

*The Economics of Land Use*



## **Final Report**

# **South I-25 Urban Corridor Study**

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Denver South Transportation Management Association (TMA)

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# 1. INTRODUCTION

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The South I-25 Corridor is the most successful business district outside of downtown in the Denver metropolitan area with over 35 million square feet of office space and 130,000 employees. The corridor is also growing and evolving. Since the completion of the \$1.7 billion TREX project in 2006, the corridor has added over 4.1 million square feet of office space, a 15 percent increase, and it has become more mixed use with the addition of 4,000 housing units, to reach 14,000 units overall, a 40 percent increase. The land use pattern is also evolving with 66 percent of the office new development and 80 percent of the new housing development occurring within one-half mile of the corridor's six light rail stations on RTD's Southeast Line.

In light of these changes, the objectives for this South I-25 Urban Corridor Study are to determine how the area can remain the premier employment location in the region. What are the potentials for additional commercial and residential growth over the next 20 years? How can the area's business parks and shopping centers, area jurisdictions, and the Denver South Transportation Management Association (TMA) maintain and enhance the viability and quality of the corridor as a place to work and also to live? Lastly, how can the study area accommodate the associated increases in travel demand in a feasible and fiscally sustainable way?

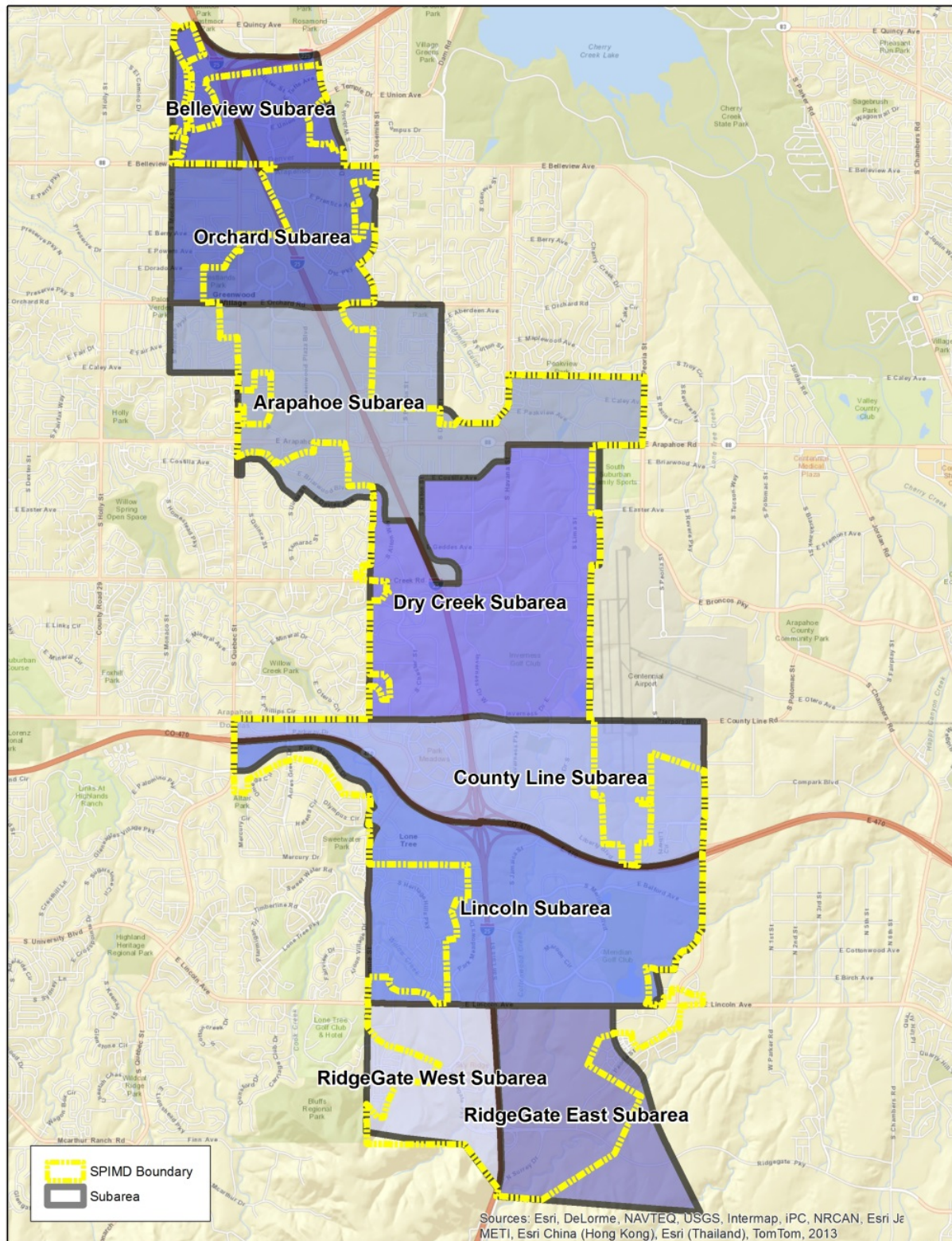
## **Project Team**

The Denver South Transportation Management Association (TMA) retained Economic & Planning Systems (EPS), with Felsburg, Holt & Ullevig (FHU), Goodbee and Associates, Sky to Ground, and Steer Davies Gleave (SDG) to prepare this corridor study and development strategy. The TMA is a partnership of public and private entities in the South I-25 Urban Corridor working to identify and develop transportation solutions to enhance mobility, drive economic development, and increase the image within the Southeast I-25 Corridor. Its objective is to promote working relationships between its partners for the purpose of identifying and developing transportation solutions that enhance mobility, drive economic development and promote the image within the South I-25 Corridor.

## **Study Area**

The South I-25 Corridor study area is defined as the higher density and predominately commercial development within the I-25 highway corridor, and adjacent Southeast Corridor light rail line, from the intersection of I-25 and I-225 in the City and County of Denver on the north to RidgeGate in Lone Tree on the south. The study area closely parallels the boundaries of the Southeast Public Improvement Metropolitan District (SPIMD) which encompasses all of the commercial properties in the corridor and imposes a 2.0 mill levy to help pay for needed infrastructure improvements.

**Figure 1**  
**South I-25 Corridor Study Area**





## Corridor History

Development in the corridor first dates to 1962 when the Denver Technological Center (DTC) was established. George Wallace, the founder and architect of DTC, acquired 40 acres at the intersection of I-25 and I-225 just south of the city and moved his company from downtown Denver. Today Denver Tech Center encompasses 909 acres, with 14.0 million square feet of total space and 9.4 million square feet of office space accommodating over 1,000 companies and 35,000 employees. DTC contains primarily multitenant Class A office buildings. It is also decidedly more mixed use with 3,300 housing units, three hotels, and a modest amount of retail space.



Denver Technological Center

The DTC vision was to be a place for companies to locate closer to their residences in the highly desirable suburban communities south of Denver. One of the key plan design concepts was the “superblock” containing over 30 acres which is the equivalent of about 16 city blocks. Each parcel of development was required to have a minimum of 30 percent open space and other design controls resulted in each superblock having at least 40 percent open space.

DTC was followed by Inverness Business Park which was started in 1971 with the purchase of 640 acres east of I-25 at Dry Creek Road. The business park was developed as 3 to 5 acre sites built as two and three story office buildings and one story flex buildings surrounding a golf course that opened in 1974.



Inverness Hotel and Conference Center

By 1983 the park expanded by an additional 340 acres to reach a total of 970 acres. In 1987, a parcel was sold to become the Inverness Hotel and Conference Center. Over the years, larger Class A properties have been built along the I-25 frontage and the park is largely built out today.



CH2M at Meridian Office Park

Meridian was the third major business park built in the South I-25 Corridor located at the confluence of I-25 and E-470 immediately south of Centennial Airport. The fledgling park was acquired by DTC Corporation in 1984 and expanded in 1985 to 1,630 acres including a Jack Nicklaus designed golf course. In addition to the golf course, the development’s zoning requires 30 percent open space overall creating a park like setting. Unlike, DTC, Meridian is largely corporate and regional headquarters including such companies as EchoStar, First Data, American Family Insurance, Liberty Media, Western Union, and CH2M.

The South I-25 Corridor continued to grow in the 1980s and 1990s with the addition of other office and business parks east and west of the highway including Greenwood Plaza, Panorama Business Park and Palazzo Verde, as well as the location of major Class A office buildings along the I-25 frontage, principally at major interchanges. The corridor has extended south of C-470/ E-470 with the inclusion of the 3,000 acre RidgeGate planned community south of Lincoln and I-25 with major business park elements in both the 900-acre RidgeGate West portion (west of I-25) that is largely built out and the 1,800 acre RidgeGate East development (east of I-25) that is yet to be started.

Over the last 15 years the corridor has evolved to become more urban and more mixed use. There have been a number of notable projects contributing to these changes including the following:

- **Denver Tech Center** – The oldest business park in the corridor has also been the most successful in becoming more mixed use. A total of 14 million square feet of space has been built including 9.4 million square feet of office. Additionally, there is 3,151 multifamily housing units, 115 single family units, three hotels with a total of 1,220 rooms, and an upscale retail project called Belleview Promenade.
- **Light Rail** – The \$1.8 billion TREX multimodal transportation project completed in 2006 rebuilt and expanded South I-25 from Broadway to County Line Road and added a new 19.2 mile light rail line with 10 stations, six of which are in the South I-25 Corridor study area. Since the rail line opened, transit oriented development (TOD) around these stations has significantly increased residential and office densities in the I-25 Corridor.
- **Vallagio** – This mixed use housing and retail built on 30 acres of land purchased from Inverness on the north end of the business park is the largest example of this new TOD. The Vallagio is a phased, primarily residential mixed-use development approximately a half mile from Dry Creek Station; currently there are 330 condominiums, 44,000 square feet of retail, and 24,000 square feet of office space. The Dry Creek Station is accessible by a quarter-mile long pedestrian bridge that spans Inverness Drive and I-25. The pedestrian bridge extension to the Vallagio Village Center was built by the developer in order to connect the development to transit and make it transit oriented.
- **Belleview Station** – Belleview Station is an example of a new generation of mixed use TODs that is densifying development in the I-25 South Corridor. The master planned project, which is in its initial phase of development, is on a 55-acre site surrounding the Belleview light rail station. Two mixed use projects have been completed including 653 apartments with structured parking and 71,000 square feet of first level retail space. A 330,000 17-story office building has just broken ground that will have a second phase of 170,000 square feet. Although entitled with City of Denver TMU-30 zoning at a 5:1 FAR, total buildout on the site is estimated to be in the range of 5.0 million square feet of development.

## Study Outline

The study summary report is organized into four sections following this Introduction:

**Existing Corridor Conditions** – This section provides a review of existing development conditions and historical trends including data on office, residential, industrial, retail and hotel land uses. Also included is a comprehensive inventory of transportation infrastructure including roads, transit, bike and pedestrian facilities, as well as data on current usage and community patterns.

**Corridor Forecasts and Needs** – This section provides EPS' forecasts of development potentials for the corridor over the next 20 years along with an assessment of how the form and location of development is expected to evolve. Based on projected increase in growth, transportation impacts and potential transportation facility and management improvements are identified.

**South I-25 Corridor Strategy** – This section presents recommendations and goals for the corridor and the strategies and actions to achieve these goals needed to realize these changes. A list of short term priority actions is also recommended.

**Short Term Action Plan** – This section presents a prioritized list of short term actions recommended to be undertaken by the TMA to jumpstart implementation of the corridor strategy.

## 2. EXISTING CORRIDOR CONDITIONS

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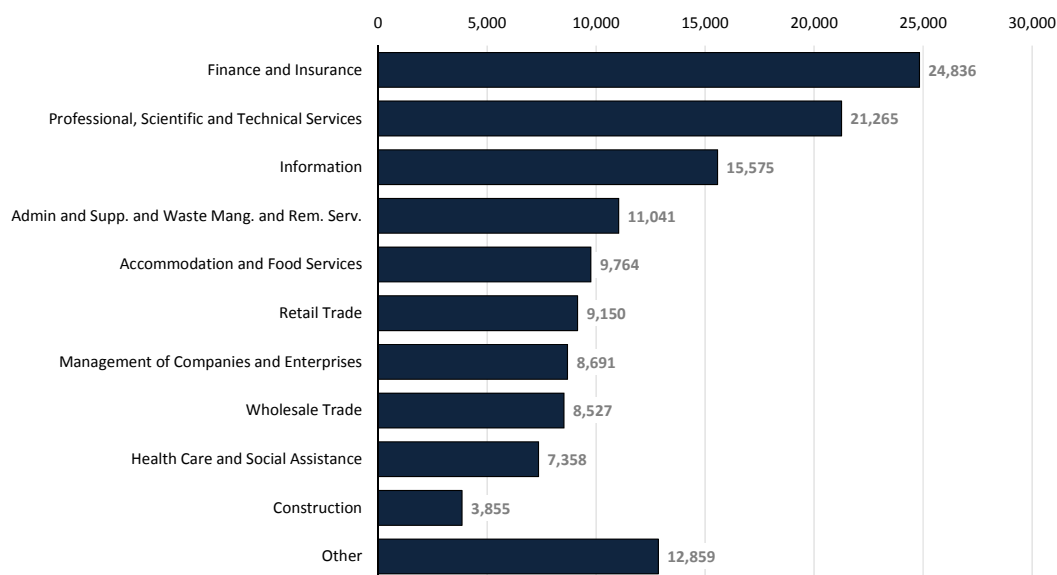
The South I-25 Corridor has evolved greatly over the half century of development that has occurred. Its evolution from an area containing a series of individual office parks to a major destination for all uses (office, residential, retail and hotels) is reflective in the recent demographic and development trends. An analysis of economic and demographic characteristics illustrates the types of people, housing, and businesses located in the corridor. Real estate and development conditions and trends are summarized including data on the total amount of development by type, absorption trends and capture rates, and shifts in development patterns due to the introduction of rail, changing business practices, and demographic shifts. Existing transportation facilities and travel patterns are also inventoried including roads and highways, transit systems, and the bike and pedestrian systems. A comprehensive commuter survey is also profiled providing data on current commuting patterns and desires. The analysis of existing conditions provides the basis for identifying development opportunities and issues to be addressed by the proposed corridor strategy.

### Economic, Demographic and Development Trends

#### Corridor Employment Trends

The South I-25 Corridor has grown from a primary location for office employment to a corridor with a diverse array of jobs and residents. Currently, there are 133,000 people working along the corridor for well over 5,000 companies and businesses. Employment in the corridor is predominately in three main industries, Finance and Insurance, with 25,000 jobs, Professional, Scientific and Technical Services, with 21,000 jobs, and Information, with 16,000 jobs (**Figure 2**).

**Figure 2**  
**South I-25 Corridor Employment by Industry, 2013**



Source: Bureau of Labor Statistics; Economic & Planning Systems

The three largest industries in the corridor have a greater concentration of jobs than the State. As shown in **Table 1** each industry has a location quotient (measurement of the percent of jobs in an industry in the corridor relative to the State) over 3.0, which means there are three times as larger a concentration of employment in these industries in the corridor compared to the State. Professional Services also has a large concentration with a location quotient of 1.9.

**Table 1**  
**South I-25 Corridor Location Quotient by Industry, 2013**

Industry	2013 LQ
Finance and Insurance	3.4
Management of Companies and Enterprises	3.3
Information	3.1
Professional, Scientific and Technical Services	1.9
Admin and Supp. and Waste Mang. and Rem. Serv.	1.2
Real Estate and Rental and Leasing	1.1
Wholesale Trade	1.1
Mining, Quarrying, and Oil and Gas Extraction	1.0
Accommodation and Food Services	0.8
Unclassified	0.7
Retail Trade	0.6
Other Services, except Public Administration	0.6
Construction	0.5
Health Care and Social Assistance	0.5
Arts, Entertainment, and Recreation	0.3
Educational Services	0.2
Manufacturing	0.2
Public Administration	0.1
Transportation and Warehousing	0.1
Agriculture, Forestry, Fishing and Hunting	0.0
Utilities	0.0

Source: BLS QCEW; Economic & Planning Systems

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Employment in the corridor grew by 17,500 jobs from 2005 to 2013. The majority of employment growth was in the corridor's largest industries, with Professional Services employment increasing by over 5,000 jobs. Other industries of strength, Management of Companies and Administrative and Support Services, grew by 2,980 and 3,550 jobs respectively. One industry that experienced significant growth over the past decade historically was not an industry of strength was Health Care, which grew by 2,950 jobs between 2005 and 2013.

The Information industry lost employment during the past decade. Employment in this Industry is shifting rapidly and is a highly sought after industry for most major metro areas. The corridor's strength in this area has been driven by the cable television industry, which is changing and shifting towards internet related applications. The environments that information technology companies are seeking are typically more urban, flexible and mixed use in order to capture new workers that prefer these work settings. The increased competition the corridor is facing from downtown Denver and other urban cores in competing cities is illustrated by Liberty Global recently relocating from South I-25 to downtown Denver.

**Table 2**  
**South I-25 Corridor Employment by Industry, 2005 to 2013**

Industry	2005	2013	2005-2013		
			Total	Ann. #	Ann. %
Agriculture, Forestry, Fishing and Hunting	19	6	-13	-2	-13.6%
Mining, Quarrying, and Oil and Gas Extraction	421	1,102	681	85	12.8%
Utilities	86	6	-80	-10	-27.9%
Construction	5,840	3,855	-1,985	-248	-5.1%
Manufacturing	1,719	1,308	-411	-51	-3.4%
Wholesale Trade	8,249	8,527	278	35	0.4%
Retail Trade	8,646	9,150	504	63	0.7%
Transportation and Warehousing	1,190	913	-277	-35	-3.3%
Information	15,982	15,575	-407	-51	-0.3%
Finance and Insurance	23,433	24,836	1,404	175	0.7%
Real Estate and Rental and Leasing	2,945	3,011	66	8	0.3%
Professional, Scientific and Technical Services	16,150	21,265	5,116	639	3.5%
Management of Companies and Enterprises	5,711	8,691	2,980	372	5.4%
Administrative and Support and Waste Management and Remediation Services	7,491	11,041	3,550	444	5.0%
Educational Services	1,062	1,888	826	103	7.5%
Health Care and Social Assistance	4,408	7,358	2,950	369	6.6%
Arts, Entertainment, and Recreation	916	1,094	178	22	2.2%
Accommodation and Food Services	8,707	9,764	1,057	132	1.4%
Other Services, except Public Administration	1,600	2,349	750	94	4.9%
Public Administration	831	1,170	339	42	4.4%
Unclassified	18	10	-7	-1	-6.5%
<b>Total Wage and Salary Employment</b>	<b>115,425</b>	<b>132,921</b>	<b>17,496</b>	<b>2,187</b>	<b>1.8%</b>

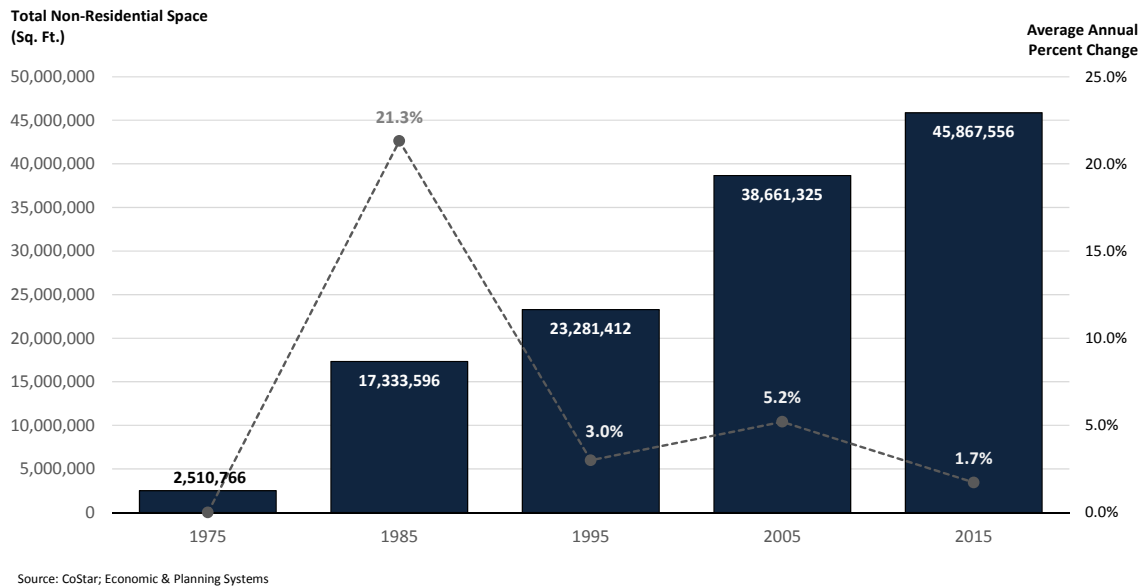
Source: BLS QCEW; Economic & Planning Systems

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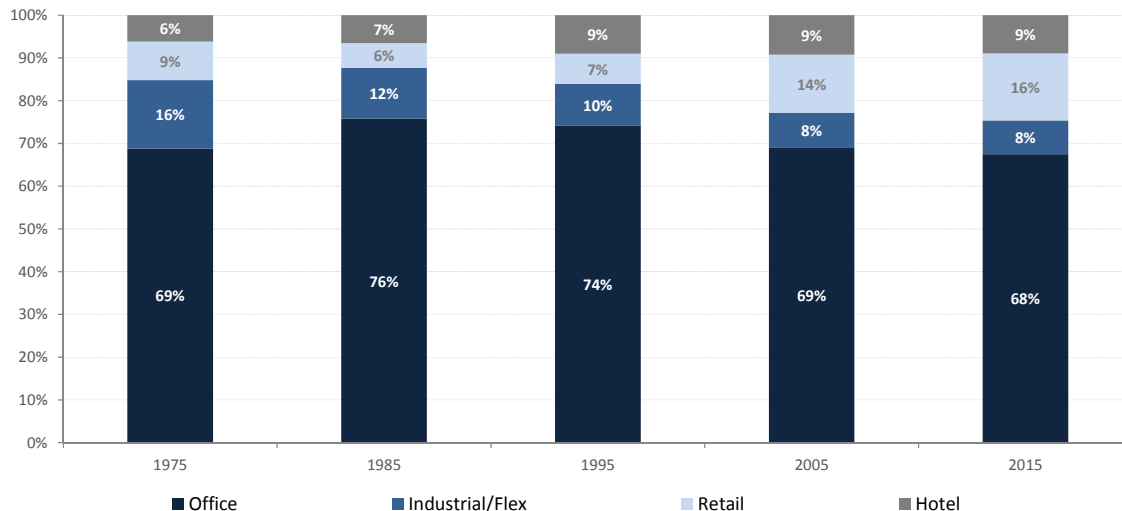
## Commercial Development Trends

The South I-25 Corridor has over 45 million square feet of commercial and industrial space as shown in **Figure 3**. Office space has made up approximately 70 percent of the corridor non-residential space over the past 40 years. In 1975, industrial space was the second most prevalent non-residential use along the corridor with 16 percent of the total, but its share of space has decreased to 8 percent in 2015 (**Figure 4**). Retail and hospitality uses have increased in prevalence and make up a quarter of the non-residential space along the corridor. This trend is likely to continue and retail, hospitality and entertainment uses will capture a larger share as more residential uses in and along the corridor drive demand.

**Figure 3**  
**Total Non-Residential Square Feet, 1975 to 2015**

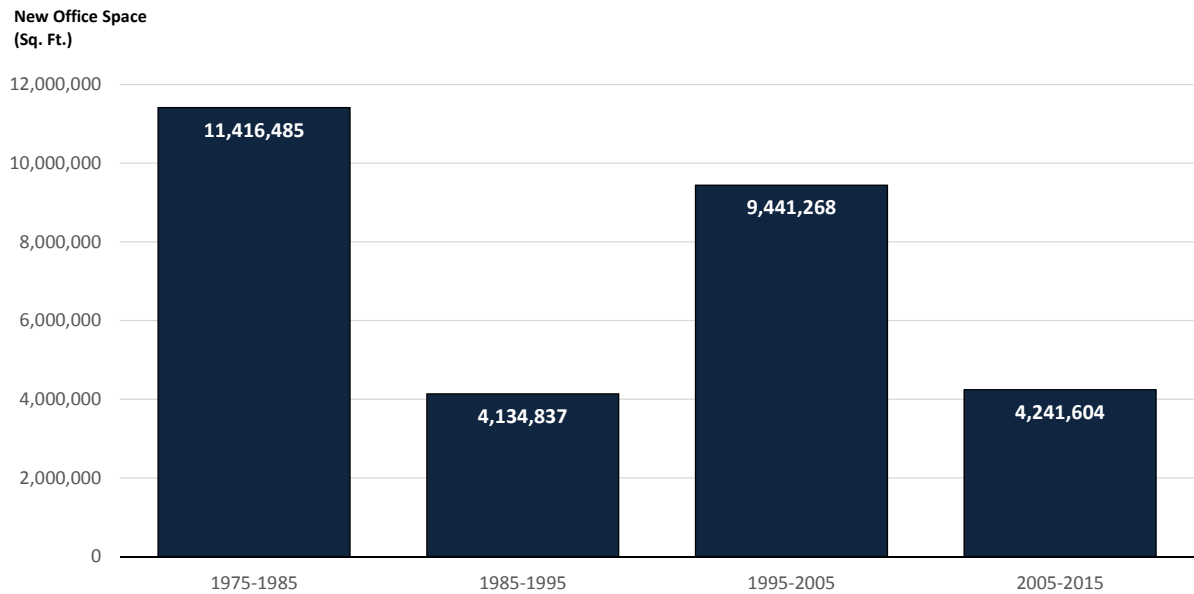


**Figure 4**  
**Percent Non-Residential Square Feet by Use, 1975 to 2015**



The evolution of the corridor to become a major employment destination has occurred over approximately a 40 year period but that growth has been cyclical in nature. The first, and largest, major boom of office space development along the corridor occurred from 1975 to 1985 when approximately 11 to 12 million square feet of office space was developed. Between 1985 and 1995, only 4.1 million square feet of office were added, which was followed by another boom from 1995 to 2005. The corridor has increased by 4.2 million square feet of office space in the last 10 years.

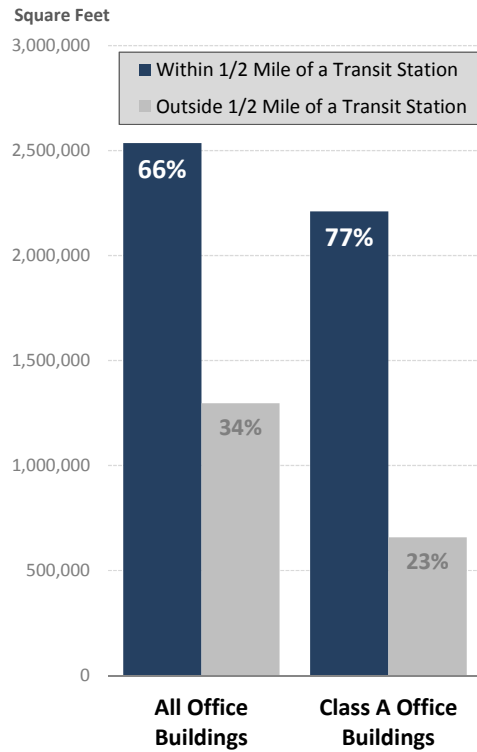
**Figure 5**  
**South I-25 Corridor Office Space by Year Built, 1975 to 2015**



Source: CoStar; Economic & Planning Systems

One of the most pronounced trends within office development along the corridor over the past 10 years has been the shift of office development to locate at or near transit stations. The southeast light rail line was finished in 2006 with six stations along I-25 from Bellevue South to Lincoln. Between 2006 and 2013, two-thirds of the office buildings built along the corridor were within a half mile of a station. Of the Class A buildings built, 77 percent were within a half mile of a station.

