

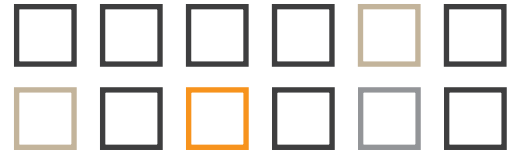
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WEST SIDE TRANSIT ENHANCEMENT STUDY

SERVICE PLAN ASSESSMENT

FEBRUARY 2012

Acknowledgements



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"This material is based on work supported by the Federal Transit Administration under Cooperative Agreement No. CO-79-1000. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the Author(s) and do not necessarily reflect the view of the Federal Transit Administration."



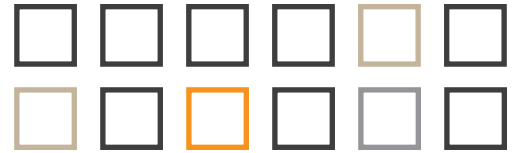
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1. Study Overview



DENVER LIVABILITY PARTNERSHIP

The Denver Livability Partnership (DLP) is an integrated effort among the organizations listed below that aims to expand permanent affordable housing, improve access to jobs, and enhance multi-modal connectivity along Denver's transit corridors. Organizations participating in the DLP include:

- United States Department of Transportation (US DOT)
- United States Environmental Protection Agency (US EPA)
- United States Department of Housing and Urban Development (US HUD)
- Urban Land Institute (ULI)
- Urban Land Conservancy (ULC)
- Denver Regional Council of Governments (DRCOG)
- City & County of Denver
- Denver Regional Transportation District (RTD)
- Denver Housing Authority (DHA)
- Denver Health
- LiveWell Westwood
- Transit Alliance
- Enterprise Community Partners



1.1 PURPOSE

1.1.1 The Denver West Side Transit Enhancement Study

The Denver West Side Transit Enhancement Study (WSTES) is a key element of the DLP and is comprised of the following activities:

Phase One:

- Assess the feasibility of improved transit service and connections between the neighborhoods of Denver's West Side and the existing Central Corridor and future West Corridor light rail lines.
- Assess current RTD services and identify opportunities (if any) to improve connections and access for choice and transit-dependent riders with light rail, local and regional bus service, and other public transit services.

Phase Two:

- Identify infrastructure improvements that may be warranted around transit stops, helping to improve pedestrian connections and connections for other modes of transportation to RTD services.
- Identify and prioritize strategies for improvement of access for West Side neighborhoods to jobs, recreation, education, and other services and opportunities.

This study provides an assessment of unmet transit needs within the West Side study area as well as existing market opportunities and areas of potential transit investment.





1.2 STUDY AREA

1.2.1 Boundaries

For the purposes of the study, use of the term “West Side” refers to a study area that includes neighborhoods roughly bounded by 17th Avenue south to Mississippi Avenue and Sheridan Boulevard east to Broadway and Speer Boulevard, shown in Figure 1.1. This area includes existing connections to the Central Corridor light rail line and future access to the West Corridor light rail line.

1.2.2 Neighborhoods

WSTES focuses on the following West Side statistical neighborhoods: West Colfax, Villa Park, Barnum West, Barnum East, Westwood, Athmar Park, Valverde, Sun Valley, Auraria, and La Alma/Lincoln Park. Figure 1.1 displays the study area including current RTD services and neighborhoods within the West Side study area.

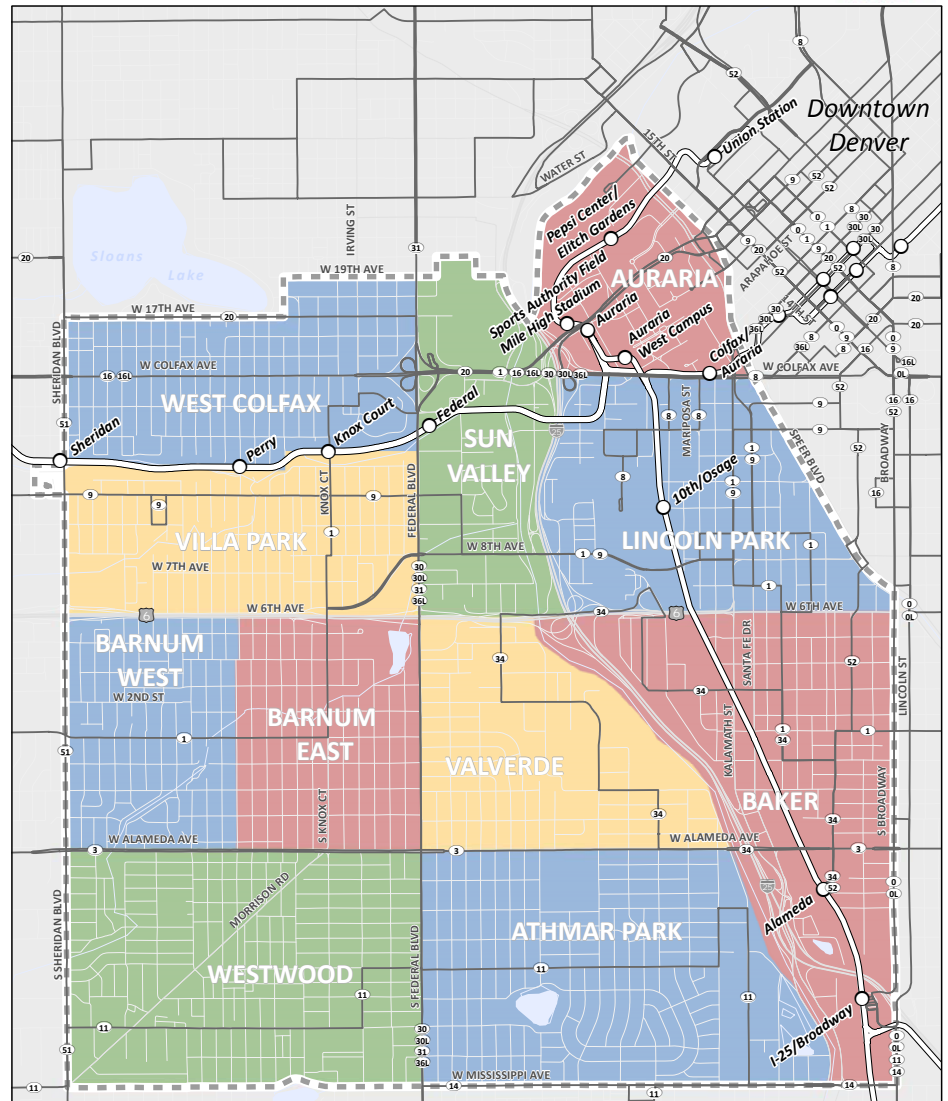


Figure 1.1 - West Side Study Boundary and Statistical Neighborhoods



2. Market Conditions



Examining current and future market conditions of the West Side provides a market context for the performance of existing RTD services within the study area and highlights opportunities for potential transit investment and ridership growth.

Analysis of the following market characteristics helps identify where areas of population and employment densities are more likely to be oriented towards transit use:

- Population and Employment Density
- Median Household Income
- Zero Vehicle Households
- Vehicle to Population Ratio
- Existing conditions ridership information
- Time spent traveling to work

Data used in the study includes the 2009 American Community Survey, the 2010 U.S. Census, and DRCOG-developed 2010 and 2020 estimates of population and employment density.

2.1 POPULATION AND EMPLOYMENT DENSITY

2.1.1 Current

Higher population and employment densities are more supportive of regular transit usage. In the West Side service area, the highest population densities are concentrated along the Colfax Avenue corridor and between the Broadway corridor and Central Corridor light rail line in the La Alma/Lincoln Park and Baker neighborhoods. The Federal Boulevard corridor also contains significant population concentrations,

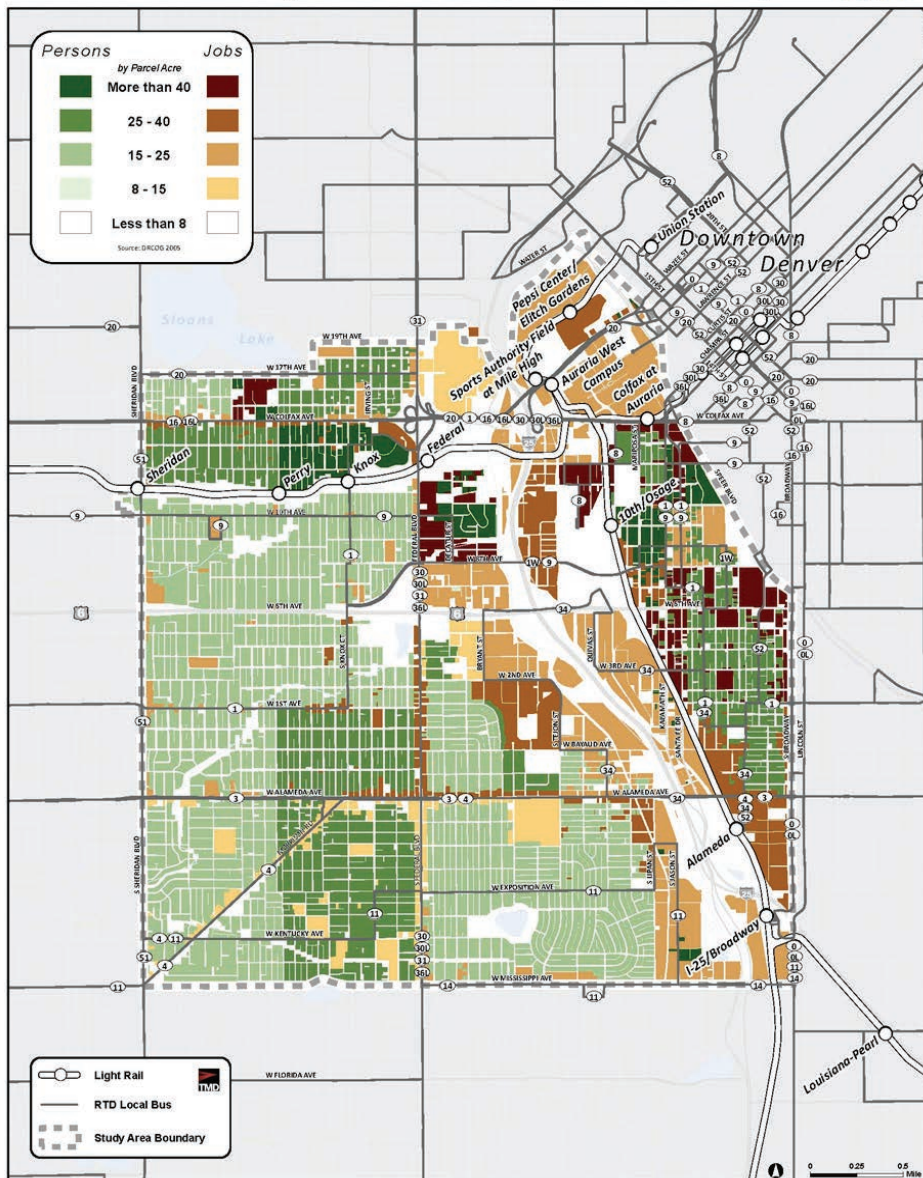


Figure 2.1 - 2010 Population & Employment Density





particularly in the Sun Valley, Barnum East, and Westwood neighborhoods.

Colfax Avenue, Federal Boulevard, Alameda Avenue, and Broadway represent major retail/commercial corridors with moderate employment densities through the study area.

Despite more dispersed development, the South Platte River industrial area hosts a large workforce in the light industrial and manufacturing industries. Significant population and employment densities are also found near the Decatur-Federal and 10th & Osage transit oriented development areas (TODs).

Figure 2.1 displays 2010 population and employment densities in the West Side study area.

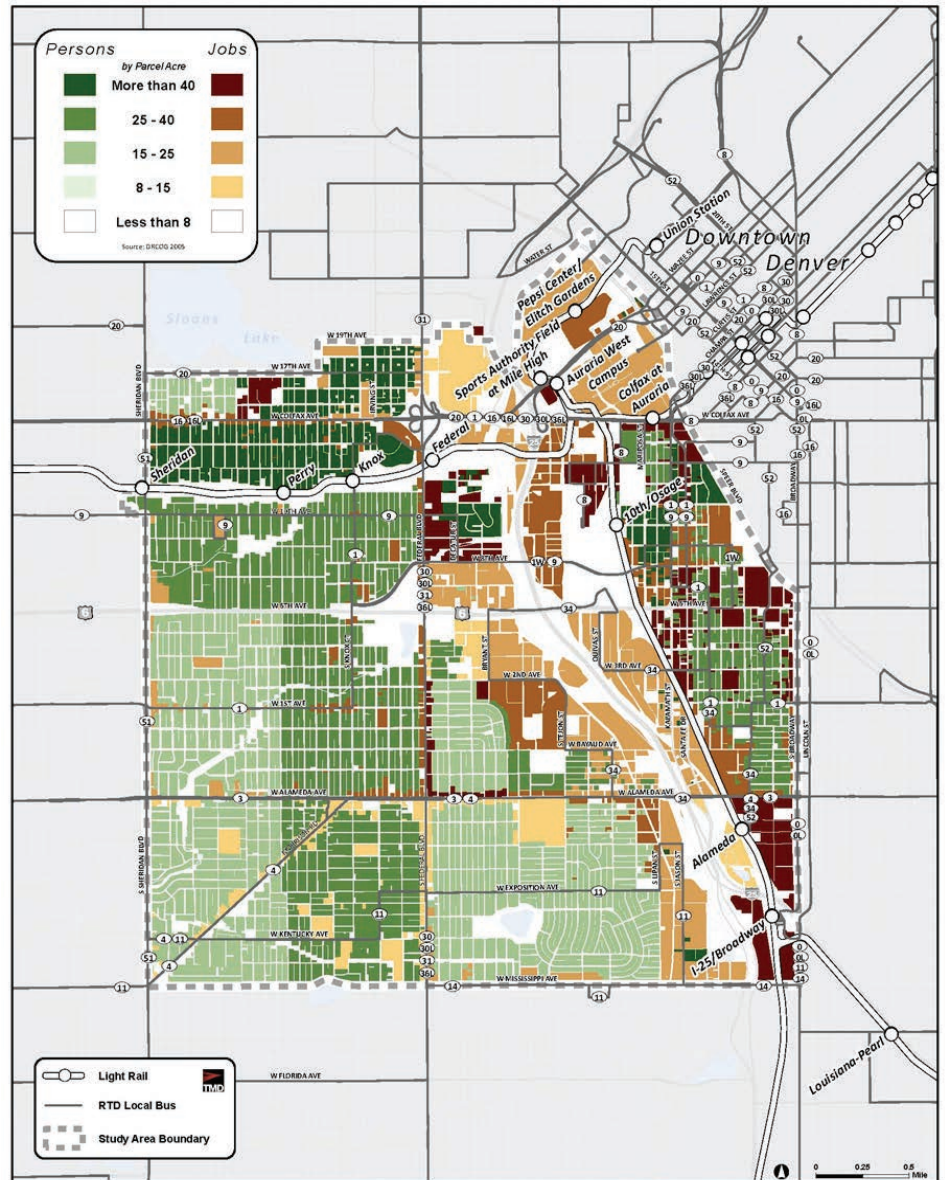


Figure 2.2 - 2020 Population & Employment Density





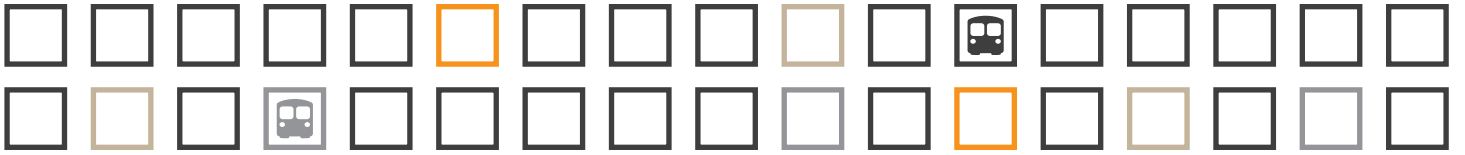
2.1.2 Future

Future population and employment projections for 2020 suggest that the greatest population growth will occur along Colfax Avenue, within the La Alma/Lincoln Park neighborhood, and in the Sun Valley neighborhood near the Decatur-Federal Station. Significant employment growth is projected along Colfax Avenue and adjacent to the 10th/Osage, Alameda, and I-25/Broadway Stations. Minimal population changes are forecasted in neighborhoods such as Barnum West, Westwood, Valverde, and Athmar Park. Figure 2.2 (page 7) displays 2020 projected population and employment density. Table 2.1 provides estimates on future population and employment densities for study area neighborhoods.

Table 2.1 provides additional information regarding current and future population and employment details and displays existing and future population densities by statistical neighborhood.

Statistical Neighborhood	Population						Employment					
	2010		2020		Change (2010 - 2020)		2010		2020		Change (2010 - 2020)	
	Total	Density per Parcel Acre	Total	Density per Parcel Acre	Total	Density per Parcel Acre	Total	Density per Parcel Acre	Total	Density per Parcel Acre	Total	Density per Parcel Acre
Athmar Park	9,092	21.1	9,338	21.7	246	0.6	3,523	17.7	3,867	19.4	344	1.7
Auraria	259	314.8	369	448.5	110	133.7	4,612	17.2	5,744	21.4	1,132	4.2
Baker	4,703	34.5	4,900	35.9	197	1.4	10,339	25.4	12,310	30.3	1,971	4.9
Barnum East	6,171	25.7	6,377	26.6	206	0.9	874	29.3	908	30.5	34	1.1
Barnum West	5,107	19.0	5,280	19.7	173	0.6	553	21.3	579	22.3	26	1.0
La Alma/Lincoln Park	4,819	42.6	5,234	46.3	415	3.7	11,645	46.8	13,110	52.7	1,465	5.9
Sun Valley	1,604	50.2	2,135	66.9	531	16.6	5,648	22.5	6,049	24.1	401	1.6
Valverde	4,013	26.6	4,164	27.6	151	1.0	5,719	22.9	5,889	23.5	170	0.7
Villa Park	7,900	23.6	8,579	25.7	679	2.0	628	19.7	807	25.3	179	5.6
West Colfax	11,439	39.2	14,468	49.6	3,029	10.4	4,173	49.0	4,810	56.5	637	7.5
Westwood	13,823	24.6	14,172	25.2	349	0.6	1,446	12.4	1,501	12.9	55	0.5





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2.2 DEMOGRAPHIC CHARACTERISTICS

2.2.1 Median Household Income

Median household income (Figure 2.3) is defined by the U.S. Census Bureau as the sum of money income received in a calendar year by all household members 15 years old and over, including household members not related to the householder, people living alone, and other nonfamily household members. Median household income is used to identify areas where transit is likely to succeed based on income levels. Typically, residents of lower income neighborhoods are more likely to use transit, while higher income residents are less inclined to use transit and are considered to be choice riders. Low income residents are more likely to use transit out of necessity with the assumption that they are less able to afford automobiles with some or all of the household using transit as their primary mode.

