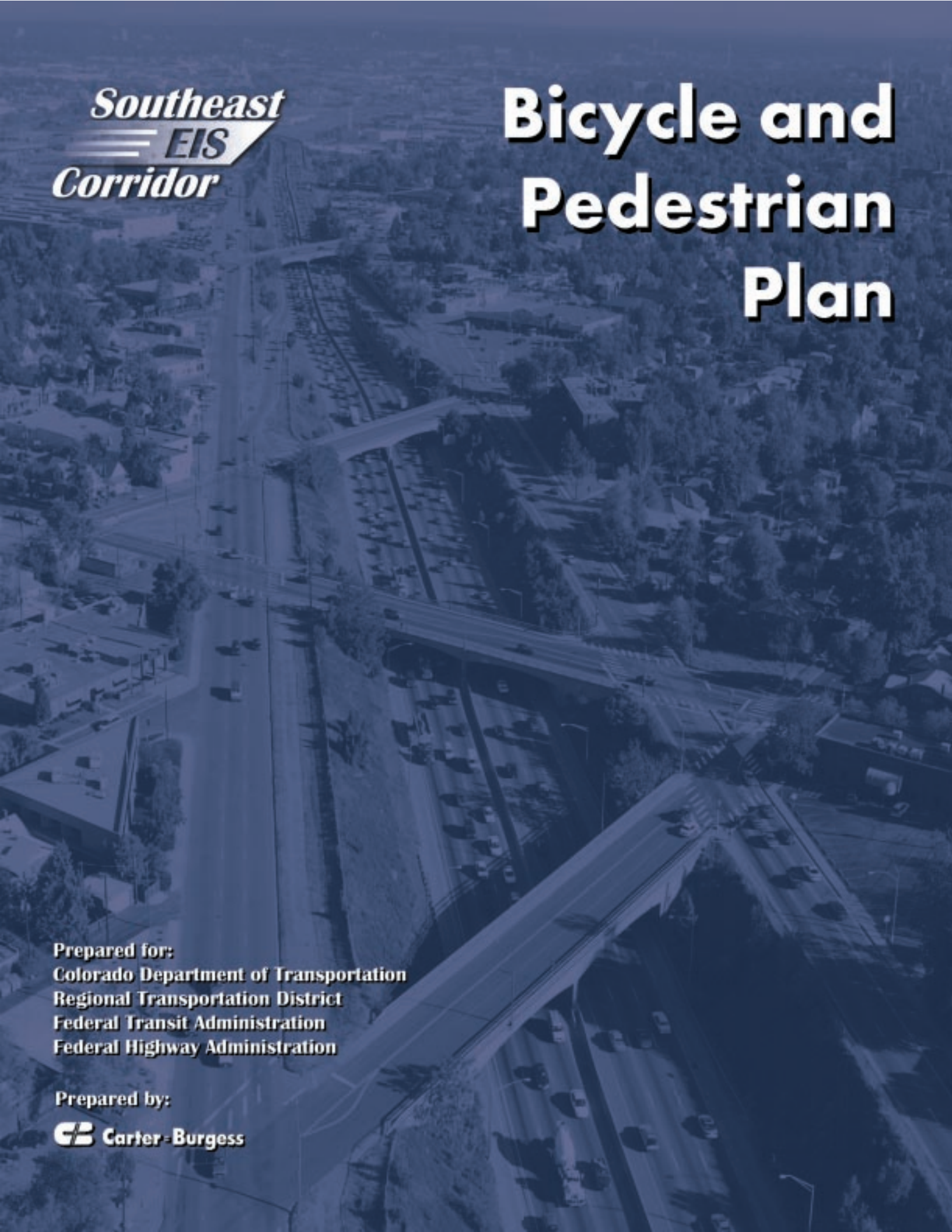
Southeast EIS Corridor

Bicycle and Pedestrian Plan



Prepared for:
Colorado Department of Transportation
Regional Transportation District
Federal Transit Administration
Federal Highway Administration

Prepared by:

Carter-Burgess

Southeast Corridor Bicycle and Pedestrian Plan

December 1999

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Colorado Department of Transportation
Regional Transportation District
Federal Highway Administration
Federal Transit Administration

Prepared by:
Carter & Burgess, Inc.

TABLE OF CONTENTS

TABLE OF CONTENTS- CONT.

LIST OF FIGURES

LIST OF FIGURES (CONT.)

section 1

INTRODUCTION

- PROJECT SCOPE
- TARGET AUDIENCE
- NEEDS ASSESSMENT
- HOW INFORMATION IS TO BE USED
- RELATIONSHIP WITH OTHER DOCUMENTS
- FREQUENTLY ASKED QUESTIONS

The Southeast Corridor Multimodal Project was created to improve transportation throughout the booming south I-25 and I-225 corridors. Presently, traffic crawls along its 19.7 miles for over eight hours a day. This scene is a sign of the times as our reliance on the car continues to grow, as does our population. However, this project will introduce light rail transit along side highway expansion. And for the first time, an effort will be made to look at pedestrian and cycling improvements throughout the entire corridor as a part of the transportation solution.

As with most highways of their time, I-25 and I-225 effectively cut neighborhoods in half, leaving few places to cross safely. Parks. Commercial districts. Homes. Places of work. These highways separate all to the point where there is little alternative but to drive to your destination, no matter how close. Current conditions restrict crossing of the highways because there are either no sidewalks or substandard ones.

There are an estimated 100 million bikes in this country. However, most roadways and transit operations have made bike- and pedestrian- access secondary to function and efficiency. Bike racks on buses have caught on in the industry in recent years, though, and have become very popular. Studies have shown that a majority of park-n-Ride trips are generated by users within three miles of the facility (two miles is considered a desirable cycling distance). Bus-mounted bike racks serve this market well.

The *Southeast Corridor Bicycle and Pedestrian Plan* is a supplemental document to the *Southeast Corridor Final Environmental Impact Statement* (FEIS), December 1999. Bicycle and pedestrian improvements proposed by the project are addressed in the FEIS; however, this document goes into greater detail by further explaining design standards and specific improvements to pedestrian and cycling facilities. Chapter Two- Alternatives Considered in the FEIS provides background of the proposed improvements at light rail stations and park-n-Rides and provides a good introduction to the contents of the *Bicycle and Pedestrian Plan*.

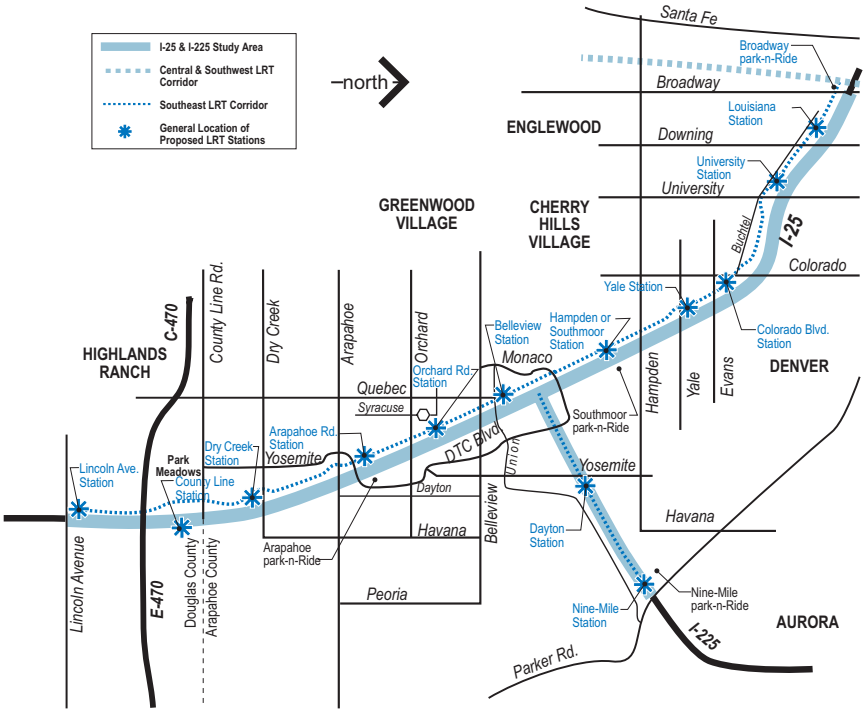


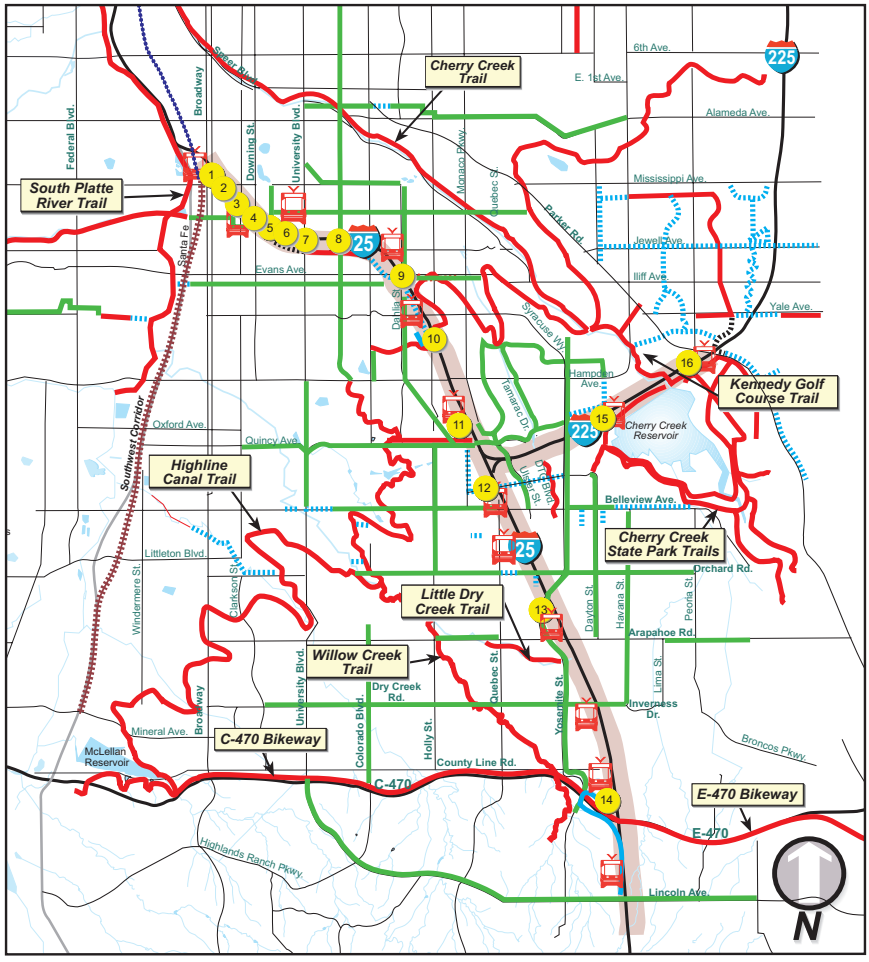
Figure 1-1. *Map of the Southeast Corridor study area.*

PROJECT SCOPE

The Southeast Corridor Multimodal Project includes the construction of 17.9 miles of new double-tracked light rail along side improved and expanded Interstates 25 and 225. In general, all improvements will take place within existing right-of-way or at park-n-Ride locations. Limited right-of-way acquisition is required to accommodate expanded highway lanes and the light rail line in certain locations. Improvements to bike and pedestrian facilities will occur with other roadway and light rail improvements associated with the project. For example, bridges replaced between Logan and University because of highway and light rail construction will have sidewalks and bike lanes to accommodate safer crossing of the highway. Improvements outside of the new right-of-way or off-site at light rail station locations will be the responsibility of local jurisdictions.

The Southeast Corridor project is fiscally constrained. The project will make as many improvements to the pedestrian and bike access throughout the corridor as possible with a limited pool of funding.

SOUTHEAST CORRIDOR BIKE AND PEDESTRIAN IMPROVEMENTS



List of improvements

1. Replace Logan bridge
2. Replace Washington bridge
3. Replace Louisiana bridge
4. Replace Emerson bridge
5. Replace Downing bridge
6. Replace Franklin bridge
7. Improve access thru University/ I-25 intersection
8. Add sidewalks on Colorado bridge
9. Replace Evans bridge
10. Improve/ modify Highline Canal underpass. Construct new construction detour along Yale.
11. Construct underpass to Southmoor station from park-n-Ride
12. Add elevator access to Union overpass from platform
13. Add overpass to Arapahoe platform from park-n-Ride; sidewalk access to Fiddler's Green
14. Modify Columbine trail crossing at C-470/ I-25
15. Connect Dayton station to Cherry Creek trails via old Dayton bridge
16. Construct underpass at Nine Mile station to access platform and Cherry Creek trails

Legend:
- Freeway
- Other Roads
- Existing Off-Street Route
- Existing On-Street Route
- Planned Route (SEC funded)
- Planned Route (not funded)
- Funded Improvements (others)
- Modified/ Replaced by Project
- Project Limits

Figure 1-2. *This map shows existing and proposed bike routes in the southeastern metro Denver area. The Southeast Corridor project splits this area in half and will become an important link between those halves. Specific improvements are highlighted by the yellow circles.*

This document is intended to identify those improvements, as well as recommend others for local participation.

TARGET AUDIENCE

There are several stakeholders, or partners, that represent the target audience of the *Southeast Corridor Bicycle and Pedestrian Plan*. Stakeholders have (or will have) a vested interest in the Southeast Corridor design and implementation phases. They are the lead project agencies, Corridor users, landowners, and business owners. Their input is important to the successful implementation of the Bicycle and Pedestrian Plan.

Lead Federal Agencies:
- U.S. Department of Transportation
- Federal Transit Administration
- Federal Highway Administration

Lead Local Agencies:
- Colorado Department of Transportation
- Regional Transportation District

Local Jurisdictions:
- City and County of Denver
- City of Greenwood Village
- City of Aurora
- Arapahoe County
- Douglas County

Neighborhood Associations
Citizen Interest Groups, such as bike groups/ clubs
Business Associations
Local Developers
Land Owners
Corridor Users
Corridor Residents
Corridor Businesses
Other government, planning, or development agencies, such as Denver Regional Council of Governments

NEEDS ASSESSMENT

Because the Southeast Corridor project is fiscally constrained, the number and scope of improvements to be made to pedestrian and bicycle facilities is limited. To make the most of available monies, a needs assessment was prepared to evaluate the potential improve-

ments and determine what is included in the project budget.