**Figure 6**  
**South I-25 Corridor New Office Space by Location, 2006 to 2013**



## Demographic and Housing Trends

The study area includes pockets of residential uses including single family homes due to the boundaries of the corridor that align with traffic analysis zones that encompass the SPIMD boundary. Therefore, the corridor demographic information primarily includes residents within these enclaves but also includes residents within adjacent neighborhoods to SPIMD.

The development of multifamily residential buildings within previously single purpose office parks began in DTC in the late 1980s has increased steadily since. As a result, the population in the corridor has more than doubled over the past 15 years with the resident population increasing from 10,637 residents in 2000 to 23,397 in 2014, which equates to an increase of 12,760 residents, as shown in **Table 3**.

The number of households in the corridor has increased from 5,029 to 12,511 from 2000 to 2014. This amount of household growth resulted in the development of nearly 8,700 residential units within a 15 year period, which equates to 618 units per year and annual average growth rate of 6.8 percent. The average number of people per household has decreased over this period from 2.12 to 1.87 indicating that large majority are one or two person households in multifamily housing.

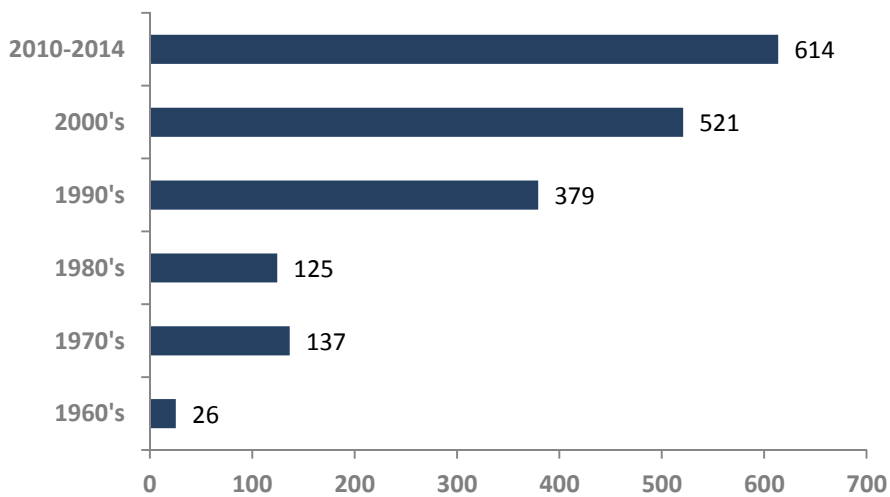
**Table 3**  
**South I-25 Corridor Population and Households, 2000 to 2014**

	2000	2010	2014	Change 2000-2014		
				Total #	Ann #	Ann. %
Population	10,637	21,158	23,397	12,760	911	5.8%
Households	5,029	11,332	12,511	7,482	534	6.7%
Persons per HH	2.12	1.87	1.87			
Housing Units	5,712	13,072	14,369	8,657	618	6.8%

Source: ESRI; US Census Bureau; Economic & Planning Systems

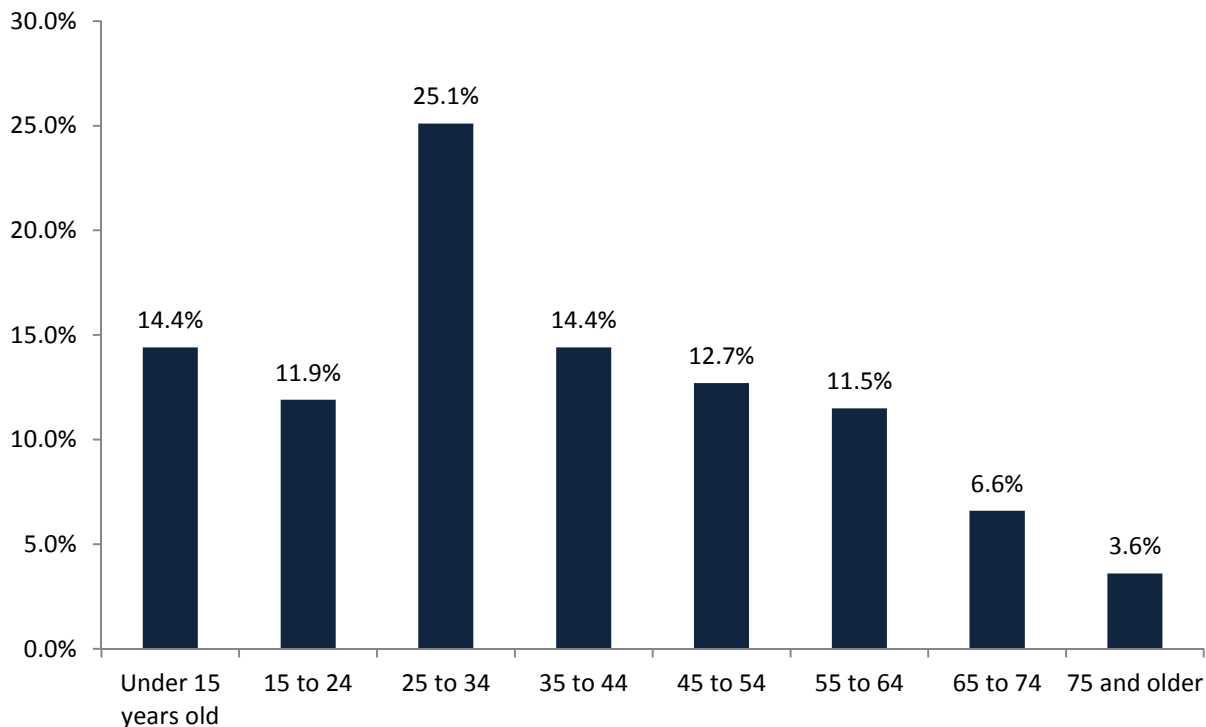
Residential development within the corridor began in significant numbers in 1990's when nearly 3,800 units were built that decade (379 per year), as shown in **Figure 7**. Housing development jumped in the 2000's with 5,200 units built in the 2000's (521 per year). The rate of housing development continues to grow in the corridor as nearly 2,500 units were built from 2010 to 2014 (614 per year).

**Figure 7**  
**South I-25 Corridor Housing Units per Year by Decade Built, 1960 to 2014**



Residents of the corridor are a variety of ages, as the median age is 35 years old, which is similar to the metro wide average. However, the age cohort with the highest concentration is residents between 25 to 34 years old, which accounts for a quarter of the residents of the corridor.

**Figure 8**  
**South I-25 Corridor Percent Residents by Age**



Residents of the corridor are more affluent than the metro area average. The average household income in the corridor is \$114,364, which is \$27,000 greater than the metro area average of \$87,501. The higher income households reflect the education level of residents of the corridor. Over 72 percent of corridor residents (over the age of 25) have at least an associate degree; nearly a quarter (24 percent) have a graduate degree.

**Table 4**  
**South I-25 Corridor Household Income**

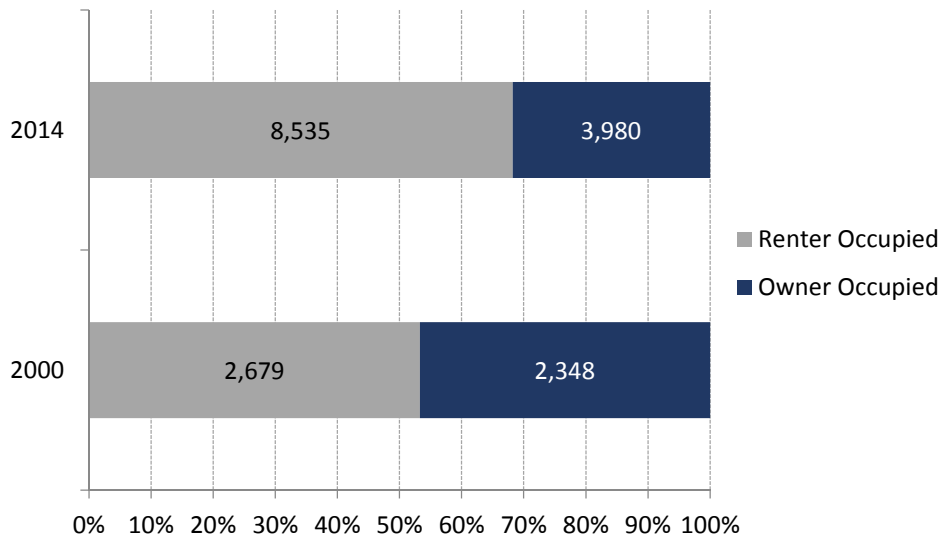
Income	# Households	% Households
<\$15,000	688	5.5%
\$15,000 - \$24,999	513	4.1%
\$25,000 - \$34,999	901	7.2%
\$35,000 - \$49,999	1,564	12.5%
\$50,000 - \$74,999	2,052	16.4%
\$75,000 - \$99,999	1,689	13.5%
\$100,000 - \$149,999	2,315	18.5%
\$150,000 - \$199,999	988	7.9%
\$200,000+	1,789	14.3%
Average Household Income	\$114,364	---
Median Household Income	\$81,380	---

Source: ESRI; US Census; Economic & Planning Systems

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The majority of households along the corridor rent their home. The percent of renter occupied households along the corridor is 68 percent, which is 15 percent higher than in 2000. There has been an increase of nearly 6,000 renter occupied units since 2000 and an increase of only 1,600 owner occupied units. Nearly all renter occupied units are within multifamily apartment units. Multifamily buildings (buildings with 5 or more units) account for 70 percent of all units along the corridor.

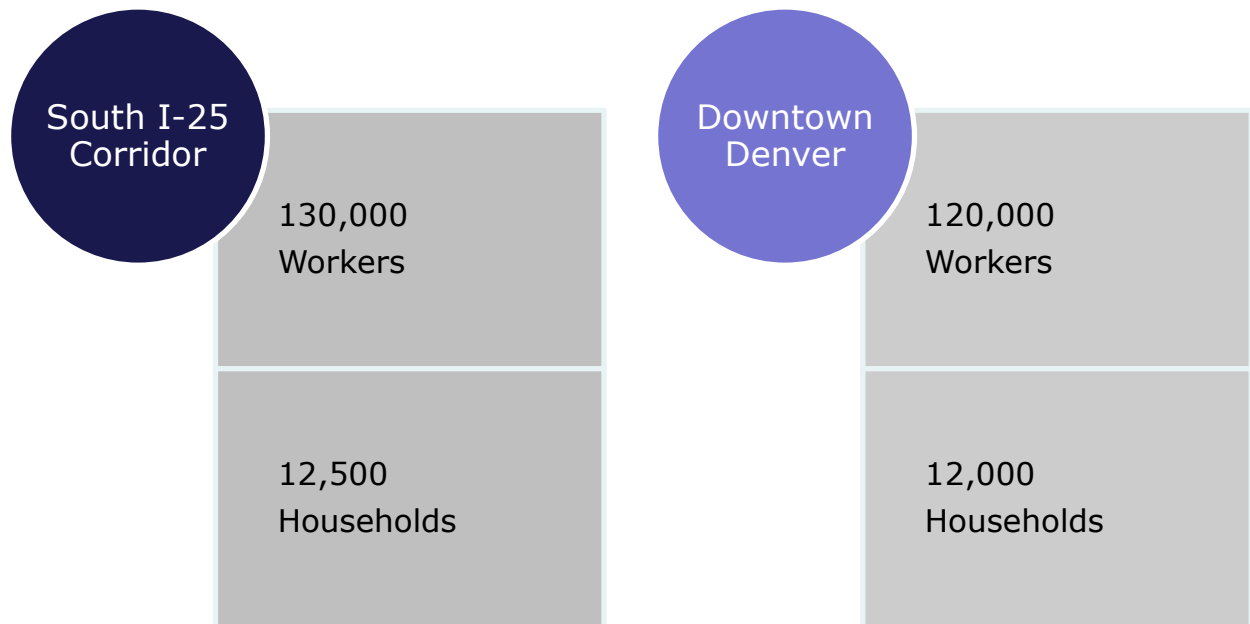
**Figure 9**  
**South I-25 Corridor Housing Tenure, 2000 to 2014**





The increasing concentration of multifamily housing, and primarily apartment units, near and within employment centers is a trend that is occurring nationally—particularly in the downtown and urban cores of major cities, including Denver. However, this has not been isolated to just downtown as evident by the rate of growth of households found in the South I-25 Corridor, which has almost identical amounts of jobs and households as downtown Denver. Based on the Downtown Denver Partnerships boundaries, there are approximately 120,000 workers and 12,000 households in downtown Denver. The South I-25 Corridor, as defined for this study, has 130,000 workers and 12,500 households (**Figure 10**).

**Figure 10**  
**South I-25 Corridor and Downtown Denver Population and Employment**



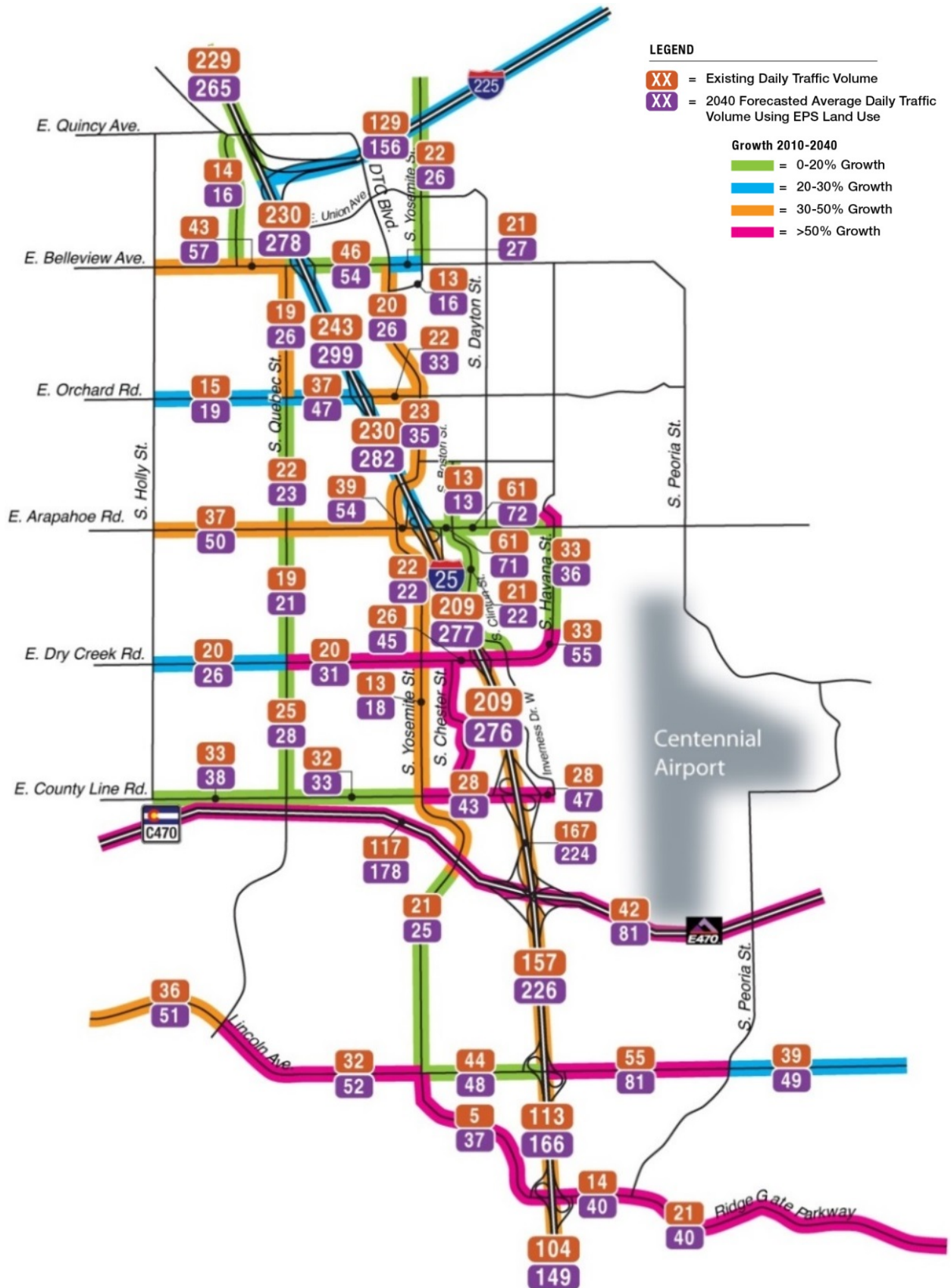
## Existing Transportation Inventory

This section examines transportation infrastructure and services within the study area, including the transit system, the roadway network, and active modes.

### Roadway Network

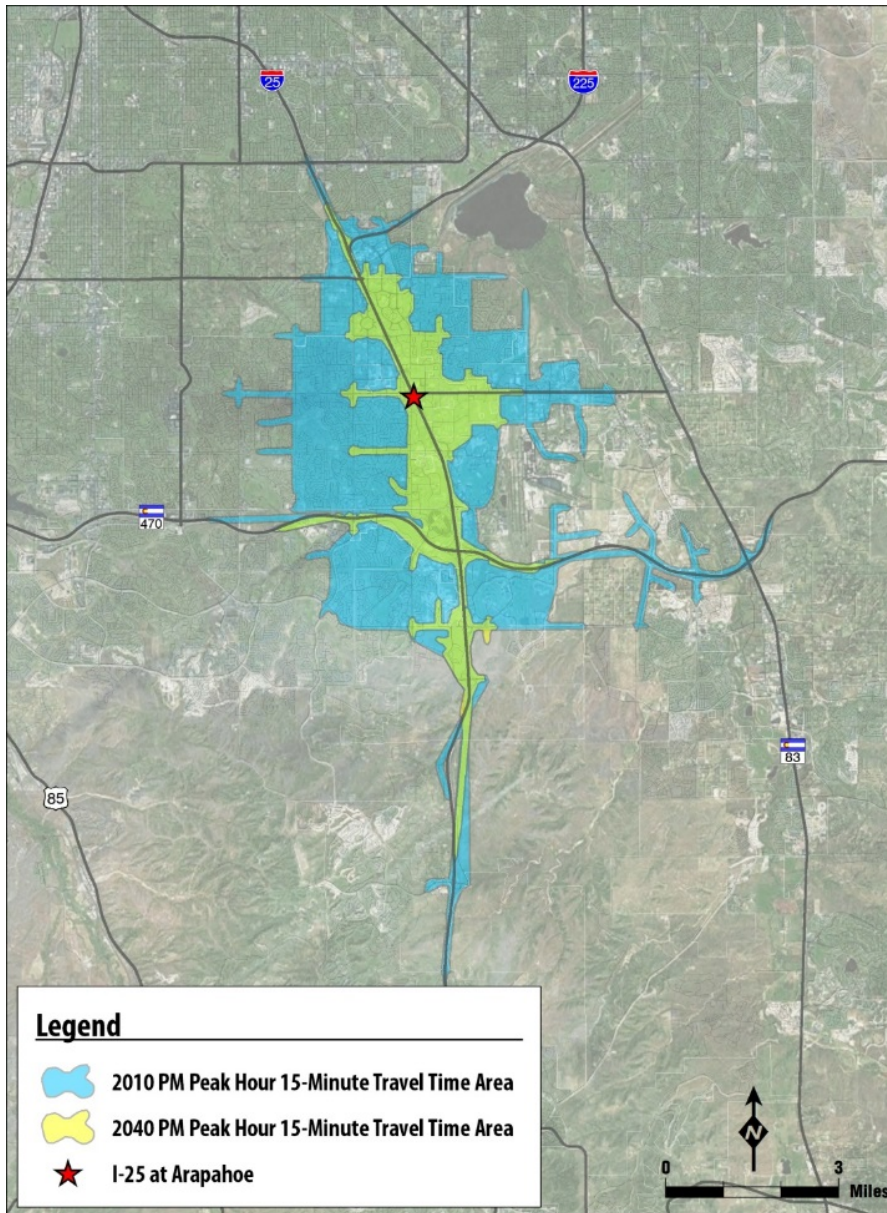
Much of I-25 in the corridor currently has daily volumes over 200,000 vehicles per day. Along with I-25 through downtown Denver, these are the highest traffic levels currently seen in Colorado. Based on current traffic generation rates, the forecasted development are expected to generate an increase of 40,000 to 70,000 vehicles per day on I-25 within the study area as shown in **Figure 11**. Many of the arterials in the study area are also expected to see daily volume increases of 30 percent or more by 2040.

### Figure 11 2010 to 2040 Traffic Volumes



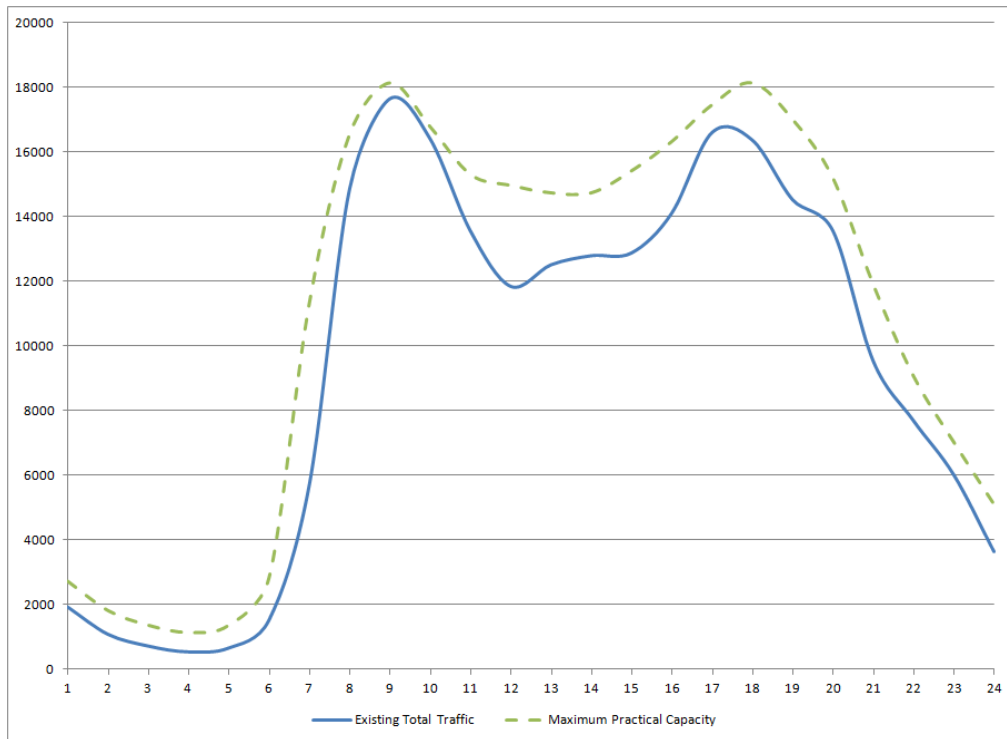
The projected increase in traffic is expected to contribute to increased congestion and longer commutes. **Figure 12** shows that by 2040 increases in congestion levels will significantly reduce the 15-minute east-west commuting sheds.

**Figure 12**  
**PM Peak Hour 15-Minute Travel Time Area from I-25 and Arapahoe Road – 2010 vs. 2040**



I-25 is currently at or very near its capacity during peak hours. **Figure 13** shows that traffic volumes over a 24-hour period on I-25 at Arapahoe Road exhibit a flat curve with heavy traffic volumes in both directions for several hours of the day. The figure also shows the maximum practical capacity possible for this section of roadway - with current daily volumes of approximately 230,000, under ideal conditions, the roadway could potentially handle only up to 10 to 15 percent more traffic.


















**Figure 13**  
**Existing and Practical Maximum Capacity on I-25 and Arapahoe Road**



Source: CDOT, Count Data from April 28, 2015

The projected traffic volumes are also expected to negatively impact levels of service (LOS) at the eight main I-25 interchanges in the study area. Apart from Dry Creek and County Line, which are currently being studied, all of the interchanges are expected to have a LOS of F by 2040 without new improvements as shown in **Figure 14**.

**Figure 14**  
**Generalized Level of Service Assessment at Interchanges**

Interchange	Current Conditions	2040 Conditions with No Improvements	Improvement Status / Potential Effect for 2040
Bellevue			 Improvements identified in Corridor Study
Orchard			 Improvements being planned by GV
Arapahoe			  Improvement being implemented
Dry Creek		Study underway	Study underway
County Line		Study underway	Study underway
C-470/E-470			Design/Build Process - TBD
Lincoln			Short-range improvements underway, add'l long-range improvement TBD
RidgeGate		Long-range forecasts and planning in process	

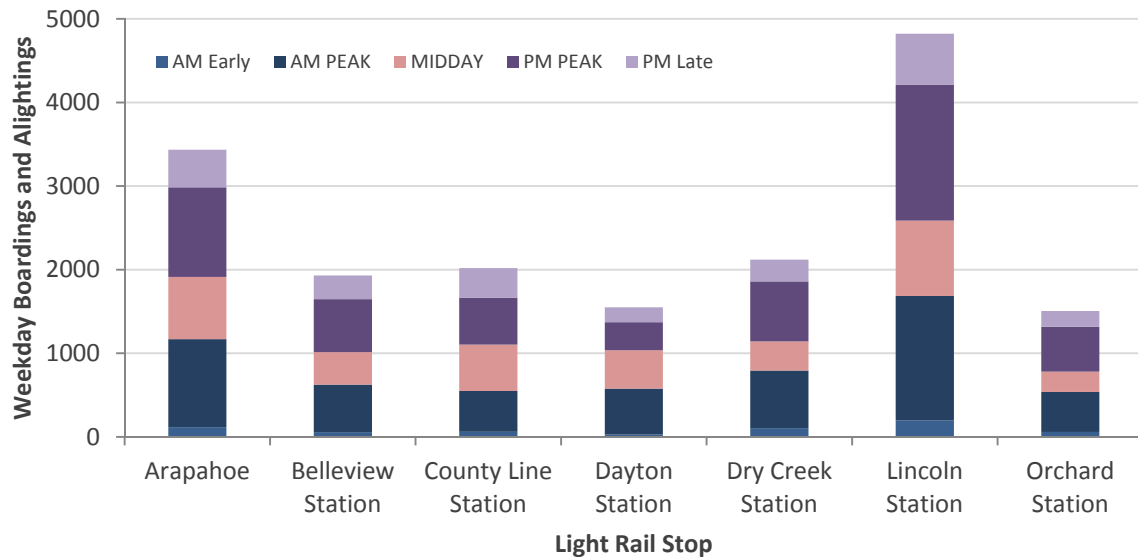
## Transit Network

### Light Rail Service

The study area is currently served by two RTD light rail lines – the E and F. Light rail service runs between every 15 to 30 minutes within the study area. The F line, which provides service from 18<sup>th</sup> and California to Lincoln, offers 15-minute headways during the peak periods. The E line from Union Station to Lincoln provides service every 30 minutes during the peak periods. During the mid-day period, both the E line and F line provide service every 30 minutes.

The South I-25 Corridor has six light rail stations. Lincoln Station has the largest ridership of any station, with a total of nearly 5,000 boardings and alightings per day followed by Arapahoe at Village Center with just under 3,500 per day. The remaining four stations range between 1,500 and 2,000 passenger activities a day as shown in **Figure 15**.

**Figure 15**  
**Light Rail Boardings and Alightings**





The utilization of the RTD Park-n-Rides within the study area varies significantly from location to location. **Table 5** shows the total spaces, average daily use, and percentage of capacity for study area Park-n-Rides. Two Park-n-Rides within the study area are near 100 percent capacity (Bellevue and Orchard), though these Park-n-Rides provide a relatively small number of total spaces.

