

# 4 **TRANSPORTATION IMPACTS AND MITIGATION**

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This chapter compares the transportation impacts of the No Action and Build alternatives. These impacts are subdivided by mode of travel and include transit service, ridership and operations; traffic conditions; and pedestrian and bicycle facilities. In each context the current conditions are described along with the alternatives' impacts and associated mitigation measures, where applicable.

A variety of data and analyses is used to evaluate and compare the alternatives' transportation impacts. The DRCOG 2015 and 2035 *Regional Travel Demand Model*, also known as Compass, provides much of the travel demand forecasting and future transportation system conditions. The model represents the region's fiscally constrained long range transportation plan (*2035 Metro Vision Regional Transportation Plan*), incorporating regionally adopted forecasts for population and employment, and facility improvements to highway and transit networks. Impacts to parking and traffic circulation are additionally examined in the opening year of the project using DRCOG's model for the 2015 horizon year.

RTD adapted DRCOG's travel demand models to simulate the following scenarios:

- 2015 Build Alternative;
- 2035 No Action Alternative; and
- 2035 Build Alternative.

## **4.1 COMPATIBILITY WITH LOCAL TRANSPORTATION PLANS**

The No Action and Build alternatives were evaluated for their compatibility with transportation planning documents that include the Southeast Corridor. Relevant transportation plans include those adopted by DRCOG, Douglas County, and the City of Lone Tree. Table 4.1-1 presents a summary of each alternative's compatibility with these planning documents.

Without exception the relevant transportation planning documents make explicit mention of the Southeast Corridor Extension or encourage the type of multi-modal transportation system fostered by the project. DRCOG develops the long-range comprehensive land use and transportation plans for the Denver metropolitan region where the Southeast Corridor Extension, along with other rapid transit corridors, is considered a key component to achieving a more efficient and sustainable regional transportation system. The Denver region's Transportation Improvement Program (DRCOG, 2008a) lists the Southeast Corridor Extension for implementation.

**TABLE 4.1-1: LOCAL AND REGIONAL PLAN COMPATIBILITY**

Plan Name	Compatible with Plan?	
	No Action Alternative	Build Alternative
DRCOG Metro Vision 2035	No	Yes
2035 DRCOG Metro Vision Transportation Plan	No	Yes
2008-2013 Transportation Improvement Program	No	Yes
State Implementation Plan for Air Quality	No	Yes
Douglas County 2030 Comprehensive Master Plan	No	Yes
Douglas County 2020 Transportation Plan	No	Yes
City of Lone Tree Comprehensive Plan	No	Yes

Sources: DRCOG, 2007a; DRCOG 2007b; DRCOG, 2008a; Douglas County, 2008a; Douglas County 2003; City of Lone Tree, 2007.

At the county level, Douglas County’s long-range comprehensive plan calls for more concentrated and mixed-use growth in its urban areas. The plan acknowledges the important role transit service plays in fostering more efficient development patterns and addressing increasingly congested highways and arterials. The *Douglas County 2020 Transportation Plan* (Douglas County, 2003) was developed and adopted prior to completion of the FasTracks-related planning documents, but still it envisions the extension of a transit corridor south from the Lincoln Station to Castle Rock and El Paso County using a combination of light rail and/or commuter rail technology. It also advocates for a more robust local bus network to better integrate Parker and Lone Tree with light rail service.

The City of Lone Tree strongly advocates for enhanced transit service in the Southeast Corridor. The RidgeGate Planned Development, a key part of the City’s long term growth strategy, was planned around the provision of light rail transit and three new stations serving the mixed-use and transit-oriented developments envisioned.

## 4.2 TRANSIT

This section examines each alternative’s impact on transit service and ridership in the corridor, including implications for station activity, station access, parking, and travel times. The assessment includes those transit routes that would interface directly with the Southeast Corridor light rail line, as displayed in Chapter 2, Figure 2.2-1.

### 4.2.1 Corridor Level Transit Service and Ridership

Existing transit service in the study area is a combination of light rail, fixed route bus, and call-and-ride shuttle service centered on the existing end-of-line light rail station at Lincoln/I-25. Light rail routes E (to Denver Union Station), F (to downtown Denver) and G (to Nine Mile Station)<sup>1</sup> operate from Lincoln Station. The station area includes a 1,734-space park-n-Ride,

<sup>1</sup> Light rail route G service discontinued in May 2009, but RTD plans to reintroduce the service in the future.

bus bays and drop-off areas on either side of I-25, and a pedestrian bridge spanning the Interstate.

