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3.0 TRANSPORTATION ANALYSIS

This chapter presents the improvements and impacts of the No Action Alternative and system alternatives (System Alternatives 1, 2, 3, and the Preferred Alternative) on traffic safety, transit service, surface street and freeway circulation, freight and rail service, and pedestrian/bicycle facilities.

Traffic forecasts presented and evaluated in this chapter are Year 2025 forecasts and are based upon the DRCOG 2025 regional travel demand forecasting model with modifications discussed in this chapter. Comparison between these forecasts and those based on the newer DRCOG 2030 model show that forecasted traffic levels are similar, so that the 2025 forecasts used as a basis of analysis for this EIS remain valid.

3.1 Existing Roadway and Traffic Conditions

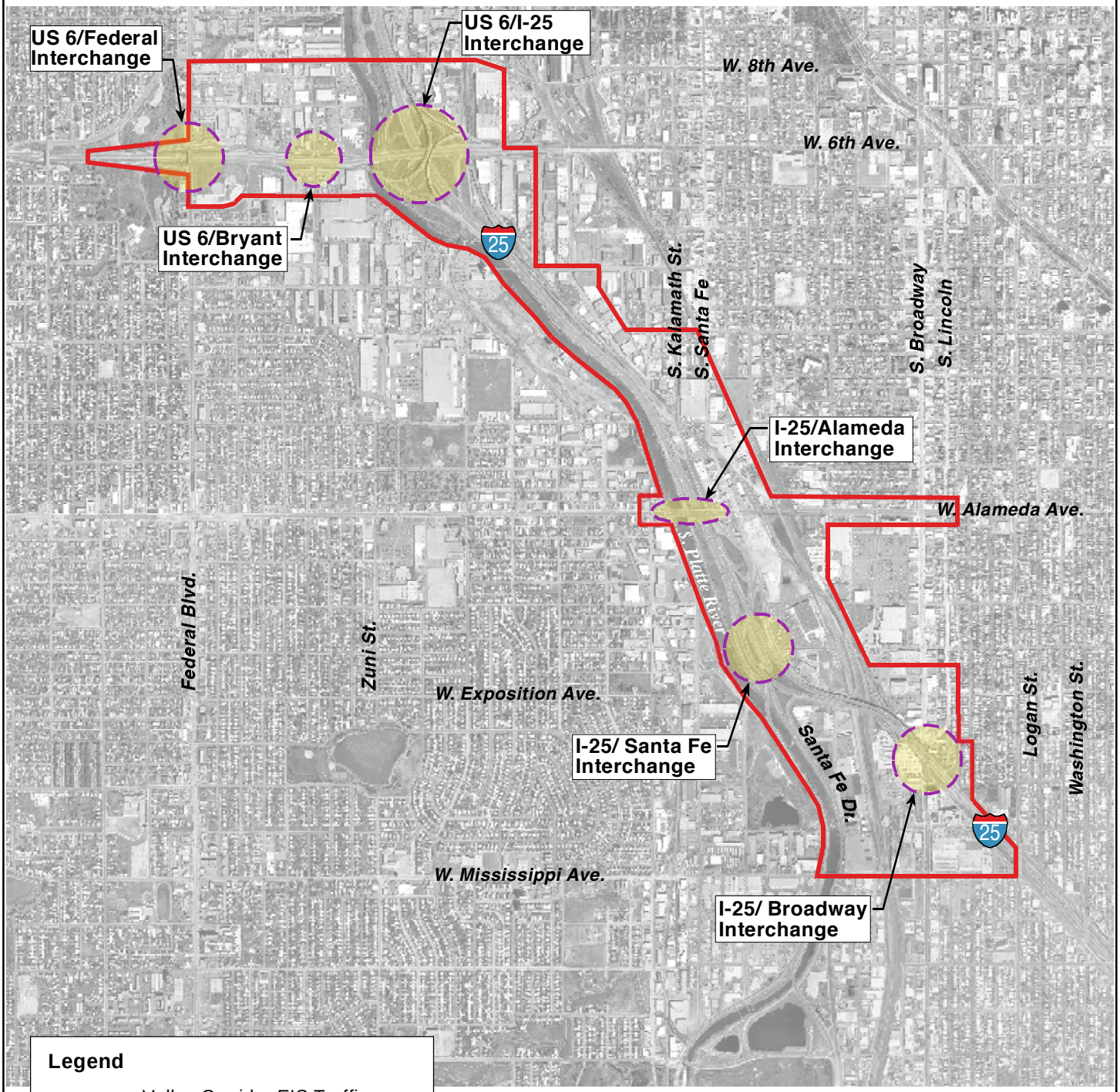
3.1.1 Transportation Network

3.1.1.1 ROADWAY NETWORK

The traffic analysis study area is depicted on **Figure 3-1**. Based on regional planning categories, roadways within the study area include:

- Freeways: Freeways provide for interregional travel and carry the greatest proportion of regional trips. Access is restricted to grade-separated interchanges. Freeways within the study area include I-25, a freeway which serves as the principal north-south traffic carrier through the center of the Denver metropolitan area, and US 6 (6th Avenue), which runs east-west through the northern part of the study corridor.
- Major Regional Arterial: Major regional arterials carry a substantial number of regional trips in support of the freeway network while serving limited local access. Santa Fe Drive south of I-25 is a major regional arterial within the study area.
- Principal Arterials: Principal arterials carry regional trips while serving local access. Principal arterials within the study area include Broadway, Lincoln Street, Federal Boulevard, Santa Fe Drive and Kalamath Street north of I-25, and Alameda Avenue.
- Minor Arterials: Minor arterials both serve through traffic and facilitate local access. Mississippi Avenue is a minor arterial within the study area.

In addition to facilitating vehicular travel, the arterial roadways serve pedestrian, bicycle, and transit modes. The characteristics of these modes of travel within the study area are discussed below.



North

Traffic Analysis Study Area

Figure 3-1

3.1.1.2 PEDESTRIAN / BICYCLE MOBILITY

The quality of pedestrian and bicycle facilities within the project corridor is mixed. I-25, the Consolidated Main Line railroad, and the South Platte River act as barriers to east-west pedestrian and bicycle mobility through the corridor. North-south mobility is provided via the South Platte River trail and local street systems. The project corridor street system has a mix of adequate sidewalk and other pedestrian and bicycle amenities and multiple limitation to pedestrian and bicycle mobility, including gaps in sidewalk continuity, busy at-grade intersections, and narrow sidewalks.

More detailed information regarding pedestrian and bicycle mobility is provided in **Chapter 1** *Purpose and Need* and **Chapter 2** *Alternatives*.

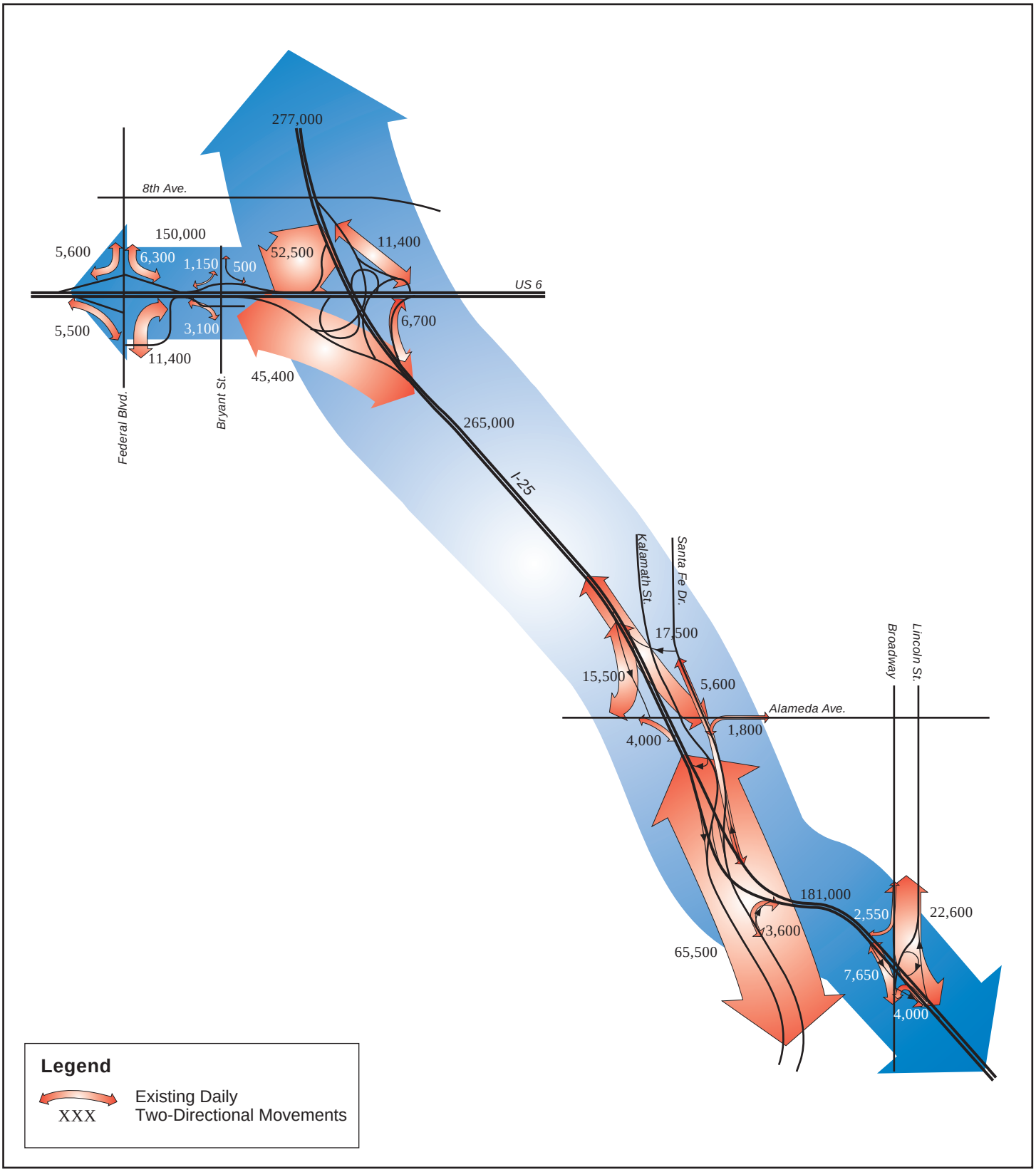
3.1.1.3 TRANSIT ROUTES

There is an existing network of regional, express, and local bus routes that serve the study area. The right side lanes of Broadway and Lincoln Street, between I-25 and Downtown Denver, are designated for buses and right-turning vehicles only during peak periods. RTD is now operating LRT along Santa Fe Drive from Mineral to downtown Denver and is currently constructing and implementing the Southeast Corridor of the LRT network. RTD plans to modify some bus routes and schedules to complement Southeast Corridor LRT completion in November 2006. This will include revised feeder bus routes, headways, and LRT station access/circulation. Additional changes to RTD's operations are likely in the future in conjunction with FasTracks implementation and other transit system improvements that may be implemented over time. More information about the bus and LRT network is provided in **Chapter 1** *Purpose and Need*.

3.1.2 Existing Travel Demand

Existing traffic volumes were assembled from counts obtained by Counter Measures Inc., between 1999 and 2001, before the beginning of the T-REX project. Peak-hour traffic counts were conducted along mainline I-25 south of the Broadway interchange in June 1999. These mainline freeway traffic counts were factored to daily volumes based on a peak-hour percentage of approximately 7 percent. Daily surface street traffic counts indicate that several roadways within the study area exhibit vehicle flows in excess of 30,000 vehicles per day, including Lincoln Street, Broadway, Alameda Avenue, Santa Fe/Kalamath, US 6, Federal Boulevard, and 8th Avenue.

Figure 3-2 depicts existing two-way daily traffic movements. Wider arrows indicate a greater traffic volume. Daily traffic volumes on I-25 are approximately 265,000 vehicles per day north of the Santa Fe Drive interchange and range from 170,000 to 200,000 vehicles per day south of the Santa Fe Drive Interchange. North of US 6, mainline I-25 exhibits daily flows in excess of 275,000 vehicles per day. Peak-hour volumes show that mainline I-25 traffic is relatively balanced by direction through the study area. Percentages of traffic occurring in the peak hour are approximately 7 percent of daily traffic, and traffic flows remain heavy over long periods of the day. Traffic movements connecting US 6 west with I-25 north and south exceed 40,000 vehicles per day, as does the connection between Santa Fe Drive to the south and I-25 to the north.



