Union Area Transportation Study

November 2017

Michael Baker INTERNATIONAL

Lakewood

Acknowledgements

City Council

MAYOR

Adam Paul

COUNCIL MEMBERS

Ramey Johnson

Charley Able

Scott Koop

Sharon Vincent

Shakti

Pete Roybal

David Wiechman

Barb Franks

Karen Harrison

Dana Gutwein

Planning Commission

Glenda Sinks

Johann Cohn

Robert Eadie

Dale Miller

Henry Hollender

Katherine Sukalski

City Staff

Jay Hutchison

David Baskett

John Padon

Matt Duncan

Paul Rice

Roger Wadnal

Mike Whiteaker

Ron Ritschard

Kit Lammers

Stacie Oulton

Vanessa Zarate

The Community

A sincere thanks to all of the residents who provided their time and feedback to help the City of Lakewood establish their vision along the Union corridor!

Consultant Team

MICHAEL BAKER INTERNATIONAL

Danielle Smith, P.E.

Jennifer Carpenter

Anne Kuechenmeister

Katie Schwarz

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Union Area Transportation Study

Existing Conditions

Purpose of the Study

The Union Area Transportation Study was conducted to create a list of projects that could be incorporated into the Capital Improvement and Preservation Plan to improve transportation in the area. Lakewood staff and City Council recognize that the presence of the West Line light rail transit, Park-n-Ride and bus transfer has made this area a focal point for future development and multimodal users, and they are looking for ways to relieve congestion in the area.

While residents, employees and the local government recognize the need for improvements in the area, not everyone is in agreement as to the focus of those improvements. In addition to listing proposed projects, this plan establishes the priorities of each of the stakeholders and evaluates the following three future scenarios:

Auto oriented focus – This scenario assumes that vehicle miles traveled will continue to increase, roadway improvements suggested in previous studies would be implemented when triggers are reached, and parking sufficiency would be reconsidered along with current parking standards.

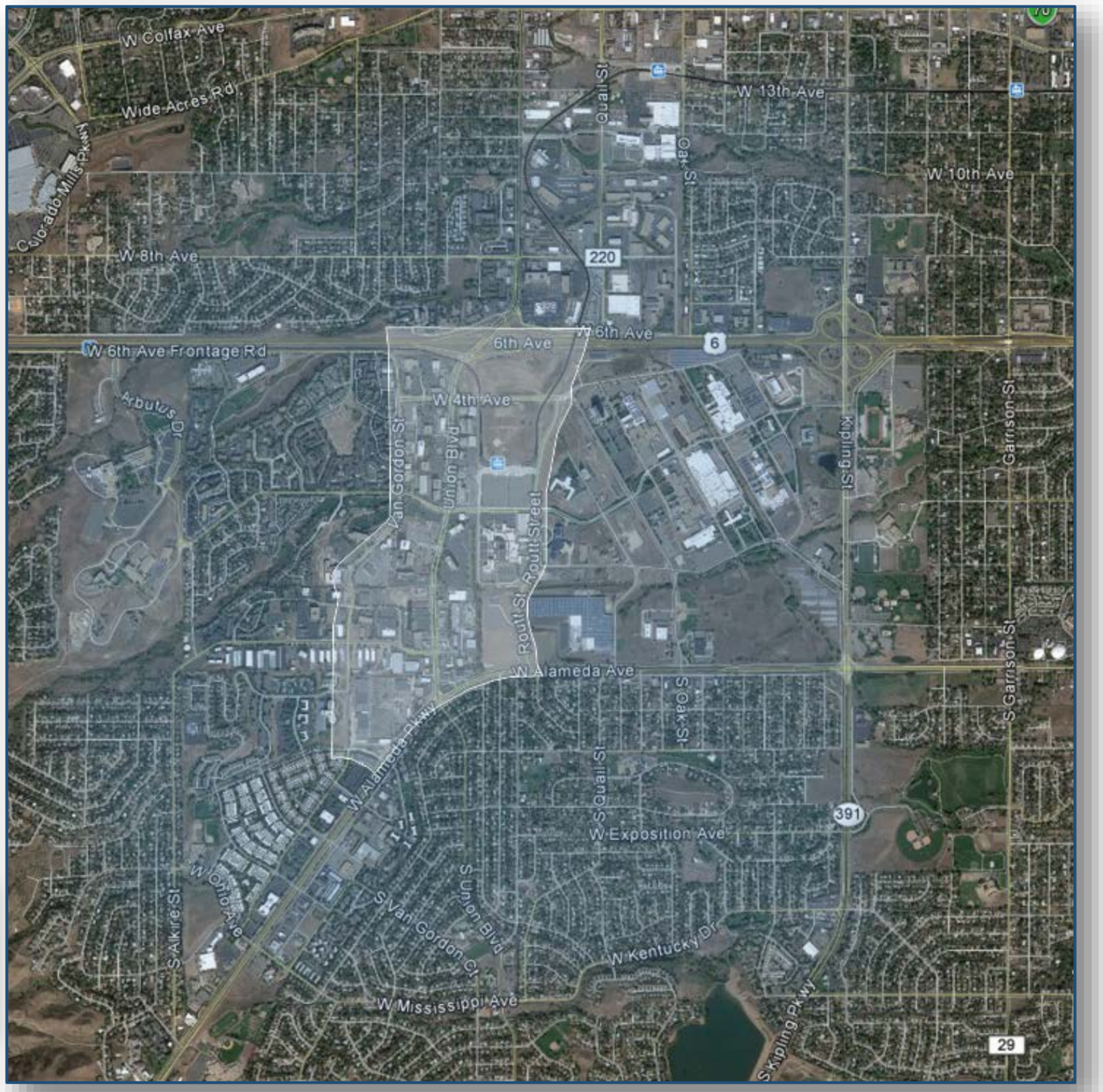
Mixed mode focus – This scenario aims to maximize alternate modes while improving roadway operations. This scenario would incorporate all improvements identified in existing planning documents while adding improvements for alternative modes such as bicycles, pedestrians and transit users.

Alternative mode focus – This scenario focuses on prioritizing bicycle and pedestrian solutions while maximizing alternate modes. This analysis shows how to convert the area to become a walkable neighborhood, where living without owning a car would be practical. Improvements for automobile traffic would be minimized while adding any needed improvements for bicycles, pedestrians, transit and innovative technology such as ride hailing, car sharing, and bicycle sharing. Reduced parking standards or maximum parking standards would be in place for new development. An independent study is currently underway to determine the feasibility of adding a Transportation Management Association along the West Line from Denver to Golden that could assist in implementation.

Recognizing that improvements or challenges in one area may have an impact on adjacent areas, the project has outlined both a focus area and an impact area.

Focus Area (white):
High concentration of proposed projects to address stakeholder priorities.

Impact Area (blue):
Important for connectivity to and from Union Blvd. area.



GOALS

The goals of engagement, as laid out in the Community and Engagement Plan for this project, were:

- Engage a diverse group of stakeholders in order to understand broadly what their priorities, goals, concerns and values are for this area;
- Engage stakeholders where they are;
- Provide digital and in-person opportunities for engagement;
- Engage stakeholders on multiple levels: inform, consult, collaborate;
- Ensure that all internal staff and consultants are aligned in messaging;
- Create compelling videos to engage both stakeholders and City Council;
- Get stakeholder input on priority projects.

The engagement process was purposefully structured to meet these goals, with innovative strategies that support the accomplishment of the goals.

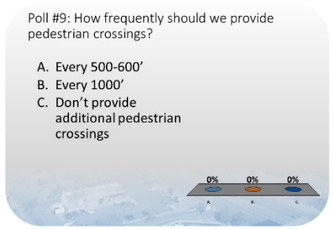
PROCESS

The public participation process involved internal coordination, stakeholder identification, digital engagement setup and face-to-face engagement strategies. The engagement strategies were carried throughout the project and offered multiple venues and platforms for public input.

The public participation process began with internal coordination and systems setup, which included the Union Corridor Communication and Engagement Plan (Attachment A). This plan ensured that the full team understood the goals for engaging with stakeholders, the target audiences, strategies and also the aims of the overall project. Area stakeholder groups and organizations were also identified in the stakeholder matrix. A one-page project fact sheet was distributed via e-mail, website, and in physical locations to disseminate project information and guide stakeholders to the project website (Attachment B).

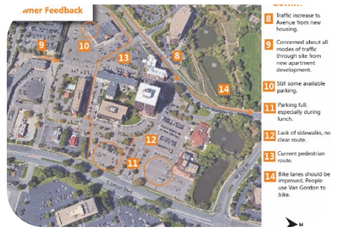
Digital engagement is a key element to reaching out to the diverse users along the corridor. This included a central website (Lakewood.org/Union). This central location housed a project description, project maps and links to surveys, videos and event sign-ups.

Engagement Method	Number of Stakeholders Reached
Online Project Survey link	Submissions: 386
Website	1,793 Views
Open ended comment and questions	Submissions: 23
Facebook	3,477 views
Twitter	3,889
E-newsletters	820 subscribers, 4 e-newsletters sent
US Mail	79,000 addresses
Nextdoor.com	????



86,739 | Number of outreach activities

672 | Project Interactions



87,411 | Total interactions and outreach activities

Face-to-face engagement opportunities were dispersed geographically along the corridor and in various formats. A key challenge was engaging the many different users of the area. The professional community, residents, commuters and diners each have different preferred locations, times and manners of participating in engagement. To engage these users, we offered diverse options for face-to-face engagement where they congregate. These included:

- Attending existing group meetings (Lakewood Bicycle Advisory Team and the Union Boulevard Professionals Group)
- Interviewing area stakeholders
- Public open houses and workshops
- Pop-up meetings (at the RTD Federal Center Station and Jason's Deli)
- A focus group of area stakeholders
- Four meetings with property and business owners and property managers

Additional information on engagement can be found throughout this report and connected to the project topics that engagement informed.

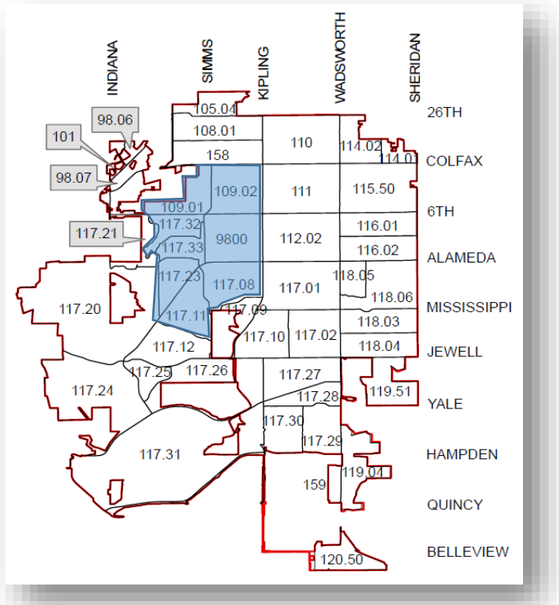
The City of Lakewood has completed many studies within and surrounding the Union Boulevard corridor. The following studies were identified as having the most relevance to this plan.

2010 POPULATION & HOUSING CHARACTERISTICS REPORT

This report presents the 2010 population and housing characteristics at both the City and census tract level.

The census tracts that comprise the study area within the Union Area Transportation Study are highlighted in blue. The census tracts that correlate with the focus area, shown on the right, include portions of 9800, 117.32, 117.33. and 117.23.

To gain a better understanding of the population within the study area, a summary is provided below. The average household size gives an indicator of how many cars each household may have, while a higher poverty level could indicate where there is a need for enhanced bus service or pedestrian amenities.



Census Tract	Median Age	Average Household Size	Single Family Households	Multifamily Households	Median Household Income	Poverty Status
West of Union						
117.32	29.7	1.77	159	2478	$ 45,855	12.4%
117.33	34.5	2.2	403	333	$ 44,861	27.7%
117.23	34.4	1.95	627	1064	$ 41,707	8.3%
East of Union						
9800	No Residential - Not Included					
South of Alameda						
117.11	40.6	2.26	1264	609	$ 79,489	4.2%
117.08	43	2.53	1628	34	$ 65,500	9.6%
North of 6th						
109.01	40	2.31	910	400	$ 51,078	14.1%
109.02	34.7	2.14	588	618	$ 34,976	24.1%

FEDERAL CENTER/UNION BLVD CORRIDOR CONNECTIVITY PLAN – JULY 2011

This plan evaluated the Union Boulevard corridor and outlined a list of projects necessary to improve pedestrian, bicycle and vehicular connectivity in the area. A major focus was access to the proposed Federal Center light rail and transit station. After construction of the Federal Center Station was completed, the City constructed a HAWK signal for pedestrians to cross Union Boulevard, north of 2nd Place, as well as a sidewalk from the HAWK signal to the Federal Center Station in order to improve access to the station.

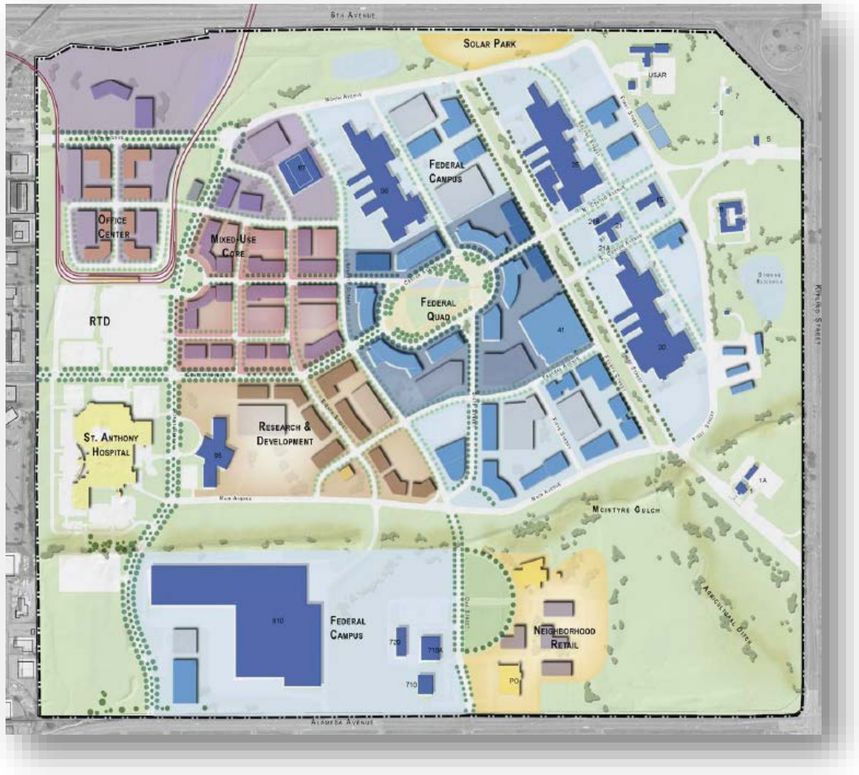
Plan Recommendations

- Provide a walkway from 2nd Place along the western edge of the light rail station lot and to the platform.
- Provide a walkway from Union Blvd across the 264 Union Blvd parcel to the station.
- Provide walkways through private developments/parking lots
  - E/W thru block bound by Union Blvd, 4th, Fed Center Station, 2nd
  - E/W thru block bound by Union Blvd, 2nd, Hospital, Sere Lane
  - E/W thru block bound by Van Gordon, 4th, Union, 2nd
  - E/W thru block bound by Van Gordon, 2nd, Union, Cedar
- Utilize the proposed cross-section for Union Blvd to establish consistent treatment, sizing, and location.
  - 115' ROW, 8' sidwalks both sides, 17' between peds and cars, retain 27' median, 33' pavement each
- Provide controlled mid-block pedestrian crossings on Union
  - 700' north of 2nd Place, adjacent to the 264 Union Blvd site
  - 600' south of 1st ave at Sere Lane
- Extend bike lanes across Union Blvd on 2nd Place to the Federal Center station
  - Requires widening to allow 5' on-street bike lanes
- Implement cycle tracks from 4th Avenue to Alameda Avenue along Union Blvd
  - Widening Union to allow 5' bike lanes on either side was too costly
  - 115' ROW, 8' sidwalks both sides, 8' between peds and cycle track, 5' cycle track, 2' buffer between cycle track and curb, retain 27' median, 33' pavement each direction
- Improve Ped and Bike connections from Southern neighborhoods to Union and the Fed Center Station
  - Connect Routt St bike lanes to neighborhoods south of Alameda
  - Enhanced signalized crossing of Alameda at Routt St and short bicycle connector between Simms St and Bike Lanes on Routt St extension, from Alameda to 4th
  - Designated shared roadway along W. Exposition Ave between Simms and Kipling
  - Bike Lanes on Oak Street, when it is built
- Bike Connectivity Improvements
  - Kipling Street underpass at McIntyre Gulch
  - Routt Street overpass at 6th Avenue with sidewalks and bike lanes
  - On-street bike lanes on 4th between Van Gordon and Oak St.
  - McIntyre Gulch bike path thru Federal Center
  - Federal Center Station Bike Parking
- Study a transit circulator for feasibility of implementation and funding options

Note: Completed Projects shown in this format.

Another major recommendation from this plan was the implementation of cycle tracks from 4th Avenue to Alameda Avenue along Union. Based on the volume and speed of traffic on Union, staff does not support cycle tracks as recommended. The remaining recommendations have been reviewed and incorporated into this Union Area Transportation Study as applicable.

Denver Federal Center Master Plan



At the time the DFC Master Plan was done, the Denver Federal Center (DFC) was a 640-acre secured facility operated by the General Services Administration (GSA). The Federal Center is currently used for office, research and administrative purposes and serves approximately 8,000 employees. The DFC Master Plan update was completed in January 2008 to replace the 1997 plan and to address new opportunities for site development. The DFC Master Plan provides guiding direction for development to shape future growth and investment on the Federal Center site.

The vision for the DFC campus is to integrate a mix of uses that complement the larger community, serve as a model for innovative partnerships, and enhance value for taxpayers while embracing sustainability, design excellence and greater accessibility for the public.

The defining characteristic of the DFC Master Plan is the central quad planned for the core of the Federal Center property. The enhanced streetscapes throughout the campus would encourage area workers to walk to and from transit and into adjacent districts. A new, mixed-use center around the quad will be the heart of the campus and will be woven in the fabric of the surrounding neighborhoods and commercial districts via roadway and land use connections. The quad will be surrounded by complementary office buildings, including secure federal buildings, non-secure federal buildings and research buildings.

Plan Recommendations

Widen Alameda to 6 lanes from west of Union to Allison
Widen Kipling to six lanes from 6th Ave to Mississippi
Extend Routt St over 6th Ave and connect to Quail St.
Widen Routt St to 4-lanes from Alameda to 8th Ave.
Provide separate left turn lanes at all signalized intersections along Routt
Provide 2 WBR turn lanes at Union & 4th
Provide 2 WBR turn lanes at Union & 2nd
Provide 2 SBL turn lanes and 1 SBR turn lane at Union & 2nd
Provide 2 EBL turn lanes, 2 SBL turn lanes, 2 SBR turn lanes at Alameda & Oak
Provide 1 WBR turn lane at Alameda & Oak
Provide a NBL turn lane at Kipling & Gate 1. This includes realignment of the access to Jeffco Stadium on the east side of Kipling
Widen bridge by two lanes to accommodate dual lefts from NB to WB and SB to EB
Signalize the dual rights from the WB off ramp to NB Simms
Expand EB off ramp for dual left turns and dual right turns.
Grade seperation of Union & Alameda to accommodate 2030 volumes.

Note: Completed Projects shown in this format.

