

Appendix C

Secure Bicycle Parking Technical Memorandum



MEMORANDUM

Date: December 31, 2014

To: Denver Regional Council of Governments
Northwest Corridor Working Group

From: Toole Design Group

Project: Northwest Corridor Bicycle/Pedestrian Accessibility Study

Re: Secure Bicycle Parking Report and Conceptual Designs

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 Study by 36 Commuting Solutions and advances the top priorities that were identified in that study.

This technical memorandum (memo) is a presentation of one of the six NW Corridor Study tasks: Secure Bicycle Parking. The memo includes a description of bicycle parking best practices, existing conditions, recommended site improvements, and implementation considerations. The memo also includes an attachment with conceptual design plans for each station location where secure bicycle parking is proposed.

Study Area

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

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

These seven stations comprise the Northwest Corridor.

Scope of Work

The NW Corridor Study includes the conceptual design of secure bicycle parking at all Corridor stations. This memo, including the design package, provides recommendations for improvements that will offer access-controlled, high-capacity bicycle parking at the study area transit stations.

To complete this task, data was collected and analyzed from site visits and a stakeholder workshop. Additional data was provided by RTD, 36 Commuting Solutions, and Boulder County, including the following:

- DRCOG 2014 Web Mapping Service draft imagery
- Parcel data compiled from local City or County jurisdictions
- 2020 daily and AM peak boardings/alightings at US 36 BRT stations
- Preferred (previously-developed) site locations for secure bicycle parking facilities
- Electronic design drawings of existing Bus-Bike secure bicycle parking shelters
- Boulder County's Bus-Bike program design guidelines

The design for this task built upon the existing Bus-Bike secure bicycle parking shelters operated by Boulder County. During the data collection and information gathering phase, Boulder County was interviewed about their experience to date. The discussion focused on their overall design, layout, materials, and site locations.

The Project Team worked closely with local jurisdictions along the Corridor to identify the general design aesthetic for the proposed secure bicycle parking facilities. The key stakeholders and local jurisdictions included members of the Corridor Working Group (CWG): 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.



Northwest Corridor Bicycle/Pedestrian Accessibility Study

- Station Study Area
- US 36 BRT Line
- Northwest Rail Line (funded)
- Local Service



Figure 1: Location Map and Study Area

Summary of Bicycle Parking Best Practices

The Association of Pedestrian and Bicycle Professionals (APBP) published *Bicycle Parking Guidelines, 2nd Edition* in 2010. The document is only national guidelines for bicycle parking, and it includes guidance about quantities and siting considerations. The guidelines were used to inform the NW Corridor Study.

Principles

A bicycle parking space is an area where one bicycle can be safely stored and conveniently accessed while parked on a durable, stable, and slip-resistant surface.

Providing bicycle parking encourages people to bicycle for transportation, while providing additional site-specific benefits. Inadequate bicycle parking facilities and fear of theft are major deterrents to bicycle transportation; as such, users are more likely to use a bicycle for transportation purposes if they are confident that they will find convenient and secure bicycle parking at their destination.

From a site design perspective, allocating specific areas for high-capacity and secure bicycle parking provides an orderly appearance to a transit station. Providing designated bicycle parking areas will also deter bicyclists from locking their bicycles to various station amenities including benches, railings, or trees.

Secure Bicycle Parking

Around the country, bicyclists have expressed their desire for secure bicycle parking. A number of transit agencies, such as the Massachusetts Bay Transportation Authority (MBTA) and Bay Area Rapid Transit (BART), have added secure bicycle parking shelters to their menu of parking options.

The Denver region is no different. According to a recent RTD survey, 73 percent of respondents were either very or somewhat likely to use this type of bicycle parking. Secure bicycle parking provides a locked structure, safe from the elements, to store one's bicycle.



A 'Pedal & Park' access-controlled secure bicycle parking facility in Greater Boston, MA

Performance Criteria

The development of secure bicycle parking is only as good as the design, materials and effective implementation. The following performance criteria were used to develop designs for secure bicycle parking facilities for the study area locations:

- Aesthetics
- Capacity
- Cost
- Maintenance
- Materials
- Safety
- Security
- Space efficiency
- Usability

Facility Site Locations

Bicycle parking facilities should be located close to the route naturally taken by cyclists. The location should be visible, easily accessible, and a comfortable distance from the final destination. The recommended secure bicycle parking facility locations are shown in the conceptual site design plan set in **Attachment A**.

Summary of Existing Conditions

The communities along the Corridor include the City of Boulder, Town of Superior, City of Louisville, City and County of Broomfield, and City of Westminster. The BRT stations will be the future home of the Flatiron Flyer bus rapid transit service, providing 18 miles of BRT service from Boulder to Denver starting in 2016. Upon completion, the BRT system will provide express lane extensions, enhanced canopy shelters, ticket vending machines, programmable information displays, and real-time bus information.

