Federal Center/ Union Boulevard Corridor Connectivity Plan

Adopted
July 2011

OV CONSULTING

City of Lakewood

City of Lakewood

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Executive Summary

The City of Lakewood embarked on the Federal Center/Union Boulevard Corridor Connectivity Plan in July 2009. This year-long planning process was designed to examine changing mobility needs along the Union Boulevard Corridor, to adjacent neighborhoods and the Federal Center, and to define the actions needed to improve pedestrian, bike and vehicular connectivity in the area, and specifically to and from the Federal Center light rail and transit station, opening in 2013.

The Union Boulevard Corridor/Federal Center area is an essential business and activity center in the City and it is poised to undergo significant change over the next five to 15 years. The Regional Transportation District's (RTD) 2013 light rail service to the Federal Center station at 2nd Place, the City's Transit Mixed Use (TMU) zoning and projected intensification of land uses, the construction of St. Anthony Hospital and the future land use changes defined in the Federal Center's Environmental Impact Statement (EIS) and Master Plan mean new complexities in local mobility and travel demand. This study reinforces these planning efforts and determines the pedestrian and bicycle improvements that will enhance connectivity in today's land use pattern and in future development.

The connectivity planning process was a collaborative effort with staff, RTD, General Services Administration (GSA), St. Anthony Hospital, local property owners, businesses and neighborhoods. A Stakeholder Committee comprised of these representatives met to kick-off the process, identify project goals, develop concepts for connectivity, discuss draft recommendations and review the draft report. The City held a public Design Workshop to identify local issues and connectivity needs, and an Open House to present potential connectivity solutions. Stakeholder and public participation, along with key focus group meetings with businesses and neighborhoods, were essential to running an open, communicative process and in developing project recommendations that reflect local community concerns.

The Union Boulevard Corridor follows a suburban style office development pattern. Cross streets are spaced far apart, creating "superblocks" with buildings set back from the street and surrounded by expansive parking lots. The provision of ample parking and the long walking distances between uses results in high peak hour commuter traffic and similar lunch hour traffic congestion. The unsignalized segments of Union Boulevard are roughly one third of a mile in length, so pedestrians tend to cross mid-block at uncontrolled locations. Existing walkways along Union Boulevard are meandering and sometimes discontinuous, also an incentive for driving to corridor destinations.

Connectivity solutions for the Union Boulevard Corridor are designed to more readily enable people to move by foot or bicycle between destinations and to and from the Federal Center station that will be located on 2nd Place. The Connectivity Plan identifies specific recommendations and supporting implementation projects that will create pedestrian and bicycle connections both now and in the future, as land use development patterns change. The key recommendations to enable future connectivity include the following:

Recommendation 1 – Establish a Sense of Place and Identifiable Character for the Union Boulevard Corridor.

Implementation of sound urban design and streetscape treatments will create a comfortable and safe environment for pedestrian movement along the corridor.

Recommendation 2 - Improve Pedestrian Access to the Future Federal Center Station Platform.

A walkway from 2nd Place along the western edge of the station lot and to the platform will reduce pedestrian/vehicular conflict at the station.

Recommendation 3 – Establish a Pedestrian Walkway to the Federal Center Light Rail Transit (LRT) platform from Union Boulevard.

A walkway from Union Boulevard across the 264 Union Boulevard parcel to the station will provide pedestrians shorter, direct connections to the platform from office buildings west of Union Boulevard.

Recommendation 4 – Establish Additional Pedestrian Linkages through Private Development along Union Boulevard.

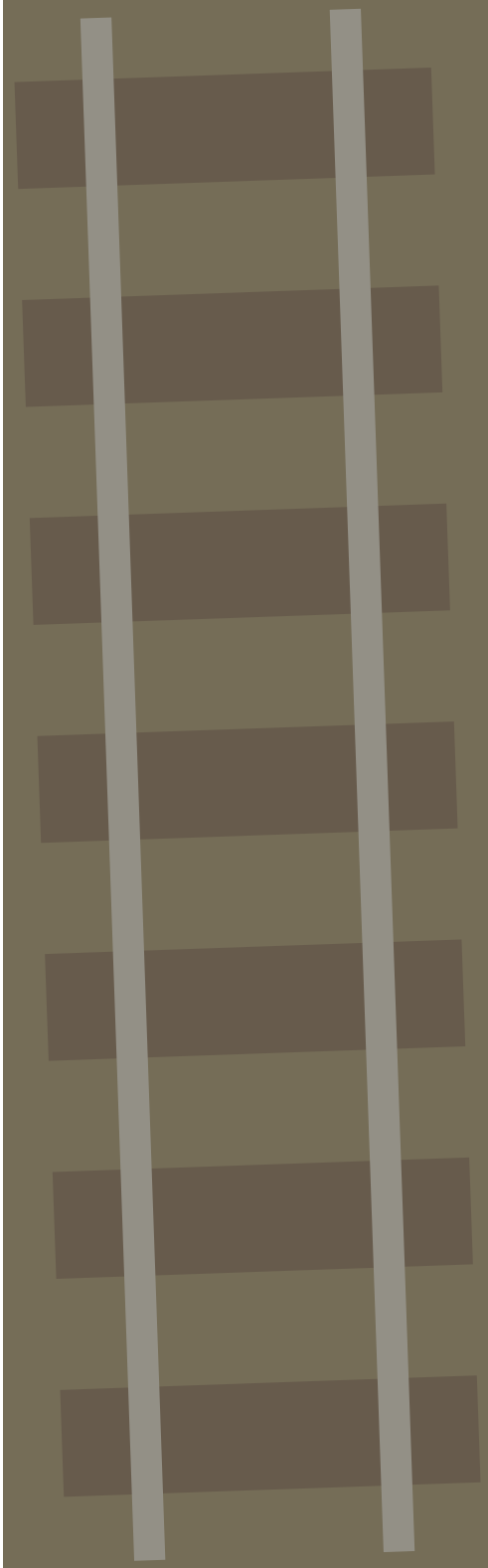
The construction of walkways through private developments/parking lots will allow for better pedestrian movement through the superblocks.

Recommendation 5 – Redesign Pedestrian Facilities along the Union Boulevard Corridor to Establish Consistent Treatment, Sizing and Location.

The proposed cross-section for Union Boulevard utilizes consistent design and dimensions for a pedestrian amenity zone and sidewalk area.

Recommendation 6 – Improve Pedestrian Crossings of Union Boulevard

Controlled mid-block crossings of Union Boulevard will better



enable pedestrian movement between uses and the Federal Center station.

Recommendation 7 – Develop a Consistent Bicycle Connection along 2nd Place to the Federal Center station.

The extension of bike lanes across Union Boulevard on 2nd Place to the Federal Center station will provide safe and efficient connectivity between western neighborhoods, businesses and the station.

Recommendation 8 – Develop Cycle Tracks along Union Boulevard to Increase North-South Connectivity Through the Corridor.

The implementation of cycle tracks from 4th Avenue to Alameda Avenue along Union Boulevard will improve bicycle north-south connectivity and enhance system continuity.

Recommendation 9 – Improve Pedestrian and Bicycle Connections from Southern Neighborhoods to the Union Boulevard Corridor and Federal Center Station.

Connections to the southern neighborhoods are important to minimizing vehicular traffic through the neighborhood and to the station.

Recommendation 10 – Make Other Bicycle Connectivity Improvements.

Other enhancements such as the Routt Street overpass at 6th Avenue, the Kipling Street underpass and improved on-street bike lanes will enhance bike mobility through the Union Boulevard Corridor. The Kipling Street Underpass is a recommended change to the Lakewood Bicycle System Master Plan.

Recommendation 11 – Increase Transit Coverage and Connectivity along the Union Boulevard Corridor.

A future transit circulator should be studied further for feasibility of implementation and funding options.

The addition of St. Anthony Hospital, the future Federal Center mixed-use development, the allowable intensification of land uses near the Federal Center station and the addition of RTD's light rail service will bring increasing pressure for improved pedestrian and bicycle connectivity to the area. This study identifies the difficulties with existing connectivity in the area and recommends both the immediate improvements that will enhance connectivity in 2013, as well as long-term actions that will work in conjunction with redevelopment opportunities along the corridor.

Purpose of the Study

The City of Lakewood began work on the Federal Center/Union Boulevard Corridor Connectivity Plan in July of 2009. The intent of the plan was to examine mobility issues in the Union Boulevard Corridor, the Federal Center area and adjacent neighborhoods, as depicted in the project study area shown in Figure 1. The purpose was to develop a comprehensive connectivity program to ensure pedestrian, bike, and vehicular access to and from the future Federal Center station, opening by 2013.

Greater connectivity is typically established through visibility of bike and pedestrian facilities, the establishment of defined links or facilities between land uses, and urban design treatments that bring attention to these facilities and establish priority for different modes. With these improvements come greater walkability, convenient means for biking, continued vehicular access, enhanced pedestrian environment and streetscape, and opportunities for different land use types and design elements. Strategies to establish future connectivity were examined within the project study area, identified as the area surrounding Union Boulevard corridor extending from 6th Avenue on the north, to Van Gordon Street and adjacent uses to the west, Routt Street and the Federal Center to the east and Alameda Avenue and Glennon Heights neighborhoods to the south. Connectivity issues were examined specifically within and through this area.

The Union Boulevard/Federal Center area is an essential business and activity center in the City and it is anticipated that this area will undergo significant change over the next five to 15 years. The opening

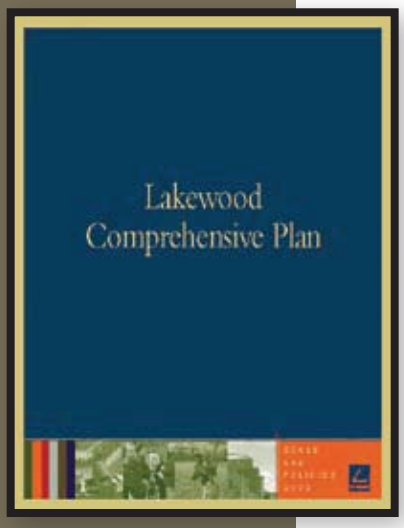
Figure 1 - Project Study Area

of the Federal Center station, the construction of St. Anthony Hospital and related medical offices across from the station, the introduction of mixed-use development between Union Boulevard and the Federal Center with its GSA Federal Center Site Plan, Master Plan and EIS, and the City's adoption of the Transit Mixed Use (TMU) zoning for the corridor all indicate changes in land use type and density. These changes present a new series of complexities in local mobility and travel demand that will be best addressed through changes to local transit, bike and pedestrian facilities, and improvements to walkability supported by integrated land use patterns and urban design features.

Study Process

Previous Planning Processes

The Union Corridor Station Area Plan, adopted in November 2006, is one of a series of station area plans completed by the City for stations along the West Corridor line. *The Union Corridor Station Area Plan* highlights the vision for the Union Boulevard area and is a guiding element of this Connectivity Plan. Additionally, the City completed the *Lakewood West Central Subarea Transportation Study* (2007) which analyzed future vehicular travel demand and trip generation in the area surrounding the Federal Center. These projected traffic volumes were used in the assessment of future connectivity needs in the Union Boulevard Corridor.



The overall vision is to transform the area along Union Boulevard and adjacent to the Federal Center station into a mixed-use urban corridor. The area will continue to be the City of Lakewood's mid and high-rise development area and one of its urban centers. Development that occurs along the corridor is to be urban in form, with building entrances located directly on sidewalks to allow for easy walking access. The corridor will be pedestrian-friendly with wide sidewalks and street trees planted to create a pleasant atmosphere. Multi-story office and residential buildings, with ground floor retail will be located in the blocks nearest the Federal Center boundary and near the new St. Anthony Hospital. Additional mixed-use development, with primarily office and retail uses, is anticipated in the area between Union Boulevard and Van Gordon Street and north of Alameda Avenue.

The Union Corridor Station Area Plan builds on the goals and policies

of the City's Comprehensive Plan and calls specifically for improvements "that reflect the community desire for access to the station by alternative transportation modes, and non-vehicular connections to the station area and surrounding neighborhoods." This Connectivity Plan addresses these policies and develops the specific actions and implementation guidelines needed to ensure future multi-modal connectivity called for in these policies.

Connectivity Planning Process

The project team worked to establish a macro level vision for connectivity combined with micro level projects that will create accessible places and increased interaction over time. Specifically, the process included:

- Phase 1 – the review of existing conditions and assessment of today's connectivity environment;
- Phase 2 – the development of concepts for improved connectivity and review by the stakeholders and public;
- Phase 3 – targeted specific project recommendations that begin to implement improved non-vehicular connectivity.

Strategies include elements of land use development and design, integrated bike and pedestrian facilities and new ways of thinking about connecting people, places and transit with balance among all user-types. This report follows each of these phases and highlights the key decision points in the process.

The Goals of this Connectivity Plan, established during the planning process with Stakeholders, call for more specific connectivity direction:

- Goal #1 - Increase bike and pedestrian connectivity through the Union Boulevard Corridor study area with improved facilities north-south along Union Boulevard and established crossings east-west.
- Goal #2 - Increase the visibility of bike and pedestrian facilities and establish these as a viable option for travel within the Union Boulevard Corridor.
- Goal #3 - Reduce the number of vehicle trips within the Union Boulevard Corridor during commuter hours and the lunch hour.
- Goal #4 - Maintain traffic flow on Union Boulevard and retain viable access to local businesses along Union Boulevard.
- Goal #5 – Improve the bike and pedestrian facilities between neighborhoods to the south and west and establish clear connections between these neighborhoods and the Federal Center station.
- Goal #6 - Consider connections to and from the station, Alameda Avenue, Belmar and Lakewood Commons via a local transit circulator.
- Goal #7 – Foster land use redevelopment that establishes a stronger mix of uses, supports improved pedestrian mobility and changes trip-making behavior in the area.

Public Participation

Understanding the local community and business needs for mobility were critical to understanding today's environment and planning for tomorrow's connectivity options. The City embarked on a collaborative process with local businesses and neighborhoods through the establishment of a working Stakeholder Committee, Focus Groups and two public meetings.

Stakeholder Committee

The Stakeholder Committee was comprised of local business owners, managers, neighborhood representatives, and City Council and Planning Commission members who worked with the project team to develop project goals, identify key issues, strategize short-term and long-term connectivity solutions and review recommendations. The role of the stakeholder committee was to identify the needs and issues of the study area, provide input throughout the process, review and discuss alternative strategies for connectivity, and to participate in the successful integration of the light rail and transit with the surrounding area.

Stakeholder Meetings were held throughout the planning process including:

- July 2009 – Kick-off the planning process, listen to Stakeholders, collect input on current conditions and concerns;
- November 2009 – Review of September public workshop and results of the public web survey, identify project goals and discuss concepts for connectivity;
- March 2010 – Review Draft Recommendations and prepare for Public Open House in March;
- May 2010 – Review of Draft Report and discussion of Implementation Plan;
- September 2010 – Concluding comments on Final Plan.

Focus Groups

As a result of stakeholder discussions, three Focus Group meetings were held in February 2010 to allow stakeholders and other community members time outside the main meetings to review alternatives in more depth. These meetings were held with GSA, local businesses, restaurants, hotels, and surrounding neighborhoods and their specific input became part of the connectivity recommendations.

Public Workshop

The first public workshop for the project was held on September 24, 2009, and was attended by 29 people. The workshop provided an opportunity for residents of the neighborhoods surrounding the Federal Center and Union Boulevard Corridor, and employees in the area to express concerns and discuss opportunities related to non-auto movement through the area, and to and from the future Federal Center station.

The workshop included an overview presentation, as well as design tables for Pedestrian Mobility, Bicycle and Neighborhood Connectivity and Land Use where attendees participated in an open discussion about current issues, design concepts and future connectivity solutions.

GSA Focus Group Input:

- GSA would like bike lanes, sidewalks and a smaller median on 2nd Place in front of the station. They will try to match the configuration used by Lakewood for 2nd Place into the Federal Center.
- Bike connections from the neighborhood to the south are important.
- GSA would like to see a circulator shuttle that links the Federal Center site, Kipling Street, Alameda Avenue and Belmar.
- GSA is in early stages of land disposal of the office center north of the station. The site will likely be marketed in conjunction with opportunities at the RTD park-n-Ride location.

Business/Hotel Focus Group Input:

- FirstBank, Sheraton and Crown West, the owner of 240 Union Boulevard, are all very supportive of pedestrian access between Union Boulevard and the station through their sites.
- FirstBank is willing to work with the recently submitted site plan (or future redevelopment plans) to find a way to accommodate a walk way and parking.
- Circulator options should include a route that serves Union Boulevard, GSA, St. Anthony Hospital and the Federal Center station.

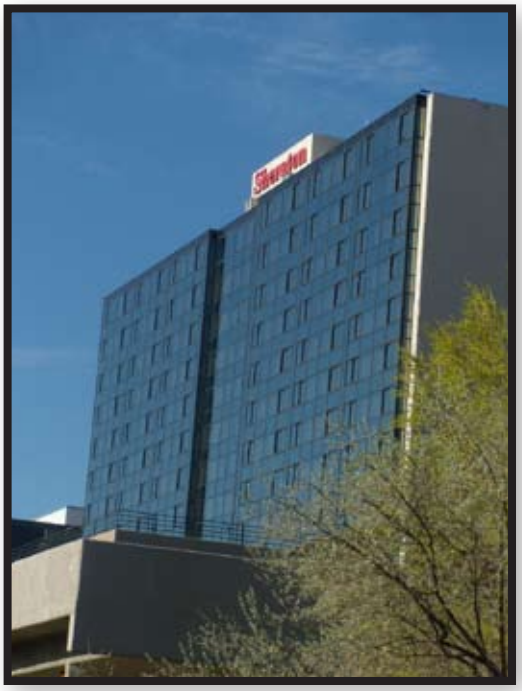
Neighborhood Focus Group Input:

- Supportive of improved walking and biking connections through existing employment along Union Boulevard.
- Recognizes that the pedestrian environment needs to look much different than it does now.
- In favor of at-grade pedestrian crossings on Union Boulevard in the short term, with consideration of overpasses in the long-term.
- Would like to see inviting “features” of future walkways and pedestrian plazas, such as landscape, water features, lighting, and furniture.

Comments from Public Workshop, September 2009

Attendees commented on a range of concerns over existing conditions and ideas for future implementation in the area:

- We must make the area pedestrian friendly; all north-south traffic does not need to travel Union Boulevard. Van Gordon Street and Routt Street bypass can siphon off some of this traffic demand.
- Poor sidewalk conditions are a big concern along Union Boulevard. They are not attractive, too close to the road, not inviting, lack of vegetation, light posts, benches, trash cans, etc. Crossing Union Boulevard is extremely dangerous now. What safeguards will be in place with the new system?
- A central plaza or square would be pedestrian friendly, promote sustainability, beautification, and public gatherings. There should be a cross over bridge available, fountains, outdoor terraces, cafes, trees, flowers, art-works or sculptures. It should be a friendly and visually interesting space that is central and easy to access.
- Bike share would be a good idea for the Union Boulevard Corridor.
- Union Boulevard should be a major north-south bike route with on-street bike lanes.
- A shuttle from Federal Center station to other central corridor locations including Belmar should be considered. The "Union Boulevard Shuttle" should have access to the bus bays at the Federal Center station and should link retail, restaurant and hotel uses such as the Sheraton, Hampton Inn, Homewood Suites, Candlewood Suites and Residence Inn.
- There is a specific need for increased pedestrian safety and mobility between DDRC and the park-n-Ride and Federal Center station.
- Mid-block pedestrian crossings are needed between 2nd Place and 4th Avenue on Union Boulevard.
- Improved east-west pedestrian connections should be developed between the station area and Union Boulevard.
- Consistent street trees and aesthetic treatments would make a big difference along Union Boulevard.
- 2nd Place/Union Boulevard is a good location for a pedestrian underpass.



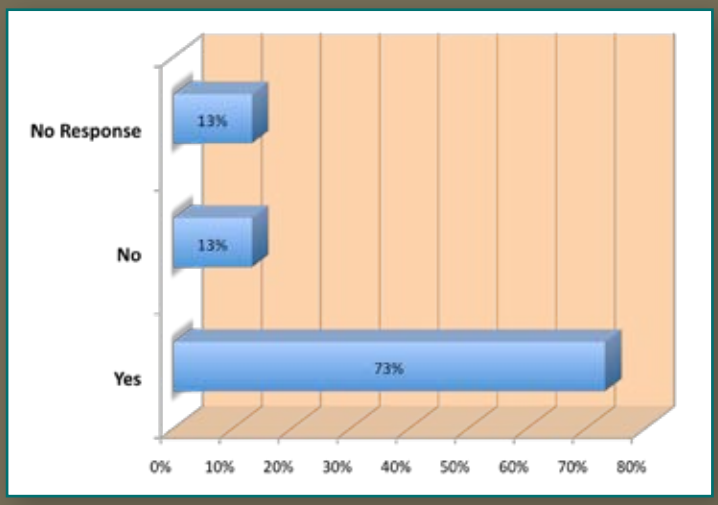
Web Survey

A web survey was made available to the public via the City's website and on computers at the public Design Workshop, and was distributed to stakeholders and local businesses. There were fifteen respondents to the survey. Results indicated a desire for greater pedestrian and bicycle mobility, improved sidewalks and bike lanes, better crossings of Union Boulevard and the operation of a circulator shuttle in conjunction with the Federal Center station.

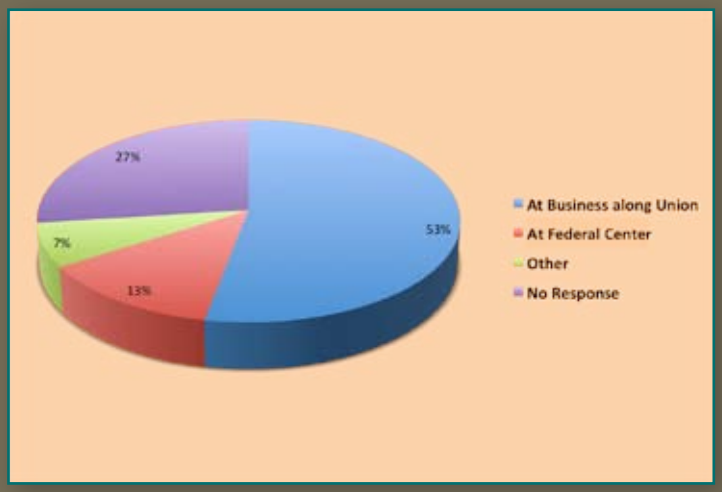
The web survey questions, and results of the subsequent data, can be found on the following two pages.

Web Survey Results:

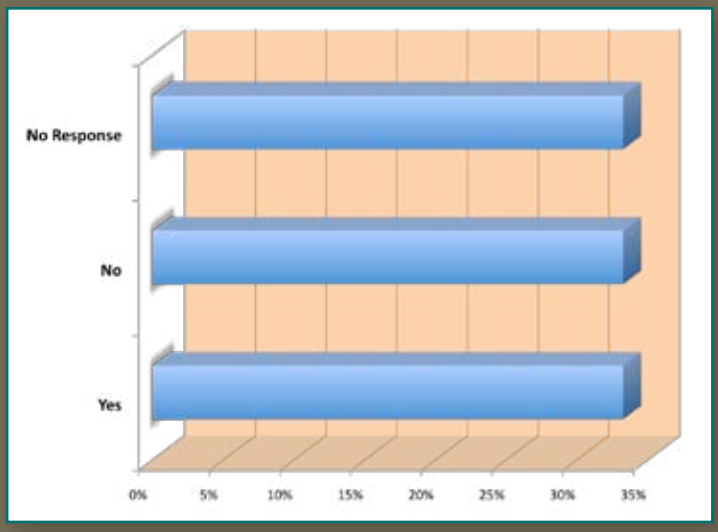
Do you work near the future Federal Center station?



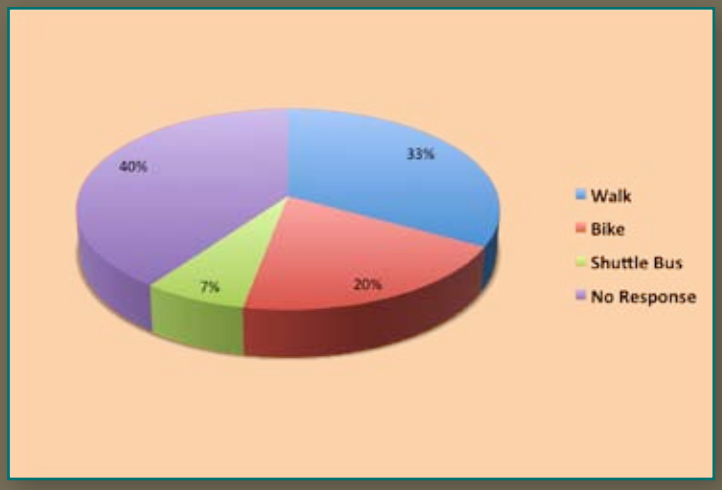
If yes, where are you employed?