Connecting the West Corridor Communities: Implementation Strategy for Transit Oriented Development – 2011

This report provides a summary of relevant information for Transit Oriented Development (TOD) strategies and implementation in the West Corridor. The Center for Transit-Oriented Development evaluated 14 station area plans as well as demographic, economic and real estate conditions at each station. The station plans were then organized into three types of categories for implementation: transformational, intensification, and infill. The Federal Center Station was categorized as the transformational implementation type. This category is defined by a station area having sufficient development opportunities to transform into something different and more significant than the current uses and densities while also having moderate-to-high density employment and moderate-to-high development opportunity. Recommendations for implementation of TOD at the Federal Center Station include establishing a team of key leads from GSA, Lakewood, RTD, Metro West Housing Solutions and other partners to coordinate 1) the redevelopment and disposition of the Federal Center land, 2) the Union Boulevard corridor, and 3) the RTD TOD pilot program. The West Line Corridor Collaborative was since created to coordinate these efforts. Additionally, it was recommended that equity issues be addressed by incorporating affordable and senior housing opportunities into the process.

Union Blvd Corridor Urban Design Plan – November 2011

The purpose of this plan was to refine the vision for Union Boulevard, recommend a network of streets and sidewalks to support the vision, describe how to implement the vision, and incorporate the development plans of the GSA and DFC. The plan provides recommendations related to the design and location of future public and private investments such as streetscape improvements, sidewalk and pedestrian connections, benches, lighting and directional signage. Other components of the plan include opportunities to create strong connections to the Federal Center transit station and a summary of how properties could begin to redevelop to higher density, mixed use developments.

LAKEWOOD 2025 COMPREHENSIVE PLAN – APRIL 2015

The 2025 Lakewood Comprehensive Plan outlines the vision for the community, describes the existing development and services within the city, identifies growth, activity and industrial areas; provides an overview of the future of the multimodal transportation system; and discusses how the city will be a sustainable community.

Vision

Based on input from residents and discussions among members of the Comprehensive Plan Advisory Committee, a vision statement for the City of Lakewood was developed, which focuses on being a city that is livable, mobile, innovative, and sustainable.

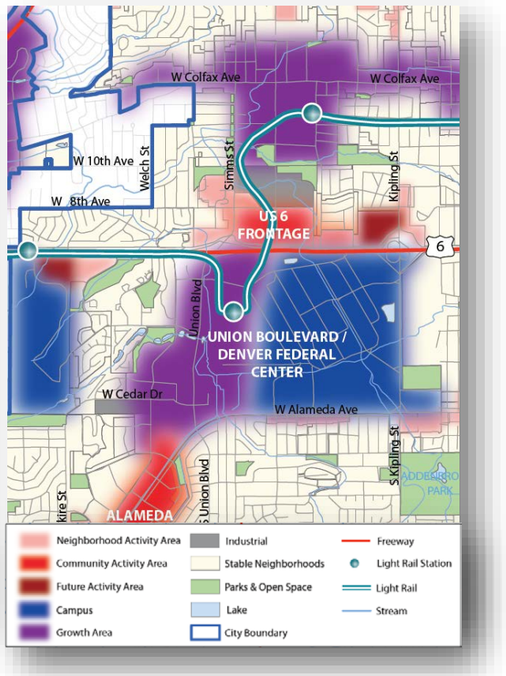
Future Development

Between 2010 and 2035, a population increase from 143,000 people to 190,000 is expected. The projected population increase would require a significant number of residential units to be constructed in a community that is largely built out. Based on the projected growth, approximately 812 units will need to be built annually to support the future growth. Additionally, employment is expected to increase from 73,500 jobs to 107,000, requiring a significant increase in new or redeveloped commercial space. The Comprehensive Plan identifies growth areas that are intended to accommodate the vast majority of residential and employment increases anticipated by 2035.

Growth Areas

The Union Boulevard corridor is located within one of the identified growth areas. A growth area is defined as locations that have been planned and zoned for higher density employment, retail and residential growth. The growth areas are also located along major transportation corridors, with frequent rail and bus service, in addition to automobile access.

Goals associated with the Union Boulevard and Denver Federal Center (DFC) Growth area include transforming the areas along Union Boulevard and along the western portion of the DFC into a high-density mixed-use urban corridor in accordance with transit oriented development principles and ensuring a strong working relationship with federal government agencies to encourage increased employment and continued high quality development.



Multimodal Transportation

The guiding principle for the movement of traffic in Lakewood is to "support connectivity through a variety of transportation options and encourage residents to utilize multiple transportation modes." The goals for multimodal transportation follow the guiding principle.

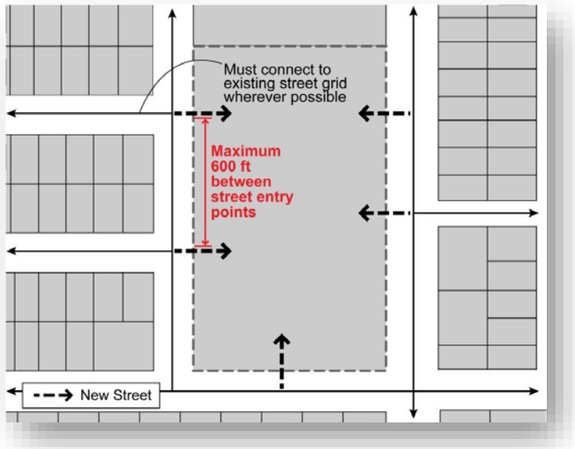
- Improve the pedestrian and bicycle environment within the city.
- Improve transit connections between neighborhoods and growth and activity areas, as well as between growth and activity areas.
- Promote the use of shared transportation options.
- Educate residents about, and encourage the use of, alternatives to the automobile.
- Provide adequate maintenance of the existing transportation network to provide safe and reliable options.
- Ensure that adequate transit service and schedules are provided within the city.
- Strategically provide additional capacity and operational efficiencies on roadways to limit congestion and expand multimodal options.
- Reduce speeding on local streets through residential neighborhoods.

The Comprehensive Plan recognizes that as Lakewood continues to reach build-out of vacant private properties, and continues to promote and encourage infill and redevelopment, consideration of the connection between transportation and growth areas becomes important. Further, it states that increasing the frequency of transit, encouraging new transit routes, and providing pedestrian and bicycle opportunities for commuting will be important in achieving the desired vision of the growth areas and zoning.

As a means of improving the transportation system for all modes, the Comprehensive Plan incorporates goals for establishing complete streets and improving way-finding, which helps guide people through and around a community.

Zoning

In 2012, the Lakewood Zoning Ordinance was updated to include mixed-use districts throughout the city. Since then, the Zoning ordinance has been updated several times with minor changes. The most recent update became effective on Jan. 30, 2017. The entire Union Boulevard Corridor consists of mixed-use zoning districts intended to allow for a range of different uses within the same building or block. While single uses are permitted for individual buildings, the mix-use zoning districts allow for commercial and residential uses to be built within the same block, which is less flexible under a typical Euclidean zoning code. The new code also focuses to encourage pedestrian-friendly development, maintain the integrity of adjacent neighborhoods, provide areas for public and semi-public uses, and provide development flexibility within a specific district. The zoning category within a half-mile walking distance of the Federal Center Station is Transit Mixed Use, which transitions to Urban Mixed Use around Sere Lane (outside the half-mile walking area), and then to Suburban Mixed Use south of Cedar Lane. These categories serve as contexts to indicate the appropriate development pattern, level of pedestrian and auto access, parking requirements, and maximum building heights for a given area.

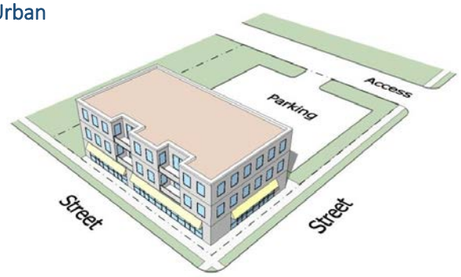


In urban and transit designations, development of five acres or greater in size must provide connections to and through the site at a maximum of 600 feet.

Transit

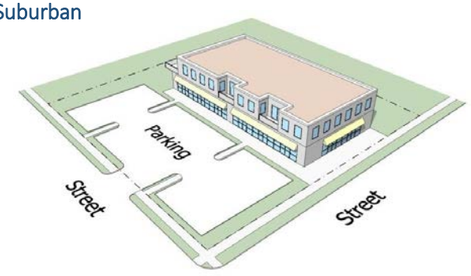
The Transit category restricts auto-oriented design elements, requires that buildings be pulled up toward the street, with parking located behind buildings or in above or below grade structures, and is conducive to pedestrian and bicycle travel.

Urban



The Urban category permits auto-oriented design elements with specific design requirements, requires that parking be located behind or on the side of buildings, with a short distance between buildings and the street, and is somewhat conducive to pedestrian and bicycle travel.

Suburban



The Suburban category permits auto-oriented design elements, allows for a limited amount of parking between the building and the street, and has limited connectivity for bicycles and pedestrians.

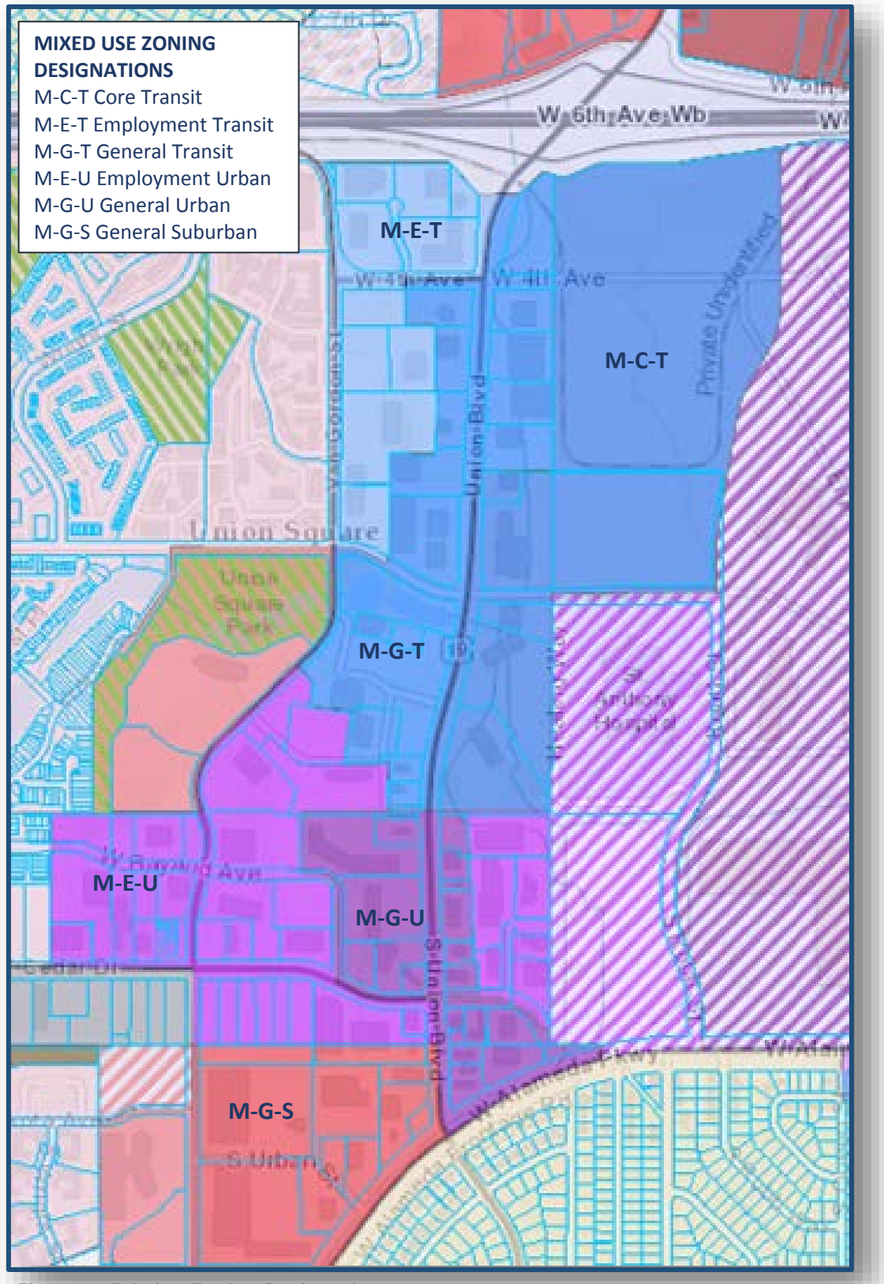


Figure 1: Existing Zoning Designations

Land Use

Development within the corridor has increased significantly within the last 10 years. Since 2007, approximately 1.6 million square feet of development has occurred within the focus area, including completion of St. Anthony Hospital. While that level of development intensity is not expected to continue over the next 20 years, additional residential, medical office and hotel uses are already being planned for the area.

Historically, the Union Boulevard Corridor has been developed with suburban office, retail and restaurant uses. The largest office use within the corridor is the Denver Federal Center, which employs approximately 8,000 people. In addition to the Denver Federal Center, the focus area comprises 360,000 square feet of retail in 35 buildings, approximately 32,000 residents and 5,000-6,000 additional employees. The large business community and residents in this area support the many restaurants and businesses along this corridor, generating high volumes of traffic (vehicular, bicycle and pedestrian) throughout the day.

Figure 2: Developments Constructed Between 2010 and 2017

Figure 3: Developments in Planning Today

Building Occupancy

Building occupancy can be a measure of the health of an area, but there are many factors that impact occupancy. For both retail and office buildings, availability of space is the first factor to consider. In the Union corridor, the amount of available retail space has decreased in the last 5 years with the demolition of the retail strip near Wendy's and Sere Lane and the redevelopment of the Beacon 85 apartments. On the other hand, the amount of office space has increased in the last 5 years due to the construction of the hospital, medical office buildings and other office uses along the corridor.

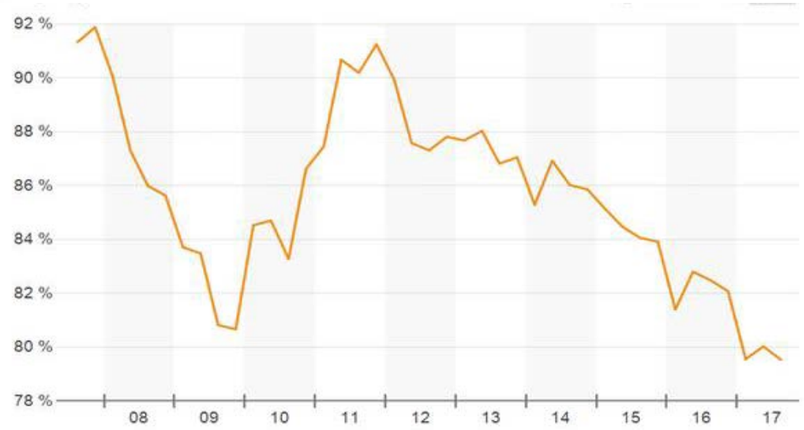
Other factors to consider when evaluating building occupancy include office culture, office set-up, tele-commuting, shared spaces, type of office, building age, view shed, and rent. For example, some consultants today are modifying their office space to be more open to allow for additional collaboration. As a result, the amount of space allocated to each employee is smaller, allowing more people to fit within the same footprint.

In order to evaluate the health of the corridor as it relates to building occupancy, occupancy can be compared with the average occupancy within the market. While office occupancy within the corridor is lower than the market average of 80-88%, office occupancy in Denver is also experiencing a 15 year low, indicating that some of the factors outlined above may be having an impact throughout the Denver Metro Area. Retail occupancy within the corridor is generally consistent with the market average of 90-94% occupancy.

Figure 43: Union Boulevard Building Occupancy

Office Occupancy Rate

The Union Boulevard corridor is currently comprised of 28 office buildings totaling 2.1 million square feet of space, of which approximately 18.6%, or 392,000 square feet is currently vacant, up from a five year average of 14.1%.



Retail Occupancy Rate

The Union Boulevard corridor is currently comprised of 35 retail buildings totaling 360,000 square feet of space, of which approximately 3.8%, or 13,500 square feet is currently vacant, down from a five year average of 12.5%.

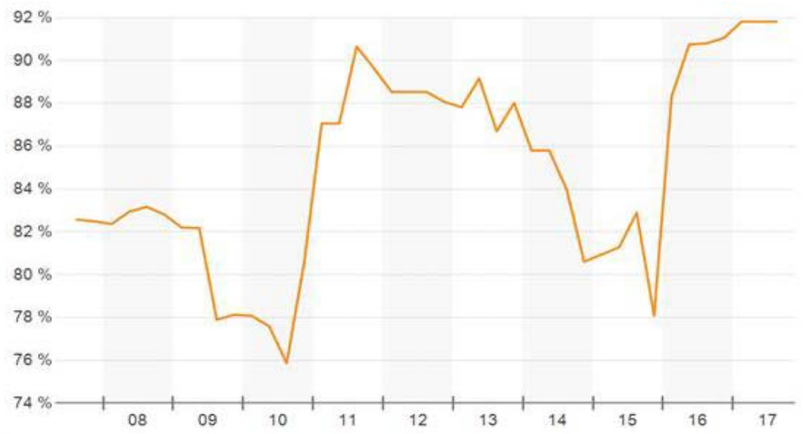


Table 1: Parking Overview for Office & Residential

Office				Parking Occupied							
Address	Building Occupancy	Bldg SF	Parking Supply	Noon 5/17/17		2:00pm 5/17/17		6:00pm 5/23/17		Existing Parking Supply (per 1,000 sf)	Parking Maximum (per 1,000 sf)
66 Van Gordon (State Farm)	43%	60,710	187	23	12%	22	12%	0	0%	3.08	3.5
360/370 Van Gordon (Tallgrass, Kinder Morgan)	100%	151,752	377	253	67%	275	73%	27	7%	2.48	2.5
134/44 Union (Inspector General, US Fish & Wildlife, CGI)	87%/79%	200,790	804	326	41%	319	40%	48	6%	4	2.5

Residential				Parking Occupied							
Address	Building Occupancy	DU	Parking Supply	12:00pm 5/17/17		2:00pm 5/17/17		6:00pm 5/23/17		Existing Parking Supply (per DU)	Parking Maximum (per DU)
Union West 35 Van Gordon St	66%	267	425	107	25%	112	26%	160	38%	1.59	1.5

Much of the development along the Union Boulevard corridor was constructed in the 1980s. This is reflected in the relatively low-density developments and large parking lots. With the updated zoning code, allowable land use densities have increased and parking requirements have been reduced, and in some cases restricted. However, these changes will only be reflected with new development or redevelopment.

As shown on Figure 5, many of the existing office buildings are providing between 3.0 and 4.0 spaces per 1,000 square feet, which would fall within the urban/suburban designations today. Of the buildings shown, 68% are located in a transit designation, within a quarter mile of the transit station, and 28% are located in an urban designation, within a quarter to half mile from the transit station. New buildings within a quarter mile of the transit station would be restricted to a maximum of 2.5 spaces per 1,000 square feet. Buildings located between a quarter to half mile of the station would be restricted to 3.5 spaces per 1,000 square feet.

To identify existing parking supply and demand along the corridor, parking associated with office, retail, restaurant, and residential uses were observed. The graphics on this page represent the existing parking supply and demand of office buildings within the focus area. Based on the revised zoning code, the current parking maximum for the office uses in the table is between 2.5 and 3.5 spaces per 1,000 SF. The existing supply generally falls within this range, except for the parking area associated with 134 Union Blvd. and 44 Union Blvd. While those buildings are 80-90% occupied today, they are only using 40% of their supply. Assuming this trend continues, if the buildings were 100% occupied, they would only require 394 spaces, or 1.96 spaces per 1,000 square feet, indicating that the current office parking maximum is more than adequate for the existing demand.