The Westminster Rail Station is not located along US 36 or the BRT Line, but is included in the study area and formally part of the Northwest Corridor. When it opens in 2016, it will be the northern terminus of the Northwest Rail Line, a commuter rail line from Union Station in Downtown Denver. RTD plans to extend the line north from Westminster to Longmont in future years. The station will be located at approximately 71st Avenue and Hooker Street between Lowell Boulevard and Federal Boulevard in the City of Westminster.

The US 36 Bikeway, currently under construction, will provide access to and from US 36 BRT stations.

Existing Bicycle and Automobile Parking

Table 1 includes a summary of existing bicycle and automobile parking at each of the Corridor stations.

Table 1: Inventory of Existing Bicycle and Automobile Parking by Station

Station	Existing Bicycle Parking		Existing Vehicle Parking	
	Type	Quantity	Type	Quantity
Table Mesa	West side: U-racks, Bicycle trees East side: bicycle lockers, bicycle racks, bus-bike shelter	140	East side: structured	824
McCaslin	Inverted U-racks, bicycle lockers	48	Both sides: surface	466
Flatiron	Inverted U-racks	16	Both sides: surface	264
Broomfield	Inverted U-racks, bicycle lockers	24	West side: surface and structured	940
Church Ranch	Inverted U-racks, bicycle lockers	24	Both sides: surface	396
Westminster Center	Inverted U-racks, bicycle lockers	80	East side: structured West side: surface	1,310
Westminster Rail (under construction)	N/A	N/A	N/A	N/A

Table Mesa Station

The Table Mesa Station is located in the City of Boulder at the junction of US 36, Table Mesa Drive, and S Boulder Road. It is the northern terminus of the US 36 BRT project. A parking garage is located on the east side of US 36 and the RTD bus lane is located on the west side. A pedestrian bridge over US 36 connects the east and west sides. Currently, there are designated on-road bicycle facilities on Table Mesa Drive and an existing Bus-Bike secure bicycle parking facility on the east side.



The existing Bus-Bike access-controlled secure bicycle parking facility at Table Mesa WB BRT stop

McCaslin Station

The McCaslin Station is located in the City of Louisville to the east and Town of Superior to the west of US 36. A pedestrian bridge over US 36 connects the east- and west-side BRT stops. Existing surface parking lots provide parking for the station as well as adjacent commercial development. Currently, there are designated on-road bicycle facilities on McCaslin Boulevard.

Flatiron Station

The Flatiron Station is located in the City and County of Broomfield with BRT stops on both the east and west sides of US 36. A pedestrian tunnel under US 36 connects the east and west transit stops. Existing surface parking lots provide parking for the station, as well as to adjacent commercial development and the Flatiron Crossing Mall. Currently, there are designated on-road bicycle facilities on E Flatiron Crossing Drive and proposed on-road facilities for W Midway Boulevard.

Broomfield Station

The Broomfield Station is located in the City and County of Broomfield with BRT stops on the east and west sides of US 36. A pedestrian bridge over US 36 connects the east and west BRT stops. A combination of surface and garage parking is located on the west side including Arista, a mixed-use development, and the 1ST BANK Center, a multi-purpose arena. Parking on the east side is currently limited to one ADA accessible space and limited kiss-and-ride spaces. Currently, there are designated on-road bicycle facilities on Arista Place and Broomfield Lane, and planned on-road facilities for 116th Street and Commerce Street.

Church Ranch Station

The Church Ranch Station is located in the City of Westminster with BRT stops on the east and west sides of US 36. Promenade Drive and Promenade Drive S provide connections under US 36 to the east and west transit stops. Existing surface parking lots provide parking to access the station, as well as to adjacent commercial development. Currently, there are no designated on-road bicycle facilities to access the transit station.

Westminster Center Station

The Westminster Center Station is located in the City of Westminster with BRT stops on the east and west sides of US 36. A parking garage is located on the east side of US 36 and surface parking is provided on the west side. A pedestrian bridge over US 36 connects the east and west transit stops. Currently, there are no designated on-road bicycle facilities to access the transit station.

Westminster Rail Station

The Westminster Rail Station will be located in the City of Westminster and is currently under construction. The Westminster Rail Station will be located at approximately 71st Avenue and Hooker Street between Lowell Boulevard and Federal Boulevard in the City of Westminster. The vision for this station includes a vibrant, mixed-use district with a 40-acre community park for recreation activities and open space. A new street infrastructure network is planned to be phased in as growth dictates to provide circulation to the station platform and parking garage structure.