**Table 5**  
**Light Rail Park-n-Ride Parking Utilization in Study Area**

Station	Spaces	Average Daily Use	% of capacity
Arapahoe at Village Center Station	1,115	498	45%
Bellevue Station	59	56	95%
County Line Station	368	155	40%
Dry Creek Station	235	203	96%
Lincoln Avenue Station	1,734	1,178	68%
Orchard Station	48	45	95%

### Future Light Rail

**Southeast Extension** – In July 2014, the RTD Board authorized the Southeast extension, a 2.3-mile addition to the existing Southeast light rail line. This \$225 million extension is anticipated to be completed in 2019 and will provide service to three new stations: Sky Ridge, Lone Tree City Center, and RidgeGate Parkway (**Figure 16**). Design is currently under way and construction will begin in the spring of 2016.

**Figure 16**  
**RTD Southeast Extension**

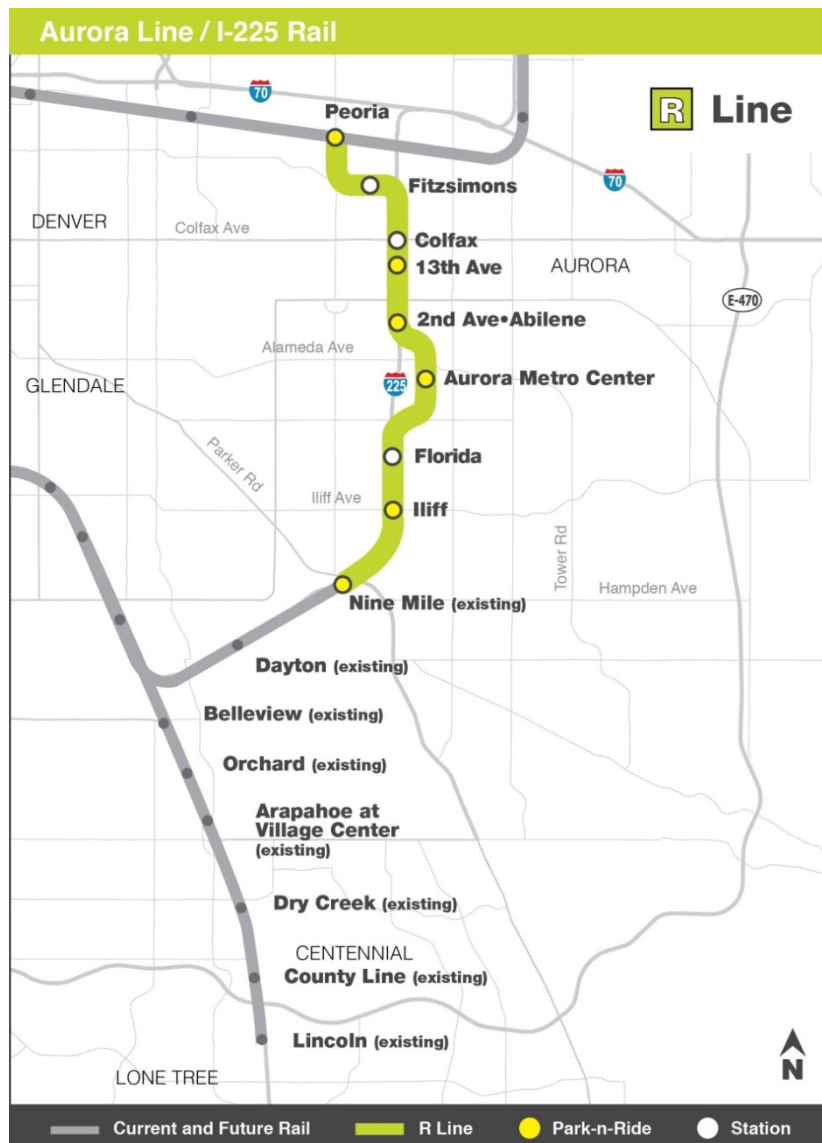


Source: RTD



**R Line (Aurora Line)** – The R Line (also known as the Aurora Line/I-225 Rail) is a 10.5-mile extension of rail from the current Nine Mile station north to Peoria station where transfers can be made to the University of Colorado A Line to Union Station on the west or DIA on the east (**Figure 17**). Currently under construction, the R Line will travel 22 miles from the new Peoria station at the north end of the line to Lincoln Station at the south end of the line when it opens in 2016 (with additional service to the end of the new Southeast Extension when that component opens in 2019). This will provide study area employees and residents with direct light rail access to Aurora and (with a transfer) the new commuter rail line to Denver International Airport.

**Figure 17**  
**RTD R Line**



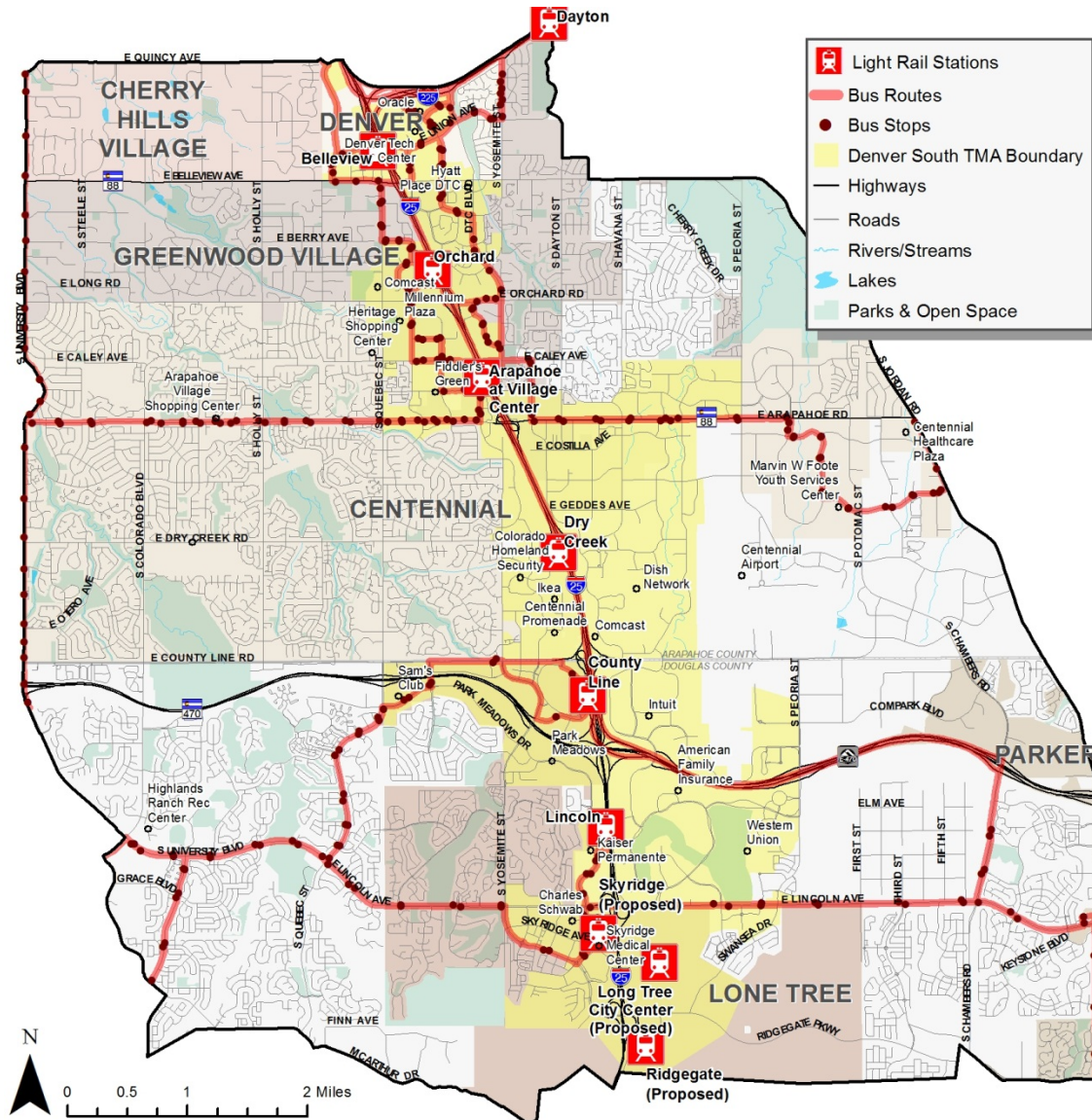
Source: RTD

Once the R Line is completed, its operations will be integrated into the Southeast light rail line through the study area. Current plans call for 15-minute headways throughout most daytime hours, with 30-minute headways during the early morning and late night hours. This means that combined with the existing service on the E and F lines, a total of 10 trains per hour in each direction will serve the study area, resulting in average headways of 6 minutes during peak periods.

## Bus Service

RTD bus service in the study area is relatively minimal with the highest concentration of routes in the DTC area. South of Arapahoe Road there are relatively few routes as shown in **Figure 18**.

**Figure 18**  
**Existing RTD Bus Schedule**



Source: RTD

Bus service frequencies vary, with most routes providing 30-minute headways during the AM and PM peak periods, although four routes provide less-frequent service (402L, 402, 410, and P). These same five runs provide less frequent (or no service) during the day, since they primarily serve the commuting populations, as shown in **Table 6**.

**Table 6**  
**Study Area Bus Service Overview (Weekday Service)**

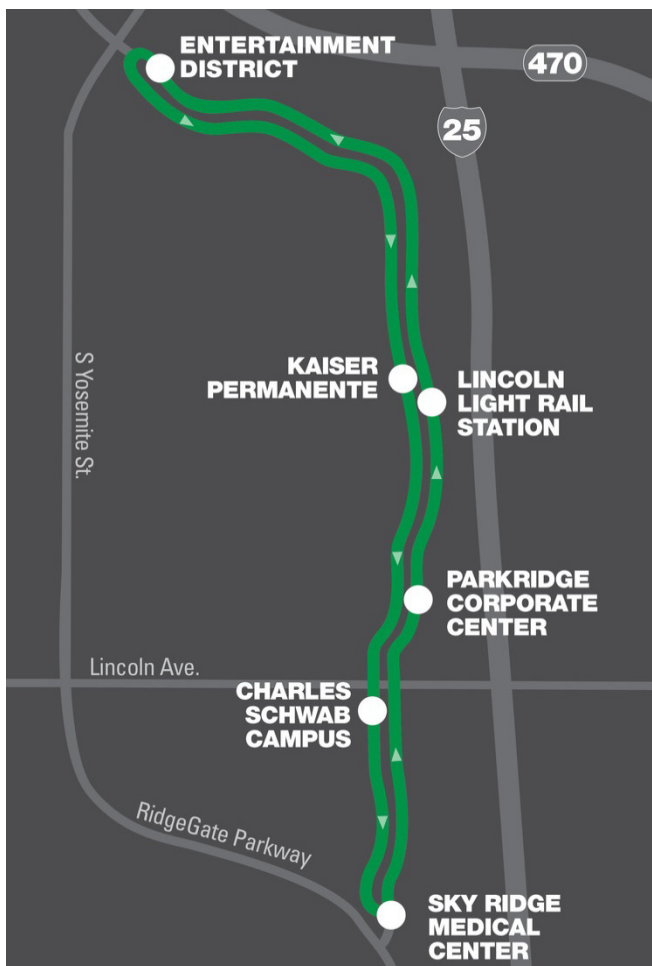
Route	Direction	AM Peak Frequency (6-9AM)	Mid-day Frequency	PM Peak Frequency (3-6PM)
27: Yale Avenue	East/West	30	30	30
46: South Dahlia	North/South	30	30	30
65: Monaco Parkway	North/South	30	30	30
66: Arapahoe Road	East/West	30	30	30
73: Quebec Street	North/South	30	30	30
402L: Highlands Ranch Parkway	East/West	30	30-60	30
403: Wildcat Crosstown	East/West	30-60	30-60	30
410: Lincoln Ave / Parker	East/West	30-60	1-2 runs	30-60
P: Parker / Denver	North/South	30 in AM	N/A	30 in PM

Source: RTD

Arapahoe at Village Center Station has the most boardings and alightings out of all bus stops in the study area. The activity at this stop occurs consistently throughout the day, with approximately 250 passenger activities at both peak periods with 400 passenger activities during the midday period. Many of the bus trips come as transfers from the Arapahoe light rail station, since it is the second most utilized light rail station in the study area. The next most-utilized stop is South Ulster Street & Tufts Avenue, located near the Belleview light rail station.

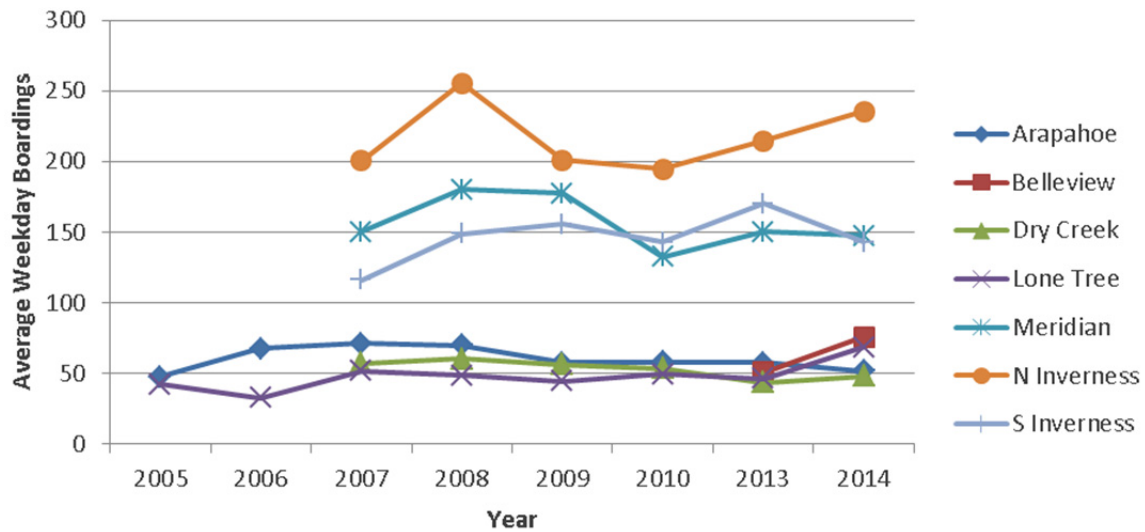
**Lone Tree Link** – This free shuttle developed through a public-private partnership provides service throughout employment centers in Lone Tree along Park Meadows Drive to bus and light rail connections. A number of major locations in Lone Tree are served including; Entertainment District, Kaiser Permanente, Sky Ridge Medical Center, Charles Schwab Campus, Parkridge Corporate Center, and the Lincoln light rail station as shown in **Figure 19**. Average weekday boardings per week were 406 (December 2015) with 72 percent of the trips serving the Charles Schwab campus. Funding for this service comes from a number of public and private organizations: Charles Schwab, City of Lone Tree, Denver South TMA, Sky Ridge Medical Center, Kaiser Permanente and Parkridge Corporate Center.

**Figure 19**  
**Lone Tree Link Service Map**



**RTD Call-n-Ride** – This flexible service provides many of the benefits of transit while still allowing flexibility to provide service closer to and from where people actually want to go. RTD has seven Call-n-Ride zones in the study area, primarily focused around light rail stations. RTD provides two types of Call-n-Ride service: one-time reservations; and subscription service. The Arapahoe, North Inverness, and Meridian Call-n-Rides have average weekday boardings above 100. The remaining Call-n-Ride zones average around 50 weekday boardings per weekday as shown in **Figure 20**.

**Figure 20**  
**Call and Ride Weekday Boardings**



## Bicycle and Pedestrian Facilities

In 2012, the Denver South TMA completed a last half-mile study to better understand the existing bicycle and pedestrian infrastructure around light rail stations. While the last half-mile study helped identify and prioritize areas around the light rail stations, this study seeks to more broadly understand the existing bicycle and pedestrian infrastructure network and how improvements could help shift travel away from automobiles to better accommodate projected growth in the corridor.

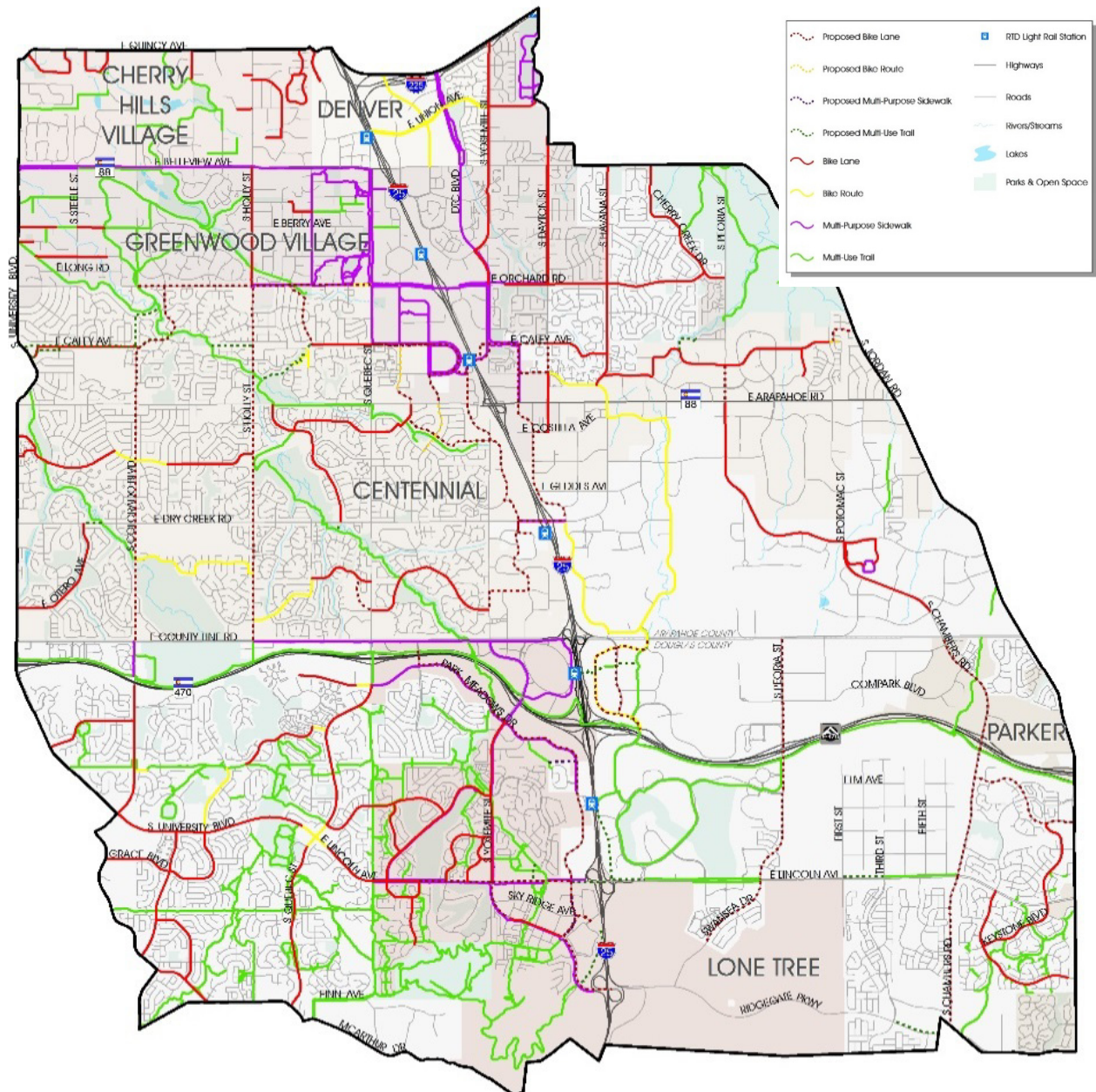
### Bicycle Facilities

A comprehensive inventory of the existing bicycle facilities within and adjacent to the focus area for the current corridor study was compiled with input from Arapahoe County, the City and County of Denver, Douglas County, the City of Centennial, the City of Lone Tree, and the Town of Parker.



**Figure 21** identifies the four bicycle facility types that exist as well as those that have been proposed in city and/or county plans and other studies within the broader study area. While there are a large number of bicycle facilities across the study area to support both recreational and commuter bicyclists, there are significant north/south and east/west gaps in the network.

**Figure 21**  
**Existing Bicycle Facilities**



The employee commuter survey conducted for this study indicated that only 0.4 percent of employees walk to work and 0.2 percent bike to work on an average day. The average commute distance for the small sample of bicycle commuters in the corridor is 9.3 miles, which is nearly three times farther than the national average of 3.6 miles as identified in the 2010 National Household Travel Survey. The bicycle distance is likely longer due to the limited housing available around the major employment centers within the corridor. The average walk distance to work is one mile, which is in line with the national average of 1.2 miles.

### ***Pedestrian Facilities***

The last half-mile study also contained a detailed inventory of existing pedestrian infrastructure and gaps around light rail stations. Corridor municipalities, in many cases working with private development, continue to address pedestrian infrastructure needs at individual station areas.

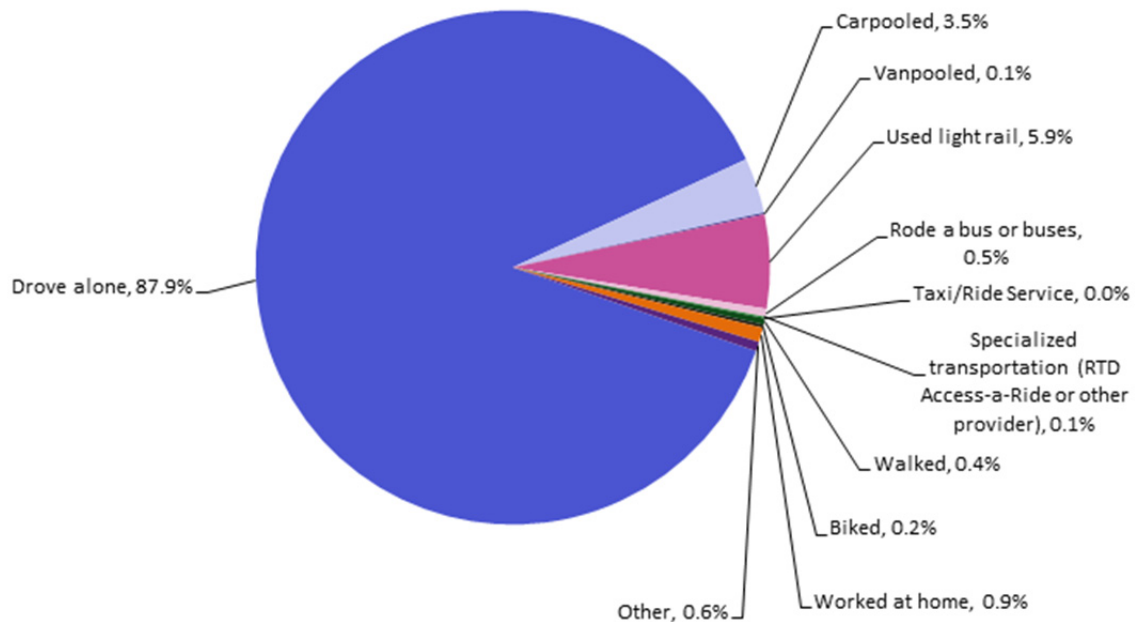
## Commuter Survey

Employees working for organizations within South I-25 Corridor Study area were invited to participate in a survey about their work commute and workplace amenities in April 2014. An electronic copy of the survey was distributed by major employers and additional paper copies of the survey were distributed to retail establishments and hotels in order to obtain a representative sample by type of business and type of employee. A total of 2,742 persons completed the survey with the most significant findings highlighted below.

### Mode of Travel

The great majority of employees in the Study Area commute to work by driving alone. On the day they completed the survey, 88 percent of employees reported they had traveled to work by driving alone. The next most common form of transportation used was light rail, by 6 percent of respondents. About 4 percent had carpooled and a very small portion—0.1 percent—vanpooled. About 1 percent had used traveled to work by bus or specialized transportation. Active transportation (walking or biking) comprised a very small proportion of the work commute trips made. About 1 percent of respondents had worked from home the day they completed the survey.

**Figure 22**  
**Mode of Travel to Work Today**

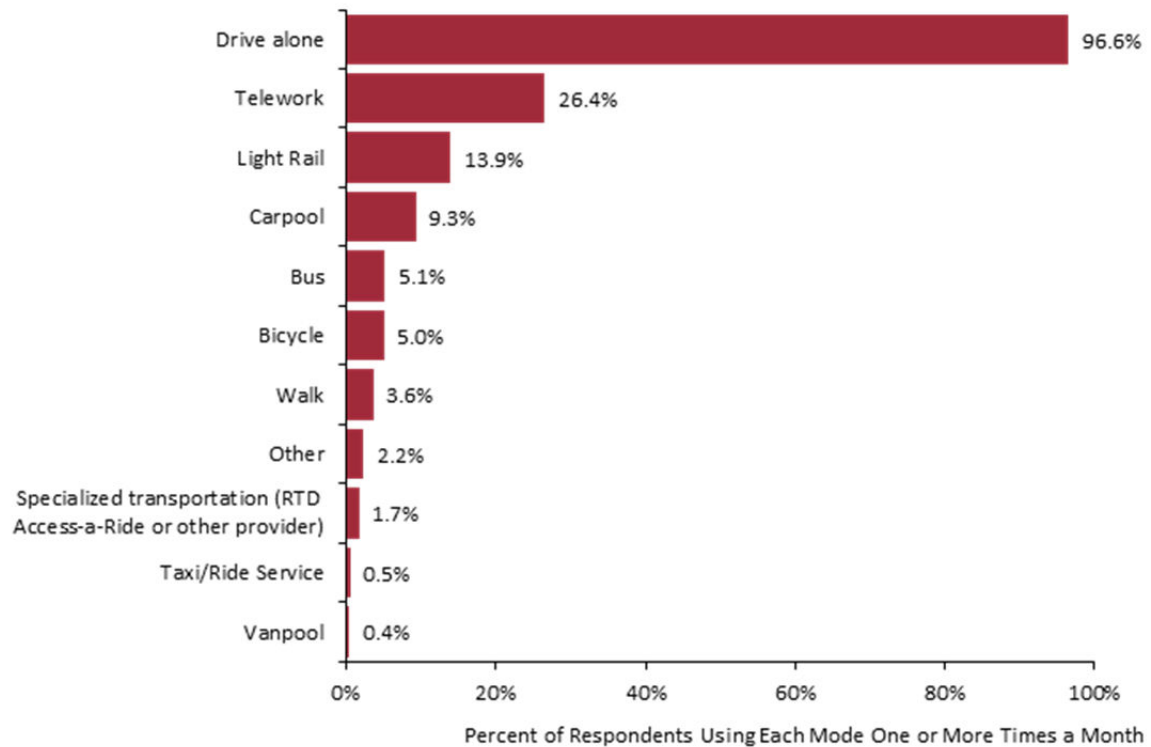




## Other Travel Patterns

When asked how often they typically used various transportation modes for the work commute, 97 percent said they drove alone one of more times per month, indicating that just 3 percent never drove alone for the work commute. About one-quarter of respondents reported teleworking at least once a month, and nearly 14 percent of all respondents said they used light rail at least once a month.