North

System Traffic Movements
Existing Conditions

Valley Highway - Logan to 6th Ave. Environmental Impact Statement (EIS)

Figure 3-2

3.1.3 Existing Traffic Operations

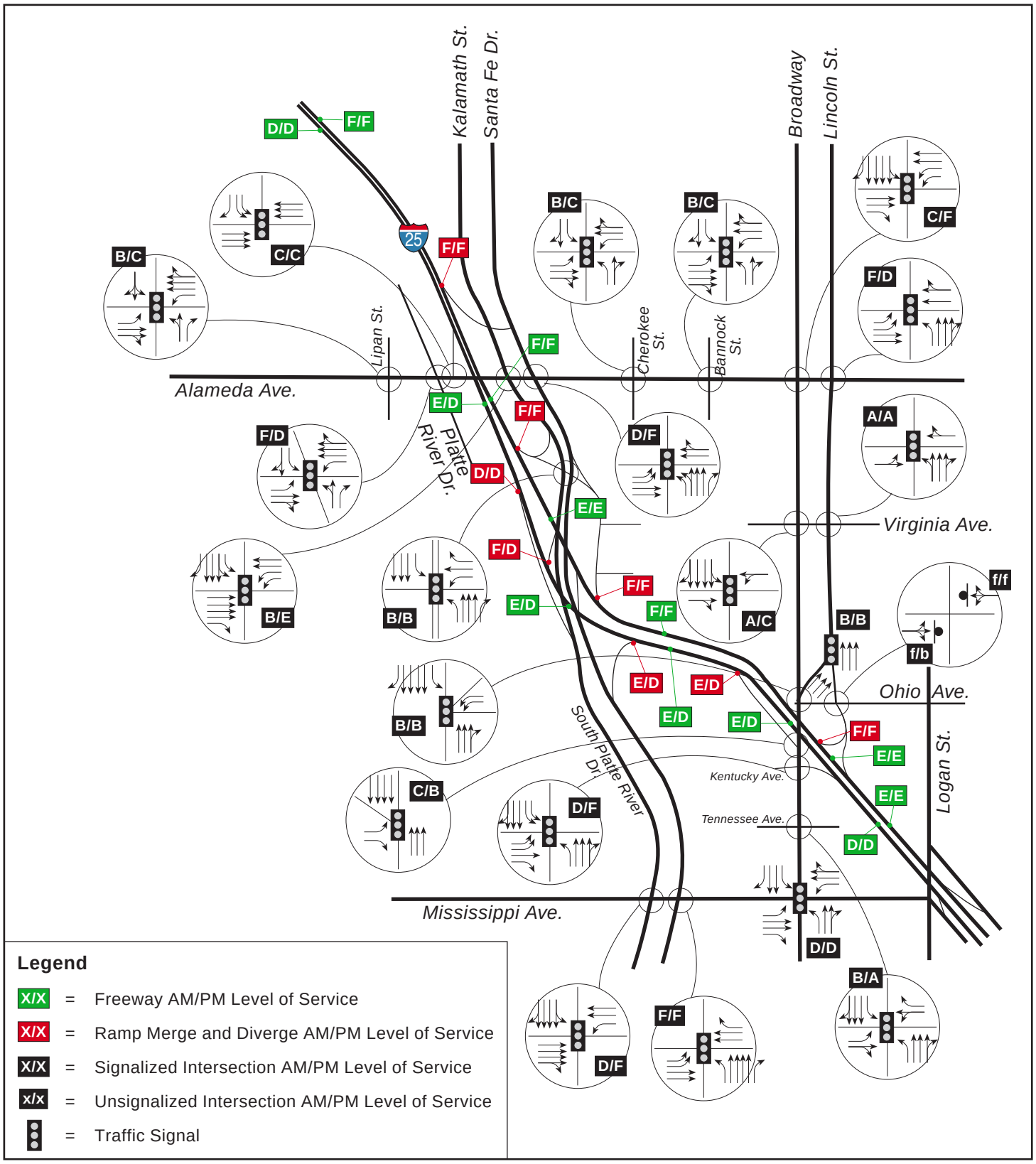
Analysis of traffic operations in the study area used methods documented in the Transportation Research Board's *Highway Capacity Manual, 2000 Edition*. The result of such an analysis is a level-of-service (LOS) rating, which is a qualitative assessment of the traffic flow for a given roadway facility. LOS is described by a letter designation ranging from "A" to "F" with LOS A representing essentially uninterrupted flow, and LOS F representing a breakdown of traffic flow with excessive congestion and delay. For analysis of a signalized intersection, a LOS rating is calculated for the intersection as a whole.

LOS analysis of an unsignalized intersection yields an LOS rating for each critical vehicle movement. A LOS rating may also be calculated for mainline, merge, diverge, or weaving sections along a major freeway. Freeway and unsignalized intersection LOS were calculated using highway capacity software. The Synchro software analysis package and methodology was used to calculate LOS ratings for signalized intersections throughout the study area. Results of the LOS analysis of existing conditions in the study area are shown on **Figure 3-3** (Logan Street to Alameda Avenue) and **Figure 3-4** (US 6 Area).

For the purposes of this analysis, LOS F operations are considered congested. Signalized LOS analyses of 27 intersections were performed based on existing peak-hour conditions. Of these, five were shown to operate at LOS F during either the AM or PM peak hour (see **Figure 3-3**). Congested locations within the traffic analysis study area include the Alameda Avenue intersections with Broadway and Lincoln Avenue and the Mississippi Avenue intersections with Santa Fe Drive and South Platte River Drive.

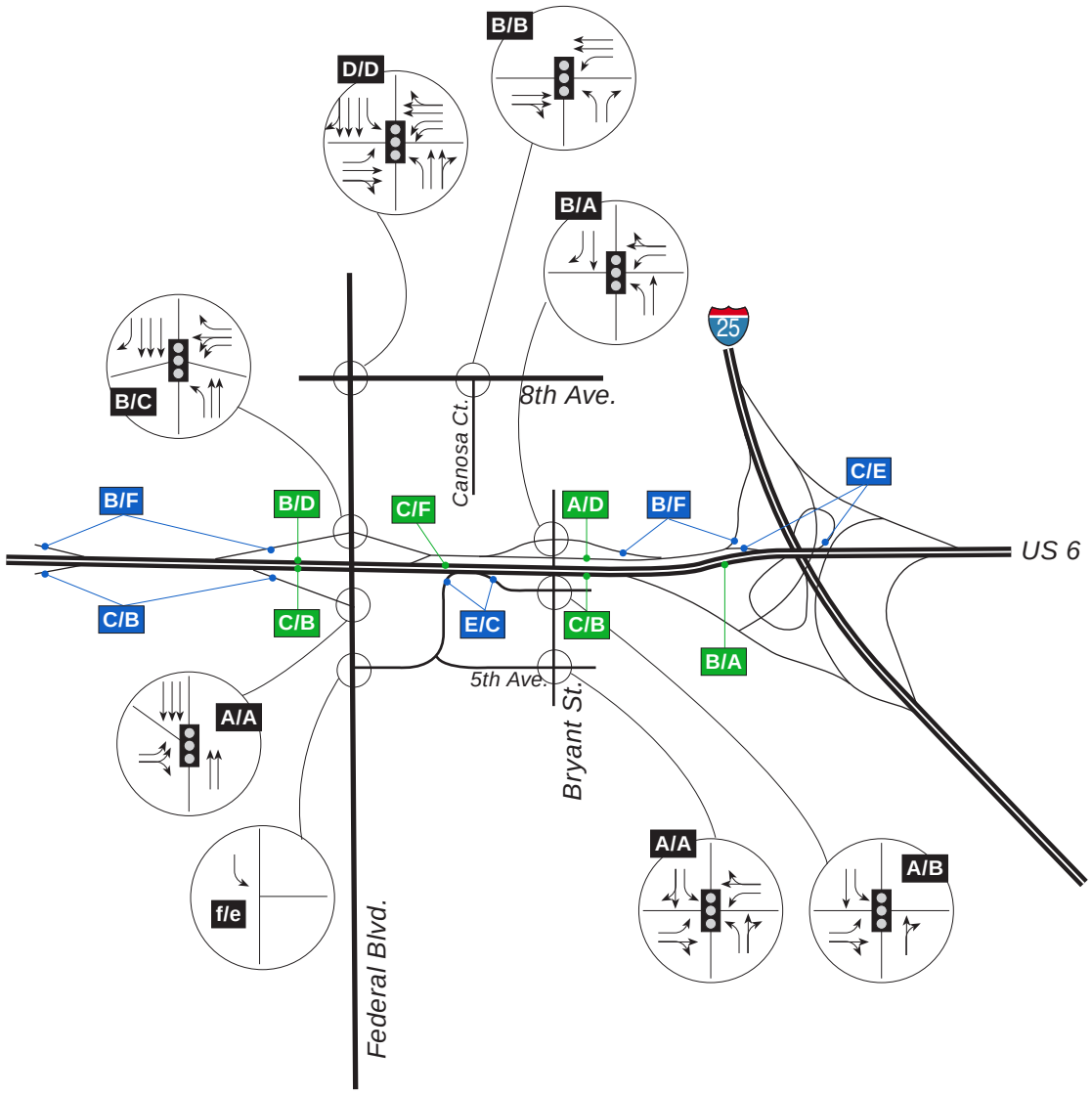
Results of operational analyses along the I-25 and US 6 freeways indicate that northbound traffic on I-25 exhibits poorer operational conditions than traffic in the southbound direction. Congested operating conditions along mainline I-25 create difficulty for ramp merge and diverge movements. Operational results for ramp sections reflect poor mainline traffic operations. Weaving sections along US 6 west of I-25 operate at LOS E/F during the peak hours (see **Figure 3-4**).

Existing traffic operations were also evaluated using the Corridor Simulation (CORSIM) traffic microsimulation tool. CORSIM is a tool within the Traffic Software Integrated System (TSIS) suite of software created by the FHWA. Microsimulation enables the user to input a roadway network consisting of freeways and surface streets and simulate the flow of individual vehicles through the network. Network measures-of-effectiveness, such as vehicle delay, travel time, and average speed, may be gathered and summarized. Results of the CORSIM analysis of existing conditions are presented in comparison with the No Action Alternative in **Section 3.3.2** *Traffic Operations*.



Existing Conditions: Logan Street to Alameda Avenue Levels of Service and Lane Geometry

North



Legend

X/X	=	Freeway AM/PM Level of Service
X/X	=	Weaving Section AM/PM Level of Service
X/X	=	Signalized Intersection AM/PM Level of Service
x/x	=	Unsignalized Intersection AM/PM Level of Service
	=	Traffic Signal

North

Existing Conditions: US 6 Area Levels of Service and Lane Geometry

3.1.3.1 EXISTING TRAFFIC SAFETY

The Transportation Equity Act for the 21st Century requires explicit consideration of safety in the transportation planning process. A detailed safety evaluation of the Valley Highway study corridor was undertaken and is included in the *Traffic Safety Report* and addendum (CDOT, 2005; CDOT, 2006a). The analysis employed the concepts of Level of Service of Safety (LOSS) and pattern recognition to test the frequency and severity of crashes throughout the corridor. The LOSS formulation categorizes four levels of "potential for accident reduction," I through IV. Level IV indicates an accident history significantly greater than expected for a given roadway type, thus possessing a high potential for accident reduction. Level I indicates a better than expected safety performance and thus a low potential for accident reduction.

LOSS analysis shows that all portions of I-25 in the study area are performing at LOSS IV both from the frequency as well as severity perspective. US 6 is performing at LOSS III for both frequency and severity. These results suggest a high potential for accident reduction in the study area. Safety problems on I-25 and US 6 can be related to congestion, recurrent and frequent queuing, close interchange spacing, and geometric characteristics of the existing alignment of I-25. Enhancements that provide better geometrics and improved traffic operations, including improved lane balance, ramp metering, full shoulders, and improved ramp spacing, have the potential to significantly improve safety performance. Most of the safety problems on interchange ramps may be attributed to congestion and backups on mainline I-25 and US 6 that result in rear end and sideswipe same-direction accidents.

3.2 Compatibility with Transportation Plans and Programmed Projects

The system alternatives developed for this EIS are generally compatible with area transportation plans and projects. Several such plans or projects are cited below.

- Transportation Expansion Project (T-REX project): The Broadway viaduct forms the north terminus of this major roadway expansion project, which will widen I-25 to accommodate an eight-lane section south of Broadway. The system alternatives will continue this eight-lane section through the study area.
- Regional Transportation Plans: Improvements to be implemented for the Valley Highway project will be consistent with an adopted, conforming regional transportation plan (RTP) before a Record of Decision is issued. Improvements identified in this Final EIS are planned to be implemented in phases. CDOT has recently submitted to DRCOG amendments to the 2030 RTP. These amendments will place Phase 1 in the fiscally-constrained element of the RTP and place the entire Preferred Alternative in the Metro Vision (fiscally unconstrained) Plan. Improvements in specific subsequent phases will need to be included in a conforming RTP in order for a Record of Decision for that phase to be issued.
- Planned Roadway Improvement Projects: The proposed widening of Federal Boulevard to six lanes between Alameda Avenue and US 6 and the completion of the Broadway viaduct were included in the traffic modeling of future conditions in the study area.
- *Blueprint Denver* (CCD, 2002c): The transportation component of *Blueprint Denver* emphasizes the need to manage the effectiveness of Denver's roadway network, first by investing in operational and reconstruction improvements. The Valley Highway EIS system alternatives, including the Preferred Alternative, are consistent with that goal by proposing improvements that improve vehicular travel conditions along both freeways and surface

streets throughout the study area. Pedestrian accommodations in *Blueprint Denver* and the *Pedestrian Master Plan* are also reflected in the system alternatives.

- *Denver Bicycle Master Plan Update 2001*(CCD, 2002a): Several improvements identified in the *Denver Bicycle Master Plan* are reflected in the Valley Highway system alternatives:
  - The Bayaud Avenue connection across I-25 is incorporated within each of the system alternatives
  - The system alternatives incorporate improvements to the South Platte River Trail, including enhanced connectivity to the South Platte River trail at Alameda Avenue and improved horizontal and vertical clearances at the US 6 and Santa Fe Drive South Platte River Trail structures
- *Federal Boulevard Corridor Plan and Federal Boulevard EA:* A conceptual corridor plan was previously prepared by the City and County of Denver. An Environmental Assessment is currently being prepared by CDOT for Federal Boulevard from Alameda Avenue to 5th Avenue. The improvements identified in this Final EIS will not preclude other improvements envisioned for the corridor. For example, the Federal Boulevard interchange and bridge would allow future widening with minimal reconstruction.

3.3 Future Travel Demand

DRCOG, as the metropolitan planning organization for Denver, is responsible for developing regional transportation plans and travel demand forecasting models for the metropolitan area. Year 2025 travel demand forecasts for this project were developed using DRCOG's most current Year 2025 model (the 2025-BA model version). The DRCOG regional forecasting process is based on demographic data and forecasts for each of 1530 transportation analysis zones (TAZs) in the regional modeling area. In all, 30 TAZs are within or immediately adjacent to the Valley Highway study area.

Traffic forecasts were first prepared based on a Valley Highway "no action" scenario, with the *2025 Regional Transportation Plan* background roadway network in place. The same travel demand levels were reallocated to represent the system alternatives under evaluation in the Valley Highway EIS process.

For the EIS modeling effort, the one DRCOG TAZ that covers the bulk of the Cherokee Development area (bounded by Santa Fe Drive, I-25, Broadway, and Mississippi Avenue) was subdivided into three TAZs (TAZs 180, 1531, and 1532) to provide a more refined view of the access configurations being evaluated for this development area. For the three TAZs in the Cherokee Development area and TAZ number 235 (the Gates Redevelopment area), revised household and employment forecasts were substituted based on current plans for the redevelopment of these two areas. Developers of these two parcels are working with the City and County of Denver to develop mixed use, transit oriented developments that are anticipated to generate substantially higher numbers of vehicle trips than the continued Gates Rubber operation that is reflected in DRCOG 2025 forecasts.