Three fixed route buses operate in the area: Route #403 connects Lincoln Station to Mineral Station via Highlands Ranch; Route #410 operates between Lincoln Station and three park-and-Ride lots near Parker; and Route #465 parallels I-25 from Sky Ridge Medical Center in the south to the Denver Tech Center in the north, making stops at four Southeast Corridor Light Rail stations en route. Further, a new feeder bus route, PRG, will connect Parker with the Lone Tree City Center Station.

The Lone Tree call-n-Ride shuttle provides curb-to-curb service within an area bounded by Lincoln Avenue on the south, I-25 on the east, County Line Road on the north, and the North-South Trail on the west. The shuttle makes hourly stops at Lincoln Station when reservations are not necessary; otherwise, users must prearrange their pick-ups. Similarly, the Meridian call-n-Ride serves the business park east of I-25 and north of Lincoln Avenue. This shuttle makes frequent stops at Lincoln Station East and additionally operates as a flex route service with scheduled time points on a circular route through the business park.

RTD offers Access-a-Ride service throughout the study area. Access-a-Ride provides transportation to passengers with disabilities who are unable to use RTD's regular lift-equipped fixed route bus service and who qualify for certification under the eligibility guidelines established by the Americans with Disabilities Act (ADA) of 1990.

Table 4.2-1 shows the headways for the existing corridor transit services, as well as for those services provided under the No Action and Build Alternatives. Both light rail and some fixed route bus services would have improved headways in 2035, without a marked difference between alternatives. The operations plan will be optimized as the design progresses such that the project minimizes operational costs while maximizing ridership. The change to the operational plan that is most likely will be the reduction of train frequencies. The reduction of train frequencies would reduce traffic, parking, and noise impacts. Therefore, the train frequencies of 7.5 minutes during the peak, and 10 minutes in the off peak, assumed in this document, represent "worst case" from an environmental impact perspective. The Build Alternative does introduce a new feeder bus route, PRG, which will operate between the Southeast Corridor Extension and the town of Parker. Routes 403 and 465 would be modified to connect with the Build Alternative's three proposed stations.

**TABLE 4.2-1: TRANSIT SERVICE FREQUENCY IN THE SOUTHEAST CORRIDOR**

Transit Line	Peak/Off-Peak Headways (Minutes)		
	2008	No Action Alternative (2035)	Build Alternative (2035)
Light Rail Line E at Lincoln Station	30/15	15/15	15/15
Light Rail Line F at Lincoln Station	15/15-30 <sup>1</sup>	10/15	10/15
Light Rail Line G at Lincoln Station	30/-	7.5/10	7.5/10
Route 403	30/120	30/60	30/60
Route 410	30/120	30/120	30/120
Route 465 <sup>3</sup>	30/30-60 <sup>2</sup>	30/30	30/30
Route PRG	not in service	not in service	30/60

Source: RTD 2008 Published Schedule; RTD 2035 Travel Demand Model.

Notes: 1. 15-minute mid-day and 30-minute evening headway; 2. 30-minute mid-day and 60-minute evening headway; 3. Route 465 discontinued in May 2009.

Transit ridership in the corridor will increase in future years as the area population and employment increase. Corresponding increases in transit service levels in the Build Alternative will also result in transit patronage increases. Route level ridership information is provided in Table 4.2-2. The table shows ridership gains in the No Action Alternative are attributed to light rail route and bus routes.

**TABLE 4.2-2: TRANSIT RIDERSHIP IN THE SOUTHEAST CORRIDOR**

Transit Line	Average Weekday Daily Riders		
	2008	No Action Alternative (2035)	Build Alternative (2035)
Light Rail Line E	6,592	16,557	20,420
Light Rail Line F	15,918	28,819	30,389
Light Rail Line G <sup>1</sup>	752	18,635	30,813
<i>All Southeast Light Rail Lines</i>	<i>23,262</i>	<i>64,011</i>	<i>81,622</i>
Route 403	297	1,464	1,245
Route 410	211	4,159	1,560
Route 465	416	1,417	1,436
Route PRG	not in service	not in service	2,443
System-wide Linked Transit Trips		420,828	436,957

Source: RTD Bus and Light Rail Transit Ridership 2008; RTD 2035 Travel Demand Model.

