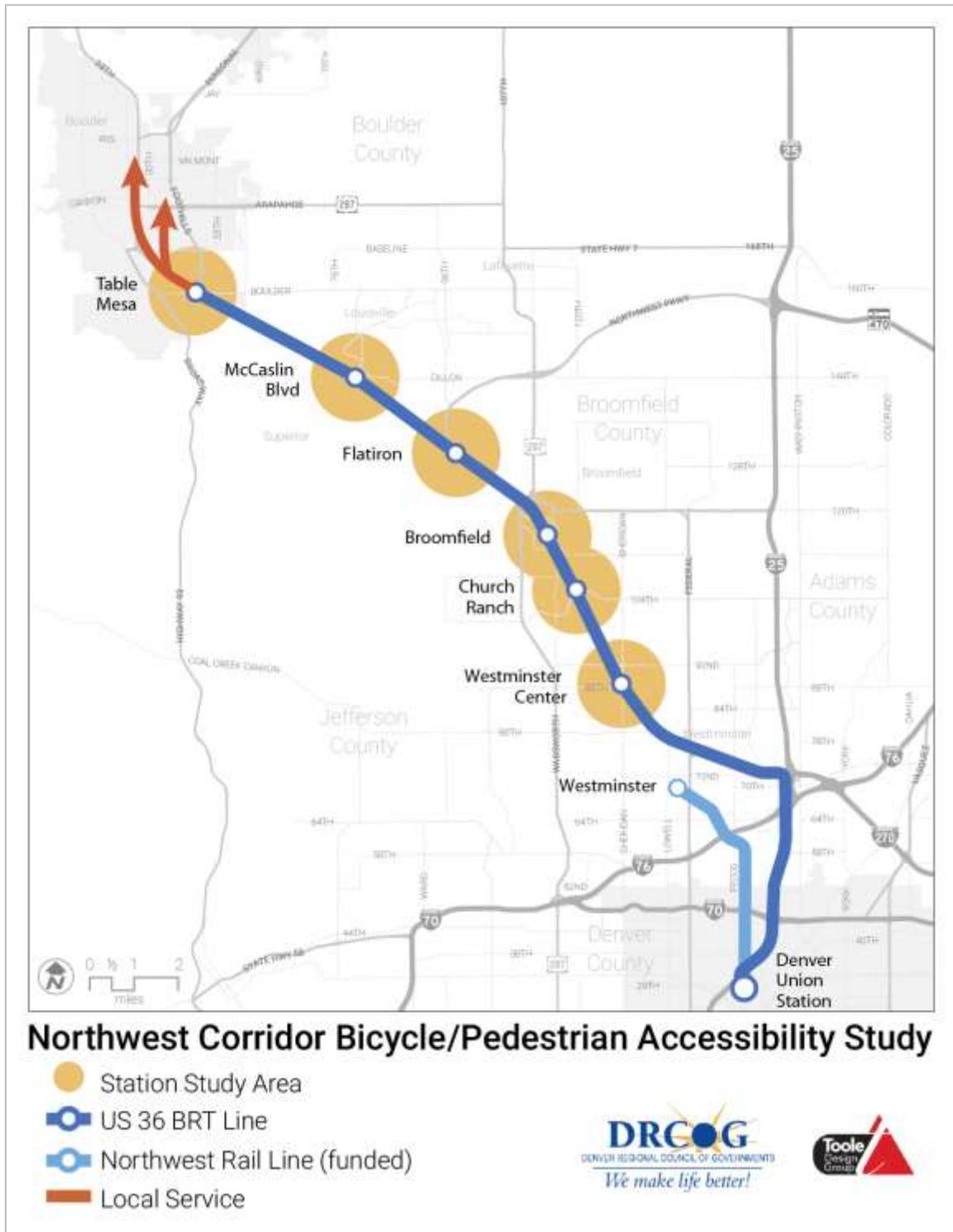


Figure 1 Location Map and Study Area

Background

This report builds upon the previous planning work completed by 36 Commuting Solutions for the US 36 Corridor.

US 36 BRT

US 36 BRT service is part of RTD's FasTracks voter-approved, multi-year comprehensive plan to expand rapid transit service in the Denver metro region. The US 36 BRT Line includes 18 miles of BRT service that connects Denver's Union Station to Boulder, passing through Westminster, Broomfield, Superior and Louisville. The US 36 BRT Line includes six stations: Westminster Center, Church Ranch, Broomfield, East Flatiron Circle, McCaslin, and Table Mesa. The US 36 BRT project is a joint partnership between RTD and CDOT. The RTD FasTracks program includes two phases of BRT implementation.

Phase 1

Phase 1 included \$19 million in improvements, such as adding bus slip ramps and access improvements to RTD Park-and-Rides at US 36 and McCaslin, US 36 Church Ranch, and US 36 and Broomfield. These projects are complete.

Phase 2

Phase 2 includes \$141.5 million in RTD funds for the implementation of BRT on US 36. The US 36 RTD FasTracks program calls for adding BRT elements such as: shared use of the new US 36 Express Lanes, branded vehicles, high frequency service, pre-paid fare collection via kiosks, Programmable Information Displays (PIDs) to provide riders with real-time bus arrival information, station design enhancements, and a BRT service identity. Phase 2 will also include the extension of the US 36 Bikeway.

First and Final Mile Study

The "first and final mile" refers to the part of a transit trip at the start and/or end of the journey – the part of the trip that connects a transit user to/from the station and their origin or destination. The US 36 Corridor exhibits suburban land use patterns such as single land uses connected by larger arterial roadways, which are designed and built primarily for people traveling in cars. This land use pattern can make it difficult, intimidating, and sometimes unsafe to travel between the transit stations and nearby origins/destinations by walking or bicycling. To address this, the First and Final Mile Study¹ identified suitable options to better connect transit riders to and from the US 36 BRT stations to the surrounding activity centers.

¹ US 36 First and Final Mile Study. 36 Commuting Solutions. February 2013. Please note that the study did not include the Westminster Rail Station.

The study identified the following eleven strategies to address first and final mile connections at the six BRT stations between Westminster and Table Mesa:

1. Secure overnight bicycle parking.
2. A mobile app to plan multimodal trips.
3. Transit supportive land use policies.
4. Branded wayfinding and signage.
5. Bicycle share.
6. Private car share (e.g., eGO, ZIP Car, Occasional Car, electric vehicle car share, etc.).
7. US 36 real-time transit tracker.
8. B-cycle membership cards (valid in Denver and Boulder currently).
9. EcoPasses.
10. Peer-to-peer car share.
11. Commuting buddy system (e.g., Bicycle Buddy, Transit Buddy, etc.).

The study prioritized these strategies in terms of their ability to increase the convenience of public transit and reduce Single Occupant Vehicle (SOV) travel to each BRT station. Bicycle share was not highly recommended due to the challenges of implementing a seamless system across a large geographic area, but further study was recommended.

Scope of Work

This report introduces the concept of bicycle share and provides bicycle share recommendations for each transit station in the corridor. To complete this task, data was collected and analyzed from site visits and a stakeholder workshop conducted by the project team in October 2014. Additional data was provided by RTD, 36 Commuting Solutions, and the U.S. Census. The project team worked closely with local jurisdictions along the corridor to identify the key activity centers, goals for bicycle share, and recommended technologies for each station area. The key stakeholders and local jurisdictions included members of the Corridor Working Group: DRCOG, RTD, 36 Commuting Solutions, Adams County Housing Authority, City and County of Boulder, Town of Superior, City of Louisville, City and County of Broomfield, City of Westminster, and CDOT.

Bicycle Share

Bicycle share is a service in which bicycles are made available for shared use on a short-term basis. For automated bicycle share systems in other U.S. cities, these short-term, point-to-point trips typically last between 15 to 20 minutes and are one to three miles long.² Generally, the system is accessed through low-cost subscriptions ranging from a few dollars for a one day membership to between \$50 and \$100 for an annual membership. Bicycle share systems have been implemented in numerous cities across the country including the Colorado cities of Denver, Boulder, and Aspen. Other cities are planning bicycle share systems and are looking to tap into the benefits of providing expanded mobility options, a means to rapidly increase participation in bicycling, and a way to expand the reach of transit.

Why Are Cities Embracing Bicycle Share?

Bicycle share systems are becoming more popular in the U.S., with over 40 systems now operating, 13 of which were added in 2013 alone.³ Bicycle share is a high profile, fast, and relatively inexpensive way to enhance a city's transportation infrastructure and to offer an effective first- and final- mile solution to support large-scale transit investments. Compared to other major transportation investments, bicycle share offers a high return on investment. For example, \$10 million could purchase:

- 0.02 miles of heavy rail/subway;
- 0.1 miles of light rail;
- 0.5 miles of streetcar;
- 1 mile of road; or
- A 2,000 bicycle/200 station bicycle share system that could be implemented in 12-18 months (note: this would be larger than the entire Minneapolis-St. Paul system, which has 170 stations).⁴

Cities are choosing to implement bicycle share due to its short implementation time frame and low costs, but also because of its ability to:

- Increase mobility options;
- Complement transit, walking, driving, and other modes;
- Spur spontaneous bicycle trips (bicycle share is a fast way to increase riders on the bicycle network);
- Reduce traffic and parking congestion; and
- Encourage environmental, social, economic and health benefits.

² *Bicycle Sharing in the United States: State of the Practice and Guide to Implementation*. Federal Highway Administration. United States Department of Transportation. September 2012.

³ Malouff, Dan. "Here are America's largest bicycle sharing systems in 2013." Greater Greater Washington, 6 Jan 2014. Web. 9 October 2014. <http://greatergreaterwashington.org/post/21260/here-are-americas-largest-bicyclesharing-systems-in-2013/>

⁴ "Our Story." Nice Ride Minneapolis. Web. 9 October 2014. <https://www.niceridemn.org/about/>

Goals for Bicycle Share along the US 36 Corridor

At a stakeholder workshop held in Westminster on October 20, 2014, the project team presented four main bicycle share technologies, draft goals for bicycle share along the corridor, and key markets at each station (see Attachment A for a workshop summary). The workshop was followed by an online survey that asked stakeholders for their opinions on the advantages and disadvantages of each technology and the following key questions:

- If bicycle share were to be implemented along US 36, what would you like it to achieve?
- Is one coordinated bicycle share solution needed for the corridor?
- For what trips would bicycle share be used within the US 36 Corridor?

Stakeholders were also asked to identify the five top destinations and activity centers that might be good candidates for bicycle share near each transit station.

Using feedback from the meeting and the follow-up survey, the project team determined that bicycle share along the US 36 Corridor should first and foremost complement and extend transit and support commuting trips. Other, lower priority goals were also identified. The following list ranks the top seven goals as identified from stakeholder input:

- 1. Complement and extend the reach of transit.**
- 2. Support commuting trips.**
- 3. Grow bicycling in the corridor.**
- 4. Support economic development.**
- 5. Ensure accessibility for all socioeconomic groups.**
- 6. Support casual and recreational trips (non-commuting).**
- 7. Attract tourists and visitors to the corridor.**

These goals were considered in deciding what types of bicycle share systems may be appropriate at each station.