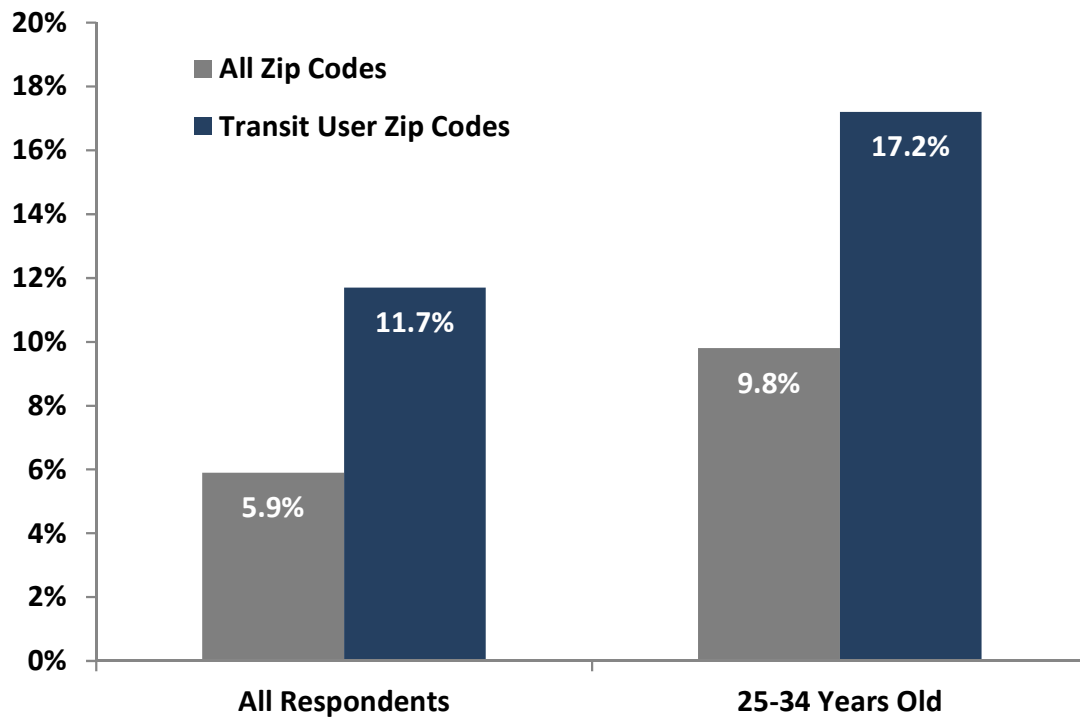
**Figure 23**  
**Mode of Travel to Work One or More Times per Month**



### Transit Use by Age and Location

Transit ridership numbers are significantly higher when cross-tabulated by age of respondent. On the day they completed the survey, 9.8 percent of younger workers between 25 and 34 years of age reported they had traveled to work by light rail compared to 5.9 percent of total respondents as shown below. Transit ridership also increases when filtering out commuters who do not have light rail transit as a viable option. A total of 11.7 percent of all employees with a transit station within their home zip code rode transit on the day of the survey and 17.2 percent of the younger workforce 25 to 34 years did as well as shown in **Figure 24** below.

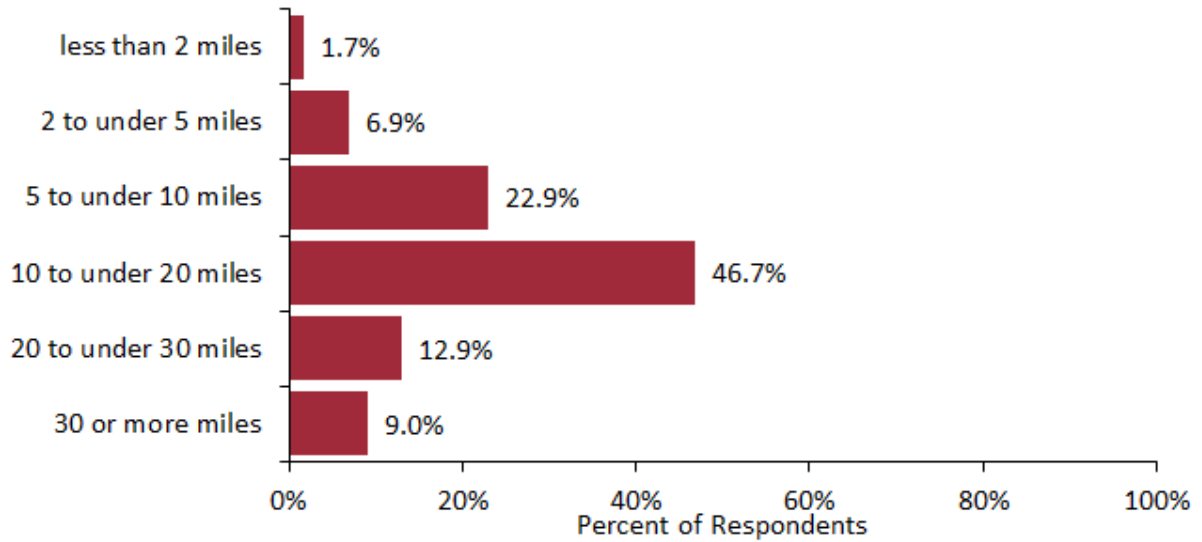
**Figure 24**  
**Transit Use by Age and Location**



## Length of Commute

The average distance of employees' work commute was 14.6 miles, and the average duration was 30 minutes. Nearly half of employees surveyed had a commute distance of 10 to 20 miles, while over 20 percent of respondents had commute distances of 20 or more miles.

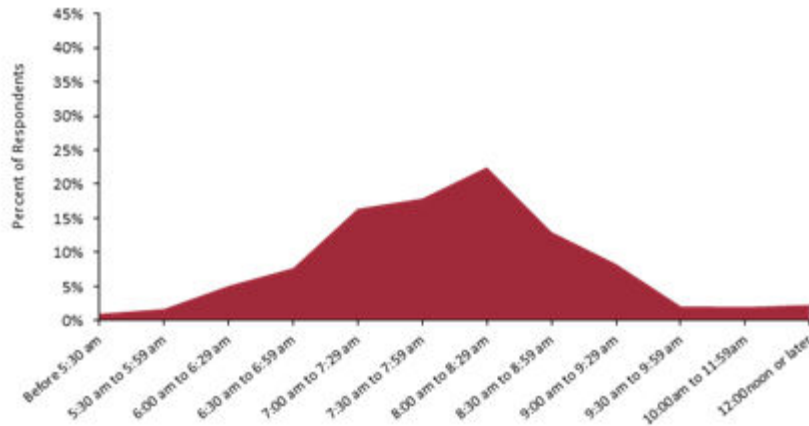
**Figure 25**  
**Distance of Commute**



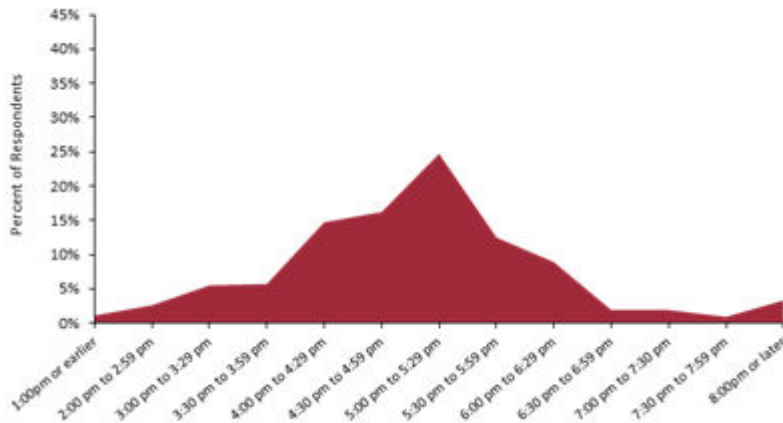
## Peak Travel Demand

The morning and evening peak hour travel times are illustrated in **Figure 26** below. The morning rush hour, while highly concentrated, is more spread out than the evening rush hour. About 80 percent of employees arrive in a three hour window from 6:30 to 9:30 am compared to the evening when an equal number leave within the two hour period from 4:00 to 6:00 pm.

**Figure 26**  
**Peak Morning Travel Demand**



**Figure 27**  
**Survey Respondents: Peak Evening Travel Demand**

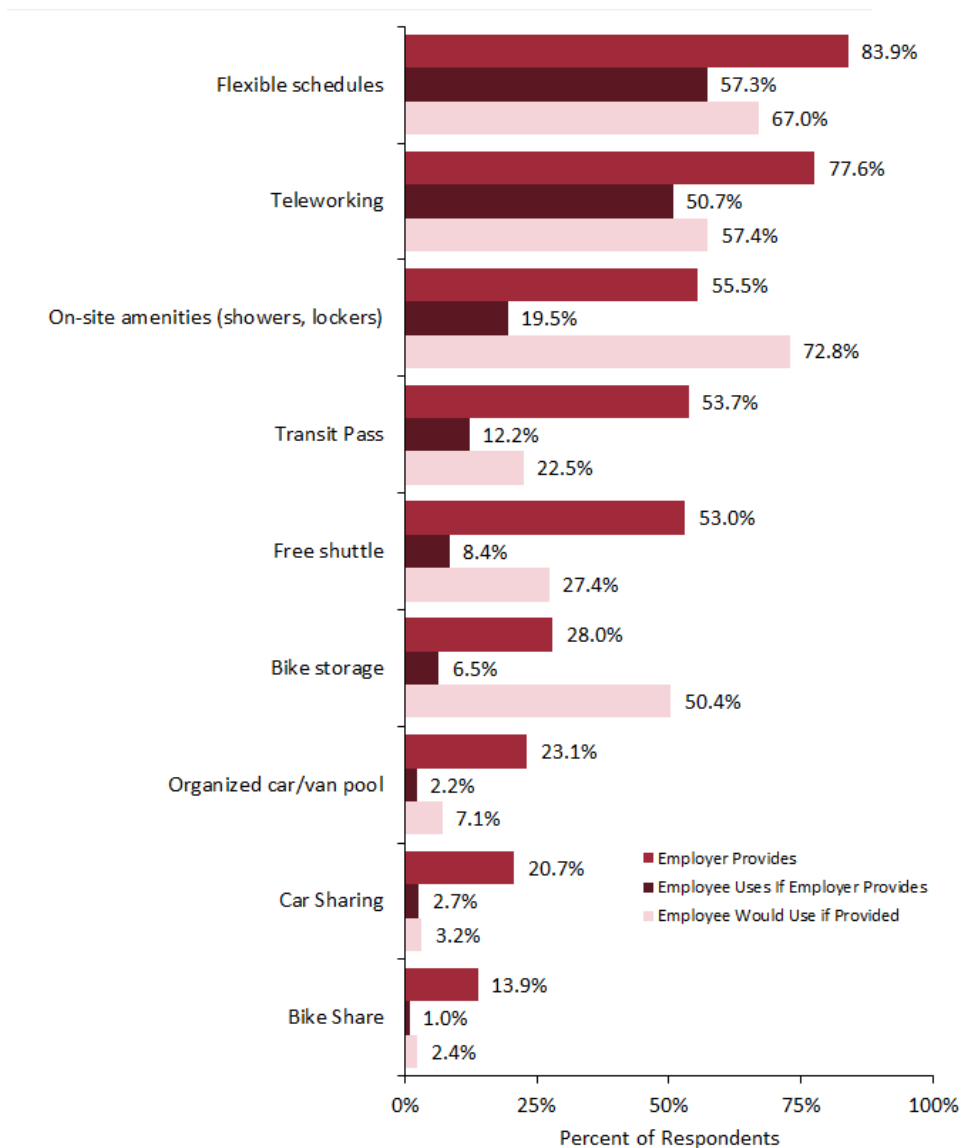


## Alternate Model Incentives

When asked what amenities or policies their employer provides that would encourage the use of alternative modes of transportation for the work commute, 8 in 10 reported their employer provides flexible schedules and another 8 in 10 that their employer allows teleworking.

Over half of those who had these options available to them said that they do use them, while an even greater proportion of those who did not have them available said they would use them if they could. Just over half of employees reported that their workplace offers on-site amenities such as showers or lockers. About 20 percent of respondents said that they use these when provided, while over 70 percent said they would use them if they were available to them. Slightly more than half of respondents said that their employer offers them a transit pass. About 10 percent use an available transit pass, while about 20 percent said they would use one if provided by their employer.

**Figure 28**  
**Alternate Model Use and Preferences**



### 3. CORRIDOR FORECASTS AND NEEDS

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The previous analysis of existing conditions provides a basis for forecasting growth and development potentials and opportunities for the corridor over the 2015 to 2035 time period. The development forecasts also provide the basis for identifying needed transportation improvements and transportation management solutions to enable the study area to maintain its position as the premier business location in the Denver metro area.

#### **Corridor Business Park Development**

Suburban business parks date from the late 1950s, evolving in part as a reaction to deteriorating conditions in urban downtown areas, and also by a desire by business executives to work closer to their suburban homes. These parks are master planned developments in suburban settings with clusters of firms in a campus setting and are generally auto-oriented, single use, and separated from surrounding residential and commercial uses. Denver was very much at the forefront of this development trend with the founding of DTC in 1962.

#### **National Development Trends**



Research Triangle Park, NC

One of the earliest and largest parks was Research Triangle Park founded in 1959 and located northwest of Raleigh, NC on I-40 straddling the Wakefield County and Durham County line. Research Triangle encompasses 7,000 acres of wooded land with over 190 companies located in 22.5 million square feet of building space. There are more than 50,000 employees, with the largest companies being IBM, with 14,000, Glaxo Smith Kline, with 5,000, and Cisco, with 4,000 employees.

Another seminal early development was the creation of Stanford Research Park (SRP) in Palo Alto, California, also in the late 1950s. A university related research park is a specialized element of the larger business park phenomenon that is focused on the development and attraction of businesses with a relationship to the research capabilities of a major higher education research institution. SRP was the first of a generation of university research parks developed



Stanford Research Park, Palo Alto, CA

across the county. It is built on 700 acres and contains 10.4 million square feet of space, 162 buildings and 23,000 employees. The park's tenants are predominantly scientific, technical and research-oriented firms with major companies in electronics, space, biotechnology, and computer hardware and software. The park was the first of its kind and became a cornerstone for the development of numerous corporate business park campuses in nearby Silicon Valley.

Over the last half of the 20<sup>th</sup> century, major business parks proliferated in all the major cities of the country. Much of the San Francisco bay area tech employers are located in business parks in Silicon Valley. Boston's tech oriented businesses were drawn to Route 128, a beltway through the city's suburban ring.



Las Colinas Business Park, Dallas, TX

The suburbanization of businesses is not limited to the tech industry; Dallas' office employment is highly suburbanized including the business park portion of Las Colinas, a 12,000 acre planned community located near Dallas/Fort Worth Airport with a major employment concentration totaling 25 million square feet housing four Fortune 500 companies and 30 other major employers. The 40-year-old Las Colinas project is now one of the largest corporate office locations in the country.

## Recent Development Changes

In recent years, a number of economic and demographic forces have converged that raise questions about the health and sustainability of the suburban business park going forward. A recent internet search revealed a number of articles challenging the viability of the business park development model including: The Death of the Suburban Corporate Campus; NJ's Suburban Office Parks Turning into Dinosaurs in an Evolving Economy; Can Research Triangle Reinvent the Office Park?, and Is the Suburban Office Park Dead (And How it Might be Saved).

The economic model upon which these business parks were built (both nationally and in the South I-25 Corridor) is changing. These parks were historically centers of innovation. Technological advancements and increased productivity mean that most companies do not need as much space as in the past. Also, employees are demanding a different work environment, both internal to the company in the form of more space for collaboration, and external in the form of nearby housing and retail shopping facilitating opportunities to live and work in close proximity. At least in some locations, business parks that began 50 years ago are starting to show their age with buildings declining from Class A and B to Class C properties with higher vacancies and lower rents.

## National Trends

The focus on improving suburban business parks dates back to at least the beginning of the 21<sup>st</sup> Century. In 2002, the Urban Land Institute (ULI) published a study titled *Ten Principles for Reinventing America's Suburban Business Districts*. The report authors state that existing suburban business districts "encompass a disparate group of isolated uses with little or no integration, a transportation system that is auto oriented and often hostile to pedestrians, and a near total absence of civic identity". They suggest that in response to the social and economic forces identified above, there is a potential to "transform America's more than 200 suburban business districts into more integrated live-work-shop places". It also suggests that the same forces that led to the resurgence of central business districts in the 1990s—such as increasing development densities, improving pedestrian connections between buildings, and improving transit—will be focus of smart growth and the reinvention of suburban business districts. The report's principles include: "Break up the Superblocks and Optimize Connectivity; Embrace Mixed Uses; Honor the Human Scale by Creating a Pedestrian-friendly Place: and Think Transit - Think Density".

Much of what was recommended in the ULI report has been occurring to a limited degree over the last 15 years. Property owners and developers are trying to reinvent the suburban office park in much the same way that outmoded mills and factories were revitalized to mixed use developments a generation ago. Many master developers are adding restaurants, hotels, and other amenities, as well as housing, to compete with the "live, work, play" attraction of the city. Notable efforts are underway at some of the most prominent business parks including a new 50-year master plan for Research Triangle Park that allows for mixed use and higher densities, and a study to evaluate innovation district potentials for Stanford Research Park.

In some of the most vibrant urban markets (including San Francisco, Boston, Seattle, and Denver), the appeal of the downtown mixed use environment has grown to the point where real estate values are higher downtown than in the premier suburban business districts, including rents, occupancy rates, and even absorption. A significant portion of the millennial workforce, particularly those employed in technology and other knowledge based industries, are showing a preference



for living in downtowns and other mixed use activity centers where they can live and work in close proximity with available transit to minimize dependencies on the auto. As a result there are a greater number of small businesses forming or locating in these downtown areas and even some notable examples of larger companies moving from the suburbs back to the central city.

### **Innovation Districts**

A recent outgrowth of these employment shifts has created an urban planning focus on the development of innovation districts that seek to capitalize on these economic development trends. “Innovation districts” can be defined as economic development tools that utilize partnerships with higher education institutions, businesses, and government to fuel job growth and redevelopment in targeted locations. Innovation districts are based on the premise that collaboration and productivity result from proximity; therefore, job creation and innovation can be fostered through the intentional clustering of businesses, institutions, ideas, and people.

There are three general models for innovation districts:

- **Anchored Districts** – These projects are clustered around major anchor research institutions and are typically in downtown or mid-town settings. Examples include the Kendall Square/ MID cluster in Cambridge; the University City/University of Pennsylvania cluster in Philadelphia; and the St. Louis/Washington University and St. Louis University cluster in St. Louis.
- **Re-imagined Urban Areas** – These projects include revitalizing industrial districts and waterfronts in major urban areas including: San Francisco’s Mission Bay; Boston’s South Waterfront; and Seattle’s South Lake Union.
- **Urbanized Science Park** – This model is focused around the urbanization and diversification of traditional business research parks. Examples include the new master plans for Research Triangle Park and Stanford Research Park as well as similar efforts at the University of Wisconsin-Madison, University of Virginia-Charlottesville, and University of Arizona-Tucson.

## Medical Districts

A related planning concept are medical districts that are intended to capitalize on the business and research associated with major medical institutions. These include city-initiated efforts that are intended to organize the spinoff business development surrounding major hospitals and/or clusters of hospitals, as well as university-driven projects created to capture commercialization of basic research taking place within university medical centers.

The recently completed University of Texas at Austin Medical District Master Plan creates a partnership between UT Austin, Seton Healthcare, and Central Texas Healthcare to create a compact urban development on the southern edge of the UT campus in downtown Austin. It will contain the university's planned new medical school and medical research building, as well as a new teaching hospital and medical office building. The vision for the district integrates health care teaching and research within an interdisciplinary setting taking advantage of adjacent university resources.



The University of Colorado Anschutz Medical Campus

A local example is the creation of a medical district at the Anschutz Medical Campus in Aurora. The University of Colorado relocated its medical school, hospital and research facilities to a 200 acre campus site at the former Fitzsimons Army Medical Center. Children's Hospital of Denver co-located on the property and Veteran's Hospital is building on an adjacent 25 acre site. The public medical facilities are complemented by a 160-acre bioscience research park intended to facilitate the commercialization of university research as well as capture

other private sector medical related businesses. The Anschutz Medical Campus has been the fastest growing employment center in the metro area since 2005, having captured nearly 20,000 jobs over the last 10 years.

## South I-25 Corridor

The South I-25 Corridor has experienced a number of relatively significant changes over the last 15 years with the introduction of rail transit and associated mixed use TOD. In many ways, the corridor is ahead of the curve nationally in terms of adapting to market and development changes. However, there are remaining questions and challenges that will affect the corridor's future growth and market position including the following:

- **Corporate Work Environment** – Historically, many of the larger companies in the corridor—especially in financial services and communications—have shown a preference for the corporate campus setting found in the corridor's suburban business parks. Other employment sectors—notably professional and technical services and information technology firms that tend to locate in multitenant buildings—appear to be showing a preference for buildings in more urbanized mixed use and TOD settings. What type of work environment will national and regional companies seek going forward will have an impact on which areas of the corridor grow the fastest as well as the prognosis for redevelopment opportunities for outmoded properties.

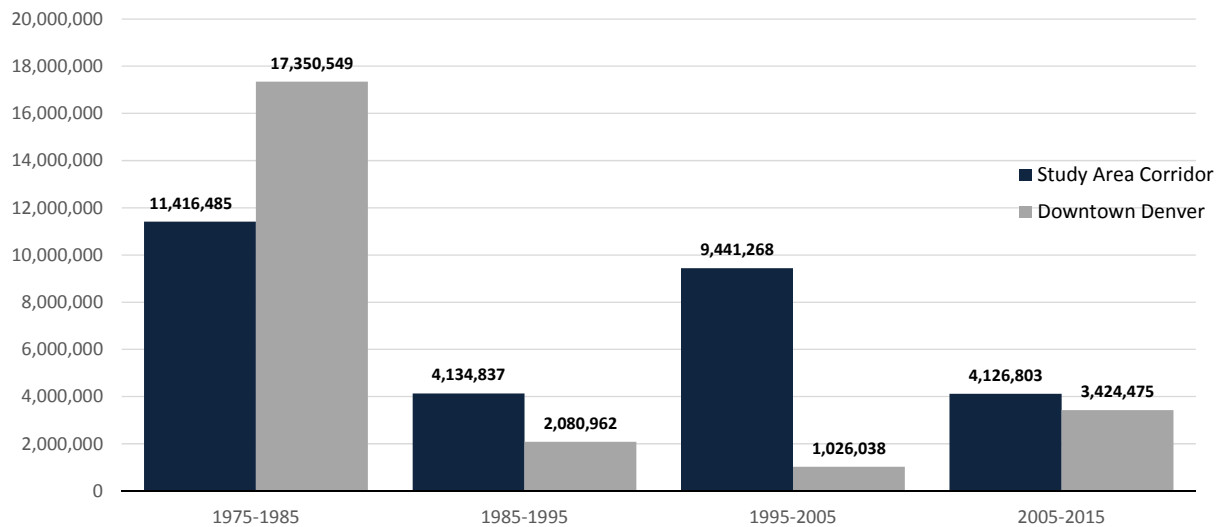
- **Transit Ridership** – While the completion of the Southeast light rail line in 2006 has had an immediate impact on land use patterns, transit mode share has been relatively modest at about 7 percent of daily corridor employee commuter trips. This is due to multiple factors, the most important of which is that a large number of commuters to the south have limited access options between transit stations and workplaces. The ability of the corridor to attract and accommodate significant additional development will be increasingly dependent on transit utilization as additional I-25 corridor highway capacity expansions are not anticipated in the foreseeable future. However, transit use is not likely to increase significantly unless major incentive programs such as reductions in parking availability, improved last mile connections around stations, and improved rubber tire transit connections are implemented to attract additional transit ridership.
- **Innovation Economy** – Knowledge based industries and workers are increasingly choosing to locate in the amenity rich cores of central cities. This development trend is accelerating development of urban housing non-traditional workplaces, as millennials are choosing to live in downtown area, walkable, or amenity rich neighborhoods, and work in a variety of collaborative work environments oriented to the tech oriented entrepreneurial businesses created by the knowledge based workforce. Cities are also capitalizing on these development trends by promoting these synergies in Innovation Districts. Downtown Denver has experienced a development growth surge since the end of the recession in 2010 due to the innovation economy starting in Lower Downtown, and expanding to the Central Platte Valley, River North (RiNo) and Uptown neighborhoods. The I-25 Corridor has not to date participated in this development trend to any significant degree. It will need to prioritize developing amenity rich, walkable mixed use districts and neighborhoods in order to become more competitive for these businesses.
- **Research, Education, and Healthcare** – Related to the innovation economy is the opportunity to reposition business parks to become more science and research oriented. The education and healthcare sectors are also forecast to be among the fastest growing over the next 20 years. The attributes around which an innovation district or medical district might be developed have been lacking the South I-25 Corridor, as there are no major institutions of higher education around which a urbanized science cluster can be developed. This has changed recently as both major public universities in Colorado, the University of Colorado and Colorado State University, have located satellite campuses in the corridor.

## The Future

The South I-25 Corridor is the dominant employment center in metro Denver, outside of downtown, with 35.2 million square feet of office space and nearly 130,000 employees. There is sufficient approved and planned development to add another 10 to 15 million square feet in the corridor over the next 20 years, provided the area can continue to remain competitive for employment growth in its traditional areas of strength, and also compete for new and emerging growth sectors. The future development potentials of the South I-25 Corridor are therefore partially dependent on the future of the suburban business park which is still its predominant land use form, but also dependent on the success of the corridor in adapting and responding to economic and demographic changes and their impact on both living and workplace preferences and location patterns.

Although the South I-25 Corridor has dominated office development in the metro area since 1985, downtown has largely caught up and may be surging ahead based on recent and current construction. As shown in **Figure 29**, the South I-25 Corridor has built 4.1 million square feet of office space over the last 10 years, down from 9.4 million in the preceding 10 year period. Downtown has completed 3.4 million square feet from 2005 to 2015 compared to 1.0 million in the preceding decade, and also has an additional 1.2 million square feet under construction.

**Figure 29**  
**New Office Space Construction, South I-25 and Downtown 1975 to 2015**



Source: CoStar; Economic & Planning Systems

## Development Forecasts

A forecast of the demand for new development along the South I-25 Corridor was completed to measure the potential job growth for the area, and also to identify the resulting impacts on infrastructure. The forecast is meant to illustrate the potential for the corridor and identify any impediments to achieving this potential. The 20 year growth forecast for employment and housing is translated into demand for new development square feet, residential units, and acres. The forecast was used to estimate future traffic demand and compare demand for development acreage with available land capacity.

### Non-Residential Forecast

The employment forecasts by industry for 2014 to 2035 are shown in **Table 7** using a shift-share analysis methodology. The forecasted rates of growth by industry for the metro area were factored up or down for the corridor based on the differences in performance in each industry between the metro area and corridor over the past nine years (2005 to 2013). The corridor is forecast to grow from 133,000 in 2014 to 207,000 in 2035 which is an increase by 74,000 jobs, as shown.