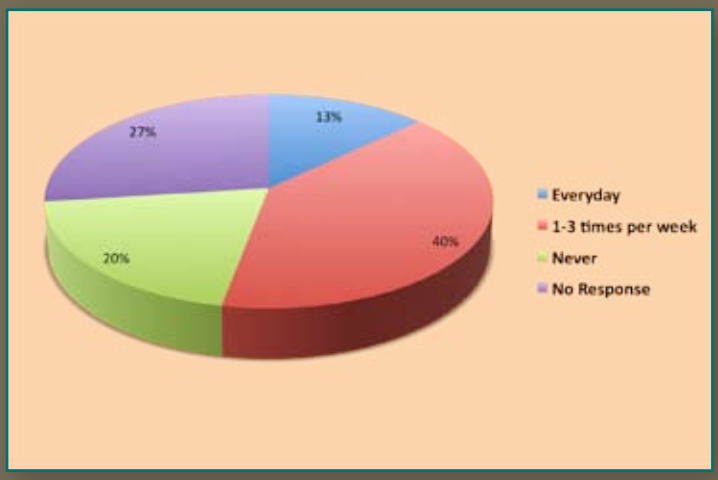
Do you plan to take the light rail to work when it becomes available?



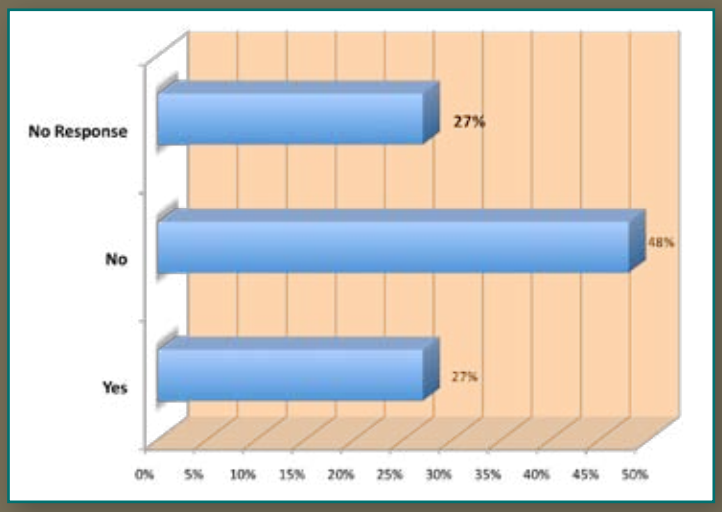
What would be your preferred method to get from light rail to your place of employment?



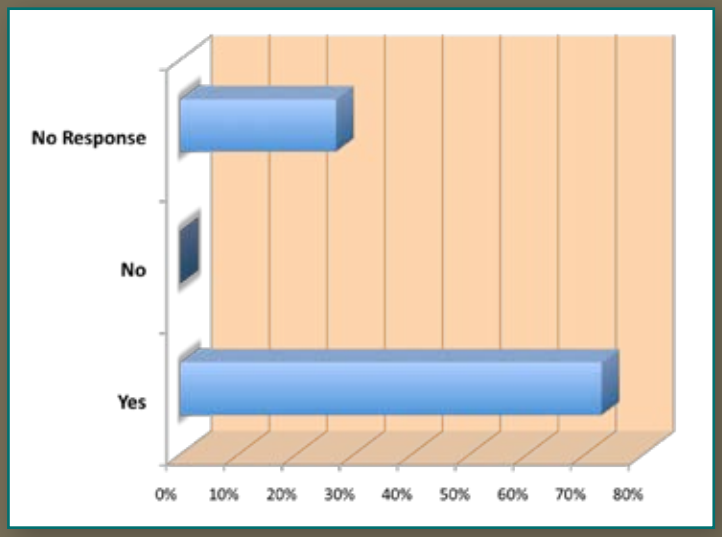
How many times per week do you walk to lunch from your place of employment?



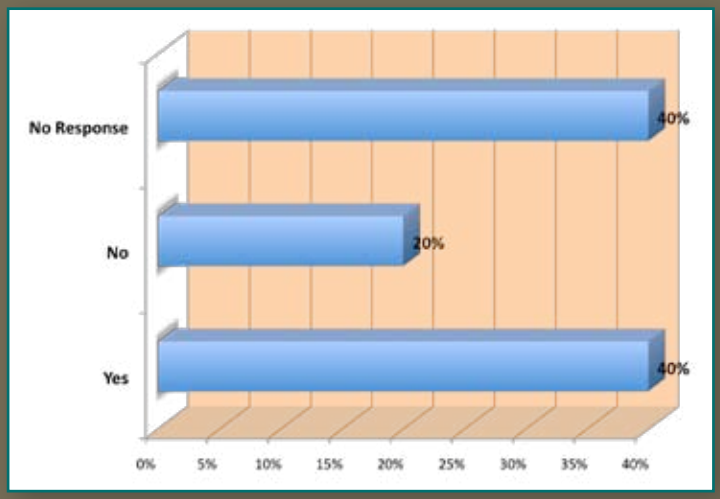
Do you live near the future Federal Center station?



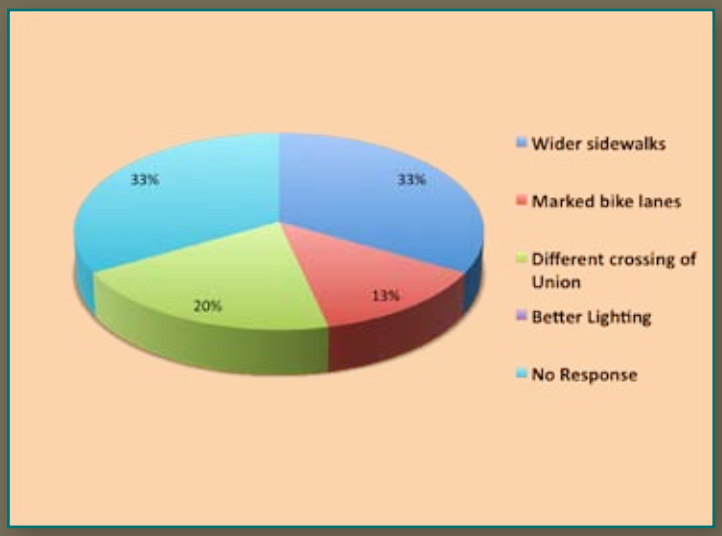
Do you plan to use light rail to commute or travel to other locations?



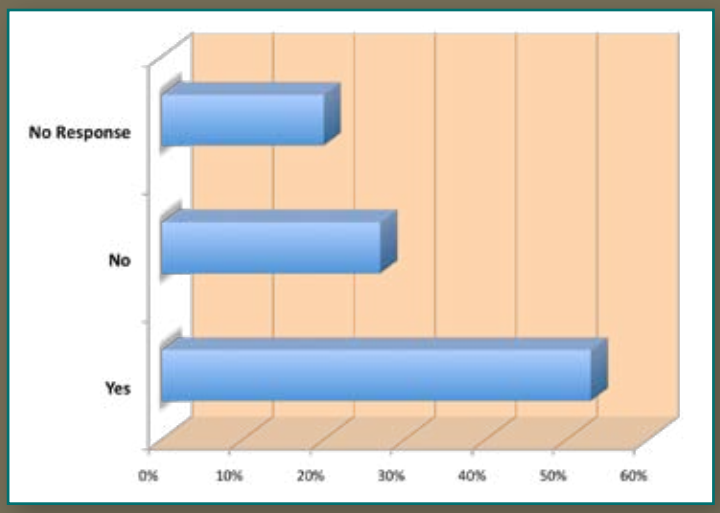
Would you walk or bike to the station from your residence?



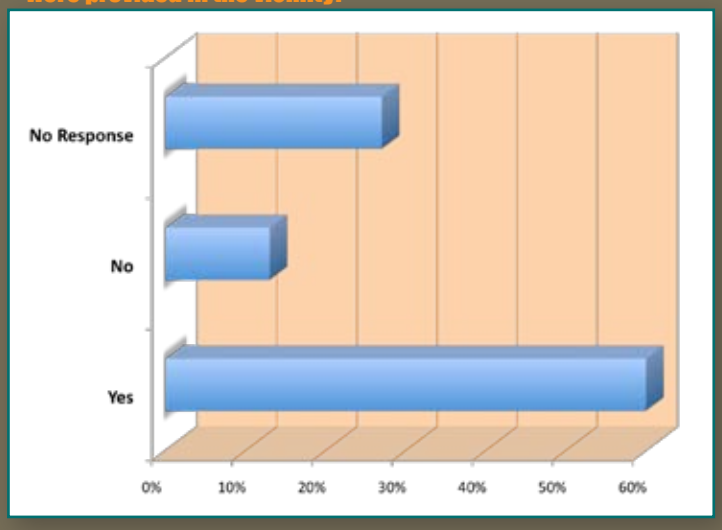
What would make it easier to walk or bike to the station?



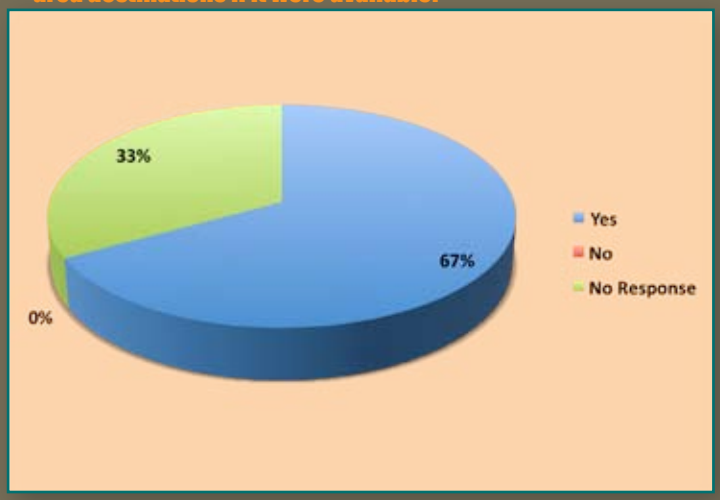
Do you currently bike in the area?



Would you bike to and from the Federal Center station if enhanced bike lanes were provided in the vicinity?



Would you ride a circulator shuttle to and from the Federal Center station and other area destinations if it were available?

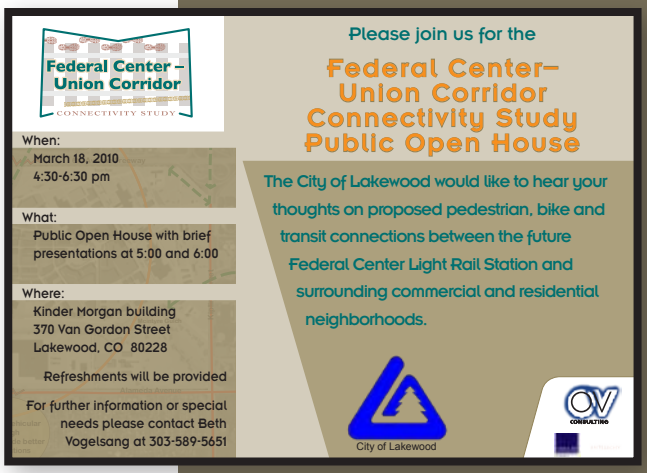


Public Open House

A public Open House was held on March 18, 2010, and was attended by 23 people. The project team provided an overview presentation and specific recommendations for connectivity improvements on boards around the room. Attendees discussed with project team members their opinions of the recommendations, connectivity strategies and timeframe for improvements in conjunction with other changes in the area.

The Open House was an opportunity for the public to comment on the direction for improvements and the alternatives being recommended in the draft report. Ten specific recommendations addressed pedestrian crossings of Union Boulevard, cycle tracks along Union Boulevard, other connecting bike and pedestrian facilities, land use design and access and potential circulator routes linking the Federal Center station to surrounding uses.

The input received at the Open House was reflected in the refinement of the plan recommendations and the Final Draft.



Today's Conditions Assessment

Land Use, Population and Employment

The Union Boulevard Corridor today is predominantly an auto-oriented corridor with three travel lanes in each direction and limited bike and pedestrian facilities along Union Boulevard, or crossings of Union Boulevard. The multi-story suburban office land use pattern along the corridor is marked by extensive at-grade parking for each development and few, if any, pedestrian connections between buildings or corner uses. The development design follows a super-block pattern along Union Boulevard, between 4th Avenue and Cedar Drive creating significant walking distances between uses. Corner restaurants and small scale retail designed to serve the office lunch demand or after-hours crowd can be difficult to access by foot. Restaurant uses at 2nd Place and Union Boulevard, for example, are off-set from the sidewalk along Union Boulevard by the detention pond at the corner of the intersection. The existing land use pattern today is set up for auto circulation and numerous vehicle trips between corridor uses throughout the day. There are few bicycle and pedestrian connections that penetrate the super-block configuration and create alternatives to the vehicle trip up and down the corridor.

Table 1 breaks down existing and projected employment and residential use by block. The significant increase in employment, coupled with a growing residential presence in the corridor will mean higher demand for bike and pedestrian connections between uses and the facilities for these connections that create a safe and visible presence for users.

A projected number of residents is provided based on estimates derived from the TMU zoning, as well as the description of districts as identified in the *Federal Center Master Plan*. As such, there are an estimated 600 residents currently in the study area, with a projected number of over 4,000, for a 586 percent increase. This translates to an estimated 2,744 residential units in the study area in the future.

There are currently just over 13,000 employees working in the corridor, including 6,000 at the Federal Center. Projected employment

Lakewood Connectivity Study Land use Analysis Existing and Future Employment and Residences within the Union Boulevard Corridor Date 15-Apr-10

Table 1

Parcel	Existing Employment	Future Employment	Existing Residential Units	Future Residential Units	Existing Residents	Future Residents	Assumptions / Notes
West of Union Boulevard							
A N. of 4th Avenue	457	500	0	120	0	180	not much job growth, some redevel. to residential assumed
B Between 2nd Place and 4th Avenue	1,229	1,400	0	120	0	180	~1.5 million sf of space between B, C, and D
C S. of 2nd Place	939	1,300	0	120	0	180	~1.5 million sf of space between B, C, and D
D N. of Cedar Drive	1,007	1,300	0	0	0	0	~1.5 million sf of space between B, C, and D
E S. of Cedar Drive	783	1,018	0	0	0	0	modest redevel. of more office
S W. of Van Gordon Street N. of 2nd Place	25	25	400	400	600	600	no change
T W. of Van Gordon Street S. of 2nd Place	640	815	0	120	0	180	some employment and residential infill
Subtotal	**5,080**	**6,358**	**400**	**880**	**600**	**1,320**	
% Increase		**25%**		**120%**		**120%**	
East of Union Boulevard							
F N. of 4th Ave	0	0	0	0	0	0	parcel ultimately consumed by infrastructure
G Between 2nd Place and 4th Avenue	1,054	1,800	0	144	0	216	some redevel. and intensification of the parcel
H S. of 2nd Place	676	1,068	0	200	0	300	most opportunity for major reinvestment: both intensification and diversity of use
I McIntyre Gulch to Alameda Avenue	253	337	0	0	0	0	modest job growth
J Fed Center N. of 4th Avenue	0	700	0	0	0	0	estimated per Federal Center Master Plan: 1,002,000 total space btwn J and K, and part to O
K Fed Center S. of 4th Avenue	0	1,072	0	848	0	1,272	estimated per Federal Center Master Plan: 1,002,000 total space btwn J and K, and part to O
L Station area	0	400	0	120	0	180	assumes 150,000sf office space
M St Anthony Hospital	0	2,400	0	0	0	0	hospital and Medical Office Building uses
N St Anthony Hospital future growth	0	400	0	0	0	0	future St. Anthony related development
O Fed Center MU +R&D	2,076	3,953	0	552	0	828	estimated per Federal Center Master Plan, part from J and K total sf
P Fed Center Quad & Campus	3,198	6,500	0	0	0	0	estimated per Federal Center Master Plan descriptions
P1 Fed Center Campus	726	850	0	0	0	0	estimate given low employment nature of this building
Q Retail on Alameda Avenue	30	183	0	0	0	0	110,000 sf of retail estimated per Federal Center Master Plan
Subtotal	**8,013**	**19,663**	**0**	**1,864**	**0**	**2,796**	
% Increase		**145%**					
Summary							
TOTALS	**13,093**	**26,021**	**400**	**2,744**	**600**	**4,116**	
% Increase		**99%**		**586%**		**586%**	

General Notes:
1. Existing employment and residential unit numbers from City of Lakewood. Not all building information was available.
2. Future employment includes both additional jobs that can be accommodated in existing buildings as well as new estimated development
3. The following ratios were used to calculate future numbers: employment: 1 job per 375/sf; residential: 1.5 residents per unit; retail: 1 job per 600 sf; for areas that had a significant mix of office and retail, a simple 1 job per 375/sf was utilized to calculate future jobs.
4. For P - the Federal Center Quad and Campus Districts, a higher ratio was utilized than 375sf/employee given that not all of this space would be traditional office space
5. Compiled and estimates provided by Entelechy LLC

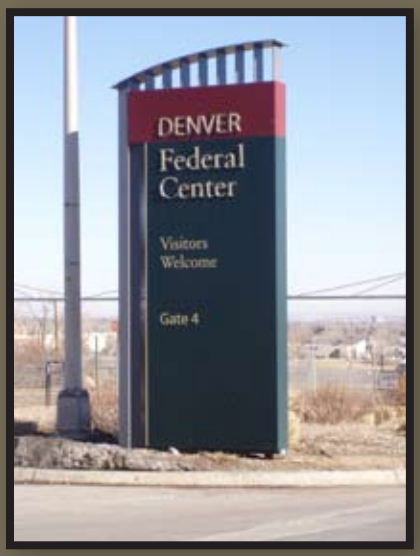
(through 2030) in both the corridor and Federal Center is estimated to increase to 26,000 employees, representing an additional 13,000 employees in the area. This estimated increase in employment is attributed to three primary factors:

1. The opening of St. Anthony Hospital in 2010 and phases beyond this, with an estimated 1,150 employees:

   The Ortho Colorado Hospital opened in 2010 and St. Anthony Hospital is scheduled to open in 2011. Adjacent medical buildings are planned to open by 2012. The new campus will include 270 beds and up to 200,000 square feet of medical office buildings, with room for additional expansion. Employment is estimated at 1,150 upon opening of the main hospital. St. Anthony Hospital is expected to generate an additional 1,265 jobs in the community (Lewin Group) in 2011 and will become an anchor for activity with employees, hospital visitors and related retail opportunities all contributing to the level of pedestrian use at the site, the Federal Center station and to Union Boulevard businesses.

2. The *Federal Center Master Plan's* projected increase in employment from today's 6,000 employees to 11,300 employees in the future:

   The Master Site Plan for the Federal Center integrates a mix of land uses throughout the site and emphasizes greater accessibility for the public. Transportation connectivity is an essential part of that, especially to the Federal Center station. It is important that the station be accessible to pedestrians, bicycles, autos and regional and local buses, with clear visual connection between the station and surrounding uses. The planned changes at the Federal Center include a mix of uses and densities and are expected to greatly influence the level of residential, office, and commercial activity in the area, and the level of pedestrian activity.



   The Master Site Plan includes a mix of uses found in districts throughout the site:

   Office Center District – This public district is located closest to Union Boulevard and is a highly visible district of the Federal Center. It is planned to be primarily office use with an additional 848 residential units, and 630,000 sq. ft. of new commercial space.

   Mixed-use Core District – This public district is located just east of the Federal Center station and Routt Street and will be the central element of the transit-oriented development. Development would be three to four stories with a mix of retail, office, residential, and hotel lodging and conference space.

   Research and Development District– This district will be 623,000 sq. ft. of dedicated research space for federal and non-federal users of quasi-industrial space.

   Federal Quad District - The central "Quad" district is located at the heart of the Federal Center site and is the focal point of the new mixed-use center connected to surrounding residential, commercial and office uses. The "Quad" is limited to federal agency uses. The distance between the central "quad and the Federal Center station will be about a ten minute walk.

Federal Campus District – This district would be limited to federal uses, secured by perimeter fencing and would not have a mixed-use component for general public use.

Neighborhood Retail District – This district is comprised of 110,000 sq. ft. of retail space at 7th and Alameda Avenue.

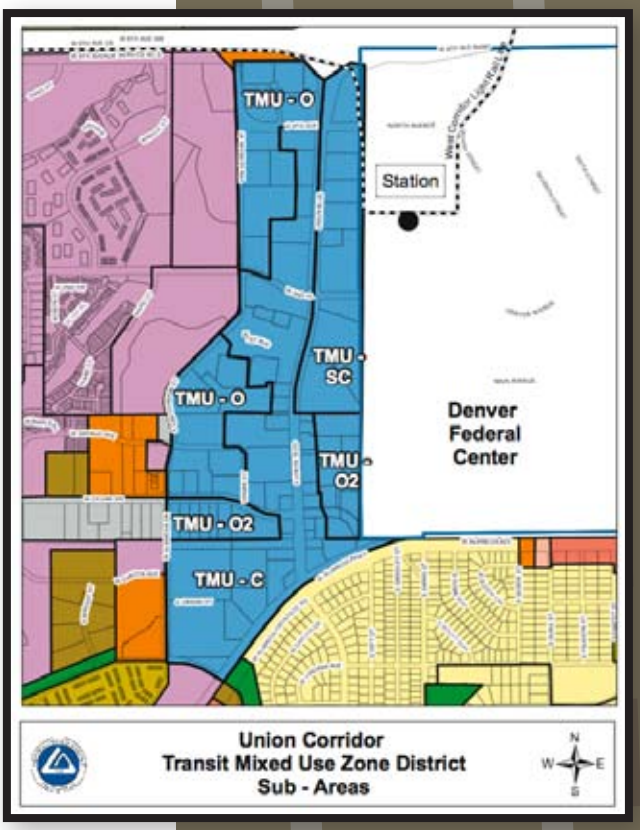
3. The City of Lakewood's TMU Zone District:

The City of Lakewood's TMU Zone District was adopted in February 2007 and the area around four future stations, including the Federal Center station, were rezoned to the TMU Zone District. The district calls for a mix of office, retail and residential uses with residential densities greater than 20 dwelling units per acre, building heights between three and 12 stories at the Federal Center station area core and design elements that encourage and complement pedestrian-scale interest and activity.

The TMU District also calls specifically for circulation and connectivity requirements including:

- Internal walk connections between buildings;
- External walk connections from site to adjacent multi-use trails, parks and greenways;
- Bicycle parking and storage;
- Sidewalks through surface parking located within landscaped islands;
- Minimum sidewalk widths on lots between five to nine feet depending on parking.

Figure 2 illustrates the existing and projected employment and residential information by block.



City of Lakewood
Transit Mixed Use Zoning Development Manual
Ground floor retail, 3 floors office, 3 floors residential condominiums
(451 E. 17th Avenue - Denver, CO)

Employment and Resident Information

Federal Center / Union Corridor Connectivity Plan

April 2010

City of Lakewood Colorado

Figure 2: Employment and Resident Information

Existing Traffic Conditions

The existing arterial roadways in the study area (Union Boulevard, Kipling Street, 6th Avenue, Alameda Avenue) currently carry high volumes of commuter-oriented traffic during the morning and evening peak periods. Much of the commuter traffic along these roadways is destined to businesses within the Union Boulevard corridor and to the Denver Federal Center campus. Both Union Boulevard and Kipling Street operate at capacity during the morning and evening peak hours. Union Boulevard currently carries 38,000 vehicles per day (vpd) north of Alameda Avenue and 58,000 vpd south of 6th Avenue Kipling Street carries approximately 46,000 vpd between Alameda Avenue and 6th Avenue. Alameda Avenue carries slightly less traffic, at 29,000 vpd, with congestion points at Kipling Street and Union Boulevard.