Stakeholders identified that, in general, a single bicycle share technology is not necessarily required for the entire system. However, they acknowledged that there are some advantages to providing one coordinated bicycle share technology solution, such as a consistent user experience, inter-operability between areas, and simplified operations. Stakeholders expressed interest in smart bike systems for their flexibility, relative low-cost, and ability to serve a wide-range of users.

Stakeholders also stated a desire for coordinated management of bicycle share systems, especially due to the overlapping jurisdictions between station areas.

Bicycle Share Technologies

Four primary categories of bicycle share technology were considered for the US 36 Corridor: bicycle libraries, employer-owned bicycle fleets, smart bike, and smart dock systems. **Table 1** provides a high-level overview of each technology type and a brief summary of the advantages and disadvantages of each. Detailed descriptions and case studies of these systems follow **Table 1**.

Table 1 Summary of Bicycle Share Technologies

Type	Characteristics	Advantages	Disadvantages	Examples
Bicycle Library	<ul style="list-style-type: none"> •Low-technology systems, often using refurbished bicycles that require staff to check bicycles in and out •Bicycles can be rented by anyone 	<ul style="list-style-type: none"> •Inexpensive bicycle share option •Maintenance costs are generally low •Allows for longer term rentals •Allows for a variety of bicycle types •Interaction with staff provides person-to-person communications and an opportunity for other messaging 	<ul style="list-style-type: none"> •Limited, fixed locations •Requires staff (either unpaid volunteers or paid workers) to check out bicycles •More difficult to provide extensive geographic coverage •Rentals limited to the time period the library is open 	<ul style="list-style-type: none"> •City of Fort Collins Bicycle Library •Northeastern University
Employer-provided Bicycle Fleet	<ul style="list-style-type: none"> •Low-technology (like bicycle libraries) or high-technology (like smart bike or smart dock systems) bicycle fleets made available to employees 	<ul style="list-style-type: none"> •Relatively inexpensive to set up depending on the level of technology •Private setting maintains control and accountability 	<ul style="list-style-type: none"> •Not available for public use •May require staff to administer the program 	<ul style="list-style-type: none"> •Nike •Google •Facebook •Mozilla
Automated “Smart Bike” System	<ul style="list-style-type: none"> •A fleet of bicycles with automated payment, locking, and other features built onto the bicycle allowing any user to check out a bicycle and drop it off anywhere in the service area 	<ul style="list-style-type: none"> •Less expensive than smart dock bicycle share •Offers more flexibility for where bicycles can be locked •Utilizes existing bicycle parking infrastructure such as bicycle racks •Automated system available any time 	<ul style="list-style-type: none"> •Relies on cell phone and internet to access the system •Locating bicycles is less reliable without fixed stations •Technology is still largely untested •Less visible than smart dock systems •Fewer sponsorship opportunities 	<ul style="list-style-type: none"> •Phoenix (planned) •State University of New York at Buffalo •Yale Bicycle share Program
Automated “Smart Dock” System	<ul style="list-style-type: none"> •A fleet of bicycles docked at stations that feature automated check-out •Bicycles can be checked out by anyone and returned to any station in the system 	<ul style="list-style-type: none"> •Easy to find locations •Electric or in-person access at the stations •Scalable and can be financed (partly) through sponsorship •Stations are made up of interconnected docks that are modular, solar powered, and make use of wireless communications •Automated system available any time 	<ul style="list-style-type: none"> •Most expensive system type (\$40-\$50K per station) •Requires extensive coordination with City or jurisdiction to implement stations 	<ul style="list-style-type: none"> •Denver B-cycle. •Nice Ride Minnesota (Minneapolis and St. Paul, MN) •Capital Bikeshare (Washington, DC) •Divy (Chicago, IL)



Bicycle Libraries

Bicycle libraries are central locations where a fleet of bicycles is made available for check-out. Bicycle libraries typically use refurbished bicycles and are staffed by people who manage bicycle rentals and repairs.

Advantages

One of the biggest advantages of bicycle libraries is their accessibility. Bicycle libraries are open to anyone and do not require credit cards, cell phones, or other technology to check out a bicycle. Additionally, bicycle libraries tend to have flexible rental lengths (half day, full day, etc.), which allows for libraries to be tailored to a specific rental market.

Bicycle libraries tend to get the most use from visitors or transient populations (such as students that may not have a bicycle when they move to campus). For this reason, bicycle libraries have had the greatest success in tourist areas where visitors benefit from the one-on-one experience of talking to a staff member about the best routes and destinations or university campus settings where students can check out a bicycle for the semester.

Disadvantages

Bicycle libraries are centrally located and must be staffed (either through unpaid volunteers or paid workers) which limits where and when bicycles can be checked out. These systems do not as easily serve spontaneous or one-way trip-making and serve more as a rental service than a transportation system.

Cost

Bicycle libraries are a low cost bicycle share option. The main costs include the bicycles themselves, a physical space for the bicycle library, and staff to refurbish, maintain, and manage the library. Many bicycle libraries reduce their overhead costs by using refurbished or donated bicycles, utilizing donated or reduced-rent space, and using volunteers (at least partially) to operate the library.

The Fort Collins Bicycle Library operates a fleet of approximately 200 bicycles at five locations with donated physical space, refurbished bicycles, a paid director, and volunteer staff at a cost of approximately \$80,000 per year.

Case Study: Fort Collins Bicycle Library

The Fort Collins Bicycle Library is one of the most successful bicycle libraries in the U.S. Since April 2008, the program has grown from 50 to 200 bicycles and has recorded over 23,000 bicycle check-outs by over 18,000 riders.⁵

The Bicycle Library is open between April and mid-December and allows residents and visitors to check out a bicycle from any of their five locations and return them at any of the six drop-off locations.⁶ The bicycles are usually refurbished and do not have consistent branding (like a color or sticker) which keeps costs low.

To rent a bicycle, one can walk up to a library location or make a reservation online, complete a waiver form either online or in person, and put down a \$150 deposit. It costs \$10 per day to rent a bicycle, however, if the bicycle is returned before closing to the same location from which it was rented, the rental fee is waived. The library is staffed by employees and volunteers who provide safety information, helmets, maps, and locks along with bicycle check-outs.

The program is managed by the City and operated by Bicycle Fort Collins, a 501(c)(3) non-profit. Since 2008 the program has been funded by two Congestion Mitigation and Air Quality (CMAQ) grants as well as in-kind donations from the Downtown Development Authority (DDA), the City, and other community partners.



Figure 2 Fort Collins Bicycle Library

Source: Fort Collins Bicycle Library

⁵ Annual check-outs increased from approximately 1,500 in 2008 to 4,600 in 2013.

⁶ Locations, accessed online, October 9, 2014. <http://www.fcbicyclelibrary.org/locations.php>

Employer-Provided Bicycle Fleets

Employer-provided bicycle share systems are private fleets of bicycles available to employees to use. There are varying levels of system sophistication within this category of bicycle share. For example, an employer-provided bicycle fleet can function as a low-technology bicycle library for employees or it can provide fully automated bicycle check-out similar to smart bike or smart dock systems (see below). The commonality is that the bicycle fleets are generally housed on a private campus and are for private use only.

Advantages

Employer-provided bicycle fleets allow for flexibility of bicycle system choice. For example, employer-provided bicycle share can be regular bicycles provided in a manner similar to a bicycle library where a staff member is assigned to check bicycles out, or employees may sign up for the program and be given access to the program (e.g., provided a PIN code to unlock the bicycles or a bicycle room, or could be fully automated, but available only to employees). The

bicycle fleet may also be branded, such as the Firefox bicycle fleet pictured in **Figure 3**.



Figure 3 Mozilla Bikes

Source: Bikes Make Life Better

An advantage of employer-provided bicycle fleets is that they are directly provided to employees within an organization and can be promoted through existing health and wellness and other corporate programs. These programs are often subsidized by the employer such that it is free for employees to use the system.

Disadvantages

Employer-provided bicycle fleets are not publicly available which limits their impact on the number and variety of riders they would each along the corridor. Some employer-provided bicycle fleets are less flexible than other bicycle share options because all bicycles must be returned to the worksite and need a separate lock to lock the bicycle at a different destination. These systems can also be limited in the type of trips they can serve, i.e., they serve an employee when they are at work, but unless that employer provides a station of bicycles at a transit station, fleets cannot be used to make the trip from the station to and from work.

Cost

The cost varies greatly depending on the type of system implemented. For example, fleets that entail refurbished bicycles stored in a secure area are the least expensive to develop while a high-technology system would be significantly more expensive to implement. 36 Commuting

Solutions provides a guide to employers for how to set up an employer-provided bicycle share system that includes a simple cost estimating tool.⁷ Depending on the options selected, this could range anywhere from \$250 to \$1,000 per bicycle. Automated options, such as the system offered by Zagster, cost between \$100 and \$150 per bicycle per month. Under this model, Zagster supplies the bicycles, works with local bicycle shops to maintain them, and provides the software to manage the fleet.^{8,9}

Case Study: Google

The Google Bikes program began in 2007 when the company purchased 100 blue bicycles as an experiment at their headquarters in Mountain View, California. The bicycles were popular, and Google has since expanded their fleet to 1,300 multi-colored bicycles that are each ridden approximately 1,000 miles each year (see **Figure 4**).¹⁰

Bicycles are available for employees to travel between buildings and within campus but may be taken off campus, as well. Brendon Harrington, Google's transportation operations manager, says "We just want to make it as easy as possible to get between buildings. We don't want to have to swipe a badge or sign a waiver." For this reason, bicycles are scattered throughout the campus and are not locked. This accessibility, coupled with the Google Campus' low traffic volumes and bicycle infrastructure, contributes to the system's success.

A staff of seven people operates the system and maintains the bicycles.

⁷ <http://36commutingsolutions.org/us36/wp-content/uploads/Employer-Bike-Sharing-Program-Toolkit.pdf>

⁸ Weese, Evan. "Easton partners with Zagster for bicycle-sharing program." *Columbus Business First*. 24 June 2014. Web. 13 October 2014. <http://www.bizjournals.com/columbus/news/2014/06/24/easton-partners-with-zagster-for-bicycle-sharing.html?page=all>

⁸ Minimum fleet size unknown.

⁹ Garthwaite, Josie. "A New Model: Cycle Hire, for Hire." *New York Times*. October 18, 2012. Accessed 11 November 2014 at http://green.blogs.nytimes.com/2012/10/18/a-new-model-cycle-hire-for-hire/?_r=0

¹⁰ McMillan, Robert. "Inside the Cycleplex: The Weird, Wild World of Google Bikes." 25 April 2013. Accessed 4 October 2014. <http://www.wired.com/2013/04/google-bikes/all/>



Figure 4 Google Bikes

Source: Business Insider

Case Study: Zagster at General Motors

General Motors' (GM) Warren Technical Center in Warren, Michigan has a small fleet of 50 smart bikes to enable its 19,000 employees, tenants, and guests to bicycle between buildings on the main campus and to off-campus sites.¹¹ The bicycles are available at seven stations on the campus with six more stations under consideration.¹²

To use a Zagster bicycle, members must do the following (see **Figure 5**):

- Register for the system
- Locate an available bicycle using the smartphone app
- Use the provided PIN code to open the attached lockbox (with a key inside),
- Use the key to unlock the bicycle.