A proposed rendering of the future Westminster Rail Station

Source: City of Westminster

Recommended Site Improvements

Design Process

To kick-off the secure bicycle parking design process, a half-day workshop with the stakeholders was conducted. The purpose of the stakeholder workshop was to define the general aesthetic and regional consistencies for the secure bicycle parking facilities through a consensus-building and interactive process. The workshop established that the current Boulder County secure bicycle parking shelters will be the baseline for the design of the proposed facilities.



Stakeholder workshop to discuss the general design aesthetic and regional consistencies for secure bicycle parking

RTD and 36 Commuting Solutions provided their preliminary location study related to the site placement of the proposed secure bicycle parking facilities at each US 36 BRT station. This design memo, and the corresponding conceptual design package, is based on the recommendations of this previous effort. Deviations from the proposed locations are noted, where applicable.

The conceptual design for the NW Corridor Study was then based on high-resolution aerial photography from DRCOG (draft, dated 2014) and GIS data obtained from DRCOG and local jurisdictions.¹ The design process included:

- Site design and layout with regards to access and circulation, including guidance informed by the proposed BRT station platform design
- Recommended dimensions for the layout of bicycle rack elements and bicycle rack type
- A modular-sized bicycle shelter structure to demonstrate feasibility with conceptual designs evaluated from the manufacturers below:
 - DERO Bike Rack Company
 - Duo-Guard Industries Inc.
 - Urban Racks
 - Velodome Shelters

Attachment A includes conceptual plan drawings for each location, along with details for the proposed bicycle shelters.

¹ The City and County of Broomfield provided GIS data.

Bicycle Parking Industry Consultation

To gauge precedent for secure bicycle parking, consultation with leading manufacturers in the bicycle parking industry was conducted. A proof of concept for the initial secure bicycle parking structure was developed, discussed, and presented to manufacturers to demonstrate feasibility with the proposed design components. The analysis and discussions involved four manufacturers: Dero Bike Rack Company, Duo-Guard Industries Inc., Urban Racks, and Velodome Shelters.

The goals for secure bicycle parking were identified during the stakeholder workshop. These goals, along with performance criteria from the APBP *Bicycle Parking Guidelines, 2nd Edition, 2010*, were used to evaluate the various bicycle parking manufacturers consulted. The rating system shown in Table 2 is relative to the existing Boulder County Bus-Bike shelters. A ‘better’ rating meets or exceeds the desired performance criteria identified, relative to the Boulder County shelters. A ‘worse’ rating does not meet or is below the desired performance criteria identified, relative to the Boulder County shelters. **Table 2** shows a side-by-side comparison of the performance criteria identified and manufacturer proof of conceptual design. The criteria identified highlights the opportunities and barriers associated with each design concept as discussed in this report.

Table 2: Bicycle Parking Manufacturer Comparisons²

Manufacturer	Characteristics				
	Aesthetics	Capacity	Magnitude of Cost	Materials (Steel & Wire mesh)	Safety & Security
DERO Bike Rack Co.					
Duo-Guard Industries					
Urban Racks					
Velodome Shelters					

Better Worse

² Symbology for this table is represented in color.

The images below show sample aesthetics from each manufacturer.

Dero Bike Rack Company



Cycle Station

Source: Dero Bike Rack Company

Duo-Guard Industries



Sentry Shelter Model

Source: Duo-Guard Industries

Urban Racks



Parkiteer Shelter

Source: Urban Racks

Velodome Shelters



Guardian Shelter

Source: Velodome Shelters

Bicycle Parking Shelter Capacity

This section identifies the methodology used to determine the potential demand for secure bicycle parking at the stations. The demand numbers help determine the size of the shelters. Because the prefabricated shelters proposed are modular and can easily be added to over time, it is possible to respond to additional demand over time by expanding modular units or increasing the number of bicycle parking spaces with higher capacity bicycle rack elements. The following steps were taken to determine bicycle parking demand:

- Consultation with bicycle parking manufacturers confirming proof of concept regarding rack element layout and rack types
- RTD’s anticipated 2020 daily and AM peak boardings/alightings for each station were reviewed and APBP *Bicycle Parking Guidelines, 2nd Edition* recommendations were applied³
- The APBP recommendations were compared to existing bicycle parking quantities, and the larger of the two numbers was used to categorize stations
- The recommended bicycle shelter sizes were then categorized into three sizes:
 - Low bike parking capacity (two rows of inverted-U racks) – 38 bike capacity
 - Standard bike parking capacity (one row of inverted-U racks and one row of double tier style racks) – 50 bike capacity
 - High bike parking capacity (two rows of double tier style racks) – 62 bike capacity

Based on this methodology, **Table 3** summarizes the initial recommendations for each station.

