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FINAL TRAFFIC STUDY REPORT

Volume I

for the

CENTENNIAL CORRIDOR PROJECT

on Route 58 in Bakersfield

between Cottonwood Road

and Interstate 5

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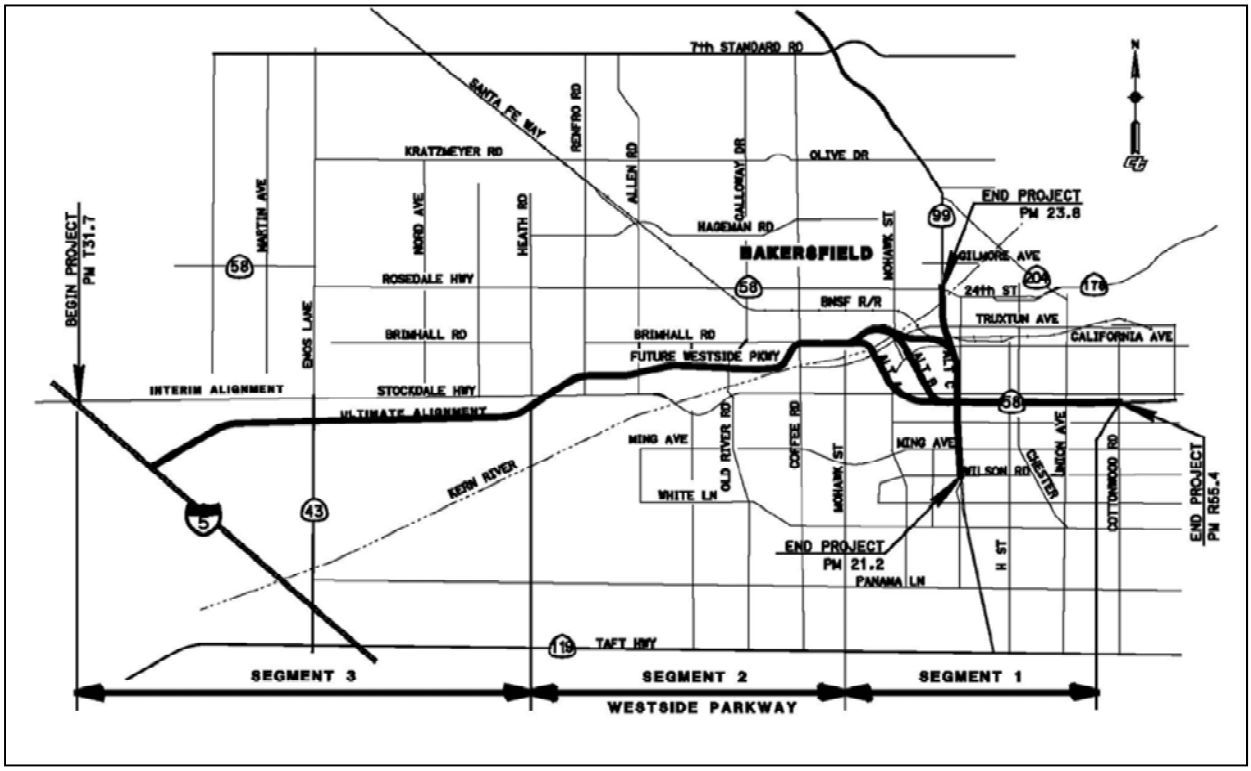
VICINITY MAP



on Route 58 in Bakersfield

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EXECUTIVE SUMMARY

Project Overview

The California Department of Transportation (Caltrans) proposes to establish a new alignment for State Route 58, which would provide a continuous route along State Route 58 from Cottonwood Road on existing State Route 58, east of State Route 99 (post mile R55.6), to Interstate 5 (I-5) (post mile T31.7). Improvements to State Route 99 (post miles 21.2 to 26.2) and Westside Parkway would also be made to accommodate the connection with State Route 58.

The project is located at the southern end of the San Joaquin Valley in the city of Bakersfield in Kern County, California. The study site is bound on the east by Cottonwood Road, on the west by I-5, on the north by Gilmore Avenue, and on the south by Wilson Road. Caltrans is the lead agency for the project pursuant to the California Environmental Quality Act and the National Environmental Policy Act.

The proposed continuous route is known as the Centennial Corridor.

The purpose of the Centennial Corridor project is to provide route continuity and associated traffic congestion relief along State Route 58 within metropolitan Bakersfield and Kern County from State Route 58 east (from Cottonwood Road) to Interstate 5.

The American Association of State Highway and Transportation Officials' *A Policy on Geometric Design of Highways and Streets* (2004) defines route continuity as a roadway throughout the length of a designated route. The goal of route continuity is to ease the driving task by reducing the need to change lanes and search for directional signing. Route continuity is evaluated in terms of consistent levels of service by providing an appropriate number of lanes.

State Route 58 is a critical link in the state transportation network that is used by interstate travelers, commuters, and large numbers of trucks. Under existing conditions, State Route 58 does not meet the capacity needs of the area, and this is expected to get worse as the population grows. State Route 58 lacks continuity in central Bakersfield, which results in severe traffic congestion and reduced levels of service on adjoining highways and local streets. This route is offset by about one mile at State Route 43 (Enos Lane) and by approximately two miles at State Route 99. The merging of two major state routes (58 and 99) into one alignment between the eastern and western legs of State Route 58 degrades the traffic level of service on this segment of freeway. In addition, State Route 99's close spacing between its two interchanges with State Route 58 (east and west), in addition to an interchange at California Avenue, results in vehicles aggressively changing lanes, which adds to congestion.

State Route 58 is a high volume, east–west, interregional route in Bakersfield and is critical to the economic vitality of the region and the state. It provides significant goods and freight movement connections between Interstate 5 and State Route 99 in the Central Valley. State Route 58 also links to other important goods movement corridors nationwide such as State Route 14, Interstate 15, Interstate 40 and U.S. 395.

As noted above, there are two locations within the project study area where the route is offset: approximately one mile at State Route 43 and approximately two miles at State Route 99. Because State Route 99 is a major state highway in the Central Valley and is the only north–south freeway in Bakersfield, it carries large volumes of traffic. Regional and interregional traffic using State Route 58 contribute to the already considerable volumes of traffic on State Route 99 along the segment shared by these two highways.

The population of metropolitan Bakersfield is rapidly growing. In the area east of State Route 99, three highways (State Route 204, State Route 178 and State Route 58) provide a well-developed freeway system to handle large volumes of local traffic movement. There are no freeways in the metropolitan area west of State Route 99 to support growth. The stop- and signal-controlled local highways and streets west of State Route 99 add to commute times and provide lower levels of service. The proposed project would provide the additional capacity to accommodate this growth.

Existing Conditions

State Route 58 generally travels in the east–west direction for approximately 240 miles across California and is currently one of the most significant routes going through Bakersfield. West of Bakersfield, the route is called the Blue Star Memorial Highway and runs for roughly 100 miles until terminating at Highway 101, near Santa Margarita, California. East of Bakersfield, the route is called the Barstow–Bakersfield Highway and runs for about 140 miles until terminating at Interstate 15 near Barstow, California.

Within metropolitan Bakersfield, State Route 58 is made up of four principal sections, as illustrated on Figure 1 and described below.

Interstate 5 to Allen Road

Starting at Interstate 5, State Route 58 is currently a conventional highway, locally identified as the Rosedale Highway. Between Interstate 5 and Allen Road, the corridor is a two-lane facility surrounded by agricultural land with some recently developed residential areas.

The alignment of State Route 58 is offset by approximately one mile where the roadway jogs, and is co-located with State Route 43. The intersections of State Route 43 with State Route 58 north and State Route 58 south are stop sign controlled. Speed limits are posted at 55 miles per hour (mph).

Allen Road to State Route 99

This section of State Route 58/Rosedale Highway is principally a business route with two lanes in each direction and outside turn pocket lanes at street intersections. The highway typically includes a slightly raised, non-landscaped median varying up to about 20 feet wide. No posted speed limits are evident, except in 25 mph school zones, but traffic generally travels at about 45 to 55 mph. Although there are very few residential areas directly along this highway, this section services the communities of Rosedale, Greenacres and Fruitvale, which surround the highway.

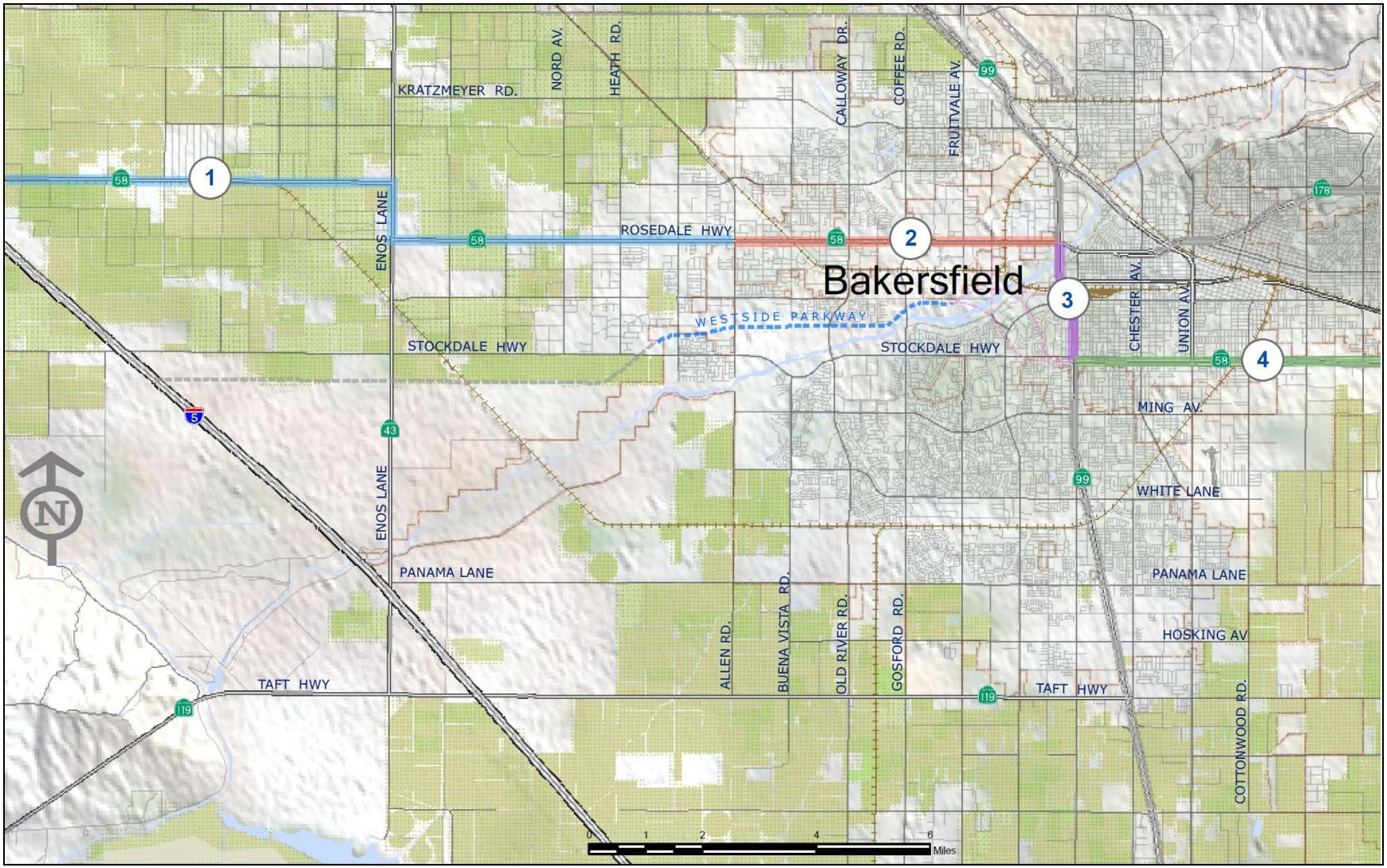


Figure 1: Principal Sections of State Route 58 in the Centennial Corridor Vicinity

The first two miles of Rosedale Highway east of Allen Road is a mix of undeveloped land, old homes and businesses, and a trailer park. Just east of Allen Road is a 25 mph zone for Rosedale Middle School; and just past this school is Rosedale Park. Continuing east, the highway elevates over the BNSF Railway and then returns to its previous ground level. Past the railroad and as the route approaches Calloway Drive, there are some small businesses and shopping areas. For about one mile on the north side of the highway, between Calloway Drive and Coffee Road, exists a large restaurant and shopping center made up of newer "big box" retailers called the Northwest Promenade. The south side has a few smaller businesses, auto shops and gas stations, but the majority of the land is open for overhead power line towers and petroleum storage reservoirs. Just east of Coffee Road, the highway crosses over both the Friant–Kern Canal and then the Calloway Canal. The posted speed limit is reduced to 25 mph for the Vista West High School located to the south. Farther east, the highway crosses over Calloway Canal again as the canal turns back north near Fruitvale Avenue. Just east of this, the highway crosses over Emery Ditch and still farther east, is another railroad crossing. For the two and a half miles between Coffee Road and the interchange with State Route 99, the highway services a few businesses and restaurants, but is mostly undeveloped or adjoined by light industrial land uses with some auto shops, storage facilities and warehouses. East of the railroad crossing, around Gibson Street, the speed limit is 40 mph. As the highway passes under State Route 99, it opens up to three lanes and will have additional single or double turn lanes as needed. The area surrounding this interchange is made up of numerous large restaurant and hotel chains. It also services the Bakersfield Heart Hospital located northeast of the interchange.

State Route 58 West to State Route 58 East (State Route 99)

State Route 99 is an extensive north–south route in the middle of California servicing more than 400 miles of the state. It extends north past Sacramento and terminates at its junction with Interstate 5, about 20 miles south of Bakersfield. At the north end of Bakersfield, it provides freeway access to the Meadows Field Kern County Airport. Farther south, it has a large interchange with State Route 204 and Airport Drive.

Within the study area, both east and west travel directions of State Route 58 have ramps that directly access southbound lanes of State Route 99. The two state routes combine and continue in the north–south direction for two miles until an interchange immediately south of Brundage Lane where both routes diverge. This portion of the freeway consists of four lanes with shoulders in each direction, separated by a concrete barrier with a posted speed limit of 65 mph (55 mph for trucks or haulers). Exit numbers descend in the south direction. State Route 99 Exit 26 will connect travelers to 24th Street/State Route 178. Exit 25 connects to the Civic Center and California Avenue. Exit 24 accesses Stockdale Highway or Brundage Lane and the section where State Route 58 diverges east from State Route 99. One mile farther south is the final exit in the study area, Exit 23 for Ming Avenue.

State Route 99 to Cottonwood Road

East of Bakersfield, State Route 58 is also called the Barstow–Bakersfield Highway and continues east for about 140 miles until its junction with Interstate 15 near Barstow, California. Traveling south on State Route 99, the access ramp for State Route 58 east elevates high as an overpass above Stockdale Highway, State Route 99, State Route 58 and Wible Road, before descending back down to access the eastbound lanes of State Route 58. Traveling west on State

Route 58, an exit ramp connects to the State Route 99 northbound lanes as an underpass below Brundage Lane and Oak Street. State Route 58 east is a divided highway separated by a metal barrier and a wide median. It consists of two lanes with shoulders in each direction and has a posted speed limit of 65 mph (55 mph for trucks or haulers). There are several residential areas offset from the highway on both sides up to the Union Avenue/State Route 204 exit. Exit numbers ascend in the east direction. Exit 111 provides access to Chester Avenue and downtown Bakersfield. About one-quarter mile west of Exit 114 for Mt. Vernon Avenue, the highway widens to three lanes in each direction and continues with this cross section as the road leaves the city of Bakersfield.

Figure 2 illustrates the location of congestion along the freeway portions of the route. State Route 58 east of State Route 99 is relatively uncongested under existing conditions except for the eastbound segment approaching Union Avenue. The shared section of State Route 99 and State Route 58 between State Route 58 east and Rosedale Highway is more congested, with slower speeds and light congestion experienced at interchange on-ramp merge areas and off-ramp diverge sections.

Future No-Build Conditions

Traffic volumes are expected to increase in the future as Kern County continues to attract new residents and Bakersfield continues its role as a crossroads of north–south and east–west interstate and intrastate personal travel and trade corridor movements. Table 1 and Figure 3 chart the history of population growth past, present and future. As has been the trend for the past 60 years, residents and jobs have been attracted to Kern County in increasing numbers. All population forecasts support a continuation of population increases once the current economic slowdown passes.

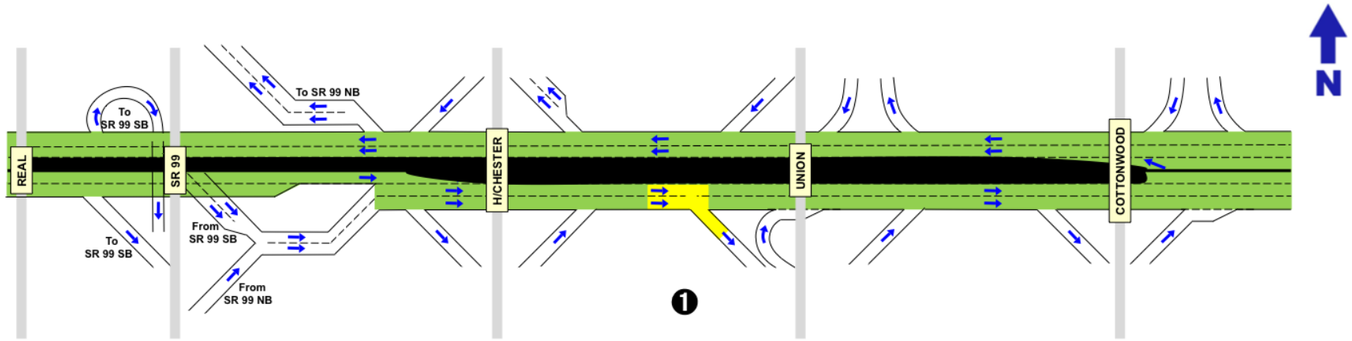
More residents, more jobs, and more trade will result in higher volumes of automobiles, trucks and trains passing through central Bakersfield. Figure 4 illustrates the pattern of traffic volumes using metropolitan Bakersfield's arterial streets and state highways in 2006 and 2038. State highways such as State Route 58, State Route 99 and State Route 178 are expected to experience major increases in traffic flows.

As a result of increased traffic volumes, the level of congestion along State Route 58 and the shared portion of State Route 99 (between State Route 58 east and Rosedale Highway) is expected to worsen. Figure 5 illustrates the location of bottlenecks, traffic queues and slower speeds anticipated to occur by year 2038, assuming no project to connect State Route 58 east with the Westside Parkway.

Congestion will be particularly heavy along State Route 99 in the vicinity of State Route 58, where speeds will slow below 40 mph due to heavy on- and off-ramp volumes and weaving conflicts. The extent of congestion is illustrated on the graphic by segments colored as red and yellow. Traffic will also slow along westbound State Route 58 as the traffic queue along southbound State Route 99 spills back to the on-ramp from westbound State Route 58.

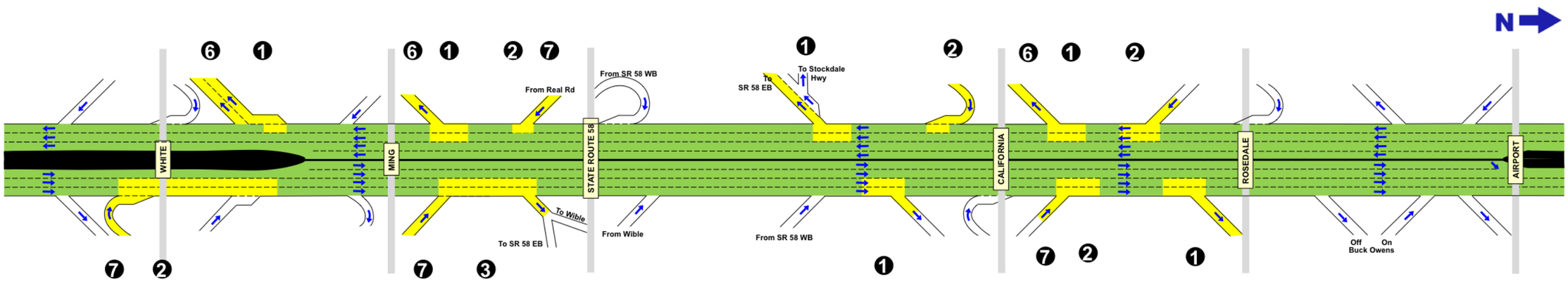
STATE ROUTE 58

Segment 1



	CONGESTION CAUSES	DESCRIPTION
1	Heavy off-ramp volume	Vehicles crowd right lanes of freeway trying to exit
2	Heavy on-ramp volume	Vehicles entering freeway crowd right lanes of freeway
3	On-ramp to off-ramp weave conflicts	Heavy volumes of traffic entering freeway conflict with heavy volumes of traffic exiting freeway
4	Spillback from bottleneck on mainline	Traffic congestion ahead causes approaching traffic to slow speed and compress space between vehicles
5	Bottleneck	Traffic volumes on mainline (combined on-ramp, weaving, off-ramp, through movements) exceed capacity, causing traffic to slow and compress space between vehicles
6	Off-ramp/arterial street bottleneck	Congestion on arterial street limits throughput of freeway off-ramp
7	On-ramp spillback	Congestion on freeway limits throughput of on-ramp to freeway

STATE ROUTE 99



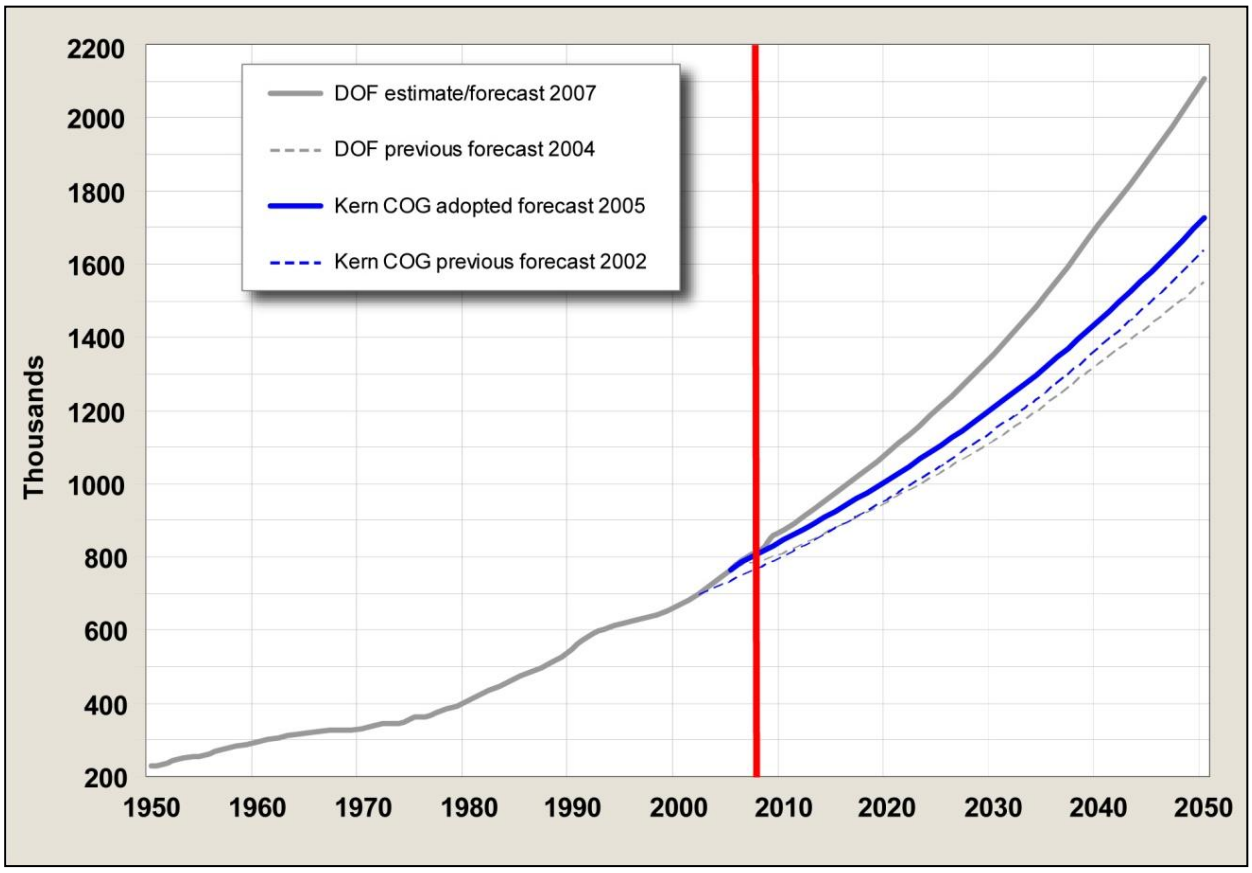
LOS A, B, C, D
LOS E
LOS F

Figure 2: Existing Traffic Operational Conditions on State Route 58 and State Route 99

Table 1. Comparison of Kern County Population Forecasts

	CA DEPARTMENT OF FINANCE[1]		CALIFORNIA ECONOMIC FORECASTS REPORT[2]					KERN COG[3]
YEAR	2004	2007	2005	2005	2007	2008	2010	2005
1995			630,300					
2000	664,694	665,519	665,367	665,373				
2005	732,800		767,764	770,424	768,928			765,600
2010	808,808	871,728	886,417	895,263	885,176	853,486	848,730	845,600
2015			1,009,368	1,036,709	1,005,806	950,991	938,042	924,533
2020	950,112	1,086,113	1,132,743	1,185,769	1,128,324	1,057,804	1,040,449	1,010,800
2025			1,255,384	1,331,953	1,241,859	1,165,153	1,148,731	1,105,094
2030	1,114,878	1,352,627		1,474,471	1,347,635	1,272,081	1,256,152	1,208,200
2035							1,367,600	1,321,000
2040	1,325,648	1,707,239						1,444,100
2050	1,549,594	2,106,024						1,726,200

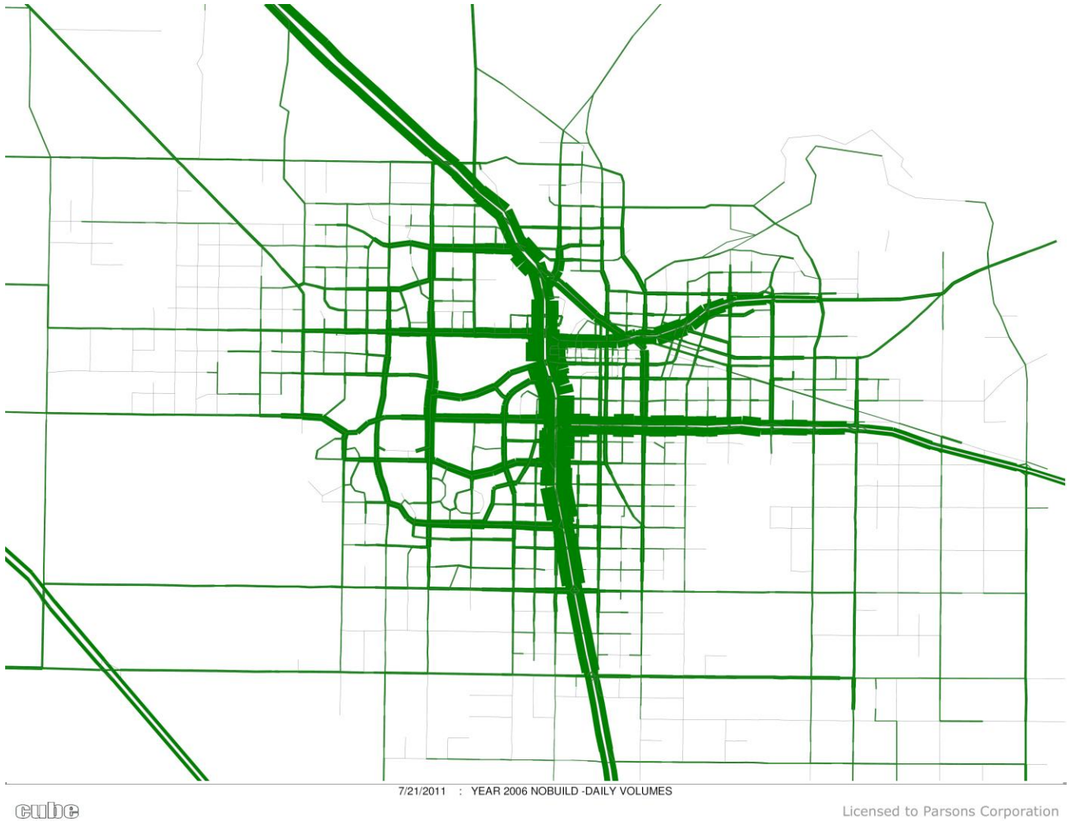
Sources:
[1]California Department of Finance, Demographic Research Unit, May 2004 and July 2007
[2]California Department of Transportation, county-level economic forecast reports from 2005, 2006, 2007, 2008 and 2010 prepared by Dr. Mark Schniepp, California Economic Forecasts, Inc.
[3]Kern Council of Governments, Kern County Travel Demand Model Population Forecast, updated 2005.



Source: Kern Council of Governments *Final Regional Growth Forecast Report*, October 2009

Figure 3: Comparison of Kern County Population Forecasts

2006 Daily Traffic Volumes



Source: Parsons

2038 No-Build Alternative Daily Traffic Volumes

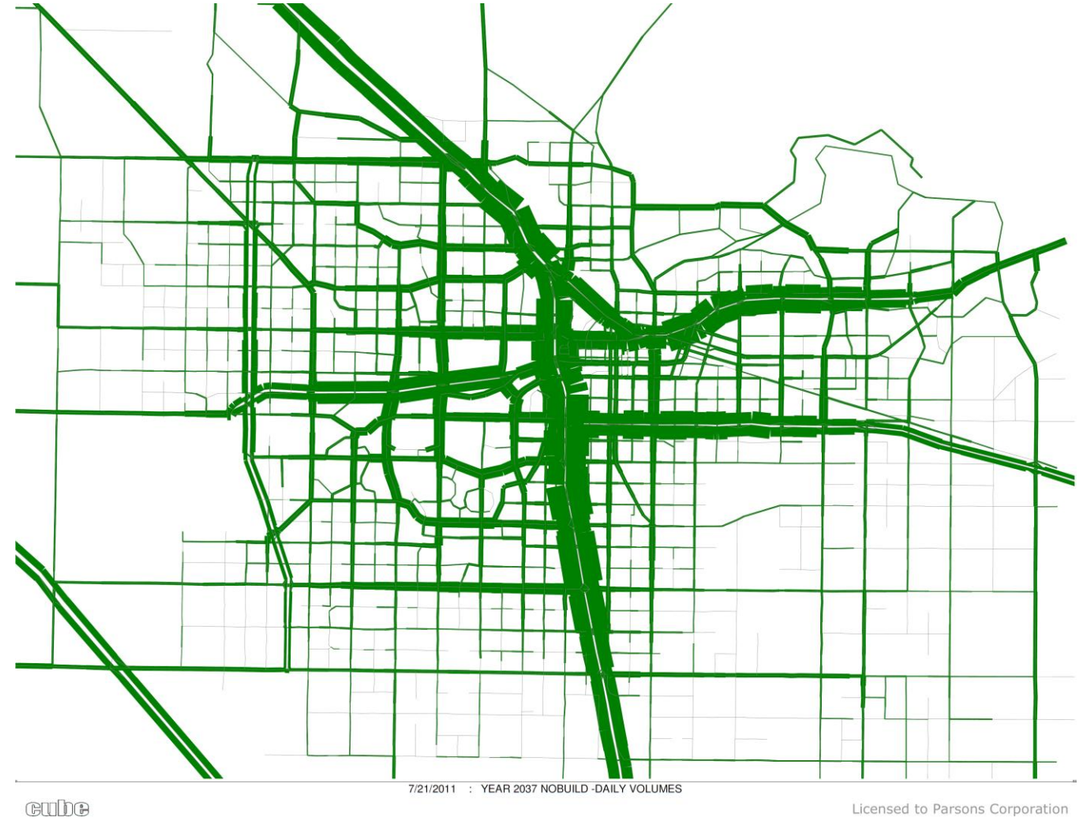
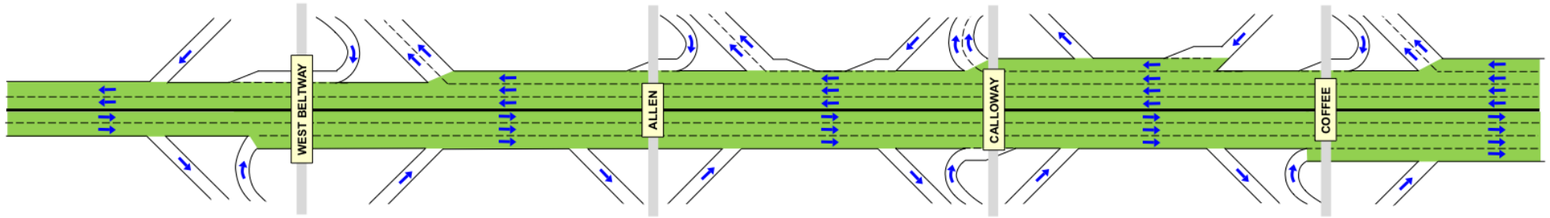


Figure 4: Difference between Year 2006 and Year 2038 Daily Traffic Volumes

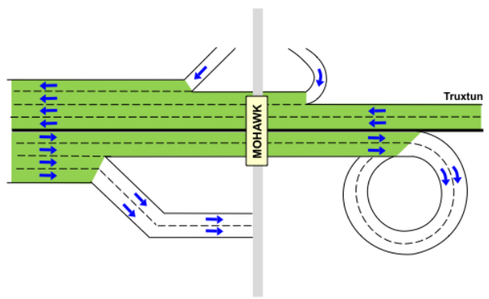
STATE ROUTE 58

Segment 2—Westside Parkway

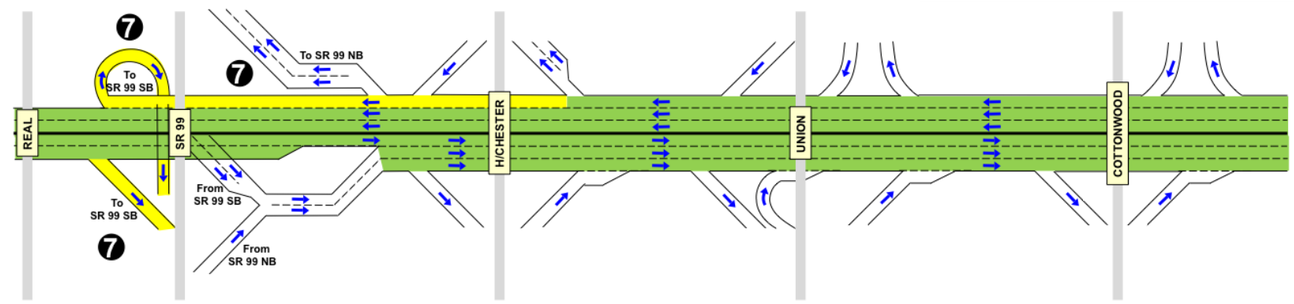


CONGESTION CAUSES		DESCRIPTION
1	Heavy off-ramp volume	Vehicles crowd right lanes of freeway trying to exit
2	Heavy on-ramp volume	Vehicles entering freeway crowd right lanes of freeway
3	On-ramp to off-ramp weave conflicts	Heavy volumes of traffic entering freeway conflict with heavy volumes of traffic exiting freeway
4	Spillback from bottleneck on mainline	Traffic congestion ahead causes approaching traffic to slow speed and compress space between vehicles
5	Bottleneck	Traffic volumes on mainline (combined on-ramp, weaving, off-ramp, through movements) exceed capacity, causing traffic to slow and compress space between vehicles
6	Off-ramp/arterial street bottleneck	Congestion on arterial street limits throughput of freeway off-ramp
7	On-ramp spillback	Congestion on freeway limits throughput of on-ramp to freeway

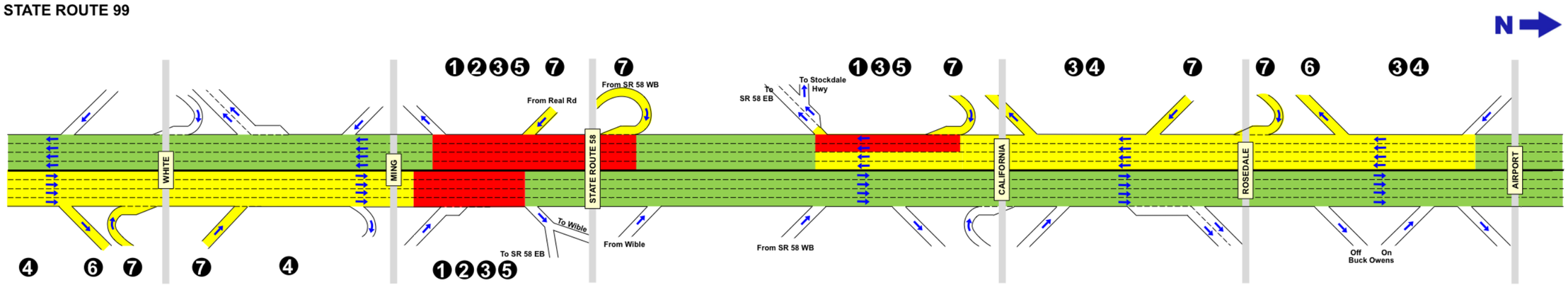
Segment 1—Westside Parkway



Segment 1—State Route 58 (East)



STATE ROUTE 99



LOS A, B, C, D
LOS E
LOS F

Figure 5: No-Build Year 2038 Forecast Traffic Operational Conditions on State Route 58 and State Route 99

This expected traffic congestion will impact both Kern County residents and interregional truck flows. Figure 6 illustrates the pattern of truck movements using interstate routes within Kern County (Interstate 5, State Route 99, and State Route 58/Interstate 40). Heavy truck volumes in Kern County are forecast to increase by 87 percent between the years 2000 and 2030 according to the *San Joaquin Valley Goods Movement Study*.

Proposed Project Alternatives

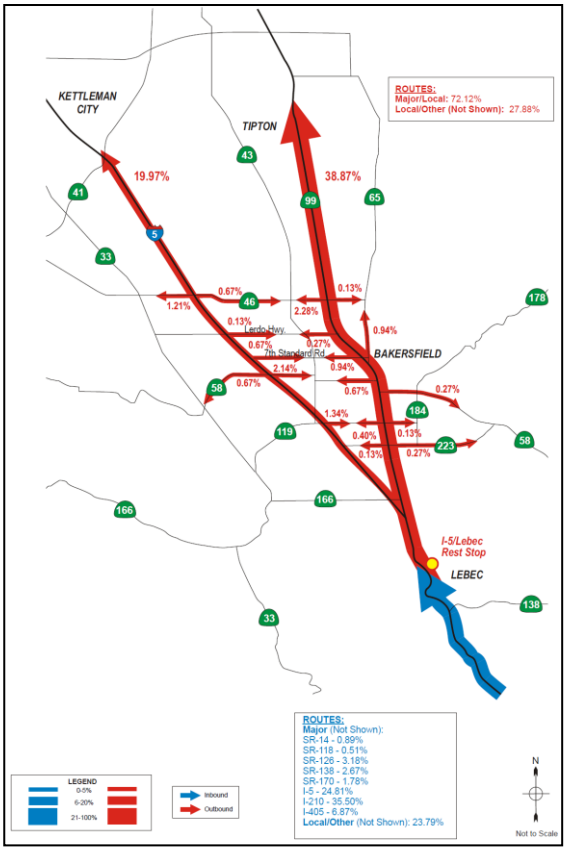
To address the anticipated increase in traffic volumes and resulting congestion, a project has been proposed to connect the segment of State Route 58 east of State Route 99 with the Westside Parkway and the western end of Stockdale Highway, and to adopt this alignment between Interstate 5 and State Route 99 as State Route 58. This project would provide continuity for State Route 58 in Kern County. In addition to providing route continuity and associated traffic congestion relief, this project would:

- Provide interregional and regional connectivity for east–west traffic traveling within metropolitan Bakersfield and Kern County
- Promote economic growth and international/interregional trade by improving linkages between existing segments of the interstate system
- Reduce commercial and regional commute time trough a major freight corridor
- Improve local east–west circulation and reduce congestion to accommodate existing and planned land uses in accordance with adopted growth projections
- Improve operations and reduce congestion on the shared portion of State Route 58 and State Route 99.

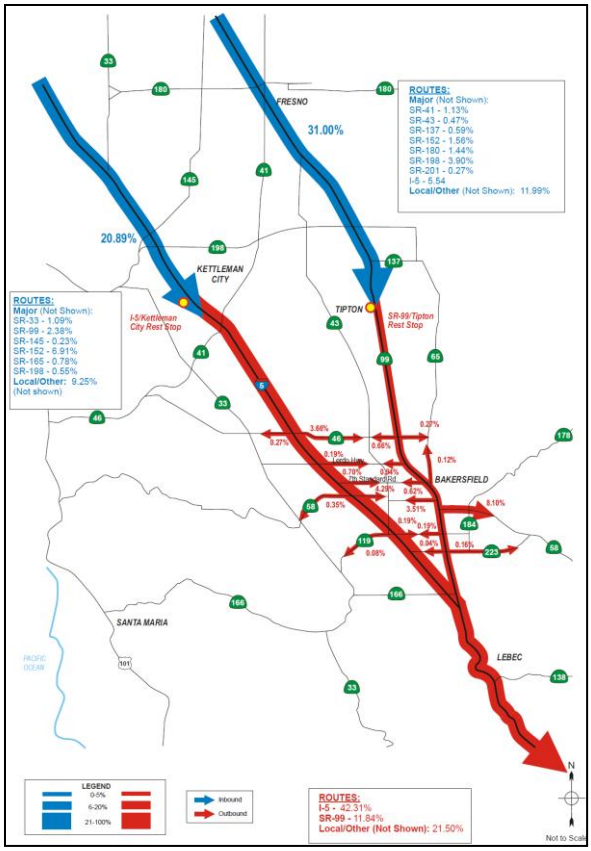
The project alternatives include three build alternatives and a no-build alternative. In addition, this traffic study report evaluates a transportation systems management alternative referenced as alternative M. These alternatives are described below.

No-build Alternative: The no-build alternative would not construct any improvements. The Westside Parkway would be constructed as a local facility, but would not connect to State Route 58, State Route 99, or Interstate 5. Rosedale Highway, the west leg of State Route 58 between State Route 99 and Interstate 5, would be widened from four lanes to six lanes between State Route 99 (Gibson Road) and Allen Road, and from two lanes to four lanes between Allen Road and Enos Lane (State Route 43).

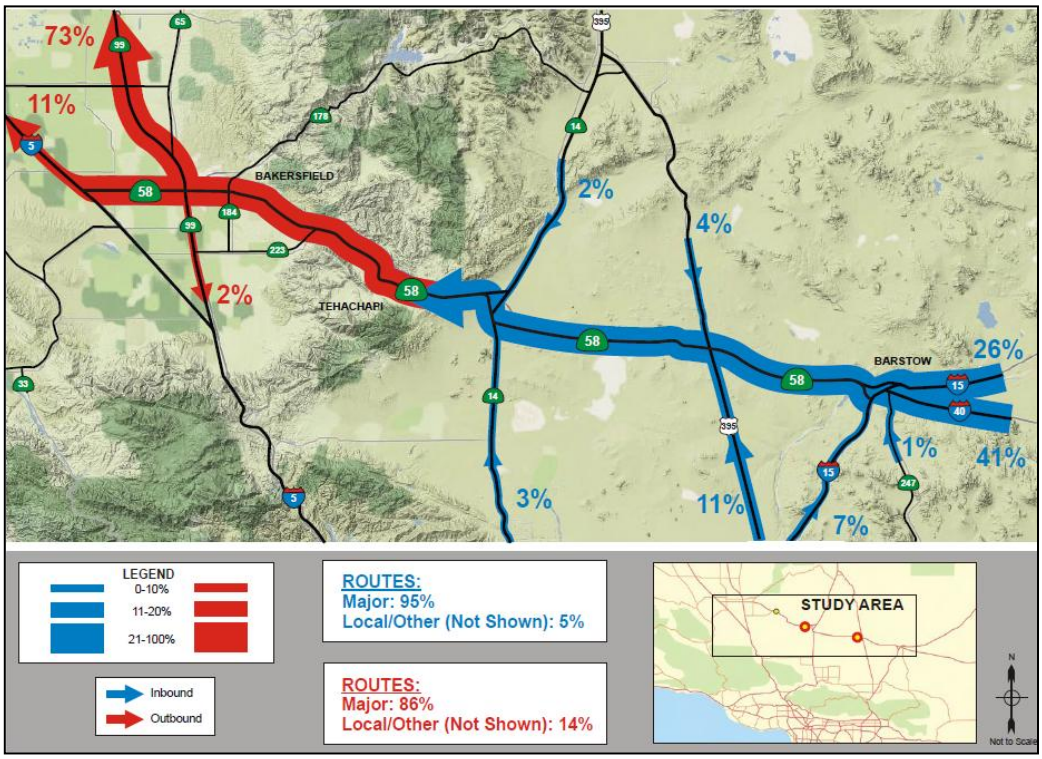
Alternative M: Alternative M, the transportation system management alternative, proposes local arterial improvements to increase the person-carrying capacity. Low-cost improvements include traffic signal optimization, intersection widening and bus service and stop improvements along all of the east–west arterial streets from Hageman Road to Ming Avenue. The same improvements are also assumed for the no-build and all build alternatives, and were therefore not specifically evaluated by this traffic study. Higher cost improvements include constructing grade separations along Rosedale Highway at four major north–south arterial streets and reducing the number of intervening signalized intersections between Allen Road and State Route 99. Detailed traffic operational analysis of the alternative indicates that Rosedale Highway would also need to



Northbound Route Choice (Lebec Rest Stop)



Southbound Route Choice (Kettleman City/Tipton Rest Stop)



Westbound Route Pattern on State Route 58 Corridor

Sources: I-5/SR-99 Origin and Destination Study, SR-58 Origin and Destination Truck Study, KOA Corporation

Figure 6: Interstate and Interregional Truck Flow Patterns in Kern County

be widened to eight lanes between Fruitvale Avenue and State Route 99, a distance of 1.8 miles, to accommodate forecast traffic volumes. This alternative assumes there is no new direct connection between the approved Westside Parkway and existing State Route 58/State Route 99 interchange.

Alternative A: Alternative A proposes to connect the east end of the Westside Parkway to State Route 58 by a six-lane facility on the west side of the State Route 58/State Route 99 interchange. This alternative would run parallel to and south of Stockdale Highway for approximately one mile before turning north and connecting to the Westside Parkway between Mohawk Street and Coffee Road. There would also be linkage to the Mohawk Street interchange providing additional connectivity with downtown Bakersfield.

Alternative B: Alternative B proposes to connect the east end of the Westside Parkway to State Route 58 by means of a six-lane facility on the west side of the State Route 58/State Route 99 interchange. The alignment would travel in a westerly direction for approximately one-half mile on the south side of Stockdale Highway, at which point it would turn to the northwest and join the Westside Parkway just east of the Mohawk Street interchange.

Alternative C: Alternative C proposes to connect the existing State Route 58 to the Westside Parkway by means of a six-lane facility that runs parallel to the existing State Route 99. Auxiliary lanes and ramp modifications on State Route 99 would be required to accommodate weaving movements associated with the new connections.

The proposed continuous alignment for State Route 58 has been divided into three distinct segments and the combination of these three segments comprises the Centennial Corridor project. Segment 1 is the eastern segment that would connect the Westside Parkway (Segment 2) to the existing State Route 58 east freeway. Segment 2 is comprised of what is locally known as the Westside Parkway and extends from Heath Road to Truxtun Avenue. Segment 3 is the western segment that extends from Interstate 5 to Heath Road.

The project's segments are numbered from east to west as shown on Figure 7.

Segment 1 extends from the easterly terminus of Segment 2 near Truxtun Avenue to the existing State Route 58 east freeway in the vicinity of Cottonwood Road. It is the only segment where construction alternatives A, B and C are being considered. These three build alternatives plus a transportation systems management/transit alternative (alternative M) and a no-build alternative are being considered, as indicated above.

Segment 2 encompasses a local freeway facility known as the Westside Parkway. As part of the Centennial Corridor project, it is anticipated that the Westside Parkway would be successfully adopted as State Route 58 (under build alternatives A, B, or C).

Westside Parkway is a local, access controlled, multilane freeway that extends from its western terminus near the intersection of Stockdale Highway near Heath Road to its eastern terminus near Mohawk Street, Truxtun Avenue and the Kern River.

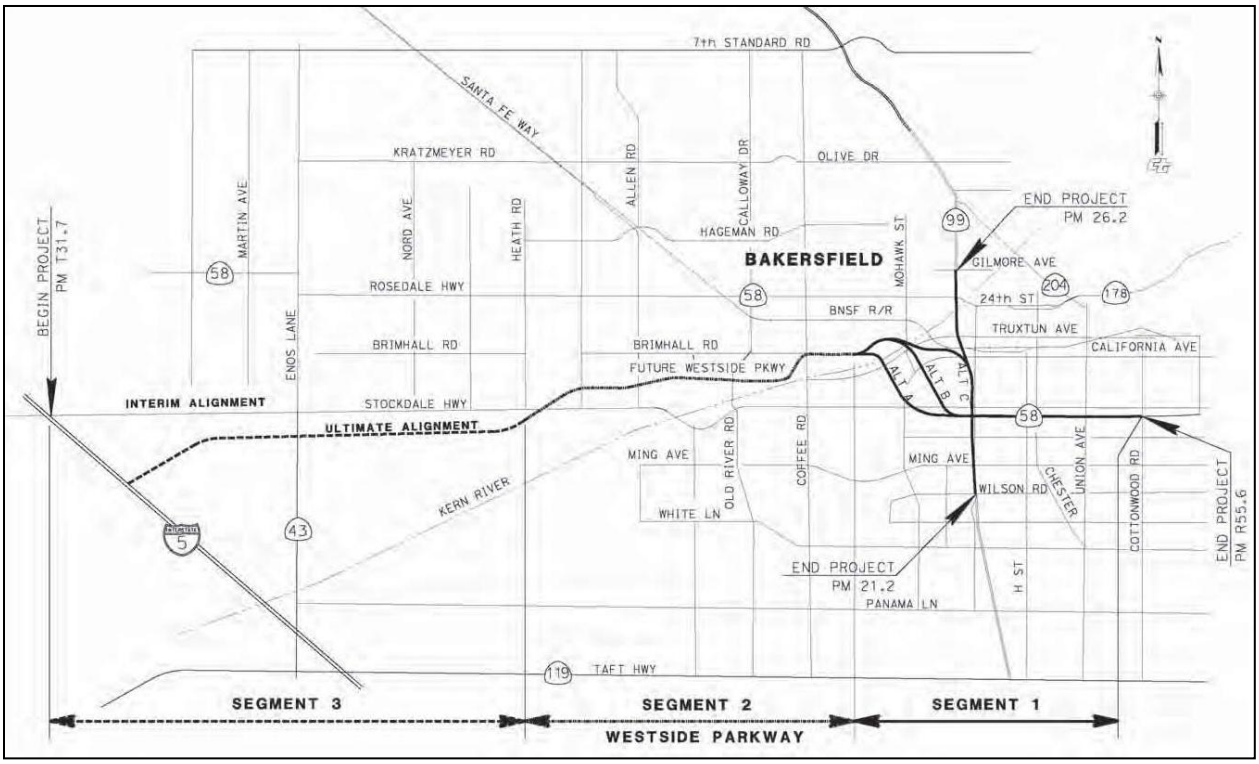


Figure 7: Segments for the Centennial Corridor

Segment 3 extends from Interstate 5, approximately two miles south of the Stockdale Highway/ Interstate 5 interchange, to the intersection of Heath Road and Stockdale Highway. The Centennial Corridor project proposes an interim connection to Interstate 5 via Stockdale Highway from the end of Segment 2 near Heath Road under build alternatives A, B, or C. Under alternative M, the connection to Interstate 5 would remain on existing State Route 58, known locally as Rosedale Highway.

This traffic operations analysis is focused on Segment 1, as the limits of construction primarily occur within this segment along with the majority of potential traffic related impacts. The traffic operations analysis addresses Segment 2 to determine if the freeway connector project (Segment 1) will impact the design requirements of the Westside Parkway. The analysis of Segment 3 traffic operations is limited to the interim connection to Interstate 5 via Stockdale Highway under build alternatives A, B, or C.

Qualitative Traffic Performance of the Project Alternatives

The purpose of this traffic study report is to examine the performance of the build alternatives from a traffic perspective and compare this performance to the no-build alternative.

As stated above, the no-build alternative would not construct any improvements. It would not provide interregional or regional connectivity for east–west traffic traveling within metropolitan Bakersfield and Kern County. It would not provide continuity for State Route 58 in Kern County. It would not promote economic growth and international/interregional trade by improving linkages between existing segments of the interstate system. The no-build alternative

would not reduce commercial and regional commute time through a major freight corridor; nor would it improve local east–west circulation. It would also not improve operations or reduce congestion on the shared portion of State Route 58 and State Route 99 between State Route 58 east and Rosedale Highway.

Six qualitative criteria have been defined to measure the effectiveness of the three build alternatives and the transportation system management/transit alternative for addressing the purpose of the Centennial Corridor project. These criteria are listed below along with Parsons' subjective assessment of the alternative's performance.

1. Provide continuity for State Route 58 in Kern County.

   State Route 58 is offset by approximately one mile at Enos Lane (State Route 43) and by approximately two miles at State Route 99. The improvements proposed for the transportation systems management do not address route continuity objectives, which are the fundamental purpose of the project. Build alternatives A, B and C would provide for a continuous route from Interstate 5 to points east of Kern County via Stockdale Highway, Westside Parkway, the Centennial Corridor and State Route 58 east. This assumes that Westside Parkway and a portion of Stockdale Highway west of Heath Road will be successfully adopted as State Route 58 once the proposed project is constructed.

   The transportation systems management does not meet or address this criterion, which is the purpose of the project. Build alternatives A, B and C fully meet this criterion.

2. Provide traffic congestion relief and interregional and regional connectivity for east–west traffic traveling within metropolitan Bakersfield and Kern County.

   Upgrading Rosedale Highway to a super-arterial, the backbone of the transportation systems alternative, allows the facility to attract and accommodate 11,000 to 34,000 additional vehicles per day between Allen Road and State Route 99, with 24,000 additional vehicles using the upgraded route immediately west of State Route 99. Just east of Enos Lane (State Route 43), the transportation system management alternative increases the use of State Route 58 east by 1,500 vehicles per day compared to the no-build alternative.

   Build alternatives A, B and C would attract between 113,700 to 121,400 vehicles per day in the section west of State Route 99. At Allen Road, use of the Westside Parkway would increase to 81,000 vehicles per day, compared to 66,000 vehicles per day using the Westside Parkway (west of Allen Road) under the no-build alternative. Use of State Route 58 east of State Route 99 would increase by 5,625 vehicles per day under alternative A to 14,485 vehicles per day under alternative C.

   The transportation systems management/transit alternative provides some traffic congestion relief and improves local connectivity to State Route 99, thereby partially meeting this criterion. Build alternatives A, B and C provide substantial traffic congestion relief and interregional and regionally connectivity for east–west traffic, thereby fully meeting this criterion.

3. Promote economic growth and international and interregional trade by improving linkages between existing segments of the interstate system.

   The transportation systems management alternative improves existing State Route 58 west by upgrading approximately six miles of the alignment to a super-arterial facility, from Allen Road to State Route 99. This improvement does not address or further the objective of connecting Interstate 5 to Interstate 15 and Interstate 40 (in Barstow) via a continuous State Route 58 freeway facility.

   Build alternatives A, B and C would construct a freeway between the eastern end of the Westside Parkway and the western end of the State Route 58 east freeway, thereby furthering the objective of connecting Interstate 5 with Interstate 15 via a continuous State Route 58 freeway.