The high level of congestion on these streets is both an incentive and a disincentive in supporting multi-modal transportation alternatives. The high congestion levels make walking, bicycling and transit use more competitive with automobile travel from a travel-time stand point; however, highly congested roadways also create more conflicts with non-motorized users operating along and across these busy streets. Pedestrians crossing busy intersections such as Union Boulevard and 4th Avenue, Union Boulevard and 2nd Place, Union Boulevard and Cedar Drive, and Union Boulevard and Alameda Avenue often face challenging conflicts with turning vehicles, long crosswalk distances, and sometimes long delays before receiving the crossing signal indication.

Vehicular Access

Along the Union Boulevard corridor, cross streets are spaced far apart, creating super-blocks with large amounts of commercial land use and expansive parking lots. This condition is less conducive to pedestrian and bicycle travel because it creates long travel distances between businesses, and non-motorized travel paths are often across parking lots that do not have designated pedestrian or bicycle facilities. The unsignalized segments of Union Boulevard between Cedar Drive and 1st Avenue and also between 2nd Place and 4th Avenue are about one third of a mile in length, so pedestrians are more likely to cross Union Boulevard at uncontrolled locations rather than walking out of direction to a signalized crossing several minutes away.

Neighborhood Traffic Conditions

As is often the case when large-scale development changes occur (i.e. St. Anthony Hospital, Federal Center station and future Federal Center redevelopment), nearby residents become acutely aware of the potential impacts of vehicular traffic to the neighborhood street system. This is the case with the Glennon Heights and West Star neighborhoods that lie to the south of Alameda Avenue, and the Union Square Community Association that lies to the west of Union Boulevard. Residents in these areas are concerned that additional through traffic will be generated on streets like 2nd Place, Union Boulevard south of Alameda Avenue, and Simms Street. Each of these streets has adjacent residential land uses that need to be taken into consideration from a traffic safety standpoint. If congestion on the arterial roadway system becomes too great, then vehicular traffic will "spill-over" onto these streets. It will be important that the carrying capacity of the arterial street system be maintained and, where necessary, strategic improvements be made to manage congestion, reduce the potential of increased traffic on the residential street system, and encourage bike and pedestrian activity.

Projected Traffic Growth on Union Boulevard

Based on the findings of the *Lakewood West Central Subarea Transportation Study (2008),* traffic growth on Union Boulevard is projected to increase by 36 percent between 2004 and 2030. Travel demand management (TDM) strategies were identified in the report as one of a handful of mitigation measures to help offset this demand. TDM strategies include improving alternative transportation modes such as bicycle and pedestrian connectivity to the Federal Center, St. Anthony Hospital and the Federal Center station. Additionally, the recent construction of Routt Street north of Alameda Avenue is expected to help relieve some traffic demand on Union Boulevard. Long-term improvements (currently unfunded) include extending Routt Street over 6th Avenue, reconstruction of the Union Boulevard/Simms Street/6th Avenue interchange, and improvements to the Union Boulevard and Alameda Avenue intersection.

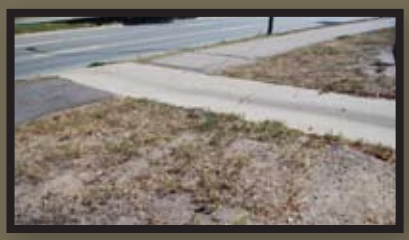
Existing Pedestrian Activity

The suburban office development pattern and super-block configuration along Union Boulevard Corridor greatly shapes auto traffic and the ability of employees, visitors and residents to walk easily within the study area today. But the condition of the sidewalks along Union Boulevard and the lack of secondary pedestrian facilities also influences whether employees, visitors or residents are willing to walk versus drive to destinations along the corridor.

An inventory of existing pedestrian facilities and their condition reveals a variety of walking conditions along Union Boulevard. The inconsistencies make for a difficult and uninviting pedestrian environment along the corridor. Several key issues include: the presence of sidewalk on only one side of the 6th Avenue interchange; lack of continuity of sidewalks along Union Boulevard, depending on land use; a mix of concrete and asphalt sidewalk materials; inconsistent width between curb and sidewalk; and poor visibility of vehicle access across setback pedestrian paths.

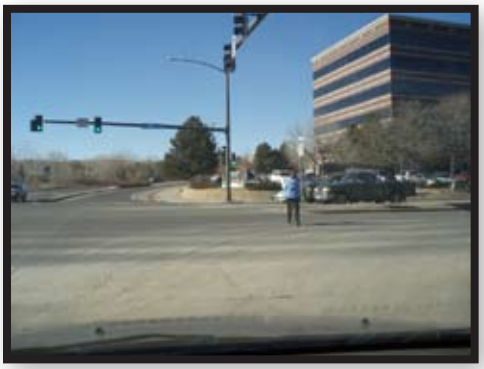
Union Boulevard between W. 4th Avenue to 2nd Place – meandering design means different setbacks from curb face and proximity to Union Boulevard vehicles.

Sometimes sidewalks are located adjacent to parking with few amenities



West side of Union Boulevard between 4th Avenue and 2nd Place - mid-block drainage feature interrupts sidewalk

The width of the right-of-way and right-hand turning movements across pedestrian crossings make even signalized street crossings difficult.



The presence of the landscaped median along Union Boulevard makes it easier for pedestrians to cross mid-block. Frequent jaywalking is observed especially in segments of the corridor where signalized crossings are far apart.

East side Union Boulevard. at Cedar Drive – sidewalk interrupted by vehicular access

To assess the current level of pedestrian activity in the study area, pedestrian movements were observed over a one-week period in August, 2009. The number of pedestrians crossing Union Boulevard between Alameda Avenue and 6th Avenue was recorded from noon to 1:00 pm. Crossings of Alameda Avenue in the vicinity of Union Boulevard were also measured. Figure 3 illustrates the level of pedestrian activity at each of the controlled crossing points (signalized intersections) and also at midblock jay walking locations.

Figure 3: Pedestrian Activity at Controlled Crossing Points Along Union Boulevard

The data indicates the highest pedestrian crossing activity occurs at the intersection of 2nd Place and Union Boulevard where 87 pedestrians were observed crossing Union Boulevard during the noon hour. The level of pedestrian activity at 2nd Place is more than double that of any other location along the Union Boulevard corridor. Many of these pedestrians are office workers crossing from office buildings on the west side of Union Boulevard to restaurants on the east side. It's also important to note that the north side crosswalk at 2nd Place has approximately twice as much pedestrian activity as the south side crosswalk. The north side crosswalk also has more pedestrian-vehicle conflicts due to the high volume of vehicular traffic turning from 2nd Place to and from the north leg of Union Boulevard.

The pedestrian-crossing observations also revealed that pedestrians frequently cross Union Boulevard at midblock locations between Cedar Drive and 1st Avenue and between 2nd Place and 4th Avenue. The number of mid-block crossings in these two locations are higher than any other locations along

the corridor. Pedestrians crossing mid-block are typically avoiding the out-of-direction walking that is required to cross at the signal. There are no officially marked midblock crossings of Union Boulevard so pedestrians utilize the landscaped median to cross Union Boulevard's travel lanes.

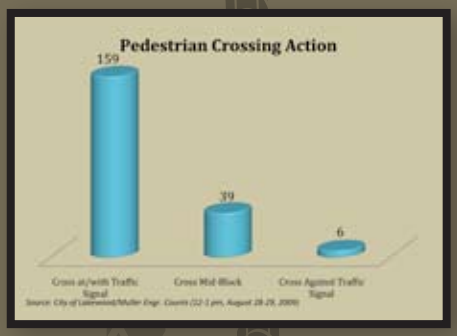
Further south on the Union Boulevard corridor at Alameda Avenue, pedestrian activity is lower than the central and northern portions of the corridor. This is primarily due to the low density residential land uses that lie to the south of Alameda Avenue and the less pedestrian-oriented land uses south of Cedar Drive. The congested intersection of Alameda Avenue and Union Boulevard is difficult for pedestrians to negotiate due to the high volume of turning traffic, high travel speeds along Alameda Avenue and the long crossing distances for pedestrians crossing both Alameda Avenue and Union Boulevard.

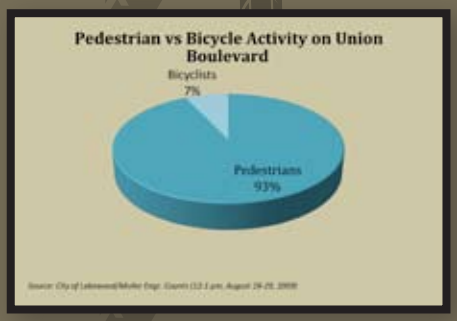
Pedestrian travel within the Union Boulevard corridor was also found to consist primarily of pedestrians crossing Union Boulevard as opposed to pedestrians walking along the corridor. This is likely due to the long block spacing on Union Boulevard, which creates long distances between buildings and acts as a disincentive to pedestrian travel. Also a certain amount of north-south pedestrian travel occurs within the parking lots that lie between Union Boulevard and the office buildings, particularly along the west side of Union Boulevard. Pedestrian travel within the parking lots was not recorded and, as such, is not reflected in Figure 3.

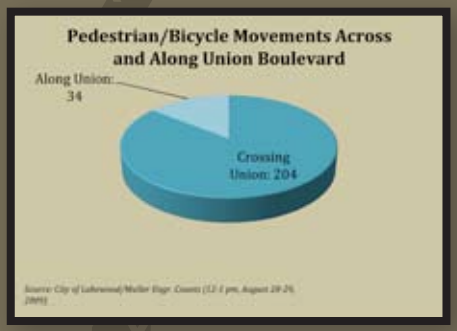
Bicycle trips on Union Boulevard are relatively small when compared to pedestrian travel. Based on data collected during the noon hour, approximately seven percent of non-motorized trips are made by cyclists. Although not measured, the percentage of bicycle trips is likely higher during the morning and evening commuting times because bicycle trips tend to be more commuter-oriented than pedestrian trips. Input received from the bicycling community also indicated there is a latent demand for bicycle travel along Union Boulevard. Many cyclists currently avoid Union Boulevard due to the lack of adequate bicycle facilities and the heavy volume of on-street vehicular traffic.

Pedestrian Safety

In addition to an analysis of pedestrian crossing and travel movements in the study area, pedestrian crash data was also reviewed to determine if there were any identifiable patterns or trends in the







crash data. Crash data from 2004-2008 was obtained from the City of Lakewood Traffic Engineering Division. Over this five-year period there have been a total of ten pedestrian-vehicle crashes, or an average of two per year. The crash data does not indicate there is a serious pedestrian safety problem, nor does it indicate any identifiable patterns or trends at specific intersections. To assist the project team in evaluating the relative safety of each intersection along the corridor, a Pedestrian Intersection Safety Indexing (PISI) of the Union Boulevard and Alameda Avenue corridors was completed.

The PISI methodology was developed by the Federal Highway Administration's (FHWA) Turner-Fairbanks Highway Research Center (TFHRC). Using historical data from pedestrian facilities across the country, the PISI is used to evaluate several indices that correlate intersection characteristics to pedestrian safety. The indices are used to prioritize the need for pedestrian safety improvements in a project study area. Characteristics that are considered include:

- Is the intersection signalized or stop sign controlled?
- Number of through travel lanes
- Speed limit
- Average daily traffic (ADT)
- Adjacent land use characteristics (commercial, residential, etc.).

Table 2: Pedestrian Intersection Safety Indices

Location	Signal	Stop Sign	Thru Lanes	Speed	ADT (x1000)	Land Use	Ped ISI	Dist. to Station(mi)	Mod. PISI
Union: 2nd to 4th	No	No	6	40	45	Comm	5.3	0.19	28.1
2nd/Union	Yes	No	6	40	45	Comm	3.7	0.24	15.6
Union: Cedar to 1st	No	No	6	40	44	Comm	5.3	0.51	10.5
1st/Union	Yes	No	6	40	44	Comm	3.7	0.36	10.4
4th/Union	Yes	No	6	40	58	Comm	3.8	0.41	9.3
Van Gordon - Midblock	No	No	2	30	15	Other	3.6	0.58	6.2
Alameda: Union to Oak	No	No	4	45	27	Other	4.5	0.75	6.0
Union/Cedar	Yes	No	5	35	38	Comm	3.3	0.7	4.7
Alameda/Robb	Yes	No	4	45	27	Other	2.8	0.61	4.6
Union/Alameda	Yes	No	6	35	38	Comm	3.6	0.85	4.2
Alameda: Oak to Kipling	No	No	4	45	30	Other	4.5	1.33	3.4
Kipling Midblock	No	No	4	45	46	Other	4.5	1.43	3.2
Van Gordon - Signal	Yes	No	2	30	15	Other	1.8	0.58	3.1
Alameda/Oak	Yes	No	4	45	28	Other	2.8	1.09	2.6
Alameda/Kipling	Yes	No	4	45	45	Other	2.9	1.59	1.8
Kipling/Fed Ctr Gate 1	Yes	No	4	45	46	Other	2.9	1.64	1.8
Kipling Fed Ctr Gate 2	Yes	No	4	45	46	Other	2.9	1.81	1.6

The above characteristics are entered into a spreadsheet and a PISI value is calculated. Higher PISI scores indicate the intersection is less safe relative to the other locations. Table 2 shows PISI ranking of each crossing location along Union Boulevard and Alameda Avenue.

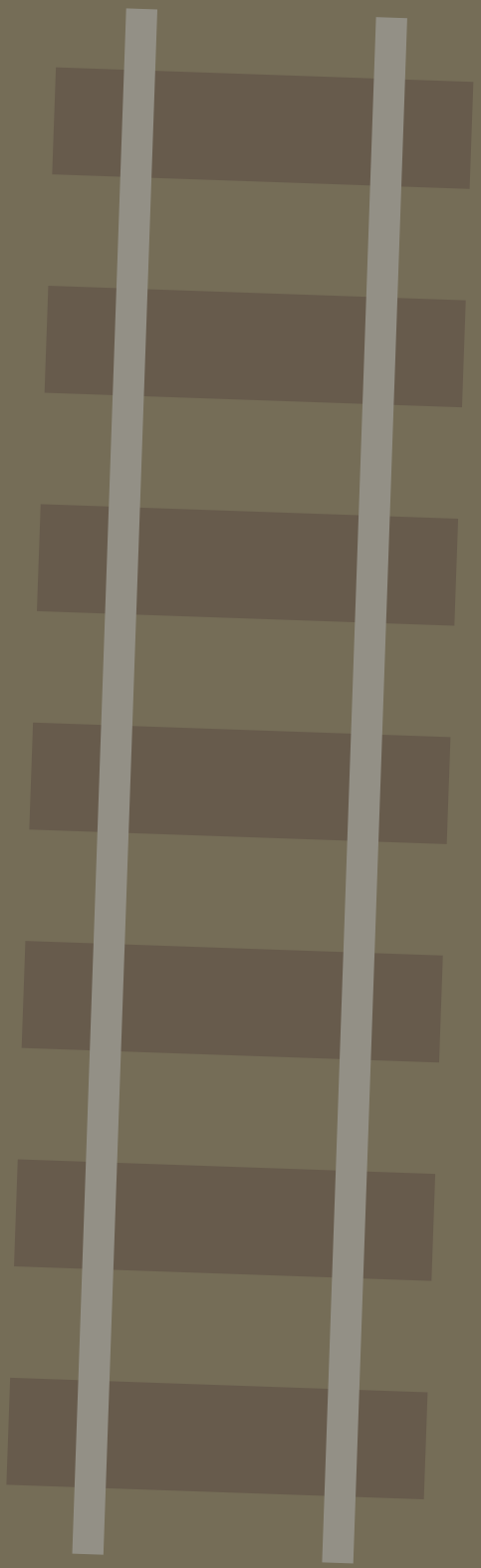
The PISI score shown was modified to take into account the crossing location's proximity to the future Federal Center station (e.g. the closer the crossing is to the station, the higher the priority for improvements). This modified PISI score is shown in the far right column. Based on this analysis, five locations were identified as having significantly higher modified PISI scores from the others in the study area:

- Union Boulevard between 2nd Place and 4th Avenue
- Union Boulevard at 2nd Place
- Union Boulevard between Cedar Drive and 1st Avenue
- Union Boulevard at 1st Avenue
- Union Boulevard at 4th Avenue

These locations were then evaluated in more detail to identify potential crossing treatments to improve pedestrian safety and mobility.

Bike Connections

Bicycling can be an attractive alternative if safe and efficient facilities are provided for bicycle travelers both along their route of travel and at their origin and destination. Developing safe and efficient facilities for cyclists requires a comprehensive knowledge of their capabilities and limitations. Bicyclists can attain travel speeds near those of automobiles but they are also as vulnerable as pedestrians to being seriously injured in collisions with automobiles. This mix of performance characteristics means that higher speed bicycle users should be separated from pedestrians and that bicycle facilities need to provide an environment that reduces the likelihood of auto/bicycle collisions. It is also critical that bicycle facilities be "interconnected," meaning that there be few, if any, gaps in the bicycle system and that facility type continuity is generally maintained. At locations where the facility type changes, for example transitioning from on-street bike lanes to an off-street bike path, the transitions must be carefully considered so as to not introduce unwanted safety issues or behaviors.



Existing Conditions

Bicycle facilities currently provided in the study area consist primarily of on-street bike lanes and two- way bike paths adjacent to major arterials.

On-Street Bike Lanes

- Van Gordon Street and W. Alameda Drive
- W. 2nd Place west of Union Boulevard
- Union Street south of Alameda Avenue
- Routt Street between Alameda Avenue and W. 2nd Place

Bike Paths

- Alameda Avenue - north side
- Union Boulevard – west side between Alameda Avenue and 6th Avenue, east side between Sere Lane and W 4th Avenue
- S. Kipling Street – east side

There are currently several factors that diminish bicycle connectivity in the study area including major roadway barriers, lack of continuous facilities, and changes in facility type. These existing facilities are illustrated in Figure 4.

Bicyclists traveling along major roadways such as Alameda Avenue need a separated facility of some type. This could be a bike path, a bike lane, or a wide shoulder that the cyclist can use to travel safely through the area. Quite often the resulting separate facility provided is an adjacent bike path or wide sidewalk. While these facilities do provide separation from auto traffic they can be unsafe facilities for cyclists if designed improperly. This is especially true in areas with many driveways or intersection conflict points. Bike paths adjacent to roadways in this situation tend to have higher auto/bicycle accident rates and can give inexperienced cyclists a false sense of safety. The two-way nature of these facilities increases potential conflicts because turning autos must look for bicycle traffic in both directions to avoid a collision. This is especially true

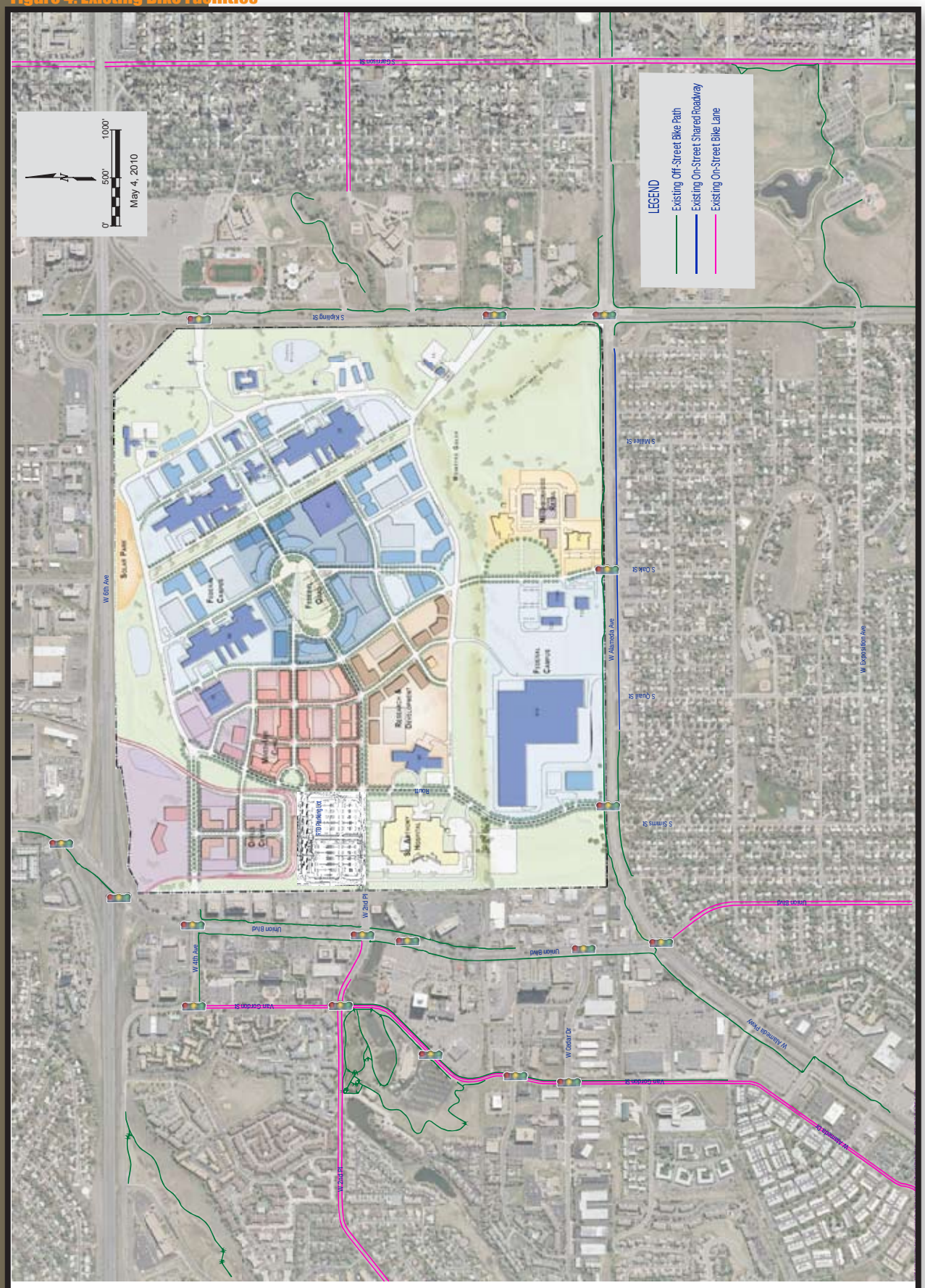
for left turning autos and cyclists traveling the same direction as the auto but on the left side of the road. Turning left across traffic lanes is a complex maneuver that involves making judgments about acceptable gaps in the opposing traffic stream and also watching the driveway or intersection throat you will cross to determine if there are any conflicts. When you add in higher speed bicycle traffic coming from behind and to the left of the left turning auto the situation becomes even more complex and prone to mistakes and accidents.

Bicyclists wanting to safely cross major roadways such as Union Boulevard generally require either a traffic signal or grade separated crossing (over or underpass) to cross safely. This is due to the width of the major roadways, the travel speed of autos, and the volume of autos on the roadway. The type of crossing chosen is usually based on factors like cost, constructability and facility type continuity (bike paths will have more grade separated crossings and on-street bike lanes generally have signalized crossings). Access controlled highways such as 6th Avenue require a grade separated crossing for cyclists. This is often accomplished in conjunction with a grade separated auto crossing at an interchange. These crossings can be extremely challenging due to the high volume of turning vehicles at the interchange and the usual interchange intersection design that attempts to maximize auto traffic flow to reduce congestion. The study area has several major arterials including Union Boulevard, Alameda Avenue, and S. Kipling Street along with 6th Avenue which is an access controlled highway.

Bicycle system continuity in the study area is interrupted by two major elements: the Federal Center itself which is a fenced and gated area effectively blocking east-west connections between 6th Avenue and Alameda Avenue; and 6th Avenue which is an access controlled highway that requires grade separated crossings for bicycles and autos. As the Federal Center redevelops, east-west connectivity is expected to improve.