Using the bicycle lock and lockbox, the user may make multiple stops while they have the bicycle checked out, however, the bicycle must be returned to one of the seven stations on campus.

¹¹ Higgins, Tim. "GM Turns to Employee Bicycle share Program to Get Around Campus." *Bloomberg*. 26 August 2014. Web. 14 October 2014. <http://www.bloomberg.com/news/2014-08-26/gm-turns-to-employee-bicycle-share-program-to-get-around-campus.html>

¹² Ibid.



Figure 5 How Zagster Works

Source: <https://account.zagster.com/howitworks>

Automated Smart Bike Systems

Automated smart bike systems include a fleet of bicycles with independent locks and other technology fitted to the bicycle so that it can be picked up and dropped off anywhere within the service area. The model is similar to the Car2Go car share service and allows more flexibility for providing bicycle share in areas that traditional citywide bicycle share systems could not reach.

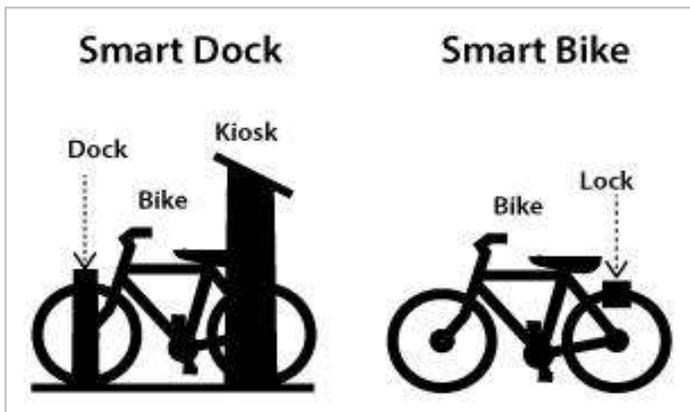


Figure 6: Smart Dock and Smart bike Systems

Source: Inventropolis.com

Smart bike technology is different from the more traditional smart dock technology because the technology is housed on the bicycle itself (rather than at a station). Smart bikes still require regular maintenance and management. To make bicycle maintenance easier for the company, there is often a financial incentive provided to return bicycles to a “station area” (or a specific bicycle rack).

Informal station areas can be created using “geofenced” hubs where users are encouraged to return their bicycles. This informality of creating station areas lend itself to high adaptability of the system (e.g. station areas can be modified with new developments or other land use changes). Choosing smart bike station areas should be completed with the implementation of the smart bike systems.

Advantages

Automated smart bike systems provide flexibility by having an independent lock on the bicycle. Smart bikes can be rented from and returned to anywhere within a service area and are not limited to docking stations.

Disadvantages

Smart bikes are a relatively new bicycle share option that has yet to be implemented in a large-scale metropolitan setting. For this reason, there are a number of uncertainties about the performance of these systems and the maintenance and operations costs involved for these types of programs.

Smart bike systems provide greater flexibility but less reliability than smart dock systems due to the user certainty about available bicycles at docking stations. Because smart bike systems lack traditional station areas, they offer less visibility than smart dock systems. They also have fewer branding and sponsorship opportunities (which can potentially affect the system's financial viability).

Smart bikes may be more challenging to rebalance and service because each bicycle has to be found and loaded for service individually (although this is facilitated with GPS technology), which is more time consuming than locating station-docked bicycles.

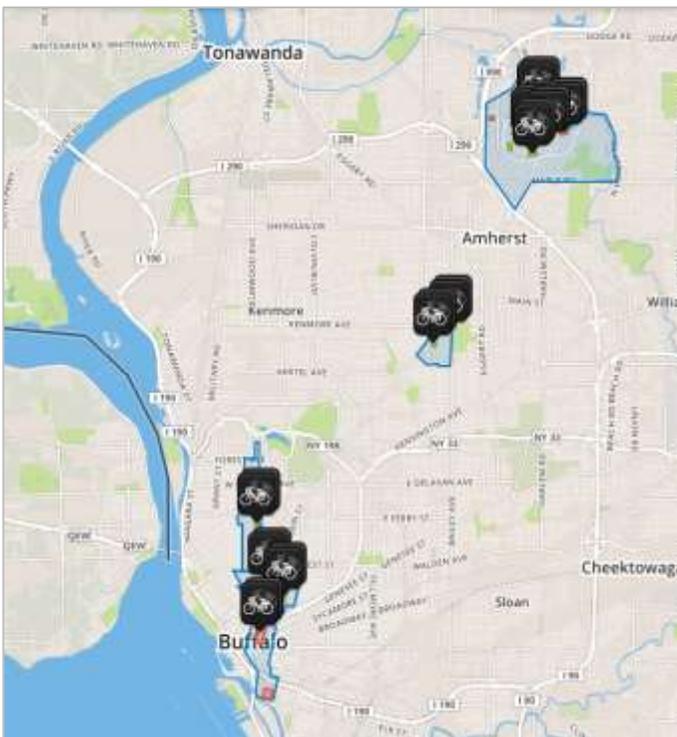


Figure 7: Bicycle Availability in Buffalo, NY

Source: <http://buffalo.socialbicycles.com/>

Cost

Smart bike systems are less costly than smart dock systems with recent estimates suggesting a capital cost of approximately \$2,000 per bicycle. It is uncertain how much these systems cost to operate.

Case Study: State University of New York at Buffalo

Buffalo BikeShare is a 65-bicycle smart bike system that includes Downtown Buffalo and the State University of New York campus in Buffalo, New York. When the program started in 2013, it was only available only to students. However, now membership is available to off-campus subscribers, as well.

Members pay an annual enrollment fee and are provided with up to 60

minutes of free riding time each day. Beyond the initial free hour, it costs \$3 per additional hour. Riders can lock the bicycles anywhere in the system, however, to encourage users to return bicycles to common locations, the bicycles are fitted with a GPS unit and the system set up with 16 “geofenced” hubs that act as stations where it is encouraged users return the bicycles. There is a \$5 fee each time a bicycle is locked outside of a hub area.

Bicycles can be reserved on a mobile app, website, or the keypad of the bicycle. Each user is given a four-digit PIN to unlock the bicycle. To end a trip, a user simply locks the bicycle to a rack using the provided lock. To date, over 350 users have signed up for the program and taken over 8,000 rides.¹³

Automated Smart Dock Systems

Automated smart dock systems are the most popular type of bicycle share system in the U.S. These systems provide a network of stations and a fleet of bicycles for short-term use. The locking mechanism and other technology is housed at the station or docking point, not on the bicycle.

Advantages

Automated smart dock systems offer high-visibility stations that make it easier for users to reliably find a bicycle which encourages spontaneous trips. Mobile apps and real-time websites for smart dock systems allow users to see available bicycles and open docking points.

Additionally, both stations and bicycles provide a visible presence that helps to promote the program and provide branding and sponsorship opportunities. Smart dock systems are ideal for

areas with fixed destinations, e.g., at major transit stations, or in areas where there is a mixture of land uses to generate users throughout the day.



Figure 8 Denver B-cycle Rider

Disadvantages

Smart dock systems offer less flexibility than smart bike systems in that users are limited to a set number of stations provided at specific locations. As such, smart dock systems serve a smaller number of destinations. Access to the system is gained via the internet or at the stations themselves, but requires a credit card. Smart dock systems are more expensive and require more time to implement (due to siting, permitting, and construction) than other bicycle share options.

¹³ Buffalo BikeShare website. Accessed November 10, 2014 at <http://buffalo.socialbicycles.com/#memberships>

Cost

Smart dock systems cost approximately \$40,000 to \$45,000 per station, which typically include 10 bicycles and 17 docking points. Operating costs vary between systems depending on whether they are operated privately or by a non-profit.

Case Study: Denver B-cycle

Denver B-cycle was the first large-scale municipal bicycle share system in the U.S. that opened in 2010.¹⁴ The system is operated by Denver Bike Sharing, a 501(c)(3) non-profit. Their system includes 700 bicycles and 84 stations distributed throughout central Denver, including at locations geared toward daily users (such as in residential areas) as well as areas frequented by tourists (such as the Convention Center, REI store, and Denver Union Station).

Denver B-cycle's 24-hour memberships cost \$8 each while annual passes cost \$80 each. All rides over 30 minutes incur charges, regardless of the membership type. In 2013 there were 51,100 24-hour memberships and just over 4,000 annual memberships purchased.¹⁵ The B-cycle system costs approximately \$1.96 million to operate each year.¹⁶

Technology Compatibilities

As noted earlier in the report, cities along the US 36 Corridor are not limited to one bicycle share system. There is an opportunity to implement different bicycle share technologies at each station area along the Corridor. For example, a city could provide a smart dock bicycle share system to serve commuter trips but also offer a bicycle library to check out bicycles to visitors. While multiple bicycle share systems may be implemented, thoughtful planning will be required to avoid confusion or conflicts among users.

Generally, bicycle share technologies work well together, however there are a few exceptions, as shown in **Table 2**.

¹⁴ What is Denver B-cycle? <https://denver.bcycle.com/WhatisDenverBcycle.aspx>

¹⁵ Denver Bike Sharing. 2013 Annual Report.
http://denverbikesharing.org/AnnualReports/DBS_2013_Annual_Report.pdf

¹⁶ Ibid.

Table 2 Technology Compatibility Matrix

	Bicycle Library	Employer-Provided Bicycle Fleet	Automated “Smart Bike” System	Automated “Smart Dock” System
Bicycle Library				
Employer-Provided Bicycle Fleet				
Automated “Smart Bike” System				
Automated “Smart Dock” System				

As shown above:

- Smart bike and smart dock technologies are not compatible due to the proprietary nature of the technology.
- Employer-provided bicycle fleets are generally not compatible with other employer-provided fleets because each system is provided for private employee use only.¹⁷

¹⁷ Ibid.



Transit Integration

There are varying levels of bicycle share-transit integration that may be as simple as physically locating bicycle share stations near transit stations or as complicated as providing a single fare card for use on both systems. **Figure 9** shows levels of bicycle share integration.