Note: <sup>1</sup> Light rail route G service discontinued in May 2009, but RTD plans to reintroduce the service in the future.

The Build Alternative would shift more market share to transit. Average weekday ridership along the Southeast Corridor Line is projected to exceed 81,000 in 2035, which is a 17,600-rider increase over the No Action Alternative and a 250 percent increase over current ridership. The

supporting bus transit system in the Build Alternative would also experience notable gains in ridership. The modified routes serving Lone Tree and the new light rail stations would experience moderate changes in ridership levels. The PRG route, between Parker and Lone Tree City Center Station, would attract nearly 2,500 daily riders.

RTD system-wide linked transit trips indicate the total number of patrons using transit. The forecasted difference in linked transit trips between the No Action Alternative and Build Alternative indicate the net gain in transit riders caused by the Southeast Corridor Extension. The total system wide linked transit trips under the Build Alternative will exceed those in the No Action Alternative by 16,129 trips, meaning the Southeast Light Rail Extension will attract over 16,000 new transit patrons.

#### 4.2.2 Station Boardings

Daily boarding information by station is projected for the three new stations that are part of the Build Alternative, as well as for Lincoln Station. These data indicate the relative attractiveness of a transit station. Lincoln Station is included because, as the current end-of-line station, it stands to be most affected by the Build Alternative.

Table 4.2-3 shows that, in the Build Alternative, the RidgeGate Station would be the busiest of the three new light rail stations, with more than 5,000 average daily boardings. It would be followed by the Lone Tree City Center Station at nearly 2,800 boardings. Boardings at Lincoln station are lower by over 4,000 in the Build Alternative, indicating that the new stations are more attractive to these potential users.

**TABLE 4.2-3: AVERAGE WEEKDAY DAILY BOARDINGS BY STATION**

Light Rail Station	Light Rail Lines Serving Station	Average Weekday Boardings		
		2008 <sup>1</sup>	No Action Alternative (2035)	Build Alternative (2035)
RidgeGate Parkway	E,F,G	0	0	5,146
Lone Tree City Center	E,F,G	0	0	2,753
Sky Ridge	E,F,G	0	0	665
Lincoln	E,F,G	2,001	6,423	2,184

Source: RTD 2008 LRT Station Activity-Wkday; RTD 2035 Travel Demand Model.

Notes: <sup>1</sup>. Boardings averaged across 12-month period from August 2007 to August 2008.

#### 4.2.3 Station Access by Mode

The mode split for access to each station in the Build Alternative was estimated for 2035. Three modes of access are possible: drive, bus, and walk/bike. Drive access would be included only when parking will be available at the station. The mode splits in Table 4.2-4 show that driving would be the predominant access mode for the RidgeGate Station, bus would have nearly a 2/3-share at the Lone Tree City Center Station, and almost all patrons would access the Sky Ridge Station by bicycle or on foot.

**TABLE 4.2-4: STATION MODE OF ACCESS: BUILD ALTERNATIVE, 2035 AVERAGE WEEKDAY**

Station	Drive	Bus	Walk/Bike
RidgeGate Parkway	92%	5%	3%
Lone Tree City Center	0%	62%	38%
Sky Ridge	0%	1%	99%
Lincoln	33%	51%	16%

Source: RTD 2035 Travel Demand Model.

#### 4.2.4 Parking Supply

Table 4.2-5 shows the anticipated changes in park-n-Ride supply in the study area. Currently, the Lincoln Station park-n-Ride is the only such facility in the immediate study area of the Southeast Corridor Extension. Utilization there is trending upward, reaching 64 percent of capacity in September 2008 and averaging 50 percent over the previous year. The No Action Alternative would not supply new parking in the study area.

**TABLE 4.2-5: PARK-AND-RIDE SUPPLY IN THE SOUTHEAST CORRIDOR**

Park-and-Ride	Existing Condition (2008)	Build Alternative (2015)	No Action Alternative (2035)	Build Alternative (2035)
<b>Southeast Corridor Line</b>				
RidgeGate Parkway	0	2,000	0	2,000
Lone Tree City Center	0	No Change	No Change	No Change
Sky Ridge	0	No Change	No Change	No Change
Lincoln	1,734	No Change	No Change	No Change
<b>Connecting Buses</b>				
Highlands Ranch Town Center	177	No Change	No Change	No Change
Parker	173	No Change	No Change	No Change
Lincoln/Jordan	102	No Change	No Change	No Change

Source: RTD 2008 Data.