   The transportation systems management alternative does not meet or address this criterion.

4. Reduce commercial and regional commute time through a major freight corridor.

   The transportation systems management alternative reduces travel time along Rosedale Highway by reducing traffic signal delays at major cross streets and reducing the number of signalized intersections between Allen Road and State Route 99. The attractiveness of State Route 58 west as a major freight corridor is relatively unchanged from the no-build condition, as more attractive alternative routes, such as State Route 46, offer less delay to commercial vehicles traveling through, but not destined to, metropolitan Bakersfield.

   Build alternatives A, B and C reduce the number of traffic signals between Interstate 5 and State Route 99 to two locations, at the intersections of Stockdale Highway with Enos Lane (State Route 43) and Heath Road. Once adopted as State Route 58, this route will become the major freight corridor for east–west heavy truck movements through Kern County.

   The transportation systems management alternative reduces travel time, but does not address interstate trucking needs. Build alternatives A, B and C provide a nearly non-stop route between Interstate 5 and State Route 99.

5. Improve local east–west circulation and reduce congestion to accommodate existing and planned land uses in accordance with adopted growth projections.

   Compared to the no-build alternative, alternative M, the transportation systems management alternative, attracts 11,000 to 34,000 additional vehicles per day to Rosedale Highway, thereby reducing traffic volumes on Hageman Road, Westside Parkway, Stockdale Highway and Ming Avenue. Planned commercial land uses along Rosedale Highway benefit from higher drive by levels of traffic, while residential serving roadways benefit from reduced traffic volumes.

   Build alternatives A, B and C each accommodate more than 100,000 vehicles per day on the segment of State Route 58 immediately west of State Route 99. These alternatives

will remove through traffic from east–west local arterial streets, allowing residents the opportunity to access commercial establishments along these roadways under less congested conditions.

The transportation systems management alternative, as well as build alternatives A, B and C, all meet this criterion.

6. Improve operations and reduce congestion of the shared portion of State Route 58 and State Route 99.

   Compared to the no-build alternative, alternative M adds more than 20,000 additional vehicles per day to State Route 99 over the shared section with State Route 58. No improvements to State Route 99 are included with the transportation systems management alternative, by virtue of the cost associated with constructing auxiliary lanes between State Route 58 west and State Route 58 east. Overall level of service degrades slightly along the shared portion of State Route 58 and State Route 99, compared to the no-build alternative.

   The transportation systems management alternative does not meet or address this criterion.

   Figures 8, 9, and 10 illustrate the location of congestion along State Route 58 and the portion of State Route 99 that will no longer be shared with State Route 58 under build alternatives A, B and C, respectively. Comparison of these graphics with Figure 5 indicates that the extent of the bottleneck surrounding the State Route 58/State Route 99 freeway system interchange will be significantly reduced in the southbound direction along State Route 99, and eliminated in the northbound direction. Poor performance will remain between Rosedale Highway and California Avenue in the southbound direction, however.

   Build alternatives A, B and C address and largely meet this criterion.

Overall, the transportation systems management alternative partially addresses the need and purpose of the Centennial Corridor project, whereas build alternatives A, B and C fully address the need and purpose of the project.

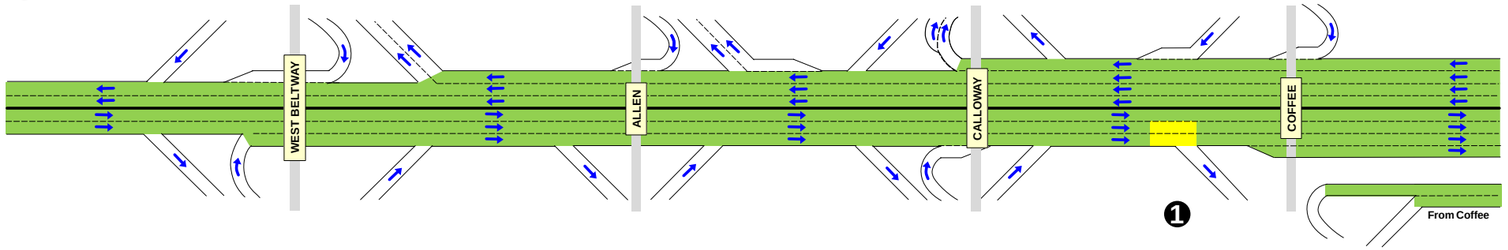
System-wide Performance of the Project Alternatives

To provide a quantified measure of overall system-wide performance, the four build alternatives were evaluated using a traffic impact analysis computer software product developed for the Federal Highway Administration. This product, the Surface Transportation Efficiency Analysis Model (STEAM) version 2.0, provides a quantitative measurement of economic impacts, natural resource usage, environmental impacts, and net monetary benefits (or costs).

The STEAM 2.0 assessment found that the transportation systems management alternative (build alternative M) provides approximately $22.3 million of monetized benefits per year assuming design year (2038) traffic conditions, compared with $75.3 million of benefits per year for build alternative A, $68.8 million of benefits per year for build alternative B, and $72.7 million of benefits per year for build alternative C, all assuming year 2038 traffic conditions. Life cycle, or

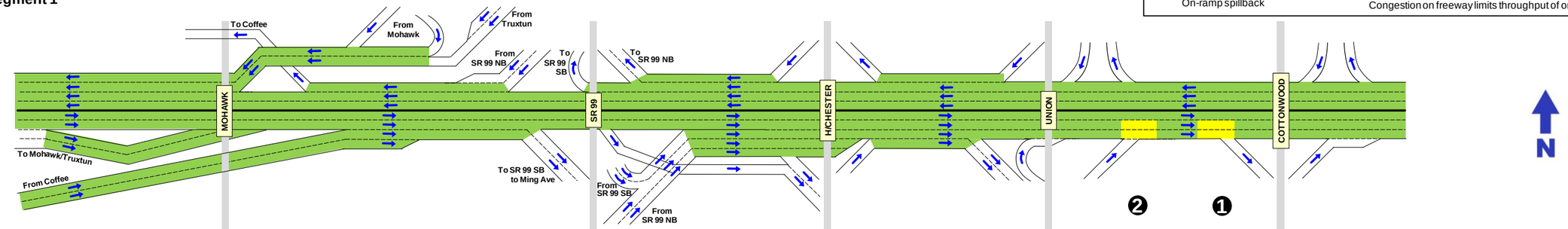
STATE ROUTE 58

Segment 2

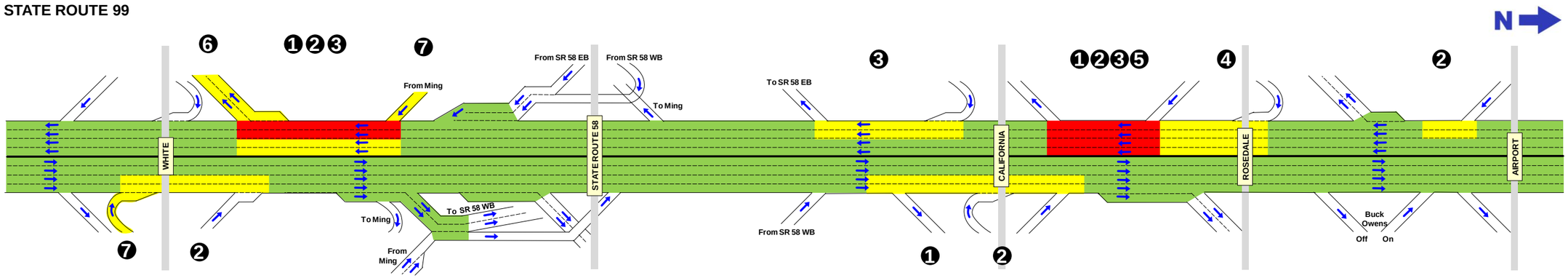


CONGESTION CAUSES	DESCRIPTION
Heavy off-ramp volume	Vehicles crowd right lanes of freeway trying to exit
Heavy on-ramp volume	Vehicles entering freeway crowd right lanes of freeway
On-ramp to off-ramp weave conflicts	Heavy volumes of traffic entering freeway conflict with heavy volumes of traffic exiting freeway
Spillback from bottleneck on mainline	Traffic congestion ahead causes approaching traffic to slow speed and compress space between vehicles
Bottleneck	Traffic volumes on mainline (combined on-ramp, weaving, off-ramp, through movements) exceed capacity, causing traffic to slow and compress space between vehicles
Off-ramp/arterial street bottleneck	Congestion on arterial street limits throughput of freeway off-ramp
On-ramp spillback	Congestion on freeway limits throughput of on-ramp to freeway

Segment 1



STATE ROUTE 99



LOS A, B, C, D
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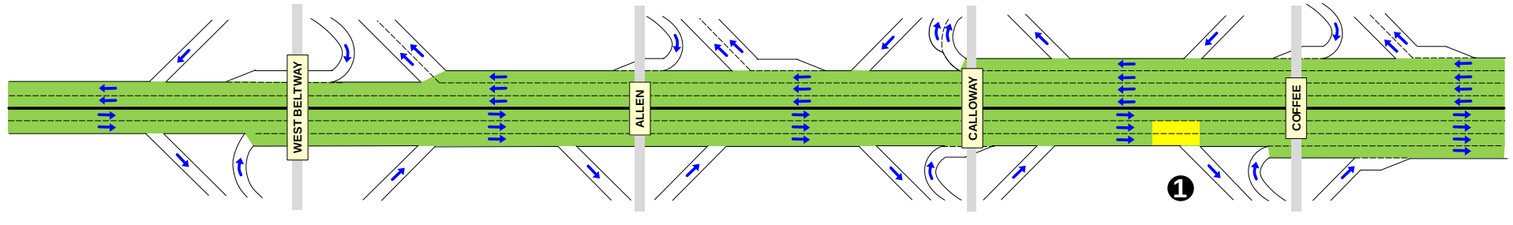
Figure 8: Alternative A Year 2038 Forecast Traffic Operational Conditions on State Route 58 and State Route 99

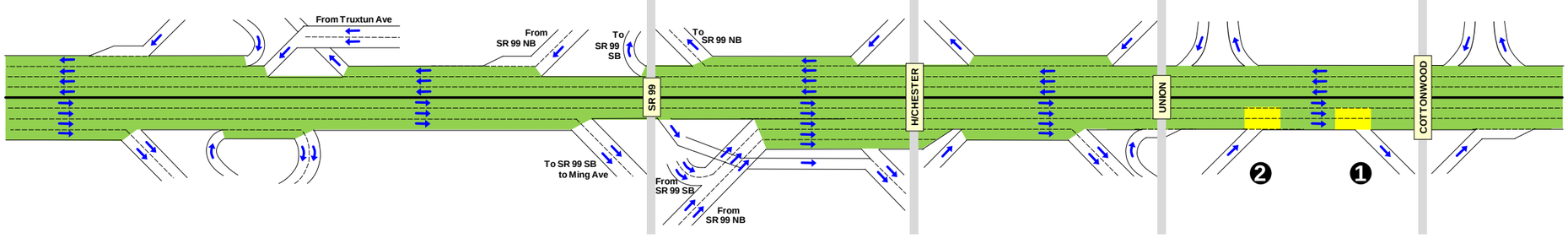
STATE ROUTE 58

Segment 2

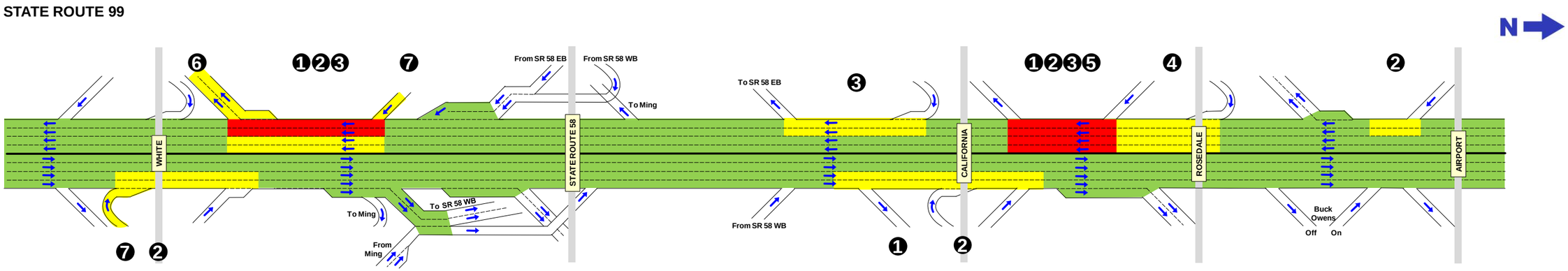


CONGESTION CAUSES	DESCRIPTION
Heavy off-ramp volume	Vehicles crowd right lanes of freeway trying to exit
Heavy on-ramp volume	Vehicles entering freeway crowd right lanes of freeway
On-ramp to off-ramp weave conflicts	Heavy volumes of traffic entering freeway conflict with heavy volumes of traffic exiting freeway
Spillback from bottleneck on mainline	Traffic congestion ahead causes approaching traffic to slow speed and compress space between vehicles
Bottleneck	Traffic volumes on mainline (combined on-ramp, weaving, off-ramp, through movements) exceed capacity, causing traffic to slow and compress space between vehicles
Off-ramp/arterial street bottleneck	Congestion on arterial street limits throughput of freeway off-ramp
On-ramp spillback	Congestion on freeway limits throughput of on-ramp to freeway

Segment 1



STATE ROUTE 99

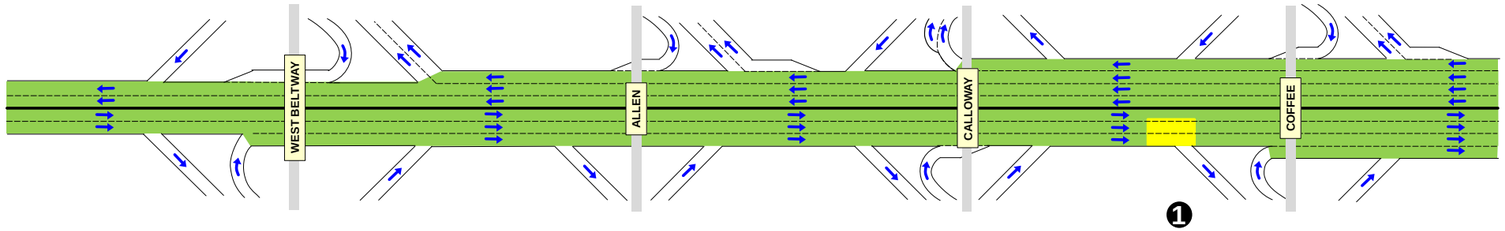


LOS A, B, C, D
LOS E
LOS F

Figure 9: Alternative B Year 2038 Forecast Traffic Operational Conditions on State Route 58 and State Route 99

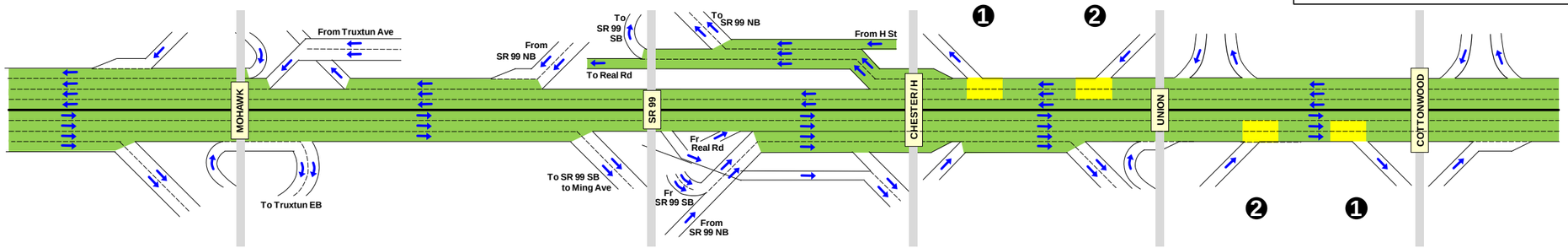
STATE ROUTE 58

Segment 2



CONGESTION CAUSES	DESCRIPTION
Heavy off-ramp volume	Vehicles crowd right lanes of freeway trying to exit
Heavy on-ramp volume	Vehicles entering freeway crowd right lanes of freeway
On-ramp to off-ramp weave conflicts	Heavy volumes of traffic entering freeway conflict with heavy volumes of traffic exiting freeway
Spillback from bottleneck on mainline	Traffic congestion ahead causes approaching traffic to slow speed and compress space between vehicles
Bottleneck	Traffic volumes on mainline (combined on-ramp, weaving, off-ramp, through movements) exceed capacity, causing traffic to slow and compress space between vehicles
Off-ramp/arterial street bottleneck	Congestion on arterial street limits throughput of freeway off-ramp
On-ramp spillback	Congestion on freeway limits throughput of on-ramp to freeway

Segment 1



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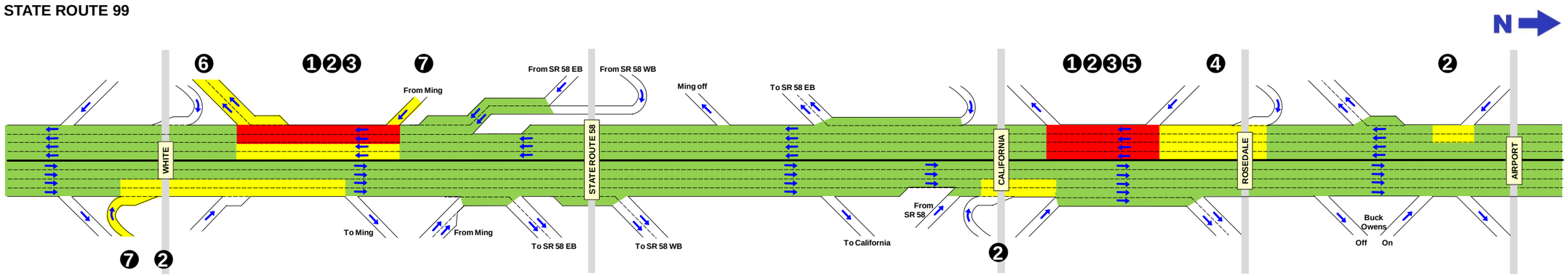
STATE ROUTE 99



LOS A, B, C, D
LOS E
LOS F

Figure 10: Alternative C Year 2038 Forecast Traffic Operational Conditions on State Route 58 and State Route 99

twenty years of benefits, amount to $605.3 million for the transportation systems management alternative, compared with more than $1 billion for alternatives A, B and C. The capital cost of the transportation systems management alternative has been preliminarily estimated as $252 million compared with an estimated $570 to $691 million for alternatives A, B and C. Thus, the transportation systems management alternative returns approximately 60 percent of the benefits provided by the full-build alternatives, but is more cost-effective. Over time, beyond the 20-year life cycle design year horizon, the transportation systems management alternative benefits continue to decline, year by year, while build alternatives A, B and C increase due to residual capacity being available to meet growth beyond 2038.

Table 2 provides specific information regarding the benefits calculated using the STEAM 2.0 computer software product, while Table 3 presents a summary of the cost versus benefit analysis.

Table 2. Summary of Centennial Corridor Project Benefits *(Year 2038)*

BENEFIT TYPE	BUILD ALTERNATIVE M	BUILD ALTERNATIVE A	BUILD ALTERNATIVE B	BUILD ALTERNATIVE C
User Benefits				
In-vehicle travel time	$ 16,259,900	$ 64,133,300	$ 60,348,900	$ 64,691,200
Fuel costs	2,576,200	6,395,300	5,149,700	5,898,300
Non-fuel operating costs	(213,000)	(2,248,500)	(3,002,300)	(3,159,400)
Internal accident costs	3,857,300	7,920,100	5,645,600	6,087,000
Revenue Transfers	$ (680,200)	(1,699,500)	$ (1,370,700)	$ (1,568,400)
Reduction in External Costs				
Emissions Global warming Noise	See detailed technical studies			
Accident	$ 474,500	$ 973,500	$ 694,500	$ 748,800
Other mileage based	0	0	0	0
Total Benefits $/year in 2038	**$ 22,274,700**	**$ 75,264,200**	**$ 68,836,400**	**$ 72,697,500**
Total Benefits $/year in 2018	**32,030,800**	**7,759,000**	**14,266,100**	**30,803,200**
Life Cycle Benefits 2018–2040 Total	**$605,287,000**	**$1,030,458,000**	**$1,014,868,000**	**$1,230,735,000**

Source: Parsons, based on STEAM 2.0

Table 3. Summary of Life-Cycle Benefits and Costs

METRIC	BUILD ALTERNATIVE M	BUILD ALTERNATIVE A	BUILD ALTERNATIVE B	BUILD ALTERNATIVE C
Cost	$252,000,000	$ 690,963,000	$ 569,946,000	$ 665,879,000
Present value of costs	$229,180,000	$ 627,607,000	$ 516,534,000	$ 603,614,000
Total benefits (Q2 2018–2040)	$605,287,000	$1,030,458,000	$1,014,868,000	$1,230,735,000
Present value of benefits	$433,029,000	$ 679,807,000	$ 677,650,000	$ 838,365,000
Present value benefit/cost ratio	1.9	1.1	1.3	1.4
Payback period	10 years	22 years	19 years	18 years

Given these findings, the authors of this traffic study conclude that the transportation systems management alternative is not a feasible alternative for meeting the long-term needs identified for the Centennial Corridor project.

Quantitative Traffic Performance of Build Alternatives A, B and C

Tables 4 through 7 present freeway mainline performance of AM peak hour conditions for the no-build alternative and build alternatives A, B and C. Graphic representations of these performance results were provided previously as Figures 5 and 8 through 10. On the whole, there is no significant difference between the build alternatives A, B and C insofar as the quality of service provided to the traveling public. None of the build alternatives stand above or below other build alternatives, except that all provide much better performance compared to the no-build alternative and the transportation system management alternative (which cannot be comparably measured).

In addition to quantifying freeway performance, level of service, a measure of traffic congestion, was calculated for 79 study area intersections. The locations of these intersections are illustrated on Figure 11. Level of service A through D meet quality of delay policy standards in metropolitan Bakersfield; while LOS E is on the cusp of excessive congestion, characterized by low speeds and traffic backups at intersections. As metropolitan areas increase in size and level of congestion, LOS E is often considered to be the limit of acceptable delay. At present, LOS D is the limit of acceptable delay in Kern County and metropolitan Bakersfield.

Table 8 provides a side-by-side comparison of intersection level of service for existing conditions versus year 2038 conditions. Alternatives A, B and C all perform, on balance, equal to the no-build alternative. There are spot locational differences due to the build alternatives reduction or elimination of bottlenecks along State Route 99, which allow more traffic to exit or enter the freeway at ramp terminal and adjacent intersections.

Comparing alternatives A, B and C with one another, alternative C yields one additional intersection failure (LOS F) compared with alternatives A and B. Intersection #51, Stockdale Highway at Real Road, fails under alternative C during the PM peak hour, as it does under no-build conditions. The intersection does not fail with alternatives A and B because the connection of Real Road to State Route 58 east is eliminated under these two build alternatives. Hence, less traffic is able to access Real Road and Stockdale Highway, in turn.

Local Circulation Impacts

In the case of each project alternative (A, B, and C), modifications to local streets and properties are required which affect travel access. The particular modifications and impacts depend on the alternative examined. Several local streets will be shortened, modified, or removed, but little or no disruption to existing circulation patterns is expected. In the limited number of cases where through traffic is eliminated on an existing local roadway, an adjacent or nearby street will provide an alternative route.

Adjustments to local roadways as a result of the proposed project are not expected to impact the provision of emergency services, such as fire or police, or affect access to health care facilities. Some minor adjustments with respect to route maps and patrol duties for fire and police

Table 4. No-Build Mainline Freeway Analysis Summary Results

Freeway Segment	NO-BUILD AM PEAK						NO-BUILD PM PEAK					
	Demand	Served	% Served	Speed	Density	LOS	Demand	Served	% Served	Speed	Density	LOS
	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)
SR-99 NB Mainline												
SR 99 NB south end of the network to White Lane off-ramp	7,025	6,570	94%	38	44.0	E	6,580	6,570	100%	60	28	D
White Lane off-ramp to White Lane loop on-ramp	5,960	5,527	93%	31	44.0	E	5,485	5,360	98%	59	23	C
White Lane loop on-ramp to White Lane direct on-ramp	7,565	5,850	77%	28	53.0	F	7,130	6,226	87%	47	33	D
White Lane diagonal on-ramp to Ming Avenue off-ramp	8,260	6,159	75%	23	66.0	F	7,740	6,805	88%	31	57	F
Ming Avenue off-ramp to Ming Avenue on-ramp	7,470	5,204	70%	18	72.0	F	6,920	5,857	85%	20	73	F
Ming Avenue on-ramp to SR 58 EB/Wible Road off-ramp	9,055	6,807	75%	32	47.0	F	8,415	7,374	88%	34	48	F
SR 58 EB/Wible Road off-ramp to Wible Road on-ramp	6,230	4,624	74%	61	19.0	C	5,915	5,185	88%	61	21	C
Wible Road on-ramp to SR 58 WB on-ramp	6,870	5,135	75%	61	21.0	C	6,525	5,683	87%	61	23	C
SR 58 WB on-ramp to California Avenue off-ramp	8,655	6,950	80%	58	29.0	D	8,240	7,383	90%	58	31	D
California Avenue off-ramp to California Avenue loop on-ramp	7,475	5,982	80%	62	24.0	C	7,360	6,598	90%	61	27	D
California Avenue loop on-ramp to California Avenue diagonal on-ramp	8,040	6,396	80%	60	26.0	D	8,100	7,058	87%	60	29	D
California Avenue diagonal on-ramp to Rosedale Highway off-ramp	8,280	6,349	77%	60	25.0	C	8,430	7,026	83%	58	28	D
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	5,840	4,599	79%	62	19.0	C	6,340	5,365	85%	62	22	C
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	5,015	3,917	78%	63	16.0	B	5,790	4,923	85%	62	20	C
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	5,615	4,451	79%	61	18.0	C	6,540	5,607	86%	60	24	C
Airport Drive off-ramp to SR 99 NB north end of the network	3,865	3,168	82%	63	13.0	B	5,125	4,390	86%	62	18	B
SR-99 SB Mainline												
SR 99 SB north end of the network to Airport Drive on-ramp	3,895	3,895	100%	64	15.0	B	4,595	4,595	100%	63	18	C
Airport Drive on-ramp to Rosedale Highway off-ramp	5,320	5,320	100%	60	22.0	C	6,710	6,412	96%	42	39	E
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	4,245	4,245	100%	63	17.0	B	5,615	5,417	96%	60	23	C
Rosedale Highway loop on-ramp to Rosedale Highway diagonal on-ramp	5,395	5,395	100%	59	19.0	C	6,995	6,891	99%	47	32	D
Rosedale Highway diagonal on-ramp to California Avenue off-ramp	7,085	7,085	100%	55	30.0	D	8,620	8,240	96%	52	39	E
California Avenue off-ramp to California Avenue on-ramp	5,885	5,885	100%	62	23.0	C	7,430	7,076	95%	40	45	E
California Avenue on-ramp to SR 58 EB/Stockdale Highway off-ramp	6,605	6,605	100%	55	27.0	D	8,480	8,048	95%	46	44	E
SR 58 EB/Stockdale Highway off-ramp to SR 58 WB on-ramp	4,715	4,715	100%	62	18.0	B	6,385	6,089	95%	55	28	D
SR 58 WB on-ramp to Real Road on-ramp	6,265	5,829	93%	52	34.0	D	8,140	7,419	91%	26	70	F
Real Road on-ramp to Ming Avenue off-ramp	6,775	6,721	99%	54	28.0	D	8,795	8,258	94%	42	47	F
Ming Avenue off-ramp to Ming Avenue on-ramp	5,545	5,410	98%	62	21.0	C	7,050	6,578	93%	61	27	D
Ming Avenue on-ramp to White Lane off-ramp	6,235	6,043	97%	61	24.0	C	7,885	7,452	95%	60	30	D
White Lane off-ramp to White Lane loop on-ramp	4,740	4,628	98%	63	18.0	C	5,855	5,522	94%	62	22	C
White Lane loop on-ramp to White Lane diagonal on-ramp	4,950	4,828	98%	62	19.0	C	6,430	6,018	94%	61	25	C
White Lane diagonal on-ramp to SR 99 SB south end of the network	5,410	4,952	92%	62	20.0	C	7,105	6,430	90%	61	26	D
WSP EB Mainline												
Westside Parkway west end of the network to West Beltway off-ramp	2,190	2,190	100%	47	24	C	2,180	2,155	99%	54	24	C
West Beltway off-ramp to West Beltway loop on-ramp	1,390	1,341	96%	61	11	B	1,225	1,130	92%	61	9	A
West Beltway loop on-ramp to West Beltway diagonal on-ramp	2,574	2,518	98%	61	14	B	2,100	1,985	95%	61	11	A
West Beltway diagonal on-ramp to Allen Road off-ramp	3,124	3,031	97%	63	16	B	2,245	2,120	94%	63	11	B
Allen Road off-ramp to Allen Road on-ramp	2,929	2,842	97%	63	15	B	2,065	1,967	95%	63	10	A
Allen Road on-ramp to Calloway Drive off-ramp	4,739	4,642	98%	60	26	C	3,675	3,524	96%	61	19	C
Calloway Drive off-ramp to Calloway Drive loop on-ramp	3,631	3,583	99%	63	19	C	2,746	2,627	96%	64	14	B
Calloway Drive loop on-ramp to Calloway Drive diagonal on-ramp	4,115	4,034	98%	62	22	C	3,127	2,974	95%	62	16	B
Calloway Drive diagonal on-ramp to Coffee Drive off-ramp	5,029	4,989	99%	59	28	D	3,889	3,706	95%	61	20	C
Coffee Drive off-ramp to Coffee Drive loop on-ramp	2,844	2,844	100%	64	15	B	2,184	2,058	94%	64	11	A
Coffee Drive loop on-ramp to Coffee Drive diagonal on-ramp	3,229	3,229	100%	63	13	B	2,614	2,469	94%	64	10	A
Coffee Drive diagonal on-ramp to Mohawk Street off-ramp	3,779	3,779	100%	63	15	B	3,089	2,920	95%	63	11	B
WSP WB Mainline												
Mohawk Street loop on-ramp to Mohawk Street diagonal ramp	1,957	1,957	100%	63	11	A	3,170	2,973	94%	62	16	B
Mohawk Street diagonal ramp to Coffee Drive off-ramp	2,962	2,919	99%	62	11	B	4,585	4,160	91%	62	16	B
Coffee Drive off-ramp to Coffee Drive loop on-ramp	1,777	1,757	99%	64	7	A	3,370	3,199	95%	64	13	B
Coffee Drive loop on-ramp to Coffee Drive diagonal on-ramp	2,332	2,225	95%	63	9	A	4,350	4,109	94%	62	17	B
Coffee Drive diagonal on-ramp to Calloway Drive diagonal off-ramp	2,977	2,840	95%	63	12	B	5,375	5,148	96%	61	22	C
Calloway Drive diagonal off-ramp to Calloway Drive loop off-ramp	2,665	2,550	96%	62	14	B	4,865	4,614	95%	61	25	C
Calloway Drive loop off-ramp to Calloway Drive on-ramp	2,085	1,996	96%	64	10	A	3,850	3,670	95%	63	20	C
Calloway Drive on-ramp to Allen Road off-ramp	2,550	2,446	96%	63	13	B	4,835	4,628	96%	60	26	C
Allen Road off-ramp to Allen Road on-ramp	1,700	1,643	97%	64	9	A	2,955	2,825	96%	63	15	B
Allen Road on-ramp to West Beltway off-ramp	1,925	1,864	97%	63	10	A	3,285	3,138	96%	62	17	B
West Beltway off-ramp to West Beltway loop on-ramp	865	825	95%	64	6	A	1,410	1,363	97%	63	11	A
West Beltway loop on-ramp to West Beltway diagonal on-ramp	1,260	1,158	92%	62	9	A	1,955	1,831	94%	61	15	B
West Beltway diagonal on-ramp to Westside Parkway west end of the network	1,550	1,452	94%	60	12	B	2,305	2,181	95%	58	19	C
SR58 EB Mainline												
SR 99 on-ramp to H Street off-ramp	4,850	4,300	89%	58	25	C	4,585	4,138	90%	59	24	C
H Street off-ramp to Chester Avenue on-ramp	4,305	3,815	89%	62	21	C	4,110	3,701	90%	62	20	C
Chester Avenue on-ramp to Union Avenue off-ramp	4,900	4,494	92%	59	25	C	4,950	4,535	92%	60	25	C
Union Avenue off-ramp to Union Avenue loop on-ramp	3,985	3,718	93%	62	20	C	4,305	3,967	92%	62	21	C
Union Avenue loop on-ramp to Union Avenue diagonal on-ramp	4,285	3,969	93%	62	22	C	5,075	4,575	90%	60	25	C
Union Avenue diagonal on-ramp to Cottonwood Road off-ramp	4,560	4,249	93%	61	23	C	5,710	5,226	92%	60	29	D
Cottonwood Road off-ramp to Cottonwood Road on-ramp	4,010	3,751	94%	62	20	C	5,110	4,698	92%	62	25	C
Cottonwood Road on-ramp to SR 58 east end of the network	4,315	4,052	94%	62	22	C	5,595	5,169	92%	61	28	D
SR58 WB Mainline												
SR 58 east end of the network to Cottonwood Road off-ramp	4,870	4,870	100%	63	26	D	4,090	4,090	100%	63	22	C
Cottonwood Road off-ramp to Cottonwood Road on-ramp	4,615	4,615	100%	62	25	C	3,850	3,830	99%	63	20	C
Cottonwood Road on-ramp to Brundage Lane off-ramp	4,855	4,855	100%	61	27	D	4,250	4,226	99%	62	23	C
Brundage Lane off-ramp to Brundage Lane on-ramp	3,975	3,931	99%	62	21	C	3,655	3,655	100%	62	20	C
Brundage Lane on-ramp to Union Avenue on-ramp	4,195	4,123	98%	61	23	C	4,050	4,008	99%	61	22	C
Union Avenue on-ramp to Chester Avenue off-ramp	4,595	4,505	98%	60	25	C	4,605	4,527	98%	60	25	C
Chester Avenue off-ramp to H Street on-ramp	3,860	3,778	98%	62	20	C	3,960	3,850	97%	46	29	D
H Street on-ramp to SR 99 NB off-ramp	4,265	4,265	100%	56	26	C	4,555	4,323	95%	39	37	E
SR 99 NB off-ramp to SR 99 SB off-ramp	2,480	2,480	100%	58	14	B	2,840	2,677	94%	23	40	E

Bottleneck Location

Queue

Table 5. Alternative A Mainline Freeway Analysis Summary Results

Freeway Segment	ALT. A AM PEAK						ALT. A PM PEAK					
	Demand	Served	%Served	Speed	Density	LOS	Demand	Served	%Served	Speed	Density	LOS
	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)
SR-99 NB Mainline												
SR 99 NB south end of the network to White Lane off-ramp	7,075	7,075	100%	59	31	D	6,655	6,655	100%	62	27	D
White Lane off-ramp to White Lane loop on-ramp	5,950	5,848	98%	61	24	C	5,575	5,566	100%	62	23	C
White Lane loop on-ramp to White Lane direct on-ramp	7,590	7,162	94%	47	38	E	7,230	6,686	92%	51	33	D
White Lane direct on-ramp to Ming Avenue off-ramp	8,285	8,015	97%	58	32	D	7,915	7,395	93%	56	30	D
Ming Avenue off-ramp to C-D (SR 58 WB) off-ramp	7,370	7,370	100%	60	25	C	7,065	6,781	96%	53	26	C
SR 58 WB off-ramp to SR 58 EB off-ramp	6,245	6,117	98%	60	23	C	5,935	5,456	92%	60	21	C
SR 58 EB off-ramp to Ming Avenue on-ramp	4,990	4,990	100%	62	20	C	4,270	4,065	95%	63	16	B
Ming Avenue on-ramp to SR 58 on-ramp	5,990	5,888	98%	60	25	C	5,120	4,836	94%	61	20	C
SR 58 on-ramp to California Avenue off-ramp	7,175	7,163	100%	58	30	D	6,240	6,016	96%	60	24	C
California Avenueoff-ramp to California Avenue loop on-ramp	6,025	6,025	100%	62	24	C	5,530	5,308	96%	62	21	C
California Avenue loop on-ramp to California Avenue direct on-ramp	7,075	6,780	96%	58	29	D	6,905	6,108	88%	57	27	D
California Avenue direct on-ramp to Rosedale Highway off-ramp	7,555	6,881	91%	57	28	D	7,805	6,598	85%	53	30	D
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	5,590	5,192	93%	61	21	C	6,005	5,209	87%	62	21	C
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	4,795	4,432	92%	63	18	B	5,605	4,859	87%	63	19	C
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	5,515	5,124	93%	59	22	C	6,395	5,618	88%	60	24	C
Airport Dr off-ramp to SR 99 NB north end of the network	3,775	3,556	94%	63	14	B	5,030	4,446	88%	62	18	B
SR-99 SB Mainline												
SR99 SB north end of the network to Airport Dr On Ramp	4,035	4,035	100%	64	16	B	4,735	4,735	100%	63	19	C
Airport Dr On Ramp to Rosedale Hwy Off Ramp	5,485	5,450	99%	60	22	C	6,805	6,805	100%	55	30	D
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	4,110	4,110	100%	63	16	B	5,495	5,495	100%	60	24	C
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	5,210	5,210	100%	55	21	C	6,870	6,870	100%	42	36	E
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	6,045	6,045	100%	57	26	D	8,210	8,151	99%	40	51	F
California Ave Off Ramp to California Ave On Ramp	4,550	4,550	100%	62	19	C	6,555	6,442	98%	60	27	D
California Ave On Ramp to SR58 EB Off Ramp	5,110	5,110	100%	60	21	C	7,495	7,202	96%	58	30	D
SR58 EB Off Ramp to Ming Ave Off Ramp	4,155	4,155	100%	62	17	B	6,055	5,814	96%	61	24	C
Ming Ave Off Ramp to SR58 WB On Ramp	3,220	3,220	100%	63	13	B	4,850	4,617	95%	62	18	C
SR58 WB On Ramp to Ming Ave On Ramp	5,745	5,745	100%	62	18	B	7,590	7,109	94%	49	28	D
Ming Ave On Ramp to White Ln Off Ramp	6,530	6,516	100%	59	27	D	8,435	7,514	89%	34	56	F
White Ln Off Ramp to White Ln Loop On Ramp	4,860	4,841	100%	63	19	C	6,365	5,629	88%	61	23	C
White Ln Loop On Ramp to White Ln Direct On Ramp	5,120	4,953	97%	62	20	C	6,915	6,129	89%	61	25	C
White Ln Direct On Ramp to SR99 SB south end of the network	5,565	5,193	93%	62	21	C	7,560	6,506	86%	61	27	D
WSP EB Mainline												
Westside Parkway west end of the network to West Beltway off-ramp	2,230	2,230	100%	47	24	C	2,220	2,217	100%	44	25	C
West Beltway off-ramp to West Beltway loop on-ramp	1,485	1,485	100%	61	12	B	1,350	1,267	94%	60	11	A
West Beltway loop on-ramp to West Beltway direct on-ramp	3,010	2,796	93%	61	15	B	2,690	2,586	96%	61	14	B
West Beltway direct on-ramp to Allen Road off-ramp	3,300	3,073	93%	62	16	B	2,965	2,835	96%	63	15	B
Allen Road off-ramp to Allen Road on-ramp	2,920	2,699	92%	63	14	B	2,655	2,543	96%	63	13	B
Allen Road on-ramp to Calloway Drive off-ramp	4,920	4,665	95%	60	26	C	4,530	4,351	96%	61	24	C
Calloway Drive off-ramp to Calloway Drive loop on-ramp	3,960	3,796	96%	63	20	C	3,730	3,606	97%	63	19	C
Calloway Drive loop on-ramp to Calloway Drive direct on-ramp	4,900	4,653	95%	59	26	D	4,770	4,558	96%	58	26	D
Calloway Drive direct on-ramp to Coffee Drive off-ramp	6,050	5,867	97%	59	32	D	5,880	5,703	97%	60	31	D
Coffee Drive off-ramp to Truxtun Avenue/Mohawk Street off-ramp	5,025	4,836	96%	61	21	C	5,055	4,869	96%	62	21	C
Truxtun Avenue off-ramp to Coffee Drive on-ramps	1,935	1,839	95%	63	15	B	2,355	2,296	97%	63	18	C
Coffee Drive on-ramps to SR 99 SB and Ming Avenue C-D off-ramp	3,810	3,700	97%	61	20	C	4,525	4,438	98%	61	24	C
SR 99 SB off-ramp (and C-D Ming Avenue) to H Street off-ramp	1,930	1,836	95%	63	15	B	2,355	2,309	98%	62	19	C
H Street off-ramp to SR 99 NB and SB on-ramp	1,648	1,564	95%	63	12	B	2,047	1,986	97%	63	16	B
SR 99 NB and SB on-ramp to Chester Avenue on-ramp	3,535	3,408	96%	60	12	B	4,745	4,275	90%	58	16	B
Chester Avenue on-ramp to Union Avenue off-ramp	4,560	4,401	97%	61	18	C	5,935	5,410	91%	60	23	C
Union Avenue off-ramp to Union Avenue loop on-ramp	3,525	3,405	97%	63	18	C	4,910	4,517	92%	62	24	C
Union Avenue loop on-ramp to Union Avenue direct on-ramp	3,865	3,698	96%	62	20	C	5,575	5,086	91%	59	29	D
Union Avenue direct on-ramp to Cottonwood Road off-ramp	4,190	4,044	97%	62	22	C	6,150	5,727	93%	59	32	D
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,560	3,445	97%	63	18	C	5,245	4,893	93%	62	26	D
Cottonwood Road on-ramp to SR 58 east end of the network	3,870	3,739	97%	62	20	C	5,545	5,172	93%	61	28	D
WSP WB Mainline												
SR 58 east end of the network to Cottonwood Road off-ramp	5,270	5,270	100%	63	28	D	5,030	5,030	100%	63	27	D
Cottonwood Road off-ramp to Cottonwood Road on-ramp	5,035	5,035	100%	62	27	D	4,725	4,717	100%	62	25	C
Cottonwood Road on-ramp to Brundage Lane off-ramp	5,350	5,350	100%	56	33	D	5,255	5,219	99%	60	29	D
Brundage Lane off-ramp to Brundage Lane on-ramp	4,170	4,082	98%	61	22	C	4,265	4,222	99%	62	23	C
Brundage Lane on-ramp to Union Avenue on-ramp	4,535	4,409	97%	61	24	C	4,625	4,545	98%	60	25	C
Union Avenue on-ramp to Chester Avenue off-ramp	5,100	4,963	97%	61	20	C	5,395	5,323	99%	60	22	C
Chester Avenue off-ramp to H Street on-ramp	4,070	3,952	97%	62	21	C	4,280	4,249	99%	62	23	C
H Street on-ramp to SR 99 NB off-ramp	4,705	4,612	98%	61	19	C	4,940	4,901	99%	60	20	C
SR 99 NB off-ramp to SR 99 SB off-ramp	3,520	3,444	98%	61	19	C	3,820	3,795	99%	61	21	C
SR 99 SB off-ramp to SR 99 NB on-ramp	2,320	2,218	96%	62	18	B	2,595	2,581	99%	62	21	C
SR 99 NB on-ramp to Coffee Drive off-ramp	3,820	3,753	98%	61	20	C	4,225	4,290	102%	61	23	C
Coffee Drive off-ramp to Mohawk Street/Truxtun Avenue on-ramp	1,870	1,843	99%	63	15	B	2,650	2,650	100%	62	22	C
Mohawk Street/Truxtun Avenue on-ramp to Coffee Drive loop on-ramp	4,030	3,966	98%	63	16	B	6,430	6,355	99%	62	26	C
Coffee Drive loop on-ramp to Coffee Drive direct on-ramp	4,180	4,101	98%	63	16	B	6,670	6,556	98%	61	27	D
Coffee Drive direct on-ramp to Calloway Drive direct off-ramp	4,480	4,348	97%	62	17	B	7,220	7,073	98%	60	29	D
Calloway Drive direct off-ramp to Calloway Drive loop off-ramp	3,830	3,689	96%	62	15	B	6,225	6,091	98%	61	25	C
Calloway Drive loop off-ramp to Calloway Drive on-ramp	2,920	2,800	96%	63	15	B	4,875	4,764	98%	62	26	C
Calloway Drive on-ramp to Allen Road off-ramp	3,420	3,287	96%	62	18	B	5,755	5,589	97%	58	32	D
Allen Road off-ramp to Allen Road on-ramp	2,270	2,168	96%	64	11	B	3,525	3,454	98%	63	18	C
Allen Road on-ramp to West Beltway off-ramp	2,620	2,492	95%	62	13	B	3,895	3,792	97%	61	21	C
West Beltway off-ramp to West Beltway loop on-ramp	1,120	1,090	97%	64	9	A	1,510	1,468	97%	63	12	B
West Beltway loop on-ramp to West Beltway direct on-ramp	1,440	1,318	92%	62	11	A	1,935	1,842	95%	61	15	B
West Beltway direct on-ramp to Westside Parkway west end of the network	1,745	1,600	92%	60	13	B	2,280	2,184	96%	59	19	C
SR99 NB C-D												
SR 99 NB C-D on-ramp to Westside Parkway C-D off-ramp	2,500	2,500	100%	53	16	B	2,480	2,480	100%	53	16	B
SR99 SB C-D												
Westside Parkway C-D on-ramp to SR 99 SB C-D on-ramp	2,525	2,525	100%	45	19	C	2,740	2,662	97%	42	21	C
WSP EB C-D 1												
Begin C-D (Coffee Drive loop on-ramp to Coffee Drive direct on-ramp)	915	915	100%	49	19	C	1,100	1,100	100%	49	23	C
Coffee Drive direct on-ramp to end of C-D network (Westside Parkway EB)	1,875	1,875	100%	53	18	B	2,170	2,155	99%	53	20	C
WSP EB C-D 2												
Begin C-D to Mohawk Street off-ramp	3,090	3,030	98%	52	23	C	2,700	2,608	97%	53	20	C
Mohawk Street off-ramp to Mohawk Street on-ramp	1,580	1,536	97%	54	14	B	1,300	1,250	96%	54	12	B
WSP EB C-D 3												
WSP EB C-D On Ramp to SR 99 SB Off Ramp	1,880	1,851	98%	52	15	B	2,170	2,107	97%	51	17	B
SR 99 SB Off Ramp to SR 99 SB C-D On Ramp	555	546	98%	47	7	A	655	626	96%	47	8	A
SR 99 SB C-D On Ramp to Ming Ave	1,490	1,468	99%	48	15	B	1,860	1,805	97%	44	23	C
WSP WB C-D												
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	800	780	98%	64	6	A	1,710	1,653	97%	64	13	B
Mohawk Street loop on-ramp to Mohawk Street direct on-ramp	1,305	1,270	97%	62	10	A	2,735	2,620	96%	60	22	C
Mohawk Street direct on-ramp to Westside Parkway on-ramp (end of C-D network)	2,160	2,127	98%	61	14	B	3,780	3,672	97%	59	25	C

Bottleneck Location

Queue

Table 6. Alternative B Mainline Freeway Analysis Summary Results

Freeway Segment	ALT. B AM PEAK						ALT. B PM PEAK					
	Demand	Served	%Served	Speed	Density	LOS	Demand	Served	%Served	Speed	Density	LOS
	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)
SR-99 NB Mainline												
SR-99 NB south end of the network to White Lane offramp	6,945	6,945	100%	62	28	D	6,695	6,695	100%	62	27	D
White Lane off-ramp to White Lane loop on-ramp	5,865	5,865	100%	61	24	C	5,600	5,558	99%	62	23	C
White Lane loop on-ramp to White Lane direct on-ramp	7,495	7,133	95%	46	39	E	7,230	6,610	91%	51	32	D
White Lane direct on-ramp to Ming Avenue off-ramp	8,200	8,094	99%	58	32	D	7,905	7,433	94%	59	29	D
Ming Avenue off-ramp to C-D (SR 58 WB) off-ramp	7,325	7,325	100%	61	25	C	7,045	6,861	97%	61	23	C
SR 58 WB off-ramp to SR 58 EB off-ramp	6,055	5,970	99%	60	22	C	5,840	5,645	97%	61	21	C
SR 58 EB off-ramp to Ming Avenue on-ramp	4,805	4,784	100%	62	19	C	4,185	4,106	98%	63	16	B
Ming Avenue on-ramp to SR 58 on-ramp	5,755	5,668	98%	60	23	C	4,960	4,828	97%	61	20	C
SR 58 on-ramp to California Avenue off-ramp	6,855	6,855	100%	59	28	D	6,055	5,965	99%	60	24	C
California Avenue off-ramp to California Avenue loop on-ramp	5,755	5,753	100%	62	23	C	5,371	5,191	97%	62	21	C
California Avenue loop on-ramp to California Avenue direct on-ramp	6,815	6,674	98%	56	30	D	6,740	6,024	89%	58	26	C
California Avenue direct on-ramp to Rosedale Highway off-ramp	7,285	6,933	95%	56	29	D	7,650	6,545	86%	54	29	D
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	5,545	5,454	98%	61	22	C	6,020	5,283	88%	62	21	C
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	4,725	4,646	98%	62	19	C	5,650	4,934	87%	63	20	C
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	5,420	5,271	97%	58	23	C	6,425	5,719	89%	60	24	C
Airport Drive off-ramp to SR 99 NB north end of the network	3,700	3,591	97%	63	14	B	5,020	4,502	90%	62	18	C
SR-99 SB Mainline												
SR 99 SB north end of the network to Airport Drive on-ramp	4,025	4,025	100%	64	16	B	4,740	4,740	100%	63	19	C
Airport Drive on-ramp to Rosedale Highway off-ramp	5,425	5,425	100%	60	22	C	6,825	6,825	100%	56	30	D
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	4,075	4,075	100%	63	17	B	5,535	5,535	100%	61	23	C
Rosedale Highway loop on-ramp to Rosedale Highway direct on-ramp	5,170	5,170	100%	55	21	C	6,930	6,930	100%	44	35	E
Rosedale Highway direct on-ramp to California Avenue off-ramp	5,825	5,825	100%	57	26	C	8,000	8,000	100%	43	45	F
California Avenue off-ramp to California Avenue on-ramp	4,370	4,370	100%	62	18	B	6,340	6,323	100%	60	26	D
California Avenue on-ramp to SR 58 EB off-ramp	4,905	4,905	100%	61	20	C	7,290	7,175	98%	57	30	D
SR 58 EB off-ramp to Ming Avenue off-ramp	3,990	3,990	100%	62	16	B	5,875	5,796	99%	61	24	C
Ming Avenue off-ramp to SR 58 WB on-ramp	3,150	3,150	100%	63	13	B	4,750	4,750	100%	62	19	C
SR 58 WB on-ramp to Ming Avenue on-ramp	5,760	5,664	98%	62	17	B	7,610	7,551	99%	59	24	C
Ming Avenue on-ramp to White Lane off-ramp	6,535	6,447	99%	59	26	D	8,465	8,044	95%	37	53	F
White Lane off-ramp to White Lane loop on-ramp	4,835	4,752	98%	63	19	C	6,405	6,075	95%	61	25	C
White Lane loop on-ramp to White Lane direct on-ramp	5,075	4,975	98%	62	20	C	6,945	6,550	94%	61	27	D
White Lane direct on-ramp to SR 99 SB south end of the network	5,510	5,243	95%	62	21	C	7,570	6,939	92%	61	28	D
WSP EB Mainline												
WSP west end of the network to West Beltway Off Ramp	2,220	2,220	100%	47	24	C	2,215	2,176	98%	46	24	C
West Beltway Off Ramp to West Beltway Loop On Ramp	1,495	1,468	98%	61	12	B	1,350	1,260	93%	60	10	A
West Beltway Loop On Ramp to West Beltway Direct On Ramp	2,990	2,956	99%	61	16	B	2,680	2,551	95%	61	14	B
West Beltway Direct On Ramp to Allen Rd Off Ramp	3,290	3,233	98%	62	17	B	2,945	2,824	96%	63	15	B
Allen Rd Off Ramp to Allen Rd On Ramp	2,915	2,861	98%	63	15	B	2,645	2,541	96%	63	13	B
Allen Rd On Ramp to Calloway Dr Off Ramp	4,910	4,909	100%	60	27	D	4,495	4,356	97%	61	24	C
Calloway Dr Off Ramp to Calloway Dr Loop On Ramp	3,960	3,940	99%	63	21	C	3,680	3,570	97%	63	19	C
Calloway Dr Loop On Ramp to Calloway Dr Direct On Ramp	4,930	4,821	98%	59	27	D	4,690	4,516	96%	60	25	C
Calloway Dr Direct On Ramp to Coffee Dr Off Ramp	6,055	6,018	99%	60	32	D	5,785	5,677	98%	60	31	D
Coffee Dr Off Ramp to Coffee Dr Loop On Ramp	4,980	4,936	99%	62	26	D	4,910	4,803	98%	62	26	C
Coffee Dr Loop On Ramp to Coffee Dr Direct On Ramp	5,970	5,892	99%	62	24	C	5,960	5,874	99%	61	24	C
Coffee Dr Direct On Ramp to Mohawk St Off Ramp	7,040	6,691	95%	59	28	D	7,075	6,961	98%	58	29	D
Mohawk St Off Ramp to Mohawk St On Ramp	5,220	4,918	94%	60	27	D	5,425	5,379	99%	61	30	D
Mohawk St On Ramp to Truxtun Ave Off Ramp	5,735	5,422	95%	60	24	C	6,515	6,410	98%	57	29	D
Truxtun Ave Off Ramp to SR99 SB C-D Off Ramp(SR99 SB&Ming Ave)	4,135	3,835	93%	62	21	C	5,115	5,020	98%	61	28	D
SR99 SB C-D Off Ramp(SR99 SB&Ming Ave) to H St Off Ramp	2,095	1,934	92%	63	15	B	2,760	2,690	97%	62	22	C
H St Off Ramp to SR 99 NB&SB On Ramp	1,762	1,625	92%	63	13	B	2,393	2,353	98%	62	19	C
SR99 NB&SB On Ramp to Chester Ave On Ramp	3,605	3,487	97%	63	13	B	5,055	4,957	98%	61	18	C
Chester Ave On Ramp to Union Ave Off Ramp	4,600	4,462	97%	61	18	C	6,260	6,160	98%	59	26	D
Union Ave Off Ramp to Union Ave Loop On Ramp	3,580	3,456	97%	63	18	C	5,210	5,088	98%	62	28	D
Union Ave Loop On Ramp to Union Ave Direct On Ramp	3,905	3,705	95%	62	20	C	5,845	5,625	96%	59	32	D
Union Ave Direct On Ramp to Cottonwood Rd Off Ramp	4,235	4,032	95%	62	22	C	6,410	6,242	97%	59	33	D
Cottonwood Rd Off Ramp to Cottonwood Rd On Ramp	3,600	3,413	95%	63	18	C	5,470	5,317	97%	62	29	D
Cottonwood Rd On Ramp to SR58 east end of the network	3,915	3,717	95%	63	20	C	5,765	5,578	97%	61	30	D
WSP WB Mainline												
SR 58 east end of the network to Cottonwood Road off-ramp	5,220	5,220	100%	63	28	D	4,970	4,970	100%	63	26	D
Cottonwood Road off-ramp to Cottonwood Road on-ramp	5,015	5,015	100%	62	27	D	4,675	4,641	99%	62	25	C
Cottonwood Road on-ramp to Brundage Lane off-ramp	5,340	5,340	100%	60	30	D	5,195	5,129	99%	61	28	D
Brundage Lane off-ramp to Brundage Lane on-ramp	4,225	4,225	100%	62	23	C	4,205	4,166	99%	62	22	C
Brundage Lane on-ramp to Union Avenue on-ramp	4,600	4,597	100%	61	25	C	4,560	4,472	98%	61	24	C
Union Avenue on-ramp to Chester Avenue off-ramp	5,180	5,180	100%	61	21	C	5,310	5,267	99%	60	22	C
Chester Avenue off-ramp to H Street on-ramp	4,085	4,085	100%	62	22	C	4,210	4,210	100%	62	23	C
H Street on-ramp to SR 99 NB off-ramp	4,785	4,785	100%	61	20	C	4,925	4,925	100%	61	20	C
SR 99 NB off-ramp to SR 99 SB off-ramp	3,685	3,680	100%	61	20	C	3,830	3,830	100%	61	21	C
SR 99 SB off-ramp to SR 99 NB on-ramp	2,514	2,471	98%	62	20	C	2,610	2,610	100%	62	21	C
SR 99 NB on-ramp to Mohawk Street off-ramp	4,199	4,199	100%	61	23	C	4,355	4,286	98%	61	23	C
Mohawk Street off-ramp to Truxtun Avenue on-ramp	3,319	3,319	100%	61	27	D	3,610	3,585	99%	61	29	D
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	4,339	4,336	100%	61	24	C	5,475	5,429	99%	60	30	D
Mohawk Street loop on-ramp to Mohawk Street direct ramp	4,994	4,975	100%	62	20	C	6,730	6,629	98%	61	27	D
Mohawk Street direct ramp to Coffee Drive off-ramp	5,784	5,521	95%	61	21	C	7,720	7,230	94%	59	28	D
Coffee Drive off-ramp to Coffee Drive loop on-ramp	3,609	3,518	97%	63	14	B	5,690	5,565	98%	62	22	C
Coffee Drive loop on ramp to Coffee Drive direct on-ramp	3,769	3,657	97%	63	14	B	5,970	5,820	97%	62	23	C
Coffee Drive direct on-ramp to Calloway Drive direct off-ramp	4,094	3,892	95%	63	15	B	6,545	6,360	97%	61	26	C
Calloway Drive direct off-ramp to Calloway Drive loop off-ramp	3,494	3,319	95%	62	13	B	5,620	5,358	95%	61	22	C
Calloway Drive loop off-ramp to Calloway Drive on-ramp	2,734	2,544	93%	63	13	B	4,375	4,166	95%	62	22	C
Calloway Drive on-ramp to Allen Road off-ramp	3,309	3,056	92%	62	16	B	5,390	5,094	95%	59	29	D
Allen Road off-ramp to Allen Road on-ramp	2,184	2,046	94%	64	11	A	3,265	3,119	96%	63	16	B
Allen Road on-ramp to West Beltway off-ramp	2,564	2,396	93%	62	13	B	3,700	3,549	96%	62	19	C
West Beltway off-ramp to West Beltway loop on-ramp	1,079	992	92%	64	8	A	1,510	1,441	95%	64	11	B
West Beltway loop on-ramp to West Beltway direct on-ramp	1,384	1,268	92%	62	10	A	1,960	1,815	93%	61	15	B
West Beltway direct on-ramp to Westside Parkway west end of the network	1,674	1,555	93%	60	13	B	2,320	2,173	94%	58	19	C
State Route 99 NB Collector-Distributor												
SR 99 NB C-D on-ramp to Westside Parkway C-D off-ramp	2,635	2,635	100%	53	17	B	2,520	2,434	97%	53	15	B
State Route 99 SB Collector-Distributor												
Westside Parkway C-D on-ramp to SR 99 SB C-D on-ramp	2,610	2,503	96%	46	18	C	2,860	2,860	100%	46	22	C
Westside Parkway EB Collector-Distributor												
Westside Parkway EB C-D on-ramp to SR 99 SB off-ramp	2,040	1,886	92%	52	15	B	2,355	2,315	98%	52	18	C
SR 99 SB off-ramp to SR 99 SB C-D on-ramp	600	577	96%	47	6	A	715	682	95%	47	7	A
SR 99 SB C-D on-ramp to Ming Avenue	1,440	1,418	98%	48	15	B	1,840	1,705	93%	48	18	B

