

UNIVERSITY STATION
MULTI-STATION PLAN & MOBILITY STUDY
 COLORADO STATION

FINAL REPORT SEPTEMBER 2017



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CHAPTER 1

PROJECT OVERVIEW

INTRODUCTION

The Multi-Station Plan & Mobility Study explores a strategy for activating the University and Colorado Stations and improving the connectivity network in the station area and surrounding neighborhoods. The Study ran from June 2016 through May 2017 and was funded through an Urban Center/Station Area Master Planning grant through DRCOG. The study was led by Transportation Solutions, in partnership with the City and County of Denver. The University of Denver, Regional Transportation District (RTD), Lincoln Property Company, Mile High Development, City and County of Denver Councilman Kashmann and Councilwoman Black and numerous local residents were instrumental to pulling together this plan.

In 2006 the Regional Transportation District opened its Southeast Corridor light rail line, including the University and Colorado Stations. These two stations have matured over the past decade to carry strong corridor ridership, but they remain “backdoor” stations, lacking active uses and integration with the surrounding community. The Multi-Station Plan & Mobility Study identifies the characteristics of these stations today, and recommends strategies to increase bike and pedestrian connectivity to the stations, maximize mobility options at the station and leverage adjacent development opportunities to increase station activity. The recommendations of this Study, implemented in coordination with station area development plans and University of Denver Master Plan, will transition the University and Colorado Stations to integral, vibrant community assets and serve to increase mobility options for residents, students and employees throughout the study area.



View of University Station



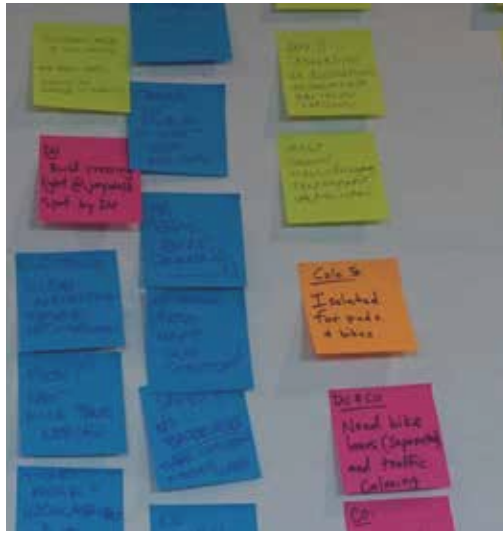
View of Colorado Station

STUDY PURPOSE

The purpose of the Multi-Station Plan & Mobility Study is to identify a cohesive strategy and key implementable actions that will increase local connectivity, access and mobility to each station, resulting in more vibrant people-friendly stations integral to the surrounding communities.

The local needs identified and addressed through this study process include:

- Transforming the stations to innovative mobility hubs with access to greater multi-modal opportunities.
- Increasing first/last mile connectivity to the stations through pedestrian and bicycle facility improvements and increased network visibility.
- Incorporating active promotion of alternative transportation options through future marketing, way-finding and TDM strategies, in coordination with Transportation Solutions and Denver Regional Council of Governments' (DRCOG's) WAY to Go program.
- Facilitating future Transit Oriented Development (TOD) investments at or near the stations by strengthening the connectivity framework throughout the area.
- Addressing other local considerations identified through a collaborative stakeholder and public outreach process.



Stakeholder Workshop - Assessment Materials

Stakeholder Workshop - Assessment Materials

STUDY AREA

Figure 01: Project Study Area



Source: Project Team

The study area for this project is generally defined as the half-mile radius around the University and Colorado Stations and the areas in between, as shown in Figure 01

Study Context

There have been many supporting studies and actions over recent years that have led to, and support, the development of the Multi-Station Plan & Mobility Study

- *Metro Vision 2035 designation of University and Colorado Stations as urban centers and call for multi-modal facilities*
- *Completion of the Denver TOD Strategic Plan characterizing the stations as needing to be “energized” (2014).*
- *Opening of the bike/ped bridge at Colorado Station (August 2015).*
- *Next phase development at Colorado Center (200,000 SF office, 189 housing units and a main street retail area).*
- *Development of the University of Denver’s Campus Transportation Plan update (completed in 2016).*
- *Emerging discussion regarding a potential bike/pedestrian bridge across I-25 in proximity to University Station.*
- *Strong market potential for both high density residential and commercial development.*
- *Renewed interest from RTD in being “more proactive” and “facilitating TOD outcomes” at station areas (RTD TOD Assessment Status Report, July, 2015).*

STUDY GOALS

- Transform these stations from backdoors to active “mobility hubs,” integral to the area.
- Design a supporting transportation network that effectively catalyzes supporting land use, innovation and place-making.
- Integrate these stations with the surrounding community.

STUDY SCHEDULE



At the beginning of the twelve month period, the focus was in collecting, documenting and analyzing the existing conditions and market study, with special attention to the existing transportation infrastructure. Using the information learned during the existing conditions analysis, concepts for strategic mobility and land use planning recommendations were developed with direction and input from a variety of city representatives, stakeholders and community members. Chapter 5 of this report documents the final recommendations. During each phase of work, city staff, stakeholders and the community provided input and directions through committee meetings, stakeholder meetings, and “pop-up” events. The next chapter provides a more detailed description of the different outreach strategies undertaken throughout the study.

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CHAPTER 2

COMMUNITY PARTICIPATION

The planning process for the Multi-Station Plan and Mobility Study included four key phases of work distinctly coordinated with management, stakeholders and community members. A robust outreach process, tailored to the community and area stakeholders, was essential to understanding today's conditions, guiding the development of study concepts and refining eventual study recommendations. This section highlights the organization of the work program and coordinated outreach and participation process.

WORK PROGRAM

EXISTING CONDITIONS & NEEDS ASSESSMENT

Collection and review of data; analysis of conditions; identification of area needs and development of framework assessment

CONCEPT DEVELOPMENT

Identification and development of a range of concepts for stations and study area addressing station activation, improved pedestrian environment and crossings, bicycle/pedestrian connectivity and programming

DRAFT RECOMMENDATIONS

Critical evaluation of the draft concepts and identification of initial recommendations

FINAL RECOMMENDATIONS

Refinement of draft recommendations to reflect stakeholder and community input; development of final recommendations for documentation

PROJECT
MANAGEMENT
TEAM

STAKEHOLDERS

PUBLIC

PROJECT ORGANIZATION



PMT meeting



PMT at site visit tour

Project Management Team (PMT)

The Project Management Team (PMT) convened monthly throughout the study process and provided direction on the course of the study and the development of recommendations. The PMT represented a broad range of expertise and interests, designed to ensure a comprehensive review and understanding of the study area. The PMT kicked off the study with a site tour of Colorado and University Stations, Colorado Center, University of Denver Campus and Buchtel Blvd. and neighborhoods between the two stations.

Members of the PMT included

- Transportation Solutions
- City and County of Denver Transit Oriented Development, Public Works, Community Planning and Development
- City and County of Denver Council members Kashmann and Black
- Regional Transportation District
- University of Denver Center for Sustainability, Facilities Management and Parking
- Mile High Development
- Lincoln Property Development



Stakeholder meeting

Stakeholder Committee

A stakeholder working group comprised of representatives of neighborhood associations, business groups and other community-focused organizations met five times at key milestones throughout the project. This group actively engaged in the development of the existing conditions evaluation, concept development and recommendations through Stakeholder Committee meetings and supporting neighborhood focus group meetings.



Discussion at Stakeholder meetings

COMMUNITY OUTREACH

“Reaching Out”

At the onset of the study, the project team attended over forty neighborhood and university meetings (October 2016 through February 2017). The team’s efforts to converse with the surrounding neighborhoods, residents, students and faculty was part of a concerted effort to “reach out” to a broad audience and diverse community to better understand the needs and concerns around the stations and to inform the existing conditions analysis and needs assessment. Additionally, in October 2016 the team held “pop-up” events at the two stations to gather direct input from light rail and bus transit users.

University and Neighborhood Groups:

- DU Sustainability Council.
- DU Graduate Student Council.
- University Park Registered Neighborhood Organization (RNO) Board Meeting.
- University Hills North RNO Board Meeting.
- Denver Police District #3 Citizens’ Advisory Board.
- DU Good Neighbors.
- Bonnie Brae RNO Board Meeting.
- Rosedale-Harvard Gulch General Membership.
- University Neighbors RNO.
- Virginia Village RNO.
- Wash Park East Neighborhood.
- University Park General Membership.
- Cory-Merrill General Membership.



Pop-up event at Colorado Station

“Community Workshops”

The first public meeting was held in January 2017 as an overview and workshop on the range of concepts for increased connectivity and activation of the stations and the study area between the stations. Over 100 people attended this workshop and participated in conversations with the project team.

The second and final public meeting was held in May 2017. The project team provided a cohesive summary of the planning process and outcomes, as well as shared the recommendations of the study for review and input by the community.



Public Open House, January 2017



Public Open House, January 2017



Final Public Open House, May 2017

PMT & STAKEHOLDER INPUT

One of the initial activities of the PMT and stakeholder groups was to discuss and document a list of existing constraints and future opportunities at the two station areas. This exercise assisted the project team when developing options and concepts and pointed out issues that should be addressed in this study or future projects. The constraints gathered per station area are detailed below. The community input gathered through University, neighborhood and public meetings, and pop-up events is also displayed below.

University Station Area

- Distance from the station to University Blvd.
- Lack of year-round businesses.
- Lack of pedestrian/bike crossings across Buchtel from the station.
- Pedestrian unfriendly environment.
- Lack of activation on High St.
- Direction / wayfinding signs for cars are hard to follow.
- Crossing from the platform to the Buchtel/High St. crosswalk is dangerous.
- Convenient and free parking is preferred.
- What is going on with the empty retail space under the garage? Would like to see a coffee shop or small market or something similar.
- There is a need for real-time transit information at the DU station. The current ones do not work.
- There is a need for drop-off areas at station (or better marked areas).
- There is currently a lot of bike/pedestrian conflict on the shared use path into the station. The path is often unusable for bikes during peak times due to the high number of pedestrians.
- There is a need for improved/additional crossings along Buchtel. Currently, there is a lot of jay-walking along Buchtel between High St. and University Blvd.
- Improve pedestrian crossing of University/Buchtel.
- Improve bicycle access and increase bicycle routes/facilities throughout the University area.
- Make Buchtel a “bikeway” linking both stations.
- Improve pedestrian crossings of Buchtel; improve pedestrian crossing of High St. and Buchtel; increase pedestrian space and way-finding at the station.
- Create a “gateway” to campus near the station.
- Increase the number of uses near the station: housing, retail, restaurants.
- Redevelop the parking structure at the station – but don’t lose the number of spaces!

Colorado Station Area

- Lack of connectivity to adjacent neighborhoods (south of Evans, west of Colorado).
- Lack of landscaping/urban design/pedestrian amenities/sidewalks on Colorado.
- Difficulty in changing the existing RTD facilities and infrastructure.
- Barriers to development: Public Storage, Freeway Ford.
- Lack of scale and continuity to the ‘wedge’ east of the park-n-ride.
- Fractured ownership in parcels between Colorado Center Dr. and Evans, and between Colorado Blvd. and I-25 is a challenge to development.
- Overall auto-oriented area: unsafe and dangerous for pedestrians and neighbors.
- Traffic on Evans and Colorado makes the area pedestrian and bicycle-unfriendly.
- Zoning on Evans Ave encourages auto-oriented, non-TOD uses such as drive-through fast food establishments.
- Low visibility and access to pedestrian bridge.
- I-25 is a barrier to neighborhoods to the north.
- It’s a popular transfer station—but most people aren’t very familiar with the surrounding neighborhood.
- It is unsafe for pedestrians to cross Colorado Center Dr. The crosswalk is rarely used and cars often don’t pay attention and skip the stop sign.
- Link RTD station to uses south of Evans and to Colorado Center development.
- Improve pedestrian safety at Buchtel/Colorado Blvd.
- Enhance pedestrian environment along Colorado Center Dr.; increase utilization of bike/pedestrian bridge.
- Connect neighborhoods to the east of I-25 via bike/pedestrian bridge.
- Rethink RTD parking lot for redevelopment opportunities - but keep the parking!
- Lack of housing choices.

"BIG IDEAS" EXERCISE



Green Streets investment throughout



Family-friendly transit Plazas (Director Park, Portland OR)



Housing wrapped Parking (Denver)



Pedestrian bridge (Colorado Station)

In addition, the project team asked the PMT and stakeholders to develop a list of "big ideas" for improvements at the two station areas. These big ideas were meant to be innovative, unconstrained by cost or institutional barriers, and free-form, and are summarized below.

General

- Create a bike/pedestrian boulevard from the Louisiana/Pearl light rail station to the Colorado Station, including elevated sections similar to the High Line in New York City.
- Put all parking underground at the stations and develop the air rights above.
- Provide convenient first and last mile shuttles to connect the surrounding neighborhoods with the stations.
- Invest in 'green streets' and pedestrianization throughout.
- Create family-friendly pedestrian plazas along the LRT line and at stations.
- Increase density with no parking minimums.
- Put I-25 underground and connect the neighborhoods on both sides with parks and plazas.

University Station Area

- Move the light rail line and station underground to recapture and re-energize the plaza above.
- Partner with DU for more housing in the station area.
- Move the light rail station east to better connect with University Blvd.
- Improve pedestrian crossings throughout the I-25 interchange and ramp system at University Blvd.
- Build a pedestrian bridge across I-25 to connect the light rail station with the neighborhoods to the north.
- Expand bike sharing and parking throughout the station area.
- Redevelop or wrap the RTD parking garage.

Colorado Station Area

- Close Colorado Center Dr. to autos and create a pedestrian plaza and park.
- Sell the air rights at the RTD station and develop above it.
- Buy out and redevelop the Freeway Ford parcel.
- Add Bus Rapid Transit and protected bicycle lanes on Colorado Blvd.
- Cover the station platform and make it an underground station accessed through development on the existing RTD parking lot site.



CHAPTER 3

EXISTING CONDITIONS

This chapter documents all relevant background data and summarizes the relevant transportation conditions and infrastructure characteristics within the University and Colorado Stations study area.

UNIVERSITY OF DENVER STATION

EXISTING LAND USE

Figure 02 shows current land use in the study area. It shows significant single-family residential land use in areas adjacent to the two stations, with civic/public uses around the University Station (related to the University of Denver) and significant commercial and office land use around the Colorado Station, reflected in the significant office characted of the area.

Figure 02: Land Use in Study Area



- | | | | | |
|---|---|--|--|--|
| Single Family | Mixed Use | Institutional | Industrial | Vacant |
| Multi Family | Commercial | Office | Parks | Other |

Source: Project Team

EXISTING ZONING

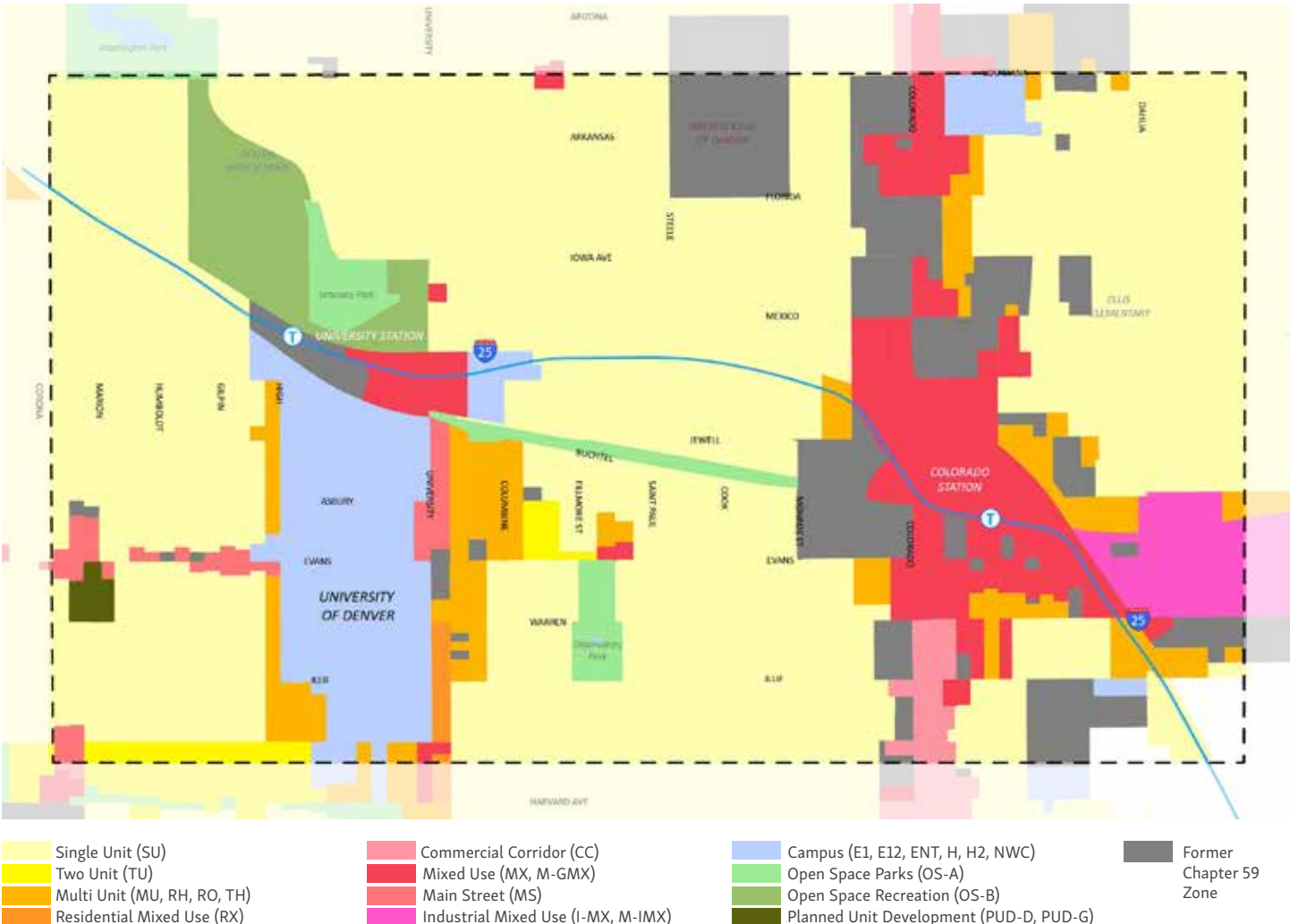
Current zoning is shown in Figure 03.