According to the 2009 American Community Survey, the Denver City median household income was \$45,000 per year. The median household income level of nearly every neighborhood in the West Side study area is below the citywide median. Figure 2.3 shows significant concentrations of very low

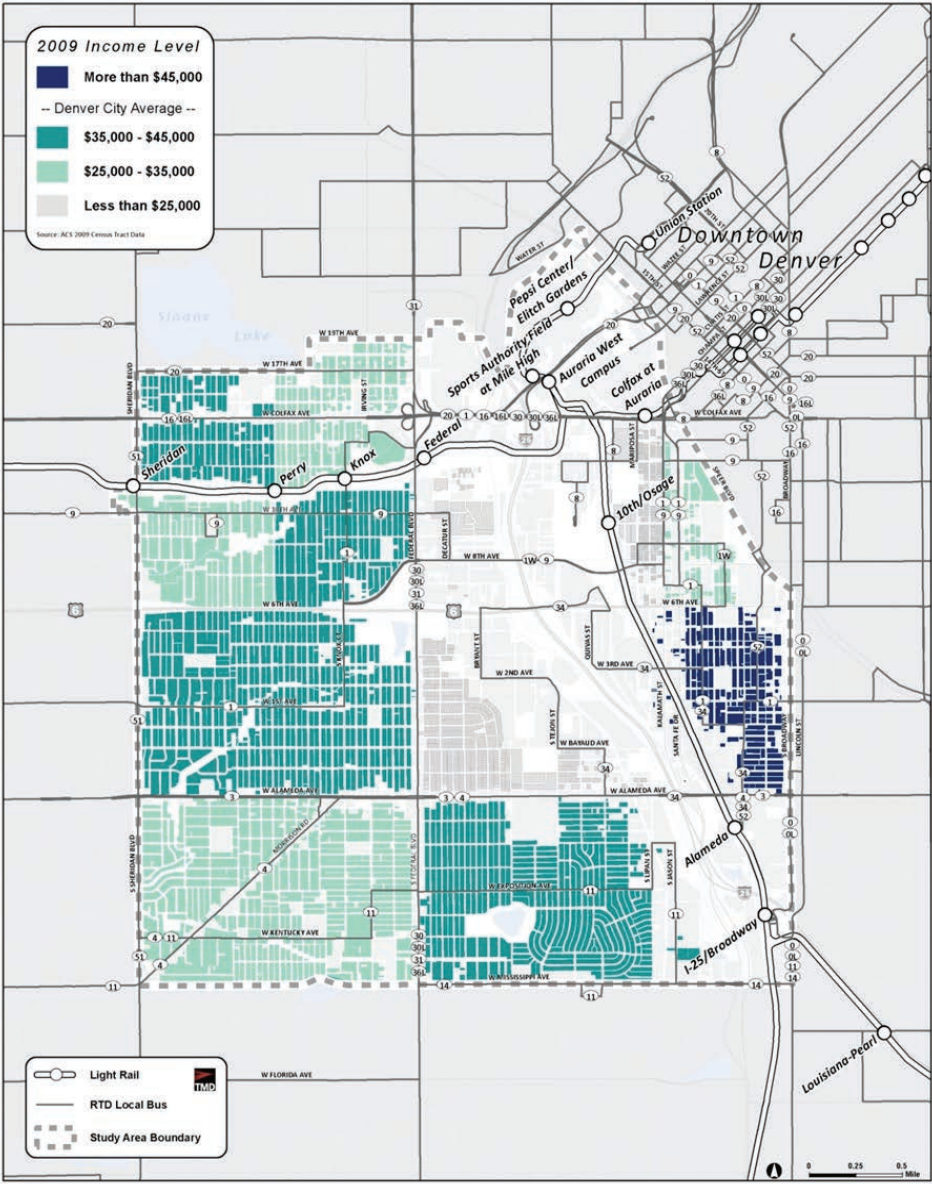


Figure 2.3 - Median Household Income





income households (\$25,000 per year or less) within the Valverde, La Alma/Lincoln Park, and Sun Valley neighborhoods. The Valverde neighborhood is surrounded by high frequency bus service on Federal Boulevard and Alameda Avenue. The La Alma/Lincoln Park and Sun Valley neighborhoods are within walking distance to existing and future light rail stations, respectively, and are near high frequency bus service on Colfax Avenue. The Westwood and West Colfax neighborhoods also have concentrations of low income households earning between \$25,000 and \$35,000 per year. The Denver Housing Authority provides public housing in many of these low income neighborhoods, including Westwood, Sun Valley, La Alma/Lincoln Park, and West Colfax.

2.2.2 Vehicle Access

Figures 2.4 and 2.5 (page 12) identify populations with low vehicle availability based on two separate measures: high population-to-vehicle ratio and zero vehicle households, respectively. Typically an area is seen to have a population with low vehicle availability if there are two or more persons (of driving age) per vehicle or three or more households per acre without access to a car.

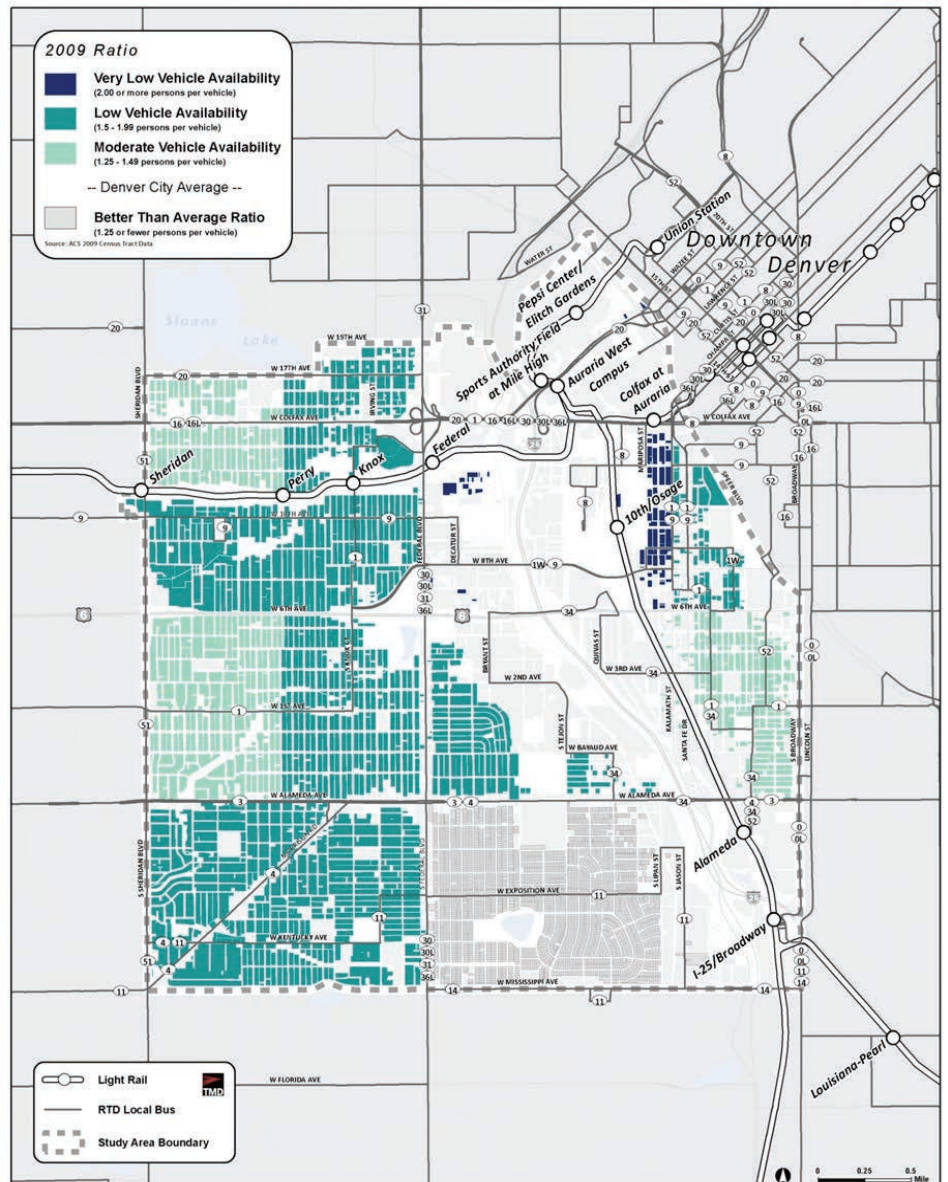
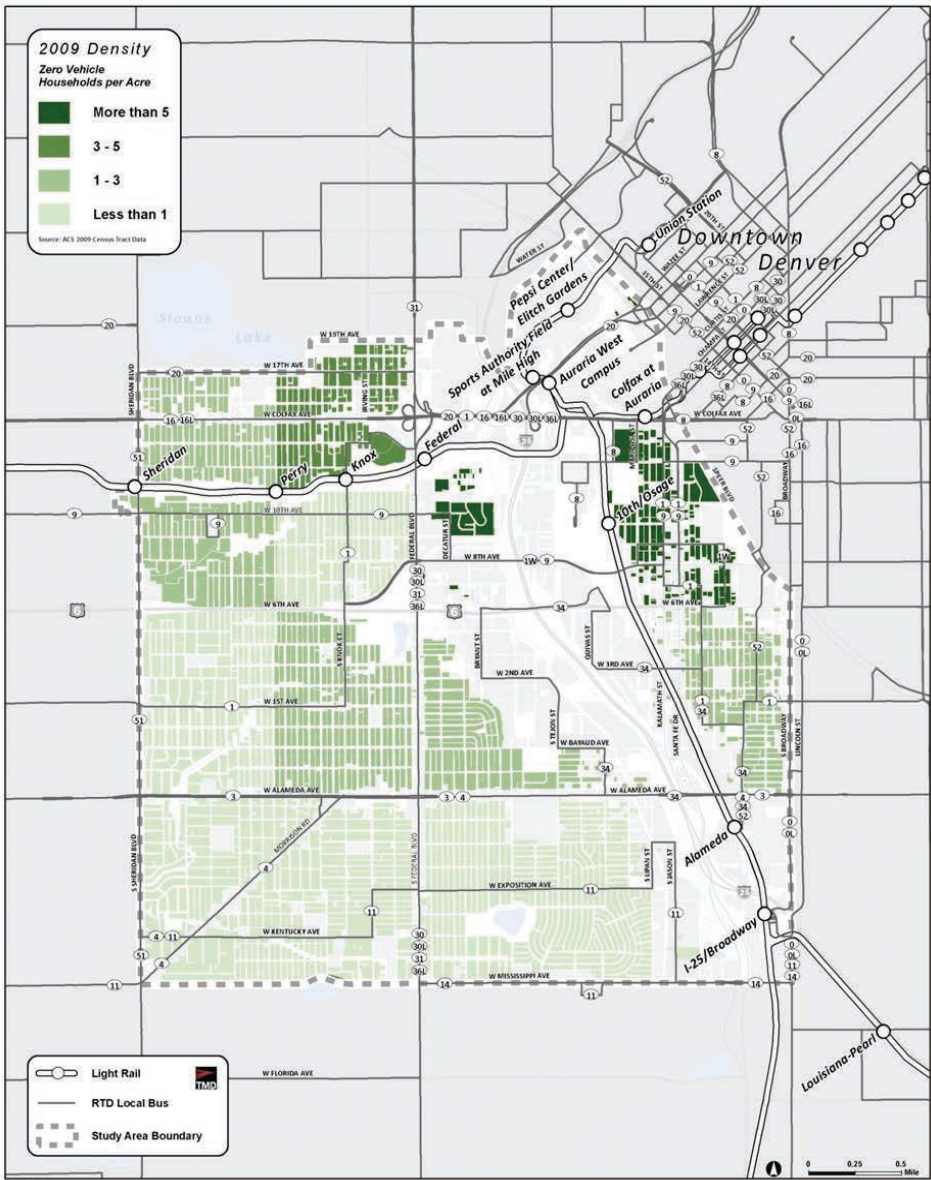


Figure 2.4 - Vehicle/Driving Age Population Ratio





The West Colfax, Sun Valley, and La Alma/Lincoln Park neighborhoods contain significant concentrations of populations with low vehicle availability, particularly near the Decatur/Federal Station, the 10th/Osage Station, and along Colfax Avenue, Federal Boulevard, and Alameda Avenue. Neighborhoods with low automobile availability generally correspond with areas of concentrated low income, senior, or college-aged populations, where vehicle ownership is either unnecessary or unfeasible.

Figure 2.5 - Density of Zero Vehicle Households





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2.3 KEY DESTINATIONS

Major destinations for the West Side include:

- Employment
- Educational Institutions
- Medical, Social Service, and Civic Uses
- Grocery and Retail Shopping
- Tourism and Recreation

Within the West Side, key destinations are primarily concentrated along major existing transit corridors, including Colfax Avenue, Broadway, Federal Boulevard, Alameda Avenue, Sheridan Boulevard, 17th Avenue, and Mississippi Avenue. Proximity to high frequency transit service provides riders with strong connections between key destinations and areas throughout the RTD network. Figure 2.6 displays key destinations within the West Side.

2.3.1 Employment

Medical and social service locations within the Sun Valley neighborhood (Workforce Center at Westside and Westside Family Health Center) and La Alma/Lincoln Park neighborhood (Denver Health Medical Center) are significant employment centers located in the West Side. St. Anthony's Hospital, formerly one of the largest employers in the West Side study area, recently relocated operations to the Denver Federal Center in Lakewood. This move opened up a large parcel for future redevelopment just south of Sloan's Lake. Other employment destinations within the study area are typically retail/commercial businesses concentrated along major corridors (e.g. Broadway Marketplace) or light industrial/

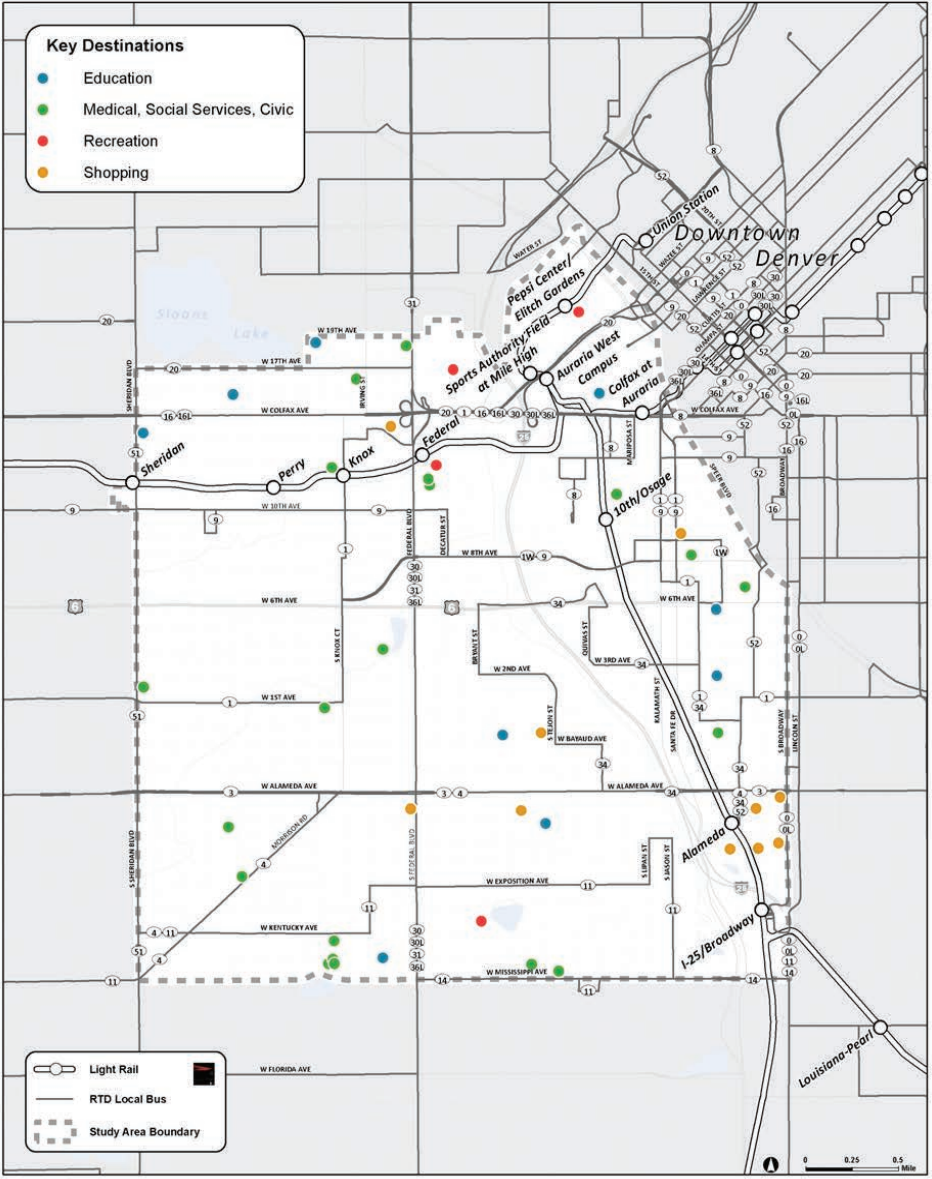


Figure 2.6 - Key Destinations





manufacturing businesses on either side of the I-25 corridor (e.g. South Platte River industrial district).