Bottleneck Location

Queue

Table 7. Alternative C Mainline Freeway Analysis Summary Results

Freeway Segment	ALT. C AM PEAK						ALT. C PM PEAK					
	Demand	Served	%Served	Speed	Density	LOS	Demand	Served	%Served	Speed	Density	LOS
	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)
SR-99 NB Mainline												
SR-99 NB south end of the network to White Ln Off Ramp	7,085	7,085	100%	62	29	D	6,680	6,680	100%	62	27	D
White Ln Off Ramp to White Ln Loop On Ramp	6,000	6,000	100%	61	24	C	5,575	5,524	99%	62	22	C
White Ln Loop On Ramp to White Ln Direct On Ramp	7,650	7,241	95%	45	40	E	7,210	6,578	91%	51	32	D
White Ln Direct On Ramp to Ming Ave Off Ramp	8,350	8,324	100%	58	36	E	7,890	7,598	96%	59	32	D
Ming Ave Off Ramp to Ming Ave On Ramp	7,455	7,455	100%	61	31	D	7,005	6,754	96%	61	28	D
Ming Ave On Ramp to SR58 EB Off Ramp	9,030	9,030	100%	59	31	D	8,525	8,291	97%	59	28	D
SR58 EB Off Ramp to SR99 NB C-D Off Ramp(WSP WB)	7,735	7,303	94%	60	27	D	7,090	6,490	92%	61	24	C
SR99 NB C-D Off Ramp(WSP WB) to California Ave Off Ramp	6,000	5,948	99%	61	24	C	5,220	5,112	98%	62	21	C
California Ave Off Ramp to SR99 NB C-D On Ramp(SR58WB&H St)	4,950	4,933	100%	59	21	C	4,565	4,404	96%	60	18	C
SR99 NB C-D On Ramp(SR58WB&H St) to California Ave Loop On Ramp	6,055	5,986	99%	60	25	C	5,695	5,493	96%	61	23	C
California Ave Loop On Ramp to California Ave Direct On Ramp	6,985	6,688	96%	58	29	D	7,005	6,287	90%	58	27	D
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	7,420	7,057	95%	59	24	C	7,840	6,948	89%	58	24	C
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	5,655	5,349	95%	61	22	C	6,170	5,380	87%	61	22	C
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	4,840	4,595	95%	62	18	C	5,795	5,030	87%	62	20	C
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	5,515	5,253	95%	59	22	C	6,550	5,747	88%	59	24	C
Airport Dr Off Ramp to SR99 NB north end of the network	3,755	3,518	94%	63	14	B	5,130	4,482	87%	62	18	B
SR-99 SB Mainline												
SR 99 SB north end of the network to Airport Drive on-ramp	3,980	3,980	100%	64	16	B	4,795	4,795	100%	63	19	C
Airport Drive on-ramp to Rosedale Highway off-rRamp	5,390	5,314	99%	60	21	C	6,850	6,850	100%	55	31	D
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	4,030	4,009	99%	63	16	B	5,550	5,550	100%	60	24	C
Rosedale Highway loop on-ramp to Rosedale Highway direct on-ramp	5,120	5,120	100%	55	20	C	6,920	6,920	100%	43	36	E
Rosedale Highway direct on-ramp to California Avenue off-ramp	5,770	5,770	100%	58	24	C	7,980	7,980	100%	41	48	F
California Avenue off-ramp to California Avenue on-ramp	4,355	4,355	100%	62	18	B	6,355	6,354	100%	60	27	D
California Avenue on-ramp to SR 58 EB off-ramp	4,880	4,880	100%	62	16	B	7,300	7,177	98%	61	24	C
SR58 EB off-ramp to SR 99 SB off-ramp (Ming Avenue)	3,960	3,935	99%	62	16	B	5,910	5,815	98%	61	24	C
SR 99 SB off-ramp (Ming Avenue) to SR 99 SB on-ramp (Westside Parkway EB and SR 58 WB and H Street)	3,160	3,118	99%	63	12	B	4,795	4,763	99%	61	19	C
SR 99 SB on-ramp (Westside Parkway EB and SR 58 WB and H Street) to Ming Avenue on-ramp	5,609	5,509	98%	61	18	B	7,535	7,465	99%	61	24	C
Ming Avenue on-ramp to White Lane off-ramp	6,404	6,284	98%	58	26	C	8,375	8,224	98%	39	55	F
White Lane off-ramp to White Lane loop on-ramp	4,719	4,653	99%	62	19	C	6,355	6,244	98%	61	26	C
White Lane loop on-ramp to White Lane direct on-ramp	4,979	4,766	96%	62	19	C	6,920	6,732	97%	61	28	D
White Lane direct on-ramp to SR 99 SB south end of the network	5,246	5,063	97%	62	20	C	7,333	7,116	97%	61	29	D
WSP EB Mainline												
WSP west end of the network to West Beltway Off Ramp	2,215	2,215	100%	46	25	C	2,210	2,210	100%	46	27	D
West Beltway Off Ramp to West Beltway Loop On Ramp	1,530	1,517	99%	60	13	B	1,360	1,318	97%	60	11	A
West Beltway Loop On Ramp to West Beltway Direct On Ramp	3,005	2,966	99%	61	16	B	2,685	2,608	97%	61	14	B
West Beltway Direct On Ramp to Allen Rd Off Ramp	3,285	3,209	98%	62	17	B	2,940	2,850	97%	63	15	B
Allen Rd Off Ramp to Allen Rd On Ramp	2,925	2,843	97%	63	15	B	2,645	2,547	96%	63	13	B
Allen Rd On Ramp to Calloway Dr Off Ramp	4,915	4,870	99%	60	27	D	4,465	4,383	98%	61	24	C
Calloway Dr Off Ramp to Calloway Dr Loop On Ramp	3,940	3,940	100%	63	21	C	3,640	3,631	100%	63	19	C
Calloway Dr Loop On Ramp to Calloway Dr Direct On Ramp	4,860	4,806	99%	59	27	D	4,605	4,525	98%	59	25	C
Calloway Dr Direct On Ramp to Coffee Dr Off Ramp	5,960	5,960	100%	60	32	D	5,690	5,652	99%	61	30	D
Coffee Dr Off Ramp to Coffee Dr Loop On Ramp	4,910	4,872	99%	62	26	D	4,815	4,815	100%	62	26	C
Coffee Dr Loop On Ramp to Coffee Dr Direct On Ramp	5,860	5,811	99%	62	24	C	5,885	5,885	100%	61	24	C
Coffee Dr Direct On Ramp to Mohawk St Off Ramp	6,935	6,878	99%	55	31	D	6,995	6,995	100%	56	31	D
Mohawk St Off Ramp to Mohawk St On Ramp	5,045	5,009	99%	61	27	D	5,295	5,287	100%	61	29	D
Mohawk St On Ramp to Truxtun Ave Off Ramp	5,520	5,471	99%	60	23	C	6,345	6,279	99%	58	29	D
Truxtun Ave Off Ramp to SR99 SB C-D Off Ramp(SR99 SB&Ming Ave)	3,970	3,899	98%	62	21	C	4,950	4,940	100%	61	27	D
SR99 SB C-D Off Ramp(SR99 SB&Ming Ave) to H St Off Ramp	2,025	1,964	97%	63	16	B	2,605	2,486	95%	63	20	C
H St Off Ramp to Real Rd On Ramp	1,685	1,652	98%	63	13	B	2,248	2,132	95%	63	17	B
Real Rd On Ramp to SR 99 NB&SB On Ramp	2,663	2,560	96%	60	22	C	3,228	2,896	90%	58	25	C
SR99 NB&SB On Ramp to Chester Ave On Ramp	4,535	4,535	100%	62	18	C	5,665	5,332	94%	61	22	C
Chester Ave On Ramp to Union Ave Off Ramp	5,185	5,185	100%	61	21	C	6,580	6,236	95%	59	26	D
Union Ave Off Ramp to Union Ave Loop On Ramp	4,135	4,135	100%	62	22	C	5,215	4,939	95%	62	27	D
Union Ave Loop On Ramp to Union Ave Direct On Ramp	4,435	4,434	100%	62	24	C	5,825	5,471	94%	60	31	D
Union Ave Direct On Ramp to Cottonwood Rd Off Ramp	4,725	4,715	100%	61	26	C	6,375	6,054	95%	59	34	D
Cottonwood Rd Off Ramp to Cottonwood Rd On Ramp	4,080	4,058	99%	62	22	C	5,315	5,014	94%	62	27	D
Cottonwood Rd On Ramp to SR58 east end of the network	4,390	4,344	99%	62	23	C	5,590	5,246	94%	61	29	D
WSP WB Mainline												
SR 58 east end of the network to Cottonwood Road off-ramp	5,245	5,245	100%	63	28	D	5,145	5,145	100%	63	28	D
Cottonwood Road off-ramp to Cottonwood Road on-ramp	5,045	5,017	99%	62	27	D	4,870	4,870	100%	62	26	D
Cottonwood Road on-ramp to Brundage Lane off-ramp	5,420	5,372	99%	61	30	D	5,455	5,394	99%	61	30	D
Brundage Lane off-ramp to Brundage Lane on-ramp	4,595	4,592	100%	61	25	C	4,780	4,705	98%	61	26	C
Brundage Lane on-ramp to Union Avenue on-ramp	5,095	4,984	98%	60	28	D	5,190	5,047	97%	60	28	D
Union Avenue on-ramp to Chester Avenue off-ramp	5,865	5,784	99%	60	24	C	5,900	5,713	97%	59	33	D
Chester Avenue off-ramp to SR 58 WB C-D off-ramp (SR 99 NB and SB and Real Road)	5,040	4,792	95%	59	23	C	5,195	4,847	93%	60	24	C
SR 58 WB C-D off-ramp (SR 99 NB and SB and Real Road) to SR 99 NB C-D on-ramp (SR 99 NB and H Street)	1,785	1,785	100%	63	14	B	1,865	1,826	98%	63	15	B
SR99 NB C-D on-ramp (SR 99 NB and H Street) to Mohawk Street off-ramp	4,171	4,171	100%	59	24	C	4,440	4,290	97%	59	24	C
Mohawk Street off-ramp to Truxtun Avenue on-ramp	3,281	3,266	100%	61	27	D	3,650	3,563	98%	61	29	D
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	4,281	4,235	99%	61	23	C	5,525	5,432	98%	60	30	D
Mohawk Street loop on-ramp to Mohawk Street direct ramp	4,906	4,853	99%	62	20	C	6,730	6,652	99%	61	27	D
Mohawk Street direct ramp to Coffee Drive off-ramp	5,716	5,378	94%	61	20	C	7,705	7,235	94%	59	28	D
Coffee Drive off-ramp to Coffee Drive loop on-ramp	3,546	3,522	99%	63	14	B	5,595	5,546	99%	62	22	C
Coffee Drive loop on-ramp to Coffee Drive direct on-ramp	3,726	3,656	98%	63	14	B	5,895	5,814	99%	62	23	C
Coffee Drive direct on-ramp to Calloway Drive direct off-ramp	4,036	3,903	97%	63	15	B	6,490	6,351	98%	61	25	C
Calloway Drive direct off-ramp to Calloway Drive loop off-ramp	3,451	3,335	97%	62	13	B	5,540	5,402	98%	61	22	C
Calloway Drive loop off-ramp to Calloway Drive on-ramp	2,726	2,656	97%	63	14	B	4,275	4,162	97%	62	22	C
Calloway Drive on-ramp to Allen Road off-ramp	3,276	3,168	97%	62	17	B	5,330	5,180	97%	59	29	D
Allen Road off-ramp to Allen Road on-ramp	2,136	2,064	97%	64	11	A	3,230	3,179	98%	63	17	B
Allen Road on-ramp to West Beltway off-ramp	2,506	2,419	97%	62	13	B	3,675	3,577	97%	61	19	C
West Beltway off-ramp to West Beltway loop on-ramp	1,021	990	97%	64	8	A	1,455	1,440	99%	64	11	B
West Beltway loop on-ramp to West Beltway direct on-ramp	1,321	1,269	96%	62	10	A	1,930	1,855	96%	61	15	B
West Beltway direct on-ramp to Westside Parkway west end of the network	1,616	1,549	96%	60	13	B	2,305	2,202	96%	57	19	C
State Route 99 NB Collector-Distributor												
SR 99 NB C-D on-ramp to SR 99 NB C-D off-ramp	3,490	3,490	100%	53	22	C	3,705	3,548	96%	52	23	C
State Route 99 SB Collector-Distributor												
SR 58 WB C-D on-ramp to SR 99 SB C-D off-ramp	3,320	3,236	97%	52	21	C	3,675	3,638	99%	52	24	C
SR 99 SB C-D off-ramp to SR 99 SB C-D on-ramp	870	840	97%	49	17	B	935	898	96%	49	18	C
SR 99 SB C-D on-ramp to Ming Avenue off-ramp	1,670	1,664	100%	48	17	B	2,050	1,965	96%	48	20	C
State Route 58 WB Collector-Distributor												
SR 58 WB C-D on-ramp to SR 99 NB C-D off-ramp	3,905	3,793	97%	52	24	C	4,035	3,901	97%	52	25	C
SR 99 NB C-D off-ramp to SR 99 SB off-ramp	2,150	2,120	99%	51	21	C	2,200	2,100	95%	51	20	C
SR 99 SB off-ramp to Real Road off-ramp	775	775	100%	49	8	A	870	870	100%	49	9	A

Bottleneck Location

Queue

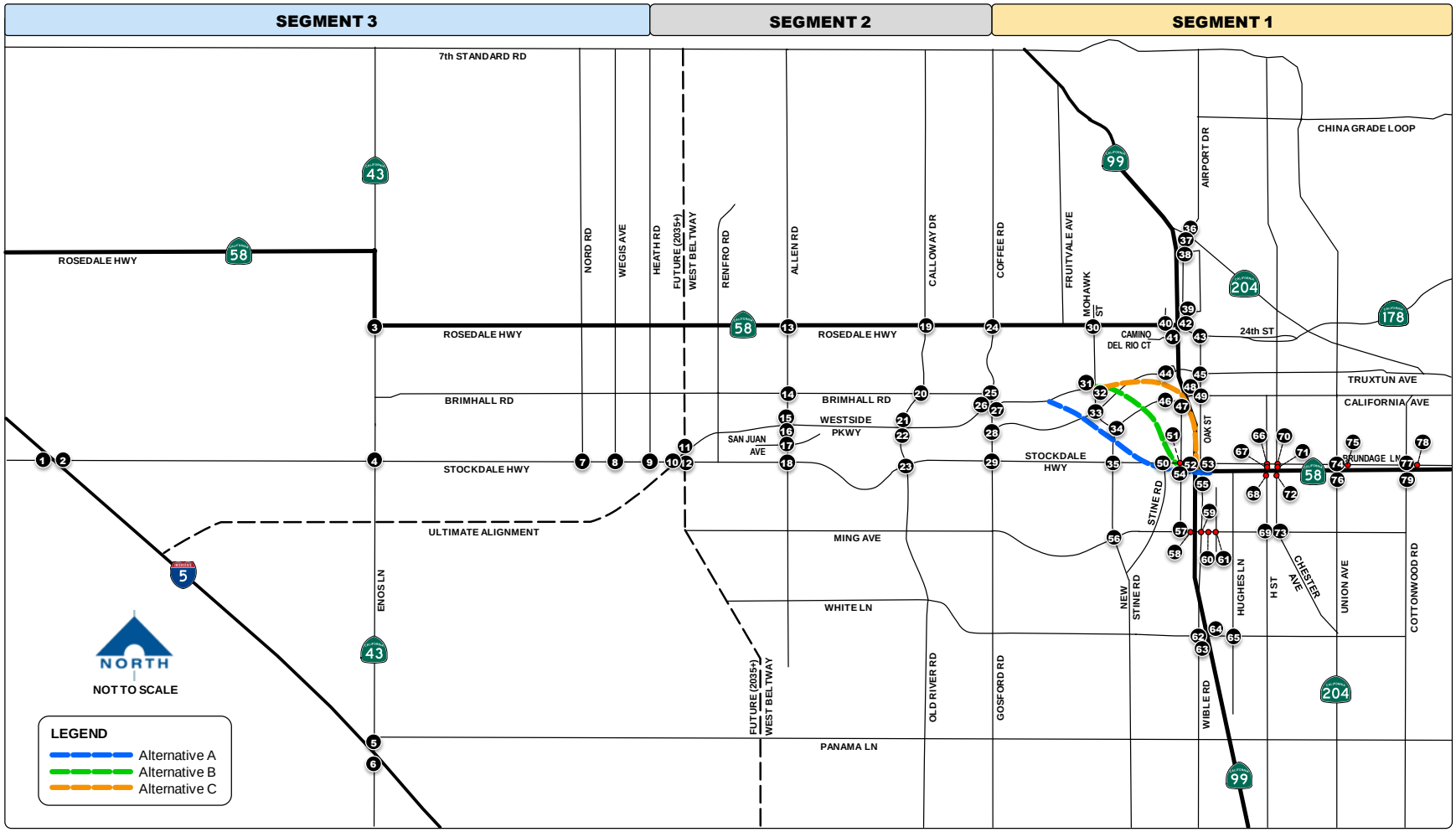


Figure 11. Location Map of Study Intersections

Table 8. Existing versus Year 2038 Comparison of Intersection Level of Service

Current Int. Number	Intersection	Type of Control	Existing (Source: F&P Associates, Inc Reported Synchro ver. 6 results)				Design Year 2038 No-Build Condition				Design Year 2038 Alternative A				Design Year 2038 Alternative B				Design Year 2038 Alternative C			
			AM PEAK		PM PEAK		AM PEAK		PM PEAK		AM PEAK		PM PEAK		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
			LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	I-5 SB Ramps/Stockdale Highway	NB/SB TWSC	B	10.2	C	15.1	A	6.4	F	92.0	A	5.3	F	66.3	A	5.7	F	69.0	A	5.4	F	52.1
		Imp-Signal*	N/A				B	12.2	B	11.6	B	11.4	B	11.2	B	11.7	B	11.3	B	11.7	B	11.3
2	I-5 NB Ramps/Stockdale Highway	NB/SB TWSC	A	9.5	B	11.7	A	4.0	B	14.0	A	7.2	B	16.8	A	6.1	B	19.9	A	4.0	B	11.6
3	SR-43 (Enos Lane)/Rosedale Highway	4-way Stop	B	12.0	B	14.9	D	25.8	F	77.0	D	28.5	F	81.9	D	28.4	F	78.7	D	28.1	F	83.1
		Imp-Signal	N/A				N/A				C	26.8	C	32.6	C	26.0	C	32.8	C	26.9	C	33.0
4	SR-43 (Enos Lane)/Stockdale Highway	4-way Stop	B	14.9	D	31.7	F	>150	F	>150	F	>150	F	>150	F	>150	F	>150	F	>150	F	>150
		Imp-Signal*	N/A				C	24.2	C	23.0	B	15.5	C	22.1	B	17.0	C	23.7	B	15.9	C	29.8
5	SR-43 (Enos Lane)/I-5 NB Ramps	EB/WB TWSC	B	11.9	C	15.6	A	3.4	B	10.7	A	4.3	B	10.1	A	3.7	B	14.6	A	3.3	B	13.5
6	SR-43 (Enos Lane)/I-5 SB Ramps	EB/WB TWSC	B	14.5	D	26.9	A	5.7	C	19.8	A	4.1	C	21.2	A	3.9	C	21.9	A	4.6	C	18.1
7	Stockdale Highway/Nord Rd	Signal	N/A				C	31.8	C	29.1	C	34.5	C	32.4	C	31.8	C	28.2	C	34.6	C	22.1
8	Stockdale Highway/Wegis Avenue	NB/SB TWSC	N/A				F	>150	F	>150	F	>150	F	>150	F	>150	F	>150	F	>150	F	>150
		Imp-Signal*	N/A				C	21.5	C	23.2	C	31.3	C	30.7	C	30.9	C	28.6	C	27.7	C	33.0
9	Stockdale Highway/Heath Road	STOP-Existing SIGNAL-Future	C	18.2	C	22.2	C	29.2	C	27.6	C	23.8	C	26.7	C	25.5	C	26.6	C	28.5	C	23.6
10	Stockdale Highway/WSP	Signal	Does not Exist				A	7.6	A	9.0	A	9.0	A	8.3	A	8.4	A	7.8	A	9.5	A	6.4
11	West Beltway/WSP WB Ramp	Signal	Does not Exist				A	6.5	B	14.7	A	8.5	B	17.2	A	7.4	B	19.5	A	9.6	B	16.3
12	West Beltway/WSP EB Ramp	Signal	Doesn't Exist				B	11.2	B	18.2	A	8.3	B	15.3	A	8.8	B	13.7	A	7.9	B	14.2
13	Allen Road/Rosedale Highway	Signal*	D	37.3	E	76.9	D	40.7	D	47.1	D	36.1	D	48.0	D	37.5	D	47.7	D	36.2	D	47.3
14	Allen Road/Brimhall Rd	Signal	C	21.2	B	19.9	C	25.9	C	33.5	C	23.5	C	34.4	C	23.1	C	33.1	C	26.9	C	27.8
15	Allen Road/WSP WB Ramps	Signal	Does not Exist				B	15.0	C	28.0	B	17.5	C	29.3	B	17.2	C	30.1	B	19.3	C	20.5
16	Allen Road/WSP EB Ramps	Signal	Does not Exist				B	10.2	A	3.7	B	10.9	B	11.5	B	10.2	B	12.3	B	17.1	B	13.8
17	Allen Road/San Juan Avenue	Signal*	Does not Exist				C	22.8	C	26.5	C	22.8	C	25.0	C	22.2	C	25.6	C	22.8	C	22.3
18	Allen Road/Stockdale Highway	Signal	D	39.0	C	27.0	C	29.8	C	32.5	C	31.1	C	33.0	C	30.0	C	33.7	C	33.6	C	28.1
19	Calloway Drive/Rosedale Highway	Signal*	E	69.0	F	91.0	D	49.4	D	54.8	E	59.2	E	58.6	E	55.6	E	63.2	E	59.7	E	61.8
20	Calloway Drive/Brimhall Road	Signal	C	31.9	C	25.4	C	29.9	C	28.5	C	29.8	C	35.0	C	34.9	C	33.2	C	31.7	C	31.2
21	Calloway Drive/WSP WB Ramps	Signal	Does not Exist				B	10.8	C	20.5	B	19.2	C	28.3	B	13.1	C	25.6	B	14.2	C	20.2
22	Calloway Drive/WSP EB Ramps	Signal	Does not Exist				B	18.4	A	8.9	B	11.2	A	7.5	B	15.9	A	8.9	B	13.5	A	8.7
23	Calloway Drive/Stockdale Highway	Signal	D	36.1	D	38.5	D	52.3	D	39.7	D	42.9	D	37.0	D	44.9	D	38.2	D	44.0	D	35.9
24	Coffee Road/Rosedale Highway	Signal*	E	75.7	E	65.7	F	83.1	F	98.0	E	79.4	F	97.1	E	67.1	F	134.5	E	69.7	F	110.3
25	Coffee Road/WSP WB Ramp-Brimhall Road	Signal	E	60.1	E	72.7	C	27.3	D	43.2	C	32.0	C	31.6	C	30.9	C	31.9	C	27.6	C	31.1
26	Coffee Road/WSP WB On Ramp	Unsignalized	Does not Exist				N/A				N/A				N/A				N/A			
27	Coffee Road/WSP EB Ramps	Signal	Does not Exist				C	28.7	B	19.0	B	18.2	B	11.0	B	18.1	B	14.3	B	11.1	B	14.1
28	Coffee Road/Truxtun Ave	Signal	E	67.2	F	81.2	C	20.5	C	24.5	B	12.4	B	18.5	B	13.4	B	16.7	B	12.5	B	17.8
29	Coffee Road/Stockdale Hwy	Signal*	F	112.0	F	90.2	E	55.6	F	99.2	E	67.1	F	84.0	E	57.1	F	82.8	E	69.9	F	86.7
30	Mohawk Street/Rosedale Highway	Stop, Existing* Signal, Future*	F	62.4	F	53.2	F	103.6	F	123.2	E	78.8	F	108.2	E	73.1	F	99.5	E	76.8	F	96.7
31	Mohawk Street/WSP WB Ramps	Signal	Does not Exist				n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	B	10.9	A	8.9	B	11.4	A	8.0
32	Mohawk Street/WSP EB Ramps	Signal	Does not Exist				C	24.4	B	19.5	B	11.8	B	13.8	B	18.3	B	12.3	B	18.2	B	14.4
33	Mohawk Street/Truxtun Avenue	Signal	C	29.0	D	41.5	C	31.1	E	59.8	C	26.4	C	25.5	C	33.6	C	28.8	C	33.5	C	29.7
34	Mohawk Street/California Avenue	Signal*	C	30.5	C	34.3	F	105.5	F	175.0	D	37.1	E	70.3	D	40.6	E	62.4	D	35.2	E	65.6
35	Stockdale Hwy/California Avenue	Signal*	E	55.9	F	81.9	F	94.5	F	104.3	D	43.3	E	62.5	D	46.2	E	60.1	D	44.0	E	60.9
36	Airport Drive/State Rd-SR-204 Off	Signal	D	35.9	D	42.5	C	20.2	C	21.9	C	22.2	C	22.6	C	21.9	C	26.7	C	21.5	C	21.9
37	Airport Drive/SR-99 NB Ramp	Signal	A	8.8	C	21.9	A	7.1	B	10.6	A	9.5	B	11.6	A	9.1	B	12.0	A	8.9	B	11.0
38	Buck Owens Boulevard/Rio Mirada Drive	Signal	D	43.7	B	17.8	C	29.1	C	28.6	C	21.7	C	25.0	C	30.9	C	29.4	C	32.6	C	27.5
39	SR99 NB Ramps/Buck-Owens Boulevard	Signal	D	38.9	D	37.5	D	37.5	D	46.2	D	41.7	D	43.4	D	45.3	D	42.3	D	42.4	D	42.6
40	Rosedale Highway/Camino Del Rio Court	Signal	C	28.6	D	37.0	C	20.9	D	49.9	C	30.4	D	49.4	C	33.7	D	45.3	C	32.8	D	46.4
41	Rosedale Highway/SR 99 SB Ramps	Signal	D	41.0	D	44.5	C	22.7	D	37.6	C	21.2	C	21.8	C	20.5	C	20.9	C	20.7	C	22.6
42	Rosedale Highway/SR99 NB Ramps	Signal	D	50.9	F	125.6	C	26.6	C	30.0	C	33.2	D	42.9	C	24.2	D	36.3	C	26.1	D	37.7
43	24th Street/Oak Street	Signal	F	89.4	F	100.3	D	37.5	C	29.5	C	31.3	D	38.4	C	33.2	D	39.0	C	30.4	D	36.9
44	Truxtun Avenue/Empire Drive	Signal*	N/A				C	21.6	D	47.6	C	29.4	D	42.5	C	30.0	D	52.4	c	29.7	D	47.6
45	Truxtun Avenue/Oak Street	Signal	D	43.3	E	74.4	E	61.9	E	73.9	D	52.0	D	46.3	D	52.7	D	45.3	D	51.8	D	48.1
46	California Avenue/Chester Lane	Signal	B	17.5	C	27.8	C	23.7	C	30.1	C	20.2	F	130.7	C	28.7	F	123.6	C	21.1	F	121.3
47	California Avenue/SR99 SB Ramps	Signal	D	48.8	D	44.5	D	54.6	E	76.1	E	57.8	F	90.3	E	60.1	F	83.2	E	58.9	F	83.2
48	California Avenue/SR99 NB Ramps	Signal	E	74.8	C	25.1	C	28.5	D	51.5	C	32.5	C	25.9	C	28.1	C	21.2	C	30.7	C	24.5
49	California Avenue/Oak St	Signal	D	44.1	E	78.7	C	28.3	E	61.5	C	29.7	E	58.6	C	27.5	E	57.9	C	28.2	E	58.1
50	Stockdale Highway/Stine Road	Signal *	N/A				F	90.7	F	>150	D	36.1	F	90.0	D	38.7	F	83.8	D	35.9	F	94.0
51	Stockdale Highway/Real Road	Signal	F	95.8	F	93.2	D	48.3	F	94.0	D	36.0	D	53.1	D	42.8	D	50.7	D	45.2	F	91.3
52	Stockdale Highway/SR99 SB Ramp	Signal	B	12.2	B	10.5	B	16.8	B	18.0	***Intersection does not exist in Alternative***											
53	Brundage Lane/Oak Street	Signal	C	28.9	D	38.8	C	31.9	D	40.3	C	25.9	C	30.4	C	25.3	C	31.4	C	29.9	C	30.6
54	Real Road/SR58	Signal	C	27.0	C	27.3	C	21.8	D	39.3	***Intersection does not exist in Alternative***								C	21.1	D	39.9
55	Wible Road/SR99 NB Ramps	Signal	B	17.9	C	32.2	B	15.5	C	28.4	***Intersection does not exist in Alternative***											
56	Ming Avenue/New Stine	Signal*	E	56.5	E	79.6	E	57.2	E	70.3	D	42.1	D	44.4	D	48.0	D	44.6	D	44.4	D	44.0
57	Ming Avenue/Real Road	Signal	C	25.4	E	60.8	C	25.3	E	64.5	C	30.6	C	29.9	C	30.5	C	30.6	C	25.7	C	28.4
58	Ming Avenue/SR99 SB Ramps	Signal	A	3.4	C	29.3	A	3.2	B	15.6	A	8.8	B	15.7	A	7.9	B	15.2	A	4.9	B	15.8
59	Ming Avenue/Wible Road	Signal	E	61.3	E	68.1	C	23.2	C	24.5	C	25.8	C	28.2	C	26.3	C	24.1	C	28.1	C	27.4
60	Ming Avenue/SR99 NB Ramps	Signal	C	26.7	D	40.4	D	36.4	C	28.3	C	25.1	C	33.6	C	27.8	C	34.3	C	33.8	C	34.5
61	Ming Avenue/Castro Lane	Signal	B	16.7	C	24.7	C	25.3	D	38.9	C	30.1	D	39.8	C	28.9	D	36.8	C	28.6	D	35.9
62	White Lane/Wible Road	Signal*	D	54.7	F	83.3	E	70.3	F	115.6	E	72.6	F	115.8	E	71.7	F	118.3	E	69.9	F	114.0
63	White Lane/SR99 SB Ramps	Signal*	C	22.3	F	109.5	C	24.9	F	106.2	C	25.1	F	98.5	C	23.4	F	105.5	C	24.3	F	105.3
64	White Lane/SR99 NB Ramps	Signal*	A	5.4	A	6.9	A	9.6	B	15.5	B	10.2	B	15.6	B	10.8	B	15.7	B	10.2	B	16.9
65	White Lane/Hughes Lane	Signal*	D	35.9	D	38.3	D	42.1	C	29.5	D	36.1	D	36.2	D	35.7	D	39.4	D	37.2	D	38.9
66	H Street/Brundage Lane	Signal	C	20.7	D	35.3	C	29.2	E	68.0	C	26.2	D	53.8	C	26.9	D	47.9	C	24.9	C	25.8
67	H Street/SR58 WB Ramp	Signal	B	17.1	E	56.3	C	20.6	E	64.3	B	15.7	D	35.1	B	13.5	D	36.0	B	14.7	D	35.9
68	H Street/SR58 EB Ramp	Signal	D	41.1	C	27.2	D	40.0	C	29.0	C	23.2	C	25.7	C	24.7	C	27.5	C	24.6	C	26.2
69	H Street/Ming Ave	Signal*	C	29.6	D	35.5	D	36.0	D	47.5	D	36.6	D	44.1	D	37.9	D	40.9	D	37.2	D	43.2
70	Chester Avenue/Brundage Lane	Signal	C	21.0	C	30.7	C	23.2	E	68.0	C	26.2	D	53.8	C	26.9	D	47.9	C	24.9	C	25.8
71	Chester Avenue/SR58 WB off Ramp	Signal	B	18.0	C	23.9	C	26.0	C	28.5	C	23.9	C	27.2	C	20.6	C	27.5	C	20.7	C	28.1
72	Chester Avenue/SR58 EB on Ramp	Signal	C	28.9	C	22.2	C	30.7	C	25.7	C	29.9	C	31.1	C	28.6	C	29.1	C	27.7	C	21.8
73	Chester Avenue/Ming Ave	Signal*	C	23.7	C	24.0	D	35.1	D	47.6	D	42.2	D	50.0	D	39.5	D	52.7	D	40.0	D	51.2
74	Union Avenue/Brundage Lane	Signal	D	42.1	D	39.6	D	46.8	D	43.4	D	42.7	D	47.8	D	45.6	D	49.4	D	44.6	D	51.0
75	Brundage Lane/SR58 WB Ramps	Signal	B	19.7	B	15.1	C	23.4	D	41.0	C	24.8	D	41.8	C	23.6	D	43.4	C	25.1	D	42.6
76	Union Avenue/SR58 EB Ramps	Signal	B	16.2	B	10.9	B	18.0	B	15.8	B	19.9	B	18.9	B	19.8	B	20.0	B	19.7	B	18.5
77	Cottonwood-MLK/Brundage Lane	Signal	N/A				C	28.8	C	27.5	C	25.2	C	27.6	C	23.6	C	28.9	C	23.9	C	25.2
78	Cottonwood-Brundage/SR 58 WB Ramps	Signal	N/A				C	27.3	C	32.9	C	23.3	C	33.1	C	21.2	C	30.3	C	20.2	C	33.9
79	Cottonwood/SR 58 EB Ramps	Signal	N/A				B	15.8	B	15.7	B	11.0	B	18.8	B	10.7	B	19.6	B	12.1	B	17.4

Intersection* LOS Summary based on Synchro 6
TWSC Two-Way Stop Control
N/A Existing counts not available
LOS E Conditions
LOS F Conditions
Source: Existing LOS Calculation are done Fehr & Peers Associates Inc and Future LOS Calculation are done by Parsons

personnel will be necessary to ensure quick response times. Disruptions in access to local schools are expected to be very minimal, with safe and efficient alternatives to currently used routes readily available.

Local roadway and freeway access modifications and their ramifications for local circulation, emergency and health services provision, and the location of schools for each of the build alternatives are summarized below. Figure 12 illustrates the general study area, depicting the locations where access modifications will be required. It should be noted that a portion of the affected areas east of Oleander Drive and south of Belle Terrace are not visible on this map, but the streets involved are discussed below. The location and proposed treatment of each affected local street can be seen in layout drawings provided in the full body of the *Centennial Corridor Traffic Study* report.

Alternative A—Street Closures and General Circulation

NORTH OF STATE ROUTE 58

On the north side of State Route 58, the following existing through streets will be terminated or converted to cul-de-sacs just north of the proposed right-of-way:

- Jones Street
- Williamson Way
- McDonald Way
- Business Park South

Jones Street will be closed both south of Stockdale Highway and north of Peckham Avenue. Nearby north–south access is available at Stine Road. Williamson Way will be also closed south of the proposed roadway. Nearby north–south access is available at Real Road. Existing north–south traffic on McDonald Way will be diverted to Cunan Street to the east and South Montclair Street to the west. Business Park South will be shortened to the north to accommodate the roadway project and traffic will be diverted to adjacent Business Center Drive.

SOUTH OF STATE ROUTE 58

On the south side of State Route 58, the following existing through streets will be terminated or converted to a cul-de-sac just south of the proposed right-of-way:

- Jones Street
- South Gamsey Avenue
- Williamson Way
- Myrtle Street
- Dixon Avenue
- Frazier Avenue
- Westwood Street
- McDonald Way
- Brite Street
- South Oleander Avenue
- Houchin Road

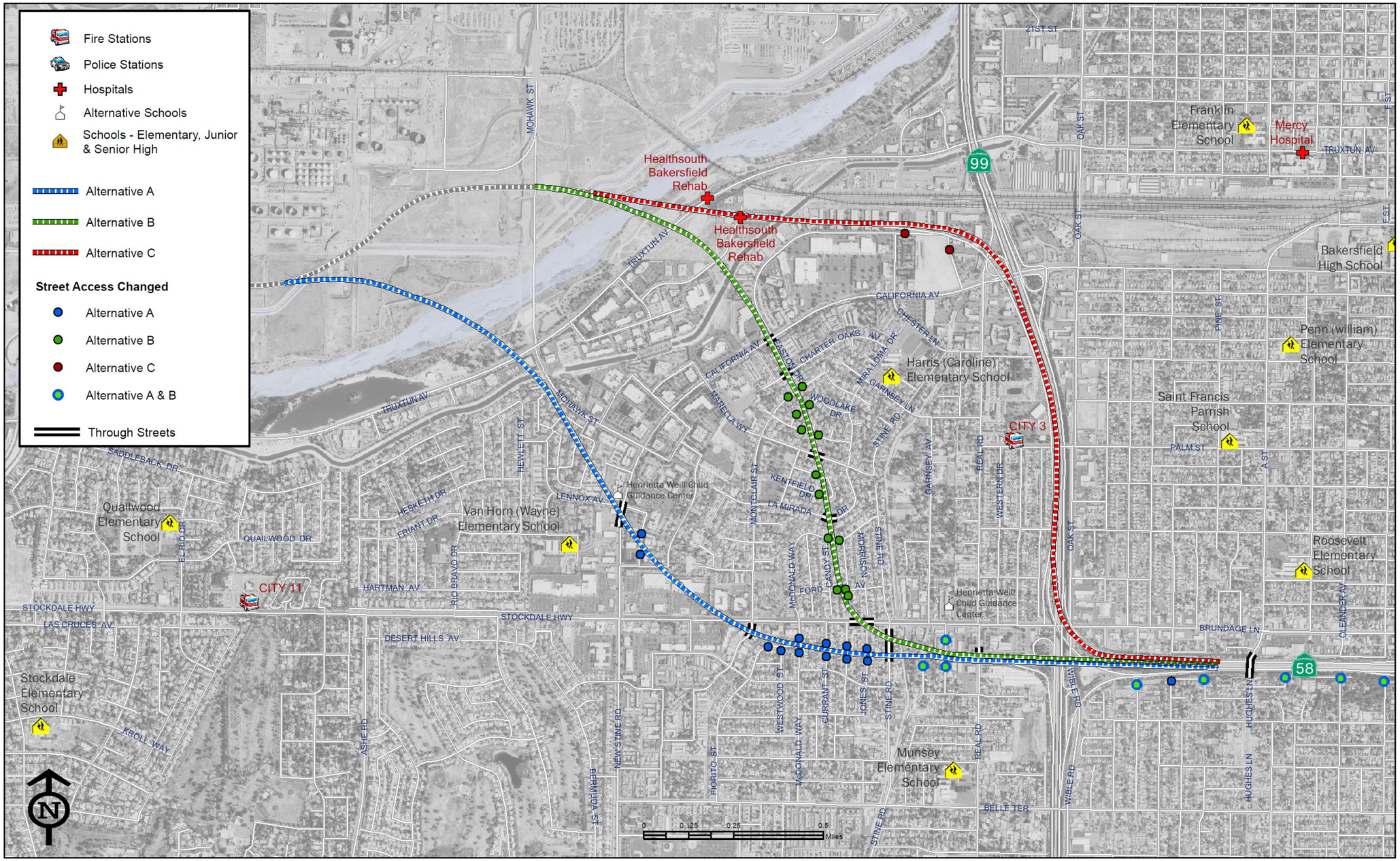


Figure 12. Local Roadway Access Modifications

Stine Road will continue as a through street, forming an underpass at the proposed roadway. Real Road will form a traffic-divided underpass of the mainline, in addition to the eastbound on-ramps and westbound off-ramps of the proposed highway. South Gamsey Avenue is an existing cul-de-sac which will be shortened to accommodate the roadway right-of-way. Myrtle Street and Dixon Avenue are currently linked at their northern termini by a connecting street. The street will be eliminated and converted to a cul-de-sac to accommodate the proposed roadway. Both streets will be minimally affected in terms of circulation due to nearby Hughes Lane, which will continue as a major through street. Frazier Avenue and Westwood Street will be terminated but the connecting street between the two will be retained. McDonald Way will be terminated and traffic diverted east to become Peckham Avenue. North–south traffic will be served by South Montclair Street to the east and Stine Road to the west. Brite Street, an east–west street, will be terminated and the connecting road between Brite Street and South Oleander Avenue eliminated. The existing Houchin Road cul-de-sac will be moved slightly to the south to accommodate the proposed roadway. North–south traffic will still access H Street as currently used.

WEST OF STATE ROUTE 99

On the west side of State Route 99, the following existing streets will be terminated just west of State Route 99:

- Wood Lane
- Laverne Avenue

Eastbound traffic on Wood Lane and Laverne Avenue has access to Belle Terrace or Ming Avenue, streets in close proximity which provide through movements east of State Route 99. Seville Street will be extended north, just past Laverne Avenue, to serve existing properties. A frontage road connection between Mona Way and Belle Terrace will be established. Belle Terrace will form an underpass of State Route 99. Affects on circulation in this area will be very limited.

Alternative B—Street Closures and General Circulation

NORTH OF STATE ROUTE 58

On the north side of State Route 58, the following existing through streets will be terminated just north of the proposed right-of-way:

- Kentfield Drive
- Hillsborough Drive

Southbound traffic on Kentfield Drive and Hillsborough Drive will be diverted a short distance east or west to Marella Way or La Mirada Drive, both of which provide through movements via underpasses of the proposed roadway.

SOUTH OF STATE ROUTE 58

On the south side of State Route 58, the following existing through streets will be terminated or converted to a cul-de-sac just south of the proposed right-of-way:

- South Myrtle Street
- South Gamsey Avenue

- Kensington Avenue
- Woodlake Drive
- Montclair Street
- Charter Oaks Avenue
- Dixon Avenue
- Brite Street
- South Oleander Avenue
- Houchin Road

Stine Road and Williamson Way, one street on either side of South Gamsey Avenue, will remain as north–south through streets and retain easy access north to Stockdale Highway. Real Road will remain as a major north–south divided collector roadway. Northbound traffic on Kensington Avenue, Woodlake Drive, Montclair Street, and Charter Oaks Avenue will be diverted either east or west to California Avenue or either Marella Way or La Mirada Drive, respectively. California Avenue will remain as a major north–south divided arterial roadway. Brite Street, an east–west street, will be terminated and the connecting road between Brite Street and South Oleander Avenue eliminated. Northbound traffic on Dixon Avenue will be directed one block east to Hughes Lane. Northbound traffic on South Oleander Avenue and Houchin Road will be diverted to H Street, one and two blocks to the east, respectively. Hughes Lane, H Street, Chester Avenue, and South P Street will remain as north–south arterial roadways serving the City of Bakersfield.

WEST OF STATE ROUTE 99

On the west side of State Route 99, the following existing through streets will be terminated just west of State Route 99:

- Wood Lane
- Laverne Avenue

Seville Street will be extended north just past Laverne Avenue to serve existing properties. A frontage road connection between Mona Way and Belle Terrace will be established. Belle Terrace will form an overpass of State Route 99. The existing Wood Lane cul-de-sac will be moved slightly to the west. North–south through access will remain at Belle Terrace.

Alternative C—Street Closures and General Circulation

WEST OF STATE ROUTE 99

On the west side of State Route 99, the following existing streets will be terminated just west of State Route 99:

- Chester Lane
- Elcia Drive
- Terrace Way
- Wood Lane

Chester Lane currently forms a cul-de-sac at its eastern-most terminus, just west of State Route 99. Traffic circulation will not be affected as the two streets on either side of Chester Lane

(California Avenue and Palm Street) provide east–west through access. Elicia Drive and Terrace Way, two adjacent and parallel streets will be connected just west of State Route 99 to provide circulation for adjacent properties. A frontage road connection between Mona Way and Belle Terrace will be established. Belle Terrace will form an overpass of State Route 99. The existing cul-de-sac on Wood Lane will be moved slightly to the west. North–south through access will remain at Belle Terrace.

SOUTH OF STATE ROUTE 58

On the south side of State Route 58, an existing street, Commerce Drive, will be converted to a cul-de-sac just south of the proposed right-of-way. Commerce Drive currently ends in a cul-de-sac south of Truxtun Avenue. Commerce Drive will be terminated farther to the south in order to accommodate the proposed roadway right-of-way, but neither circulation nor access is affected.

Emergency Service Access

In the case of alternative A, one health care center (HealthSouth Bakersfield Rehab) and two fire stations (City 3 and City 11) are located within the immediate vicinity of the proposed right-of way. In the case of alternatives B and C, one health care center (HealthSouth Bakersfield Rehab) and one fire station (City 3) are located within the immediate vicinity of the proposed right-of-way.

In each case, the expected change as a result of the proposed project in existing local circulation patterns will be minimal and will not unduly affect traffic or the provision of local emergency services. Service provision from the closest police station, Bakersfield Central Receiving Station at 1415 Truxtun Avenue, is not expected to be affected.

Access to Schools

Two schools, Van Horn Elementary and Henrietta Well Child Guidance Center are in the immediate vicinity of the alternative A right-of-way. Two schools, Harris Elementary and Henrietta Well Child Guidance Center, are in the immediate vicinity of the alternative B right-of-way. In each case, at least some students will be forced to access the school via a nearby local alternative to the route currently used. Because the actual closures of streets are minimal and the opportunities for alternate access readily available, however, situations are not expected in which functional access to any of these facility would be materially affected.

Based on the location of schools in the vicinity of alternative C construction, no changes in access for students are expected.

Freeway Access Modifications

Modifications to existing access ramps along State Route 99 and State Route 58 are required as part of the project and will impact travel access. Impacts will differ in degree depending on the alternative and location examined.

Freeway access modifications resulting from the proposed project are not expected to impact the provision of public safety services, such as fire or police, or affect access to health care facilities. Minor re-routing adjustments with respect to call response and patrol duties for fire and police personnel will be necessary to ensure quick response times. Disruptions in access to local schools are expected to be very minimal, with safe and efficient alternatives to currently used routes readily available.

Freeway access modifications and their ramifications for local circulation and alternative travel route recommendations are summarized below:

- The southbound State Route 99 off-ramp with direct access to Stockdale Highway will be eliminated under **alternatives A, B and C**. The provided alternative will be for vehicles to exit instead at the California Avenue interchange, just to the north. California Avenue and Oak Street provide a direct connection with the Stockdale Highway corridor.
- The northbound State Route 99 exit and entrance access points to and from Wible Road will be eliminated under **alternatives A, B and C**. Under existing and no-build conditions, these ramps provide access to and from the Stockdale Highway corridor. The provided alternative will be for vehicles to utilize either the California Avenue interchange to the north or the Ming Avenue interchange to the south, depending upon their destination.
- Access from Real Road and the Stockdale Highway corridor to southbound State Route 99 will be eliminated under **alternatives A, B and C.** The available alternative will be for drivers to utilize Real Road or Stine Road to access southbound State Route 99 via the Ming Avenue interchange.
- The connection between westbound State Route 58 to Real Road and the Stockdale Highway corridor will be eliminated under **alternatives A and B**, only. The likely alternative is for drivers to utilize the H Street/Chester Avenue interchange. The next nearest intersection to the north would be Calloway Drive in the case of alternative A, and Mohawk Street in the case of alternative B.
- Ming Avenue corridor access to and from State Route 58, east of State Route 99, will be eliminated under **alternatives A and B**, only. The area is characterized by relatively heavy traffic associated with movements to and from the Valley Plaza Mall and other nearby retail businesses. The provided alternative will be for vehicles to utilize the Chester Avenue interchange.
- Access from westbound State Route 58 to California Avenue via State Route 99 will be eliminated under **alternative C,** only. Drivers will instead be required to utilize Chester Avenue or H Street to access California Avenue to the north.

Future Projects and Interim Conditions

The future year transportation networks assume a large number of highway and transit elements listed in the 2011 Regional Transportation Plan (Amendment 1) which are "constrained" by funding that is currently available or reasonably projected to be available by the opening (2018) and design year (2038) analysis scenarios. In addition to these constrained projects, two "unconstrained" (unfunded) projects have been considered by this traffic study:

1. The construction of Segment 3 of the Centennial Corridor from the west end of the Westside Parkway to Interstate 5
2. The construction of Segment 1 freeway-to-freeway connector ramps between State Route 58 (west) and State Route 99 north.

These future projects and interim conditions are discussed below.

Segment 3—Heath Road to Interstate 5

The limits of Segment 3 were previously illustrated on Figure 7. The ultimate alignment is proposed as a new 7.4-mile-long freeway that would follow an east–west alignment parallel to the Cross Valley Canal. The route would be about one-third mile south of Stockdale Highway from Heath Road to about 1.2 miles west of State Route 43. The alignment would continue to follow the canal in a southwest direction and connect to Interstate 5 at a new freeway-to-freeway interchange located two miles south of the Stockdale Highway/Interstate 5 interchange. Segment 3 was evaluated in the approved *Route 58 Route Adoption Project, A Tier I Environmental Impact Statement/ Environmental Impact Report* (Caltrans, 2001). A Tier I document shows a general alignment and identifies impacts at a conceptual level and is done when there is not full funding for the improvements. An alignment known as the Cross Valley Canal alignment was identified as the "least environmentally damaging practicable alternative." Segment 3 will remain at the Tier I, route-adoption level of analysis until there is sufficient funding for construction. At that time, a project-level environmental document will be prepared.

In the interim, Stockdale Highway, from the Westside Parkway to Interstate 5, would be temporarily adopted as State Route 58, under build alternatives A, B and C. Under the no-build and transportation system management alternatives, State Route 58 would remain on its currently alignment. With build alternatives A, B, and C, improvements would be required at the Stockdale Highway and State Route 43 (Enos Lane) intersection. The proposed improvements would widen the intersection along all approaches and add signals to control the traffic movements. Enos Lane would be widened to add a dedicated left-turn lane and a shared through/right-turn lane in both directions. Stockdale Highway would be widened to provide a dedicated left-turn lane, a dedicated through movement lane, and a shared through/right-turn lane in both directions. Though physically located in Segment 3, these improvements would be built as part of segment 1 to ensure adequate traffic operations at this intersection.

In addition to these project related improvements at Stockdale Highway and Enos Lane, land developer improvements are assumed under no-build and build alternatives A, B, and C as a condition of entitlement. These land development conditions of approval call for the widening of Stockdale Highway to four lanes from Nord Road to Enos Lane and the installation of traffic signals and intersection improvements at Stockdale Highway and Wegis Avenue and at Stockdale Highway and Nord Road. These intersection improvements and lane additions are assumed under all year 2038 no-build and build analysis scenarios.

In addition to local street intersections, the traffic analysis examined traffic operations at the two off-ramp termini intersections of Stockdale Highway and Interstate 5. The analysis results indicated that by year 2038, a traffic signal would need to be installed at the Interstate 5 southbound off-ramp to Stockdale Highway. This traffic signal installation is needed for all no-build and build project scenarios for year 2038 projected traffic volumes. A signalized intersection is not needed to address opening year 2018 conditions.

The Federal Highway Administration's August 2010 *Interstate System Access Informational Guide* indicates that improvements to traffic control at ramp termini with local roads should be reviewed to ensure that the changes in traffic control (i.e., signalization) do not result in queue spillback into the mainline lanes of the interstate facility and that sufficient storage is provided.

This review has been undertaken and no spillback to the mainline will occur given the installation of a traffic signal at the southbound off-ramp termini when traffic volumes warrant.

It should be noted that construction of a new freeway segment from Heath Road to Interstate 5 will likely negate the need for a traffic signal installation at the southbound off-ramp to Stockdale Highway. As this traffic signal is not needed for opening year project conditions, and may never be needed under future conditions, this traffic operational analysis recommends that coordination with FHWA's Division Office be deferred until such time that traffic volumes and queue lengths approach or meet traffic signal warrants.

With the installation of traffic signals at the intersections identified above, Stockdale Highway will operate at level of service C or better conditions at all segment 3 study intersections.

In addition to intersection analysis, highway segment analysis was conducted for the two segments lying east and west of State Route 43 which are unsignalized (uninterrupted flow) for a distance of two or more miles:

1. Interstate 5 to State Route 43
2. State Route 43 to Nord Road

The results of the highway segment analysis indicate that Stockdale Highway operates, and will continue to operate, below Caltrans (District 6) level of service threshold of the transition between LOS C and LOS D for rural roads (Stockdale Highway west of Enos Lane) or the transition between LOS D and LOS E for urban roads (Stockdale Highway east of Enos Lane).