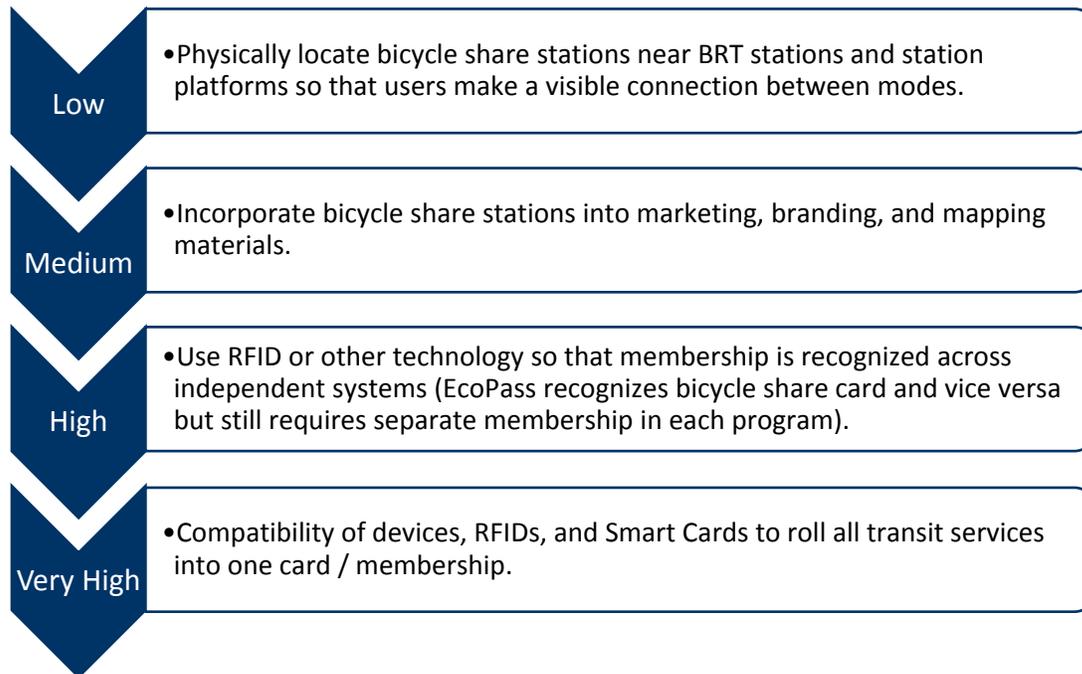


Figure 9 Bicycle Share Integration

The first two levels (Low and Medium) of integration are relatively simple to implement, however, no bicycle share systems in the U.S. currently provide integrated ticketing or membership (High and Very High). A model system in Guangzhou, China has successfully integrated bicycle share into its BRT service and allows passengers to use a single card to pay for both systems.¹⁸

Barriers to more detailed bicycle share-transit integration are often technological (such as sharing proprietary information, compatibility of technology and software platforms, etc.) or institutional (such as leadership for the process, revenue sharing, prioritization, etc.). Membership or payment integration would require institutional collaboration between bicycle share equipment vendors and system operators, between the local and regional jurisdictions, and between operators and RTD.

¹⁸ US DOT. "Frequently asked Questions and Answers concerning Bike Sharing Relative to the United States Department of Transportation" June 14 2014. Accessed October 4, 2014.

http://www.fta.dot.gov/documents/Informal_Q_and_As_Final_6-14-12.pdf

System Planning

Each station area was analyzed to understand its characteristics, nearby destinations, and activity centers as to determine what bicycle share technologies would be appropriate at each location. Stakeholder feedback gathered at the October 2014 workshop and through an online survey indicated that a single coordinated bicycle share system is not needed for the corridor due to each station area's unique characteristics and the Corridor's large geographical area.

The following analysis provides key characteristics, activity centers, and recommended bicycle share technologies for each station area.

Westminster Center BRT Station/Westminster Rail Station

Key Characteristics

- The Westminster Center BRT Station is located at the intersection of Sheridan Boulevard and US 36. It is directly adjacent to a concentration of commercial land uses surrounded by residential land uses. There are a number of multi-family apartment complexes within approximately 1 mile of the station but is otherwise dominated by single-family residential uses.
- Roughly 1 mile northwest of the station is the Farmers High Line Canal Trail which provides off-street access to open spaces and residences north of Westminster Center BRT Station.
- The future Westminster Rail Station will be located at the southeast corner of the intersection of 71st Avenue and Irving Street and is approximately 2.5 miles southeast of the Westminster Center BRT Station.

Westminster Center BRT Major Activity Centers

- The Westminster City Hall campus, Police Department, and Center Park are located approximately ½ mile northeast of the station.
- The Westminster Mall site is a former shopping mall undergoing redevelopment. The 105-acre site will offer mixed-use, high-density spaces to live, work, and play, including retail shopping, offices, hotels, residential and parks/gathering places. This development will be The Westfield Shopping Center, which includes mostly large retailers such as Whole Foods Market, Walmart, and Sports Authority, is approximately ½ mile north.
- Several apartment complexes, such as the Toscana, Sunset Ridge, Sandpiper, Castlegate, Wadsworth, and Vance Apartments, are located in a ½ to 1 mile arc south, southwest, and west of the station (see the "Multi-family Residential Density").
- St. Anthony's Hospital, one of the City of Westminster's largest employers is located approximately 3 miles southeast of the station.

Westminster Rail Major Activity Centers

- The Westminster Plaza Shopping Center is located approximately ½ mile north of the Westminster Rail Station and includes a Safeway, Banfield Pet Hospital, and other commercial uses.
- The Hidden Lake Open Space, just south of the rail station, provides outdoor recreation opportunities.

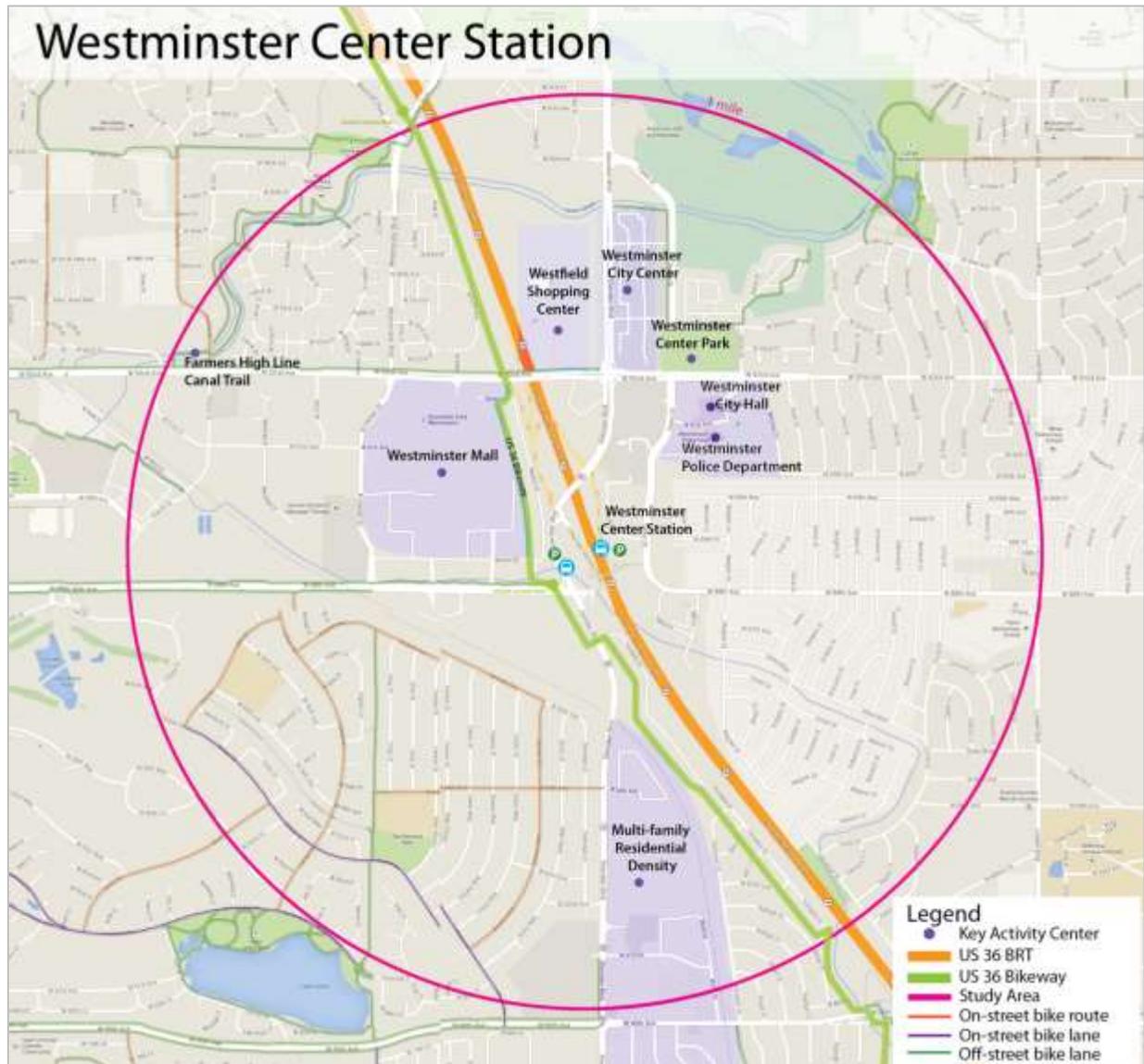


Figure 10 Westminster Center BRT Station Area

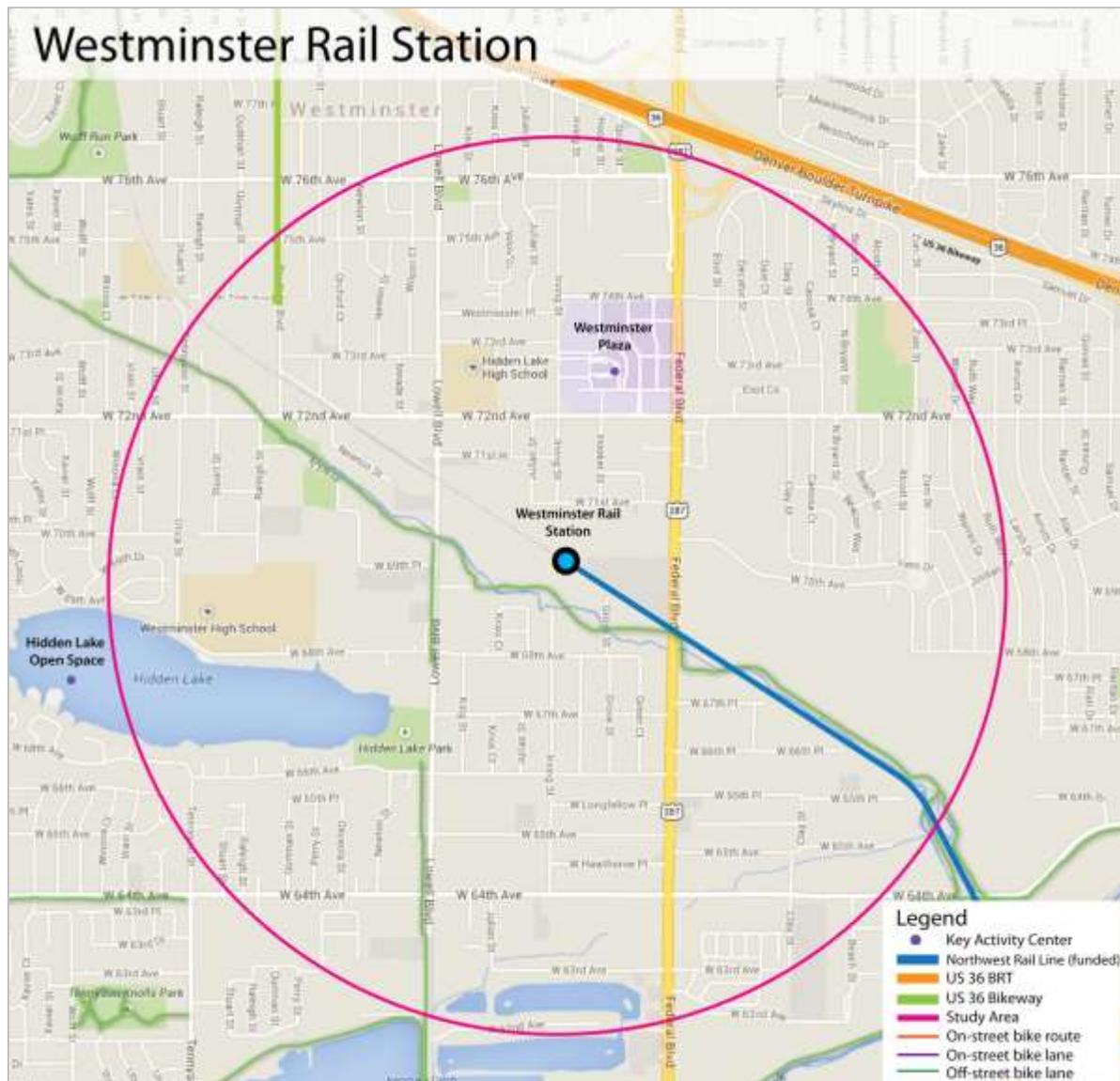


Figure 11 Westminister Rail Station Area

Recommended Technology: Smart Bike System

There are a number of trip destinations within 3 miles of the Westminister Center and the future Westminister Rail Station that would be well served by a bicycle share system. However, the dispersed nature of much of the surrounding area around the two stations makes it difficult and expensive to provide smart dock stations in a way that would cover the major destinations and the local population that primarily lives in single-family, low-density development. As such, smart bike technology may provide more flexibility in dispersed areas with pseudo “stations” developed using specially branded bike racks and geofencing at key destinations such as at the Westminister Center BRT Station, the Westminister Rail Station, the Westfield Shopping Center, St. Anthony’s Hospital, and the apartment complexes in the area.