This analysis of land use around the two station areas shows that existing zoning is compatible with the potential for providing mixed-use higher-density development in the study area, with a variety of zoning designations in different parcels related to commercial mixed use and residential development. The potential exists for better coordination of zoning to improve zoning consistency throughout the two station areas supportive of TOD development.

The area encompassing the University Station and garage (and the existing University Station senior housing project just to the west of the station) is zoned R-MU-30.

The area north of the Colorado Station is zoned commercial mixed-use (C-MX-20) with an overlay district (UO-1). The area south of the light rail line and station (including the Freeway Ford complex and part of the RTD parking lot) is zoned for commercial mixed use also (C-MX-20), with a portion of the existing RTD parking lot zoned for a Planned Unit Development (PUD-109)

Figure 03: Zoning in Study Area



Source: Denver Open Data/Project Team



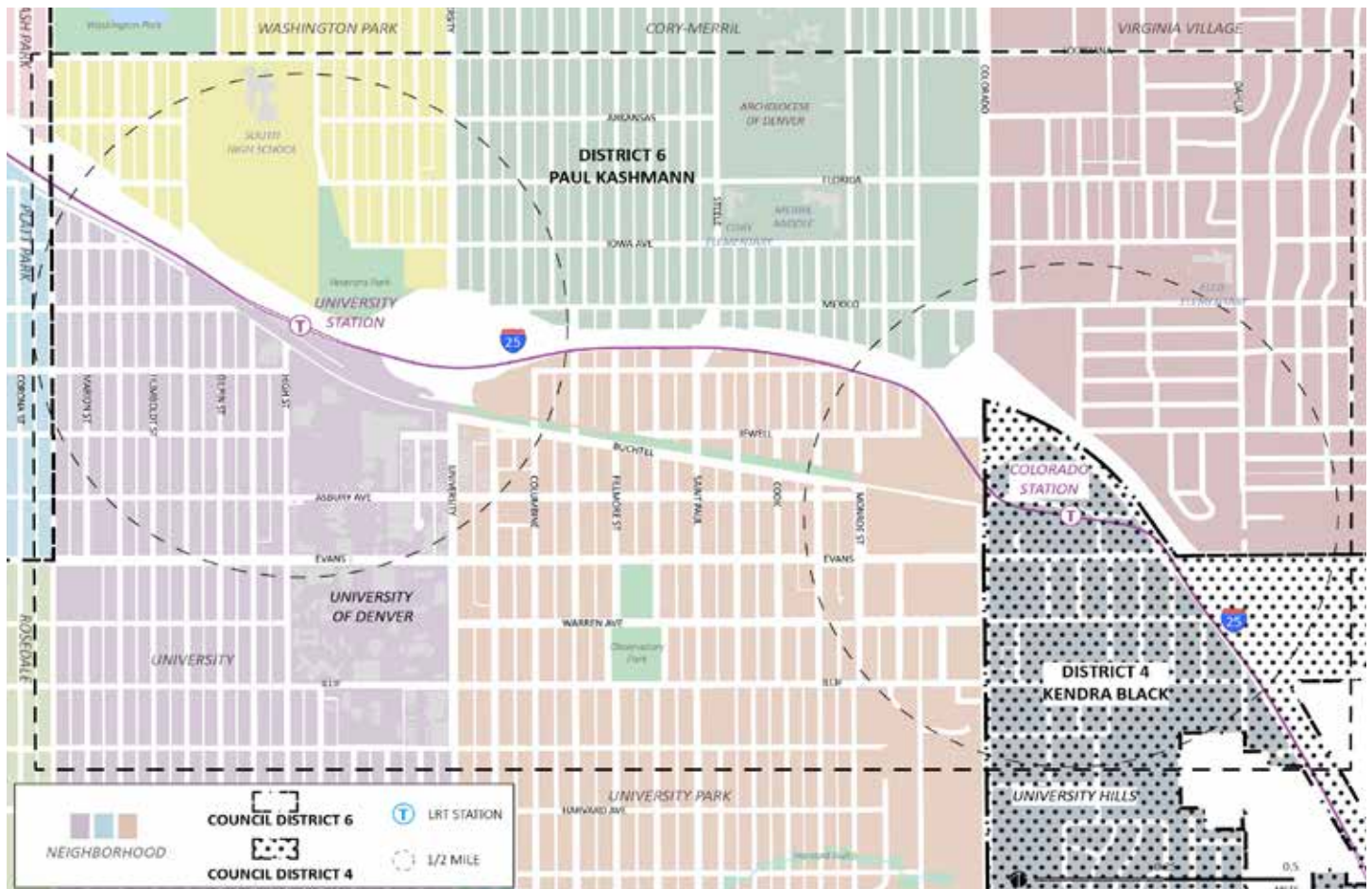
EXISTING CONDITIONS

NEIGHBORHOODS, COUNCIL DISTRICTS & RNOs

The study area includes several neighborhoods, two different council districts and a variety of Registered Neighborhood Organizations (RNOs). The neighborhoods included in the study area are: Washington Park, Cory-Merrill, Virginia Village, University, University Park, and University Hills. The two different council districts are: Council District 6 represented by Councilman Paul Kashmann, and Council District 4, represented by Councilwoman Kendra Black. The study area also includes a total of 15 RNOs.

In order to increase the mobility in the area and increase the activity at the two stations it was important to understand the needs from the different neighborhoods, their representatives and organizations.

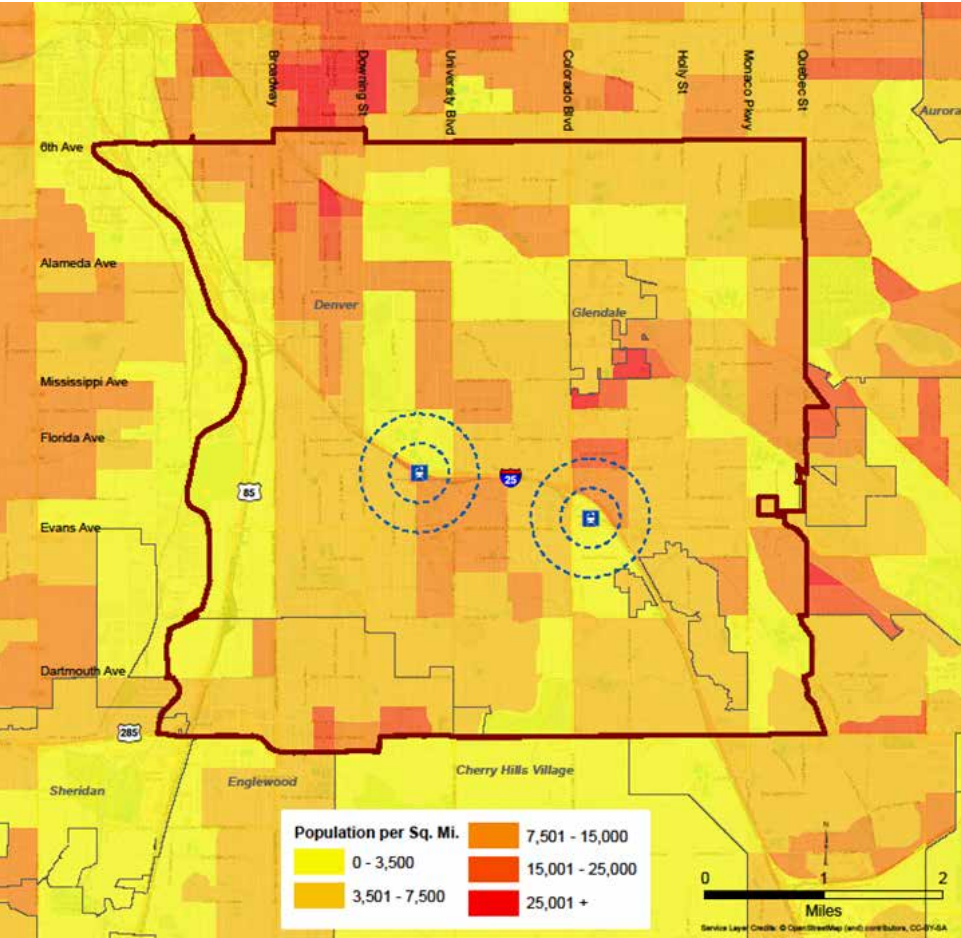
Figure 04: Neighborhoods, RNOs, and Council Districts



Source: Project Team

OVERALL POPULATION

Figure 05: Overall Population



Source: Project Team

The University and Colorado Stations are located approximately four miles south of Downtown Denver. The neighborhoods surrounding the stations include Washington Park, Cory-Merill, and Virginia Village to the northwest, north, and northeast, respectively. The University, University Park, and University Hills neighborhoods lie to the southwest, south, and southeast, respectively.

Figure 05 illustrates the population per square mile of the market and study areas. The figure shows a fairly low population concentration within the market area indicative of single-family unit neighborhoods. There are, however, a few pockets of high population concentrations, such as the north end of the Virginia Village neighborhood near Glendale, and the Speer neighborhood south of Speer Blvd. where many multi-story apartment and condo buildings are present.

Population concentrations around the stations are also quite low. However, high-density student housing increases the population concentration southeast of University Station, and high density apartment buildings increase the population concentration north of the Colorado Station across I-25.

Table 01: Population Summary

2016 Estimates

	Persons	Households	Persons / Household
University Station 1/4 Mile Radius	2,595	1,076	2.41
University Station 1/2 Mile Radius	7,332	3,148	2.33
Colorado Station 1/4 Mile Radius	1,038	615	1.69
Colorado Station 1/2 Mile Radius	4,931	2,574	1.92
Market Area	157,145	80,020	1.96
City of Denver	687,137	304,496	2.26

Source: Claritas, ArLand



EXISTING CONDITIONS

DEMOGRAPHICS AND MARKET ANALYSIS

In addition to examining the ¼ and ½ mile radii around each of the stations, the study also examines a broader market area, generally encompassing a 3 mile radius from the stations.

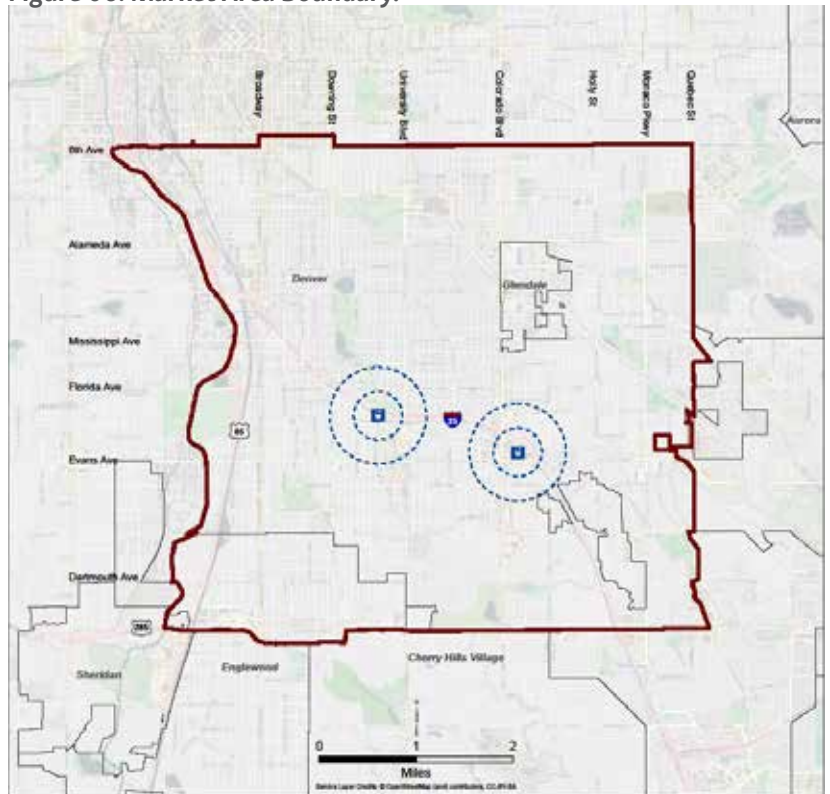
The population around University Station is younger than Colorado Station, the Market area and the City. The millennial population (25-34 years) represent 22.2%. The Colorado Station, on the other hand, has a higher percentage (19%) of the population aged 65 years or older than the market area or the city.

A low number identify as Hispanic or Latino in the market area compared to the City and County of Denver. However, greater Hispanic concentrations are present within the ¼ mile radii of Colorado Station.

The market area has a higher median household income (\$60,835) than the station areas and the city.

For a more complete look at the Market Analysis please see the University and Colorado Station Area Market Analysis document.

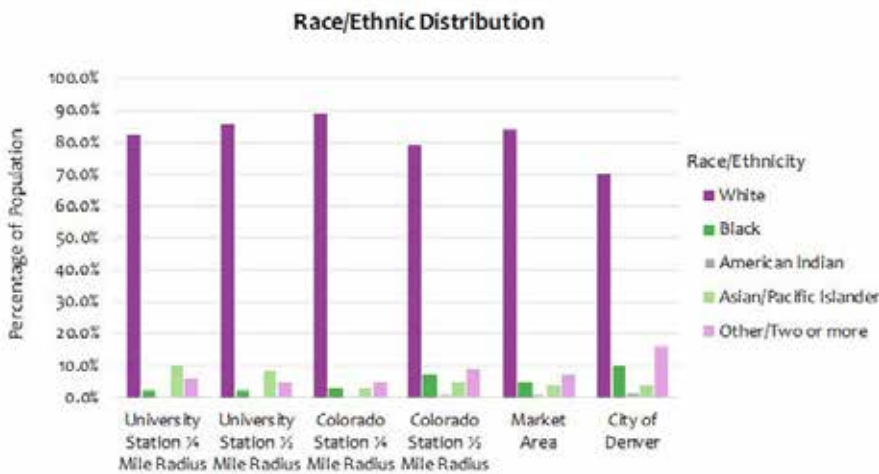
Figure 06: Market Area Boundary.