Available funding, constructability, and projected opening day use were key factors in determining what improvements were included in the base funding package. No matter if the improvement is funded or not, all are seen as important needs for the Corridor's ultimate success in improving pedestrian and bicycle access.

Figure 1-3. NEEDS ASSESSMENT *The following chart lists the needs assessment performed on proposed Southeast Corridor bicycle and pedestrian facilities. Each need includes a list of issues supporting the need, the proposed solution, whether it is funded or not, and why.*

NEED: Improve cross-access across I-25 between Logan and University Blvd.
ISSUES: -Bridges currently do not accommodate pedestrians/ bikes
-Dense residential community; disjointed ped./ bike network
PROPOSED IMPROVEMENT: Add sidewalks/ bike lanes to bridges
FUNDED: Yes
JUSTIFICATION: Bridges to be rebuilt to accommodate highway/ light rail expansion

NEED: Pedestrian connection between University of Denver and South High School
ISSUES: -Potential sharing of facilities discussed between DU and South
-University Station will provide alternate access to each facility
PROPOSED IMPROVEMENT: Build a pedestrian overpass from University Station to South High
FUNDED: No
JUSTIFICATION: Denver has identified a potential alternate funding source for this project

NEED: Extend Buchtel Trail from University, west along Buchtel
ISSUES: -Buchtel reconstructed from University to High Street.
-New station and other DU developments will increase ped./ bike traffic
PROPOSED IMPROVEMENT: Extend trail to University Station
FUNDED: Yes (by another source)
JUSTIFICATION: Right-of-way and funding has been identified by another source

NEED: Improve ped./ bike access through University interchange
ISSUES: -Hazardous freeway off-ramps with no signalization
-Substandard ped./ bike accommodations
PROPOSED IMPROVEMENT: Add sidewalks along University through inter change; make interchange, signal improvements
FUNDED: Yes
JUSTIFICATION: University interchange will be reconstructed as a part of highway improvements

FIGURE 1-3. CONTINUED

NEED: Improve ped./ bike access across Steele Street bridge
ISSUES: - Substandard ped./ bike accommodations
PROPOSED IMPROVEMENT: Add sidewalks, bike lanes
FUNDED: Yes
JUSTIFICATION: Steele bridge will be reconstructed to accommodate highway/ light rail improvements

NEED: Improve ped./ bike access across Colorado Boulevard bridge
ISSUES: -High traffic volumes, dangerous intersection
-No sidewalks
PROPOSED IMPROVEMENT: Add sidewalks to bridge
FUNDED: Options under study
JUSTIFICATION: Bridge will not be rebuilt. Currently studying sidewalk options on structure. Other traffic issues exist on Colorado beyond I-25

NEED: Improve ped./ bike access through Colorado/ Evans and I-25 interchange complex
ISSUES: -High traffic volumes, dangerous intersection
-No sidewalks
PROPOSED IMPROVEMENT: Build new pedestrian overpass from Colorado Center to Jewell
FUNDED: No
JUSTIFICATION: Sidewalk/ bike lanes added to Evans bridge, and additional improvements to Evans are being planned by Denver; sidewalk options being studied for Colorado bridge. No available funding.

NEED: Improve access through Yale Ave. interchange
ISSUES: -High peak traffic volumes
-Substandard sidewalks, traffic signals
PROPOSED IMPROVEMENT: Add sidewalks and pedestrian friendly signals
FUNDED: Yes
JUSTIFICATION: Modifications to be made as part of this project; new sidewalks to be built for Highline Canal detour during construction closure.

NEED: Better access at Highline Canal under I-25
ISSUES: -Dangerous approaches, poor access from neighborhood, poorly lit
PROPOSED IMPROVEMENT: Improve approach radii, add ramp from Grape, improve lighting
FUNDED: Yes
JUSTIFICATION: Tunnel to be extended due to highway/ light rail improve ments; proposed improvements to occur as a result.

NEED: Ped. access from Southmoor park-n-Ride/ light rail platform to neighbor hoods west of I-25
ISSUES: -Circuitous access to residents west of I-25 and Thomas Jefferson High School
PROPOSED IMPROVEMENT: Add access to Hillcrest Drive
FUNDED: No
JUSTIFICATION: Strong opposition from neighborhood

FIGURE 1-3. CONTINUED

NEED: Improve ped./ bike access from Belleview Station to east side businesses
ISSUES: -Grade separated station, below existing overpass
PROPOSED IMPROVEMENT: Add elevators and stairs from platform to sidewalk on north side of bridge
FUNDED: Yes
JUSTIFICATION: Key for access to major employment center using an existing structure.

NEED: Improve ped./ bike access from Orchard Station to east side businesses
ISSUES: -Circuitous access
PROPOSED IMPROVEMENT: Build pedestrian overpass from station across I-25
FUNDED: No
JUSTIFICATION: Shuttle service presently in use will serve station. No available funding.

NEED: Improve ped./ bike access at Arapahoe park-n-Ride
ISSUES: -West side platform with limited access to west side businesses
PROPOSED IMPROVEMENT: Build paved track crossing to a new walk west to Fiddler's Green Circle
FUNDED: Yes
JUSTIFICATION: Ped. overpass already being built to provide platform access from east side park-n-Ride; easement will need to be secured for sidewalk.

NEED: Improve ped./ bike access at Dry Creek Road
ISSUES: -Limited access to east side uses
PROPOSED IMPROVEMENT: Build pedestrian overpass from Dry Creek Station to east side of I-25
FUNDED: No
JUSTIFICATION: Shuttle service planned for station. No available funding.

NEED: Improve ped./ bike access at Lincoln Avenue
ISSUES: -Limited access from Lincoln Ave. Station to east side businesses
PROPOSED IMPROVEMENT: Build pedestrian overpass from Lincoln Station to east side of I-25
FUNDED: No
JUSTIFICATION: No funding available.

NEED: Improve ped./ bike access from Hampden Town Center to Cherry Creek trail system
ISSUES: -presently no planned access
-existing I-225 crossing is unused (old Dayton farm bridge)
PROPOSED IMPROVEMENT: Construct sidewalks from Dayton Station to the existing bridge and connect to new Cherry Creek trail at base of dam.
FUNDED: No
JUSTIFICATION: Text

FIGURE 1-3. CONTINUED

NEED: Improve ped./ bike access from Nine Mile park-n-Ride to Cherry Creek trail system

ISSUES: -no access presently
-Interchange improvements underway will make crossing Parker Road more difficult.

PROPOSED IMPROVEMENT: Construct a ped. crossing from the park-n-Ride to the Cherry Creek trail (already planned as apart of the Parker/ I-225 interchange reconstruction as a ped. bridge)

FUNDED: Yes (funding to be shared between SE Corridor and Parker/ I-225 interchange projects)

JUSTIFICATION: Costs shared with other project; ped. underpass will replace ped. bridge and also provide access to light rail platform.

HOW INFORMATION IS TO BE USED

Much of the information presented within this document is the heart of the Southeast Corridor bicycle and pedestrian program. The information describes the improvements and standards to be used for pedestrian and bicycle improvements throughout the Corridor. The information will guide the design of these facilities and their construction by the design- build contractor.

Other information, including recommendations for light rail vehicle design, will be pursued separately from the Southeast Corridor project. The purchase of new light rail vehicles will be a separate contract. Such recommendations will be pursued by RTD when writing the specifications for the new vehicles and seeking bids from manufacturers. Also further study will go into looking at other systems nationwide. Additionally, with the Southwest Corridor light rail line becoming operational, there will be an opportunity to test some of the overall recommendations on that system to work out deficiencies.

A major step towards implementation of all improvements, funded or not, is the cooperation of the agencies, municipalities and other stakeholders involved. Quite often, differing goals and lack of communication hampers planning efforts, such as those proposed in this document. It is vitally important that all stakeholders cooperate and agree on common goals and outcomes. There should be a clearinghouse for information exchange and coordina-

tion of planning efforts. The improvements proposed within are small pieces of the whole, and in order for the ultimate success of the Corridor to be achieved, all of these pieces will ultimately need to be implemented. Cooperation among stakeholders will be a means to that end.

RELATIONSHIP WITH OTHER DOCUMENTS

The *Bicycle and Pedestrian Plan* is a companion document to the Final Environmental Impact Statement, however, there are a handful of other documents that will aid in implementation of the recommendations.

The *Southeast Corridor Urban Design Guidelines* essentially meshes the technical aspects with the aesthetic considerations of the Corridor and how users will interface with it and what they will see. Included are guidelines for pedestrian access, interface with all modes at light rail stations, and even pedestrian and bicycle design considerations and standards for new bridges. There is much overlap between the *Guidelines* and the *Bicycle and Pedestrian Plan*.

Also important are RTD's *Light Rail Design Criteria* and *Transit Facilities Design Guidelines*. Each provides more technical-based information on design and construction of transit elements that will make up the Southeast Corridor project.

Another important document of note is AASHTO's *Guide for the Development of Bicycle Facilities*. This document provides standards for the design of bike facilities and was used as a measuring stick for proposed improvements in the Southeast Corridor.

For other documents reviewed in preparation for this document, please see Section 5- References.

FREQUENTLY ASKED QUESTIONS

Will rebuilt bridges be designed to accommodate both pedestrians and cyclists?

Yes. Most of the bridges scheduled for rebuilding will be in "The Narrows" on I-25, between Broadway and Evans, where the heaviest concentration of bike routes exist. (The exception is the Colorado Boulevard bridge, which will remain in its present condition.) Currently, most bridges in the Narrows have only a two to three foot wide area for people to walk. Bridges will be designed to have a five-foot sidewalk and a five-foot, on-street bike lane.

What about adding a trail along I-25 in the right-of-way?

Existing right-of-way will not accommodate a parallel bike lane. A major goal of the project is to minimize the acquisition of property. The project is currently fiscally constrained, and in order to accommodate a parallel bike trail would require the acquisition of numerous homes and businesses. The design team and agencies involved believe that there are adequate parallel bike routes to accommodate such north/ south riders. Where there are disconnects, coordination with local jurisdictions will improve those connections.

Why isn't there a direct connection with the neighborhood west of the Hampden/ Southmoor Station?

Through numerous public meetings, the neighborhood west of the proposed Hampden/ Southmoor Station overwhelmingly opposes any connection to the light rail station from the neighborhood. Their concerns include increased noise, traffic, crime, and increased parking on local streets. Additionally, any connection would require the purchase of several homes, affecting the neighborhood.

In addition to rebuilt bridges, the Federal Highway Administration encourages improved Interstate shoulders for use by cyclists. How will this apply to the Southeast Corridor project?

In the urban context, sharing of interstate shoulders is not a safe means of cycling. The numerous on- and off-ramps, typically spaced at one-mile intervals, present a very dangerous obstacle for cyclists. High volumes of motorists will be entering or exiting the highway at high speeds and creating a hazardous situation for both driver and potential cyclist.

During construction, how will bike routes be detoured?
We are still a few years away from construction and detour information is not yet available. However, when it comes time for finalization of design plans, the design team will coordinate with local jurisdictions to create detours that are safe and convenient for cyclists. Well-marked and publicized bike route detours will make it easier for cyclist, and motorists, to recognize the temporary routes.

section 2

PROPOSED STATION AMENITIES AND IMPROVEMENTS

SITE DESIGN ISSUES

Planning for Southeast Corridor light rail stations has involved the delicate task of weaving new facilities into existing communities. In doing so, the design team has faced the task of making stations fit into existing transportation networks, particularly pedestrian and bicycle networks. However, many issues have arisen from these efforts.

Accommodating people getting to and from light rail stations by foot or bike is an important goal of station planning. However, this task becomes difficult when there are disconnects in the local sidewalk or bike route system. Some older areas of the city have substandard or no sidewalks, while some newer areas have none, since they are either under development or largely car-oriented. In other cases, crossing municipal boundaries means a bike route disappears.

Much of what this document focuses on is planning for station accommodations of pedestrians and cyclists and improving their access to the transit system. And, where possible, physically and financially, the project is improving access across the highway. However, because the scope of the project generally extends from right-of-way line to right-of-way line, many issues are left unresolved.

What the design team has tried to do is allow full access of pedestrians and cyclists at all light rail stations. To this end, improvements include accessible sidewalks, well lit walkways, adequate signage to inform patrons of local destinations and the local pedestrian/ bike network, and plenty of bike storage. Also, the design team is working with RTD to better accommodate cyclists on its trains (discussed in Section 4).

Beyond these station property lines, however, much of the responsibility of improving pedestrian and bicycle access falls with local jurisdictions. This document has identified Southeast Corridor improvements, but also made recommendations for other improvements that should be made. Once again, the role of the stakehold-

U-RACK (CLASS 3) 	• Standard rack for RTD, Denver, and many other jurisdictions • Bike is locked to an inverted 'U' metal bar or strap anchored in concrete or on a frame • High capacity, very flexible, least space needed of the three racks offered • Offers least protection from elements and vandalism • Simple to use with any lock
BIKE LID (CLASS 1) 	• Currently being experimented with by RTD and Denver • Hard plastic shell pulled down over bike and locked with user's U-lock or padlock • Greater protection from elements than U-rack, accommodates 1 or 2 bikes per rack, requires more space than U-rack • Variety of configurations available to meet site space restraints
BIKE LOCKER (CLASS 1) 	• Currently used by RTD at many park-n-Rides very successfully • Bikes completely enclosedin a lockable cabinet; lock is integral with door • Most protection from theft, the elements, and vandalism when used and maintained properly; each locker holds two bikes; requires most space of the three racks offered • Leases and keys available from RTD

Figure 2-1. *Types of bike storage to be offered at all light rail stations.*

ers becomes important. There are numerous instances where new bike route spurs can be designated and signed as such. Better signage indicating the presence of pedestrians and cyclists around stations will raise awareness with motorists. Even things such as courtesy air machines could be a local contribution at stations.

BIKE STORAGE

Bike storage will be offered at all stations. There will be three types of bike storage offered at all stations- bike racks, bike lids, and bike lockers.

