

existing count volumes are shown on
Figures 3-7a and **3-7b**.

Daily traffic volumes on C-470 range from approximately 60,000 vehicles per day east of Kipling Parkway to 104,000 vehicles per day west of Yosemite Street. The predominant traffic volumes are observed traveling eastbound during the morning peak hour and westbound during the evening peak hour.

Travelers on C-470 currently experience congestion and delay during peak travel periods. Travel times are unreliable as they can vary greatly throughout the day and from day to day. These conditions form the basis for this study's purpose and need, as discussed in **Chapter 1** of this EA. The following sections describe the traffic characteristics that contribute to the congestion, delay, and reliability problems on C-470.

Existing traffic operations were analyzed to characterize the level of current deficiencies on C-470 and to provide a baseline for assessing future traffic operations. The operations analyzed include freeway, interchange, and intersection level of service (LOS).

Freeway

Freeway traffic operations are expressed in terms LOS, as defined by the *2000 Highway Capacity Manual* (HCM). Operational LOS is a congestion measure used to describe service quality and is related to the density of the traffic stream. Free-flow conditions with no restrictions are described as LOS A. LOS B through D conditions demonstrate progressively worse traffic conditions. LOS F represents a breakdown in traffic flow, characterized by the familiar traffic jam.

The entire section of C-470 between Wadsworth Boulevard and I-25 generally operates at LOS E/F in both directions during the AM and PM peak hours. However, from Ken Caryl Avenue to Wadsworth Boulevard, C-470 generally operates at LOS C or better during the peak hours.

Given the high level of congestion during peak hours, and increasingly during off-peak hours as well, traffic flow conditions frequently break down to LOS F conditions.

Interchanges and Arterial Intersections

Interchange ramp terminals and arterial intersection operations in the project area were evaluated using existing signal timing and current intersection geometry.

Results of the existing intersection operational analysis are presented in **Table 3-13**. The results show that all of the project area intersections currently operate at an acceptable LOS (LOS D or better for urban conditions) during the peak hours, with the exception of a few intersections along County Line Road, Santa Fe Drive, and Quebec Street. Vehicle queue at closely spaced intersections were observed during field observations. Queues that extend the entire distance between two intersections can temporarily worsen the operations.

Peak Hour Directional Variations

Existing hourly traffic volumes on C-470 west of Yosemite Street are shown in **Figure 3-8**. AM traffic volumes are the highest between 8:00 and 9:00, with the highest PM volumes occurring between 5:00 and 6:00.

Travel Time

Travel times were collected to determine current weekday peak and off-peak travel times on C-470. **Table 3-14** summarizes existing travel times and delay in the peak and off-peak periods.

Vehicle Classification

Vehicle classification data was collected during the peak hours in the summer of 2003. As shown in **Table 3-15**, truck traffic within the project area composes less than four percent of the total traffic during the AM and PM peak hours, while bus traffic composes less than one percent.

**Table 3-13
Existing (2003) Peak Hour Intersection LOS and Delay**

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Average Delay (seconds)	LOS	Average Delay (seconds)
Ken Caryl Avenue/West Ramps	B	19.1	C	24.9
Ken Caryl Avenue/East Ramps	B	10.3	B	10.6
Ken Caryl Avenue/Simms Street	B	18.3	B	19.3
Ken Caryl Avenue/Kipling Parkway	C	29.8	D	36.3
Chatfield Avenue/Kipling Parkway	B	19.7	C	32.8
Kipling Parkway/North Ramps	A	8.6	C	26.6
Kipling Parkway/South Ramps	B	16.2	C	26.7
Ken Caryl Avenue/Wadsworth Boulevard	C	27.4	C	33.8
Chatfield Avenue/Wadsworth Boulevard	C	30.5	D	39.1
Wadsworth Boulevard/North Ramps	C	30.5	D	46.4
Wadsworth Boulevard/South Ramps	C	26.9	C	23.5
Ken Caryl Avenue/Pierce Street	C	22.8	C	25.1
Chatfield Avenue/Pierce Street	B	13.1	B	12.8
Ken Caryl Avenue/Platte Canyon Drive	C	33.5	C	24.4
Santa Fe Drive/Mineral Avenue	E	66.7	F	91.0
Santa Fe Drive/County Line Road	F	>100.0	F	>100.0
Santa Fe Drive/North Ramps	B	13.8	C	30.3
Santa Fe Drive/South Ramps	D	40.8	D	52.7
Santa Fe Drive/Blakeland Drive	C	22.7	B	16.6
Santa Fe Drive/Town Center Drive	B	19.5	C	20.9
Santa Fe Drive/Highlands Ranch Parkway	B	18.2	D	42.8
Lucent Boulevard/County Line Road	A	7.2	B	13.6
Lucent Boulevard/North Ramps	B	15.1	C	22.4
Lucent Boulevard/South Ramps	A	6.4	B	14.2
Lucent Boulevard/Plaza Drive	D	51.5	D	38.2
Lucent Boulevard/Town Center Drive	B	17.5	C	22.8
Lucent Boulevard/Highlands Ranch Parkway	C	25.1	C	23.1
Broadway/Dry Creek Road	B	10.9	C	24.4
Broadway/Mineral Avenue	C	27.2	C	33.3

Table 3-13
Existing (2003) Peak Hour Intersection LOS and Delay (continued)