2.3.2 Educational institutions

Table 2.2 displays educational destinations located within the West Side by neighborhood. The three colleges sharing the Auraria Campus represent one of the largest destinations for college-aged students in the Metro Denver area. College students are typically a transit dependent group due to a combination of limited access to automobiles, costs of parking downtown, or the student EcoPass that is issued for many campus programs. Students most commonly utilize transit when traveling to and from school and also when making work, shopping, or entertainment related trips. The Auraria Campus and other schools listed in Table 2.2 are each located along or near the RTD transit network. Denver Public Schools (DPS) provides bus services for elementary and middle school aged children and those children with disabilities. DPS high school students are eligible to receive discounted RTD passes.

2.3.3 Medical, Social, and Civic Services

Table 2.3 displays medical, social service, and civic destinations within the West Side by neighborhood. Denver Health in La Alma/Lincoln Park and the West Side Workforce Center in Sun Valley represent major trip destinations and generators. Both facilities are located along the RTD network. Potential plans for the former St. Anthony’s Hospital site on West Colfax include a neighborhood health clinic.

Neighborhood	Educational Destination
Auraria	Metropolitan State University of Denver (Auraria Campus)
	Community College of Denver (Auraria Campus)
	University of Colorado - Denver (Auraria Campus)
Baker	Fairmont Dual Language Immersion Academy (K-8)
	Denver Center for International Studies (MS, HS)
La Alma/ Lincoln Park	Colorado High School Charter
	New West Denver High School
	West Generation Academy
	West Leadership Academy
Valverde	Florence Crittenton High School
	Rishel Middle School
West Colfax	Beth Jacobs High School
	Lake Middle School
	Yeshiva Toras Chaim Talmudical Seminary College and High School – Orthodox
Westwood	Denver Indian Center
	Kepler Middle School

Table 2.2 - Educational Destinations by Neighborhood

Neighborhood	Medical/Social Services/Civic Destination
Athmar Park	Athmar Park Library
	Motor Vehicle Department
Baker	La Familia Recreation Center
Barnum East	Barnum Recreation Center
	Rose Barnum Branch Library
Barnum West	Barnum Senior Center
	Rocky Mountain SER
La Alma/Lincoln Park	Boys and Girls Club
	Denver Health Medical Center
	La Alma Recreation Center
Sun Valley	Westside Family Health Center
	Denver Workforce Center at Westside
Villa Park	Gates Retirees
West Colfax	Boys and Girls Club
	Denver Urban Horticulture
	Mile High Youth Corps
	Mulroy Neighborhood Center
Westwood	Boys and Girls Club
	Denver Indian Center
	Southwest Improvement Council
	Westwood Branch Library
	Westwood Community Center
	Westwood Family Health Center

Table 2.3 - Medical, Social Service, and Civic Destinations by Neighborhood





Neighborhood	Grocery/Major Retail Shopping Destination
Athmar Park	Alameda Square Shopping Center
	Little Saigon Market
Baker	Broadway Marketplace (includes KMart, Albertson's, Sams Club)
	Home Depot
Barnum	Mi Pueblo Market
La Alma/Lincoln Park	King Soopers
	Plaza de Santa Fe
	Santa Fe Arts District
West Colfax	Mile High Vista (future)

Table 2.4 - Grocery and Major Retail Shopping Destinations by Neighborhood

2.3.4 Grocery and Retail Shopping

Connecting residents of the West Side study area to shopping destinations for basic daily needs and food access is a key element of the West Side Transit Enhancements study. Table 2.4 displays the key shopping destinations within each West Side neighborhood. The Broadway corridor contains several major retail and grocery shopping destinations, including the Broadway Marketplace. Alameda Square Shopping Center offers grocery options for nearby residents of Athmar Park, Valverde, Barnum West, Barnum East, and Westwood. The small shopping district at 1st Avenue/Knox Court contains the only local market for residents of the Barnum neighborhoods so access to the area on Route 1 is critical for nearby residents. Similarly, the shopping center at Mile High Vista is home to a new grocery store serving the West Colfax, Sun Valley, and Villa Park neighborhoods. Major shopping destinations lie beyond the study area boundaries with frequent, direct access from existing RTD bus services, including Lakewood Commons/ Belmar Shopping Center, Walmart Supercenter (Colfax Avenue), Target (Sheridan Boulevard), Avanza Supermarket (Federal Boulevard), and Safeway (Sheridan Boulevard and Federal Boulevard). Other shopping destinations are located along the major commercial corridors intersecting the study area.

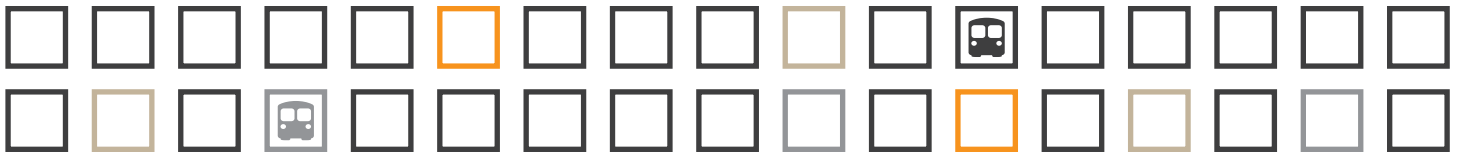
Neighborhood	Recreation and Tourism Destinations
Athmar Park	Huston Lake
Auraria	Pepsi Center
Baker	La Familia Recreation Center
Barnum East	Barnum Recreation Center
Colfax	Sloan's Lake
La Alma/Lincoln Park	La Alma Recreation Center
	Mile High Station
Sun Valley	Colorado Sports Hall of Fame
	Rude Recreation Center
	Sports Authority Field at Mile High

Table 2.5 - Recreation and Tourism Destinations by Neighborhood

2.3.5 Tourism and Recreation

Table 2.5 displays key recreation and tourism destinations within the West Side study area. Sports Authority Field at Mile High is a major trip generator during Broncos games and other special events. Mile High is currently served by the BroncosRide which picks up sports patrons at different locations around the Denver area on Broncos game days.





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2.4 FUTURE DEVELOPMENTS

2.4.1 Baker

- *Broadway Marketplace* – A major redevelopment project is planned west of South Broadway located near RTD’s Alameda and I-25/Broadway light rail stations. Plans include additional office space, retail space, residential space, hotel accommodations, and educational space - all of which will add significant densities to the site. The future presence of high density, transit oriented development is likely to increase transit demand along the Broadway and Alameda corridors as well as adjacent light rail stations.
- *Alameda Station Village* - A new transit oriented development (TOD) residential community including 225 new apartment units is planned directly adjacent to the Alameda light rail station. This project is currently being designed and is planned to begin construction in 2013.

2.4.2 West Colfax

- *West End Lofts* - Completed in early 2012, the development includes a \$17 million dollar, mixed-use, Transit Oriented Development (TOD), including 101 workforce housing apartments and 9,295 square feet of commercial space over 5-6 retail bays. The site is the former Shuffle Inn (5000-50 W. Colfax Avenue).
- *Mile High Vista* – Located at the intersection of W. Colfax Avenue and Irving Street; within ¼ mile of I-25 and ¼ mile of the Knox and Decatur/Federal light rail stations. Plans include a 12-story mixed-use Urban Land Conservancy (ULC) transit oriented development (TOD), the new West Denver public library, 72 affordable apartments, and a small commercial building. Completion is expected in 2013.
- *St. Anthony’s Central Hospital* – In November 2011, Centura Health announced exclusive negotiations with EFG Brownfield Partners to head redevelopment efforts of the former St. Anthony’s Hospital location. The St. Anthony Central Redevelopment Task Force indicated that redevelopment efforts should include the preservation of mixed-income housing, a health care component, and allow the site to act as an anchor for the neighborhood while complementing existing neighborhoods and businesses. The status of the plan for the site should be continually monitored to determine the future impact on transit services in the area.

2.4.3 Westwood

- *Morrison Road District* – Morrison Road acts as a town center and neighborhood shopping area for the Westwood neighborhood and new opportunities for pedestrian destinations may fill in portions of Morrison Road in the future. According to Blueprint Denver, land along the road is, “underused, and the diagonal orientation of the roadway with its adjacent unusual lot configurations predispose the area to redevelopment that would take advantage of these unique features.” Despite the potential for redevelopment, there are no immediate plans for significant redevelopment along Morrison Road. Future development may warrant additional investment in transit service.

2.4.4 Sun Valley

- *Decatur-Federal Station Area Plan and General Development Plan* - The Decatur-Federal Station Area Plan and General Development Plan efforts underway currently are both activities funded by the Denver Livability Partnership. Both plans will guide future growth and change near the light rail station and in the Sun Valley neighborhood over the next 20 years. Focused on the area adjacent to the new West Light Rail Line station, the plans articulate the future vision for Sun Valley Homes, a 33 acre public housing site and some of the oldest housing in DHA’s portfolio. DHA has targeted Sun Valley as “next” on their list (after South Lincoln Homes) for development of livable and high quality mixed income communities near transit.





2.5 TRAVEL DEMAND

A travel demand analysis of 2010 person-trips (including all transportation modes, not just vehicles) was conducted for the study area, divided into four neighborhood quadrants: northwest, southwest, southeast, and northeast (see Figure 2.7). Travel patterns were analyzed and mapped within and between each quadrant. The circles represent the number of trips made within a traffic analysis zone (TAZ) and the lines represent trips made between TAZs.

The northwest and southwest quadrants have limited neighborhood to neighborhood travel, with the majority of travel occurring to and from the immediately adjacent neighborhoods outside of the study area. High levels of travel demand to downtown Denver and areas outside of the study area suggests that there is more external travel in the study area than internal travel. Furthermore, the Denver Strategic Transportation Plan indicated that more than 86 percent of person trips made in the West Side travel shed are pass-through trips likely on the study area's main north/south and east/west arterial roadways.

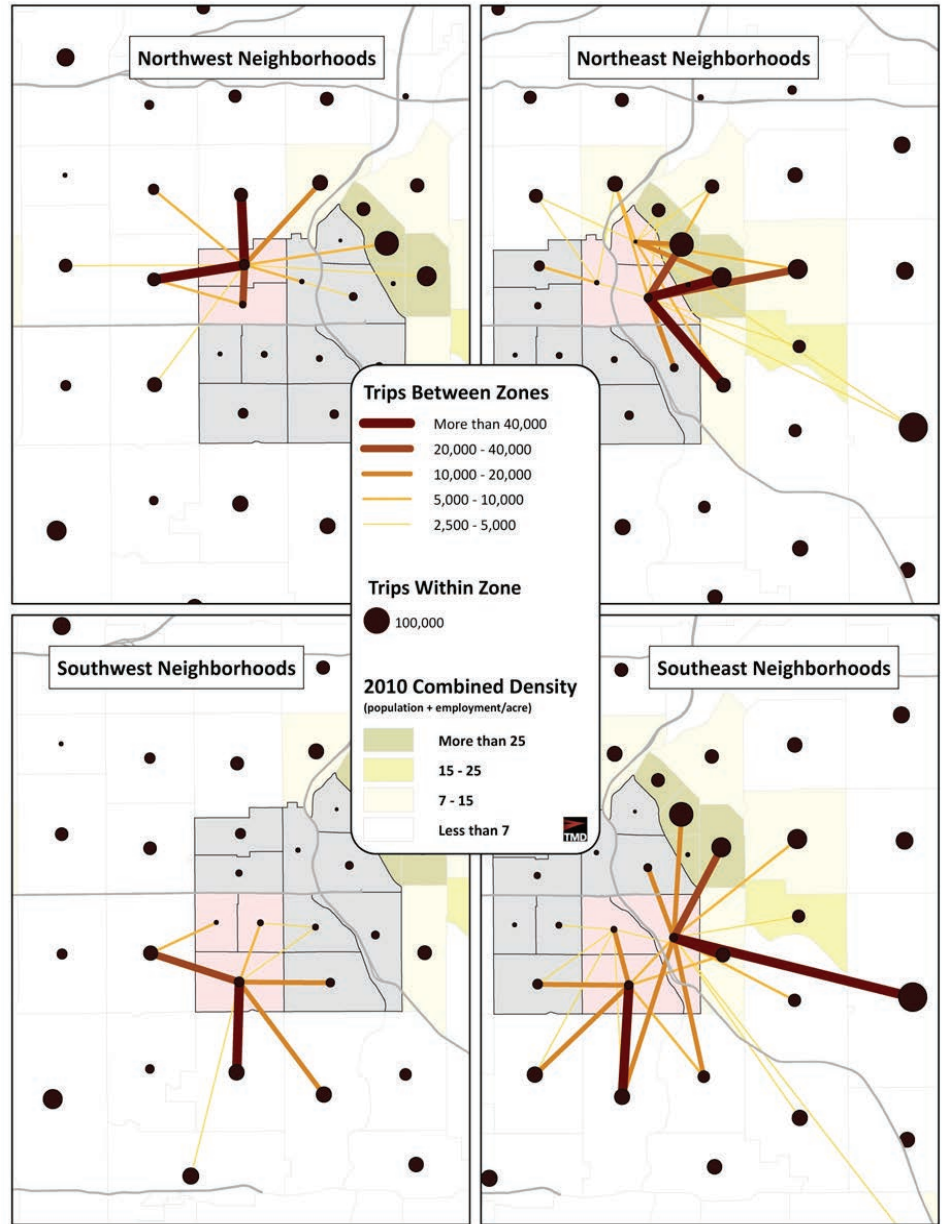
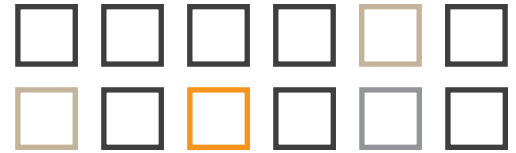


Figure 2.7 - Travel Demand in Traffic Analysis Zones



3. Transit Service



3.1 EXISTING SERVICE

The West Side is currently served by three different classes of bus service along major arterials: Central Business District (CBD) Local service, Urban Local service and Limited Service (Figure 3.1). In addition, RTD light rail services the study area via the Central Corridor. Corridors with high commute demand (Broadway, Colfax Avenue, and Federal Boulevard) are supplemented with peak-only Limited overlays in addition to the underlying Local service. CBD Local and Limited routes provide direct trips into downtown Denver, while Urban Local routes provide connections to the greater RTD network outside of downtown. Light rail is accessible via six stations in the study area: Pepsi Center/Elitch Gardens, Sports Authority Field at Mile High, Auraria West Campus, 10th/Osage, Alameda, and I-25/Broadway Stations.

3.1.1 Existing Service Levels

Table 3.1 to the left defines the travel time periods used for the study. Table 3.2 displays current West Side service levels by identifying the combined peak (AM and PM) frequencies for each corridor. These illustrate how service levels are designed to best meet market demand.

Service frequencies in the West Side are designed to match the varying market demand within the study area, particularly commute and urban demand. The highest frequency corridors operate on major urban arterials closer to downtown at frequencies of 10 minutes or better, such as Broadway, Colfax Avenue, and Federal Boulevard. The east-west corridors of Alameda Avenue, 8th Avenue, 10th Avenue, and 20th Avenue also operate at

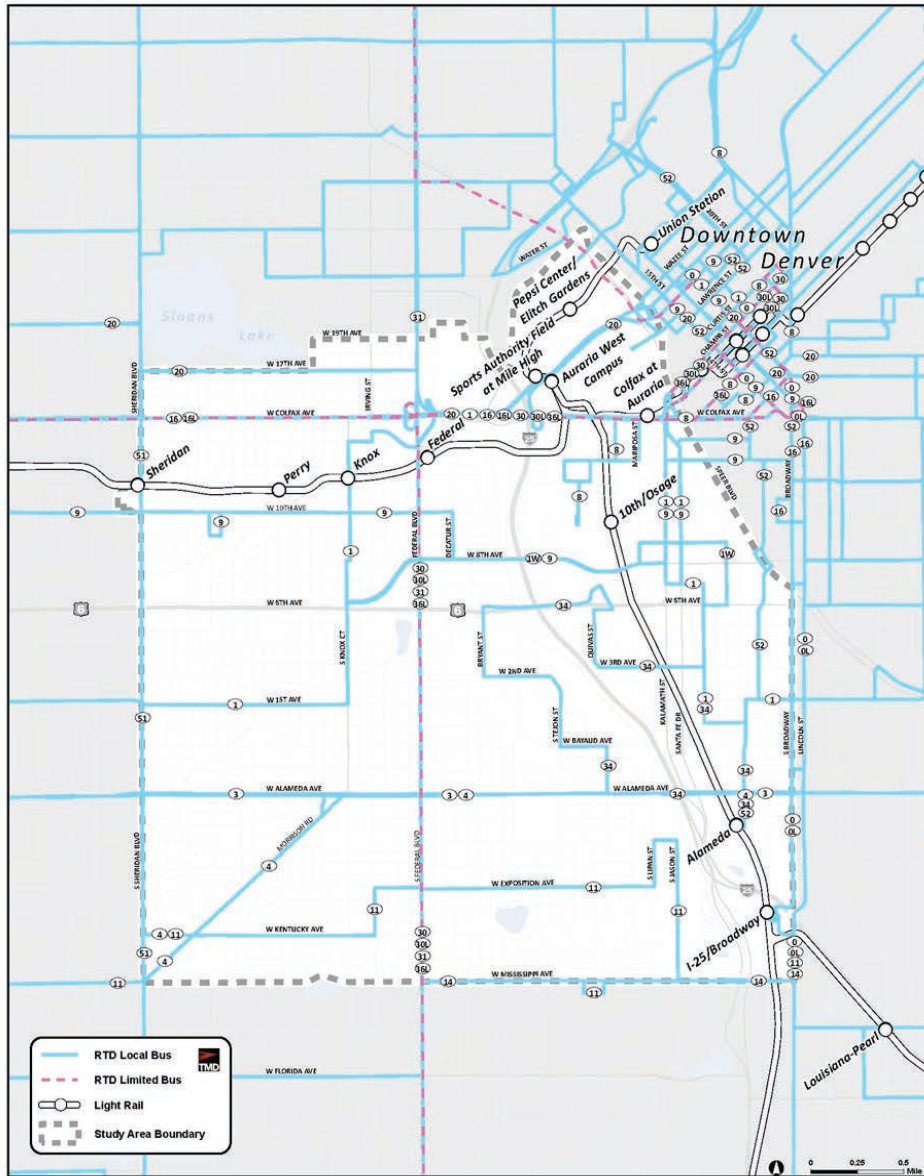
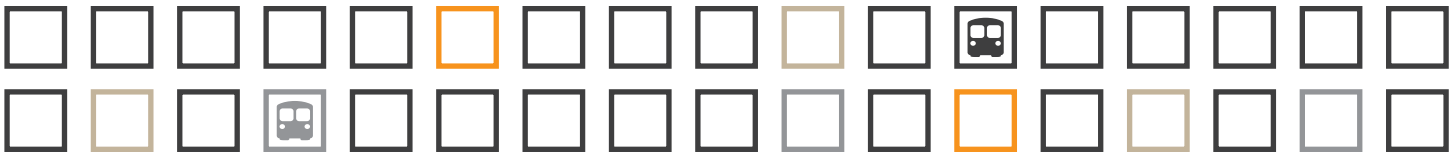


Figure 3.1 - Existing RTD Service

Table 3.1 - Defined Travel Time Periods

Defined Travel Time Periods		
Time Period	Start	End
AM Early	5:00 AM	5:59 AM
AM Peak	6:00 AM	8:59 AM
Midday	9:00 AM	2:49 PM
PM Peak	3:00 PM	5:59 PM
Evening	6:00 PM	7:59 PM
Late Evening	8:00 PM	11:59 PM





spontaneous use frequencies of 10-15 minutes. Such corridors are intended to facilitate all-day spontaneous use (bus travel without the use of a bus schedule) and form the core network. More tailored, less-frequent services (greater than 15 minutes) provide coverage along streets such as Sheridan Boulevard.