Table 3: Recommended Secure Bicycle Parking Capacity

Station	Recommended Shelter Capacity
Table Mesa	High
McCaslin	Standard
Flatiron	Low
Broomfield	Standard
Church Ranch	Low
Westminster Center	High
Westminster Rail	Standard

³ The Guidelines recommend using a 5 percent bicycle parking rate for rail/bus terminals and stations/airports in areas with standard (not urbanized) density or areas with a between one and five percent commute mode share. Because the Corridor service area covers a mix of urbanized and suburban development intensities, and the Denver region’s bicycle commute mode share was 2 percent in 2013, this approach was taken.

Conceptual Design Site Locations

The conceptual site plans are based on the DRCOG MapMart Cloud web mapping service (WMS) 2014 aerial imagery. The aerial imagery is not final and a current field survey was not completed as part of this project. The final secure bicycle parking shelter site locations shall be coordinated and approved by RTD or the identified property owner.

Table Mesa Station

With an existing Bus-Bike shelter on the westbound (WB) side of the Table Mesa BRT station, shelter design work focused on providing a shelter at the eastbound (EB) BRT stop. The following factors drove the preferred site location:

- Locating the shelter on RTD property
- Identifying a space that does not conflict with existing stormwater facilities adjacent to the existing concrete pad with bicycle parking
- Utilize the existing concrete pad to install the facility (if appropriate)
- A location that does not block the existing pathway or future US 36 Bikeway⁴
- Opportunities to relocate existing bicycle racks and bicycle tree parking
- A location close to the pedestrian bridge to serve east and WB BRT stops without transporting bicycles over the bridge
- A highly visible location



Preliminary Table Mesa EB secure bicycle parking facility photo simulation

The recommended site is located on existing concrete, which would require relocating or removing the western half of the existing bicycle parking (one row of inverted-U racks and one bicycle tree). The proposed site aligns with the previously recommended location.

McCaslin Station

The focus of the conceptual design was the EB BRT stop. The following factors drove the preferred site location:

- Locating the shelter on RTD property
- A highly visible location
- Minimal disturbance for the structural concrete pad installation
- Relocating landscape materials as needed
- Maintain existing Xcel Energy easement
- Providing connectivity to the future US 36 Bikeway

⁴ At the time of this report, the US 36 Bikeway was under construction with an anticipated opening date as soon as 2015.

- Protecting existing above and below ground utilities

The recommended site is located in the landscaped median in between Center Drive and the accessible parking spaces. The previous recommended site was located where there are three existing automobile parking spaces. The revised proposed site aligns with the revised recommended location and maintains the existing Xcel Energy easement.

Westbound Side

When developing designs for this project, it was understood that a shelter at the WB BRT stop was already funded and being implemented by others, and part of a current construction project. As this project was being finalized, however, we learned that this shelter is in fact not included in the current construction project. The next step for this secure bicycle parking shelter requires further site analysis and evaluation to determine an adequate location.



Preliminary McCaslin EB secure bicycle parking facility photo simulation

Flatiron Station

Secure bicycle parking facilities are proposed for the stops on both sides of the station. With an accessible tunnel to reach both platforms without dismounting from a bicycle, it was assumed that users will park their bicycle at the closest facility to their departure platform. The following anticipated impacts and design considerations were considered for the preferred site locations:

Eastbound Side

- Locating the shelter on CDOT or City and County of Broomfield property
- A highly visible location (maximized sight lines of bicyclists using the US 36 Bikeway, and pedestrians)
- Minimal disturbance for the structural concrete pad installation (locating concrete pad immediately adjacent to new pad for platform)
- Relocating landscape materials (if appropriate)
- Providing connectivity to the future US 36 Bikeway
- Protecting existing above and below ground utilities



Preliminary Flatiron EB secure bicycle parking facility photo simulation

- Locating the shelter as to not conflict with the new layout of BRT platforms
- Minimize potential drainage impacts from bicycle shelter roof
- Locating the bicycle shelter outside heavy shade such that ice build-up would not impact adjacent US 36 Bikeway or pedestrian walkways

Westbound Side

- Locating the shelter on RTD property
- A highly visible location (maximized sight lines of bicyclists using the US 36 Bikeway, and pedestrians)
- Minimal disturbance for the structural concrete pad installation
- No disturbance of the existing retaining wall
- Protecting existing above and below ground utilities
- Locating the shelter as to not conflict with the new layout of BRT platforms
- Minimize potential drainage impacts from bicycle shelter roof
- Locating the bicycle shelter outside heavy shade such that ice build-up would not impact adjacent US 36 Bikeway or pedestrian walkways



Preliminary Flatiron WB secure bicycle parking facility photo simulation

The recommended site at the EB BRT stop is located in the existing landscaped area, northwest of the platform. The recommended site at the WB BRT stop is in the grass area at the termination of the existing sidewalk to the southeast of the existing parking lot. The proposed location was not previously identified as a recommended site; however, subsequent coordination with RTD and the City and County of Broomfield found that the proposed location met the site selection criteria.