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Average Delay (seconds)	LOS	Average Delay (seconds)
Broadway/County Line Road	C	24.2	D	49.1
Broadway/North Ramps	B	17.7	B	15.9
Broadway/South Ramps	B	11.7	C	24.5
Broadway/Dad Clark Drive	C	28.0	C	25.5
Broadway/Plaza Drive	C	23.0	C	23.1
Broadway/Highlands Ranch Parkway	C	31.6	C	33.8
University Boulevard/Dry Creek Road	C	30.3	D	43.2
University Boulevard/County Line Road	C	29.4	D	51.5
University Boulevard/North Ramps	D	36.2	C	25.2
University Boulevard/South Ramps	B	18.7	C	31.1
University Boulevard/Dad Clark Drive	B	13.2	B	18.9
University Boulevard/ Highlands Ranch Parkway	D	36.6	D	44.6
Colorado Boulevard/Dry Creek Road	C	24.2	D	37.2
Colorado Boulevard/County Line Road	C	30.5	D	43.2
Holly Street/Dry Creek Road	C	30.5	C	33.3
Holly Street/County Line Road	C	31.8	E	74.0
Quebec Street/Dry Creek Road	D	33.1	E	69.2
Quebec Street/County Line Road	C	34.4	E	60.6
Quebec Street/North Ramps	C	21.1	C	27.1
Quebec Street/South Ramps	C	23.0	C	23.7
Quebec Street/Park Meadows Drive	C	39.6	C	34.2
Quebec Street/Lincoln Avenue	C	34.7	E	76.0
Yosemite Street/Dry Creek Road	C	21.3	D	38.6
Yosemite Street/County Line Road	C	32.5	D	36.1
Yosemite Street/North Ramps	B	13.1	C	20.7
Yosemite Street/South Ramps	B	14.7	B	14.7
Yosemite Street/Park Meadows Drive	C	20.6	C	24.0
Yosemite Street/Lincoln Avenue	C	22.4	C	28.6

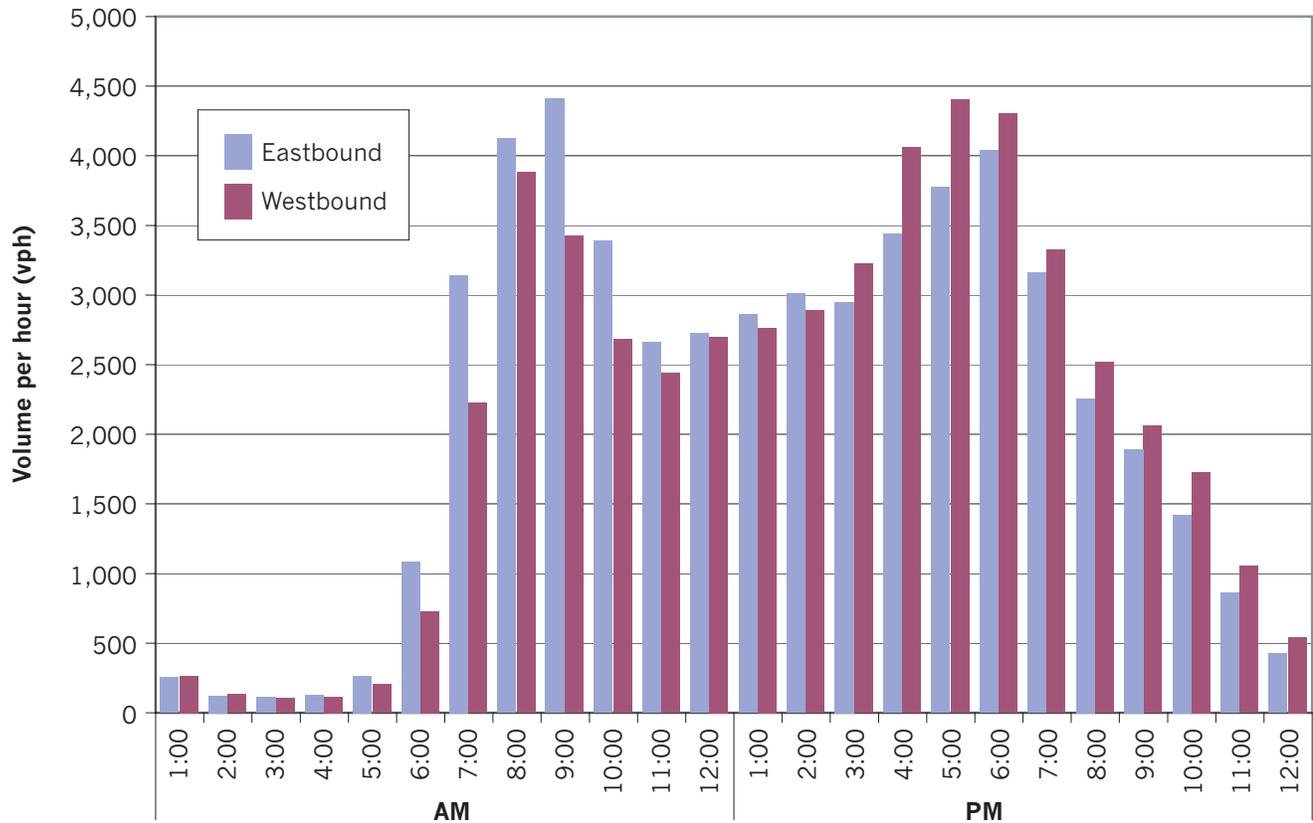
Table 3-14
Existing (2003) Travel Time and Delay

		Average Travel Time (Minutes)		Average Delay (Minutes)	
		Eastbound	Westbound	Eastbound	Westbound
Existing	AM Peak Hour	24-25	19-20	11	6
	PM Peak Hour	19-20	30-32	6	18
	Off-Peak	13-14	13-14	N/A	N/A

Table 3-15
Existing (2003) Heavy Vehicle Percentages

Vehicle Type	AM Peak Hour		PM Peak Hour	
	Eastbound	Westbound	Eastbound	Westbound
Truck	3.2%	2.5%	0.7%	1.9%
Bus	0.1%	0.1%	0.4%	0.1%