Church Ranch BRT Station

Key Characteristics

- The Church Ranch BRT Station is located at US 36 and Church Ranch Boulevard in a significant commercial district that includes a two retail malls, restaurants, hotels, and entertainment attractions.
- The station offers some bicycle share potential to visitors with a number of hotels oriented towards business travelers and attractions such as a movie theater, ice rink, Butterfly Pavilion, and Westminster City Park.
- Though there are some multi-family apartment complexes west of the station, the majority of land use around the station is single-family residential.
- The Walnut and Big Dry Creek Trails provide off-street bicycling opportunities and connections to parks, open space, and key destinations.

Major Activity Centers

- The Westminster Promenade is an outdoor pedestrian village located directly east of the Church Ranch BRT Station and includes a variety of restaurants, retail, and entertainment venues including a 24-screen movie theater, ice rink, and bowling center.
- The Shops at Walnut Creek are located across on the west side of US 36 and include a Super Target, restaurants, and smaller retail stores.
- There are a number of hotels within 1 mile of the station including the Westin Hotel, located a ½ mile east of the station, which is geared toward business travelers and conferences. Other hotels include the Drury Inn & Suites, Marriott, Spring Hill Suites, and La Quinta Inn & Suites located approximately a ½ mile southwest of the station.
- There are several local attractions nearby the station including the Butterfly Pavilion located a ½ mile east of the station and Westminster City Park and Recreation Center, located approximately 1 mile east of the station, providing open space and activities for visitors.
- Approximately ½ mile south of the station, the Cleo Wallace Center provides children with residential and community-based psychiatric and behavior care.
- The Church Ranch Corporate Center is located ½ mile south of the station along Church Ranch Boulevard. This Center is business-oriented but also includes apartments, hotels, dining, shopping, childcare, an assisted living facility, a convenience store, service station, and a variety of other amenities.
- Beyond the immediate 1 mile station area, there is a second commercial district at the Church Ranch Boulevard/Wadsworth Parkway intersection that includes several larger retail stores and several multi-family apartment complexes nearby. This commercial district is approximately 1.5 miles west of the station.
- The Front Range Community College has a campus approximately 3 miles northeast of the station.
- Single-family residential land uses make up the majority of land use outside of the above destinations.

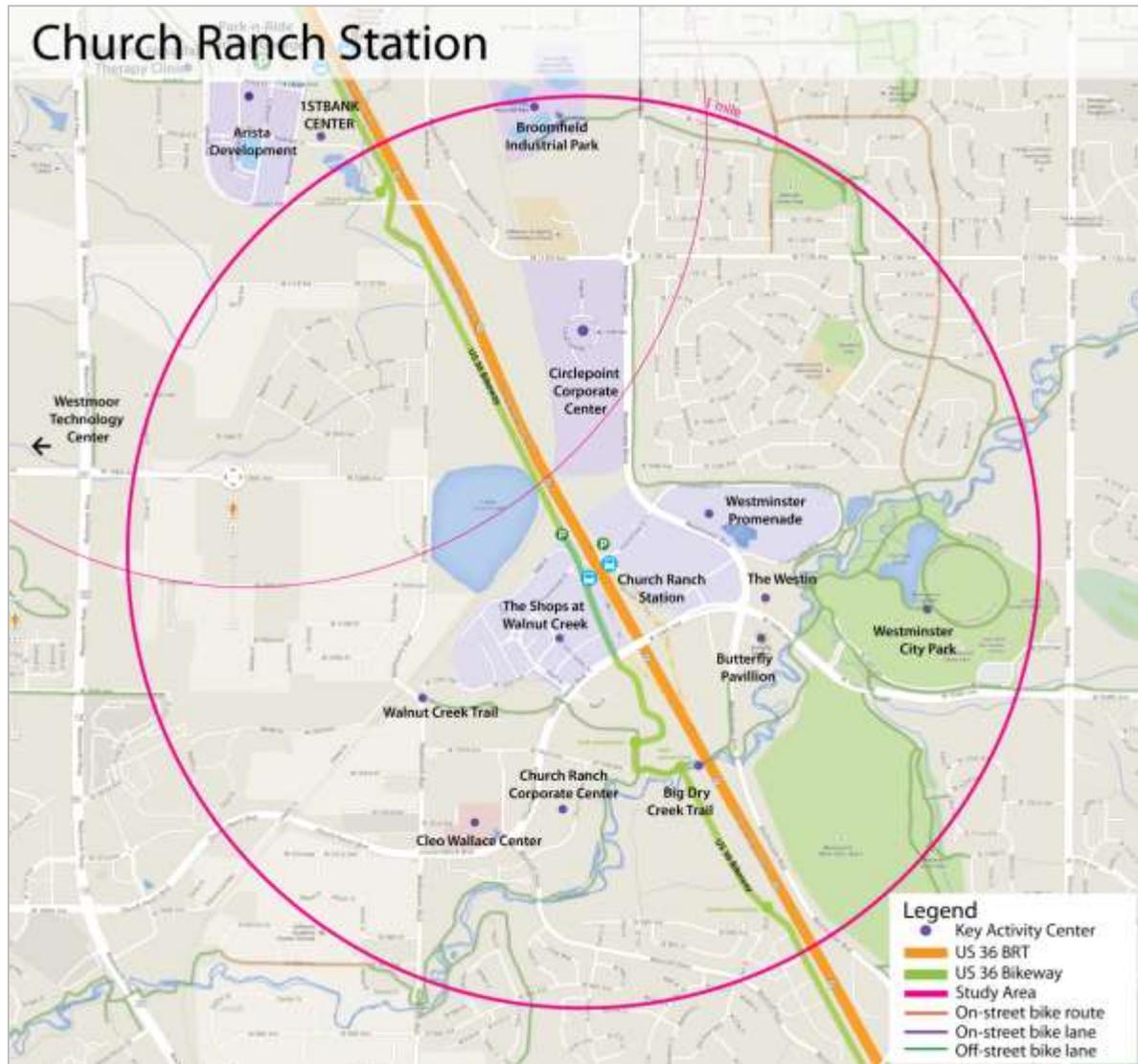


Figure 12 Church Ranch BRT Station Area

Recommended Technology: Hotel-Provided Bicycle Fleets (near-term)/Smart Bike System (long-term)

The majority of attractions are located within walking distance ($\frac{1}{2}$ to 1 mile) of the station and as such the effectiveness of a bicycle share system may be limited. However, despite a close concentration of key activity centers, there may still be potential for a visitor-oriented system that includes the BRT Station, local area hotels, and entertainment attractions such as the Westminister City Park and the Westminister Promenade. For example, hotels could provide bicycle fleets to their guests as a visitor amenity. This would be an easy way for visitors to access the retail, entertainment, and recreational amenities in the area.

Given the number of destinations and the otherwise dispersed nature of the surrounding area, it may be difficult and expensive to provide a smart dock bicycle share system. Therefore, smart bikes may be a more cost-effective way of providing bicycle share with pseudo "stations" developed around key attractions.

Broomfield BRT Station

Key Characteristics

- The Broomfield BRT Station is located across from the 1STBANK CENTER, a concert and entertainment venue, in a mixed-use portion of Broomfield that includes residential and commercial uses.
- Though there are residential and commercial land uses within 1 mile of the station, there is also significant vacant and undeveloped land.

Major Activity Centers

- The Broomfield Urban Transit Village (called Arista) is located directly west of the Broomfield BRT Station and is a new mixed use development consisting of several residential towers, ground floor retail, and the 1STBANK CENTER.
- The Children's Hospital Colorado Therapy Care is located ½ mile west of the station along Arista Place. The 20,000 square foot facility provides pediatric care and serves as a major employer in the station area.¹⁹
- The Broomfield Civic Center, which includes the City Hall, Court House, Motor Vehicle Department, and Public Library, is located approximately 1.5 miles northeast of the station. There are a number of retail and shopping centers in this area as well.
- The Rocky Mountain Metropolitan Airport, used for business and personal travel, is a public airport located 1 mile west of the station.
- One mile southwest of the station is the Westmoor Technology Park which includes ten office buildings and a conference center.
- The Broomfield Industrial Park is located ½ mile east of Broomfield BRT Station and provides pickleball courts, baseball diamonds, basketball courts, open grass areas, playgrounds, and picnic areas.
- The Circle Point Corporate Center includes seven buildings as part of a master-planned office park. It is approximately 1 mile southeast of the station off West 112th Avenue and Westminster Boulevard.
- Other significant employers include Hunter Douglas and Sandoz, Inc. located on Midway Boulevard, located approximately 2.5 miles north of the station, and Brocade Communication Systems and Trimble Navigation, located 3.5 miles southwest of the station.