Market Area in Red

Race/Ethnic Distribution

Median Age



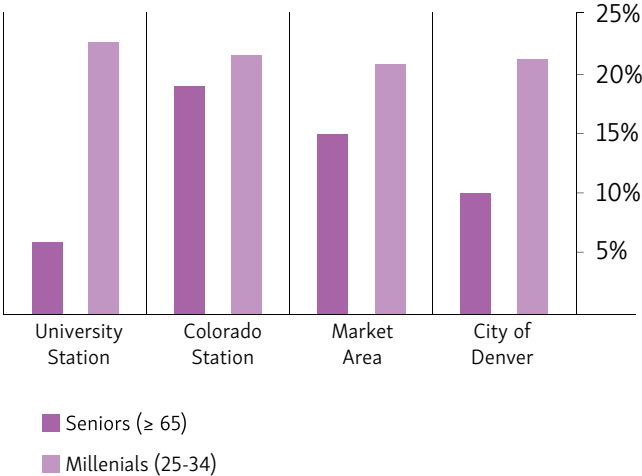
38.1
Market Area

34.8
City of Denver

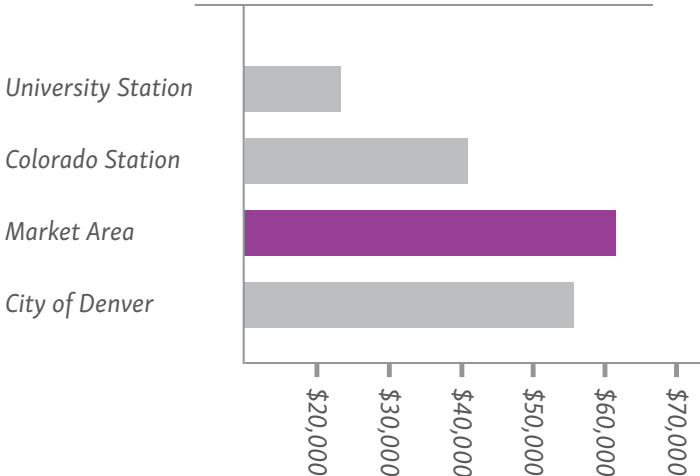
25.1
University Station

39.4
Colorado Station

Percent of Seniors and Millennials



Median Household Income



DEMOGRAPHIC & MARKET ANALYSIS TAKEAWAYS

- The University Station area has a significantly higher number of average persons per household than the Colorado Station and the City and County of Denver as a whole, which is to be expected given its high student population. This means that the areas surrounding the University Station have a good potential for high transit usage targeted to the student population.
- The areas around the Colorado Station have a significantly higher median age than the City and County of Denver, reflecting a relatively high senior population. Those aged 55 and above (generally the Baby Boom generation) comprise around 30% of the population around the Colorado Station, indicating a potential market for mobility services for an aging population in that area.
- Millennials (those aged 25-34) comprise more than 20% of the population in both station areas, indicating a high potential for the use of alternative mobility services (including bike and car sharing and traditional and non-traditional transit services) and improved urban amenities around the two stations.
- Median household incomes in the areas around both stations are significantly lower than in the market area and the City and County of Denver, indicating a potential market for transit usage.
- The following represent the market analysis conclusions in regards to what the market can support in each of the following uses:
 - **Housing:** 1,600 Multifamily units: Colorado Station: market rate residential, for-sale condos, senior affordable and family affordable (east of I-25) near the pedestrian bridge. University Station: international graduate student families, domestic students, alumni associated housing, market rate residential.
 - **Retail:** 52,000 square feet at University. 40,000 square feet at Colorado.
 - **Office:** 130,000 square feet.
 - **Hotel:** 2-3 hotels or about 460 keys (rooms).



TRAFFIC AND RELATED FACILITIES



Bicyclist near the University Blvd. and Buchtel Blvd.

- Grid system creates opportunities for good connectivity in the area.
- I-25 and major arterial roads create significant barriers for pedestrians and cyclists.

The majority of the study area is organized in a grid street pattern which creates multiple opportunities for east-west street connectivity in the immediate area, but places significant vehicular demand on Evans Ave. as a continuous east-west arterial facility. North-south connectivity is limited due to the presence of I-25, and traffic counts along University Blvd. and Colorado Blvd. indicate a strong reliance on these arterials to move north-south traffic through the area.

For pedestrians and cyclists, the major arterials of Colorado Blvd. and University Blvd. act as barriers to comfortable east-west mobility, despite the signalized crossings at Buchtel Blvd. and Evans Ave. North-south connectivity is inhibited by the presence of I-25, making Franklin St. and Steele St. the only real bike and pedestrian-friendly connections over the highway.

Figure 07: Street Classification and Traffic Count



Source: Project Team

STATION AREA WALKSHEDS

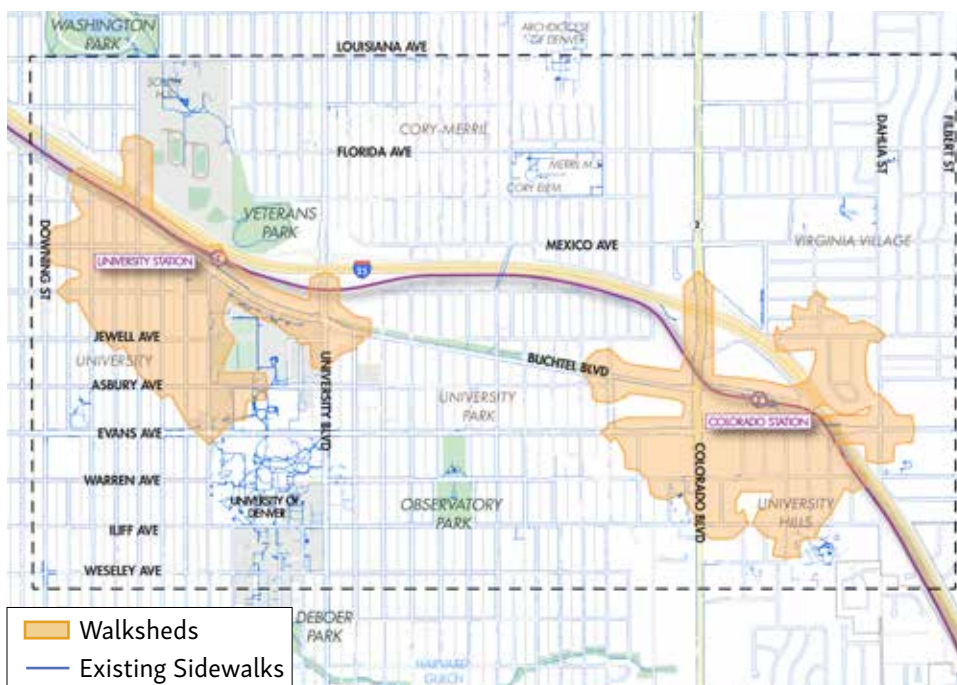


Pedestrian crossing at University Blvd. and Evans Ave. intersection

A walkshed is a spatial analysis of possible pedestrian movement. While there is no one definition, the Transit Street Design Guide published by the National Association of City Transportation Officials (NACTO) in 2016 defines a walkshed as “the distance people will walk to a transit stop.”

Figure 08 illustrates the walksheds calculated for the two station areas, with the orange areas showing the areas that are within a ten-minute (or roughly a half-mile) walk of each transit station. The I-25 freeway clearly represents a major barrier for pedestrians wishing to access the two transit stations from surrounding neighborhoods. When the pedestrian bridge across I-25 from the Colorado Station opened, the walkshed expanded to include residents in Virginia Village to the east of the station.

Figure 08: Station Area Walksheds and Existing Sidewalks



Source: Project Team and City and County of Denver

Additional guidelines from the NACTO guide

The directness and clarity of the pedestrian network in the transit walkshed has immediate relevance to the safety of transit passengers, and must be prioritized in ridership-oriented transit street design and planning. Good sidewalks save money, since disconnected walking networks can prevent efficient transit routing patterns.

Access to transit is improved with direct pedestrian paths of travel that provide the shortest distance to transit stops for the largest numbers of potential riders. Short block lengths and a high density of intersections will maximize the area reachable on foot in a reasonable length of time.

The movement of transit passengers is as important as the design of transit stations. Within and around a transit stop, pedestrians should be able to travel in direct paths whenever possible, and safety measures should be designed so that the station remains a welcoming environment.

EXISTING CONDITIONS

BICYCLE AND PEDESTRIAN FACILITIES



Franklin St Bicycle Lane Crossing I-25



Pedestrian Bridge at Colorado Station

Bicycle facilities play an important role in mobility in and around transit station areas. According to the NACTO guide:

Bicycle networks extend the reach of transit, providing an easy way for many transit riders to make first- and last-mile connections. Integrating bike share and personally owned bicycles with transit is a key step in creating an urban mobility system that covers the entire city or urban area.

Figure 09 illustrates existing and planned bicycle facilities in the study area. While some station area streets are already designated as sharrows or have non-protected bike lanes, these two types of bicycle facilities are the only ones that exist within the study area. However, figure 09 shows that a buffered bike lane is proposed for the segment of Buchtel Blvd. between the University and Colorado Stations, with additional proposed designated bikeways and bike lanes on a variety of neighborhood streets in the station areas.

Per 2011 Denver Moves, a bike lane is a facility type where a portion of the roadway is designated for preferential use by bicyclists. Buffered Bike Lanes are created by painting a flush buffer zone between a bike lane and the adjacent travel lane. Bikeways on the other hand, are roads that have been designated as part of the bicycle system where bicyclist operate with motor vehicles without any designated bicycle facility

A pedestrian/bicycle bridge was installed at the east end of the Colorado Station in 2014, but it is generally underutilized, and access on both ends is complicated and inconvenient.

In addition, the closest B-cycle bike sharing facility is located north of the University Station across I-25 at the intersection of Louisiana and Franklin (at South High School). A B-cycle facility formerly was located at the University Station but was removed in 2015 due to low usage.

Figure 09: Existing and Planned Bicycle Facilities in the Study Area



Source: Denver Moves Bicycle Facilities Map

Takeaways

- Lack of consistent bicycle and pedestrian connectivity.
- There is a need for a good wayfinding strategy to help guide pedestrians and cyclists to the stations.
- No bikeshare systems currently serve the area.
- Major roads, such as I-25, Colorado Blvd., University Blvd., and Evans Ave. represent connectivity barriers.
- Major intersections difficult to navigate by pedestrians and cyclist. Major issues at Buchtel/University, and Buchtel/Colorado, Evans/University and Evans/Colorado.

BUS ACTIVITY



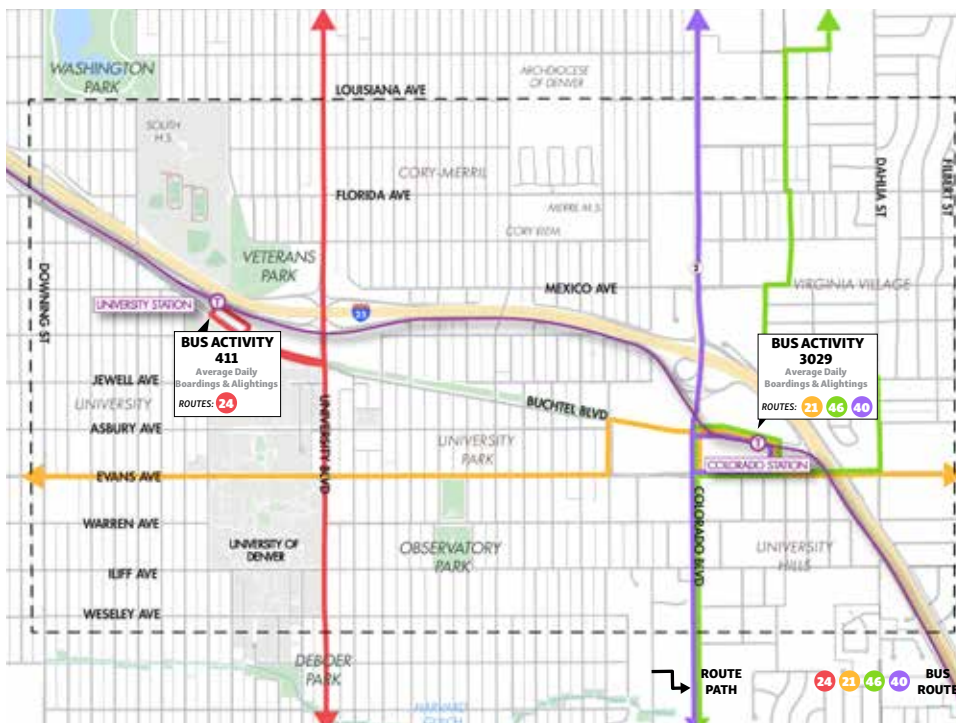
Bus Station at Colorado Station with Light Rail Station below grade

The University and Colorado Stations opened in 2006. Colorado Station is a major bus facility and transfer point. Route 40, serving Colorado Blvd. is one of the city’s busiest lines. In addition to the three RTD routes illustrated, the Bustang also makes several stops here at peak periods, connecting users south to Colorado Springs.

Bus activity at University Station is limited to Route 24, stopping here every 30 minutes at peak.

Altogether, bus boardings and alightings at the Colorado Station total 3,029 on an average weekday. Figure 10 shows the RTD bus routes serving the two stations and related daily activity.

Figure 10: Station Area Bus Routes and Ridership



Source: RTD

Bus Routes

The **University Station** is served by one bus route:

- **Route 24** (the University Blvd. route). The route travels north and south on University between the 40th/Colorado commuter rail station on the north and C-470 on the south. It diverts off of University Blvd. onto Bachtel Blvd. to serve the University Station. RTD ridership reports show a total of 411 daily bus boardings and alightings at this station.

The **Colorado Station** is served by three bus routes:

- **Route 21** (Evans Ave.) runs from the Federal Center in Lakewood on the west to the Aurora Metro Center on the east on weekdays (with a slight truncated route on the west on weekends).
- **Route 40** (Colorado Blvd.) runs from 60th and Dahlia on the north to the Southmoor light rail station at I-25 and Hampden on the south.
- **Route 46** (South Dahlia) runs from the Cherry Creek area at 1st and Milwaukee to the Denver Tech Center at Ulster and Tufts on weekdays; on weekends, its southern terminus is at the Colorado Station.

RAIL ACTIVITY

Figure 11 summarizes rail station activity at the two study area stations and other stations along the RTD southeast rail line.

The figure shows that the two stations have a moderate to high level of boardings and alightings compared with other stations on the southeast line, with the University Station having just over 3,900 boardings and alightings on an average weekday, and the Colorado Station having more than 5,100. Other major transfer points (I-25/Broadway, Southmoor, Nine Mile, and Lincoln) are the only other stations on the southeast line with activity similar to or greater than that seen at the two study area stations.

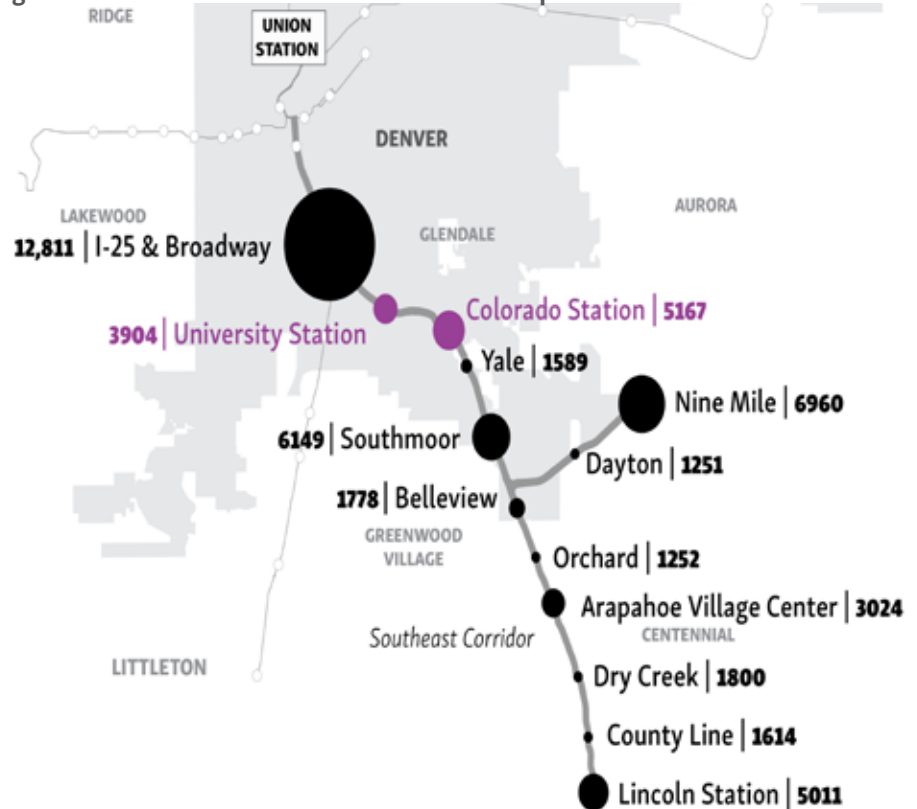


Light Rail at Colorado Station

Transit Analysis Takeaways

- The two stations have some of the highest ridership numbers of the corridor.
- Bus routing and ridership generally serve major thoroughfares, but provide little service to adjacent neighborhoods.
- Stations layout is difficult to navigate for inexperienced riders.
- Significant pedestrian/vehicular conflicts occur at the two stations, especially at the University Stations since pedestrians are mixed with autos and buses at the entrance to the platform.

Figure 11: Station Area Bus Routes and Ridership



Source: RTD

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CHAPTER 4

FRAMEWORK ASSESSMENT

This chapter describes the immediate context of the University and Colorado Station areas today and includes a complete needs assessment of mobility challenges. In addition, it includes a framework analysis as the basis for subsequent mobility recommendations.

THE STATION AREAS TODAY

University Station



- 1** The RTD light rail station parking garage entrance conflicts with the pedestrian circulation to and from the station.
- 2** RTD parking garage unfinished first floor space negatively effects station activity today.
- 3** University Senior Housing development lacks visual unity and connectivity to the platform
- 4** Apartment complexes east of the station have minimal connectivity or relationship to the station.
- 5** Four lanes of Buchtel Blvd. acts as a barrier between the station and campus. Heavy pedestrian movements across Buchtel occur at various unmarked locations.
- 6** Intersection of Buchtel and University is difficult to navigate for pedestrians and bicyclists.
- 7** The DU parking garage site sits on an important, visible corner in relationship to the campus and station.
- 8** Retail and entertainment uses along University lack visibility or connection to the campus.
- 9** Intersection of University Blvd. and Evans Ave. is difficult to navigate for pedestrians and bicyclists but is in high demand due to location near campus.
- 10** Evans Ave. is a barrier to north-south connectivity on campus.
- 11** Pedestrian spine within campus does not align with any designated pedestrian crossing of Buchtel Blvd.
- 12** I-25 Interchange footprint is overwhelming and difficult to navigate as a pedestrian or cyclist. It is a clear impediment to connectivity to neighborhoods and high school north of I-25.
- 13** Minimal, visible pedestrian and bicycle connections within neighborhood and to/from station.