3.1.2 Existing Service Spans

West Side routes operating along major corridors typically display longer service spans and provide all-day service. These routes form the core network. Major spontaneous use corridors with service spans of nearly 24 hours include South Broadway (Route 0), West Colfax Avenue (Route 16), and Alameda Avenue (Route 3). The Mississippi Avenue (Route 11) and Sheridan Boulevard (Route 51) corridors also operate during the AM Early and Late Evening hours. Service spans of the remaining West Side bus routes typically begin in the AM Peak time period and end before 12:00 midnight in the Late Evening time period.

Service Level by Corridor		
Combined Peak Frequency	Corridor	Route(s)
Better than 10 minutes	S. Broadway	0, 0Ltd
	W. Colfax Avenue	16, 16Ltd
	S. Federal Boulevard	30, 30Ltd, 31, 36Ltd
10 to 15 minutes	Alameda Avenue	3, 4, 34
	W. 8th Avenue	1, 9
	W. 10th Avenue	9
	20th Avenue	20
Greater than 15 minutes	W. 1st Avenue	1
	W. 52nd Avenue	52
	N. Broadway	8
	W. Florida Avenue	14
	Mississippi Avenue	11
	Sheridan Boulevard	51

Table 3.2 - Service Level by Corridor

Table 3.3 displays the service class, description, peak and off-peak (Midday) and weekend frequencies, and service span for all routes considered a part of the West Side bus network.

Table 3.3 Current West Side Transit Route Network

Current West Side Transit Route Network									
Route	Service Class	Description	Frequency				Span of Service		
			Weekday		Saturday	Sunday	Weekday	Saturday	Sunday
			Peak	Off-Peak					
0	CBD Local	South Broadway	7.5	10	15	15	3:43 - 26:56	2:13 - 26:54	2:15 - 26:52
0L	Limited CBD Local	South Broadway Limited	15	-	-	-	5:31 - 9:10 / 15:19 - 19:05	-	-
1	CBD Local	West 1st Avenue	30	30	60	60	5:07 - 23:23	5:07 - 23:22	7:28 - 21:42
3	Urban Local	Alameda Avenue	15	30	30	30	4:27 - 24:57	5:10 - 24:57	5:10 - 24:57
4	CBD Local	Morrison Road	45	-	-	-	6:24 - 8:53 / 15:18 - 18:10	-	-
8	CBD Local	North Broadway/Huron	30	60	60	60	4:57 - 22:06	6:04 - 20:05	8:04 - 20:05
9	CBD Local	West 10th Avenue	15	15	30	30	5:15 - 21:03	7:07 - 18:59	8:19 - 18:00
11	Urban Local	Mississippi Avenue	30	30	30	60	4:12 - 24:37	5:22 - 24:12	6:21 - 20:10
14	CBD Local	West Florida Avenue	30	30	60	60	5:22 - 19:17	6:11 - 19:02	9:11 - 19:01
16	CBD Local	West Colfax Avenue	15	15	15	15	4:19 - 26:02	2:13 - 26:02	2:13 - 26:01
16L	Limited CBD Local	West Colfax Limited	20	30	30	30	5:08 - 21:37	6:14 - 19:48	6:14 - 19:48
20	CBD Local	20th Avenue	15	30	30	30	5:10 - 23:50	5:26 - 23:50	5:26 - 23:47
30	CBD Local	South Federal Boulevard	15	15	15	-	4:32 - 22:12	8:33 - 18:00	-
30L	Limited CBD Local	South Federal Limited	30	-	-	-	5:56 - 9:21 / 14:59 - 18:29	-	-
31	CBD Local	Federal Boulevard	15	15	15	30	4:10 - 26:05	4:16 - 26:05	4:16 - 26:05
34	Urban Local	Platte Industrial	45	-	-	-	5:37 - 8:01 / 15:07 - 17:01	-	-
36L	Limited CBD Local	Fort Logan Limited	30	-	-	-	4:52 - 8:48 / 14:20 - 19:16	-	-
51	Urban Local	Sheridan Boulevard	30	30	30	30	4:42 - 23:43	5:30 - 23:40	5:30 - 23:40
52	CBD Local	W 52nd Avenue/South Bannock	30	30	30	60	4:37 - 24:14	4:50 - 24:13	5:56 - 20:43



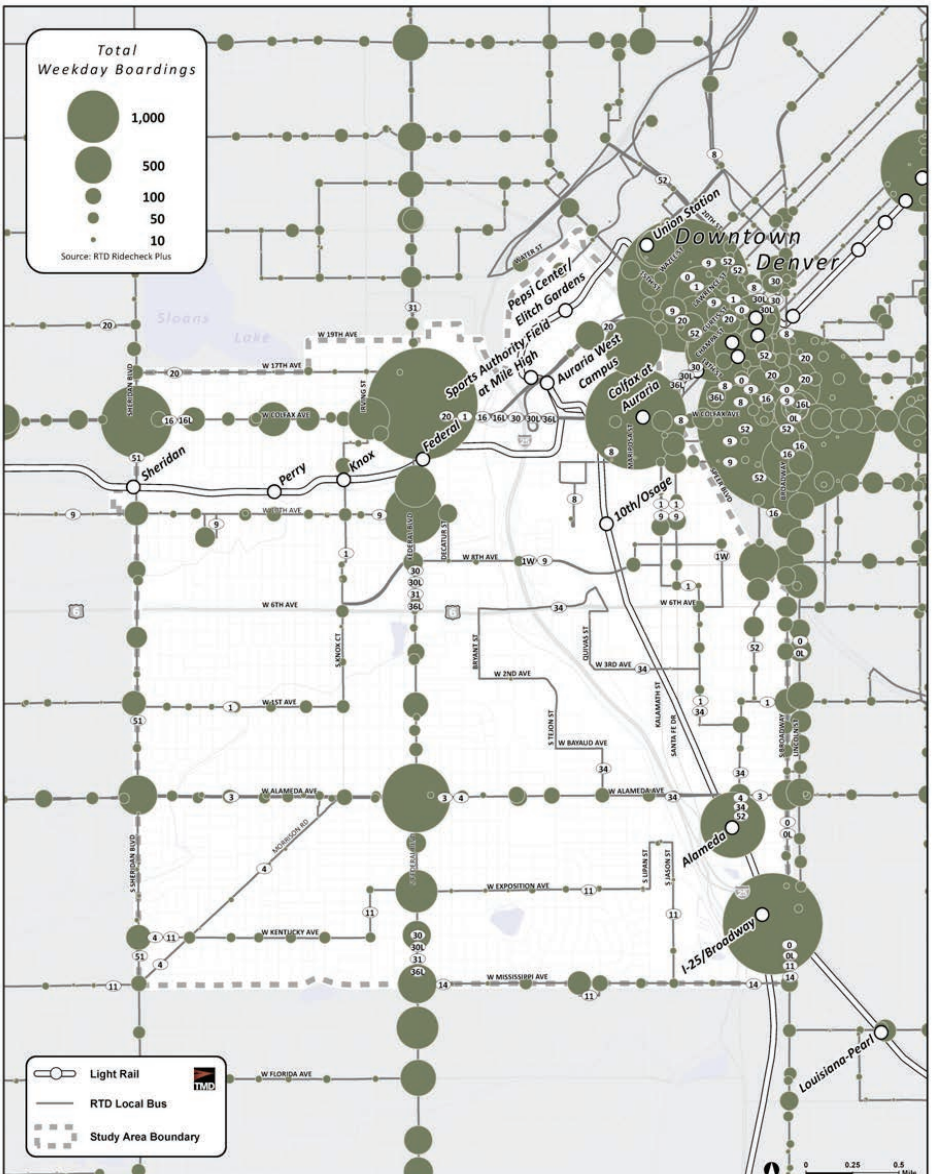


Figure 3.2 - RTD West Side Average Weekday Passenger Boardings

3.2 RIDERSHIP

RTD 2009-2010 Ridecheck Plus data provided average weekday ridership data for West Side bus services. Existing RTD Local and Limited routes generate approximately 22,150 average weekday passenger boardings within the West Side study area. Figure 3.2 displays average weekday boardings by individual stop.

3.2.1 Current Ridership Patterns

Concentrations of weekday passenger boardings coincide with spontaneous use frequencies along key corridors, with Broadway, Colfax Avenue, and Federal Boulevard experiencing the greatest number of boardings. Areas with less frequent service, such as West 1st Avenue and Knox Court display lower levels of passenger activity. With the exception of Colfax Avenue and Alameda Avenue, east-west corridors display low daily boardings in comparison to many north-south routes. This is likely due to the 6th Avenue, I-25, and Lakewood Gulch barriers, which limit connectivity by bisecting the street system. The Strategic Transportation Plan (2008) found that north-south travel demand in the West Side is expected to surpass capacity by 2030 due to these east-west barriers.

Significant ridership concentrations are also found at major bus-to-bus and bus-to-rail transfer locations, including Colfax/Sheridan, Colfax/Federal, Alameda/Federal, Colfax/Broadway, Auraria Station, Alameda Station, and I-25/Broadway Station. These ridership concentrations are indicative of the use of the RTD system as a cohesive network, where customers transfer between multiple routes for trip completion.





3.3 ROUTE SERVICE PERFORMANCE

3.3.1 Weekday Boardings by Route

Spontaneous use corridors within the study area generate the greatest weekday boarding activity including Routes 0 (South Broadway), 31 (Federal Boulevard), 16 (West Colfax Avenue), and 30 (South Federal Boulevard). Each route experiences over 5,500 weekday boardings. Table 3.4 displays weekday boardings by route.

3.3.2 Passenger Boardings per In-Service Hour by Route

Productivity measures the performance of a route (boardings) against the amount of service supplied (in-service hours). Weekday productivity for Local and Limited routes is shown by boardings per in-service hour in Table 3.5. Several routes that experienced high weekday boardings also placed high in terms of productivity: Routes 0Ltd, 16, 16Ltd, 30, and 36L each experience 45 or more boardings per in-service hour. Routes operating along secondary streets (e.g. Routes 1, 8, and 34) generally achieve lower productivity below 30 boardings per in-service hour.

3.3.3 Productivity by Route Segment

Productivity by route segment allows for an in-depth route analysis and showcases strong and weak route segments. Additionally, such detailed analysis can easily identify problem segments of a route and allow planners to identify potential routing alternatives prior to whole-scale route changes. Figure 3.3 (page 24) provides a geographic representation of average weekday passenger boardings per in-service hour by segment. Routes 8 and 34 show low performance across all route segments, with each segment experiencing fewer than 20 passengers per in-service hour. Routes 1, 3, 9, and 11 display some underperforming route segments, with each underperforming segment experiencing fewer than 20 passengers per in-service hour. These segments are located along the eastern and western boundaries of the West Side study area and within the South Platte River industrial area. Conversely, route segments operating along higher frequency corridors, Colfax Avenue (Routes 16 and 16L) and Federal Boulevard (Routes 30 and 31), have the greatest productivity, with 80 or greater passengers per in-service hour. In addition, Routes 14 and 51 have routes segments with strong productivity, particularly along Sheridan Boulevard and between the Federal Boulevard and Broadway corridors.

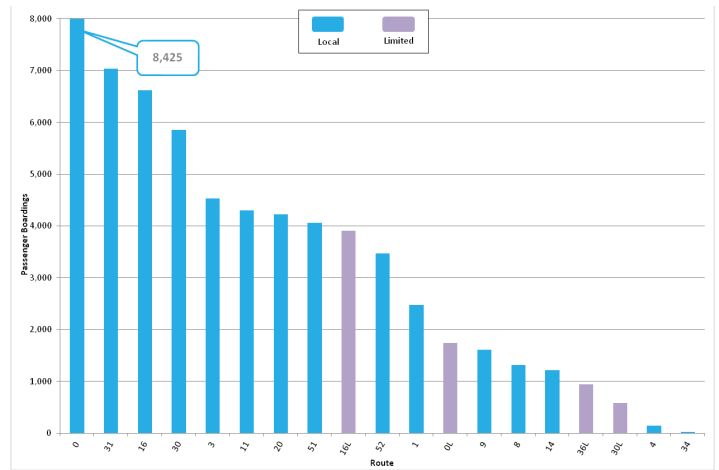


Table 3.4 - Average Weekday Boardings

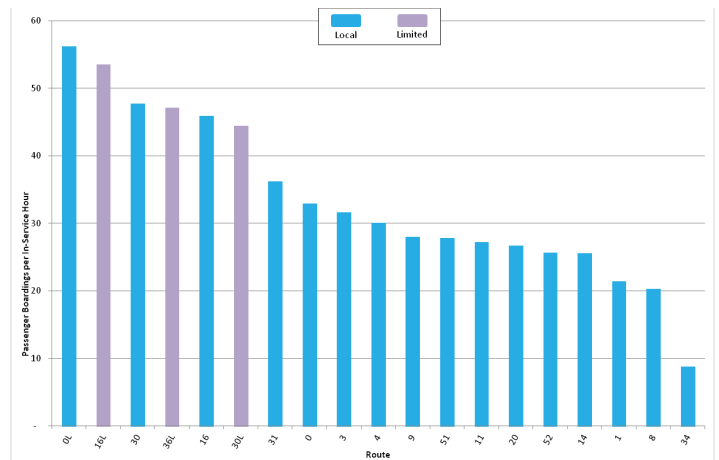
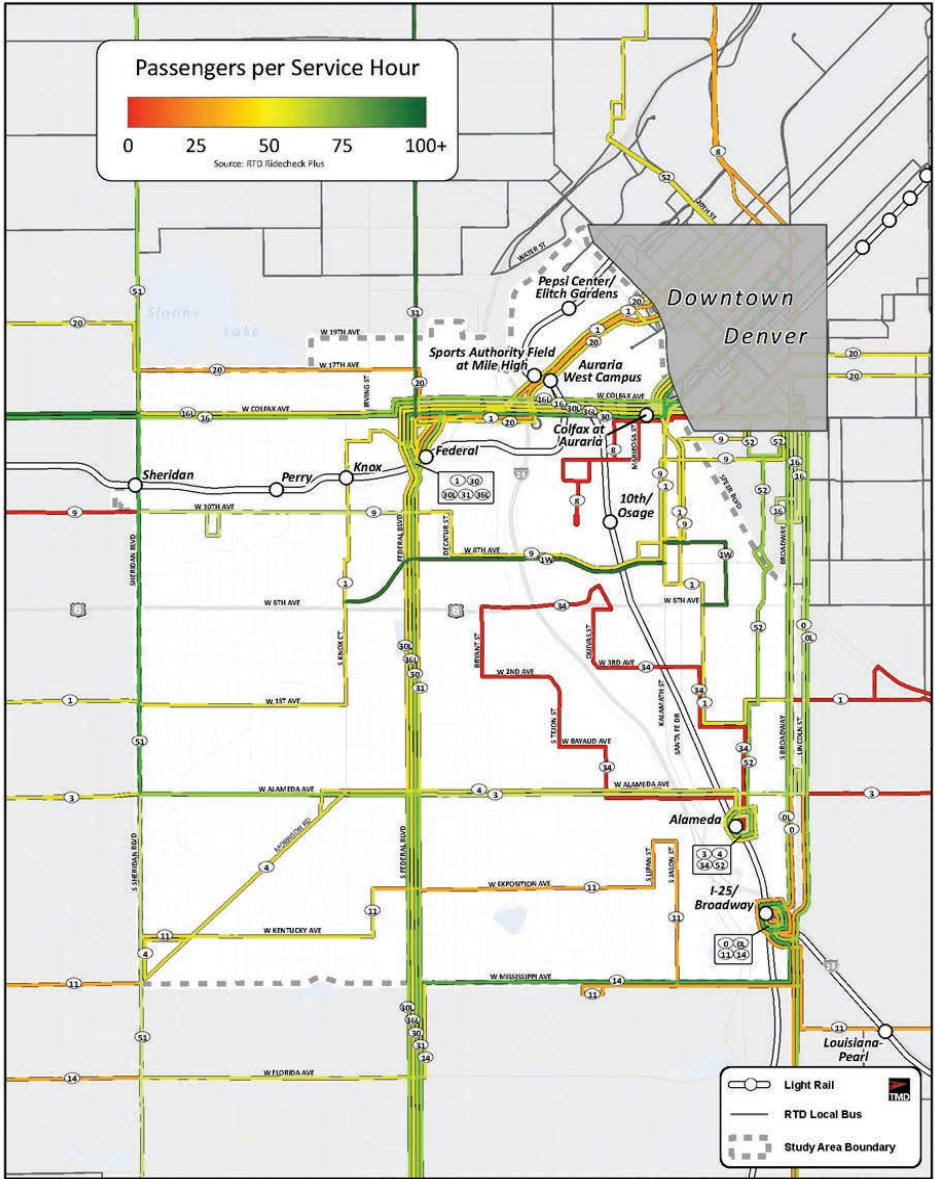


Table 3.5 - Passenger Boardings per In-Service Hour



3.3.4 Subsidy per Passenger Boarding by Route

Subsidy per boarding measures the financial performance of a route by comparing the number of boardings with the net cost incurred upon RTD to operate the route (subsidy). Routes having low subsidy per boardings combine efficient and effective service with higher ridership.