Broomfield Station

Secure bicycle parking facilities are proposed for each BRT stop at this station. With an accessible bridge to reach both platforms and on-street bicycle facilities on both sides, it is assumed users will park their bicycle at the closest facility to their arrival BRT stop. The following anticipated impacts and design considerations were considered for the preferred site locations:

Eastbound Side

- Locating the shelter on RTD property
- A highly visible location (maximized sight lines of bicyclists using the US 36 Bikeway, and pedestrians)
- Minimal disturbance for the structural concrete pad installation
- Providing connectivity to the future US 36 Bikeway, Broomfield Lane and Arista Place on-street bicycle facilities

- Protecting existing above and below ground utilities
- Locating the shelter as to not conflict with the new layout of BRT platforms
- Maintain pedestrian circulation to/from local and regional bus service
- Maximize access to bicycle shelter from bicycle route
- Minimize potential drainage impacts from bicycle shelter roof
- Locating the bicycle shelter outside heavy shade such that ice build-up would not impact adjacent US 36 Bikeway or pedestrian walkways



Preliminary Broomfield EB secure bicycle parking facility photo simulation

Westbound Side

- Locating the shelter on RTD property
- A highly visible location
- Minimal disturbance for the structural concrete pad installation
- Providing connectivity to the future US 36 Bikeway, 116th Avenue and Commerce Street on-street bicycle facilities
- Maintaining access to the existing pedestrian bridge
- Limiting drainage and wetland impacts
- Protecting existing above and below ground utilities
- Locating the shelter as to not conflict with the new layout of BRT platforms
- Minimize potential drainage impacts from bicycle shelter roof
- Locating the bicycle shelter outside heavy shade such that ice build-up would not impact adjacent US 36 Bikeway or pedestrian walkways

Several locations were identified during the preliminary siting by others. The EB stop proposed site is located in the landscape area just north of the plaza space adjacent to the RTD bus way. The proposed location was not previously identified as a recommended site; however the proposed location meets the identified site selection criteria and is the result of coordination with RTD and the City and County of Broomfield.

The WB stop proposed site is in the location adjacent to the elevator and south of the pedestrian bridge. The previously recommended site location was located in the green space adjacent to the parking spaces; this site location may impact existing open drainage systems. Coordination with the City and County of



Preliminary Broomfield WB secure bicycle parking facility photo simulation

Broomfield and RTD has indicated that the proposed location meets the site selection criteria and could be less impactful than the previously recommended site at this BRT stop.

Church Ranch Station

Secure bicycle parking facilities are proposed for each BRT stop at this station. The construction of the EB BRT stop is funded from CDOT Funding Advancements for Surface Transportation and Economic Recovery (FASTER) funds and the platform is being shifted from its originally planned location. The WB BRT stop is not affected by FASTER funding. The following anticipated impacts and design considerations were considered for the preferred site locations:



Preliminary Church Ranch EB secure bicycle parking facility photo simulation

Eastbound Side

- Locating the shelter on CDOT property
- Platform relocation (further west)
- A highly visible location
- Minimal disturbance for the structural concrete pad installation
- Providing connectivity to the future US 36 Bikeway and relocated platform
- Protecting existing above and below ground utilities

Westbound Side

- Locating the shelter on CDOT property
- A highly visible location with adequate sight lines
- Limiting disturbance to platform for structural concrete pad installation
- Identifying a location off of the existing platform given the physical limitations of the platform
- Protecting existing above and below ground utilities

Several locations were identified during the preliminary siting by others and no recommended location was identified. The EB station preferred site, developed during this project, is located adjacent to the proposed US 36 Bikeway west of the station



Preliminary Church Ranch WB secure bicycle parking facility photo simulation

platform. The proposed location meets the identified site selection criteria. The WB station preferred site, developed during this project and finalized based on construction activities, is located at the intersection of Promenade Drive and Promenade Drive South, between the RTD bus way and existing sidewalk. The WB proposed location may need additional grading and retaining structures for implementation. The proposed location meets the identified site selection criteria.