Colorado Station



- 1 Below grade platform acts as a barrier to connectivity through the station area and creates confusion and isolation for riders.
- 2 Lack of visible connectivity from Colorado Center to the station, and from the station to the neighborhood south of Evans Ave.
- 3 RTD large surface parking lot acts as a barrier and inhibits pedestrian activity in the station area.
- 4 Freeway Ford and parking lot does not contribute to an active pedestrian environment near the station.
- 5 Auto-oriented Colorado Center Drive minimizes physical connection to the new bike and pedestrian bridge over I-25.
- 6 Lack of relationship between the station and neighborhoods north of I-25.
- 7 Evans Ave. is a busy arterial that lacks an evident pedestrian environment or amenities.
- 8 Intersection of Colorado Center Drive and Buchtel Blvd. carries heavy traffic and bus volumes; bike and pedestrian navigation of intersection difficult.
- 9 Parcels adjacent to the station and along Colorado Blvd. lack relationship with the station.
- 10 Neighborhoods south of Evans Ave. lack visible, physical connections to the station.

NEEDS ASSESSMENT

Based on the background data and discussions with the project’s stakeholders, the project team identified specific needs related to mobility and development for the two station areas.

General

- More diverse and integrated types of housing are needed in the area.
- More multi-modal and comfortable connections are needed throughout.
- Buchtel is a major opportunity for a bike boulevard and pedestrian/crosswalk improvements at both stations.
- There is a need to make the area a more active neighborhood with desirable public spaces throughout.

University Station Area

- There is a need to improve bicycle and pedestrian connectivity/friendliness along Buchtel and other streets in the area.
- The DU parking garage on High St. presents a major opportunity for redevelopment.
- A public-private partnership focused on development around the parking garage would benefit the area. Ideas for use of the existing retail space include: casual sit-down restaurants or other neighborhood-focused retail; housing; office; an improved public space; and reorientation of the bus loading areas to eliminate vehicular conflicts with pedestrians.
- Overall improvement of High, Buchtel, and University are needed relative to the station. Those three roadways should be activated to create a welcoming and easily identifiable gateway to the campus.
- There should be a focus on attracting year-round retail activity on University instead of seasonal retail focused on students.
- The shared use of DU parking for off-site consumers should be considered, especially when campus activity is light.
- There is a need to add more on-campus housing. In particular, there is the need to add international student/faculty/senior housing in the area, which could possibly be included at the RTD garage, or across I-25, connected by a pedestrian bridge to the station and campus.
- Good wayfinding is needed all around the station and campus.
- The “Main Street” concept should be extended from the station to the south side of campus to provide an easily identifiable path for pedestrians and bicyclists.
- Bicycle facilities should be greatly expanded at the station (including bike storage, bike sharing, and other facilities).

Colorado Station Area

- The City should work with property owners around the station to improve land use (instead of fast food and storage facilities).
- The City should work with the neighborhoods to the south to develop good plans for redevelopment of the land south of Evans Ave.; that area could be the neighborhood’s ‘downtown’.
- The City should work with the local community to create safe pedestrian crossings to better connect nearby neighborhoods.
- Consideration should be given to locating DU affordable graduate, international, and staff housing near the station (perhaps as joint development on the RTD park-n-ride lot).
- There is a major need to improve walkability and urban design in and around the RTD station.
- The RTD park-n-ride is underutilized and would better serve the area if redeveloped with retail and multifamily mixed use buildings with improved connectivity to the station and surrounding areas.
- There is a need to drastically improve urban design along Colorado Center Dr. and its connectivity to the pedestrian bridge.

MOBILITY FRAMEWORK

Specifying a connectivity framework, based on the needs and opportunities, will help guide and align the recommendations in order to solve for the mobility barriers and arrive at the desired goals.

Figure 12: Study Area Block Pattern



Figure 13: Study Area Land Use Pattern



Figure 14: Study Area Mobility Barriers



Figure 15: Study Area Mobility Framework



Block Pattern - Grid

The study area contains the basic elements for good connectivity. The existing grid pattern and small block size is a strong framework for connectivity options and direct station access.

Land Use Pattern

The two station areas are surrounded by mostly single family housing residential uses. Along Colorado Blvd. and at the Colorado Station there are significant commercial and office uses. Around the University Station, there is a unique combination of institutional and event uses in addition to residential uses. The mix of uses within the study area provide both, the population and destination locations for people to move within the area.

Mobility (Bike/Ped) Barriers

The residential pockets are bounded by some roadways that while serving as vehicular connectors, represent barriers for pedestrian and bicycle movement within the study area. The North-South arterials of University and Colorado, carry an average of 35,000 to 45,000 average daily vehicles per day.

Framework & Key Intersections

The grid pattern and the key North-South and East-West connections are the framework for evaluating future solutions.





CHAPTER 5

RECOMMENDATIONS

STUDY GOALS

1

Transform these stations from “backdoors” to central mobility hubs that are integral to the community.

2

Design a supporting transportation network that enables mobility options and changes in travel behavior.

3

Catalyze land use, inspire innovation and encourage place-making.

RECOMMENDATIONS OVERVIEW

1

PHYSICAL NETWORK IMPROVEMENTS

These recommendations comprise changes to the built environment at the stations and specific infrastructure improvements that create a network for bike and pedestrian connectivity through the study area, and enable broader mobility options.



Strategy 1A Physical Network Improvements University Station Zone

Strategy 1B Physical Network Improvements University Park Zone

Strategy 1C Physical Network Improvements Colorado Station Zone

Figure 16: Physical Network Improvements, Overview by Zones



Source: Project Team

A Bicycle facility improvements at Franklin / Buchtel intersection

New pavement markings and signage help transition from existing bicycle facilities at Franklin to a new cycle track along Buchtel.

B Pedestrian bridge over I-25

A bridge connecting neighborhoods north of the station increases visibility, access, and activity. Evaluation requires a related parking study north of I-25.

C Redesigned intersection with roundabout at High / Buchtel

This redesigned intersection and roundabout enables RTD curbside bus service and turnaround and allows for flexible special event operations.

D Transit plaza at University Station

Removing vehicle access to the RTD garage from High St and consolidating access points to the east creates opportunity for a large public plaza.

E Mid-block pedestrian 'Z' crossing near DU Ritchie Center

A new staggered crosswalk creates a safe refuge, allowing pedestrians to face oncoming traffic before making a decision at the mid-block crossing.

F Redesigned intersection at University / Buchtel

Pedestrian and bicycle oriented intersection removes high speed right turns, shortens crossing distances, and features exclusive bicycle signal phasing.

G Redesigned intersection at University / Asbury

Pedestrian and bicycle oriented intersection features enhanced pedestrian crossing features.

H Redesigned intersection at University / Evans

Design emphasizes pedestrian safety and mobility enhancements near heart of DU campus.

I Enhanced pedestrian crossing at Clayton

Enhanced pedestrian crossing creates better access to Historic Buchtel Trail and accompanying open space.

J Pedestrian and bicycle improvements at St. Paul / Steele

Narrowing of Buchtel and exclusive pedestrian and bicycle phases improve safety and emphasize multimodal connections.

K Redesigned intersection at Monroe

Traffic signalized intersection and smaller crossing distances improves pedestrian and bicycle experience and creates new crossing of Buchtel.

L Redesigned intersection at Colorado / Buchtel

Pedestrian and bicycle oriented intersection removes high speed right turns, shortens crossing distances, and features exclusive bicycle signal phasing.

M Redesigned access to Colorado Center and auto-oriented wayfinding

Creating additional access into Colorado Center can reduce vehicle congestion along Colorado Center Dr. and Evans Ave.

N Redesigned intersection at Colorado / Evans

Design features an improved pedestrian experience and significant safety enhancements for crossings of Colorado Blvd. and Evans Ave.

O 2-way cycle track along Buchtel, Franklin to I-25

A 'bicycle super highway' connecting University and Colorado Stations provides safe and attractive access to light rail and nearby bicycle facilities.

P Pedestrian improvements along Asbury

A key neighborhood connector, an improved Asbury includes complete sidewalks and other amenities to enhance connectivity.

Q New Bellaire complete street

Bellaire continues through existing RTD parking lot, aligning the street grid and providing direct neighborhood access to Colorado Center Main Street.

R New pedestrian crossing of Evans

Improvements to the pedestrian environment at and across Evans increases opportunities to reach Colorado Station safely and efficiently.

2

MOBILITY HUBS, SERVICES AND PROGRAM LEVEL RECOMMENDATIONS

Strategy 2A - Develop the Stations as Regional Mobility Hubs

Strategy 2B - Develop a Network of Local Mobility Hubs

The Physical Network Improvements create the opportunity to redefine the space needed at the University and Colorado Stations to accommodate more innovative Mobility Hubs and hub operations in the future. These strategies are supported by additional strategies for future services, programming and information that can be developed independently over time, in coordination with other ongoing planning efforts.



Strategy 2C - Develop a Station Area Wayfinding System

Wayfinding system design and signage is a relatively simple and low-cost strategy that can greatly enhance the utilization of the mobility hub, and complement and leverage other investments.



Strategy 2D - Expand Local Transit

Microtransit is becoming a popular solution for mobility between transit/ rail stations, area destinations and neighborhoods. Different technologies are being tested in cities around the country and the options for microtransit and shuttle operations are quickly growing.



Strategy 2E - Expand Bicycle Facilities

The expansion of available bicycling options at both stations is a great way to increase the reach of the connectivity framework in the area. Bike sharing system technologies are enabling easier, custom, more cost-effective programs built around the "bike on technology" approach.



Strategy 2F - Enhance and Expand TDM Programs

Transportation Demand Management refers to a wide range of transportation strategies that attempt to improve the transportation system's overall efficiency, sustainability and options for moving residents and employees.



1 PHYSICAL NETWORK IMPROVEMENTS

STRATEGY 1A - PHYSICAL NETWORK IMPROVEMENTS UNIVERSITY STATION ZONE

Figure 17: Physical Network Improvements, University Zone



A Bicycle facility improvements at Franklin / Buchtel intersection

B Pedestrian bridge over I-25

C Redesigned intersection with roundabout at High / Buchtel

D Transit plaza at University Station

E Mid-block pedestrian 'Z' crossing near DU Ritchie Center

F Redesigned intersection at University / Buchtel

G Redesigned intersection at University / Asbury

H Redesigned intersection at University / Evans

A Bicycle facility improvements at Franklin / Buchtel intersection

This improvement would provide new pavement markings and signage to help the transition from the existing bicycle facilities at Franklin St. to a new cycle track along Buchtel Blvd.



Existing bike lane at Franklin St.



Bike box example at Portland

B Pedestrian bridge over I-25

A bridge across I-25 for pedestrians and bicyclists would connect the University Station and DU to the neighborhoods north of the station. This project was cited by several stakeholders as a long-term need to better connect the University and University Station with the neighborhood north of I-25 around South High School and Washington Park. This facility (similar to the one currently in place at the Colorado Station) would provide safe and convenient crossings of I-25. This concept would link Veterans Park to the station and increase bicycle and pedestrian connectivity and transit ridership.

Further exploration of this recommendation will require a parking management plan to be developed north of I-25 in order to avoid spill over parking from the station.

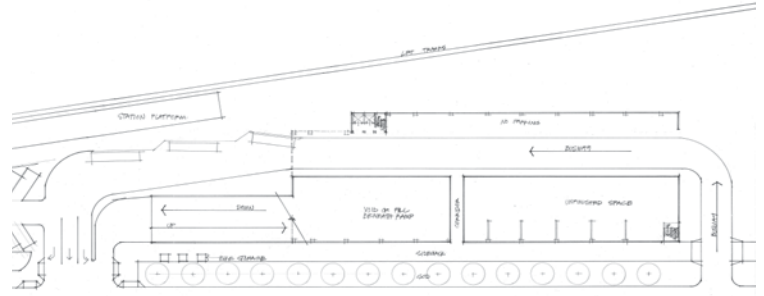


Existing Pedestrian Bridge at Colorado Station

C Redesigned intersection with roundabout at High and Buchtel

One major concern expressed by stakeholders and users of the University Station was related to pedestrian flow to the platform on the west side of the RTD Parking garage. The current configuration, as shown in Figure 18 has RTD buses entering the garage from the east side, circulating in a long tunnel-like structure under the garage, and emerging on the west side of the garage for passenger pick-up and drop-off near the platform. Buses then use the traffic signal at Buchtel and High St. to re-enter Buchtel eastbound, turning south or north on University. Autos using the garage enter and exit at the traffic signal at Buchtel and High, using a ramp to access the garage’s second level. Pedestrians and cyclists accessing the platform from Buchtel are asked to use a sidewalk on the west side of the plaza; however, many walk through the bus and auto lanes, causing additional potential conflicts with vehicles.

Figure 18: Existing Bus and Vehicular Circulation



The project team’s proposed alternative involves eliminating all conflicts between pedestrians/bicyclists and vehicles (both buses and autos) by re-designing access points into and out of the station. This consists of **three steps: eliminate bus circulation through the garage; establish a roundabout at Buchtel and High; and revise auto access into and out of the garage.**

C1: Eliminate bus circulation through the garage

Buses would stage curbside along Buchtel Blvd. in front of the parking garage. This change eliminates routing of buses through the parking structure and eliminates the need for bus bays next to the University Station platform. Instead, buses would load and unload on Buchtel Blvd.; this curbside space would be designated as a “mobility hub” (as described later in Recommendation 2).

C2: Establish a roundabout at Buchtel and High

To allow RTD buses and other vehicles to circulate east on Buchtel to access University Blvd., the project team is proposing the implementation of a roundabout or traffic circle at Buchtel and High. This facility, as illustrated in Figure 19, would be designed to provide both continuous access for autos moving through the intersection but also to allow RTD buses sufficient turning radius to reverse direction on Buchtel. Figure 19 also shows conceptual designs of how bicycle and pedestrian access is provided on the outskirts of the roundabout. This type of facility is becoming more and more common in Colorado; the Town of Avon has at least two roundabouts of this type in its urban core that promote safe and efficient movement of vehicles, pedestrians, and bicyclists.

Figure 19: Conceptual View of Roundabout

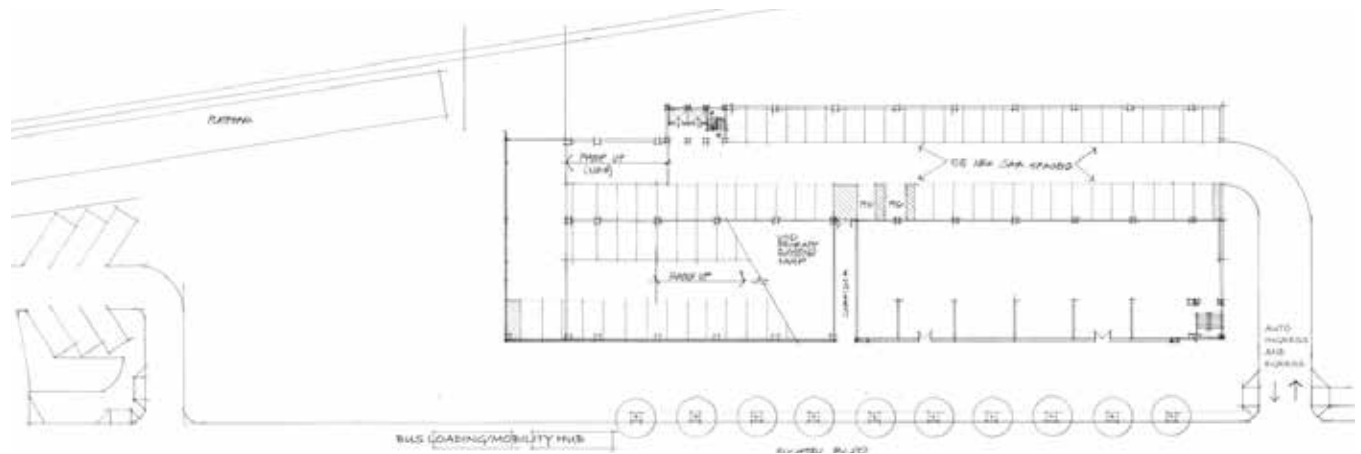


Proposed conceptual roundabout design at Buchtel Blvd and High St.