State Route 58/State Route 99 Interim Connections

The build alternatives A, B, and C do not provide direct connector ramps to or from the north on State Route 99 as part of the Centennial Corridor project. The preliminary plans allow for these ramps to be constructed a future date. Interim access will be provided by the State Route 99 interchange with existing State Route 58 (west), connecting to the Westside Parkway via Mohawk Street.

As part of the build alternatives, the project will improve the southbound State Route 99 off-ramp to Rosedale Highway. To provide an acceptable level of service, the number of turn lanes will need to be improved from one left-turn plus one shared left- and right-turn lane to two left-turn lanes and two free right-turn lanes. The additional turn lanes will each be 12 feet wide.

In addition to this ramp termini intersection improvement, Rosedale Highway will be widened from two lanes per direction to three lanes per direction to the west of Gibson Street to Mohawk Street and beyond. This widening of Rosedale Highway is a separate project which will be constructed with or without the Centennial Corridor project.

Figure 13 illustrates the interim route connection between the Westside Parkway and State Route 99, to and from the north. The route covers 2.1 miles from the State Route 99/Rosedale Highway undercrossing to the Westside Parkway/Mohawk Street overcrossing.

A southbound State Route 99 to westbound Westside Parkway motorist following the interim connecting route would pass through seven signalized intersections; while an eastbound to northbound motorist would pass through 10 signalized intersections.

Figure 13: Interim Connection between Westside Parkway and State Route 99

The year 2038 level of service computed for these intersections is LOS D or better except at the intersection of Mohawk Street and Rosedale Highway where LOS E and F conditions are forecast for year 2038.

Insofar as the build alternatives, providing direct connector ramps to/from the north on State Route 99 would lengthen the route traveled, but this journey would occur at a higher rate of speed. The relative change in distance and travel time is as follows:

Comparative Distance and Travel Time from Westside Parkway to/from State Route 99 North

		DELTA	
	LENGTH (miles)*	MILES	TIME (min)**
Interim route	2.6	0	0
Alternative A (with future ramps)	4.5	+1.9	–0.7
Alternative B (with future ramps)	4.9	+2.3	–0.3
Alternative C (with future ramps)	2.7	+0.1	–2.5

*State Route 99/Rosedale Highway undercrossing to 0.55 miles west of Westside Parkway/Mohawk Street overcrossing.
**Average change in travel time. During peak hours, could be more; during off-peak hours, could be less.

Based on this assessment of motorist delay and increased vehicle miles traveled, direct connector ramps from Westside Parkway to/from State Route 99 (north) will be deferred until sometime following year 2038, or when demand and traffic operating conditions along the interim route warrant.

Independent Utility and Logical Termini

Federal Highway Administration regulations (23 Code of Federal Regulations 771.111[f]) require that (1) projects have logical limits and be long enough that the environmental analysis has a broad scope; (2) projects are usable and a reasonable use of funds, even if no additional transportation improvements in the area are made (this is known as independent utility); and (3) approval of a project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. As discussed below, the Centennial Corridor project build alternatives A, B, and C comply with these requirements.

Both the ultimate project (construction of all three roadway segments) and phased project (construction by segment) have logical limits. The ultimate project would provide a freeway facility that connects State Route 58 with State Route 99 and Interstate 5 at freeway-to-freeway interchanges. The segment 1 project would close a gap by connecting State Route 58 (east) with the new Westside Parkway (segment 2).The connecting ramps from State Route 58 (west) to and from State Route 99 (south) would be constructed as part of the Centennial Corridor project. Connecting ramps from State Route 58 (west) to and from State Route 99 (north) would be constructed at a later date. Insofar are the connection to Interstate 5, segments 1 and 2 and Stockdale Highway would serve the developed portion of metropolitan Bakersfield by moving traffic, goods, and freight through the area, and would provide access to Interstate 5 for improved regional access. The ultimate segment 3 freeway facility would connect Interstate 5 with the west

end of the Westside Parkway at the point in time when the travel demand exceeds the capacity of Stockdale Highway (a two-lane roadway). Identifying segment 3 as a future alignment for State Route 58 will allow preservation of an adequate transportation corridor in the future. Combined with the existing State Route 58 (east), the project would provide a high capacity, high level of service, east–west facility in the San Joaquin Valley.

Another important consideration is whether the project is of sufficient length to address traffic and environmental related matters on a broad scope. At 17.4 to 18.5 miles long (depending on the alternative), the study corridor extends well beyond the proposed construction limits. This ensures that the traffic issues that would be addressed in detail if construction of segment 3 and the State Route 58 (west)/State Route 99 (north) direct connector ramps, as proposed in the future, are considered at a Tier I planning level now.

The project's phased implementation would provide an effective and efficient roadway even if no additional transportation improvements are made as the connection of segment 1 and segment 2 would provide an adequate traffic level of service through 2038 (the project's design year). Finally, there are no other projects that would be needed or are dependent on construction of the Centennial Corridor project.

CHAPTER 1. INTRODUCTION

1.1 Project Overview

The California Department of Transportation (Caltrans) proposes to establish a new alignment for State Route 58, which would provide a continuous route along State Route 58 from Cottonwood Road on existing State Route 58, east of State Route 99 (post miles T31.7 to R55.6), to Interstate 5 (I-5) via the Westside Parkway. Improvements to State Route 99 (post miles 21.2 to 26.2) and Westside Parkway would also be made to accommodate the connection with State Route 58.

The project is located at the southern end of the San Joaquin Valley in the city of Bakersfield in Kern County, California (see Figure 1-1). The study site is bound on the east by Cottonwood Road, on the west by I-5, on the north by Gilmore Avenue, and on the south by Wilson Road. Caltrans is the lead agency for the project pursuant to the California Environmental Quality Act and the National Environmental Policy Act.

The proposed continuous route, known as the Centennial Corridor, has been divided into three segments, as shown in Figure 1-2.

Segment 1 is the easternmost segment, which would connect the existing State Route 58 (East) freeway to the Westside Parkway. Multiple alignment alternatives are being evaluated for this segment and are discussed below.

Segment 2 is composed of the Westside Parkway, which extends westerly from Truxtun Avenue to Heath Road. This roadway is a local facility that is currently under construction and would be transferred into the State Highway System. The analysis evaluates potential impacts associated with incorporating the Westside Parkway as part of the State Highway System, as well as improvements to facilitate traffic operations between the Westside Parkway and the Centennial Corridor. The analysis provides updates to the relevant results of the *Westside Parkway Environmental Assessment/Final Environmental Impact Report*, as necessary.

Segment 3 would extend from Heath Road to I-5. This segment will need a temporary route adoption for the use of Stockdale Highway between Heath Road and I-5 as an interim alignment for State Route 58 and for a future new alignment (ultimate) as identified in the 2002 *Route 58 Route Adoption Project Tier I Environmental Impact Statement/Environmental Impact Report* (EIS/EIR) will be constructed when there is greater traffic demand and funding is available. Therefore, traffic analysis of Segment 3 has been evaluated for the interim use of Stockdale Highway between Heath Road and I-5. Improvements to the Stockdale Highway/State Route 43 (known locally as Enos Lane) intersection would be made to accommodate the additional traffic.

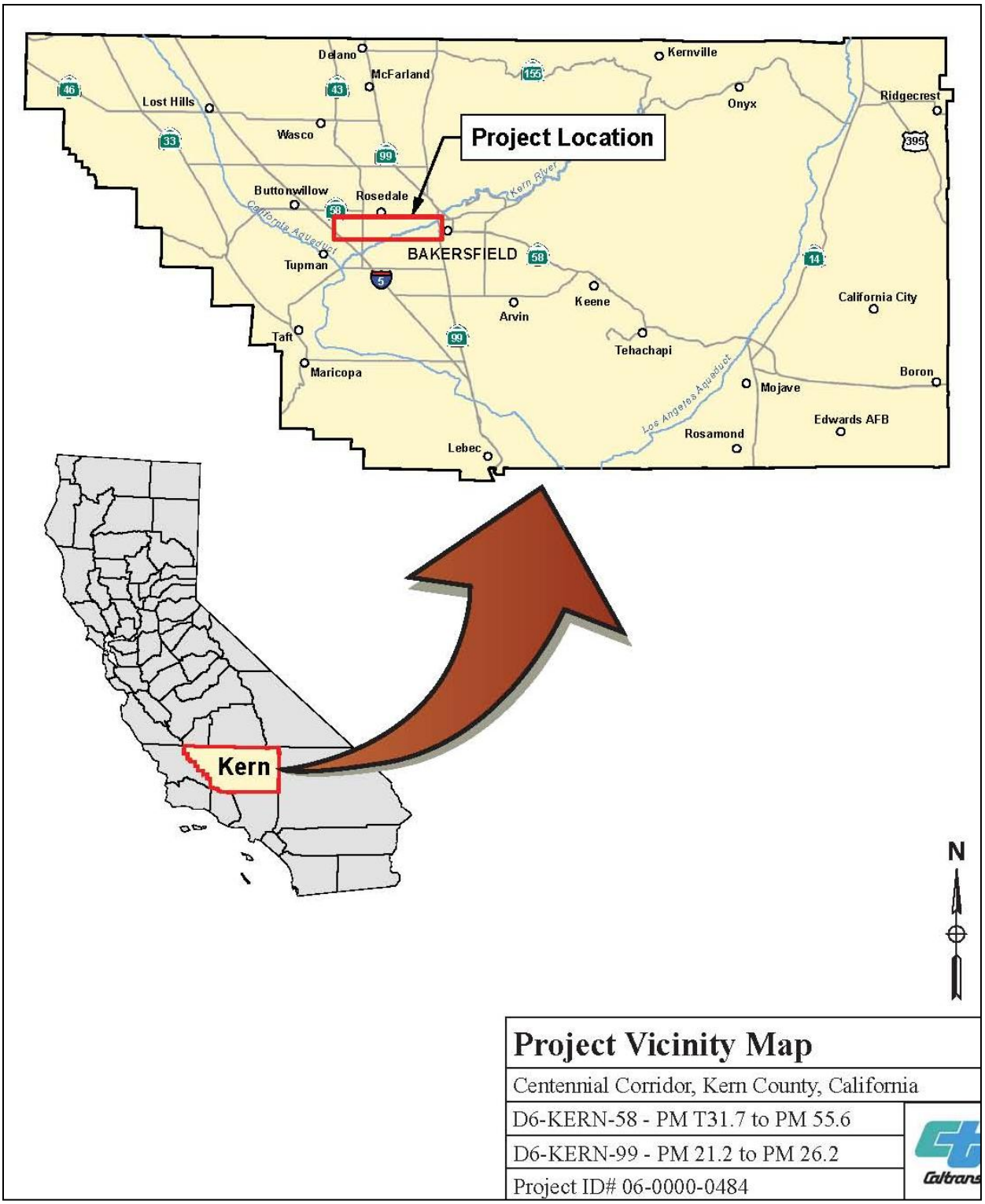


Figure 1-1: Project Vicinity

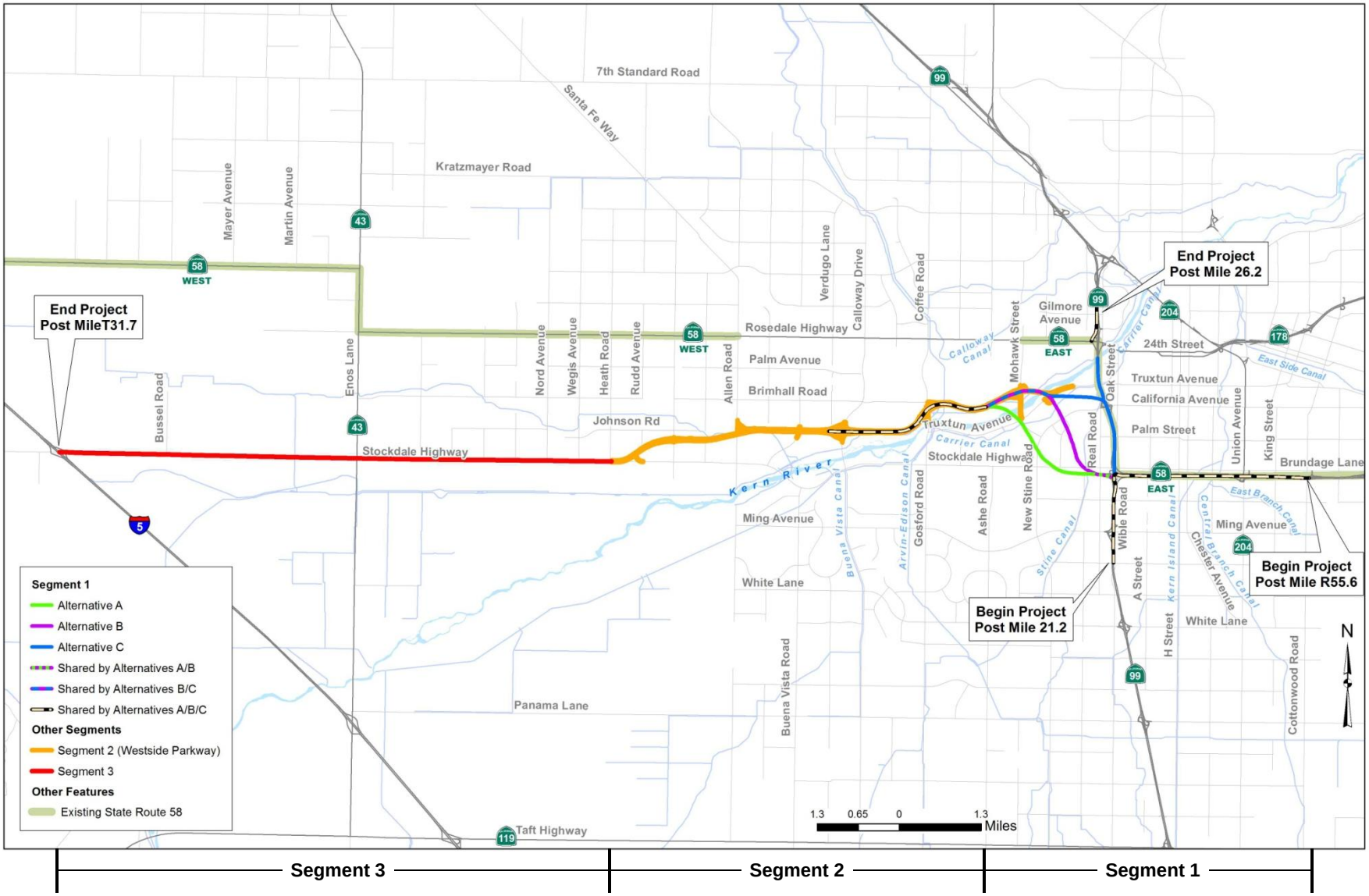


Figure 1-2: Project Location Map

1.2 Purpose and Need

The purpose of the Centennial Corridor project is to provide route continuity and associated traffic congestion relief along State Route 58 within Metropolitan Bakersfield and Kern County from State Route 58 east (at Cottonwood Road) to I-5.

State Route 58 is a critical link in the state transportation network that is used by interstate travelers, commuters, and a large number of trucks. Under existing conditions, State Route 58 does not meet the capacity needs of the area, and this is expected to get worse as the population grows. State Route 58 lacks continuity in central Bakersfield, which results in severe traffic congestion and reduced levels of service on adjoining highways and local streets. This route is offset by about one mile at State Route 43 and by about two miles at State Route 99. The merging of two major state routes (58 and 99) into one alignment between the eastern and western legs of State Route 58 degrades the traffic level of service on this segment of freeway. In addition, State Route 99's close spacing for its two interchanges with State Route 58 (east and west), in addition to an interchange at California Avenue, results in vehicles aggressively changing lanes, which adds to congestion.

1.3 Project Description

The project alternatives include three build alternatives and a no-build alternative. In addition to these, this traffic study report evaluates a transportation systems management alternative referenced as alternative M.

No Build Alternative

No construction of Segment 1 would occur under the no-build alternative. In addition, no improvements to the Westside Parkway from Truxtun Avenue to the Calloway Drive interchange would be required. There would also be no improvements made to the Stockdale Highway/State Route 43 intersection. The No-Build Alternative would involve the following actions: (1) the Westside Parkway would be route adopted into the State Highway System; (2) the portion of Mohawk Street from Westside Parkway to Rosedale Highway would be designated as part of State Route 58, which would provide a connection to State Route 99; (3) Stockdale Highway between Heath Road and Interstate 5 would serve as an interim alignment for State Route 58 until ultimate improvements are constructed; and (4) the portion of State Route 58 (West) from Allen Road to Interstate 5 would be relinquished to the local jurisdictions as a local facility.

Build Alternatives

As shown in Figure 1-3, the three build alternatives (Alternatives A, B, and C) within Segment 1 propose new alignments that would extend from Cottonwood Road on the existing State Route 58 (East) and connect I-5 via the Westside Parkway. Alternatives A and B would be west of State Route 99, and Alternative C would parallel State Route 99 to the west. Under Alternative A, the eastern end of the Westside Parkway mainline would be realigned to conform to the Alternative A alignment, and ramp connections would be provided to the Mohawk Street interchange. Under Alternatives B and C, the alignments would connect to the Westside Parkway by extending the mainline lanes built as part of the Westside Parkway project. Detailed descriptions of the alternatives are provided on the following subsections.

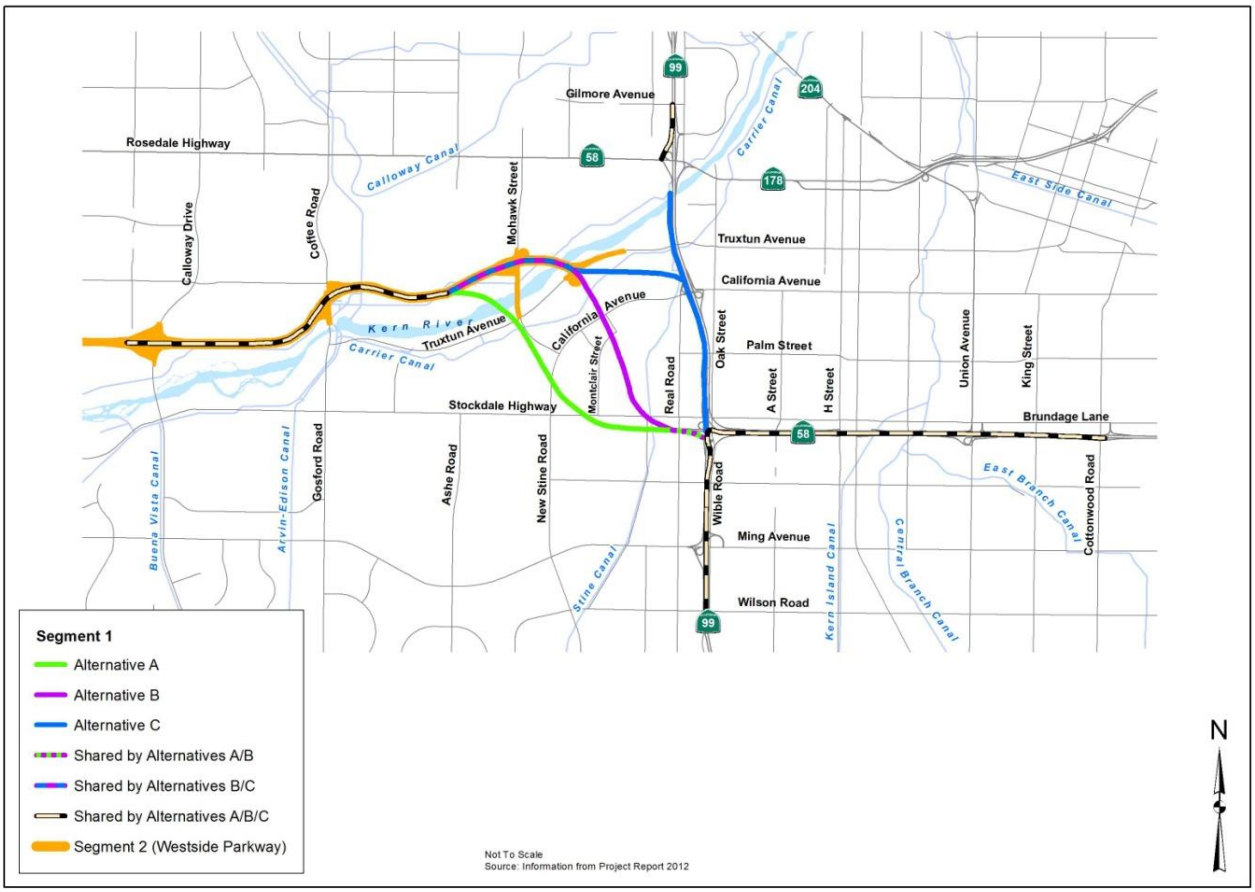


Figure 1-3: Alternatives for Segment 1 of the Centennial Corridor

Common Design Features of the Build Alternatives

The build alternatives would connect State Route 58 (East) to the east end of the Westside Parkway by means of a six-lane freeway. All the build alternatives would involve a route adoption to include the selected Segment 1 alignment and the Westside Parkway into the State Highway System as State Route 58. In Segment 3, there would be a temporary route adoption of Stockdale Highway as the interim State Route 58 connection to Interstate 5 until the ultimate alignment (the Cross Valley Canal alignment addressed in the 2001 EIS/EIR) is constructed, which would occur at a later date. Though the alignment and design characteristics vary by alternative, the three build alternatives have the following common design features.

Segment 1

All the alternatives would provide the following connections between State Route 58 and State Route 99 using high speed connection ramps:

- Northbound State Route 99 to westbound Centennial Corridor.
- Northbound State Route 99 to eastbound State Route 58 (East).
- Southbound State Route 99 to eastbound State Route 58 (East).
- Eastbound Centennial Corridor to southbound State Route 99.
- Westbound State Route 58 (East) to southbound and northbound State Route 99.

Direct connector ramps from southbound State Route 99 to westbound State Route 58 are not being provided as part of this project. However, to accommodate this movement, the southbound State Route 99/Rosedale Highway off-ramp would have two lanes off the freeway and be widened to four lanes at the intersection with Rosedale Highway. Additionally, an auxiliary lane would be provided on State Route 99 from south of Gilmore Avenue to the State Route 58 (Rosedale Highway) off-ramp. Direct connector ramps from eastbound State Route 58 to northbound State Route 99 are not being provided as part of this project.

The project would require the widening of the South P Street Undercrossing and the westbound State Route 58 Grade Separation over State Route 99. In addition, the Stockdale Highway off-ramp from southbound State Route 99 and the Wible Road on- and off-ramps on State Route 99, located just south of the existing State Route 58/State Route 99 interchange, would be removed.

Segment 2

The Westside Parkway would be incorporated into the State Highway System with each of the Build Alternatives. Improvements to connect Centennial Corridor to the Westside Parkway would extend from where each build alternative connects at the eastern end of the Westside Parkway toward the west, ending at the Calloway Drive interchange. The proposed improvements would widen the Westside Parkway by constructing one additional lane in the median to provide auxiliary lanes. In the westbound direction, the median widening would extend from east of the Friant-Kern Canal through the Calloway Drive interchange. The limits of the added lane in the eastbound direction would differ between each alternative, as described in the Unique Design Features of the Build Alternatives section below. With each build alternative, modifications to the westbound diamond off-ramp to Calloway Drive and the eastbound loop on-ramp from Coffee Drive would be required.

Though the improvements described above are physically located in Segment 2, construction would be undertaken as part of Segment 1 construction to facilitate traffic operations between the Westside Parkway and the Centennial Corridor.

Segment 3

With each build alternative, the Stockdale Highway/State Route 43 intersection would be widened and traffic signals would be added to control the traffic movements. State Route 43 would be widened to add a dedicated left-turn lane in both directions. Stockdale Highway would be widened to add a dedicated left-turn lane and a shared through/right-turn lane in both directions. Though physically located in Segment 3, these improvements would be built as part of Segment 1 to ensure adequate traffic operations at this intersection.

Unique Design Features of the Build Alternatives

ALTERNATIVE A

Alternative A would travel westerly from the existing State Route 58/State Route 99 interchange for about 1 mile, south of Stockdale Highway, where it would turn northwesterly and go over Stockdale Highway/Montclair Street, California Avenue/Lennox Avenue, Truxtun Avenue, and the Kern River before joining the eastern end of the Westside Parkway near the Mohawk Street interchange.

A link would be provided from northbound State Route 99 to westbound State Route 58 and from eastbound State Route 58 to southbound State Route 99 via high-speed connectors. No direct connector ramps would be built from southbound State Route 99 to westbound State Route 58 or from eastbound State Route 58 to northbound State Route 99. Southbound State Route 99 would be widened to accommodate the additional traffic from eastbound State Route 58 to the southbound State Route 99 connector. The existing westbound State Route 58 to southbound State Route 99 loop-ramp connector would be realigned and would connect to the proposed eastbound State Route 58 to southbound State Route 99 connector before merging onto southbound State Route 99. The existing southbound State Route 99 to eastbound State Route 58 connector and northbound State Route 99 to eastbound State Route 58 would be preserved with some changes.

The limits of widening on State Route 99 would extend to the Wilson Road overcrossing. On northbound State Route 99, a three-lane exit would be provided just north of Wilson Road to carry the northbound State Route 99 to westbound State Route 58 traffic on two lanes and the Ming Avenue on- and off-ramp traffic on the third lane. All ramps in this area would have to be realigned to provide for the additional lanes. The Wible Road on- and off-ramps just south of the existing State Route 58/State Route 99 interchange, which is in conflict with the Caltrans standards of interchange spacing, would have to be removed to accommodate this design. The Stockdale Highway off-ramp on the southbound State Route 99 to eastbound State Route 58 connector would be removed as well. Under this concept, State Route 58 would also lose its link with Real Road. Also, Alternative A would provide an auxiliary lane on southbound State Route 99 from south of Gilmore Avenue to the Rosedale Highway off-ramp.

The median widening to provide an auxiliary lane along the Westside Parkway would extend westerly from the connection point with Centennial Corridor between Coffee Road and Mohawk Street to the Coffee Road off-ramp.

Other features with this alternative include (1) the construction of 19 soundwalls; (2) the construction of a park and ride facility off Mohawk Street between California Avenue and Truxtun Avenue, to replace the facility that would be displaced by the project; (3) 7 infiltration basins, which would be placed throughout the study area to retain stormwater runoff for water quality improvement purposes; and (4) 48 retaining walls of varying sizes located throughout the study area.

ALTERNATIVE B

Alternative B would run westerly from the existing State Route 58/State Route 99 interchange for about 1,000 feet, south of Stockdale Highway, where it would turn northwesterly and span Stockdale Highway/Stine Road, California Avenue, Commerce Drive, Truxtun Avenue, and the Kern River before joining the east end of Westside Parkway between the Mohawk Street and Coffee Road interchanges. This alignment would depress State Route 58 between California Avenue and Ford Avenue. Overcrossings are proposed at Marella Way and La Mirada Drive to ease traffic circulation.

Alternative B proposes the same connections to State Route 99 that Alternative A does and would require similar improvements on State Route 99 and existing State Route 58.

The median widening to provide an auxiliary lane along the Westside Parkway would extend westerly from the connection point with Centennial Corridor between Coffee Road and Mohawk

Street to the Coffee Road off-ramp. Modifications would be required to the eastbound Mohawk Street off-ramp, westbound Truxtun Avenue on-ramp and reconstruction of the eastbound Mohawk Street loop on-ramp. In addition, construction of the proposed westbound Mohawk Street off-ramp and realignment of the Cross Valley Canal maintenance access road from Mohawk Street would be required.

Other features with this alternative include (1) the construction of 24 soundwalls; (2) the construction of a park and ride facility north of California Avenue, next to the Centennial Corridor, to replace the facility that would be displaced by the project; (3) 8 infiltration basins that would be placed throughout the study area to retain stormwater runoff for water quality improvement purposes; and (4) 42 retaining walls of varying sizes located throughout the study area.

ALTERNATIVE C

Near the existing State Route 58/State Route 99 interchange, Alternative C would turn north and run parallel to the west of State Route 99 for about one mile. The freeway would turn west and span the BNSF Railway rail yard, Truxtun Avenue, and the Kern River. This alternative proposes undercrossings at Brundage Lane, Oak Street, State Route 99, Palm Avenue, and California Avenue.

Connections would be provided from eastbound State Route 58 to southbound State Route 99 and from northbound State Route 99 to westbound State Route 58. The existing westbound State Route 58 to southbound State Route 99 loop-ramp connector would connect to the proposed eastbound State Route 58 to southbound State Route 99 connector before merging onto southbound State Route 99. The southbound State Route 99 Ming Avenue off-ramp would be relocated north of the eastbound State Route 58 to southbound State Route 99 connector to facilitate weaving between the Ming Avenue off-ramp and the eastbound State Route 58 to southbound State Route 99 connector traffic. A connector would be provided east of northbound State Route 99 from Brundage Lane to south of California Avenue to facilitate weaving between westbound State Route 58 to northbound State Route 99 traffic with northbound State Route 99 to westbound State Route 58 traffic.

Improvements on State Route 99 would extend from the Wilson Road overcrossing (south of the State Route 58/State Route 99 interchange) to the Gilmore Avenue overcrossing (north of the State Route 58/State Route 99 interchange). A collector-distributor (C-D) road system would provide access from westbound State Route 58 to northbound State Route 99, as well as from northbound State Route 99 to westbound State Route 58. The Wible Road on- and off-ramps just south of the existing State Route 58/State Route 99 interchange would have to be removed to accommodate the northbound State Route 99 auxiliary lane. The Stockdale Highway off-ramp on the southbound State Route 99 to eastbound State Route 58 connector would be removed as well. Under this concept, southbound State Route 99 would also lose its link with Real Road.

The median widening to provide an auxiliary lane along Westside Parkway would extend westerly from the connection point with Centennial Corridor between Coffee Road and Mohawk Street to the Coffee Road off-ramp. Modifications would be required to the eastbound Mohawk Street off-ramp, westbound Truxtun Avenue on-ramp, and reconstruction of the eastbound Mohawk Street loop on-ramp. In addition, construction of the proposed westbound Mohawk Street off-ramp and

realignment of the Cross Valley Canal maintenance access road from Mohawk Street would be required.

Other features with this alternative include (1) the construction of 17 soundwalls; (2) the construction of a park and ride facility at Real Road and Chester Lane to replace the facility that would be displaced by the project; (3) 11 infiltration basins that would be placed throughout the study area to retain stormwater runoff for water quality improvement purposes; and (4) 42 retaining walls of varying sizes located throughout the study area.

ALTERNATIVE M

Alternative M, the transportation system management alternative, proposes local arterial improvements to increase the person-carrying capacity. Low-cost improvements include traffic signal optimization, intersection widening and bus service and stop improvements along all of the east–west arterial streets from Hageman Road to Ming Avenue. The same improvements are also assumed for the no-build and all build alternatives, and were therefore not specifically evaluated by this traffic study. Higher cost improvements include constructing grade separations along Rosedale Highway at four major north–south arterial streets and reducing the number of intervening signalized intersections between Allen Road and State Route 99. Detailed traffic operational analysis of the alternative indicates that Rosedale Highway would also need to be widened to eight lanes between Fruitvale Avenue and State Route 99, a distance of 1.8 miles, to accommodate forecast traffic volumes. This alternative assumes there is no new direct connection between the approved Westside Parkway and existing State Route 58/State Route 99 interchange.

1.4 Background

The need for a high-capacity transportation corridor in western Kern County has been recognized by local and regional planners for decades. The 2001 *Route 58 Route Adoption Project Tier I Environmental Impact Statement/Environmental Impact Report* focused on the location of a multi-modal transportation corridor to replace existing State Route 58 in the future. The purpose of the Tier 1 study was to provide continuity for State Route 58 in Kern County, and to provide an alignment for a future multi-modal transportation faculty that would reduce congestion on the local transportation network in the western metropolitan Bakersfield area. The Tier 1 study documented previous transportation planning studies, and analyzed many different alternatives from State Route 58 (east) to Interstate 5. A major result of the Tier 1 effort was the selection and adoption of the Cross Valley Canal alignment as the preferred alternative which led to the preservation and future acquisition of sufficient right-of-way to meet long-term future transportation needs, such as mixed-use travel lanes, truck route, high occupancy vehicle (HOV) lanes, rapid transit and light rail.

The 2007 *Tier 2 Westside Parkway Environmental Assessment/Final Environmental Impact Report* was prepared to evaluate the construction-level impacts of the first transportation project identified along the Tier 1 Cross Valley Canal alignment preferred alternative. Except for adjustments at the east end, the alignment of Westside Parkway is nearly identical to the eastern segment of the Cross Valley Canal alignment. Westside Parkway extends west from Truxtun Avenue near Mohawk Street to Stockdale Highway at Heath Road. Westside Parkway builds upon the previously

identified Tier 1 alignment by providing a major link toward improving route continuity for State Route 58.

The construction of Centennial Corridor would provide the next logical step that is needed to implement the on-going plan for improving route continuity and connectivity for State Route 58. The connection from State Route 58 (east) to Westside Parkway using the Centennial Corridor Segment 1 proposed build alternatives A, B or C would move east–west regional and inter-regional motor vehicle and truck traffic through Bakersfield to Interstate 5 more efficiently than currently experienced.

All of the above background leads to this traffic study report to evaluate the performance of the build alternatives and the transportation system management/transit alternative from a traffic accommodation perspective.

CHAPTER 2. EXISTING CONDITIONS

2.1 Land Use and Demographic Conditions

The city of Bakersfield, located at the southern "horseshoe" end of San Joaquin Valley in Kern County, has the ninth highest population in the state of California. The city has an arid climate with hot, dry summers and brief, moderate winters. The southern tip of the Sierra Nevada is just to the east and the city limits extend to the Sequoia National Forest at the base of the Greenhorn Mountain Range and at the entrance to Kern Canyon. The Tehachapi Mountains are south of Bakersfield and the Temblor Range is to the west. The city is located midway between Fresno in the north and Los Angeles in the south, with a total area of approximately 143.6 square miles[1]. Being one of the fastest growing cities in the country, Bakersfield ranks third in agriculture-related production and generates more than 75 percent of the state's oil supply[2]. The city's economy also relies on petroleum extraction and refining, and manufacturing.

Over the past 20 years, Bakersfield has undergone significant growth in both population and housing units. Figure 2-1 illustrates the growth in the area between years 1990 and 2010. According to the United States Federal Census, the population of Bakersfield was estimated to be nearly 347,483 and the population of the entire metropolitan Bakersfield area well over 500,000. It is also estimated that there are more than 120,725 housing units throughout the city, of which 92.1 percent were occupied. The population density is 2,419 persons per square mile[3]. Figure 2-2 represents 2010 housing units by census block in the study area.

A majority of Bakersfield residents, 34.8 percent, were under 18 years of age, 7.4 percent were 18 to 24 years old, 28.0 percent were 25 to 44 years old, 21.3 percent were 45 to 64 years old, and 8.5 percent were 65 years of age and over. The median age was estimated to be 30.0 years. Year 2010 U.S. Census shows that 45.5 percent of the Bakersfield population is designated as Hispanic. Overall, 56.8 percent declared a status of white, 8.2 percent black, and 6.2 percent Asian. The 2010 median annual household income in Bakersfield was estimated to be $53,083. This can be compared to the Kern County median household income of $47,368, the California median income of $58,938 and the U.S. median income of $50,221. In August 2011, the Bureau of Labor Statistics reported that Bakersfield–Delano had an unemployment rate of 14.4 percent, which was higher than the state of California's unemployment rate of 12.1 percent, and the national rate of 9.1 percent[4].

Figure 2-3 presents the population density by census block and race within the portion of metropolitan Bakersfield addressed by this traffic study. Areas of high population density are generally located south of the Kern River on either side of State Route 99, State Route 58, State Route 178, and along major arterials such as Stockdale Highway, Ming Avenue, Chester Avenue and Union Avenue. On the north side of the Kern River, the population density is significantly lower. Areas with high population north of the river are scattered along Hageman Road and Rosedale Highway generally between Allen Road and Fruitvale Avenue. A small number of residents reside in the areas farther west, near Interstate 5.

[1] State of California Department of Finance, Demographic Research Unit.
[2] Ranking and oil supply statistics are based on the City of Bakersfield's official website.
[3] http://www.bakersfieldcity.us/edcd/about_new.htm
[4] http://www.bakersfieldcity.us/edcd/demographics.html

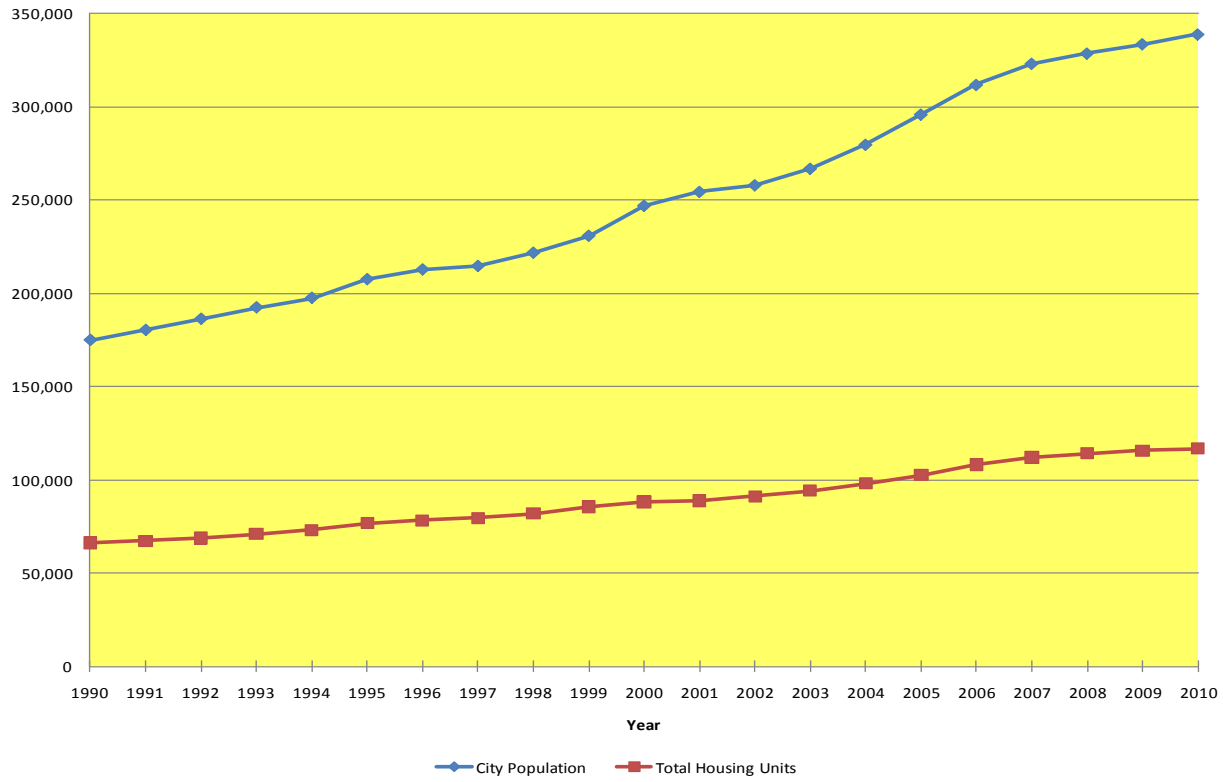


Figure 2-1: City of Bakersfield Population and Housing between 1990 and 2010

Employment

The 2010 Census data indicates that in Bakersfield, approximately 102,000 residents were employed civilians who are 16 years of age and over. As shown in Table 2-1, the majority of the employed labor force is in the educational, health, and social services industry (23.4 percent). The second largest industry is retail trade, representing approximately 12.3 percent of total employed civilians. Other industry groups in the area include professional scientific, management, administrative, and waste management services (9.2 percent); agriculture, forestry, fishing, hunting and mining (9.5 percent); art, entertainment, recreation, accommodation, and food services (8.5 percent); public administration (6.2 percent); construction (5.0 percent); finance, insurance, real estate, rental and leasing (5.4 percent); manufacturing (5.1 percent); transportation, warehousing and utilities (5.1 percent); wholesale trade (3.8 percent); other services (5.0 percent); and information (1.5 percent). The estimated 2006 employment distribution within the study area is illustrated in Figure 2-4, based on data provided by the California Employment Development Department. It is assumed that the overall 2010 employment distribution has changed relatively little within the past five years. As is shown in the figure, on the south side of the Kern River, areas along Chester Avenue north of California Avenue (downtown area), Stockdale Highway west of State Route 99, Truxtun Avenue and State Route 99 have high concentrations of employment. On the north side of the river, areas with high employment are located on either side of State Route 99 as well as along Rosedale Highway between Calloway Drive and Fruitvale Avenue.

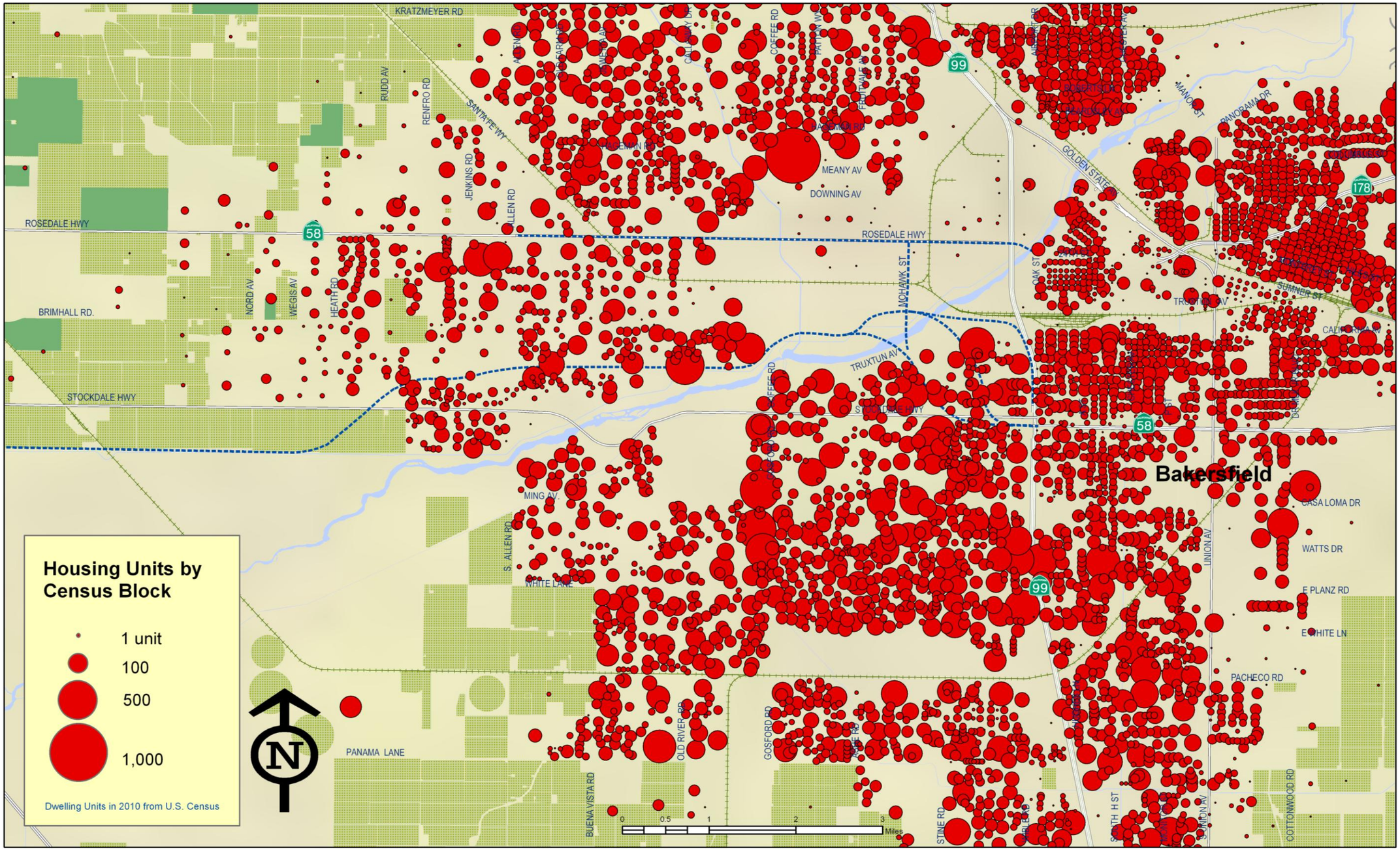


Figure 2-2: Bakersfield 2010 Housing Units by Census Block

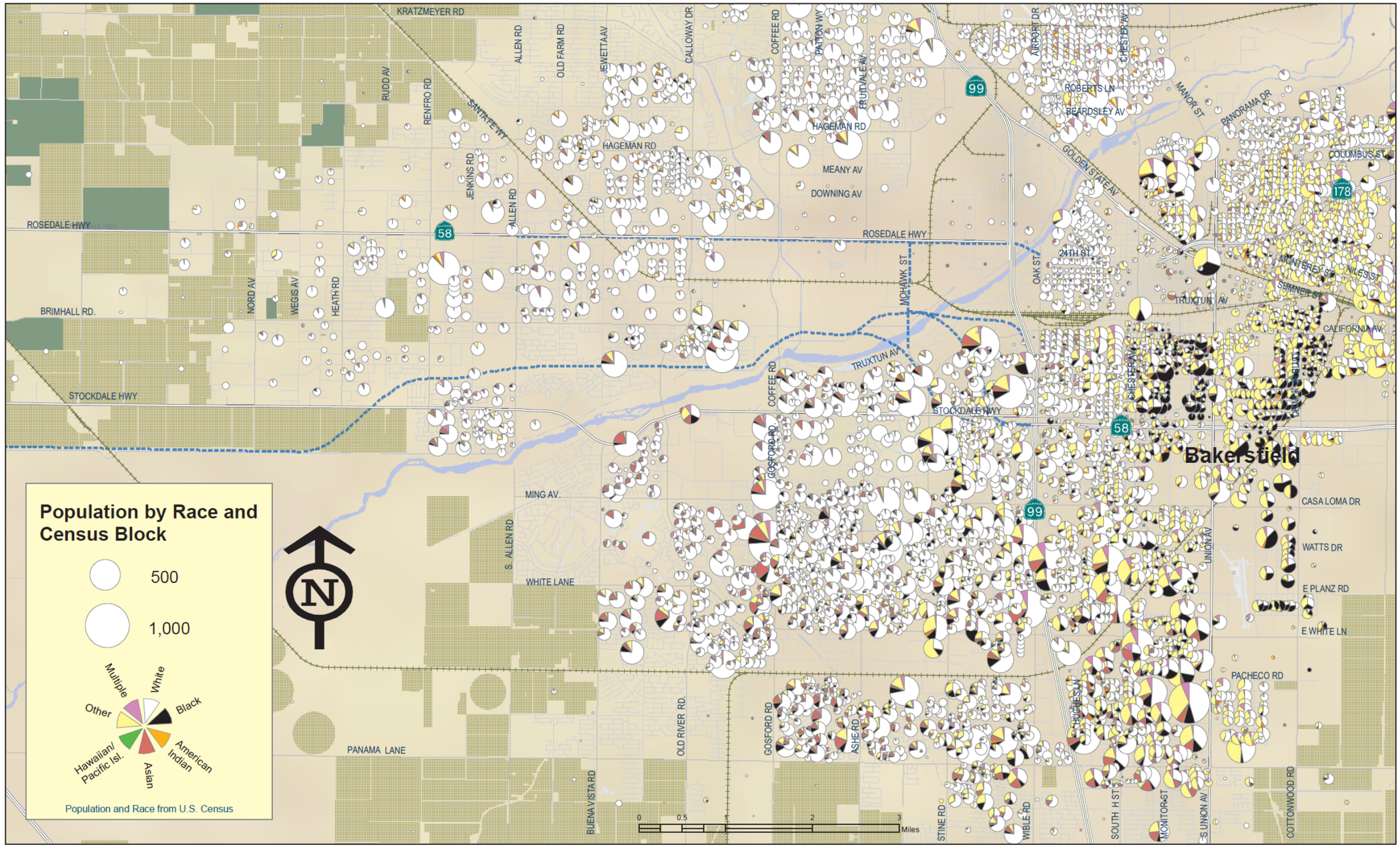


Figure 2-3: Centennial Corridor Study Area 2010 Population Density by Census Block and Race (2010 Census Data)

Table 2-1. Census 2010 Employed Civilian Population *(16 years of age and over)*

INDUSTRY	EMPLOYED CIVILIANS	PERCENTAGE
Educational, health, and social services	32,722	23.4%
Retail trade	17,226	12.3%
Professional, scientific, management, administrative, and waste management services	12,794	9.2%
Agriculture, forestry, fishing and hunting, and mining	13,204	9.5%
Arts, entertainment, recreation, accommodation, and food services	11,853	8.5%
Public Administration	8,711	6.2%
Construction	7,003	5.0%
Finance, insurance, real estate, and rental leasing	7,525	5.4%
Manufacturing	7,071	5.1%
Transportation and warehousing, and utilities	7,129	5.1%
Wholesale trade	5,370	3.8%
Other services	7,005	5.0%
Information	2,097	1.5%
Total	**139,710**	**100.0%**

Land Use

The proposed Centennial Corridor, which extends from east of State Route 99 to Interstate 5, covers an approximate distance of 20 miles and consists of three segments: the Eastern segment from the existing State Route 58 near Cottonwood Road to Mohawk Street; Westside Parkway from Mohawk Street to Heath Road; and the Western segment from Heath Road to Interstate 5.

Based on the 2002 Metropolitan Bakersfield General Plan, existing land use surrounding the three segments of the corridor was generalized by eight land use categories. These eight land use categories include residential, commercial, industrial, recreation, agriculture, resource/utility, undeveloped/vacant, and government uses. Future land use for this area was also determined to follow the existing development patterns according to the 2002 Metropolitan Bakersfield General Plan and the 2007 Kern County General Plan. Figure 2-5 provides the type and distribution of land uses within Bakersfield and unincorporated Kern County in the vicinity of the Centennial Corridor.

The eastern segment of the corridor is located between downtown Bakersfield and the Kern River, and is generally bounded by Rosedale Highway to the north, Ming Avenue to the south, Cottonwood Avenue to the east, and Mohawk Street to the west. In general, the lands to the west and east of the Kern River within this segment area are designated primarily for industrial and residential uses, respectively. Commercial lands are situated along Truxtun Avenue, Stockdale Highway, California Avenue, State Route 99 and Union Avenue. In addition, industrial land use is also located along the Burlington Northern Santa Fe (BNSF) Railway yard east of the Kern River.

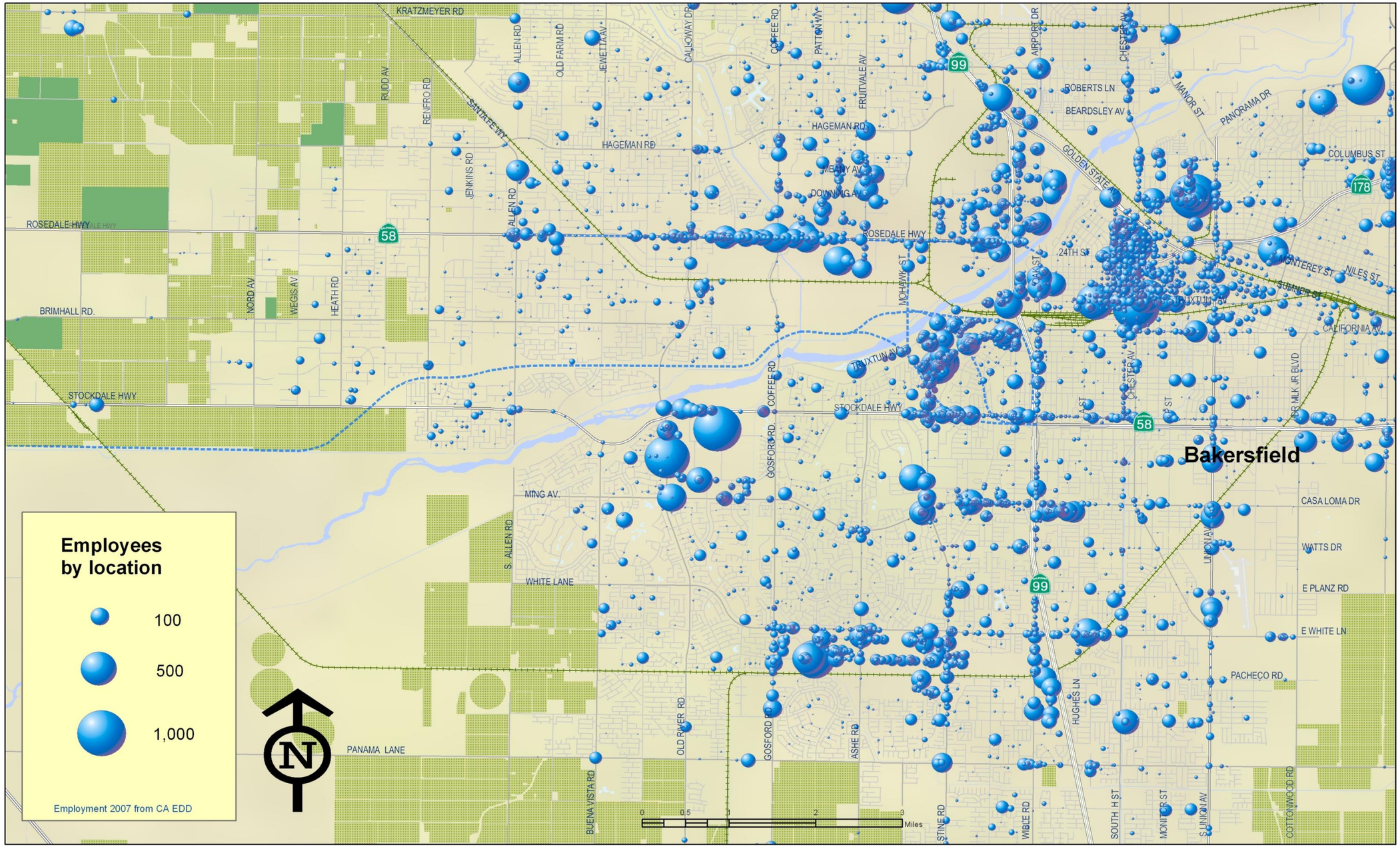


Figure 2-4: Distribution of Centennial Corridor 2006 Employment (2006 California Employment Development Department Data)

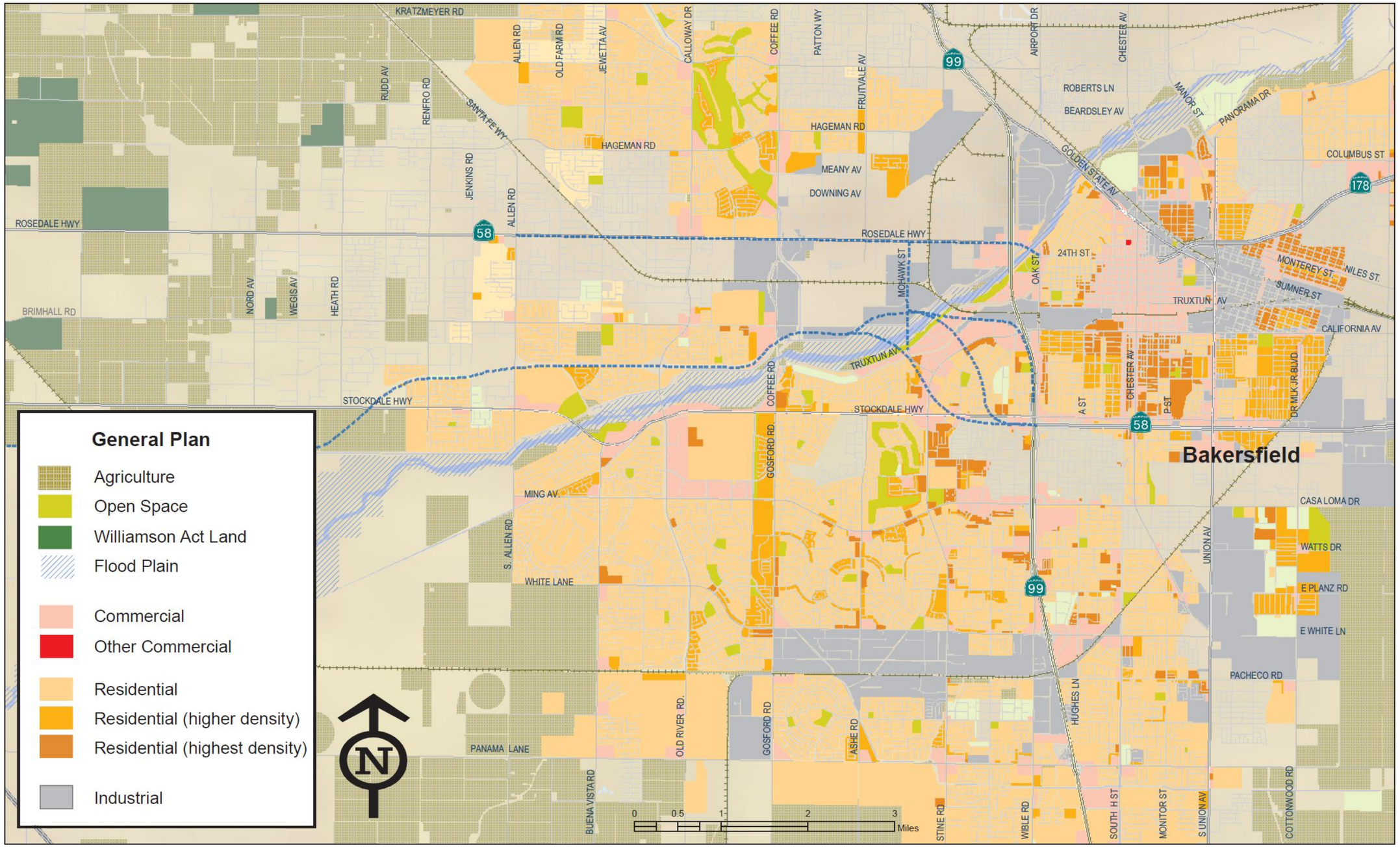


Figure 2-5: Study Area Land Use Type and Distribution along Centennial Corridor

The Bakersfield Municipal Airport, which is situated east of Union Avenue and south of Casa Loma Drive, is surrounded solely by industrial lands. On the east and west sides of the airport, the lands are largely designated as agricultural and residential uses, respectively. The airport does not serve the general public through commercial airlines, but provides only charter and executive services.