Bicycle facility type continuity is an issue in the study area especially along Union Boulevard. On-street bicycle lanes are provided along Union Street south of

Figure 4: Existing Bike Facilities



Existing Bike Facilities

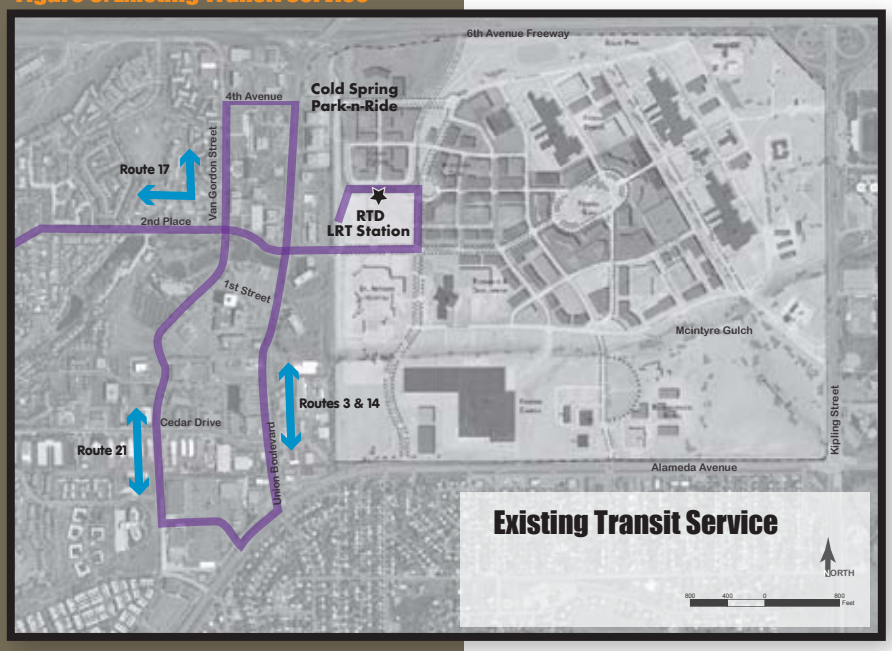
Alameda Avenue but off-street two-way bike paths/sidewalks are provided between Alameda Avenue and 6th Avenue with only the west side bike path/sidewalk being continuous in that area. Transitioning from on-street bike lanes to an off-street bike path is very difficult and often results in potentially unsafe behavior such as crossing Union Boulevard at an unsignalized location, riding in the traffic lanes (which can be accomplished safely only by very experienced cyclists), or riding on facilities not designed for cyclists like the sidewalk between Alameda Avenue and W. Cedar Drive on the east side of Union Boulevard. Another concern is the elimination of bike lanes at intersections. This occurs on W. 2nd Place heading eastbound at Union Boulevard and Union Boulevard heading north at Alameda Avenue among others. This situation can come as a surprise to a cyclist that hasn't traveled these roadways. The result is a forced mixing of autos and cyclists in an area where conflicts and accident rates tend to be higher. This situation often arises due to a lack of roadway width to accommodate all the necessary auto lanes and the bike lane and can be expensive to remedy due to right of way costs and drainage infrastructure.

Today's Transit Activity

Today, the Regional Transportation District (RTD) operates 14 bus routes out of the Cold Spring park-n-Ride located at the corner of 4th Avenue and Union Boulevard. Routes 3, 9, 14, 16, 17, 21, 100, 2X, 5X, 6X, CV, EV, GS, AF all carry passengers from this location. Local routes 3, 14, 17 and 21 serve the local study area with service on Union Boulevard or Van Gordon Street and the cross streets of 4th Avenue and 2nd Place.

The most important routes to the study area include Routes 3, 14, 17 and 21 which provide service to local land uses, and are highlighted in Figure 5. These routes currently serve the major arterials in the study area including Union Boulevard, Van Gordon Street and Alameda Avenue. Ridership counts for local service in this area are somewhat low, with the highest ridership occurring at Cold Spring park-n-Ride and at 2nd Place at the Warren Tech building and Red Rocks Community College. Counts at stops along Union Boulevard indicate a steady but relatively low level of activity per day. Because these routes are anticipated to remain

Figure 5: Existing Transit Service



in place after the opening of LRT, it is important to consider their coverage area and performance when examining potential circulator service for the same area.

- Route 3 runs from Cold Spring park-n-Ride, along Union Boulevard with stops at 4th Avenue, 2nd Place, Ellsworth Street and Cedar Drive, and on to Alameda Avenue. This route travels Alameda Avenue to Kipling Street and Wadsworth Boulevard before continuing east toward Aurora. Service operates on 15-minute headways during the peak hours and 30-minute headways off-peak. Ridership on Union Boulevard is relatively low with the highest activity shown at Union Boulevard and 2nd Place with about 12 boardings per day.

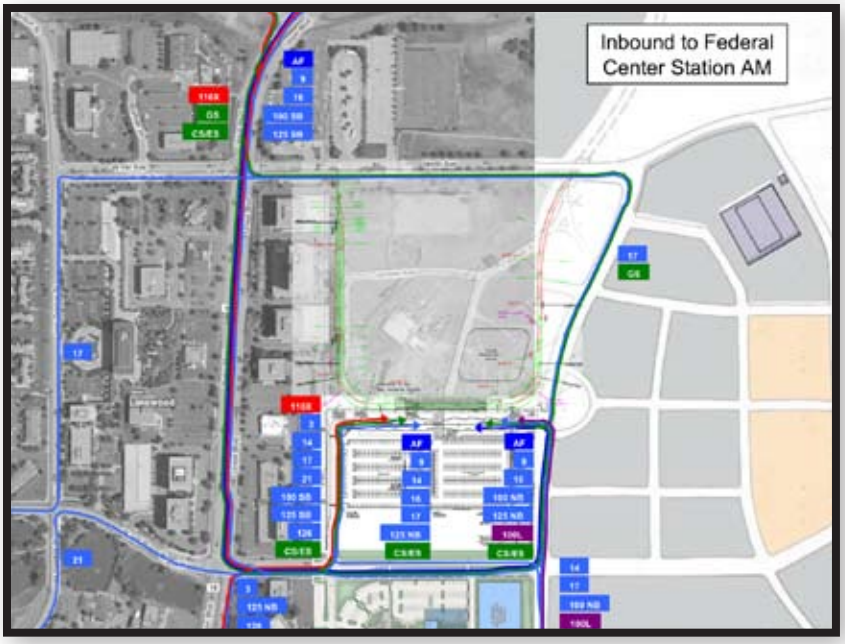
- Route 14 operates out of Cold Spring park-n-Ride with service to stops in the Federal Center and along Union Boulevard primarily during the peak commuter hours. The highest concentration of ridership activity occurs at Cold Spring park-n-Ride with about 22 boardings and 12 alightings east-bound and 19 boardings and 27 alightings westbound. The numbers taper off significantly at stops along Union Boulevard. The highest ridership activity is shown at Union Boulevard and Cedar Drive with 16 boardings and two alightings eastbound and one boarding and two alightings westbound, per day.

- Route 17 provides service from Cold Spring park-n-Ride, west across 4th Avenue, along Van Gordon Street to 2nd Place and from 2nd Place to Campus Loop Road at Red Rocks Community College on primarily 30-minute headways. This route connects residential uses along 2nd Place and the Red Rocks campus, and will be a direct connection between these uses and the Federal Center station. Ridership along Van Gordon Street is relatively low with on and off counts between two and eight per day. However, ridership tends to pick up on 2nd Place as service nears the Red Rocks campus and Warren Tech. Counts at Warren Tech indicate ten boardings and 33 alightings northbound and 34 boardings and 14 alightings southbound.

Bus operations from Cold Spring park-n-Ride will be transferred to the Federal Center station lot in spring of 2011, before the opening of light rail in 2013. Bus service will run out of the Federal Center station and it is anticipated that the 12 existing routes will remain in service and bus schedules will pulse with the arrival of LRT on 15 or 30 minute headways.

The surface parking lot at the Federal Center station will accommodate 1,000 parking spaces. The majority of buses will enter the lot from the bus-way access on 2nd Place and proceed to the bus bays adjacent to the platform. Other buses will enter off Routt Street directly to the bus bays.

The following diagrams illustrate the anticipated inbound bus routing and outbound bus routing. The majority of RTD routes will travel Union Boulevard to 2nd Place to access the station contributing to the increasing number of southbound left-hand turning movements at the 2nd Place intersection. While increasing the number of routes on 4th Avenue would reduce demand at 2nd Place, the two at-grade light rail crossings on 4th Avenue make that option difficult for RTD service providers.



Tomorrow's Connectivity Solutions

Tomorrow's connectivity solutions for the Union Boulevard Corridor are not just ideas about connecting people and places but are specifically identified implementation projects that will establish these connections in the immediate future and over the long-term. This section identifies the recommendations for improving the Union Boulevard Corridor environment and pedestrian and bicycle connections, along with the specific projects required to implement these recommendations for improved connectivity.

Recommendation 1:

Establish a Sense of Place and Identifiable Character for the Union Boulevard Corridor

The Union Boulevard Corridor currently lacks a sense of place, character and identity that would set it apart from any other suburban office corridor. The super-blocks established and precipitated when this area was initially built (1980s) causes a significant negative impact to both the sense of place, as well as mobility choices. This Connectivity Plan is a first step, providing a framework from which a great economically vital, multi-modal corridor can ensue.

Implementation of sound urban design along the Corridor is essential to creating a sense of place and identity for the corridor. Urban design treatments should create a sense of comfort for users, recognize safety, and provide an overall positive experience:

- Comfort for users: protection from the elements, benches, trees, a feeling of enclosure and "place" created from building set close to the street.
- Safety: minimal conflicts among travel modes, identifiable facility or "place" for users, appropriate lighting, clear signage and wayfinding, provision of shelter or protection from the wind, rain, cold, heat and noise.
- Experience: interactive, visually appealing, quality relationship between streetscape and development, pleasant.

Complete a Streetscape Design Process

Streetscape design should create a neutral, yet defined, pattern to the street which complements the surrounding land uses and is appropriate in scale and proportion to the street. Streetscape design should bring coherence and unity to the street and help to create a sense of place for users.

Union Boulevard is the major access through the area and the interaction of this roadway with it's streetscape and bicycle/pedestrian facilities becomes the "face" of the street. Creating a defined edge, coupled with pedestrian amenities, is important to identifying this public realm and its role in linking public movement with adjacent private development or land uses.

The landscape along Union Boulevard is primarily 25-35 years old. Much of the vegetation is nearing the end of its useful life. Given this, and given the desire to improve mobility, a sense of place and the economic vitality of the corridor, a streetscape design process should be completed by the City, in conjunction with corridor businesses. This group should identify the common elements of a preferred streetscape design and begin to implement these elements as redevelopment occurs. The streetscape design along Union Boulevard should encourage a higher volume of pedestrian activity and interaction with building frontages. The following principles should be discussed during the streetscape process:

1. Establish a consistent streetscape surface for use in all sidewalks along Union Boulevard;
2. Identify street furniture that fits within the context of the street and adjacent land uses and minimizes visual clutter;
3. Establish "gateways" to the area, either vertically or through paving patterns;
4. Establish a consistent street edge with consistent street trees or plantings (while recognizing that there are some "pinch point" areas where a modified section will be warranted);
5. Establish clear signage and wayfinding located in a way to encourage ease of movement;

6. Identify pedestrian-scale lighting and other amenities such as trash receptacles and shelters.

7. Develop an inclusive design that uses materials and amenities that work for all, and do not hinder or impede pedestrians or cyclists from using the street or sidewalk area.

8. Good streetscape design and implementation requires a multi-disciplinary approach including urban designers, traffic engineering, safety and maintenance.

Other Considerations

Future buildings along the Union Boulevard Corridor must be built to the street, following the TMU zoning. Minimum setbacks will help provide enclosure, security, and sense of place and can be measured from the property line as opposed to the curb. The TMU zoning language, particularly for front yard setbacks, should be reviewed and amended as necessary to assure maximum setbacks for buildings along Union Boulevard, while maintaining existing easements and being cognizant of potential easements that may support the future streetscape and multi-modal treatment of the street.

Further, any new buildings that are built on Union Boulevard should have an operable front door and address on Union Boulevard. The ground floors of these buildings, no matter what the use, should have a significant amount of glazing facing a public or private street. These windows should be transparent, with no black out glass permitted.

Parking adjacent to Union Boulevard should be minimized. If such parking exists, and if any existing parking undergoes 'upgrades,' additional screening and landscaping should be implemented through an updated site design review.

Recommendation 2:

Improve Pedestrian Access to the Federal Center Station Platform

The Federal Center station will be located just east of Union Boulevard on 2nd Place. Under its current configuration, pedestrians will access the station primarily from 2nd Place at one of two walkways indicated by yellow arrows in Figure 6: the walkway just east of the busway/access aisle; and the walkway through the center aisle of the parking lot. Pedestrians will be forced to walk across the bus/auto access driveway and through the parking lot, to reach the station platform.

Figure 6: Proposed Pedestrian Connections at Federal Center Station

Establish a Pedestrian Walkway from 2nd Place to the Federal Center Station Platform

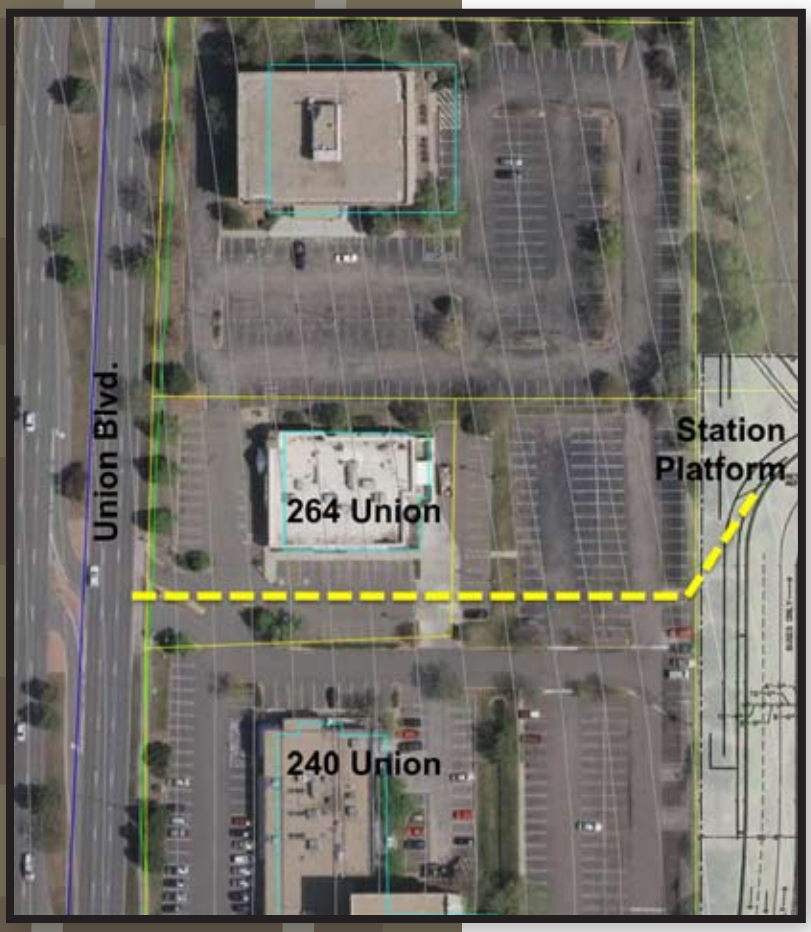
The City of Lakewood should continue negotiations with the adjacent property owner of the parcel to the west (Crown West Realty) to secure a north-south easement from 2nd Place to the platform as needed to intersect with RTD property, indicated by the red dashed line in Figure 6. The walkway should be five feet wide at a minimum or preferably up to eight feet wide. The City should also continue negotiations with RTD to ensure construction of this proposed walkway, or at a minimum, the ability to construct this walkway in the future. This improved pedestrian access off 2nd Place will be a direct, visible, and convenient method of accessing the station and, more importantly, avoid pedestrian interaction with traffic at the bus and auto access way.

Improve Sidewalks Along 2nd Place

Because the station is located off of Union Boulevard, pedestrian connections along 2nd Place and to the platform will be critical, as shown by the yellow arrows in Figure 6. RTD will be constructing eight foot sidewalks along 2nd Place in the section directly in front of the station, as well as through the station parking lot. The City should enhance the existing five foot sidewalk between the intersection of Union Boulevard and 2nd Place and the station. This section should be eight feet in width on both the north and south sides of 2nd Place.

Recommendation 3:

Establish a Pedestrian Walkway to the Federal Center Station Platform from Union Boulevard



Establishing an alternative access point to the station platform from Union Boulevard will allow pedestrians and cyclists to avoid the significant traffic congestion anticipated at 2nd Place and Union Boulevard. Additionally, an identified access point located in the vicinity of 264 Union Boulevard will act as a more direct connection for users from surrounding businesses, making walking directly to the station platform a more viable option.

This east-west connection to the station should be a minimum of five feet in width. However a 10 to 12 foot wide sidewalk with eight foot landscaping/amenity zones on both sides would be preferable and would create an appealing pedestrian environment.

Recommendation 4:

Establish Additional Pedestrian Walkways through Private Development on Union Boulevard

The majority of employment in the Union Boulevard Corridor lies in the superblocks between Union Boulevard and Van Gordon Street, and 4th Avenue and Cedar Drive. The office buildings throughout this area are surrounded by parking lots and are isolated from adjacent uses. Today, designated pedestrian connections through these lots are limited, or are non-existent. In very few locations are pedestrians able to penetrate across the entire block without major obstacles. It is easier to exit the lot with your car and drive to a luncheon destination than to walk across a parking lot and along Union Boulevard to a destination.

The City's TMU zoning calls for a change in the development pattern over time. However, in 2013 with the opening of light rail, current development uses or layout are expected to look essentially the same.

Continued on page 39

264 Union Boulevard Redevelopment Scenario

The 264 Union Boulevard redevelopment scenario follows closely the recommendations established in the Urban Design Section of this report. Currently, 264 Union Boulevard has a smaller pad site to the north and a larger office and retail building on the remainder of the site, surrounded by parking.

The redevelopment scenario illustrates a concept for the integration of redevelopment efforts with a strong pedestrian connection east-west through the site and improved mobility to and from the Federal Center station. Cutting through the site creates the short-cut opportunity and line of desired travel that minimizes distance for pedestrians. The pedestrian walkway should be a minimum of five feet in width, and preferably 10 feet to 12 feet wide with eight foot landscape zones on either side.

There are two options for providing this pedestrian walkway.

a) North of the existing pad building/site – Figure 7
b) South of the existing pad building/site – Figure 8

- North of the existing pad building/site may be easier to implement given specific parcel lines – this option could straddle three properties at a more natural breaking point, therefore 'sharing' more equitably the impact of such a walkway. This natural breaking point would allow for more room for a walkway and for planting zones with canopy trees to provide shade and shelter on either side. Additionally, there would only be one internal vehicular crossing point for pedestrians.
- A pedestrian walkway south of the existing pad building/site would potentially serve both the 246 Union Boulevard and 240 Union Boulevard building sites better.

Either way, the scenario provides several necessary components to increasing connectivity to the Federal Center station. The scenario:

1. Provides a much needed east-west connection between Union Boulevard and the Federal Center station.
2. Creates a clear pedestrian connection internally through the site.
3. Enhances the streetscape and encourages ground floor activity of adjacent sites.
4. Provides the vertical connection needed from the walkway to the station platform via both stairs and a handicap accessible ramp.

Figure 7: Proposed Pedestrian Walkway at 264 Union Boulevard Site – North of Pad Building

Figure 8: Prposed Pedestrian Walkway at 264 Union Boulevard Site – South of Buioding Pad

Continued from page 37

It will be important for the City to work with property owners to create alternative pedestrian connections and reduce the walking distance required to access the Federal Center station.

The construction of five to eight-foot walkways through these private developments would greatly enhance pedestrian mobility, and could be accomplished as shown in Figure 9 by:

- Building pedestrian facilities across existing landscaped berms that currently act as barriers;
- Relocating parking to allow a continuous pedestrian connection through the lot;
- Defining a central pedestrian backbone through the development that would bisect the super-block and tighten the walking distance for pedestrians.

The City should negotiate with existing land owners for easements across properties to allow for better pedestrian movement through super-blocks. Recommended connections should occur:

1. East-west through the super-block bound by Union Boulevard to the west, GSA lands to the east (future Federal Center station), 4th Avenue to the north and 2nd Place to the south;

2. East-west through the super-block bound by Union Boulevard to the west, St. Anthony Hospital to the east, 2nd Place to the north, and Sere Lane to the south;

3. East-west through the super-block bound by Van Gordon Street to the west, Union Boulevard to the east, 4th Avenue to the north, 2nd Place to the south;

4. East-west through the super-block bound by Van Gordon Street to the west, Union Boulevard to the east, 2nd Place to the north, W. Cedar Drive to the south.

These connections would break up the current parking lot dominance of the super-blocks and provide a safe, convenient and visible link for pedestrians from the office door to the platform.

Figure 9: Obstacles to Pedestrian Access

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Super-Block Redevelopment Scenario

The Redevelopment Scenario block is bounded by St. Anthony to the east, Union Boulevard to the west, 2nd Place to the north and Sere Lane to the south. This block currently has a smaller pad site to the north and two office buildings on the remainder of the site, surrounded by a sea of parking. The site also contains a pond at the northwest corner which is assumed to remain, as well as a drainage corridor that runs generally along the east edge of the site.

The redevelopment scenario shown assumes full redevelopment of the block. The program includes three office buildings that face Union Boulevard, as well as one that faces 2nd Place, one building that faces a continued 1st Avenue (ideally a public street) that continues from the west side of Union Boulevard and continues east connecting to the St. Anthony Hospital site. A final building is used as a wrap, facing both Union Boulevard and 1st Avenue

Parking is accommodated via two parking structures, in order to meet the needs of a more intense development program warranted near an Federal Center station. Additional short term parking is provided via an internal street system.

The redevelopment scenario provides several necessary components to increasing the connectivity and livability of the Study Area:

1. Extends 1st Avenue for vehicles, pedestrians and bicycles
2. Provides a partial extension of Sere Lane for vehicle traffic in and out of the site, while providing pedestrian and bicycle movement east to west. Sere Lane would be a potential location for a pedestrian signalized crossing of Union Boulevard and connection to the multiuse trail that traverses through the Federal Center Site to Kipling Street, connecting with a larger trail system in the City.
3. Provides for an internal street system and short term parking for patrons as no on-street parking exists on either Union Boulevard or 2nd Place.
4. Provides pedestrian connections at all four edges of the site, as well as clear connections internally both north-south and east-west through the site.
5. Provides for ground floor activity along Union Boulevard, 1st Avenue and 2nd Place and helps create Union Boulevard as a 'living street.'
6. Establishes several options for pedestrians to get through or around the site and to the Federal Center station, key for access near light rail.
7. Provides a consistent streetscape and edge to Union Boulevard and 2nd Place, with an amenity zone between the sidewalk and street that contains street trees, pedestrian lights, signage and wayfinding, trash receptacles, and other streetscape amenities that support living streets.

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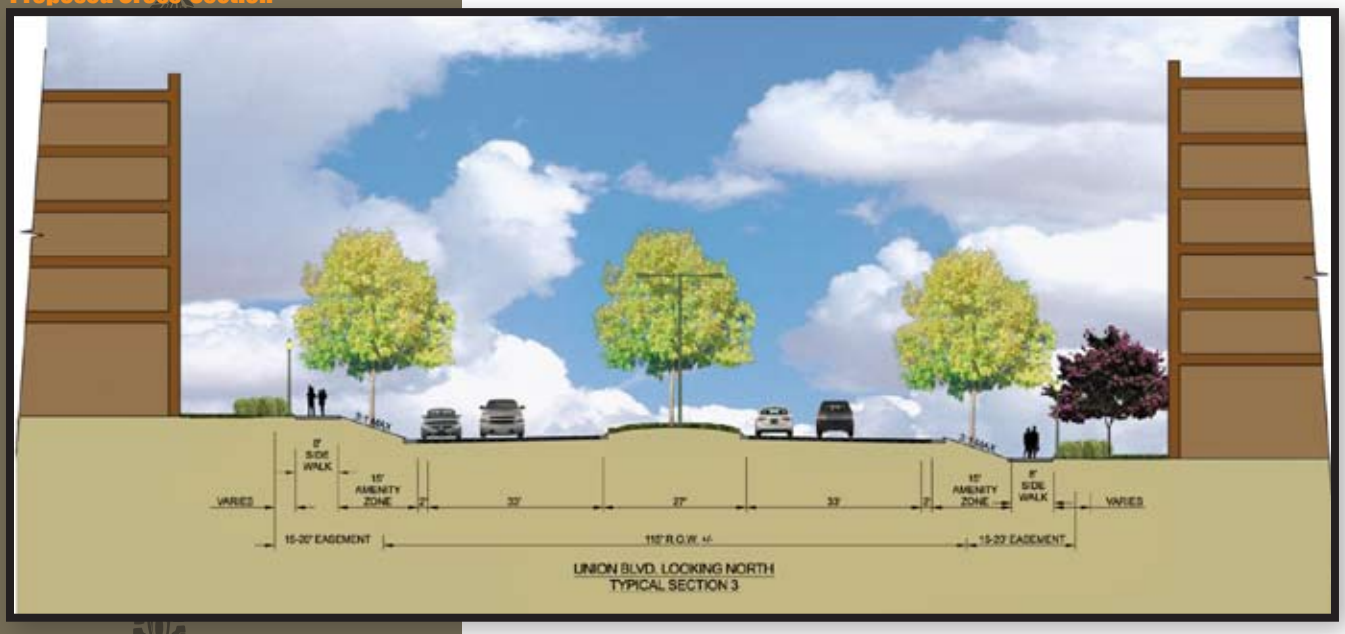
Recommendation 5:

Redesign Pedestrian Facilities along the Union Boulevard Corridor with Consistent Design Treatments, Dimensions and Location

Designated pedestrian facilities, consistent in location, design and visibility, are important to transforming Union Boulevard Corridor from an auto-oriented arterial to a multi-modal street with an evident pedestrian environment. Union Boulevard is a major north-south auto connection within the western portion of the City and, as such, must continue to move vehicular traffic. In fact, Union Boulevard may someday be widened to three northbound lanes rather than maintaining the current lane configuration. However, modifying the streetscape and pedestrian facilities to a consistent pattern and tying these facilities to abutting development that will be created under the TMU zoning can change the activity level and integration of pedestrians substantially. Future pedestrian interaction is anticipated to be significantly different than that existing today with set-back buildings and adjacent expansive parking lots.