C3: Reconfigure auto access into and out of the garage

The existing access to the RTD parking garage is located at High St. Its current configuration restricts pedestrian movements and creates a significant barrier to pedestrian connectivity and access to the University Station platform. In addition, the ramping system for vehicles to access the garage occupies a large space in an area that could be utilized to create better access to the University Station platform and to locate enhanced station plaza type amenities. In order to create better pedestrian access and station plaza amenities near the platform, it is recommended that the private vehicle access to the RTD parking garage be relocated to the access driveway and roadway on the east side of the structure. This roadway is currently used exclusively for RTD buses. The driveway off Buchtel Blvd would be reconfigured into an intersection type access with traffic signal control and two-way traffic would be implemented on the access roadway. Access to the existing parking in the garage would be achieved by ramping up to the second level. Due to the current configuration and construction of the parking garage, it is estimated that this can be achieved with minimal changes to existing parking stalls and no modifications to the structural elements of the garage. Additionally, RTD bus activity would be relocated to a curbside stop location along Buchtel Blvd near High St. This would result in enough available space in the current bus stop area to create up to 55 additional parking spaces to support RTD parking or supplemental parking to support other development at the parking garage. An illustration of the reconfigured auto access and ramping system concept is shown in Figure 20 below.

Figure 20: Concept Design for Revised Auto Access into Garage



Proposed vehicular and bus circulation



Current aerial of LRT station and circulation.



Revised auto access creates opportunity for a plaza.

Note: RTD rough order of magnitude cost estimates to reconfigure the ramps range from \$350,000 to \$500,000 dollars.

RTD Parking Garage Wrap Exploration

Parking Garage Wrap Case Studies

Residential wraps around parking garages are common features of modern TOD development. In most cases, parking garages are “internal” to mixed-use development, with the street frontage (usually residential or commercial or other mixed-use) hiding the parking garage. Examples include the following.



The District - Parking structure wrap in Denver



Mosaic Development (Indianapolis) Before wrap - plan view



Mosaic Development (Indianapolis) After wrap - elevation view

Activating the Unused Retail Space

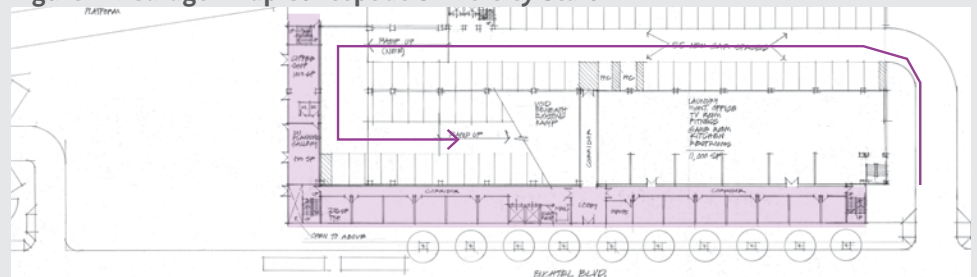
The RTD garage at University was built with approximately 11,000 square feet of unfinished space at the east end, designated for retail or some other local/neighborhood use (see Figure 18). RTD has tried unsuccessfully for several years to activate the space; however, given its unfinished nature (estimates range up to more than \$1 million for finish-out for utilities and floor construction), developers have been reluctant to work with RTD to find uses for the space. RTD should work with Transportation Solutions and DU to develop a strategy for activating the space, including development of potential shared financial incentives. Options include restaurants or coffee shops, office or administrative space for DU or other local businesses, a mobility hub (including bicycle rental and repair), and other creative uses.

Parking Garage Wrap

The idea of wrapping the parking structure with residential, office or innovation center uses is proposed to satisfy several goals, including: adding to the pool of student and/or staff housing documented elsewhere in this report, catalyzing the finishing of the vacant space in the first level of the structure and putting it to good use (which is not likely to happen without some catalyst), and hiding the parking structure from view from the area to the south. Many people object to the presence of the parking structure; however, the parking utilization rate in the structure is fairly high and there is no other place in the area to provide parking to support the University Station. It may be that the objections to the parking structure have mostly to do with its appearance, not its function or location. It is not likely that the parking structure will be demolished just to remove an eyesore, especially since it is fairly new and serves a useful function.

This concept (as shown in Figure 21) includes wrapping the south and west sides of the parking structure with 6 levels of residential dwelling units (for a yield of 60 apartments); place a coffee shop and gallery space on the first level at the west end of the structure facing the plaza; and finish the unfinished space in the parking structure next to the sidewalk for use as lounge, fitness, restrooms, laundry, kitchen, management office, etc. to support the apartment development. The residential wrap would block the views of the south and west sides of the parking garage from DU and by extending the ramp, add new car spaces to meet a portion of its own needs. A small number of additional off-site car spaces may need to be provided, or a smaller parking requirement negotiated. Wrapping the garage is predicated upon implementation of Recommendation C detailed above.

Figure 21: Garage Wrap Concept at University Station



Conceptual parking structure wrap with residential units after circulation is changed.

D Transit plaza at University Station



View of proposed plaza, green space, and bike share. Looking west towards the parking structure

With the elimination of auto and bus traffic on the west side of the garage south of the University Station platform, the space between the platform and Buchtel Blvd. west of the parking structure could then be developed as a plaza about a half-acre in size. Wrapping the parking garage further supports the activation of the transit plaza and helps delineate and leverage funding resources.

Figure 22 shows a concept for the plaza between Buchtel Blvd. and the University Station platform. The plaza serves as a space that connects the LRT station and the surrounding uses functioning as a space where the different uses and modes of transportation overlap in a safe and efficient manner. The concept shows a “grid” of wide paths that delineate the approximate paths that pedestrians would take to get from the entry points at the sidewalk edge to the platform. There are three main areas: the paths, the sod/tree lawn area, and the trellis or pergola shade area. The tree lawns could be used for sitting/waiting. The two trellises or pergolas add another dimension to the space serving as an area for sitting that marks the confluence of the two main pedestrian paths and serves as a vertical element that would act as a gateway to the station plaza. Other areas within the plaza include a mobility hub located along Buchtel Blvd. where the bus drop off will occur. On the east side of the plaza, the concept shows a landscape buffer separating the exit driveway for the parking spaces that belong to the University Station senior housing project and the transit plaza.

Figure 22: Plan View of Conceptual Transit Plaza



Plan view of conceptual transit plaza next to existing LRT station

E Mid-block pedestrian 'Z' crossing near DU Ritchie Center



Pedestrians at Buchtel Blvd.



Typical "z" crossing

One of the major issues noted by stakeholders was the lack of safe pedestrian crossings throughout the station areas, particularly in high-traffic areas around the two station platforms and on major adjacent thoroughfares. Buchtel Blvd. in front of the University Station was noted as a key location in need of at least one mid-block designated crossing. This project is proposing controlled pedestrian crossings (with pedestrian-activated signals) on Buchtel at one or more locations near the LRT station and the DU campus.

One additional recommendation is that, where possible, the crossings should utilize a Z crossing configuration which requires pedestrians to turn and face oncoming traffic, an additional safety measure.

F Redesigned intersection at University/Buchtel



City of Austin "Polka dot" Curb Extension

A key element of improving bicycle and pedestrian safety throughout the two station areas includes the potential redesign of key high-activity intersections. Transportation Solutions should begin working with the City and County of Denver, DU, and Colorado Center and related stakeholders to plan, fund, and implement short-term improvements to those high-activity intersections, including but not limited to:

- Potential installation of either leading pedestrian interval or all-pedestrian and bike signals.
- Adding right-turn-on-red restrictions to prevent right turn conflicts with pedestrians and bicyclists.
- Constructing curb extensions to reduce the distance required for pedestrian and bicycle travel across intersections.
- Adding pedestrian refuges in medians where appropriate to provide safety locations for pedestrians and bicyclists.
- Creating tighter turning radii at corners to both slow vehicles and create shorter crossing distances for bicyclists and pedestrians.

One particular short-term strategy involves paint instead of more costly construction. The City of Austin, for example, has implemented "polka dot" crossings to provide temporary low-cost "curb extensions". In addition, Denver Public Works issues permits to community organizations to install artistic crosswalks and intersection artwork/ murals "to promote neighborhood identity and sense of place". Transportation Solutions should work with the City and County of Denver, DU, and Colorado Center stakeholders to develop a community-based program to propose and implement one or more of these improvements at this intersection and others. These and other "tactical urbanism" efforts can increase visibility of pedestrian activity without major design or construction expenditures.

G Redesigned intersection at University / Asbury

This project would improve pedestrian safety and mobility at the intersection of Asbury Ave. and University Blvd. The main element of the project involves significantly narrowing the east and west legs of the intersection to reduce the pedestrian crossing distance and to align the pedestrian crosswalks more effectively through the intersection. Bulbouts could be added where appropriate and traffic signal control strategies such as restricting right turns on red or implementing pedestrian lead phases could be considered.

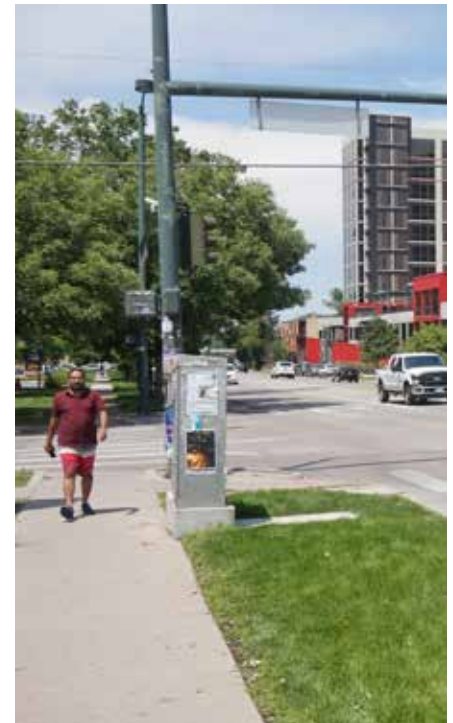


Existing University Blvd. & Asbury Ave. intersection

Figure 23: University/Asbury Intersection Concept



University Blvd. & Asbury Ave. intersection concept



University & Asbury intersection today

H Redesigned intersection at University / Evans

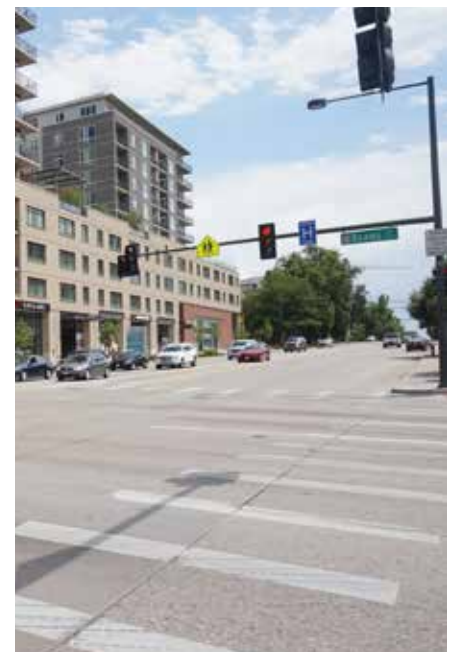
This intersection carries very high numbers of pedestrians throughout the day. This fact coupled with the high levels of auto traffic on both University Blvd. and Evans Ave. makes this a priority intersection for the implementation for pedestrian safety improvements. Shortening pedestrian crossing distances with curb bulbouts, enhancing crosswalks with high visibility treatments, and traffic signal operational strategies such as adding a pedestrian lead phase and restricting right turns on red should all be considered in future re-design (key project CCD Next Steps Study).



Current University Blvd. & Evans Ave



Pedestrian Lead Phase should be considered for Pedestrian safety

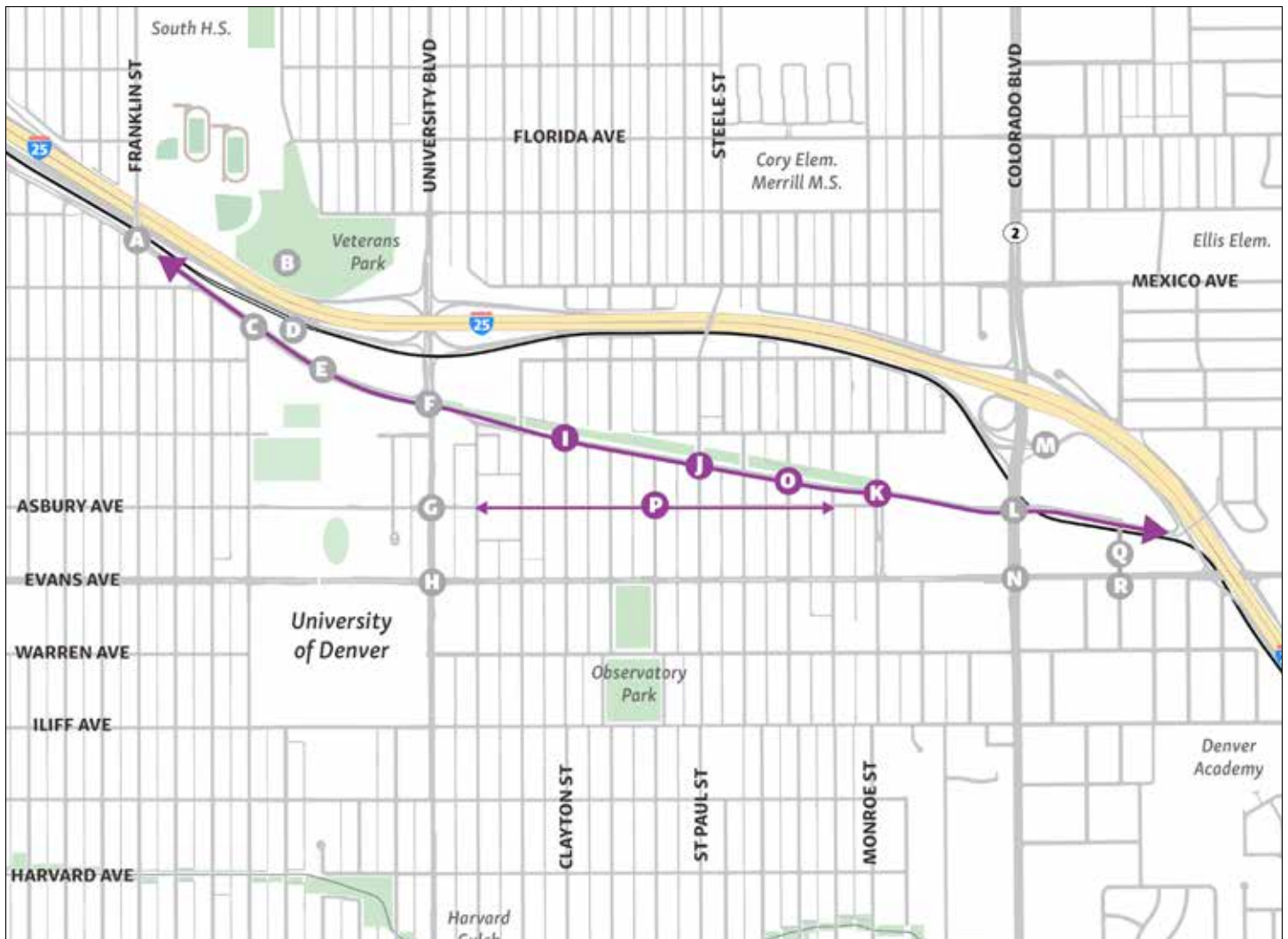


University & Evans intersection view

1 PHYSICAL NETWORK IMPROVEMENTS

STRATEGY 1B - PHYSICAL NETWORK IMPROVEMENTS UNIVERSITY PARK ZONE

Figure 24: Physical Network Improvements, University Park Zone



- I** Enhanced pedestrian crossing at Clayton
- J** Pedestrian and bicycle improvements at St. Paul / Steele
- K** Redesigned intersection at Monroe
- O** 2-way cycle track along Buchtel, Franklin to I-25
- P** Pedestrian improvements along Asbury

I Enhanced pedestrian crossing at Clayton

This project would provide a controlled crossing with a pedestrian-activated signal at the intersection of Buchtel Blvd. and Clayton St. This location was chosen because Clayton St. is located halfway between signalized crossings at University Blvd. and St. Paul St. and serves neighborhood crossing activity well. Clayton St. is also a main access to the new facility being planned by the University of Denver along Colorado Ave. near I-25 just to the north.



Controlled crossing at City of Boulder, CO.

J Pedestrian and bicycle improvements at St. Paul / Steele

This project would add pedestrian and bicyclist safety improvements to the signalized intersection at Buchtel Blvd. and St. Paul St. This would consist of traffic calming devices and curb redesign to result in shorter crossing distances for bicyclists and pedestrians. These would also be either a leading pedestrian phase or exclusive bicycle and pedestrian traffic signal phasing. St. Paul St. is a primary north-south access point, providing access to the north across I-25 as it becomes Steele St.



Existing Intersection at Buchtel Blvd. and St Paul St.

Figure 25: Buchtel/St. Paul Intersection Concept



Intersection at Buchtel Blvd. and St Paul St. concept

K Redesigned intersection at Monroe

This project would add a traffic signal and a redesigned intersection at Buchtel Blvd. and Monroe St., including shorter crossing distances for bicyclists and pedestrians. Monroe St. is the primary route currently used by RTD buses to access the Colorado Station from Evans Ave.