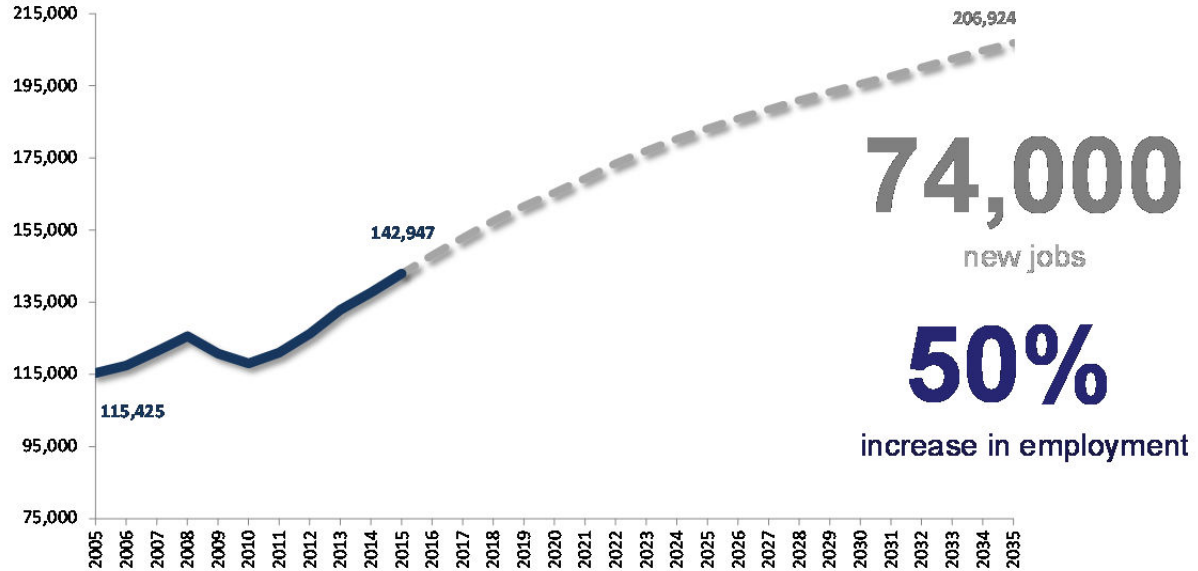
**Table 7**  
**South I-25 Corridor Employment Forecast, 2014 to 2035**

Description	Growth Rates		Total Employment		2013-2035
	2005-2013	2014-2035	2013	2035	Total
	Historical	Forecast			
Finance and Insurance	0.7%	2.0%	24,836	38,193	13,356
Professional, Scientific and Technical Services	3.2%	2.1%	21,265	35,258	13,993
Information	0.8%	1.6%	15,575	19,334	3,760
Admin and Supp. and Waste Mang. and Rem. Serv.	4.6%	1.7%	11,041	16,008	4,967
Accommodation and Food Services	1.4%	1.7%	9,764	14,046	4,282
Management of Companies and Enterprises	5.2%	2.5%	8,691	15,279	6,588
Retail Trade	0.7%	2.0%	9,150	14,121	4,971
Health Care and Social Assistance	7.6%	4.5%	7,358	17,487	10,129
Wholesale Trade	0.2%	1.2%	8,527	11,398	2,870
Construction	-5.0%	0.7%	3,855	4,465	611
Others	3.5%	3.2%	12,859	21,336	8,476
<b>Total Employment</b>	<b>1.8%</b>	<b>2.0%</b>	<b>132,921</b>	<b>206,924</b>	<b>74,003</b>
<b>% of Metro Area</b>			<b>10.6%</b>	<b>11.5%</b>	

Source: Bureau of Labor Statistics, QCEW; Economic & Planning Systems

The additional 74,000 jobs would represent a 50 percent increase over current employment level as shown below.

**Figure 30**  
**South I-25 Corridor Forecast Employment Growth, 2014 to 2035**



The employment forecast by industry was used to estimate demand for new development. Demand for new development was developed by estimating the number of jobs per industry that would locate in office, retail, industrial or hospitality space based on national industry averages and the existing building inventory in the corridor matched with employment by industry. For each use national averages for employees per square foot of space were used to estimate demand for building square feet. For office development, three office types were used; low rise and R&D, campus and mid-rise office, and high-rise office as illustrated in **Figure 31**. Industry average floor area ratios for each use were then used to translate demand for building space to land demand.

**Figure 31**  
**South I-25 Office Types**

R&D Low-Rise Office



Campus/Mid-Rise Office



High Rise Office



The total demand for new building square feet along the corridor is estimated to be 22.5 million square feet by 2035, as shown in **Table 8**. The forecast allocation by type is based on existing development patterns in the corridor. Office development is expected to account for 63 percent of the new square feet.

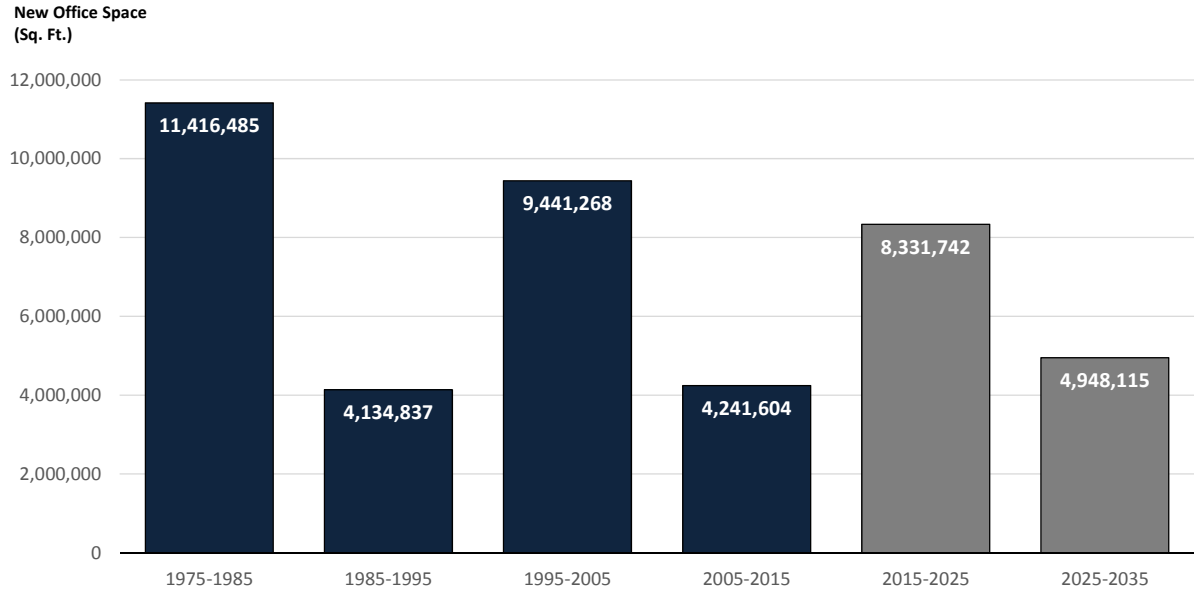
**Table 8**  
**New Building Square Feet Demand by Use, 2014 to 2035**

Description	Change 2014-2035		
	Total	Ann. #	% of Total
<b>Cumulative Demand for Space by Type</b>			
R&D/Low-Rise Office	4,954,391	235,923	22%
Campus/Mid-Rise Office	4,831,095	230,052	21%
High-Rise Office	4,579,399	218,067	20%
Industrial/Flex	2,419,701	115,224	11%
Retail	4,857,724	231,320	22%
Hotel	<u>867,812</u>	<u>41,324</u>	<u>4%</u>
<b>Total</b>	<b>22,510,122</b>	<b>1,071,911</b>	<b>100%</b>

Source: Economic & Planning Systems

Based on regional employment estimates for the Denver metro area, growth is expected to be stronger in the next 10 years and temper in the second half of the 20 year forecast period. There is estimated to be demand for 8.3 million square feet of office in the next 10 years, and then demand for another 5 million from 2025 to 2035, as shown in **Figure 32**. This forecast matches with the cyclical nature of growth in the corridor historically and is being matched, at least currently, by under-construction and proposed development projects along the corridor.

**Figure 32**  
**South I-25 Corridor Office Space Demand, 2014 to 2035**



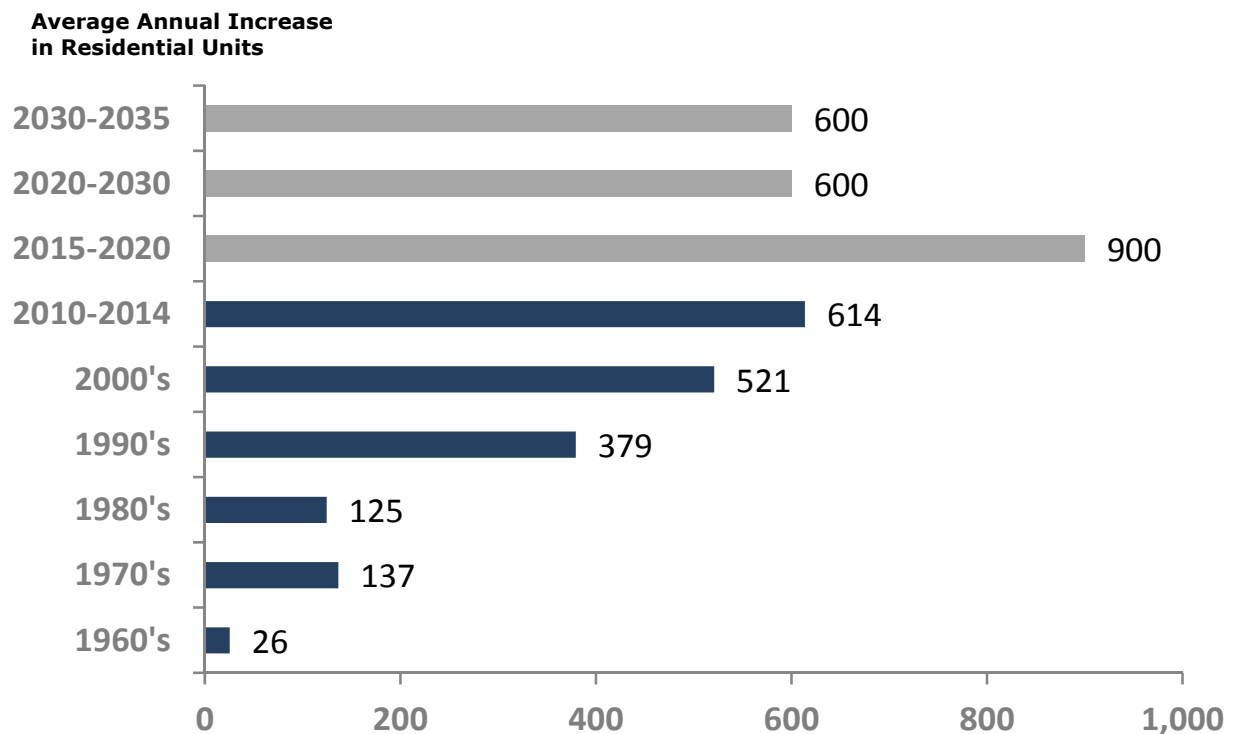
Source: CoStar; Economic & Planning Systems



## Housing Forecast

Housing development in the corridor has been steadily increasing by each decade. Over the past 15 years an average of 614 housing units per year were built along the corridor, which is the highest rate ever. Based on under construction and proposed housing projects, the rate of housing units built per year will likely increase for the next five years. Based on the projects only currently under development, the rate of housing growth of the next five years will exceed the average of 600 units per year. An estimated 900 units per year are expected to be developed over the next five years. From 2020 to 2035, the rate of housing development is estimate to return to rates seen over the past 15 years. The estimated demand for new housing along the corridor is 13,500 units by 2035. This would increase the housing stock from just over 14,000 units to nearly 28,000 units, which equates to a doubling the number housing units.

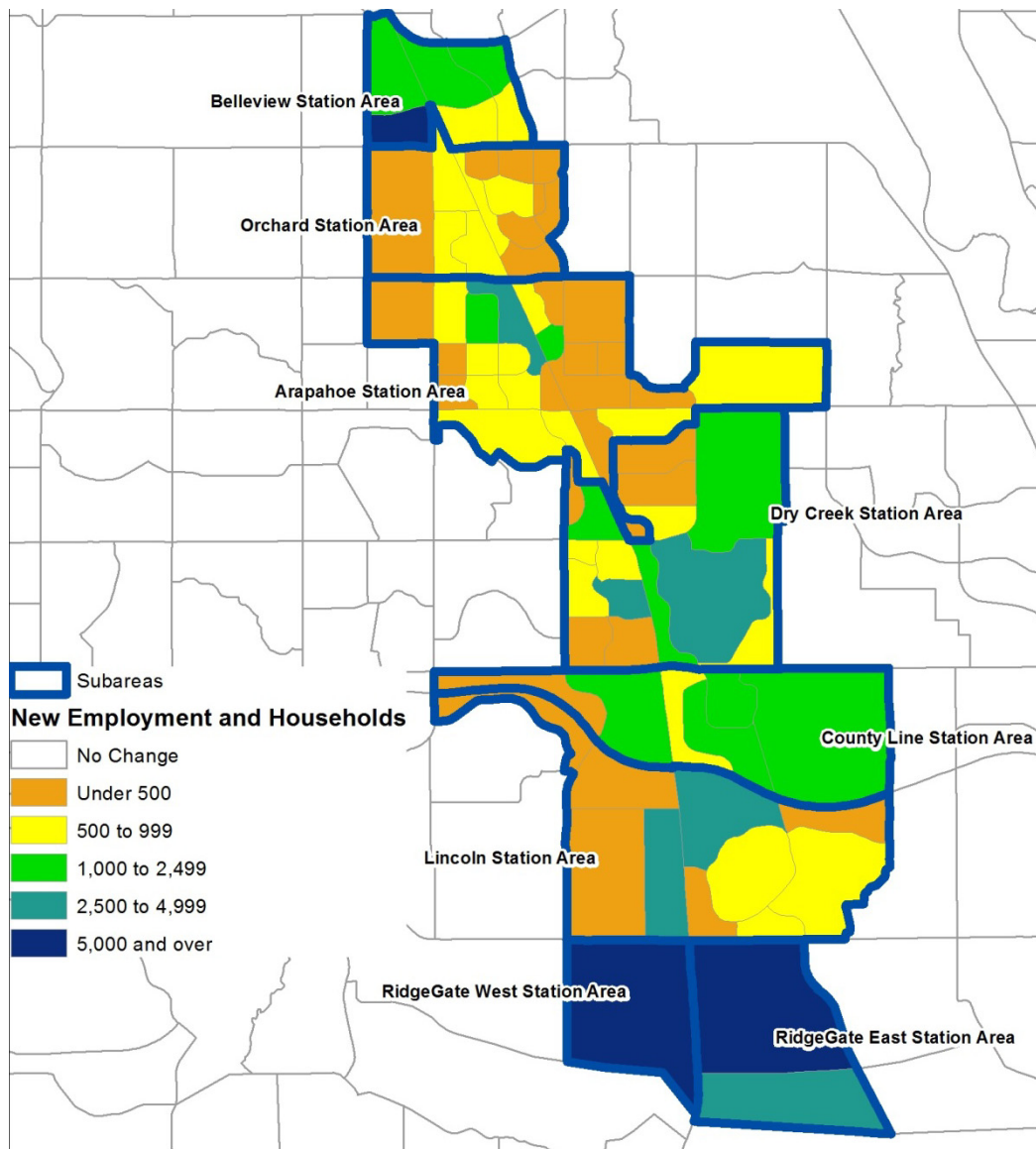
**Figure 33**  
**South I-25 Corridor Forecast New Housing Units by Year, 2015 to 2035**



## Baseline Growth Forecast

The estimated demand for new non-residential space and housing units was allocated along the corridor by Traffic Analysis Zone (TAZ). The allocation was based on historic capture, planned development projects, and vacant land. The change in households and employment by TAZ and subarea along the corridor is shown in **Figure 34**. Based on planned projects and vacant land, the largest amount of development is expected to occur on the ends of the corridor at the Belleview Station TOD and within RidgeGate in Lone Tree. Other major areas of development are estimated to be near the Arapahoe at Village Center station and the Dry Creek station.

**Figure 34**  
**South I-25 Corridor Baseline Growth Forecast, 2015 to 2035**



The demand for new acres supporting the building square feet and housing units forecast was compared to the available amount of land that is either planned for development or vacant. There are an estimated 1,400 acres of land that are within planned and under construction, major development projects or are vacant along the corridor. By 2035, the demand for land is estimated to be 1,700 to 1,800 acres based on existing densities. The corridor therefore does not have sufficient land within vacant sites or major projects to support all the forecast development. Redevelopment of underutilized land and/or development occurring at greater density will be needed to accommodate the estimated demand.

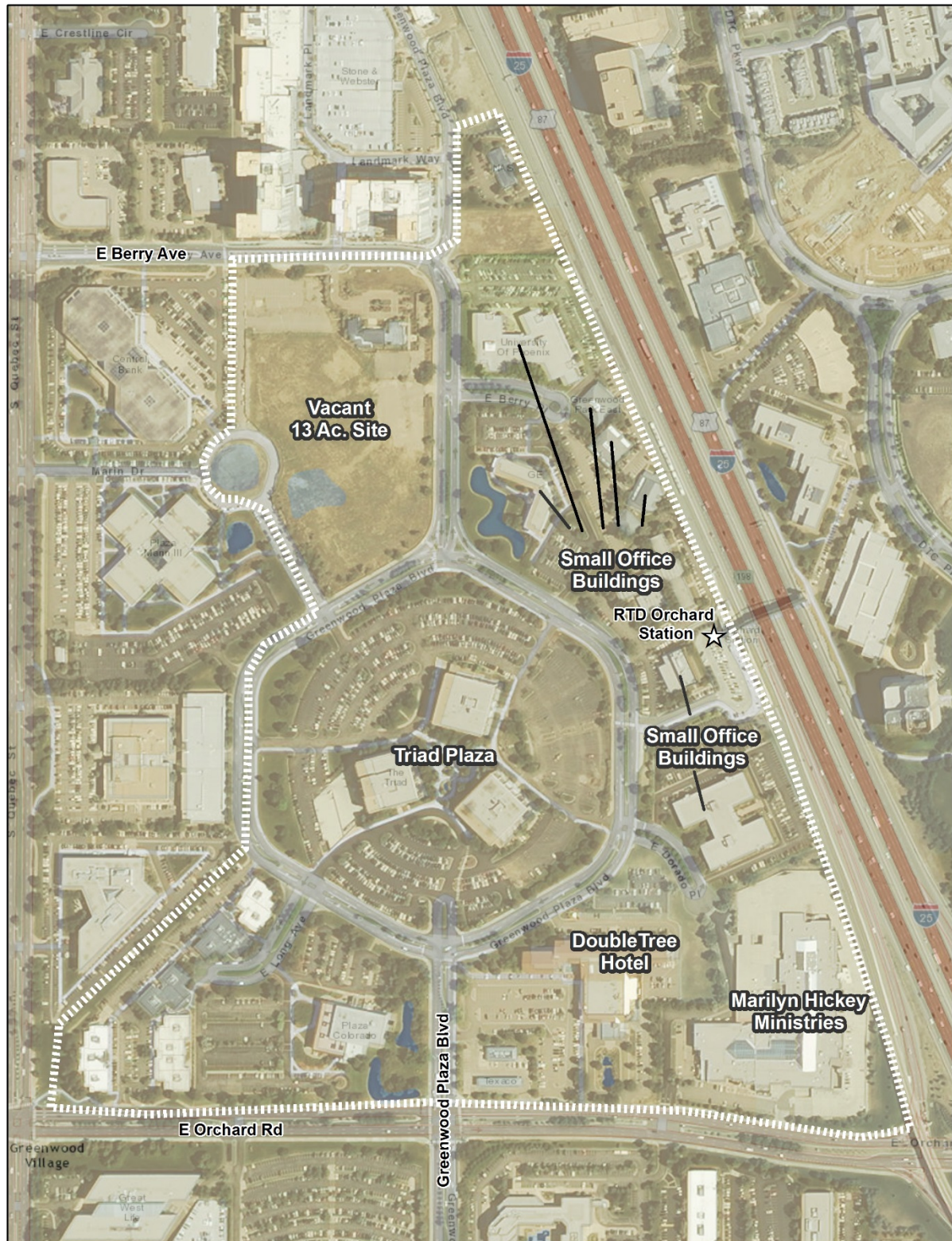
## Redevelopment

A portion of the forecasted future demand is expected to occur through the redevelopment of outmoded light industrial and low FAR office buildings in the corridor. Areas with these conditions exist in several locations including: in Greenwood Village, primarily in Greenwood Plaza west of I-25; in Centennial south of Orchard and north of Dry Creek on both sides of I-25; and in unincorporated Arapahoe County in the lower density areas of Inverness close to Centennial Airport. An impetus for redevelopment is the conversion of these lower value uses with land values of less than \$10 per square foot to higher density multifamily residential and mixed use developments that support land values of \$35 per square foot or higher. Based on current development activity, the strongest market for these uses is close to the light rail stations and the I-25 arterial interchanges.

Greenwood Village is planning for redevelopment activity for one of the potential redevelopment areas north of Orchard and west of I-25 by completing a subarea plan for a 100-acre area including the Marilyn Hickey Ministries building on 9.6 acres at the southwest corner of I-25; a number older small office buildings north and south of the Orchard Light Rail Station; and a 13-acre vacant site south East Berry Avenue and the Landmark as shown on **Figure 35**. While there have been no specific redevelopment proposals submitted to the city, and not all existing uses are expected to be redeveloped, the proposed subarea plan anticipates an increase in development density in the future including a mix of office, retail, hotel, and residential uses.



**Figure 35**  
**Orchard Station Subarea Plan Boundary**



## Development Opportunities

The prognosis for economic vitality and growth in the South I-25 Corridor will be dependent on how it responds to the national and local opportunities and challenges outlined above. The forecasts of future development potentials are based on the following assumptions:

**1. Business parks will continue to get denser and more mixed use.**

A sentiment held by many is that the single purpose business park is an outmoded development model. There continue to be many companies that prefer to have an enclosed and secure corporate campus; however they want these campuses to be in closer proximity to retail, housing, and entertainment services. The recent location decision by Charles Schwab is a good example. The company purchased a 40-acre site and has built a new campus with three integrated buildings and sufficient land for future expansion. The location appealed to the company because it provided the opportunity to build a secure campus that was also in close proximity to retail and community services as well as to light rail. The most successful business parks will therefore be those that successfully introduce a greater mix of uses and amenities.

**2. The suburban business park campus is not dead, but it will account for a smaller share of future development.**

An analysis of planned developments in the pipeline indicate that the greatest amount of new development in the I-25 Corridor will continue to be within the TOD influence zone surrounding the corridor's six existing rail stations, as well as close to the three planned stations on the Southeast extension through Lone Tree and RidgeGate. This includes planned office, retail, and residential projects such as Belleview Station, RidgeGate East, Arapahoe Village Station, and the Jones District at Dry Creek. The study area can therefore be expected to become denser but in a linear pattern along the highway/rail corridor with a sharp drop off to more traditional campus style development further away.

**3. The South I-25 Corridor is expected to experience redevelopment of low density office and outmoded light industrial at higher value locations.**

There is approximately 1,400 acres of vacant land within the corridor and most of the new development is expected to occur on these sites. There is however a number of key locations with outmoded uses and low land values that are expected to attract redevelopment interest for TOD, particularly for high density housing and mixed use development. These sites are primarily at or near the RTD light rail stations. The opportunity to increase development densities by a factor of three or more provides an incentive for redevelopment that can overcome the higher costs of land assembly.

**4. The South I-25 Corridor needs to develop the requisite qualities and amenities in order to be a competitive innovation district.**

Innovation districts in suburban settings rely on the research and science connections between universities and business. The innovation ecosystem is a synergistic relationship between people, firms and place that generate and accelerate commercialization including tech transfer and entrepreneurial business formations. **Table 9** summarizes the key implementation success factors for innovation districts.

The South I-25 Corridor has the levels of regional economic activity to support a district. However, the corridor currently lacks the educational resources upon which to build these partnerships. It also lacks the place making elements that promote the interface of companies and workers. Downtown Denver has many advantages both in terms of placemaking and urban amenities. CU Denver's graduate schools are located within the downtown and have a number of programs with business partnerships. Also, Colorado State University (CSU) is a partner with the National Western Stock Show (NWSS) and City of Denver in the National Western Center project located near the site of the existing NWSS facilities in the RiNo neighborhood north of Downtown. CSU has committed \$350 million for an equine sports medicine facility, water resources research facility, and an onsite campus classroom building. The combined facilities of the NWSS and CSU are expected to generate over 6,000 new agri-business and science jobs.

**Table 9**  
**Innovation District Implementation Success Factors**

University-Related	Regional Economy	Market	Project Implementation
<ul style="list-style-type: none"> <li>University proximity</li> <li>University-tenant match</li> <li>University investment or commitment</li> </ul>	<ul style="list-style-type: none"> <li>Regional economic health</li> <li>Regional cluster-innovation match</li> <li>Regional entrepreneurial support and tech transfer</li> <li>Regional access to capital</li> </ul>	<ul style="list-style-type: none"> <li>University as a tenant</li> <li>Ability to accommodate tech companies and "gazelles"</li> <li>Ability to accommodate start-ups</li> <li>Real estate feasibility and investment horizon</li> </ul>	<ul style="list-style-type: none"> <li>Diversity of space and tenants</li> <li>Neighborhood amenities</li> <li>Connectivity</li> <li>On-site start-up support</li> <li>Supportive policy environment</li> <li>Project development and management expertise</li> </ul>

**5. Attracting a major educational or medical anchor would help increase and diversify future employment growth.**

An innovation district would provide employment diversity and growth in the corridor. In order to do so, the corridor would need to attract a technology and research oriented higher education institution. This is a challenging, but not unprecedented goal. With the State's population projected to grow to 6 to 7 million in the next 20 years, another state university campus may be supportable and/or the branch campuses established by CU-Denver, CSU and Regis University may grow to include more than classroom teaching. Also, there may be opportunities for innovative public-private investments, with CSU's investment in the National Western Center being a current example.

Another opportunity to diversifying employment growth would be through a larger medical district cluster. Sky Ridge Hospital is already present at the south end of the corridor and there are other dispersed medical uses in the Lone Tree area. There are current zoning restrictions that prevent additional medical uses adjacent to Sky Ridge, but this restriction expires in 2021. The future development of a town center in RidgeGate East would provide a location for a new university branch or an additional hospital either of which could become an anchor for additional medical or hospital uses, which would create the basis for a larger medical district cluster.

## **Transportation Needs**

The analysis of current transportation conditions and additional impacts created by the expected 20 year growth forecasts will affect the ability of workers, residents, and visitors to travel to the study area. This section identifies the anticipated transportation facilities and programs needed to maintain and improve transportation access to and travel within the South I-25 Corridor.

### **Roads**

The roadway capacity limitations of I-25 and the major east-west arterials impacting employee commutes is the most serious concern. With a potential of 70,000 additional workers over the next 20 years, a 45 percent increase, these roadway capacity issues are only going to worsen which will threaten the attractiveness and viability of the corridor.

Congestion levels along South I-25 are nearly back to what they were prior to the construction of the T-REX Project, which added lane capacity and the addition of the Southeast light rail line as a transit option for the corridor in 2006. Despite the completion of this major infrastructure investment, I-25 is at capacity during peak periods and congestion periods continue to lengthen. The highway is estimated to have the potential to accommodate 10 to 15 percent additional traffic by spreading of peak periods through voluntary or mandatory flex hour schedules, improved intelligent transportation system (ITS) tools, and enhanced incident management strategies.

A number of major capacity enhancement projects are planned on some of the east-west corridors in the study area. However, this will not allow the roadways to keep pace with growth long-term. A substantial shift in travel modes will be needed to accommodate projected and desired employment growth within the corridor. Overall, proposed expansion of I-25 and its related arterial network are not expected to keep pace with projected growth in the study area.

## Transit

The relatively low levels of transit use are also a constraint. The commuter survey indicated that on the survey day almost 9 out of 10 employees drove alone in their car to work, with 1 in 14 (approximately 7 percent) using light rail or a bus. Delving further into the data reveals that one factor contributing to low transit ridership is that a large percentage of existing corridor employees (generally those living to the east, west and south) lack viable transit options. Light rail transit ridership nearly doubled from 5.9 percent to 11.7 percent when only workers with a rail station in their home address zip code were included in the analysis. It is also encouraging to see that transit usage by millennials is significantly higher than the workforce as a whole.