Table 3.6 displays subsidy per passenger boarding for each West Side route. The top performers in terms of subsidy per boarding strongly correlate with those displaying the highest level of productivity: Routes 30, 16, 36Ltd, and 31. The most financially effective routes operate along major corridors and in the core grid network, each requiring well below \$2.00 in subsidy per boarding. More costly services require over \$4.00 in subsidy per boarding due to high operating costs and relatively low fare revenue generated from ridership.

In comparison to RTD 2010 Service Standards, 67 percent of CBD Local routes perform worse than their standard class average of \$2.62 subsidy per boarding. Additionally, 27 percent of routes (Routes 1, 4, 8, and 14) are below the 25 percent maximum standard of \$4.04 subsidy per boarding for CBD Local routes, suggesting that they experience low productivity and may not generate enough ridership to compensate for cost. Of the Urban Local routes, Route 34 has a subsidy per boarding at \$22.24, placing it below the class average and below the 25 percent maximum standard of \$5.98.

3.3.5 RTD Service Standards and Recent Service Changes

RTD service standards are intended to optimize usage of the District's resources.

Figure 3.3 - RTD West Side Weekday Service Productivity





The service performance (productivity) standards discussed earlier are used to identify routes and services that may benefit from restructuring or are candidates for elimination. Separate service standards are identified for each class of service. Routes are evaluated based on ridership and on financial effectiveness (subsidy per passenger boarding). These standards are based on the performance of the least productive 10 percent of the routes in each service class for either the ridership or subsidy per passenger measure, or on the least productive 25 percent of routes in both measures. All RTD services are designed to match the level of service with demand, thus improving performance and sustainability.

Recent January 2012 service changes were determined under the service standard methodology discussed above. Ridership, productivity, and financial effectiveness were examined for each route, and then evaluated based on the established service standards within their respective service class.

3.4 FUTURE SERVICE

3.4.1 West Rail Line

The West Rail Line will provide high capacity transit service between downtown Denver and the Jefferson County Government Center. The line will open with the levels of service shown in Table 3.7 with service operating from 5:00 AM to 2:00 AM (the subsequent day).

Several West Rail Line stations will be located within the study area and are shown in Table 3.8. Of these stations, two are pedestrian oriented in nature with limited or no bus pullouts. Enhancing connections to planned West Corridor LRT stations is a key element of future transit in the West Side study area.

3.4.2 West Corridor Bus Service

In 2010, RTD engaged a consultant to develop a plan for future bus service to supplement the West Rail Line. The plan focused on improving service levels on existing major RTD corridors that will intersect the West Rail Line, and realigning services due to the change in demand generated by the rail line, aiming to improve the overall core grid network throughout the West Corridor area. Recognizing additional transit demand (both LRT and bus) generated by the future rail line, improving service levels and capacity along major grid corridors is necessary to accommodate the growing transit market and to foster spontaneous use of the integrated bus and LRT network.

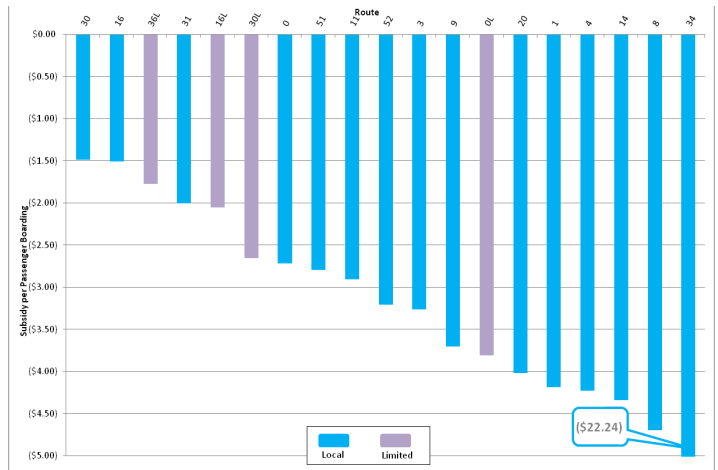


Table 3.6 - Subsidy per Passenger Boarding

West Corridor Rail Line Service Levels			
(Denver Union Station to Federal Center)			
Weekday		Weekend	
Peak	7.5 min	Peak	15 min
Base	15 min	Base	15 min
Late Evening/Early AM	30 min	Late Evening/Early AM	30 min
(Federal Center to JeffCo)			
Weekday		Weekend	
Peak	15 min	Peak	15 min
Base	15 min	Base	15 min
Late Evening/Early AM	30 min	Late Evening/Early AM	30 min

Table 3.7 - West Corridor Rail Line Service Levels

West Corridor Rail Line Station Facts		
Station	Location	Parking Spaces
Auraria West Station	West of 5th Street, south of Walnut Street, and north of Colfax Avenue.	0
Decatur-Federal Station	East of Federal Boulevard, south of Howard Place.	1,900
Knox Station	Directly west of Knox Court, north of the trackway.	0
Perry Station	West of Perry Street and north of 12th Avenue in Denver.	0
Sheridan Station	Either side of reconstructed Sheridan Blvd., at approximately 12th Avenue.	800
Total		2,700

Source: FasTracks West Corridor Station Fact Sheets.

Table 3.8 - West Corridor Rail Line Station Facts





3.4.3 Adopted West Corridor Service Changes

In November 2012, the following service changes were adopted by the RTD Board for routes that operate within the West Side. The changes will be effective in Spring 2013 when the West Rail Line opens. The routes are discussed below with a summary provided in Table 3.9.

- Route 1 (West 1st Avenue) will continue to provide access into central downtown Denver, however it will no longer operate through the Colfax/Federal Transfer Center. Its alignment will be reviewed in 2014 following the relocation of connecting Market Street Station to Union Station. Peak school trips will be removed because light rail provides faster and more frequent service for the student travel patterns.
- Route 3 (Alameda Crosstown) will have all trips realigned to Federal Center Station via Union Boulevard, discontinuing service along its low-performing Green Mountain pattern. This service change will have no effect in the West Side study area.
- Route 4 (Morrison Road) was discontinued as part of January 2012 service changes due to low performance (fewer than 10 boardings per trip) and duplication of existing local services. Route 4 only operated in peak hour periods (7 AM trips, 8 PM trips) and on 45 minute frequencies. Westwood riders can utilize Routes 3 and 11 for east-west connections to the Central Corridor light rail lines or frequent Routes 30/31 and 50/51 for north-south connections to the West Rail Line.
- Route 9 (West 10th Avenue) segments west of Wadsworth Blvd. will be diverted to Lakewood Commons and Belmar; service west of Wadsworth is replaced by Belmar call-n-Ride. Midday headways will be improved to 30 minutes, permitting interlining with Route 28 and better connections with West Rail Line service at Lamar and Lakewood-Wadsworth Stations. Other than the improved frequency, these changes will have no effect in the West Side study area. Earlier service plan drafts proposed merging this route with a reinstated Route 49 (North Lowell), but there was limited public support for this rerouting in the RTD public hearing process.
- Route 14 (West Florida Avenue) weekday daytime trips will terminate at Lakewood Commons, with Route 21 replacing segments of local service to Federal Center via the existing Route 14 alignment on Union Boulevard. This service change will have no effect in the West Side study area.
- Route 16 (West Colfax Avenue) will operate every 15 minutes throughout the West Side and beyond to Oak Station, with every other trip serving Golden throughout the day. Connections to light rail will be available for all trips at Oak Station. Additional Route 16 trips will be provided between Decatur/Federal Station as needed to maintain connections between the Denver Civic Center and West Rail Line points.
- Route 16Ltd (West Colfax Limited) will be discontinued due to duplication of the light rail line, as light rail is expected to attract a significant proportion of existing Route 16Ltd line-haul travel into downtown. Midday weekday service and weekend service into Golden previously provided by Route 16Ltd will be provided by Route 16 every 30 minutes. The service consolidation along Colfax Avenue ensures that the bus network is effectively integrated with the new West Rail Line. In addition, it also ensures that available resources are optimized as best possible while maintaining the current quality of service that West Side customers receive.
- Route 20 (20th Avenue) short-turn trips that current terminate at the Colfax & Federal Transfer Center would be extended to Federal Boulevard, terminating at 16th & Grove, in order to maintain connections.
- Route 30 (South Federal) will be consolidated with Route 31 (Federal Crosstown) into a single Federal Boulevard crosstown service. The combined routes will operate with a 7 ½- minute average frequency in the West Side (between Federal/Evans Transfer Center and Federal/Colfax). All trips terminating at Evans will be designated as Route 31. Route 31 will continue north from Colfax with 30-minute service extending to Front Range Community College and the Westminster Center park-n-Ride each, for a combined 15-minute frequency. Trips terminating in the Colfax/Federal Transfer Center or at the Wadsworth/





Hampden park-n-Ride will be designated as Route 30 trips. Routes 30 and 31 will make the same stops northbound and southbound at the Decatur/Federal Station. Route 30 trips southwest of Federal/Evans will be provided on middays, Saturdays, and in the reverse peak direction on weekdays.

- Limited Routes 30Ltd and 36Ltd (South Federal Limited and Fort Logan Limited) will maintain current operations, providing West Side peak commuters with a one-seat ride into downtown Denver from South Federal Boulevard. These routes will provide a distributor alternative for West Rail Line customers oriented toward the center of downtown Denver at times of high demand. Peak period service on South Federal Boulevard will operate at a combined average of 5 minute headways.
- Route 50 (Lakes Crosstown) is a new route that will connect with the West Rail Line at Sheridan Station. Service will operate between Bear Valley and Old Town Arvada via Sheridan Blvd., diverting from Route 51 north of Lakeside to serve Old Town Arvada. It will operate every 30 minutes weekdays between 6 a.m. and 7 p.m., coordinated with Route 51 scheduled to operate a combined 15-minute frequency on the common portion on Sheridan Blvd. through the study area.
- Route 51 (Sheridan Crosstown) will maintain existing 30 minute service along its current alignment and receive improved weekday service levels of every 15 minutes in the West Side (between 48th Avenue and Dartmouth Avenue) as described in Route 50, above. Route 51 currently displays strong productivity (nearly 40 boardings per hour) and warrants additional investment for service improvements. Following the introduction of light rail service, the improved segment on Routes 50/51 is expected to generate significant additional demand on Sheridan Boulevard. Service hours are proposed to be extended until 12:30 am on the central portion of the route.

Proposed West Corridor Bus Service Levels					
Route	Notes	Frequency			
		Weekday		Saturday	Sunday
		Peak	Off-Peak		
1	Realign to no longer serve Colfax/Federal Transfer Center.	30	30	60	60
3	Realign to Federal Center Station via Union Boulevard, discontinuing service along Green Mountain pattern.	15	30	30	30
4	Discontinued as part of January 2012 service changes due to low performance; alternative service via Routes 3, 11, 30/31, and 50/51.	-	-	-	-
9	Diverted at Wadsworth Boulevard to Lakewood Commons and Belmar; interlined with Route 28 for connections to Lamar and Lakewood-Wadsworth stations.	30	60	60	60
11	No change.	30	30	30	60
14	Daytime trips will terminate at Lakewood Commons, with Route 21 replacing local service to Federal Center.	30	30	30	60
16	Operate to Oak Station; alternating trips operate to Golden (replaces Route 16Ltd bus service to Golden).	15	15	15	15
16L	Discontinue due to duplication of future West Rail Line.	-	-	-	-
20	Short-turn trips extended to make connections on Federal Boulevard.	15	30	30	30
30	Consolidated with Route 31 - Federal Crosstown. Frequencies shown are north of Evans.	15	15	15	-
30L	No change.	30	-	-	-
31	Consolidated with Route 30.	15	15	15	15
36L	No change.	30	-	-	-
50	Connects Bear Valley and Old Town Arvada via Sheridan. Coordinates with Route 51 for combined 15-min. frequency.	30	30	-	-
51	Service extended until 12:30 a.m.; coordinated with new Route 50 for combined 15-min. frequency weekdays.	30	30	30	30

Table 3.9 - West Corridor Bus Service Proposals





3.5 COVERAGE ANALYSIS

3.5.1 Area Coverage Standards

RTD currently utilizes area coverage standards, providing guidelines for tailoring service to the needs of the communities within the District. These standards also help ensure that all communities receive a level of service that best matches their needs. Typically, when an RTD route operates outside of the Denver Central Business District (CBD), an area coverage standard based on a combined density measure of population and employment is used. The density measure helps to determine potential demand for transit to and from a particular area. Table 4.10 displays minimum and maximum density requirements typically used to provide the most appropriate service levels.

Despite RTD area coverage standards calling for 1/4 mile walk access to stops for the study area, experiences in other transit markets across the country indicate 1/4 mile is the typical distance most customers are willing to walk for local bus service. Past experiences in major cities including San Francisco and Los Angeles suggest customers are willing to walk significantly farther for premium bus service that operates at spontaneous use frequencies (15 minutes or better), even up to 0.6 miles

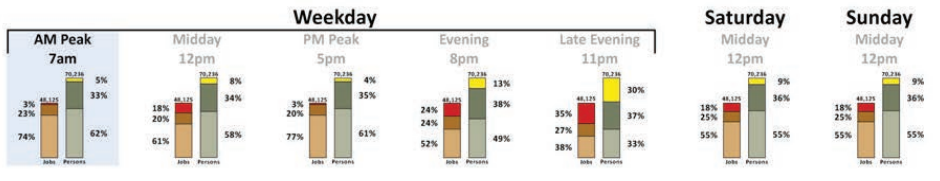
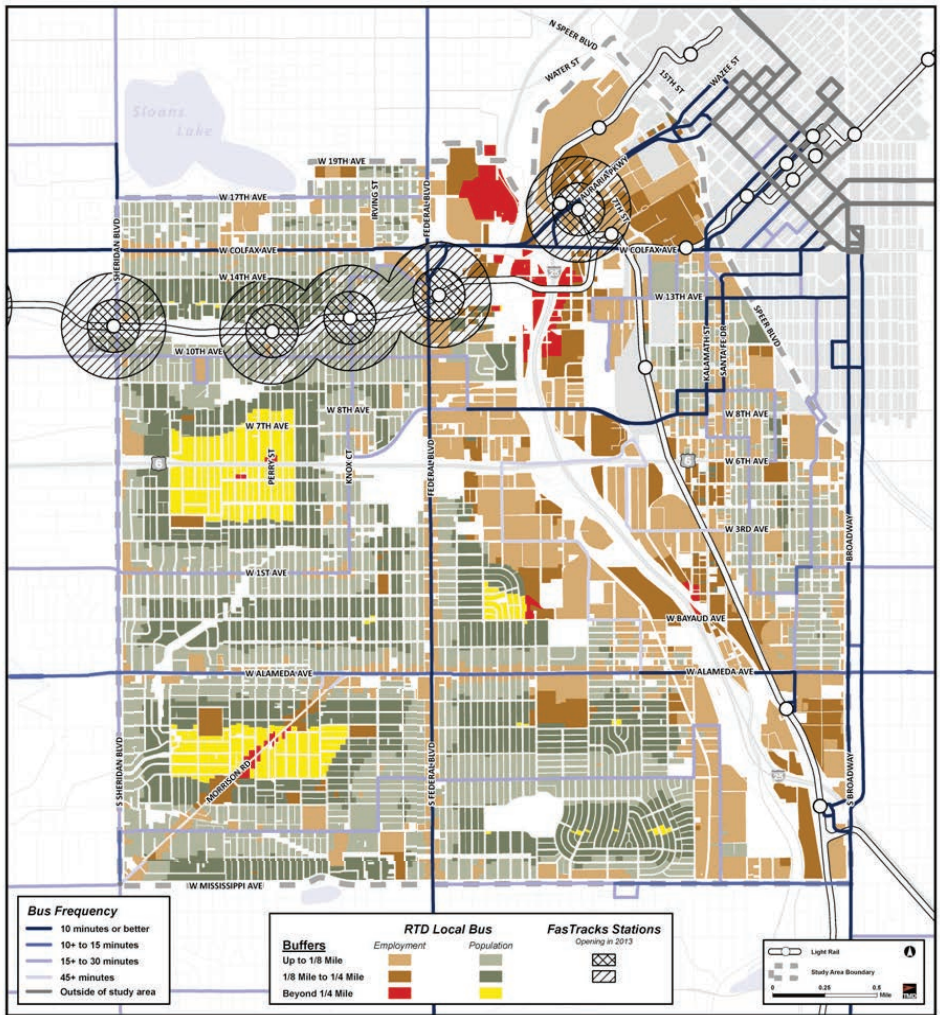


Figure 3.3 - Stop Coverage Access Weekday 7 am

Persons per Acre	Service Level	RTD Area Coverage Standards Description	Reasoning
3-12 residents and employees per acre	Minimum	Peak period pNR service	Service warranted if travel time to the Denver CBD by Exp bus, or a bus/rail timed connection, exceeds 20 min
	Maximum	Local service on major arterials with pedestrian access within 1/4 mile	Peak period, LTD, Exp, or Reg service from PNRs if travel time to the Den CBD by Exp bus exceeds 20 min
12 or more residents and employees per acre	Minimum	Local service on major arterials with pedestrian access within 1/4 mile	Peak per, LTD, Exp, or Reg service from PNRs if either travel time to the Denver CBD by Express bus, or a bus/rail timed connection, exceeds 20 minutes.
	Maximum	Local service within 1/2 mile route spacing	Limited, Express, or Reg service if travel time to the Denver CBD by an Express bus exceeds 20 minutes.