Existing Intersection at Buchtel Blvd. and Monroe St.

Figure 26: Buchtel/Monroe Intersection Concept



Intersection at Buchtel Blvd. and Monroe St. concept

0 2-way cycle track along Buchtel, Franklin to I-25



Westlake cycle track, Seattle

Figure 27: Buchtel Blvd. as a connector



Buchtel as the spine that connects the different neighborhoods and the two stations

Stakeholders, members of the community and elected officials identified the need for a visible, accessible and protected bike facility along Buchtel Blvd., extending from the bike bridge at Colorado Station west to Franklin St. Key to this facility improvement would be improved crossings of Colorado Blvd. and University Blvd. and increased access from the neighborhood south of Buchtel Blvd.

Currently, Buchtel Blvd. between and in front of the two stations has three major typical cross sections:



Buchtel Blvd at High St.

- The roadway immediately in front of the University Station is approximately 83 feet wide, with four lanes of traffic, left turn lanes in medians at signalized intersections, and on-street parking. (Note: as Buchtel continues west, the two-lane eastbound lanes transition to a single lane at Williams St. just west of the station; the two-lane westbound lanes transition to one lane at Franklin St., with a forced right turn on north bound Franklin at that location.)



Buchtel Blvd at Monroe

- Designated bike lanes appear on Buchtel just east of University, beginning just east of Josephine St. and heading east toward Colorado. In this stretch, the bike lanes continue to a point just short of Colorado Blvd., with the westbound lanes beginning at Monroe St., and the eastbound bike lanes ending just west of Colorado Blvd. For most of this portion of Buchtel, there are two lanes of traffic bordering the eastbound and westbound bike lanes, with left turn pockets at signalized intersections.



Colorado Center Dr.

- East of Colorado Blvd., Buchtel becomes Colorado Center Dr., with four lanes of traffic and bordering sidewalks along with bus bays serving RTD bus routes. This roadway does not have any designated bike paths or bike lanes, as bicyclists are required to share the road with other traffic to access points within the Colorado Center development or the bicycle/pedestrian bridge crossing I-25 just east of the development.

The major recommendation related to the bicycle facility on Buchtel is the creation of a “bike boulevard” (also labeled by stakeholders during the study as a “bike superhighway”) along Buchtel from the Colorado Station to Franklin St. (and potentially to the Louisiana/Pearl Station, Logan St., and Broadway to tie into bike facilities being planned for that arterial). See Figures 28 through 33 for the recommended cross-sections.

Based on operational analysis and review with stakeholders and the public, the project team is recommending the implementation of a two-way cycle track on Buchtel Blvd. from Franklin St. to University Station to Colorado Station and finally to the bike/ped bridge over I-25, including improvements to crossings at the two major intersections at University and Colorado Blvds. The primary reasons for this recommendation include:

- The two-way track provides a continuous and contiguous cross-section for bicycle movement throughout the entire corridor, greatly reducing confusion for bicyclists, autos, and pedestrians in the corridor.
- The two-way track greatly simplifies movement of bicycles through the two major intersections, assuming a separate signal movement for bicyclists and pedestrians, eliminating auto conflicts.



Cycle track example in Seattle

Buchtel Blvd. proposed cross-sections

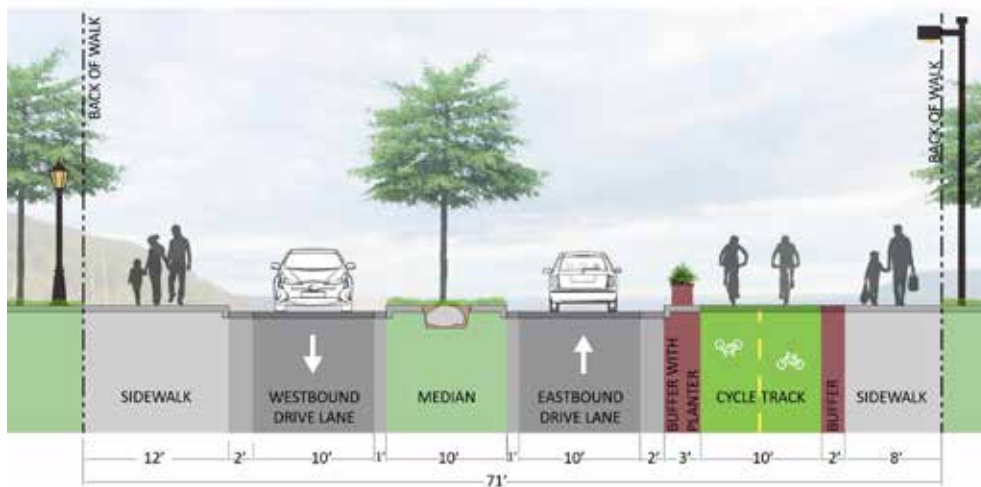
The following sections illustrate how the cycle track will work along Buchtel Blvd. from Franklin St., on the east side, to the Colorado Center, on the west side, and further connect to the existing pedestrian bridge at the Colorado Center and connect with the norther neighborhood of Virginia Village. The following map illustrates the order in which the sections are presented below, following Buchtel Blvd. from west to east, looking east.

Figure 28: Buchtel Blvd and Cycle Track Cross Sections Reference Map



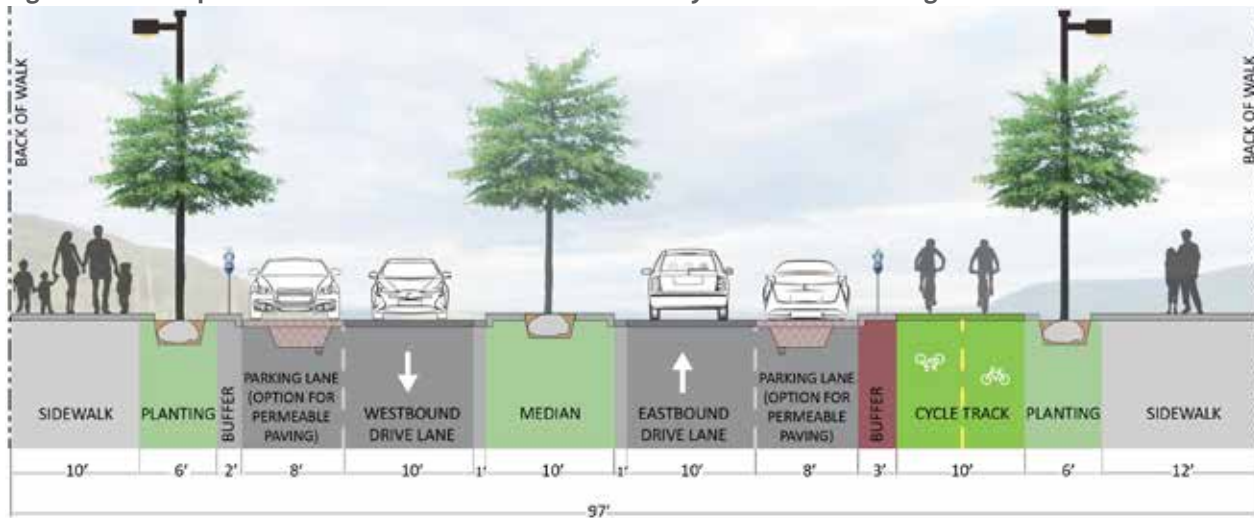
Section A: Buchtel Blvd. Looking East - East of Franklin St.

Figure 29: Conceptual Cross Section of Buchtel Blvd. with Cycle Track East of Franklin St.



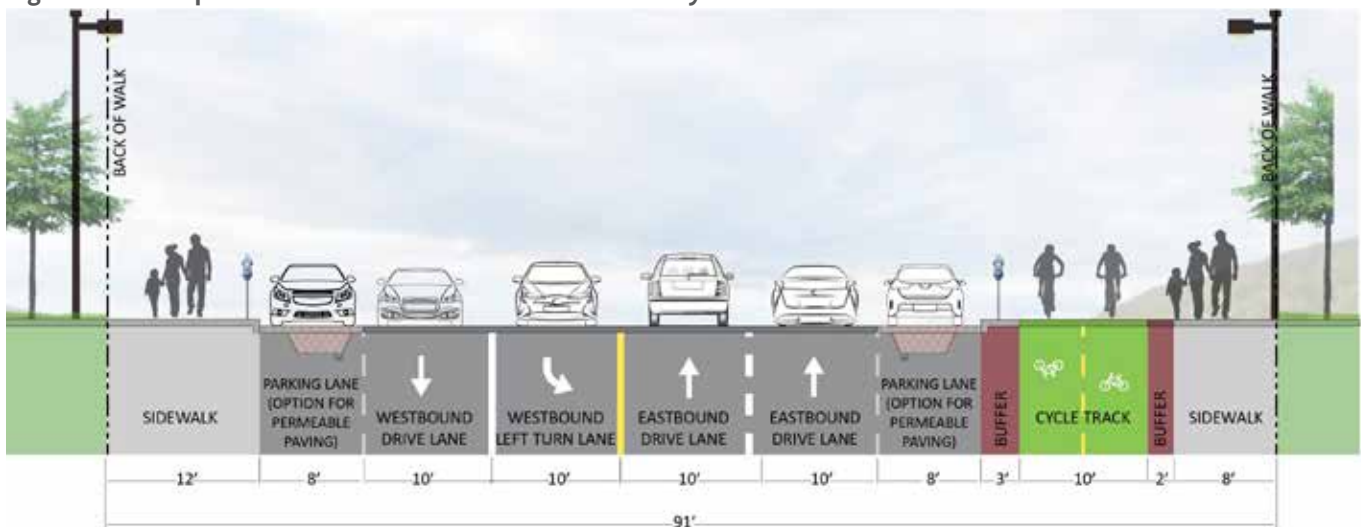
Section B: Buchtel Blvd. Looking East - East of High St.

Figure 30: Conceptual Cross Section of Buchtel Blvd. with Cycle Track East of High St.



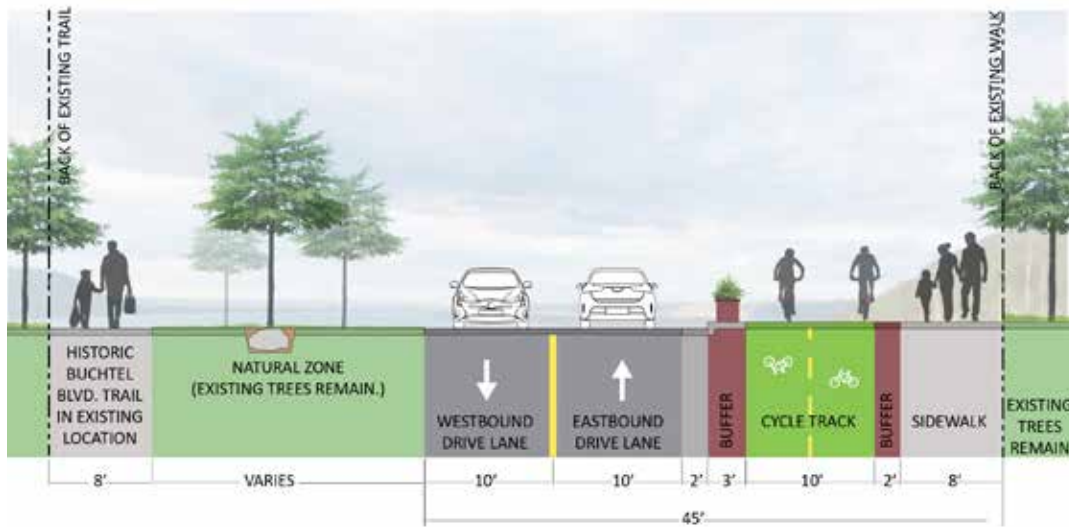
Section C: Buchtel Blvd. Looking East - Near Ritchie Center

Figure 31: Conceptual Cross Section of Buchtel Blvd. with Cycle Track near Ritchie Center



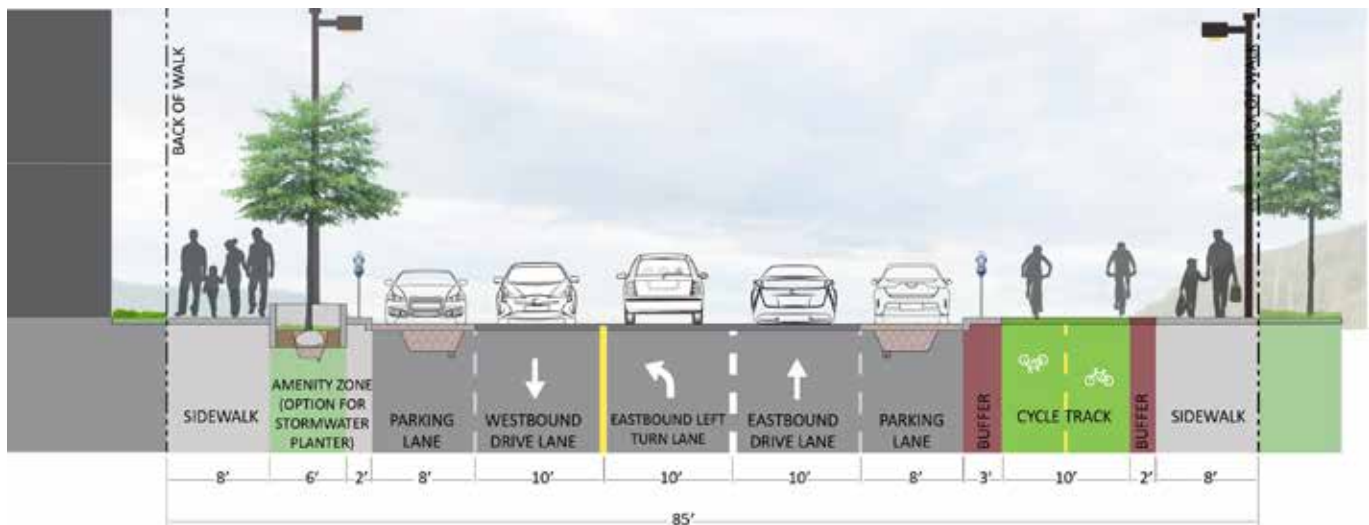
Section D: Buchtel Blvd. Looking East - East of St. Paul St.

Figure 32: Conceptual Cross Section of Buchtel Blvd. with Cycle Track East of St. Paul St.



Section E: Colorado Center Dr. Looking East - East of Colorado Blvd.

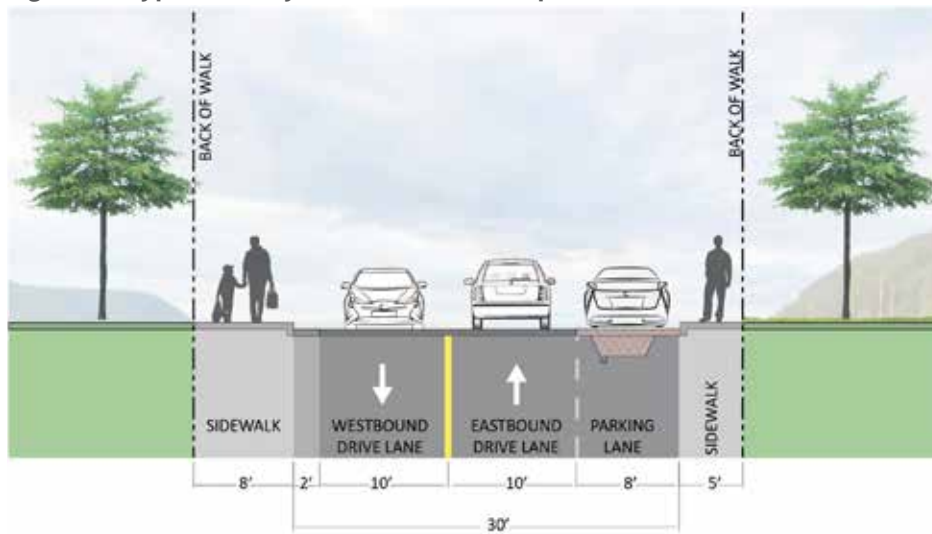
Figure 33: Conceptual Cross Section of Colorado Center Dr. with Cycle Track East of Colorado Blvd



P Pedestrian improvements along Asbury

Asbury Ave. plays a major role in mobility through the DU campus area and has been redesigned and landscaped recently to improve pedestrian and bicycle safety and reduce auto conflicts. Transportation Solutions should work with DU and local neighborhood groups to increase utilization of Asbury through campus to include existing and future transit or microtransit connections. Asbury east of University should include the integration of “complete streets” concepts incorporating autos, bicyclists, pedestrians, transit, and wayfinding, with a particular emphasis on traffic calming and slowing. See Figure 34 for a conceptual cross section of Asbury Ave.