The average distance traveled by study area workers is shown in **Table 10**, distributed by mode of travel. The average commute distance for all workers coming to the study corridor is 14.6 miles, with transit users commuting a longer distance on average (nearly 18 miles). In addition, the highest concentrations of study area workers live south and east of I-25 (a total of approximately 20 percent), with only approximately 13 percent coming from within the study area itself. This means that the majority of study area workers travel a relatively long distance from areas with little or no transit services.

**Table 10**  
**Distance of Study Area Worker Commutes by Travel Mode**

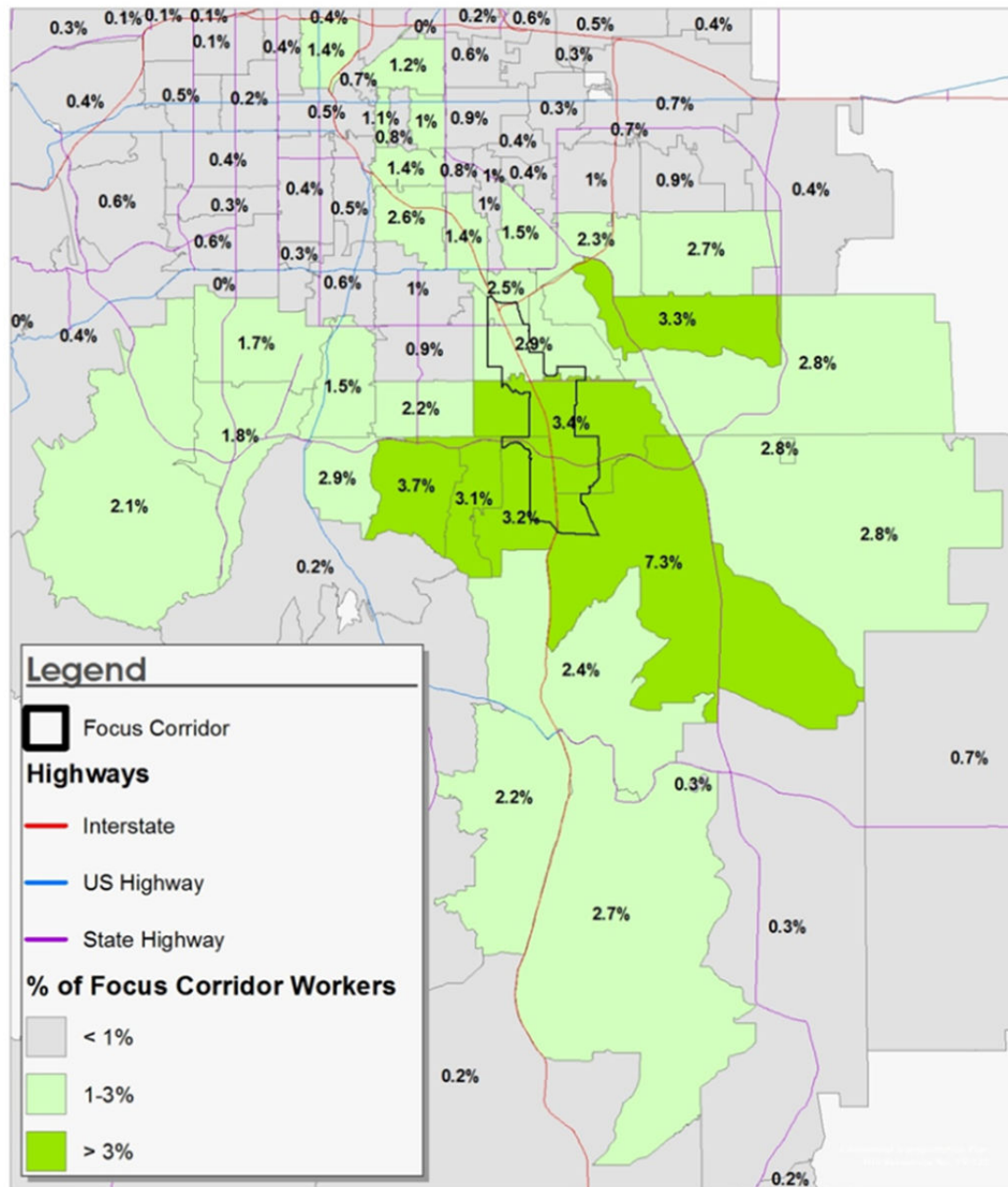
How far away is your home from work?	Distance in Miles		
	25 <sup>th</sup> Percentile	Average	75 <sup>th</sup> Percentile
Overall	8.0	14.6	18.0
Car	8.0	14.3	17.9
Transit	12.0	17.8	20.0
Walk	0.6	1.0	1.4
Bike	5.6	9.3	13.1

Source: NRC Survey



The home address distribution of study area workers by zip code is shown in **Figure 36**. It shows that home locations are widely dispersed throughout the metro area. The highest concentrations of workers live south and east of I-25 (a total of approximately 20 percent), with approximately 13 percent coming from within the study area itself, 14 percent from the Highlands Ranch/C-470 area, and 11 percent from east of Parker Road and Aurora.

**Figure 36**  
**Distribution of Study Area Workers by Zip Code**

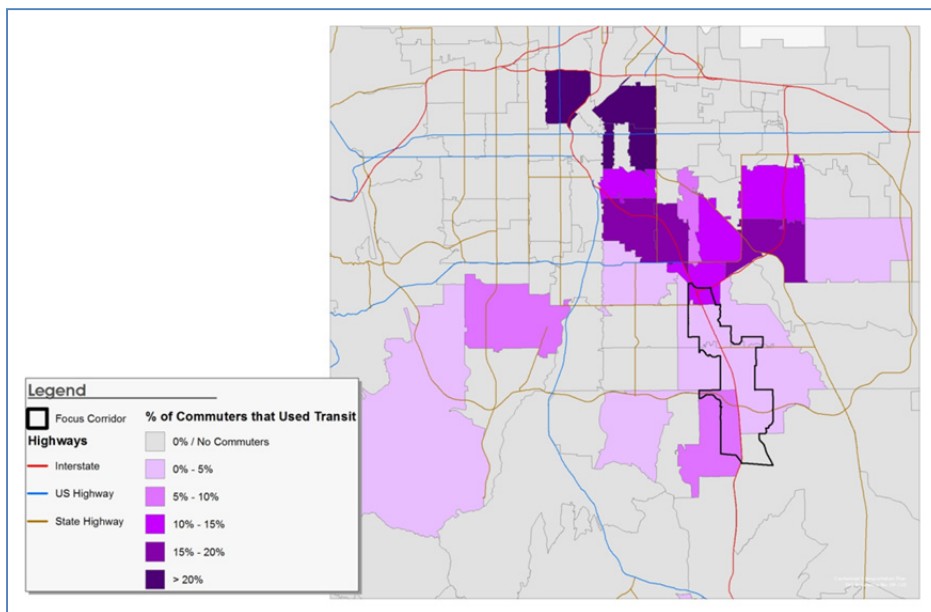


Source: NRC Survey

In response to the commuter survey question, “How did you get to work today?” almost 9 out of 10 employees in the study area drove alone in their car to work. Approximately 7 percent of workers used light rail or a bus to get to work, and fewer than 1 percent walked or biked to work. Another 4 percent used carpools or vanpools to get to work. However, the survey responses show different results based on age of respondent. More than 10 percent of workers under the age of 35 used light rail or bus to get to work, and almost 1 percent walked or biked to work. In addition, workers between the ages of 55 and 64 showed a slightly higher percentage of transit use than the survey respondents as a whole.

Those who use transit come primarily from the Denver core and those who use transit to access the study area for work come primarily from the north, with the largest concentrations coming from downtown Denver and along the I-25 Corridor, likely reflecting their use of light rail. Additional high concentrations of transit users come from south and east Denver (areas with relatively good transit service), with less transit use coming from the east, west, and south, where few transit options exist (**Figure 37**).

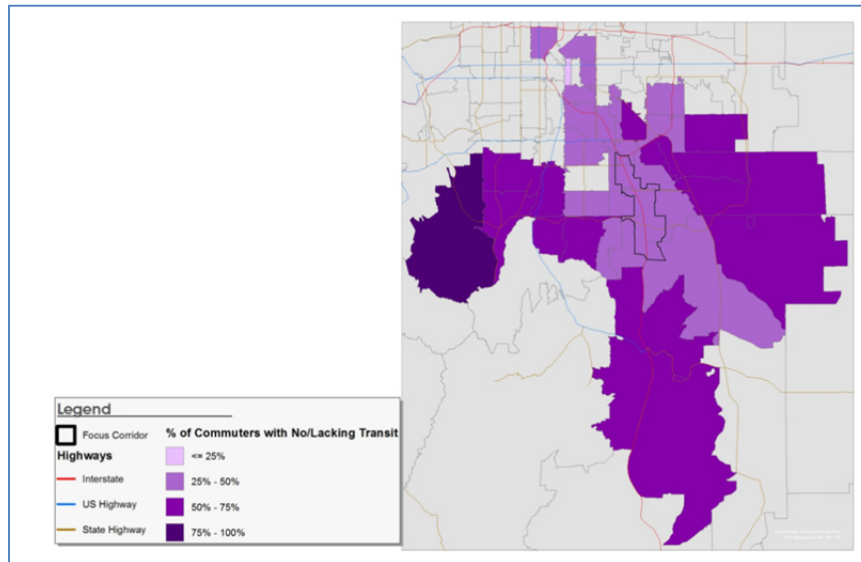
**Figure 37**  
**Distribution of Study Area Workers Who Use Transit**



Source: NRC Survey

The commuter survey also showed dissatisfaction with transit availability and facilities in the study area as shown in **Figure 38**. The distribution of workers who commented on the lack of transit or inadequacy of transit to commute to work shows very high percentages of workers who live to the east, west, and south of the study who said they have limited or no transit access to work.

**Figure 38**  
**Distribution of Study Area Employees with Limited or No Transit Access to Work**



Source: NRC Survey

## Bicycles

Bicycle commuting in the corridor is extremely limited due in large part to an incomplete and unconnected bike and trail system. The employee survey indicates that just under 9 percent of employees commute less than five miles, however, only 0.2 percent of employees biked to work on an average day. With the anticipated growth in the corridor, shifting people to alternative modes for work and personal trips, will help relieve automobile traffic and improve quality of life for those that live and/or work in the corridor.

I-25 is a major barrier for east-west bicycle travel and safe crossings are needed. Additionally, while there are a number of trails that run north-south and east-west within the corridor, there are a number of gaps in the on-street and off-street bike network that don't allow for continuous, safe travel. Additionally, many of the business parks within the corridor do not follow a grid network, which impacts the efficiency of travel via bicycle. The creation of priority bicycle corridors and wayfinding signage could help make cycling a more attractive travel option.

While the cities and counties within the corridor have significant investment in the bicycle and trail network, corridor partners need to work together to ensure that a viable network is built across city and county lines. It is important that the network meets the needs of all user types; typically, 60 percent of the population is interested in bicycling, but have concerns about safety and ease of use of facilities. Ensuring that bicycle infrastructure investment meets the needs of this large user subset will be critical in increasing mode split for both commute and personal trips.

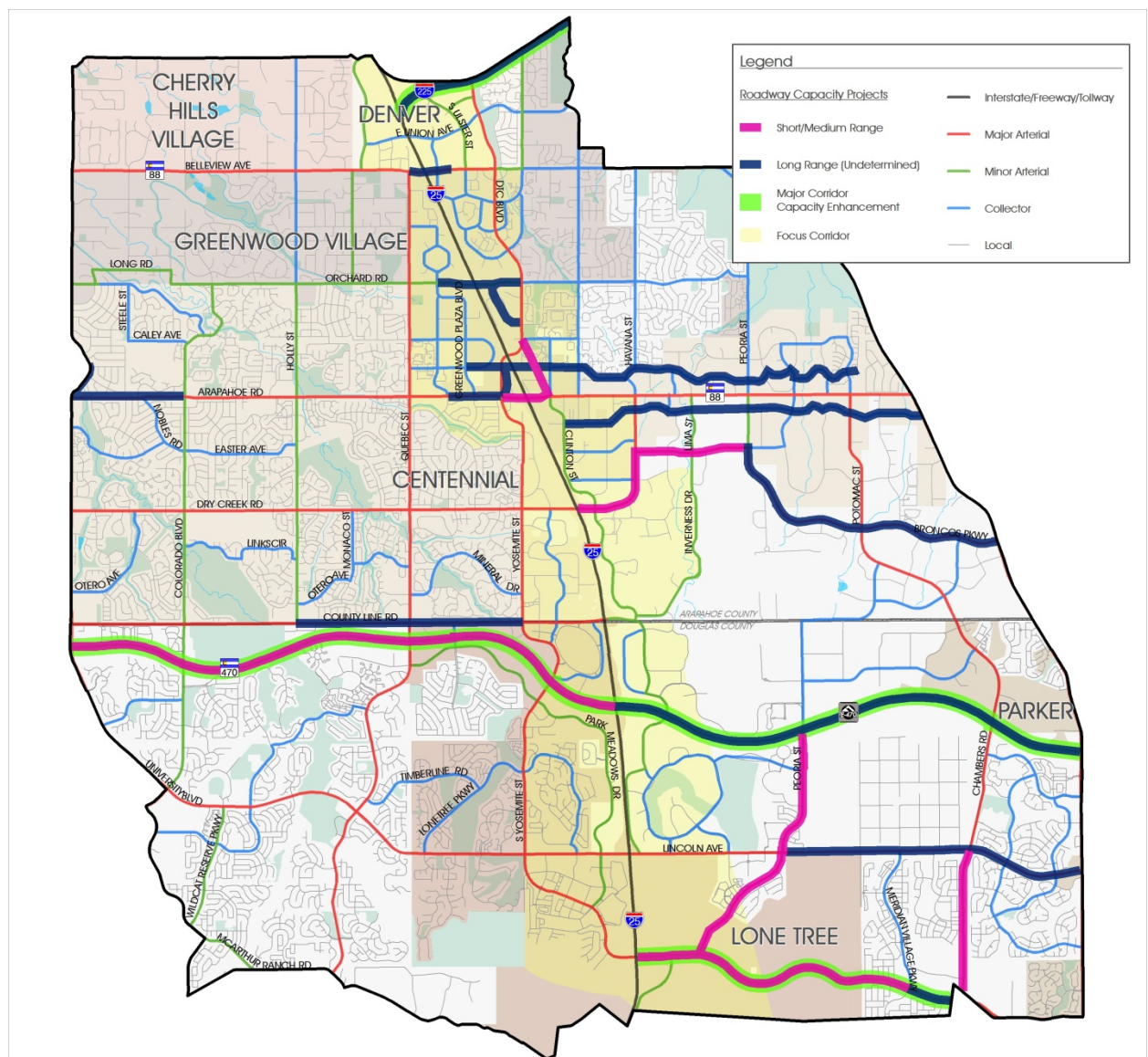
## Transportation Improvement Projects

This section provides summary information on planned funded and unfunded transportation projects to address existing deficiencies in the study area. The projects are separated into Roadway, Bike, and Transit projects.

### Planned Roadway Improvement Projects

The major roadway capacity projects planned within the corridor study are described in **Table 11** and shown in **Figure 39** along with the timeframe for which the improvements are anticipated (short/medium and long-range). The major capacity projects identified include: C-470, E-470, I-225, RidgeGate Parkway, and County Line Road. **Figure 39** also identifies where focused operational projects are planned and anticipated timeframes for completion. The primary operational improvement projects include Bellevue, Arapahoe, and Lincoln.

**Figure 39**  
**Planned Roadway Capacity Projects**



**Table 11**  
**Planned Roadway Capacity Projects**

Location	Improvements	Source
I-225, I-25 to Yosemite St	Additional lane on westbound I-225	CDOT - Planning and Environmental Linkage Study
Bellevue Ave, Quebec St to Syracuse/DTC Pkwy	Bellevue intersection improvements and turn restrictions	Arapahoe County, Denver & Greenwood Village - Bellevue Corridor Study
Orchard Rd, Greenwood Plaza Blvd to Yosemite St	I-25 interchange modifications and lane improvements east and west of the interchange	Greenwood Village – Subarea Planning Study
Peakview Ave, Costilla/Briargate Ave, Arapahoe Rd, Syracuse Way to Parker Rd sections	Improvements and new connections to parallel and circulator roads in the Arapahoe Road Corridor	Arapahoe County, Centennial & Greenwood Village – Arapahoe Rd Corridor Study
Dry Creek Rd/Easter Ave/ Broncos Parkway Corridor, I-25 to Parker Rd	Intersection reconfigurations to prioritize east-west corridor traffic movements	Centennial & Arapahoe County – Dry Creek Corridor Study
County Line Rd, Holly St to Yosemite St	Widen to six lanes	Centennial Transportation Master Plan
C-470, Wadsworth to I-25	Add managed lanes in both directions	CDOT – Design-build project will begin in 2016
E-470, I-25 to Parker Rd	Widen to eight lanes	E-470 Traffic and Revenue Study
Lincoln Ave, Peoria St to Parker Rd	Widen to six lanes	Douglas County Transportation Plan, Lone Tree plans, DRCOG Regional Transportation Plan
RidgeGate Pkwy, I-25 to Meridian Village Pkwy	Widen to four lanes	Douglas County Transportation Plan, Lone Tree plans, DRCOG Regional Transportation Plan
Peoria St, RidgeGate Pkwy to E-470	Widen to four lanes	Douglas County Transportation Plan
Chamber Rd, Lincoln Ave to Mainstreet	Widen to four lanes	Douglas County Transportation Plan



## Completed Planning Projects

The completed planning projects within the study area are described below. These planning projects provide the basis for many of the recommended road improvement projects at the end of this section.

- **Arapahoe Road Corridor Study** – A corridor study, conducted by Arapahoe County along with Centennial and Greenwood Village, completed in 2007. The study focused on the Arapahoe Road corridor between Yosemite Street and Parker Road.
- **Bellevue Avenue Corridor Study** – The study, led by Arapahoe County with participation of Greenwood Village, Denver and CDOT, was completed in 2015. It focused on the Bellevue Avenue corridor between Newport Street west of I-25 and Syracuse/DTC Parkway east of I-25.
- **C-470 Corridor Revised Environmental Assessment** – The C-470 Corridor Coalition, a coalition of Douglas County, CDOT, and other corridor counties and municipalities, completed the C-470 Corridor Revised Environmental Assessment, Kipling Parkway to I-25, in 2015. The study resulted in the C-470 managed lane project that is the subject of the design-build project beginning in 2016.
- **Centennial Transportation Master Plan** – A citywide transportation plan completed in 2013.
- **Douglas County 2030 Transportation Plan** – A county-wide transportation plan completed in 2009.
- **DRCOG Regional Transportation Plan** – The current fiscally-constrained Denver regional transportation plan adopted by the DRCOG board in 2015.
- **E-470 Traffic and Revenue Study** – The E-470 Public Highway Authority completed a traffic and revenue study in 2014 to forecast short- and long-range traffic demands, toll revenues and improvement needs on E-470.
- **I-225 Planning and Environmental Linkage Study** – A planning and environmental linkage study conducted by CDOT along with Denver and Aurora, completed in 2014. The study focused on the I-225 corridor between Yosemite Street and I-25.

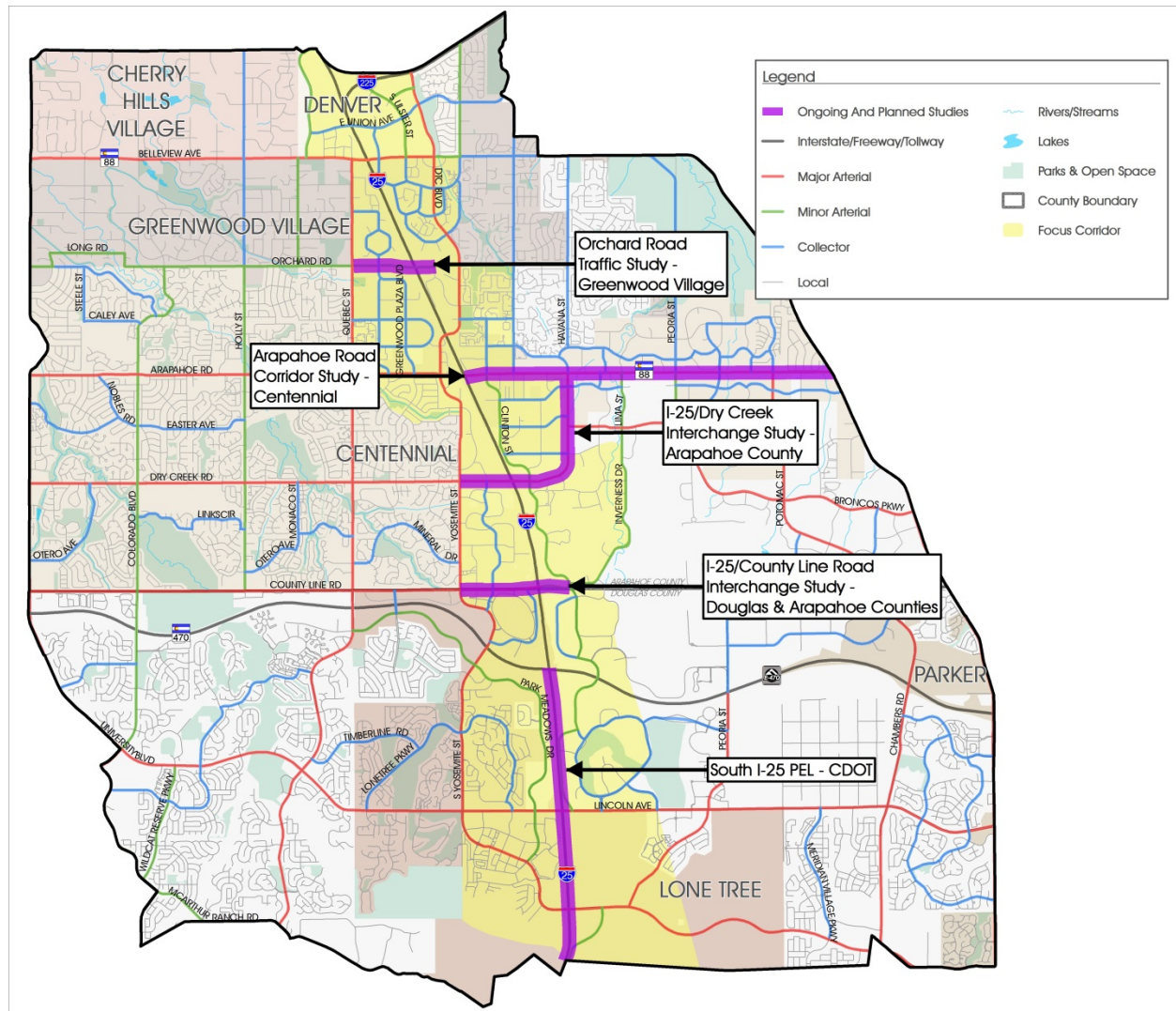
## Ongoing Planning Studies

In addition to the approved and planned roadway improvement projects that have already been identified, a number of ongoing planning studies are occurring throughout the study area as identified in **Figure 40**. These include the following:

- **Orchard Road Traffic Study** – The City of Greenwood Village is evaluating options to increase capacity around the Orchard and I-25 interchange as part of the Orchard Road Subarea Plan process that anticipates substantial redevelopment and additional density west of the highway.
- **Arapahoe Road Corridor Study** – This Centennial project is planning to look at access, signalization and multimodal improvements along Arapahoe Road between the I-25 interchange area and Parker Road.
- **I-25/Dry Creek Interchange Study** – Arapahoe County and Centennial are currently evaluating multi-modal improvement needs on the Dry Creek Road corridor east and west of the I-25 interchange.

- **I-25/County Line Road Interchange Study** – Douglas County, Arapahoe County, Centennial and Lone Tree are currently evaluating multi-modal improvement needs on the County Line Road corridor east and west of the I-25 interchange.
- **South I-25 PEL** – CDOT is initiating a Planning and Environmental Linkage (PEL) study looking at improvement needs in the I-25 corridor between C-470/E-470 and Monument.

**Figure 40**  
**Ongoing and Planned Studies**



## Priority Unfunded Roadway Improvements

The consultant team identified a number of unfunded priority roadway projects in the completed and ongoing planning studies. They are intended to be short term projects for which the SPIMD and the Denver South TMA can create a list of priority projects for funding over the next 10 years as shown in **Table 12**.

**Table 12**  
**Priority Unfunded Roadway Improvements**

SPIMD District	Location	Description	Purpose	Planning Status	Cost Range	Partners
1. Belleview	Belleview Ave, Niagara St to I-25	Belleview/Quebec left turn restrictions and U-turn intersections	Increase capacity and improve traffic flow on Belleview Ave through the I-25 interchange; accommodate Belleview Station growth	Concept recommended in Belleview Corridor Study, next steps are confirmation of concept and further design	\$6M to \$13M	Arapahoe County, Denver, Greenwood Village, SPIMD
2. Orchard	Orchard Rd, Greenwood Plaza Blvd to Willow St	Lane geometry improvements west of and through the interchange	Improve traffic flow on Orchard Rd through the I-25 interchange; accommodate redevelopment plans northwest of the interchange	Improvements being identified and planned through Greenwood Village subarea planning project	\$8M to \$10M	Greenwood Village, SPIMD
3. Arapahoe	East of I-25/Arapahoe, between I-25, Dayton St, Costilla Ave and Caley Ave	Circulator road improvements, including street extensions and intersection configurations	Improve traffic circulation surrounding the I-25/Arapahoe interchange; improve access to Arapahoe Park-n-Ride and surrounding development	Plans contained in Arapahoe Road Corridor Study and Centennial Transportation Plan, next steps are focused planning and design	\$15M to \$22M	Centennial, Greenwood Village, Arapahoe County, SPIMD
3. Arapahoe	Arapahoe Rd, Yosemite St to Greenwood Plaza Blvd	Add a continuous auxiliary lane westbound	Increase capacity at Arapahoe/Yosemite intersection and reduce westbound Arapahoe Rd weaving	Contained in South Greenwood Village I-25 Corridor Traffic Analysis, next steps are focused planning and design	\$0.25M to \$0.5M	Greenwood Village, Arapahoe County, SPIMD
4. Dry Creek	Dry Creek Rd, Yosemite St to Inverness Dr E.	Intersection geometry, Transportation systems management and operations	Improve Dry Creek corridor traffic flow	Package under development through Dry Creek Corridor Study	\$1M to \$5M	Centennial, Arapahoe County, SPIMD
4. Dry Creek	Easter Ave, Havana St and Peoria St	Intersection reconfigurations to prioritize east-west corridor traffic movements	Enhance the Dry Creek/ Easter Ave/ Broncos Pkwy east-west corridor as an alternative to Arapahoe Rd	Concepts developed by Centennial (Havana St) and Arapahoe County (Peoria St)	\$11M to \$13M	Centennial, Arapahoe County, SPIMD
5. County Line Rd.	County Line Rd/ Inverness Pkwy/ Inverness Dr intersections	Reconstruct/consolidate intersections	Improve County Line Rd corridor traffic flow	Under development through County Line Corridor Study	\$3.4M to \$3.7M	Douglas County, Arapahoe County, Inverness Metro Improvement District, SPIMD
5. County Line Rd.	Southbound I-25 Ramp/County Line Rd/ Park Meadows Dr intersection	Lane improvements	Improve traffic flow and safety at County Line Rd west ramp terminal intersection	Under development through County Line Corridor Study	\$1.8M to \$2.0 M	Douglas County, Arapahoe County, Centennial, Lone Tree, Park Meadows Metro District, SPIMD
5. County Line Rd.	County Line Road/PF Chang driveway intersection west of I-25	Lane improvements, signalization and access improvement	Improve traffic flow and access on County Line Rd	Under development through County Line Corridor Study	\$1.2M to \$1.4M	Douglas County, Lone Tree, Park Meadows Metro District, SPIMD
6. Lincoln Ave.	I-25 to Peoria St	Operations and intersection improvements; potential grade separation at Havana St intersection	Increase capacity on Lincoln Ave corridor; accommodate east RidgeGate development	Under development by Douglas County	\$10M to \$14M	Douglas County, Lone Tree, SPIMD
7. RidgeGate	RidgeGate Pkwy, I-25 to Stepping Stone Cir	Widen to 4 lanes	Increase capacity on RidgeGate Pkwy to accommodate existing and growing demand	Unfunded project, design has been completed	\$6M to \$10M	Lone Tree, Douglas County, SPIMD



## Transit Improvements

One of the factors contributing to low transit usage is that it is not available in many commute sheds. The major transit need going forward will be enhanced bus service on key east-west arterials. The following travel corridors are identified as having the potential for enhanced transit connections:

- **Arapahoe Road** – Currently, Arapahoe Road is the only major east-west arterial in the study area with any significant bus service, and its frequencies are only 30 minutes. Enhanced service in this corridor, up to and including the potential for BRT service, could provide improved transit access for residents of southeast Aurora to the east and Centennial to the west.
- **Lincoln Avenue** – Lincoln also has minimal east-west bus service, with frequencies ranging from 30 to 60 minutes. Enhanced service in this corridor could provide improved transit access for residents of Highlands Ranch on the west and Parker on the east.
- **RidgeGate Parkway** – Transit enhancements could provide additional access commute access, particularly when the southeast LRT extension is complete in 2019. This corridor would provide good access to the study area from Parker.
- **C-470** – This highway is slated for significant upgrades to be completed by 2018 with the current plan calling for the addition of two tolled express lanes westbound from I-25 to Colorado Boulevard, one tolled express lane westbound from Colorado to Wadsworth, and one tolled express lane eastbound from Platte Canyon Road to I-25. These improvements should be studied with the potential for enhanced transit service, including the potential for BRT service along the corridor to provide service for employees from Highlands Ranch and the new Sterling Ranch development.
- **I-25** – The main highway spine to the south of the study area should also be studied for the potential for enhanced transit service, particularly from the south including Castle Rock and other portions of Douglas County. CDOT has implemented the Bustang express bus service from Colorado Springs to Denver, though it currently has no stops at either Castle Rock or the study area. The TMA could potentially help subsidize the service to provide a stop in the study area for commuters from the south.