Table 3.10 - RTD Area Coverage Standards





for frequent service. Some routes in the West Side study area, particularly those that comprise the core grid network, operate at this spontaneous use frequency, including Federal Boulevard and Broadway routes most of the day, and Routes 3, 9, 16, and 20 in the weekday peak periods. Directing customers towards these frequent services and focusing service resources on key corridors is a key element for providing effective bus service throughout the study area.

3.5.2 AM Peak (7:00 AM)

During the AM peak period (Figure 3.4), specifically 7:00 am, all residents and employees are within walking distance (½ mile) of an RTD bus stop with service. Approximately 33 percent of West Side residents and 23 percent of employees are within ¼ mile of an RTD bus stop with service. Additionally, 62 percent of residents and 74 percent of employees are within 1/8 mile of an RTD bus stop with service.

3.5.3 Midday (12:00 PM)

During the midday period (Figure 3.5), specifically 12:00 pm, all residents and employees remain within walking distance of an RTD bus stop with service. Approximately 34 percent of West Side residents and 20 percent of employees are within ¼ mile of an RTD bus stop with service. Additionally, 58 percent of residents and 61 percent of employees are within 1/8 mile of an RTD bus stop with service.

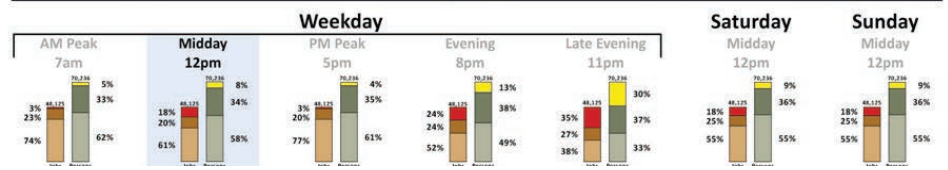
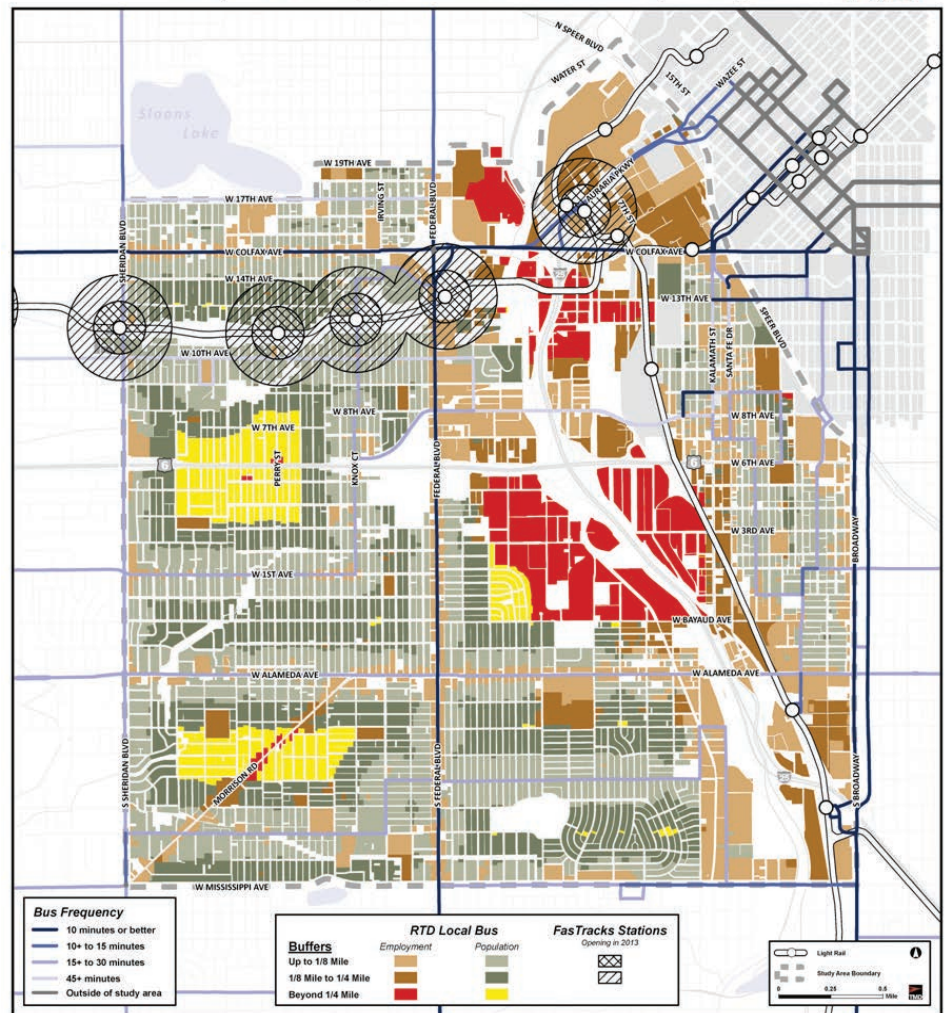


Figure 3.5 - Stop Coverage Access Weekday 12 pm





3.5.4 PM Peak (5:00 PM)

During the PM peak period (Figure 3.6), specifically 5:00 pm, all residents and employees remain within walking distance of an RTD bus stop with service. Approximately 33 percent of West Side residents and 23 percent of employees are within 1/4 mile of an RTD bus stop with service. Additionally, 62 percent of residents and 74 percent of employees are within 1/8 mile of an RTD bus stop with service.

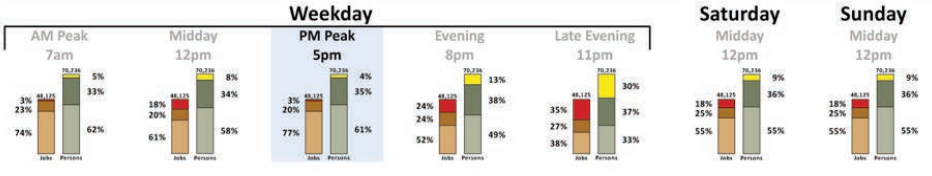
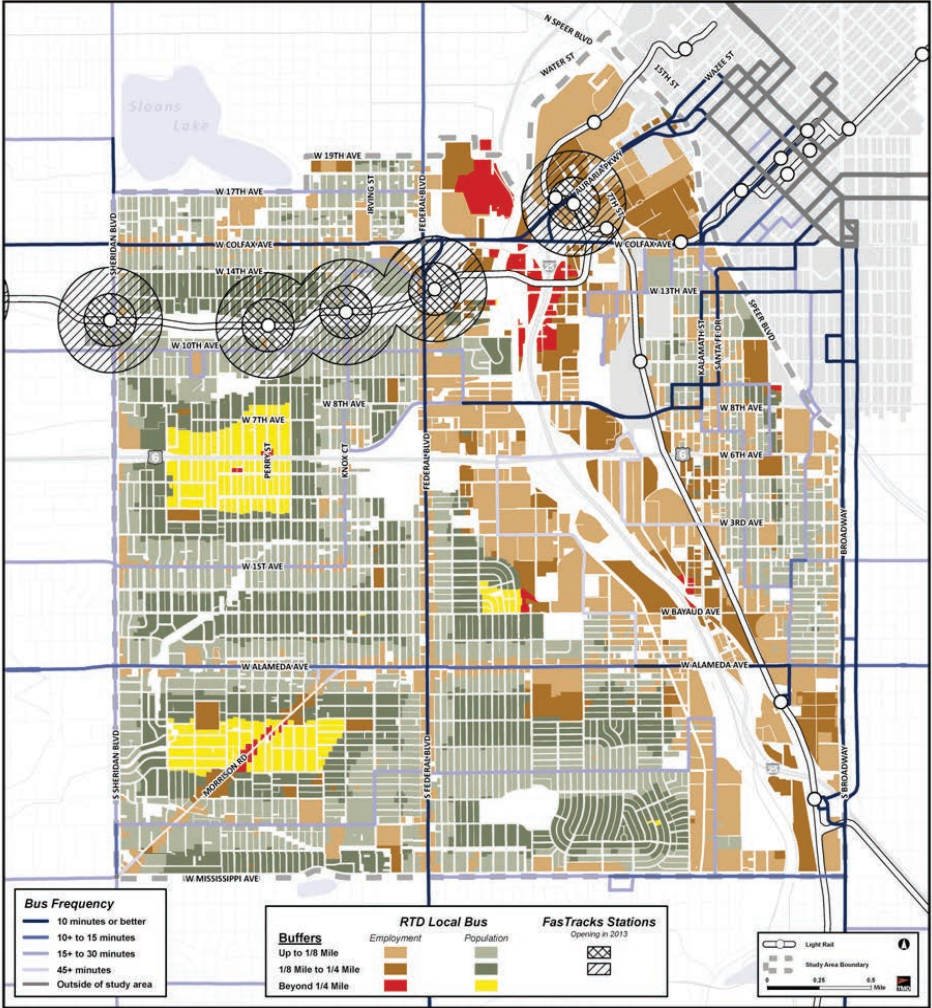


Figure 3.6 - Stop Coverage Access Weekday 5 pm





3.5.5 Late Evening (11:00 PM)

During the late evening period (Figure 3.7) at 11:00 p.m., most residents and employees remain within walking distance of an RTD bus stop with service. Approximately 37 percent of residents and 27 percent of employees are within ¼ mile of an RTD bus stop with service. Additionally, 33 percent of residents and 38 percent of employees are within 1/8 mile of an RTD bus stop with service.

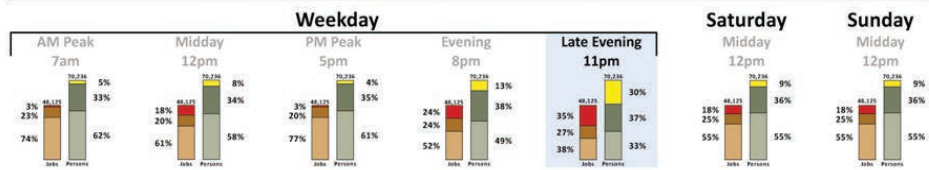
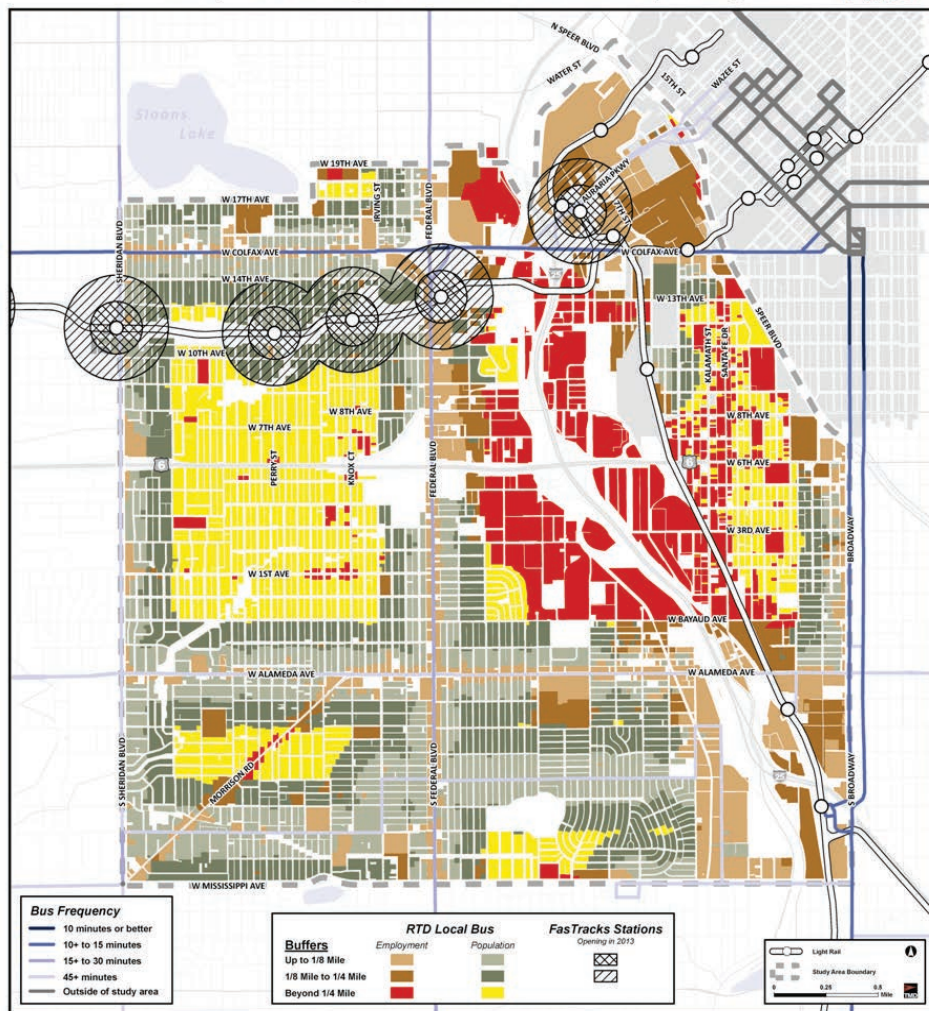
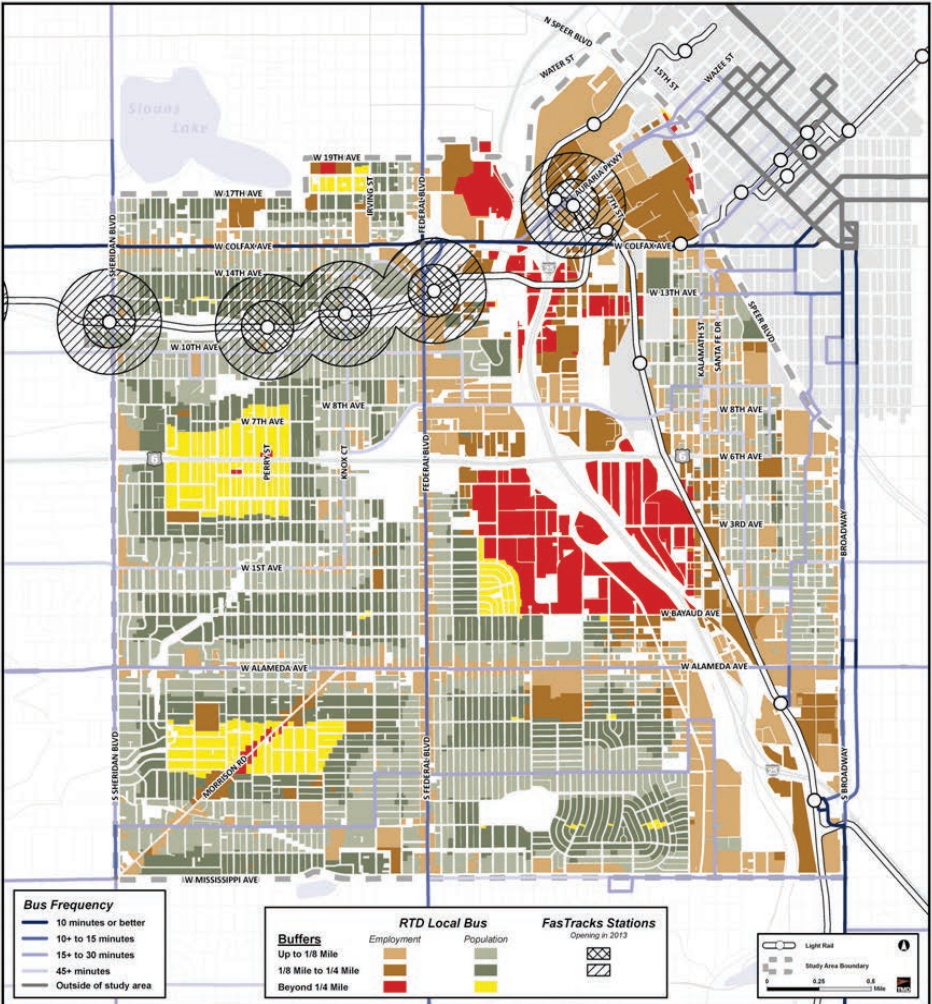


Figure 3.7 - Stop Coverage Access Weekday 11 pm





3.5.6 Saturday (12:00 PM)

On Saturday (Figure 3.8), specifically 12:00 pm, nearly all residents and employees remain within walking distance of an RTD bus stop with service. Approximately 9 percent of residents and 18 percent of employees are within 1/2 mile while 36 percent of residents and 25 percent of employees are within 1/4 mile of an RTD bus stop with service. Additionally, 55 percent of residents and 55 percent of employees are within 1/8 mile of an RTD bus stop with service.