The Build Alternative would add 2,000 additional parking spaces at the RidgeGate Avenue park-n-Ride, which would intercept most transit patrons from the Lone Tree's RidgeGate Planned Development and those patrons traveling from northbound I-25. The Build Alternative's additional parking supply also relieves future parking demand at Lincoln Station.

#### 4.2.5 Travel Times

Travel times from the I-25/RidgeGate Parkway interchange to Denver Union Station were forecast for the year 2035. Automobile and transit travel times are calculated under the No Action and Build Alternative in the morning peak hour and peak direction. These travel times point to the relative attractiveness and viability of a given mode. The results presented in Table 4.2-6 confirm that worsening congestion along the region's major highways increasingly will

render transit the more efficient mode. Whereas a trip to Denver Union Station in 2035 would take a driver 64 minutes, riding light rail would reduce the trip time by 20 minutes (31 percent).

**TABLE 4.2-6: TRAVEL TIME DURING MORNING PEAK HOUR, 2035 AVERAGE WEEKDAY**

Mode	I-25/RidgeGate Parkway to Denver Union Station (Minutes)		
	2005	No Action Alternative (2035)	Build Alternative (2035)
Auto	36	64	64
Transit	62	58	44

Source: RTD 2035 Travel Demand Model.

### 4.3 TRAFFIC

The traffic impact of an alternative presents itself locally, at intersections and arterial streets, and regionally, on the major highway corridors. This section reports on local and regional travel demand resulting from each alternative and its predicted effect on roadway congestion levels and local traffic operations, specifically near new transit stations.

#### 4.3.1 Existing Roadway Conditions

The study corridor, as shown in Figure 1.1-1 in Chapter 1, parallels Interstate 25 (I-25) from the existing end-of-line station at Lincoln to south of the new RidgeGate interchange at I-25 mile post 192. This approximately 1.5-mile stretch of I-25 has experienced increased use as Lone Tree, Castle Rock and other southern communities expand. Table 1-2 in Chapter 1 indicates that congestion is projected to increase substantially along I-25 by 2035. The percentage of peak travel time spent in delays was 11 percent in 2006 and is projected to reach 54 percent by 2035. The total daily vehicle delay in 2035 is forecast to be over 34,000 hours, a 16-fold increase over 2006. These projections assume that the Southeast Corridor Extension is in place. Even more heavily congested conditions can be expected under the No Action Alternative.

Much of the local roadway network in the study corridor is yet to be constructed. Presently, Lincoln Avenue and Park Meadows Drive are the principal roadways in the area. Park Meadows Drive provides access to Lincoln Station and the accompanying mixed-use developments from Lincoln Avenue north to Yosemite Street.

Lincoln Avenue is the major east/west arterial providing Interstate access for the Lone Tree community, the Meridian Business Park, and the town of Parker. Backups are recurring at the Lincoln Avenue interchange, and the facility is anticipated to undergo various capacity improvements.

#### 4.3.2 Vehicle Miles of Travel and Vehicle Hours of Travel

Two important measures of travel demand and congestion are vehicle miles traveled (VMT) and vehicle hours traveled (VHT), which are assessed both at the corridor and regional levels. Increasing VMT indicates more miles are driven on area roadways, potentially resulting in

increased traffic problems and pollution. VMT is impacted by several factors including changes in land use, population, employment, and available transportation alternatives.

Correspondingly, VHT measures the amount of time vehicles spend on area roadways. This measure more closely tracks congestion levels, as increasing travel times for the same travel patterns point to worsening traffic conditions. Increasing VHT generally corresponds to more travel delay, slower travel speeds and increased emissions.

The added transit capacity and access of the Build Alternative relieves some travel demand for strained area roadways. The regional and corridor projections for weekday VMT and VHT, reported in Table 4.3-1, show moderate reductions in both measures under the Build Alternative. In the Southeast Corridor, VMT would be reduced by 16,200 miles and VHT would be reduced by nearly 3,000 hours compared to the No Action Alternative. The regional differences in VMT and VHT are slight, which is expected given the relative scale of the Southeast Corridor Extension project.