Based on discussions among DRCOG, CDOT, FHWA, and City and County of Denver representatives, it was determined that demographic forecasts for these areas should reflect current development plans in order to provide more realistic traffic forecasts as a basis for roadway improvement planning. DRCOG has developed Year 2030 demographic forecasts for

these areas that reflect current development plans. For this EIS, an estimate of 75 percent of the Cherokee and Gates Development plans was included in the forecasting process and a sensitivity check to DRCOG's 2030 demographic forecasts was performed. The two were found to be reasonably compatible relative both to land use forecasts and resulting traffic forecasts. A detailed comparison is provided in the Traffic Report Addendum (FHU, 2006b). That comparison supports the validity of using the 2025 model forecast as a basis for EIS analysis.

Figure 3-5 depicts Year 2025 two-way daily traffic volumes for movements within the study area. A comparison of these forecasts with existing traffic volumes shows forecasted growth of 10 percent to more than 20 percent on freeway segments of I-25 and US 6. Growth projections on arterial street segments range from little or no growth on certain ramps and roadway segments to sharp growth at other locations. Specifically, traffic volumes are projected to grow by more than 30 percent along segments of Broadway and Santa Fe Drive serving the anticipated future redevelopment of Gates, Cherokee Denver, and other sites.

3.3.1 Traffic Volumes

Year 2025 traffic volume forecasts were developed for each of the system alternatives by modifying the No Action forecasts discussed in **Section 3.3** *Future Travel Demand*. Access to I-25 provided by the system alternatives is comparable to the existing level of access. Therefore, projected peak-hour traffic volumes for the No Action Alternative in Year 2025 were directly adapted to the roadway and interchange configurations proposed with each system alternative.

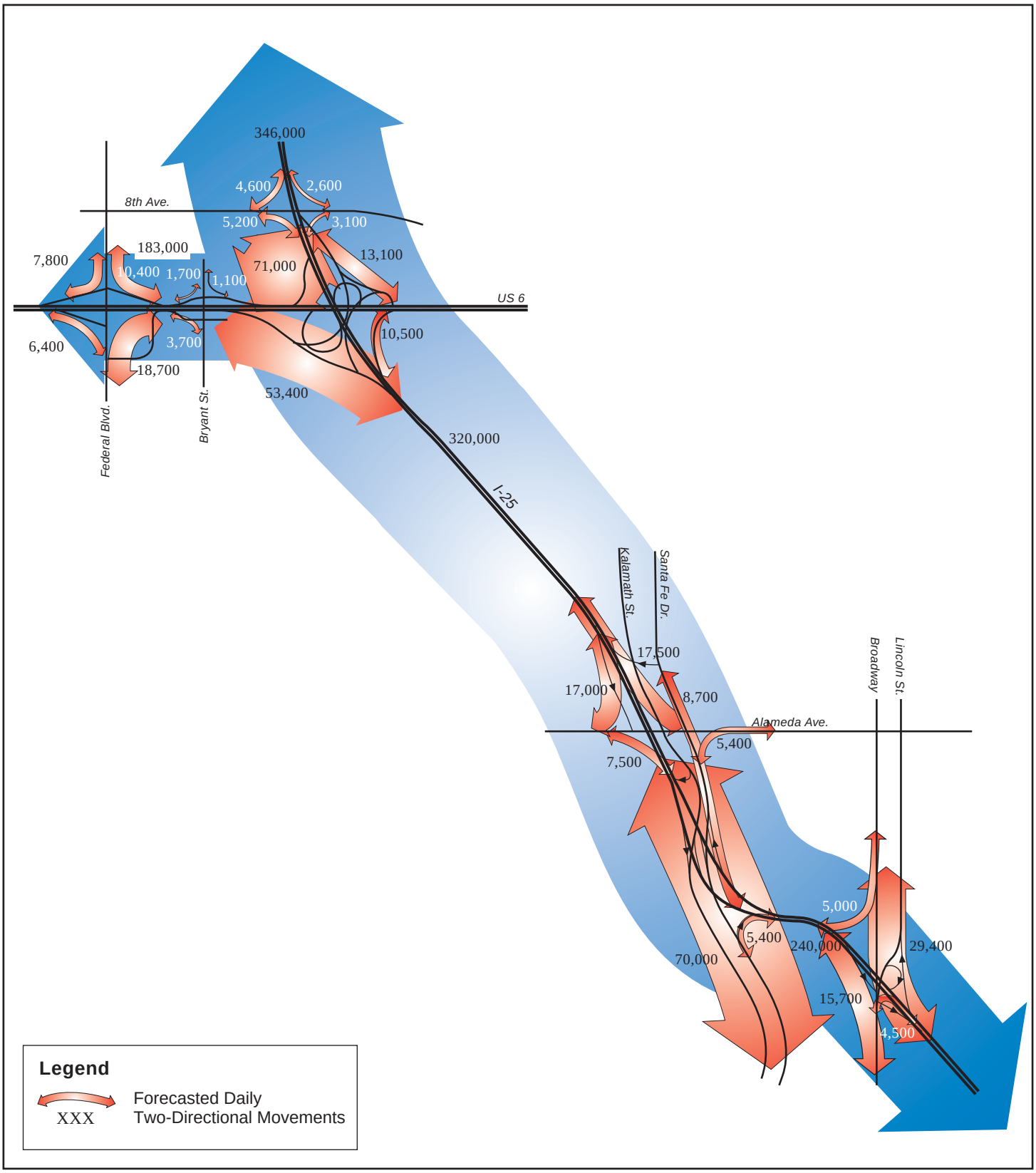
The one exception to this general consistency of access occurs along US 6. Implementation of System Alternatives 2, 3, and the Preferred Alternative would adjust US 6 access between Federal Boulevard and I-25. A common element in the system alternatives for the US 6, Federal Boulevard to I-25 study area was the removal of one or more of the existing US 6/Bryant Street ramps. **Table 3-1** identifies which Bryant Street ramps were eliminated in each of the system alternatives.

Table 3-1 System Alternative Treatment of Bryant Street Access

System Alternatives	US 6 / Bryant Street Ramps			
	EB US 6 On-Ramp	**EB US 6 Off-Ramp**	**WB US 6 On-Ramp**	**WB US 6 Off-Ramp**
System Alternative 1[a]	Retained at Decatur	Retained at Decatur	Retained at Decatur	Retained at Decatur
System Alternative 2	Closed – Diverted to Federal Boulevard	Retained Using Federal Supplemental Ramp	Retained Using Federal Supplemental Ramp	Closed – Diverted to Federal Boulevard
System Alternative 3	Closed – Diverted to Federal Boulevard	Closed – Diverted to Federal Boulevard	Closed – Diverted to Federal Boulevard	Closed – Diverted to Federal Boulevard
Preferred Alternative[b]	Closed – Diverted to Federal Boulevard	Retained Using Federal Supplemental Ramp	Retained Using Federal Supplemental Ramp	Closed – Diverted to Federal Boulevard

[a] System Alternative 1 shifts existing Bryant Street access to Decatur Street
[b] On US 6 the Preferred Alternative is a refinement of System Alternative 2

Alternatives that eliminate one or more ramp movements cause traffic to be diverted elsewhere throughout the study area. These assumptions and other traffic analysis results are detailed in the *Traffic Report* and addendum (FHU, 2005c; FHU, 2006c).



North

System Traffic Movements
Year 2025 Forecasts

3.3.2 Traffic Operations

Analysis of forecasted Year 2025 traffic operations in the study area used methods documented in the *Highway Capacity Manual* (Transportation Research Board, 2000). In addition, the CORSIM traffic simulation tool was used to evaluate traffic operations at a system-wide level. The traffic analysis effort divided the study network into two subareas:

- Logan Street to Alameda Avenue
- US 6 Area

3.3.2.1 NO ACTION ALTERNATIVE

Operational analysis of the No Action Alternative considered the present day roadway network as well as improvements that are currently programmed or identified in the *2025 Regional Transportation Plan*. Improvements incorporated in the No Action Alternative include completing construction of T-REX and the Broadway viaduct project and the proposed widening of Federal Boulevard to six lanes between Alameda Avenue and US 6. An EA is currently being prepared for the Federal Boulevard project.

Freeway Sections

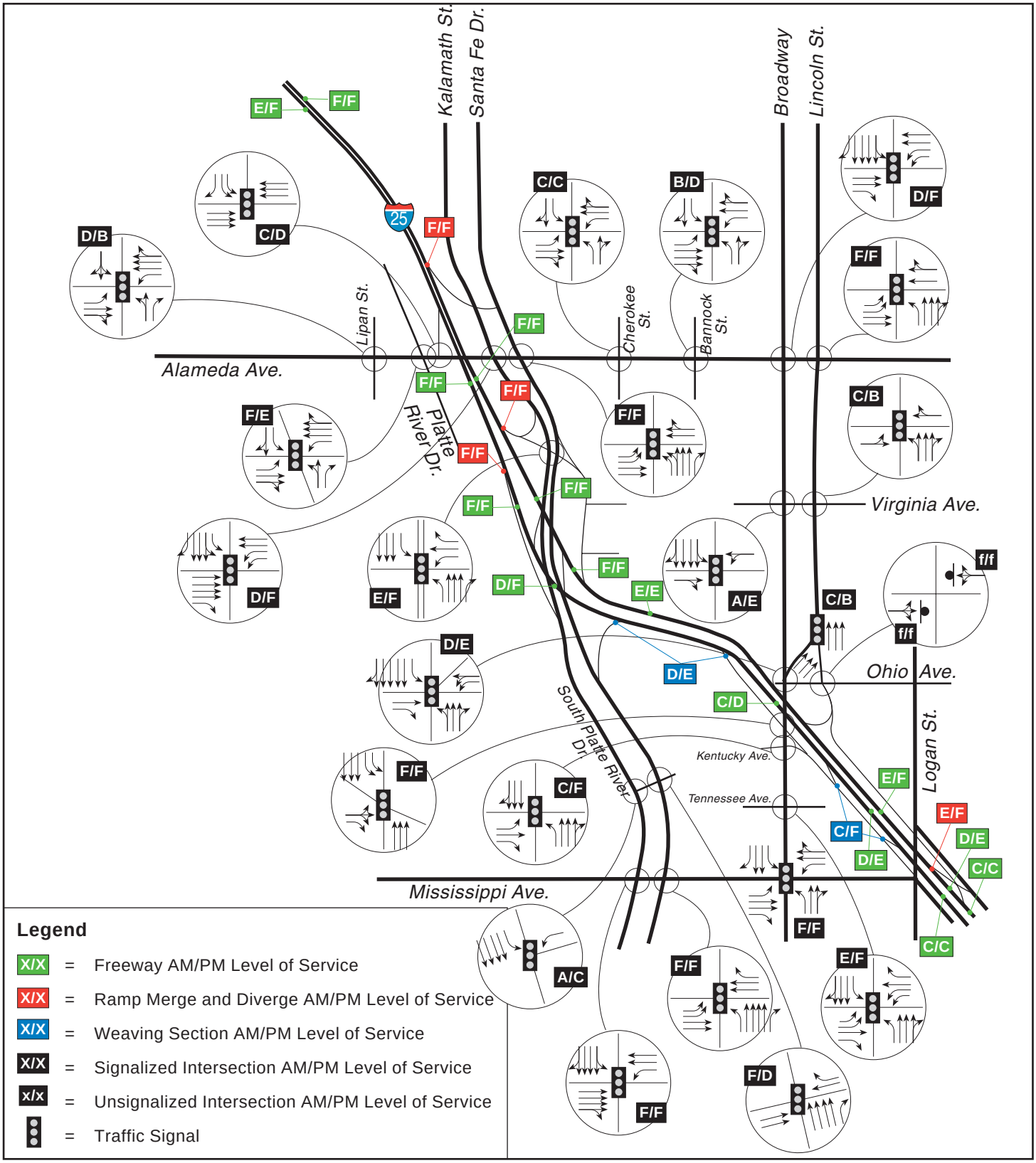
LOS results for 2025 are depicted graphically on **Figure 3-6** (Logan Street to Alameda) and **Figure 3-7** (US 6 Area). As is the case with existing conditions, the northbound direction of I-25 would exhibit poorer operational conditions than the southbound direction. The completion of the viaduct would improve northbound mainline LOS north of the Broadway interchange from F to E (see **Figure 3-6**). Congested operating conditions along mainline I-25 would create difficulty for ramp weaving, merge, and diverge movements. Weaving and ramp sections along I-25 are expected to operate at LOS F.

Freeway analysis of US 6 in the No Action Alternative revealed a general deterioration in freeway operations compared with existing conditions. In the westbound direction, the highly constrained collector-distributor road weave between southbound I-25 off-ramp and Bryant Street off-ramp would degrade from a current LOS of B/F to a future LOS of E/F (see **Figure 3-7**). In the eastbound direction, the weave section between the Federal Boulevard on-ramp and the Bryant Street off-ramp would operate at LOS F in the AM peak hour.