The proposed cross-section illustrated in Figure 10 shows improved pedestrian facilities adjacent to Union Boulevard, consistent design treatments and the interface with the building frontage. This cross-section highlights an eight-foot walkway with a 17-foot amenity zone between pedestrians and vehicle travel lanes. The cross-section retains the 27-foot landscaped median. Landscaping located between the pedestrian facilities and building frontages should invite access and interaction with first floor building uses. These cross-section improvements could be constructed in two phases: north of 2nd Place and south of 2nd Place, along Union Boulevard.

Figure 10: Union Boulevard Proposed Cross-Section



Recommendation 6:

Improve Pedestrian Crossings of Union Boulevard

As previously mentioned, the pedestrian activity along Union Boulevard is mostly dispersed from Alameda Avenue to 4th Avenue Frequent pedestrian crossings occur at midblock locations between Cedar Drive and 1st Avenue and between 2nd Place and 4th Avenue. Also, the number of pedestrian crossings in these midblock areas is expected to increase as the opening of RTD's Federal Center station and St. Anthony Hospital generates greater pedestrian traffic to and from destinations west of Union Boulevard.

Recognizing this, the project team evaluated several options to improve the safety and mobility for pedestrians crossing Union Boulevard. These options focused on the two midblock segments of Union Boulevard that currently do not have controlled crossings. Two preferred locations were identified based on proximity to the Federal Center station and St. Anthony Hospital, the potential for changing land use, anticipated pedestrian activity and the ability to minimize impacts to Union Boulevard traffic flow. These locations are:

- 700 feet north of 2nd Place adjacent to the the 264 Union Boulevard site;
- 600 feet south of 1st Avenue at Sere Lane.

Options that were considered for these proposed crossing locations included:

- Additional signalized intersections that would serve pedestrian and vehicle traffic;
- Midblock pedestrian signal(s);
- Pedestrian activated signing with flashing beacons;
- Pedestrian underpass;
- Pedestrian overpass;
- Midblock pedestrian crossing(s) with signalized hybrid beacon.

The addition of new traffic signals (either midblock or at a new intersection) was evaluated in the context of maintaining the existing signal-coordinated traffic flow along Union Boulevard. Adding new traffic signals within a coordinated system of signals can be difficult and is highly dependent on the spacing of the existing traffic signals, the current signal timing plans, and the amount of "red-time" incurred on the major street by the new signal. An analysis of these conditions showed that any new signalized intersections (serving both pedes-

City of Tucson

trians and side street vehicle traffic) would be detrimental to the flow of traffic on Union Boulevard due to the amount of time the signal would need to remain red on Union Boulevard while serving pedestrians and side street vehicle traffic.

Pedestrian activated signing with flashing beacons was also evaluated as a means to provide a controlled crossing. These types of installations have been used successfully in other locations, including on Vance Street in the Belmar area of Lakewood. They would allow for pedestrian crossings as needed, but would not be as detrimental to the flow of traffic on Union Boulevard as a signalized intersection.

Figure 11 depicts a pedestrian overpass alternative for a crossing of Union Boulevard near the 264 Union Boulevard site, north of 2nd Place. This alternative would provide an unimpeded crossing for pedestrians but at a significant cost of between $2.5 and $3.0 million. Additionally, pedestrians may still opt to cross at-grade rather than climbing stairs or walking the extra distance along the ramps to the elevated crossing. A pedestrian overpass alternative may be more viable if it occurred along with large-scale building redevelopment in a manner where the overpass could be connected to a building on one or both sides of Union Boulevard. For these reasons, a pedestrian overpass north of 2nd Place is not recommended at this time.

Pedestrian underpass alternatives were also considered but they have a similar cost as an overpass, and they can be difficult to construct under traffic. Utility relocations can also significantly increase the cost as well as impact the feasibility of construction. Additionally, personal safety associated with using the underpass is typically a concern of users. The underpass alternative is not being recommended at this time.

Implement at-grade crossings of Union Boulevard

Figure 11: Pedestrian Overpass Option near the 264 Union Boulevard site

The at-grade pedestrian crossing creates the most direct link between uses on either side of Union Boulevard. It maintains pedestrian activity at the street level, generates visibility of pedestrians along the corridor and minimizes the impact of crossing structures on adjacent land uses. At-grade crossings utilizing a safety signal known as a hybrid beacon are recommended on Union Boulevard north of 2nd Place and Union Boulevard at Sere Lane.

A pedestrian hybrid beacon is a crossing device that has been used successfully for many years in Tucson, Arizona. Studies have shown that it commands a high compliance rate from motorists and offers a protected crossing to pedestrians in a manner similar to that of a traffic signal. Its primary advantage over a traditional traffic signal is that it has less of a negative impact on traffic flow because motorists can proceed once pedestrians are clear of the crosswalk. Also, the standard criteria (warrants) for justifying installation are more easily satisfied than a standard traffic signal, and its cost is approximately 50 percent of a signal.

Figure 12 – Pedestrian Hybrid Beacon Installation on Union Boulevard at Sere Lane

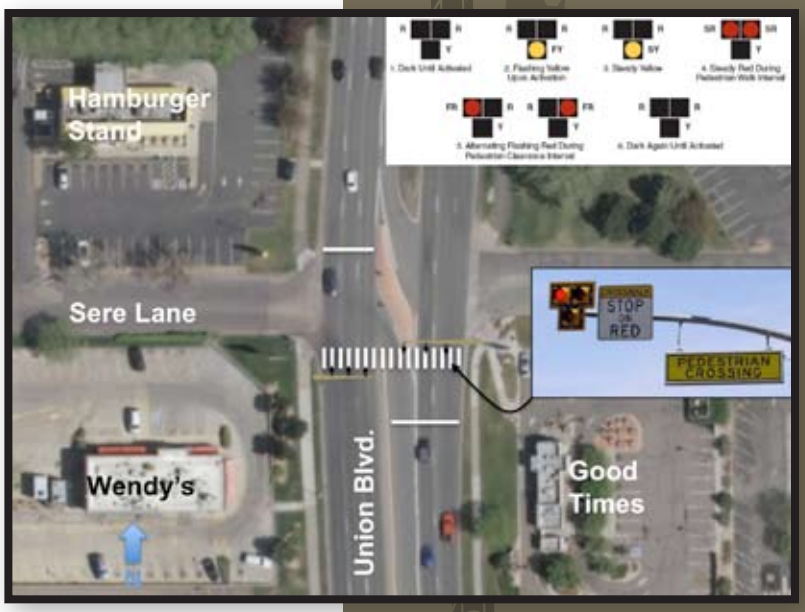
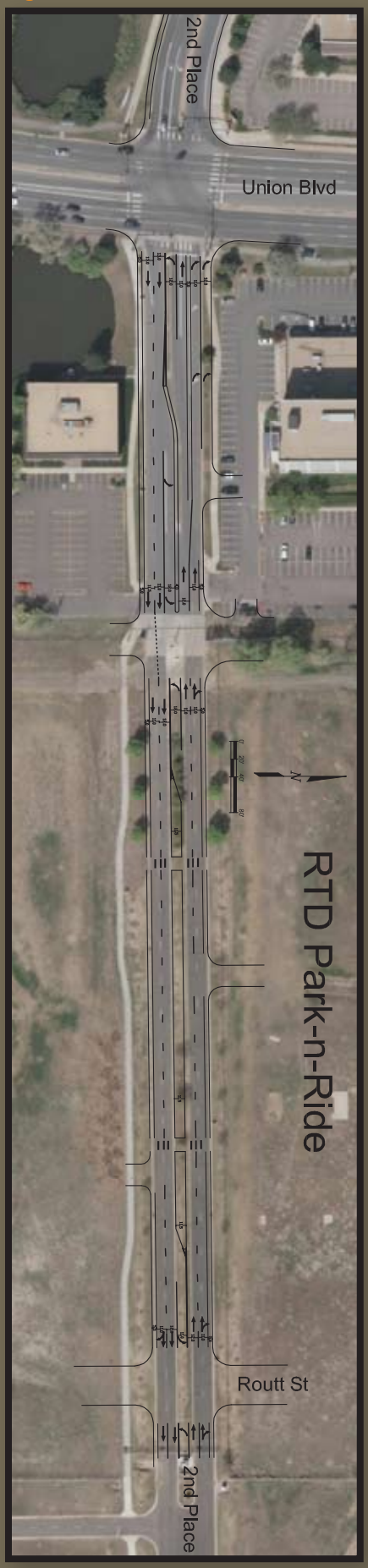


Figure 12 illustrates the concept for a hybrid pedestrian crossing at Sere Lane (approximately 600 feet south of 1st Avenue). The same installation is recommended for a crossing of Union Boulevard just north of the

Figure 13: 2nd Place Bike Lanes



264 Union Boulevard site, which would tie in directly to a future pedestrian connection to RTD's Federal Center station.

Recommendation 7:

Develop Consistent Bicycle Connection along 2nd Place to the Federal Center Station

Several recommendations and proposed infrastructure changes were developed to address the bicycle connectivity deficiencies described in the existing conditions section including major roadway barriers, system discontinuity, and facility type discontinuity. The recommendations and proposed infrastructure changes are detailed below. Figure 13 shows an overview of the proposed infrastructure connectivity improvements for cyclists.

2nd Place is a critical east west connector between the neighborhoods west of Union Boulevard and the new development in the Federal Center and the new Federal Center station east of Union Boulevard. There are currently on-street bike lanes on W. 2nd Place west of Union Boulevard except for a small eastbound gap just west of Union Boulevard. These bike lanes should be extended across the Union Boulevard and W. 2nd Place intersection and east to the future Oak Street. The addition of these on-street bike lanes will provide safe and efficient connectivity for cyclists to access the Federal Center station, connect the neighborhoods to the west with the redeveloped Federal Center, and tie the larger on-street bike lane system together. Implementing this recommendation requires modifications to 2nd Place.

The signalized intersection of Union Boulevard and 2nd Place is projected to be very busy in the future and will carry a significant number of buses and automobiles to and from the new Federal Center station and St. Anthony Hospital. Changes to the intersection such as implementing a double left turn for southbound traffic will utilize most of the currently available space just east of Union Boulevard on W. 2nd Place. Widening of W. 2nd Place to the south approximately five feet east and west of Union Boulevard will be necessary to accommodate on-street bike lanes on both the north and south sides of W. 2nd Place. Modifications will also be necessary in the section between the Federal Center station parking access and Routt Street. The median will need to be narrowed leaving approximately 11 feet from face of curb to face of curb to create the space needed to add a bike lane in each direction on W. 2nd Place in this section. As

W. 2nd Place is extended between Routt Street and Oak Street bike lanes should be included in the initial design and constructed so retrofitting is not necessary. Figure 13 shows one possible configuration of the on-street bike lanes on W. 2nd Place.

Recommendation 8:

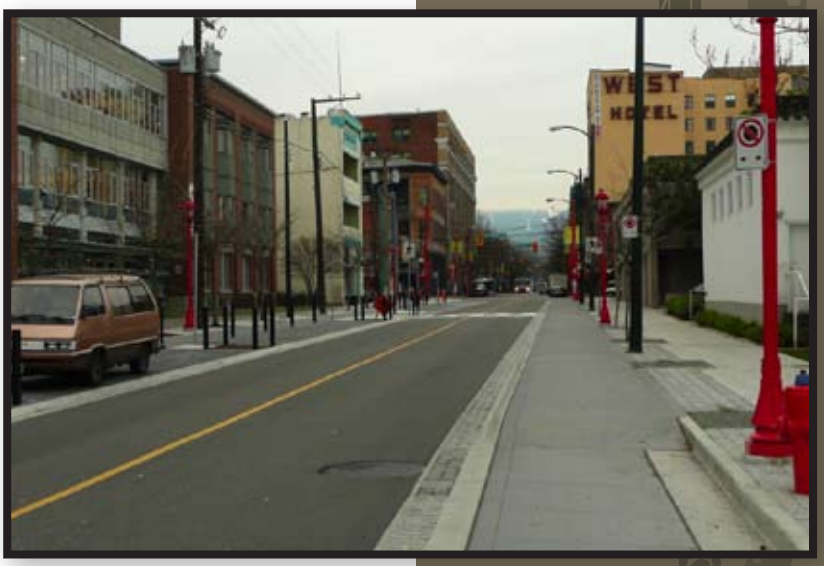
Develop Cycle Tracks along Union Boulevard to Increase North-South Connectivity through the Union Boulevard Corridor

North-south connectivity in the study area is currently lacking due to the 6th Avenue barrier and the Federal Center property. Over time more bicycle friendly north-south roadways will be constructed in the redeveloped Federal Center and an additional crossing of 6th Avenue via extended Routt Street may be implemented that will improve north-south connectivity in the study area. However, even after these improvements Union Boulevard will be a vitally important north-south travel route for cyclists due to land use patterns along Union Boulevard and bicycle system continuity considerations including the presence of on-street bike lanes on Union Boulevard south of Alameda Avenue. In the meantime Union Boulevard will continue to serve as the primary north-south connectivity option for cyclists traveling to, from, and through the study area. Several options were evaluated for improving bicycle connectivity along Union Boulevard including adding bike lanes and improving the existing two-way bike paths along Union Boulevard. Adding bike lanes was determined to be infeasible due to the difficulty and cost related to widening Union Boulevard by five feet on either side including the necessary relocation of drainage infrastructure and utilities. Improving the existing two-way bike path on the west side of Union Boulevard was determined to not be in the best option because of the poor safety record of two-way adjacent bike paths in locations such as Union Boulevard that have a fairly high number of driveways and turning vehicle traffic interrupting the bike path. As a result a third option of implementing cycle tracks along Union Boulevard was evaluated. It was determined that cycle tracks designed appropriately would provide the best cyclist connectivity while maintaining safety and efficiency.

The proposed cycle tracks along Union Boulevard differ from traditional bike paths in several ways including:

- **They are one-way facilities that are co-directional with traffic.** That means that each side of Union Boulevard will have a cycle track and the direction of travel of the cycle track on each side in the same direction or "with" adjacent auto traffic.

- **They are narrower than traditional bike paths** to reinforce the one-way nature of the facility.
- **They are for bicycles only.** No pedestrians are allowed on the cycle track itself. A separate sidewalk is provided for pedestrians. Design elements to encourage each mode to use its appropriate space will be implemented such as signing, markings, and pavement characteristics.
- **They are separated from adjacent vehicular traffic** by a normal six inch barrier curb and a two foot buffer but are otherwise directly adjacent to traffic lanes. This provides the safety and security that cyclists desire when traveling along a major arterial while at the same time assuring that the cyclists are visible to vehicular traffic to reduce turning movement conflicts. This minimal separation is possible because there is no on-street parking along Union Boulevard.



Source: http://photos-a.ll.facebook.com/photos-ll-snc1 from JARED

Figure 14: Carrall Street Cycle Track, Vancouver, BC

- **They have consistent and linear cross sectional elements** that keep the relationship between traffic lanes and cyclists the same throughout the entire Union Boulevard corridor between Alameda Avenue and 4th Avenue.

Due to space and right of way constraints it will not be possible to implement a consistent cross section for the sidewalk and amenity zone elements along the entire length of Union Boulevard. However, the cycle track portion of the cross section remains constant regardless of the positioning of the sidewalk and amenity zone. Figure 15 and 16 show the two preferred cross-sections for the cycle tracks and sidewalks along Union Boulevard.

A cycle track located in Vancouver, BC, shown in Figure 14 is a similar cross section from the face of curb to face of building as the proposed Lakewood cycle tracks.

Figure 15: Proposed Cycle Track Typical Section 1 along Union Boulevard

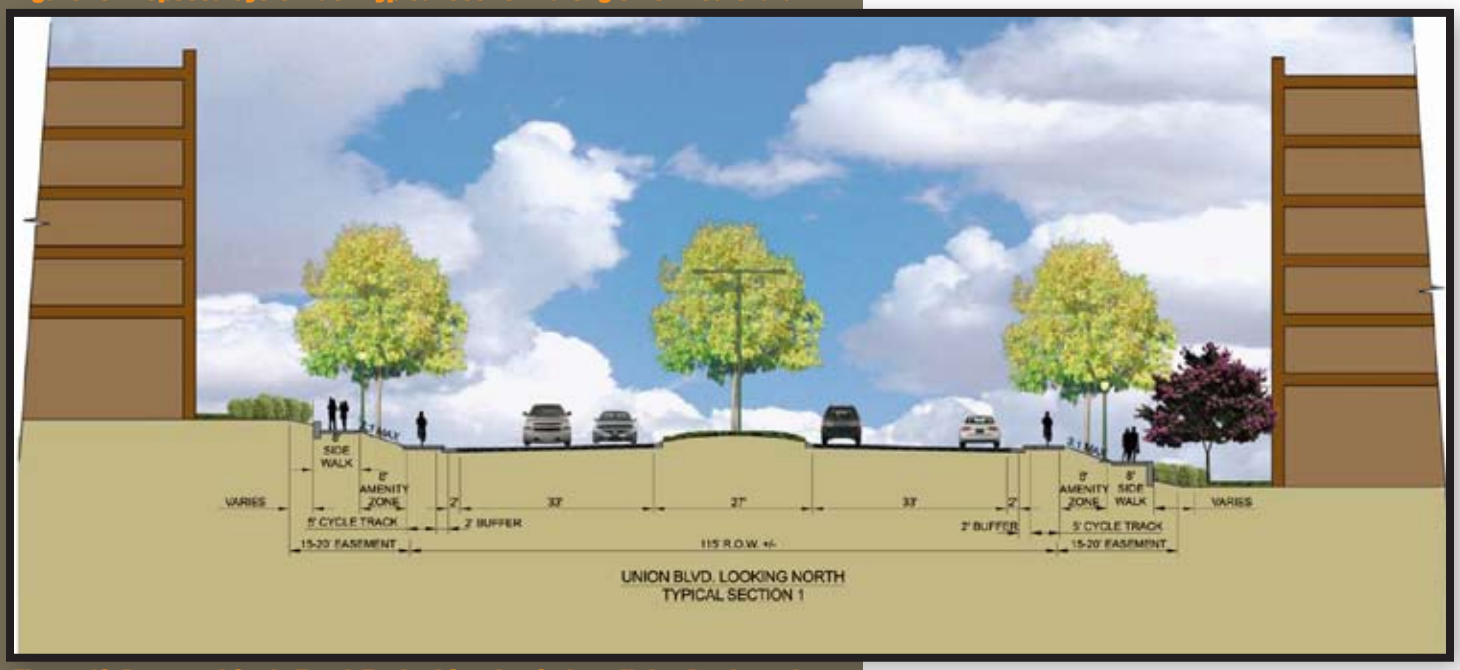
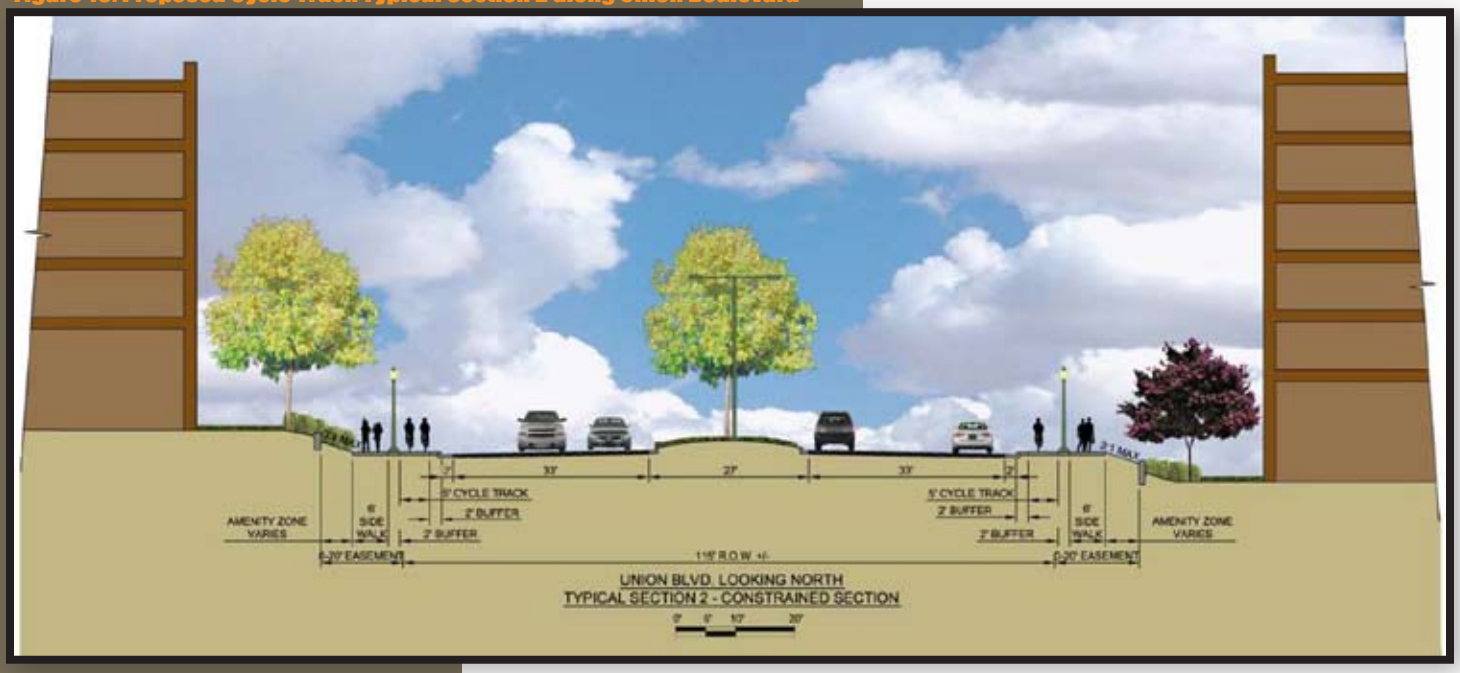


Figure 16: Proposed Cycle Track Typical Section 2 along Union Boulevard



It is also important to determine not just the preferred cross section but also how the cycle track elements fit together along Union Boulevard. Figures 17 a and 17 b show how the cycle tracks would be integrated into the existing right of way and cross section of Union Boulevard. Due to the directional nature of the cycle tracks, they integrate well with the bike lanes on Union Boulevard south of Alameda Avenue. Cyclists merely continue in the direction that they were traveling but transition to or from the cycle tracks. The area north of 4th Avenue will integrate well with future planned facilities once the current RTD park-n-Ride is

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Figure 17 a: Cycle Tracks Schematic – Union Boulevard South