Bike racks offered will be the standard inverted "U" rack, with a capacity of two bikes per rack. They allow cyclists to easily lock their

bike up and take up the least amount of space of the three storage types offered. This type of racks is currently the standard of many local cities.

Bike lids are a relatively new entry into local bike storage types. RTD currently offers them in limited quantities at some of its facilities. Bike lids consist of a hinged, hard plastic shell that is closed over the bike. Users can lock their bikes to the wheel guide inside the shell, and also lock the shell closed.

Bike lockers are regarded as the most secure means of securing a bike. The lockers completely enclose the bike inside of a lockable storage cabinet. RTD currently uses lockers at many facilities. Users pay a small deposit to RTD to rent the lockers for a certain time period. There is currently a waiting list for lockers at many locations.

section 2

PROPOSED STATION AMENITIES AND IMPROVEMENTS

BIKE RACK DISTRIBUTION

STATION LOCATION	bus routes	u-racks	bike lids	bike lockers	vehicular parking
BROADWAY/ I-25	7	Existing station- no changes			
LOUISIANA	3	6	4	7	0
UNIVERSITY BLVD.	3	6	4	7	540
COLORADO BLVD.	4	4	4	7	363
YALE AVE.	2	4	4	7	161
SOUTHMOOR	3	5	4	7	767
BELLEVIEW AVE.	8	6	4	7	59
ORCHARD RD.	2	6	4	7	49
ARAPAHOE RD.	9	6	4	7	820
DRY CREEK RD.	2	4	4	7	235
COUNTY LINE RD.	2	4	4	7	686
LINCOLN AVE.	2	4	4	7	1120
DAYTON	1	4	4	7	347
NINE MILE	12	10	4	12	815
TOTALS		69	52	96	5962

Figure 2-2. *Each class of bike rack will be offered at all stations. The chart illustrates the number of racks at each station, as well a comparison to the number of bus routes serving the station and vehucular parking provided. All RTD buses have bike storage capabilities. Bike storage offered at each station was determined as a 5% of the vehicular parking offered. So for very 100 vehicular spaces, there are five bike storage spaces. This is a baseline number, and some locations will have more bike storage space where there is an anticipated higher level of bike usage.*

BROADWAY/ I-25 STATION

at a glance...

BUS ROUTES SERVING STATION:

0, 0L, 11, 14, 6X, T, W

BIKE ROUTES NEAR STATION:

SPUR FROM D9

BIKE RACKS PROVIDED:

EXISTING SUPPLIES WILL BE MAINTAINED

The Broadway/ I-25 Station will receive minor modifications to accommodate the addition of Southeast Corridor light rail tracks. Bike facilities will not be disrupted. Existing facilities include both bike racks and lockers.

Seven bus routes will serve this station once bus service is altered for new light rail service. Those will be routes 0, 0L, 11, 14, 6X, T, and W. All routes will include buses equipped with bike racks, or capable of storage in undercarriage bins. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

Bike access to the station, from a spur off of Route D9 (Washington Street), follows Ohio Avenue to the station. The intersection of Ohio and Lincoln/ Broadway is somewhat dangerous, though. Traffic exiting I-25 has the right of way to proceed onto Lincoln or Broadway, without yielding or stopping for pedestrians and cyclists. Improvements at this intersection are out of the scope of the Southeast Corridor. However, recommendation for improved crossing of Broadway at Ohio is strongly encouraged as a part of the Broadway Viaduct replacement by CDOT, or a separate action by the City and County of Denver.

Figure 2-3. *Bike lockers at the Broadway/ I-25 Station.*

An alternative to this route is using Logan and Mississippi to reach Broadway. As a part of this project, the Logan Street bridge over I-25 will be replaced. The new structure will have both sidewalks and dedicated bike lanes. Sidewalks exist along Mississippi, however, some modifications will be necessary to ensure easy and accessible access through drives and other vehicular access points at the Gates Rubber complex. New traffic signals at the intersection of Buchtel Boulevard, I-25, and Logan and existing ones at Mississippi and Broadway will need to be adjusted to give better time for pedestrians and cyclists to cross these roadways.

Either bike route spur should be signed to give drivers a better indication that it is a pedestrian and bicycle route, as well as including trailblazer signage directing cyclists and pedestrians to the Broadway/ I-25 Station.

Figure 2-4. *Map of the area around the Broadway/ I-25 station. Existing bike routes and proposed routes and improvements are shown.*

LOUISIANA STATION

at a glance...

BUS ROUTES SERVING STATION:

11, 12, 52

BIKE ROUTES NEAR STATION:

D9, D11, D18

BIKE RACKS PROVIDED:

U-RACKS: 6

BIKE LIDS: 4

BIKE LOCKERS: 7

This station will be located at the intersection of Louisiana and Buchtel Boulevard. The light rail platform will be beside I-25, which is depressed through this area. Elevators and stairs will give access to the platform from the Louisiana Street bridge. As stated previously, elevators will be sized to accommodate bicycles. No vehicular parking will be provided at this station, so it will be even more important to make it easily accessible by foot and bike. A kiss-n-Ride will be provided along Louisiana and Buchtel to allow light rail patrons to be dropped off.

Three bus routes will serve this station once bus service is altered for new light rail service. Those will be routes 11, 12, and 52. Route 12 will pass three blocks east of the station on Downing. The Southeast Corridor project will make improvements to sidewalks and lighting along Louisiana to make the connection to the station safer to walk or bike. All routes will include buses equipped with bike racks. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

Several City and County of Denver bike routes pass near this station. Route D9 (Sherman Street) passes the Louisiana Station three blocks west via Louisiana Avenue. Route D18 passes the station south three blocks on Iowa Avenue, via Clarkson, while route D11 (Franklin) is seven blocks east via Buchtel Boulevard.

Figure 2-5. *This illustration of the new Louisiana Bridge and elevators to the platform below show the enhanced bridge with new sidewalks. Buses will drop-off and pick-up passengers on the new bridge.*

Signage on these routes should be improved to include trailblazer signage directing riders to the station.

Bike storage will be provided at this station. Since the key concept of this station is its identity as a neighborhood station, there will be a strong emphasis on bike parking and pedestrian access. Bike racks, lids, and lockers will be supplied in larger-than-normal quantities because of the high activity and concentration of cyclists in this area, as well as the lack of vehicular parking. The dense nature of the neighborhood as well as frequent walkers and cyclists, as demonstrated at nearby Washington Park, will foster this concept.

Additional recommendations include an enhanced Louisiana Avenue connection to the Pearl Street Commercial District nearby and continuation of the Buchtel Trail from University (its present terminus) to Logan along southbound Buchtel. Right-of-way and funding has been identified to extend the University to Franklin segment to serve the University Station. However, right-of-way and funding has not been identified yet for the Franklin to Logan segment. Much of the right-of-way between Buchtel and I-25 will be used for highway expansion and light rail. The only other option is to build the trail along the south side of Buchtel, which is occupied by private landowners through this area. This segment will need to be coordinated through the City and County of Denver.

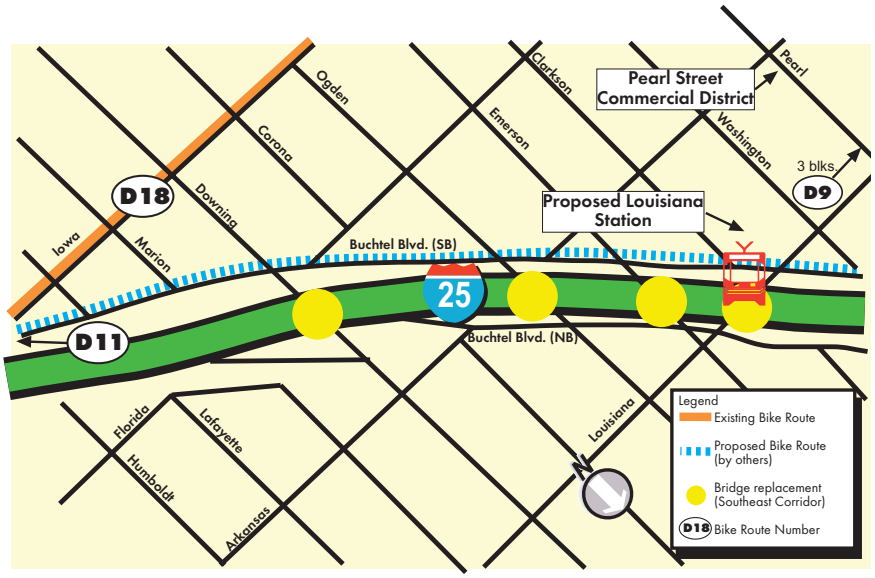


Figure 2-6. *Map of the area around the proposed Louisiana Station. Existing bike routes and proposed routes and improvements are shown.*

UNIVERSITY BLVD. STATION

at a glance...

BUS ROUTES SERVING STATION:

24, 52, 24L

BIKE ROUTES NEAR STATION:

D11, D18, BUCHTEL TRAIL

BIKE RACKS PROVIDED:

U-RACKS: 6

BIKE LIDS: 4

BIKE LOCKERS: 7

The University Station has the potential to be a highly utilized location for all modes. It is adjacent to the University of Denver campus and amenities like the new Ritchie Wellness Center and several dormitories. The station platform will be on-grade, so there will be no need for stairs, ramps, or elevators for access. Bike racks, lids, and lockers will be provided. The intended market for these bike storage elements will be local residents and transit users since nearby University of Denver (DU) provides bike storage on-campus for its students. It should be noted, though, that there will be space for students who use transit.

Three bus routes will serve this station once bus service is altered for new light rail service. Those will be routes 24, 52, and 24L. All routes will include buses equipped with bike racks. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

Several City and County of Denver bike routes pass near this station. Route D11 passes three blocks to the west along Franklin Street, as well as route D18 along Iowa. In addition, the city is currently improving Buchtel Boulevard by rebuilding the roadway, medians, and adding new sidewalks. The Buchtel Trail will be extended as a part of the Southeast Corridor project from its terminus at University Boulevard to Franklin with help from city funds. Right-of-way has been identified for this action. The trail extension will allow direct access to the University Station.

Future accommodations include the allotment of space for a new pedestrian overpass between the University Station and the South High School/ Denver Public Schools (DPS) athletic complex. This overpass will not be a part of the Southeast Corridor funding, however the City and County of Denver has identified a potential funding source. It has been long discussed between the University of Denver and DPS that they share facilities- the University has lacked playing fields while South High and DPS has lacked some of the athletic facilities that the new Ritchie Center now provides.

This future connection will pave the way for such an agreement. Regardless, a pedestrian overpass in this location will be an important link across I-25.

The University Boulevard interchange with I-25 will be completely reconstructed as a part of the Southeast Corridor project. The interchange will be reconfigured from a cloverleaf to a single-point urban interchange. Not only will this action improve vehicular movement, but it will also make it much easier for pedestrians and cyclists to maneuver through this stretch of University Boulevard. In essence, the distance a pedestrian will have to cross will be shortened. New traffic signals with pedestrian signals and 10' wide sidewalks will be constructed to allow for safer passage through this intersection. In addition, there will be minor modifications to the Buchtel and University intersection, with new signals added that will better accommodate pedestrians.

An important aspect of this station is its proximity to activity centers at DU and South High School. Better pedestrian and cycling accommodations will make it more attractive for event patrons to use transit and walk to events at these two facilities instead of fighting limited parking on campus. There are plans for a traffic signal at the new Cable Museum at DU, across Buchtel from the park-n-Ride structure. This signal will accommodate pedestrian

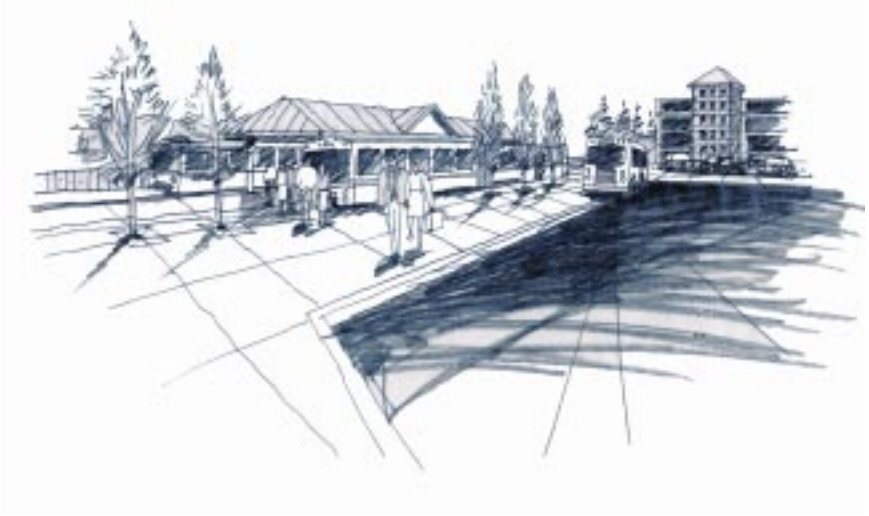


Figure 2-7. *Illustration of the University Station. Visible is the light rail platform on the left and new parking structure in the background. Buses will drop-off and pick up passengers on the ground level of the structure and exit via a drive running past the platform.*

crossing of Buchtel to the campus from the University Station.

Improved signage should be provided on both local streets and the DU campus to direct pedestrians and cyclists to the University Station and other pedestrian and cyclist facilities in the area. Also, signage should be improved to indicate to drivers the high concentration of pedestrians and cyclists along Buchtel, particularly at the light rail station. This will be a high activity area with cars, buses, pedestrians, and cyclists all coming together.