Figure 3-8
Existing (2003) Hourly Traffic Volumes
(West of Yosemite Street)



1 Accident History

2 An accident history analysis was conducted for
 3 approximately 16 miles of C-470 from the Ken
 4 Caryl Avenue interchange to the I-25 inter-
 5 change. The entire safety study can be found in
 6 the *Safety Chapter for the C-470 Corridor*
 7 *Environmental Assessment* (March 2005). The
 8 study evaluated accident history on C-470
 9 between January 1, 2000, and December 31, 2002.
 10 This section of C-470 is classified as a Federal
 11 Aid Primary urban expressway. Approximately
 12 1,565 accidents occurred within the project area
 13 during the three-year study period. Accidents on
 14 the cross streets and interchange ramps within
 15 the project area are included in this total.
 16 Accidents of the property-damage-only category
 17 composed 1,140 of the total accidents, or 73
 18 percent, while 417 accidents (27 percent)
 19 involved injuries. One-half percent of all
 20 accidents during this period were
 21 fatal. **Figures 3-9** and **3-10** show accident types
 22 and proportions identified over the three-year
 23 study period. **Figure 3-9** presents the distribution
 24 profile by accident type for mainline C-470,
 25 while **Figure 3-10** shows the types of accidents
 26 occurring on interchange cross streets and
 27 ramps.

28
 29 Rear-end collisions are the predominant accident
 30 type on both the mainline and interchange
 31 locations in the project area. Collisions of this
 32 type typically imply the existence of congested
 33 traffic resulting from capacity limitations on the
 34 existing highway. The higher portion of
 35 approach turn and broadside-type accidents also
 36 reflect intersection-related conflicts associated
 37 with ramp intersections at interchanges.

38
 39 Most mainline sections of C-470 operate with
 40 better than expected safety performance when
 41 compared with similar facilities throughout the
 42 state. Closer review indicates that short sections
 43 near the Santa Fe Drive and Lucent Boulevard
 44 interchanges exhibit recent total accident
 45 frequency levels which are slightly worse than
 46 expected for this type of highway. Analysis of
 47 accident data for injury and fatal accidents indi-
 48 cates that the majority of the corridor operates

51 with lower-than-expected accident frequen-
 52 cy when compared with similar facilities around
 53 the state. Highway sections near the Santa Fe
 54 Drive and Lucent Boulevard interchanges
 55 experience higher than expected injury and
 56 fatality-related crashes.

57
 58 Interchange accidents along the Corridor can
 59 similarly be attributed to congestion and
 60 backups during periods of high traffic volumes.
 61 The following interchanges are worthy of noting
 62 because they experience higher than expected
 63 crashes:

- 64
 65 ■ Santa Fe Drive – Approximately 158
 66 accidents occurred in the immediate inter-
 67 change vicinity on Santa Fe Drive and on
 68 the entrance/exit ramps to C-470. Rear-end
 69 and approach turn collisions together
 70 made up nearly 75 percent of these
 71 crashes. At the signalized ramp inter-
 72 section on the north side of the bridge
 73 structure, over half of the accidents were
 74 approach turns. These crashes involved
 75 northbound vehicles on Santa Fe turning
 76 left onto the westbound C-470 entrance
 77 ramp colliding with southbound Santa Fe
 78 traffic. The frequency of these accidents is
 79 increased by periodic volume congestion
 80 and the limited storage capacity of the
 81 current northbound to westbound left turn
 82 lane configuration

83
 84 The south ramp intersection includes a
 85 double left turn lane for vehicles making
 86 the southbound to eastbound turn
 87 movement. This movement requires
 88 drivers to execute a turn through more
 89 than 90 degrees due to interchange skew.
 90 Approximately eleven same-direction
 91 sideswipe accidents are noted in these
 92 lanes. Ensuring that durable pavement
 93 markings are used and maintained for the
 94 turn lane stripe extensions into the inter-
 95 section can help mitigate this type of
 96 accident

Figure 3-9
C-470 Mainline Highway Accident Type Distribution
 January 1, 2000 to December 31, 2002