Westminster Center Station

Secure bicycle parking facilities are proposed for each BRT stop at this station. With an accessible bridge to reach both platforms and access to bicycle facilities on both sides, it is assumed users will park their bicycle at the closest facility to their platform. The following anticipated impacts and design considerations were considered for the preferred site locations:

Eastbound Side

- Locating the shelter on RTD property
- A highly visible location
- Relocating two accessible parking space (if necessary)
- Site location would require security approval from RTD
- Protecting existing above and below ground utilities

Westbound Side

- Locating the shelter on RTD property
- A highly visible location
- Maintain access to existing bicycle lockers and racks
- Maintain access to existing accessible walkway
- Limit disturbance for the structural concrete pad installation
- Relocating or removal of existing vegetation
- Protecting existing above and below ground utilities

The EB BRT stop recommended site is located where there are existing accessible automobile parking spaces. Additional bollards may be needed to provide increased protection from vehicles circulating in the adjacent parking lot. The WB BRT stop recommended site is located south of the existing bicycle lockers and racks.



Preliminary Westminster Center EB secure bicycle parking facility photo simulation



Preliminary Westminster Center WB secure bicycle parking facility photo simulation

Both proposed sites align with the previously recommended locations.

Westminster Rail Station

Secure bicycle parking facilities are proposed for this future station. With anticipated transit-oriented development and access across the railway, it is assumed that a bicyclist will park in close proximity to the platform. A photo simulation of the proposed secure bicycle parking shelter was not developed as the majority of the Westminster Rail Station is under construction. The following anticipated impacts and design considerations were considered for the preferred site locations:

- Locating the shelter on RTD property
- A highly visible location
- Maintain access to existing accessible walkways
- Limit disturbance for the structural concrete pad installation
- Relocating or removal of existing vegetation
- Protecting existing above and below ground utilities

The Westminster Rail Station is currently under construction and no recommended location was previously identified. The proposed site is located adjacent to the North Plaza space in between the walkway and 69th Avenue.

Implementation Considerations

Bicycle Parking Prioritization

As a first step in developing a prioritization and phasing strategy, the demand for bicycle parking was estimated for each station, as previously discussed. The seven stations were grouped into three categories: those with a low parking demand, those with a standard demand, and those with a high demand. Other factors taken into consideration were ease of construction and related/concurrent projects. **Table 4** summarizes the recommended prioritization by station.

The construction phasing of the proposed shelter installations could be applied based on these categories. Other considerations that might make a location a higher priority would include available funding, public or political support, or a connection to a related project, such as bicycle improvements or transit-oriented development.

Table 4: Proposed Bicycle Shelter Prioritization

Station	Recommended Priority	Phasing Considerations
Table Mesa: EB side	High	Could be implemented within Boulder County system; existing on one WB side of Table Mesa. Relatively few impacts associated with construction.
Westminster Center: EB side	High	EB side is projected to have more boardings and alightings than WB side. Relatively few impacts associated with construction.
Westminster Center: WB side	High	Relatively few impacts may be associated with construction.
Westminster Rail	High	Could be constructed as part of existing station project. Relatively few impacts associated with construction.
Broomfield: EB side	Medium	EB side is projected to have more boardings and alightings than WB side.
Broomfield: WB side	Medium	Location has a number of site variables that could make construction difficult.
McCaslin: EB side	Medium	Explore potential for City funding similar to WB site location.
Flatiron: WB side	Medium-Low	WB side is projected to have more boardings and alightings than EB side.
Flatiron: EB side	Medium-Low	Relatively moderate impacts may be associated with construction.
Church Ranch: WB side	Low	WB side is projected to have more boardings and alightings than EB side. Location has a number of variables that could make construction difficult.
Church Ranch: EB side	Low	Location has a number of variables that could make construction difficult.

Opinion of Probable Costs

Based on the recommended 19'x26' secure bicycle shelter structures, the industry budget range for this size is approximately \$35,500 to \$90,000 per shelter.⁵ The lower end of this budget range would satisfy the desired look, feel, and functionality of the secure bicycle parking facilities identified for the Corridor. The higher end would allow for higher-quality materials, such as stainless steel. This budget accounts for facility warranty, engineered stamped drawings, a steel enclosed structure with wire mesh and secure doors, bicycle rack components and the construction fee to install the shelter. This budget range does not cover the shipping, structural concrete pad, electrical requirements, geotechnical/technical survey, extended warranty or ongoing maintenance, delivery, or an access-control system. A further detailed cost estimate has been developed in Table 5 to reflect the costs associated with the proposed secure bicycle parking shelters.

A similar facility considered a benchmark in the region is the Boulder County Bus-Bike shelters. The existing Bus-Bike facilities were approximately \$36,500 per shelter structure in 2012.⁶ In 2014, a further inquiry and investigation into a similar secure bicycle parking facility by the CWG revealed an approximate increase in cost to \$66,500 per shelter structure. The estimated cost was provided by a bicycle parking manufacturer.