**TABLE 4.3-1: VMT AND VHT IN THE CORRIDOR AND REGION, 2035 AVERAGE WEEKDAY**

Measure	Region			Southeast Corridor		
	No Action Alternative 2035	Build Alternative 2035	Difference	No Action Alternative 2035	Build Alternative 2035	Difference
VMT	127,162,929	127,055,472	(107,458)	3,595,278	3,579,077	(16,201)
VHT	4,283,691	4,270,227	(13,464)	172,828	169,887	(2,941)

Source: RTD 2035 Travel Demand Model.

### 4.3.3 Station Area Impacts and Mitigation

Station area impacts are described below in terms of roadway intersections and parking demand.

#### 4.3.3.1 Traffic Impacts Methodology

Future traffic impacts are evaluated at intersections interfacing directly with and in the vicinity of proposed stations. Traffic generation in the study area is influenced by transit readership, parking space availability, and mode of access to the station. Both morning and afternoon (AM and PM) peak hour traffic volumes were calculated for roadways in the 2015 and 2035 analysis years. These volumes were derived from approved DRCOG regional travel demand models.

The study area intersections underwent a capacity analysis to quantify how well they process forecast traffic. Synchro© Version 7 software analyzed all study area intersections according to methods put forth by the Transportation Research Board’s *Highway Capacity Manual* (TRB, 2000). This software is for modeling, optimizing, managing, and simulating traffic systems, and it is an industry standard for assessing intersection operations.

Intersection operations are rated by Level of Service (LOS) that ranges from A to F, characterizing the operational conditions of the traffic flow (Table 4.3-2). LOS A represents the best operating condition, where vehicles experience little to no delay. LOS F is a “failing grade”,

with high congestion and delays. Typically LOS D is considered the minimum acceptable level appropriate for an urban setting.

**TABLE 4.3-2: LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS**

Level of Service (LOS)	Average Delay (Seconds Per Vehicle)		Description <sup>1</sup>
	Signalized Intersection	Unsignalized Intersection	
A	≤ 10	≤ 10	Very low delay; most vehicles do not stop at all.
B	> 10 and ≤ 20	> 10 and ≤ 15	More vehicles stop than with LOS A, increasing average delay.
C	> 20 and ≤ 35	> 15 and ≤ 25	The number of vehicles stopping is significant; however, many still pass through the intersection without stopping.
D	> 35 and ≤ 55	> 25 and ≤ 35	Congestion is readily apparent with many vehicles stopping and individual cycle failures are noticeable (i.e., not all vehicles waiting at the intersection get through on first green indication).
E	> 55 and ≤ 80	> 35 and ≤ 50	Frequent cycle failures occur.
F	> 80	> 50	Unacceptable operations, which include many cycle failures caused by arrival flow rates exceeding intersection capacity.

Source: Transportation Research Board Highway Capacity Manual (TRB, 2000).

Note: 1. Descriptions specifically address signalized intersections.

RTD FasTracks policy calls for mitigation measures to be implemented at intersections that fall below LOS D. If the No Action LOS is already below LOS D, then any increase in overall intersection delay, greater than ten percent, would be considered an adverse effect. Mitigation measures in this case would improve delay to match that of the No Action condition.

#### 4.3.3.2 Traffic Impacts and Mitigation

The 2035 forecast for overall LOS and delay at station area intersections are presented in Table 4.3-3. The table reveals that a number of intersections and movements will operate at unsatisfactory levels throughout the study area, except along the Frontage Road at the access points to RidgeGate Station. Generally the Build Alternative does not result in worse congestion than the No Action Alternative for 2035; however, for three locations the increase in delay is greater than 10 percent over the No Build Alternative. These impacts are not associated with a particular station in the Southeast Corridor Extension. All impacts should be revisited during final design to accommodate uncertain development schedules associated with adjacent properties. At this time, the schedule for build out of the Coventry Development Corporation, including the City Center and areas adjacent to the RidgeGate Station is uncertain. Typically station generated traffic can be mitigated through the addition of turn lanes, lengthening turn lanes (increasing storage) and/or adding signals; however, solutions for congestion in the study

area should be determined in conjunction with the implementation of development plans. Local street improvements associated with adjacent developments would be the responsibility of the local jurisdiction and the developer.