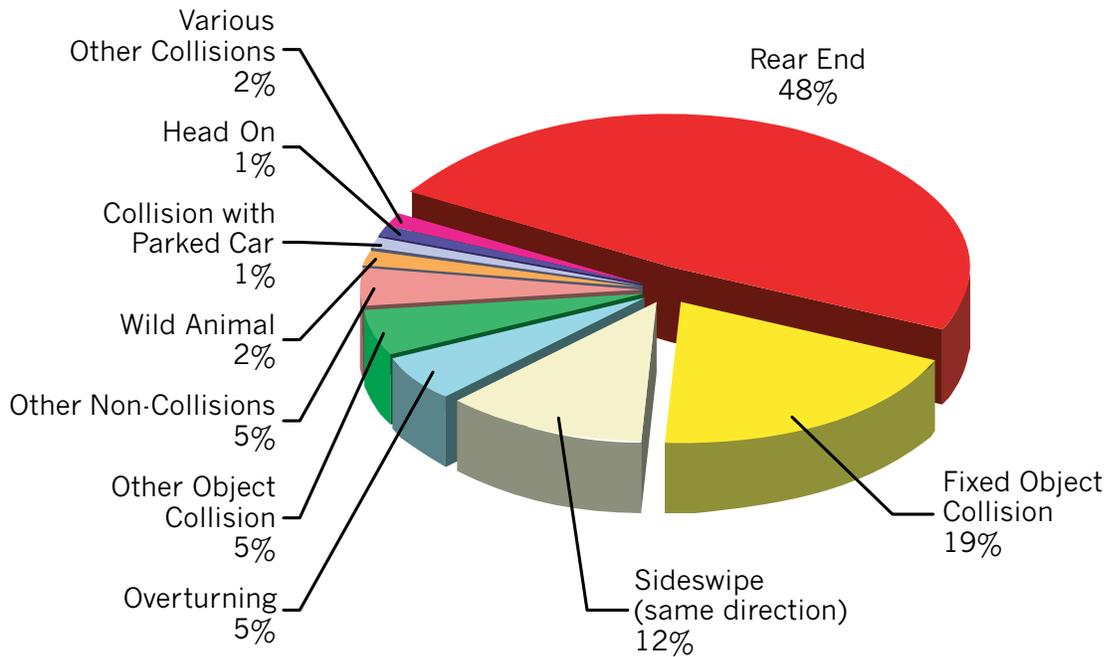
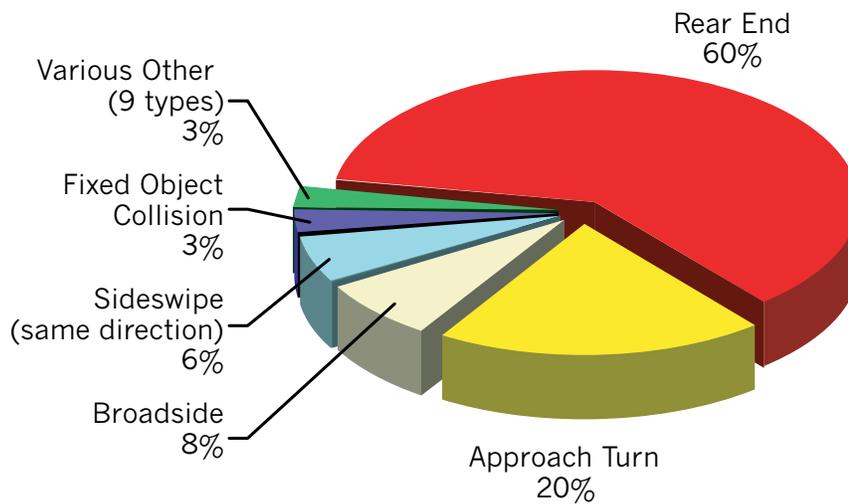


Figure 3-10
C-470 Interchange Accident Type Distribution
 January 1, 2000 to December 31, 2002