## Bicycle Improvements

Concurrently with this planning effort, the Denver South TMA has undertaken a more comprehensive bicycle network study to help prioritize key bicycle improvements that could help support growth and development within the corridor. To guide this process, three bicycle workshops were held with the Transportation Advisory Committee (TAC) and other interested parties from local cities and counties. The first meeting was used to review existing conditions and to gather input and to provide comments on the existing and proposed bicycle facilities within the corridor, as shown in **Figure 41**. This meeting was also used to begin the process of identifying the most critical connections and bicycle linkages in the study area. At the second workshop, the consultant team presented the top 12 priority bicycle alignments that emerged from the first workshop, which are identified in **Figure 42**. Stakeholders were asked to refine the proposed bicycle alignments and to identify their top four priority routes during the workshop. Several of the preliminary alignments were combined based on participant feedback. **Figure 41** identifies the final four most important alignments that emerged from the process, which were further discussed and refined at a third and final workshop with the TAC.

Connections to the following regional trails will be important:

Regional Trails East of I-25

- Centennial Trail (E-470)
- Cherokee Trail (E-470)
- Cherry Creek Trail
- Meridian Trail (E-470)

Regional Trails West of I-25

- Centennial Trail (C-470)
- Highline Canal Trail
- Willow Creek Trail

The traveling public, including cyclists, often do not have an understanding of where one city ends and another one begins. **Figure 42** identifies the top four priority bicycle alignments, which includes two north/south bicycle corridors—one on the east side of I-25 and the other on the west side of I-25.

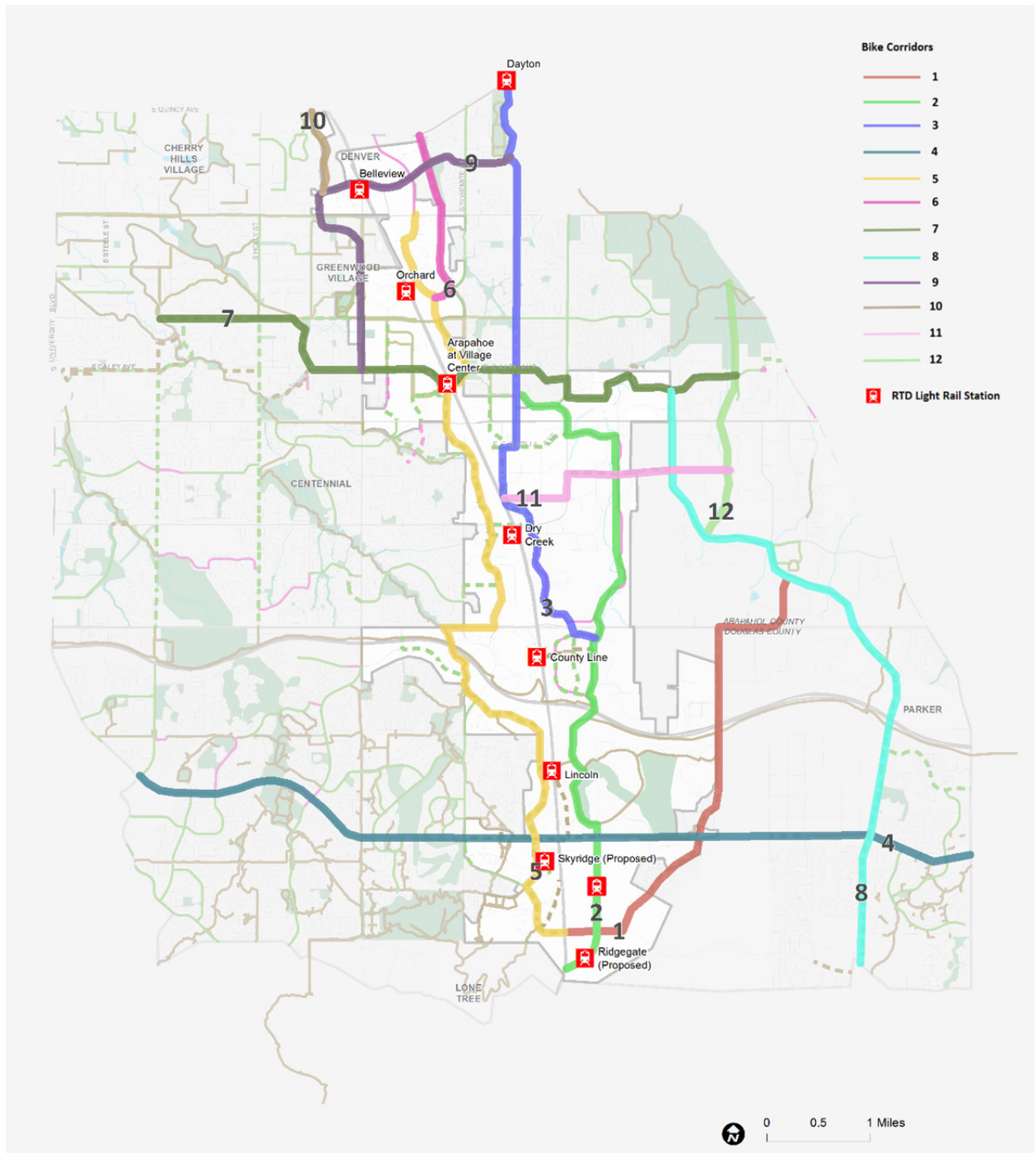
**West of I-25** – This proposed north/south bicycle corridor begins in Douglas County to the south and travels along many existing bicycle paths north all the way to Denver past the Belleview LRT Station. The corridor:

- Connects numerous employment locations and some residential uses that are close in proximity to I-25
- Provides access to a number of schools and educational institutions along the corridor
- Crosses C-470 and provides access to the regional Centennial Trail (C-470 Trail)
- Provides direct or close access to the Belleview, Arapahoe, Dry Creek, Lincoln, and SkyRidge (future) light rail stations

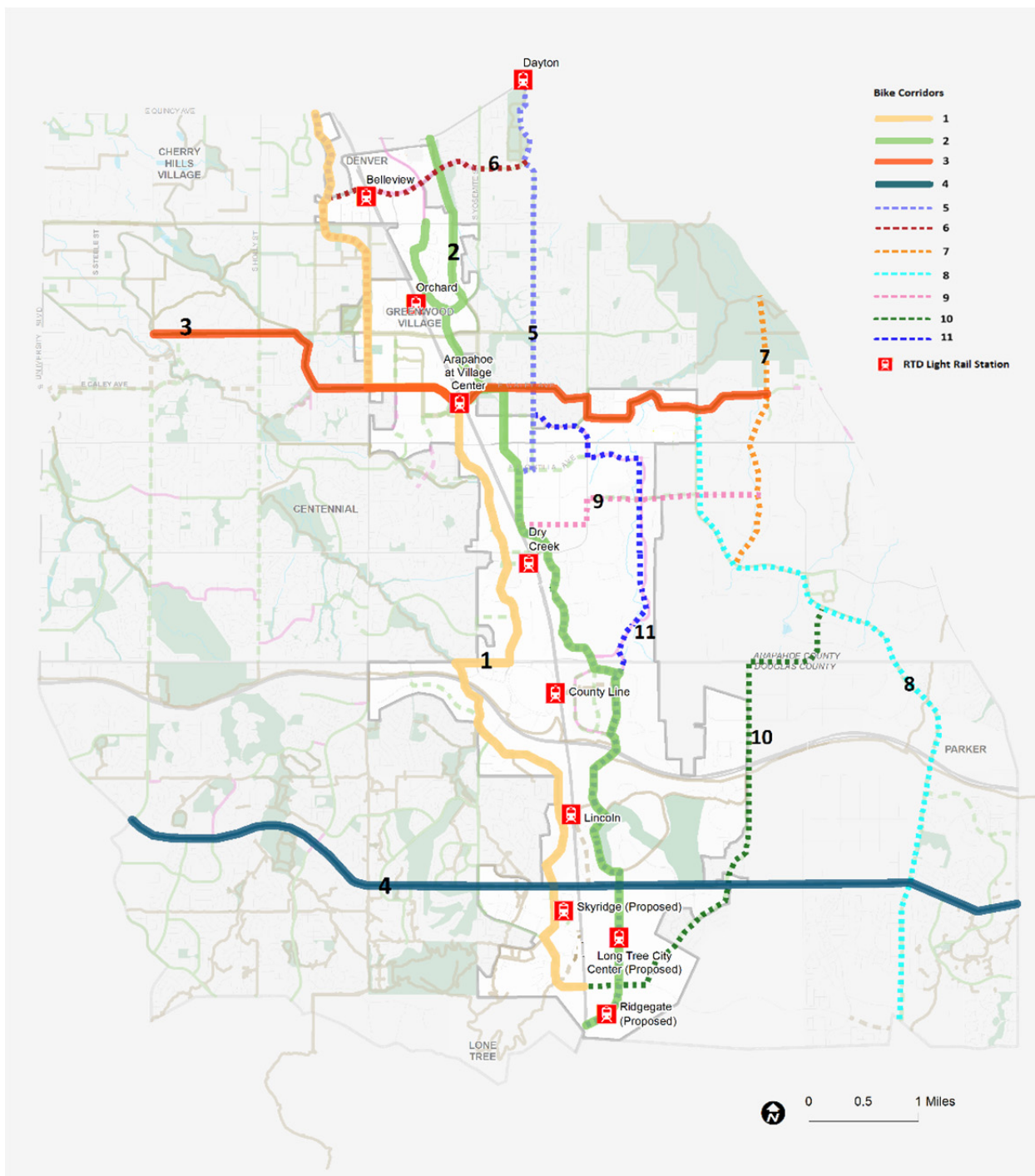
**East of I-25** – This proposed north/south bicycle corridor also begins in Douglas County in the south near the future RidgeGate LRT station that will be located in the RidgeGate East development, and traverses along several existing multi-use trails, bike routes, and bike lanes. The corridor ends in Denver on the north end with a split of the corridor in the Denver Tech Center; one route continues north on Yosemite and the other heads north on DTC Boulevard. The corridor:

- Connects numerous employment locations and future development in RidgeGate east as well as some residential uses
- Provides access to a number of schools and educational institutions along the corridor
- Crosses E-470 and provides access to the regional Centennial Trail (E-470 Trail)
- Provides direct/close access to the RidgeGate (future), Lone Tree City Center (future), Lincoln, Dry Creek, Arapahoe, and Orchard light rail stations.

**Figure 41**  
**Priority Bicycle Alignments**



### Figure 42 Refined High Priority Bicycle Alignments



## Bike

To develop planning level cost estimates for the priority north-south bicycle corridors located on the east and west sides of I-25, the routes were broken into segments as identified in **Figure 43**.

**Table 13 and Table 14** include details and planning level cost estimates for each segment.

Portions of the bicycle corridors that already have existing bicycle lanes and multi-use trails are not included.

**Table 13**  
**North-South Priority Bicycle Corridor - West of I-25**

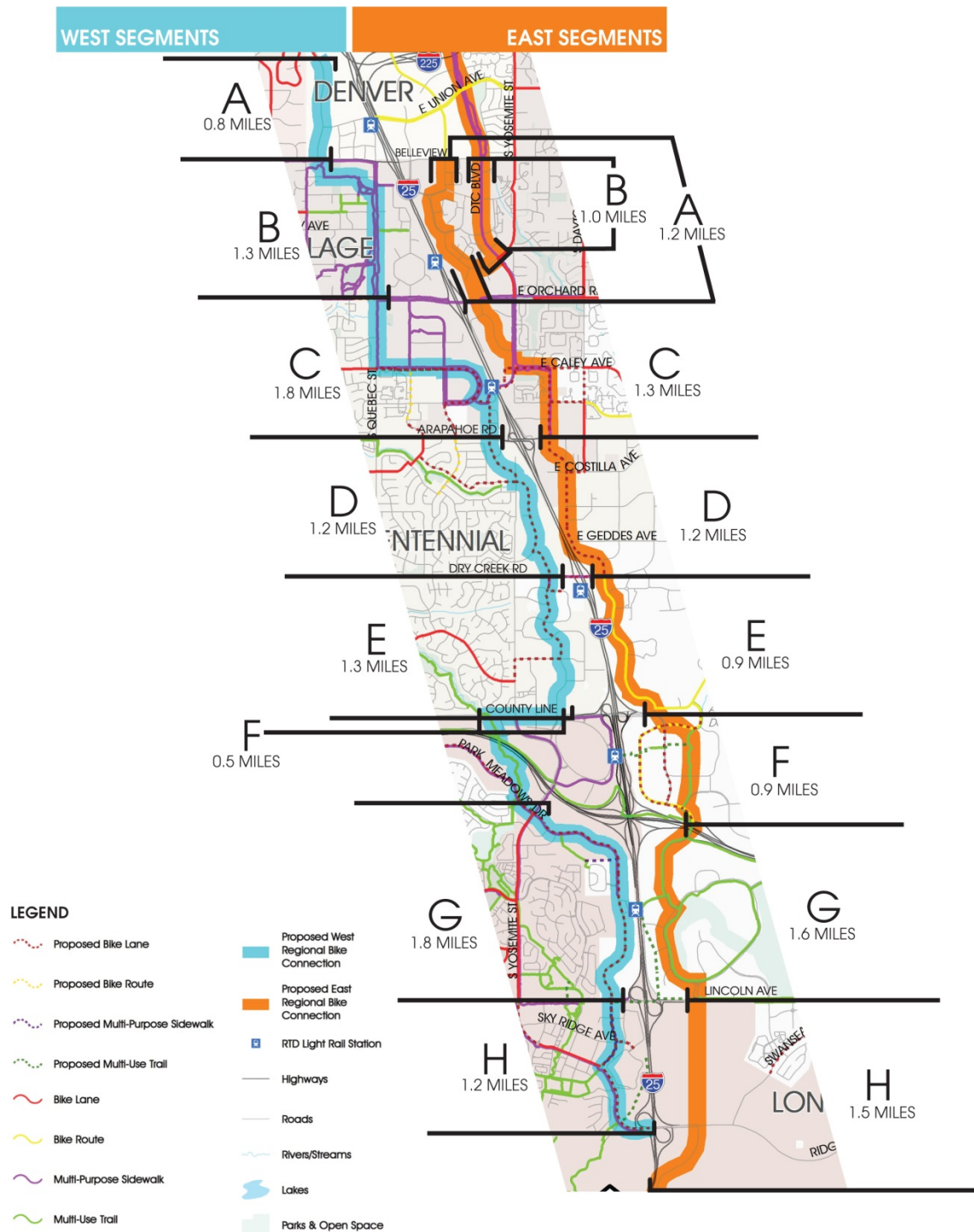
Segment	Description	Length (miles)	Planning Status	Signed Bike Route Cost Estimate	Bike Lane with Re-Striping Cost Estimate	Partners
East - A	S Ulster Street-DTC Pkwy-Great Life - DTC Pkwy to Orchard	1.2	No plans	\$7,500	\$100,000 - \$250,000	Denver, Greenwood Village, Arapahoe County, SPIMD
East - B	DTC Blvd-Great West Life, Bellevue to Orchard	1	Existing multi-purpose sidewalk	\$6,000	\$100,000 - \$250,000	Greenwood Village, Arapahoe County, SPIMD
East - C	S Willow Drive-Yosemite-Caley-Boston, Orchard to Arapahoe	1.3	Existing multi-purpose sidewalk, bike lane identified (except on Willow)	\$8,000	\$100,000 - \$250,000	Greenwood Village, Centennial, Arapahoe County, SPIMD
East - D	S Clinton St, Arapahoe to Dry Creek	1.2	Proposed bike lane	\$7,500	\$100,000 - \$250,000	Centennial, Arapahoe County, SPIMD
East - E	Inverness Dr W, Dry Creek to County Line	1.2	Existing bike route	N/A	\$100,000 - \$250,000	Centennial, Arapahoe County, Inverness Metro District, SPIMD
East - F	Inverness Pkwy-Inverness Way S-Inverness Way E-Inverness Trail, County Line to E-470	0.9	Proposed bike Lane on S Valley Rd, Inverness Way S, and Inverness Pkwy, Existing multi-use trail (Inverness Trail)	\$6,000	<\$100,000	Arapahoe County, Inverness Metro District, SPIMD
East - G	S Jamaica St-Meridian Blvd-Oswego, E-470 to Lincoln	1.6	Existing multi-use trail	\$10,000	\$100,000 - \$250,000	Douglas County, SPIMD
East - H	Oswego-Ridgegate Pkwy-S Havana St, Lincoln to PNR	1.5	No plans	\$9,000	\$100,000 - \$250,000	Douglas County, SPIMD

**Table 14**  
**North-South Priority Bicycle Corridor - East of I-25**

Segment	Description	Length (miles)	Planning Status	Signed Bike Route Cost Estimate	Bike Lane with Re-Striping Cost Estimate	Partners
East - A	S Ulster Street-DTC Pkwy-Great Life - DTC Pkwy to Orchard	1.2	No plans	\$7,500	\$100,000 - \$250,000	Denver, Greenwood Village, Arapahoe County, SPIMD
East - B	DTC Blvd-Great West Life, Bellevue to Orchard	1	Existing multi-purpose sidewalk	\$6,000	\$100,000 - \$250,000	Greenwood Village, Arapahoe County, SPIMD
East - C	S Willow Drive-Yosemite-Caley-Boston, Orchard to Arapahoe	1.3	Existing multi-purpose sidewalk, bike lane identified (except on Willow)	\$8,000	\$100,000 - \$250,000	Greenwood Village, Centennial, Arapahoe County, SPIMD
East - D	S Clinton St, Arapahoe to Dry Creek	1.2	Proposed bike lane	\$7,500	\$100,000 - \$250,000	Centennial, Arapahoe County, SPIMD
East - E	Inverness Dr W, Dry Creek to County Line	1.2	Existing bike route	N/A	\$100,000 - \$250,000	Centennial, Arapahoe County, Inverness Metro District, SPIMD
East - F	Inverness Pkwy-Inverness Way S-Inverness Way E-Inverness Trail, County Line to E-470	0.9	Proposed bike Lane on S Valley Rd, Inverness Way S, and Inverness Pkwy, Existing multi-use trail (Inverness Trail)	\$6,000	<\$100,000	Arapahoe County, Inverness Metro District, SPIMD
East - G	S Jamaica St-Meridian Blvd-Oswego, E-470 to Lincoln	1.6	Existing multi-use trail	\$10,000	\$100,000 - \$250,000	Douglas County, SPIMD
East - H	Oswego-Ridgegate Pkwy-S Havana St, Lincoln to PNR	1.5	No plans	\$9,000	\$100,000 - \$250,000	Douglas County, SPIMD



**Figure 43**  
**East and West I-25 Bicycle Corridors**



## **Other Transportation Opportunities**

The information developed for this project points out both constraints and opportunities for transportation in the corridor in the decades to come.

### **1. *Traditional auto-based transportation improvement opportunities are limited.***

The major north-south spine in the study area – I-25 – is near capacity, particularly during peak periods, and has limited ability for additional capacity. Therefore, the continued growth of the study area could potentially be hampered by this lack of auto capacity unless convenient and significant alternatives are offered.

### **2. *Transportation options should adapt to the changing environment forecast for the study area.***

As the demographic trends and office park environment changes shown in the development forecasts occur over the next two or more decades, the menu of transportation options will need to evolve and adapt to meet those changing markets. This means that along with new development trends such as increased residential and retail development and the implementation of technology-based innovation districts, the transportation network will need to adapt to better serve those development trends. The study area has the opportunity to become a 'living laboratory' for new and innovative transportation solutions that correspond to new development trends, with a major emphasis on public-private partnerships, with the private sector becoming more involved in transportation improvements.

### **3. *Take advantage of the opportunities presented by the Southeast light rail extension to begin planning innovative transportation improvements on a large scale.***

The Southeast light rail extension and the high-intensity development it will serve provides a tremendous opportunity for the study area stakeholders to begin to implement significant innovative transportation delivery solutions as the development begins to be implemented in the next few years. Like the development itself, these transportation network improvements can be implemented in stages as densities begin to occur and as the land use begins to change.



## 4. SOUTH I-25 CORRIDOR STRATEGY

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The overall goal of the South I-25 Corridor Study is to ensure that it remains the premier business location in the region. To do so will require the Denver South TMA and its member jurisdictions to not be complacent, but rather proactive in marketing and promoting the area for new business, encouraging a development and land use pattern conducive to attracting future growth opportunities, and addressing the transportation and other infrastructure investments required to serve this new growth, as well as shifting travel patterns and mode preferences to accommodate the projected increases in travel demand.

The Denver South EDP has an excellent program and staff for business recruitment and development, and is not the subject of this study. Rather this project is focused on improving the built environment to accommodate the anticipated economic development and address the anticipated impacts that growth will place on the transportation system and the adjacent communities. The corridor strategy is organized around three sub-goals and the recommended strategies and actions for realizing their success:

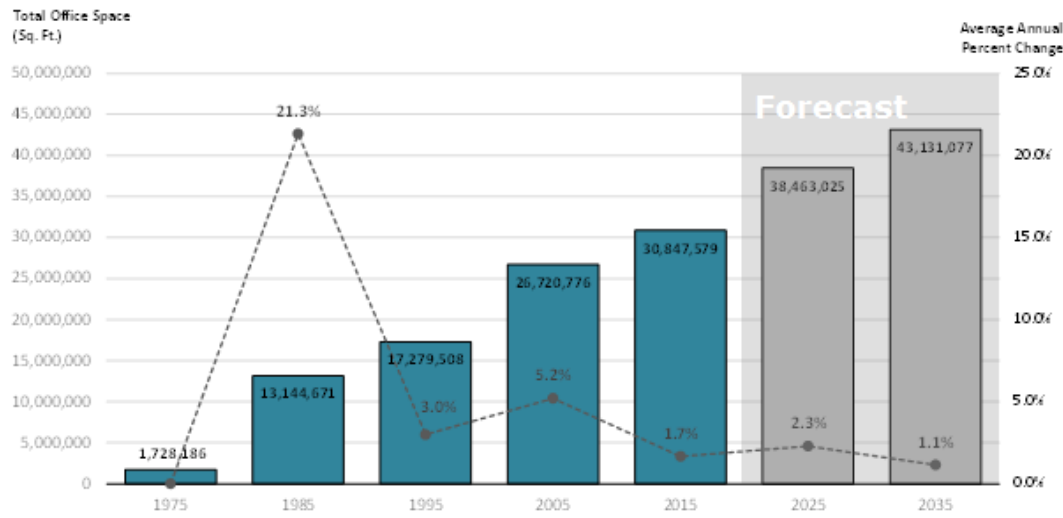
- I. Modify corridor land use patterns,
- II. Increase connectivity **to** the corridor, and
- III. Increase mobility **within** the corridor.

### I. Modify corridor land use patterns

The overall goal is to modify land use patterns within the corridor to maximize economic development opportunities. The South I-25 Corridor is forecast to have the potential to grow by 74,000 jobs over the next 20 years. This equates to an estimated 20.1 million square feet of commercial space including office, industrial/flex, retail and hotel uses. Office space is expected to continue to be the predominant land use with an additional 13.3 million square feet of space built over the next 20 years (**Figure 44**). Going forward, an even greater portion of this new office space is expected to be built in high-rise office buildings near transit stations and highway interchanges. And while corporate campuses will continue to be appealing to some employers, they are expected to be built more compactly and closer to employee amenities including retail, housing, and transit.

The corridor is also expected to become increasingly mixed use. An additional 4.5 million square feet of retail space and 1,000 hotel rooms are expected to be built. The greatest increase in development however is forecast to be in housing with an additional 13,500 housing units predicted, which would nearly double the number of residential units in the study area. Nearly all of the forecasted housing development is expected to be built as TOD within walking distance of the soon to be nine rail stations in the corridor.

**Figure 44**  
**Office Space Forecasts, 2015 to 2035**



The following strategies are recommended to allow the Denver South area to maximize its opportunities for economic development and growth.

#### **A. Increase the mixture of land uses within the corridor**

The era of the single use office park has passed. The increased demand for mixed-use development in general, and for additional retail and housing in particular, creates additional benefits for the entire corridor. The area will increasingly have the amenities that the companies are seeking—driven in large degree by the desires of the younger workforce. The supportability of mixed use development near rail stations is also increasing land values for TOD sites, which will make redevelopment of lower density and outmoded office and industrial space more feasible, creating development opportunities for those jurisdictions and property owners in the more built out portions of the corridor from Orchard south to Dry Creek Road. An additional benefit of mixed use development is that it mitigates some of the traffic impacts associated with purely office development, as it has different peak travel demand patterns. The following actions are recommended to help achieve this strategy:

##### **1. Double the households to jobs ratio from 10 percent to 20 percent.**

A total of 13,500 housing units are forecasted to be supportable over the next 20 years which is an average of 675 units per year. 3,500 housing units is approximately 20 percent of the forecast number of jobs for the corridor. This development is expected to be almost entirely higher density apartments and condominiums built as TOD. Increasing the amount of housing units, and therefore increasing the number of residents, has multiple benefits that are intertwined with promoting mixed use, including: generating market support for retail uses; providing opportunities for a greater number of corridor employees to live close to work; and increasing land values to incentivize redevelopment. These benefits outweigh the concerns expressed by some local jurisdictions regarding the negative fiscal impacts of residential and apartments based on an overly narrow consideration of tax generation rates to the exclusion of other economic development and land use benefits.