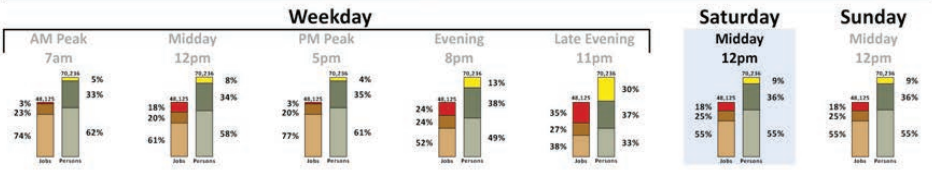


Figure 3.8 - Stop Coverage Access Saturday 12 pm





3.5.7 Sunday (12:00 PM)

On Sunday (Figure 3.9), specifically 12:00 pm, nearly all residents and employees remain within walking distance of an RTD bus stop with service. Approximately 9 percent of residents and 18 percent of employees are within 1/2 mile while 36 percent of residents and 25 percent of employees are within 1/4 mile of an RTD bus stop with service. Additionally, 55 percent of residents and 55 percent of employees are within 1/8 mile of an RTD bus stop with service.

Generally, RTD currently provides adequate service coverage to the vast majority of the study area. Some pockets emerge where RTD stop access is beyond the 1/4 mile minimum coverage standard (such as Perry Street), however, nearly all of the study area is within 1/2 mile of an RTD stop. Off-peak and weekend coverage leaves some areas underserved, however, these areas are primarily employment centers where transit demand is extremely limited outside of regular work shifts.

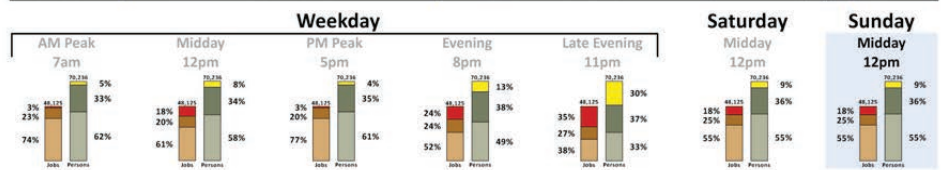
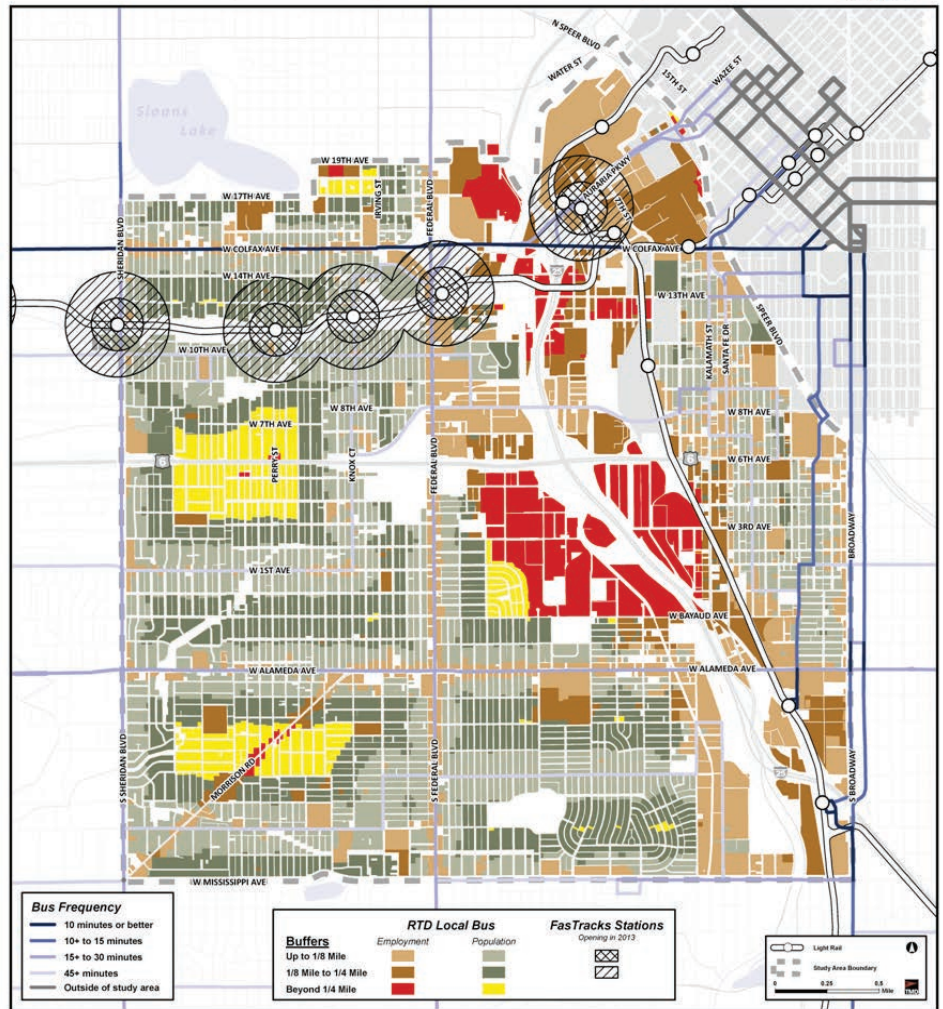
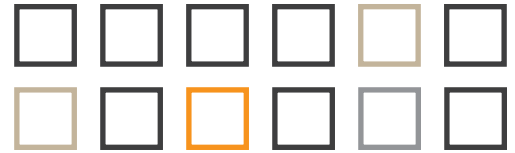


Figure 3.9 - Stop Coverage Access Sunday 12 pm



4. Market Conditions

and Transit Analysis Summary

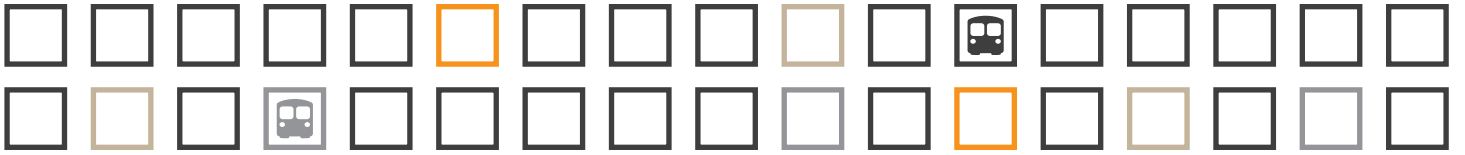


Market and service research, combined with on-site field work and meetings with the City and County of Denver (CCD) and RTD staff, helped to develop a complete understanding of the West Side and the neighborhoods within it. Additionally, CCD held several rounds of public outreach to understand the transit needs of residents and employees within the West Side. These efforts led team members to the following conclusions:

- The West Side neighborhood study area is currently served by an extensive fixed route transit network.
- Transit service frequencies are designed to match the varying market demand within the study area.
- The highest frequency corridors (Broadway, Colfax Avenue, and Federal Boulevard) operate at service frequencies equivalent to 10 minutes or better in the weekday peak period.
- Transit service operating hours on some routes are some of the longest in the RTD system, exceeded only by Route 15 on East Colfax and employment-oriented skyRide services.
- Transit coverage within the area is extensive. Nearly all residents are within a half mile of an RTD bus stop, regardless of time period and day of week. Over 50% of residents are within 1/8 mile of an RTD bus stop during the day.
- The Strategic Transportation Plan found that I-25, the South Platte River, and the Central rail corridor pose significant barriers between residential neighborhoods within the study area and major destinations closer to downtown and the Broadway corridor. Current RTD east-west service largely bridges the gap across this physical barrier where possible.
- Various types of development (housing, retail, office, etc.) are occurring near existing major transit nodes (Alameda Station, Auraria Campus, Colfax and Federal, for example).
- Existing routes connect to major employment generators and retail activities.
- The West Corridor line, projected to open in 2013, will provide significantly improved travel opportunities for West Side residents, while also serving as a catalyst for development around the line's major nodes.
- RTD bus service plans associated with the opening of the West Corridor LRT line will improve the directness of service for existing bus routes (Federal Boulevard) and provide longer operating hours for other corridors (Sheridan Boulevard) traversing the neighborhood.

Analysis revealed that unmet needs, even in an expanded view, are relatively narrow in scope and relate to serving relatively small market segments within the neighborhood itself or people who conduct activities beyond the typical span of service currently provided by RTD. Moreover, they are outside of the current RTD planning standards for service improvements.

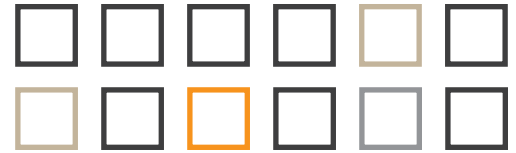




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5. Unmet Needs



Prospective unmet needs in the West Side study area include:

5.1 LATE NIGHT SERVICE IMPROVEMENTS

Existing RTD services in the study area do not operate on a twenty-four hour basis. Transit service on major corridors (Federal Boulevard, Colfax Avenue, etc.) is sustained late into the evening, whereas service on secondary arterials and neighborhood streets is largely discontinued during the late evening and early morning time periods.

While most transit demand in the study area is concentrated during existing service spans, some limited transit demand exists during the late evening and early morning time periods. Following the public outreach effort, CCD found that a segment of West Side residents and employees desire transit service to operate at hours beyond the current span of service (and those planned for the West Rail Line). This demand is generated by West Side residents who work atypical work shifts or are seeking such employment, but still rely on transit services for their daily work commute. Late night demand of this nature does not warrant fixed route transit service, and the performance of such a service is unlikely to meet acceptable RTD metro-wide performance standards for fixed route service. As such, if additional late night service is pursued, alternative service products should be explored.

5.2 SERVICE COVERAGE GAPS

The service coverage analysis in Chapter 4 identified service gaps during the various time periods throughout the day. The majority of the study area is covered by RTD services during the peak time periods, with the exception of an area centered on Perry Street south of 10th Avenue and north of 1st Avenue. Another service gap emerges along Morrison Road in Westwood outside of the peak travel periods. While these areas lie beyond the ¼ mile coverage standard established by RTD, they are within ½ mile of frequent RTD services on adjacent corridors – an acceptable walk distance. Given the spacing of high-quality adjacent bus routes, fixed route service would prove to be an ineffective method for addressing these disconnected service gaps. This is compounded by other constraints, including above average vehicle ownership in parts of the neighborhood, the physical condition of residential streets, and extensive on-street parking. The dilemma is that while a service gap appears to exist, demand for service is





projected to be low, especially given the presence of a well-established transit network. As such, if additional service coverage is pursued, alternative service products should be explored to address these perceived service coverage gaps.

5.3 SERVICE BARRIERS

The study area is bisected by the South Platte River, Interstate 25, and the Central LRT Corridor, posing a significant barrier between the West Side residential neighborhoods and destinations in downtown Denver and along the Broadway corridor. Several RTD bus services currently provide frequent connections across this barrier, and the future West Corridor LRT line will provide high capacity connections to downtown Denver from the northern portion of the study area. Preserving these frequent services is essential to maintaining direct connections from West Side neighborhoods to major destinations and the greater RTD network. As density develops along the southern edge of the study area, RTD should re-examine service frequencies and operating hours.

5.4 CONNECTIONS TO FUTURE WEST CORRIDOR LIGHT RAIL

With the West Corridor LRT service due for completion in 2013, it is critical to ensure that West Side residents have frequent and direct connections to future LRT stations. The West Corridor Bus Sketch Plan recommended frequency improvements along major corridors to provide enhanced connections to future LRT stations. As customers acclimate to the new service, additional travel demand will likely develop. Historically, RTD has monitored service after the opening of LRT lines, implementing service adjustments as necessary. This process should continue for the West Corridor LRT line in conjunction with CCD and West Side neighborhood stakeholders.

5.5 PEDESTRIAN INFRASTRUCTURE IMPROVEMENTS

Pedestrian amenities are an integral part of the overall transit customer experience. Recognizing this, CCD has conducted an extensive inventory and analysis of existing pedestrian ways and bus stops in the neighborhood. A combination of adequate way-finding aids, lighting, sidewalk amenities, and comfortable stop wait environments provide customers with a high-quality “portal” to transit services. Upgrading all of the pedestrian ways and bus stops located within the study area is too costly within currently available resources. However, targeted improvements, particularly around defined neighborhood gateways and major transit stops, will preserve current ridership while attracting new riders to transit.

5.6 SUMMARY

The study area is well served by the current RTD network. Current RTD services are well utilized by customers living within the study area, particularly on major grid corridors. Potential unmet needs are relatively narrow in scope and do not lend themselves to traditional fixed route transit solutions. The opening of the line represents a potential new investment cycle for the neighborhood as a whole, reinforcing existing development and likely spurring new development throughout the study area. Following the opening of the West Corridor LRT, emerging developments and demand patterns should be monitored to allow for service adjustments as necessary.



6. Public Outreach



Public Outreach is a major component of the DLP, and as such, is addressed both in the DLP program budget as well as in its overall Public Outreach Plan. Components of the public outreach effort are subject to Title VI of the Civil Rights Act.

Early in the planning process, a public outreach strategy was created with a specific interest in reaching out to the marginalized populations present in the study area. The public outreach strategy was designed to rely heavily on the Denver Livability Partnership partner agencies as well as the City Council Offices that represent pieces of the study area.

There are several highlights of the WSTES public outreach program. First, a brief, self-administered travel behavior survey (Figure 6.1) was created and distributed to obtain anecdotal information on how study area residents and stakeholders use and view transit. The survey was developed with exhaustive input from area stakeholder and DLP project partners. The survey, made available in both hard copy and on the project website, was comprised of two parts.

The first part of the survey asked each respondent to provide information for three (3) places visited during a typical week. Possible destinations could be places of employment, school, shopping locations, etc. The information requested about each trip included origin, destination, travel mode (vehicle, walk, bike, or transit), and time of day of the trip.

The second part (Figure 6.2) of the survey included questions to inform which trade-offs West Side stakeholders value regarding transit service.

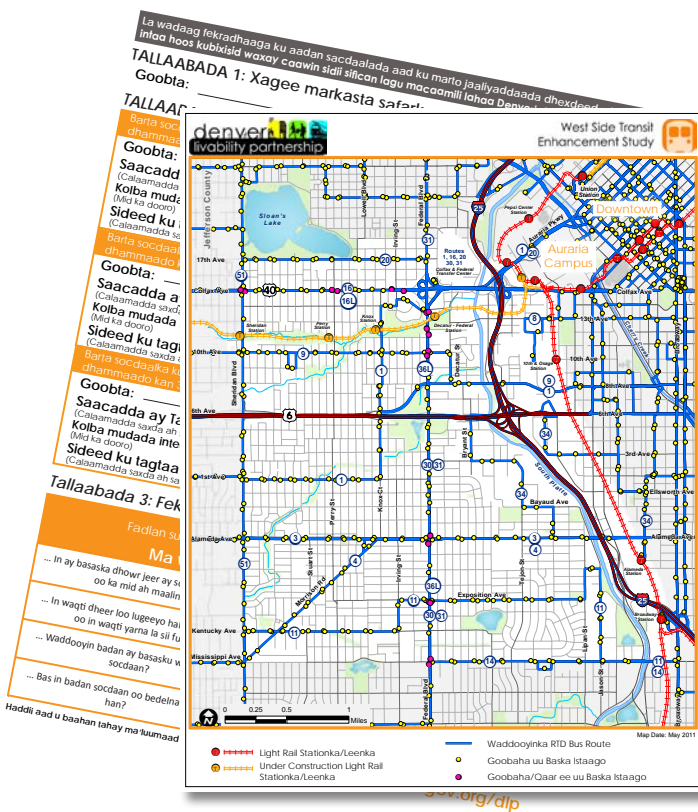


Figure 6.1 - Travel Behavior Survey - Somali

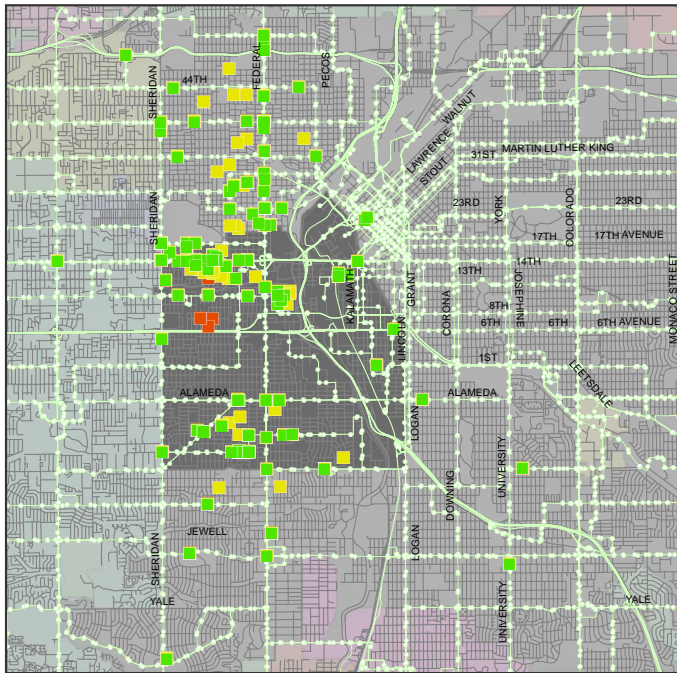
Please circle only one answer in each question below.

Would you rather have...

... More frequent service for a shorter duration of the day?	OR	... Less frequent service for a longer duration of the day?
... A longer walk to a stop and less time riding?	OR	... A shorter walk to a stop and more time riding?
... More routes running on more streets, with less frequent service?	OR	... Fewer routes running on fewer streets, with more frequent service?
... A more frequent route that requires a transfer?	OR	... A less frequent route that does not require a transfer?