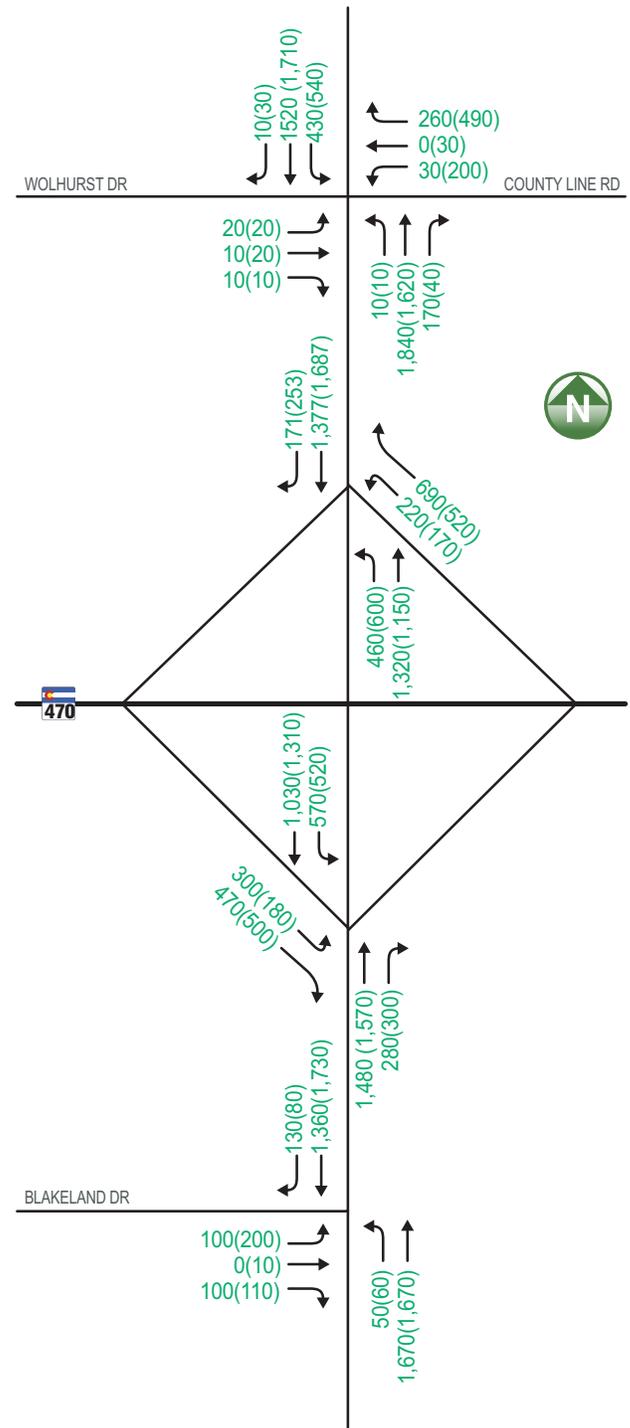


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- 1 ■ Lucent Boulevard – 47 crashes occurred on
2 Lucent Boulevard and the ramps during
3 the three year study period. Of these, 45
4 percent were approach turn collisions and
5 19 percent were rear end collisions. An
6 elevated frequency of approach turn collisions
7 was noted at the north ramp inter-
8 section
- 9
- 10 ■ Broadway – 233 accidents occurred at the
11 Broadway interchange during the study
12 period. Of these, 24 percent were approach
13 turn collisions. Both north and south ramp
14 intersections exhibited these collisions.
15 Rear end collisions occurred with moderate
16 frequency (55 percent) in the channelized
17 right turn lanes from the freeway off-ramps
18 to north- and southbound Broadway
- 19
- 20 ■ University Boulevard – over 150 accidents
21 occurred in the University Boulevard inter-
22 change area during the study period. Of
23 these, 69 percent were rear end collisions
24 and 18 percent were approach turn colli-
25 sions. Approach turn collisions were
26 prevalent at the north ramp intersection,
27 and rear end collisions were predominant
28 in the channelized right turn lanes from the
29 westbound freeway off-ramps to north-
30 bound University Boulevard
- 31
- 32 ■ Quebec Street – 295 accidents occurred
33 during the study period, of which 72
34 percent were rear ends and 18 percent were
35 approach turn collisions. The north ramp
36 intersection had a high approach turn
37 collision frequency involving northbound
38 vehicles on Quebec Street turning left. At
39 both north and south ramp intersections,
40 numerous rear end collisions occurred in
41 the channelized right turn lanes. A high
42 number of rear end crashes also occurred
43 along Quebec Street itself. Periodic
44 congestion may be a contributing factor to
45 this condition
- 46
- 47 ■ Yosemite Street – this location did not
48 exhibit unusual accident frequency, with
- 49

Figure 3-11
Existing (2003) Santa Fe Drive
Traffic Volumes



Legend

XXX(XXX) 2025 AM (PM) Peak Hour Traffic Volumes

Source: 2003 traffic counts

51 collisions during the study period. Rear end collisions were most common, accounting for 50 percent of the total, followed by approach turn crashes at 25 percent of the total. Most of the approach turn collisions take place at the north ramp intersection

Santa Fe Drive Interchange Operations

Santa Fe Drive carries a significant volume of traffic into the Denver metropolitan area. Its interchange with C-470 is an important connector that warrants deeper study, especially due to its higher levels of congestion and accident history.

TRAFFIC VOLUMES AND OPERATIONS.

Santa Fe Drive is a regional facility that extends from downtown Denver south to the Town of Castle Rock. In the vicinity of C-470, Santa Fe Drive is a four-lane facility, currently carrying between 35,000 and 40,000 vehicles per day.

Existing peak hour traffic counts were collected at the Santa Fe Drive interchange and at the County Line Road and Blakeland Drive intersections with Santa Fe Drive.

Figure 3-11 shows traffic counts collected in the vicinity of the Santa Fe Drive interchange.

Peak hour operations for intersections in the Santa Fe Drive interchange area are shown

in Table 3-16. The analysis shows that current LOS at the interchange ramp intersections and at the Blakeland Drive/Santa Fe Drive intersection are at LOS C or better. LOS F was calculated for the Santa Fe Drive/County Line Road intersection for the peak hours.

I-25 Interchange Operations

The I-25 interchange operates at an acceptable level of service, with a few exceptions including the northbound I-25 to westbound C-470 ramp and mainline I-25 between the C-470 /E-470 and Lincoln Avenue interchanges. The northbound I-25 to westbound C-470 ramp is a left-hand side merge that ends in a lane drop, which leads to slower operating speeds and safety concerns on C-470. In addition, traffic must weave onto I-25 between C-470 and Lincoln in the northbound and southbound directions due to lane drops at the Lincoln and C-470/E-470 interchanges, which lead to slower operating speeds and reduced safety on I-25.

3.3.1.2 Environmental Consequences

The DRCOG regional travel demand model, calibrated with existing peak hour traffic counts on C-470 and the adjacent arterial streets, was used to develop 2025 peak hour traffic forecasts for all three alternatives considered in the EA.

An AIMSUN micro-simulation model was then used for refined traffic forecasting and alternatives analysis for the three alternatives. Year 2025

**Table 3-16
Existing (2003) Santa Fe Drive Intersection Delay and Level of Service**

Intersection	AM Peak Hour		PM Peak Hour	
	Average Delay (seconds)	LOS	Average Delay (seconds)	LOS
Santa Fe Drive and C-470 eastbound	32.5	C*	24.4	C
Santa Fe Drive and C-470 westbound	22.9	C*	22.6	C*
Santa Fe Drive and County Line Road	>100	F*	>100	F*
Santa Fe Drive and Blakeland Drive	22.7	C*	16.6	B

* LOS represents operations assuming each intersection is isolated. These intersections are routinely affected by excessive left turn and through queues from adjacent intersections resulting in poorer operations than indicated



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1 traffic volume projections from the regional
2 travel demand model were incorporated into the
3 micro-simulation model for the project area to
4 produce refined forecasts.

5
6 The 2025 No-Action and build alternatives'
7 networks for the project area included existing
8 roadway facilities plus committed projects on
9 fiscally constrained regional transportation plans
10 within the project area. These plans include:

- 11
12 ■ *Denver Regional Council of Governments*
13 *2025 Fiscally Constrained Regional Transpor-*
14 *tation Plan* (April 2002)
- 15
16 ■ *Douglas County 2020 Transportation Plan*
17 *(April 2004)*
- 18
19 ■ *US 85 Access Management Plan, South I-25*
20 *Corridor and US 85 Corridor Environmental*
21 *Impact Statement* (March 2001)
- 22
23 ■ *County Line Road, I-25 to Santa Fe Drive EA*
24 *and Section 4(f) Evaluation* (1998)
- 25
26 ■ *Douglas County Capital Improvement Projects*
27 *(2004)*

28 29 **No-Action Alternative**

30 **FREEWAY VOLUMES AND OPERATIONS.**

31 The No-Action Alternative AM and PM peak
32 hour volumes on C-470 and the adjacent
33 arterial street system are shown in
34 **Figure 3-12a** and **Figure 3-12b**. Under the No-
35 Action Alternative, the facility is expected to
36 generally operate at LOS F both eastbound
37 and westbound during both peak periods.
38 **Tables 3-17a** and **3-17b** show the AM and PM
39 freeway levels of service for the 2025 No-
40 Action Alternative, and compare them to the
41 GPL and EL Alternatives. GPL and EL Alter-
42 native operations are discussed in their
43 respective sections.