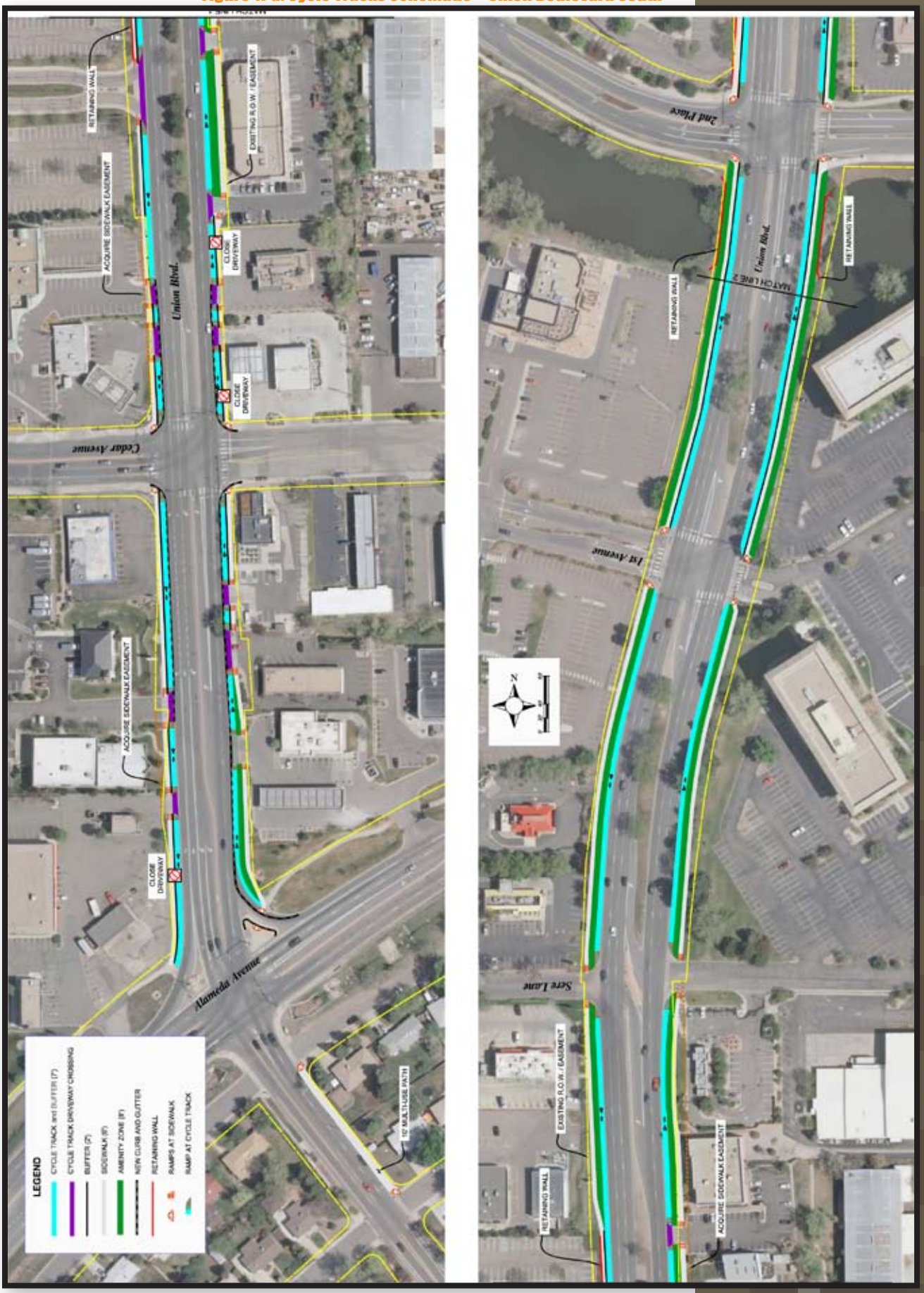
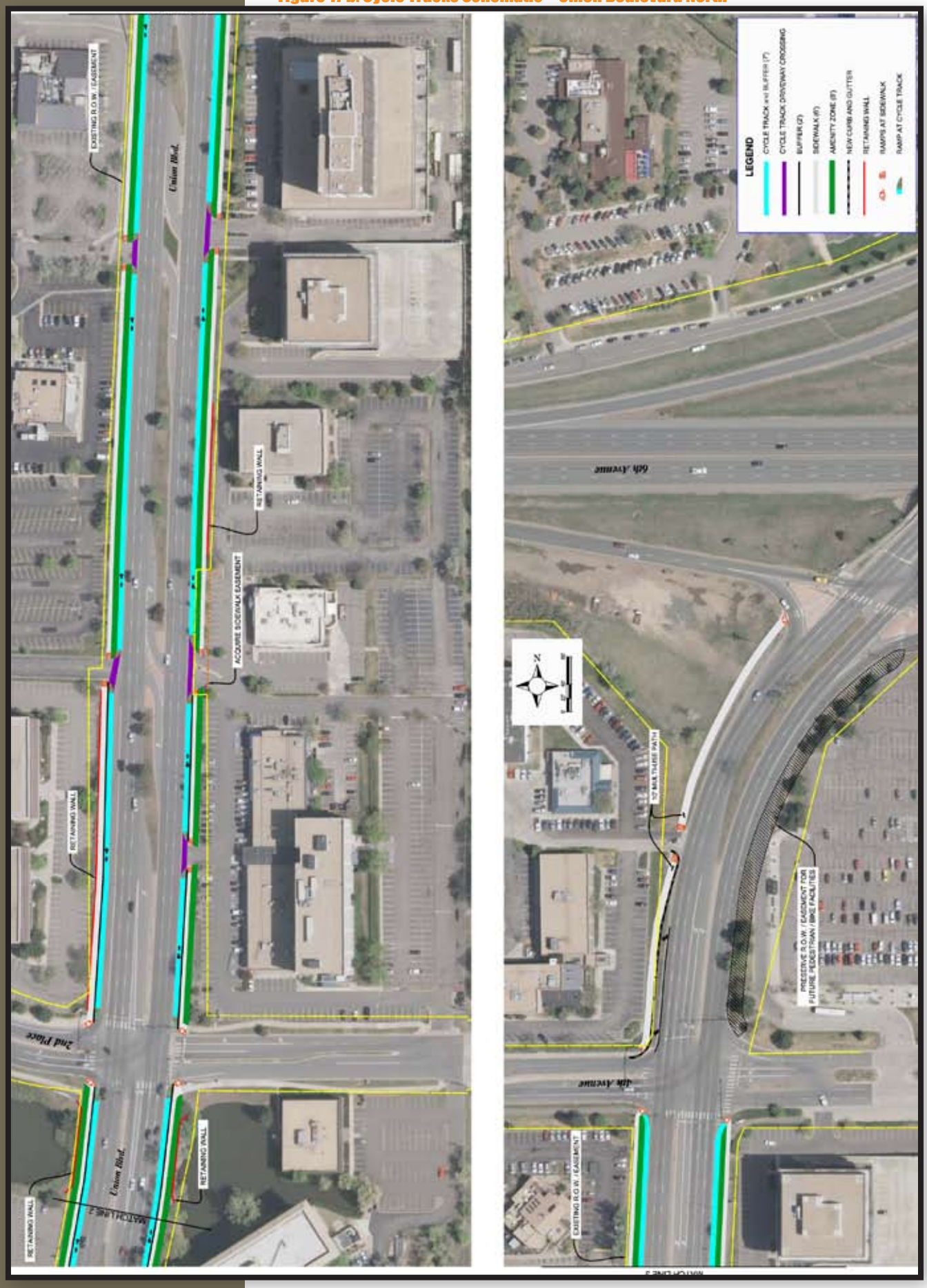


Figure 17 b: Cycle Tracks Schematic – Union Boulevard North



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redeveloped and the Union Boulevard/6th Avenue interchange is reconstructed. Since there are no firm plans for this reconstruction the cycle tracks terminate at 4th Avenue and cyclists will need to utilize an improved two-way bike path on the west side of Union Boulevard to travel across 6th Avenue.

The proposed cycle track improves cyclist connectivity, maintains safety, and enhances facility type and system continuity.

Recommendation 9:

Improve Pedestrian and Bicycle Connections from Southern Neighborhoods to the Union Boulevard Corridor and to the Federal Center Station

Providing bicycle connections to the redeveloped Federal Center, St. Anthony Hospital, and the Union Boulevard Corridor from the neighborhoods to the south of Alameda Avenue is an important part of improving the bicycle connectivity of the study area. Alameda Avenue acts as a major barrier to north-south travel between the neighborhoods on the south and those areas to the north. Several improvements are proposed to address this challenge including:

- **S. Simms Street Connection from Union Boulevard to Alameda Avenue** A designated shared roadway should be implemented on this roadway to connect the Routt Street bike lanes to the neighborhoods to the south of Alameda Avenue

- **Improved Crossing of Alameda Avenue at Routt Street (shown in Figure 18).** Both an underpass and an at-grade enhanced pedestrian crossing were evaluated at this location. Due to cost and constructability factors as well as facility type continuity considerations, an enhanced signalized crossing of Alameda Avenue at Routt St and a short bicycle connector between S. Simms St and Routt Street are recommended.

- **W. Exposition Avenue East-West Connection.** A designated shared roadway along W. Exposition Avenue between S. Simms Street and Kipling Street will provide enhanced east-west mobility through the southern

Figure 18: Signalized Crossing at Proposed Routt Street

neighborhoods that will enhance their access to other bicycle facilities in the area and improve system continuity.

- **Routt Street Bike Lanes.**
  Bike lanes are a component of the construction of Routt Street from Alameda Avenue to 4th Avenue. These lanes will greatly improve north south connectivity and create an interconnected bicycle facility in the Union Boulevard Corridor and surrounding area.

- **Oak Street Bike Lanes.**
  The intersection of Alameda Avenue and Oak Street is currently signalized and provides a safe crossing of Alameda Avenue for cyclists. Future plans in the Federal Center show Oak Street being extended from Alameda Avenue to 4th Avenue. Including bike lanes on Oak Street when it is constructed will greatly enhance connectivity from the southern neighborhoods to the Federal Center and other bicycle infrastructure in the study area and allow for greater system continuity.

Recommendation 10:

Make Other Bicycle Connectivity Improvements

In addition to the three main recommendations described previously, several other bike connectivity improvements are identified for the study area. These are described below and shown in Figure 19.

Enhanced Roadway Crossings

- Kipling Street Underpass - McIntyre Gulch crosses under Kipling Street north of Alameda Avenue. Recreation areas and several existing bike paths are located on the east side of Kipling Street near this location and more inexperienced and child cyclists are expected to want to travel to and from this location. Because of the type of cyclists likely attracted to this area it has been determined that improving the existing underpass of Kipling Street at McIntyre Gulch to accommodate both drainage and cyclists/pedestrians should be accomplished. The Kipling Street underpass is a recommended change to the Lakewood Bicycle System Master Plan.

- Routt Street Overpass at 6th Avenue - At some point in the future Routt Street may be extended over 6th Avenue on the north side of the Federal Center. If this were to happen, bike lanes and sidewalks should be included on the future bridge structure to improve north-south connectivity in the study area. This is an unfunded project at this time. This improvement is also included in the Lakewood Bicycle System Master Plan.

- Hybrid Signal Installations - These hybrid traffic signals were described in the pedestrian connectivity section of this plan and their primary purpose is to improve pedestrian connectivity across and along Union Boulevard. They can also serve cyclists traveling on the cycle tracks along Union Boulevard by increasing the number of safe crossing opportunities of Union Boulevard and providing better access to land uses along Union Boulevard. The proposed hybrid signal at Sere Lane also aligns well with the proposed McIntyre Gulch Bike Path described below and provides a safe crossing on Union Boulevard between the neighborhoods west of Union Boulevard and the proposed bike path.

Improved On-Street Bike Lanes

- 4th Avenue Bike Lanes - The installation of on-street bike lanes on 4th Avenue between Van Gordon Street and Oak Street provides another east-west bicycle connectivity route and improves bicycle system continuity in the study area. These bike lanes would allow cyclists that want to avoid the north end of Union Boulevard to bypass that area. They would have two at-grade crossings of the Federal Center LRT tracks that need to be designed with cyclist safety and performance characteristics in mind. This improvement was included in the Lakewood Bicycle System Master Plan.

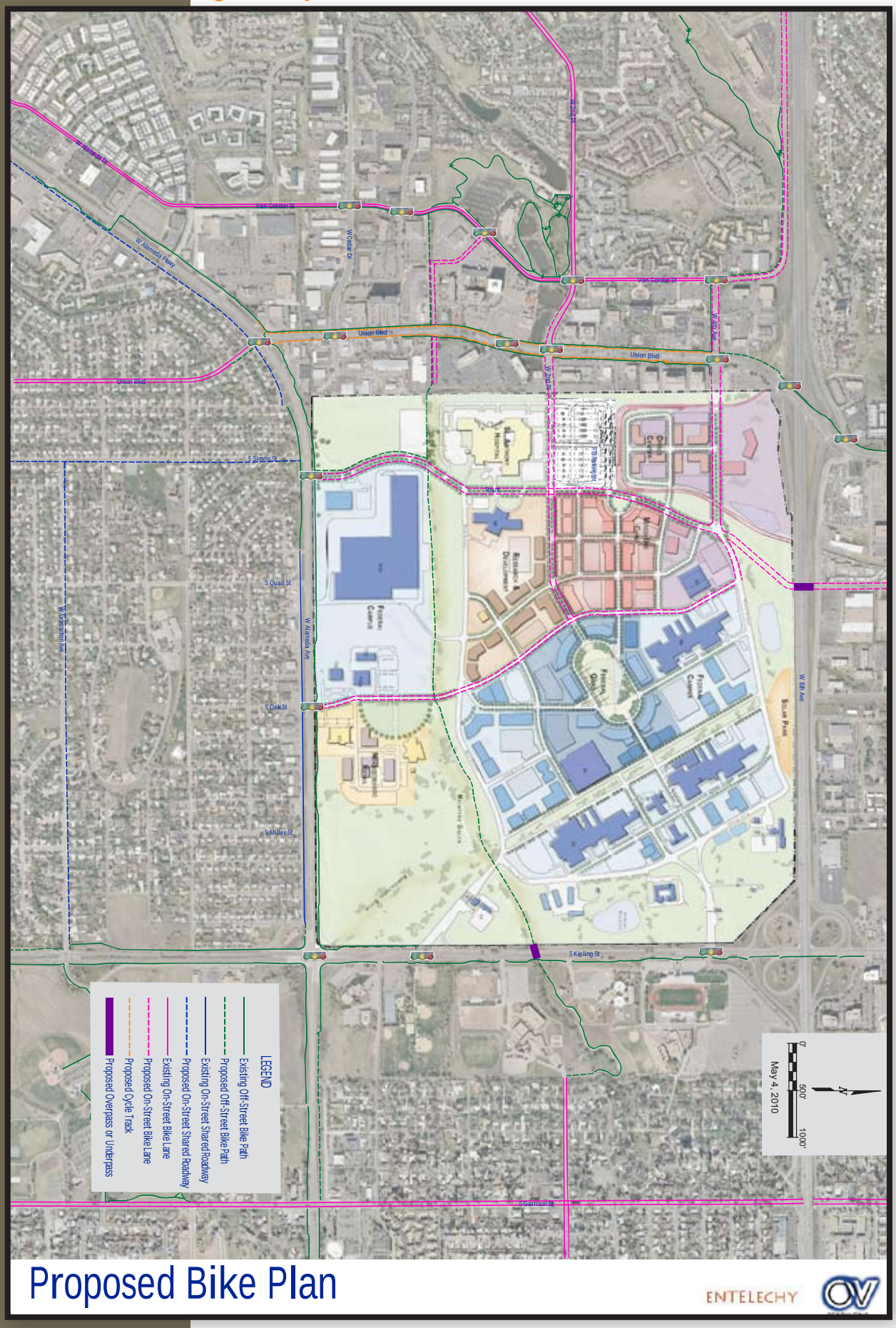
- Van Gordon Street Bike Lanes - The existing bike lanes on Van Gordon Street do not currently continue north of 4th Avenue. They should be extended north and then west along the 6th Avenue Frontage Road to improve connectivity to businesses and neighborhoods west of Van Gordon Street. The recommendation for the extension of the bike lanes is a change to the Lakewood Bicycle System Master Plan which called for a bike path.

Bike Paths

- McIntyre Gulch Bike Path - A bike path is recommended to be implemented from the west end of the Federal Center property to Kipling Street along McIntyre Gulch with connections to other bike facilities that would allow cyclists to safely cross Union Boulevard and Kipling Street at a hybrid signal and underpass, respectively. This facility would improve east-west connectivity for children and less experienced cyclists through the study area. This improvement was included in the Lakewood Bicycle System Master Plan.

- Alameda Avenue Bike Path and Shared Roadway Extension - The existing bike path on the north side of Alameda Avenue should be extended from Kipling Street to Garrison Street. This area is an existing

Figure 19: Proposed Bike Plan



Proposed Bike Plan

ENTELECHY

gap in the bike path system and also provides connectivity to the Garrison Street on-street bike lanes. The south side of Alameda Avenue has an intermittent frontage road/bike path cyclist route. The frontage road in this area should become a designated shared roadway to complete the east-west connectivity route. This improvement was included in the Lakewood Bicycle System Master Plan.

Supportive Connectivity Improvements

- Federal Center Station Bike Parking - The current station plans for the Federal Center station include both bicycle racks and bicycle lockers near the station platforms. It is important for cyclists to have a safe and secure place to store their bicycle in order to maximize the synergies between bicycling and transit. Construction of these bicycle parking facilities should be completed as planned.

Recommendation 11:

Increase Transit Coverage and Connectivity along the Union Boulevard Corridor

Throughout this Connectivity Study, stakeholders and the public expressed an interest in implementing a transit circulator within the study area. The City should continue to study the feasibility of a future transit circulator operation to work in conjunction with light rail. Although RTD runs fixed-route service along Union Boulevard and adjacent streets, the public's perception is that a dedicated local service concentrated on connecting LRT passengers with surrounding land uses would be beneficial and successful. The project team examined initial routing concepts, ridership potential and service characteristics of such a circulator service and recommends that these initial efforts be studied further for feasibility of implementation, efficiency and funding.

Transit circulators typically serve specific origin and destination points along a route that drive ridership and service demand. Routing can be designed in a loop configuration or as a point-to-point service, whichever best serves travel demand and limits out-of–direction travel for the user. Clear and simple routing, shorter distances and shorter travel times are common characteristics of a successful service. Today, many transit circulator systems are fare-free, thereby encouraging users to hop on and off the service easily and conveniently without the disincentive of carrying change for the fare.

There are many service characteristic and performance indicators to consider when designing and evaluating service. RTD has developed the following service standard guidelines for new circulator services. These standards generally need to be considered in a feasibility assessment of whether to run service or not.

- # Passengers/hour (productivity measure)
- # Passengers/trip
- Population and Employment densities approaching 12 persons per acre
- Subsidy/passenger to operate
- Minimum service frequency of 30-60 minutes
- Specific trip performance (boardings per mile multiplied by the length of the trip)
- Stop spacing requirements – Residential every 600', Commercial every 500'

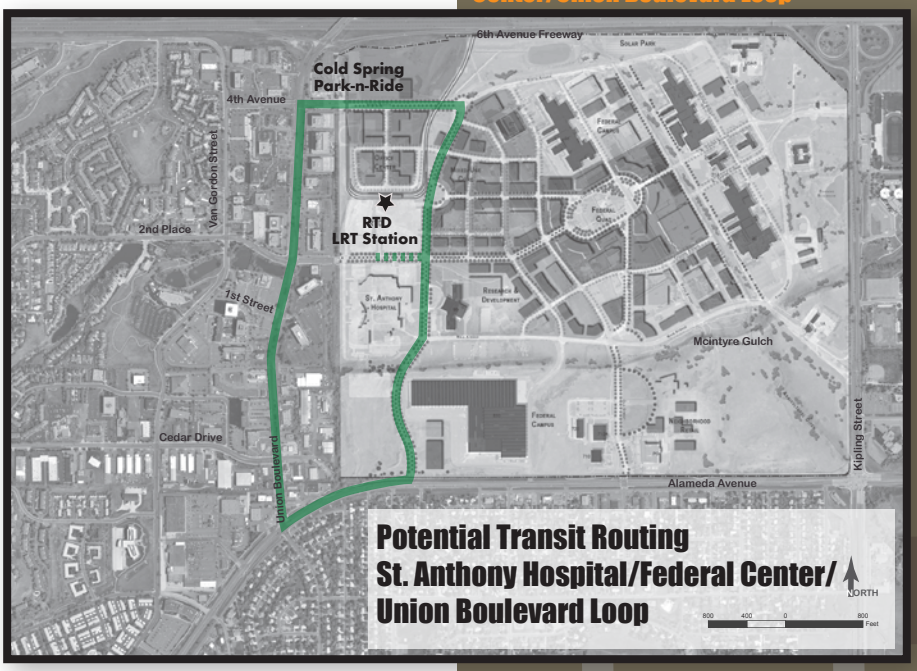
The study area, outside the Federal Center, has approximately 480 businesses and roughly 5,000 employees today. As discussed earlier, these numbers are expected to increase with new development under the TMU zoning, the addition of St. Anthony Hospital and related facilities and the implementation of the *Federal Center Master Plan*. Existing hotel guests along the corridor represent another market segment that would use a circulator to access the Federal Center station for events in downtown Denver and Golden.

Three conceptual service routes were developed to accommodate the demands of these markets and to capture a portion of these potential riders. These potential routes illustrate ideas that should be studied further in a feasibility assessment.

Concept #1 – St. Anthony Hospital/Federal Center/Union Boulevard Loop.

The St. Anthony Hospital/Federal Center/Union Boulevard Loop (as shown in Figure 20) serves an area with over 8,000 employees, the hospital, Union Boulevard hotels, as well as the majority of restaurants, fast food and other retailers in the corridor. If this circulator routing captured about three percent of the employment along the route, then about 240 riders per day could be expected. Hotel guests, lunch-time trips, and hospital visitors could make that number even higher.

Figure 20: St. Anthony Hopsital/Federal Center/Union Boulevard Loop



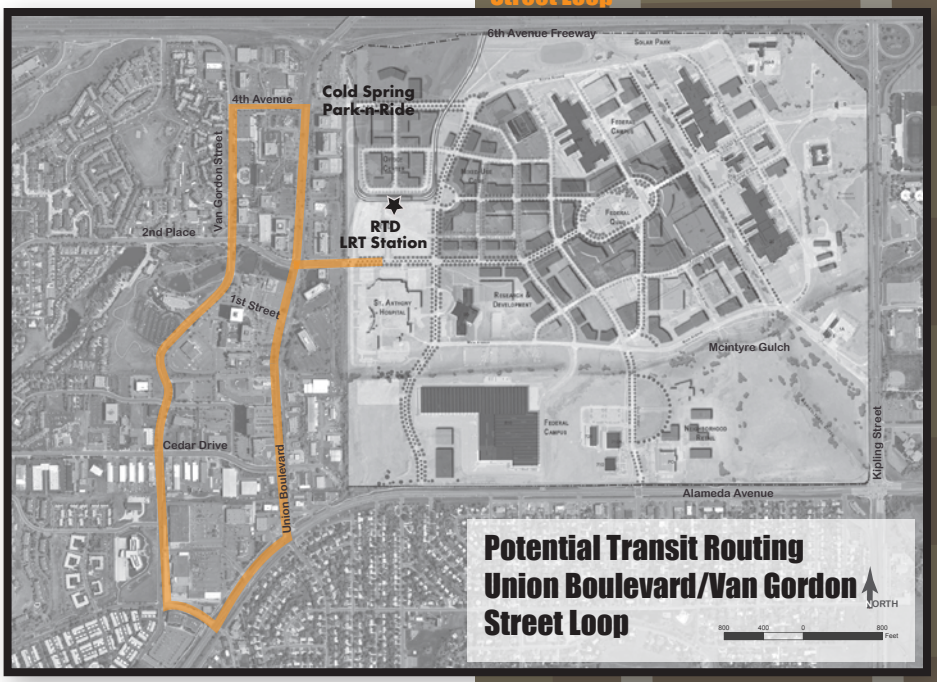
The St. Anthony Hospital/Federal Center/Union Boulevard loop is roughly 2.5 miles in length with a travel time of approximately 11 minutes in a single direction, plus stops. This route could be run with a single bus in a single direction on 30-minute headways and if demand warranted, service could be increased to a bi-directional loop requiring two buses (one in each direction) for this same 30-minute service in each direction. Four buses would be required to increase frequency to 15-minutes in each direction.

Concept #2 – Union Boulevard / Van Gordon Street Loop

The Union Boulevard/Van Gordon Street loop (as shown in Figure 21) is designed to encourage more office employees located in the area to commute by light rail, bus and circulator. The route runs past 6,000 estimated employees on Union Boulevard and Van Gordon Street and approximately 1,300 residential units. The route also runs past food services and lunch destinations along Union Boulevard. If this circulator captured about three precent of the total employees along the loop, approximately 220 riders per day could be expected. Because of the number of office locations on the loop, noon-time trips would be expected to add to that number substantially.