¹⁹ Children's Hospital Colorado Therapy Care. Broomfield
<http://www.childrenscolorado.org/about/locations/broomfield/therapy-care>

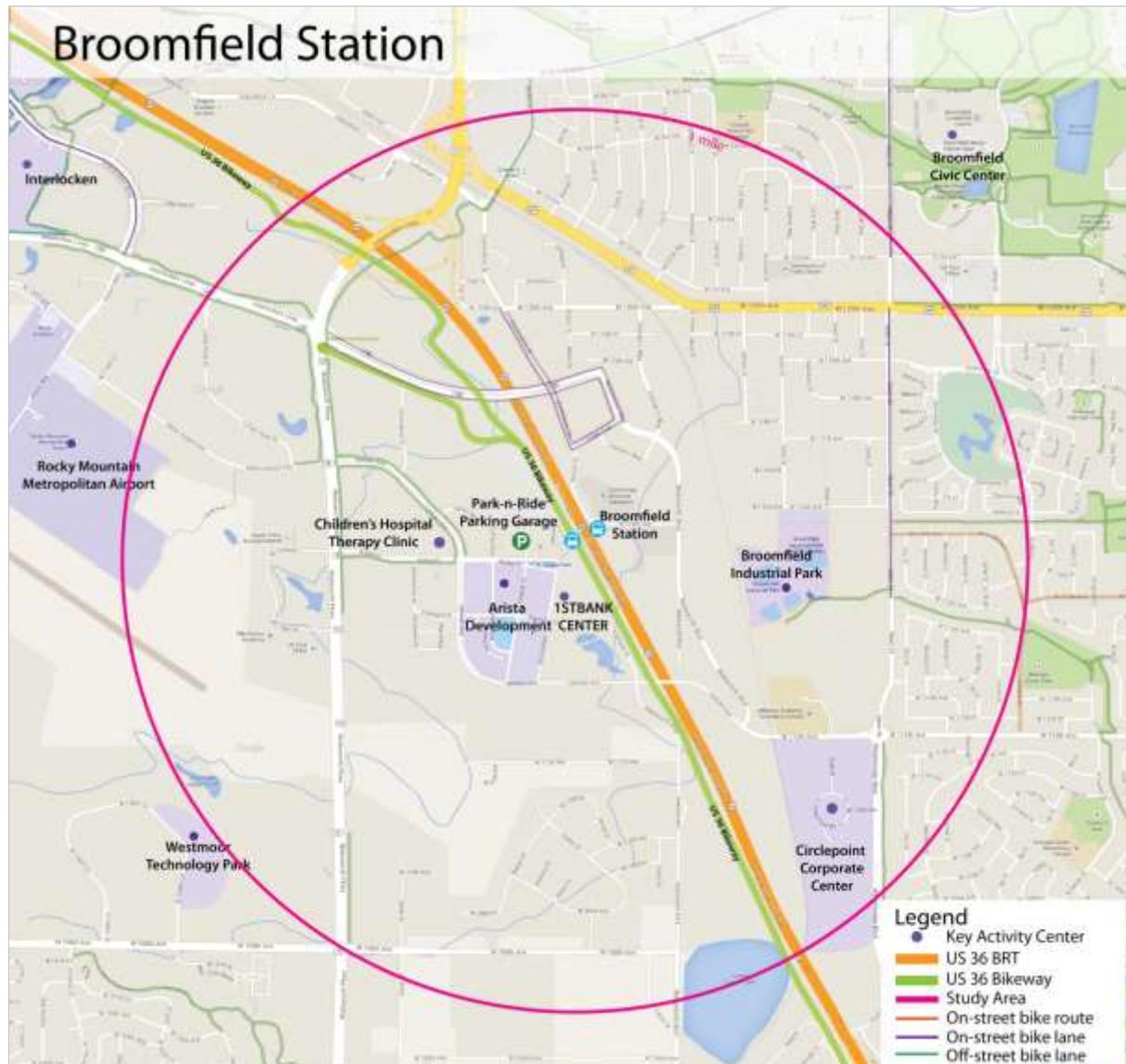


Figure 13 Broomfield BRT Station Area

Recommended Technology: Employer-Provided Bicycle Fleets (near-term) / Smart Bike System (long-term)

The Broomfield BRT Station provides the most potential for bicycle share along the US 36 Corridor. The station is located some distance away from the key destinations, particularly major employment centers, in the area. Therefore, bicycle share is an ideal way to fulfill the first and final mile of travel. It could also be a means of connecting the Arista development and 1STBANK CENTER with the Broomfield Town Center and other retail, restaurant, and entertainment destinations in the region.

In the short term, major employers at the Interlocken Advanced Technology Environment, along Midway Boulevard, at the Westmoor Technology Park, and at the Circle Point Corporate Center should be encouraged to provide bicycle fleets. However, these will have limited effect in filling the last mile transit trip from the station unless there are bicycles available at the station. It is

encouraged that over the long term, a coordinated and automated bicycle share system be implemented with public stations at the Broomfield and Flatiron BRT Stations, the Broomfield Town Center, and other major employment centers to provide an effective first and final mile connection. Given the number of bicycle share stations that would be required, a smart bikes system is recommended.

Flatiron BRT Station

Key Characteristics

- The Flatiron BRT Station is located at the East Flatiron Crossing Drive and US 36 intersection and is within ½ mile of the Flatiron Crossing Shopping Mall. It provides a close connection to the major employers and employment campuses on Interlocken Boulevard, which are between one and two miles from the station.
- Beyond the commercial land uses, there is a small residential development east of US 36 and some single-family residential neighborhoods between 2 and 3 miles west of the station.²⁰
- Northeast of the station is the Carolyn Holmberg Preserve at Rock Creek Farm, a small Boulder County Open Space with trails, picnic tables, and fishing ponds.

Major Activity Centers

- The Flatiron Crossing Mall, located southwest of the Flatiron BRT Station, has over 200 retail shops including a Nordstrom and Macy's, restaurants, and a movie theater.
- Flatiron Marketplace is an older mall just south of the station that is located in an anticipated new urban renewal area (URA).²¹ URAs allow for the use tax increment financing to redevelop run-down areas, fix up infrastructure or attract new businesses or jobs. In the future, mixed-use development is envisioned for this marketplace.
- The Interlocken Advanced Technology Environment is a 963-acre, advanced technology business park located 1 mile south of the Flatiron BRT Station. Interlocken includes several of the largest employers in the City and County of Broomfield,²² including Oracle, Level 3 Communications, Vail Resorts, and Staples.
- The Parkway Circle is a residential development located approximately ½ mile north of the Flatiron BRT Station.
- The Colorado Technology Center (CTC) is a large campus located in Louisville, approximately 1.5 miles north of the station. The CTC is home to several leading

²⁰ As of 2012, there were 11,855 employed within 1 mile of the BRT station, of which only 0.2 percent lived in the station area. From 36 Commuting Solutions' US 36 First and Final Mile Study.

²¹ Quinn, Megan. "Flatiron Marketplace owner expected to breathe new life into Broomfield retail." Broomfield Enterprise. 8 August 2013. Accessed 10 November 2014.

http://www.broomfieldenterprise.com/ci_23852318/flatiron-marketplace-owner-expected-breathe-new-life-into

²² <http://www.broomfield.org/DocumentCenter/View/4246>

manufacturing and high-technology companies including Pearl Izumi, Whitewave Foods, Coherent Technologies, Inc., Comfort Systems USA, Kiosk Information Systems, and Fresca Food.

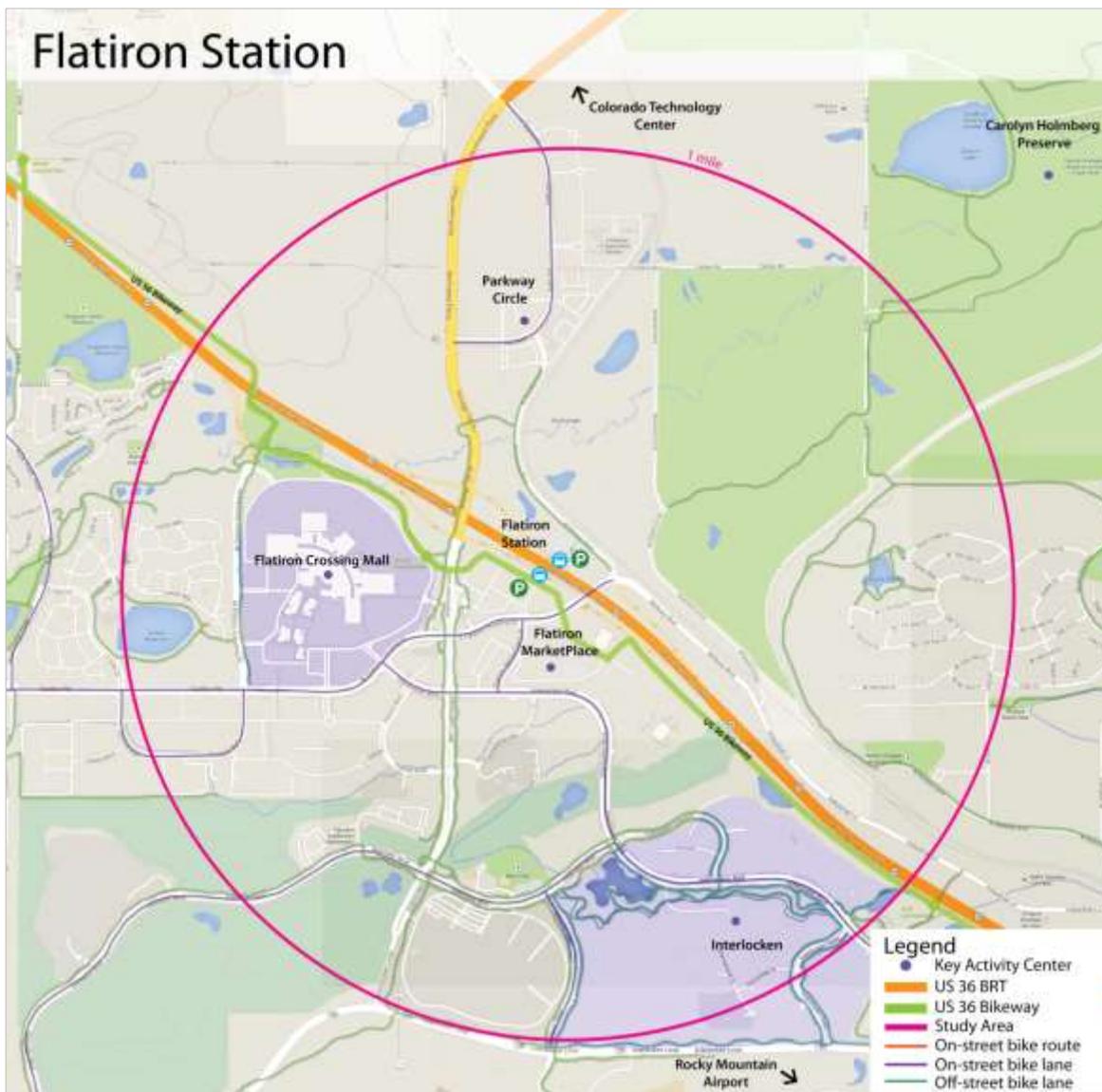


Figure 14 Flatiron BRT Station Area

Recommended Technologies: Employer-Provided Bicycle Fleets (near-term) / Smart Bike System (long-term)

The Flatiron BRT Station could be integrated into one bicycle share system to serve this station, the Broomfield BRT Station, and employees at Interlocken Advanced Technology and the CTC. Bicycle share could also serve future developments in the area, including the pending development of the former StorageTek site in Louisville.