44
45 Due to the limited capacity on C-470 under
46 the No-Action Alternative, severe congestion
47 on C-470 constrains the amount of traffic that
48 can get to and from the arterial street system

49 during the peak hours. Therefore, the unmet
50 peak hour travel demand would spread into
51 adjacent hours resulting in an increase in the
52 number of hours that peak period congestion
53 would occur. The duration of congestion in
54 2025 would be approximately 10 hours long,
55 based on AM and PM operations of LOS E or
56 worse. **Table 3-18** shows the expected peak
57 period lengths for the No-Action Alternative,
58 and compares these to the GPL and EL Alter-
59 natives. GPL and EL Alternative peak hour
60 spreading is discussed in their respective
61 sections.

62
63
64
65 **FREEWAY TRAVEL TIMES.** Existing travel
66 time and delay are shown in **Table 3-19**.

67 **Table 3-19** shows the No-Action Alternative
68 travel time and delay, and compares them to
69 those of the GPL and EL Alternatives. These
70 data indicate an increase in travel time of
71 approximately 10 minutes over existing
72 conditions. GPL and EL Alternative travel
73 time and delay are discussed in their
74 respective sections.

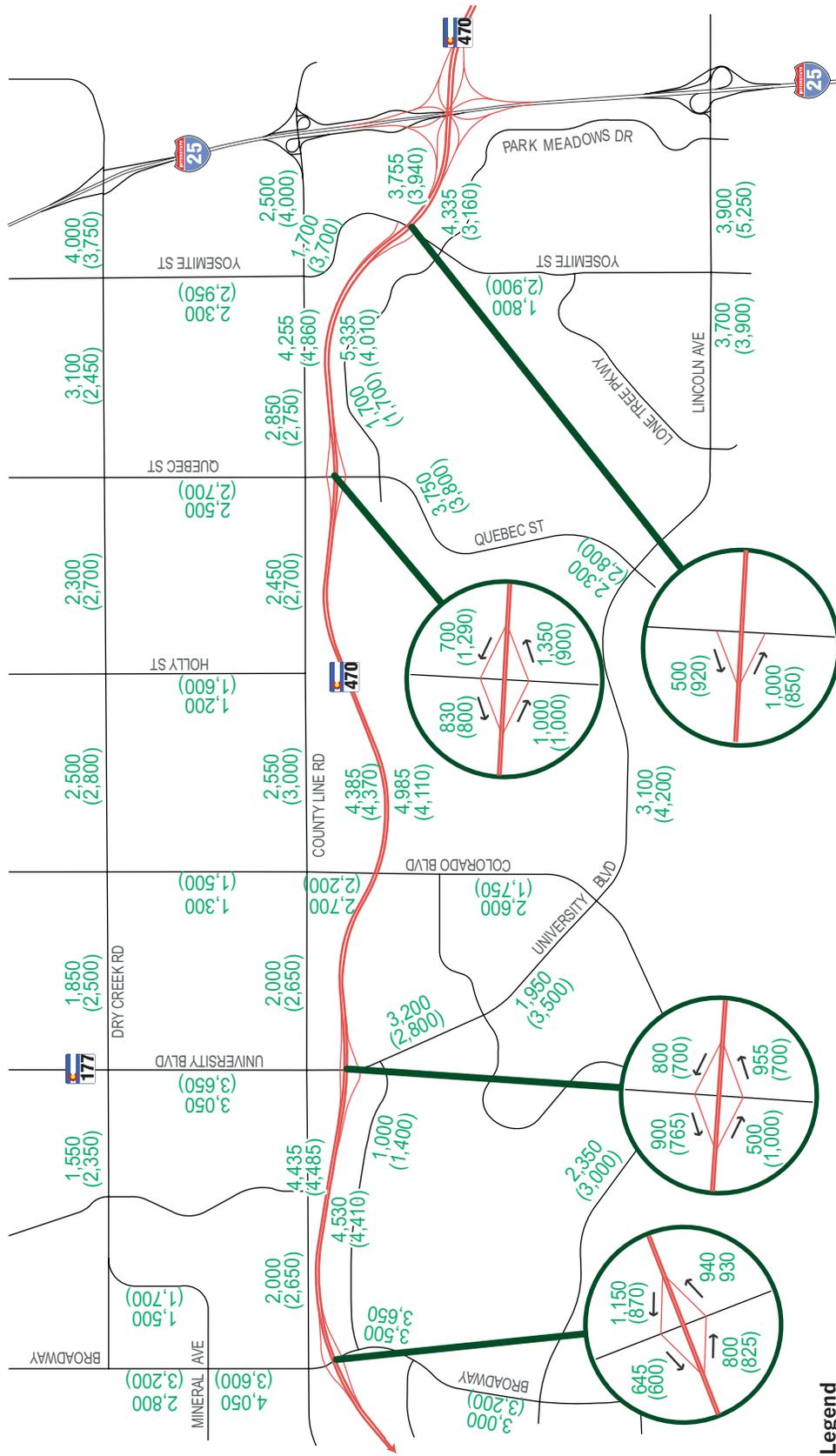
75 76 **FREEWAY VEHICLE MILES OF TRAVEL** 77 **AND VEHICLE HOURS OF TRAVEL.**

78 The miles traveled along a roadway can be
79 measured in terms of vehicle miles of travel
80 (VMT), which represents the total number of
81 miles traveled by all vehicles along a
82 roadway for a given period of time. Vehicle
83 hours of travel (VHT) represents the total
84 time spent by vehicles traversing a roadway
85 during a given period of time.