The Westside Parkway segment of the Centennial Corridor is bounded by Rosedale Highway to the north, Ming Avenue to the south, Mohawk Street to the east and Heath Road to the west. Within this segment area, the predominant land use is residential. Industrial land use is located near the BNSF rail tracks near Rosedale Highway north of the Kern River. Toward the west end of this area, agriculture land use is predominant on both the north and south sides of the river.

The western segment of the study corridor is generally bounded by Rosedale Highway to the north, the Kern River to the south, Heath Road to the east and Interstate 5 to the west. This area is primarily comprised of agriculture lands with some residential land use located between Heath Road and Nord Avenue south of Rosedale Highway.

Schools

Figure 2-6 shows library and school locations within the study area. A total of 82 schools are located within the study area of the corridor. Forty-nine of these schools are elementary schools, twelve are junior high schools, eight are high schools, three are special education schools, one is a university (California State University Bakersfield), and nine are alternative education, community and continuation schools.

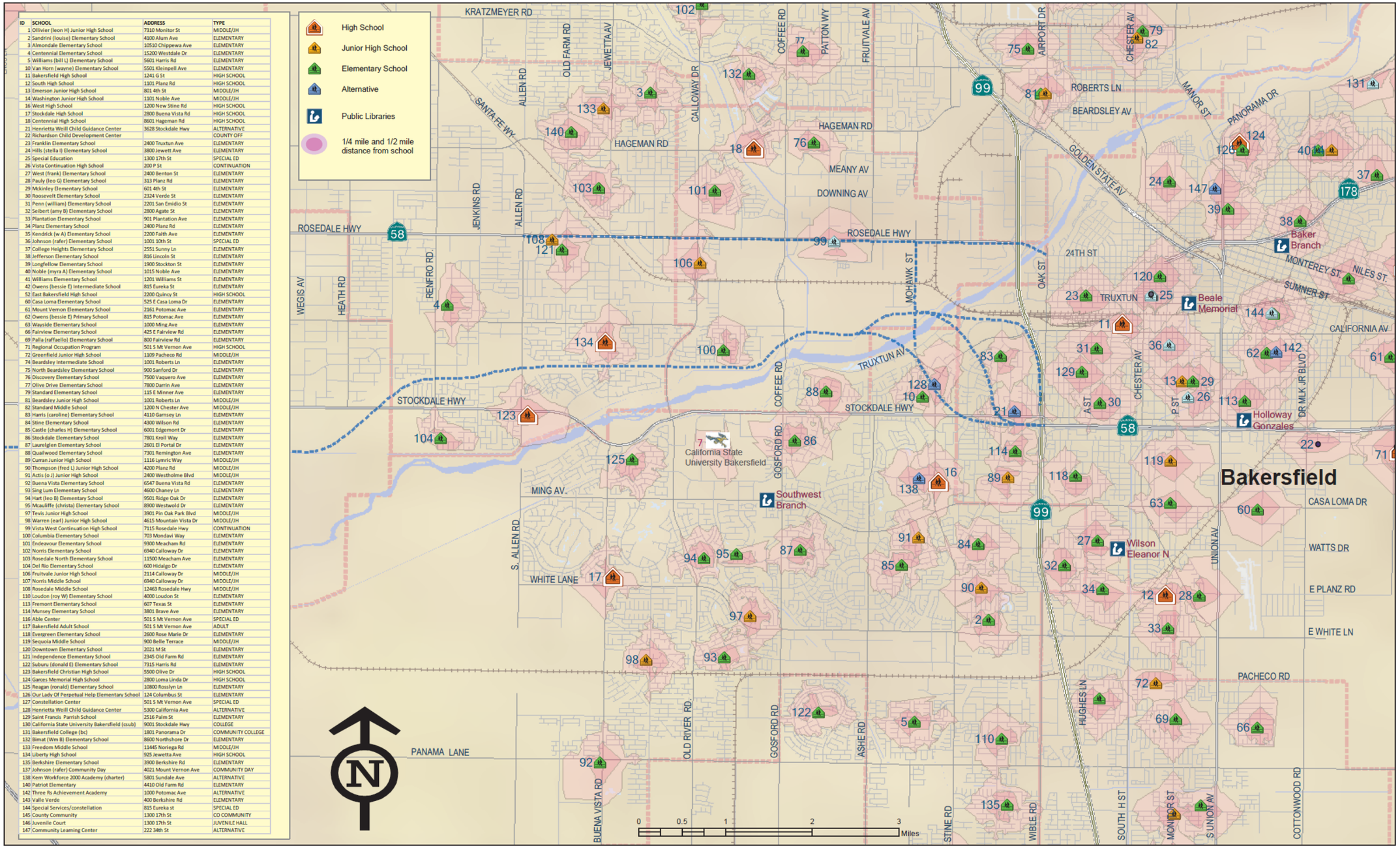
Table 2-2 presents the 2010 Census total school enrollment in the Bakersfield by school type.

The total school enrollment (3 years and over) was 114,196. Of this total enrollment, students between 5 and 14 years of age made up more than one-half of the total students in the area. The next largest group is within the 15 to 17 age group, which made up approximately 16 percent of the total school enrollment. Insofar as school type is concerned, students attending grades 1 through 12 made up close to 70 percent of the total (94.6 percent of whom were enrolled in public schools) while college students made up nearly 24 percent of the total.

Eight libraries serve the areas surrounding the study corridor. Two of the eight libraries, the California State University Bakersfield library and the Southwest Bakersfield library, are located south of Stockdale Highway and west of State Route 99. There are six libraries situated to the east of State Route 99—they are Beale Memorial Library, Baker Street Branch Library, Kern County Law Library, Grace Van Dyke Bird Library, Holloway–Gonzales Library, and Eleanor N. Wilson Branch Library. Of these six, Eleanor N. Wilson Branch Library is located south of State Route 58, whereas the others are located north of State Route 58.

Public Services

The Bakersfield Fire Department and Bakersfield Police Department provide public safety services for the city. As shown in Figure 2-7, 12 city fire stations and six county fire stations are located within the study area. Of these fire stations, Stations #67, #11, #3 and #1 are in close proximity of the Centennial Corridor. Four police stations are located within the study area limits, two of which are located near the study corridor—the Rosedale Substation and Central Receiving Facility.



ID	SCHOOL	ADDRESS	TYPE
1	Ollivier (leon H) Junior High School	7310 Monitor St	MIDDLE/JH
2	Sandrini (louise) Elementary School	4100 Alum Ave	ELEMENTARY
3	Almondale Elementary School	10510 Chippewa Ave	ELEMENTARY
4	Centennial Elementary School	15200 Westdale Dr	ELEMENTARY
5	Williams (bill L) Elementary School	5601 Harris Rd	ELEMENTARY
10	Van Horn (wayne) Elementary School	5501 Kleinpell Ave	ELEMENTARY
11	Bakersfield High School	1241 G St	HIGH SCHOOL
12	South High School	1101 Planz Rd	HIGH SCHOOL
13	Emerson Junior High School	801 4th St	MIDDLE/JH
14	Washington Junior High School	1101 Noble Ave	MIDDLE/JH
16	West High School	1200 New Stine Rd	HIGH SCHOOL
17	Stockdale High School	2800 Buena Vista Rd	HIGH SCHOOL
18	Centennial High School	8601 Hageman Rd	HIGH SCHOOL
21	Henrietta Weill Child Guidance Center	3628 Stockdale Hwy	ALTERNATIVE
22	Richardson Child Development Center		COUNTY OFF
23	Franklin Elementary School	2400 Truxtun Ave	ELEMENTARY
24	Hills (stella I) Elementary School	3800 Jewett Ave	ELEMENTARY
25	Special Education	1300 17th St	SPECIAL ED
26	Vista Continuation High School	200 P St	CONTINUATION
27	West (frank) Elementary School	2400 Benton St	ELEMENTARY
28	Pauly (leo G) Elementary School	313 Planz Rd	ELEMENTARY
29	Mckinley Elementary School	601 4th St	ELEMENTARY
30	Roosevelt Elementary School	2324 Verde St	ELEMENTARY
31	Penn (william) Elementary School	2201 San Emidio St	ELEMENTARY
32	Seibert (amy B) Elementary School	2800 Agate St	ELEMENTARY
33	Plantation Elementary School	901 Plantation Ave	ELEMENTARY
34	Planz Elementary School	2400 Planz Rd	ELEMENTARY
35	Kendrick (w A) Elementary School	2200 Faith Ave	ELEMENTARY
36	Johnson (rafer) Elementary School	1001 10th St	SPECIAL ED
37	College Heights Elementary School	2551 Sunny Ln	ELEMENTARY
38	Jefferson Elementary School	816 Lincoln St	ELEMENTARY
39	Longfellow Elementary School	1900 Stockton St	ELEMENTARY
40	Noble (myra A) Elementary School	1015 Noble Ave	ELEMENTARY
41	Williams Elementary School	1201 Williams St	ELEMENTARY
42	Owens (bessie E) Intermediate School	815 Eureka St	ELEMENTARY
52	East Bakersfield High School	2200 Quincy St	HIGH SCHOOL
60	Casa Loma Elementary School	525 E Casa Loma Dr	ELEMENTARY
61	Mount Vernon Elementary School	2161 Potomac Ave	ELEMENTARY
62	Owens (bessie E) Primary School	815 Potomac Ave	ELEMENTARY
63	Wayside Elementary School	1000 Ming Ave	ELEMENTARY
66	Fairview Elementary School	425 E Fairview Rd	ELEMENTARY
69	Palla (raffaello) Elementary School	800 Fairview Rd	ELEMENTARY
71	Regional Occupation Program	501 S Mt Vernon Ave	HIGH SCHOOL
72	Greenfield Junior High School	1109 Pacheco Rd	MIDDLE/JH
74	Beardsley Intermediate School	1001 Roberts Ln	ELEMENTARY
75	North Beardsley Elementary School	900 Sanford Dr	ELEMENTARY
76	Discovery Elementary School	7500 Vaquero Ave	ELEMENTARY
77	Olive Drive Elementary School	7800 Darrin Ave	ELEMENTARY
79	Standard Elementary School	115 E Minner Ave	ELEMENTARY
81	Beardsley Junior High School	1001 Roberts Ln	MIDDLE/JH
82	Standard Middle School	1200 N Chester Ave	MIDDLE/JH
83	Harris (caroline) Elementary School	4110 Garnsey Ln	ELEMENTARY
84	Stine Elementary School	4300 Wilson Rd	ELEMENTARY
85	Castle (charles H) Elementary School	6001 Edgemont Dr	ELEMENTARY
86	Stockdale Elementary School	7801 Kroll Way	ELEMENTARY
87	Laurelglen Elementary School	2601 El Portal Dr	ELEMENTARY
88	Quailwood Elementary School	7301 Remington Ave	ELEMENTARY
89	Curran Junior High School	1116 Lymric Way	MIDDLE/JH
90	Thompson (fred L) Junior High School	4200 Planz Rd	MIDDLE/JH
91	Actis (o J) Junior High School	2400 Westholme Blvd	MIDDLE/JH
92	Buena Vista Elementary School	6547 Buena Vista Rd	ELEMENTARY
93	Sing Lum Elementary School	4600 Chaney Ln	ELEMENTARY
94	Hart (leo B) Elementary School	9501 Ridge Oak Dr	ELEMENTARY
95	Mcauliffe (christa) Elementary School	8900 Westwold Dr	ELEMENTARY
97	Tevis Junior High School	3901 Pin Oak Park Blvd	MIDDLE/JH
98	Warren (earl) Junior High School	4615 Mountain Vista Dr	MIDDLE/JH
99	Vista West Continuation High School	7115 Rosedale Hwy	CONTINUATION
100	Columbia Elementary School	703 Mondavi Way	ELEMENTARY
101	Endeavour Elementary School	9300 Meacham Rd	ELEMENTARY
102	Norris Elementary School	6940 Calloway Dr	ELEMENTARY
103	Rosedale North Elementary School	11500 Meacham Ave	ELEMENTARY
104	Del Rio Elementary School	600 Hidalgo Dr	ELEMENTARY
106	Fruitvale Junior High School	2114 Calloway Dr	MIDDLE/JH
107	Norris Middle School	6940 Calloway Dr	MIDDLE/JH
108	Rosedale Middle School	12463 Rosedale Hwy	MIDDLE/JH
110	Loudon (roy W) Elementary School	4000 Loudon St	ELEMENTARY
113	Fremont Elementary School	607 Texas St	ELEMENTARY
114	Munsey Elementary School	3801 Brave Ave	ELEMENTARY
116	Able Center	501 S Mt Vernon Ave	SPECIAL ED
117	Bakersfield Adult School	501 S Mt Vernon Ave	ADULT
118	Evergreen Elementary School	2600 Rose Marie Dr	ELEMENTARY
119	Sequoia Middle School	900 Belle Terrace	MIDDLE/JH
120	Downtown Elementary School	2021 M St	ELEMENTARY
121	Independence Elementary School	2345 Old Farm Rd	ELEMENTARY
122	Suburu (donald E) Elementary School	7315 Harris Rd	ELEMENTARY
123	Bakersfield Christian High School	5500 Olive Dr	HIGH SCHOOL
124	Garces Memorial High School	2800 Loma Linda Dr	HIGH SCHOOL
125	Reagan (ronald) Elementary School	10800 Rosslyn Ln	ELEMENTARY
126	Our Lady Of Perpetual Help Elementary School	124 Columbus St	ELEMENTARY
127	Constellation Center	501 S Mt Vernon Ave	SPECIAL ED
128	Henrietta Weill Child Guidance Center	5300 California Ave	ALTERNATIVE
129	Saint Francis Parrish School	2516 Palm St	ELEMENTARY
130	California State University Bakersfield (csub)	9001 Stockdale Hwy	COLLEGE
131	Bakersfield College (bc)	1801 Panorama Dr	COMMUNITY COLLEGE
132	Bimat (Wm B) Elementary School	8600 Northshore Dr	ELEMENTARY
133	Freedom Middle School	11445 Noriega Rd	MIDDLE/JH
134	Liberty High School	925 Jewetta Ave	HIGH SCHOOL
135	Berkshire Elementary School	3900 Berkshire Rd	ELEMENTARY
137	Johnson (rafer) Community Day	4021 Mount Vernon Ave	COMMUNITY DAY
138	Kern Workforce 2000 Academy (charter)	5801 Sundale Ave	ALTERNATIVE
140	Patriot Elementary	4410 Old Farm Rd	ELEMENTARY
142	Three Rs Achievement Academy	1000 Potomac Ave	ALTERNATIVE
143	Valle Verde	400 Berkshire Rd	ELEMENTARY
144	Special Services/constellation	815 Eureka st	SPECIAL ED
145	County Community	1300 17th St	CO COMMUNITY
146	Juvenile Court	1300 17th St	JUVENILE HALL
147	Community Learning Center	222 34th St	ALTERNATIVE

Figure 2-6: Locations of Libraries and Schools in the Centennial Corridor Study Area

Table 2-2. Census 2010 Total School Enrollment by Type *(3 years of age and over)*

TYPE OF SCHOOL	NUMBER OF STUDENTS	PERCENTAGE
Nursery School, Preschool	6,228	5.5%
Kindergarten	4,989	4.4%
Elementary, Grade 1 to 4	23,763	20.1%
Elementary, Grade 5 to 8	25,753	22.6%
High School, Grade 9 to 12	26,705	23.4%
College, Undergraduate	22,903	20.1%
Graduate, Professional School	3,855	3.4%
Total	**114,196**	**100.0%**

Eight hospitals can be found within the study area. The Mercy Southwest Hospital is located near Stockdale Highway while the HealthSouth Bakersfield Rehabilitation Hospital and Mercy Hospital of Bakersfield are both located near Truxtun Avenue. The remaining five hospitals are situated east of State Route 99 and north of Truxtun Avenue.

Shopping Centers

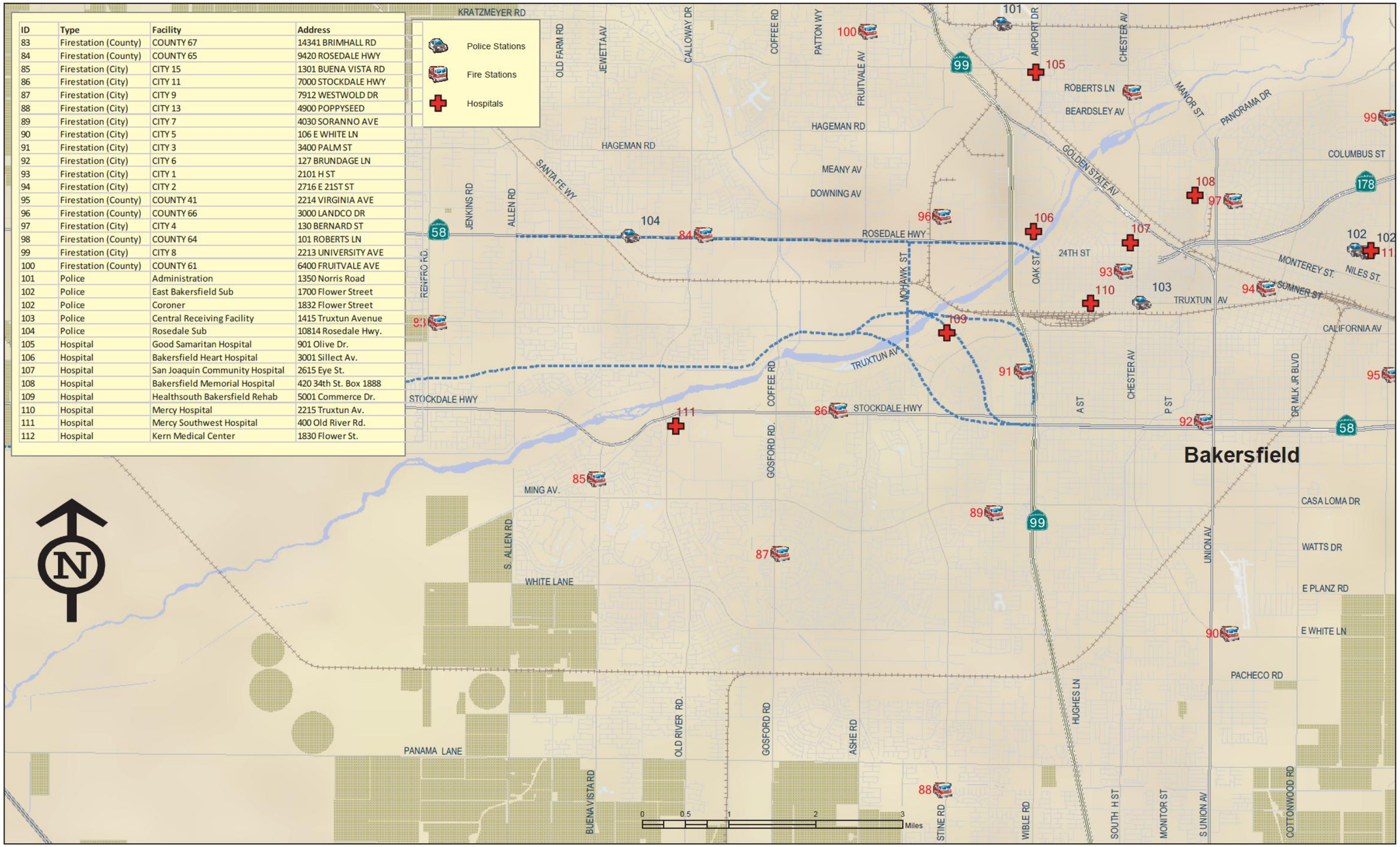
Various shopping centers are located throughout metropolitan Bakersfield. The Valley Plaza is located immediately to the east of State Route 99 south of Ming Avenue. The Stockdale Village Shopping Center is situated north of Stockdale Highway at California Avenue. In addition, two shopping centers are located along Ming Avenue west of State Route 99: the Builders Square Shopping Center at Stine Road and the Marketplace Shopping Center near the California State University of Bakersfield.

Recreational Facilities

Bakersfield currently has 55 parks located throughout the city, some of which are the Park at River Walk and Centennial Park near Stockdale Highway, Jastro Park and Central Park near Truxtun Avenue, and Saunders Park and Beach Park in the State Route 99 and State Route 58 areas. See Figure 2-8 for the locations of the parks and recreational facilities in the project study area.

The Rabobank Arena (formerly known as Centennial Garden) is home to Bakersfield's ECHL ice hockey team and California State University, Bakersfield Men's NCAA Division I basketball. Attached to the arena is a 3,000 seat theater and an approximately 18,000 square foot exhibit hall, which is presently known as the Rabobank Theater and Convention Center. The arena is located on Truxtun Avenue within the study limits.

Several other recreational facilities can also be found within the project area. Stockdale Country Club, Kern City Golf Course, and Seven Oaks Country Club are located between Stockdale Highway and White Lane on the west side of State Route 99. Bakersfield Country Club and Valle Grande Public Golf Course are located to the east of State Route 99. The Dr. Martin Luther King Jr. Community Center is also located within the study area. The facilities include meeting rooms, a kitchen, picnic areas and a gymnasium, which are available for public rental via reservation. The Saunders Recreation Facility, located at 3300 Palm Street in the project area, is a covered and lighted indoor/outdoor multi-use facility with a manufactured sports floor which can be utilized for roller hockey, basketball and indoor soccer. The facility is available for league sports as well as for rental purposes.



ID	Type	Facility	Address
83	Firestation (County)	COUNTY 67	14341 BRIMHALL RD
84	Firestation (County)	COUNTY 65	9420 ROSEDALE HWY
85	Firestation (City)	CITY 15	1301 BUENA VISTA RD
86	Firestation (City)	CITY 11	7000 STOCKDALE HWY
87	Firestation (City)	CITY 9	7912 WESTWOLD DR
88	Firestation (City)	CITY 13	4900 POPPYSEED
89	Firestation (City)	CITY 7	4030 SORANNO AVE
90	Firestation (City)	CITY 5	106 E WHITE LN
91	Firestation (City)	CITY 3	3400 PALM ST
92	Firestation (City)	CITY 6	127 BRUNDAGE LN
93	Firestation (City)	CITY 1	2101 H ST
94	Firestation (City)	CITY 2	2716 E 21ST ST
95	Firestation (County)	COUNTY 41	2214 VIRGINIA AVE
96	Firestation (County)	COUNTY 66	3000 LANDCO DR
97	Firestation (City)	CITY 4	130 BERNARD ST
98	Firestation (County)	COUNTY 64	101 ROBERTS LN
99	Firestation (City)	CITY 8	2213 UNIVERSITY AVE
100	Firestation (County)	COUNTY 61	6400 FRUITVALE AVE
101	Police	Administration	1350 Norris Road
102	Police	East Bakersfield Sub	1700 Flower Street
102	Police	Coroner	1832 Flower Street
103	Police	Central Receiving Facility	1415 Truxtun Avenue
104	Police	Rosedale Sub	10814 Rosedale Hwy.
105	Hospital	Good Samaritan Hospital	901 Olive Dr.
106	Hospital	Bakersfield Heart Hospital	3001 Sillect Av.
107	Hospital	San Joaquin Community Hospital	2615 Eye St.
108	Hospital	Bakersfield Memorial Hospital	420 34th St. Box 1888
109	Hospital	Healthsouth Bakersfield Rehab	5001 Commerce Dr.
110	Hospital	Mercy Hospital	2215 Truxtun Av.
111	Hospital	Mercy Southwest Hospital	400 Old River Rd.
112	Hospital	Kern Medical Center	1830 Flower St.

Figure 2-7: Locations of Fire and Police Stations in the Centennial Corridor Study Area

Figure 2-8: Locations of Parks and Recreational Facilities in the Centennial Corridor Study Area

The Bakersfield Ice Sports Center is another recreational facility which is located within the study limits. The center provides leagues for both youth and adult hockey as well as ice skating lessons, rental facilities, a pro shop and a snack bar. Adjacent to the ice sports center is the McMurtrey Aquatic Center, which is a state-of-the-art swimming, diving and recreational facility. The center contains a large recreational pool as well as a heated, Olympic-sized competition pool. The facility hosts various local high school swim meets and is also used for recreational swimming.

Journey to Work

Employment data included in the 2010 Census showed the means of transportation for workers 16 years and over in the Bakersfield metropolitan statistical area. Approximately 135,000 workers travelled in various transportation modes. The majority of the workers (93.1 percent) commuted by cars, trucks or vans (79.8 percent alone, 13.3 percent in carpools), 1.2 percent used public transportation, 3.5 percent worked at home, and 1.2 percent walked to work, while the rest (1.1 percent) travelled by motorcycle, bicycle, or other means. The mean travel time to work for all 97,100 workers who did not work at home was approximately 22.6 minutes.

2.2 Roadway Facilities

The juxtaposition of regional roadway and local arterial streets within the focused study area are illustrated on Figure 2-9. Their characteristics are described below.

Regional Roadway Network

State Route 99

State Route 99 is a north–south highway spanning nearly the entire length of the Central Valley. Between its northern terminus at State Route 36 near Red Bluff and its southern terminus at Interstate 5 near Wheeler Ridge, State Route 99 is considered an alternate route to the Interstate 5 corridor. This freeway passes through the cities of Bakersfield, Fresno, Merced, Modesto, Stockton, Sacramento and Ceres.

Within Bakersfield, State Route 99 has junctions with Panama Lane, White Lane, Ming Avenue, State Route 58 east, Stockdale Highway, California Avenue, State Route 58 west/Rosedale Highway, Buck Owens Boulevard, and Airport Drive/Golden State Avenue. In the study area, State Route 99 has four lanes in each direction with hard shoulders on the sides of the roadway. In addition, there are shoulders in the center of the route in each direction that are separated by a concrete barrier. The posted speed limit is 65 miles per hour (mph).

State Route 58

State Route 58 generally travels in the east–west direction for approximately 240 miles across California and is currently one of the most significant routes going through Bakersfield. West of Bakersfield, the route is called the Blue Star Memorial Highway and runs for roughly 100 miles until terminating at Highway 101, near Santa Margarita, California. East of Bakersfield, the route is called the Barstow–Bakersfield Highway for about 140 miles until terminating at Interstate 15 near Barstow, California.

Within this study area, State Route 58 is made up of four principal sections, as illustrated on Figure 2-10 and in the following text.

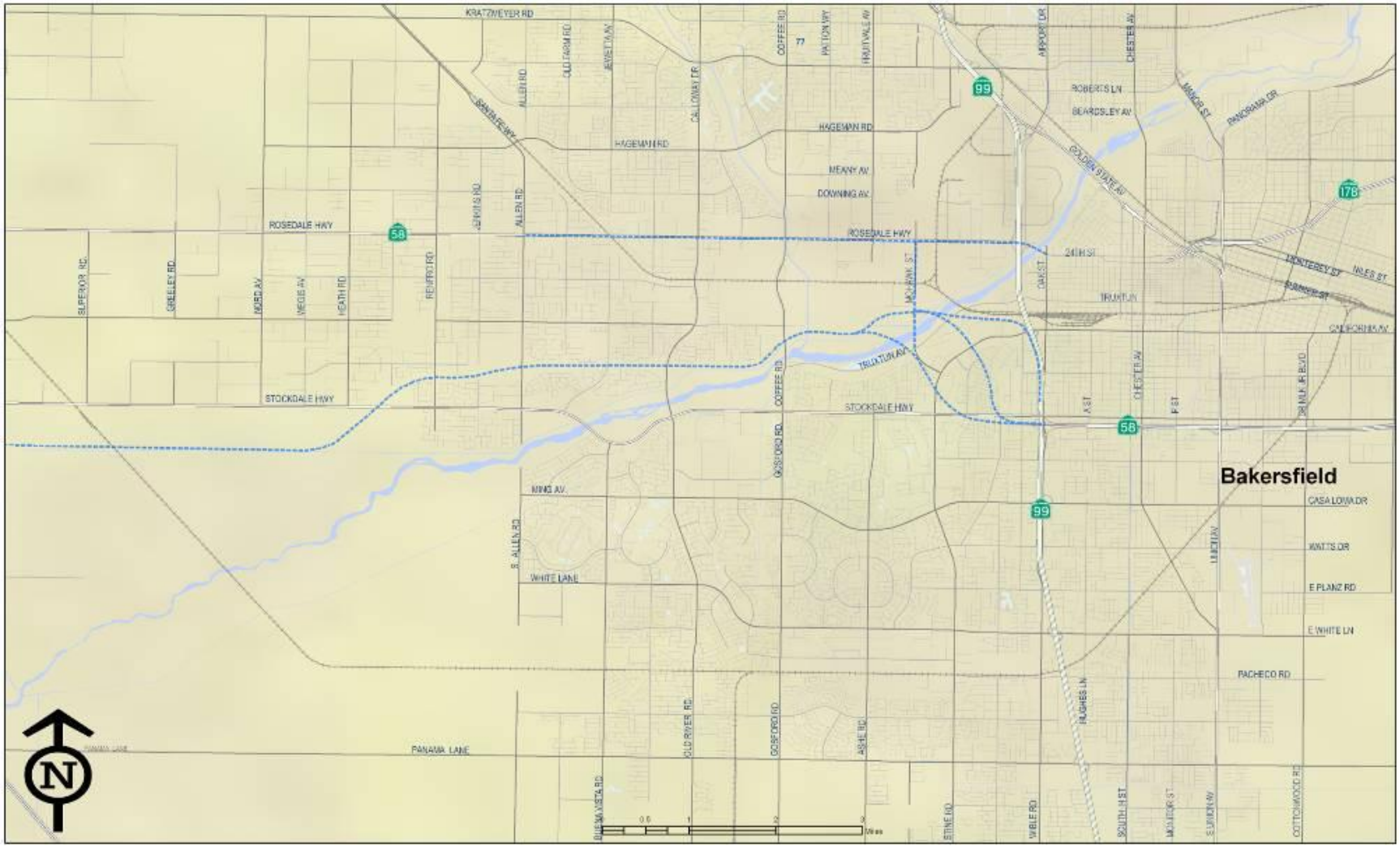


Figure 2-9: Study Area Roadway Network

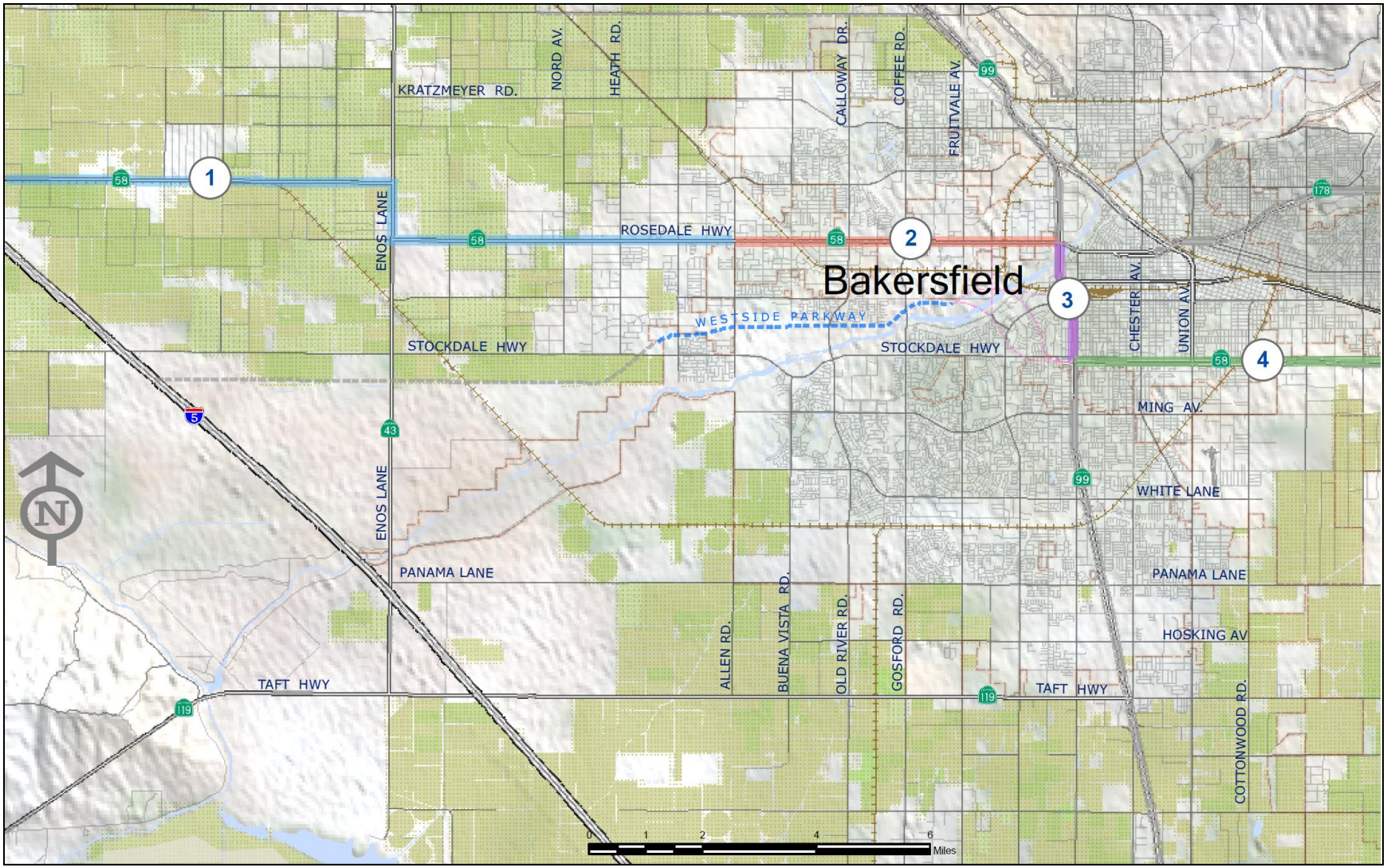


Figure 2-10: Principal Sections of State Route 58 in the Centennial Corridor Vicinity

INTERSTATE 5 TO ALLEN ROAD

Starting at Interstate 5, State Route 58 is currently a conventional highway, locally identified as the Rosedale Highway. Between Interstate 5 and Allen Road, the corridor is a two-lane facility surrounded by agricultural land with some recently developed residential areas. The alignment of State Route 58 through central Bakersfield is illustrated on Figure 2-11.

The alignment of State Route 58 is offset by approximately one mile where the roadway jogs, and is co-located with State Route 43. The intersections of State Route 43 with State Route 58 north and State Route 58 south are stop sign controlled. Speed limits are posted at 55 mph.

ROSEDALE HIGHWAY OR BLUE STAR MEMORIAL HIGHWAY

This section of State Route 58/Rosedale Highway is principally a business route with two lanes in each direction and outside turn pocket lanes at street intersections. The highway typically includes a slightly raised, non-landscaped median varying up to about 20 feet wide. No posted speed limits could be found, except in 25 mph school zones, but traffic generally travels at about 45 to 55 mph. Although there are very few residential areas directly along this highway, this section services the communities of Rosedale, Greenacres and Fruitvale, which surround the highway.

The first two miles of Rosedale Highway east of Allen Road is a mix of undeveloped land, old homes and businesses, and a trailer park. Just east of Allen Road is a 25 mph zone for Rosedale Middle School; and just past this school is Rosedale Park. Continuing east, the highway elevates over the BNSF Railway and then returns to its previous ground level. Past the railroad and as the route approaches Calloway Drive, there are some small businesses and shopping areas. For about a mile on the north side of the highway, between Calloway Drive and Coffee Road, exists a large restaurant and shopping center made up of newer “big box” retailers called the Northwest Promenade. The south side has a few smaller businesses, auto shops and gas stations, but the majority of the land is open for overhead power line towers and petroleum storage reservoirs. Just east of Coffee Road, the highway crosses over both the Friant–Kern Canal and then the Calloway Canal. The posted speed limit is reduced to 25 mph for the Vista West High School located to the south. Farther east, the highway crosses over Calloway Canal again as the canal turns back north near Fruitvale Avenue. Just east of this, the highway crosses over Emery Ditch and still farther east, is another railroad crossing. For the two and one-half miles between Coffee Road and the interchange with State Route 99, the highway services a few businesses and restaurants, but is mostly undeveloped or adjoined by light industrial land uses with some auto shops, storage facilities and warehouses. East of the railroad crossing, around Gibson Street, the speed limit is 40 mph. As the highway passes under State Route 99, it opens up to three lanes and will have additional single or double turn lanes as needed. The area surrounding this interchange is made up of numerous large restaurant and hotel chains. It also services the Bakersfield Heart Hospital located northeast of the interchange.

CO-ROUTE WITH STATE ROUTE 99

State Route 99 is an extensive north–south route in the middle of California servicing more than 400 miles of the state. It extends north past Sacramento and terminates at its junction with Interstate 5, about 20 miles south of Bakersfield. At the north end of Bakersfield, it provides freeway access to the Meadows Field Kern County Airport. Farther south, it has a large interchange with State Route 204 and Airport Drive.

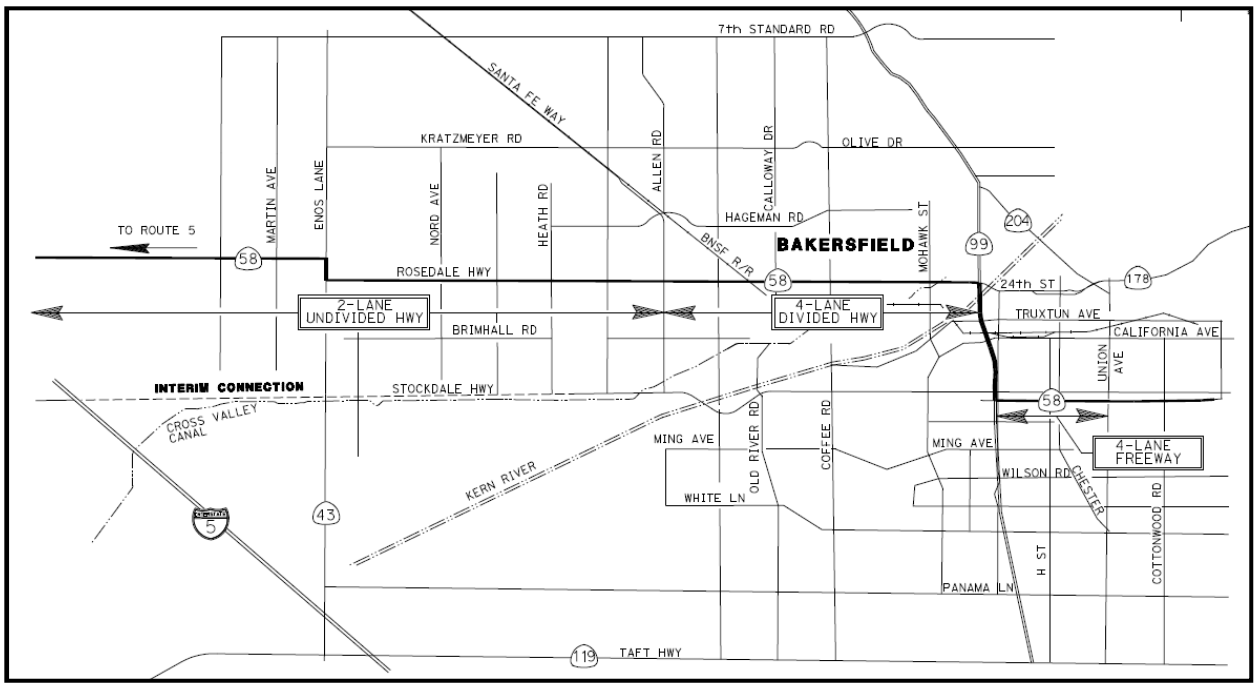


Figure 2-11: Existing State Route 58

Within the study area, east and west travel directions of State Route 58 have ramps that directly access southbound lanes of State Route 99. The two state routes combine and continue in the north–south direction for two miles until an interchange immediately south of Brundage Lane where both the routes diverge again. This portion of the freeway currently requires some maintenance, as the pavement condition is substandard. It consists of four lanes with shoulders in each direction, separated by a concrete barrier with a posted speed limit of 65 mph (55 mph for trucks or haulers). Exit numbers descend in the south direction. State Route 99 Exit 26 will connect travelers to 24th Street/State Route 178. Exit 25 connects to the Civic Center and California Avenue. Exit 24 accesses Stockdale Highway or Brundage Lane and the section where State Route 58 diverges east from State Route 99. One mile south is the final exit in the study area, Exit 23 for Ming Avenue.

STATE ROUTE 58 EAST OR BARSTOW–BAKERSFIELD HIGHWAY

East of Bakersfield, State Route 58 is also called the Barstow–Bakersfield Highway and continues east for about 140 miles until its junction with Interstate 15 near Barstow, California. Traveling south on State Route 99, the access ramp for State Route 58 east elevates high as an overpass above Stockdale Highway, State Route 99, State Route 58 and Wible Road, before descending back down to access eastbound lanes of State Route 58. Traveling west on State Route 58, an exit ramp connects to the State Route 99 northbound lanes as an underpass below Brundage Lane and Oak Street. The pavement in this section of State Route 58 is also not in excellent condition and requires maintenance. State Route 58 east is a divided highway separated by a metal barrier and a wide median. It consists of two lanes with shoulders in each direction and has a posted speed limit is 65 mph (55 mph for trucks or haulers). There are several residential areas offset from the highway on both sides up to the Union Avenue/State Route 204 exit. Exit numbers ascend in the east direction. Exit 111 provides access to Chester Avenue and downtown Bakersfield. About one-quarter mile west of Exit 114 for Mt. Vernon Avenue, the highway widens to three lanes in each direction and continues with this cross section as the road leaves Bakersfield.

State Route 178

State Route 178 consists of two separated segments. The separation is connected by different local roads and State Route 190 through Death Valley National Park. One of the segments starts at State Route 99 west of downtown Bakersfield, continues as 24th Street and joins Kern Canyon Road in the east. The other segment of State Route 178 starts in the southeasterly part of Death Valley National Park. It joins State Route 127 then branches north from State Route 127 to the California–Nevada state line.

State Route 178 intersects major roads such as State Route 99, Oak Street, F Street, Chester Avenue, Golden State Avenue (State Route 204), Union Avenue, Beale Avenue, Haley Street, and Mount Vernon Avenue.

Interstate 5

Interstate 5 is a major north–south route of the Interstate Highway System. Its southern terminus lies at the United States–Mexico border at the San Ysidro crossing and the route heads north across the length of California before it crosses into Oregon south of the Medford–Ashland metropolitan area.

This highway links the major California cities of San Diego, Los Angeles, Sacramento, and Redding. With the proposed Centennial Corridor, travelers in the Bakersfield area will connect with Interstate 5 at the west end of the corridor.

Major East–West Roadways in Study Area

Truxtun Avenue

Truxtun Avenue begins on the west end of the study area with a T-intersection at Coffee Road and continues northeasterly just south of the Kern River paralleling its meandering alignment until passing under State Route 99. The posted speed limit on the west end is 55 mph, but then reduces to 45 mph for the segment approaching the BNSF Railway grade separated crossing until Oak Street. The majority of the western half is not divided with a barrier, but includes a two-way left-turn lane. There are no bike lanes or on-street parking. Truxtun Avenue from Oak Street toward the east is two lanes in each direction with on-street parking. As the arterial approaches Chester Avenue, it widens to three lanes with right turn lanes for the remainder of the eastern study area.

Immediately east of Coffee Road, Truxtun Avenue crosses the Arvin–Edison Canal. The majority of this segment is flanked by a grassy area, including trees, shrubs and a park-type area on the north (Kern River) side. On the south side of Truxtun Avenue, there are some newer business buildings, office parks, numerous medical centers and facilities. Truxtun Plaza West and East, Office Park Drive and Commercial Way provide access to these centers. Truxtun Avenue intersects Mohawk Street, which is currently under construction for an extension to the north. Approximately one mile west of downtown, Truxtun Avenue passes under the BNSF Railway and the land use changes to primarily undeveloped and industrial use. East of this point, the roadway diverges from the path of the river and continues directly east through the heart of downtown Bakersfield, running parallel to and just north of the BNSF Railway.

After passing under the State Route 99 freeway, Truxtun Avenue provides access to major downtown landmarks and public service facilities such as Mercy Hospital, the Bakersfield Police Department, the Greater Bakersfield Chamber of Commerce, Bakersfield City Hall, the Kern County Superior Court, Rabobank Arena Theater and Convention Center, a TRIP office building, the Greater Bakersfield Convention and Visitor's Bureau, County of Kern Administrative Center, the Bakersfield Amtrak Station and the Beale Memorial Library. The roadway also provides connection to many north–south downtown streets that service numerous hotels, bars and restaurants. Within the downtown limits, the posted speed limit ranges from 25 to 40 mph. The majority of this downtown arterial includes a landscaped, raised median about 15 feet in width with sidewalks on both sides, and restricted parallel parking for access to frontage businesses. Although the principal land use is commercial, there are a few churches along this segment and single-story family homes with no property walls.

As Truxtun Avenue approaches the eastern end of the study area, it becomes elevated over Union Avenue. However, 25 mph at-grade roads exist on each side to provide vehicle access to and from Union Avenue. These frontage one-way roads also allow eastbound travelers to make U-turns in order to travel toward the west on Truxtun Avenue.

New Stine Road/California Avenue

New Stine Road generally runs in the north–south direction and originates approximately 10 miles south of Stockdale Highway at Bear Mountain Boulevard. After crossing Stockdale Highway to the north, the road becomes California Avenue and its alignment turns northeast. California Avenue runs in an east–west direction through downtown Bakersfield just south of Truxtun Avenue and the BNSF Railway and about one mile north of State Route 58 (Barstow–Bakersfield Highway). It continues east past the study area, about 2.5 miles past Union Avenue, until merging with Edison Highway/State Route 184, which follows the Union Pacific Railroad out of Bakersfield.

New Stine Road

The segment of New Stine Road within the study area is approximately one mile long between Ming Avenue and Stockdale Highway. This segment primarily serves the community of Kern City. It has a posted speed limit of 45 mph, is three lanes in each direction with a median approximately 15 feet wide and has right-turn lanes at intersections. The roadway has bike lanes, but no on-street parking. The majority of this segment is residential including both single-family homes and a few apartment complexes. West High School, which is located on the east side of New Stine Road at Sundale Avenue, contains park areas and sports fields. The surrounding area on the other side of the street includes residential communities for senior adults and retirees. Farther north on the west side, there is a wide, non-striped road running parallel to New Stine Road to provide separate access for the residential community there.

California Avenue

As New Stine Road crosses north past Stockdale Highway and becomes California Avenue, the roadway operates with three lanes in each direction. In this initial segment of California Avenue, the bike lane striping is discontinued and the speed limit is reduced to 40 mph. The arterial continues to be divided by an approximately 15-foot wide median and is heavily landscaped on both sides. This initial segment of California Avenue crosses over the Gates Canal and begins

turning toward the northeast in the direction of State Route 99. There is a church, University of Phoenix and a few apartment complexes, but the surrounding land uses are primarily made up of shopping centers, restaurants and businesses. These retail centers include the Stockdale Village, Stockdale West and Fashion Plaza shopping centers. Farther north, a new shopping area named 99 Plaza is to be developed. The medians narrow as California Avenue passes under the State Route 99 overpass. On either side of this crossing are gas stations, fast food restaurants and small businesses.

After passing the Oak Street intersection, California Avenue operates in the east–west direction and continues to be six lanes with a landscaped median and no designated on-street parking. The roadway serves the downtown Westchester community and for the next mile, the south side of the roadway is primarily residential without property walls. The north side has several parallel BNSF Railway tracks to allow for switching trains. As California Avenue approaches H Street, the majority of the north side includes several large facilities and a stadium that are a part of Bakersfield High School. In the vicinity of the school, the posted speed limit is 25 mph.

The remaining segment of California Avenue within the study area continues to operate with three lanes in each direction with a large, landscaped median. The landscaping includes large trees and shrubs and is hardscaped with rocks as a base. The speed limit varies between 35 and 40 mph. The median narrows when there are left-turn pockets at intersections or other access points. Newer, more modern, businesses exist between H Street and Chester Avenue. Maya 16 Cinemas is located on the north side and businesses, offices, restaurants and auto shops populate the frontage through to Union Avenue. Parallel on-street parking is available outside the travel lanes for some of the small businesses. Business buildings become older and smaller farther east and some light industrial land uses are located at the eastern end of the route.

Stockdale Highway/Brundage Lane

Stockdale Highway traverses the study area in the east–west direction. From Allen Road, it continues to the State Route 99/State Route 58 interchange and operates as Brundage Lane east of this interchange, continuing past Union Avenue.

The majority of Stockdale Highway includes bike lanes and a raised median approximately 10 to 15 feet wide with well-maintained landscaping. From Allen Road to the vicinity of the Gosford Road/Coffee Road intersection, the highway provides three travel lanes in each direction with a speed limit of 55 mph. Just east of Allen Road, the highway curves to the southeast as it crosses the Kern River and the Cross Valley Canal. It continues this way until reaching the intersection with Buena Vista Road where it turns back to the north. To the south is the BCHS Sports Center and Fresno Pacific University, and to the north is a well-maintained public area called The Park at Riverwalk.

As the highway approaches the Old River Road/Calloway Drive intersection, land uses include restaurants, businesses and a few residential areas. Mercy Southwest Hospital and several medical business and facilities are located just east of this intersection. Farther east, the highway crosses the Kern River Canal. To the south, the California State University of Bakersfield is spread across approximately a square mile of land.

From the Gosford Road/Coffee Road intersection to State Route 99, the speed limit is reduced to 45 mph, but the raised, landscaped median and bike lanes continue. Three traffic lanes continue until the New Stine Road/California Avenue intersection, and then the highway narrows to two lanes in each direction. The segment serves a higher density of mixed residential and business land use and includes businesses, restaurants, shopping centers and churches. The residential areas are a mix of apartments, living communities separated with property walls and single-story homes with no property dividers. This section also has some residential areas accessed via service roads which run parallel to the highway. These residential access roads are typically unstriped and wide enough to allow for parking.

As Stockdale Highway crosses over State Route 99/State Route 58, it also passes under an overhead structure for an access ramp and the name of the road changes to Brundage Lane. Brundage Lane forms the southern boundary of downtown Bakersfield and continues to operate in an east–west direction, closely paralleling State Route 58 just to its north. Union Avenue is approximately two miles east of this crossing and the land use is primarily fast food, gas and auto or other business use with older, less maintained buildings. There are also a few older houses and apartments. The road narrows to two lanes, the speed limit is reduced to 40 mph, and there is a two-way, left-turn lane in the center.

Ming Avenue

Ming Avenue is a major arterial that traverses the study area in an east–west direction. On the west end, it starts at Allen Road from a T-intersection. Although the first mile east of Allen Road to Buena Vista Road utilizes only two lanes in each direction, the majority of this arterial includes three lanes in each direction. The arterial also includes additional single and double outside turning lanes at intersections, striped bike lanes, and a posted speed limit of 45 mph. From Allen Road to New Stine Road, it principally services residential communities along its route, where the west end has newer, more expensive homes with tall property walls. The route includes a heavily landscaped, raised median varying up to 20 feet wide and well-maintained landscaping and sidewalks along both sides of the road. The Seven Oaks Country Club and its golf course are located on the south side, between Buena Vista Road and Old River Road. This entire section also contains the Seven Oaks residential community. From Old River Road to Gosford Road, the residential use continues with the Haggin Oaks Community. This section also includes some small businesses, restaurants, markets and shopping areas. Near the southwest corner of Ming Avenue and Gosford Road is the Kern County Southwest Branch Library. This intersection continues to have residential communities separated by property walls on all four corners. Ming Avenue then services the Stockdale residential community east of this intersection. Newer homes without property wall separation exist along this section of the route. From Ashe Road to the State Route 99/58 interchange with Ming Avenue, the median is less significant and landscaping is reduced considerably, but still exists. Also, the land use contains more of a mix between smaller homes, apartment complexes and small businesses, gas stations and fast food restaurants.

Ming Avenue crosses above State Route 99/58 with an overpass structure and contains exit and entrance ramps to the freeway. The Valley Plaza regional shopping center is located on the northeast corner of this interchange and includes larger buildings for major department stores and restaurants. Just east of this mall and near Hughes Lane, the road reduces to two lanes in each direction with a striped, non-raised median center turning lane with some parking permitted along

the outside of the road. There are a few single-story residential homes along this portion of the route, but the majority of land use is small businesses. East of H Street, the posted speed limit drops to 40 mph. Although there is a park and school to the north, the remaining route through to Union Avenue is less maintained and principally contains older businesses and gas stations. The opposing direction of travel on the road soon is separated only by a double striped centerline. Just east of the Union Avenue intersection, the road name changes to Casa Ioma Drive.

Major North–South Roadways in Study Area

Allen Road

Allen Road is currently a minor arterial in the study area that runs in the north–south direction. Although some of the land on either side of this road is either undeveloped or includes a few small shopping areas and gas stations, Allen Road is primarily surrounded by residential communities within this study area. These communities are typically bordered with property walls. With the exception of a school zone, no posted speed limit signs were found along this road.

The northern limit of Allen Road within the study area is at Rosedale Highway. Generally, the northern half of Allen Road is one lane in each direction and is divided by either a two-way left-turn lane or a double yellow center line. The southern half of Allen Road typically consists of two lanes in each direction with a raised, landscaped median. Certain sections have extra wide outside lanes as the cross section is established to eventually provide three lanes in each direction. There are also some bike lanes and on-street parking within this southern segment, especially near the school. As Allen Road approaches Stockdale Highway heading south, the speed limit is posted as 25 mph for the Bakersfield Christian High School, which lies farther south and utilizes much of the land on the east side of the road.

The southernmost section of Allen Road was just recently constructed. This extension begins just north of the Kern River and continues to Ming Avenue. It includes a major bridge crossing over the river and the Cross Valley Canal. The Kern River Parkway Bike Trail is south of the river. The southern limit of Allen Road within the study area ends at Ming Avenue.