Surface Streets

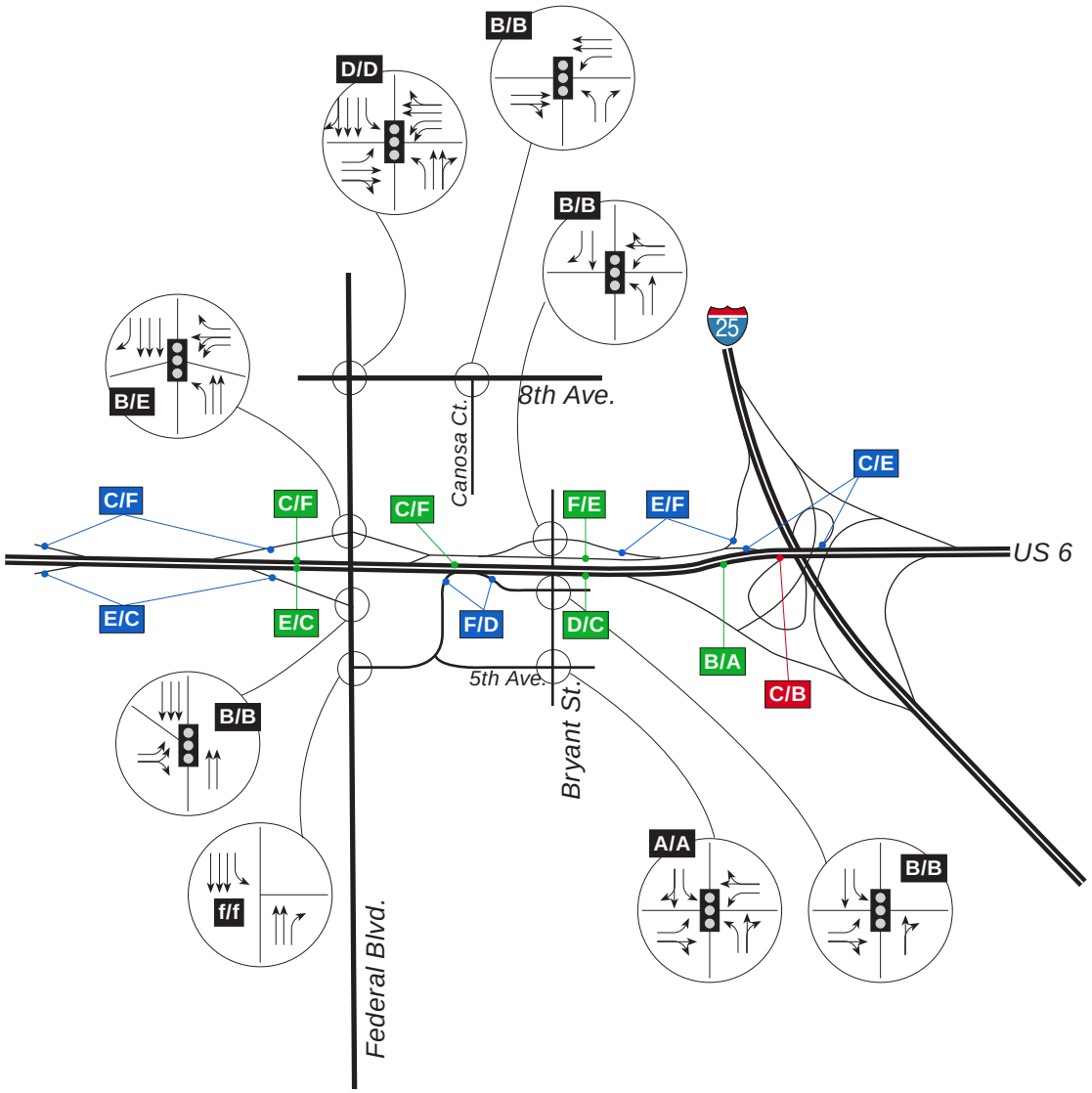
Similar to the freeway results, analysis of projected Year 2025 traffic conditions at the surface street intersections reflects a general pattern of worsened operational conditions. Thirteen of the 29 analyzed signalized intersections are expected to operate at LOS F during either the AM or PM peak hour (see **Figure 3-6**). An average intersection delay in excess of 80 seconds per vehicle results in LOS F. Several intersections are anticipated to operate with well above 80 seconds of average delay. For example, an average delay of 279 seconds per vehicle is anticipated during the PM peak hour at the intersection of Mississippi Avenue and South Platte River Drive.

Level of service results for surface street intersections are discussed in more detail in the *Traffic Report* (FHU, 2005c).



No Action Alternative: Logan Street to Alameda Avenue 2025 Levels of Service and Lane Geometry

North



Legend

X/X	=	Freeway AM/PM Level of Service
X/X	=	Ramp Merge and Diverge AM/PM Level of Service
X/X	=	Weaving Section AM/PM Level of Service
X/X	=	Signalized Intersection AM/PM Level of Service
x/x	=	Unsignalized Intersection AM/PM Level of Service
	=	Traffic Signal

North

No Action Alternative: US 6 Area 2025 Levels of Service and Lane Geometry

No Action System Traffic Simulation

A comparison of the existing (CORSIM) delay times with the 2025 No-Action simulation results is provided in **Table 3-2.** The anticipated 2025 network delay represents nearly a threefold increase over existing delay. Delay would comprise a greater portion of total travel time by the Year 2025, accounting for more than 50 percent of travel time.

Table 3-2 Existing and 2025 No Action Daily Hours of Delay

	Existing Conditions (Vehicle-Hours)		2025 No Action Conditions (Vehicle-Hours)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Delay Time (% of total)	1,206 (42%)	1,254 (40%)	2,702 (58%)	3,858 (65%)
Free-Flow Time (% of total)	1,655 (58%)	1,857 (60%)	1,925 (42%)	2,085 (35%)
Total Travel Time	2,861	3,111	4,627	5,943

Source: FHU, 2005c

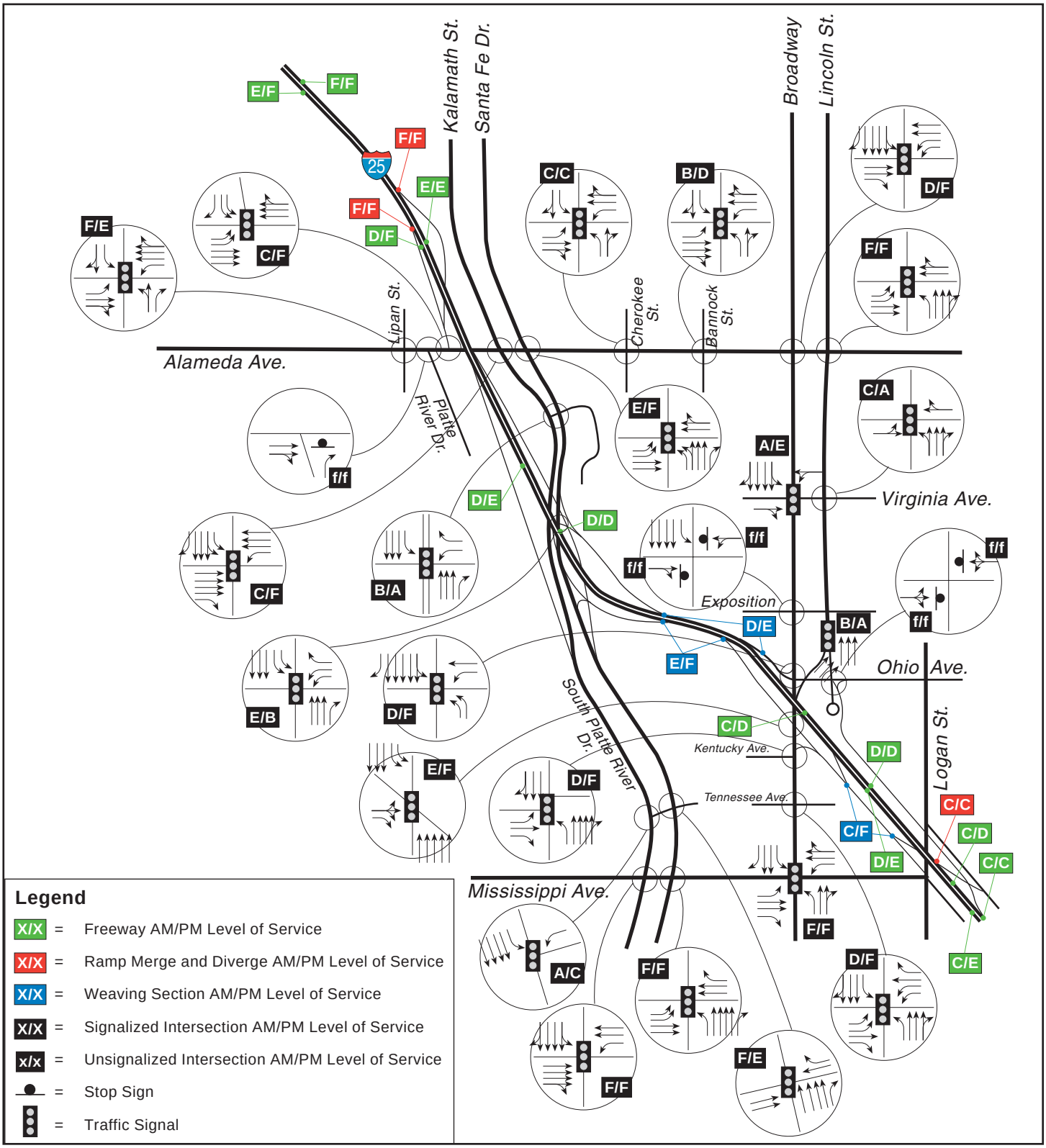
3.3.2.2 SYSTEM ALTERNATIVES

Traffic operations were quantified for each system alternative (System Alternative 1, 2, 3, and the Preferred Alternative) based on a number of metrics that indicate the extent and duration of congestion in the traffic analysis study area. These include intersection and freeway levels of service, delay calculations per the *Highway Capacity Manual*, time duration of congested conditions, CORSIM statistics including total system delay, average speeds, and a calculation of travel rate index. The results of these analyses are detailed in the *Traffic Report* (FHU, 2005c).

Level of Service

Level of service analysis of the system alternatives used methods documented in the *Highway Capacity Manual*. The results are depicted graphically as follows and provide a qualitative comparison of alternative operational performance:

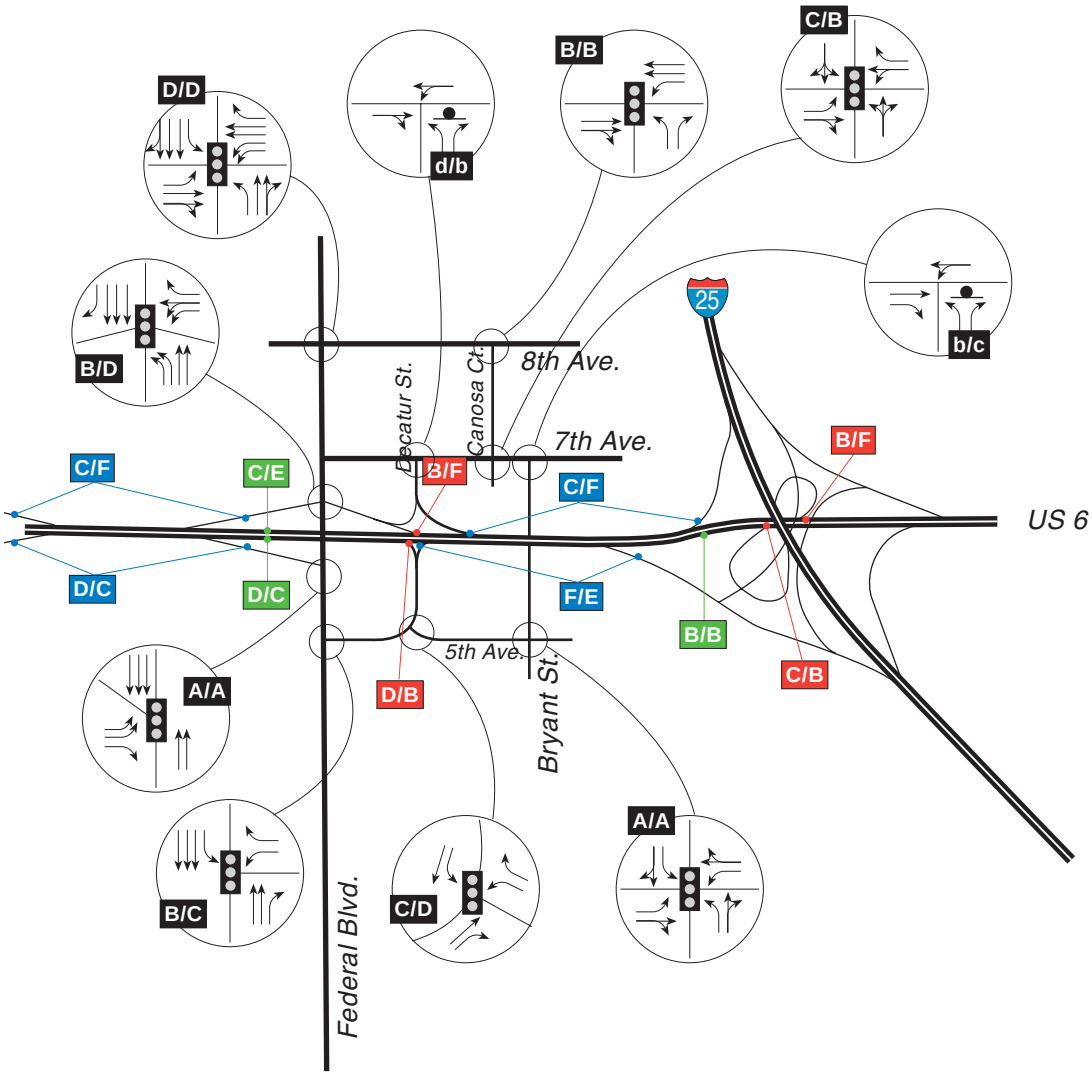
- **Figures 3-8 and 3-9: System Alternative 1**
- **Figures 3-10 and 3-11: System Alternative 2**
- **Figures 3-12 and 3-13: System Alternative 3**
- **Figures 3-14 and 3-15: Preferred Alternative**



System Alternative 1: Logan Street to Alameda Avenue 2025 AM/PM Peak Hour Levels of Service and Lane Geometry