Figure 34: Typical Asbury Cross Section Concept



Example of neighborhood roundabout as a traffic calming element



Example of raised crosswalk as a traffic calming element



A complete network of curb ramps and sidewalks enhance the pedestrian environment

1 PHYSICAL NETWORK IMPROVEMENTS

STRATEGY 1C - PHYSICAL NETWORK IMPROVEMENTS COLORADO STATION ZONE

Figure 35: Physical Network Improvements, Colorado Station Zone



- L** Redesigned intersection at Colorado / Buchtel
- M** Redesigned access to Colorado Center and auto-oriented wayfinding
- N** Redesigned intersection at Colorado / Evans
- Q** New Bellaire complete street
- R** New pedestrian crossing of Evans

L Redesigned intersection at Colorado / Buchtel

This project would entail a redesign of the intersection of Buchtel Blvd. and Colorado Blvd., primarily by incorporating traffic calming devices, shorter crossing distances for pedestrians and bicyclists (including curb extensions and median pedestrian refuges where appropriate), and exclusive signal phasing for pedestrians and bicyclists (in conjunction with the implementation of a two-way cycle track along Buchtel as described in Recommendation O).



Current Buchtel Blvd & Colorado Blvd.

Figure 36: Buchtel/Colorado Intersection Concept



Concept Buchtel Blvd & Colorado Blvd.



Colorado Center & Colorado Blvd. intersection looking west

M Redesigned access to Colorado Center and auto-oriented wayfinding

This project would redesign the intersection of Colorado Blvd. and the South Frontage Rd. just south of I-25 to promote its use as an alternative to Buchtel Blvd./Colorado Center Dr. to access the Colorado Center development. This access point is underutilized as most motorists are unaware of its access to Colorado Center. The redesign of this intersection could include geometric change, to make the intersection more compact as well as additional signage and wayfinding.



Existing intersection of Colorado Blvd. and South Frontage Rd.



Concept intersection of Colorado Blvd. and South Frontage Rd.



View of intersection from Colorado Blvd. looking north.

RECOMMENDATIONS

N Redesigned intersection at Colorado / Evans

This project would add improvements to the intersection of Evans Ave. and Colorado Blvd. to improve bicycle and pedestrian safety, including traffic calming devices and shorter crossing distances for bicyclists and pedestrians. Narrowing the intersection as much as possible, while creating pedestrian refuge islands and spurring right turn lane, pedestrian crossings and featuring direct line of sight compound curve designs, are some of the improvements that will be implemented.



Existing intersection at Colorado Blvd. and Evans Ave.



Pedestrian refuge islands possible improvement for intersection

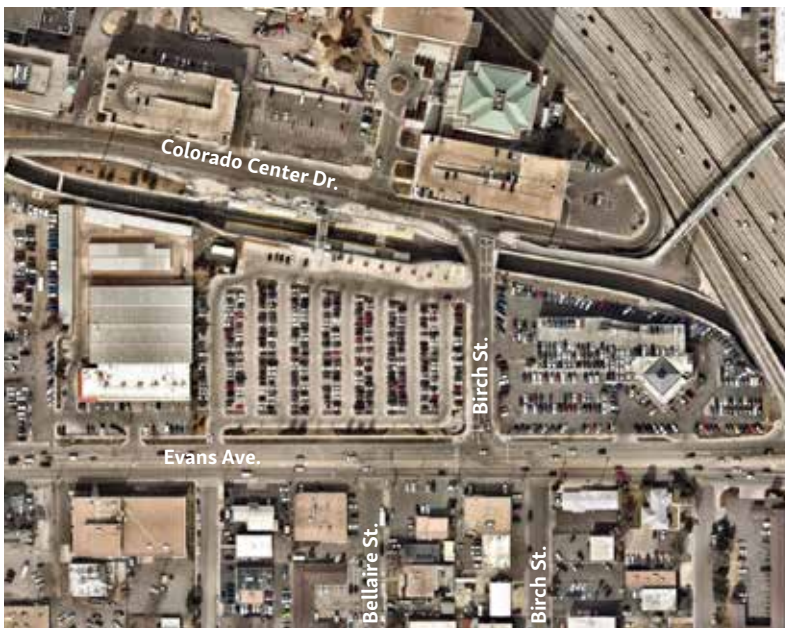


Existing cross walk at Colorado Blvd. and Evans Ave. intersection

Q New Bellaire complete street

R Pedestrian Crossing at Evans

This project would align Bellaire St. north across Evans Ave. through potential future redevelopment of the existing RTD parking lot. This recommendation could provide north-south access to neighborhoods to the south and a core “complete street” through future development to promote pedestrian and bicycle access to the RTD station. Recommendation “R” highlights the new Bellaire intersection at Evans would focus pedestrian crossings at a mid-block signalized crossing. Explored and recommended concepts are presented next.



Existing layout of Colorado Station and RTD's parking lot



Existing RTD parking lot (looking north)
Location of proposed Bellaire complete Street

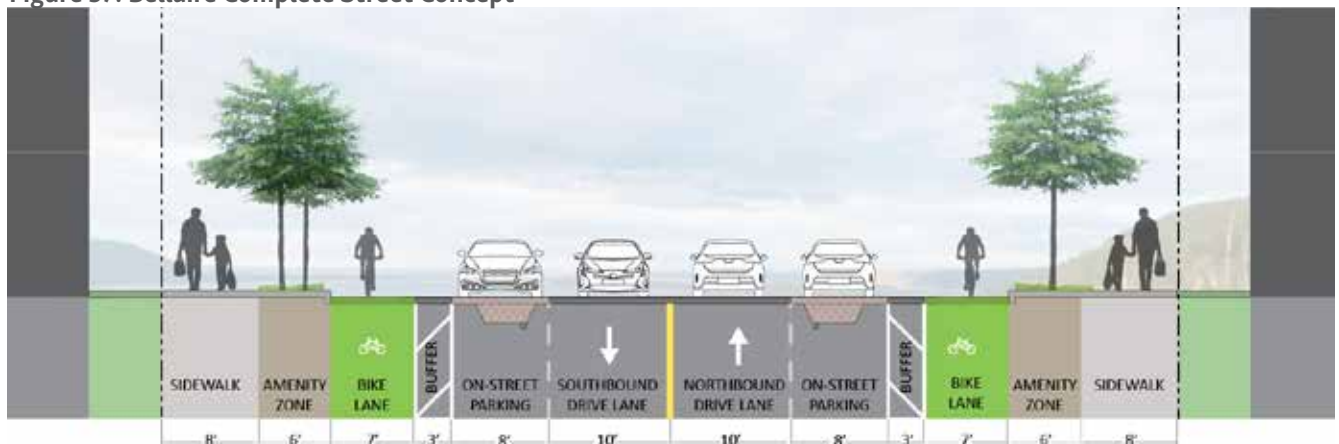
Proposed Layout Alternatives for Bellaire Realignment

Features Common to All Concepts

The project team developed a variety of concepts for the Colorado Station area that reconfigure circulation, complement Colorado Center development and influence future potential redevelopment south of Colorado Center Dr., at the RTD parking lot. Common to all concepts are the following:

- Bellaire St. is a principle connection from neighborhoods south of Evans Ave. through the station area to Colorado Center’s “main street” retail and restaurant district Bellaire serves as a visible spine, providing auto and transit circulation, but more importantly, it establishes a visible and defined pedestrian environment through the site.
- Birch St. is realigned through the existing Freeway Ford site to align with Birch St., south of Evans. This creates the opportunity to re-build the street grid within a future development site. The Birch bridge or crossing of the LRT trench would be abandoned or converted to public space in favor of the Bellaire crossing location. The width of this crossing or cover at Bellaire varies by concept.
- The extension of Asbury east-west through the site, complements the Bellaire connection and re-defined grid pattern, but is optional based on any future redevelopment footprint.
- Today’s RTD surface parking lot is converted to future structured parking or below-grade parking based on the redevelopment of the site. In all events, the existing parking space count is recommended to be carried forward, with no loss in parking spaces.

Figure 37: Bellaire Complete Street Concept



Concept of Bellaire Street as a Complete Street, feature common in all Concepts

Concept A

Figure 38: Bellaire Realignment and Redevelopment Concept A



- Bus bays and transit service are accommodated on Colorado Center Dr.
- Bike and pedestrian facilities are also located on Colorado Center Dr. with mixing zone to be determined in coordination with RTD.
- LRT trench is covered at the Bellaire crossing with the option to uncover former Birch crossing or re-use bridge area for community plaza or parklet.

RECOMMENDATIONS

Concept B

Figure 39: Bellaire Realignment and Redevelopment Concept B



- Bus bays and transit service are relocated from Colorado Center Dr. to a “lid” over the platform extending from the intersection of Colorado Center Dr. and Main St. to Birch St.
- Auto, transit, bike and pedestrian site circulation is expanded via Bellaire and Albion St.
- A protected two-way cycle track is prioritized along Colorado Center Dr. creating a continuous, visible link to Colorado Center development, the LRT station and the I-25 bike/pedestrian bridge.

Concept C

Figure 40: Bellaire Realignment and Redevelopment Concept C



- Bus bays and transit service is relocated below grade in conjunction with future site redevelopment.
- Bus circulation is via a ramp to a below-grade station.
- LRT trench remains open but integrated with site development. Bellaire, along with a possible Ash St. extension, cross the trench.
- A protected two-way cycle track is prioritized along Colorado Center Dr. creating a continuous, visible link to Colorado Center development, the LRT station and the I-25 bike/pedestrian bridge.

Recommended Concept



Preferred Concept partially covers the trench creating usable space at grade where a Mobility Hub and plaza can develop

Figure 41: Bellaire Realignment Recommended Concept



- The recommended concept for the Colorado Station area includes key preferred elements of the range of concepts considered by the project team, stakeholders and community.
- Bus bays and transit service are relocated from Colorado Center Dr. to a partial “lid” over the platform extending from Ash St. to Birch St. and including the principle connection at Bellaire St.
- Auto, transit, bike and pedestrian site circulation is expanded in a grid pattern to include north-south connectivity along Albion, Ash, Bellaire and Birch and east-west connectivity at Asbury and Colorado Center Dr.
- A protected two-way cycle track is prioritized along Colorado Center Dr. creating a continuous, visible link to Colorado Center development, the LRT station and the I-25 bike/pedestrian bridge.

2 MOBILITY HUBS, SERVICES AND PROGRAM LEVEL RECOMMENDATIONS

STRATEGY 2A - DEVELOP THE STATIONS AS REGIONAL MOBILITY HUBS

The University and Colorado Stations should serve as Regional Mobility Hubs, providing a new level of integrated mobility services and convenience for students, commuters and residents in the study area.

Regional hubs are typically connected to a regional transit service and supported by a more concentrated or mixed land use pattern. These hubs offer a variety of mobility options, usually contain car-share spaces, charging stations, larger drop off zones and are tied to active, defined public space.

The physical network improvements recommended for the University and Colorado Stations create the space to develop a visible, integrated “hub” for mobility options. These defined hub spaces allow not only for RTD transit services, but also for future micro-transit services, rideshare services, bike share and car share programs and an opportunity for a local way-finding network.



Colorado Station: The “lid” over the LRT tracks, intersection with a new Bellaire complete street and relocated bus bays, defines a space for gathering, mobility services and programming at the station Regional Mobility Hub at Colorado Station



University Station: The development of a visible plaza and gathering space, coupled with the staging of buses curbside along Buchtel Blvd. enhances the pedestrian environment and visibility of mobility options at the station front door.

Mobility Hubs Characteristics

“Mobility hubs” is an emerging concept in multi-modal transportation planning that attempts to take the concept of a transportation center to a new level of integration and convenience for the user.

Some key characteristics of mobility hubs have been developed by a number of studies and projects. Those key characteristics can be summarized as including, among other uses:

- A strategic point of intersection on the regional transportation network that accommodates a higher intensity of use and degree of seamless connections.
- A central place where seamless connections are made between multiple forms of transportation with a priority place on pedestrian connections.
- A place where buildings and transit interact effectively and efficiently with streets.
- A vibrant place with a concentration of uses, including employment, living, shopping, and a mix of highly connected public and private accessible spaces.
- A high-tech mini-transportation center that is integrated into a transportation network where different modes connect or intersect. It provides 24/7 electronic access to transportation options (bus, rail, bicycle, car sharing, taxis), an “electronically hip” convenience store for travelers.

STRATEGY 2B - DEVELOP A NETWORK OF LOCAL MOBILITY HUBS

The University and Colorado Regional Mobility Hubs should, in time, be supported by a network of local hubs found within the neighborhoods or University of Denver campus. Neighborhood Hubs typically are smaller in scale and are located in lower-density or mixed-use residential areas. Hub elements are unique to the mobility needs of the surrounding community and may contain smaller scale services based at local retail or neighborhood destinations, such as: schools, community centers, libraries and campus student centers.

In order to develop a local hub pilot program, there should be further coordinated study of high-activity areas relevant to the station area communities, the University and Evans retail/restaurant corridors, the campus, Colorado Center and surrounding neighborhood destinations. In the future, no resident or student should be more than a quarter mile, or five-minute walk, from a mobility hub or range of mobility options.

What elements should be included in the Network of Local Mobility Hubs?

Mobility hubs come in all shapes and sizes. Each hub is uniquely sized, programmed and designed for the location and community it serves. Hub locations should be highly visible and central to surrounding uses in order to create a high-quality user experience.

Transit Stop or Rail Service



Bike Share



Wayfinding



Rideshare



EV Charging Stations



Secure Bike Parking



Emergency Phone/USB



Retail



Public Space



Car Share



Shelter/Seating/Light



Pedestrian Connection



STRATEGY 2C - DEVELOP A STATION AREA WAYFINDING SYSTEM

A critical strategy to transitioning the University and Colorado Stations to Regional Mobility Hubs, supported by a network of local neighborhood hubs, is to develop a comprehensive wayfinding system for the study area. Wayfinding can be a relatively simple and low-cost method of increasing awareness and visibility of mobility options, establishing community identity and highlighting points of interest within the area. Wayfinding is more than providing directions for drivers; it can be an effective tool for more efficiently moving pedestrians and cyclists by: indicating direction and distance to and from a hub; highlighting alternative local routes; and by increasing awareness of a range of options for travel.

Why a Wayfinding System?

A wayfinding network should extend to neighborhoods and destinations north and south of I-25, increasing the “reach” of the station area and making connections more visible to the community. Neighborhood wayfinding could specifically increase utilization of the pedestrian/bicycle bridge across I-25 off Colorado Center Dr., increase utilization of Steele St. as a local connector linking neighborhoods north and south of I-25 and highlighting improved bike and pedestrian facilities serving both station locations.

The development, funding and implementation of a comprehensive wayfinding program, integrated with elements of the LRT Stations as Regional Mobility Hubs should be studied further and address the following aspects:

- System signage should be consistent, highly visible and part of an overall mobility strategy for the community
- Signage should identify walk-time and bike-time (instead of travel distance) and be directional in nature
- Signage should be user friendly for a range of users; pedestrians, cyclists, transit users, residents, students and visitors



Implementation of a wayfinding system along the pedestrian/bicycle bridge across I-25 could increase utilization of the bridge as a connection between Colorado Station and the neighborhoods to the North.



Walk Your City helps communities, plan, make, and install quick wayfinding strategies to boost walkability. They approach wayfinding by creating signs that shows distance, in minutes to everyday amenities.

This low-cost approach can help communities test out wayfinding strategies, as in the case of Raleigh North Carolina.

Walk Your City signs in Raleigh, North Carolina

STRATEGY 2D - EXPAND LOCAL TRANSIT

The DU Campus Transportation Master Plan (August 2016) recommended the implementation of a shuttle system to better connect the University Station with the campus and adjacent neighborhoods. In the Multi-Station Mobility Study, increasing local transit connectivity is also identified as critical to activating the stations and increasing mobility options for residents and students in the study area. Two key recommendations highlight the potential for the role of shuttle systems, autonomous shuttles as prototypes or other multi-occupant transit options to supplement local public transit, improve local access and increase rail and transit ridership.

Implement a local transit route along High and Iliff Streets

Figure 42: Concept Route along High and Iliff St.



High St. from the University Station to Iliff, and potentially along Iliff to University Blvd. and back, is a good candidate for an initial pilot program. This routing would address the needs of students to access areas of the campus and the needs of area residents to move from the adjacent neighborhoods to the station. A High St. shuttle or autonomous transit vehicle would extend the reach of the station significantly, and would supplement any other campus-wide shuttle or microtransit programs. High St. is seen by DU as a “complete street” that should prioritize pedestrians, bicyclists, and transit as primary mobility modes.

Implement a local transit route along future Bellaire Street

Figure 43: Concept Route along Future Bellaire St.



Bellaire St. serving the Colorado Station is also a good candidate for a local shuttle or microtransit project. This type of pilot project would vastly improve connectivity between the Colorado Station and the residential neighborhoods to the south of Evans and increase the mobility options for numerous residents. Operational service options for neighborhoods north of I-25 should also be explored as pilot programs are developed. Service north-south on Steele St. to Buchtel Blvd. would connect many residents with either station, depending on direction of travel.