Similarly, the office building located at 66 Van Gordon St. is 43% occupied, but it is only using 12% of the supply. Continuing this parking trend, at 100% occupancy a supply of 53 spaces, or 0.87 spaces per 1,000 square feet would be required to support anticipated demand. While the existing office uses at 360 & 370 Van Gordon St. are 100% occupied, they are currently only utilizing 1.81 spaces per 1,000 square feet. These parking demands indicate that a portion of the existing parking supply at these locations could be removed or repurposed without impacting the users of the building.

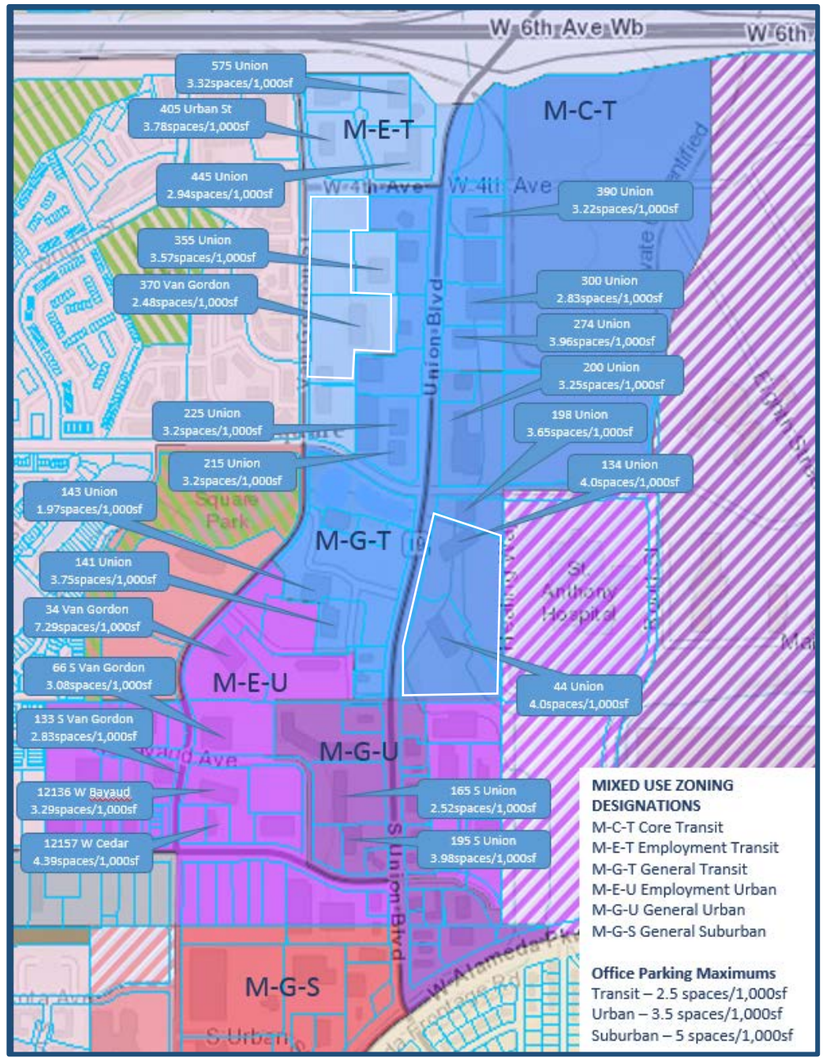


Figure 44: Union Boulevard Zoning Designations & Office Parking Supply

Due to concerns addressed about the new 85 Beacon apartment project being constructed near Wendy's on Union Boulevard, we evaluated the new apartment complex at 35 Van Gordon St. to see how parking is being utilized in multifamily residential. At the time that parking counts were conducted, only 66% of the units were occupied. However, during the 6 o'clock hour, only 38% of the parking spaces were occupied. While an additional count later into the evening would be beneficial to evaluate total demand, it is interesting to note that over 100 cars of the 176 occupied units remained in the garage during all hours counted. This leads us to believe that a number of the residents are using other modes to commute to work.

Table 2: Parking Overview for Retail/Restaurant

Retail/Restaurant				Parking Occupied							
Address	Building Occupancy	Bldg SF	Parking Supply	Noon 5/17/17		2:00pm 5/17/17		6:00pm 5/23/17		Existing Parking Supply (per 1,000 SF)	Current Parking Maximum (per 1,000 SF)
Retail/Restaurant 375 Union (Westerra, Potbelly, Sport Clips, Noodles & Co)	100%	16,973	61	45	74%	23	38%	19	31%	3.59	Retail 3.0 Restaurant 5.0
195 S Union (West Rail, Soup N Juice, Firehouse Subs, Union Salon)	71%	23,342	93	46	49%	27	29%	63	68%	3.98	Retail 4.0 Restaurant 8.0
Restaurant 150 S Union (Starbucks, Anthonys, Hana Matsuri, Mad Greens)	100%	13,650	42	34	81%	18	43%	25	60%	3.08	8.0
385 Union (Jose O' Shea's)	100%	9,252	110	66	60%	43	39%	104	95%	11.89	5.0
12037 W Alameda (McDonalds)	100%	5,077	43	32	74%	15	35%	16	37%	8.47	12.0

Within the corridor there are many restaurant uses, but the retail uses are limited and many are located within buildings serving other uses. In an effort to include analysis of the retail parking supply and demand, the analysis evaluates two strip centers that have both restaurant and retail uses. Three additional locations were chosen to analyze a sampling of the restaurant uses separately.

The retail/restaurant strip centers both provide a parking ratio closer to that of the retail requirement. However, despite the limited parking supply, the mix of retail with the restaurant uses has helped to reduce demand, resulting in an adequate parking supply. Additionally, both sites are located next to office buildings that currently provide more than adequate parking for their tenants. In the event that demand for these strip centers increased or the mix of uses became predominantly restaurant uses, parking demand would exceed the parking supply and patrons would utilize the existing office parking adjacent to these sites.

Of the restaurants analyzed, all appear to have adequate parking to accommodate their parking demand despite providing fewer spaces than required at 150 S Union and 12037 W Alameda. However, on the day that these parking assessments were conducted, people were observed parking in the southwest corner of the 44 Union Blvd. lot and walking to 150 S. Union. Approximately 15-20 cars were seen parked at that location, indicating that the parking supply for 150 S. Union may not be adequate to serve the existing demand. This is likely due to the fact that the parking provided is more consistent with retail parking requirements than the existing restaurant uses. It should be noted that when the amount of parking provided is small, such as 150 S. Union and 12037 W. Alameda Ave., circulation through the parking lot also becomes very important to keep traffic flowing. Doing so allows vehicles to circulate to find an open spot and limits the impact on the adjacent arterial or collector roadway. During observations of 150 S. Union, cars were seen backing out onto Union Boulevard as people in the parking lot were backing out of their spots, creating congestion on Union Boulevard.

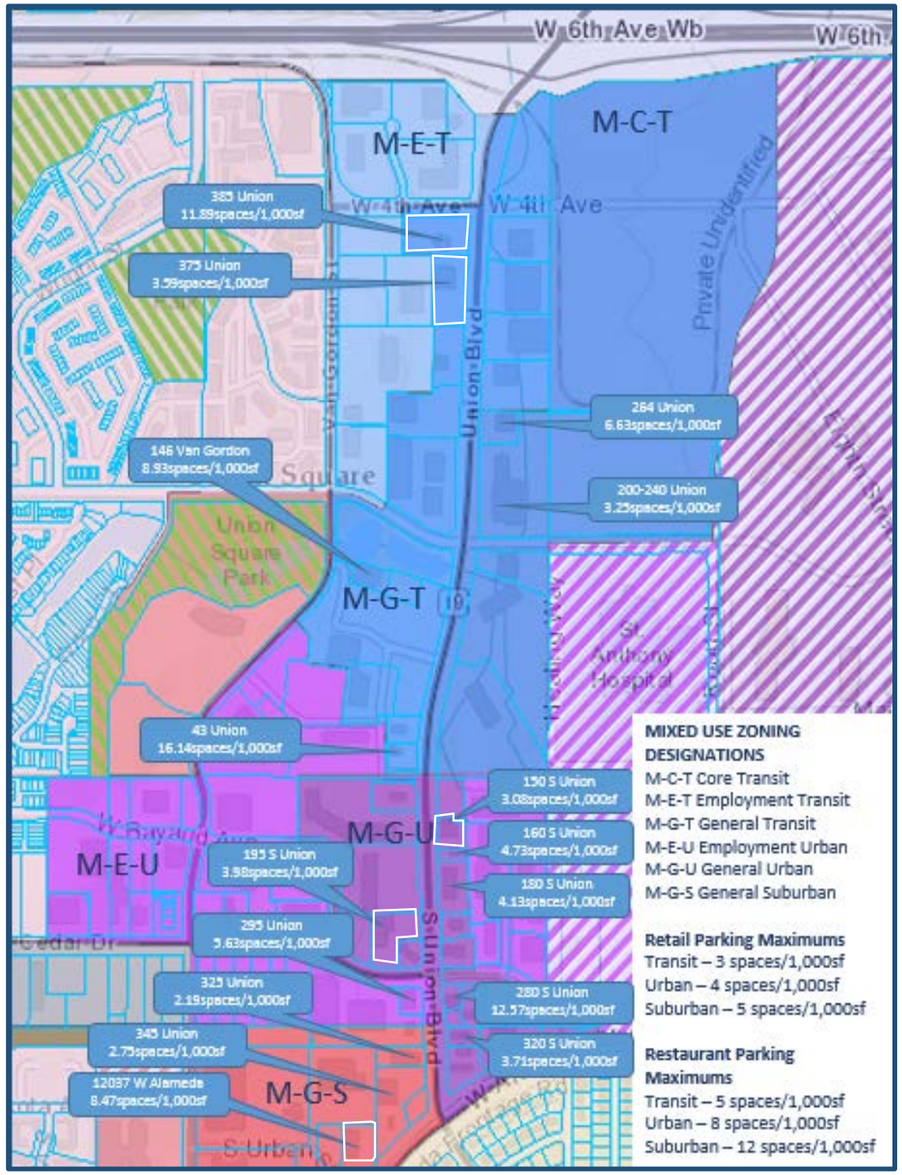


Figure 85: Union Boulevard Zoning Designations & Retail/Restaurant Parking Supply

Shared Parking

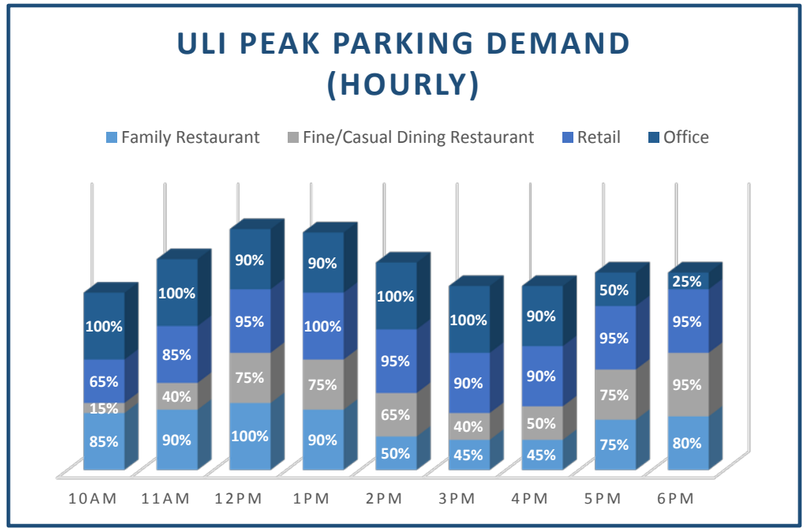
Shared parking is the concept that two different uses can share a parking space if their demand occurs during different times of the day. The optimal mix of uses are office and hotel since parking demand for office peaks at 10 a.m. and 2 p.m., while the peak demand for hotel occurs between 10 p.m. and 6 a.m. Along the corridor, there are several locations where a mix of uses exists. One location that seems to have limited parking with a high parking demand is located at 200-240 Union Blvd. The site is surrounded by large office buildings to the north, west and south, and is adjacent to the Federal Center Station and St. Anthony Hospital. The site consists of an 88,588 square foot office building, and 24,320 square feet of retail and restaurant uses, including three hair and nail boutiques (Regus, Supercuts, & Opi Nails), five family restaurants (Jason's Deli, Rubios, Subway, Smashburger & Tuk Tuk Thai Grill), and a sit-down restaurant (240 Union).

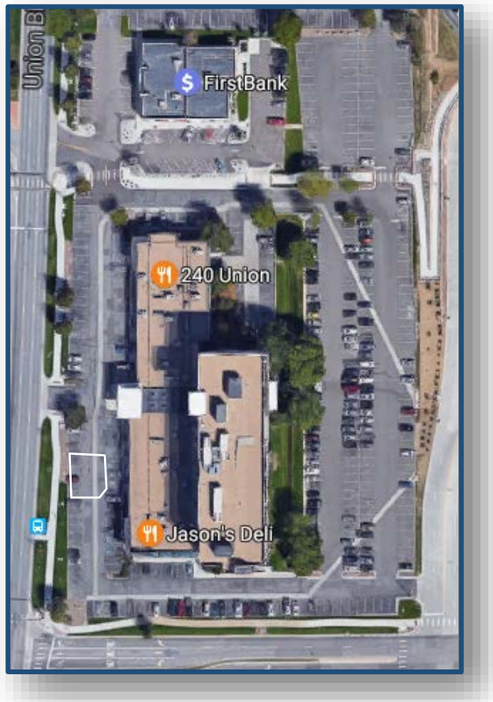
To assess the parking demand at this location, shared parking concepts from Urban Land Institute's Shared Parking manual, 2nd Edition, were evaluated. ULI Shared Parking identifies when the peak parking demand for various uses occurs. The peak parking demand for each of these uses varies, but when the uses are combined, the peak demand occurs at noon. Unlike the mix of office and hotel uses, the mix of uses in this building nearly all peak around the same time. The only use that requires less than 90% of their total parking at this time is the "Fine/Casual Dining Restaurant", and even that use experiences 75% of total demand at noon.

Table 3: Parking Overview for Mixed Use Development

Mixed Use (Retail/Restaurant/Office)				Parking Occupied							
Address	Building Occupancy	Building Square Feet	Parking Supply	Noon 5/17/17		2pm 5/17/17		6pm 5/23/17		Existing Parking Supply (per 1,000 Square Feet)	Current Parking Maximum (per 1,000 Square Feet)
200-240 Union (Jason's Deli, Subway, Smashburger, Rubios, 240 Union)	100%	112,908	367	324	88%	242	66%	178	49%	3.25	Retail 3.0 Restaurant 5.0 Office 2.5

This site currently provides 367 parking spaces. Based on the new parking maximums in the updated zoning code, the uses in this building would be required to provide 326 parking spaces if they were located on different sites. However, applying the concept of shared parking and peak hourly demand, it was determined that a reduction of 7.7% or 25 fewer spaces would be required to accommodate these uses. However, parking counts were conducted at this site on Wednesday, May 17, 2017 and a peak parking demand of 324 spaces was observed at noon. This indicates that the current parking standards already account for the concept of shared parking that is typically associated with mixed-use buildings in transit or urban designated areas. If the desire is to reduce required parking further, it is recommended that additional considerations be made, such as the enforcement of Transportation Demand Management Programs, enhanced wayfinding, or regulating the mix of use to increase the amount of parking that is shared.





VEHICLES

Union Blvd. is a north/south roadway providing regional connectivity within Lakewood. Approximately 1.15 miles to the east, Kipling St. provides additional north/south connectivity. To the west, no other north/south routes exist for 2.8 miles, until reaching I-70/C-470. As a result, Union Blvd. serves approximately 41,000 cars per day.

For local trips, Van Gordon St. and Routt St. provide north/south connectivity. East/west connectivity occurs via W. 4th Ave. and W. 2nd Pl. W. Cedar Dr. provides a connection between Van Gordon St. and Union Blvd., but does not continue to Routt St.. As Union Blvd. is one mile long from W. 6th Ave to Alameda Pkwy., the local roadway network creates "super blocks" for vehicles and pedestrians to travel and a roadway spacing of a third to half mile.

BLOCK SIZES

Urban planners use a concept of transect zones to determine the appropriate density and form for a given area. These transects go from very low density rural development to very high density urban development. Along the Union Boulevard corridor, density ranges from high density urban transects to lower density suburban transects. In these transects, block perimeters, or the measurement around a block, should be between 2,000 to 3,000 feet (or 500-750 feet between parallel roads) to allow for a distribution of traffic through the corridor, and to reduce the distance a pedestrian must travel. The large blocks in the study area result in fewer options for vehicles to travel, which leads to wider roads and larger intersections. The larger the road or intersection, the more difficult and less comfortable it is for pedestrians to cross the road. While many of the existing blocks would likely be difficult to break up with vehicular roads, it may be possible to do so for pedestrians, with new sidewalks and shared-use paths.

TRANSIT

The area is served by The Federal Center Station on RTD's W line from approximately 4 a.m. through 2 a.m., or 22 hours a day. Federal Center Station is located east of Union Blvd., between W. 4th Ave. and W. 2nd Pl. and serves approximately 2,700 riders per day. The station opened in 2013 and ridership was expected to grow with time, but based on ridership data from RTD, has remained relatively steady since opening day.

One of the challenges of providing a transit network that will rival taking a car is the concept of first-mile/last-mile. The idea is that people have a way to get close to their destination, but they may or may not have a way to get to their final destination. Bus, biking and walking are the most common ways that people use to travel to and from their final destination, but other modes could include b-cycle, Zagster, Uber or Lyft. RTD has found that the most common mode of travel to their stations is by foot, as 75% of their patrons walk to access RTD stations.