This Union Boulevard/Van Gordon Street loop is roughly three miles in length with a travel time of 14 minutes, without stops. With stops, this route could reach 22-24 minutes per trip. While one bus in a single direction on 30-minute headways may still be possible, depending on the number of stops, it will result in out-of-direction travel for many of the office workers anticipated to use the service. If

Figure 21: Union Boulevard/Van Gordon Street Loop



the loop is designed to capture commuters, it should provide quick, convenient and direct service between the station, office buildings and lunch locations. A bi-directional loop would minimize the out-of-direction travel and could be accomplished with either two buses (one in each direction) or four buses (two in each direction).

Concept #3 – Belmar Extension

The Belmar routing (as shown in Figure 22) acts as a point-to-point service carrying riders from the Federal Center station and the Federal Center to Belmar and back. This type of service was requested by Federal Center employees, as well as other stakeholders, as a way of linking the Federal Center station and Union Boulevard Corridor employees with lunch time destinations at Wadsworth Boulevard and Alameda Avenue, and the City of Lakewood offices and facilities.

Because this routing is seven miles in length, the total travel time extends beyond 19 minutes without stops. This length and time of trip would deter lunch-time trips and ridership could be lost to automobile travel, especially when congestion along Alameda Avenue is low. This routing would be expected to require two buses minimum to maintain 30-minute headways.

Figure 22: Bel Mar Extension

Implementation

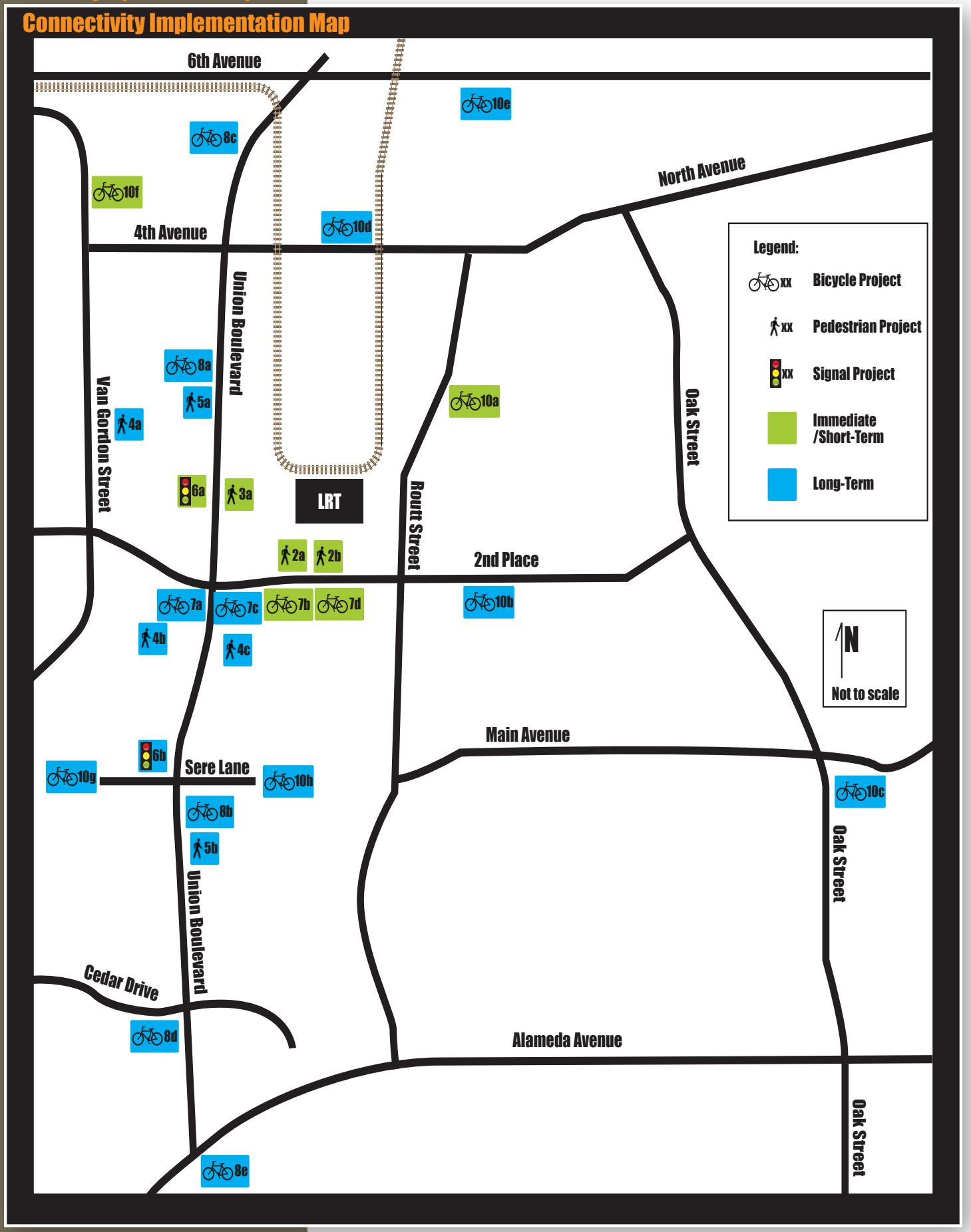
Moving from recommendations to specific implementable projects is critical to creating the desired future connectivity in the study area. This section identifies those specific implementation projects, categorizes the projects by immediate, short-term and long-term implementation timeframes and illustrates these improvements in a correlating map.

The implementation of the recommended projects shown in Tables 3 and 4 and illustrated in Figure 23 will likely require an environment conducive to private sector investment, the participation of the public sector and a strong public/ private cooperation. The adoption of the TMU Zone District was the first step in creating this environment for change along the Union Boulevard Corridor. There are several other methods of cooperating with developers and establishing funding mechanisms that could aid in the implementation of the recommended connectivity projects including:

- Reductions in development fees and an expedited development process;
- Development of public-private partnerships that enhance redevelopment opportunities and support infrastructure improvements;
- Application of fee programs such as Public Improvement Fees (PIF) or Enhanced Sales Tax Incentive Programs (ESTIP) in support of infrastructure improvements;
- Tax Increment Financing (TIF) typically administered through an Urban Renewal Authority;
- Bond financing for specific public improvements;
- Special Tax Assessment districts placing special assessments on property owners in order to pay back infrastructure improvements in the district; and
- Business Improvement Districts (BID) created to construct public improvements and support economic development through planning, marketing, fees and tax assessment.

The connectivity projects recommended in this plan are categorized as appropriate for immediate, short-term and long-term implementation. The medium and long-term projects may be best achieved through redevelopment and more involved public-private partnerships. Immediate improvement projects could be implemented through the establishment of special districts in the Union Boulevard Corridor, applications for TIP funding and other state grants and local matches.

Figure 23:
Connectivity Implementation Map



Project Implementation Matrix
Union Blvd. Corridor Connectivity Plan
Sorted By Recommendation Number

Recommendation	Proj #	Project Description	Project Limits	Project Type	Potential Funding Category	Funding Sources
#1 Establish a Sense of Pl. and Identifiable Character for Union Blvd. Corridor	1a	City should work with area businesses and property owners to establish a preferred streetscape for the Union Blvd. Corridor	4th St. to Alameda Ave. along Union Blvd.	Study and Community Process	Planning Study	Lakewood
#2 Improve Pedestrian Access to the LRT Station Platform	2a	Construct 5' wide minimum, but 8' wide preferred, concrete sidewalk from 2nd Pl. to the station platform area along west side of western station access road	2nd Pl. to the LRT station	Sidewalk	RTD West Corridor	RTD West Corridor
	2b	Widen sidewalks along 2nd Pl. in front of LRT Station from 5' to 8'.	Western LRT station access road to Routt St.	Sidewalk	RTD West Corridor	RTD West Corridor
#3 Establish a Pedestrian Walkway to the LRT Station Platform from Union Blvd.	3a	Construct concrete sidewalk of minimum 8' in width between Union Blvd and the LRT Station. Preferred design: 10-12' wide sidewalk with 8' landscaping/ amenity zones on either side.	Union Blvd. to LRT station	Sidewalk and Landscaping	Developer	Developer
#4 Establish Pedestrian Walkways through Private Development on Union Blvd.	4a	Construct sidewalk between Union Blvd and Van Gordon St midway between 2nd Pl. and 4th Ave. utilizing existing sidewalk and paths as much as possible	Van Gordon St. to Union Blvd.	Sidewalk	Capital Improvement, Developer	Lakewood, Developer
	4b	Construct sidewalk between Union Blvd. and Van Gordon St. at approximately 1st Ave. utilizing existing sidewalk and paths as much as possible	Van Gordon St. to Union Blvd.	Sidewalk	Capital Improvement, Developer	Lakewood, Developer
	4c	Construct sidewalk between Union Blvd. (at 1st Ave.) and 2nd Pl. near the LRT station western access road	Union Blvd. to 2nd Pl.	Sidewalk	Capital Improvement, Developer	Developer, Lakewood
#5 Redesign Pedestrian Facilities along the Union Blvd. Corridor with Consistent Design Treatments, Dimensions and Location	5a	Construct improvements north of 2nd Pl.	2nd Pl. to 4th Ave.	Sidewalk and Landscaping	Capital Improvement, Developer	TIP, Lakewood, Developer
	5b	Construct improvements south of 2nd Pl.	2nd Pl. to Alameda Ave.	Sidewalk and Landscaping	Capital Improvement, Developer	TIP, Lakewood, Developer
#6 Improve Pedestrian Crossings of Union Blvd.	6a	Install Pedestrian Hybrid Beacon Signal near 264 Union Parcel	At Union Blvd just north of 264 Union Parcel driveway	Traffic Signal	Capital Improvement	TIP, Lakewood
	6b	Install Pedestrian Hybrid Beacon Signal at Sere Ln.	At Union Blvd. near Sere Ln. Intersection	Traffic Signal	Capital Improvement	TIP, Lakewood
#7 Develop Consistent Bicycle Connections along 2nd Pl. to the LRT Station	7a	Extend eastbound bike lane on 2nd Pl. from west of Union Blvd. to Union Blvd.	450' west of Union Blvd. on 2nd Pl. to Union Blvd.	Striping, Widening	Maintenance, Capital Improvement	Lakewood, TIP

Importance	Time Frame	Complexity of Project	Project Dependencies	Planning Level Cost Estimate*	Notes
Medium	Short Term	Low	none	TBD	The details of the preferred streetscape elements along Union Blvd need to be agreed upon by the stakeholders.
High	Immediate	Medium	Securing of easement	$60,000 + ROW/Easement if needed	Requires an easement from property owner on the west side of the access road. This should be completed by the West Corridor opening date.
High	Immediate	Low	none	RTD including in station cost	RTD to adjust their parking lot design to allow this without moving the curb lines. This should be completed by the West Corridor opening date.
High	Short Term	High	Pedestrian hybrid beacon signal installation on Union Blvd. near the site (project #6a).	$120,000 + ROW/Easement (10' wide sidewalk)	The grades are challenging and this improvement crosses private property. Permission may be obtained in the near term to construct a minimal sidewalk through the parcel to allow pedestrian access to the LRT station from Union Blvd. If the site redevelops in the longer term an improved pedestrian/bicycle route through the site should be included in the design. The pedestrian hybrid beacon signal on Union Blvd. near this connection should be in place prior to the implementation of the pedestrian route through the site.
Medium	Long Term	High	Redevelopment or securing of easement agreement	$160,000 + ROW/Easement	Part of this route is in place already but the property is private. An easement and maintenance agreement would need to be developed and the property owners permission would need to be obtained
Medium	Long Term	High	Redevelopment or securing of easement agreement	$250,000 + ROW/Easement	Part of this route is in place already but the property is private. An easement and maintenance agreement would need to be developed and the property owners permission would need to be obtained
Medium	Long Term	High	Redevelopment	$180,000 + ROW/Easement	This route crosses private property that may redevelop in the future. When this property redevelops, pedestrian routes and facilities should be designed to travel through the center of the site instead of the edges to facilitate pedestrian movement.
Medium	Long Term	High	Redevelopment, secure funding	$ 1,350,000	Existing curb locations on Union Blvd. remain the same. All work to be done behind the existing curb. This project can be accomplished block by block if necessary for funding purposes. It may require relocation of some utilities, fire hydrants, light posts or other existing elements.
Medium	Long Term	High	Redevelopment, secure funding	$ 1,725,000	Existing curb locations on Union Blvd. remain the same. All work to be done behind the existing curb. This project can be accomplished block by block if necessary for funding purposes. It may require relocation of some utilities, fire hydrants, light posts or other existing elements.
High	Short Term	Medium	Implementation of pedestrian walkway described in project #3a	$ 150,000	
High	Short Term	Low	none	$ 150,000	
Medium	Long Term	Medium	none	$800 for striping only or $75,000 for widening and striping	This project will likely require widening of 2nd Pl. to the south on the west side of Union Blvd. to provide enough width for the bike lane. This depends on the final configuration of 2nd Pl. on the east side of Union Blvd. and the required lane alignment characteristics across the intersection.

Note: Costs are planning level cost estimates in Year 2010 dollars. They do not include ROW or easement acquisition costs if necessary.

Recommendation	Proj #	Project Description	Project Limits	Project Type	Potential Funding Category	Funding Sources
	7b	Reconfigure roadway geometry on 2nd Pl. between Union Blvd. and the LRT Station western access road to allow for a westbound bike lane	Union Blvd. to LRT station western access road	Curb and Gutter, Striping	Maintenance, Capital Improvement	Lakewood, TIP
	7c	Widen 2nd Pl. to the south between Union Blvd. and the LRT station western access road to allow for the implementation of an eastbound bicycle lane	Union Blvd to LRT station western access road	Curb and Gutter, Striping	Maintenance, Capital Improvement	Lakewood, TIP
	7d	Narrow the median on 2nd Pl. between the LRT station western access road and Routt St to allow space for eastbound and westbound bicycle lanes along 2nd Pl.	LRT station western access road to Routt St.	Curb and Gutter, Striping	Maintenance, Capital Improvement	Lakewood, TIP
#8 Develop cycle tracks along Union Blvd. to Increase North-South Connectivity through the Corridor	8a	Construct cycle track on both sides of Union Blvd. between 2nd Pl. and 4th Ave.	2nd Pl. to 4th Ave.	Sidewalk and Landscaping	Capital Improvement	TIP, Lakewood
	8b	Construct cycle track on both sides of Union Blvd. between Alameda Ave. and 2nd Pl.	Alameda Ave. to 2nd Pl.	Sidewalk and Landscaping	Capital Improvement	TIP, Lakewood
	8c	Construct 10' wide bike path on the west side of Union Blvd between 4th Ave. and 6th Ave.	4th Ave. to 6th Ave. EB offramp	Sidewalk	Capital Improvement	Lakewood, TIP
	8d	Eliminate left turn lane shadowing and move the east and west curblines toward the middle of the intersection at Union Blvd./Cedar Ave.	Alameda Ave. to 300' north of Cedar Ave.	Intersection reconfiguration	Capital Improvement	Lakewood, TIP
	8e	Widen sidewalk to 10' wide on east side of Union Blvd. between Alameda Ave. and Dakota Dr.	Dakota Dr. to Alameda Ave.	Sidewalk	Capital Improvement	Lakewood, TIP
#9 Improve Pedestrian and Bicycle Connections from Southern Neighborhoods to the Union Blvd. Corridor and to the LRT station	9a	Enhance existing signalized pedestrian crossing of western leg of the Routt St./Alameda Ave. intersection with improved crosswalk markings, pedestrian countdown timers, and pedestrian friendly signal phasing.	At Routt St./Alameda Ave. Intersection	Traffic Signal, Striping	Maintenance, Signals	Lakewood
	9b	Build 10' wide sidewalk connection on the south side of Alameda Ave. between the bike path and Alameda Ave. that aligns with the western Alameda Ave./Routt St. crosswalk	Bike path to Alameda Ave.	Sidewalk	Capital Improvement	Lakewood
#10 Make Other Bicycle Connectivity Improvements	10a	Extend bike lanes on Routt St. from 2nd Pl. to 4th Ave.	2nd Pl. to 4th Ave.	Striping	Maintenance	Developer, Lakewood
	10b	Extend bike lanes east of Routt St. on 2nd Pl. when constructed	Routt St. to Oak St.	Striping	Maintenance	Developer, Lakewood

Importance	Time Frame	Complexity of Project	Project Dependencies	Planning Level Cost Estimate*	Notes
High	Short Term	High	This project should be done at the same time as adding bike lanes to 2nd Pl. between the LRT station western access road and Routt St (Project # 7d)	The cost of this project is included in the previous estimate for widening this area as part of the LRT station area plan	The median in the center of 2nd Pl. must be reconfigured to allow for more width on the north side of 2nd Pl. to accommodate a 5' wide bike lane. This area will eventually be widened to accommodate double westbound right turns and the bike lanes should be maintained after the widening project. Most of this widening is planned for as part of the LRT station plan to allow for westbound double right turns. Those plans should be modified to include width for a bike lane.
Medium	Long Term	Medium	Bike lanes should be in place on 2nd Pl. east of here (project #7d) before this project is implemented	$200,000 + ROW/Easement if needed	This project will need to accommodate the need for two receiving lanes on eastbound 2nd Pl. wide enough for side by side RTD buses. This section is generally downhill so bikes are able to maintain a similar speed to other vehicles more easily in this section which is why this project is a lower priority than project #7b.
High	Short Term	Medium	none	$ 150,000	This is an important link from the Routt St. bike lanes to the LRT station area, Union Blvd, and the neighborhoods to the west of Union Blvd. It appears that it will be possible to narrow the median to provide enough room for bike lanes while still allowing shadowed left turn lanes at the intersections.
High	Long Term	High	none	$ 1,344,000	The cost of this project depends on whether project #5a is completed. The higher number in the cost column is for the entire cross section and the lower number is for adding the cycle tracks only once project #5b is complete. It is important to implement cycle tracks on both sides of Union Blvd. at the same time due to their one-way pair operation.
High	Long Term	High	Reconfiguration of the Union Blvd./Cedar Ave. Intersection (project #8d)	$ 1,976,000	The cost of this project depends on whether project #5b is completed. The higher number in the cost column is for the entire cross section and the lower number is for adding the cycle tracks only once project #5b is complete. It is important to implement cycle tracks on both sides of Union Blvd. at the same time due to their one-way pair operation.
Medium	Long Term	Low	Implementation of cycle tracks between 2nd Pl. and 4th Ave. (project #8a)	$ 139,000	This project is intended to improve the northern end of the corridor for bike and pedestrian access. Until the Union Blvd./Simms St./6th Ave. interchange is redesigned bikes will continue to have to use only the west side of the Union Blvd bridge to cross 6th Ave. It will be important to improve this link once the cycle tracks are in place between 2nd Pl. and 4th Ave.
High	Long Term	High	none	$ 560,000	This project is necessary to provide enough room for cycle tracks and sidewalks on both sides of Union Blvd. that will meet existing standards. Without narrowing Union Blvd. to create a few more feet of space behind the curb lines the cycle track concept is not implementable in this area.
Medium	Long Term	Low	Implementation of cycle tracks between Alameda Ave. and 2nd Pl. (project #8b)	$ 88,000	This project is intended to improve the southern end of the corridor for bike and pedestrian access. Union Blvd. is too narrow south of Alameda Ave. to add northbound bike lanes so the improvement of the sidewalk area into a wider facility that can accommodate bikes is the best solution. It will be important to improve this link once the cycle tracks are in place between Alameda Ave. and 2nd Pl.
Medium	Short Term	Low	none	Completed Summer 2010	This project makes it easier for pedestrians and bikes to cross Alameda Ave. at Routt St. and to link the Routt St. bike lakes with the Simms St. shared roadway
Medium	Short Term	Low	Signal improvements at the Routt St. / Alameda Ave. intersection (project #9a)	Completed Summer 2010	This is part of the Routt St./Simms St. bike route connection
High	Short Term	Low	Completion of Routt St.	$ 10,000	The timeframe depends on when Routt St is completed in this section. Bike lanes are currently included in the design of Routt St. in this section.
High	Long Term	Low	Completion of 2nd Pl.	$ 10,000	

Recommendation	Proj #	Project Description	Project Limits	Project Type	Potential Funding Category	Funding Sources
	10c	Construct bike lanes on Oak St. when it is completed in the Federal Center	Alameda Ave. to 4th Ave.	Striping	Maintenance	Developer, Lakewood
	10d	Implement bike lanes on 4th Ave. from Van Gordon St. to Oak St.	Van Gordon St. to Oak St.	Striping, Widening	Maintenance, Capital Improvement, Developer	Lakewood, Developer, TIP
	10e	Construct bike lanes on Routt St. when it is extended over 6th Ave.	4th Ave. to Quail St.	Striping	Maintenance	Lakewood
	10f	Extend bike lanes north of 4th Ave. on Van Gordon St. and along 6th Ave. south frontage road.	4th Ave. to Zang St.	Striping, Widening	Maintenance	Lakewood
	10g	Construct bike path between Van Gordon St. and Union Blvd. along the Sere Ln. Alignment	Van Gordon St. to Union Blvd.	Sidewalk	Developer, Capital Improvement	Developer, TIP, Lakewood
	10h	Construct bike path between Union Blvd. and Kipling St. along Sere Ln. and McIntyre Gulch	Union Blvd. to Kipling St.	Sidewalk	Developer, Capital Improvement	Developer, TIP, Lakewood
	10i	Construct bike underpass of Kipling St. at McIntyre Gulch	Kipling St. at McIntyre Gulch	Underpass	Capital Improvement	TIP, Lakewood
	10j	Implement shared roadway on Simms St. between Union Blvd. and Alameda Ave.	Union Blvd. to Alameda Ave.	Signing	Maintenance	Lakewood
	10k	Implement a shared roadway along Exposition Ave. between Simms St. and Kipling St.	Simms St. to Exposition Ave.	Signing	Maintenance	Lakewood
#11 Increase Transit Coverage and Connectivity along the Union Blvd. Corridor	11a	Work with RTD to tune route and schedule changes when West Corridor opens	Union Blvd. Corridor Area	Collaboration	General Budget	RTD, Lakewood
	11b	Continue study of potential circulator system	Union Blvd. Corridor Area	Study	Planning Study	Lakewood, RTD

* Estimated costs are in Year 2010 dollars and do not include cost for ROW or easement acquisition.

Importance	Time Frame	Complexity of Project	Project Dependencies	Planning Level Cost Estimate*	Notes
High	Long Term	Low	Completion of Oak St.	$ 30,000	
Medium	Long Term	High	Some portions depend on completion of Routt St. to 4th Ave. and the extension of 4th Ave. to Oak St. when Oak St. is complete	$20,000 for striping only or $250,000 for widening and striping	The section between Van Gordon St. and Union Blvd. should be implemented as soon as possible for westbound bike lanes. Adding eastbound bike lanes in this section will likely require widening of 4th Ave. The other pieces should be implemented as the roadways in the area are built out and the Federal Center redevelopment takes place. This improvement will require coordination with development as it occurs to avoid expensive changes after roadways are configured.
High	Long Term	High	Extension of Routt St. over 6th Ave.	$ 8,000	This is an important connection but it could take some time for the extension of Routt St. over 6th Ave to happen The cost estimate assumes the roadway and bridge are constructed to accommodate bike lanes and the cost of the roadway and bridge are not included in the cost.
Medium	Short Term	Low	none	$15,000 + widening cost if required	Some portions of this project may require widening of the roadway. The widening cost is not included in the cost estimate. Bike lanes can be added in some portions (such as northbound north of 4th Ave) without widening.
Medium	Long Term	High	Redevelopment of some parcels or securing of easement agreements and the implementation of the pedestrian hybrid beacon signal at Union Blvd. (project #6b)	$250,000 + ROW/ Easement	This project makes an important connection between the neighborhoods west of Van Gordon St. and Union Blvd. however it will require land owner or developer cooperation.
Medium	Long Term	High	Redevelopment of some parcels or securing of easement agreements, the implementation of the pedestrian hybrid beacon signal at Union Blvd. (project #6b), and the completion of the underpass of Kipling St. at McIntyre Gulch (project #10i)	$1,500,000 + ROW/Easement	This project makes a desirable east-west bicycle/pedestrian route and links the neighborhoods to the east of Kipling St. with Union Blvd. This is a very complex project that has several dependencies to completion. This is one of the few projects that serves all types of pedestrian and bicycle users from commuters to recreational riders to children.
Medium	Long Term	High	Ability to construct the bike path along McIntyre Gulch (project #10h) close to the timing of this project completion	$ 2,000,000	This project provides an all user crossing of Kipling St. and links the neighborhoods and schools to the east of Kipling St. with the Federal Center and Union Blvd. areas. This project should be performed in close conjunction with the construction of the bike path along McIntyre Gulch (project 9h) so that it is useful shortly after completion.
High	Short Term	Low	In conjunction with improvements to the Routt St./Alameda Ave. traffic signal and the short bike path connector from the signal to the existing bike path (project #'s 9a and 9b)	$ 1,500	This project requires neighborhood concurrence and support.
Medium	Short	Low	none	$ 2,000	This project makes east-west connectivity easier through the neighborhoods on the south side of Alameda Ave.
High	Immediate	Medium	working with RTD	TBD	RTD has planned changes to existing routes and services that Lakewood should be helping to monitor to determine if any further modifications are required.
Medium	Short Term	Low	none	TBD	Lakewood should continue to study the potential for a circulator service in the Union Blvd. Corridor area and perform more research to gauge the potential demand.