**TABLE 4.3-3: LEVEL OF SERVICE AT STATION AREA INTERSECTIONS**

Intersection (all signalized)	2035 AM Peak Hour				2035 PM Peak Hour			
	No-Action		Build		No-Action		Build	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Yosemite St / Lincoln Ave <i>After Mitigation</i>	F	91	F	97	F	123	F	140
			E	70			F	109
Park Meadows / Lincoln Ave	F	289	F	240	F	388	F	377
Lincoln Ave / I-25 SB Off-Ramp	F	242	F	202	F	236	F	201
Lincoln Ave / I-25 NB Off-Ramp	F	137	D	55	F	84	D	39
RidgeGate Pkwy / I-25 SB Off-Ramp	F	112	F	105	F	89	F	87
RidgeGate Pkwy / I-25 NB Off-Ramp <i>After Mitigation</i>	F	163	F	457	C	31	D	48
			D	54			D	45
RidgeGate Pkwy / Frontage Rd <i>After Mitigation</i>	F	235	F	248	F	140	F	306
			F	242			F	115
Frontage Rd / RidgeGate: NE Access	-	-	B	10	-	-	B	30
Frontage Rd / RidgeGate: SW Access	-	-	B	11	-	-	B	18

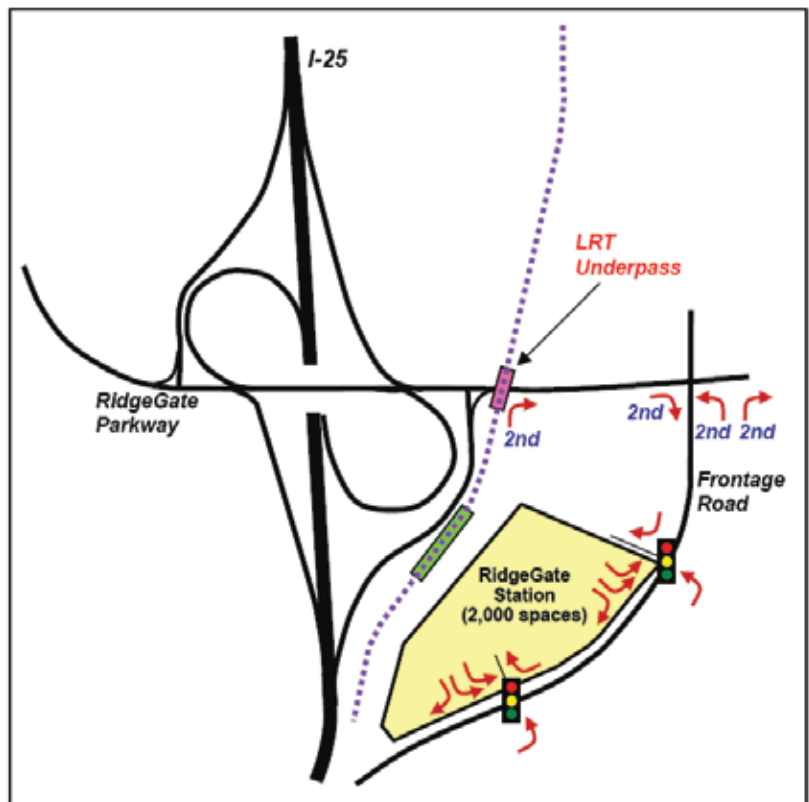
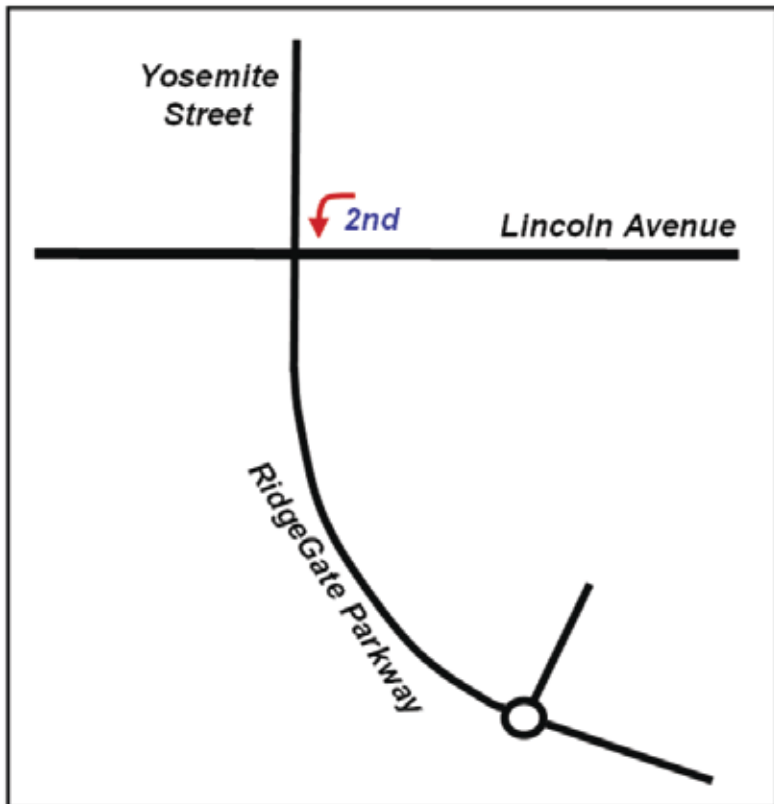
Source: Southwest Corridor Extension Project Team, 2009; RTD 2035 Travel Demand Model.