McCaslin BRT Station

Key Characteristics

- The McCaslin BRT Station is immediately surrounded by commercial land uses with single- and multi-family residential land uses to the northeast and southeast of the station. The station area encompasses the Town of Superior and the City of Louisville, thereby providing access to both town centers and some increased residential densities.
- Louisville is consistently ranked as one of the best small towns to live due to its historic downtown (see below), its proximity to trails and open space, and a significant number of employment opportunities. The City's Comprehensive Plan (2013) has designated the station in the McCaslin urban center, which is undergoing further planning as part of the McCaslin Boulevard Small Area Plan. This plan "will provide the required regulatory framework necessary to implement the vision of the Comprehensive Plan for the properties in the McCaslin Urban Center and Urban Corridor" while addressing "specific use and density allowances, building placement, block structure, landscaping, and signage requirements consistent with the urban center and urban corridor patterns envisioned along McCaslin Boulevard."²³
- With Superior's and Louisville's extensive on-street and off-street bicycle network, (like the Coal Creek and Mayhoffer Singletree Trails) coupled with planned improvements (such as the US 36 Bikeway and Davidson Mesa underpass), the McCaslin BRT Station is well suited for bicycling and transit integration.

Major Activity Centers

- The Avista Adventist Hospital is the largest employer in Louisville, located 1 mile southeast of the station. This comprehensive medical center provides a full-range of medical specialties to the Louisville, Broomfield and Boulder area communities. East of the Avista campus is another large employer, the Centennial Peaks Hospital, which offers mental health treatment. With both hospitals located adjacent to the US 36 Bikeway, they are well suited for bicycle access.
- Another major employer in the area is Key Equipment Finance, located approximately 1 mile south of the station along McCaslin Boulevard.²⁴
- The Colony Square Shopping Center, located just north of the station, has a number of restaurants and small service shops.
- Located less than ½ mile southeast of the station are CableLabs and Medtronic. CableLabs is a non-profit research and development consortium focused on cable services while Medtronic is a bio-tech company focused on developing and

²³ City of Louisville. <http://www.louisvilleco.gov/portals/0/Planning/Comp%20Plan/2012-2013compplan/2013%2004%2002%20Table.pdf>

²⁴ "About Key Equipment Finance." Key Equipment Finance. Accessed November 10, 2014. <http://www.keyequipmentfinance.com/>

manufacturing medical device technology and therapies. Both companies are major employers of Superior and Louisville residents.



Figure 15 Superior Town Center Rendering

Source: Superior Town Center

- On August 19, 2014, the Town of Superior’s Board of Trustees voted in favor of an amendment to the approved Planned Development Plan for the Superior Town Center.²⁵ This Amendment sanctions the creation of a pedestrian-oriented Town Center at the southeast corner of the McCaslin BRT Station. The application provided for approximately 157 acres of mixed-use development that will help complete Superior connect Original Town to Rock Creek Ranch and Waterford. This could include commercial/retail, office, private indoor recreation, civic space, a pre-K school, two hotels with up to 500 rooms, 1,400 homes, three large multi-sport playing fields, and a large two acre Town Square and Pedestrian Promenade that would connect the Town Square to Coal Creek and its recreation amenities and trails.
- The McCaslin BRT Station is located 2.5 miles from Historic Downtown Louisville, five square blocks that include over 100 businesses including shops, restaurants, galleries, studios, and live music almost every night of the week. The Louisville City Hall and Public Library are also within the downtown core.

²⁵ Superior Town Center. Accessed November 10, 2014. <http://www.superiortowncenter.com/html/projectinfo.html>

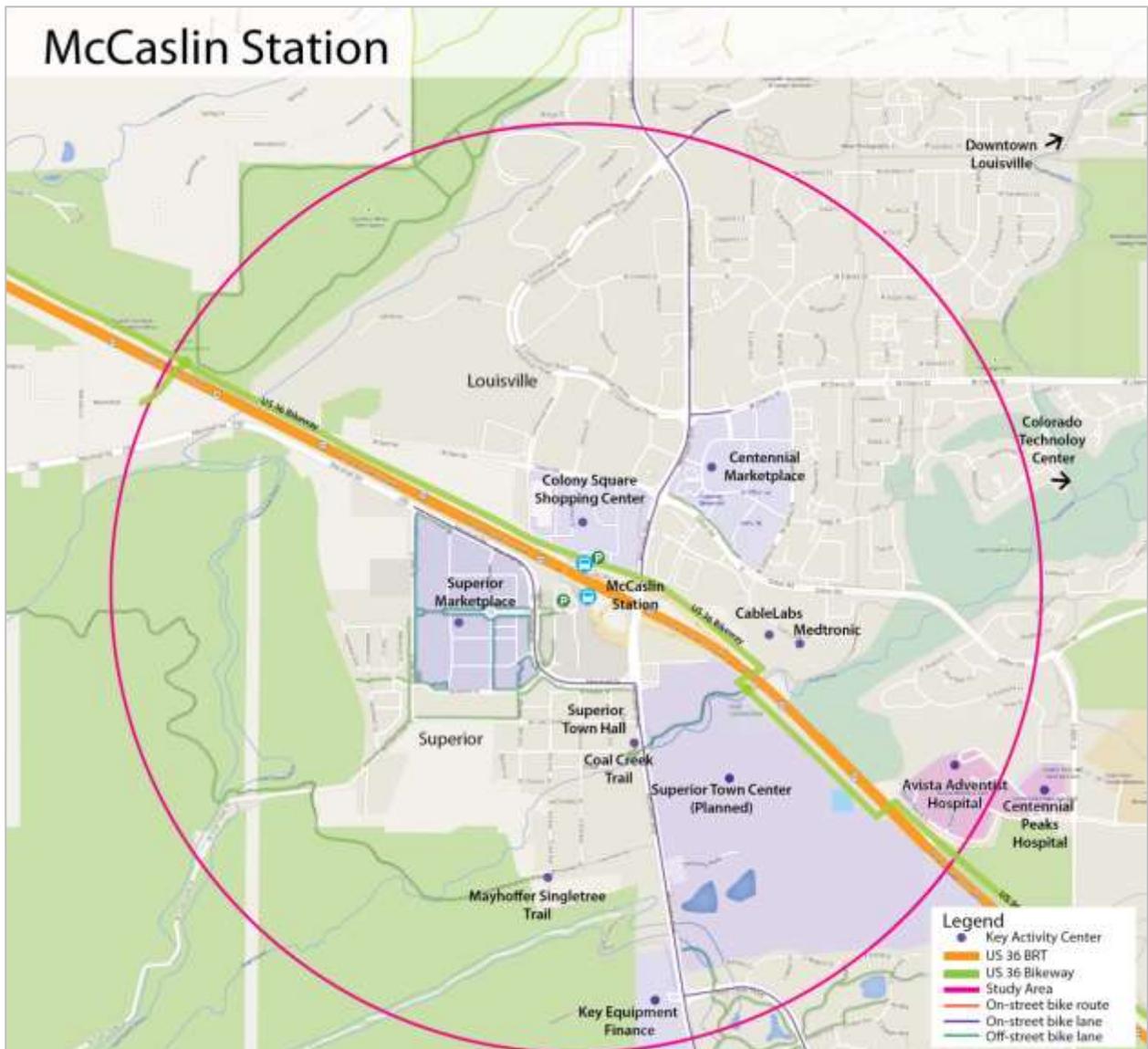


Figure 16 McCaslin BRT Station Area

Recommended Technologies: Employer-Provided Bicycle Fleets (near-term) / Smart Bike System (long-term)

With numerous key activity centers located outside of the immediate station area (distances that are too far to quickly walk), bicycle share has the potential to be extremely successful. Over the long term, it is encouraged that a coordinated automated bicycle share system be implemented with public stations at the McCaslin BRT Station, Superior Market Place, downtown Louisville, Davidson Mesa Open Space, and future development at the Superior Town Center and the former Sam's Club on McCaslin Boulevard. The Superior Town Center, while located within walking distance of the station, can still benefit from the additional mobility and transit accessibility brought by bicycle share.

Smart bikes would provide direct access to Louisville's downtown and commercial core and the extensive trail network around the McCaslin BRT Station.²⁶ For example, this station could become a gateway to the mountains and open space by connecting riders to the Coal Creek Trail, Eldorado Canyon State Park, the Davidson Mesa Open Space, and the Centennial Valley. As the planned Davidson Mesa underpass of US 36 is completed, there will be even more connections between Lafayette, Louisville, and Superior to the Eldorado Canyon State Park. Due to the extensive trail connections nearby, the Town and/or the City should consider studying the feasibility of a full-service bicycle station (with bicycle storage, long-term rentals, and bicycle maintenance facilities) or a long-term bicycle rental facility at this station.

With major employment centers such as the Avista Adventist Hospital (approximately 1 mile southeast) and the Key Government Finance Center (approximately 1 mile south), there are immediate opportunities for employer-provided bicycle fleets. Similar to the Broomfield and Flatiron BRT Stations, employer-provided bicycle fleets will have limited effect in serving the last mile transit trip from the station unless bicycles are available at the station.

Table Mesa BRT Station

Key Characteristics

- While there are some apartment buildings and multi-family residential areas around the immediate station area, the majority of land use is single-family residential.
- There are a number of parks and other open spaces within the station area.
- Lower commercial uses than with other BRT stations along the corridor.

Major Activity Centers

- Table Mesa BRT Station is approximately 2 miles from the south end of the University of Colorado Boulder campus.
- East Boulder Community Center is located approximately 1 mile east of the BRT station.
- Meadows on the Parkway shopping center, which includes a branch of the Boulder Public Library, is located approximately 1 mile north of the BRT station.
- Table Mesa Shopping Center, which includes a King Soopers, a bank, and restaurants as well as nearby apartments and a branch of the Boulder Public Library, is located approximately 1 mile west of the BRT station.

²⁶ Given the number of bicycle share stations that would be required, smart bikes may be the most cost-effective way of providing a bicycle share system, though a smart dock system may be explored as an idealized option.