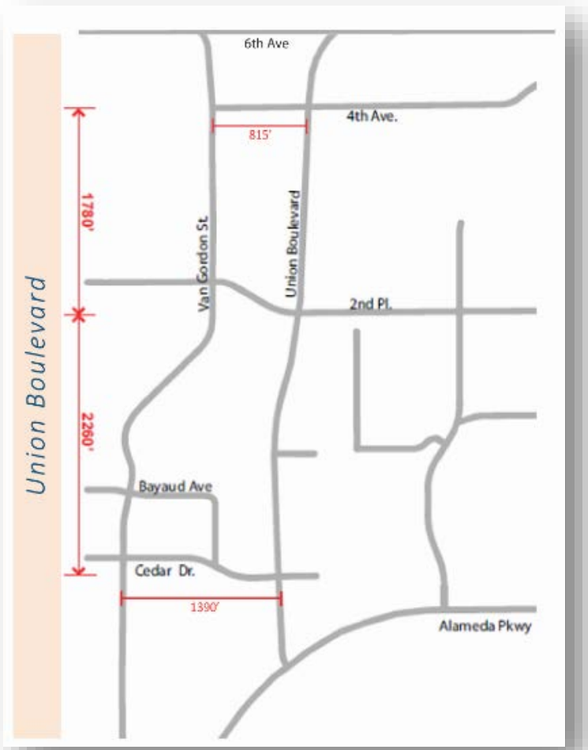
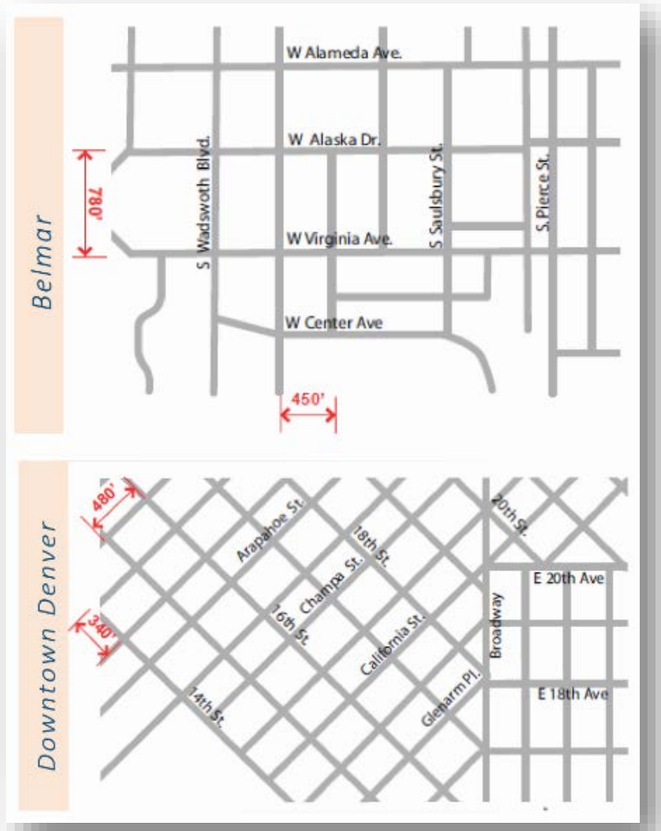


Figure 124: Block-Size Demonstrations for Comparison

Figure 125: Existing Bike & Pedestrian NetworkFigure 126: Block-Size Demonstrations for Comparison



Bus

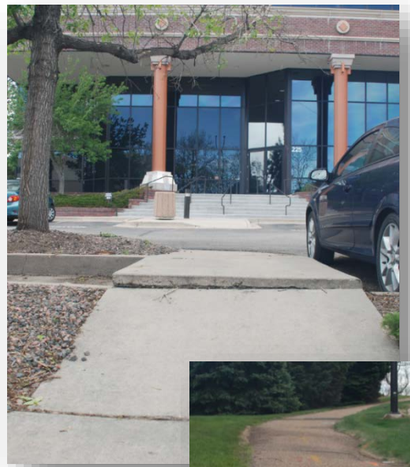
RTD also provides bus service in the area via regional routes CV and GS; local routes 3, 16, 17, 21, 100, and 100L; and the Green Mountain Call-N-Ride. These routes cover travel through Golden to Boulder, north to Westminster, south into Green Mountain and to Schaffer Parkway; east to the Aurora Metro Center Station R Line; and to 16th Street in Downtown Denver; and throughout the study area. However, the availability of regular service in and around the area is limited, making it difficult for users to get around without a car.

Bicycles

Within the study area, a network of north/south bicycles lanes have been provided on Van Gordon St. and Routt St. from W. Alameda Pkwy. to W. 4th Ave., and an on-street shared roadway is provided on the south side of Alameda Pkwy., which is low speed and safe for bicyclists to use. However, if a bicyclist chooses to travel nearly anywhere else within the study area, they are forced to either travel in the vehicle lanes with cars, or on the sidewalks with the pedestrians. The safest option for the bicyclists is to ride on the sidewalks, but many times that becomes challenging with the groups of pedestrians that utilize the sidewalks, so bicycles are forced to find other routes, such as riding through parking lots to avoid confrontation.

Pedestrians

The existing pedestrian network follows the roadway network and the quantity of infrastructure that is provided is quite good considering the fact that many of the sidewalks are between 6 ½ to 8 feet wide. There are only a few locations where sidewalk connections are missing or are less than 5 feet wide. However, a closer look at the existing infrastructure shows large cracks and bumpy asphalt in the existing sidewalks and a lack of ADA accessible connections to the larger pedestrian network.



As mentioned above, the existing transportation network consists of super blocks that increase the distance a pedestrian must travel, and as a result, many pedestrians are seen walking through parking lots or crossing Union Blvd. mid-block. Creating smaller pedestrian blocks of 2,000 to 3,000 foot perimeters and providing additional pedestrian crossings of Union Boulevard would improve the safety and environment of the existing network, potentially leading to an increased pedestrian volume and potentially reducing vehicular demand.

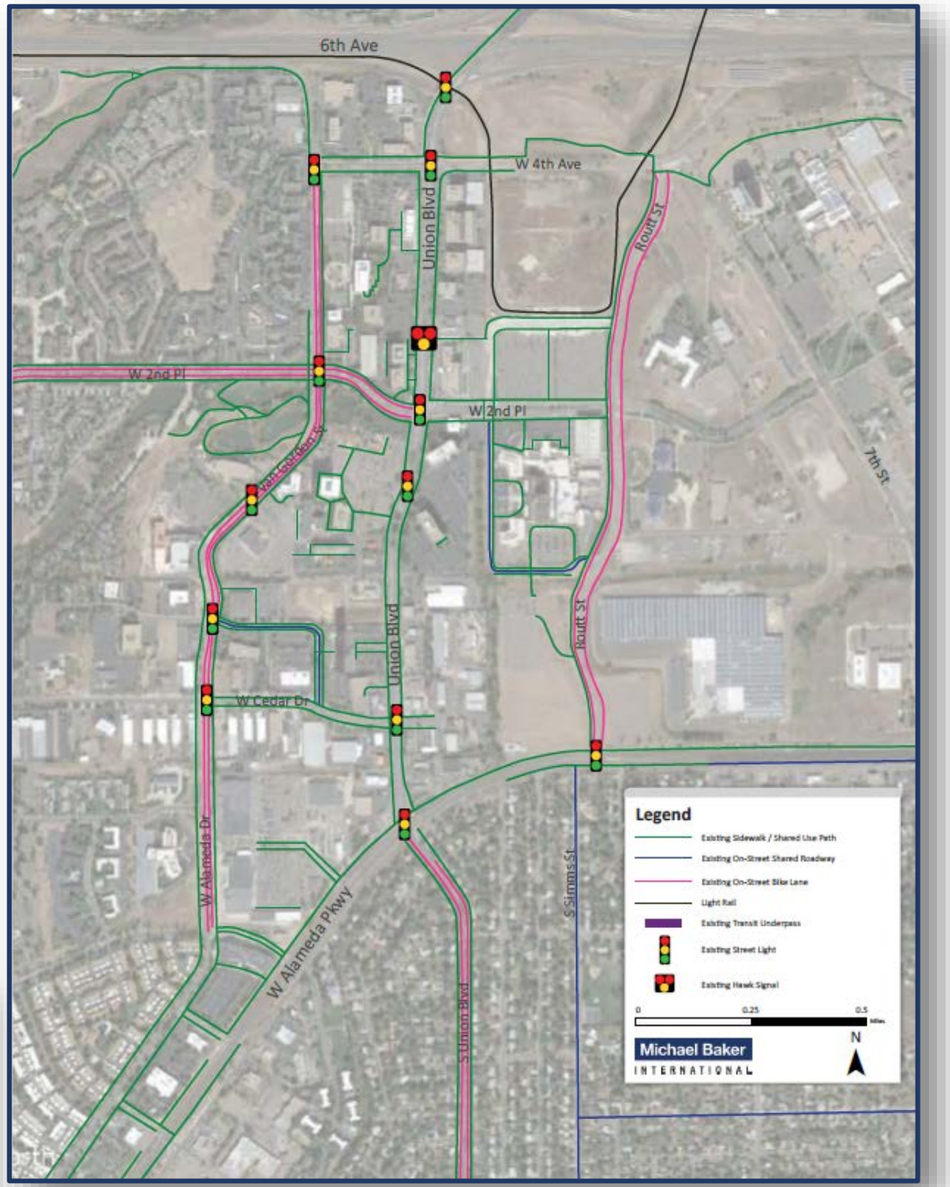


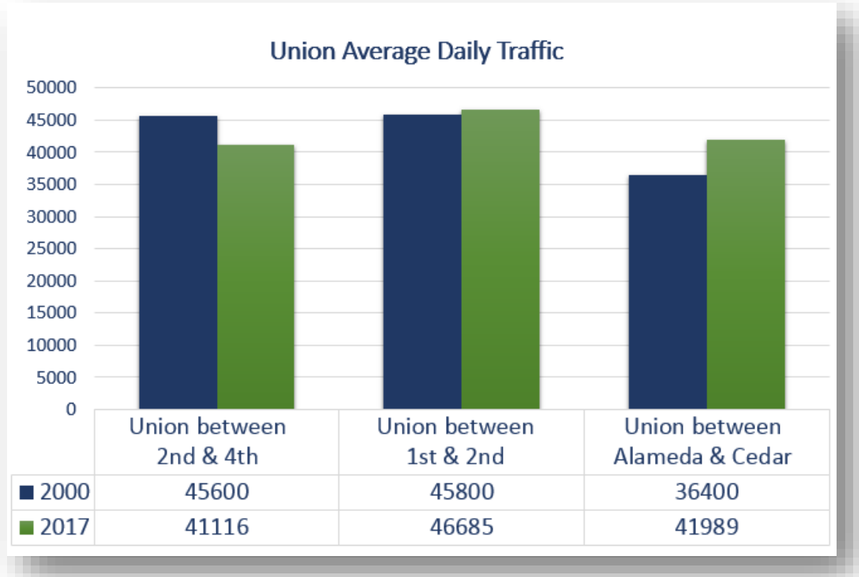
Figure 127: Existing Bike & Pedestrian Network

Traffic Volumes

Average Daily Traffic Counts (ADT)

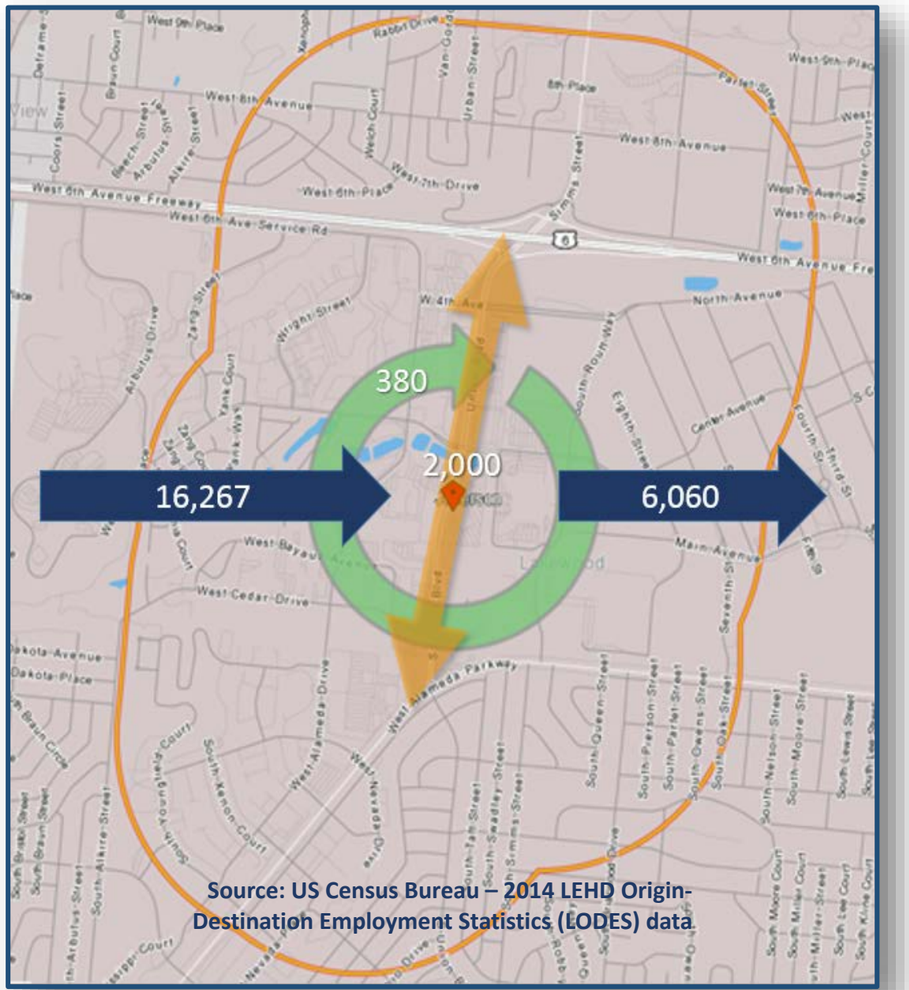
Daily traffic counts were conducted throughout the study area to determine the volume of traffic on the study area roadways. These counts were compared to older counts conducted as far back as 1991. These counts show that traffic varies along the corridor, with some locations increasing over time and others decreasing. The section of Union Blvd. between W. 2nd Pl. and W. 4th Ave. has decreased, but the decline in trips could be a result of the opening of light rail at the Federal Center Station in 2013. Daily boardings and alightings for Federal Center Station have been between 2,450 and 2,750 people per day over the last three years.

Traffic counts on other roadway segments in the area indicate a shift in travel patterns along the corridor. Generally speaking, traffic on Van Gordon St. and Union Blvd., north of W. 2nd Pl. has decreased, but traffic to the south on Van Gordon St., Union Blvd. and Alameda Pkwy. has increased. Some of the increases could be due to new development in the area, such as the hospital or new apartments, hotels and restaurants; while others could be a result of re-routed trips due to the emergence of real-time traffic data showing where congestion exists on the regional roads.



TRAVEL PATTERNS

The United States Census Bureau provides Longitudinal Employer-Household Dynamics (LEHD) data that shows where people live and work. The latest data provided is from 2014, but analyses can be run as far back as 2002. The data shows that more than 16,000 people travel to the area outlined in orange for work, 6,000 leave the area for work, and only 380 live and work within the area. From traffic counts in the study area we derived that only 2,000 of the 41,000 trips per day are people driving through the corridor to get to their destination.



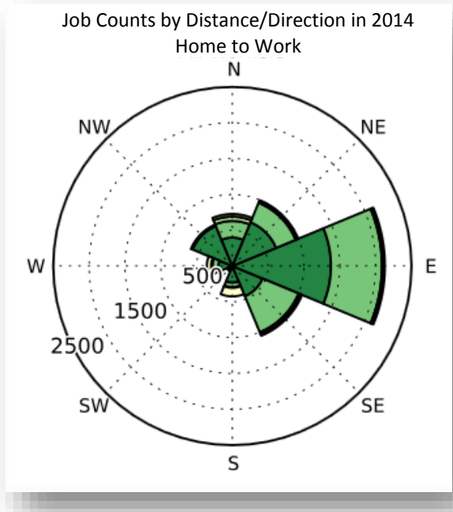
Source: US Census Bureau – 2014 LEHD Origin-Destination Employment Statistics (LODES) data

Source: US Census Bureau – 2014 LEHD Origin-Destination Employment Statistics (LODES) data

Within the LEHD program, the focus area for the Union Boulevard Corridor Study was selected and a 0.5 mile buffer was added (shown in orange). Within the buffered area, an analysis was conducted to determine where the people that live in this area travel to work in 2014. The radial graphic to the right, shows that approximately 2,000 of the 6,388 people living in the area travel east to Denver for work, and the table below indicates that 38% of the people that live in this area travel more than 10 miles to get to work. The number of people living in the area has reduced by 18%, from 7,561 people in 2002.

Jobs by Distance - Home Census Block to Work Census Block

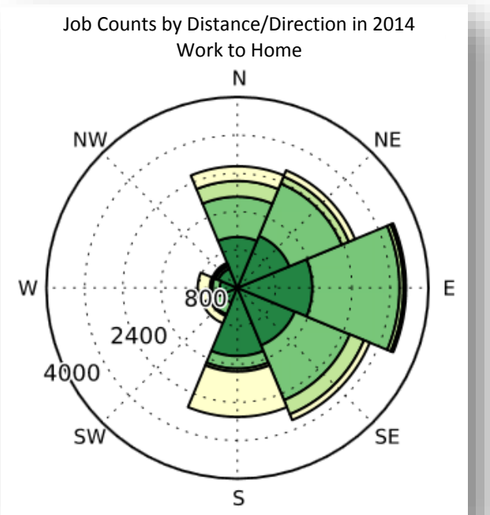
	2014 Count	2014 Share
Total All Jobs	6,388	100.0%
Less than 10 miles	3,951	61.9%
10 to 24 miles	1,965	30.8%
25 to 50 miles	152	2.4%
Greater than 50 miles	320	5.0%



Another analysis was conducted to determine where the employees in the area live. Using the same 0.5 mile buffer around the focus area, the LEHD data shows that the distribution of employees is more evenly distributed in all directions except that travel to the west is minimal. Of the 16,647 employees identified in this area, 12%, or 2,042 travel more than 50 miles to get to work, with the majority of those travelling more than 50 miles coming from the south, indicating they commute from Colorado Springs. The number of people working in the area has increased by 51% from 11,010 in 2002.

Jobs by Distance - Work Census Block to Home Census Block

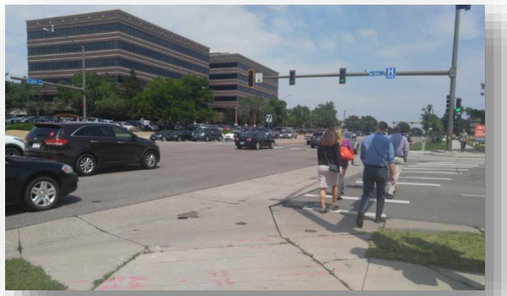
	2014 Count	2014 Share
Total All Jobs	16,647	100.0%
Less than 10 miles	7,694	46.2%
10 to 24 miles	5,839	35.1%
25 to 50 miles	1,072	6.4%
Greater than 50 miles	2,042	12.3%



Peak Hour Counts

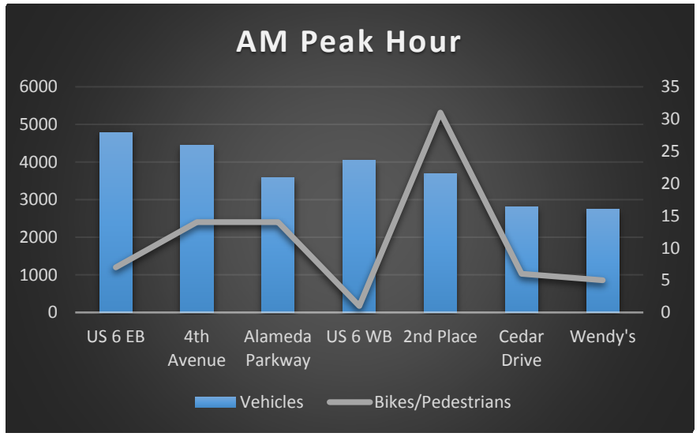
Turning movement counts of vehicles, bicycles and pedestrians were conducted on Tuesday, May 23, 2017, during the AM, mid-day, and PM peak hours. Counts were conducted at intersections along Union Blvd. and Van Gordon St., with a couple additional counts conducted along W. Alameda Ave. For all of the intersections counted, common peak hours of 7:15-8:15 a.m., noon-1 p.m. and 4:30-5:30 p.m. were identified.