Additional administrative or internal costs associated with the proposed bicycle parking facilities would include: key card access-controlled software; end user support maintenance/repair; and server hardware. These lifecycle costs could be upwards of approximately \$40,000 for initial system-wide start-up. Additional annual maintenance costs per year should also be factored in; they may include utilities, cleaning, and miscellaneous repairs totaling approximately \$2,000 per year. These numbers are based on information from Boulder County as well as industry standards.

Based on costs received from parking manufactures, cost estimates for the various Corridor bicycle shelter sizes are shown in **Table 5**.

⁵ Based on an average range of costs received from bicycle parking manufacturers.

⁶ The cost for the Boulder County shelters is higher than the current cost estimates. This could be due to a number of factors including a discount associated with installing/constructing many shelters at once.

Table 5: Proposed Bicycle Shelter Approximate Costs

Secure Bicycle Shelter: Low Capacity			
Item Description	Quantity	Unit Cost	Cost
Bicycle Shelter Structure	1	\$35,500	\$35,500
Structural Concrete Pad	1	\$15,000	\$15,000
Geotechnical/Technical Survey	1	\$1,500	\$1,500
Bicycle Rack Components			
Inverted-U rack	18	\$90	\$1,620
Bicycle repair station	1	\$1,400	\$1,400
Oversized parking area	1	\$90	\$90
Signage materials	1	\$2,500	\$2,500
Lighting LED	4	\$250	\$1,000
System communications network	1	\$2,000	\$2,000
Installation and Shipping	1	\$3,500	\$3,500
Subtotal			\$65,000
15% Contingency			\$9,800
		Total Cost:	\$74,800
Secure Bicycle Shelter: Standard Capacity			
Item Description	Quantity	Unit Cost	Cost
Bicycle Shelter Structure	1	\$35,500	\$35,500
Structural Concrete Pad	1	\$15,000	\$15,000
Geotechnical/Technical Survey	1	\$1,500	\$1,500
Bicycle Rack Components			
Static double-tier rack	3	\$1,200	\$3,600
Inverted-U rack	18	\$90	\$1,620
Bicycle repair station	1	\$1,400	\$1,400
Oversized parking area	1	\$90	\$90
Signage materials	1	\$2,500	\$2,500
Lighting LED	4	\$250	\$1,000
System communications network	1	\$2,000	\$2,000
Installation and Shipping	1	\$3,500	\$3,500
Subtotal			\$68,000
15% Contingency			\$10,200
		Total Cost:	\$78,200

Secure Bicycle Shelter: High Capacity			
Item Description	Quantity	Unit Cost	Cost
Bicycle Shelter Structure	1	\$35,500	\$35,500
Structural Concrete Pad	1	\$15,000	\$15,000
Geotechnical/Technical Survey	1	\$1,500	\$1,500
Bicycle Rack Components			
Static double-tier rack	6	\$1,200	\$7,200
Bicycle repair station	1	\$1,400	\$1,400
Oversized parking area	1	\$90	\$90
Signage materials	1	\$2,500	\$2,500
Lighting LED	4	\$250	\$1,000
System communications network	1	\$2,000	\$2,000
Installation and Shipping	1	\$3,500	\$3,500
Subtotal			\$70,000
15% Contingency			\$11,000
		Total Cost:	\$81,000

The probable costs serve as a guideline that can be refined based on the final site locations, desired bicycle parking spaces, and structural and geotechnical engineering for each shelter.

Branding and Wayfinding Strategies

The use of consistent and notable branding and the installation of wayfinding signing will help to maximize non-motorized access between the transit stations and surrounding destinations. The branding and wayfinding for the secure bicycle parking facilities should provide station orientation, identification, and information for the users.

Currently, the Boulder County shelters have a distinct look and name. While this branding appears to be effective, the CWG is interested in branding specific to the Corridor. To that end, a separate task of this project focused on developing Corridor branding and recommendations for wayfinding signage. A summary of the proposed treatments for secure bicycle parking shelters have been provided in this memo.



A branding image developed for the existing Bus-Bike shelters

Source: Boulder County

Branding integrated into the secure bicycle parking facilities should include:

- Specific colors for each secure bicycle parking facility
- Specific typeface or fonts
- Specific icons and shapes

The wayfinding recommendations integrated into the secure bicycle parking facilities should be developed to assist the user with:

- Guiding users between BRT stations and surrounding community destinations
- Identifying routes to existing bicycle infrastructure

Recommended Branding

During this project process, the CWG recommended the branding depicted below for use at the Corridor stations, within the station areas, and along the US 36 Bikeway. The branding could be applied to the secure bicycle parking shelters and at other bicycle parking facilities, as shown below. Wayfinding components of the secure bicycle parking facilities should include a parking beacon (illuminated, if possible), bicycle parking access information, and a pedestrian/bicycle area map delineating key area destinations and bicycle routes.