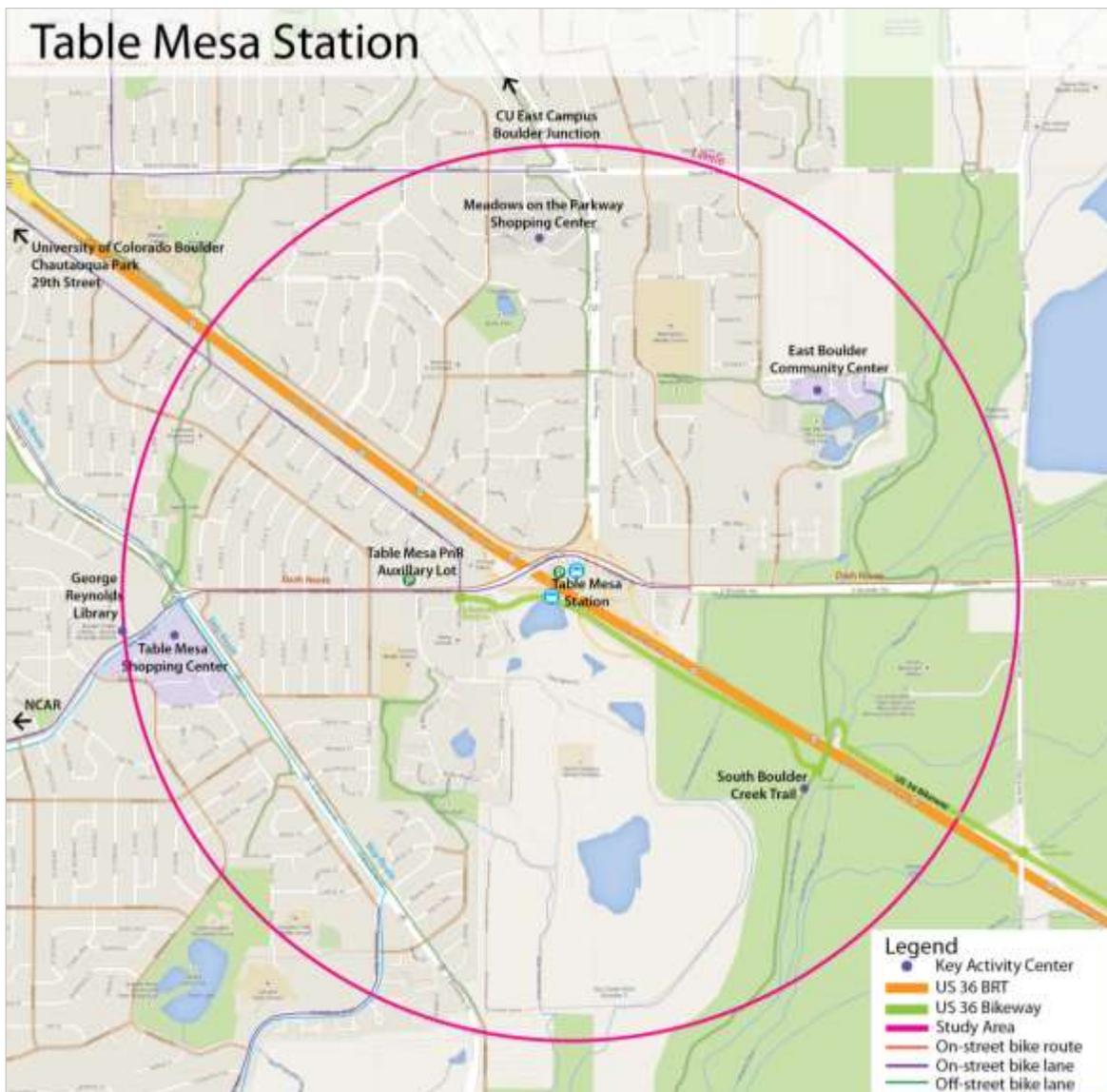


Figure 17 Table Mesa BRT Station Area

Other Considerations

Over the past year, Boulder B-cycle (a smart dock bicycle share system) has been expanding its coverage area. Future expansion is described in the organization's 2020 Vision Plan, which includes an expansion of the system south to Table Mesa by 2020 and stations at the Table Mesa BRT Station, in addition to those at 30th and Colorado Avenue, South Broadway Street and Table Mesa Drive.²⁷ Annual B-cycle memberships are reciprocal between systems so members

²⁷ Boulder B-cycle. 2020 Vision Plan—Full System Buildout. <https://boulder.bcycle.com/LinkClick.aspx?fileticket=-5nsBUQSfjw%3d&tabid=1104>

of Boulder B-cycle (including members using the future system at Table Mesa) would also have reciprocal membership to Denver's system.

Recommended Technology: Smart Dock System

With the southward expansion of Boulder's B-cycle system to the Table Mesa BRT Station expected by 2020, no other bicycle share system is recommended. Boulder B-cycle docking stations at the Table Mesa BRT station would provide bicycle share visibility and reliability, as well as a seamless service for Denver and Boulder B-cycle members who travel the US 36 Corridor. Additionally, the Table Mesa B-cycle station would enable transit riders to access the key activity centers via Table Mesa Drive, Thunderbird Drive, and the US 36 Bikeway.

Conclusion

The implementation of a fully-integrated, high-technology bicycle share system is a long-term transportation option for the Corridor. The following strategies can be implemented in the near term to lay the groundwork to develop a more comprehensive bicycle share system over the long term.

A central agency (such as 36 Commuting Solutions) should assume responsibility for advancing bicycle share along the Corridor. This agency would be responsible for coordinating stakeholders, making decisions regarding the development of the system, monitoring progress in the industry, and leading near-term efforts. In the near term, the central agency should develop educational resources for employers, apartment building managers, and other private entities to establish bicycle fleets (both low- and high-technology options) at their locations.

Over the long term, the agency should work with RTD and local agencies to implement a high-technology, publically-available bicycle share system at the seven stations and key destinations as outlined in this report. Ideally, this bicycle share system would integrate with the existing systems implemented in the near-term to create a holistic, public/private system oriented for the first and final mile of commuting trips in the corridor. The central agency may assume responsibility for fundraising, planning, and implementing the bicycle share system, including the purchase of equipment. This would allow organizations an easy pathway to setting up their own systems while providing a common technology platform, which is key for bicycle share system integration.²⁸ They may also take on operations or transition this responsibility to a third party.

Although smart bikes have not been implemented at a citywide scale to date, these systems offer the flexibility needed to serve each station area's low-density land uses in the most

²⁸ Low-technology equipment could include several options at a variety of price points. However, high-technology equipment should be sourced from one vendor so that these systems are compatible with a larger publically-available system in the future.

affordable manner. Upcoming launches of citywide smart bike systems in Phoenix, Hamilton, and other cities should be monitored to understand any issues or problems with operating these types of programs on a large scale.

Summary of Station Area Recommendations

The stations with the most potential for short- and long-term implementation of bicycle share are the Broomfield and Flatiron BRT Stations which have a significant number of large employers located at least one mile from the station. The McCaslin BRT Station may also have potential with two key employment campuses between one and four miles of the station.

The Westminster Rail, Westminster Center BRT, and Church Ranch BRT Stations have less potential for near-term employer-provided bicycle fleets but may be good candidates for a future automated bicycle share system. The dispersed land uses around these and all station areas lend themselves to smart bike systems that are less expensive per bicycle and can be distributed more freely than smart dock stations.

Stations where visitors and tourists are considered an important market, e.g., at the Church Ranch BRT Station, may be good locations for a private company to provide longer-term bicycle rentals.

The Table Mesa BRT Station is currently included in Boulder B-cycle's long-term expansion plans. The central agency should work with Boulder B-cycle, the City of Boulder, and RTD to help secure funding or to provide other resources to expedite the implementation of bicycle share stations at and around the Table Mesa BRT Station. There may be opportunities for Federal Transit Administration (FTA) or other public funding grants to support stations connecting to the US 36 BRT.

Appendix D

Attachment A: Bikeshare Feasibility Workshop Summary

Northwest Corridor Bicycle/Pedestrian Accessibility Study

Bike Share Feasibility Workshop

Thursday, October 16, 2014 2:00 – 3:30 PM

Attendees:

Name	Organization	Email
Genevieve Hutchison	RTD	Genevieve.hutchinson@rtd-denver.com
Melina Dempsey	DRCOG	MDempsey@drcog.org
Paul Aldretti	DRCOG	PAldretti@drcog.org
Alex Hyde-Wright	Boulder County	ahyde-wright@bouldercounty.org
Debra Baskett	City and County of Broomfield	dbaskett@broomfield.org
Audrey DeBarros	36 Commuting Solutions	Audrey@36commutingsolutions.org
Rich Dahl	City of Westminster	rdahl@CityofWestminster.us
Grant Penland	City of Westminster	gpenland@CityofWestminster.us
Alex Ariniello	Town of Superior	alexa@superiorcolorado.gov
Andrea Meneghel	CDR Associates	ameneghel@mediate.org
Jessica Juriga	Toole Design Group	Jjuriga@tooledesign.com
Adrian Witte (phone)	Toole Design Group	awitte@tooledesign.com
Geneva Hooten	Toole Design Group	Ghooten@tooledesign.com

Summary of Discussion

Toole Design Group (TDG) and its project team conducted a bike share feasibility workshop with stakeholder members. TDG presented an overview of bike share along with four key technologies. The group discussed goals for bike share within the corridor as well as benefits/disadvantages to each technology type.

Bike Share Technologies

Andrea Meneghel, CDR Associates, opened the meeting by stating the purpose of the meeting, facilitating a round of introductions and reviewing the agenda. Jessica Juriga (TDG) provided a general overview of the Northwest Corridor Bicycle and Pedestrian Accessibility Study and then focused the group on the objectives for the bike share task.

Adrian Witte, TDG, presented an overview of bike sharing, U.S. bike share programs, and the four primary technologies (please see the presentation for the information presented). The four bike share technologies are:

- Bike libraries,
- Employer-provided bicycle fleets,
- Smart bike systems, and
- Smart dock systems.

For each technology Adrian provided a case study, advantages, disadvantages, and an overview of inter-system compatibilities.

Discussion Points and Questions

Operations

- Bike share systems have both public and private sector operators. It is common for cities or local government agencies to own systems and contract the operations. The cities of Boulder and Denver have created non-profits to own and operate their bike share systems.
- Typically, cities own the systems and place stations on city-owned land. In other situations, private operators lease systems to the city or cities provide the land as an in-kind contribution.

System Features – Bikes and Helmets

- No systems in the US are using electric bikes. There are systems in Europe doing so and some European vendors are beginning to enter the US market.
- Helmets are not often provided. When they are used, the liability is often carried by the provider, not the agency. Typically helmet use is low due to users being spontaneous trip-makers. Where you have annual memberships for bike share programs, helmet use is higher. Some systems have helmet vending machines.

How is your community discussing bike share systems?

- The City and County of Broomfield has discussed what can be successful given land use and geographic layout. Nothing regarding bike share is in the comprehensive plan, but the concept has been thought about and discussed.
- The City of Westminster has tied bike sharing to visitor use and discussed systems near retail or recreation areas and trails.
- The Town of Superior sees bike sharing more as a transportation demand management application around the future town center.

Who would use bike share in your communities?

- Employees of major corridor employers
- Visitors
- Commuters
- Those making in-community trips

Goals for Bike Share

The stakeholder group discussed goals for bike share within the US 36 Corridor. Using a simple voting structure, the group decided on a goal ranking. However, with greater discussion and debate, the group decided that bike share should complement and extend transit and support commuting trips. The other goals are ranked as following:

1. To complement and extend transit
2. To support commuting trips
3. To encourage and support recreational trips (tourists and visitors to the corridor)
4. To support economic development (including tourism, businesses, retail, etc.)
5. To provide accessibility to all socio-economic groups

Voting on goals led to greater discussion and debate, including the following comments:

- To grow bicycling in the corridor as an additional mode of travel/commuting is an important goal; to grow it in a recreational sense isn't as high of a priority.
- To grow bicycling in the corridor is implied within all of the goals.
- The First and Final Mile Study and a potential bike share program all reflect the ultimate goal of increasing transit ridership throughout the US 36 corridor.

Due to the importance of understanding stakeholder goals for bike share, a follow-up question is included as part of an online survey.

Corridor Consistencies, Costs and Ridership

- It is important to have some consistency and compatibility throughout the corridor for the bike share systems. However, systems may have to be station specific given that each station area has very unique and distinct needs.
- Investment costs and pricing models need to fit community specific purposes.
- The final report for this task will include capital and operational cost estimates.

Next Steps

The project team will be sending the Northwest Corridor Working Group members a survey to solidify bike share goals, key destinations, and recommended bike share technology for the seven stations under study.

After obtaining this information, the project team will complete a bike share feasibility memo to be sent to Stakeholders on November 12, 2014. All comments are due back to the project team by November 19, 2014.