Other Elements for a Successful Local Transit Strategy

Key to a successful transit strategy, is the condition of the pedestrian environment and the comfort of transit riders while at the station. While the development of plaza space, mobility hubs and key pedestrian access improvements are critical, there are several other aspects of the station environment that should be studied further to activate pedestrian use:

- Ticket vending and validation locations and number, in relation to platform access.
- Station lighting, sight paths and visibility at and near the platform.
- Elimination of vehicular conflicts with pedestrians and identification of clear pedestrian walk paths to the platform.
- Implementation of real-time train arrival and departure information.
- Convenient and comfortable passenger waiting areas and amenities

Local Transit Enhancement Options

Implement the DU Shuttle Program

DU Transportation Master Plan recommended the implementation of the DU Shuttle Program. The proposed route location and type of service should be further analyzed to serve the needs of the students and surrounding neighborhoods while incorporating new technology as it becomes available.



Shuttle route from DU Transportation Master Plan

Develop pilot programs for autonomous vehicles routes

Key stakeholders should explore the possibility of incorporating the emerging technologies of autonomous vehicles into key corridors, such as High and Iliff St. and Bellaire. The high-tech firm Olli is partnering with IBM to begin developing multi-occupant autonomous shuttle vehicles for urban applications, and such a program may meet the need of the campus and adjacent community.



Olli Self-driving Vehicle

Explore transit service enhancements with RTD

The use of RTD Call-n-Ride service within the two station areas – along with the potential development of “flex” routes could help increase access opportunities to the two station areas. Ongoing coordination with RTD recommended.



Call-n-ride bus in Golden CO

Begin exploring Micro Transit

Micro Transit is another emerging type of transit that uses smartphone technology and user preferences to establish routes and provide a transit service. Chariot currently operates in San Francisco providing alternative multi-occupant transit in selected areas as a supplement to local public transit.



Chariot in San Francisco, CA

Explore Partnerships with Transportation Network Companies (TNCs)

Transportation Network Companies (TNCs) such as Lyft and Uber are becoming a major provider of choice for millennials and others who want more flexibility in their travel. Exploring partnerships with these companies could help provide a first and last mile service in selected locations. Lyft shuttle is a feature lyft is rolling out in San Francisco where users can choose between direct service, pool service or shuttle service.



Lyft Shuttle San Francisco Map

STRATEGY 2E - EXPAND BICYCLE FACILITIES

Expansion of bicycle facilities throughout the two station areas, either as part of a mobility hub implementation or as a stand-alone element, is a short-term component that could be relatively inexpensive and easy to implement. The DU Campus Transportation Master Plan calls for increasing the levels of bike parking on campus and providing “high-quality long-term and short-term bike parking.” It also calls for implementing a “DU-focused bike share system” and construction of a bike station similar to B-cycle on campus. DU and Colorado Center, Stakeholders and community members should begin planning, funding, and implementing a phased program of bike facility expansion throughout the two station areas, including:

- Installation of bike sharing facilities, consisting of either a B-cycle kiosk-style system or a stand-alone bike-lock program, or some combination of the two (further illustrated below). The planning effort should recommend initial locations for these facilities (most likely at the two LRT stations at minimum), with eventual expansion to other locations throughout the two station areas (ideally in conjunction with examination of potential mobility hub locations).
- Installation of bike storage/rack facilities, again at key locations such as potential mobility hub locations, throughout the two station areas where they do not exist today.
- Potential of one or more bike “libraries” similar ones in Fort Collins and Golden, which provide staffed facilities with bike and helmet rentals, bike safety information, and route information. This could be expanded to include bike repair facilities and other bike-related activities.

Tech-on-Bike Systems



Zagster currently operates a docking station system in several cities including the City of Fort Collins.



Limebike is currently working with a variety of cities to establish the first programs.



Golden Bike Library expands summer 2017 to a hybrid system, with hourly on-site rentals and automated kiosk locations.

STRATEGY 2F - ENHANCE AND EXPAND TDM PROGRAMS

Transportation Demand Management (TDM) refers to a wide range of transportation strategies that attempt to improve the transportation system's overall efficiency and sustainability (in all senses of the word). In the United States, TDM strategies are generally targeted at reducing peak period demand for vehicle travel in order to reduce roadway congestion (although in some urban areas, a form of TDM is often used to reduce peak period demand for transit through the use of peak and off-peak fares).

In general, TDM strategies encourage travelers to prioritize travel modes, times, and routes that are more cost-effective over travel modes, times, and routes that are less cost-effective (VTPI 2014). During peak periods times when transportation systems are oversubscribed, the most cost-effective modes are typically those that are also the most space-efficient, such as walking, bicycling, transit, and shared vehicles (carpools, vanpools, taxis, etc.).

The best TDM programs do not focus solely on reducing peak period demand for vehicle travel (i.e. "relieving traffic congestion"). Instead, they focus on catalyzing a shift away from SOV travel generally (and sometimes even away from personal vehicle ownership). This is done through a comprehensive approach integrated with public-sector and private-sector partners inside and outside the transportation profession to create:

- Expanded travel choices (e.g. shared vehicles to solve "first mile and last mile" access barriers to transit stations).
- Improved information about those travel choices (e.g. real-time updates on the availability of shared vehicles).
- Strategic pricing of all modes to incentivize travelers to utilize travel modes, times, and routes that are the most cost effective from a system-wide perspective (e.g. priced parking during peak periods of travel demand).

Existing and Planned TDM in the Station Areas

Existing

EcoPass: This employer-sponsored annual transit pass program provides unlimited rides to pass holders on RTD buses and light rail. EcoPass also includes the Guaranteed Ride Home (GRH) program, which provides free taxi rides to employees in the event of an emergency or other unexpected schedule change, and trips to and from the airport on RTD's SkyRide bus service and the University of Colorado A Line light rail service (RTD 2017).

eGo CarShare: The eGo CarShare program operates at locations throughout Denver, Boulder, and Longmont, including carshare facilities at Colorado Center at the Colorado Station. The program provides members with short-term access to a range of efficient vehicles and also includes business and nonprofit plans for employers (eGo CarShare 2016).

Way to Go: The Denver Regional Council of Governments' (DRCOG) Way to Go program helps travelers learn about and try alternative commute options. The tools available through this program (including rideshare matching) could be utilized in both the Colorado and University Station areas (My Way to Go 2016).

Enterprise CarShare: Enterprise offers their carsharing service at the University of Denver. According to existing conditions analysis done as part of the University of Denver's campus transportation master plan, this program is apparently not well very utilized (University of Denver 2016).

CollegePass/EcoPass: Two discount transit pass programs offer unlimited bus and light rail rides to University of Denver, including the University Station (University of Denver 2016). One program is for students (CollegePass) and the other program is for campus employees (EcoPass).

Car2Go: This carsharing program is present in both station areas. University Station and the surrounding areas, up until Yale Ave. became part of the Car2Go's Home Area in its recent expansion. Colorado Station itself, and the area west of Colorado Blvd. is not located within the Home Area, yet Colorado Station RTDs Parking lot is considered an allowed parking area outside Car2Go's regular Home Area.

Planned

First/last mile studies: First/last mile access improvements continues to be studied along with potential future bikeshare systems at the Colorado Station.

Campus transportation master plan: Denver University was working on a campus transportation master plan in 2016, and many of the recommendations under consideration would be directly related to TDM implementation opportunities at University Station (University of Denver 2016).

Additional TDM Implementation Opportunities in the Station Areas

Establish district-wide parking management programs

Develop a district-wide parking management approach. Such an approach should include demand-responsive parking prices for all public parking, “parking cash-out” for all private parking, and single parking valet program for areas with limited off-street parking, and coordinated signage. All parking revenues generated from public parking should be reinvested in the district they were generated in to fund TDM programs that reduce parking demand.

Expand subsidized transit passes

Expand partnership between RTD and the University of Denver, to facilitate Neighborhood EcoPasses to residents within one-fourth mile to one-half mile of the station areas.

Develop a comprehensive employee flexible scheduling program

Promote additional flexibility programs for study area employees, including: comprehensive telecommuting and a compressed workweek program. Programs could include option for employees to work from home or other non-office locations one or more days a week, promotion the use of four 10-hour days per week or other alternative scheduling to reduce daily trips to and from the study area, and flexible scheduling to promote work hours that differ from the traditional 8-to-5 time period, to ‘flatten’ out transportation demand. Implementing more comprehensive flexible schedule options for employees would be one of the most cost-effective ways to mitigate peak hour travel demand.

Develop innovative employee information programs to promote trip planning

Develop a pilot program for “casual/dynamic” travel planning that uses a mobile app to provide up-to-date information to employees and residents in the two station areas on all modes. This could include the ability to provide instant ridesharing/carpooling partners for drivers, up-to-date transit information (including next bus and next train information), and information on available bike and car sharing facilities and options.

Redevelop existing parking facilities

Existing parking structures within one-quarter mile of the station areas should be evaluated for feasibility for redevelopment as mixed-use buildings with multi-modal accommodations (aka “mobility hubs”). Sites located in close proximity to high-capacity transit nodes should not be standalone parking facilities as these districts evolve and travel demand increases.

Revise development regulations as needed to promote alternative mode use:

Conduct a comprehensive review of development regulations and parking/transportation impact requirements for the station areas and connecting corridors. Identify regulations that may be contributing to excessive vehicle travel, undermining the return on investment of taxpayers’ significant and ongoing investment in transit service, and working at cross-purposes with the City’s policy goals (ranging from encouraging infill development near transit to reducing GHGe). As necessary, create an overlay zone for the station areas and connecting corridors to allow for more appropriate development regulations for these unique contexts. In particular, a reduction or elimination of minimum parking requirements should be phased in for development projects that implement TDM programs recommended, either through on-site implementation or partnering/funding district-wide implementation. This also could include mandatory or optional car and bike sharing requirements for new developments and the potential for an alternative mode facility tax, or assessment district.



COLORADO STATION



CHAPTER 6

GOING FORWARD



RECOMMENDATION PHASING

Community and stakeholder involvement was fundamental to the Multi-Station Plan and Mobility Study and resulted in the identification of physical infrastructure improvements, connectivity strategies and mobility services, programs and policies that specifically address local mobility issues. The recommendations in this plan are organized by category of improvement and are identified as short term, medium term and long-term timeframes for implementation. Additionally, the key partners in implementation of each recommendation are also identified for planning purposes.

The following table identifies the short-term and medium to long-term recommendations found within this planning document, and identifies the partners needed to make these recommendations a reality.

Physical Network Improvements

Table 02: Summary of Recommendations - Physical Network Improvements

Near Term Recommendations	Responsibility
Establish uncontrolled pedestrian crossings on Buchtel, mid-block at DU	CCD, TS, DU
Create a two-way cycle track along Buchtel	CCD, TS
Implement ped/bike crossing at Buchtel/Clayton	CCD, DU
Implement ped/bike crossing at Buchtel/St. Paul	CCD
Implement pedestrian improvements along Asbury through the DU campus	CCD, TS, DU
Redesign the intersection at Buchtel/University to promote ped/bike safety	CCD
Redesign the intersection at Evans and University to promote bike/ped safety	CCD
Redesign the intersection at Buchtel/Monroe to promote bike/ped safety	CCD
Redesign the intersection at Buchtel/Colorado to promote bike/ped safety	CCD, Colorado Center, CDOT
Redesign the intersection at Evans/Colorado to promote bike/ped safety	CCD, CDOT
New pedestrian crossings of Evans	Colorado Center, CCD, RTD, TS
Medium to Long-Term Recommendations	
Revise bus and auto access and circulation to the University Station at Buchtel/High (eliminate bus circulation through garage.)	CCD, RTD
Establish a roundabout at Buchtel/ High	CCD, RTD
Create a transit plaza at the University Station	CCD, RTD, TS
Ped/bike bridge across I-25 from University LRT station	CCD, RTD, CDOT
Redesign the intersection at Asbury and University to promote bike/ped safety	CCD
Redesign access to Colorado Center at South Frontage Road	CCD, Colorado Center, CDOT
Implement new complete street design on Bellaire	CCD
Implement bicycle/pedestrian improvements at Buchtel/Franklin	CCD

Legend: CCD=City and County of Denver; TS=Transportation Solutions; DU=University of Denver; RTD=Regional Transportation District

Mobility Hubs, Services and Program Level Recommendations

Table 03: Summary of Recommendations - Mobility Hubs, Services and Program Level Recommendations

Mobility Hubs, and Wayfinding

Near-Term Recommendations

Responsibility

Develop the Stations as regional Mobility Hubs	TS, DU, Colorado Center, RTD
Develop a network of local Mobility Hubs	CCD, TS, DU, RTD, Colorado Center
Develop a station area wayfinding system	TS, DU, RTD, Colorado Center

Comprehensively enhance and expand local transit and shuttle operations

Near-Term Recommendations

Responsibility

Implement the DU shuttle program	DU
Explore and implement transit service enhancements with RTD	DU, Colorado Center, TS, RTD
Explore partnerships with private transit providers and new technologies	DU, Colorado Center, TS, RTD

Medium to Long-Term Recommendations

Implement microtransit on High Street and Illiff Avenue next to DU campus	TS, RTD, DU
Implement microtransit on Bellaire to link Colorado Station to neighborhoods to the south	TS, RTD, Colorado Center

Expand bicycle facilities

Near-Term Recommendations

Responsibility

Install bike sharing facilities at key locations	TS, DU, Colorado Center
Install bike storage/rack facilities at key locations	TS, DU, Colorado Center

Expand and enhance TDM programs

Near-Term Recommendations

Responsibility

Establish parking management programs	TS, DU, Colorado Center, CCD
Expand subsidized transit pass programs	TS, DU, Colorado Center, RTD
Develop comprehensive employee flexible scheduling program	TS, DU, Colorado Center

Medium to Long-Term Recommendations

Develop comprehensive trip planning programs for employees	TS, DU, Colorado Center
Undertake comprehensive review of (and revise) development regulations to promote alternative mode use	TS, DU, Colorado Center, CCD

Legend: CCD=City and County of Denver; TS=Transportation Solutions; DU=University of Denver; RTD=Regional Transportation District

GOING FORWARD

There are several critical action items from the Multi-Station Plan and Mobility Study that serve not only to conclude the study, but to propel the recommendations found within forward toward implementation. Continued work and partnering is critical to successful design and implementation of the recommendations.

Next Steps Study

Extensive neighborhood and stakeholder participation in this study highlighted the importance of critical physical infrastructure improvements during the planning process, and fortunately, many of these recommendations were called out for further evaluation and design detail as part of a City and County of Denver (CCD) Next Steps Study for the Multi-Station Area. The CCD Next Steps Study enables further engineering detail of Buchtel Blvd., intersection design and pedestrian interface at Buchtel Blvd and University Blvd. and Colorado Blvd., and Evans Ave. at University Blvd. and Colorado Blvd. The City and County of Denver, along with Transportation Solutions, University of Denver, RTD, Colorado Center and neighborhood representatives will continue to work through the design details of the recommendations initiated in the Multi-Station Plan and Mobility Study.

Transferability of Lessons Learned

Local challenges and physical barriers to accessing Denver's rail stations and transit services are not unique to the University and Colorado Stations. The lack of first/last mile connections to many of the region's transit centers inhibits local mobility and reduces mobility options for many. The community and stakeholder planning process followed in this study was designed specifically to link community conversations to the planning and design process. It resulted in the identification of specific community driven improvements that address local connectivity and work to activate the University and Colorado Stations. The following findings from the Multi-Station Plan and Mobility Study may be transferable to other first/last mile connectivity studies and subsequent next steps efforts:

- Engage neighborhoods, community organizations and stakeholders in defining local mobility issues at the onset of the study.
- Utilize a variety of outreach methods, locations and settings to garner input.
- Understand the connectivity "backbone" in place today vs. the community's connectivity needs.
- Seek the 4 P's - site specific and area wide Physical improvements, Programmatic opportunities, Policy recommendations and Partnerships to transform mobility options.
- Look to changing technologies and unique opportunities to address specific mobility needs.
- Leverage other agency investments to create mutually beneficial returns.
- Develop a lasting working arrangement among stakeholders and partners to support implementation

Partnership

Transportation Solutions' active involvement as the Transportation Management Association for this area is critical to moving forward the recommendations, programming and services from this study. Transportation Solutions should continue their critical work in assessing service needs, identifying pilot program opportunities and partnerships, and seeking collaborative funding arrangements to support the expansion of mobility options throughout the area. In particular, and unique to the study area, Transportation Solutions should continue to partner with local developers such as Colorado Center and Mile High Development and City Council members in rethinking our land use patterns to supported an integrated connectivity framework and expanded mobility options. Transportation Solutions should continue its work with important stakeholders such as University of Denver and RTD in supporting broader planning efforts and the integration of key mobility components in their transformative plans. Lastly, but certainly not least, Transportation Solutions should continue to communicate and foster relationships with local residents and neighborhood organizations, as well as City and County of Denver planners, to carve out the opportunities for implementation of recommended improvements and other local amenities that contribute to a vibrant pedestrian environment and active transportation environment to these important stations and mobility hubs.

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