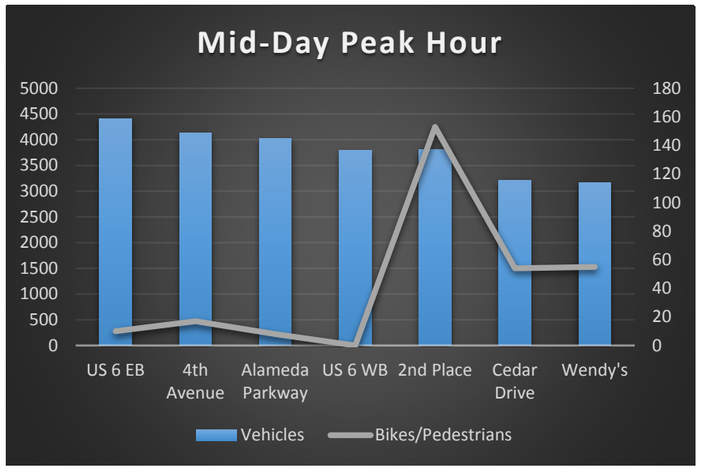
Generally speaking, heading north on Union Blvd. approaching US 6, traffic volumes increase. The exception is the Union Blvd./Alameda Pkwy. intersection which has traffic volumes equal to the intersection of Union Blvd. with US 6 Westbound. While the intersections of Union Blvd. with W. Cedar Dr. and the Wendy's experienced the lowest traffic volumes, these intersections still experienced 2,800 to 3,800 cars during the peak hours.

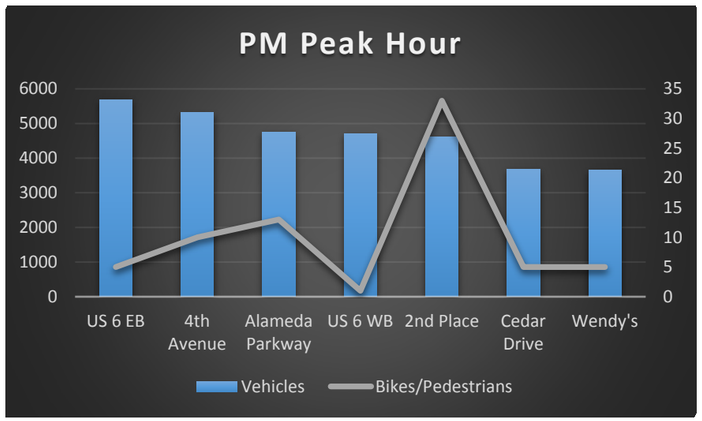


The intersection of Union Blvd./W. 2nd Pl. experienced significantly higher bicycle/pedestrian counts than any other intersection within the corridor. During the mid-day peak, this intersection experienced 150 bicycles/pedestrians compared to 30 or 35 bicycles/pedestrians during the AM and PM peak hours. Along the remainder of the corridor, the bicycle/pedestrian counts were also highest during the lunch hour. The intersections with W. Cedar Dr. and the Wendy's experienced approximately 55 bicycles/pedestrians during the mid-day peak hour, compared with five pedestrians at each of those intersections during the AM and PM peak hours. The remaining intersections experienced minimal (less than 15) bicycles/pedestrians during peak hours.

With approximately 14,000 employees in the area, the lunch hour rush creates a conflict with vehicular traffic. Along the corridor there are four major restaurant strips that users frequent; 1) Noodles & Company/Potbelly, 2) Jason's Deli/Subway/Tuk Tuk/Smash Burger/Rubios/240 Union, 3) Old Chicago/Chipotle/Tokyo Joes, and 4) Jimmy John's/Panda Express/Mad Greens/Anthony's/Hana Matsuri/Good Times. Both of the restaurant strips on the east side of Union Blvd. have limited parking, leading to a higher volume of bicycle and pedestrian traffic. The first strip center has the fewest restaurants, and is located furthest from the majority of office buildings. The second and third restaurant strips are adjacent to the intersection of Union Blvd./W. 2nd Pl. which would explain the high pedestrian volumes at that location. The fourth restaurant strip is located between the Wendy's and W. Cedar Dr., which would account for the high bicycle/pedestrian volumes at those locations.



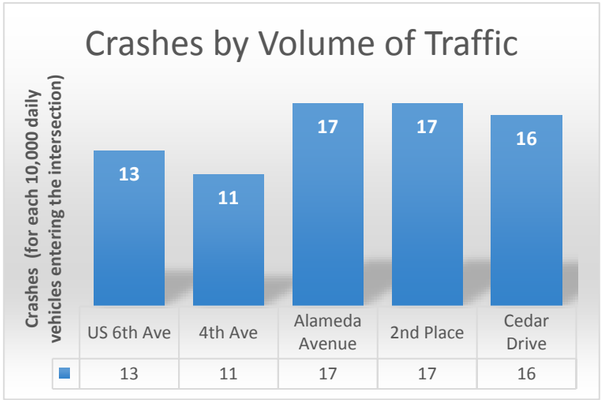




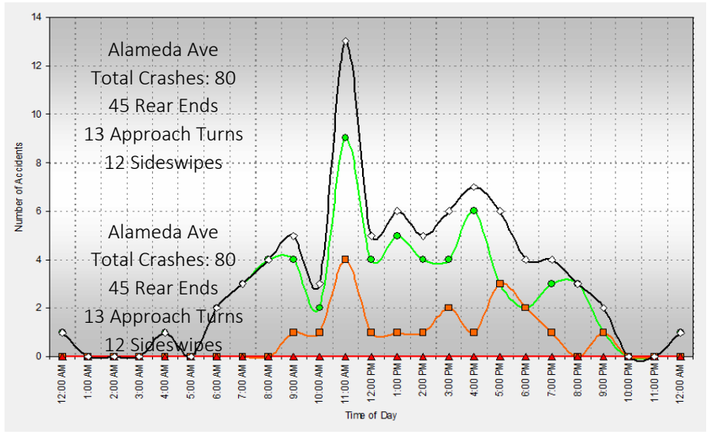
Crash Data

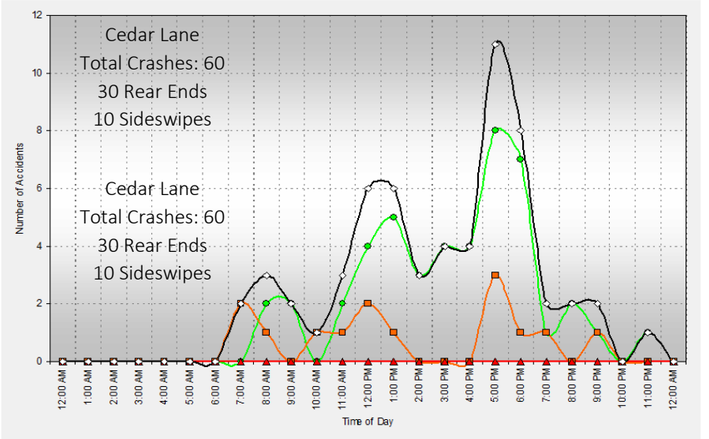
Hourly Crash Data

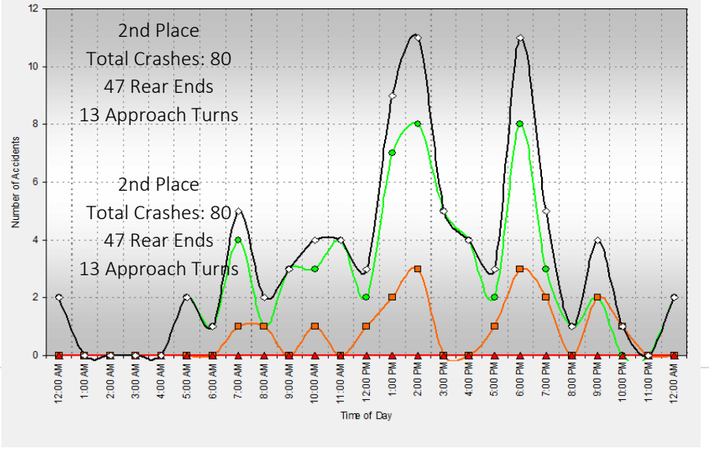
The latest crash data available for the study area was for December 2015. To gain a better understanding of the crash situation along the corridor, crash data was collected for the three years prior to December 2015 and analyzed by intersection and time of day. Graphs of this information are provided on the next page. Additionally, the crash data can be compared to the traffic counts at the intersections along the corridor to assess the situation. Crash data for US 6th was the highest, but that includes both signalized intersections at the ramps for US 6 eastbound and westbound. The next highest crash intersections were at W. Alameda Ave. and at W. 2nd Pl. While Alameda has the highest volume of vehicles during the PM peak hour and the highest number of pedestrians during the AM peak hour, the peak crash time was during the mid-day peak hour. W. 2nd Pl. experiences a high volume of crashes during both the mid-day and PM peak hours, with the mid-day peak hour experiencing the highest volume of pedestrians, and the PM peak hour experiencing the highest volume of vehicles. Interestingly, W. 4th Ave. experiences the lowest number of crashes, despite having the second highest traffic volume.

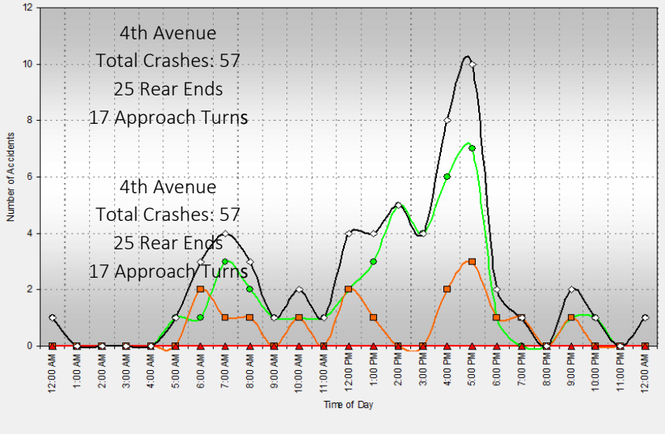


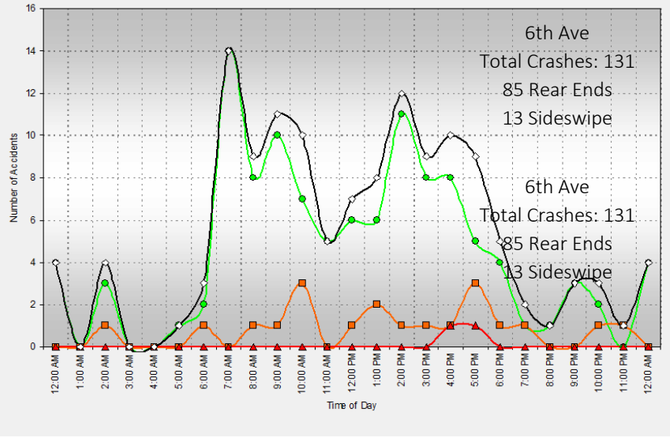
TIME OF DAY CRASH DATA (12/2012 THRU 12/2015)







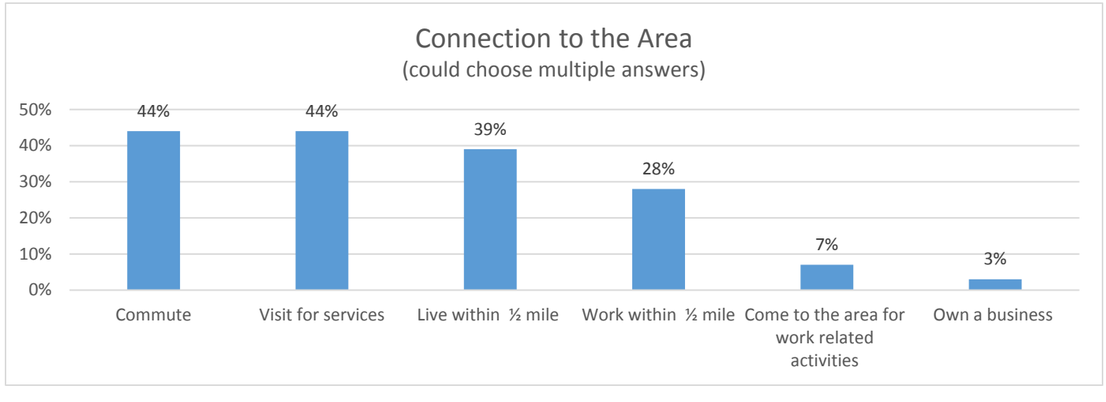




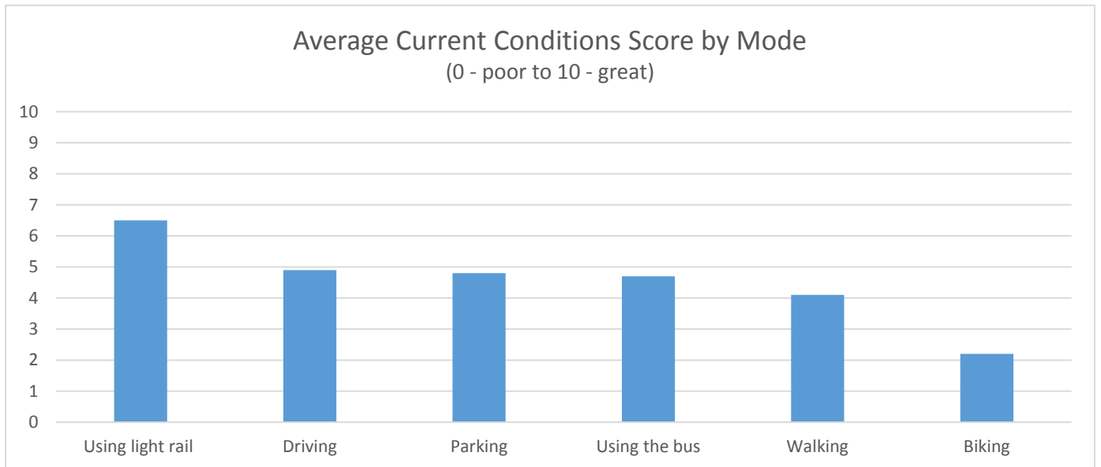
Stakeholder Feedback

Who did we hear from and what is their connection to the area?

A survey was distributed digitally to all stakeholders and there were 374 responses in the spring of 2017. Many of the survey respondents have been in the area over 10 years (61%), while those who have been in the area 1-7 years represent 26% of the respondents. The largest age group to respond was those between 25 – 44 years old, with 42% of respondents. Respondents have varying connections to the area with most commuting through and visiting for services. Respondents also gave input on commuting through and visiting for services. Most respondents move through and come to the area by car, with walking a distant second.



The conditions of the area, with light rail rating highest, followed by driving and parking, supports the users' mode choice to drive. Biking conditions rate lowest, and area users also noted that they infrequently bike in the area. A full summary and analysis of the survey results can be found in Attachment C.

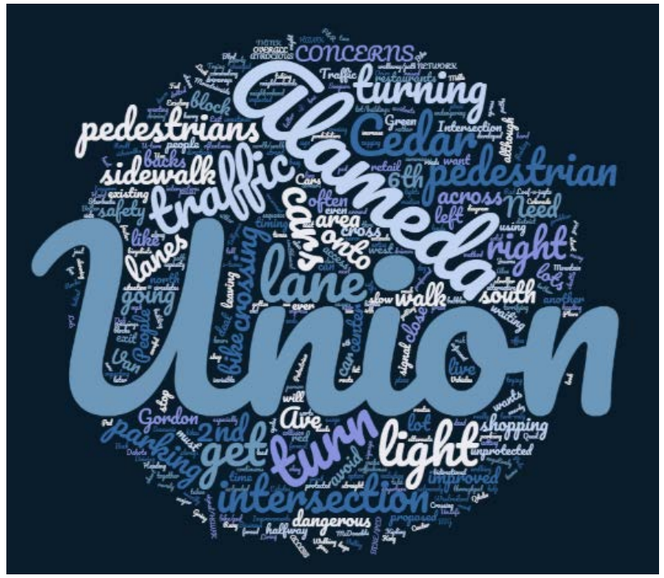


Assets

In an analysis of open-ended survey responses, several key categories emerged. Stakeholders believe that Union is a vibrant place with diverse businesses and services. They value the light rail and the station amenities, including ample parking, at the Federal Center Station and feel that this is a quality connection and amenity. While many stakeholders noted that traffic is a concern, there was also a high number of stakeholders who reported that traffic flow is currently working well. Walking and adequate parking rounded out the list for area assets.

"Businesses are staying in the area, new ones starting up and the area is more vibrant"
-Area Stakeholder

"I like the access to RTD, traffic doesn't seem unreasonable despite the growth in the area"
– Area Stakeholder



Wordcloud of how people describe the Union Area

Concerns and Challenges

Challenges are listed in order of most frequently reported to lesser reported. Stakeholders consider vehicle congestion as the top item that currently isn't working well. This is followed by pedestrian conditions and safety. Growth and development are also a key issue for stakeholders who connect the area growth with increased congestion on Union. Biking conditions and safety for all users at intersections (vehicular turning movements) are other key concerns.

> *"Extremely dangerous for biking and walking, no cross walks at many intersections. Generally dangerous for anyone not in a car."*

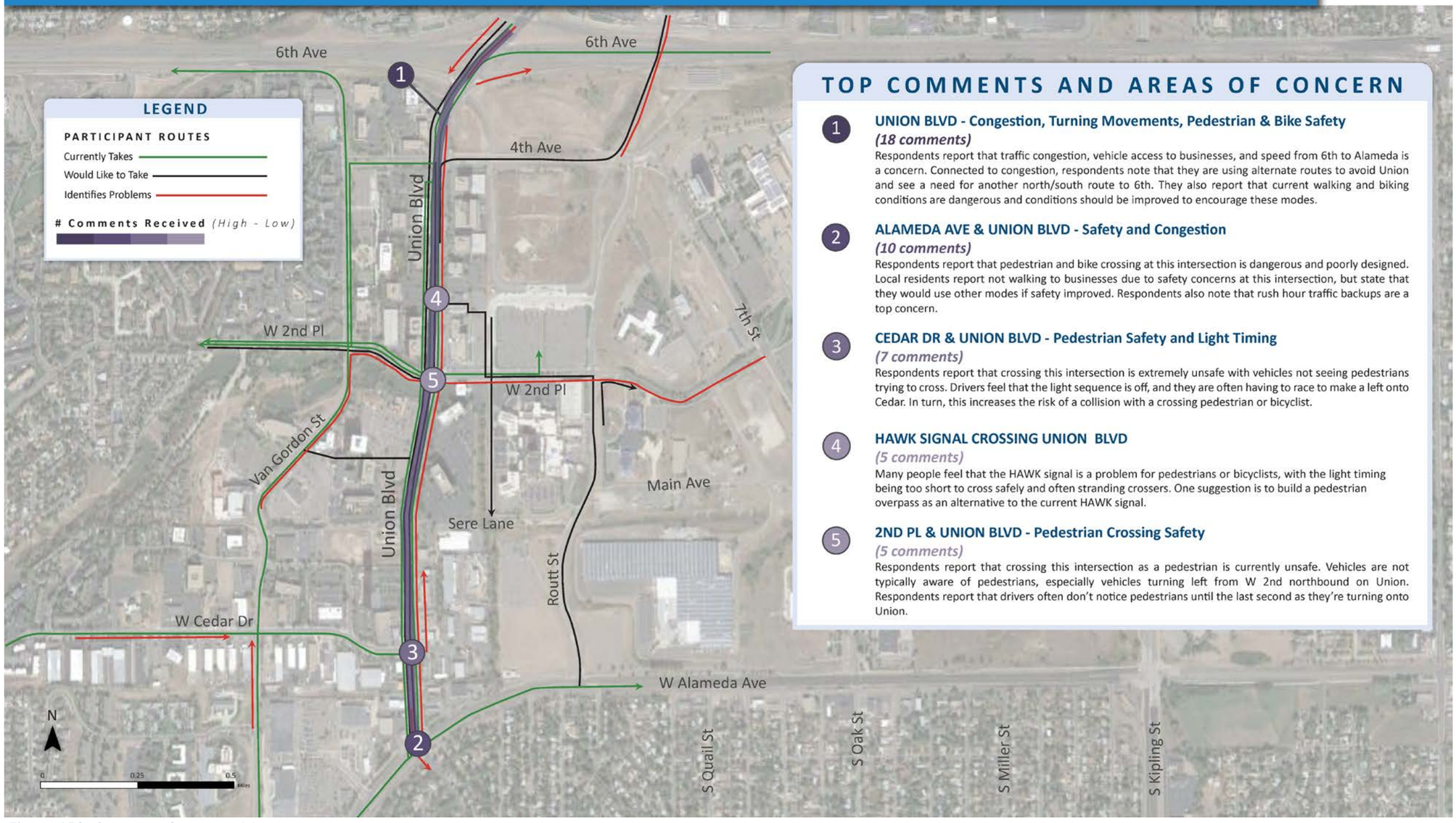
> *"New high-density apartments will dramatically increase traffic entering and exiting Union. Traffic already backs up horribly at lights and intersections along Union. "*

Mapping Concerns and Assets

Stakeholders identified specific locations for many of their issues or concerns. The intersections of Alameda/Union and 2nd/Union are both noted as critical points of conflict for users. The summary map, Figure 9, gives an overview of the top comments. All mapped comments can be found in the appendix.