North

Figure 3-8

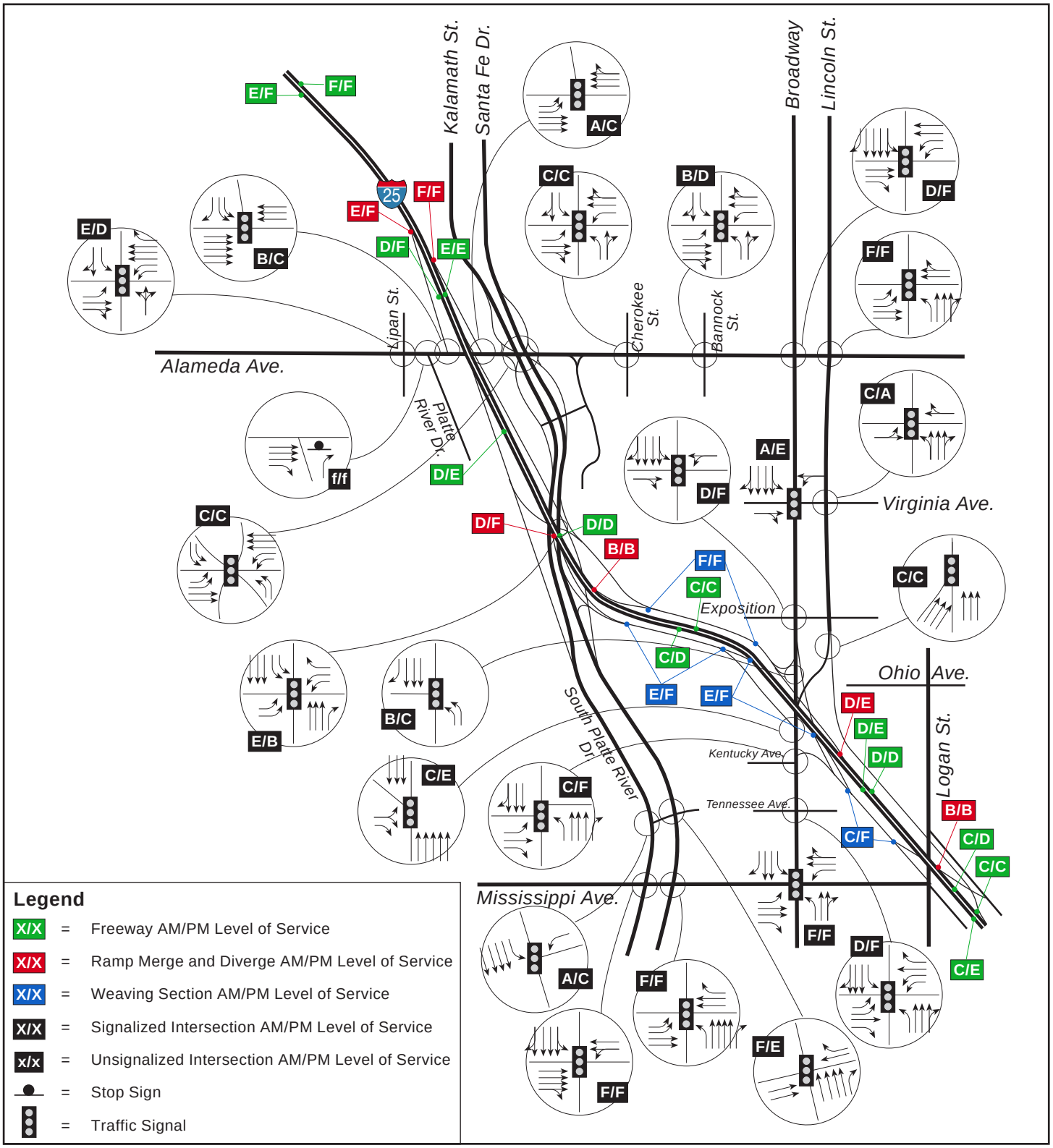


Legend

X/X	=	Freeway AM/PM Level of Service
X/X	=	Ramp Merge and Diverge AM/PM Level of Service
X/X	=	Weaving Section AM/PM Level of Service
X/X	=	Intersection AM/PM Level of Service
	=	Stop Sign
	=	Traffic Signal

System Alternative 1: US 6 2025 AM/PM Peak Hour Levels of Service and Lane Geometry

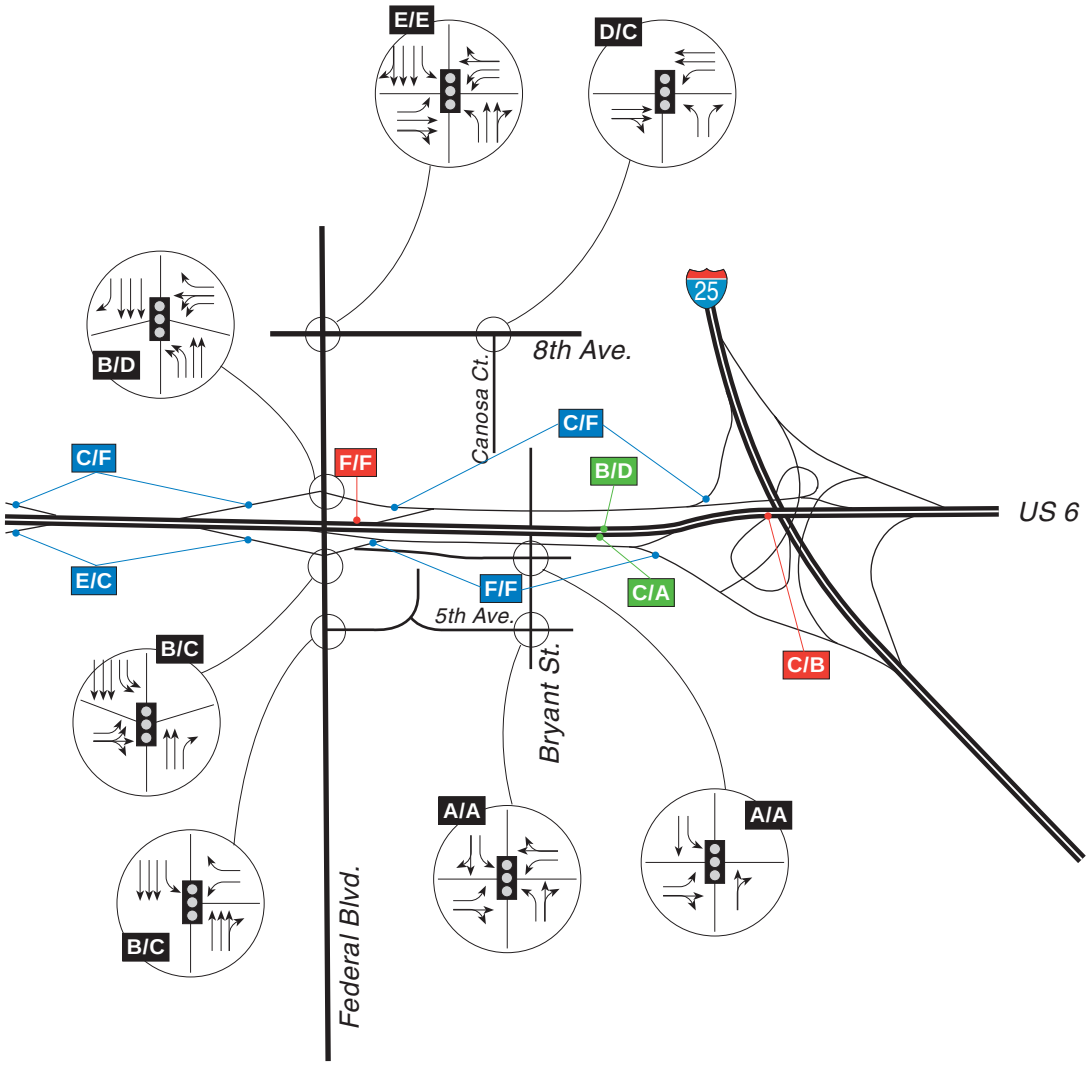
North



System Alternative 2: Logan Street to Alameda Avenue
2025 AM/PM Peak Hour Levels of Service and Lane Geometry

North

Figure 3-10

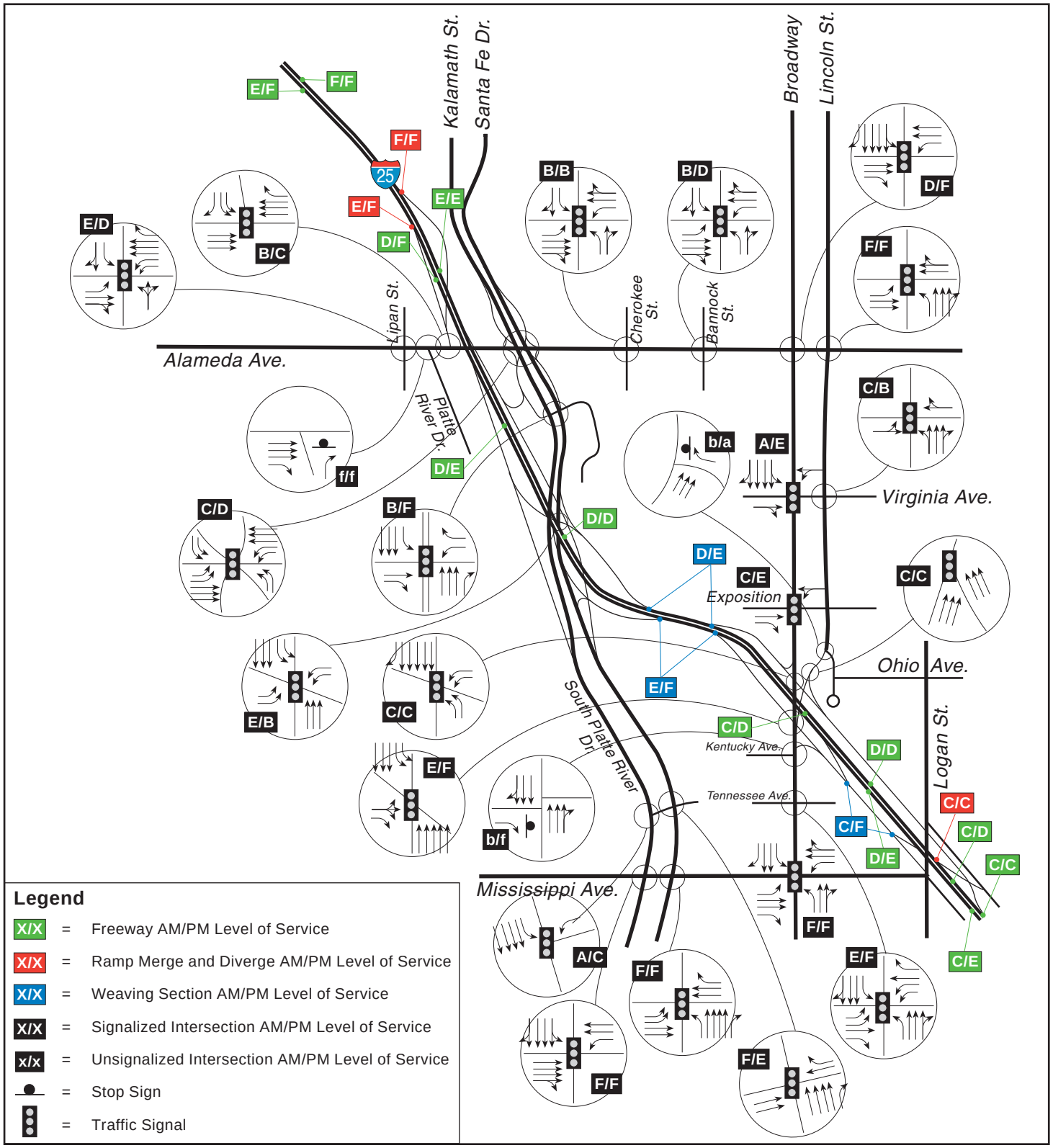


Legend

- X/X = Freeway AM/PM Level of Service
- X/X = Ramp Merge and Diverge AM/PM Level of Service
- X/X = Weaving Section AM/PM Level of Service
- X/X = Intersection AM/PM Level of Service
- = Traffic Signal

North

System Alternative 2: US 6 2025 AM/PM Peak Hour Levels of Service and Lane Geometry

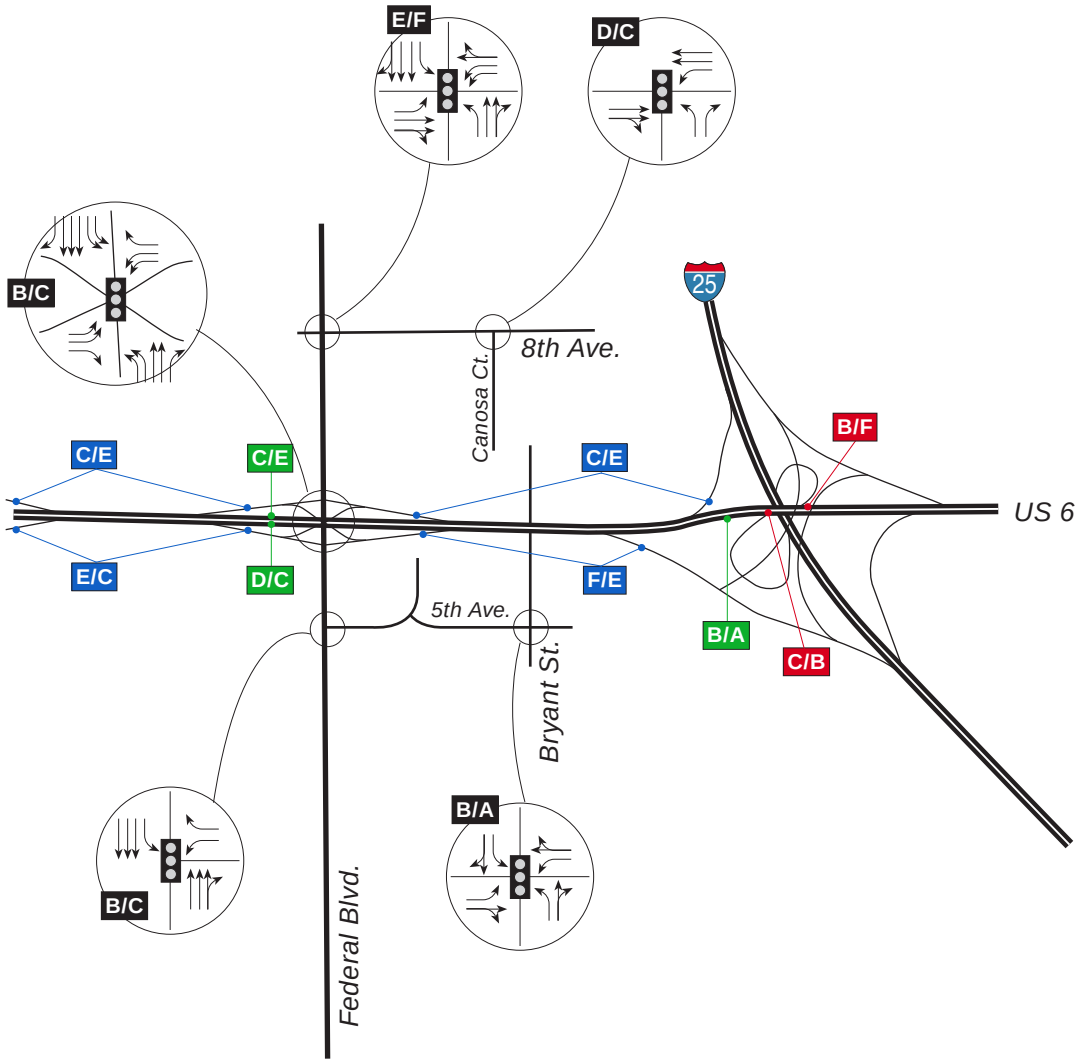


System Alternative 3: Logan Street to Alameda Avenue 2025 AM/PM Peak Hour Levels of Service and Lane Geometry

North

Valley Highway - Logan to 6th Ave. Environmental Impact Statement (EIS)