Notes: Yellow highlights indicate locations where LOS F delays for the Build exceed the No Action by >10 percent.

Proposed mitigation measures for the three locations noted on Table 4.3-3 where LOS F delays for the Build Alternative exceed the No Action by more than 10 percent are:

- Second westbound turn lane at Lincoln Avenue and Yosemite Street;
- Second free-flow northbound right turn lane at RidgeGate Parkway and the I-25 northbound off ramp; and
- Second eastbound right turn lane, second northbound left turn lane and second northbound right turn lane at RidgeGate Parkway and the Frontage Road.

Figure 4.3-1 illustrates the geometric and traffic control mitigation proposed for these three locations.



- Southeast Light Rail Extension
- Underpass
- New Traffic Signal
- Station Platform
- New Stop Sign Control
- 2015 Lane Improvements

**Figure 4.3-1**  
**Geometric and Traffic**  
**Control Improvements**  
**2015**



The following discussion summarizes the general traffic operations for the Build Alternative and proposed mitigation measures in the vicinity of the proposed stations, where applicable. Local street improvements associated with adjacent developments would be the responsibility of the local jurisdiction and the developer.

### **Sky Ridge Station**

The Sky Ridge Station would be positioned just north of Sky Ridge Avenue, across from the Sky Ridge Medical Center. Except for the medical center, development in the area is ongoing or planned. Patrons would access the Sky Ridge Station primarily by foot and bus. The local street system is not completed in this area. As a result, no station impact analysis has been conducted at this time.

### **City Center Station**

The Lone Tree City Center Station would be situated in the core of RidgeGate Planned Development, an intensely developed, mixed-use area where building heights can reach 30 stories. The station will be integrated into this urban fabric. Patrons would access the City Center Station primarily by foot and bus. The station design would provide for ample bicycle parking and ease of access for pedestrians in all directions. A detailed station plan for the Lone Tree City Center Station will be devised as development plans mature for City Center. There is no local street system in place east of I-25 in this area. As a result, no station impact analysis has been conducted at this time.

### **RidgeGate Station**

The RidgeGate Station and park-n-Ride would be located southeast of the RidgeGate and I-25 interchange. Access to the station would be provided at two access points along the Frontage Road. The 2,000-space park-n-Ride would be implemented for opening year, 2015. Both access points are expected to operate at LOS B through 2035. Figure 4.3-1 illustrates the geometric and traffic control improvements related to the location of the RidgeGate Station. Improvements associated with the new station accesses include:

- Signalized intersections at both Frontage Road station access points;
- Right turn lane on the Frontage Road at both station access points;
- Left turn lane on the Frontage Road at both station access points; and
- Double left turn lanes and single right turn lanes from the station to the Frontage Road at both access locations.

Table 4.3-4 contains a summary of potential traffic impacts and proposed mitigation measures.