Bike-N-Ride shelter



Client/Project		Project No.
Northwest Corridor Branding and Wayfinding Report		JANW251001
Date	Revision	Scale
11.25.14		N/A
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Preliminary branding schematic design for secure bicycle parking shelter

Source: Cloud Gehshan Associates

Note: image for illustration purposes only. Details of the Bike-n-Ride branding can be found in Appendix A of the Northwest Corridor Bicycle and Pedestrian Accessibility Study Summary Report.

Naming

During the project process, the CWG recommended that the name used for the secure bicycle parking shelters should be Bike-n-Ride. For example, the McCaslin Bike-n-Ride would be located at the McCaslin BRT Station. This naming convention was desired due to its alignment with other RTD transit terminology (Park-n-Ride, Call-n-Ride, etc.), its clarity, and its applicability to various types of transit (as opposed to the existing Boulder Bus-Bike naming).

Maintenance and Operations Strategies

Maintenance

The need for maintenance is predicated on the shelter conditions throughout its useful life; in other words, the shelters should never be in a state of disrepair. The secure bicycle parking facility must function and look appealing to enhance the overall use and performance of the facility.

A structured maintenance approach must be implemented to ensure proper functioning of the bicycle parking facility. These maintenance techniques should include:

- Cleaning - The facility should be swept for debris with a layout conducive for this. Trash receptacles should also be placed in close proximity to the facility to reduce the amount of debris at the shelter. Power-washing or other methods of cleaning the shelter and racks should also be considered to remove debris, chain oil, etc.
- Prevention - Areas not designated for bicycle parking should be signed as such to curtail illegal bicycle parking. In addition, educational signage as to how to use the secure bicycle parking facility may in preventative maintenance as well.
- Removal of abandoned bicycles - Stickers or other notices can be attached to parked bicycles that appear to be abandoned. These notices can indicate a date when the bicycle will be removed by the facility operator if not removed by the owner.

Operations

A number of operational considerations must be addressed as the design and implementation of the shelters advances. At the conceptual design stage, operations are typically not addressed in detail; however, it is good practice to begin planning for these elements as soon as possible. The main considerations include:

- Customer service - The interface that customers experience while creating an account or getting information about the shelters is critical to their success.⁷ 36 Commuting Solutions has expressed an interest in potentially providing or managing this role for the Corridor. More discussion about this role is recommended.
- Information technology - the technology used to operate the shelters, including how customers access the shelters, should be considered as early as possible. Ideally, access to the shelters would be provided by a smart card. Conversations with RTD and other Corridor partners need to occur to advance this decision.

⁷ Two examples include: https://www.mbta.com/riding_the_t/bikes/register/Default.asp and <http://www.bouldercounty.org/roads/transit/pages/finalmileproject.aspx>

To assist with associated costs of maintenance and operations, alternate financing could be considered. Financial models may include:

- Membership fees - A nominal monthly or annual fee could be considered for users.
- Sponsorships - Partnering with corporate sponsors for naming rights, similar to many bicycle share stations around the country.
- Advertising - Partner with advertising companies for the right to install displays or other advertising on, in, or around the shelter, similar to bus shelters.

Advertising

RTD currently has a transit advertising policy which includes available advertising for bus interiors, bus exteriors, light rail interiors, fully wrapped buses or light rail trains, 16th Street Mall Shuttle exteriors, and signature ads. The RTD policy could potentially be revised to include the Bike-n-Ride structures. Secure bicycle parking facilities provide a public good and as such are not typically financially self-sustaining and require lifecycle costs. Consideration should be given to permit advertising or sponsorship on the proposed secure bike parking shelters or bus shelters to enhance the long-term viability of the secure bicycle parking facilities.

An example of a bicycle parking facility that includes advertising is the McDonald's Cycle Center in Chicago, IL. Managed by the Chicago Department of Transportation, this indoor bike station provides lockers, showers, a snack bar with patron seating, bicycle repair, bicycle rentals and bicycle parking spaces. The final design construction cost totaled approximately \$3 million and was funded through federal grants from the Federal Highway Administration and Federal Transit Administration. The original name of the facility was Millennium Park Bike Station, however the Chicago Department of Transportation received a \$5 million grant from McDonald's to underwrite the operations of the McDonald's Cycle Station for a term of 50 years.

Next Steps

As a short-term next step, the organizations with property or other jurisdictional controls over the station sites, such as RTD, local jurisdictions, and 36 Commuting Solutions, should engage in a conversation about roles and responsibilities associated with the bicycle shelters operations and maintenance. The end result could be an intergovernmental agreement about these aspects of the shelters.

Attachment A

Conceptual Design Plans