Mapping Participant Comment Summary

Lakewood



TOP COMMENTS AND AREAS OF CONCERN

1. **UNION BLVD - Congestion, Turning Movements, Pedestrian & Bike Safety**
   (18 comments)
   Respondents report that traffic congestion, vehicle access to businesses, and speed from 6th to Alameda is a concern. Connected to congestion, respondents note that they are using alternate routes to avoid Union and see a need for another north/south route to 6th. They also report that current walking and biking conditions are dangerous and conditions should be improved to encourage these modes.

2. **ALAMEDA AVE & UNION BLVD - Safety and Congestion**
   (10 comments)
   Respondents report that pedestrian and bike crossing at this intersection is dangerous and poorly designed. Local residents report not walking to businesses due to safety concerns at this intersection, but state that they would use other modes if safety improved. Respondents also note that rush hour traffic backups are a top concern.

3. **CEDAR DR & UNION BLVD - Pedestrian Safety and Light Timing**
   (7 comments)
   Respondents report that crossing this intersection is extremely unsafe with vehicles not seeing pedestrians trying to cross. Drivers feel that the light sequence is off, and they are often having to race to make a left onto Cedar. In turn, this increases the risk of a collision with a crossing pedestrian or bicyclist.

4. **HAWK SIGNAL CROSSING UNION BLVD**
   (5 comments)
   Many people feel that the HAWK signal is a problem for pedestrians or bicyclists, with the light timing being too short to cross safely and often stranding crossers. One suggestion is to build a pedestrian overpass as an alternative to the current HAWK signal.

5. **2ND PL & UNION BLVD - Pedestrian Crossing Safety**
   (5 comments)
   Respondents report that crossing this intersection as a pedestrian is currently unsafe. Vehicles are not typically aware of pedestrians, especially vehicles turning left from W 2nd northbound on Union. Respondents report that drivers often don't notice pedestrians until the last second as they're turning onto Union.

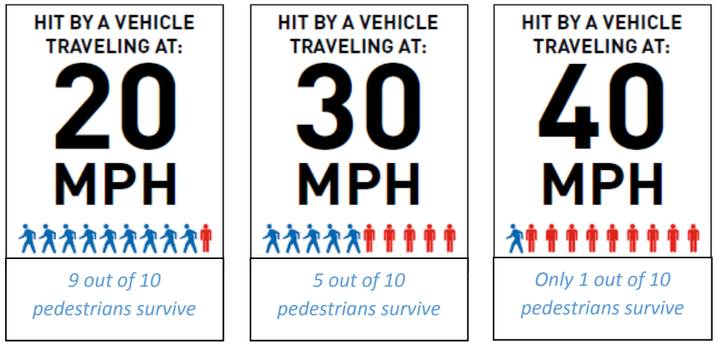
Figure 153: Comment Summary Map

Regional & National Trends

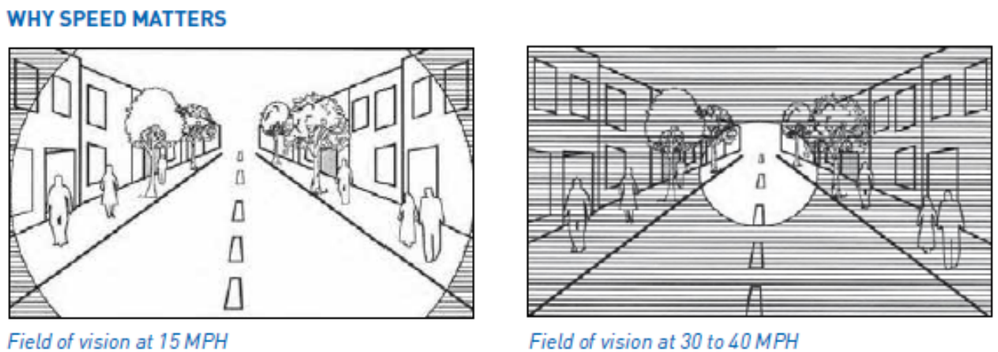
This study is intended to evaluate the impacts of alternative modes of transportation on the roadway network. Understanding current national and regional trends provides a better understanding of the impacts and opportunities that are available. There are some concepts that would apply to the study area regardless of the scenario, and emerging modes of transportation that will need to be accounted for to provide a better understanding of the impacts and opportunities that will become available.

Vision Zero

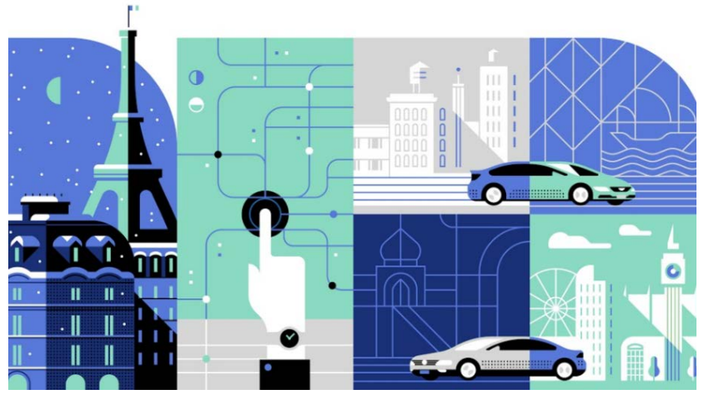
Vision Zero is a policy that started in Sweden in the late 1990s to achieve safety for all road users, setting the goal of zero traffic fatalities or severe injuries. Vision Zero holds that traffic deaths and severe injuries are preventable and focuses attention on shortcomings of the transportation system itself. Vision Zero acknowledges that people will make mistakes, so collisions will happen. Given this reality, the focus is not on avoiding all crashes, but rather on lowering the likelihood of crashes resulting in severe injuries.



As of March 2017, 27 cities have committed to Vision Zero by setting a clear goal of eliminating traffic fatalities and severe injuries by putting a strategy in place or committing to doing so in a clear time frame, and engaging key city departments.

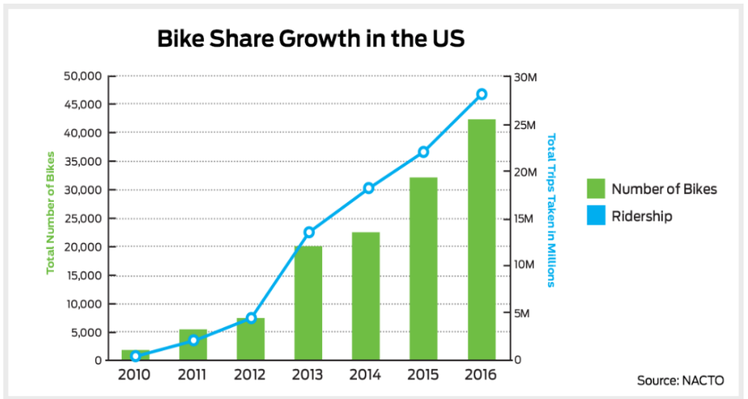


Ride Share & Bike Share



Ride share and bike share choices are anticipated to change the transportation network as we know it. While ride share could increase congestion because drivers will continue driving on roads until they are called to transport another passenger, the emergence of bike share programs could lead to higher prioritization of bike lanes, paths and pedestrian crossings, both programs are helping to solve the first mile/last mile problem that transit agencies have been trying to address for some time.

Transit agencies know that increasing their service area will likely result in increased ridership. Many transit agencies struggle to provide 30 minutes between bus arrivals, much less expanding service to areas that are forecast to have low ridership, so they have changed their focus to providing connected sidewalks from their bus stops to the adjacent neighborhoods, and more recently, they are relying on ride share and bike share services to expand their reach.



While ride share programs like Uber and Lyft have been around since 2008 and 2012, bike share programs like Bcycle and Zagster are newer to the scene, but are spreading quickly. As of the time of this report, 55 U.S. cities already had bike share programs in place. Bike share programs have been shown to reduce vehicle miles travelled and primarily replace trips taken by public transportation. However, in locations where long-distance bicycle connections are poor, they can also help to solve the first mile/last mile issue, but with the benefit of reducing Co2 emissions and increasing physical activity. The number of bikes in the nation has increased 30% from 2010, with over 42,000 bikes in 2016.

More recently, dockless bikeshare is becoming a reality across the Country. Dockless bikeshare is similar to typical bikeshare, just without docking stations. The bikes have a built-in lock with GPS and cellular technology. The cost savings of $50,000 per dock allows companies to provide dockless bikeshare for a more reasonable rate without the need for public funding.

Potential Growth Scenarios

As described in the existing conditions portion of this report, the existing land uses are focused on the automobile, where the car dominates all modes of transportation. On the other hand, the update to the zoning code completed in 2012 indicates that at the time, the City planned to change the character of this area into a higher density, mixed-use form. The form of development that would result from the 2012 code updates is similar to the alternative mode scenario analyzed within this report. Since the 2012 update, a significant amount of development has occurred and an increase in bike and pedestrian traffic has been realized. The additional traffic has resulted in congestion of traffic between modes and traffic concerns from the local residents. As a result, some in the City have expressed concerns that the current direction may be unsustainable in the future. The purpose of this study is to evaluate three potential growth scenarios to determine how each would impact the transportation network. The basic components of land use form and the transportation network were used to define how each of the scenarios would look and function.

Auto Oriented – This scenario assumes that traffic volumes would continue to increase throughout the area. The focus for this scenario is on the automobile and improvements that would reduce vehicle congestion.

Mixed Mode – This scenario aims to maximize alternate modes, such as bicycling and walking, while continuing to improve roadway operations. Improvements associated with this scenario would incorporate all modes of transportation and would enhance connectivity between places where people live, work and play.

Alternative mode – The focus of this scenario is on maximizing alternate modes and prioritizing bicycle, pedestrian, transit, and innovative technology solutions. This scenario assumes that development would be denser, promoting a form that is more compact and consistent with the pedestrian scale.

	Office Building Heights Assumed	Residential Density	Block Size	Parking Ratios	Bicycle Network	Sidewalk Network	Lane Widths/Street Trees	Transit	Car Share/ Bike Share
Auto Oriented	4 Story	15-20 Dwelling Units/Acre	1-1.25 mile (5,280-6,600 feet) average block perimeter Similar to existing conditions	1.5 spaces/dwelling unit 4 spaces/1,000 square feet office (all zones)	No additional bike lanes	Sidewalks constructed with development – 6 feet wide or wider; Union – 8 feet wide sidewalks	No change	Light rail will continue to meet demand but frequency will remain the same	Not available
Mixed Mode	6 Story	20-50 Dwelling Units/Acre	~0.75 mile (3,870 feet) average block perimeter	1.0 space/dwelling unit 3.0-4.0 spaces/1,000 square feet office (transit & urban zones)	Additional bike lanes added on some arterial and collector roads; 10 feet wide sidewalks on Union to accommodate bikes	100% - sidewalks on both sides (6 feet wide or wider); Union – 10 feet wide sidewalks	Narrower lane widths to accommodate bike lanes and sidewalks while retaining street trees	10% increase in ridership due to innovative technology	Bike share available
Alternative Mode	8 Story	50-75 Dwelling Units/Acre	~0.3-0.5 mile (1,640 - 2,460 feet) average block perimeter Similar to downtown Denver and Belmar	0.75 spaces/dwelling unit with incentives to incorporate car share into the building 2.5-3.5 spaces/1,000 square feet office (transit & urban zones)	Additional bike lanes on all arterial and collector roads; 12 feet wide sidewalks on Union to accommodate bikes	100% - sidewalks on both sides (8 feet wide or wider in transit zones); Union - 12 feet wide sidewalks	Narrower lane widths to accommodate bike lanes and sidewalks while retaining street trees	20% increase in ridership due to innovative technology	Bike share promoted

Figure 163: Scenario Overview

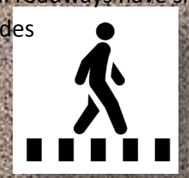
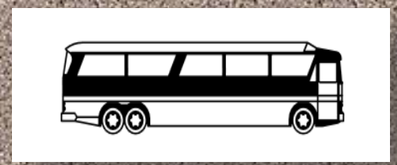
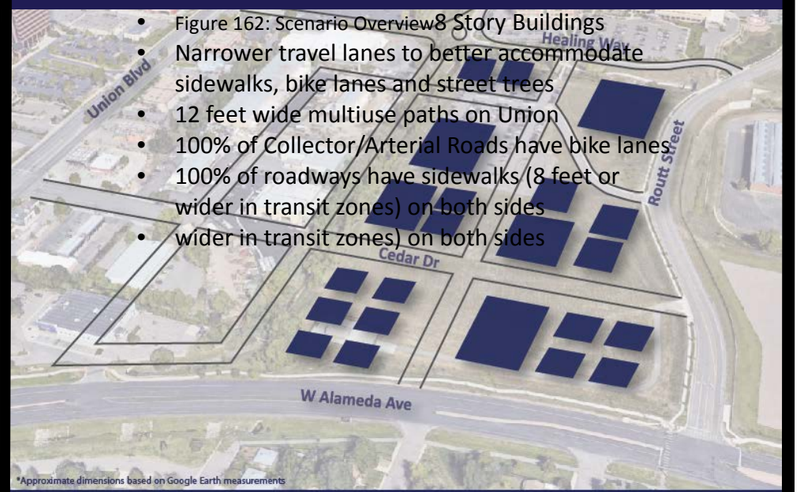
Components of Priority Mode	Union Boulevard – Auto Scenario	Union Boulevard – Mixed Scenario	Union Boulevard – Alternative Scenario
	• 4 Story Buildings • 12 feet wide vehicle travel lanes • 8 feet wide sidewalks on Union • No additional sidewalks or bike lanes constructed, unless with development or new roadway construction	• 6 Story Buildings • Narrower travel lanes to better accommodate sidewalks, bike lanes and street trees • 10 feet wide multiuse paths on Union • ½ of Collector/Arterial Roads have bike lanes All roadways have sidewalks (6 feet or wider) on both sides	• 8 Story Buildings • Narrower travel lanes to better accommodate sidewalks, bike lanes and street trees • 12 feet wide multiuse paths on Union • 100% of Collector/Arterial Roads have bike lanes • 100% of roadways have sidewalks (8 feet or wider in transit zones) on both sides • wider in transit zones) on both sides
	  	• 6 Story Buildings • Narrower travel lanes to better accommodate sidewalks, bike lanes and street trees • 10 feet wide multiuse paths on Union • ½ of Collector/Arterial Roads have bike lanes All roadways have sidewalks (6 feet or wider) on both sides  	  
	Large blocks, minimal connectivity and large, open parking lots.	Smaller blocks, increased connectivity and smaller parking requirements with the incorporation of some parking garages.	Small blocks similar to Downtown Denver or Belmar, connectivity for all modes, and parking maximums with parking in garages.
Block Size Illustrations			
	Auto Oriented Scenario	Mixed Mode Scenario	Alternative Mode Scenario

Figure 155: Scenario Overview

Figure 156: Scenario Overview

Figure 157: Scenario Overview

Figure 160: Scenario Overview

Figure 162: Scenario Overview

- 8 Story Buildings
- Narrower travel lanes to better accommodate sidewalks, bike lanes and street trees
- 12 feet wide multiuse paths on Union
- 100% of Collector/Arterial Roads have bike lanes
- 100% of roadways have sidewalks (8 feet or wider in transit zones) on both sides
- wider in transit zones) on both sides

*Approximate dimensions based on Google Earth measurements

Future Traffic Forecasts

Future Development

Future development assumptions were determined based on several factors: 1) development that has occurred over the last 20 years, 2) available land that is currently vacant (purple), and 3) portions of land prime for redevelopment (orange). The amount of each type of development that will occur is based on market demand for the individual use, and therefore, was assumed to be the same for all scenarios. However, the form of the development is expected to vary from lower density with large parking lots to higher density with parking garages.

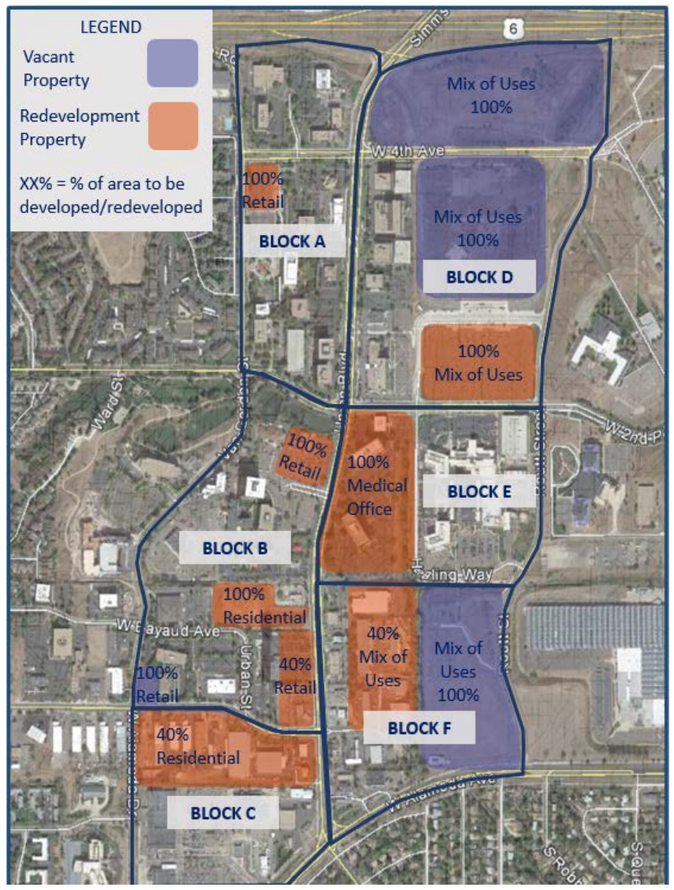


Figure 194: Assumed Development Locations

Over the last 20 years, 2.1 million square feet of development has occurred (Attachment D). Based on a review of the vacant land in the area plus areas that have potential for redevelopment, it was assumed that over the next 20 years, an additional 2.1 million square feet of development could potentially occur. The assumed mix of development for all scenarios includes the following:

- 800,000 square feet of office or medical office uses primarily located to the west and south of the hospital,
- 133,000 square feet of local serving restaurant and retail uses distributed throughout the area,
- a 128-room hotel southwest of the hospital, and
- approximately 1,100 residential dwelling units north of the transit station, south of the hospital, and in the areas west of Union, south of Sere Lane.

Growth Rate

In addition to development that is expected to occur within the corridor, it is anticipated that development in surrounding areas will grow (such as the proposed development in Green Mountain), impacting traffic conditions within the corridor. To account for this increase in potential development outside the focus area of this study, a growth rate of 0.5% per year was applied to existing traffic counts through the year 2040. This increase in traffic is consistent with Denver Regional Council of Governments (DRCOG) growth estimates through the year 2040.