**TABLE 4.3-4: TRAFFIC – SUMMARY OF IMPACTS AND MITIGATION**

Summary of Potential Impacts	Proposed Mitigation
<b>Direct Impacts</b> <ul style="list-style-type: none"> <li>▪ LOS degradations at three area intersections</li> </ul>	<ul style="list-style-type: none"> <li>▪ Implement second westbound turn lane at Lincoln Avenue and Yosemite Street</li> <li>▪ Implement second free-flow northbound right turn lane at RidgeGate Parkway and the I-25 northbound off ramp.</li> <li>▪ Implement second northbound left turn lane and third eastbound and westbound thru lanes at RidgeGate Parkway and the Frontage Road</li> </ul>
<b>Indirect Impacts</b> <ul style="list-style-type: none"> <li>▪ No impacts</li> </ul>	<ul style="list-style-type: none"> <li>▪ No mitigation needed</li> </ul>
<b>Construction Impacts</b> <ul style="list-style-type: none"> <li>▪ Temporary construction easements may be needed to gain access to the dedicated right-of-way. Any adjacent property used during construction activities will be returned to its original condition once construction is completed.</li> <li>▪ Grade separated crossing of I-25</li> </ul>	<ul style="list-style-type: none"> <li>▪ RTD will develop a traffic control plan in coordination with CDOT and public service agencies</li> <li>▪ RTD will coordinate with FHWA and CDOT regarding permits needed construct a new bridge over I-25</li> <li>▪ Any lane closures on the interstate during construction will be coordinated with CDOT and included in appropriate plans</li> </ul>
<b>Cumulative Impacts</b> <ul style="list-style-type: none"> <li>▪ No Impacts</li> </ul>	<ul style="list-style-type: none"> <li>▪ No mitigation needed</li> </ul>

#### 4.3.3.3 Parking Demand and Mitigation

The FasTracks Plan (RTD, 2004) estimated and budgeted for 2,000 surface parking spaces at RidgeGate Station. By 2035, modeling indicates an additional parking demand of 500 for a total of 2,500 spaces. Subsequent to the opening of the Southeast Corridor Extension and the RidgeGate park-n-Ride, RTD will monitor the station area parking demand and work with Douglas County, Coventry Development Corporation, and other stakeholders to identify parking strategies to meet the excess demand

To mitigate potential issues associated with the demand for an additional 500 spaces, the following strategies are identified.

- Monitor parking demand through specific counts or visual inspections to determine when the capacity is reached and to what extent added parking is needed.
- Provide user education through advertisement and media as appropriate to include other modes such as carpooling, bus transit, bicycle and walking as a means of station access.
- Analyze adjacent properties for additional parking options, including potential for shared parking agreements.
- Apply RTD parking management procedures for full lots.

#### **4.3.3.4 Grade Crossings**

The Southeast Corridor Extension will cross a number of roadways along the 2.3-mile extension, ranging from major freeways (I-25) to local streets yet to be constructed within the RidgeGate Planned Development. At all four major road crossings, the light rail alignment will be grade-separated; the extension includes bridges over Lincoln Avenue, I-25 and Sky Ridge Avenue and an underpass for RidgeGate Parkway.

The at-grade crossing treatments along the alignment will vary according to the type of roadway crossed and the context of the surrounding built environment. Crossing treatment recommendations consider maximum light rail train speed, roadway traffic speed and traffic volumes; and they are based on guidelines in the Manual of Uniform Traffic Control Devices (MUTCD) (FHWA, 2003). In accordance with the RTD Light Rail Design Criteria, each at-grade crossing shall include automatic gates, LED flashing lights, bells, signs, approach and island track circuits, emergency batteries and associated circuitry, cabling and cases as required.

In the Build Alternative, the at-grade crossing immediately east of the Sky Ridge Station will be equipped with the crossing treatments specified in the RTD Light Rail Design Criteria and required by the MUTCD for situations where train speeds are less than 25 mph. Recommendations for the remainder of the at-grade crossings along the Southeast Corridor Extension, all of which reside within Lone Tree's RidgeGate Planned Development on the east side of I-25, will be made as development plans mature.

The Colorado Public Utilities Commission (PUC) has jurisdiction to determine all public highway-rail crossing matters, including the proper location of crossings and the proper safety measures implemented. The PUC is not bound by the grade crossing recommendations made in this Environmental Evaluation and may order a different number and/or configuration of the crossings than those proposed once the applications for these crossings have been filed.

## **4.4 PEDESTRIAN AND BICYCLE FACILITIES**

The Southeast Corridor study area comprises predominantly undeveloped land and does not traverse any pedestrian or bicycle facilities. Sidewalks line Lincoln Avenue west of I-25, but they do not cross into the immediate impact area.

The No Action Alternative would not present impacts to pedestrian and bicycle facilities, nor would it impart any improvements to the system.

The Build Alternative would improve pedestrian and bicycle facilities by way of the three new light rail stations. The station design would accommodate bicycle access with designated bicycle parking. Pedestrian pathways would lead from the station area to the adjacent developments and sidewalk network. These amenities would encourage greater numbers of bicycle and pedestrian trips to the station from the surrounding community.