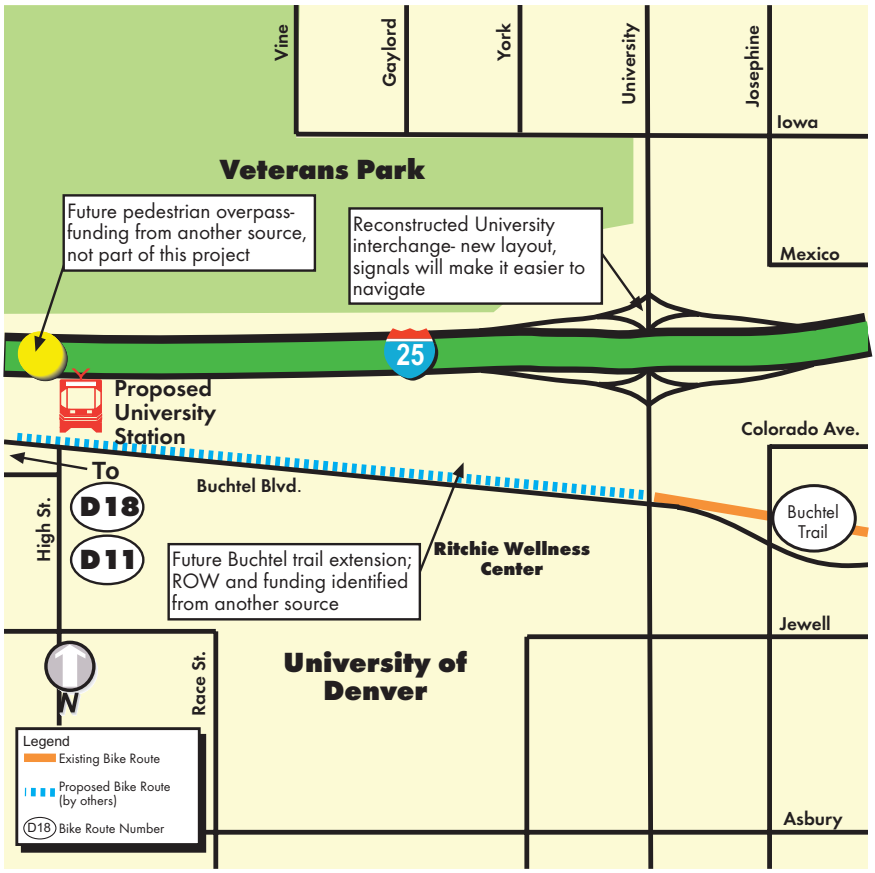


Figure 2-8. *Map of the area around the proposed University Station. Existing bike routes and proposed routes and improvements are shown.*

COLORADO BLVD. STATION

at a glance...

BUS ROUTES SERVING STATION:

21, 40, 52, D, B-LINE

BIKE ROUTES NEAR STATION:

D15, D20, BUCHTEL TRAIL

BIKE RACKS PROVIDED:

U-RACKS: 4

BIKE LIDS: 4

BIKE LOCKERS: 7

The Colorado Station is located adjacent to an established entertainment and office center- the Colorado Center- just east of the intersection of Colorado Boulevard and Evans Avenue. The station will be in an open trench and will be accessible via stairs and elevators. Bike racks, lids, and lockers will be provided at street level and at the park-n-Ride.

Four bus routes and a shuttle service will serve this station once bus service is altered for new light rail service. Those will be routes 21, 40, and 52. Also included will be the B-Line shuttle. The B-Line service provides mid-day service along the Colorado Boulevard corridor and the Cherry Creek Shopping District. All buses will stop on Colorado Center Drive, where patrons will be able to take elevators and stairs down to the platform. The Southeast Corridor project will make improvements to sidewalks and lighting along Colorado Center Drive to make the connection to the station safer to walk or bike. All routes will include buses equipped with bike racks. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

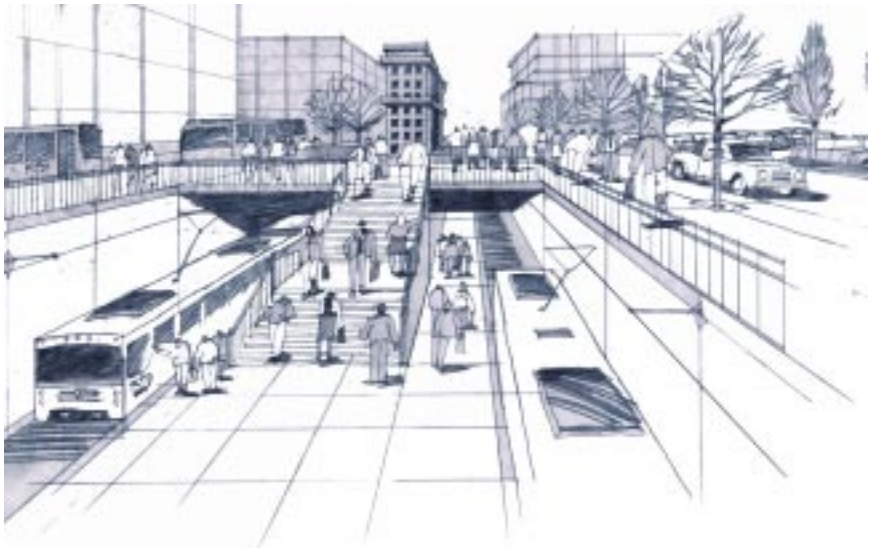


Figure 2-9. *Illustration of the Colorado Station. Visible is the light rail platform depressed below Colorado Center Drive and new park-n-Ride to the right. Buses will drop-off and pick up passengers on Colorado Center Drive on the left.*

Several City and County of Denver bike routes pass near this station. Route D20 (Iliff Avenue) passes two blocks to the south, while route D15 (Dahlia Street) passes three blocks to the east. However, both have missing links that pass through the I-25 and Evans interchange. Evans is one of the bridges that will be rebuilt. The bridge will be widened and rebuilt with bike lanes and sidewalks. The Southeast Corridor project team will work with the City and County of Denver to coordinate Evans improvements, including the rebuilding of Evans west of the interchange and improved pedestrian/ bicycle facilities. Additionally, the Buchtel Trail ends at Colorado Boulevard. Crossing improvements at Colorado Boulevard from Buchtel Boulevard are recommended for better access to the light rail station. The City and County of Denver are currently studying such improvements and, at this point in time, the City will make those improvements under a separate action.

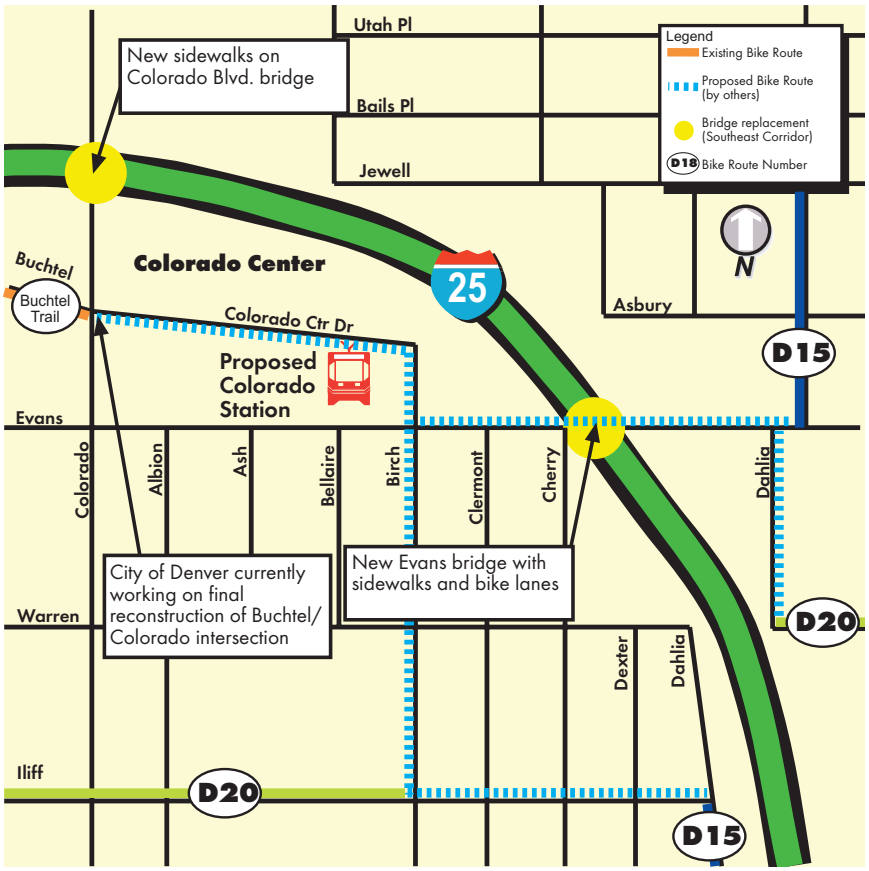


Figure 2-10. *Map of the area around the proposed Colorado Blvd. Station. Existing bike routes and proposed routes and improvements are shown.*

As stated previously, bike racks, lids, and lockers will be provided at the light rail station. However, it is further recommended that the Colorado Center development increase its accommodation for bike parking because of its status as an employment and entertainment destination. Transit and bicycle improvements will increase access to this complex for cyclists. For example, the City is currently adding a traffic signal at Evans and Birch, which will make a safer crossing for cyclists and pedestrians to the Colorado Center and the future light rail station.

The Design Team is currently studying several options for crossing I-25 at Colorado Boulevard. While the Evans bridge is being rebuilt, the Colorado bridge will not. Two of the options being studied include adding 8' wide sidewalks to either side of the existing bridge structure, or adding two separate sidewalk structures on either side of the bridge. Colorado is not a desirable route for pedestrians or cyclists, however. This interchange is very congested, and while the Southeast Corridor will make modifications to the interchange, congestion levels will not be significantly reduced because of the high concentration of office and retail rises.

As a result of the poor conditions along Colorado, it has been suggested that a separate pedestrian overpass be constructed from the Colorado Center to Jewell, north of I-25. The project team believes this option has merits and is possible the best solution. However, this structure has not been identified in project funding and will not be included in the Southeast Corridor budget. Any actions by the project will not preclude construction of the overpass in the future.

Other proposed projects include the widening of Evans by the City and County of Denver. The project will be rebuilding the Evans bridge to accommodate such a widening. However, with such a widening is an increase in the distance a pedestrian must cross to reach the Colorado Boulevard Station. While design has yet to begin on this project, it is envisioned that the widening will include three lanes in both directions and landscaped medians. Should this concept (an extension of existing Evans improvements west of Colorado) be implemented, it is recommended that pedestrian harbors be provided in the median. This concept is used on First

Avenue in Cherry Creek at Fillmore Plaza. Because of six through lanes of traffic and a wide median, space is provided in the median for pedestrians to wait for the next cycle of the crossing signal. It essentially cuts the crossing distance in half by making it two movements.

Bike routes and adjacent streets should be signed to give drivers a better indication of the presence of pedestrian and bicycle routes, as well as including trailblazer signage directing cyclists and pedestrians to the Colorado Boulevard Station. This is very important around the station because of the high concentration of activities and modes of transportation.

YALE AVE. STATION

at a glance...

BUS ROUTES SERVING STATION:

27, 56

BIKE ROUTES NEAR STATION:

HIGHLINE CANAL, D15

BIKE RACKS PROVIDED:

U-RACKS: 4

BIKE LIDS: 4

BIKE LOCKERS: 7

The Yale Station will be located just north of the Yale Avenue/ Interstate 25 interchange along Yale Circle. The light rail platform will be slightly elevated, so accessible ramps and stairs will be provided for access. Other amenities include a kiss-n-Ride and a 161-car park-n-Ride lot, to be shared with an adjacent church. Bike racks, lids, and lockers will be provided.

Future plans for the entire Yale Circle area by the City and County of Denver includes redevelopment. Plans call for the station to be integrated into a proposed transit-oriented development on the site, one of several proposed in Denver at light rail stations.

Two bus routes will serve this station once bus service is altered for new light rail service. Those will be routes 27 and 56. Buses will stop on Yale Avenue because Yale Circle provides insufficient turning radii for buses. Patrons transferring to and from buses will need to cross Yale Avenue to get to their bus or train. As a result of the highway construction, new signals will be installed at the Yale interchange. These new signals, with pedestrian lights, will make it easier for patrons to cross Yale safely. All routes will include buses equipped with bike racks. Light rail trains will be capable of accom-

Figure 2-11. *Illustration of the Yale Station. Visible is the light rail platform and a possible new office building to the left. This platform will be accessed via stairs and accessible ramps.*

modating up to two bikes per car, depending on the train's load at the time of boarding.

A major metro-wide trail, the Highline Canal Trail, passes near the station just three blocks to the south via Glencoe and Grape Streets. The Southeast Corridor plans to construct a new bike/ pedestrian access ramp from Grape Way to the trail making it easier to reach. Route D15 (Dahlia Street) passes four blocks to the west, via Yale Avenue. Interchange improvements at I-25 and Yale will make the intersection safer to pass through, while a proposed new signal (not approved at this time) at Forest Street will add another signalized intersection to cross Yale to get to Highline.

Because of light rail construction, the Highline Canal will need to be extended to accommodate the new light rail structure overhead.

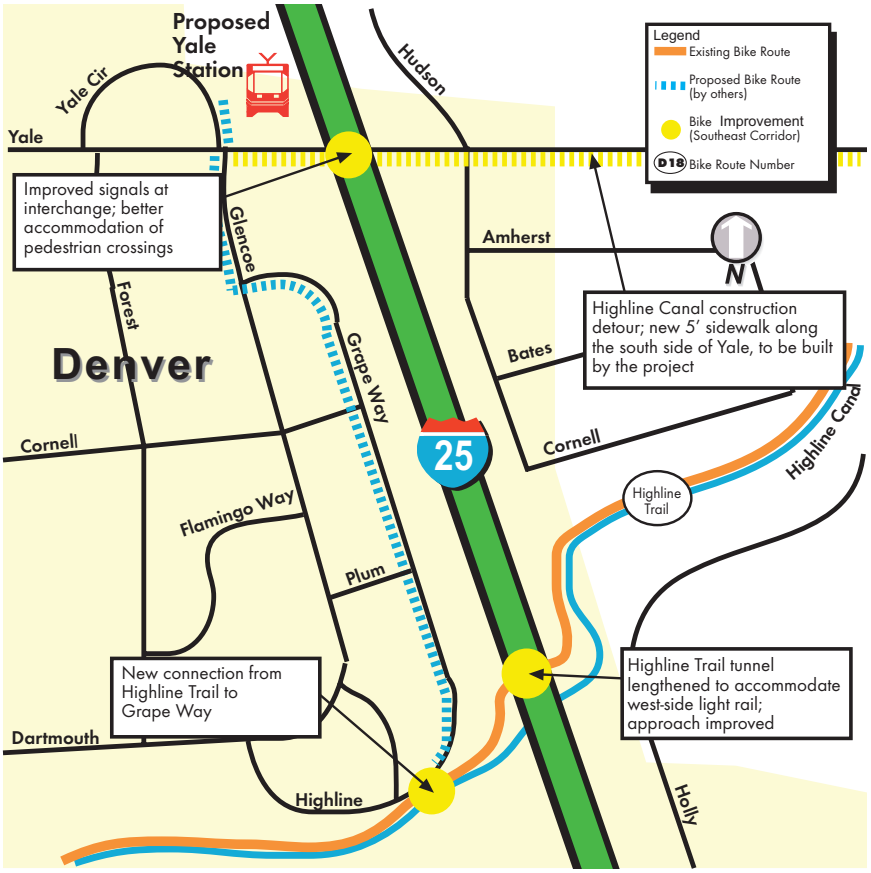


Figure 2-12. *Map of the area around the proposed Yale Station. Existing bike routes and proposed routes and improvements are shown.*

During construction, the tunnel will be closed for safety reasons. A Highline Trail detour will be provided via Grape, Glencoe, and Yale Avenue. The detour along Grape and Glencoe will be on-street through a residential area. The Southeast Corridor will build a new 5 foot wide sidewalk along the south side of Yale to provide access from Glencoe to the Highline crossing of Yale, several blocks east of I-25. Adequate signage will be provided in advance to notify of the coming detour, when it will occur, and the detour route.