Roadway Network

Over the next 20 years, it is anticipated that future development will result in the construction of a couple of key roadway connections. For all three scenarios, it was assumed that the extension of Routt Street over US 6 and the extension of Cedar Lane to Routt Street would be completed as development in those areas is constructed. In addition to these major connections, it was assumed that local roadways would be constructed in the mixed and alternative mode scenarios to meet the block size assumptions outlined during development of the scenarios.

Traffic Forecasts by Scenario

The form and type of development, mix of uses, frequency of transit service, addition of new local roadways, and presence of sidewalks and bike lanes within the study area are some of the factors that impact the mode of travel that is used. Vehicle trip reductions can be assumed based on these elements through the use of the Urban Emissions Model (URBEMIS). The URBEMIS model is a national model that is used for calculating transportation and planning impacts of these various components. It was created to assess areas with a mix of uses and good transportation options versus individual uses primarily accessed by a car. The assumptions outlined for each of the scenarios above were applied to the URBEMIS model to determine what trip reduction could be assumed for each scenario (Attachment E). The resulting 2040 future traffic forecasts with the applied trip reductions were then distributed to the roadway network. Distribution of future vehicle trips was based on existing travel patterns, knowledge of where people in the area travel to/from home and work, and engineering judgement. Vehicle trip distribution percentages are provided in Attachment F and 2040 forecasted vehicle trips are provided in Attachment G. Pedestrian trip increases were based on studies completed in locations similar to the proposed development scenarios. Ultimately, the number of pedestrians was increase by 300% from the auto scenario to the mixed scenario and 600% from the auto scenario to the alternative scenario. The forecasted vehicle and pedestrian trips on Union Boulevard are summarized in Table 4 by scenario.

As shown in Table 4, the number of vehicle trips reduces in each scenario by a much larger number than the pedestrian trips increase. This is due to a couple factors: 1) the counts forecast here only include the major intersections on Union Boulevard, 2) both vehicles and pedestrians have many more alternative routes to choose from in the mixed and alternative scenarios since the local roadway network and bike/pedestrian networks are more developed, and 3) the number of transit users is anticipated to be highest in the alternative scenario.

Table 5: Vehicle and Pedestrian Traffic Forecasts by Scenario

	Scenarios	PM Vehicle Trips (at all Union Intersections during PM Peak Hour)	PM Pedestrian Trips (at all Union Intersections during PM Peak Hour)
	Existing Conditions	27,701	91
Future Scenarios	Auto Scenario	32,500	110
	Mixed Scenario	29,400	320
	Alternative Scenario	25,800	640

Analysis Results

The existing and forecasted vehicle and pedestrian volumes were input into a traffic analysis tool called synchro to determine traffic impacts by scenario. Synchro is the leading traffic analysis tool used to analyze congestion of existing or future intersections. In addition to the modified vehicle and pedestrian volumes, additional mid-block pedestrian crossings were added to each scenario to accommodate the increases in pedestrian volumes and analyze the impact of these crossings on vehicles travelling through the corridor.

The intersection Level of Service (LOS) for each of the major intersections along Union Boulevard are provided in Attachment H and summarized below. The results indicate that reductions in vehicle trips will result in better LOS despite the addition of mid-block pedestrian crossings that will cause the driver to stop more frequently. This is explained by the fact that reducing the number of vehicles stopped at each mid-block pedestrian crossing results in shorter delays each time vehicles are stopped, thereby resulting in fewer overall delays.

Table 7: Intersection Analysis Summary

		Level of Service
Union/6th Ave EB	Existing	B
	Auto	B
	Mixed	B
	Alternative	B
Union/4th	Existing	C
	Auto	E
	Mixed	D
	Alternative	C
Union/2nd	Existing	D
	Auto	F
	Mixed	E
	Alternative	D
Union/Cedar Ln	Existing	D
	Auto	F
	Mixed	E
	Alternative	F
Union/Alameda	Existing	D
	Auto	E
	Mixed	D
	Alternative	D

To fully understand the impacts of reducing vehicle trips and increasing pedestrian mid-block crossings, arterial travel time from 4th Avenue to Alameda Parkway was also evaluated.

Table 8: Arterial Travel Time (4th to Alameda)

	Travel Time (min)	
	NB	SB
Existing	2.0	1.3
Auto	3.1	3.4
Mixed	2.1	2.3
Alternative	1.6	1.6

The results indicate that both the intersection LOS and the arterial travel time will improve as the number of local roadways increase, the sidewalk and bicycle networks improve and the number of trips using alternate modes increases.

Project List

Throughout the public engagement process for this study, stakeholders identified a number of projects that could improve the vehicle and pedestrian network in the area. These projects and others identified throughout this study have been compiled into a list of proposed projects and are outlined in Table 7. The project list is broken up into network improvements, intersection improvements and Code modifications. Where network improvements could apply to various locations within the study area, specific locations were also identified. For many of the intersection improvements, additional analyses will be necessary to evaluate the cost and benefit of various geometric or operational alternatives.

The purpose of this study was to create three future development scenarios and identify the impacts of each on the study area. The results of this study and the resulting project list will be presented to City Council to help guide the direction of future development in the area. That direction could also lead to future updates to the Zoning Ordinance and the Comprehensive Plan. The latest version of the Zoning Ordinance is representative of the Alternative Mode Scenario, while the Code that was in place prior to the 2012 update was more representative of the Auto Mode Scenario. The project list and assumptions used in the chosen scenario can be utilized to determine what that means for future development standards or intersection/network improvements.

Table 9: Recommended Project List & Relationship of Projects to Scenarios

	Auto Mode Scenario	Mixed Mode Scenario	Alternative Mode Scenario
Network Improvements			
Narrow vehicular lanes throughout the study area to accommodate wider sidewalks or bike lanes	Maintain 12' travel lanes; Maintains vehicle speed and traffic flow	11' wide; Reduces vehicle speed and possibly reduces traffic flow while increasing safety for bikes and pedestrians	10-11' wide; Reduces vehicle speed but increases safety of bikes and pedestrians and reduces crossing distance for pedestrians
Enforce access management during development/ redevelopment of properties	Fewer access points increase vehicle flow	Fewer access points increase vehicle flow and reduce conflict points between bikes and pedestrians on sidewalks	Fewer access points reduce conflict points between bikes and pedestrians on sidewalks
Reduce speed limits to a maximum of 30 MPH throughout	Reduces traffic flow	Slower speeds result in fewer fatal pedestrian accidents	Slower speeds result in fewer fatal pedestrian accidents
Construct wider sidewalks along Union Blvd to accommodate bikes	Removes bikes from vehicle lanes	10'wide to provide additional room for bikers to ride, outside the vehicle travel lanes	12' wide to provide a safe place for bikers to ride while maintaining safety for pedestrians
Extend Routt Street across US 6 to Quail Street (with separate facilities for vehicles, bikes and pedestrians)	Provides an alternative route for all modes	Provides an alternative route for all modes	Provides an alternative route for all modes
Install benches along sidewalks and paths	N/A	Improves the pedestrian environment	Improves the pedestrian environment
Install trees where feasible along sidewalks	N/A	Improves the pedestrian environment	Improves the pedestrian environment
Install bike parking at all office, retail and restaurant buildings	Reduces the chance that medium distance trips will be taken via a car	Improves the chance medium distance trips will be taken via bike	Improves the chance medium distance trips will be taken via bike
Complete connection of Zinnia Way with sidewalks, between Cedar Drive and 2nd Place	Provides an alternative route for vehicles	Redistributes vehicular traffic, thereby reducing the vehicle impact to pedestrians on other routes	Reduces the vehicle impact for pedestrians on alternative routes
Extend Cedar to Routt Street (with separate facilities for vehicles, bikes and pedestrians)	Provides an alternative route for all modes	Provides an alternative route for all modes	Provides an alternative route for all modes
Construct right turn lanes on 2nd Place, west of Union	Improves vehicle travel flow	Improves vehicle travel flow and can reduce the speed of vehicles turning into businesses that would conflict with pedestrians	Reduces the speed of vehicles conflicting with pedestrians as they turn into businesses
Create a street with sidewalks and bike lanes from Veterans Center Entrance to Wendy's	Provides improved travel thru this block by reducing conflicts with bikes and pedestrians	Provides a safer alternative for bikes and pedestrians traversing the large block surrounded by 2nd, Cedar, Van Gordon and Union	Provides a safer alternative for bikes and pedestrians traversing the large block surrounded by 2nd, Cedar, Van Gordon and Union
Provide east/west connection from 1st Street to Healing Way for vehicles, bikes and pedestrians	Provides an alternative route for all modes	Provides an alternative route for all modes	Provides an alternative route for all modes
Extend Sere Lane from Union to Healing Way with sidewalks and bike lanes	Provides an alternative route for all modes	Provides an alternative route for all modes	Provides an alternative route for all modes
Construct a low-speed, shared north/south roadway from Healing Way to Cedar Lane with sidewalks	Provides an alternative route for all modes	Provides an alternative route for all modes	Provides an alternative route for all modes
Work with RTD to get a shuttle started	Provides alternatives to independent vehicle trips	Provides alternatives to independent vehicle trips	Provides alternatives to independent vehicle trips
Install pedestrian bridge from Red Rocks Community College across US 6, near Arbitus Drive	Increased transit access should reduce vehicle trips	Improves regional bike and pedestrian connectivity	Improves regional bike and pedestrian connectivity
Provide protected mid-block crossings of Union	**Provides a safer alternative to driving a car (potentially reducing the number of cars on the road) to get from uses on either side of Union but can increase vehicle delay**	**Provides a safer alternative for bikes/pedestrians to get from uses on either side of Union**	**Provides a safer alternative for bikes/pedestrians to get from uses on either side of Union**
On Union between 4th and the HAWK signal	☐	☒	☒
On Union at Sere Lane	☒	☐	☒
On Union, near 160 Union Boulevard	☒	☐	☒

Construct new sidewalk connections and repair existing connections from buildings to the street and to other buildings	**Funnels bikes and pedestrians to limited locations to reduce conflicts with vehicles**	**Improves the existing pedestrian network and makes bikes and pedestrians more visible to vehicles**	**Improves the existing pedestrian network and makes bikes and pedestrians more visible to vehicles**
Improve connections from sidewalk to Chad's Grill and 255 Union	☐	☒	☒
Modify pedestrian access points at 215 and 225 Union to meet ADA	☐	☒	☒
Improve connections from sidewalk to Old Chicago	☐	☒	☒
Construct missing sidewalk segments	**Keeps pedestrians out of the vehicle travel lanes**	**Improves the existing pedestrian network**	**Improves the existing pedestrian network**
On west side of Van Gordon between 4th and 2nd	☐	☒	☒
On east side of Van Gordon between Bayaud and Cedar	☐	☒	☒
On north side of Alameda Parkway between Center Ave and Youngfield Ct	☐	☒	☒
Provide 6 feet wide sidewalks where they are narrower today	**Keeps pedestrians out of the vehicle travel lanes**	**Improves the existing pedestrian network**	**Improves the existing pedestrian network**
On west side of Alameda Drive between Cedar and Dakota	☐	☒	☒
On east side of Union near Cedar	☐	☒	☒
On South Union, south of the intersection with Alameda	☐	☒	☒
Create additional pedestrian sidewalks/paths to reduce block sizes	**Adding connections could increase pedestrian activity, thereby reducing vehicle travel flow**	**Construct 50% of the proposed connections shown on the proposed transportation system, within each block; Improves pedestrian network**	**Construct 100% of the proposed connections shown on the proposed transportation system, within each block; Improves pedestrian network**
Extend sidewalk connection from HAWK signal to Van Gordon and/or 2nd Place	☐	☒	☒
Provide walkways/ bicycleways through the block, consistent with the proposed transportation network	☐	50%	100%
Add bike lanes on arterial and collector roads where missing	**Removes bikes from vehicle lanes**	**Construct 50% of the proposed bike lanes shown on the proposed transportation system; Increases the bike network and safety**	**Construct 100% of the proposed bike lanes shown on the proposed transportation system; Increases the bike network and safety**
Add bike lanes on 4th Ave between Van Gordon and Routt Street	☐	☒	☒
Add bike lanes on Cedar Drive between Van Gordon and Union	☐	N/A	☒
Add bike lanes on 2nd Place from Union to the Federal Center	☐	N/A	☒
Extend existing bike lane on South Union, from the intersection with Alameda, south to existing terminus	☐	☒	☒
Establish Alameda Avenue from Taft Street west as a shared roadway for bikes	☐	☒	☒
Extend bike lanes from Van Gordon/4th Ave west to Arbutus Drive (Red Rocks Community College)	☐	☒	☒

Intersection Improvements			
Modify geometry to allow two lanes to enter onto US 6 EB	Reduces delay and queues for vehicles entering US 6 eastbound	Reduces vehicle queues at adjacent intersections, making those pedestrian crossings safer	Reduces vehicle queues at adjacent intersections, making those pedestrian crossings safer
Consider innovative intersection alternatives at the Union/Cedar and Union/Alameda intersections to maintain traffic flow	Improves traffic flow	Improves traffic flow and reduces the conflict between free-flow and U-turning vehicles with pedestrians	Reduces the conflict between free-flow and U-turning vehicles with pedestrians
Modify geometry or operations at the Union/2nd Place intersection (consider removal of right turn lanes or restricting right-turn-on-red)	Increases vehicle congestion	Reduces the distance pedestrians must cross or stops vehicles to make crossing the intersection safer	Reduces the distance pedestrians must cross or stops vehicles to make crossing the intersection safer
Install pedestrian call button in median of Union at HAWK signal	Could reduce delay to vehicles through reprogramming of the HAWK	Protects pedestrians in case they get stranded in the median	Protects pedestrians in case they get stranded in the median
Consider a roundabout with pedestrian signals at 2nd/Healing Way to better accommodate U-turns, left turns and pedestrians	Improves traffic flow	Improves traffic flow and reduces the conflict between U-turning vehicles and pedestrians	Reduces the conflict between U-turning vehicles and pedestrians
Consider a grade-separated crossing across Alameda, for pedestrians on the east side of Union at Alameda	Increases green time for vehicles going thru the Union/Alameda intersection	Increases green time for vehicles and provides a safe connection to/from Union and the neighborhood south of Alameda	Provides a safe connection to/from Union and the neighborhood south of Alameda
Construct dual westbound right turn lanes at Union/4th	Reduces delay for WBR turning vehicles	Increases pedestrian crossing distance	Increases pedestrian crossing distance
Construct a separate eastbound right turn lane at Union/2nd	Reduces delay for EBR turning vehicles	Increases pedestrian crossing distance	Increases pedestrian crossing distance
Construct a separate southbound right turn lane at Union/Cedar	Reduces delay for SBR turning vehicles	Increases pedestrian crossing distance	Increases pedestrian crossing distance
Widen the northbound approach of Union at Alameda to allow a separate right turn lane	Decreases vehicle delay but potentially increases neighborhood traffic	Increases pedestrian crossing distance	Increases pedestrian crossing distance
Provide a separate northbound right turn lane at Union/2nd	Reduces delay for NBR turning vehicles	Increases pedestrian crossing distance	Increases pedestrian crossing distance
Install a roundabout at the 2nd/Van Gordon intersection or other geometry/operational improvements	Reduces volume and severity of crashes	Increases bike and pedestrian safety through the reduction of crashes at this intersection & may require park land	Increases bike and pedestrian safety through the reduction of crashes at this intersection & may require park land
Improve pedestrian crossings at the Union/Alameda Intersection	Could increase delay for vehicles	Increases pedestrian safety by reducing conflict between vehicles and pedestrians	Increases pedestrian safety by reducing or eliminating conflict between vehicles and pedestrians
Construct raised pedestrian crossings where pedestrians cross the southbound right and westbound right turning lanes at Union/Alameda	Least impact to cars over doing nothing	Slight improvement over doing nothing	Slight improvement over doing nothing
Signalize the pedestrian crossings across the southbound right and westbound right turn lanes at Union/Alameda	Increases auto delay	Provides a protected crossing for pedestrians	Provides a protected crossing for pedestrians
Modify geometry at Union/Alameda by restricting free flow southbound right and westbound right turns	Greatly increases auto delay	Reduces pedestrian crossing distance and provides a protected crossing	Reduces pedestrian crossing distance and provides a protected crossing
Code Modifications			
Incorporate minimum parking standards for small sites such as the restaurant strip with Starbucks	Encourages vehicular use because of ease of parking	Reduces incentive for bike/pedestrian use due to increased auto traffic	Reduces incentive for bike/pedestrian use due to increased auto traffic
Require interconnections to adjacent properties (or easements to allow future interconnects) for all new development	Allows better traffic flow through a site and reduces the impact of vehicles backing into major roads	Reduces the amount of conflicts pedestrians experience while travelling on sidewalks or through the parking lot	Reduces the amount of conflicts pedestrians experience while travelling on sidewalks or through the parking lot
Increase parking requirements for office and residential uses	Residential: 1.5 spaces/DU Office: 4.0 spaces/1,000 SF	Residential: 1.0 space/DU Office: 3.0-4.0 spaces/1,000 SF (in Transit and Urban Zones) Reduces incentive for bike/pedestrian use due to larger blocks and increased auto traffic	Maintain existing parking requirements; Reduces incentive for bike/pedestrian use due to larger blocks and increased auto traffic

Stakeholder Priorities

At in-person pop up meetings, larger community meetings and via the digital survey, we asked stakeholders about their top priorities for projects to improve the corridor. A list of project priorities for voting was created from stakeholder input and feedback available from prior planning efforts. The top project priorities, in order of ranking are:

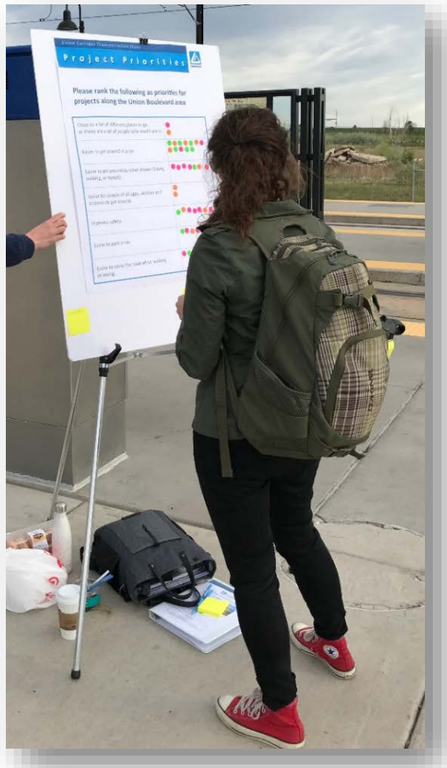
- Easier to get around by other modes
- The project improves safety
- Easier to get around in a car
- Easier to cross the road when walking or biking
- Improvements are located in high-use areas

The full list of priorities also included making it easier for people of all ages, abilities and incomes to get around and easier to park a car. These project priorities helped create a system to identify and rank projects for consideration by the community.

Stakeholder Project Support

Stakeholders at Public Workshop #2 were asked to give feedback on thematic projects throughout the corridor that address area needs, stakeholder priorities and their greatest concerns. For each project stakeholders responded via keypads about the action that should be taken, from "don't do anything" to take action on the project. 10 projects were presented along with images and explanation. A full list of projects and results can be seen in Attachment I. The top-rated projects were:

- Extend Routt Street across US 6 with sidewalks and bike lanes
- Extend Cedar to Routt Street with sidewalks and bike lanes



Priority dot voting at RTD Federal Center Light Rail Station

Participants noted that Alameda and Union is the intersection with the greatest urgency for solutions. They wanted to widen area sidewalks to accommodate both pedestrians and bicyclists, and felt that mid-block pedestrian crossings on Union should be installed every 500 – 600 feet.