Calloway Drive/Old River Road

Calloway Drive is an arterial that runs in a north–south direction starting north of Rosedale Highway and continuing south until Stockdale Highway, where the name changes to Old River Road. This road serves a mix of land uses including residential, commercial, medical facilities and schools. The posted speed limit ranges from 45 to 55 mph. Although the northern segment begins with two lanes in each direction, the majority of the road is, or will be after construction, three lanes in each direction.

The northern segment operates at 45 mph with two lanes in each direction and a two-way left-turn lane. Land use includes residential and the Fruitvale Junior High School, which is located on the east side, along with the Greenacres Park. Farther to the south, the arterial includes a 15- to 20-foot wide landscaped, raised median and side access roads. The road continues toward the south, passing under a BNSF Railway bridge and provides access to more residential areas south of the railroad.

As Calloway Drive approaches Brimhall Road, new businesses, restaurants, and convenience stores surround the intersection. The road transitions to three lanes in each direction with bike

lanes and continues with the raised landscaped median. At this point, it is assumed that the speed limit increases to 55 mph. South of Brimhall Road are residential communities with property walls on each side of Calloway Drive. Farther south, a segment of the roadway is currently under construction. The roadway narrows here to two lanes with a narrow center-striped, non-raised median. The road transitions back to three lanes with a bike lane beyond the construction zone. Residential communities continue to exist along the route. On the last segment of Calloway Drive, before it approaches Stockdale Highway, the road has a bridge structure that passes over both the Cross Valley Canal and the Kern River.

As the road continues south past Stockdale Highway, its name changes to Old River Road. The speed limit remains 55 mph. The roadway has three lanes in each direction and additional right-turn lanes at intersections. The land use on the west side of the road is primarily residential communities separated by property walls. The Mercy Southwest Hospital and other medical facilities are located on the east side of the road, immediately south of Stockdale Highway. Farther south, there is a U.S. post office and a business center with several large business buildings. Beyond this medical and business frontage, the California State University of Bakersfield with its facilities utilizes the majority of the land. As Old River Road reaches the southern limit of the study area at Ming Avenue, there is a new roadway that is completed, but not yet striped. This portion of the roadway is currently narrowed to a single lane due to construction. It is expected that this segment will have three lanes and a bike lane upon completion, consistent with previous portions of the arterial.

Coffee Road/Gosford Road

Coffee Road is an arterial that runs in a north–south direction starting at Rosedale Highway and continuing south until Stockdale Highway, where the name changes to Gosford Road. The posted speed limit is 55 mph and the majority of the roadway consists of three lanes in each direction with additional right-turn lanes at intersections. There are bike lanes and a raised, landscaped median that varies in width, with a maximum width of approximately 20 feet.

The northern part of Coffee Road is mostly undeveloped with open land, storage reservoirs, overhead power lines, reception towers and other industrial use. Half a mile south of Rosedale Highway, Coffee Road passes over the BNSF Railway with similar land use along the road beyond this bridge. There are some gas stations on each side of the road approaching the intersection with Brimhall Road. South of this point, there is another, larger bridge as Coffee Road crosses over the Cross Valley Canal and the Kern River before arriving at Truxtun Avenue. This intersection is a T-intersection which only has the option to travel east. Between Truxtun Avenue and Stockdale Highway, the road crosses over the Arvin–Edison and Kern River Canals and services several businesses, restaurants, stores and The Fountain Plaza Shopping Center.

As the route passes south of Stockdale Highway, the road name changes to Gosford Road, but maintains similar conditions of 55 mph speed limit, three lanes in each direction, outside turning lanes, bike lanes and a wide, landscaped, raised median. This segment of Gosford Road within the study area, until the Ming Avenue intersection, primarily serves the Stockdale residential communities, which are separated from the road with property walls, tall trees and landscaping. The east side has a standard sidewalk, while the west side includes a meandering concrete pedestrian path.

Oak Street/Wible Road

Within this study area, Oak Street/Wible Road is generally a frontage road running parallel and just to the east of State Route 58/State Route 99. This roadway generally forms the western border of downtown Bakersfield and serves a variety of businesses along its route. Similar to other north–south roadways, Oak Street maintains its name until passing south of Stockdale Highway, where the name changes to Wible Road. Both segments are typically either two or three lanes in each direction with bike lanes along most of the route. The median varies from a double-striped centerline to a two-way left-turn lane to a wide, raised median at the south end.

In the north, Oak Street begins with two lanes at the 24th Street intersection just southeast of the Kern River and Beach Park. It has a posted speed limit of 40 mph for most of its length. Along the northern part of Oak Street, the State Route 58/State Route 99 highway is offset approximately one-half mile to the west, allowing enough room for car dealerships, a variety of businesses, restaurants and office parks on each side. South of Truxtun Avenue, there is an extensive bridge for the road to pass over several track lines of the BNSF Railway. As Oak Street continues south of Truxtun Avenue, the alignment of State Route 58/State Route 99 begins to transition toward the east and closer to Oak Street. As Oak Street approaches California Avenue, there are several gas stations and fast food restaurants and the road widens to three lanes with right-turn lanes. Farther to the south, State Route 58/State Route 99 operates in close proximity to the west side of Oak Street, preventing any development or infrastructure on this side. However, Oak Street continues to provide access to hotels, gas stations, fast food places, car dealerships, automobile shops and other businesses located on the east side. Upon reaching Stockdale Highway, the road narrows back to two lanes in each direction while still maintaining bike lanes.

As Oak Street continues south of Stockdale Highway/Brundage Lane, the roadway name changes to Wible Road and the posted speed limit becomes 45 mph. The roadway passes under several overhead highway and ramp structures, all part of the merging interchange of State Routes 58 and 99. State Route 99 continues to run parallel and adjacent to the west side of Wible Road, allowing no other development on that side. The east side consists of various small businesses, with two travel lanes and bike lanes separated by a center double-stripe only. A wide median with no landscaping exists at the southern end, as the study limit ends at Ming Avenue. The Valley Plaza Mall is located on the southeast corner of this intersection.

Chester Avenue

Chester Avenue is an arterial that operates in a north–south direction through the heart of downtown Bakersfield, almost halfway between State Route 58/State Route 99 and Union Avenue. Beyond the study limit of Ming Avenue, the roadway name changes to South Chester Avenue and its alignment begins to veer in the southeast direction. The posted speed limit is either 40 mph or 45 mph and the majority of this route consists of two lanes in each direction, a center striped median, right-turn lanes at intersections and bike lanes. Chester Avenue primarily serves a variety of businesses, but does have some residential areas to the south.

Within the study area, the north end of Chester Avenue begins at Golden State Avenue and soon crosses over 24th Street (westbound), and then 23rd Street (eastbound), a one-way couplet. The speed limit is 40 mph. The Bakersfield Museum, City of Bakersfield Parking Mall, office parks,

banks and multi-story business buildings are located here. The buildings are relatively newer along this northern segment. There is on-street parking on each side, with wide sidewalks and a small, landscaped, raised median.

Beyond the Truxtun Avenue intersection, City Hall is on the west and the courthouse is located on the east side. The road passes under the BNSF Railway before approaching California Avenue. From this intersection until Brundage Lane, which is one mile farther to the south, there are a variety of restaurants and small businesses fronting the road with time restricted parking on each side. South of Brundage Lane, Chester Avenue intersects with State Route 58 ramps and the road crosses over the highway and then over a water canal.

The southern end of Chester Avenue has a posted speed limit of 45 mph and primarily provides access to residential neighborhoods. There are no property walls, but the homes are separated from the roadway by a wide, raised, landscaped median and parallel side frontage roads on each side of Chester Avenue. These frontage roads are not striped, but are marked as one-way and are approximately three lanes wide. The speed limit on the access roads is 25 mph. Residents park on both sides of the frontage roads leaving the center of the road for cars to travel through.

Union Avenue

Union Avenue, also called California Business Route 204/99, runs in a north–south direction and forms the eastern limit of the study area and of downtown Bakersfield. The posted speed limit is 40 mph and the majority of the road is three lanes in each direction.

On the northern end, Union Avenue passes under State Route 178 and ramps, then over the Union Pacific Railroad as it merges with Golden State Avenue (State Route 204). The route passes under Truxtun Avenue and the BNSF railroad that passes by the Amtrak Station to the west, before approaching California Avenue. This northern segment of Union Avenue primarily serves industrial areas and small businesses including fast food places and gas stations.

South of the California Avenue intersection, the route continues to operate with three lanes in each direction with a posted speed limit of 40 mph. There are varying landscaped medians up to approximately 15 feet in width. This southern segment contains numerous, relatively old lodging establishments along the rest of the route. After crossing Brundage Lane, Union Avenue crosses over and interchanges with State Route 58 and serves more small businesses, fast food places and gas stations, which are located at all intersections. The Kern County Fairgrounds and parking is located on the west at the end of the route and the road narrows to two lanes before approaching Ming Avenue and another industrial lead railroad crossing.

2.3 Existing Traffic Volumes

Figure 2-12 illustrates average daily traffic volumes on the various regional and local roadways described above. These traffic volumes were collected for the Kern Council of Governments during 2009 and/or 2010, for the most part. Other historical traffic count data can be viewed on the Kern COG website at www.kerncog.org.

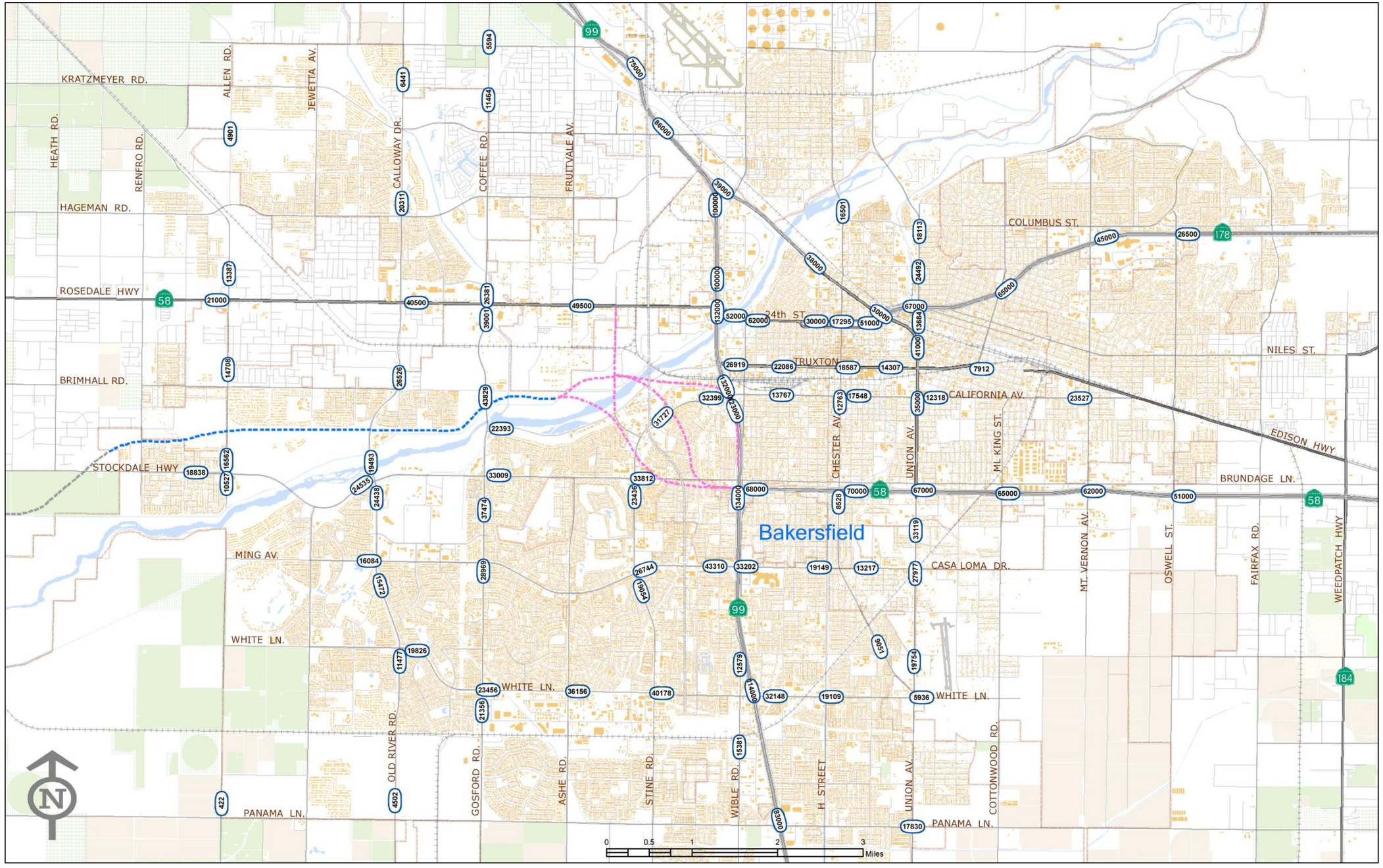


Figure 2-12: Average Daily Traffic Volumes

2.4 Existing Traffic Operational Analysis

Level of service (LOS) is a qualitative measure used to gauge traffic operational performance by describing the driver's experience within a traffic stream in terms of service measures such as speed and travel time, freedom to maneuver, traffic interruptions and delay, and comfort and convenience. Six levels of service are defined by the Highway Capacity Manual 2000. Letters designate each level—from LOS A (indicating traffic flows with little or no delay) to LOS F (indicating over-saturated conditions where traffic flow exceeds freeway capacity, generally resulting in long queues and delays). The Highway Capacity Manual 2000-defined level of service criteria for intersections are presented in Table 2-3. The level of service criteria for density on freeways are presented in Table 2-4.

The following studies undertaken for projects located within metropolitan Bakersfield were reviewed to determine if potential study intersections had been recently evaluated: *Hageman Road Extension to Golden State Avenue Traffic Report,* Parsons 2009; *Hosking Avenue/State Route 99 Interchange Traffic Report,* Parsons 2008; *Bakersfield Commons Mixed-Use Transportation Impact Report,* Gibson Transportation Consulting, 2010; *Stockdale Ranch DEIR,* RBF Consulting 2009; *Rosedale Highway Widening Project,* Fehr & Peers 2009. Based on this review of potential study intersections, a subset of key intersections were selected for analysis. The selection was based on a determination of which intersections could potentially be impacted by the Centennial Corridor project various build alternatives. Figure 2-13 illustrates the locations of the study intersections selected for detailed evaluation, while Figure 2-14 reports the AM and PM peak hour turning movement traffic volumes for these same intersections. Table 2-5 presents the results of the level of service analysis for these intersections.

Figure 2-15 depicts existing peak hour and daily traffic volumes for State Route 99 and State Route 58 freeway segments and ramps considered by this study. Tables 2-6, 2-7, 2-8 and 2-9 present the level of service results for these same freeway segments and ramps.

All of the freeway segment locations on State Route 58 eastbound operate at LOS D or better except for the Union Avenue off-ramp, which operates at LOS E during both peak hours and the Union Avenue off-ramp to on-ramp which operates at LOS C during the AM peak hour. The section between Chester Avenue and Union Avenue generally has the highest peak hour volumes in the study area. This results in higher density in this section.

In the study area, the State Route 58 westbound sections all operate at LOS D or better with the exception of the Brundage Lane off-ramp during the AM peak hour and the Chester Avenue off-ramp during both peak hours, which operate at LOS E.

The majority of the northbound State Route 99 analysis locations operate at LOS C or better. The following seven locations operate at LOS D:

- White Lane to Ming Avenue (AM peak hour)
- Ming Avenue on-ramp (AM peak hour)
- State Route 58 off-ramp (PM peak hour)
- State Route 58 on-ramp (AM peak hour)
- State Route 58 to California Avenue (AM peak hour)

- California Avenue to Rosedale Highway (AM peak hour)
- Rosedale Highway off-ramp (PM peak hour)

Table 2-3. Level of Service Definitions for Intersections

LOS	DESCRIPTION	CONTROL DELAY PER VEHICLE (sec/veh)	
		SIGNALIZED	UNSIGNALIZED
A	Traffic flows with very little delay and optimal speeds. Most vehicles do not stop at all.	0-10	<10
B	Traffic flows with very little delay and speeds may be slightly reduced. Very infrequent and short waits at traffic signals. More vehicles stop at intersections than for LOS A.	>10-15	>10-20
C	Traffic speeds continue to slow. Some vehicles may stop at this level, although many vehicles still pass through the intersection without stopping.	>15-25	>20-35
D	Congestion becomes more noticeable. Many vehicles stop and the proportion of vehicles not stopping declines.	>25-35	>35-55
E	Low speeds and traffic backups at intersections. Often considered to be the limit of acceptable delay.	>35-50	>55-80
F	Very slow speeds and congestion. Long traffic backups. Very likely to wait for multiple greens to get through an intersection. This is considered to be unacceptable for most drivers.	>50	>80

Source: Highway Capacity Manual 2000

Table 2-4. Mainline and Freeway Ramp Level of Service Definitions

LOS	DESCRIPTION	DENSITY (pc/mi/ln)	
		MAINLINE	RAMPS
A	Describes free-flow operations. Free-flow speeds prevail.	<11	<10
B	Represents reasonably free-flow operations and free-flow speeds are maintained.	>11 and <18	>10 and <20
C	Provides for flow with speeds at or near the free-flow speed of the freeway.	>18 and <26	>20 and <28
D	Describes the level at which speeds begin to decline slightly with increasing flows and density begins to increase somewhat more quickly.	>26 and <35	>28 and <35
E	At this level's highest density value, it describes operation that is at capacity of the freeway.	>35 and <45	>35
F	Describes breakdown in vehicular flow and queues forming behind the breakdown points.	>45	Demand exceeds capacity

Source: Highway Capacity Manual 2000

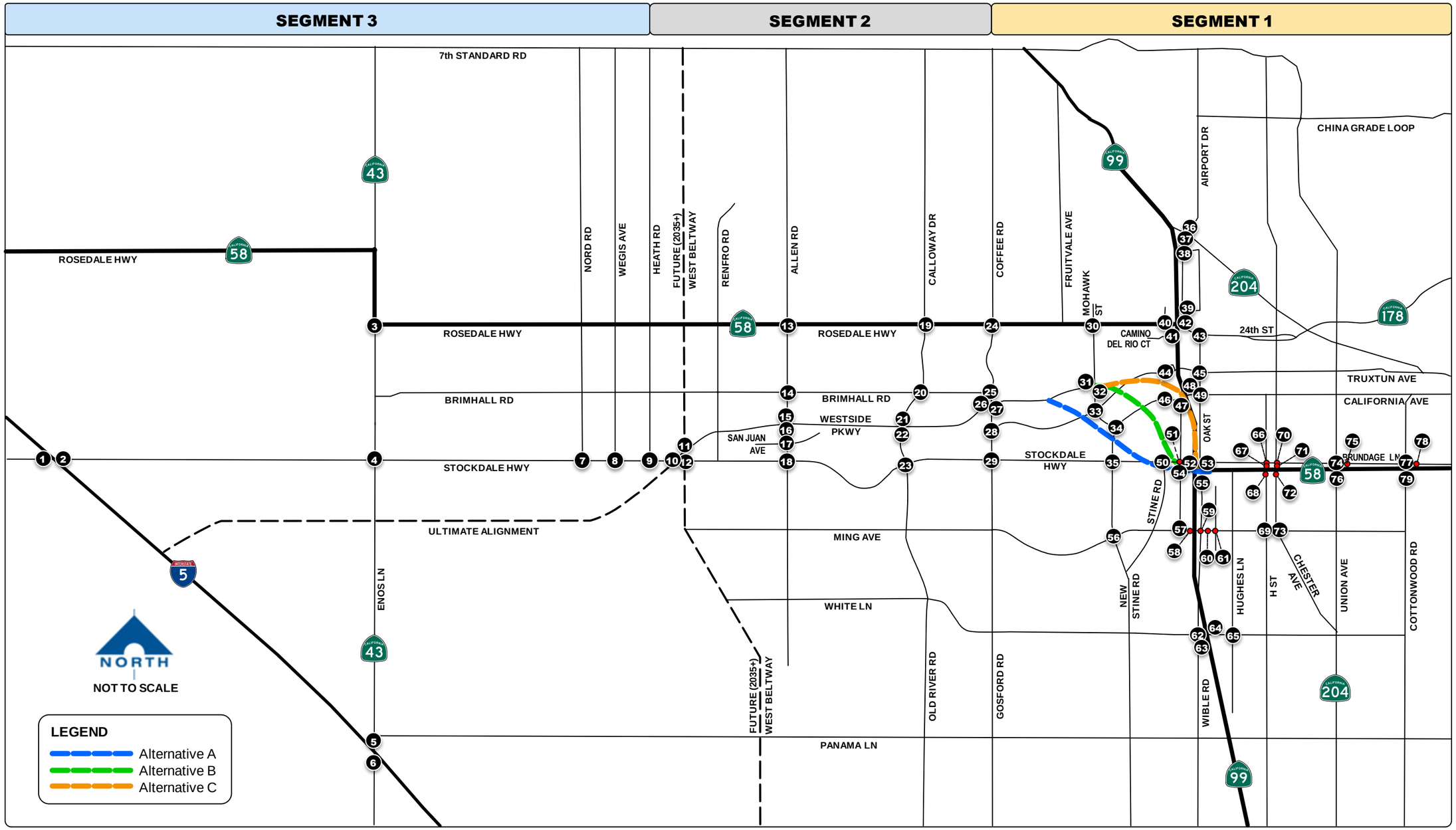


Figure 2-13: Locations of Study Intersections

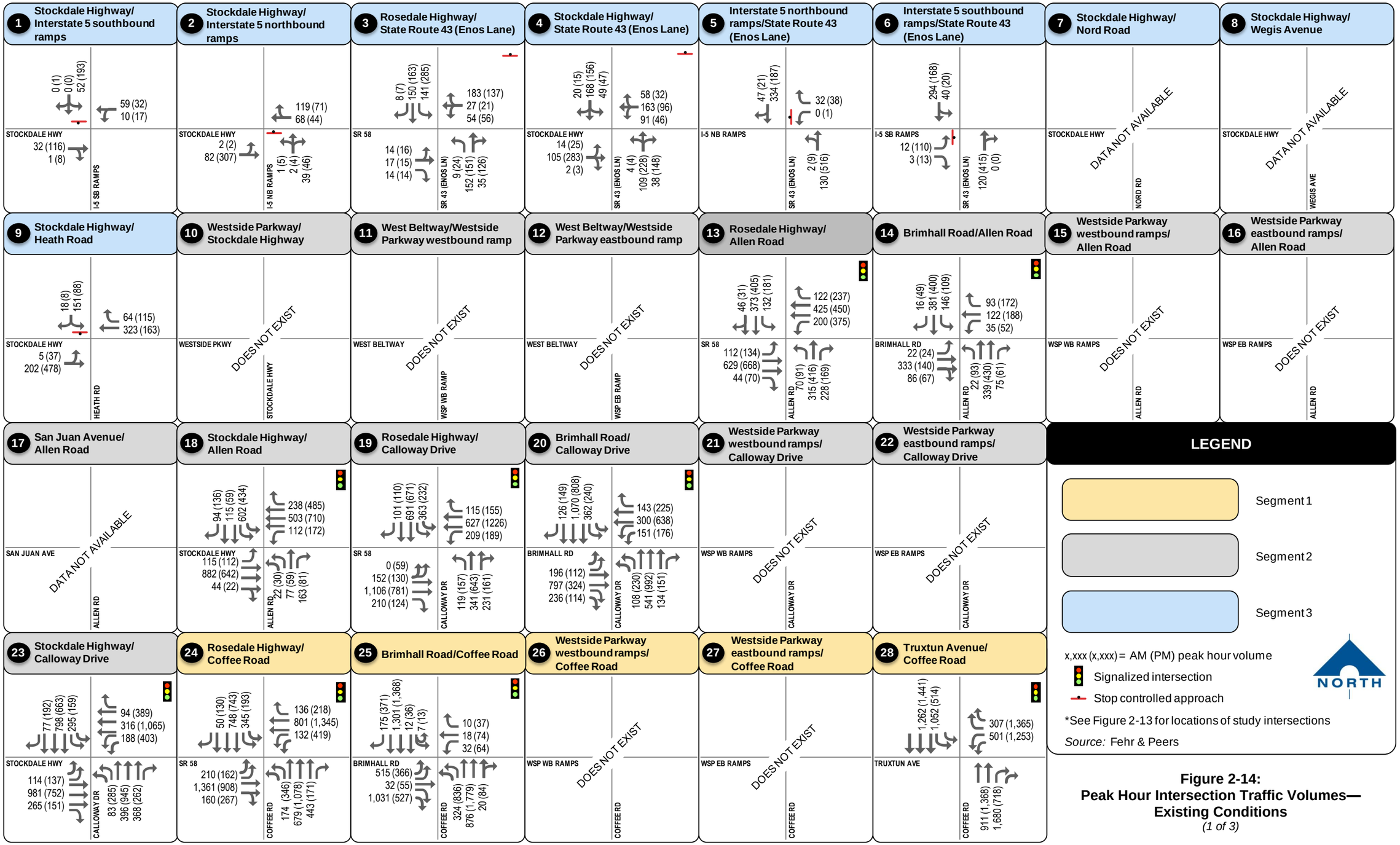


Figure 2-14:
Peak Hour Intersection Traffic Volumes—Existing Conditions
(1 of 3)

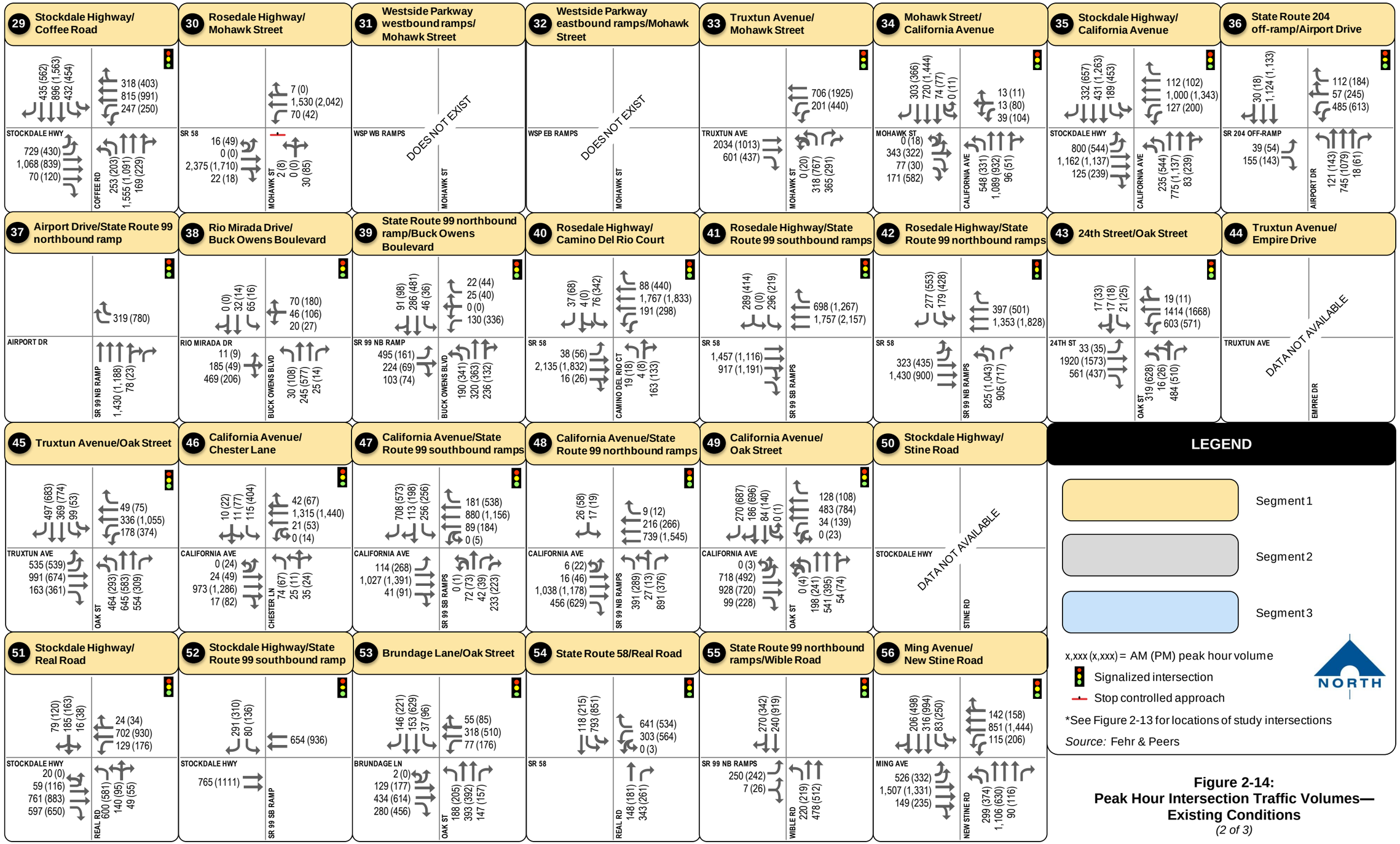


Figure 2-14:
Peak Hour Intersection Traffic Volumes—Existing Conditions
(2 of 3)

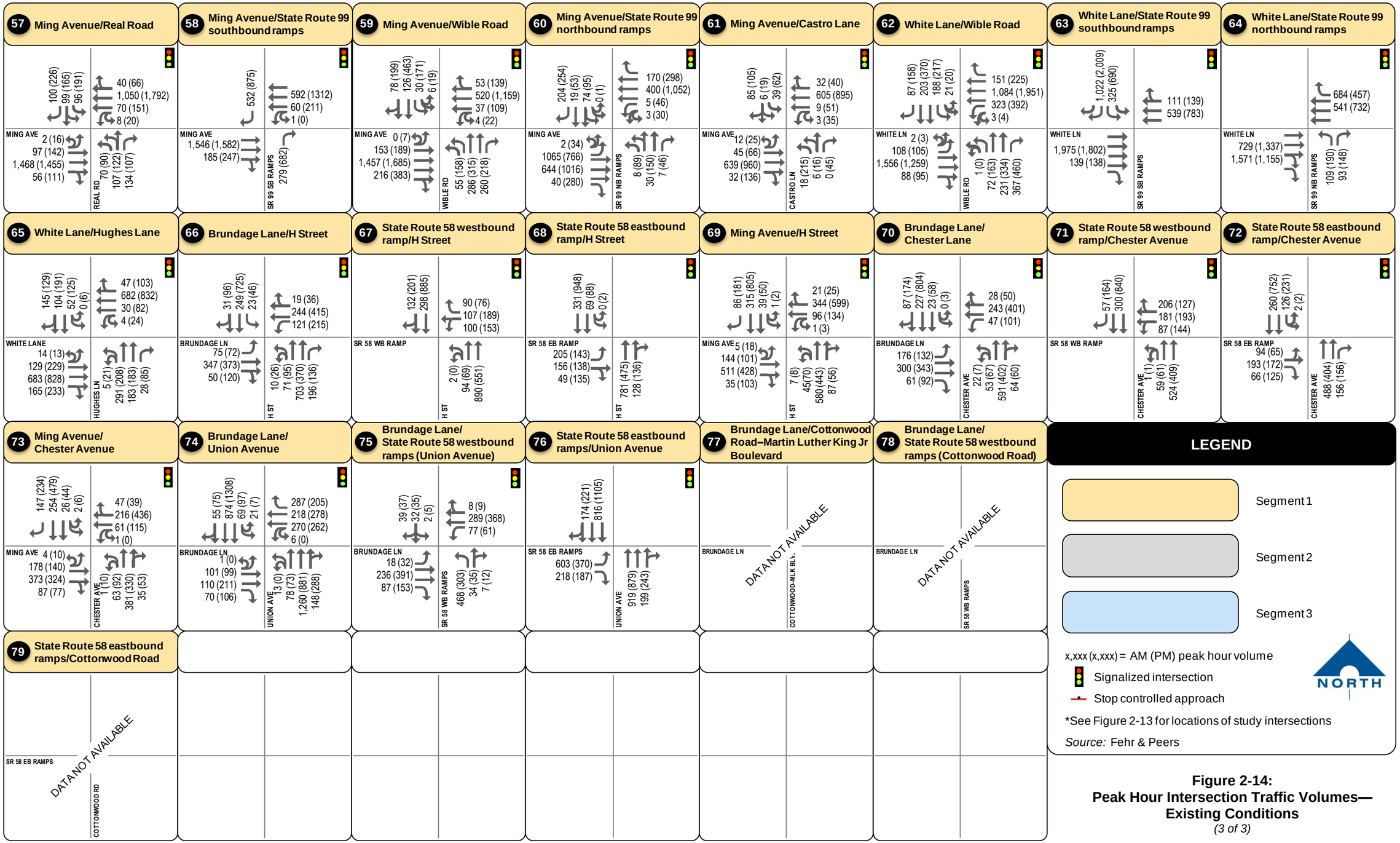
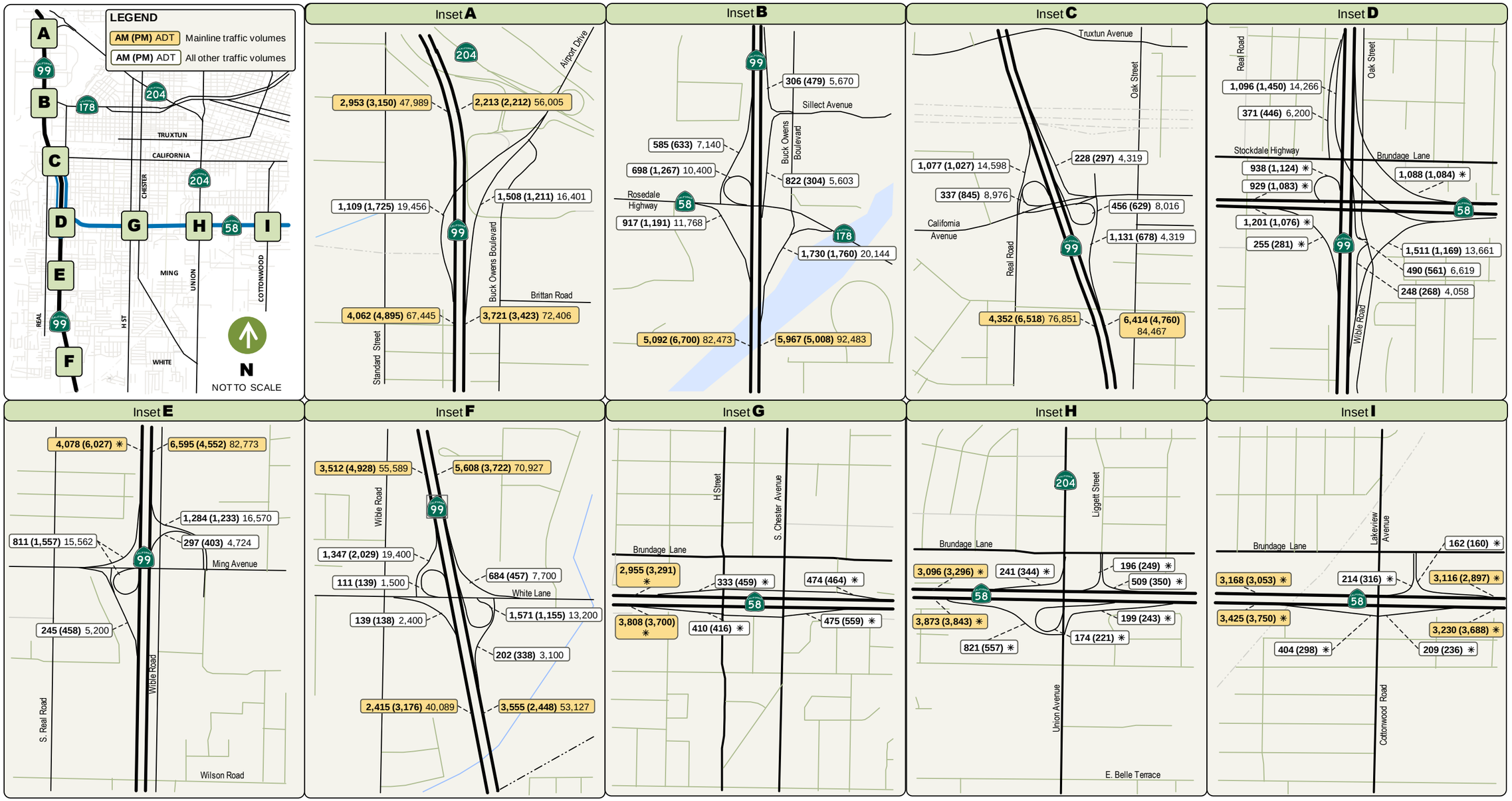


Figure 2-14:
Peak Hour Intersection Traffic Volumes—Existing Conditions
(3 of 3)



Source: Parsons

✳ Data not available

Figure 2-15:
Peak Hour and Daily Freeway Volumes—
Existing Conditions

Table 2-5. Existing Conditions Intersection Level of Service Analysis *(1 of 2)*

INTERSECTION	CONTROL	AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
1. I-5 SB ramps/Stockdale Highway	NB/SB two-way stop	B	10.2	C	15.1
	Imp-Signal*	N/A			
2. I-5 NB ramps/Stockdale Highway	NB/SB two-way stop	A	9.5	B	11.7
3. SR 43 (Enos Lane)/Rosedale Highway	4-way stop	B	12.0	B	14.9
	Imp-Signal	N/A			
4. SR 43 (Enos Lane)/Stockdale Highway	4-way stop	B	14.9	D	31.7
	Imp-Signal*	N/A			
5. SR 43 (Enos Lane)/I-5 NB ramps	EB/WB two-way stop	B	11.9	C	15.6
6. SR 43 (Enos Lane)/I-5 SB ramps	EB/WB two-way stop	B	14.5	D	26.9
7. Stockdale Highway/Nord Road	Signal	N/A			
8. Stockdale Highway/Wegis Avenue	NB/SB two-way stop	N/A			
	Imp-Signal*	N/A			
9. Stockdale Highway/Heath Road	Stop (existing) Signal (future)	C	18.2	C	22.2
10. Stockdale Highway/Westside Parkway	Signal	Does not exist			
11. West Beltway/Westside Parkway WB ramp	Signal	Does not exist			
12. West Beltway/Westside Parkway EB ramp	Signal	Does not exist			
13. Allen Road/Rosedale Highway	Signal*	D	37.3	E	76.9
14. Allen Road/Brimhall Road	Signal	C	21.2	B	19.9
15. Allen Road/Westside Parkway WB ramps	Signal	Does not exist			
16. Allen Road/Westside Parkway EB ramps	Signal	Does not exist			
17. Allen Road/San Juan Avenue	Signal*	Does not exist			
18. Allen Road/Stockdale Highway	Signal	D	39.0	C	27.0
19. Calloway Drive/Rosedale Highway	Signal*	E	69.0	**F**	**91.0**
20. Calloway Drive/Brimhall Road	Signal	C	31.9	C	25.4
21. Calloway Drive/Westside Parkway WB ramps	Signal	Does not exist			
22. Calloway Drive/Westside Parkway EB ramps	Signal	Does not exist			
23. Calloway Drive/Stockdale Highway	Signal	D	36.1	D	38.5
24. Coffee Road/Rosedale Highway*	Signal*	E	75.7	E	65.7
25. Coffee Road/Brimhall Road	Signal	E	60.1	E	72.7
26. Coffee Road/Westside Parkway WB ramps	Unsignalized	Does not exist			
27. Coffee Road/Westside Parkway EB ramps	Signal	Does not exist			
28. Coffee Road/Truxtun Avenue	Signal	E	67.2	**F**	**81.2**
29. Coffee Road/Stockdale Highway	Signal*	**F**	**112.0**	**F**	**90.2**
30. Mohawk Street/Rosedale Highway	Stop (existing)* Signal (future)*	**F**	**62.4**	**F**	**53.2**
31. Mohawk Street/WSP WB ramps	Signal	Does not exist			
32. Mohawk Street/WSP EB ramps	Signal	Does not exist			
33. Mohawk Street/Truxtun Avenue	Signal	C	29.0	D	41.5
34. Mohawk Street/California Avenue	Signal*	C	30.5	C	34.3
35. Stockdale Highway/California Avenue	Signal*	E	55.9	**F**	**81.9**
36. Airport Drive/State Road–SR 204 off-ramp	Signal	D	35.9	D	42.5
37. Airport Drive/SR 99 NB ramp	Signal	A	8.8	C	21.9
38. Buck Owens Boulevard/Rio Mirada Drive	Signal	D	43.7	B	17.8
39. SR 99 NB ramps/Buck Owens Boulevard	Signal	D	38.9	D	37.5
40. Rosedale Highway/Camino Del Rio Court	Signal	C	28.6	D	37.0
41. Rosedale Highway/SR 99 SB ramps	Signal	D	41.0	D	44.5
42. Rosedale Highway/SR99 NB ramps	Signal	D	50.9	**F**	**125.6**
43. 24th Street/Oak Street	Signal	**F**	**89.4**	**F**	**100.3**
44. Truxtun Avenue/Empire Drive	Signal*	N/A			
45. Truxtun Avenue/Oak Street	Signal	D	43.3	E	74.4
46. California Avenue/Chester Lane	Signal	B	17.5	C	27.8
47. California Avenue/SR 99 SB ramps	Signal	D	48.8	D	44.5
48. California Avenue/SR 99 NB ramps	Signal	E	74.8	C	25.1
49. California Avenue/Oak Street	Signal	D	44.1	E	78.7
50. Stockdale Highway/Stine Road	Signal*	N/A			

Table 2-5. Existing Conditions Intersection Level of Service Analysis *(2 of 2)*

INTERSECTION	SIGNAL CONTROL	YEAR 2038			
		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
51. Stockdale Highway/Real Road	Signal	F	95.8	F	93.2
52. Stockdale Highway/SR 99 SB ramp	Signal	B	12.2	B	10.5
53. Brundage Lane/Oak Street	Signal	C	28.9	D	38.8
54. Real Road/SR 58	Signal	C	27.0	C	27.3
55. Wible Road/SR 99 NB ramps	Signal	B	17.9	C	32.2
56. Ming Avenue/New Stine Road	Signal*	E	56.5	E	79.6
57. Ming Avenue/Real Road	Signal	C	25.4	E	60.8
58. Ming Avenue/SR 99 SB ramps	Signal	A	3.4	C	29.3
59. Ming Avenue/Wible Road	Signal	E	61.3	E	68.1
60. Ming Avenue/SR 99 NB ramps	Signal	C	26.7	D	40.4
61. Ming Avenue/Castro Lane	Signal	B	16.7	C	24.7
62. White Lane/Wible Road	Signal*	D	54.7	F	83.3
63. White Lane/SR 99 SB ramps	Signal*	C	22.3	F	109.5
64. White Lane/SR 99 NB ramps	Signal*	A	5.4	A	6.9
65. White Lane/Hughes Lane	Signal*	D	35.9	D	38.3
66. H Street/Brundage Lane	Signal	C	20.7	D	35.3
67. H Street/SR 58 WB ramp	Signal	B	17.1	E	56.3
68. H Street/SR 58 EB ramp	Signal	D	41.1	C	27.2
69. H Street/Ming Avenue	Signal*	C	29.6	D	35.5
70. Chester Avenue/Brundage Lane	Signal	C	21.0	C	30.7
71. Chester Avenue/SR 58 WB ramp	Signal	B	18.0	C	23.9
72. Chester Avenue/SR 58 EB ramp	Signal	C	28.9	C	22.2
73. Chester Avenue/Ming Avenue	Signal*	C	23.7	C	24.0
74. Union Avenue/Brundage Lane	Signal	D	42.1	D	39.6
75. Brundage Lane/SR 58 WB ramps	Signal	B	19.7	B	15.1
76. Union Avenue/SR 58 EB ramps	Signal	B	16.2	B	10.9
77. Cottonwood Road–MLK/Brundage Lane	Signal	N/A			
78. Cottonwood Road–Brundage Lane/SR 58 WB	Signal	N/A			
79. Cottonwood Road/SR 58 EB ramps	Signal	N/A			

*LOS summary based on SYNCHRO 6
N/A Existing counts not available
Source: Fehr & Peers Associates, Inc. (SYNCHRO 6 results)

Table 2-6. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions State Route 58 Eastbound

LOCATION	LANES	TYPE	AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY[1]	SPEED[1]	LOS	DENSITY[1]	SPEED[1]
SR 99 to H Street	3	Weave[2]	D	—	—	D	—	—
H Street off-ramp to Chester Ave on-ramp	2	Basic	D	29.0	63.5	D	27.0	64.3
Chester Avenue on-ramp	2	Merge	D	34.9	52.5	D	33.8	53.3
Chester Avenue to Union Avenue	2	Basic	D	34.3	60.3	D	33.7	60.7
Union Avenue off-ramp	2	Diverge	E	38.5	56.2	E	38.1	56.8
Union Avenue off-ramp to on-ramp	2	Basic	C	24.7	64.9	D	27.4	64.2
Union Avenue SB on-ramp	2	Merge	D	29.1	55.4	D	31.8	54.3
Union Avenue NB on-ramp	2	Merge	D	30.5	55.3	D	33.5	53.6
Union Avenue to Cottonwood Road	2	Basic	D	28.1	63.9	D	33.2	61.0

[1]Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.
[2]Weave section analysis was performed using the Leisch Method, which does not provide density or speed estimates.
Source: Fehr & Peers, 2010

Table 2-7. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions State Route 58 Westbound

LOCATION	LANES	TYPE	AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY[1]	SPEED[1]	LOS	DENSITY[1]	SPEED[1]
Cottonwood Road to Union Avenue	2	Basic	D	30.4	62.8	D	26.9	64.4
Brundage Lane off-ramp	2	Diverge	E	35.7	50.9	D	32.7	51.3
Brundage Lane off-ramp to on-ramp	2	Basic	C	24.8	64.9	C	23.6	65.0
Brundage Lane on-ramp	2	Merge	D	29.4	55.3	D	28.5	55.6
Union Avenue SB on-ramp	2	Merge	D	31.3	54.4	D	31.0	54.5
Chester Avenue off-ramp	2	Diverge	E	35.2	57.0	E	35.0	57.1
Chester Ave off-ramp to H Street on-ramp	2	Basic	C	24.7	64.9	C	24.8	64.9
H Street on-ramp	2	Merge	D	29.8	55.5	D	31.0	55.0
H Street to SR 99	2	Basic	D	27.9	64.0	D	29.4	63.3
SR 99 NB off-ramp	2	Diverge	D	33.6	58.2	D	34.8	58.4
SR 99 NB off-ramp to SB off-ramp	2	Basic	B	17.0	65.0	C	18.6	65.0
SR 99 SB off-ramp	2	Diverge	C	22.2	49.9	C	24.1	49.5

[1] Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.

Source: Fehr & Peers, 2010

Table 2-8. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions State Route 99 Northbound

LOCATION	LANES	TYPE	AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY[1]	SPEED[1]	LOS	DENSITY[1]	SPEED[1]
Panama Lane to White Lane	3	Basic	C	21.9	65.0	B	15.1	65.0
White Lane off-ramp	3	Diverge	C	27.3	61.2	C	21.0	60.8
White Lane off-ramp to on-ramp	3	Basic	C	20.6	65.0	B	13.1	65.0
White Lane EB on-ramp Loop	3	Merge	E	35.6	53.9	C	25.0	58.1
White Lane WB on-ramp	3	Merge	E	35.3	54.0	C	23.9	58.6
White Lane to Ming Avenue	3	Basic	D	34.9	59.8	C	21.5	65.0
Ming Avenue off-ramp	4	Diverge	C	27.6	59.4	C	20.4	59.6
Ming Avenue off-ramp to on-ramp	4	Basic	C	22.8	65.0	B	14.6	65.0
Ming Avenue on-ramp	4	Merge	D	31.2	57.3	C	24.0	59.5
SR 58 off-ramp	4	Diverge	E	40.6	61.4	D	30.0	62.4
SR 58 off-ramp to Wible Road on-ramp	4	Basic	C	21.0	65.0	B	13.6	65.0
Wible Road on-ramp	4	Merge	C	23.3	59.0	B	17.7	60.2
SR 58 on-ramp	4	Merge	D	31.1	57.4	C	24.8	59.4
SR 58 to California Avenue	4	Basic	D	28.8	63.6	C	20.9	65.0
California Avenue off-ramp	4	Diverge	E	36.7	60.9	C	27.0	62.4
California Avenue off-ramp to on-ramp	4	Basic	C	23.4	65.0	B	18.0	65.0
California Avenue EB on-ramp	4	Merge	C	25.3	58.5	C	22.2	59.4
California Avenue WB on-ramp	4	Merge	C	24.8	58.5	C	21.4	59.5
California Avenue to Rosedale Highway	4	Basic	D	26.5	64.5	C	22.1	65.0
Rosedale Highway off-ramp	4	Diverge	E	38.2	59.5	D	34.3	59.2
Buck Owens Boulevard off-ramp	4	Diverge	C	26.3	57.7	B	18.9	59.9

Table 2-8. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions State Route 99 Northbound *(continued)*

LOCATION	LANES	TYPE	AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY[1]	SPEED[1]	LOS	DENSITY[1]	SPEED[1]
Buck Owens Boulevard off-ramp to on-ramp	4	Basic	B	16.5	65.0	B	13.6	65.0
Buck Owens Boulevard on-ramp	4	Merge	B	18.6	60.0	B	17.8	60.2
Airport Drive off-ramp	4	Diverge	C	27.9	59.2	C	23.8	60.3
Airport Drive to Golden State Avenue	3	Basic	B	14.4	65.0	B	14.2	65.0

[1]Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.

Source: Fehr & Peers, 2010

Table 2-9. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions State Route 99 Southbound

LOCATION	LANES	TYPE	AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY[1]	SPEED[1]	LOS	DENSITY[1]	SPEED[1]
Golden State Avenue to Airport Drive	3	Basic	C	19.8	65.0	C	19.7	65.0
Airport Drive on-ramp	4	Merge	C	23.9	59.5	D	29.2	58.1
Airport Drive to Rosedale Highway	4	Basic	C	19.4	65.0	C	22.6	65.0
Rosedale Highway off-ramp	4	Diverge	C	25.4	62.6	D	28.5	62.4
Rosedale Highway off-ramp to on-ramp	4	Basic	B	16.7	65.0	C	19.7	65.0
Rosedale Highway WB on-ramp	4	Merge	C	21.9	59.5	D	28.9	57.9
Rosedale Highway EB on-ramp	4	Merge	C	25.9	58.9	D	32.4	56.6
Rosedale Highway to California Avenue	4	Basic	C	23.4	65.0	D	30.5	62.7
California Avenue off-ramp	4	Diverge	D	31.8	61.2	E	37.1	61.1
California Avenue off-ramp to on-ramp	4	Basic	C	18.7	65.0	C	25.2	64.8
California Avenue on-ramp	4	Merge	C	20.4	59.6	D	29.9	57.4
California Avenue to SR 58	4	Basic	C	20.0	65.0	D	29.4	63.3
SR 58 off-ramp	4	Diverge	D	31.0	61.9	F	—	—
SR 58 off-ramp to on-ramp	4	Basic	B	13.2	65.0	C	20.1	65.0
SR 58 on-ramp	4	Merge	C	20.5	59.8	C	27.3	58.2
Real Road on-ramp	4	Merge	B	18.3	60.1	C	24.6	58.6
Ming Avenue off-ramp	4	Diverge	C	24.7	62.1	E	36.2	60.0
Ming Avenue off-ramp to on-ramp	4	Basic	B	14.8	65.0	C	19.5	65.0
Ming Avenue on-ramp	3	Merge	C	22.0	58.9	D	29.3	57.0
Ming Avenue to White Lane	3	Basic	C	21.4	65.0	D	30.6	62.6
White Lane off-ramp	3	Diverge	B	15.1	59.1	C	24.7	57.3
White Lane off-ramp to on-ramp	3	Basic	B	13.5	65.0	B	17.7	65.0
White Lane WB on-ramp	3	Merge	B	16.1	59.6	C	20.1	58.9
White Lane EB on-ramp	3	Merge	B	16.2	59.8	C	20.0	59.2
White Lane to Panama Lane	3	Basic	B	14.7	65.0	C	19.1	65.0

[1]Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.

Source: Fehr & Peers, 2010

In addition, there are five study locations that operate at LOS E or F during at last one of the peak hours. They are as follows:

- White Lane eastbound on-ramp (AM peak hour)
- White Lane westbound on-ramp (AM peak hour)
- State Route 58 off-ramp (AM peak hour)
- California Avenue off-ramp (AM peak hour)
- Rosedale Highway off-ramp (AM peak hour)

The majority of the analysis locations on southbound State Route 99 operate at LOS C or better. The following locations operate at LOS D:

- Airport Drive on-ramp (PM peak hour)
- Rosedale Highway off-ramp (PM peak hour)
- Rosedale Highway westbound on-ramp (PM peak hour)
- Rosedale Highway eastbound on-ramp (PM peak hour)
- Rosedale Highway to California Avenue (PM peak hour)
- California Avenue off-ramp (AM peak hour)
- California Avenue on-ramp (PM peak hour)
- California Avenue to State Route 58 (PM peak hour)
- State Route 58 off-ramp (AM peak hour)
- Ming Avenue to White Lane (PM peak hour)

In addition, the PM peak hour has three locations with LOS E or LOS F conditions. The California Avenue off-ramp and the Ming Avenue off-ramp operate at LOS E. This condition is due to the high mainline and ramp volumes during the PM peak. The State Route 58 off-ramp operates at LOS F, as both the off-ramp volume and the mainline volume exceed their capacity in the two right lanes. According to PM peak hour field observations, slower free-flow periods were seen at the California Avenue off-ramp and the State Route 58 off-ramp. In addition, slower traffic was observed to be queued in the auxiliary lane at the White Lane off-ramp. This observation does not affect the analysis results, as the arterial operations on White Lane are the cause of the queues.

2.5 Summary of Existing Traffic Operational Conditions

Figure 2-16 illustrates the locations of existing traffic congestion, based on AM or PM level of service grades of D, E or F. The degree of congestion is color coded on the map.

Level of service C or better is the standard adopted by Bakersfield and Kern County for locally owned facilities. Level of service D is the standard which Caltrans attempts to maintain for state routes within urbanized areas. Level of service E is a standard adopted by many of the largest metropolitan areas of the state, such as the Los Angeles and San Francisco Bay Area regions. Other San Joaquin Valley cities generally seek level of service D or better.