Tunnel improvements include improved lighting, flared entry portals (allowing a wider view of oncoming bike/pedestrian traffic), and improved approaches. Approaches will be improved to the greatest extent possible in the right-of-way available.

Improved signage should be provided on both local streets and in the station area to direct pedestrians and cyclists to the Yale Station and other pedestrian and cyclist facilities in the area. Also, signage should be improved to indicate to drivers the high concentration of pedestrians and cyclists in the area because of the Highline Trail and at the light rail station. This will be a high activity area with cars, buses, pedestrians, and cyclists all coming together.

section 2

PROPOSED STATION AMENITIES AND IMPROVEMENTS

HAMPDEN/ SOUTHMOOR STATION

at a glance...

BUS ROUTES SERVING STATION:

21, 65, U

BIKE ROUTES NEAR STATION:

SPUR FROM D17, D22

BIKE RACKS PROVIDED:

U-RACKS: 5
BIKE LIDS: 4
BIKE LOCKERS: 7

The Hampden/ Southmoor Station has two potential locations evaluated for the FEIS. Both sites are on the east side of the highway, while the light rail platform is on the west. The Hampden site is on a parcel at the Hampden/ I-25 interchange and will utilize a pedestrian overpass to reach the platform. The City and County of Denver is pursuing this site for redevelopment. The Southmoor site utilizes the existing Southmoor park-n-Ride with a tunnel connection to the west side platform. Bike racks, lids, and lockers will be provided at either location.

Three bus routes will serve this station once bus service is altered for new light rail service. Those will be routes 21, 65, and U. All routes will include buses equipped with bike racks or undercarriage storage. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

Local bike routes D17 and D22 are linked to the station sites via a neighborhood spur along Monaco Parkway and Quincy/ Happy Canyon. These routes provide sufficient access to the east side of I-25. However, links to the west side will require a more indirect route. Because of neighborhood resistance in public meetings, a direct connection through the neighborhoods west of the station,

Figure 2-13. *Illustration of the Southmoor Station. Visible is the light rail platform on the left and the Continental Theater in the background on the east side of the highway. Passengers will access the platform via stairs and elevators from an underpass.*

and Thomas Jefferson High School, is not possible. The suggested route is to follow the spur south to Quincy and proceed west on Quincy to Happy Canyon Road.

Improved signage should be provided on both local streets and near the station to direct pedestrians and cyclists to the Southmoor or Hampden Station and other pedestrian and cyclist facilities in the area. Also, signage should be improved to indicate to drivers the high concentration of pedestrians and cyclists along Monaco, particularly at the light rail station. This will be a high activity area with cars, buses, pedestrians, and cyclists all coming together.

For either station alternative, there is some degree of vertical circulation needed to reach the light rail platform. For the Hampden alternative, there will need to be an overpass to from the redevelop-

Figure 2-14. *Map of the area around the proposed Southmoor and Hampden Station areas. Existing bike routes and proposed routes and improvements are shown.*

ment site to the light rail platform, which will be in a trench. As is the standard throughout the corridor, necessary elevators will be sized to accommodate bikes. The overpass will be enclosed with Lexan sidewalls, to increase visibility in and out of the walkway.

The Southmoor alternative will require an underpass between the park-n-Ride and light rail platform. Stairs and accessible ramps will be provided at the park-n-Ride side, while elevators and stairs will be provided at the platform. The underpass will be 20 feet wide, with a clearance of 10- 12 feet. Ample lighting and closed circuit television will be provided to increase patron safety in the underpass. Also, the area near the park-n-Ride side will be terraced to allow for surveillance of the underpass from the bus plaza.

BELLEVIEW AVE. STATION

(FORMERLY UNION AVE. STATION)

at a glance...

BUS ROUTES SERVING STATION:

27,40,65,73,105,DTC1, DTC2,DTC3

BIKE ROUTES NEAR STATION:

D17,D22, LOCAL STREETS

BIKE RACKS PROVIDED:

U-RACKS: 6
BIKE LIDS: 4
BIKE LOCKERS: 7

The Belleview Avenue Station will serve much of the north end of the Denver Technological Center and other nearby office districts. It will be on-grade with access to the Tech Center provided by taking an elevator or stairs to the top of the Union Avenue bridge and crossing over I-25. Bike racks, lids, and lockers will be provided at this station.

Eight bus routes will serve this station once bus service is altered for new light rail service. Those will be routes 27, 40, 65, 73, 105 and three private circulator routes. All RTD routes will include buses equipped with bike racks. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

Several local and regional bike routes pass near the Union Avenue Station, although most will require new, marked connections to the station. Denver routes D22 and D17 pass near the station to the north and east, respectively. Route D22 will require a spur connection to the Belleview Station via Monaco and Union. Route D17 follows Ulster and can be connected to the station via a spur on Union. Union is also a logical connection to Cherry Creek State Park and its trail system to the east.

Figure 2-15. *Belleview Station from the air, looking north. Shown is the bus plaza west of the platform and the Union Avenue bridge north of the station. Transit patrons will be able to access the station via stairs and an elevator at the bridge.*

Cherry Hills Village has a paved trail along the south side of Quincy, which is accessible by taking Monaco north to Quincy. The town also has a paved trail along Belleview beginning at Holly Street, just west of the station.

Improved signage should be provided on both local streets and new bike routes to direct pedestrians and cyclists to the Belleview Station and other pedestrian and cyclist facilities in the area. Also, signage should be improved to indicate to drivers the high concentration of pedestrians and cyclists around this station. This will be a high activity area with cars, buses, pedestrians, and cyclists all coming together. Of particular concern is the Quebec/ Belleview intersection, which is already congested.

Figure 2-16. *Map of the area around the proposed Belleview Station. Existing bike routes and proposed routes and improvements are shown.*

ORCHARD RD. STATION

at a glance...

BUS ROUTES SERVING STATION:

473, DTC1

BIKE ROUTES NEAR STATION:

LOCAL STREETS

BIKE RACKS PROVIDED:

U-RACKS: 6

BIKE LIDS: 4

BIKE LOCKERS: 7

The Orchard Station is located in the heart of the Greenwood Plaza office district and is accessible from Orchard Road via Syracuse Street. This is also an on-grade station. Bike lockers, lids and racks will be provided.

Two bus routes will serve this station once bus service is altered for new light rail service. Those will be routes 473 and a private circulator route. The RTD route will include buses equipped with bike racks. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

According to Greenwood Village Bike System mapping, most sidewalks and roadways are designated bikeways, so there is no shortage of bike routes to this location. An additional regional route is proposed by the South Suburban Parks and Recreation District to continue from the Highline Canal, near Colorado Boulevard and Belleview, northeast towards the Cherry Creek trails. It would cross I-25 near the Orchard Station. A proposed bike/pedestrian overpass over I-25 would be a project of local jurisdictions and private entities.

Figure 2-17. *View of the Orchard Road Station platform, looking south. Interstate 25 is to the left and the kiss-n-Ride is to the right.*

Improved signage should be provided on all local streets, as they are bike routes, to direct pedestrians and cyclists to the Orchard Station and other pedestrian and cyclist facilities in the area. Also, signage should be improved to indicate to drivers the high concentration of pedestrians and cyclists along Syracuse who will be travelling to and from the station. This will be a high activity area with cars, buses, pedestrians, and cyclists all coming together.

Figure 2-18. *Map of the area around the proposed Orchard Station. Existing bike routes and proposed routes and improvements are shown.*

ARAPAHOE RD. STATION

at a glance...

BUS ROUTES SERVING STATION:

66,105,473,63X,78F,85F, DTC1, DTC2, AT

BIKE ROUTES NEAR STATION:

LOCAL TRAILS

BIKE RACKS PROVIDED:

U-RACKS: 6

BIKE LIDS: 4

BIKE LOCKERS: 7

The Arapahoe Station is located four blocks north of Arapahoe Road via Yosemite near the heart of the heavily concentrated Arapahoe Road retail corridor. There are also many new residential areas being developed in this area at the southern end of the Tech Center that will generate a new pool of cyclists and transit riders. The station will be located at the existing Arapahoe park-n-Ride and will include bike lockers, lids and racks. The platform can be reached by crossing a new pedestrian overpass. Elevators and stairs will provide access to the new overpass.

Nine bus routes will serve this station once bus service is altered for new light rail service. Those will be routes 66, 105, 473, 63X, 78F, 85F, AT, and two private circulator routes. All RTD routes will include buses equipped with bike racks or undercarriage storage. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

The station is located in Greenwood Village, and just as the Orchard Station, most roadways and sidewalks are designated bike routes. The Little Dry Creek Trail, part of the South Suburban Parks and Recreation District, begins south of the station along Yosemite. It is accessible by taking Yosemite south approximately four blocks past Arapahoe. The trail begins on the west side of Yosemite and heads northwest. Sidewalk improvements will need to be made along Yosemite, however, to insure safe access to this trail.

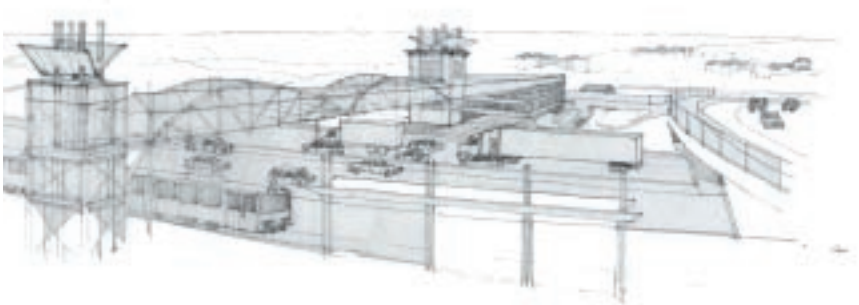


Figure 2-19. *Aerial view of the Arapahoe park-n-Ride from the west side of I-25. Visible is the new parking structure and pedestrian overpass connecting the park-n-Ride to the light rail platform.*

This recommended improvement is outside the scope of Southeast Corridor work, however.

West of the station is several new office buildings and Fiddler's Green Amphitheater. A proposed sidewalk would lead patrons west from the platform to Fiddler's Green Circle. However, an easement is still needed for such a sidewalk. It is recommended that this action be pursued.

Improved signage should be provided on roadways around the Arapahoe Station directing pedestrians and cyclists to the station and other pedestrian and cyclist facilities in the area. Also, signage should be improved to indicate to drivers the high concentration of pedestrians and cyclists along Yosemite, which is presently heavily congested. This will be a high activity area with cars, buses, pedestrians, and cyclists all coming together.

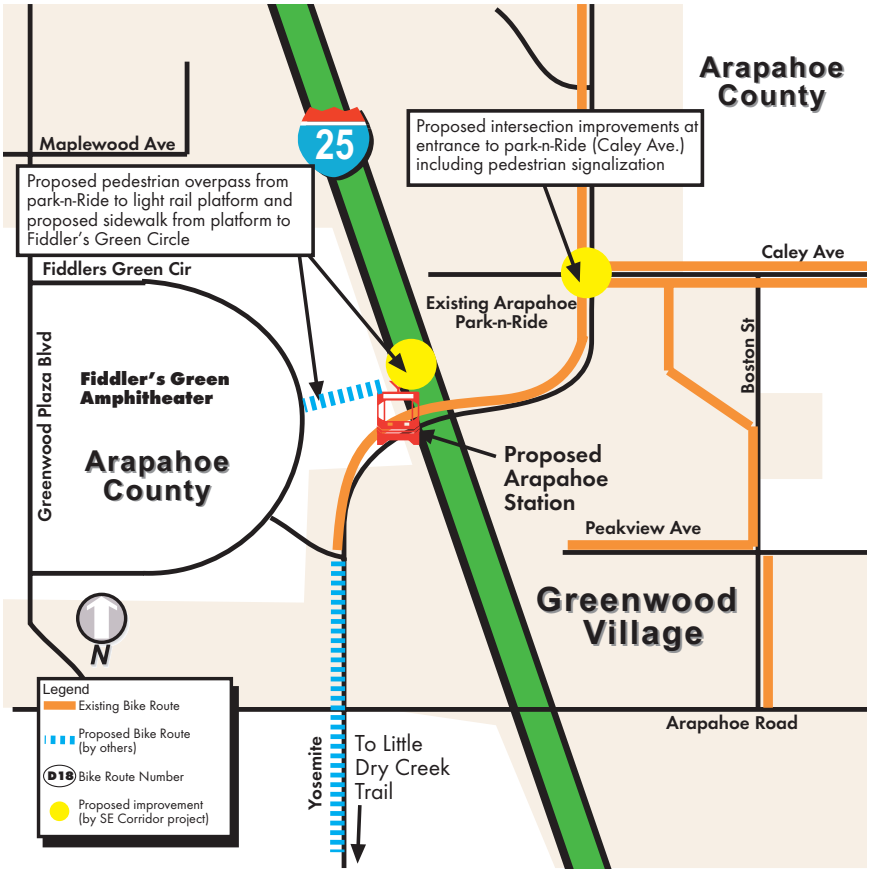


Figure 2-20. *Map of the area around the proposed Arapahoe Station. Existing bike routes and proposed routes and improvements are shown.*

DRY CREEK RD. STATION

at a glance...