Figure 3-12

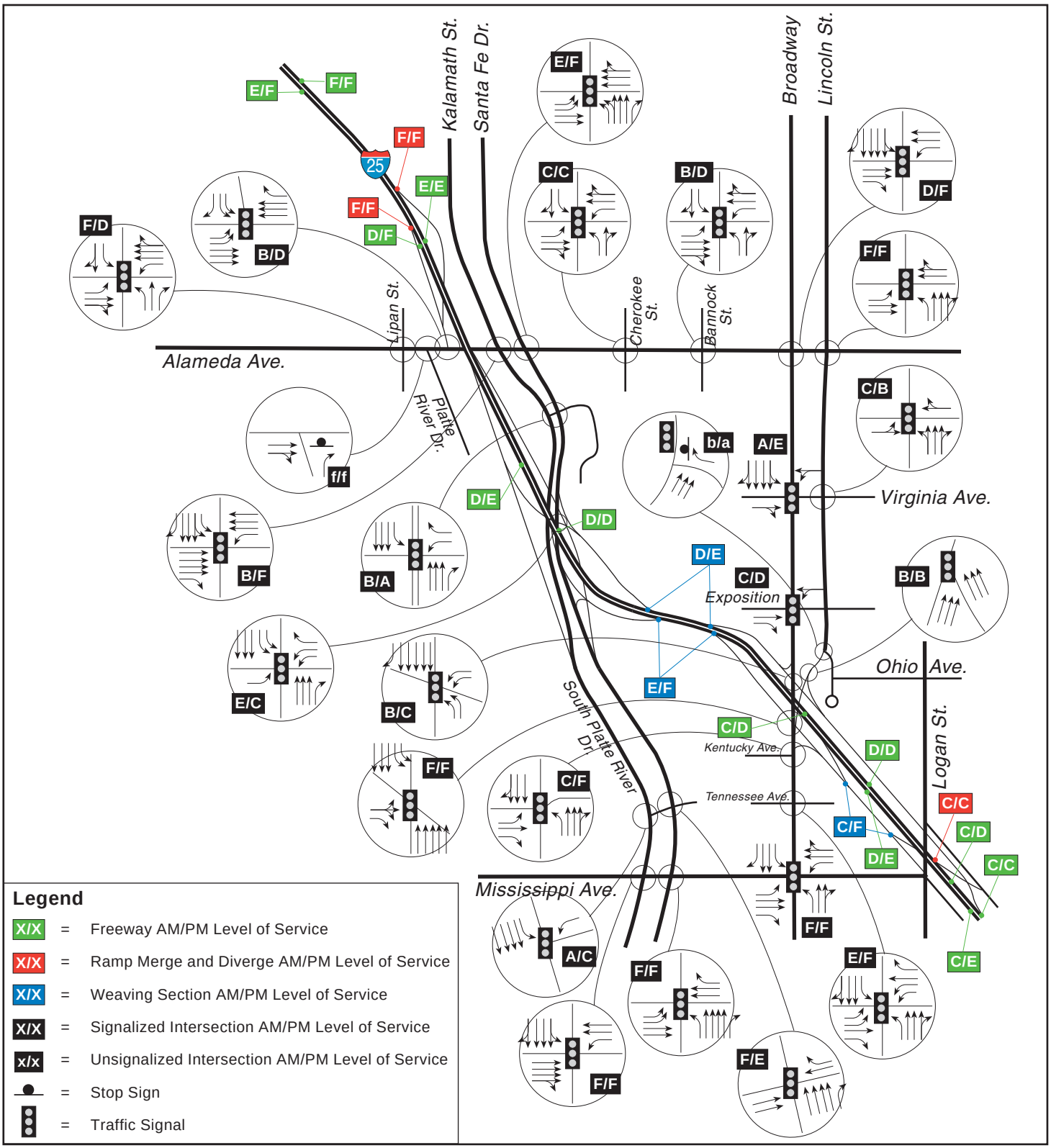


Legend

X/X	=	Freeway AM/PM Level of Service
X/X	=	Ramp Merge and Diverge AM/PM Level of Service
X/X	=	Weaving Section AM/PM Level of Service
X/X	=	Intersection AM/PM Level of Service
	=	Traffic Signal

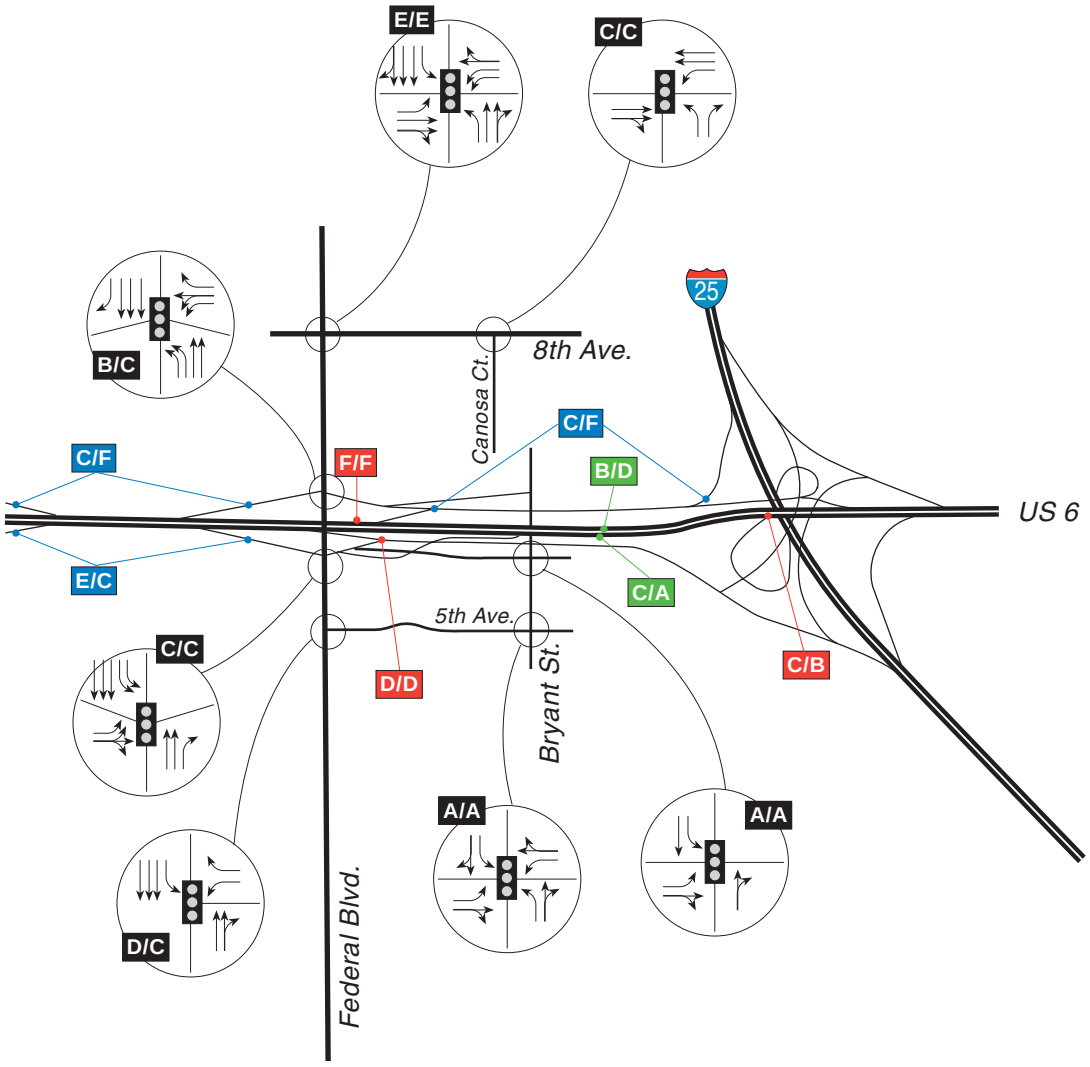
System Alternative 3: US 6 2025 AM/PM Peak Hour Levels of Service and Lane Geometry

North



Preferred Alternative
Logan Street to Alameda Avenue
2025 AM/PM Peak Hour Levels of Service and Lane Geometry

North



Legend

- X/X = Freeway AM/PM Level of Service
- X/X = Ramp Merge and Diverge AM/PM Level of Service
- X/X = Weaving Section AM/PM Level of Service
- X/X = Intersection AM/PM Level of Service
- = Traffic Signal

North

Preferred Alternative
US 6 2025 AM/PM Peak Hour Levels of Service and Lane Geometry

Hours of Congestion

Tables 3-3 and **3-4** depict the hours of congestion anticipated to occur throughout the roadway system with each alternative. Congestion is defined as LOS F operations at surface street intersections or along freeway sections. Hours of congestion were calculated by using characteristic hourly traffic volume distributions to determine the times of day during which traffic volumes are projected to result in operations of LOS E or better. The system alternatives are not projected to eliminate congestion but are shown to decrease the time duration of congested conditions in comparison with the No Action Alternative. The analysis was performed for each intersection and key freeway segments shown to operate at LOS F during either the AM or PM peak hour.

Table 3-3 depicts the hours of congestion for the surface street intersections. The number of hours of congestion at each location were averaged and added together to provide a measurement of overall congestion. Based on this measure, results for the surface street intersections indicate that System Alternative 2 would operate with the fewest cumulative hours of congestion during a typical day.

Table 3-3 Daily Hours of Congestion at Signalized Intersections

INTERSECTION	Hours of Congestion at LOS F Intersections				
	No Action	System Alternative 1	System Alternative 2	System Alternative 3	Preferred Alternative
Alameda Avenue & South Platte River Drive	4.00	0.00	0.00	0.00	0.00
Alameda Avenue & Lipan Street	0.00	1.00	0.00	0.00	1.00
Alameda Avenue & Kalamath Street	6.50	1.75	0.00	0.00	1.75
Alameda Avenue & Santa Fe Drive	6.25	3.50	0.00	0.00	1.75[a]
Alameda Avenue & I-25 ramps	0.00	2.50	0.00	0.00	0.00
Broadway & Kentucky Avenue	1.75	2.75	2.75	0.00	1.75
Broadway & Tennessee Avenue	3.75	3.75	1.00	7.50	3.75
Broadway & Exposition Avenue	0.00	0.00	1.25	0.00	0.00
Broadway & Ohio Avenue	0.00	3.50	0.00	0.00	0.00
Broadway & SB I-25 Ramps	9.50	4.00	1.00	4.50	4.25[b]
Broadway & Mississippi Avenue	10.75	10.75	10.75	10.75	10.75
Mississippi Avenue & Santa Fe Drive	10.75	10.75	10.75	10.75	10.75
Mississippi Avenue & South Platte River Drive	13.50	13.50	13.50	13.50	13.50
8th Avenue & Federal Boulevard	0.00	0.00	0.00	1.75	0.00
Sum of hours of congestion at LOS F intersections	**66.75**	**57.75**	**41.00**	**48.75**	**49.25**

[a] *Result differs from System Alternative 1 because Preferred Alternative includes a third westbound Alameda Avenue lane at Santa Fe Drive*
[b] *Result differs from System Alternative 3 because Preferred Alternative includes effect of Broadway /Kentucky Ave signalized intersection*
Source: FHU 2005c; FHU 2006c

Table 3-4 depicts hours of congestion along I-25 freeway sections. The analysis includes weaving and mainline sections shown to operate at LOS F. The No Action Alternative would exhibit the greatest duration of congestion. System Alternatives 1, 3, and the Preferred Alternative, representing very similar design concepts along I-25, would show marked improvement over the No Action Alternative. Freeway congestion would be the lowest with System Alternative 2, although the southbound I-25 Santa Fe Drive to Broadway collector-distributor road weave is not included in the calculation. By adding a collector-distributor road along I-25 between the Santa Fe Drive and Broadway interchanges, System Alternative 2 removes weaving activity from the mainline freeway. The freeway weaving section present in System Alternatives 1, 3, and the Preferred Alternative would operate at LOS F for a projected 5.5 hours per day, affecting both weaving and non-weaving vehicles.

Table 3-4 Daily Hours of Congestion along I-25 Freeway Sections

INTERSECTION	Hours of Congestion along LOS Freeway Sections				
	No Action	**System Alternative 1**	**System Alternative 2**	**System Alternative 3**	**Preferred Alternative**
Northbound 1-25					
North of Alameda Avenue On-Ramp	4.50	4.00	4.00	4.00	4.00
North of Santa Fe Drive	11.25	----	----	----	----
Southbound 1-25					
North of Alameda Avenue Off-Ramp	6.75	6.75	6.75	6.75	6.75
South of Alameda Avenue Off-Ramp	11.75	2.50	3.25	2.50	2.50
Santa Fe Drive to Broadway Weave	----	5.50	----	5.50	5.50
Sum of hours of congestion along LOS Freeway Sections	**34.25**	**18.75**	**14.00[a]**	**18.75**	**18.75**