Project implementation Matrix
Union Corridor Connectivity Plan
Sorted By Timeframe

Table 4: Project Implementation Matrix, Sorted by Timeframe

Recommendation	Proj #	Project Description	Time Frame	Project Limits	Project Type	Potential Funding Category
#2 Improve Pedestrian Access to the LRT Station Platform	2a	Construct 5' wide minimum, but 8' wide preferred, concrete sidewalk from 2nd Pl. to the station platform area along west side of western station access road	Immediate	2nd Pl. to the LRT station	Sidewalk	RTD West Corridor
#2 Improve Pedestrian Access to the LRT Station Platform	2b	Widen sidewalks along 2nd Pl. in front of LRT station from 5' to 8'.	Immediate	western LRT station access road to Routt St.	Sidewalk	RTD West Corridor
#11 Increase Transit Coverage and Connectivity along the Union Blvd. Corridor	11a	Work with RTD to tune route and schedule changes when West Corridor opens	Immediate	Union Blvd. Corridor Area	Collaboration	General Budget
#1 Establish a Sense of Pl. and Identifiable Character for Union Corridor	1a	City should work with area businesses, property owners and staff to establish a preferred streetscape for the Corridor	Short Term	4th St. to Alameda Ave. along Union Blvd.	Study and Community Process	Planning Study
#3 Establish a Pedestrian Walkway to the LRT Station Platform from Union Blvd.	3a	Construct concrete sidewalk of minimum 8' in width between Union Blvd. and the LRT station. Preferably a 10-12' wide sidewalk with 8' landscaping/amenity zones on either side.	Short Term	Union Blvd. to LRT station	Sidewalk and Landscaping	Developer
#6 Improve Pedestrian crossings of Union Blvd.	6a	Install pedestrian hybrid beacon signal near 264 Union Parcel	Short Term	At Union Blvd. just north of 264 Union Parcel Drwy	Traffic Signal	Capital Improvement
#6 Improve Pedestrian crossings of Union Blvd.	6b	Install Pedestrian Hybrid Beacon Signal at Sere Ln.	Short Term	At Union Blvd. near Sere Ln. intersection	Traffic Signal	Capital Improvement
#7 Develop Consistent Bicycle Connections along 2nd Pl. to the LRT Station	7b	Reconfigure roadway geometry on 2nd Pl. between Union Blvd. and the LRT station western access road to allow for a westbound bike lane	Short Term	Union Blvd. to LRT station western access road	Curb and Gutter, Striping	Maintenance, Capital Improvement
#7 Develop Consistent Bicycle Connections along 2nd Pl. to the LRT Station	7d	Narrow the median on 2nd Pl. between the LRT station western access road and Routt St. to allow space for eastbound and westbound bicycle lanes along 2nd Pl.	Short Term	LRT station western access road to Routt St.	Curb and Gutter, Striping	Maintenance, Capital Improvement
#9 Improve Pedestrian and Bicycle Connections from Southern Neighborhoods to the Union Blvd. Corridor and to LRT Station	9a	Enhance existing signalized pedestrian crossing of western leg of the Routt St./Alameda Ave. intersection with improved crosswalk markings, pedestrian countdown timers, and pedestrian friendly signal phasing.	Short Term	At Routt St./Alameda Ave. Intersection	Traffic Signal, Striping	Maintenance, Signals
#9 Improve Pedestrian and Bicycle Connections from Southern Neighborhoods to the Union Blvd. Corridor and to the LRT Station	9b	Build 10' wide sidewalk connection on the south side of Alameda Ave. between the bike path and Alameda Ave. that aligns with the western Alameda Ave./Routt St. crosswalk	Short Term	Bike path to Alameda Ave.	Sidewalk	Capital Improvement
#10 Make Other Bicycle Connectivity Improvements	10a	Extend bike lanes on Routt St. from 2nd Pl. to 4th Ave.	Short Term	2nd Pl. to 4th Ave.	Striping	Maintenance
#10 Make Other Bicycle Connectivity Improvements	10f	Extend bike lanes north of 4th Ave. on Van Gordon St. and along 6th Ave south frontage road	Short Term	4th Ave. to Zang St.	Striping, Widening	Maintenance

Funding Sources	Importance	Complexity of Project	Project Dependencies	Planning Level Cost Estimate*	Notes
RTD West Corridor	High	Medium	Securing of easement	$60,000 + ROW/Easement if needed	Requires an easement from property owner on the west side of the access road. This should be completed by the West Corridor opening date.
RTD West Corridor	High	Low	none	RTD including in station cost	RTD to adjust their parking lot design to allow this without moving the curb lines. This should be completed by the West Corridor opening date.
RTD, Lakewood	High	Medium	working with RTD	TBD	RTD has planned changes to existing routes and services that Lakewood should be helping to monitor to determine if any further modifications are required.
Lakewood	Medium	Low	none	TBD	The details of the preferred streetscape elements along Union Blvd. need to be agreed upon by the stakeholders.
Developer	High	High	Pedestrian Hybrid Beacon Signal installation on Union Blvd near the site (project #6a).	$120,000 + ROW/Easement	The grades are challenging and this improvement crosses private property. Permission may be able to be obtained in the near term to construct a minimal sidewalk through the parcel to allow pedestrian access to the LRT station from Union Blvd. If the site redevelops in the longer term an improved pedestrian/bicycle route through the site should be included in the design. The pedestrian hybrid beacon signal on Union Blvd. near this connection should be in place prior to the implementation of the pedestrian route through the site.
TIP, Lakewood	High	Medium	Implementation of pedestrian walkway described in project #3a	$ 150,000	
TIP, Lakewood	High	Low	none	$ 150,000	
Lakewood, TIP	High	High	This project should be done at the same time as adding bike lanes to 2nd Place between the LRT Station western access road and Routt St (Project # 7d)	The cost of this project is included in the previous estimate for widening this area as part of the LRT station area plan	The median in the center of 2nd Pl. must be reconfigured to allow for more width on the north side of 2nd Pl. to accommodate a 5' wide bike lane. This area will eventually be widened to accommodate double westbound right turns and the bike lanes should be maintained after the widening project. Most of this widening is planned for already as part of the LRT Station Plan to allow for westbound double right turns. Those plans should be modified to include width for a bike lane.
Lakewood, TIP	High	Medium	none	$ 150,000	This is an important link from the Routt St. bike lanes to the LRT station area, Union Blvd., and the neighborhoods to the west of Union Blvd. It appears that it will be possible to narrow the median to provide enough room for bike lanes while still allowing shadowed left turn lanes at the intersections.
Lakewood	Medium	Low	none	Completed Summer 2010	This project makes it easier for pedestrians and bicycles to cross Alameda Ave. at Routt St. and to link the Routt St. bike lakes with the Simms St. shared roadway
Lakewood	Medium	Low	Signal improvements at the Routt St / Alameda Ave intersection (project #9a)	Completed Summer 2010	This is part of the Routt St./Simms St. bike route connection
Developer, Lakewood	High	Low	Completion of Routt St	$ 10,000	The timeframe depends on when Routt St. is completed in this section. Bike lanes are currently included in the design of Routt St. in this section.
Lakewood	Medium	Low	none	$15,000 + widening cost if required	Some portions of this project may require widening of the roadway. The widening cost is not included in the cost estimate. Bike lanes can be added in some portions (such as northbound north of 4th Ave.) without widening.

Note: Costs are planning level cost estimates only in Year 2010 dollars. They do not include ROW or easement costs if necessary.

Recommendation	Proj #	Project Description	Time Frame	Project Limits	Project Type	Potential Funding Category
#10 Make other Bicycle Connectivity Improvements	10j	Implement shared roadway on Simms St between Union Blvd. and Alameda Ave.	Short Term	Union Blvd. to Alameda Ave.	Signing	Maintenance
#10 Make Other Bicycle Connectivity Improvements	10k	Implement a shared roadway along Exposition Ave. between Simms St. and Kipling St.	Short Term	Simms St. to Exposition Ave.	Signing	Maintenance
#11 Increase Transit Coverage and Connectivity along the Union Blvd. Corridor	11b	Continue study of potential circulator system	Short Term	Union Blvd. Corridor Area	Study	Planning Study
#4 Establish Pedestrian Walkways through Private Development on Union Blvd.	4a	Construct sidewalk between Union Blvd. and Van Gordon St. midway between 2nd Pl. and 4th Ave. utilizing existing sidewalk and paths as much as possible	Long Term	Van Gordon St. to Union Blvd.	Sidewalk	Capital Improvement, Developer
#4 Establish Pedestrian Walkways through Private Development on Union Blvd.	4b	Construct sidewalk between Union Blvd and Van Gordon St at approximately 1st Ave utilizing existing sidewalk and paths as much as possible	Long Term	Van Gordon St. to Union Blvd.	Sidewalk	Capital Improvement, Developer
#4 Establish Pedestrian Walkways through Private Development on Union Blvd	4c	Construct sidewalk between Union Blvd. (at 1st Ave.) and 2nd Pl. near the LRT station western access road	Long Term	Union Blvd. to 2nd Pl.	Sidewalk	Capital Improvement, Developer
#5 Redesign Pedestrian Facilities along the Union Blvd. Corridor with Consistent Design Treatments, Dimensions and Location	5a	Construct improvements north of 2nd Pl.	Long Term	2nd Pl. to 4th Ave.	Sidewalk and Landscaping	Capital Improvement, Developer
#5 Redesign Pedestrian Facilities along the Union Blvd. Corridor with Consistent Design Treatments, Dimensions and Location	5b	Construct improvements south of 2nd Pl.	Long Term	2nd Pl. to Alameda Ave.	Sidewalk and Landscaping	Capital Improvement, Developer
#7 Develop Consistent Bicycle Connections along 2nd Pl. to the LRT Station	7a	Extend eastbound bike lane on 2nd Pl. west of Union Blvd. to Union Blvd.	Long Term	450' west of Union Blvd. on 2nd Pl. to Union Blvd.	Striping, Widening	Maintenance, Capital Improvement
#7 Develop Consistent Bicycle Connections along 2nd Pl. to the LRT Station	7c	Widen 2nd Pl. to the south between Union Blvd. and the LRT station western access road to allow for the implementation of an eastbound bike lane	Long Term	Union Blvd. to LRT station western access road	Curb and Gutter, Striping	Maintenance, Capital Improvement
#8 Develop Cycle Tracks along Union Blvd. to Increase North-South Connectivity through the Corridor	8a	Construct cycle track on both sides of Union Blvd. between 2nd Pl. and 4th Ave.	Long Term	2nd Pl. to 4th Ave.	Sidewalk and Landscaping	Capital Improvement
#8 Develop Cycle Tracks along Union Blvd. to Increase North-South Connectivity through the Corridor	8b	Construct cycle track on both sides of Union Blvd. between Alameda Ave. and 2nd Pl.	Long Term	Alameda Ave. to 2nd Pl.	Sidewalk and Landscaping	Capital Improvement
#8 Develop Cycle Tracks along Union Blvd. to Increase North-South Connectivity through the Corridor	8c	Construct 10' wide bike path on the west side of Union Blvd. between 4th Ave. and 6th Ave.	Long Term	4th Ave. to 6th Ave offramp	Sidewalk	Capital Improvement

Funding Sources	Importance	Complexity of Project	Project Dependencies	Planning Level Cost Estimate*	Notes
Lakewood	High	Low	In conjunction with improvements to the Routt St/Alameda Ave traffic signal and the short bike path connector from the signal to the existing bike path (project #'s 9a and 9b)	$ 1,500	This project requires neighborhood concurrence and support.
Lakewood	Medium	Low	none	$ 2,000	This project makes east west connectivity easier through the neighborhoods on the south side of Alameda Ave.
Lakewood, RTD	Medium	Low	none	TBD	Lakewood should continue to study the potential for a circulator service in the Union Blvd. Corridor area and perform more research to gauge the potential demand.
Lakewood, Developer	Medium	High	Redevelopment or securing of easement agreement	$160,000 + ROW/Easement	Part of this route is in place already but the property is private. An easement and maintenance agreement would need to be developed and the property owners permission would need to be obtained.
Lakewood, Developer	Medium	High	Redevelopment or securing of easement agreement	$250,000 + ROW/Easement	Part of this route is in place already but the property is private. An easement and maintenance agreement would need to be developed and the property owners permission would need to be obtained
Developer, Lakewood	Medium	High	Redevelopment	$180,000 + ROW/Easement	This route crosses private property that may redevelop in the future. When this property redevelops, pedestrian routes and facilities should be included in the design that travel through the center of the site instead of the edges to facilitate pedestrian movement.
TIP, Lakewood, Developer	Medium	High	Redevelopment, secure funding	$ 1,350,000	Existing curb locations on Union Blvd. remain the same. All work to be done behind the existing curb. This project can be accomplished block face by block face if necessary for funding purposes. It may require relocation of some utilities, fire hydrants, light posts or other existing elements.
TIP, Lakewood, Developer	Medium	High	Redevelopment, secure funding	$ 1,725,000	Existing curb locations on Union Blvd. remain the same. All work to be done behind the existing curb. This project can be accomplished block face by block face if necessary for funding purposes. It may require relocation of some utilities, fire hydrants, light posts or other existing elements.
Lakewood, TIP	Medium	Medium	none	$800 for striping only or $75,000 for widening and striping	This project will likely require widening of 2nd Pl. to the south on the west side of Union Blvd to provide enough width for the bike lane. This depends on the final configuration of 2nd Pl. on the east side of Union Blvd and the required lane alignment characteristics across the intersection.
Lakewood, TIP	Medium	Medium	Bike lanes should be in place on 2nd Pl. east of here (project #7d) before this project is implemented	$200,000 + ROW/Easement if needed	This project will need to accommodate the need for two receiving lanes on eastbound 2nd Pl. wide enough for side by side RTD buses. This section is generally downhill so bikes are able to maintain a similar speed to other vehicles more easily in this section which is why this project is a lower priority than project #7b.
TIP, Lakewood	High	High	none	$ 1,344,000	The cost of this project depends on whether project #5a is completed. The higher number in the cost column is for the entire cross section and the lower number is for adding the cycle tracks only once project #5b is complete. It is important to implement cycle tracks on both sides of Union Blvd. at the same time due to their one-way pair operation.
TIP, Lakewood	High	High	Reconfiguration of the Union Blvd./Cedar Ave. Intersection (project #8d)	$ 1,976,000	The cost of this project depends on whether project #5b is completed. The higher number in the cost column is for the entire cross section and the lower number is for adding the cycle tracks only once project #5b is complete. It is important to implement cycle tracks on both sides of Union Blvd. at the same time due to their one-way pair operation.
Lakewood, TIP	Medium	Low	Implementation of cycle tracks between 2nd Pl. and 4th Ave. (project #8a)	$ 139,000	This project is intended to improve the northern end of the corridor for bike and pedestrian access. Until the Union Blvd./Simms St./6th Ave. interchange is redesigned bikes will continue to have to use only the west side of the Union Blvd. bridge to cross 6th Ave. It will be important to improve this link once the cycle tracks are in place between 2nd Pl. and 4th Ave.

Recommendation	Proj #	Project Description	Time Frame	Project Limits	Project Type	Potential Funding Category
#8 Develop Cycle Tracks along Union Blvd. to Increase North-South Connectivity through the Corridor	8d	Eliminate left turn lane shadowing and move the east and west curblines toward the middle of the intersection at Union Blvd./Cedar Ave.	Long Term	Alameda Ave. to 300' north of Cedar Ave.	Intersection reconfiguration	Capital Improvement
#8 Develop Cycle Tracks along Union Blvd. to Increase North-South Connectivity through the Corridor	8e	Widen sidewalk to 10' wide on east side of Union Blvd. between Alameda Ave. and Dakota Dr.	Long Term	Dakota Dr. to Alameda Ave.	Sidewalk	Capital Improvement
#10 Make Other Bicycle Connectivity Improvements	10b	Extend bike lanes east of Routt St. on 2nd Pl. when constructed	Long Term	Routt St. to Oak St.	Striping	Maintenance
#10 Make Other Bicycle Connectivity Improvements	10c	Construct bike lanes on Oak St. when it is completed in the Federal Center	Long Term	Alameda Ave. to 4th Ave.	Striping	Maintenance
#10 Make Other Bicycle Connectivity Improvements	10d	Implement bike lanes on 4th Ave. from Van Gordon St. to Oak St.	Long Term	Van Gordon St. to Oak St.	Striping, Widening	Maintenance, Capital Improvement, Developer
#10 Make Other Bicycle Connectivity Improvements	10e	Construct bike lanes on Routt St. when it is extended over 6th Ave.	Long Term	4th Ave. to Quail St.	Striping	Maintenance
#10 Make Other Bicycle Connectivity Improvements	10g	Construct Bike Path between Van Gordon St. and Union Blvd. along the Sere Ln. Alignment	Long Term	Van Gordon St. to Union Blvd.	Sidewalk	Developer, Capital Improvement
#10 Make Other Bicycle Connectivity Improvements	10h	Construct bike path between Union Blvd. and Kipling St. along Sere Ln. and McIntyre Gulch	Long Term	Union Blvd. to Kipling St.	Sidewalk	Developer, Capital Improvement
#10 Make Other Bicycle Connectivity Improvements	10i	Construct bike underpass of Kipling St. at McIntyre Gulch	Long Term	Kipling St. at McIntyre Gulch	Underpass	Capital Improvement

* Estimated costs are in Year 2010 dollars and do not include cost for ROW or easement acquisition.

Funding Sources	Importance	Complexity of Project	Project Dependencies	Planning Level Cost Estimate*	Notes
Lakewood, TIP	High	High	none	$ 560,000	This project is necessary to provide enough room for bicycle tracks and sidewalks on both sides of Union Blvd. that will meet existing standards. Without narrowing Union Blvd. to create a few more feet of space behind the curb lines the cycle track concept is not implementable in this area.
Lakewood, TIP	Medium	Low	Implementation of cycle tracks between Alameda Ave. and 2nd Pl. (project #8b)	$ 88,000	This project is intended to improve the southern end of the corridor for bike and pedestrian access. Union Blvd. is too narrow south of Alameda Ave. to add northbound bike lanes so the improvement of the sidewalk area into a wider facility that can accommodate bikes is the best solution. It will be important to improve this link once the cycle tracks are in place between Alameda Ave and 2nd Pl.
Developer, Lakewood	High	Low	Completion of 2nd Pl.	$ 10,000	
Developer, Lakewood	High	Low	Completion of Oak St.	$ 30,000	
Lakewood, Developer, TIP	Medium	High	Some portions depend on completion of Routt St. to 4th Ave. and the extension of 4th Ave. to Oak St. when Oak St. is complete	$20,000 for striping only or $250,000 for widening and striping	The section between Van Gordon St. and Union Blvd. should be implemented as soon as possible for westbound bike lanes. Adding eastbound bike lanes in this section will likely require widening of 4th Ave. The other pieces should be implemented as the roadways in the area are built out and the Federal Center redevelopment takes place. This improvement will require coordination with development as it occurs to avoid expensive changes after roadways are configured.
Lakewood	High	High	Extension of Routt St. over 6th Ave.	$ 8,000	This is an important connection but it could take some time for the extension of Routt St. over 6th Ave. to happen. The cost estimate assumes the roadway and bridge are constructed to accommodate bike lanes and the cost of the roadway and bridge are not included in the cost.
Developer, TIP, Lakewood	Medium	High	Redevelopment of some parcels or securing of easement agreements and the implementation of the pedestrian hybrid beacon signal at Union Blvd. (project #6b)	$250,000 + ROW/ Easement	This project makes a great connection between the neighborhoods west of Van Gordon St. and Union Blvd. however it will require land owner or developer cooperation.
Developer, TIP, Lakewood	Medium	High	Redevelopment of some parcels or securing of easement agreements, the implementation of the pedestrian hybrid beacon signal at Union Blvd. (project #6b), and the completion of the underpass of Kipling St. at McIntyre Gulch (project #10i)	$1,500,000 + ROW/Easement	This project makes a very nice east west bicycle/pedestrian route and links the neighborhoods to the east of Kipling St. with Union Blvd. This is a very complex project that has several dependencies to completion. This is one of the few projects that serves all types of pedestrian and bicycle users from commuters to recreational riders to children.
TIP, Lakewood	Medium	High	Ability to construct the bike path along McIntyre Gulch (project #10h) close to the timing of this project completion	$ 2,000,000	This project provides an all user crossing of Kipling St. and links the neighborhoods and schools to the east of Kipling St. with the Federal Center and Union Blvd. areas. This project should be performed in close conjunction with the construction of the bike path along McIntyre Gulch (project 9h) so that it is useful shortly after completion.

Note: Costs are planning level cost estir 2010 dollars. They do not include ROW or easement costs if necessary.

Next Steps

The intent of the Federal Center/Union Corridor Connectivity Plan was to examine the mobility issues associated with the Union Boulevard Corridor and to develop the near-term and long-term connectivity strategies and implementation actions that will ensure future pedestrian, bike and vehicular access to and from the Federal Center station and surrounding uses. The immediate and short-term actions identified in this plan are designed to weave connectivity improvements into the existing suburban office landscape while maintaining the vehicular travel capacity of Union Boulevard. Sidewalk improvements, pedestrian access to the Federal Center station platform, Union Boulevard pedestrian crossings, and additional sidewalks through existing office development are the immediate steps necessary to boost pedestrian movement in conjunction with the opening of West Corridor light rail in 2013. The City should begin to secure funding for pedestrian crossings, work with local businesses and property owners to develop sidewalks through development sites, continue discussions with RTD, pursue easements necessary for pedestrian access from 2nd Place to the station, and work with the developer at 264 Union to implement a pedestrian connection from Union Boulevard to the platform.

Over the longer term, land use changes called for under the City of Lakewood's TMU Zone District will mean a broader mix of uses, greater street-level business and residential activity and an increasing desire for walkability in the area. These potential changes should be predicated by a defined set of streetscape design guidelines that enhance the pedestrian environment of the Union Boulevard Corridor, create a "sense of place" and establishing the visibility needed to prioritize pedestrians in the area.

An additional next step should be to work with stakeholders to define this streetscape element and the local funding to implement the desired improvements in the Union Boulevard Corridor. This changing

pedestrian environment should also be accompanied by the operation of a local transit circulator designed to increase mobility options, limit personal vehicle trips in the corridor and increase local use of the Federal Center station.

Future land use changes under the TMU Zone District will also present opportunities for public-private partnerships and the implementation of phased connectivity improvements, such as the Union Boulevard cycle tracks and the modified configuration of 2nd Place to include bike lanes, thereby making biking between local uses and the Federal Center station convenient and timely. The redevelopment of existing land uses in the corridor should be accomplished in such a way as to ensure pedestrian access to and through the sites, linking adjacent uses rather than separating them by acres of parking.

The City should also further the cycle tracks design, pursue funding grants, and work with property owners to implement segments of the cycle tracks cross-section and pedestrian site connections.

The specific implementation projects recommended in this Connectivity Plan encompass the first steps necessary to improve pedestrian movement in the Union Boulevard Corridor and the next steps necessary to progress pedestrian and bike connectivity throughout the study area, especially as the Union Boulevard landscape transitions from a suburban office development pattern to a more active, accessible and urbanized corridor.