86
87 **Table 3-20** presents VMT and VHT for the
88 No-Action Alternative, and compares them
89 to the GPL and EL Alternatives. GPL and EL
90 Alternative VMT and VHT are discussed in
91 their respective sections.

92
93 **TRAVEL PATTERNS.** C-470 and most of the
94 adjacent arterial facilities are currently
95 congested during peak hours. Most of the
96 arterial street infrastructure within the
97 project area has already been completed, and
98 development has occurred adjacent to these

Figure 3-12b
2025 No-Action Alternative Traffic Volumes



Legend

XXX 2025 AM Peak Hour Traffic Volumes
 (XXX) 2025 PM Peak Hour Traffic Volumes

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Table 3-17a
Comparison of 2025 AM Peak Freeway Level of Service

Section	No-Action Alternative LOS		GPL Alternative LOS		EL Alternative LOS			
					GPL Section		EL Section	
	EB	WB	EB	WB	EB	WB	EB	WB
Ken Caryl Avenue to Kipling Parkway	C/D	C	D	C	E	C	-	-
Kipling Parkway to Wadsworth Boulevard	F	D	C	C	E	D	C	A
Wadsworth Boulevard to Platte Canyon Road	F	E	C	B/C	F	D	C	A
Platte Canyon Drive to Santa Fe Drive	F	D	C	B/C	F	A	C	A
Santa Fe Drive to Lucent Boulevard	F	E	C	B/C	F	F	C	A
Lucent Boulevard to Broadway	F	D	C	B/C	F	F	B	A
Broadway to University Boulevard	F	F	C/D	C/D	F	F	B	B
University Boulevard to Colorado Boulevard	F	F	C	C	E	E	B	B
Colorado Boulevard to Quebec Street	F	F	C	C	E	E	C	B
Quebec Street to Yosemite Street	D	F	C	C	D	C	C	A
Yosemite Street to I-25	C	F	C	C	F	A	C	A

Table 3-17b
Comparison of 2025 PM Peak Freeway Level of Service

Section	No-Action Alternative LOS		GPL Alternative LOS		EL Alternative LOS			
					GPL Section		EL Section	
	EB	WB	EB	WB	EB	WB	EB	WB
Kipling Parkway to Wadsworth Boulevard	F	E	C	C/D	F	F	B	C
Wadsworth Boulevard to Platte Canyon Road	F	E	C	C	F	D	A	B
Platte Canyon Drive to Santa Fe Drive	F	F	C	C	F	F	A	B
Santa Fe Drive to Lucent Boulevard	F	F	C	C	D	F	A	B
Lucent Boulevard to Broadway	F	F	D	C	F	F	A	C
Broadway to University Boulevard	F	F	C/D	C/D	F	F	A	C
University Boulevard to Colorado Boulevard	F	F	C	C	E	F	A	C
Colorado Boulevard to Quebec Street	F	F	C	C	E	F	B	C
Quebec Street to Yosemite Street	B	F	C	D	D	F	B	C
Yosemite Street to I-25	B	F	C	E	C	C	B	C

Table 3-18
Duration of Peak Periods in 2025

	No-Action Alternative	GPL Alternative	EL Alternative
Number of hours over capacity on mainline (LOS E or worse)	10 hours	0 hours	0 hours (express lanes section)
			5 hours (general purpose lanes section)

facilities. Therefore, many of these facilities cannot be practically expanded beyond the existing laneage without resulting in adverse effects. Land uses within the project area are mostly built out, and the type and density of additional development is expected to be consistent with existing conditions. Under the No-Action Alternative, no capacity or operational improvements would be implemented. Therefore, as traffic volumes increase within the project area, both C-470 and the surrounding arterial system would

become increasingly more congested. This would result in an increase in the hours of traffic congestion. The No-Action Alternative would not result in a change in existing traffic patterns because no capacity improvements are provided on C-470 or the adjacent arterial system.

INTERCHANGE AND ARTERIAL INTERSECTION OPERATIONS.

The majority of intersections in the 2025 No-Action Alternative would operate at

**Table 3-19
Comparison of 2025 Travel Time and Delay**

		Average Travel Time (Minutes)				Average Delay (Minutes)			
		Eastbound		Westbound		Eastbound		Westbound	
No Action Alternative	AM Peak Hour	34-35		31-32		20-21		17-18	
	PM Peak Hour	29-30		35-36		15-16		21-22	
	Off-Peak	13-14		13-14		N/A		N/A	
GPL Alternative	AM Peak Hour	15-16		15-16		1-2		1-2	
	PM Peak Hour	17-18		18-19		3-4		4-5	
	Off-Peak	13-14		13-14		N/A		N/A	
EL Alternative		ELs	GPLs	ELs	GPLs	ELs	GPLs	ELs	GPLs
	AM Peak Hour	13-14	28-29	11-12	22-23	1-2	17-18	0	11-12
	PM Peak Hour	11-12	26-27	12-13	31-32	0	15-16	1-2	20-21
	Off-Peak	11-12	11-12	11-12	11-12	N/A	N/A	N/A	N/A

**Table 3-20
Comparison of 2025 Vehicle Miles Traveled and Vehicle Hours Traveled**

	No-Action Alternative	GPL Alternative	EL Alternative
2025 AM Peak Hour VMT	106,000	171,000 (+61% from No-Action)	168,000 (+58% from No-Action)
2025 AM Peak Hour VHT	3,900	3,000 (-23% from No-Action)	4,000 (-3% from No-Action)
2025 PM Peak Hour VMT	108,000	174,000 (+61% from No-Action)	171,000 (+58% from No-Action)
2025 PM Peak Hour VHT	4,300	3,000 (-30% from No-Action)	4,000 (-7% from No-Action)

LOS D or better during the AM peak hour, with the exception of intersections along County Line Road and Dry Creek Road. During the PM peak hour, operations at 34 of the 57 signalized intersections analyzed would operate at LOS D or better. Most of the intersections operating at LOS E or worse would be along County Line Road and Dry Creek Road.