Figure 6.2 - Trade-off Questions

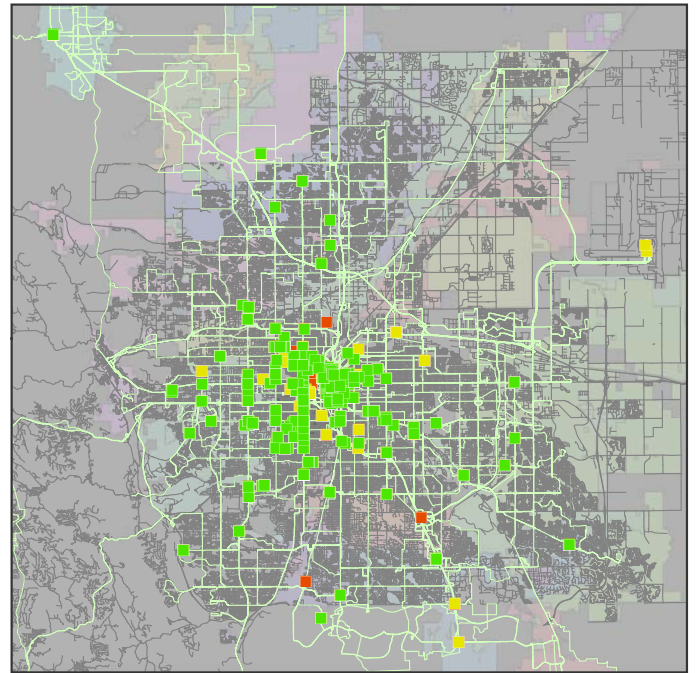




Origin - Bus Coverage

- BusStops
- BusRoutes

Origins	174	%
Within 1/2 Mile	174	100.0%
Within 1/4 Mile	170	97.7%
Within 1/8 Mile	134	77.0%



Destination - Bus Coverage

- BusRoutes

Destinations	372	%
Within 1/2 Mile	370	99.5%
Within 1/4 Mile	363	97.6%
Within 1/8 Mile	330	88.7%

Figure 6.3 - Origin - Bus Coverage

Figure 6.4 - Destination - Bus Coverage

The survey was distributed in City Council office newsletters, DLP mailing lists, through DLP project partners, and at community events.

The results (Figure 6.3 and 6.4) of the travel survey show a mobile stakeholder group with origins and destinations scattered throughout the Denver metro area.

The survey also showed that reported travel patterns (Figure 6.5) of the respondents were generally in line with normal commuting patterns as the bulk of travel occurred during the morning and afternoon hours. (Percentages do not add up to 100% because multiple choices were allowed.)

Destinations	%
Morning	61.6%
Noon	27.7%
Afternoon	53.2%
Evening	46%
Night	14.2%

Figure 6.5 - Travel Patterns





The second part of the survey asked respondents to provide more detailed feedback on the aspects of transit travel that were most important to them (Table 6.1).

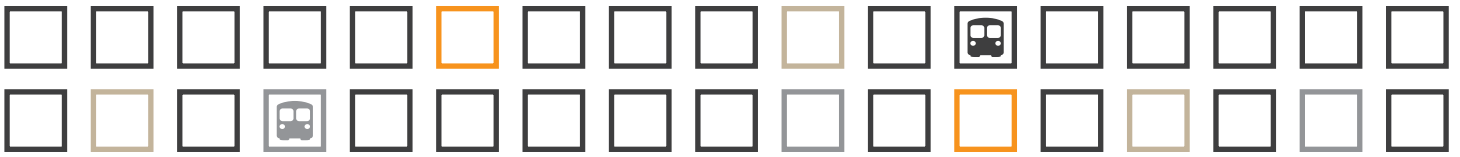
For each question, the respondent was asked to select one preference out of two scenarios. Each couplet of scenarios represented two ways of designing a transit service – each generally using the same level of resources. Between 127 and 129 responses were received for each question. Preferences varied based on each respondent’s personal preferences. Question #2 showed the most agreement among the respondents that a shorter walk with more time riding was more preferable than a longer walk to the stop and less time riding.

Overall, the trade-off questions provided important anecdotal information. The pursuit of transit efficiencies given recent transit resource challenges do not realistically allow for the availability of spontaneous use routes on every street. Therefore, answers to the four trade-off questions can help inform how transit service investments should be designed and the qualities that are most valued by stakeholders on the West Side.

	Respondents were asked to express preference for either scenario “A” or scenario “B”		Percent Response
Question 1	A	More frequent service for a shorter duration of the day?	57%
	B	Less frequent service for a longer duration of the day?	43%
Question 2	A	A longer walk to the stop and less time riding?	28%
	B	A shorter walk to the stop and more time riding?	72%
Question 3	A	More routes running on more streets with less frequent service?	45%
	B	Fewer routes running on fewer streets with more frequent service?	55%
Question 4	A	A more frequent route that requires a transfer?	41%
	B	A less frequent route that does not require a transfer?	59%

Table 6.1 - Trade-off Questions





The outreach was concluded with a public meeting held in May 2012 and open to all West Side stakeholders. The meeting was held in partnership with RTD, allowing the WESTES team to present findings from the Phase I study and RTD to present the draft West Corridor Light Rail line service changes. The attendees also participated in a drawing exercise to brainstorm improvements to bus service once the West Corridor Light Rail line opens in April 2013. The exercise confirmed several of the Phase I recommendations as well as provided new ideas to RTD for future service changes.



7. Service Concepts



As part of the West Side Transit Enhancement Study process, potential service concepts were developed to address identified unmet transit needs in the West Side study area. Service concepts 6.1 through 6.3 were initially considered, but are unlikely to serve the mobility needs of West Side residents in an efficient and cost-effective manner. The call-n-Ride service concepts described in 6.4 are recommended for further study.

7.1 RESTRUCTURE ROUTE 1

Route 1 (West 1st Avenue) operates from Lakewood Commons, north along Saulsbury Street and Teller Street, east on West 1st Avenue (into the West Side), north on Knox Court, east on West 14th Avenue and then Colfax Avenue into downtown Denver. Once in downtown Denver, Route 1 travels south along Kalamath Street and Santa Fe Drive to the Santa Fe Arts District, then south on Galapago Street, and east on 1st Avenue towards Glendale. In addition, Route 1W provides peak school service to/from West High School (at West 9th Avenue and Elati Street) and West 1st Avenue and Sheridan Boulevard. Following the opening of the West Line, Route 1 will continue to provide access to downtown Denver, however it will no longer serve the Colfax/Federal Transfer Center.

In an effort to better connect West Side residents to key destinations, more frequent transit services, and the greater RTD network, converting Route 1 into two distinct patterns was considered. Pattern A would operate along Route 1's current western alignment: west along West 1st Avenue, south along Teller Street and Saulsbury Street to Lakewood Commons. Pattern B would operate along Route 1's current western alignment until Knox Court and West 1st Avenue before continuing south along Knox Court, southwest along Morrison Road, and terminating at Sheridan Boulevard. While the two Route 1 patterns would improve service coverage for some West Side residents, creating two patterns would decrease headways west of where the route splits at 1st Avenue and Knox Court. The reduced headway would greatly decrease the quality of service available to existing riders connecting to Lakewood Commons, a major trip generator and connection point in the western portion of the RTD system.

7.2 REINSTATE ROUTE 4

Route 4 (Morrison Road) operated in peak hour periods only on 45 minute frequencies, with trips between 7 AM and 8 PM. Route 4 was discontinued due to low productivity (fewer than 10 boardings per trip) and duplication of existing local services. Considering identified unmet needs, it is an option to reinstate Route 4 and operate it with an all-day service span from 6:00 AM to 7:00 PM at improved 30 minute frequencies. The extended service span and improved frequency may attract Westwood residents and employees that were unable to utilize the original Route 4 due to possible unconventional work shifts and travel times. Based on low ridership and performance prior to the discontinuation of Route 4, it is not expected that a reinstated Route 4 is capable of generating adequate ridership to meet RTD service standards. However, if transit market conditions along Morrison Road (i.e. intensification of development) change in the future, revisiting some variation of Route 4 may be warranted.

7.3 IMPROVE SERVICE LEVELS ON KEY CORRIDORS

Presently, RTD has a strong grid system in place within the West Side study area. Routes forming the core grid system display strong ridership and high productivity while serving key transit destinations and core market areas. Further investment in core grid routes should be explored in the future, particularly following the opening of the West Line. Specific key corridors that would benefit from frequency improvements are Alameda Avenue, Federal Boulevard, and Sheridan Boulevard. Alameda Avenue currently operates with peak frequencies between 10 to 15 minutes, Federal Boulevard with peak frequencies better than 10 minutes, and Sheridan Boulevard every 30 minutes.





7.4 CALL-N-RIDE SERVICES (PREFERRED ALTERNATIVE FOR FUTURE STUDY)

Current RTD Call-n-Ride Services

RTD currently operates 21 Call-n-Rides throughout the system, typically within low demand markets where fixed route service is ineffective. Call-n-rides provide non-fixed route service within a designated geographic area where residents and employees do not have immediate access to an RTD fixed route service. Service areas are typically between 4 and 10 square miles and display low population and employment densities ranging from 2 to 4 persons per acre and 1 to 3 employees per acre. Call-n-Rides connect residents and employees to RTD fixed route services, local park-and-Ride facilities, and transit stations. They also connect riders to activity centers within the designated service area, such as shopping malls, schools, and corporate office parks.

RTD currently operates three different Call-n-Ride service types:

- Simple demand response transit (DRT) – Service with no established route or scheduled stops typically operating as a many-to-many dial-a-ride service. Transit service is provided only when specifically requested by customers.
- Point deviation – Scheduled service from at least one common stop (usually local activity centers or transit hubs). The route can deviate between the scheduled stops to serve individual needs; however, the vehicle must arrive at the checkpoints at the scheduled time. Many of RTD Call-n-Rides with scheduled stops at park-n-Rides are point deviation.
- Route Deviation – Fixed route service with scheduled stops (usually more stops than point-deviated services). Call-n-Rides of this service type differ from circulators in that they may deviate to serve off-route locations up to a certain distance. These services are often referred to as Flex Routes (such as the former service in Gateway).

Based on RTD 2013 Call-n-Ride costs, the hourly operating cost of a call-n-Ride service is approximately \$52.50. A typical 5-year call-n-Ride vehicle with equipment has a capital cost of approximately \$68,250. Often with newly implemented call-n-Ride services, such as the Belleview Call-n-Ride (grant-funded), 2 peak vehicles are required and often an additional spare may be required (if the contractor cannot provide enough spares), leading to a total of 3 peak vehicles required to operate a new call-n-Ride service.

The recommended service concepts outlined below aim to:

- Build on the existing network of RTD fixed route and Call-n-Ride services.
- Respond to route improvements that will occur in the West Side as a result of the West Corridor Service Plan recommendation.
- Address prospective unmet needs in the West Side as identified in the Draft Transit Needs Assessment.





SERVICE CHARACTERISTICS

- 3 sq mi service area
- 6:00 am - 6:00 pm
- 30 min. connection to LRT

Proposed West Side call-n-Ride (Daytime)

The West Side call-and-Ride (Figure 7.1) is proposed to operate within the neighborhoods of West Colfax, Villa Park, Barnum West, Barnum East, and Westwood. Its service area would be bounded by Colfax Avenue, Knox Court, Mississippi Avenue, and Sheridan Boulevard. The West Side call-and-Ride is recommended to be the first urban call-and-Ride in the Denver area, operating in a significantly denser market compared to most other existing RTD call-n-Rides. The proposed call-n-Ride service area covers service gap between Knox Court and Sheridan Boulevard identified in the unmet needs analysis. The proposed call-n-Ride will also provide enhanced connections to the future West Corridor LRT stations from study area neighborhoods. It would operate as a point deviation service on weekdays, providing timed connections every 30 minutes to future LRT service at Decatur-Federal Station. The proposed service span is 6:00 AM to 6:00 PM on weekdays. The call-n-Ride would require 2 vehicles for operation, at 24 daily in-service hours. With an operating cost of approximately \$52.50 per hour, it would cost approximately \$1,260 per weekday to operate the service. In addition, assuming that the call-n-Ride would operate approximately 255 weekdays in a year, it would cost a total of approximately \$321,300 per year to operate the service.

SERVICE CHARACTERISTICS

- 10.2 sq mi service area
- 1:00 am - 4:40 am
- 30 min. connection

Proposed Late Evening call-n-Ride

The Late Evening call-and-Ride (Figure 7.2) is proposed to operate with two zones, providing service coverage to all residents and employees within the West Side neighborhoods. Zone 1 (West of Federal Boulevard) will be bounded by 17th Avenue and 19th Avenue, Federal Boulevard, Mississippi Avenue, and Sheridan Boulevard. Zone 2 (East of Federal Boulevard) will be bounded by 19th Avenue, Interstate 25, Speer Boulevard, Lincoln Street, and Mississippi Avenue. Each will operate as point deviation service on weekdays and weekends, connecting to Broadway/Colfax in downtown Denver every 30 minutes. Other routes connecting at Broadway/Colfax provide late night access to commercial development along East Colfax and Broadway, as well as access to Denver International Airport for late evening and early morning shifts. The proposed service span is 1:00 AM to 4:30 AM, providing late night service to West Side residents with atypical work shifts. The call-n-Ride will require two vehicles for operation, at 7 daily in-service hours. With an operating cost of approximately \$52.50 per hour, it will cost approximately \$367.50 per weekday to operate the service. In addition, assuming that the call-n-Ride will operate approximately 255 weekdays in a year, it will cost a total of approximately \$93,712.50 per year to operate the service. This service will ensure that West Side residents and employees can connect with final and beginning trips of the Southwest Corridor's D-Line and, following opening day, with final and beginning trips of the West Line. It is recommended that the City pursue JARC grant funding to secure operating costs for the service.

The West Side and Late Night proposed call-and-Ride services intend to respond to unmet needs and RTD service coverage gaps within the West Side study area. Coverage gaps were identified between Knox Court and Sheridan Boulevard during the day time. Additional RTD coverage gaps emerge during the late evening/early





morning hours throughout a greater portion of the study area, as most bus service shuts down and light rail service closes for routine maintenance. The Late Night call-n-Ride is intended to fill these gaps for West Side residents dependent on transit during atypical travel hours.

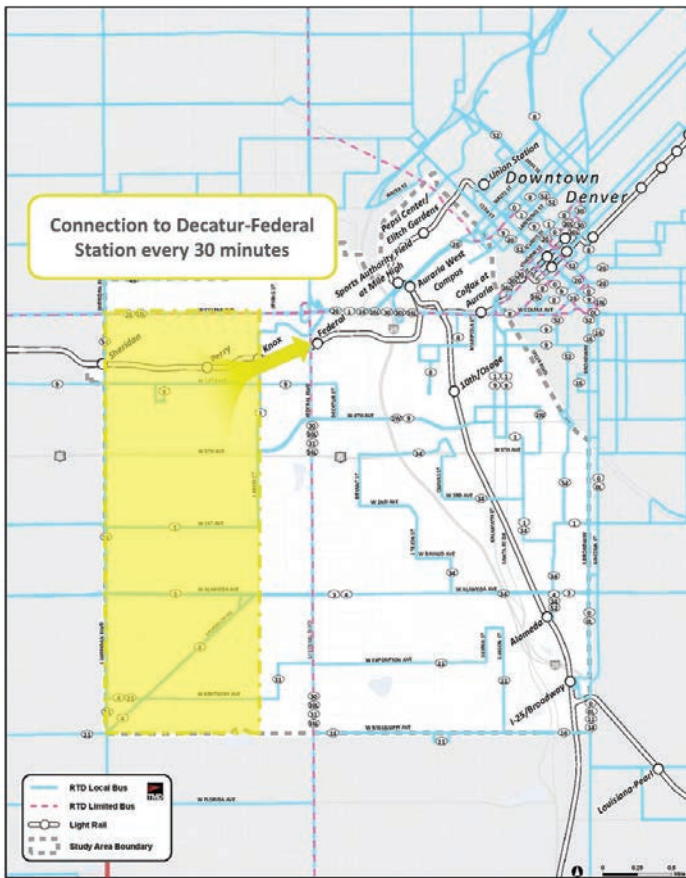


Figure 7.1 - Proposed West Side Call-n-Ride (Daytime)

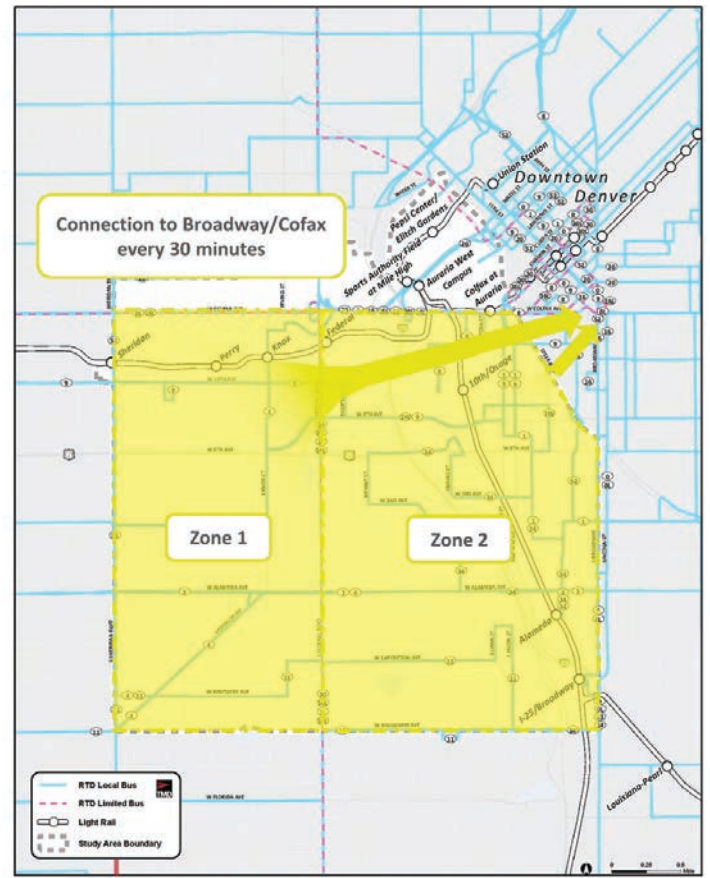


Figure 7.2 - Proposed West Side Call-n-Ride (Late Night)

NEXT STEPS

Following the conclusion of this study, next steps in the development of the two call-n-Ride services include a more detailed feasibility analysis and outreach to assess support for call-n-Ride services. The feasibility analysis will include ridership estimates, a more detailed examination of the services area, and a cost and performance assessment.