BUS ROUTES SERVING STATION:

78F,474

BIKE ROUTES NEAR STATION:

LITTLE DRY CREEK TRAIL

BIKE RACKS PROVIDED:

U-RACKS: 4
BIKE LIDS: 4
BIKE LOCKERS: 7

The Dry Creek Station is located in the Panorama Corporate Center, at Dry Creek Road and I-25. The station will be slightly elevated and will require stair and ramp access. Bike racks and lockers will be provided.

Two bus routes will serve this station once bus service is altered for new light rail service. Those will be routes 78F and 474. All RTD routes will include buses equipped with bike racks or undercarriage storage. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

The area around the station is experiencing growth, but designated bike access routes are currently lacking. The nearest trail is the Little Dry Creek Trail, one mile northwest via Dry Creek Road and Yosemite.

This area does have two things in its favor, however. First, there are several large, established housing developments to the west with the potential of generating many cyclists and pedestrians. Second, the

Figure 2-21. *Looking north at the Dry Creek Station platform. Interstate 25 is to the right and the Panorama Corporate Center is to the left. Parking will be shared with tenants in the business park.*

primary employer in the new Panorama Corporate Center has an interest in alternative means of commuting for its employees. It would be beneficial for local jurisdictions to establish new bike routes in the area connecting to other major routes. New bike routes should be designated by improved signage directing pedestrians and cyclists to the station and other pedestrian and cycling facilities in the area. Also, signage should be improved to indicate to drivers the high concentration of pedestrians and cyclists along Yosemite, which is presently heavily congested. This will be a high activity area with cars, buses, pedestrians, and cyclists all coming together.

Because the station lies in an unincorporated area, it will be important for the county and local development partners to step forward with potential pedestrian and bicycle improvements. Both should take a stake in their identification and completion.

Figure 2-22. *Map of the area around the proposed Dry Creek Station. Existing bike routes and proposed routes and improvements are shown.*

COUNTY LINE RD. STATION

at a glance...

BUS ROUTES SERVING STATION:

473, 474

BIKE ROUTES NEAR STATION:

COLUMBINE TRAIL

BIKE RACKS PROVIDED:

U-RACKS: 4

BIKE LIDS: 4

BIKE LOCKERS: 7

The County Line Station is located near the Park Meadows retail district along Park Meadows Drive. The platform will be accessible via a new pedestrian overpass between the platform and a new parking structure in the mall parking lot, where access to the overpass is gained. Elevators and stairs will be the primary means of getting to the overpass. Bike facilities will be provided near the structure.

Two bus routes will serve this station once bus service is altered for new light rail service. Those will be routes 473 and 474. All RTD routes will include buses equipped with bike racks or undercarriage storage. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

The station will be connected to the Columbine Memorial Trail, located in C-470/ E-470 right-of-way, by means of a spur along Park Meadows Drive. From the trail it will be possible to reach many destinations. To the west, the trail will take riders towards the Willow Creek Trail (unpaved) and the foothills beyond. At Yosemite, there will be a proposed route branching south along Yosemite, then south along Park Meadows Drive tot he new Lincoln Station. This new route will serve the Entertainment District, the new Heritage Hills development, and the new Lincoln Station. Going east on the Centennial Trail will allow bikers to follow E-470

Figure 2-23. *Illustration of the County Line Station platform, looking north. Interstate 25 is the the right and the Park Meadows shopping area is to the left. A pedestrian overpass will connect the platform to parking on the mall site.*

tollway and connect with bike routes to Parker and other destinations.

The existing Columbine Trail will be slightly modified through part of the I-25/C-470 interchange to accommodate the new light rail overpass. Detours due to construction will be marked in advance.

Improved signage should be provided on roadways around the County Line Station directing pedestrians and cyclists to the station and other pedestrian and cyclist facilities in the area. Also, signage should be improved to indicate to drivers the high concentration of pedestrians and cyclists in the area, which is presently heavily congested. This will be a high activity area with cars, buses, pedestrians, and cyclists all coming together. Also, pedestrian facilities should be improved, particularly along County Line Road, as it presents a big obstacle to reaching the station from the north. An inventory should be produced of area sidewalks, noting where there are deficiencies and where improvements can be made.

Figure 2-24. *Map of the area around the proposed County Line Station. Existing bike routes and proposed routes and improvements are shown.*

LINCOLN AVE. STATION

at a glance...

BUS ROUTES SERVING STATION:

410,411

BIKE ROUTES NEAR STATION:

LINCOLN AVE, SPUR FROM

COLUMBINE TRAIL

BIKE RACKS PROVIDED:

U-RACKS: 4

BIKE LIDS: 4

BIKE LOCKERS: 7

The Lincoln Avenue Station will be located northwest of the Lincoln/ I-25 interchange. It will be one of the largest facilities in the Southeast Corridor because of its end-of-line status for the I-25 light rail line. It will be an on-grade station providing both bike racks and lockers.

The area around the station is emerging as a hot retail, residential, and office market. The Park Meadows retail district and the Entertainment District are to the north, while the planned Heritage Hills mixed-use development is located to the west. Office buildings are planned for I-25 frontage. The Meridian Business Park is located on the east side of I-25, accessible from Lincoln.

Two bus routes will serve this station once bus service is altered for new light rail service. Those will be routes 410 and 411. All RTD routes will include buses equipped with bike racks or undercarriage storage. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

Figure 2-25. *Shown is the parking structure at the Lincoln Station. Bike and pedestrian access to the station will be via Park Meadows Drive, shown at left.*

Local bikers will find designated trails along Lincoln and in Meridian Business Park. The Lincoln route leads west to Highlands Ranch and its extensive trail system, as well as east to Meridian and Parker. Meridian is a popular destination for many cyclists on a weekly basis for casual races through the district's circular interior roads. A link to retail areas north of the station is proposed along the newly completed Park Meadow Drive. This will also link cyclists to the Centennial Trail along C-470/ E-470 at a point just north of the Yosemite/ C-470 intersection.

As the area is developed, it is recommended that the sidewalk network adequately connect local residential and commercial areas to the new station. Where there are disconnects in the network, efforts should be made to provide connections.

Figure 2-26. *Map of the area around the proposed Lincoln Station. Existing bike routes and proposed routes and improvements are shown.*

Improved signage should be provided in the area to direct pedestrians and cyclists to the Lincoln Station and other local pedestrian and bicycle facilities. Such facilities should be identified or planned for now as development is occurring, not after the fact. A future pedestrian facility includes a proposed overpass between the station and the east side businesses. While it is not funded currently, its future development will not be precluded by design of the Lincoln Station.

DAYTON STATION

at a glance...

BUS ROUTES SERVING STATION:

105

BIKE ROUTES NEAR STATION:

CHERRY CREEK TRAIL, D19, D21,D22

BIKE RACKS PROVIDED:

U-RACKS: 4

BIKE LIDS: 4

BIKE LOCKERS: 7

The Dayton Station will be located in the median of Interstate 225. The park-n-Ride facility will be located north of the highway in a development currently under construction- the Hampden Town Center. It will be within Aurora city limits. Users will reach the platform by crossing over I-225 in an overpass. Elevators and stairs will provide users access to the overpass. As with other stations, bike lockers, lids, and racks will be provided.

Only one bus route will serve this station once bus service is altered for new light rail service. It will be the route 105. Buses on this route will be equipped with bike racks or undercarriage storage. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

Under current conditions, the Dayton Station is inaccessible. As development on the Town Center proceeds, the infrastructure to reach the station will be established. As a result, there are several key bike route connections that are possible. The development's internal loop road will be an extension of Dayton Street. This will provide a logical place to extend the D21 route (Dayton Street) to the station. Additionally, the route D22 ends several blocks west of the site. It could also be extended to the station. The abandoned

Figure 2-27. *The Dayton Station platform will be located in the median of Interstate 225. Access to the platform will be via stairs and elevators on either side of a pedestrian overpass.*

farm bridge presents another very valuable connection across I-225. There are no plans for vehicular traffic on that bridge, so it would be a very logical connection from the station to the new Cherry Creek trail at the base of the dam. All of these routes will require coordination between the Cities of Denver, Aurora, and Greenwood Village, and the Corps of Engineers.

Figure 2-28. *Map of the area around the proposed Dayton Station. Existing bike routes and proposed routes and improvements are shown.*

NINE MILE STATION

at a glance...

BUS ROUTES SERVING STATION:

21,50,53,121,11F,17F,23F, 39F,91F,83L,63X,AT

BIKE ROUTES NEAR STATION:

CHERRY CREEK TRAILS

BIKE RACKS PROVIDED:

U-RACKS: 10
BIKE LIDS: 4
BIKE LOCKERS: 12

The Nine Mile park-n-Ride facility will be in the same location as the present facility, with a two level parking structure. The light rail platform will be in the median of I-225. There are currently plans for a large plaza at the park-n-ride facility with bike lockers and racks.

As the end-of-line station for the I-225 light rail spur and a collection point for Aurora commuters, there will be twelve bus routes serving the Nine Mile station. Bus routes include routes 21, 50, 53, 121, 11F, 17F, 23F, 39F, 91F, 83L, and AT. All RTD routes will include buses equipped with bike racks or undercarriage storage. Light rail trains will be capable of accommodating up to two bikes per car, depending on the train's load at the time of boarding.

A pedestrian underpass will be constructed to create a connection between the Nine Mile park-n-Ride and the Cherry Creek trails on the east side of the highway. A central elevator and stair lobby will be located in the middle of the tunnel to provide access to the

Figure 2-29. *The Nine Mile Station will be located in the middle of a loop ramp from I-225 to Parker Road (shown above bus plaza). The light rail platform, located in the median of the highway will be accessible via underpass.*

platform. The highway will be on bridge structures, creating the underpass. The pathway will be approximately 24 feet wide, with the sides sloping up to abutments.

The presence of Parker Road essentially precludes pedestrian and cyclists from crossing Parker Road. The City of Aurora has documented several planned crossings to link trails south of Parker with the city's trails north of Parker. One crossing is near the park-n-Ride and provides a trail spur in right-of-way between I-225 and King Soopers, connecting to several local trails. The other is at Vaughn Way. The reconstructed Parker will be grade separated at Vaughn, making it safer for cyclists and pedestrians to reach the north side. A proposed trail from Vaughn and Parker would pass down the Cherry Creek emergency spillway, northeast to the Tollgate Creek Trail, which eventually connects with the Highline Trail.

Figure 2-30. *Map of the area around the proposed Nine Mile Station. Existing bike routes and proposed routes and improvements are shown.*

It will be important to provide adequate signage directing pedestrians and cyclists through this complex interchange complex once finished. Crossings of Parker will essentially be limited to signals at Peoria and the Vaughn Way underpass. This factor will make it critical to direct pedestrians and cyclists to these crossings safely, while informing motorists of their presence.

section 3

PROPOSED CORRIDOR IMPROVEMENTS

OPERATIONAL CHANGES

The Southeast Corridor will change the face of transportation in the south metro area for decades to come. Traffic improvements to Interstates 25 and 225, as well as the expansion of light rail into this area, will be positive steps towards relieving congestion in this corridor.

At the local level, though, there will be improved pedestrian and bicycle facilities as well as improved transit service. Numerous bridges will be replaced between Logan and Evans, all with better pedestrian and bike accommodations. Other facilities at park-n-Rides will make it easier to cross the highway. Furthermore, bus service will be improved as a result of the addition of light rail to this corridor.

RTD is preparing a service plan for the Southeast Corridor's opening day. Presently, there are numerous Express routes that use Interstates 25 and 225 during peak operation times. As a result, they get caught up in the same congestion on these highways as regular motorists. Under current plans, express buses will no longer need to use the highway, as they will instead feed light rail stations. There are opportunities to increase frequency and operation of these feeders to light rail stations. Additionally, some local routes that run near stations will be revised to include stops at stations. However, the final operations plan has not been completed.

One of the issues currently under study is how to best accommodate bikes on light rail vehicles. RTD is very supportive of this concept and is currently studying how best to accomplish this goal through future vehicle procurements and operations changes. This issue is discussed in greater detail in Section 4.

TYPICAL CONDITIONS

Throughout the Corridor, there are many different conditions that are being considered in designing pedestrian and bicycle facilities. The design team is using numerous resources to design the safest and most efficient facilities for all users. Baseline standards have

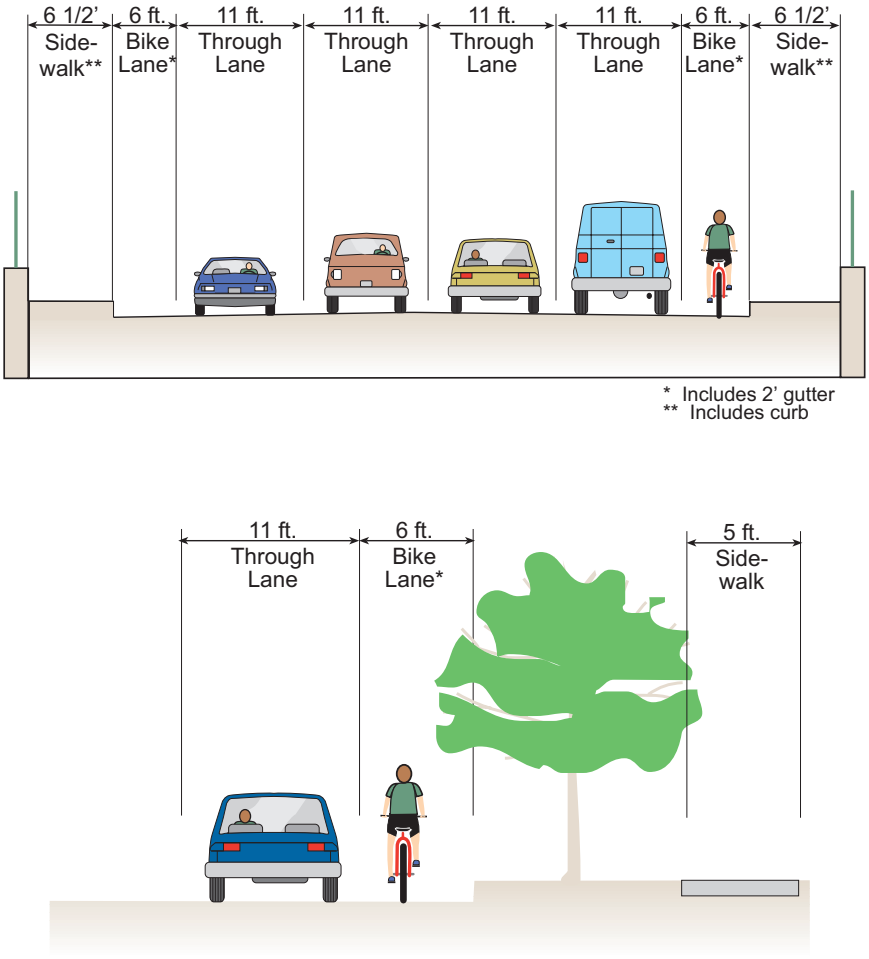


Figure 3-1. *Typical cross sections of bikeways on streets and reconstructed bridges.*

been derived from local standards and other recognized resources, such as AASHTO's Guide for the Development of Bicycle Facilities. For other resources studied in development of this document, please see Section 5.