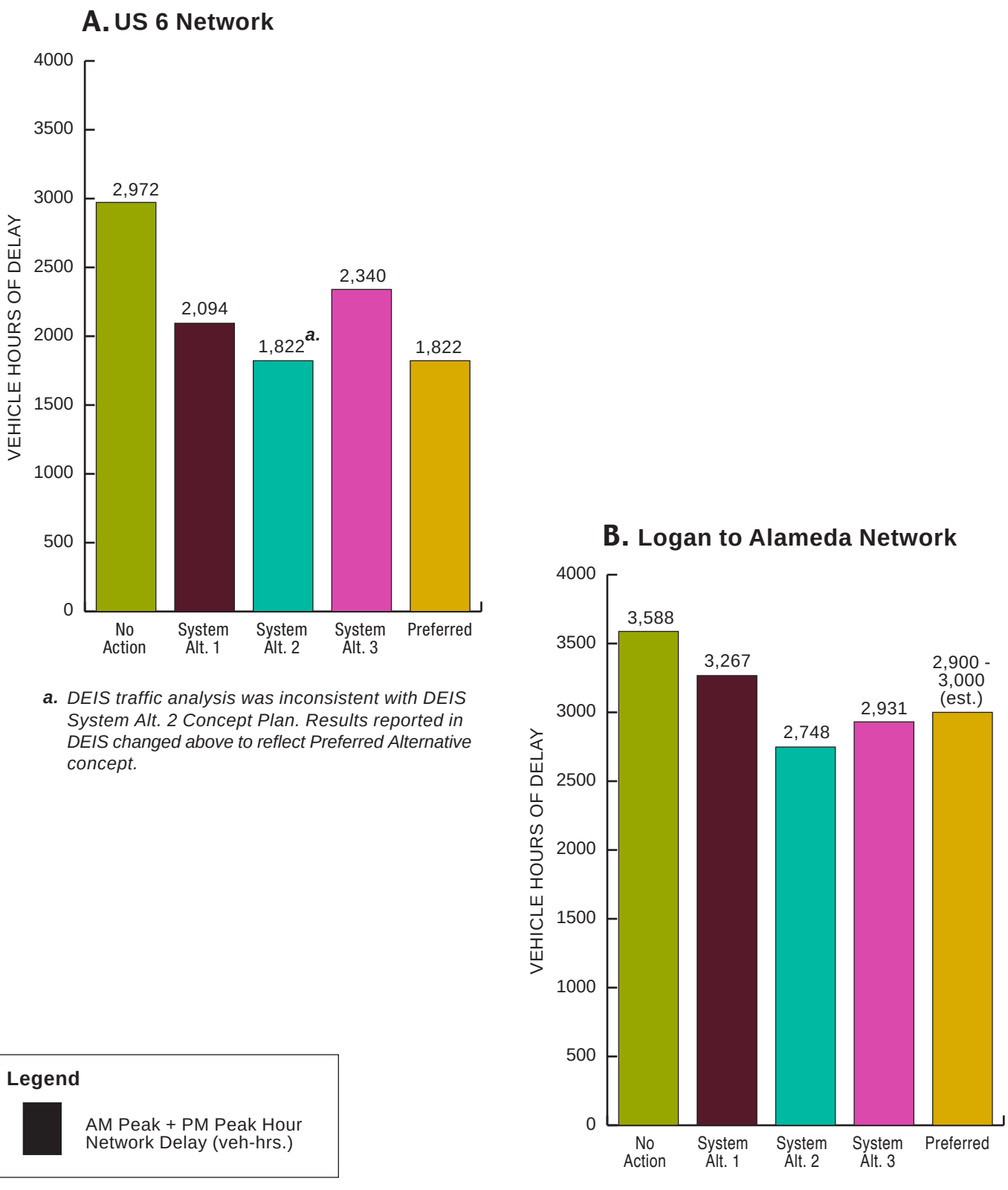
Source: FHU, 2005c
[a] Collector-distributor roads not included in compilation of hours of congestion for System Alternative 2.

Traffic Simulation Results

Overall Measures of Effectiveness

CORSIM traffic simulation models were developed for the Logan Street to Alameda Avenue portion and US 6 portion of the study area. Detailed output from these models is available in the *Traffic Report* (FHU, 2005c). A summary of the vehicle-hours of delay for each alternative is depicted on **Figure 3-16**. These delay results combine the AM peak hour and PM peak hour and include both the freeway and surface street portions of the networks. As shown, the Preferred Alternative operates most efficiently in the US 6 area.

Within the Logan Street to Alameda Avenue portion of the study area, System Alternatives 2, 3, and the Preferred Alternative exhibit the least peak hour delay. For the Logan to Alameda Network, results for the Preferred Alternative are estimated based on Subnetwork models created for the Preferred Alternative and similarities between the Preferred Alternative and System Alternatives 1, 2 and 3.



a. *DEIS traffic analysis was inconsistent with DEIS System Alt. 2 Concept Plan. Results reported in DEIS changed above to reflect Preferred Alternative concept.*

CORSIM Network 2025 Delay Comparisons

An additional measure that provides insight into system alternative traffic operations is the travel rate index. The travel rate index, a metric developed by the Texas Transportation Institute, is a measure of the amount of extra time it takes to travel during the peak period. A travel rate index of 1.50, for example, indicates it would take 50 percent longer to travel on a roadway during the peak than it would to travel during uncongested conditions. A lower travel rate index indicates that delay represents a lesser portion of overall network travel time. As shown in **Table 3-5**, System Alternative 1, 2, and the Preferred Alternative operate with the lowest travel rate index in the US 6 area and System Alternatives 2, 3, and the Preferred Alternative operate with the lowest travel rate index in the Logan Street to Alameda Avenue portion of the study area.

Table 3-5 Peak Hour Travel Rate Index Comparison

PORTION OF STUDY AREA	Peak Hour Travel Rate Index (TRI)				
	No-Action	System Alternative 1	System Alternative 2	System Alternative 3	Preferred Alternative
US 6	2.97	2.42	2.20[a]	2.58	2.20[b]
Logan Street to Alameda Avenue	2.43	2.35	2.03	2.12	2.12

Source: FHU, 2005c; FHU, 2006c
[a] Revised from Draft EIS to reflect braided ramp operations.
[b] Estimated based on subnetwork results.

Within the overall system model, it is possible to isolate portions of the network to focus on the efficiency of a particular roadway configuration. By focusing on interchange subnetworks, the operational differences between the alternatives may be seen more clearly. For example, the interchange at I-25 and Broadway is designed differently in each of the system alternatives. By isolating the links and nodes comprising the Broadway interchange, one can examine the differences between the alternatives at a finer level of detail than is provided by the network-wide measures depicted on **Figure 3-16**.

Simulation results were compiled for three subnetworks within the Broadway to Alameda Avenue model. The Alameda Avenue subnetwork included Alameda Avenue between Lipan Street and Cherokee Street. The Alameda Avenue plus Santa Fe Drive subnetwork added Santa Fe Drive/Kalamath Street between Bayaud Avenue and I-25. The Broadway subnetwork included Broadway between Exposition Avenue and Mississippi Avenue. The subnetwork simulation results are described below.

Alameda Avenue Subnetwork

As shown on **Figure 3-17**, each of the system alternatives, including the Preferred Alternative, would improve operations over the No Action Alternative, primarily by reducing the number of traffic signals along Alameda Avenue. The results of the Alameda Avenue subnetwork analysis indicated that System Alternative 3 would operate most efficiently. System Alternatives 2 and 3 both introduce a grade-separated interchange at the intersection of Alameda Avenue with Santa Fe Drive, improving operations. This intersection remains an at-grade, one-way pair in System Alternative 1, and the Preferred Alternative. In the Alameda Avenue interchange area, implementation of System Alternative 3 would save approximately 37 percent in delay over System Alternative 1.

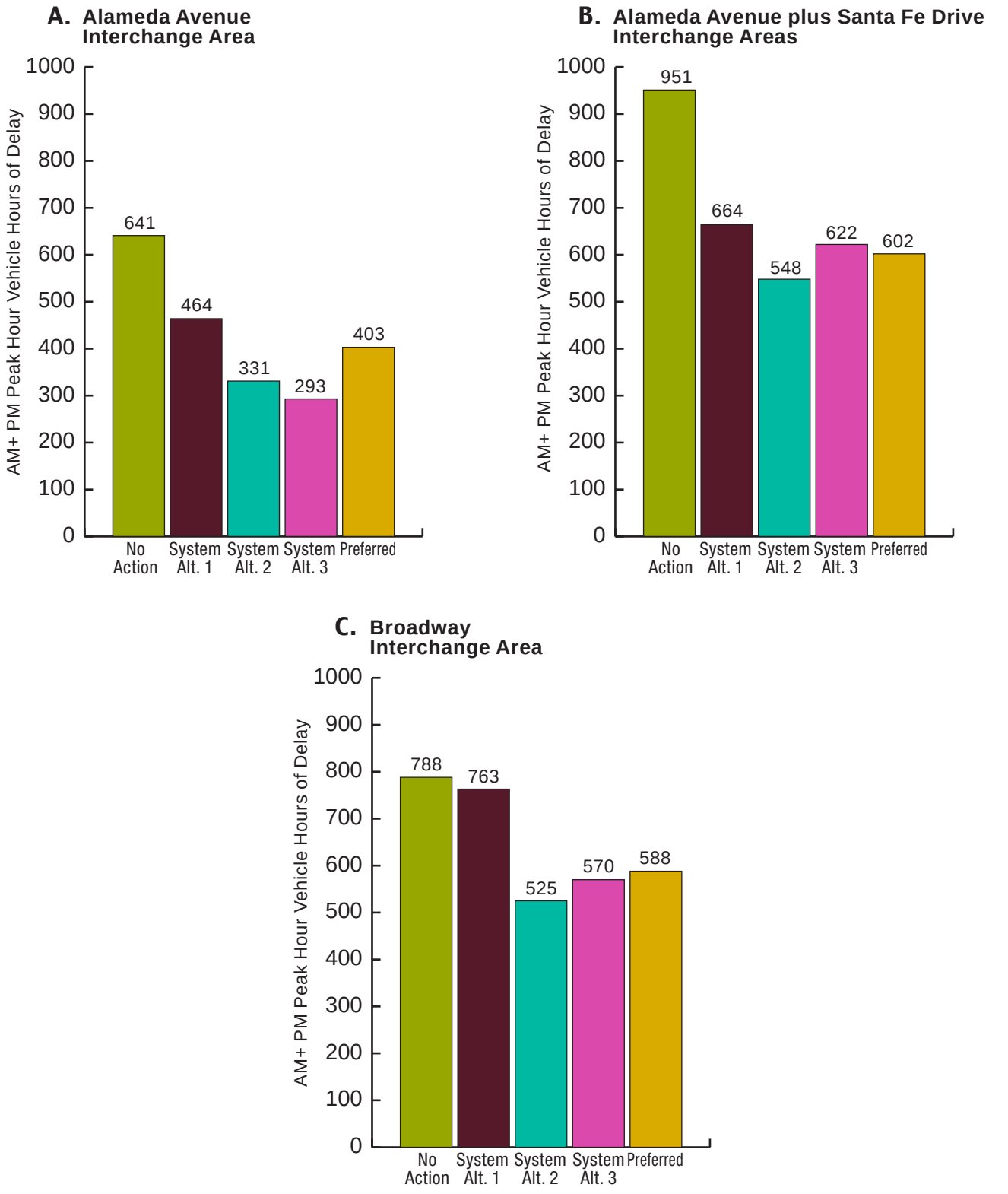
It is important to note that additional delay savings could be achieved with System Alternative 2 if the ½ diamond I-25 ramp configuration were reconfigured as a single-point interchange aligned with the mainline I-25 centerline. Preliminary operational tests of this modification indicate that a reconfigured System Alternative 2 would operate slightly more efficiently than System Alternative 3 in the Alameda Avenue area.

Alameda Avenue plus Santa Fe Drive Subnetwork

Figure 3-17 depicts the CORSIM delay results for the Alameda Avenue plus Santa Fe Drive interchange area subnetwork. As in the case of the Alameda Avenue Interchange subnetwork, each of the system alternatives would represent a marked improvement over the No Action Alternative. System Alternative 2 would perform best, in part because local access to development east of Santa Fe Drive and south of Alameda Avenue is accommodated without adding a traffic signal to Santa Fe Drive. System Alternative 1 would exhibit the greatest delay of the system alternatives.

Broadway Subnetwork

As shown on **Figure 3-17**, both System Alternatives 2, 3, and the Preferred Alternative show significant improvement over the No Action Alternative. As shown, System Alternative 2 is projected to operate with the least delay through the Broadway interchange area. This is due largely to the provision of a southbound Broadway to southbound I-25 grade-separated on-ramp. However, System Alternative 3 and the Preferred Alternative would operate with only slightly more delay. A principal reason for the relatively good operation of System Alternative 3 and the Preferred Alternative is the access provided to and from the Broadway transit station at Exposition Avenue. With the Preferred Alternative, the Exposition Avenue access would be limited to automobile traffic only (no buses).The No Action Alternative and System Alternative 1 would exhibit the poorest operations.



Surface Street Subnetwork Delay Comparisons

3.3.3 Traffic Evaluation of Consolidated Main Line Railroad Crossing

The one-way arterial street pair of Santa Fe Drive and Kalamath Street currently crosses the Consolidated Main Line railroad at grade north of Alameda Avenue. One of the principal purposes of the Valley Highway Project is to increase safety and reduce congestion and delays related to the at-grade crossing of Santa Fe Drive/Kalamath Street and the Consolidated Main Line. Therefore, each of the three system alternatives includes a grade separation of Santa Fe Drive and Kalamath Street at the Consolidated Main Line railroad. This section provides a summary of the benefits associated with this grade separation.

It should be noted that the Burlington Northern Santa Fe and Union Pacific railroads have proposed a plan for improving freight operations along the Front Range. That plan includes building a bypass on the Eastern Plains that would divert through-train movements heading south along the Consolidated Main Line. The plan would move through-freight movements and rail yards to the east, but local rail traffic would remain. The plan would also make it more possible to implement passenger rail service to the south, though there are no specific plans for such service at this time.

In response to the railroads' proposed plan, CDOT agreed to conduct a study of the public benefits and costs of participating in a partnership with the railroads to implement the proposed plan. CDOT completed that study, which indicates there would be significant public and private benefits to completing the project. The study estimates, for example, that the number of daily train movements south of Denver along the Consolidated Main Line would decrease to 16 by the Year 2030. The study is an early phase of what will become a larger effort to examine what it would take to implement the proposed plan, including detailed costs, a funding plan, a financing plan, and engineering design.

3.3.3.1 Railroad Grade Separation Benefits

As discussed in **Chapter 1** *Purpose and Need*, the at-grade railroad crossing north of Alameda Avenue currently poses a crossing Exposure Factor above 75,000, which indicates that consideration of a grade separation is warranted based on Colorado Public Utilities Commission guidelines (Colorado Public Utilities Commission, 2003). The crossing also meets the FRA conditions for consideration of a grade separation, with an estimated 310 vehicle-hour delay based on current conditions, compared with the FRA's threshold of 40 vehicle-hours of delay (FRA, 2002). The presence of a crossing train during peak travel hours creates significant vehicle queues and delays; there is a history of train and automobile accidents at the crossings.

The following benefits would be anticipated to occur with the installation of a railroad grade separation at this location:

- From 1975 to the present, there have been 22 train/automobile accidents at the crossing. The accident exposure would be eliminated with a grade separation.
- By the Year 2025, a grade separation would reduce vehicle delay by approximately 438 vehicle-hours per day.
- By removing the conflict between trains and vehicles, a grade separation would eliminate the potential for vehicle queues to extend south along Santa Fe Drive and interfere with traffic operations along Alameda Avenue.

The above benefits would primarily impact automobile travel through the study area. However, alternative modes of travel including pedestrians, bicycles, emergency vehicles, and buses would also benefit from the operational safety improvements highlighted above.