Following the input on projects at Workshop #2, the team assembled a refined list of location-specific projects and ranked these based on multiple factors. Stakeholder input to date was included in the overall project score by awarding points for projects that supported stakeholders top project priorities, their support for thematic projects and what they identified as assets and challenges for the area.

A stakeholder support score for each of the projects ranked in the top tiers was estimated based on input to date and taken back to the stakeholders for vetting. At Workshop #3, area stakeholders could rate their support for each project on a scale of 0 (no support) to 10 (very high support) and provide additional comments. This was also posted as an online survey following the workshop, which received 322 responses.

Project Name	Stakeholder Support (0 – 10)
Union/Alameda pedestrian crossing improvements	7.5
Routt street extension	7.4
2-lanes onto EB 6th	7.2
Construct new and repair existing sidewalks (from Union to buildings and between buildings)	6.9
Access management enforcement	6.6
Healing way to Cedar Lane extension	6.3
Construct a street from Veteran Center to Wendy's	6.2
Sere Lane – Union to Healing Way extension	6.0
1st to Healing Way extension	5.7
Modify 2nd Place intersection	5.2
Install HAWK mid-way button	5.2
Narrow vehicle lanes with restriping (to make room for bike lanes or wider sidewalks)	4.6
Study reducing speed limits throughout the area	4.3

How To Use This Input

The engaged stakeholders who participated in the Union Area Transportation Study have provided valuable insight into their top priority projects. The intent is to provide decision makers with a clearer understanding of what stakeholders would like to see in area projects.

Stakeholder input contributed greatly to the project prioritization process. As was communicated to stakeholders, this prioritized list will set the stage for further project-specific analysis to determine design options and feasibility, and may ultimately lead to implementation.

Stakeholder Key Takeaways

Top issues are safety for all users, vehicular congestion, concerns about development and pedestrian/bike conditions.

Vehicle congestion concerns are corridor-wide, but are most concentrated at the gateways to this study area: 6th and Union, and Alameda and Union.

Intersections are a critical point of conflict and many are currently perceived as unsafe for all users.

Vibrant businesses and activity in the area are highly valued and people appreciate the many commercial establishments along the corridor.

Project Prioritization

Prioritization of projects is a necessary function to determine how funding should be distributed. There are many systems for prioritizing projects and each is used for different purposes. A complex system was created to prioritize projects along the corridor which allows the results to be viewed from multiple perspectives. Three ways of viewing the final results are discussed in the recommendations section of the report.

Each step in the prioritization process was focused around the public input received. During the first phase of public input, we asked stakeholders about their preferred methods of travelling through the corridor, or what areas they thought were most important. It turns out that the desire to move through the corridor via walking or biking was only slightly higher than the desire to drive through the corridor. What this meant for the prioritization system was that projects for auto and non-auto modes should be able to receive a similar number of points based on their impact, and that projects that make all modes better should be able to receive additional points.

Prioritization Categories	
Proximity to Specific Land Uses	Within walking distance (1/8th mile) of the following land uses (Residential, Office, Industrial, Commercial, Transit Station)
Alternative Routes/ Connectivity	Extension of existing/planned network
	Provides an alternative to travel on/along Union Blvd (for any mode)
	Distance to adjacent parallel facility (on either side of proposed improvement) is 1/8 mile or more
Options for all ages, abilities & incomes	Provides a safer alternative for young children or the Transportation Disadvantaged (Provides improved mobility for low income or minority populations)
	Improves mobility for Vehicles, Bicycles ***and*** Pedestrians
Safety	Improves safety for vehicles
	Improves safety for pedestrians
	Improves safety for bicycles
Vehicular Accessibility	Reduces traffic/congestion on Union Blvd or Alameda Parkway
	Improves vehicular access to adjacent uses
	Reduces vehicular travel distances/times by 20% or more
	Improves Regional mobility
	Improves parking for uses with limited parking
Pedestrian Accessibility	Improves comfort for pedestrians
	Improves pedestrian access to adjacent uses
	Improves pedestrian crossings of Union Boulevard
	Improves regional mobility for pedestrians
	Improves pedestrian amenities
Bicycle Accessibility	Improves comfort for bicycles
	Improves bicycle access to adjacent uses
	Improves bicycle crossings of Union Boulevard
	Improves regional mobility for bicycles
	Improves bicycle amenities

This prioritization system is a three-step process. The first step is to determine the positive impact of the project on the transportation network. Once determined, the second step is to identify the cost of each project and see where they fit within a cost to impact matrix. The last step is to evaluate project readiness and community support for each project in order to prioritize projects within each tier of the matrix.

Impact and Cost

The impact of each project is determined based on the prioritization categories shown on the right: proximity to a mix of uses, connectivity, options for all ages, safety, and accessibility. The categories are then broken up further to determine the specific characteristics each proposed project exhibits, such as whether it improves safety for vehicles, bikes or pedestrians, reduces traffic congestion on Union, improves pedestrian crossings of Union, or improves mobility for all modes. The prioritization categories in blue represent areas where all projects could earn points, those in green represent categories where bike and pedestrian projects could earn points, and the orange categories are related to projects that would improve vehicular mobility. The total points that could be earned for auto oriented or bicycle/pedestrian projects was representative of stakeholders input regarding driving versus walking through the corridor.

Scores for positive impact associated with each project were then identified as being high, medium or low. Costs were determined and also identified as being high, medium or low. The projects were then input into the cost to impact matrix to determine which tier they would fall into. The group of projects which had a very high positive impact compared to a very low cost became tier 1 Projects. Those projects whose impact was still greater than the cost became tier 2, and those whose impact was equal to the cost became tier 3 projects. Projects with a positive impact that was less than the cost because tier 4 and 5 projects.

Impact (Ranges from 0-60) Low = 20 or below, Medium = 21-40, High = 41 or above			
	Low Cost	**Medium Cost**	**High Cost**
High Impact	TIER 1	TIER 2	TIER 3
Medium Impact	TIER 2	TIER 3	TIER 4
Low Impact	TIER 3	TIER 4	TIER 5

Cost

Low = $500,000 or less, Medium = $500,001 to $3 million, High = more than $3 million

Project Readiness and Community Support

Once the projects are placed within each of the tiers based on cost and impact, the next step is to determine the project readiness, feasibility and community support. Project readiness applies points for projects that have available right-of-way, consent from property owners to utilize their land, where prior costs had been invested to begin design of the project, where other funding sources are available to help complete the project, and where they are adjacent to another planned improvement thereby reducing the cost to complete the project. Points were applied for community support based on comments, polling, survey responses and interviews. Finally, one point was added for any project that was in line with the Comprehensive Plan.

The total scores for project readiness and community support would then be combined and the projects ranked within each tier to determine the order in which projects would be prioritized. Table 8 shows the scoring for all projects based on this three-step process. The impact/cost color shown in the table can be referenced back to the cost to impact matrix to determine what tier each project fell into. It should be noted that there were no tier 1 projects identified, and only 1 tier 5 project was identified.

Recommendations

As discussed previously, there are many ways to prioritize projects and the results of the three-step process outlined above provide only one way of doing so. The results of the three-step process can be used when a balance of project impact and cost are desired. The results for this system of prioritization are provided in Table 8.

In a situation where cost is less important than project impact or community support, the cost components can be removed. By removing the cost component, projects can be evaluated based on the level of positive impact they will provide the community plus the level of community support that exists for each project. Evaluating the projects in this way can be beneficial if you are looking for projects that will benefit the larger population. Table 9 prioritizes the projects without considering cost.

A third way of prioritizing projects is to simply look at the amount of community support exists for each project. When making decisions for a community, it is important to understand what projects the citizens feel are the most important. Table 10 prioritizes the projects based only on community support.

Table 10: Three-Step Prioritization Process

		Modify geometry to allow 2 lanes to enter onto US 6 eastbound	Improve the pedestrian crossings at the Union/Alameda Intersection where pedestrians cross the southbound right and westbound right turning lanes	Construct new sidewalk connections and repair existing connections from buildings to the street and to other buildings	Enforce access management during development/ redevelopment of properties	Construct a low speed, shared north/south roadway from Healing Way to Cedar Lane with sidewalks	Create a street with sidewalks and bike lanes from Veterans Center Entrance to Wendy's	Extend Sere Lane from Union to Healing Way with sidewalks and bike lanes	Construct a street with sidewalks and bike lanes from 1st Street to Healing Way for vehicles, bikes and pedestrians	Install pedestrian call button in median of Union at HAWK signal to protect peds from getting stranded	Modify geometry or operations at 2nd Place (consider removal of right turn lanes or restricting right-turn-on-red)	Narrow vehicular lanes throughout the study area by restriping travel lanes to accommodate wider sidewalks or bike lanes	Reduce speed limits throughout the area
		TIER 2											
Step 1	**Impact**	**Medium**	**Medium**	**Medium**	**Medium**	**High**	**Medium**	**High**	**High**	**Medium**	**Medium**	**Medium**	**Medium**
Step 2	**Cost**	**Low**	**Low**	**Low**	**Low**	**Medium**	**Low**	**Medium**	**Medium**	**Low**	**Low**	**Low**	**Low**
Step 3	**Project Readiness + Community Support**	**9.2**	**7.5**	**6.9**	**6.6**	**6.3**	**6.2**	**6**	**5.7**	**5.2**	**5.2**	**4.6**	**4.3**

		Extend Routt Street across US 6 to Quail Street (with separate facilities for vehicles, bikes and pedestrians)	Extend Cedar to Routt Street (with separate facilities for vehicles, bikes and pedestrians)	Provide protected mid-block crossings of Union	Create additional pedestrian sidewalks/ paths to reduce block sizes	Consider innovative intersection alternatives at Union/Cedar and Union/Alameda Intersections to maintain traffic flow	Consider a roundabout at 2nd/Healing Way to better accommodate U-turns and left turns	Install a roundabout at the 2nd/Van Gordon intersection or other geometry/ operations improvements	Construct dual westbound right turn lanes at Union/4th	Work with RTD to get a shuttle started	Provide a separate northbound right turn lane at Union/2nd	Complete Connection of Zinnia Way with sidewalks, between Cedar Drive and 2nd Place	Construct a separate eastbound right turn lane at Union/2nd	Plant trees where feasible along sidewalks	Install bike parking at all office, retail and restaurant buildings	Install benches along sidewalks and paths
		Tier 3														
Step 1	**Impact**	**High**	**HIgh**	**Medium**	**Medium**	**High**	**Medium**	**Medium**	**Low**	**Medium**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**
Step 2	**Cost**	**High**	**High**	**Medium**	**Medium**	**High**	**Medium**	**Medium**	**Low**	**Medium**	**Low**	**Low**	**Low**	**Low**	**Low**	**Low**
Step 3	**Project Readiness + Community Support**	**10.4**	**11**	**8**	**8**	**6**	**6**	**6**	**6**	**4**	**4**	**4**	**4**	**2**	**2**	**1**

		Construct a 10 feet wide shared use path along Union Blvd to accommodate bikes	Provide 6 feet wide sidewalks where they are narrower today	Add bike lanes where missing	Consider a grade seperated crossing for pedestrians on the east side of Union at Alameda	Narrow vehicular lanes throughout the study area by removing curb to accommodate wider sidewalks or bike lanes	Widen the NB approach of S Union at Alameda to alllow a separate right turn lane	Construct right turn lanes on 2nd Place, west of Union	Install pedestrian bridge from Red Rocks Community College across US 6	Construct missing sidewalks segments along Van Gordon and Alameda Drive
		TIER 4								**TIER 5**
Step 1	**Impact**	**Medium**	**Low**	**Low**	**Medium**	**Medium**	**Low**	**Low**	**Medium**	**Low**
Step 2	**Cost**	**High**	**Medium**	**Medium**	**High**	**High**	**Medium**	**Medium**	**High**	**High**
Step 3	**Project Readiness + Community Support**	**10**	**8**	**7**	**6**	**6**	**6**	**4**	**2**	**10**

Table 11: Prioritization Excluding Cost

		Extend Routt Street across US 6 to Quail Street (with separate facilities for vehicles, bikes and pedestrians)	Extend Cedar to Routt Street (with separate facilities for vehicles, bikes and pedestrians)	Construct a low speed, shared north/south roadway from Healing Way to Cedar Lane with sidewalks	Modify geometry at the Union/Alameda intersection by restricting free flow southbound right and westbound right turns	Construct a street with sidewalks and bike lanes from 1st Street to Healing Way for vehicles, bikes and pedestrians	Construct new sidewalk connections and repair existing connections from buildings to the street and to other buildings	Construct dual westbound right turn lanes at Union/4th	Consider a grade seperated crossing for pedestrians on the east side of Union at Alameda	Install pedestrian bridge from Red Rocks Community College across US 6	Extend Sere Lane from Union to Healing Way with sidewalks and bike lanes	Provide protected mid-block crossings of Union
Project Impact + Project Readiness + Community Support	**Total Points**	**60.4**	**59**	**53.3**	**52**	**49**	**47.7**	**46**	**46**	**40**	**39.2**	**38**

		Construct a 10 feet wide shared use path along Union Blvd to accommodate bikes	Install pedestrian call button in median of Union at HAWK signal to protect peds from getting stranded	Modify geometry or operations at 2nd Place (consider removal of right turn lanes or restricting right-turn-on-red)	Work with RTD to get a shuttle started	Improve the pedestrian crossings at the Union/Alameda Intersection where pedestrians cross the southbound right and westbound right turning lanes	Enforce access management during development/ redevelopment of properties	Create additional pedestrian sidewalks/ paths to reduce block sizes	Modify geometry to allow 2 lanes to enter onto US 6 eastbound	Construct raised pedestrian crossings at the Union/Alameda Intersection where pedestrians cross the SBR and WBR turning lanes	Signalize the pedestrian crossings at the Union/Alameda Intersection, across the SBR and WBR turn lanes	Create a street with sidewalks and bike lanes from Veterans Center Entrance to Wendy's	Narrow vehicular lanes throughout the study area by restriping travel lanes to accommodate wider sidewalks or bike lanes
Project Impact + Project Readiness + Community Support	**Total Points**	**36**	**36**	**36**	**36**	**34.5**	**33.6**	**33**	**31.2**	**31.2**	**29.2**	**28.9**	**28.3**

		Construct missing sidewalks segments along Van Gordon and Alameda Drive	Narrow vehicular lanes throughout the study area by removing curb to accommodate wider sidewalks or bike lanes	Reduce speed limits throughout the area	Provide 6 feet wide sidewalks where they are narrower today	Add bike lanes where missing	Construct right turn lanes on 2nd Place, west of Union	Install a roundabout at the 2nd/Van Gordon intersection or other geometry/ operations improvements	Provide a separate northbound right turn lane at Union/2nd	Construct a separate eastbound right turn lane at Union/2nd	Widen the northbound approach of S Union at Alameda to alllow a separate right turn lane	Complete Connection of Zinnia Way with sidewalks, between Cedar Drive and 2nd Place	Consider innovative intersection alternatives at Union/Cedar and Union/Alameda Intersections to maintain traffic flow	Consider a roundabout at 2nd/Healing Way to better accommodate U-turns and left turns	Plant trees where feasible along sidewalks	Install bike parking at all office, retail and restaurant buildings	Install benches along sidewalks and paths
Project Impact + Project Readiness + Community Support	**Total Points**	**28**	**28**	**26.6**	**25**	**25**	**24**	**24**	**24**	**22**	**22**	**21**	**20**	**19**	**10**	**7**	**7**

Note: Where values are shown to the tenths place, these results are based on a survey of citizens opinions about these specific projects.

Table 12: Prioritization Based on Community Support

	Prioritization Category	Points	Construct missing sidewalks segments along Van Gordon and Alameda Drive	Extend Cedar to Routt Street (with separate facilities for vehicles, bikes and pedestrians)	Construct a 10 feet wide shared use path along Union Blvd to accommodate bikes	Provide protected mid-block crossings of Union	Create additional pedestrian sidewalks/ paths to reduce block sizes	Provide 6 feet wide sidewalks where they are narrower today	Improve the pedestrian crossings at the Union/ Alameda Intersection where pedestrians cross the southbound right and westbound right turning lanes	Extend Routt Street across US 6 to Quail Street (with separate facilities for vehicles, bikes and pedestrians)	Modify geometry to allow 2 lanes to enter onto US 6 eastbound	Add bike lanes where missing	Construct new sidewalk connections and repair existing connections from buildings to the street and to other buildings	Enforce access management during development/ redevelopment of properties
Community Support	Community Support (based on comments, polling, survey responses and interviews)	**0-10**	**10**	**9**	**9**	**8**	**8**	**8**	**7.5**	**7.4**	**7.2**	**7**	**6.9**	**6.6**

	Prioritization Category	Points	Construct a low speed, shared north/south roadway from Healing Way to Cedar Lane with sidewalks	Create a street with sidewalks and bike lanes from Veterans Center Entrance to Wendy's	Extend Sere Lane from Union to Healing Way with sidewalks and bike lanes	Narrow vehicular lanes throughout the study area by removing curb to accommodate wider sidewalks or bike lanes	Consider innovative intersection alternatives at Union/Cedar and Union/Alameda Intersections to maintain traffic flow	Consider a roundabout at 2nd/Healing Way to better accommodate U-turns and left turns	Install a roundabout at the 2nd/Van Gordon intersection or other geometry/ operations improvements	Construct dual westbound right turn lanes at Union/4th	Consider a grade separated crossing for pedestrians on the east side of Union at Alameda	Widen the northbound approach of S Union at Alameda to alllow a separate right turn lane	Construct a street with sidewalks and bike lanes from 1st Street to Healing Way for vehicles, bikes and pedestrians
Community Support	Community Support (based on comments, polling, survey responses and interviews)	**0-10**	**6.3**	**6.2**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**5.7**

	Prioritization Category	Points	Install pedestrian call button in median of Union at HAWK signal to protect peds from getting stranded	Modify geometry or operations at 2nd Place (consider removal of right turn lanes or restricting right-turn-on-red)	Narrow vehicular lanes throughout the study area by restriping travel lanes to accommodate wider sidewalks or bike lanes	Reduce speed limits throughout the area	Work with RTD to get a shuttle started	Complete Connection of Zinnia Way with sidewalks, between Cedar Drive and 2nd Place	Construct right turn lanes on 2nd Place, west of Union	Construct a separate eastbound right turn lane at Union/2nd	Provide a separate northbound right turn lane at Union/2nd	Install pedestrian bridge from Red Rocks Community College across US 6	Plant trees where feasible along sidewalks	Install bike parking at all office, retail and restaurant buildings	Install benches along sidewalks and paths
Community Support	Community Support (based on comments, polling, survey responses and interviews)	**0-10**	**5.2**	**5.2**	**4.6**	**4.3**	**4**	**4**	**4**	**4**	**4**	**2**	**2**	**2**	**1**

Note: Where values are shown to the tenths place, these results are based on a survey of citizens opinions about these specific projects.

Attachment A – Communication and Engagement Plan

ATTACHMENT B – FACT SHEET

ATTACHMENT C – SURVEY RESULTS

ATTACHMENT D – DEVELOPMENT FROM 1997-2017

ATTACHMENT E – URBEMIS ANALYSIS

Attachment F – Vehicle Trip Distribution (By Block)

ATTACHMENT G – 2040 VEHICLE TRIP FORECASTS

ATTACHMENT H – SYNCHRO ANALYSIS

ATTACHMENT I – STAKEHOLDER PROJECT SUPPORT