Early in the planning stages of the Corridor, the design team developed a list of elements that would be included at all stations. Included was bike storage and other pedestrian amenities. With RTD's input, the types of bike storage and their quantities were produced for the Bike Plan. Much of this information was presented in Section 2.

A critical element of the Southeast Corridor program is the replacement of several bridges between Logan and Evans to accommodate highway and light rail improvements. All are currently substandard, with no accommodation of pedestrians or cyclists. Since the bridges were being replaced, it was determined to be a great opportunity to add sidewalks and bike lanes where bike routes exist. The standard for those bridges is seen in Figure 3-1. The number of lanes on each bridge may vary from location to location; however, the bike lane and sidewalk dimensions will remain the same.

DETOUR ISSUES DURING CONSTRUCTION

During construction, there will inevitably be street closures and detours, particularly between Logan and Evans, where bridges will be replaced. The project team will work with local municipalities and neighborhood groups to ensure proper notification is given to users that normal routes will be closed for a period of time and what the designated detours will be. Advance warning will be given on routes to be temporarily detoured several weeks or months before closures occur. Also, detours will be appropriately marked and signed to provide awareness to both motorists and pedestrians who may not normally have mixed on a street. Exact detour plans will be developed with the design-build contractor as construction approaches in the years to come.

section 4

PROPOSED TRANSIT IMPROVEMENTS

CURRENT ACCOMMODATIONS ON TRANSIT

As has been stated elsewhere in this document, bike access to transit is a key component of the Southeast Corridor project. Allowing bikes on transit will greatly increase mobility for an under-served market- bicyclists. In fact, the 1991 Seattle Metro *Nonmotorized Access Study* found that transit vehicle modifications and facility access requirements can be accommodated at relatively moderate capital cost. This underscores the importance of improved bike access and the inexpensive price for doing so.

RTD currently allows bicycles at all facilities and on all buses and light rail trains. The exception on transit vehicles is on 16th Street Mall Shuttles and during peak periods in peak directions, in which bikes are disallowed inside trains due to higher passenger volumes. In the last year, RTD has equipped its bus fleet with new, fold-down bike racks mounted on the front of the bus. Capacity on the racks is two bikes.

To accommodate those riders who prefer to bike to park-and-Ride or light rail stations as opposed to drive, each facility has bike racks and, in many cases, bike lockers. Bike lockers are very popular because they offer protection from theft and the elements. To obtain a key for a locker, cyclists call RTD and pay a small deposit for the locker key.

Current plans for the Southeast Corridor include two classes of bike storage- Class 1 bike lockers and bike lids and Class 3 single-bend racks (the current RTD standard rack). For a description of each type of rack, please see Figure 2-X on page 2-X.

All Southeast Corridor light rail stations will include connections to local trails through cooperation with local jurisdictions. All facilities will be designed in accordance with accepted design standards locally and nationally. Potential amenities at stations, beyond bike storage, could include bike map kiosks and courtesy air machines. Funding for the latter has not been identified in the Southeast Corridor budget, however.

In addition, upon opening the Southeast Corridor, RTD's bus system will undergo an adjustment. Many express routes in the Corridor will be transformed to feeder routes that run more frequently and terminate at light rail stations, as opposed to travelling downtown. When the express buses are converted into feeders, many cyclists that previously used the express service to carry their bike to their destination during the peak period will be forced to leave their bikes at light rail stations. This impact would be resolved if the light rail vehicles were better designed to carry bikes. Bike accommodations on light rail vehicles will be discussed later in this section.

BIKES ON BUSES

As previously discussed, RTD allows bikes on all buses in its fleet, with the exception of 16th Street Mall Shuttles. In late 1998, every bus was equipped with front mounted bike racks. In doing so, RTD became one of only a handful of transit operators in the country to allow bikes on every bus routed it operates. A quick survey of transit operators nationwide shows that many of the largest allow bikes only on certain routes, including St. Louis Metro and San Francisco Muni. There are also others who disallow bikes on all bus routes, including the Massachusetts Bay Transportation Authority in Boston.

There is no surcharge to use the racks on buses. Users simply notify the driver that they have a bike they want to put on the rack. The racks, when in their upright, unused position are lowered into place by pulling up on a lever. The rack then folds down and the user places their bike into the guides and secures the bike. These are the most popular types of bus-mounted racks in use today.

LIGHT RAIL VEHICLE STORAGE

As previously stated, bikes are allowed on light rail trains during all off-peak hours and during peak hours in the reverse peak direction. Cyclists can load their bicycles at either end of the train, so long as there is room and they don't interfere with other passengers.

There are several shortcomings to this system.

1) Bikes interfere with boarding passengers. Bikes are bulky and create obstacles. Because they are limited to the ends of

trains, they make it difficult for persons entering and exiting the train at those locations.
2) The system requires the bike passenger to stand and hold their bike. Because they are limited to the ends of trains and there are no internal racks in which to secure their bikes, cyclists must stand near the crew cab and hold their bike for the duration of their trip. This can be tiring, particularly for those bike passengers who will board at end-of-line stations like Mine Mile and Lincoln Avenue. The projected trip from either of these two stations to downtown (16th and California) is 30 minutes (FEIS, December 1999).
3) The bikes are not secured, which can create a safety hazard inside the light rail vehicle. Should there be a sudden stop, the bike will be come a moving hazard. In the same light, the bike will be an obstacle in the event of an evacuation. And in sharp turns, such as those under the Colfax Avenue or the new Southeast Corridor connection to the existing Central Corridor line at the Broadway/ I-25 Station, the bike passenger may become off-balance, causing the bike to potentially bump into other passengers.
4) Bikes take up valuable space which forces RTD to disallow bikes during peak load times.

OTHER TRANSIT AGENCIES

The following is a survey of other North American transit operators and how they accommodate bikes on rail vehicles. It should be noted that several agencies listed may use a different rail technology (such as heavy rail, also known as a Metro or subway) than is planned for the Southeast Corridor (light rail), however their accommodation of bikes is worth noting.

Valley Transit Authority (VTA)- Santa Clara County (San Jose), California

The VTA is recognized as one of the most bicycle- friendly transit systems in the country. Bikes are allowed on all VTA light rail trains, in addition to having exterior bike racks on all buses. Light rail cars are equipped with four overhead bike hooks near the articulation in the middle of the light rail vehicle. The front wheel of the bike is placed on the hook. Guides, or tracks, on the floor of the light rail vehicle secure the back wheel of the bike. Two additional bikes are allowed to stand on the "turntable" in the articu-

lated section of the train. Ample graphics and signage direct cyclists to the door they need to enter and how to hang their bike appropriately. There are no peak-period restrictions for having bikes on trains. Additionally, to further integrate modes of transportation, bike routes are shown on all transit route maps. The bike-on-rail program is so popular that there are often more bikes than can be accommodated on trains. The VTA is currently studying ways to alleviate these problems.

Several regulations apply to cyclists using VTA trains.

1) Maximum bike size id 80 inches long by 48 inches high. No motorized bicycles are allowed.
2) Keep clear of doorways and keep the bike firmly secured at all times.
3) Allow other passengers to enter or exit before boarding or exiting.
4) No muddy bicycles permitted onboard.
5) Cyclists are responsible for loading and unloading their bike.
6) Cyclists are prohibited from securing their bikes to on-board wheelchair clamps.

VTA also has bike trains in some rail rights-of-way where space allows.

Figure 4-1. *Interior of a Santa Clara VTA light rail train. The bike racks are located near the articulation in the train car, with overhead hooks to which bikes are hung.*

Los Angeles Metropolitan Transportation Authority- Long Beach Commuter Bike Station and Metro Rail

In a state full of cars, the MTA is testing the European and Japanese concept of a park-n-Ride for cyclists. The Long Beach Commuter Bike Station is the first full service commuter bike facility in the country. It offers guarded parking for 150 bikes, changing rooms, a bike rental and repair shop, gear and accessory shop, bike-transit information, outdoor café, free air, point-of-sale for transit bike permits, and a bike club. The Bike Station is located on the Long Beach Transit Mall, adjacent to light rail lines feeding Los Angeles and Orange County, in addition to 33 miles of shoreline and river bike trails. Other major civic amenities are located nearby.

Bikes are allowed on all Metro Rail trains, except during peak periods. Free bike permits are required to board trains (no permits are necessary for folding bikes or to take a bike on buses). No racks are provided on-board Metro Rail trains. Once again, bike passengers are asked to use common sense when attempting to board a crowded train.

Bike racks and lockers are provided at many stations. Lockers are available for a small fee and key deposit.

Bay Area Rapid Transit (BART)- San Francisco

BART allows bikes on trains at all times, with the exception of certain East Bay trains during the evening commute and the first car of any train. There are also some stations that are inaccessible to bike users because of the lack of elevators or high passenger volumes during commute periods. They also have a "good judgement" rule, in which the bike passenger is asked to use common sense when attempting to board a crowded train. BART trains have no racks inside train cars, so the passenger must secure bikes.

It should be noted that BART is one of the pioneers of bike-on-rail programs. They issued 9,000 permits when the program was started in 1980 and over 71,000 in1992 (NWBS Case Study no. 9, p. 41).

Washington, D.C. Metro

Metro permits bikes on trains during all off-peak periods and weekends. However, they limit bikes to only two per train during

off-peak weekday periods and four on weekends and most holidays. Also, bikes are prohibited on trains during special events that draw large crowds, such as the Fourth of July celebration and parades.

Cyclists are asked to use the last train car and enter and exit only though the first and last doors of that car. Bikes are limited to those less than 80 inches long by 48 inches high by 22 inches wide. Cyclists can access platforms only by elevator since most stations are equipped with escalators (Metro is primarily a subway). Also, bike passengers under 16 years old must be accompanied by an adult.

Bike lockers and racks are provided at many stations, with lockers being available for lease. No racks are provided on trains, so the passenger must secure bikes.

Edmonton Transit (ET)- Edmonton, Alberta, Canada

Bikes are allowed on ET light rail trains at all times except for peak direction travel. Cyclists must enter and exit through the middle doors of the light rail vehicle and hold them in the articulated area of the train.

Tri-Met- Portland, Oregon

Bikes are allowed on all buses (exterior racks) and trains with the purchase of a $5 bike permit. Permits may be purchased at Tri-Met offices or several local bike shops. Buyers must also watch a 10-minute video on how to use the bus racks and board light rail trains.

Tri-Met uses two styles of light rail vehicles- high-floor and low-floor. High-floor light rail vehicles (LRVs) are what RTD uses and have stairs at all doors. Bike passengers must enter at the doors on either end of the LRV and hold their bikes near the train cab. Another place to hold bikes is in the wheelchair tie-down space with the seats folded up. Only one wheelchair space can be used at each end of the train so the aisles do not become blocked. That space must be surrendered if a passenger with a disability enters the train.

Low-floor cars have no stairs at doors because the propulsion system is on top of the LRV, as opposed to underneath as seen in high-

floor cars. So when passengers enter the cars, there is no need to step up. Bike passengers may enter any door on low-floor cars and hold their bikes in any unoccupied space designated for disabled passengers. However if someone with a disability enters the train, the bike passenger must surrender that space.

Bike racks and lockers are provided at many stations, with lockers available by lease.

A notable program in Portland created by the city is "Bike Central". The program involves placement and operation of bike racks and lockers in the downtown Portland area and at transit centers. The Bike Central concept involves creating a network of facilities that provide bicycle commuters with storage for clothing, showers, and secure bike parking. In the downtown area, most participating facilities are athletic clubs, who offer Bike central memberships and the opportunity to use shower facilities in the clubs.

Southeast Pennsylvania Transportation Authority (SEPTA)- Philadelphia

SEPTA now allows bikes on all trains it operates during off-peak weekday hours, on weekends, and on holidays. On high-speed rail lines, bike passengers may board at any door, however SEPTA advises that the last car is usually less crowded. On regional rail lines, bike passengers may board at any door with a handicap or bike decal and use the wheelchair space, unless occupied. Two bikes are allowed during peak periods and up to five all other times, space permitting. If a group of more than five bike passengers plan to use SEPTA, they are asked to call a SEPTA group sales hotline 24 hours in advance to make arrangements.

Bike racks and lockers are provided at many stations, with lockers available by lease.

Chicago Transit Authority (CTA)- Chicago

While CTA allows bikes on its trains, many restrictions exist. CTA allows bikes only on weekends in summer months, between Memorial Day and Labor Day. Bikes are not permitted on weekdays. An adult must accompany bike passengers between the ages of 12 and 17, while those under 12 cannot bring bikes on trains. Passengers with bikes must notify a station attendant or security officer that

they are arriving with a bike. Since all CTA stations are equipped with turnstiles, some may be inaccessible to cyclists. Cyclists are forced to use accessible turnstiles or ask an attendant or security office to open an access gate. If no personnel are available, then the bike passenger must ride to the next rail station. Also, at one station on the Green Line, the only exit is through a steel bar gate, so bike passengers must exit at the station before or after this one.

Only two bikes are allowed per train, but security personnel or CTA staff reserve the right to ask cyclists to wait for the next train.