The intersections and freeway route segments addressed by this analysis are not all inclusive for the metropolitan Bakersfield area. Rather, these locations were selected for study as they may be impacted by one or more of the build alternatives analyzed for the Centennial Corridor project

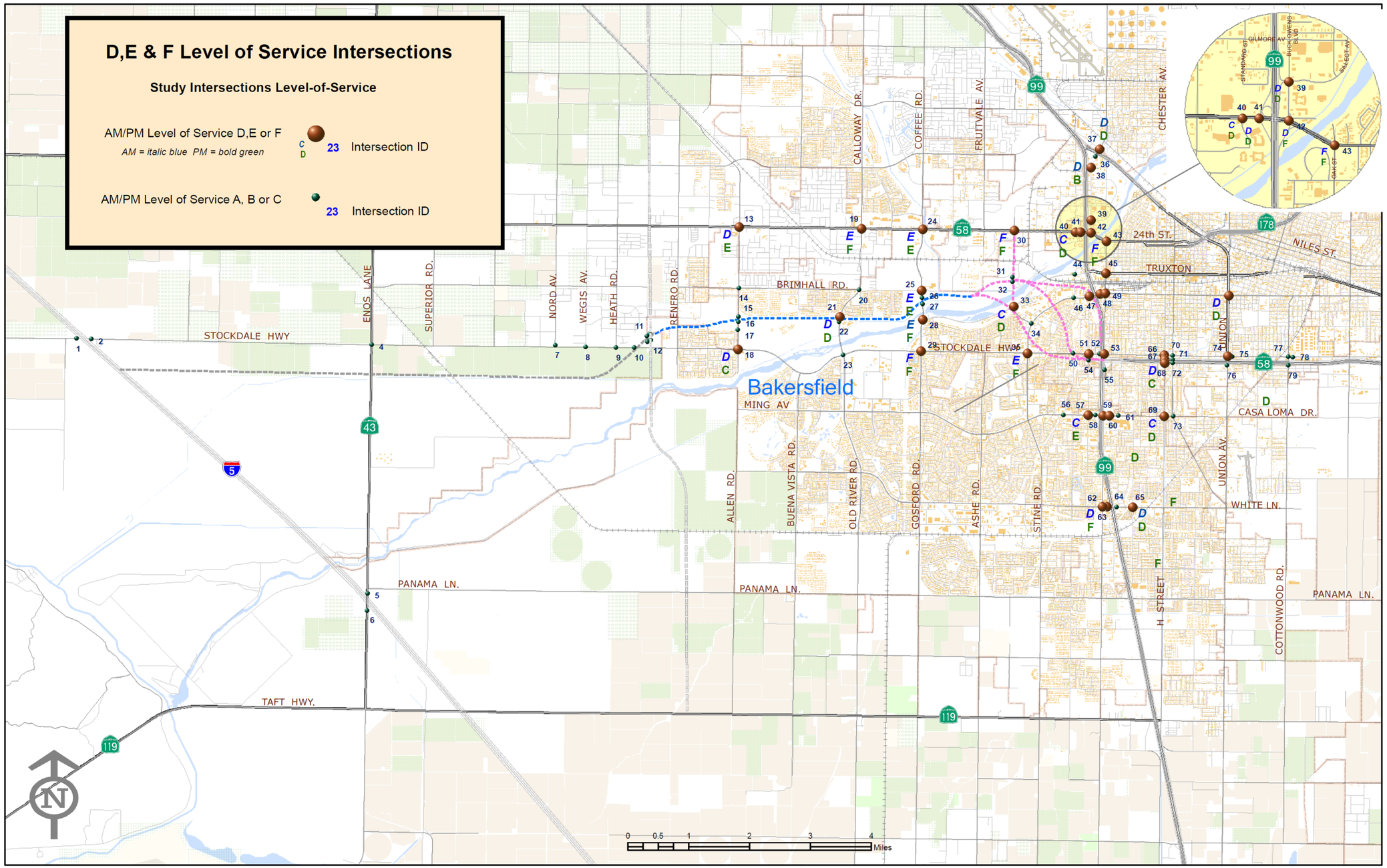


Figure 2-16: Locations of Existing Traffic Congestion

2.6 Truck Traffic in Metropolitan Bakersfield

Approximately 5,000 heavy trucks move in an east–west direction through the Bakersfield area each day, causing congestion on state highways and local arterials. This section of the *Centennial Corridor Traffic Study* report examines existing truck traffic conditions in Bakersfield and Kern County, and explains how they are part of an overall freight movement system in the San Joaquin Valley and the state of California.

Importance of Goods Movement in California, the San Joaquin Valley and Kern County

The movement of goods in the state of California is one of the most vital aspects of continued economic development. As a result of California's location on the West Coast, most of the goods and material flowing between Asia and North America must go through the state. Goods movement includes material that is distributed by trucks, ships, railroads, and airplanes.

Efficient freight transportation is also critical to the economic health of the Kern County region. As one of the prime agricultural regions in the nation, the intra-county road linkage of goods to processing plants, and the inter-county linkage of goods to other regions, manufacturers, and shipping ports are essential. Not only is Kern County a leading agricultural producer, it is also a prominent producer of oil and other minerals. These industries rely heavily on bulk movement by truck, rail and pipeline.

A key aspect of this goods movement is the travel through the San Joaquin Valley. The valley is the geographical and population center of the state. Almost every item that is trucked through California goes through the valley at some point in its journey. In addition to the pass-through goods movement, the San Joaquin Valley produces over one-half of the fresh fruits and vegetables grown in the United States. This fresh produce must move from the fields to consumers' plates, requiring at least three trips to complete this journey.

Kern County is at the southern end of the San Joaquin Valley, strategically placed to provide convenient access to both the Los Angeles Basin and the San Francisco Bay Area. As a result, Kern County (and the San Joaquin Valley) is emerging as a significant regional center for distribution of goods and materials throughout the state and the country, providing service to coastal population centers as well as a growing internal population. In addition, the manufacturing and employment base of the San Joaquin Valley is increasing. All these factors contribute to increasing demand for freight transportation in Bakersfield and Kern County.

Trucking is the dominant mode of freight transport in Kern County, accounting for 87 percent of outbound tonnage and 81 percent of inbound tonnage (*San Joaquin Valley Goods Movement Study*, September 2000). Commodity movements by truck also indicate a strong relationship with the rest of the state with shipments to andfrom Southern California and the Bay Area, constituting the greatest percentage of total tonnage to and from the San Joaquin Valley (18 and 14 percent of the total, respectively).

Figure 2-17 illustrates commodity flows between Southern California (including Kern County) and its local, regional and national markets. The map shows freight movement that has an origin or destination in the Southern California region. The map shows the importance of goods movement throughout the length of the San Joaquin Valley to Southern California and the rest of the nation. East–west flow in this map travels predominantly along Interstates 10, 15 and 40.

Figure 2-18 illustrates commodity flows between the state of California and its local, regional and national markets. The map shows freight movement that has either an origin or destination in California and the rest of the United States. The map shows the emphasis on State Route 99 and Interstate 5 for San Joaquin Valley freight movements. It also shows the small number of potential routes from California to the rest of the nation as a result of the natural barrier created by the Sierra Nevada Mountains.

Understanding the patterns of truck traffic in the San Joaquin Valley is the first step in understanding truck traffic in Kern County. The San Joaquin Valley Regional Goods Movement Action Plan (2007) provides a comprehensive view of freight movement in the valley. The main factors influencing freight movement in the valley are as follows.

- Largest agricultural region in the world (more than $20 billion in agricultural goods annually)
- Centralized location ideal for shipping and distribution facilities
- Prominent producer of oil and other minerals
- Widely dispersed cities with low densities located along State Route 99
- Numerous transportation systems including streets, highways, rail, ports and intermodal transfer facilities
- Limited east–west highways concentrate freight on a small number of state highways.

The following statistics indicate the significance of freight traffic in the valley.

- Truck traffic in Kern County accounts for 27 percent of the total traffic; in Stanislaus County, truck traffic is 19 percent of total traffic. The statewide average for truck volume is 9 percent by roadway segment.
- In 1992, truck vehicle miles traveled in the San Joaquin Valley accounted for 19 percent of all statewide vehicle miles traveled. This percentage grew to 28 percent by 2007 and continues to increase.
- From 1997 to 2003, truck traffic in the valley increased by 33 percent; statewide truck traffic only increased by 8 percent.
- Experts estimate that 25 to 30 percent of the truck traffic trips in the valley are through-trips of goods without an origin or destination in the valley.
- Interstate 5 has up to 30 percent trucks, depending on the location.
- Truck traffic on State Route 99 is 18 to 27 percent—two to three times the statewide average.

The east–west connectors are the most neglected part of the valley's transportation network. The lack of an efficient east–west route through Bakersfield has caused a dispersed system of inadequate highways, which has strained the transportation network.

The San Joaquin Valley is one of four priority regions and corridors identified by the state of California.

1. Los Angeles/Inland Empire region
2. Central Valley region
3. San Diego/border region
4. San Francisco Bay Area region.

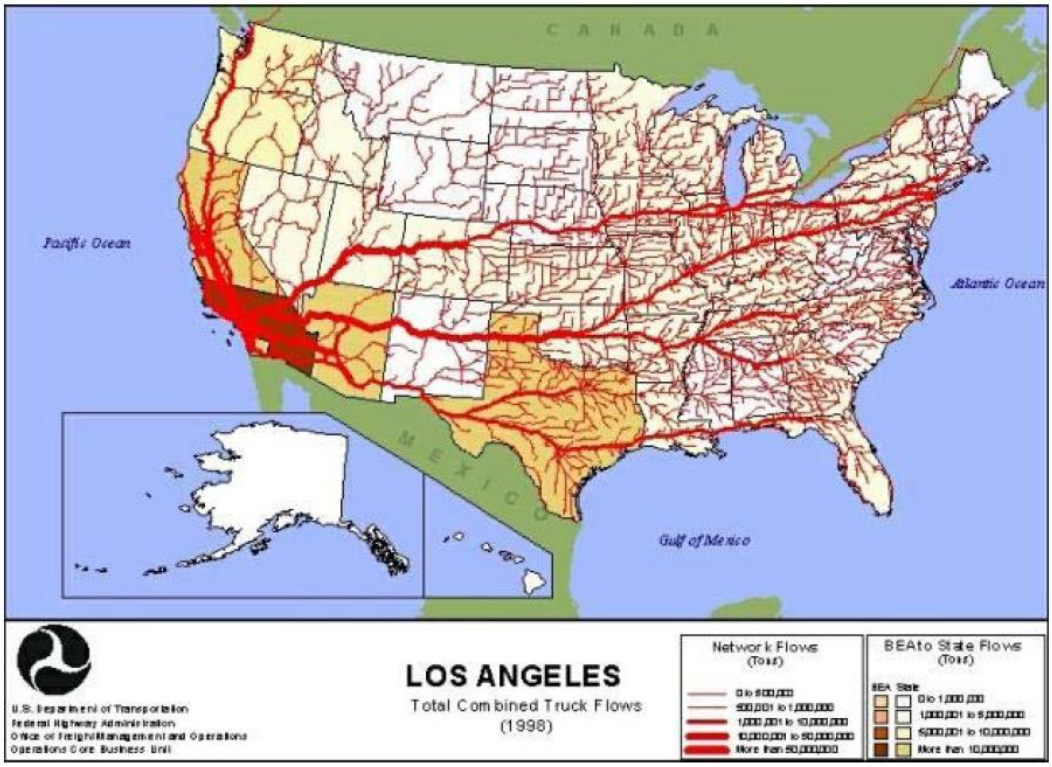


Figure 2-17: Los Angeles Total Combined Truck Flows—1998

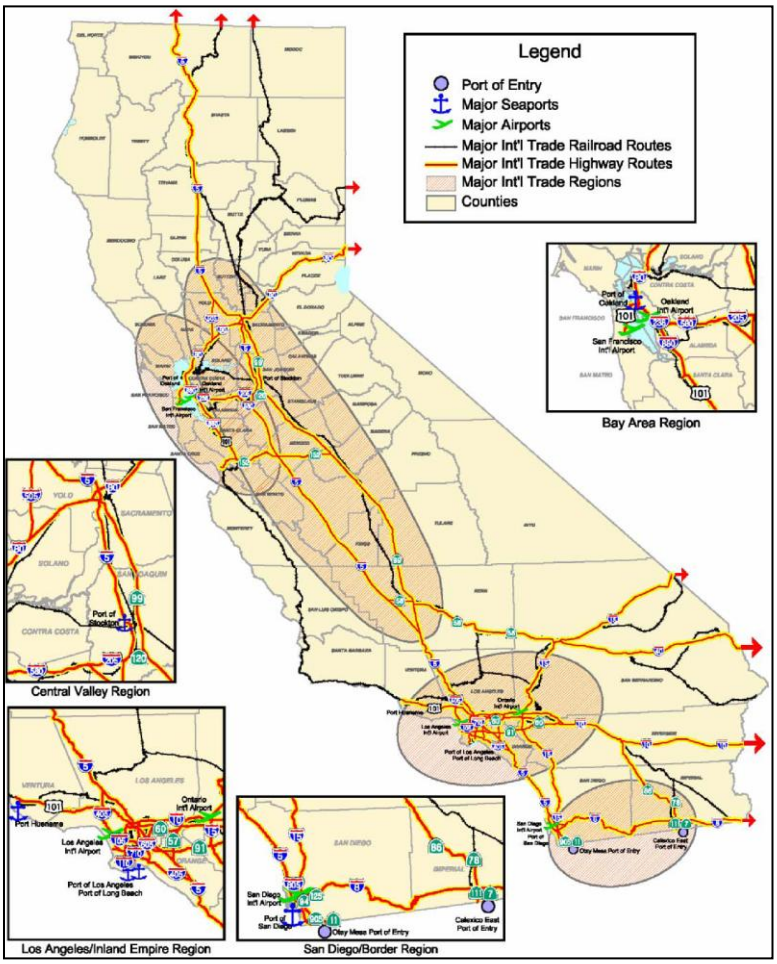
Figure 2-18: California Total Combined Truck Flows—1998

The map in Figure 2-19 illustrates these regions/corridors, which are identified in the *California Goods Movement Action Plan* (2005, 2007). The plan also contains a detailed list of projects that are proposed to improve the freight movement network in California.

Freight Movement of Agricultural Products

Freight movement consists of three distinct markets:

1. Regional and local distribution
2. Domestic trade and national distribution
3. International trade.



Source: California Goods Movement Action Plan (2007)

Figure 2-19: Priority Regions and Corridors

Crops growing in the fields require a substantial number of trips before they arrive on our plates for consumption. Agricultural activities generate three phases of collection and distribution.

- Agricultural field to preparation facility
- Preparation facility to distribution facility
- Distribution facility to market.

Kern County ranks fourth in the state with an annual agricultural production value of $3.6 billion. Six of the top seven agricultural counties in the state of California are in the San Joaquin Valley, producing $19.8 billion of agricultural products in 2009. Table 2-10 lists the top 10 agricultural counties for 2008 and 2009, with the crop value and leading commodities. Table 2-11 lists the top 20 agricultural commodities in Kern County for 2009.

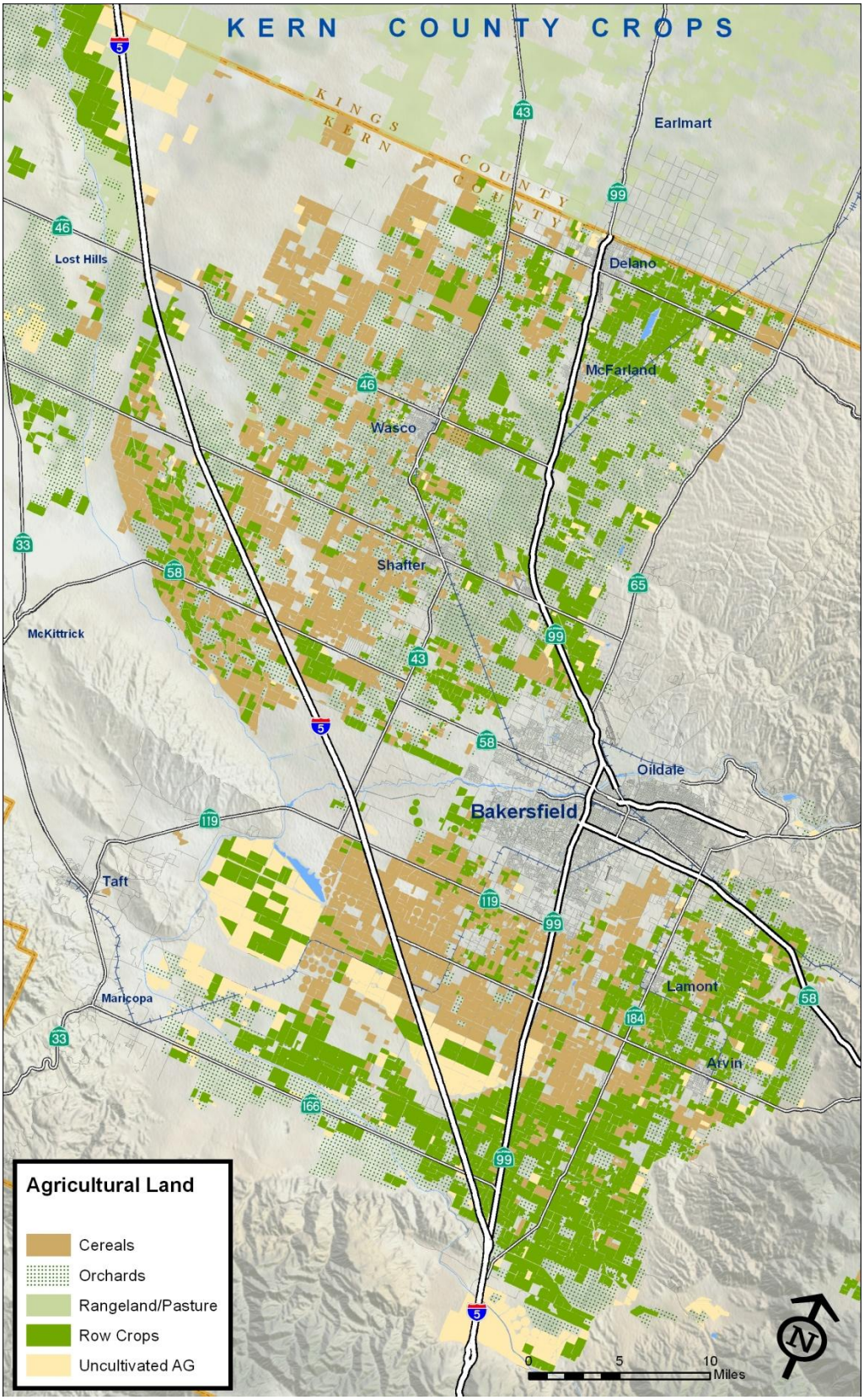
Agricultural crops occupy a large amount of land in Kern County. Figure 2-20 illustrates the types of agricultural land in the valley section of Kern County: cereals, orchards, rangeland/pasture, row crops and uncultivated agricultural land. Most of the land in this area is used for some type of agriculture.

Table 2-10. Top 10 California Agricultural Counties for 2008 and 2009
(with Crop Value and Leading Commodities)

RANK		COUNTY	TOTAL VALUE (thousands)	LEADING COMMODITIES
2008	2009			
1	1	Fresno	5,372,009	Grapes, tomatoes, poultry, almonds, cattle and calves
2	2	Tulare	4,046,355	Milk, oranges, grapes, cattle and calves, corn
4	3	Monterey	4,033,718	Lettuce, strawberries, nursery, broccoli, grapes
3	4	Kern	3,606,356	Grapes, milk, vegetables, almonds, pistachios
5	5	Merced	2,460,474	Milk, chickens, almonds, cattle and calves, sweet potatoes
6	6	Stanislaus	2,310,071	Milk, almonds, chickens, cattle and calves, tomatoes
7	7	San Joaquin	2,000,474	Grapes, milk, cherries, tomatoes, walnuts
10	8	Ventura	1,621,575	Strawberries, nursery stock, celery, raspberries, lemons
11	9	San Diego	1,548,124	Woody ornamentals, flowers and foliage, bedding plants, avocados, tomatoes
9	10	Imperial	1,452,970	Lettuce, cattle, wheat, alfalfa, broccoli

Table 2-11. Kern County Top 20 Agricultural Commodities (Year 2009)

RANK	COMMODITY	VALUE ($)
1	Grapes—all	664,499,000
2	Milk—market and manufacturing	437,610,000
3	Almonds, including by-products	435,305,000
4	Carrots—fresh and processing	343,128,000
5	Citrus—all	332,926,000
6	Pistachios	331,120,000
7	Cattle and calves	174,216,000
8	Hay, alfalfa	106,144,000
9	Pomegranate—fresh and processing	99,018,000
10	Potatoes, all	99,926,000
11	Cotton, including processed cottonseed	63,206,000
12.	Tomatoes—fresh and processing	59,045,000
13	Silage and forage	46,001,000
14	Apiary products	41,423,000
15	Eggs	30,102,000
16	Bell pepper—fresh and processing	28,844,000
17	Wheat	27,837,000
18	Nursery fruit, nut trees and vines	27,457,000
19	Roses	27,201,000
20	Onions	26,437,000

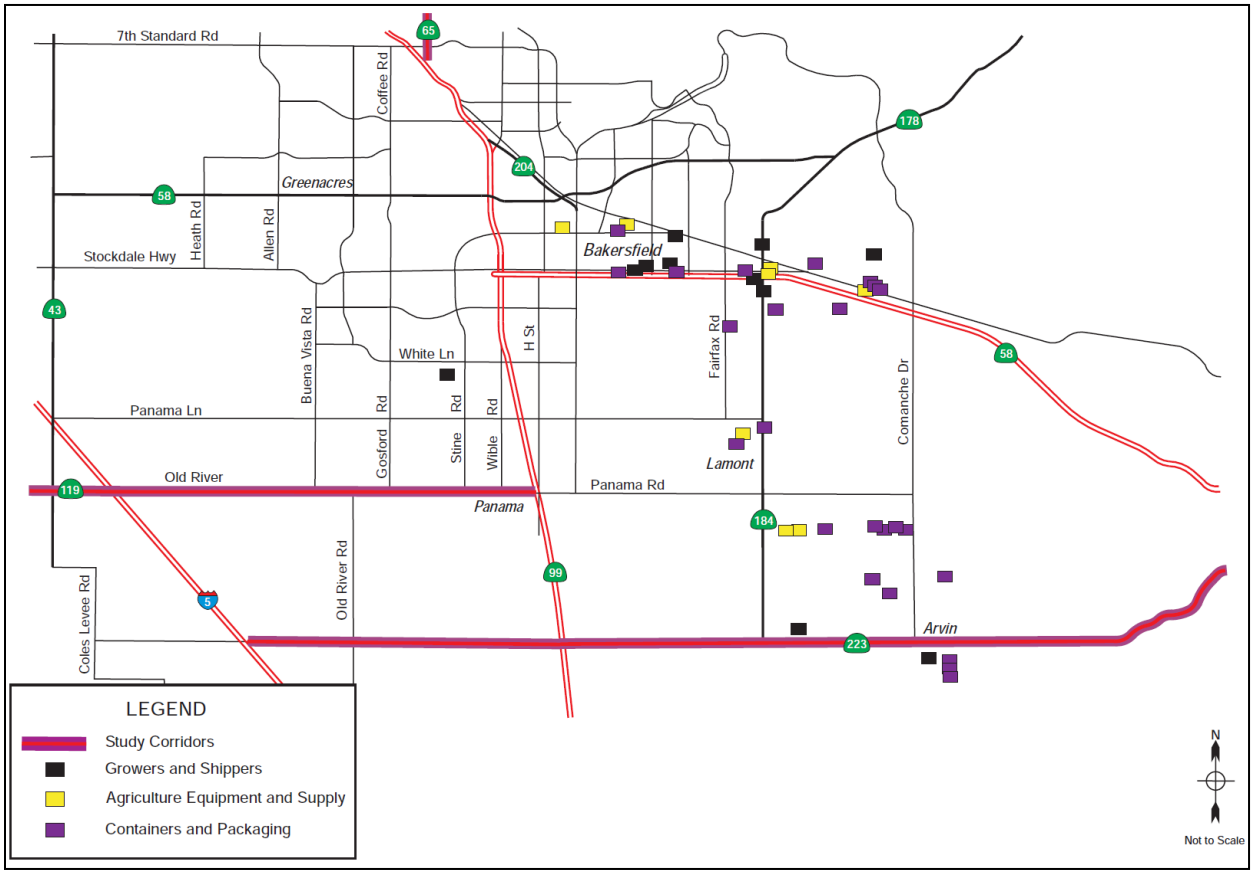


Source: Parsons

Figure 2-20: Types of Agricultural Land in Kern County

Agricultural Business and Distribution Facilities

Agricultural distribution facilities play an important part in determining the volume of truck traffic. One task of a series of truck origin and destination studies that the KOA Corporation completed under contract to the Kern Council of Governments was to locate the agricultural businesses and distribution facilities in the Bakersfield area. As Figure 2-21 shows, all of the agricultural businesses are located east of State Route 99, and most are located adjacent to State Route 58. There are also a number of facilities located adjacent to State Route 119 and State Route 184. These state highways provide an essential network for the collection and distribution of agricultural commodities. The substantial number of these facilities indicates the high intensity of freight traffic near the State Route 58 and State Route 99 interchange.



Source: SR-223 166, 119, 46 and 65 Origin and Destination Truck Study, KOA Corporation

Figure 2-21: Agricultural Business Locations near Bakersfield

The locations of distribution and supply facilities are shown on Figure 2-22. These facilities are used heavily by heavy trucks to distribute goods and materials within Kern County and beyond. The heavy concentration of these facilities along State Route 58 and State Route 99 indicates the importance of the state highway and local roadway network in providing access to these distribution hubs.

Source: SR-223, 166, 119, 46 and 65 Origin and Destination Truck Study, KOA Corporation

Figure 2-22: Distribution and Supply Locations near Bakersfield

Current Freight Movement Data, Studies, Reports for Kern County

Over the past ten years, a number of agencies have taken the initiative to study and better understand truck movement in the region. The State of California, regional transportation agencies in the San Joaquin Valley and the Kern Council of Governments have completed more than 20 truck travel and mobility studies which provide information and data that pertain to the current understanding of the issue. The identified studies either provide data for the project study area or provide valuable concepts related to goods movement or lessons learned from other areas. In general, the studies provide historical and statistical information that include goods movement trends, traffic counts, level of service, and planned roadway improvements to assist in gaining a better understanding of goods movement in the region.

Since 2009, the Kern Council of Governments, in cooperation with other San Joaquin Valley regional transportation planning agencies and Caltrans, has sponsored and administered three truck origin and destination studies in and around Kern County. All three studies were conducted by KOA Corporation and their purposes are summarized below.

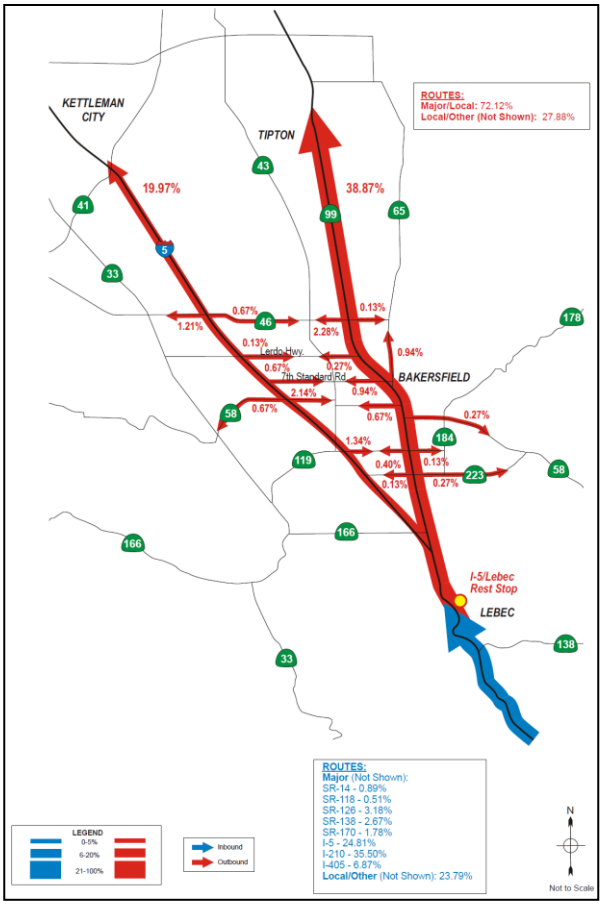
I-5/SR-99 Origin and Destination Truck Study

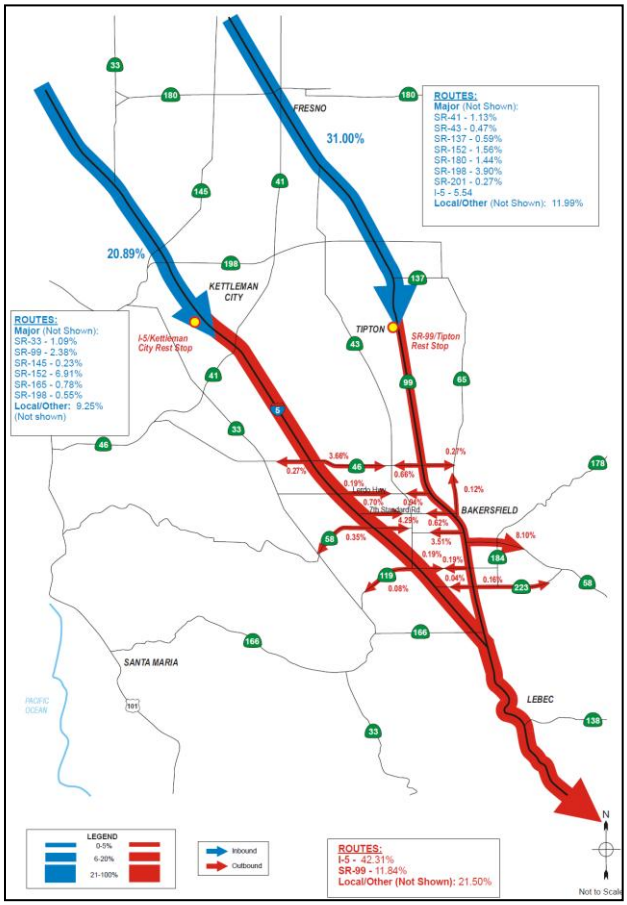
Kern COG and Caltrans, October 2009

The purpose of the study was to gain statistical information on the origin and destination of trucks traveling along Interstate 5/State Route 99 within Kern County. The study contributes to a better understanding of the directional truck distribution and types of cargo being transported in

the region for use in future planning efforts. There were three major data collection tasks involved in the project: vehicle classification counts, truck intercept surveys, and commercial fleet operator surveys during the fall and spring seasons. The project findings helped to define truck distribution patterns along Interstate 5/State Route 99 from a seasonal standpoint through the surveys and truck volume data collected. The following provides a brief description of the key findings.

- The study surveyed the different types of trucks along the Interstate 5/State Route 99 corridors. The majority of trucks (83.8 percent) are the five-axle, double-unit type.
- The study surveyed the geographic location where the trucks are based. The results showed that 70 percent were based within California, with the remaining 30 percent based in other states. Of those trucks based in California, 47 percent were based in the San Joaquin Valley region and 34 percent were based in the Southern California region.
- The survey results indicated that 83.4 percent of trucks traveling on northbound Interstate 5/State Route 99 started their trip within California and 16.6 percent started their trip from other states. Of the total trips, 49.7 percent started their trip within the Southern California region, followed by the San Joaquin Valley region at 29.8 percent.
- The survey results indicated that 15.3 percent of trucks traveling on southbound Interstate 5/State Route 99 started their trip outside of California and 84.7 percent within California. Of the total trips that originated within California, 59.2 percent started from the San Joaquin Valley region, 12.7 percent started from the Bay Area and 8.3 percent started from Greater Sacramento region.
- The results indicated that in the northbound direction (Lebec rest stop), 24.8 percent of truck drivers accessed via Interstate 5 north, 35.5 percent via Interstate 210 west and 6.9 percent via Interstate 405 north. The results indicated that in the northbound direction, the predominant route used to reach the final destination was State Route 99 north followed by Interstate 5 north. Figure 2-23 summarizes the northbound route choice pattern at the Lebec rest stop.
- The results indicated that in the southbound direction (Lebec rest stop), 15.7 percent of truck drivers accessed via Interstate 5 south and 51.4 percent via State Route 99 south. The results also indicated that in the southbound direction, Interstate 5 south was the predominate route of choice by truck drivers; and from Interstate 5, the majority route choice was split between Interstate 210 east and Interstate 405 south. Figure 2-24 summarizes the southbound route choice pattern at the Lebec rest stop.
- Truck operations are mostly local and regional. Fleets based in Kern County primarily serve Kern County origins and destinations.
- Trucks use State Route 99 much more often than Interstate 5 because origins and destinations cluster along State Route 99. Every Kern County private fleet operator interviewed was located east of Interstate 5.
- Trucks tend to use Interstate 5 to connect Kern County points with regions to the north and south (e.g., the Bay Area or the Los Angeles Basin).
- Regional trips place a burden on east–west connectors such as State Route 166, State Route 58, and State Route 46. For local trips, private fleets often use arterials or frontage roads in preference to freeways.





Source: I-5/SR-99 Origin and Destination Study, KOA Corporation

Figure 2-23: Northbound Route Choice (Lebec Rest Stop)

Figure 2-24: Southbound Route Choice (Kettleman City/Tipton Rest Stop)

SR-58 Origin and Destination Truck Study

SANBAG, Kern COG, and Caltrans District 6, 8, 9, and Headquarters, February 2009

The purpose of the study was to gain statistical information on the origin and destination of trucks traveling along State Route 58 in San Bernardino and Kern counties. The study helps provide a better understanding of the directional truck distribution and types of cargo being transported in the region for use in future planning efforts. The project tasks included literature review, vehicle classification counts, truck intercept surveys, and commercial fleet operator surveys during the fall and spring seasons. The study provided insight into seasonal truck goods movement patterns and truck volume data along State Route 58. The following provides a brief description of key study findings.

- Truck traffic along the State Route 58 Corridor is generally heaviest near the State Route 99 interchanges within Bakersfield. This is likely due to the presence of local trucks as well as regional trucks traversing the corridor and also the presence of truck-related land uses within Bakersfield.
- Between State Route 99 and Interstate 15, truck traffic makes up a relatively large percentage of total traffic. Vehicle classification count results show truck percentages range between 30 and 40 percent, depending on the segment. This is likely due to the low volume of passenger vehicles utilizing this segment of the corridor.

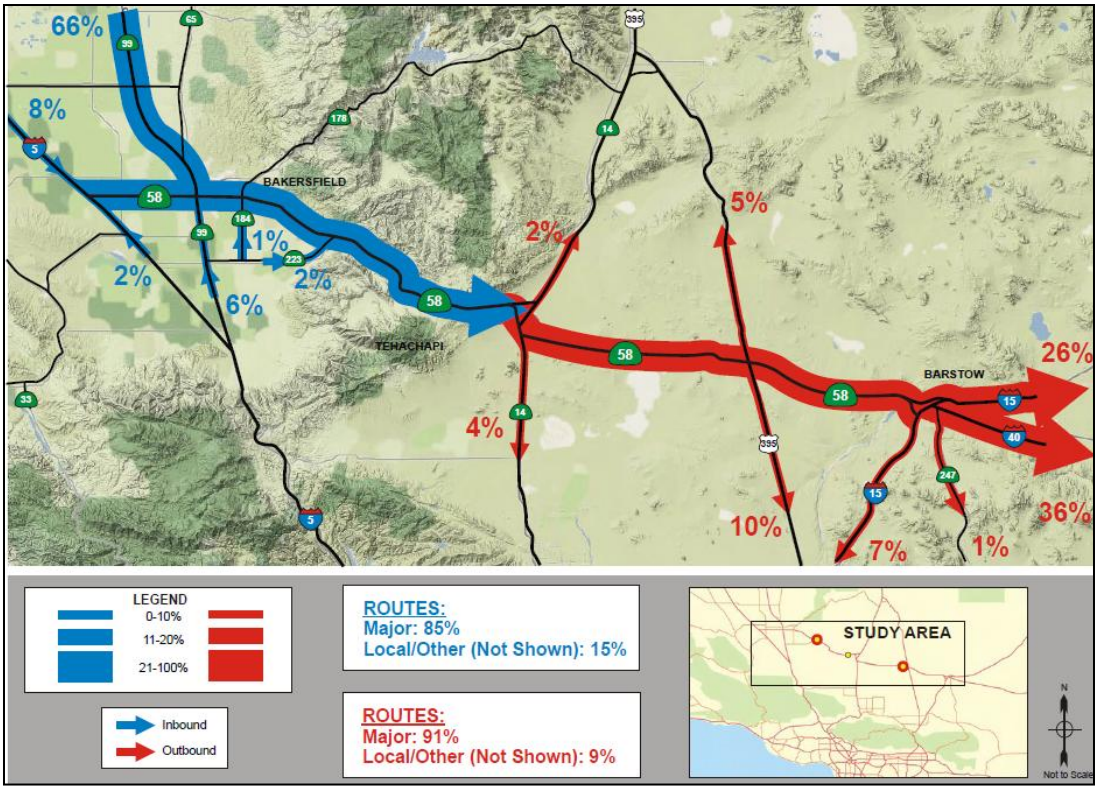
- The study surveyed the geographic location where the trucks are based. The results showed that 44 percent were based within California, with the remaining 56 percent based in other states. Of those trucks based in California, 57 percent were based in the San Joaquin Valley region and 32 percent were based in the Southern California region.
- The survey results indicated that of the total number of eastbound trucks, the majority (66 percent) used southbound State Route 99 to access State Route 58. This is consistent with the survey results which indicated that most of the trip origins were from the San Joaquin Valley and Central Coast regions. As the eastbound truck trips left the State Route 58 Corridor, the majority used eastbound Interstate 15 (26 percent) and Interstate 40 (36 percent). This pattern is also consistent with survey results which indicated that 66 percent of eastbound trips were bound for locations outside of California. The survey respondents also indicated that their route choice was based primarily on the shortest/fastest route. Figure 2-25 summarizes the eastbound route choice pattern.
- The survey results indicated that of the total number of westbound trucks, the majority used westbound Interstate 15 (26 percent) and Interstate 40 (41 percent) to access State Route 58. This is consistent with the survey results which indicated that 63 percent of westbound truck trips originated from outside of California. As the westbound trips left the State Route 58 Corridor, the majority used northbound State Route 99 (73 percent). This is also consistent with the survey results which indicated that the majority of truck trips were bound for regions located north of the State Route 58 Corridor. The survey respondents also indicated that their route choice was based primarily on the shortest/fastest route. Figure 2-26 summarizes the westbound route choice pattern.

SR-223, 166, 119, 46 and 65 Truck Origin and Destination Study

(Kern COG and Caltrans, January 2011)

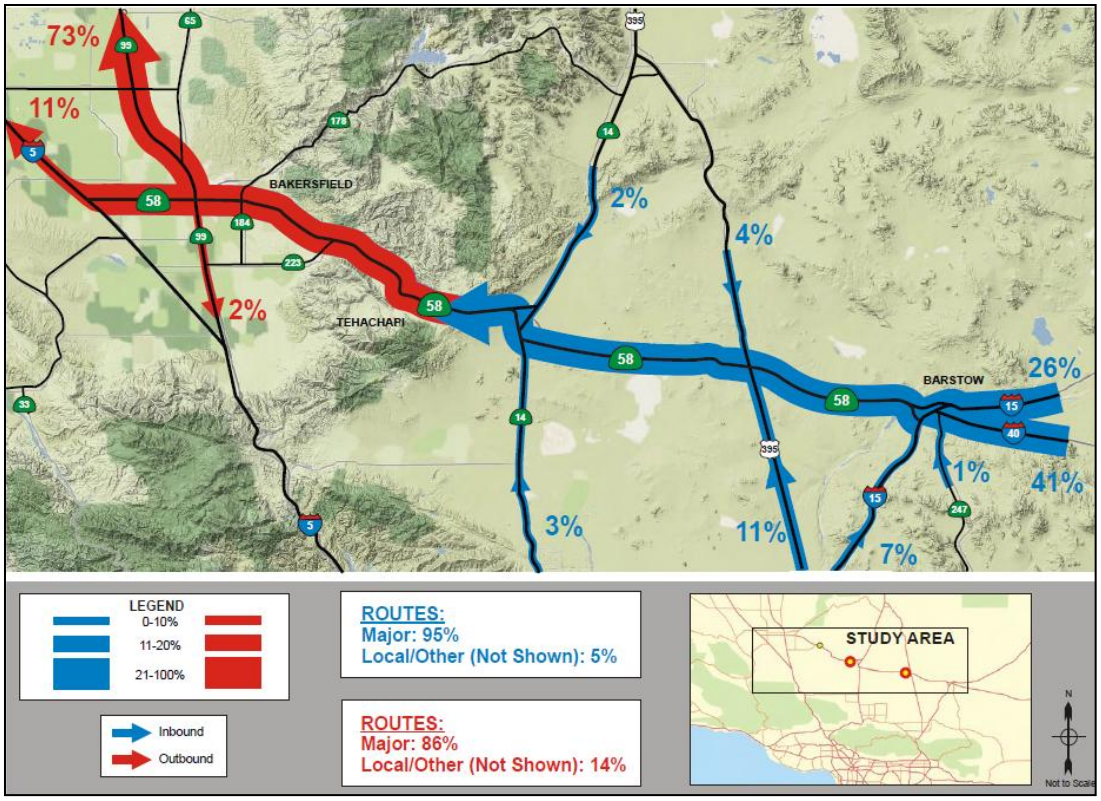
The objective of this truck study was to gain statistical information on the origin and destination of trucks traveling through Kern County on the study routes, and to better understand the types of cargo being transported by trucks. These study corridors are primarily the rural, east–west routes that serve as interregional connecters within the county. The following provides a brief description of findings.

- Of the five study routes, State Route 46 had the highest truck traffic based on the 24-hour counts and peak-period counts conducted on the route. Truck traffic along the State Route 46 corridor is generally heaviest near the Interstate 5 interchange within Lost Hills. This is likely due to the accessibility to the coast on the west and lack of significant curvilinear features of the roadway, as compared to the other study routes that have a significant number of curved segments.
- State Route 46 volumes generally had a higher proportion of trucks. Additional routes with higher truck proportions included State Route 223, State Route 166, and State Route 65. Although the total truck volumes were not as high as State Route 46 (which ranged from approximately 20 to 60 percent) on these routes, the average percentage of trucks ranged from approximately 20 to 30 percent. This is significantly higher than typical roadways, where truck volumes proportions are usually less than five percent.
- The majority of trucks (44.60 percent) were five-axle, double-unit types and the next most common were two-axle (27.16 percent) types.



Source: SR-58 Origin and Destination Truck Study, KOA Corporation

Figure 2-25: Eastbound Route Pattern on State Route 58 Corridor



Source: SR-58 Origin and Destination Truck Study, KOA Corporation

Figure 2-26: Westbound Route Pattern on State Route 58 Corridor

- Of the freight truck types identified, the majority of the truck types fell into two categories—van or hopper. The largest proportion of truck equipment types were within the freight category at 77.24 percent. The service/work category included 21.60 percent of the trucks.
- For specific freight truck types, the van and hopper were the predominant truck types observed. Overall, the van truck types had the highest proportion of trucks at 39 percent. This was followed by the hopper truck types with 26.76 percent.
- The agribusinesses surveyed tended to be clustered east of Bakersfield. The more general purpose equipment, supply, warehouse, and distribution businesses tended to be more evenly distributed across the region.
- For national trucking companies, the study routes are not normally used as trucking routes. The study routes have a higher use by local trucking companies. While they are used by regional and national carriers, central office operations staff know relatively little about the specifics of their operation using these routes unless they know of a specific movement that probably uses the route or a specific customer on or near the route.
- Truckers that primarily use the north–south routes (Interstate 5 and State Route 99) and are based beyond the study area (particularly the Los Angeles and Central Valley areas) tend to use these five routes only if they have a customer on one of the routes
- Truckers that access State Route 58 to the east primarily traverse Kern County (without stopping at local industries) and prefer to use State Route 58 when east of Bakersfield and State Route 46 when west of Kern County.
- When traveling beyond Bakersfield to either the coastal counties or points north of Kern County, truckers will use Interstate 5 or State Route 99.
- State Route 223 is often viewed as "the way to go to avoid State Route 99 at its junction with State Route 58 just south of downtown Bakersfield, particularly at rush hour" by truckers that traverse the area.
- State Route 119 and State Route 166 have large amounts of traffic related to petroleum production, which is a major component of the Taft and Maricopa area economies.
- There was relatively less agricultural traffic reported on State Route 119. The area around Taft is rather arid and much more dominated by petroleum than the rest of Kern County.
- State Route 223 is the primary route from Lamont, Arvin and Edison either to State Route 99 heading south or to State Route 58 heading east.

Truck Volumes on State Routes

Table 2-12 summarizes daily truck traffic volumes on state highways compiled by Caltrans' Division of Traffic Operations, Office of System Planning Management Traffic Data Branch for the year 2009. Annual average daily truck traffic is shown for selected locations state highways that have an east–west orientation. Truck traffic is classified by number of axles. The two-axle class includes 1½-ton trucks with dual rear tires and excludes pickups and vans with only four tires. Total vehicle annual average daily traffic (AADT) for the same year is taken from the Traffic Volumes on California State Highways booklet published by the California Department of Transportation.

Table 2-12. State Route Truck Counts *(Year 2009)*

ROUTE	POSTMILE	LEG	AADT TOTAL	TOTAL TRUCKS	TOTAL TRUCKS %	2-AXLE		3-AXLE		4-AXLE		2, 3, 4-AXLE VOLUME	5-AXLE		DESCRIPTION	YEAR VERIFIED/ ESTIMATED
						VOLUME	%	VOLUME	%	VOLUME	%		VOLUME	%		
5	0	O	69,000	16,360	23.71	3,833	23.43	636	3.89	366	2.24	4,835	11,522	70.43	Los Angeles/Kern County Line	09E
5	15.858	A	28,000	6,770	24.18	1,474	21.77	294	4.33	194	2.87	1,962	4,808	71.03	Junction Route 99 North	08E
5	15.858	B	72,000	17,410	24.18	3,494	20.07	770	4.42	486	2.79	4,750	12,660	72.72	Junction Route 99 North	08V
5	19.612	A	29,500	7,133	24.18	1,553	21.77	309	4.33	205	2.87	2,067	5,067	71.03	Junction Route 166	08E
5	38.793	A	25,000	5,443	21.77	1,185	21.77	236	4.33	156	2.87	1,577	3,866	71.03	Junction Route 119	07E
5	38.793	B	30,000	6,531	21.77	1,422	21.77	283	4.33	187	2.87	1,892	4,639	71.03	Junction Route 119	07E
5	41.193	A	27,000	5,878	21.77	1,280	21.77	255	4.33	169	2.87	1,704	4,175	71.03	Junction Route 43	07E
5	41.193	B	25,000	6,123	24.49	1,333	21.77	265	4.33	176	2.87	1,774	4,349	71.03	Junction Route 43	07E
5	52.145	A	29,000	8,831	30.45	1,545	17.5	265	3	177	2	1,987	6,844	77.5	Junction Route 58	05E
5	52.145	B	32,000	9,699	30.31	1,800	18.56	250	2.58	150	1.55	2,200	7,499	77.32	Junction Route 58	06E
5	73.017	A	31,000	9,883	31.88	1,384	14	593	6	296	3	2,273	7,610	77	Junction Route 46	05E
5	73.017	B	29,000	9,126	31.47	1,278	14	548	6	274	3	2,100	7,027	77	Junction Route 46	05E
46	20.543	A	10,500	1,986	18.91	713	35.88	79	3.99	52	2.64	844	1,142	57.49	Blackwells Corner, Junction Route 33	07E
46	20.543	B	10,500	1,986	18.91	713	35.88	79	3.99	52	2.64	844	1,142	57.49	Blackwells Corner, Junction Route 33	07V
46	32.533	A	6,100	2,379	39	404	17	167	7	95	4	666	1,713	72	Junction Route 5	03V
46	32.533	B	10,000	2,805	28.05	964	34.35	114	4.07	70	2.51	1,148	1,657	59.07	Junction Route 5	08V
46	50.904	B	8,900	3,026	34	878	29	91	3	91	3	1,060	1,967	65	Wasco, Junction Route 43 South	03E
46	51.215	A	9,600	3,264	34	947	29	98	3	98	3	1,143	2,122	65	Wasco, Junction Route 43 North	04E
46	57.785	B	7,700	3,080	40	893	29	92	3	92	3	1,077	2,002	65	Famoso, Junction Route 99	04E
58	15.41	B	300	69	23	47	68	9	13	2	3	58	11	16	Junction Route 33	03E
58	15.42	A	1,250	296	23.66	135	45.45	40	13.64	13	4.55	188	108	36.36	Junction Route 33	06V
58	23.748	A	7,000	2,240	32	1,389	62	112	5	67	3	1,568	672	30	Lokern Road	03E
58	39.96	B	6,200	1,275	20.56	517	40.54	189	14.86	52	4.05	758	517	40.54	Junction Route 43	06V
58	39.97	A	6,900	1,725	25	1,052	61	121	7	69	4	1,242	483	28	Junction Route 43	03E
58	46.1	A	28,000	7,280	26	4,950	68	510	7	291	4	5,751	1,529	21	Allen Road	03E
58	46.1	B	21,000	4,830	23	2,946	61	338	7	193	4	3,477	1,352	28	Allen Road	03E
58	51.807	B	49,500	10,890	22	7,405	68	762	7	436	4	8,603	2,287	21	Bakersfield, Real Road	03E
58	52.36	A	68,000	14,960	22	4,189	28	2,842	19	1,197	8	8,228	6,732	45	Bakersfield, South Junction Route 99	03E
58	55.404	A	65,000	16,250	25	4,875	30	1,788	11	1,625	10	8,288	7,963	49	Cottonwood Road	03E
58	59.44	A	25,000	7,845	31.38	2,224	28.35	446	5.69	156	1.99	2,826	5,019	63.98	Junction Route 184	07E
58	75.63	A	19,500	6,119	31.38	1,734	28.33	348	5.69	122	1.99	2,204	3,915	63.98	Junction Route 223	07E
58	75.63	B	19,000	5,962	31.38	1,690	28.35	339	5.69	119	1.99	2,148	3,814	63.98	Junction Route 223	07V
58	90.717	A	20,900	6,558	31.38	1,858	28.33	373	5.69	131	1.99	2,362	4,196	63.98	Junction Route 202 Southwest	07E
58	90.717	B	21,200	6,653	31.38	1,885	28.33	379	5.69	132	1.99	2,396	4,257	63.98	Junction Route 202 Southwest	07E

Table 2-12. State Route Truck Counts *(Year 2009)*

ROUTE	POSTMILE	LEG	AADT TOTAL	TOTAL TRUCKS	TOTAL TRUCKS %	2-AXLE		3-AXLE		4-AXLE		2, 3, 4-AXLE VOLUME	5-AXLE		DESCRIPTION	YEAR VERIFIED/ ESTIMATED
						VOLUME	%	VOLUME	%	VOLUME	%		VOLUME	%		
58	107.46	B	19,300	6,508	33.72	352	5.41	528	8.11	444	6.83	1,324	5,184	79.66	Randsburg Cut-Off Road	06V
58	111.13	B	14,050	4,918	35	738	15	98	2	49	1	885	4,033	82	Junction Route 14	03E
58	127.63	A	17,000	6,290	37	944	15	126	2	63	1	1,133	5,158	82	California City Boulevard	03E
99	0.748	A	44,000	11,000	25	1,650	15	660	6	330	3	2,640	8,360	76	Junction Route 5	05E
99	2.732	A	45,000	11,250	25	1,800	16	450	4	338	3	2,588	8,663	77	Mettler, Junction Route 166 West	05E
99	13.411	B	47,000	11,750	25	1,880	16	588	5	353	3	2,821	8,930	76	Junction Route 223 East	05E
99	17.5	B	54,500	13,205	24.23	3,415	25.86	647	4.9	272	2.06	4,334	8,871	67.18	Junction Route 119 West	05V
99	22.604	B	114,000	11,309	9.92	3,177	28.09	623	5.51	301	2.66	4,101	7,208	63.74	Bakersfield, Ming Avenue Interchange	08V
99	25.654	A	100,000	27,500	27.5	6,600	24	1,375	5	550	2	8,525	18,975	69	Junction Route 58 West, Junction Route 178 East	05E
99	25.654	B	132,000	27,720	21	6,930	25	1,386	5	832	3	9,148	18,572	67	Junction Route 58 West, Junction Route 178 East	05E
99	29.878	A	61,000	18,300	30	2,928	16	732	4	549	3	4,209	14,091	77	Junction Route 65	04E
99	29.878	B	78,000	23,400	30	3,744	16	936	4	702	3	5,382	18,018	77	Junction Route 65	04E
99	44.307	A	51,000	13,770	27	2,203	16	551	4	413	3	3,167	10,603	77	Junction Route 46	04E
99	44.307	B	57,000	15,960	28	2,713	17	1,436	9	958	6	5,107	10,853	68	Junction Route 46	03V
99	55.521	A	47,000	13,160	28	2,500	19	658	5	395	3	3,553	9,607	73	Delano, Junction Route 155	04E
99	55.521	B	53,000	14,840	28	2,820	19	1,929	13	445	3	5,194	9,646	65	Delano, Junction Route 155	04E
119	0	A	5,100	969	19	523	54	48	5	19	2	590	378	39	Taft, Junction Route 33	04E
119	2.14	A	7,600	1,672	22	920	55	167	10	84	5	1,171	502	30	Harrison Street	04E
119	2.14	B	5,000	1,100	22	605	55	110	10	55	5	770	330	30	Harrison Street	04E
119	18.173	B	10,600	2,332	22	1,632	70	140	6	70	3	1,842	490	21	Junction Route 43 North	04E
119	18.173	A	10,000	2,000	20	1,260	63	160	8	60	3	1,480	520	26	Junction Route 43 North	04E
119	19.773	B	10,000	1,988	19.88	1,473	74.09	220	11.05	92	4.61	1,785	204	10.25	Junction Route 5	08V
119	19.773	A	6,800	2,012	29.59	1,304	64.81	149	7.41	93	4.63	1,546	466	23.15	Junction Route 5	06E
119	31.283	B	12,500	2,625	21	1,680	64	131	5	53	2	1,864	761	29	Junction Route 99	04E
223	1.85	A	1,200	228	19	73	32	9	4	11	5	93	135	59	Junction Route 5	03E
223	10.536	B	4,700	893	19	277	31	45	5	54	6	376	518	58	Junction Route 99	03E
223	10.536	A	6,900	1,435	20.8	276	19.23	193	13.46	138	9.62	607	828	57.69	Junction Route 99	03V
223	16.014	B	6,600	1,848	28	739	40	314	17	111	6	1,164	684	37	Junction Route 184 North	03E
223	16.014	A	7,000	1,750	25	858	49	158	9	105	6	1,121	630	36	Junction Route 184 North	03E
223	20.15	B	7,200	936	13	365	39	103	11	19	2	487	449	48	Arvin, Comanche Drive	03E
223	20.15	A	10,000	1,000	10	400	40	70	7	20	2	490	510	51	Arvin, Comanche Drive	03E
223	31.92	B	1,150	441	38.33	77	17.39	48	10.87	29	6.52	154	288	65.22	Junction Route 58	06V

Source: State of California Business, Transportation and Housing Agency, Department of Transportation, Division of Traffic Operations, "2009 Annual Average Daily Truck Traffic on the California State Highway System," December 2010.

Annual average daily truck traffic is the total truck traffic volume divided by 365 days. Truck counting is done throughout the state in a program of continuous truck count sampling. The sampling includes a partial day, 24-hour, seven-day and continuous vehicle classification counts. The partial day and 24-hour counts are usually made on high volume, urban highways. The seven-day counts are made on low volume, rural highways. The counts are usually taken only once in the year. About one-sixth of the locations are counted annually. The resulting counts are adjusted to an estimate of annual average daily truck traffic by compensating for seasonal influence, weekly variation, and other variables that may be present.

The columns in Table 2-12 entitled "Year" and "Verified/Estimated" represent the year the truck percentages were verified (counted continuously or quarterly) or estimated. Selected points on a route are typically counted and the ones in between are estimated.

Each count location is identified by the post mile value corresponding to that point on the highway. The post mile values increase from the beginning of a route within a county to the next county line. The post mile values start over again at each county line. Post mile values increase usually from south to north or west to east depending on the general direction the route follows within the state. For State Route 99, the post miles run from south to north. The counts located nearest the Golden State Avenue interchange are highlighted in blue.

A leg is given for each count location and is denoted by an A (ahead leg), B (behind leg) or O (traffic volume is equal for the ahead and back legs). For traffic volumes purposes, a highway intersection or interchange has two legs. According to ascending post miles (route direction) and a post mile reference at the center of the intersection or interchange, B = back leg, A = ahead leg, and O = traffic volume is equal for the back and ahead legs.

Truck AADTs are shown as two-way traffic. Figure 2-27 illustrates the vehicle types included under each two-axle (Classes 4 and 5), three-axle (Class 6 and 50 percent of Class 8), four-axle (Class 7 and 50 percent of Class 8), and five-axle (Classes 9 through 13) count.