The assumptions used in deriving these benefits are based on assumptions contained in the *Denver Citywide Railroad Study and Plan* (CCD and CRSS Civil Engineers 1992a). Key assumptions are detailed in the *Traffic Report* (FHU, 2005c).

3.3.4 Traffic Operations Conclusions

Based on the results of the traffic operations analyses, several conclusions may be drawn regarding the relative performance of the proposed alternatives. Conclusions are summarized below according to the affected area.

3.3.4.1 US 6 / I-25 / Federal Boulevard Area

System Alternative 3 provides the shortest mainline weaving distance between Federal Boulevard and I-25 and exhibited the greatest freeway and overall delay of the system alternatives.

The collector-distributor roads along US-6 introduced by System Alternative 2 and the Preferred Alternative provide operational and safety benefits associated with segregating weaving traffic from mainline traffic. The Preferred Alternative and System Alternative 2 operate best within the freeway portion of the network.

Delay results for the surface street portion of the network indicate that the system alternatives would operate at similar levels of delay. Surface street delay results generally reflect operational conditions along Federal Boulevard. The single-point urban interchange of System Alternative 3 would eliminate one traffic signal along Federal Boulevard, thereby decreasing surface street delay in comparison with the diamond interchange signals of System Alternative 2.

System Alternative 1 operates with the lowest overall delays of the system alternatives. The Preferred Alternative exhibited the lowest freeway delays (primarily due to the collector-distributor system) while System Alternative 1 exhibited the lowest surface street delays (primarily because Bryant Street traffic would not be diverted to Federal Boulevard).

3.3.4.2 Mainline Interstate 25

Mainline I-25 from Logan Street to Alameda Avenue clearly would improve with the widening of the 6-lane section between the Broadway and Santa Fe Drive interchanges to 8-lanes, which is included in all three system alternatives. This improvement would remove a bottleneck from the freeway system, as I-25 in the future will consist of 8 travel lanes south of Broadway and 8+ lanes north of Santa Fe Drive.

Mainline I-25 north of Alameda Avenue is the most heavily-traveled portion of I-25 within the traffic analysis study area. This section is shown to operate at LOS F in the Year 2025 for all of the alternatives. Mainline traffic operations south of Santa Fe Drive represent general improvement compared with the north end of the I-25 section.

System Alternative 2 introduces collector-distributor roads along I-25 between the Broadway and Santa Fe Drive interchanges. Though weaving movements along the collector-distributor roads would operate at LOS F, mainline I-25 operations would be improved with System Alternative 2.

3.3.4.3 SURFACE STREETS - BROADWAY INTERCHANGE AREA

The installation of a grade-separated southbound Broadway to southbound I-25 on-ramp would help to make System Alternative 2 the most operationally efficient alternative for the Broadway area. However, System Alternative 3 and the Preferred Alternative would provide operational benefits by providing a connection from the Broadway transit station area to Broadway via Exposition Avenue and by simplifying traffic signal phasing patterns at the north ramp terminal intersection.

3.3.4.4 SURFACE STREETS – ALAMEDA AVENUE INTERCHANGE AREA

The provision of an interchange at the intersection of Alameda Avenue and Santa Fe Drive would provide operational benefits relative to the other alternatives. System Alternatives 2 and 3, which would both implement an interchange at this location, represent a delay savings of 15 to 40 percent over System Alternative 1 and the Preferred Alternative, both of which would not provide this interchange. In addition, a portion of the delay savings with System Alternatives 2 and 3 is attributable to the widening of Alameda Avenue east of Santa Fe Drive, which would impact the existing railroad bridges over Alameda Avenue in this area. This widening was not included in System Alternative 1 or the Preferred Alternative.

3.3.4.5 SURFACE STREETS - SANTA FE DRIVE INTERCHANGE AREA

The Santa Fe Drive interchange area would operate quite similarly across the system alternatives. System Alternative 2 would provide local access to Santa Fe Drive south of Alameda Avenue without adding a signalized intersection to the network, thereby providing some operational benefits.

3.3.4.6 SANTA FE DRIVE / KALAMATH STREET RAILROAD GRADE SEPARATION

The grade separation of Santa Fe Drive and Kalamath Street with the Consolidated Main Line railroad, which is included in all three system alternatives, would create significant benefits in terms of increased safety, reduced travel delay, enhanced reliability for all modes of travel, and improved operations on Alameda Avenue and other adjacent streets.

3.3.4.7 SYSTEM-WIDE TRAFFIC OPERATIONS

A comparison of system-wide traffic operations indicates that of the build alternatives, System Alternatives 2, 3, and the Preferred Alternative would provide the least delay to the traveling public, particularly throughout the portion of the study area between Logan Street and Alameda Avenue. The Preferred Alternative would operate best within the US 6 area.

Table 3-6 depicts the relative performance of the alternatives based on the operational analyses described in this report. The overall ratings are compiled in the column on the far right of the table, indicating that System Alternatives 2, 3, and the Preferred Alternative would perform best.

System Alternative 1 would represent an improvement over the No Action Alternative, but it would not perform as well as System Alternatives 2, 3, or the Preferred Alternative. These conclusions represent findings consistent with the anticipated results, as System Alternative 2 was developed to maximize operational efficiency. System Alternative 3 and the Preferred Alternative lag only slightly behind System Alternative 2 in terms of operational efficiency.

Table 3-6 Relative Operational Performance of System Alternatives

Legend: ○ = Best, ◒ = Moderate, ● = Worst	US 6 / Federal / I-25 Area	Broadway Interchange Area	Alameda Interchange Area	Santa Fe Interchange Area	Overall Freeway Operations	Signalized Intersection Hours of Congestion	Overall Surface Street Operations	Overall Operations
No Action	●	●	●	◒	◒	●	●	●
System Alternative 1	○	◒	◒	○	○	◒	◒	◒
System Alternative 2	○	○	○	○	○	○	○	○
System Alternative 3	◒	○	○	○	○	◒	○	○
Preferred Alternative	○	○	◒	○	○	◒	○	○

3.4 Freeway and Street Safety

This section addresses how well each alternative addresses safety problems identified based on analysis of existing conditions. The extent to which these problems are addressed is quantified by the estimated accident reduction for each design alternative. These estimates are inherently associated with some degree of uncertainty, yet this approach identifies design alternatives that are safer than others.

3.4.1 No Action Alternative

As discussed earlier, the history of collisions throughout the corridor indicates a high potential for accident reduction if improvements are constructed. Safety problems on I-25 and US 6 may be related to congestion, recurrent and frequent queuing, close interchange spacing, and geometric characteristics of the existing I-25 alignment. Safety problems along interchange ramps can be largely attributed to congestion and backups along the mainline freeway that result in rear end and “sideswipe same direction” accidents.

These existing problems are expected to persist in the No Action Alternative, as the basic configuration of roadways throughout the study area will remain the same. The safety effects of the completion of the new I-25 Broadway viaduct are considered negligible.

3.4.2 System Alternatives

The implementation of any of the system alternatives is expected to reduce the number of accidents in comparison with the No Action Alternative, though the degree of the reduction varies. Results of the safety analysis of alternatives are addressed in detail in the *Traffic Safety Report* (CDOT, 2005).

Safety improvements associated with each of the system alternatives include intersection improvements (signal phasing, protected left-turns, and geometric enhancements), ramp access improvements, additional lanes along I-25, and separation of weaving and through freeway movements on collector-distributor roadways.

Table 3-7 below depicts the relative safety performance of the system alternatives. Each of the system alternatives represents clear improvement over the No Action Alternative, with System Alternatives 2, 3, and the Preferred Alternative performing best. The Preferred Alternative and System Alternative 2 and 3 represent distinct safety advantages in the US 6 area. The primary advantage of System Alternative 2 and the Preferred Alternative in this area is the provision of a collector-distributor road along US 6 in the eastbound direction. The provision of a single-point intersection at the US 6/Federal Boulevard interchange provides a safety advantage in System Alternative 3.

Table 3-7 Relative Safety Performance of System Alternatives

Legend: ○ = Best, ◒ = Moderate, ● = Worst	US 6 Freeway and Interchanges	I-25 Mainline Freeway	Broadway Interchange Area	Santa Fe Interchange Area	Alameda Interchange Area	Overall Safety
No Action	●	●	●	●	●	●
System Alternative 1	◒	○	○	○	○	◒
System Alternative 2	○	○	○	○	○	○
System Alternative 3	○	○	○	○	○	○
Preferred Alternative	○	○	○	○	○	○

3.5 Transit / HOV Access

3.5.1 Bus / HOV Impacts

CDOT operates a bus/HOV system along Santa Fe Drive from Florida Avenue south in the southbound direction and from I-25 south in the northbound direction. The City and County of Denver and RTD manage and operate bus-only lanes along Broadway and Lincoln Street north

of I-25. They terminate/start at the Broadway park-n-Ride. These will be preserved with the three system alternatives although the southbound Broadway bus only entrance into the park-n-Ride will be integrated with a new ramp connection and signal reconfiguration.

The existing Santa Fe Drive HOV lane south of I-25 is expected to remain in place, and appropriate connections with the existing bus/HOV lanes have been integrated into the system alternatives. As discussed in **Chapter 2** *Alternatives*, expansion of the existing HOV system would not address the purpose and need goal of providing lane continuity and balance.

3.5.2 I-25 and Broadway park-n-Ride

The No Action Alternative and each of the system alternatives would retain vehicular access to the Broadway park-n-Ride generally to the current levels. Systems Alternatives 1 and 2 would retain full movement vehicular access at Kentucky Avenue and Broadway as it is today. System Alternative 3 would convert this Kentucky Avenue access to a right in/right out and introduce a new full movement access at Exposition Avenue. The Preferred Alternative would retain full movement access at Kentucky Avenue and Broadway, and add access at Exposition Avenue.

Pedestrian and bicycle access to the park-n-Ride would be improved with wider sidewalks and signals along Ohio Avenue, Lincoln Street, and Broadway. The improvements are described in detail in **Chapter 2** *Alternatives*.

3.6 Pedestrian and Bicycle Facilities

3.6.1 Common Elements to the System Alternatives

As discussed previously, pedestrian and bicycle mobility within the corridor has been identified as a project need. The City and County of Denver has identified key corridors for pedestrian and bicycle mobility and adopted standards for these facilities (CCD, 2002a; CCD, 2002b). Key components of the plan applicable to this corridor address the South Platte River Trail, east-west connectivity, and the Santa Fe Drive/Kalamath Street pedestrian facilities.

3.6.1.1 SOUTH PLATTE RIVER TRAIL

Common improvements to the trail associated with this project would include:

- Connectivity to the trail at Alameda Avenue would be enhanced
- The trail section parallel to I-25 between 2nd and 3rd Avenue would be upgraded to include widening and shoulder enhancements and screening to shield the trail from I-25
- Horizontal and vertical clearance at the US 6 underpass would be improved
- Horizontal and vertical clearance at the Santa Fe Drive bridge over the South Platte River south of I-25 would be improved

3.6.1.2 EAST-WEST CONNECTIVITY

Two principal east west bicycle/pedestrian corridors were identified for enhancement within the project corridor – along Ohio Avenue at Broadway and along Alameda Avenue.

Common improvements to bicycle/pedestrian facilities along Broadway at Ohio Avenue associated with the project would include:

- Bicycle and pedestrian movements would be improved with wider sidewalks and signals along Ohio Avenue, Lincoln Street, and Broadway. The alignments would be slightly different and are discussed further in the specific alternatives.
- Pedestrian overpasses and underpasses were considered by the Citizen Working Group but eliminated from further consideration because of the out-of-direction travel required, the visual obtrusiveness of the structures, and potential security risks.

Common improvements to bicycle/pedestrian facilities along Alameda Avenue associated with this project would include:

- An attached sidewalk would be incorporated along the south side of Alameda Avenue while a shared use bike trail offset 5 feet from the street would be provided on the north side. System Alternate 3 would provide a subtle variation on this and is discussed below.
- A pedestrian/bicycle grade-separated crossing of I-25, the South Platte River, Santa Fe Drive, Kalamath Street, and the Consolidated Main Line would be incorporated to complement the current City master plan. The alignment generally would follow an extension of Bayaud Avenue north of Alameda Avenue. The details would vary subtly with each alternative and are discussed in **Chapter 2** *Alternatives*.

3.6.1.3 SANTA FE DRIVE / KALAMATH STREET PEDESTRIAN FACILITIES

Sidewalks exist sporadically along Santa Fe Drive and Kalamath Street through the project limits. Enhanced pedestrian connectivity along Santa Fe Drive and Kalamath Street would be provided within the system alternatives. Common improvements include:

- Attached sidewalks would be included with the grade-separation options with the railroad along Santa Fe Drive and Kalamath Street north of Alameda Avenue
- Attached sidewalks would be added on the east side of Santa Fe Drive for pedestrian access to Home Depot and the Warehouse District/Cherokee Redevelopment south of I-25

3.6.2 Differentiating Elements of the System Alternatives

3.6.2.1 BROADWAY EAST-WEST CONNECTIVITY

Both the No Action Alternative and the system alternatives would route pedestrians and bicycles from areas east of Lincoln Street to areas west of Broadway via signalized at-grade crossings. The route with the fewest pedestrian/bike conflicts with vehicular traffic would be System Alternative 2. However, System Alternative 3 and the Preferred Alternative more directly eliminate conflict with the high-speed northbound Lincoln Street off-ramp.

3.6.2.2 ALAMEDA AVENUE

By grade-separating the intersection of Alameda Avenue with Santa Fe Drive, System Alternatives 2 and 3 would remove a significant amount of traffic that could conflict with pedestrians and bicycles through the intersection. System Alternative 3 would further improve safety for pedestrians and bicycles by including 10-foot wide paths separated by a buffer from both sides of Alameda Avenue.

3.7 Freight and Rail Operations

The No Action Alternative would result in continued and increasing difficulty for freight transportation throughout the corridor. Freeway sections within the corridor are expected to remain congested, causing delay for freight trucks traveling through the corridor. Rail impacts are expected to be negligible, as track configurations remain similar for each of the system alternatives. Implementation of any of the system alternatives would improve conditions for freight travel through the corridor to the same degree that traffic operations would be improved.

The US 6 area represents a substantial portion of freight travel within the study area. Multiple industrial sites concentrated around the US 6/Bryant Street area make it a key location for truck travel. In the No Action Alternative, access to the Bryant Street area is extremely constrained with closely-spaced interchange ramps and weaving sections. Each of the system alternatives would improve freight access to this area by removing the existing US 6/Bryant Street ramps.

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