In light of all of the restrictions, it should be noted that CTA was one of the only transit agencies surveyed to include a legal disclaimer in its bike program pamphlet stating that cyclists assume responsibility for all damages or injury as a result of them using CTA. Also, a statement is made telling CTA patrons to drive and park for free if trains are too crowded- an interesting statement in a brochure encouraging bike use in this pilot program.

ST. LOUIS METROLINK- ST. LOUIS

Bikes are allowed on all light rail vehicles with no time restrictions. Passengers are asked to enter at the rear or front of the car, only one bike per door entry. Other restrictions are similar to those stated by VTA. No racks are provided on trains, so the passenger must secure bikes.

MetroLink provides bike racks at certain stations.

METROPOLITAN ATLANTA RAPID TRANSIT AUTHORITY (MARTA)- ATLANTA

MARTA allows bicycles on trains at all times. They do ask that bike passengers avoid trains that are full, however. On trains, bike passengers should keep their bikes away from doors and out of aisles. To access stations, passengers with bikes use elevators.

It should be noted that bikes are not allowed on any MARTA buses.

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY (MBTA)- BOSTON

Bikes are allowed on all MBTA subways and commuter rail lines except during peak commute periods and special events, such as Red Sox games or any events at the Fleet Center. The exception is on the Green Line and all MBTA buses, where bikes are not allowed.

Permits are required for taking bikes on MBTA trains. They cost $5 and a damage and liability waiver must be signed at the time of purchase. There are age restrictions on permits, however. Children under 18 must have permits co-signed by adults, and an adult must accompany those between ages 12 and 15.

Train conductors will direct passengers to areas where they can enter trains and store their bikes on commuter rail lines. On subways, bicycles are allowed only on the end cars at the end doors. Only two bikes are allowed per train. Bike passengers are asked to board and exit after all passengers have entered and exited the train. If the train is crowded, then bike passengers should wait until the next train. Bike passengers are asked to hold their bikes while on trains.

Only selected stations have bike racks as many routes pass through dense urban areas with little room for them.

LIGHT RAIL VEHICLE DESIGN CONSIDERATIONS

Light rail vehicles currently being manufactured do not accommodate bikes efficiently. As a result, transit agencies must either disallow bikes during peak periods, which are the very times that most bicyclists wish to bring their bicycles, or to allow bikes during peak periods and risk creating safety hazards and passenger conflicts during peak load times. In order to urge manufacturers to design vehicles with better bike accessibility, transit agencies will need to call out for design criteria in the vehicle specifications. With this in mind, the following are a few light rail vehicle design considerations:

- Bike storage areas should be located near entrances, but should not interfere with boarding and deboarding passengers.
- Each vehicle should be equipped with bike racks designed to carry to bikes securely without assistance from the bicycle passengers.
- Bike racks should be quick and easy to load so that bike passengers can complete the loading process during the station dwell time.
- If bike racks are placed inside the vehicle, the bike

storage area should not be located in the designated wheelchair areas, unless the guides are built into the underside of the folding seat. When unoccupied the seat could be folded up to make available wheel guides for rear bike wheels. An overhead hook could accommodate the front wheel. The storage area should be usable by regular passengers when no bikes are being stored.

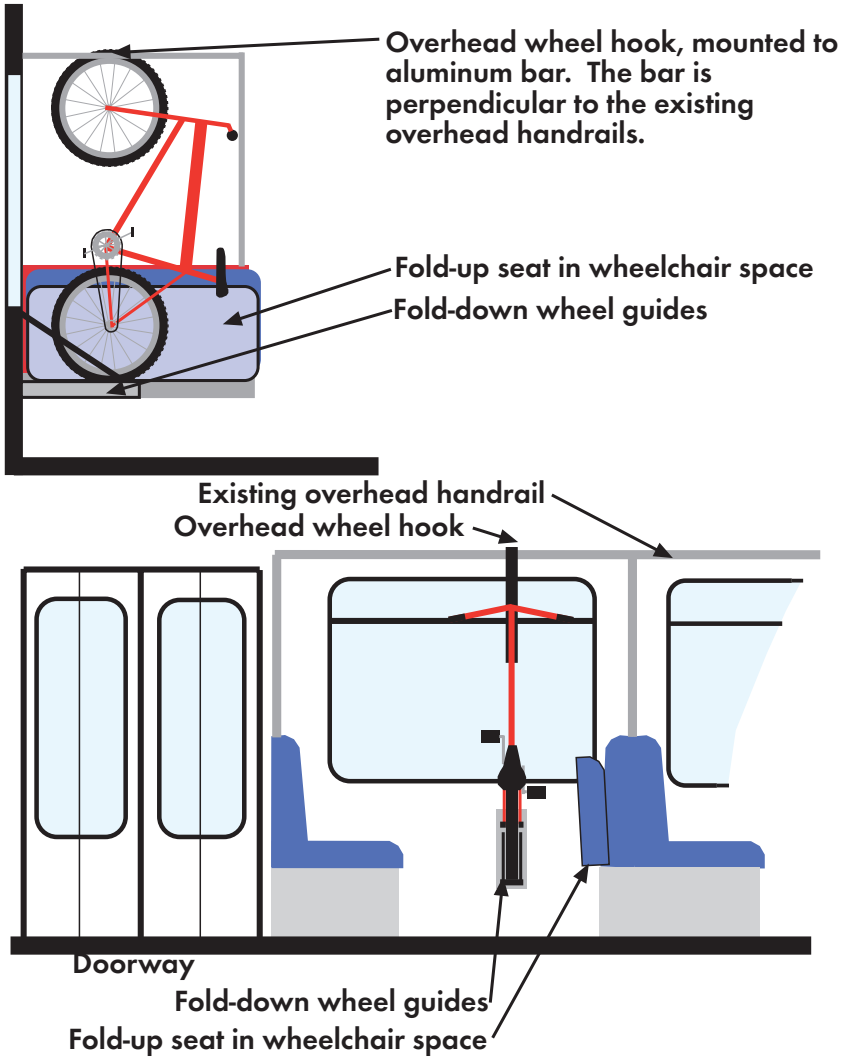


Figure 4-2. *Proposed location of bike racks in light rail vehicles. This location depicted is near the ends of the train. A seat folds up to accommodate one bike hanging overhead. Another potential location of these racks is near the articulation in the train car, as seen on VTA trains.*

- If racks are installed on the exterior of the vehicle, they must not protrude from the exterior of the vehicle or create safety hazards to bystanders or to the bicyclist loading a bicycle.
- The vehicles and platforms should include clear signage directing bike passengers to the designated bike storage areas to minimize conflicts between passengers and to quicken the loading and unloading process.

BIKE-ON-RAIL PERMITTING

Permits and safety courses become artificial barriers to bicyclists using transit. European systems have shown that good signage will serve the same purpose as permitting and requiring safety courses. However, if it is determined necessary to require permits to carry bikes onto Southeast Corridor light rail vehicles, then they should be easy to obtain. It is recommended that permits be offered by a variety of sources, such as grocery stores, local bike shops, online, via phone and mail. Also, obtaining a permit for bikes on transit should also serve as a means to register bicycles for safety purposes, in case of theft. The bottom line is that if permits are required, then there should be incentive for the bicyclists to obtain one and it should be an easy process.

Also important is the formation of a strong relationship with local bike shops and groups. By creating a partnership with these groups, there will be increased word-of-mouth and visibility for bike-on-transit programs.

EDUCATION

As stated previously, safety courses become deterrents to taking one's bike on light rail and even buses. However, there are other options for educating the public about bike-on-transit programs and using on-board racks. RTD currently has a bus-mounted rack near the customer service desk at the Civic Center Station downtown for transit users to try out and get a feel for before using the real thing. A similar set-up could be used for on-board light rail racks. Such racks could be made portable and taken to malls and schools for demonstrations.

Also, a strong print and video campaign will be important. Bike-on-transit information should become a part of all bus and light rail

schedules. Bike-on-transit program brochures should be produced and distributed to schools and all locations that carry RTD schedules and sell bus, light rail, and bike passes. Bike to Work Week should be a major public information push for bike-on-transit programs. Informational packets should be made available to the public, including school, bicycle, and scout groups. RTD could even enlist the help of local bike groups to volunteer a few hours time to spend at light rail stations during Bike to Work Week and show people how to use bike racks on light rail vehicles and buses.

As the Southeast Corridor comes to life, every effort is being made to create a bike-friendly light rail system to the greatest extent possible. Education becomes the key to letting people know how bike-friendly it is and how to use it.

BIKE DEPOTS

Several local bike groups are currently studying the creation of bike depots in Denver, specifically at Denver Union Terminal in downtown and in the Cherry Creek district. The lack of showering and changing facilities, as well as secure bike storage, at or near places of work is a strong deterrent to cycling to work or taking one's bike on the bus or light rail. Programs such as Portland's Bike Central Program or the Long Beach Bike Station should be studied closely on how those ideas can be integrated in Denver. As a future multimodal hub and stop on the new Central Platte Valley (CPV) light rail spur, Denver Union Terminal will be an ideal location for a bike depot. Available space for bike accommodations and its location on the new CPV light rail and 16th Street Mall extensions will place Union Terminal at a major transportation crossroads. Denver Union Terminal is also proposed as the terminus for new commuter rail lines to Boulder and Denver International Airport. Its status in the future of regional transportation will continue to grow as will the importance of including bicycles in those plans.

Figure 4-3. *Long Beach Bikestation. This project in Long Beach, California is seen as a model for similar endeavors nationwide..*

section 5

REFERENCES

SOUTHEAST CORRIDOR MULTI-MODAL PROJECT FINAL ENVIRONMENTAL IMPACT STATEMENT (FEIS)

Prepared by Carter & Burgess, Inc. for the Colorado DOT and the Regional Transportation District (RTD), the FEIS describes the solution for Southeast Corridor transportation improvements, how the solution was arrived at, as well as documentation of environmental impacts and proposed mitigation. Chapter Two (Alternatives Considered) provides detail on light rail station improvements and includes illustrations of the proposed station layouts. Bike and pedestrian improvements are referenced to the *Southeast Corridor Bicycle and Pedestrian Plan*.

SOUTHEAST CORRIDOR URBAN DESIGN GUIDELINES

Prepared by Carter & Burgess, Inc. for the Colorado DOT and the Regional Transportation District (RTD), the *Urban Design Guidelines* govern the appearance of the Corridor when completed. The document essentially meshes the technical aspects with the aesthetic considerations of the Corridor and how users will interface with it and what they will see. Included are guidelines for pedestrian access, interface with all modes at light rail stations, and even pedestrian and bicycle design considerations and standards for new bridges. There is much overlap between the *Guidelines* and the *Bicycle and Pedestrian Plan*.

RTD TRANSIT FACILITY DESIGN GUIDELINES

These Guidelines were prepared by RTD and lay out all of the design standards for park-n-Ride construction, as well as bus stops and bus circulation. Also included are discussions for pedestriasn and bicycle interface and related facilities.

RTD LIGHT RAIL DESIGN CRITERIA

The Design Criteria lay out the technical standards for design of all elements associated with the light rail system. A chapter is included on light rail station design with standards for pedestrian and bicycle facilities. The criteria were updated by Carter & Burgess, Inc. in 1999 for design of the Southeast Corridor. Because of several unique design circumstances, such as the need for elevators and light rail along a freeway, there was a need to update some criteria and write new ones. These revisions were written with input from and approval by RTD.

REFERENCES

Pedestrian Facilities Guidebook: Incorporating Pedestrians into Washington's Transportation System
Prepared by Otak, Inc. for the Washington DOT and other local planning agencies, this guide is broken into 11 toolkits, providing guidelines for everything from accessibility to traffic calming and intersections to pedestrian access to transit. Also included is a comprehensive, 10-page resource guide.

Implementing Bicycle Improvements at the Local Level
Published by the Federal Highway Administration in 1998, this guide highlights the benefits including bicyclists in transportation planning, post-ISTEA. The guidebook lists 13 categories of general improvements with typical problems and solutions.

AASHTO Guide for the Development of Bicycle Facilities, 1999
This is the most recent version of the guidebook published by AASHTO, relied on by many state and local planning agencies.

North Carolina Bicycle Facilities Planning and Design Handbook
The Handbook, created by the North Carolina DOT, is heavily referenced in the FHWA guide, with many guidelines taken directly from their guide.

Case Study No. 9: Linking Bicycle/ Pedestrian Facilities with Transit
This FHWA publication examines the benefits of improving transit accessibility to cyclists and pedestrians. Several other cities and countries are used as examples of how bicycling and walk access are integrated and improved. It also provides resources, helpful guidelines, and economic information regarding the successful integration of cyclists with transit systems.

Case Study No. 24: Current Planning Guidelines and Design Standards Being Used by State and Local Agencies for Bicycle and Pedestrian Facilities
The FHWA report is a compilation of Federal, trade, state, and local guidelines governing the design of bicycle and pedestrian facilities.

Conflict on Multi-Use Trails
This guide was published jointly by the FHWA and National Recreational Trails Advisory Committee. It examines problems facing trails with multiple-use groups and proposes 12 solutions to make them safer.

PLANNING AND DESIGN FOR TRANSIT HANDBOOK
This guide was published by Tri-Met in Portland and is a detailed look at land use development around transit centers and bus stops, specifically those operated by Tri-Met. The emphasis of the guide is to provide guidelines for the development of facilities that respect transit users and make access to transit easier. The Handbook is divided into three sections: Land Use Plans, Site and Building Design, and Bus Facilities Design. A fourth section titled "Development Near Light Rail" is currently under development.

TAKE BACK YOUR STREETS: HOW TO PROTECT COMMUNITIES FROM ASPHALT AND TRAFFIC, REVISED JANUARY 1998
This report was produced by the Conservation Law Foundation. The document focuses on street and road design, traffic management, and traffic calming, with the underlying advocacy for better, more pedestrian-friendly roadways.

CITY OF PORTLAND (OR) BICYCLE PARKING FACILITIES GUIDELINES
This document is available online at the following address:
www.trans.ci.portland.or.us/Traffic_Management/Bicycle_Program/parkguide.htm
The Portland guidelines briefly discuss the city's criteria for locating bike parking facilities, choosing racks, and minimum number of bike spaces required based on land use category.