## **2. Maximize transit oriented development around light rail stations.**

The Southeast Corridor light rail line has already had an impact on the market for TOD around stations as evidenced by location of new developments over the 2005 to 2015 time period. This pattern is expected to continue based on the additional capacity in existing developments as well as a number of new major planned developments at the surrounding three stations on the Southeast Rail Extension. As stated above, these station adjacent locations are supporting higher density mixed use development and generating higher land values that will support redevelopment at mid corridor locations including surrounding the Orchard, Arapahoe, and Dry Creek stations. As well, the corridor needs to significantly increase its percentage of workers using transit and alternative modes to get to work in order to address roadway capacity issues. Maximizing development opportunities around stations increases the likelihood of new workers using transit.

## **B. Create an Innovation District within the South I-25 Corridor**

An innovation district is an economic development tool that leverages partnerships between higher education institutions, businesses, and government to fuel job growth in technology oriented businesses in targeted locations. Innovation districts are based on the premise that collaboration and productivity result from proximity, and therefore job creation and innovation can be fostered through the intentional clustering of businesses, institutions, ideas, and people. An innovation district would provide employment diversity and tap into high growth sectors. The structure of the proposed innovation district could take a number of forms. The following strategies are recommended to be pursued.

### **1. Recruit a major educational institution to anchor the innovation district concept.**

The corridor will need to attract a technology and research oriented higher education institution to be a partner in the innovation district. With the State's population projected to grow to 6 to 7 million in the next 20 years, another state university campus may be supportable and/or the branch campuses established by CU-Denver and Regis University may grow to include more than classroom teaching. Alternately, one of the State's major institutions, CSU, is actively creating technology partnerships with industry to stimulate research driven technology growth. CSU's partnership with the National Western Stock Show and City of Denver to build an equine sports medicine facility at the National Western Center is an example of such a partnership.

### **2. Partner with a major business park to provide a site for an education and technology facility.**

The attraction of a technology oriented research facility will not only be an anchor for the corridor; it can also be an economic driver for a new or existing business park. Denver South EDP should therefore actively engage a major business park developer with sufficient land capacity to provide a well located parcel for the anchor institution and also to modify its master plan to incorporate the desired innovation district concept.

### **3. Pursue the development of a medical district cluster to capitalize on the future growth of health care.**

A related planning concept includes medical districts that are intended to capitalize on the business and research business associated with major medical institutions. These include city-initiated efforts that are intended to organize the spinoff business development

surrounding major hospitals and/or clusters of hospitals, as well as university driven projects created to capture commercialization of basic research taking place within university medical centers. Sky Ridge Hospital is already present at the south end of the corridor and there is a large concentration of medical uses in the Lone Tree area. The planned Lone Tree town center in RidgeGate East would provide a location for a new university branch or an additional hospital, either of which could become an anchor for a larger medical district cluster.

## II. Increase connectivity to the corridor

The analysis of transportation needs documented a large number of planning efforts throughout the corridor to address existing conditions and deficiencies. The constraints are largely funding related as there many needed projects that remain unfunded. Transportation needs are also going to continue to increase if the corridor is to be successful achieving its growth potentials. The development forecasts, if they are to be realized, will only continue to exacerbate current traffic and congestion levels. However roadway projects alone will not be able to keep up with the forecasted increases in travel demand. With these factors in mind, there are several strategies and actions that can be undertaken by the Denver South TMA and its partners to increase, improve, and enhance overall connectivity to the study area and improve access for workers and visitors to the study area.

### A. Double alternate mode commuting to 20 percent by 2025

An average 6.4 percent of survey respondents used transit (light rail or bus) to commute to the study area and an additional 4.3 percent used vanpools/carpools and bike or walking as the primary mode of travel to their place of employment. Overall, almost 88 percent of all workers used single-occupant vehicles (SOVs) to access jobs in the study area. Doubling the share of commuting by alternate modes to 20 percent would take approximately 13,000 cars off the road, but with a forecasted increase of 27,000 workers by 2020 there would still be a net increase in peak auto traffic. The following actions are recommended to help achieve this strategy:

#### **1. Develop a customized RTD transit pass program for the Denver South TMA area.**

One means of increasing transit usage is making it a more cost effective travel option. Currently, there is no area wide transit pass program. The Southeast Denver TMA promotes the RTD EcoPass program, which is available on an employer-by-employer basis; these passes provide employers with tax benefits but generally must be made available to all employees. RTD also provides a FlexPass program, which includes more flexibility in distribution and price, and also provides the opportunity for employers to set up transit pass sales or vouchers for their employees. The Denver South TMA has a variety of options to expand usage of EcoPasses in the study area, including: expanding marketing of EcoPass options and benefits to all employers; subsidizing EcoPass employer costs from TMA revenues; and working with RTD to develop a new transit pass program just for the TMA area that provides additional flexibility for distribution and usage of passes. One option would be for an EcoPass program in which all employees of companies are not required to participate; instead, the TMA could subsidize the cost differential.

## **2. Develop a centralized parking management program.**

Currently, there is no centralized parking strategy for the study area. Parking requirements vary between jurisdiction and even among individual developments. The widespread availability of free parking provides few incentives for transit use and instead maximizes the incentives for continued use of single-occupant autos. Potential solutions for developing parking strategies to help fulfill the goal of increasing non-SOV mode use include:

- Coordinated parking solutions. The TMA should work with local jurisdictions and developers to establish a coordinated parking strategy for new developments by reducing parking minimum requirements on a per-worker basis to gradually reduce free parking availability. This could also include establishing parking maximums (instead of minimums) to place a ceiling on parking spaces per workers, providing parking advantages for carpools and vanpools, unbundling parking from rent or sale prices of office or residential buildings, and parking cash-out programs (where employees are charged for parking in return for giving employees a bonus or pay increase to help offset the cost of parking).
- Satellite parking garages. To promote a “park-once” strategy and reduce congestion within the study area, the TMA could work with local jurisdictions and developers to establish new centralized parking facilities at major distribution points or intersections. This would rely on the additional establishment of internal circulation systems and first mile/last mile solutions to provide access to employers.
- Shared parking facilities. Current or future parking garages or facilities should be studied for the potential of sharing those facilities with non-SOV facilities, including first/last mile modes and programs and potentially mobility hubs to encourage alternative mode usage during the workday.
- Variable market rate on-street parking. Where appropriate, the TMA could work to establish charges for on-street parking in high-congestion areas, with higher rates being charged at peak periods. This could be especially relevant in more congested retail areas in the study area.

## **3. Develop a comprehensive car and van pool strategy**

The TMA currently works with DRCOG to promote and provide carpools and vanpools for the study area but relies on that agency to administer the program. The Denver South TMA could establish its own targeted carpool and vanpool program, up to and including the direct provision of vanpool vehicles from TMA revenues. An initial pilot program could target the most common origins and destinations for study area employees, with expansion as resources are available.

## **B. Better connect the corridor with transit**

The largest impediment to higher transit usage is that large portions of the commute shed lack transit options. There are several key commuter sheds that would benefit from enhanced transit service including new bus routes where they currently do not exist; enhancements to existing routes (including increases in frequencies and additional passenger stop amenities); and high-capacity improvements including potentially BRT options. BRT in particular has a variety of potential service enhancement possibilities, including increased frequencies, enhanced passenger stops, and improved travel times through improvements such as queue jumps, transit signal priority, and (where appropriate) exclusive lanes during peak travel times. The following actions are recommended:

**1. Work with RTD to provide enhanced east-west bus transit service.**

A number of key east-west arterial routes were identified to be evaluated for enhanced bus transit service including Arapahoe Road, Lincoln Avenue, RidgeGate Parkway, C-470 and I-25 south of the study area. The TMA should work with RTD to plan for and implement additional routes and headways on these corridors. The potential for BRT service should be studied for Arapahoe and Lincoln as well.

**2. Coordinate with Douglas County on its Transit Master Plan project.**

Douglas County is currently conducting a transit master plan project, which may result in several recommendations for new or enhanced transit service for its major employment and residential activity centers. The Denver South TMA should continue to partner with the County in the study and potentially help subsidize services that impact the study area.

### **C. Increase east-west connectivity and capacity**

The implementation of roadway capacity and operational improvement projects is critical to improving connectivity to the corridor and to support projected growth, especially east and west of the I-25 spine. While many major projects have already been identified by cities and counties in the study area, there are opportunities for the TMA to support and help move these projects forward while also advocating for corridor wide multimodal improvements.

**1. Support and leverage major capacity projects.**

The major roadway capacity projects planned within the corridor study are shown in **Figure 39** along with the timeframe for which the improvements are anticipated (short/medium and long-range). The major capacity projects identified include: C-470, E-470, I-225, RidgeGate Parkway, and County Line Road.

**2. Advocate for incremental capacity and operational improvements on major east-west arterials.**

The primary anticipated operational improvements include Belleview, Arapahoe, and Lincoln. While the cities and counties will take the lead on these projects, the TMA can help support the projects and keep them moving forward, and should also ensure that alternate modes are adequately considered and built into the projects.

**3. Continue to participate in ongoing planning studies for roadway capacity expansion projects in the South I-25 Corridor.**

In addition to the roadway improvement projects that have already been identified, a number of ongoing and planned studies are occurring throughout the study area as identified in **Figure 42**. The TMA should be actively involved in these studies and will need to track and support the implementation of the recommendations that come out of the individual studies. Support could include coordination of stakeholders, advocating for the transportation infrastructure required to meet projected growth, ensure alternative modes are adequately included in improvement design, and even financial support as warranted.

#### **4. Optimize and Maximize Capacity on I-25**

The T-REX project completed in 2006 widened I-25 between C-470/E-470 and central Denver to its current 10-lane width through most of the study corridor. Even the most aggressive transit programs are not going to fully address the growth of commuter traffic on I-25 throughout the corridor. There are no expectations for any additional lanes on I-25 in the foreseeable future. The forecasted increase in employment in the study area will necessitate squeezing an estimated 15 to 20 percent additional capacity through various operational improvements including enhanced ramp metering, ITS programs, and corridor-wide data sharing.

However, CDOT has recently completed a project addressing lane continuity on the southern end of the study corridor, and the agency is undertaking an initiative to optimize operations and the use of existing infrastructure on its busiest highways.

**Lane balancing project** – CDOT, in coordination with Douglas County and Lone Tree, recently completed a lane balancing project to develop eight through lanes between RidgeGate Parkway and County Line Road. With the completion of this project, a continuous eight through lane section of I-25 now extends from Castle Rock through Denver.

**Optimize Highway Infrastructure** – CDOT recently kicked off the RoadX program focusing on innovative technologies to improve safety and reliability of Colorado's highways. The south Denver I-25 Corridor is an early focus of the RoadX program, and it will be geared to finding innovative ways to optimize travel on the I-25 Corridor. Examples of techniques that could be part of the package of CDOT's RoadX initiatives include:

Enhanced ramp metering technology to optimize I-25 operations,  
Improved incident management programs, and  
Expanded intelligent transportation system (ITS) programs.

### **D. Increase Connectivity for Active Modes**

In planning for future growth, active modes of transportation will be critical in helping meet the transportation needs of the corridor. The TMA's Last Half-Mile study completed in 2012 provides a solid inventory of existing pedestrian facilities around the light rail stations and prioritized sidewalk and pedestrian improvements for the TMA. Moving forward with implementing the improvements will help encourage employees and residents to use active modes and will also encourage use of the light rail and other transit services. As pedestrian improvements are more localized and typically implemented at the local level, the active modes strategies below are focused on bicycling as completing bicycle links and corridors as these projects are more multi-jurisdictional in nature.

#### **1. Build connections from corridor to regional trails.**

To help shift commuter trips to bicycle, it will be important to establish an integrated bicycle network to make bicycling a safe and efficient means of transportation. As shown in **Figure 41 and Figure 42**, connectivity to existing regional trails is critical to improving commuter bicycle travel. The majority of the 12 priority bicycle alignments provide connections to regional trails outside of the primary corridor study area. The TMA should continue to work with cities and counties in the study area to advocate for funding and investment for the high



priority bicycle alignments to ensure that there is adequate bicycle connectivity to the corridor. Details and specific recommendations for the priority bicycle corridors will be included in the final Bicycle Connectivity Study soon to be completed.

**2. Complete the proposed north-south regional bike paths on both sides of I-25 though the study area.**

According to the Downtown Denver Partnership, the bike mode share in downtown Denver is 6.3 percent; by contrast it is just 0.5 percent in the I-25 South Corridor. The potential for increasing bike commuting is there, but one of the largest impediments is the lack of regional bike trails. The proposed north-south regional bike trails through the corridor connecting to Denver's more fully developed bike network to the north and existing light rail stations would greatly improve options for bicyclists to consider cycling to work. While it would take coordination and effort by the TMA to fund and implement north-south bicycle corridors, it would be a relatively low cost strategy that would have a significant return on investment.

**3. Focus on improvements to develop a 5-mile bike shed.**

Building on the Last Half-Mile Study and the priority bicycle corridors identified in **Figure 43**, the TMA could also focus on infrastructure investments that would create a comprehensive five-mile bike shed from the I-25 spine. Strategies to create a comprehensive five-mile bike shed could include improving bicycle access to and from light rail stations, ensuring that regional trails have adequate connectivity to the local network and advocating for facility improvements on existing bike routes and bike lanes.

**4. Investment in facilities.**

Through the TMA's transportation demand management work and working relationships with area employers, further improvement to existing facilities that support bicyclists will be important to help employees shift away from SOVs. Advocating for and supporting the implementation of micro mobility hubs at employer facilities will help create a non-SOV commuter culture. Micro employer mobility hubs could include: bicycle racks and/or lockers, pumps, and basic bicycle tool kits. Access to showers and lockers is also an important amenity needed to support bicyclists and to encourage a shift in travel behavior. The TMA could provide incentives to employers to invest in facilities that support bicyclists. TMA incentives could include:

- Purchase and/or installation of bike racks and/or lockers.
- Distribution of bicycle tool kits to employers to support micro mobility hub concept.
- Provide pumps to employers to provide peace of mind for the casual cyclists.
- Offer bicycle maintenance classes to increase confidence of cyclists.

### **III. Increase mobility within the corridor**

The third sub-goal is to increase mobility within the corridor. Major issues identified in the study include the lack of permeability through I-25, gaps in the pedestrian and bicycle infrastructure, and lack of internal circulation options. With these factors in mind, there are several objectives and related strategies that can be undertaken by the Denver South TMA and its partners to increase, improve, and enhance overall internal circulation within the study area for workers, residents, and visitors.



## **A. Improve bike and pedestrian mobility**

### **1. Develop additional east/west bicycle connections over I-25.**

Bicycle use is also inhibited by the lack of connections east and west through the study area. The few major arterials are the only viable options currently and these streets are too busy to accommodate cyclists other than the “strong and fearless”. Also the pedestrian bridges at light rail stations work for pedestrians but are not conducive to easy and time efficient bicycling. The Denver South TMA should work with the local jurisdictions to evaluate the feasibility of connections at half-mile locations between major arterials including Berry, Caley, Costilla/Easter, and SkyRidge.

### **2. Improve pedestrian infrastructure and facilities.**

One of the greatest impediments to transit usage is the lack of last mile connections. The large superblock development pattern, started in DTC but perpetuated throughout much of the corridor, while aesthetically pleasing, results in a limited street grid and limited options for pedestrian movement. The lack of sidewalks and walk paths also contribute to a lack of pedestrian options. Improving pedestrian connections is perhaps the most cost effective infrastructure investments that can be made in the corridor. The Denver South TMA should complete a sidewalk and trails gaps analysis building on the Last Half Mile Study and work with local jurisdictions and private development firms to get them funded and built. Site plan requirements for streets and sidewalks should also be modified for new development. The TMA should work to develop corridor-wide design guidelines/standards for walking/walkability, making block sizes smaller and increasing the street network, and developing complete street standards.

## **B. Enhance internal transit mobility**

### **1. Enhance internal transit circulation.**

The Denver South TMA should work with RTD to identify gaps in existing transit service and the potential for filling them with enhanced RTD service. If necessary, the Denver South TMA could consider subsidizing additional RTD services, similar to GO Boulder and its collaboration with RTD to subsidize local circulator services in that city such as the Hop, Skip, Jump, Bound, and other services. The TMA should work with DRCOG or other local, regional, or national agencies or entities to fund a study of short-term and long-term circulation options near study area LRT stations and throughout the study area. In particular, the TMA should explore options available through the Federal Transit Administration, New Partners for Smart Growth, National Resources Defense Council (and its Urban Solutions Program), Urban Land Institute, or other entities to fund studies of enhanced study area circulation.

### **2. Solicit proposals from the private sector for non-traditional approaches to a circulator.**

The Denver South TMA could be a “living laboratory” for exploring, testing, and implementing new approaches to local transit circulation. Many transit systems around the country are exploring options to the traditional fixed-route transit service models, such as: flexible route services, where vehicles operate on fixed routes but are allowed to deviate from those routes (either all day or just in off-peak hours) to provide demand-response pick-ups; enhanced demand-response or call-and-ride services; and checkpoint services, where on-demand

vehicles circulate through a service zone but make scheduled pickups at designated locations at established times throughout the day. In addition to those approaches undertaken by transit agencies, many areas are exploring entirely new service models that are private-sector driven. The most common recent example is from a company called Bridj, which operates completely with a mobile app for pickups and drop-offs in designated areas. The Denver South TMA (possibly along with its members and partners) could partially or totally subsidize costs for this type of provider. The TMA could open its service needs to competition from private sector entities (and RTD if it chose to do so) to develop a pilot project for local circulation around one or more study area LRT stations. The TMA could establish minimum service standards and objectives and let the private sector propose an operating structure. This type of pilot project, if successful and cost-effective, could be expanded to other portions of the study area and could be a groundbreaking example of public/private sector collaboration to meet a specific transit need.

### **3. Establish mobility hubs throughout the corridor.**

The mobility hub concept is a common-sense concept that attempts to comprehensively think about the integration of all activities in and around a transit facility in a way that maximizes its utility and benefit to transit users, local residents, employees, and visitors. The TMA should work with local jurisdictions and its private sector members to develop minimum standards for mobility hubs and to agree on potential locations for pilot locations at key areas throughout the study area.

- **Develop a bike sharing strategy:** Establish guidelines for a bike sharing program throughout the study area, including potential vendors and sponsors, initial locations, and sharing mechanisms. As noted in the bicycle strategy above, this could include “micro mobility hubs” that focus on bicycle facilities but also provide information on other modes.
- **Develop a car sharing strategy:** Similar to the bike sharing strategy, the TMA should work with its partners to establish guidelines and service standards for a car sharing strategy that meets the specific needs of the study area.
- **Develop a wayfinding/travel information strategy:** The TMA could solicit proposals for development of a comprehensive wayfinding/signage strategy for implementation initially in selected areas and ultimately throughout the study area.
- **Develop initial locations for hubs:** The TMA should work with its public and private partners to develop initial pilot locations for mobility hubs along with a hierarchy of services to be provided at different locations. The initial focus should be on major activity centers (obviously including LRT stations and key intersections), with the goal of providing some type of hub at many key locations throughout the study area. Ultimately, the TMA should decide on its long-range goal for mobility hub implementation. Depending on resources, one goal could be to ensure that no employee or resident is more than a quarter-mile from a mobility hub, where he or she would have access to all modes within no more than a five-minute walk.

## C. Become a leader in TDM programming

### **1. *Develop a comprehensive employee flexible scheduling program.***

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

### **2. *Develop innovative comprehensive employee information programs for all modes to promote trip planning.***

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

### **3. *Implement development regulatory policies that promote alternative modes.***

The TMA should explore the potential of developing a comprehensive menu of regulatory and policy programs that would promote alternative mode usage in new developments. This could include mandatory or optional car and bike sharing requirements for new developments, the potential for an alternative mode facility tax or assessment district (that could potentially provide funding for local transit circulation, car/bike sharing programs, mobility hubs, and sidewalk/trail improvements), and other regulatory options.

## 5. SHORT TERM ACTION PLAN

This section of the report presents a list of priority projects recommended to be undertaken by the Denver South TMA and EDP, area jurisdictions, and other partners as initial steps towards implementing the South I-25 Corridor Strategy. These projects are generally low cost investments that easily completed in a short timeframe or projects that are initial first steps towards implementing the more ambitious strategies outlined in the previous section. These projects as summarized in **Table 15** and described below are grouped in four categories, Development, Roadways, Bicycle Routes, Transit and TDM. The estimated timing, cost, and responsibilities are identified for each project.

**Table 15**  
**Short Term Priority Projects**

Category/Project	Estimated Cost	Timing	Partners
<b>Economic Development/Land Use</b>			
1. TMA Housing Task Force	\$0	1 - 2 years	Local jurisdictions
2. Innovation District Partnership	\$0	1 - 2 years	Universities and major landowners
<b>Roadway</b>			
1. Easter Ave, Havana St, and Peoria St	\$11m - \$13m	3 - 5 years	Centennial, Arapahoe County, Dove Valley Metro Dist
2. Orchard Rd - Greenwood Plaza Blvd to Willow	\$8m - \$10m	3 - 5 years	Greenwood Village, CDOT
3. Dry Creek - Yosemite to Inverness Dr East	\$11m - \$13m	3 - 5 years	Centennial, Arapahoe County
4. County Line Rd / Inverness Pkwy and Dr	\$3.4m - \$3.7m	4 - 5 years	Douglas and Arapahoe Counties, Inverness Metro Dist
5. Belleview Ave - Niagara St to I-25	\$6m - \$13m	4 - 5 years	Arapahoe County, Denver, Greenwood Village
<b>Bikeway</b>			
1. North/South I-25 Bikepaths	\$1.5m - \$2m	3 - 5 years	Local jurisdictions
2. Bike Connections to Regional Trails	TBD	3 - 5 years	Local jurisdictions
<b>Transit/TDM</b>			
1. RTD Bus Service Committee	\$0	1 - 2 years	RTD
2. Internal Transit Circulator Study	\$150,000-\$300,000	1 - 2 years	Local jurisdictions, RTD, local businesses
3. Mobility Hub Pilot Program	TBD	3 - 5 years	Local jurisdictions, local businesses
4. RTD Transit Pass Study	\$50k - \$100k	1 - 2 years	Local jurisdictions, RTD, local businesses

H:\133068-Denver SE I-25 Corridor Growth Study\Reports\133068-Priority Project Matrix.xlsx Sheet 1

## Development Projects

- 1. TMA Housing Task Force** - Strategy I.A.1 seeks to double the households to jobs ratio from 1:10 to 2:10 in the corridor by increasing the amount of multifamily housing built in the study area primarily around transit stations. This is important to increasing opportunities for a greater number of employees to both live and work in the corridor and reduce the projected growth of commuter traffic. This would require the forecasted number of housing units to double from 13,500 to 27,000 over the next 20 years. As ambitious as this will be, it has no chance of happening unless there broader support from the corridor's jurisdictions that housing is an important component to creating the desired mixed use development environment desired by an increasing portion of the workforce. The recommended first step project is for the Denver South TMA to convene a corridor housing task force or subcommittee to take on the transportation/housing subject and to develop corridor wide housing allocations between the member jurisdictions.

- 2. Innovation District Partnerships** – Strategies I.B.1 and I.B.2 are focused on developing an innovation district in the South I-25 Corridor. The most important missing elements to creating a district are a university partner and a major landowner partner. As a first step, the Denver South EDP should mobilize its existing economic development resources as a new initiative to reach out to potential partners at the region’s academic institutions and within the corridor’s master planned development projects regarding their interests in partnering on this effort to create a climate and environment for technology and research driven business entrepreneurship.

## Roadway Projects

- 1. Easter Avenue, Havana Street, and Peoria Street** – This unfunded project is designed to prioritize east-west travel movements to provide better traffic flows from the I-25/Dry Creek interchange east to Dove Valley. This is an important project to provide needed east-west capacity, relieve congestion on Arapahoe Road, and improve access for Centennial Airport and Dove Creek property owners. It is not on Arapahoe County’s current funded projects. However, because there would be multiple additional beneficiaries including Centennial, Dove Valley Metro District, and Centennial Airport, the TMA can help facilitate a public-private partnership solution.
- 2. Orchard Road** – Greenwood Plaza Boulevard to Willow Street – Greenwood Village is completing an Orchard Station Subarea Plan. The study area is north of Orchard and west of I-25 to Quebec and is expected to be planned for redevelopment involving a significant increase in development. This unfunded project is designed to increase capacity on Orchard and on the Orchard interchange including additional turn lanes and bike and pedestrian facilities. A public-private financing plan is anticipated including urban renewal and potentially private development investment.
- 3. Dry Creek Road** – Yosemite to Inverness Drive East – This project, proposed under the Dry Creek Corridor Study, would provide intersection improvements, ITS and other traffic flow improvements.
- 4. County Line Road and Inverness Parkway and Inverness Drive** – This project, to be recommended in the County Line Corridor Study, provides intersection improvements that would improve traffic flows to and from Inverness Business Park. It is therefore an important project for the adjacent property owners and the TMA may be able to help facilitate a public – private funding solution.
- 5. Belleview Avenue** – Niagara Street to I-25 – This project would alleviate current left turn and U-turn restrictions at intersections. This concept is recommended in the Belleview Corridor study and would facilitate better east-west traffic movements generated by the Belleview Station Master Plan now under development.

## Bike Projects

- 1. North/South Bicycle Corridors** – The completion of the north-south bicycle corridors on both the west and east sides of I-25 were determined to be the highest priority investments by the TMA's bicycle working group. . A continuous bike commuting route on the east and west sides of the I-25 spine can be implemented with road re-striping and signage; each priority north-south corridor could be implemented for the modest cost of \$1.5 to \$2.0 million.
- 2. Bike Connections to Regional Trails** – The second short-term investment is to complete the two priority east-west bicycle alignments and the other 10 remaining priority alignments identified by the bicycle working group (see **Figure 41**). These alignments connect the corridor to regional trails outside the study area and would greatly improve the accessibility of bicycling as a viable commute option. The TMA should partner with cities and counties in the study area to advocate for funding and investment for the listed investments to ensure that there is adequate bicycle connectivity to the corridor.

## Transit/TDM Projects

- 1. RTD Bus Service Committee** – Strategy/Action II.B.1 is focused on working with RTD to improve east-west bus service to the corridor. This initial step would form a committee with TMA and RTD representatives to begin exploring options for improving frequencies and coverage for existing RTD routes, up to and including TMA subsidies to improve services. This could include improving headways on existing routes, implementing new routes to fill gaps, and upgrading local circulation options.
- 2. Internal Transit Circulator Study** – Strategy/Action III.B.1 is focused on improving internal transit circulation within the corridor. As a first step, the TMA should work with local jurisdictions, RTD, and its stakeholders to develop and circulate an RFP soliciting ideas from the public and private sectors on an internal transit circulation pilot program. The resulting study should develop a clear blueprint for short-term and long-term options for transit circulation that supplement existing RTD service while providing focused technology-driven circulation options that help eliminate gaps and improve the transit mode share.
- 3. Mobility Hub Pilot Program** - Strategy/Action III.B.3 seeks to establish mobility hubs throughout the corridor study area. This is an ambitious project that will take a number of years to fully implement. As an initial first step, the TMA should work with its partners to develop a mobility hub pilot program, with installation at selected key locations throughout the study area to test the attraction and cost-effectiveness of facilities.
- 4. RTD Transit Pass Study** - Strategy/Action II.A.1 recommends working with RTD to develop a customized transit pass program for the corridor. The first step in this process would be to convene a group of major corridor employers to work with the TMA and RTD to customize a TMA-specific transit pass program. This may require an initial consultant study under direction of the stakeholders to examine the underlying obstacles to participation in current programs and to identify the benefits and incentives to increase employee and resident participation.