SAFETY. As traffic volumes increase without any improvements under the No-Action Alternative, accidents would generally be expected to increase as well.

SANTA FE DRIVE INTERCHANGE.

Tables 3-21a and 3-21b, present the No-Action Alternative operations for intersections in the Santa Fe Drive interchange area, and compare to those of the GPL and EL Alternatives. As shown, there is a wide range of operations at the Santa Fe Drive intersections for both the AM and PM peak hours, depending on which alternative is under consideration. The No Action alternative operates at mainly LOS E/F during both peak hours. The GPL Alternative operates at mainly LOS C/D during both peak hours, with one exception – Santa Fe Drive/ Highlands Ranch Parkway operates at LOS F during both peak hours. The EL Alternative operates at mainly LOS C/D during both peak hours. Operations of these intersections for the GPL and EL Alternatives are discussed in those respective sections.

I-25 INTERCHANGE OPERATIONS.

Under the No-Action Alternative, the I-25 interchange would have capacity deficiencies at two locations. The single-lane exit ramp from northbound I-25 to C-470/E-470 would operate at LOS F with forecasted traffic volumes. The single-lane eastbound C-470/ westbound E-470 entrance ramp to southbound I-25 is also projected to operate at LOS F by 2025 due to lack of capacity.

General Purpose Lanes Alternative

Capacity and operational improvements included in this alternative would decrease congestion and delay on C-470 and improve the reliability of the highway facility.

FREEWAY VOLUMES AND OPERATIONS.

The GPL Alternative freeway peak hour traffic volumes would exceed those shown for the No-Action Alternative by approximately 15 to 25 percent on portions of the corridor west of Santa Fe Drive, and 30 to 35 percent on portions of the corridor east of Santa Fe Drive during the AM peak. The PM peak hour traffic volumes would exceed the No-Action Alternative by approximately 10 to 25 percent west of Santa Fe Drive, and 30 to 50 percent east of Santa Fe Drive.

The 2025 AM and PM peak hour C-470 freeway LOS operations for the GPL Alternative were determined based on the traffic volumes reported from the micro-simulation model. The GPL Alternative 2025 traffic volumes are shown in Figure 3-13a and Figure 3-13b. The freeway LOS analysis indicates that C-470 is projected to operate generally at LOS D or better in both the eastbound and westbound directions during the AM peak hour. C-470 is projected to operate generally at LOS D or better during the PM peak hour, with the exception of westbound C-470 between I-25 and Yosemite Street, where LOS E operations are forecasted, as shown in Tables 3-17a and 17b. Based on the operational forecasts for C-470 in 2025, the congestion period is anticipated to be less than one hour during the AM and PM peak hour. (Table 3-18 summarizes the duration of peak periods in 2025.)

FREEWAY TRAVEL TIMES. 2025 peak hour travel times on eastbound and westbound C-470 are shown in Table 3-19. The AM peak hour total average travel times between Ken Caryl Avenue and I-25 would be 15 to 16 minutes in both directions. During the PM



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Table 3-21a
Santa Fe Drive Interchange Area
Comparison of 2025 AM Peak Intersection Delay and Level of Service

Intersection	No-Action Alternative		GPL Alternative		EL Alternative	
	Average Delay (seconds)	LOS	Average Delay (seconds)	LOS	Average Delay (seconds)	LOS
Santa Fe Drive/Mineral Avenue	55.4	E	60.6	E	52.8	D
Santa Fe Drive/County Line Road	>100.0	F	33.1	C	41.9	D
Santa Fe Drive/North Ramps	88.8	F	29.1	C	32.4	C
Santa Fe Drive/South Ramps	>100.0	F	37.1	D	45.5	D
Santa Fe Drive/Blakeland Drive	28.1	C	22.0	C	27.1	C
Santa Fe Drive/Town Center Drive	22.2	C	23.2	C	22.7	C
Santa Fe Drive/Highlands Ranch Parkway	98.4	F	87.5	F	55.8	E

Table 3-21b
Santa Fe Drive Interchange Area
Comparison of 2025 PM Peak Intersection Delay and Level of Service

Intersection	No-Action Alternative		GPL Alternative		EL Alternative	
	Average Delay (seconds)	LOS	Average Delay (seconds)	LOS	Average Delay (seconds)	LOS
Santa Fe Drive/Mineral Avenue	63.2	E	66.5	E	62.6	E
Santa Fe Drive/County Line Road	>100.0	F	42.1	D	24.8	C
Santa Fe Drive/North Ramps	61.7	E	25.8	C	36.7	D
Santa Fe Drive/South Ramps	96.1	F	24.4	C	32.4	C
Santa Fe Drive/Blakeland Drive	75.1	E	34.3	C	33.0	C
Santa Fe Drive/Town Center Drive	21.1	C	17.5	B	12.8	B
Santa Fe Drive/Highlands Ranch Parkway	>100.0	F	>100.0	F	64.8	E