Relative to other state highway facilities in Kern County, truck volumes on east–west state highways between State Route 99 and Interstate 5 are very high. Figure 2-28 illustrates the magnitude of five-axle or greater truck volumes on state routes in Kern County. The 2009 Caltrans truck count report shows that every day there are 6,700 five-axle trucks on State Route 58 east of the interchange with State Route 99 (9.9 percent of the AADT) and 8,000 five-axle trucks at the interchange at Cottonwood Road (12.2 percent of the AADT.)

Heavy Truck Traffic through Bakersfield

Planning for the accommodation of heavy truck traffic traveling through Bakersfield needs to consider four types of movements.

1. Internal to internal trips
2. External to external trips
3. Internal to external trips
4. External to internal trips

Internal to internal trips have both origin and destination within the metropolitan Bakersfield area. External to external (through-trips) have both trip ends outside of the study area. Internal–external and external–internal trips have one trip end outside of Kern County.

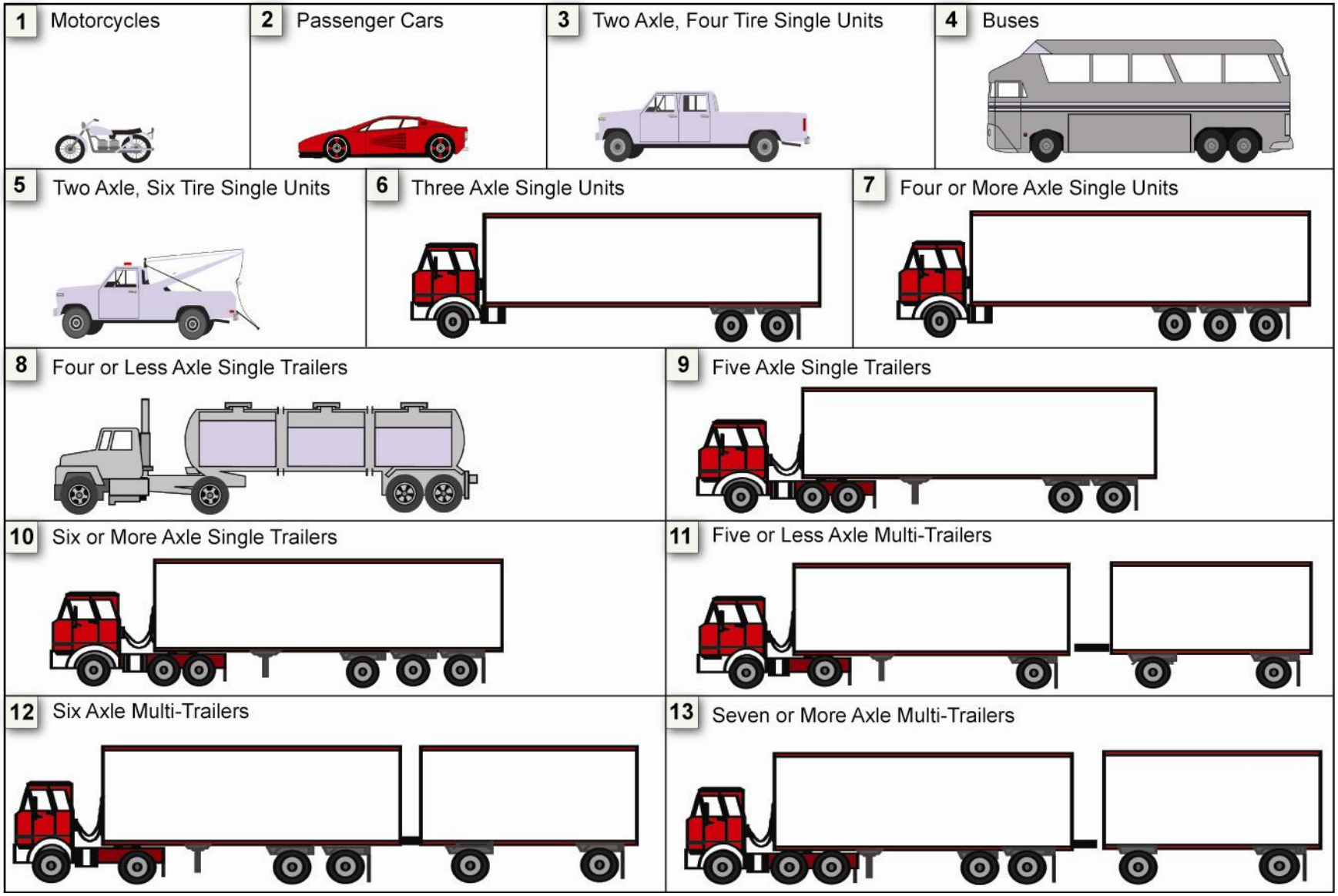


Figure 2-27: Federal Highway Administration Vehicle Classifications

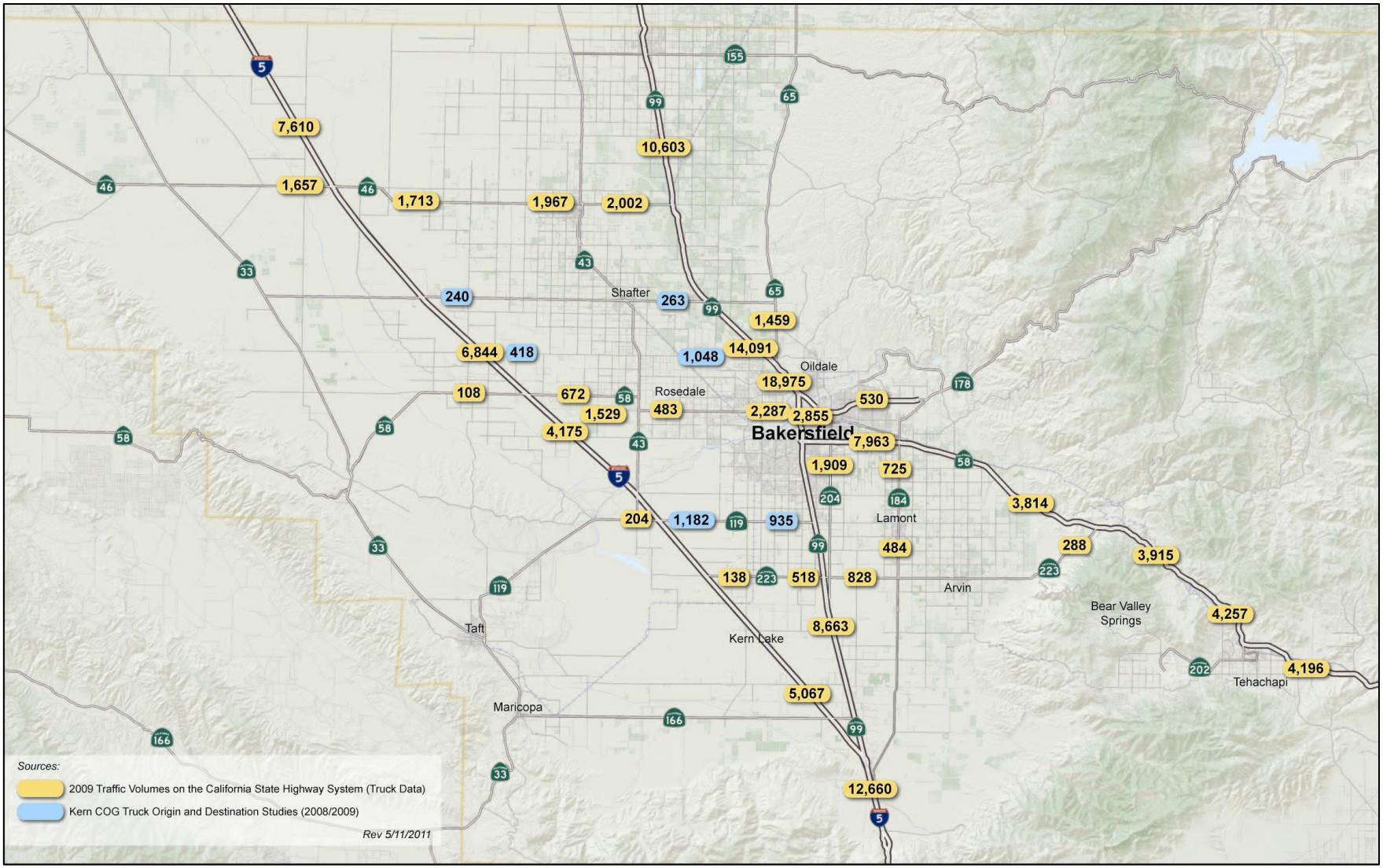


Figure 2-28: Five-Axle Truck Volumes in Metropolitan Bakersfield

Because there is no clear, unimpeded roadway allowing travel in an east–west direction through Bakersfield, traffic tends to use multiple state highways and local arterials to accomplish this task. The major east–west routes that provide direct connectivity between the major north–south routes (State Route 99 and Interstate 5), which are most likely to have truck traffic attracted to the Centennial Corridor facility are as follows: State Route 46, Lerdo Highway, 7th Standard Road, State Route 58, Stockdale Highway and State Route 119. State Route 223 is located south of the proposed Centennial project, and is not likely to contribute a significant volume of trucks to the Centennial project. By looking at the precise counts developed in the Kern Council of Governments truck origin and destination studies, one can observe a picture of the truck traffic as it passes through Bakersfield.

Table 2-13 reports traffic volumes east of Interstate 5 and west of State Route 99, divided into categories by total AADT, heavy truck traffic, and percentage of heavy trucks. By showing the existing traffic counts at these two screenlines, one notes that there are 4,690 heavy trucks east of Interstate 5 and 6,710 heavy trucks west of State Route 99. Ultimately, it is the traffic volume that is counted east of Interstate 5 that provides the most accurate estimate of the through-trip trucks traversing Bakersfield. The truck traffic counts west of State Route 99 will also include a number of heavy trucks with local destinations, usually serving large retailers or accessing distribution hubs.

Table 2-13. Vehicle and Truck Traffic East of Interstate 5 and West of State Route 99

EAST OF INTERSTATE 5			WEST OF STATE ROUTE 99		
AHEAD TOTAL AADT	HEAVY TRUCK VOLUME*	PERCENT HEAVY TRUCKS	BACK TOTAL AADT	HEAVY TRUCK VOLUME*	PERCENT HEAVY TRUCK
State Route 46					
5,830	1,820	31.2%	6,710	1,976	29.4%
Lerdo Highway					
2,103	240	11.4%	11,455	263	2.3%
7th Standard Road					
2,597	418	16.1%	10,667	1,048	9.8%
State Route 58					
7,043	851	12.1%	49,500	2,287	4.6%
Stockdale Highway					
3,649	179	4.9%	7,754	201	2.6%
State Route 119					
10,000	1,182	11.8%	10,572	935	8.8%
Total Volumes					
31,222	***4,690***	***15.0%***	***96,658***	***6,710***	***6.9%***

*5+ axle volume

Truck Traffic along Rosedale Highway (State Route 58 West)

Vehicle classification counts were conducted along Rosedale Highway in February 2008 to supplement the truck volume data compiled by Caltrans. Table 2-14 summarizes the two-way traffic count data, following the Caltrans method of vehicle classification. Weekday (Monday through Friday) daily average count data is presented.

Table 2-14. Supplemental Truck Counts on State Route 58 West (Rosedale Highway)

LOCATION TIME	ADT TOTAL	TOTAL TRUCKS	TOTAL TRUCK %	2-AXLE VOLUME	3-AXLE VOLUME	4-AXLE VOLUME	TOTAL 2-3-4-AXLE VOLUME	5+ -AXLE VOLUME	5-AXLE PERCENT OF ADT
West of Mohawk Street									
Weekday average	42,511	5,327	12.5	1,407	1,147	697	3,251	2,076	4.9
West of Calloway Drive									
Weekday average	30,708	3,263	10.6	484	680	381	1,545	1,718	5.6
West of Allen Road									
Weekday average	16,435	1,803	11.0	403	362	224	989	814	5.0
East of Enos Lane (State Route 43)									
Weekday average	7,105	1,118	15.7	287	194	133	614	504	7.1

Note: Weekday average of Monday, February 11, 2008 through Friday, February 15, 2010

2.7 Public Transit Service

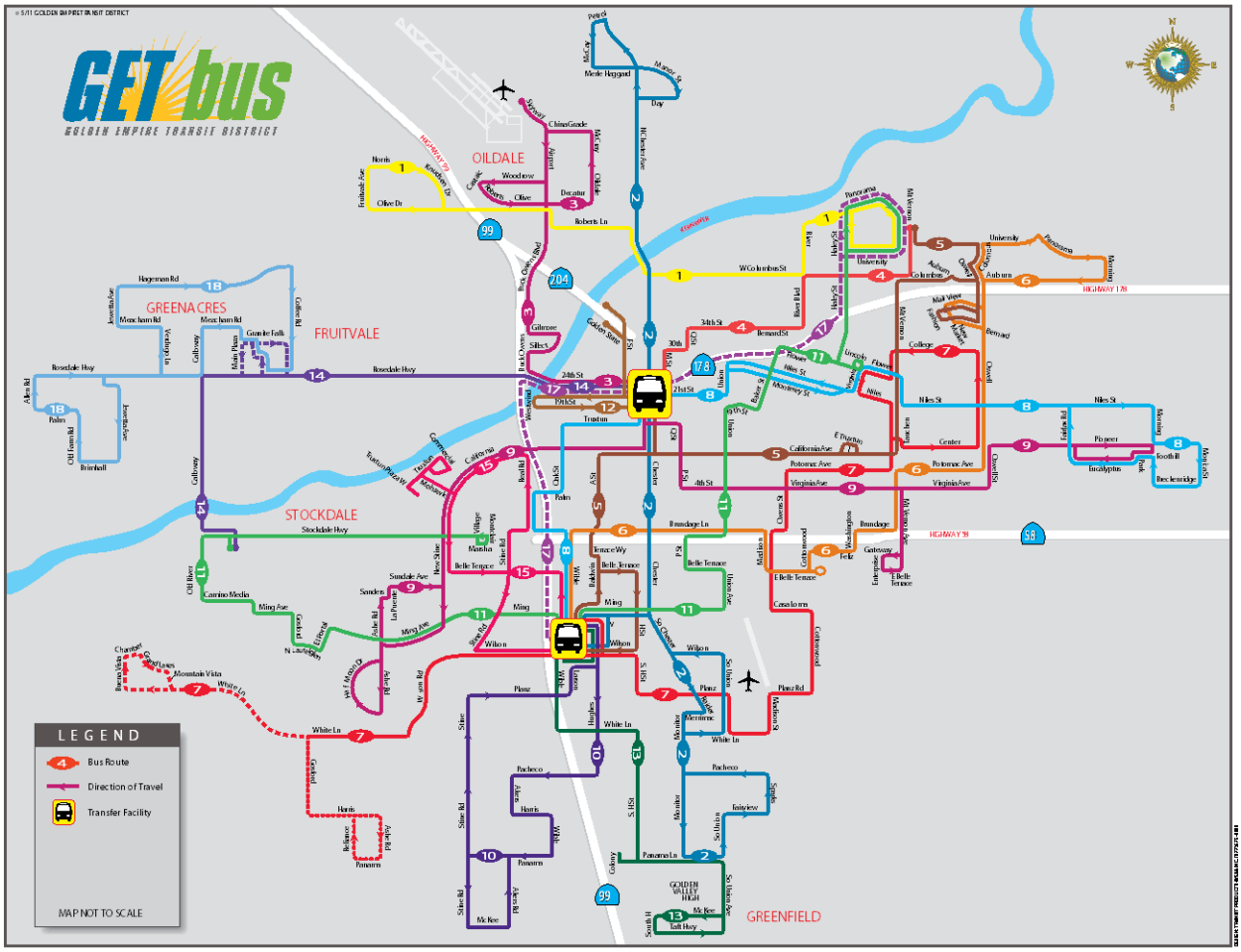
Public transit service in the Bakersfield metropolitan area is provided by the Golden Empire Transit District (GET), Kern Regional Transit Division, Amtrak and Greyhound. Four transit centers are located within the study area: the Downtown Transit Center, the Southwest Transit Center, the Bakersfield Greyhound Station and the Bakersfield Amtrak Station.

The Golden Empire Transit District provides bus service to approximately 24,000 citizens in Bakersfield each week. A recent survey conducted by GET revealed that 56 percent of their passengers have no other mode of transportation, relying almost entirely on the bus service. The bus service has more than 7 million annual boardings and travels more than 3.6 million miles per year. GET serves an area of 60 square miles with a fleet of 81 buses and 19 GET-A-Lift buses, which are fueled with clean burning, compressed natural gas. All buses are equipped with bike racks and wheelchair lifts. Figure 2-29 illustrates the GET route locations.

In addition, the Kern Regional Transit Division provides transit services to the unincorporated cities within Kern County. Some of the routes offer service between Bakersfield and the surrounding rural communities, examples of which are the intercity Buttonwillow Route between Buttonwillow and Bakersfield, and the Westside Express route between Taft and Bakersfield.

Amtrak, a nationwide rail service provider, has one route serving the study area. The Bakersfield Amtrak Station is the terminus for the San Joaquin route. AmtrakThruway is Amtrak's system of intercity coaches, locally contracted transit buses, through-ticketed local bus routes and taxi services to connect Amtrak train stations to areas not served by its railroads. In addition to providing connecting service to unserved areas, some Thruway motorcoaches operate as redundant service along well-established passenger rail corridors to add additional capacity. When normal Amtrak rail service encounters disruptions, temporary Thruway motorcoach service is established. There are seven Thruway routes that serve the study area in Bakersfield.

Greyhound is the largest provider of intercity bus transportation nationwide. It serves more than 2,300 destinations with 13,000 daily departures across North America. The Bakersfield Greyhound Station is located at 1820 18th Street.



Source: Golden Empire Transit District

Figure 2-29: Golden Empire Transit Bus Route Map

The existing transit services in the study area are:

- GET 1, 2, 3, 5, 6, 7, 8, 9, 11, 12, 14, 15, 17, 18
- Regional Transit District 8 Routes
- Amtrak Thruway 1a, 1b, 9, 10, 12, 19a, 19b
- Amtrak San Joaquin

The GET bus service provides the following route network:

- Route 1—Olive Drive/Bakersfield College
- Route 2—Chester Avenue/Oildale
- Route 3—Downtown
- Route 4—Bakersfield College/Downtown
- Route 5—Bakersfield College/Valley Plaza
- Route 6—Valley Plaza/East Hills
- Route 7—Stockdale High/Kern Medical Center
- Route 8—Foothill High/Valley Plaza
- Route 9— Foothill/Half Moon

- Route 10—Panama/Akers
- Route 11—Cal State/Bakersfield College
- Route 12—Westchester
- Route 13—Greenfield/Valley Plaza
- Route 14—Rosedale/Cal State
- Route 15— Mervyn's/Valley Plaza
- Route 17—Crosstown Express
- Route 18— Rosedale Connector
- Route 25—Replaces Routes 12 and 15 on Weekends
- Route 26—Replaces Routes 14 and 18 on Weekends

Regular fare for a single ride on GET a standard bus is $1.25; $1.50 for an express bus. Children 5 years old and under ride free when accompanied by a fare paying adult. GET-A-Lift fares are $2.50 for a single ride. Day passes are $3.00 standard; $5.00 express. Standard monthly bus passes are $36.00, or $18.00 for those qualifying for reduced rates, while Express monthly bus passes are $50.00, or $25.00 for those qualifying for reduced rates. Table 2-15 presents the bus routes and the service frequency in the study area.

Table 2-15. Golden Empire Transit Bus Service Frequency

ROUTE	WEEKDAY SERVICE FREQUENCY	WEEKEND SERVICE FREQUENCY
Route 1 Olive/Bakersfield College	40 minutes	30 minutes
Route 2 Chester Avenue/Oildale	20 minutes	30 minutes
Route 3 Downtown	30/60 minutes	60 minutes
Route 4 Bakersfield College/Downtown	20 minutes	30 minutes
Route 5 Bakersfield College/Valley Plaza	20 minutes	20 minutes
Route 6 Valley Plaza/ East Hills	60 minutes	60 minutes
Route 7 Stockdale Highway/Kern Medical Center	30/60 minutes	30 minutes
Route 8 Foothill High/Valley Plaza	30/60 minutes	30 minutes
Route 9 Foothill/Half Moon	30 minutes	30/60 minutes
Route 10 Panama/Akers	30/60 minutes	18/40 minutes
Route 11 Cal State/Bakersfield College	30/60 minutes	30 minutes
Route 12 Westchester	45 minutes	—
Route 13 Greenfield/Valley Plaza	30 minutes	30 minutes
Route 14 Rosedale/Cal State	45 minutes	—
Route 15 Mervyn's/Valley Plaza	60 minutes	—
Route 17 Crosstown Express	30 minutes	—
Route 18 Rosedale Connector	45 minutes	—
Route 25 Replaces Routes 12 and 15 on weekends	—	90 minutes
Route 26 Replaces Routes 14 and 18 on weekends		45–75 minutes

Source: Golden Empire Transit District (2011)

The Kern Regional Transit Division serves the study area with the following routes:

- Buttonwillow
- East Kern Express
- Frazier Park Express
- Lake Isabella
- Lamont-Bakersfield
- Lost Hills
- North Kern Express
- Westside Express

General public fares for the Kern Regional Transit Division buses are $1.75 per one-way ride. One child under the age of five may travel for free when accompanied by a paying adult. A one-way fare for seniors, disabled and youth (5–15) is $1.25. Table 2-16 presents the bus routes and the service frequency in the study area.

Table 2-16. Kern Regional Transit Bus Service Frequency

ROUTE	DAYS OF OPERATION	TRIPS PER DAY
Buttonwillow	Tuesday/Thursday	2
East Kern Express	Monday–Saturday	8
Frazier Park Express	Monday–Saturday	4
Lake Isabella	Monday–Saturday	4
Lamont - Bakersfield	Monday–Sunday	14
Lost Hills	Thursday/Saturday	5/3
North Kern Express	Weekdays/weekends	7/3
Westside Express	Weekdays/Saturday	5/3

Source: Kern County Roads Department (2011)

Existing intercity passenger rail service in California is provided by Amtrak on four principal corridors covering more than 1,300 linear miles and spanning almost the entire state. The existing passenger rail network in the study area includes one of these corridors, the San Joaquin Route.

The San Joaquin Amtrak Route includes two trips daily in each direction from Bakersfield to Sacramento, for a total of six daily roundtrips. The intercity route carried more than 819,000 riders in 2007 with an on-time performance of 67.9 percent. The scheduled running time between Bakersfield and Oakland averages 6 hours 9 minutes, at an average speed of 51.3 miles per hour. The maximum speed on the route is 79 mph (Caltrans, 2008).

The California State Rail Plan 2007/8–2017/18 (Caltrans, 2008) envisions an increase in service to eight daily roundtrips by 2018, carrying 1,430,000 annual riders, with 90 percent on-time performance and seeks to reduce the travel time from Bakersfield to Oakland to less than six (6) hours.

2.8 Traffic Accident Data

Tables 2-17 and 2-18 summarize the traffic accident data (from August 2007 to March 2010) compiled by the California Department of Transportation Traffic Accident Surveillance and Analysis System (TASAS) for State Route 58 and State Route 99, respectively.

Table 2-17. Accident History for State Route 58

LOCATION (STUDY AREA)	TOTAL ACCIDENTS	TOTAL FATALITIES	ACTUAL ACCIDENT RATE*			AVERAGE ACCIDENT RATE*		
			FATAL	FATAL + INJURY	TOTAL	FATAL	FATAL + INJURY	TOTAL
SR 58 (PM T52.13 to PM R55.40)	373	2	0.008	**0.41**	**1.46**	0.010	0.28	0.86

Bold and underline font indicates actual accident rates that are greater than the statewide average for similar facilities.

*The accident rate is accidents per million vehicle-miles. The fatal, fatal plus injury, and total accident rates are listed.

Source: The California Department of Transportation District 6, 2011

Table 2-18. Accident History for State Route 99

LOCATION (STUDY AREA)	TOTAL ACCIDENTS	TOTAL FATALITIES	ACTUAL ACCIDENT RATE*			AVERAGE ACCIDENT RATE*		
			FATAL	FATAL + INJURY	TOTAL	FATAL	FATAL + INJURY	TOTAL
SR 99 (PM 22.10 to PM 24.60)	533	3	0.008	**0.41**	**1.50**	0.011	0.33	1.07

Bold and underline font indicates actual accident rates that are greater than the statewide average for similar facilities.

*The accident rate is accidents per million vehicle-miles. The fatal, fatal plus injury, and total accident rates are listed.

Source: The California Department of Transportation District 6, 2011

On State Route 58, between Real Road and Cottonwood Road, there were 373 accidents (two involving fatalities). This segment of the freeway has a higher than average total accident rates when compared to similar California freeways. Approximately 64 percent of the accidents were in the westbound direction with a higher percentage of the accidents between 3:00 and 5:00 p.m. The peak accident day of the week was Thursday with 18 percent. The three highest collision types were rear end (57 percent), hit object (20 percent), and sideswipe (13 percent). Speeding (60 percent) was the highest primary collision factor, followed by improper turn (15 percent) and other violations (14 percent).

On State Route 99, between Wilson Road and California Avenue, there were 533 accidents (three involving fatalities). This segment of State Route 99 has a higher than average total accident rates when compared to similar California freeways. There were more southbound collisions (53 percent), than northbound (47 percent) on State Route 99. Approximately 43 percent of all the accidents occurred between 3:00 and 5:00 p.m. The day of the week that had the most accidents was Friday with 22 percent. The three highest collision types were rear end (60 percent), sideswipe (19 percent), and hit object (15 percent). Speeding (57 percent) was the highest primary collision factor, followed by other violations (25 percent) and improper turn (10 percent).

2.9 Bicycle Routes and Trails

Bicycle facilities are located throughout Bakersfield. The city has approximately 24 miles of bicycle paths and 79 miles of bicycle lanes. Figure 2-30 presents the bike lanes located in Bakersfield. An additional 90 miles of bicycle lanes and 43 miles of bicycle routes have been planned throughout the city. Most of the bicycle lanes are located on the south side of the Kern River along major arterials such as Stockdale Highway, Oak Street, Chester Avenue, and White Lane. Similarly, bicycle lanes on the north side of the river are located on major roadways such as Calloway Drive, Hageman Road, and Coffee Road.

The Kern River Parkway Bicycle Trail, situated along the perimeter of the Kern River on the south side, begins at the mouth of Kern Canyon near Alfred Harrell Highway in the east and extends westward more than 30 miles to Enos Lane near Interstate 5. The bicycle trail traverses a number of parks within the city such as the River Oaks Park, Yokuts Park, and Beach Park.

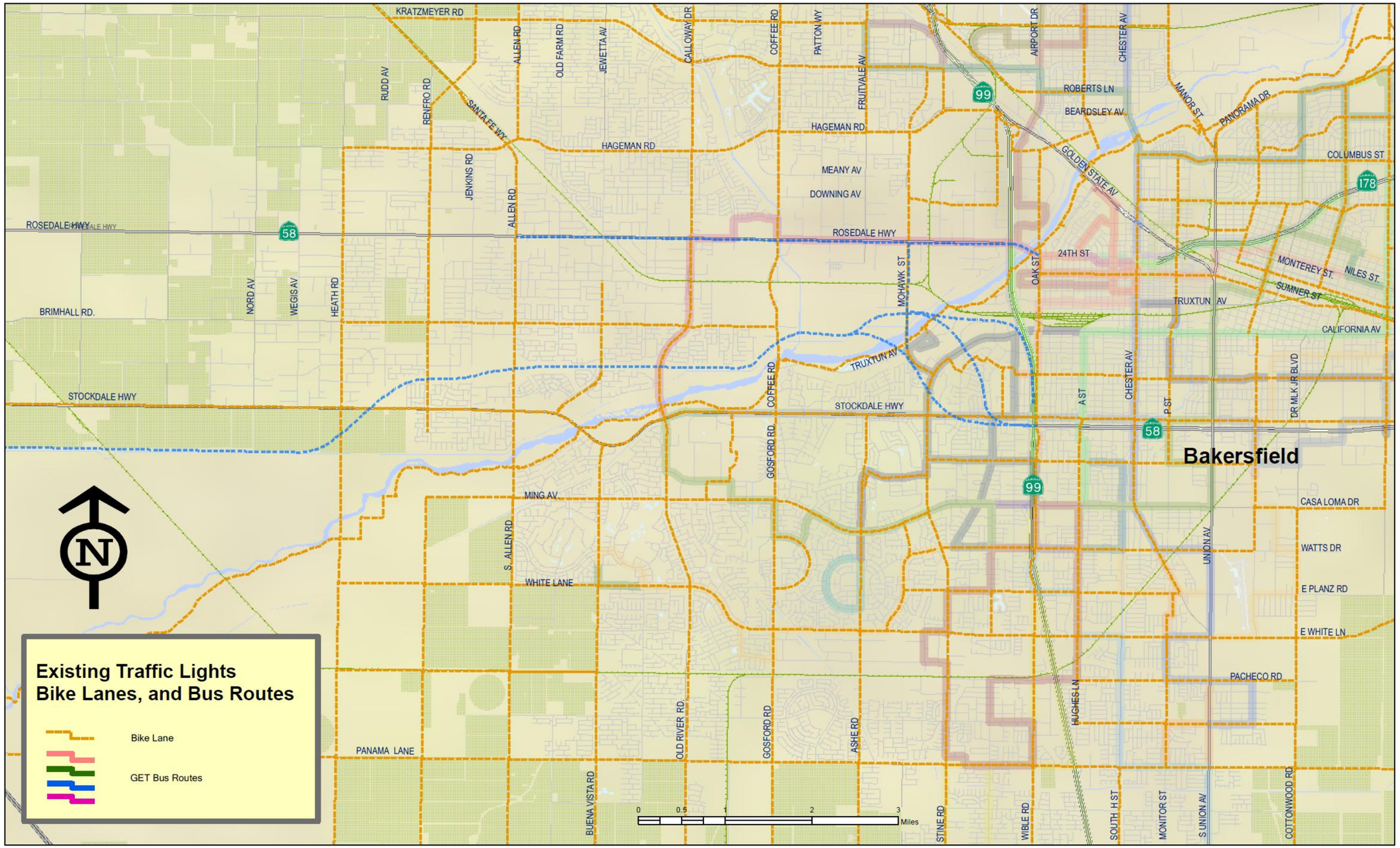


Figure 2-30: Golden Empire Transit Routes and Bicycle Lanes

CHAPTER 3. TRAFFIC VOLUME FORECAST

3.1 Travel Forecast Model

The Kern Council of Governments (Kern COG) maintains and runs a travel demand forecast model for the Kern County region. The model is used to forecast the demand for future transportation infrastructure by predicting future travel patterns based on a variety of factors including locally approved general plan land use entitlements, input from local planning departments on socio-economic growth areas, and state and federal data sources. Some of the forecast input variables include population, households, employment, school enrollment, income, traffic counts, speeds, intersection configuration, and existing or planned transportation networks.

The current Kern COG model was developed in 1998 and updated in 2007. The updated model was approved by the Kern Regional Transportation Modeling Committee in February 2008. The modeling committee provides oversight for the Kern Regional Transportation Model and consists of staff representatives from Kern COG, local entities, and California Department of Transportation (Caltrans) District 6.

The model update was a cooperative effort between Kern COG, Dowling Associates, Inc. and Parsons Transportation Group. The update to the model for Kern County uses the standard "four-step" travel modeling process. In addition to network and socio-economic demographic updates, this process consists of trip generation, trip distribution, mode choice and trip assignment. External trips have been updated using the latest 2001 Caltrans Statewide Model, and time-of-day factors have been calibrated based on new survey information. The model update was calibrated to 2006 population, employment and traffic count data, and back-checked or validated against 2003 socio-demographic data.

In late 2008/early 2009, the model was updated to reflect relatively minor refinements requested by Kern Regional Transportation Modeling Committee members. These refinements included:

- Subdivision of trip attraction rates for high, medium, and low intensity retail land use travel generators;
- Subdivision of trip attraction rates for service-office and service-warehousing land use travel generators;
- Increasing freeway ramp capacities for diamond on-ramps, from 800 vehicles per hour to 1,000 vehicles per hour, per lane;
- Increasing urban freeway free flow speeds from 55 mph to 65 mph; and
- Minor land use shifts between adjacent traffic analysis zones for future growth conditions.

These refinements, collectively known as the Kern COG 2006 Regional Travel Model (Update 1), were validated to 2006 demographic and traffic count data as discussed above. Model Update 1 was approved by the Kern Regional Transportation Modeling Committee in February 2009.

3.2 Land Use Assumptions

Population and employment projections are essential for the travel demand model to evaluate the appropriate size and location of transportation projects. The increasing population in Kern County is the most significant factor in the need to develop new transportation facilities. The demographic projections used in the model are also tied to the air quality conformity process, which must be completed before Caltrans releases state and federal highway funds for project design and construction.

It is the policy of Kern COG to revise the county growth forecast every three to five years to adjust for major changes in regional growth trends. In July 2005, the Kern COG Board considered the 2004 California Department of Finance growth forecast before adopting the Kern COG population projections. The California Department of Finance's most recent 2007 forecast indicates that the Kern County regional population would reach 1.35 million in 2030; increasing to 2.1 million by 2050. The Kern Council of Governments considered adopting new population and employment projections in 2009; however, they decided to maintain the historical trend line as reflected in the currently adopted population projections.[1]

The California Department of Finance has issued population projections for more than 40 years. Many local jurisdictions have used these estimates for planning future infrastructure needs. The California Department of Finance estimate is considered the most acceptable source for future population numbers, even though many larger jurisdictions, such as Kern COG, will use these figures only as a guideline for making their own projections.

In the late 1990's, the Caltrans, Office of Transportation Economics, sought to provide additional information with which local jurisdictions could improve the transportation planning process. In 2000, Caltrans contracted with the California Economic Forecast, Inc. to provide complete economic and population forecasts for all 58 counties up to the terminal year 2020.

In 2006, California Economic Forecast began providing projections through the terminal year 2030. As of the current March 2010 edition, the forecast horizon has been extended to 2035. As the California Economic Forecast report becomes widely known and recognized, more local jurisdictions are using these projections as an additional resource to plan for future development.

Table 3-1 presents a comparison of population projections prepared by the California Department of Finance, the California Economic Forecast report and the projections adopted by Kern COG. Figure 3-1 illustrates the California Department of Finance and Kern COG population projections in a graphic format. All of these sources point to a regular and gradual population increase, resulting in significant regional increases over the next 40 years.

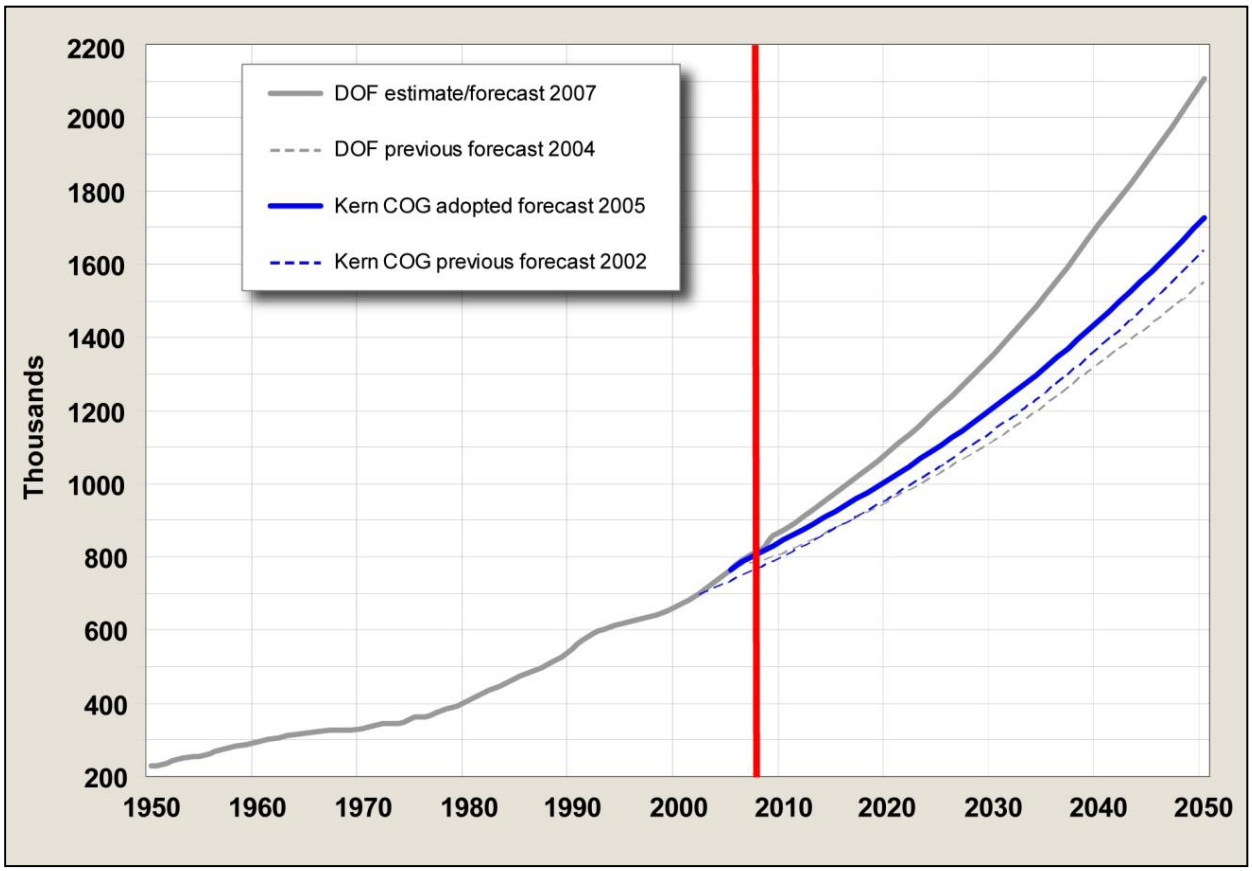
Kern COG has recently completed the planning process for transportation projects included in the regional transportation plan[2]. This process uses the population projections that the Board approved in July 2005 for determining compliance with the current San Joaquin Valley Air Quality Conformity Plan.

[1] Kern COG, *Final Regional Growth Forecast Report*, October 2009.
[2] Kern COG, *2011 Final Regional Transportation Plan*, July 15, 2010; Amendment #1, May 19, 2011.

Table 3-1. Comparison of Kern County Population Forecasts

	CA DEPARTMENT OF FINANCE[1]		CALIFORNIA ECONOMIC FORECASTS REPORT[2]					KERN COG[3]
YEAR	2004	2007	2005	2005	2007	2008	2010	2005
1995			630,300					
2000	664,694	665,519	665,367	665,373				
2005	732,800		767,764	770,424	768,928			765,600
2010	808,808	871,728	886,417	895,263	885,176	853,486	848,730	845,600
2015			1,009,368	1,036,709	1,005,806	950,991	938,042	924,533
2020	950,112	1,086,113	1,132,743	1,185,769	1,128,324	1,057,804	1,040,449	1,010,800
2025			1,255,384	1,331,953	1,241,859	1,165,153	1,148,731	1,105,094
2030	1,114,878	1,352,627		1,474,471	1,347,635	1,272,081	1,256,152	1,208,200
2035							1,367,600	1,321,000
2040	1,325,648	1,707,239						1,444,100
2050	1,549,594	2,106,024						1,726,200

Sources:
[1]California Department of Finance, Demographic Research Unit, May 2004 and July 2007
[2]California Department of Transportation, county-level economic forecast reports from 2005, 2006, 2007, 2008 and 2010 prepared by Dr. Mark Schniepp, California Economic Forecasts, Inc.
[3]Kern Council of Governments, Kern County Travel Demand Model Population Forecast, updated 2005.



Source: Kern Council of Governments *Final Regional Growth Forecast Report*, October 2009

Figure 3-1: Comparison of Kern County Population Forecasts

The travel forecast model incorporates general plan growth reflecting the Kern COG adopted population levels, which includes land development proposals pending approval. This 2035 land use scenario equates to a population of 1,321,000. Although this population estimate is less than those provided by the California Department of Finance or the California Economic Forecast report, Kern COG continues to utilize its 2005 era population projection because it most accurately reflects local and regional economic conditions.

Table 3-2 lists the distribution of population and households within Kern County, whereas Figure 3-2 illustrates the distribution of household growth within metropolitan Bakersfield between 2006 and 2035, based on the currently adopted Metropolitan Bakersfield General Plan land use map. This distribution of household growth considers all approved and pending project entitlements as of December 14, 2007 and minor shifts in housing units between adjacent traffic analysis zones as requested by the City of Bakersfield and Kern County. In general, the distribution of growth on developable lands intensifies as the proximity to central Bakersfield increases. Thus, entitled and pending entitlements along the fringes of metropolitan Bakersfield may not be fully developed by the 2035 planning horizon.

Figure 3-3 provides a corresponding distribution of metropolitan Bakersfield employment growth between 2006 and 2035. These allocations of population and employment growth were prepared by Kern COG based on local entity input, and approved by the Kern Regional Transportation Modeling Committee in February 2008 and February 2009.

Figures 3-2 and 3-3 indicate that a low proportion of household growth and a high proportion of employment growth are forecast to occur in the corridor served by the proposed Centennial Corridor project. This localized imbalance of jobs versus housing will likely place additional pressure on transportation facilities serving the westerly portion of metropolitan Bakersfield.

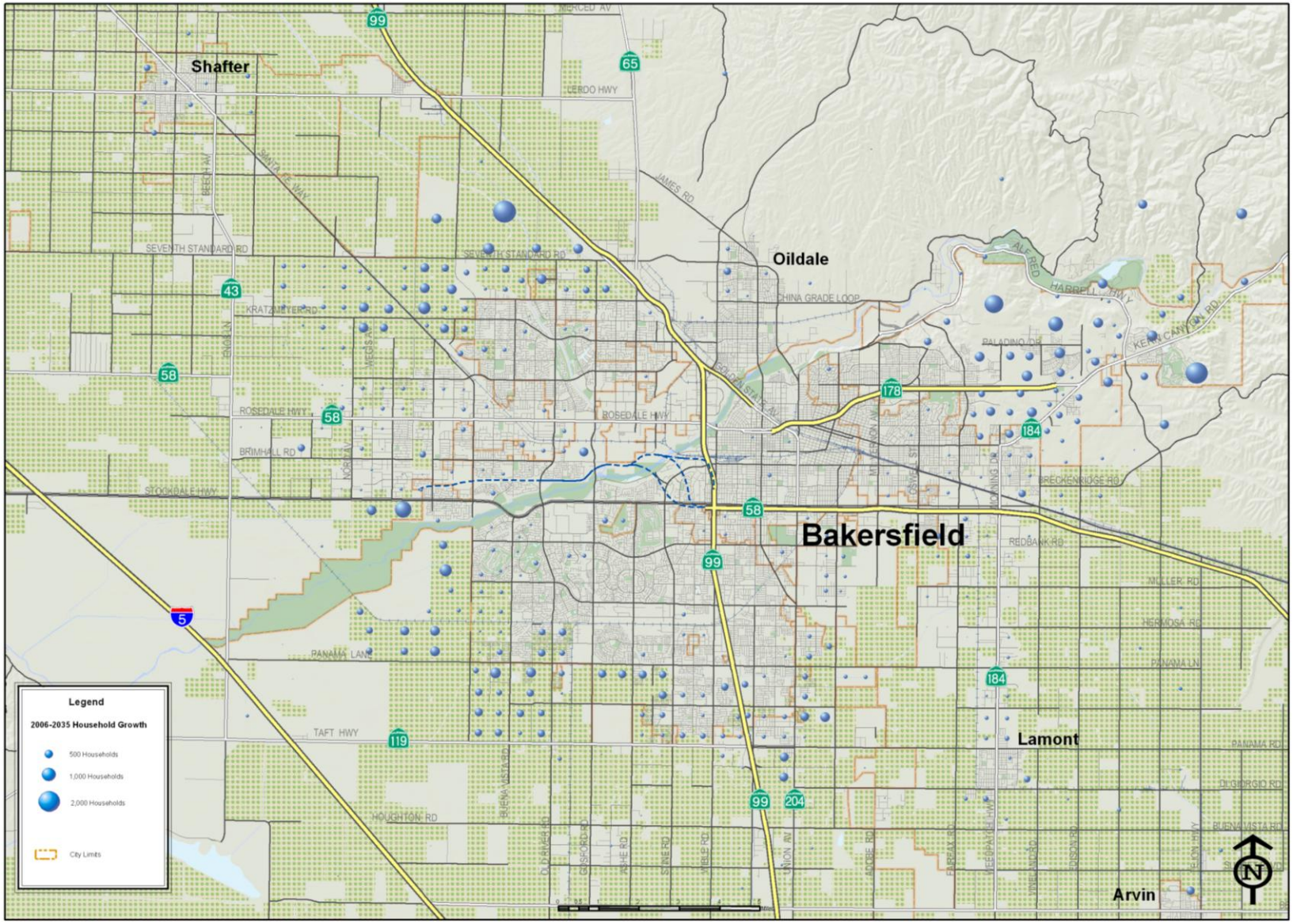
As required by Senate Bill 375, Kern COG has been working since 2009 with the Regional Modeling Committee to develop population and housing forecasts for the Sustainable Community Strategy and Regional Housing Needs Assessment. These population projections must be within 3 percent of the California Department of Finance population forecast for year 2020 and are included in the travel demand model for the *2014 Regional Transportation Plan.*

The California Department of Finance released a revised interim forecast in July 2011 that adjusts for the deviation of the previous population estimates by using the actual numbers from the United States 2010 census. California state officials have now determined that the Kern COG population projections are within the required 3 percent parameter, as the Kern COG projections are 2.97 percent below the California Department of Finance projections. Therefore, Kern COG will not be required to change its population forecast numbers for the *2014 Regional Transportation Plan.*

Table 3-2. Kern County and City Growth Trends

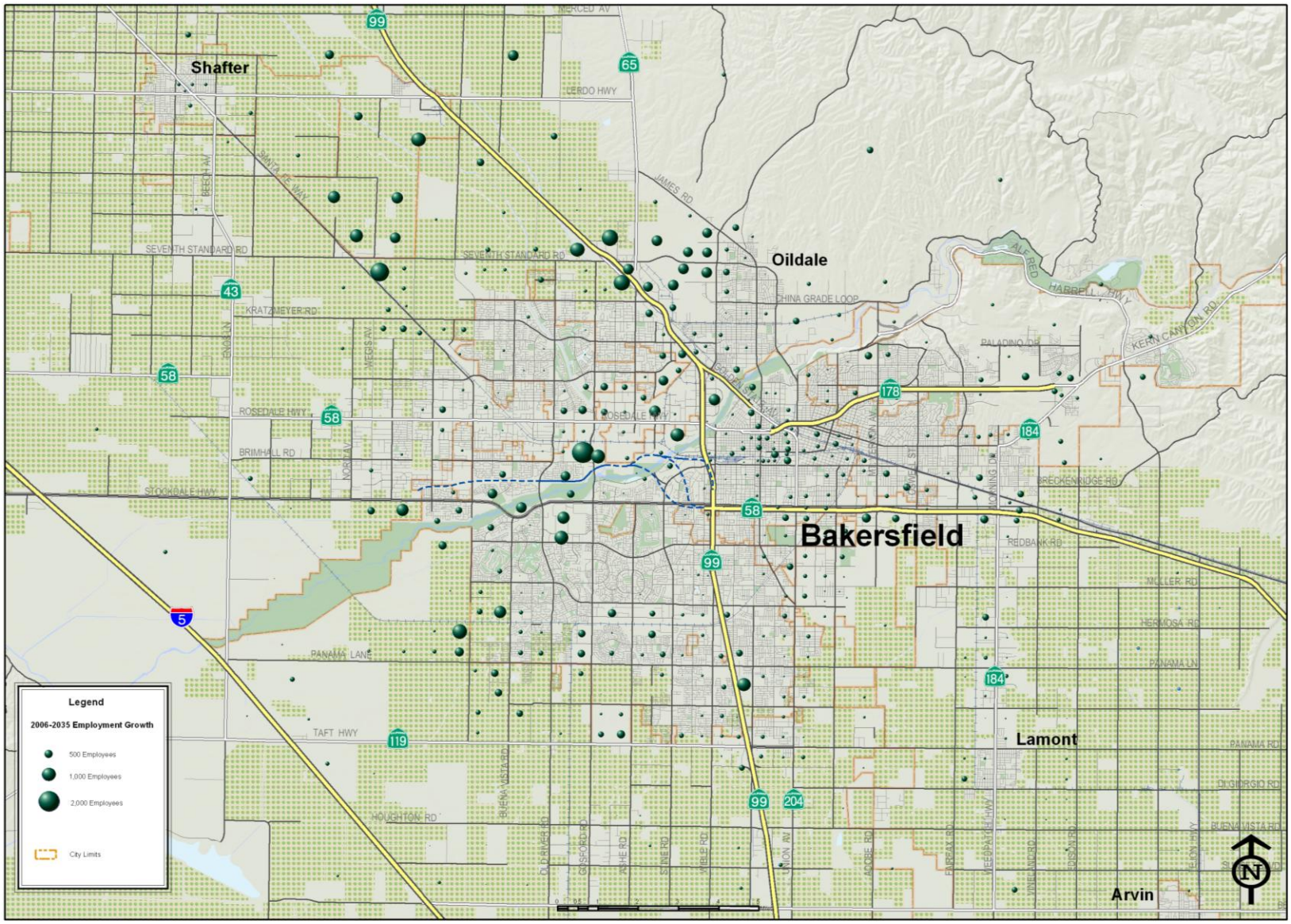
								AVERAGE ANNUAL GROWTH			
	CENSUS			FORECAST				1980–2010 HISTORIC		2010–2035 FORECAST	
YEAR	1980	1990	2000	2010	2020	2030	2035	RATE	INCREASE	RATE	INCREASE
Kern County											
Population	403,089	543,477	661,653	845,600	1,010,800	1,208,200	1,321,000	2.4%	14,750	1.8%	19,016
Households	139,881	181,480	208,655	271,327	319,200	381,600	417,200	2.2%	4,382	1.7%	5,835
Metro Bakersfield											
Population	228,000	329,100	409,800	533,461	640,536	764,941	848,487	2.8%	10,182	1.8%	12,601
Households	89,500	120,000	134,100	172,970	203,753	244,722	269,840	2.2%	2,782	1.8%	3,875
Arvin											
Population	6,863	9,286	12,956	17,100	22,800	29,100	33,400	3.0%	341	2.6%	652
Households	1,946	2,385	3,010	3,800	5,000	6,300	7,100	2.2%	62	2.5%	132
Bakersfield											
Population	105,611	174,820	246,899	341,700	437,800	541,600	609,600	3.8%	7,870	2.3%	10,716
Households	39,602	62,516	83,445	111,900	141,300	172,600	192,900	3.4%	2,410	2.2%	3,240
California City											
Population	2,743	5,955	8,385	15,300	20,600	26,700	30,700	5.6%	419	2.7%	616
Households	990	2,119	3,067	4,500	5,900	7,400	8,400	4.9%	117	2.5%	156
Delano											
Population	16,491	22,762	39,499	55,100	68,000	81,400	90,000	3.9%	1,287	1.9%	1,396
Households	4,912	6,236	8,411	10,600	12,900	15,200	16,700	2.5%	190	1.8%	244
Maricopa											
Population	946	1,193	1,111	1,150	1,250	1,340	1,400	0.6%	7	0.8%	10
Households	338	416	404	410	430	440	450	0.6%	2	0.4%	2
McFarland											
Population	5,151	7,005	9,835	13,800	17,000	20,400	22,500	3.2%	288	1.9%	348
Households	1,399	1,685	1,989	2,800	3,600	4,500	5,100	2.3%	47	2.4%	92
Ridgecrest											
Population	15,929	28,295	24,927	28,700	32,900	37,000	39,400	1.9%	426	1.3%	428
Households	5,762	10,349	9,826	11,100	12,600	14,000	14,900	2.2%	178	1.2%	152
Shafter											
Population	7,010	8,409	12,731	16,300	22,700	30,300	35,500	2.8%	310	3.1%	768
Households	2,284	2,558	3,292	4,200	6,300	8,900	10,800	2.0%	64	3.7%	264
Taft											
Population	5,316	5,902	8,811	9,300	11,600	14,000	15,500	1.8%	133	2.0%	248
Households	2,096	2,209	2,233	2,300	3,000	3,800	4,300	0.3%	7	2.5%	80
Tehachapi											
Population	4,126	5,791	11,125	14,000	18,200	22,800	25,800	4.0%	329	2.4%	472
Households	1,534	2,335	2,533	3,300	4,200	5,300	5,900	2.5%	59	2.3%	104
Wasco											
Population	9,613	12,412	21,263	26,000	33,100	40,700	45,700	3.3%	546	2.2%	788
Households	3,001	3,471	3,971	5,000	6,700	8,500	9,800	1.7%	67	2.7%	192
Unincorporated											
Population	223,290	261,647	264,111	307,150	324,850	362,860	371,500	1.1%	2,795	0.8%	2,574
Households	75,947	85,201	86,474	111,417	117,270	134,660	140,850	1.3%	1,182	0.9%	1,177

Source: Kern Council of Governments, *2011 Final Regional Transportation Plan,* July 15, 2010.



Source: Metropolitan Bakersfield General Plan

Figure 3-2: Metropolitan Bakersfield Dwelling Unit Growth from 2006 to 2035



Source: Metropolitan Bakersfield General Plan

Figure 3-3: Metropolitan Bakersfield Employment Growth from 2006 to 2035

3.3 Roadway Network Assumptions

Highway network assumptions form a critical assumption insofar as the design year base network. The planned highway system is defined by the locally approved and adopted regional transportation plan. The regional transportation plan is a long-range transportation plan covering a 20+ year time span. The most recent complete document, the *2011 Regional Transportation Plan* (2011 RTP), was regionally adopted by the Kern COG Board on July 15, 2010 and federally approved on December 14, 2010. Amendment #1 to the 2011 RTP, which revised the implementation dates of several projects, was regionally approved on May 19, 2011 and federally approved on June 2, 2011. The 2011 RTP covers the 2011 to 2035 planning horizon and accomplishes the following objectives:

- Responds to projected population and employment growth,
- Is fiscally constrained by existing and projected revenue sources and amounts, and
- Ensures that project implementation of identified projects will reach air quality compliance.

Based on the 2011 RTP, multimodal facilities will be constructed, and transportation services implemented, on a level consistent with projected funding. Funding projections are based on the assumption that current levels and sources of funding will continue throughout the planning timeframe.

The Constrained Program of Projects, a complete list of planned improvements by mode, is provided in Table 4.1 of the 2011 RTP. The Constrained Program of Projects is consistent with those projects that have been evaluated according to air quality conformity guidelines and have been found to conform to state, regional, and federal air quality requirements. The 2011 RTP also identifies an Unconstrained Program of Projects. These projects are important to the development of Kern County's transportation system, but funding has not been identified or is not available at this time. The projects listed in the Unconstrained Program of Projects are not included in the air quality conformity model.

Figure 3-4 and Table 3-3 identify the projects that are included in Amendment #1 of the 2011 RTP. Projects involving improvements to the regional network which significantly impact or complement the Centennial Corridor project are highlighted in Table 3-3. Both the Kern COG travel demand forecast model and the air quality conformity model use this regional roadway network to anticipate traffic volumes, levels of service and vehicle emission data.

Kern COG regularly updates the transportation demand model used in conjunction with the regional transportation plan by conducting the Regionally Significant Roadway Survey. Local jurisdictions respond to this survey with information about roadway capacity increasing projects planned for construction between the current time and the year 2035. These projects are incorporated into proposed updates for the regional transportation plan and other documents. This process assures that the regional transportation plan reflects local intentions and is consistent with state and federal environmental requirements.

In addition to regional roadways identified in the 2011 RTP, the location and function of local arterial and major collector streets are identified in the circulation element of the Metropolitan Bakersfield General Plan.

These local roadways are constructed as land development warrants, using funds collected by the Metropolitan Bakersfield Transportation Impact Fee Program.

The Metropolitan Bakersfield Transportation Impact Fee was originally adopted by both the City Council and the County Board of Supervisors in 1992. The impact fee is a development fee, as laid out by the State of California Government Code Section 66000 *et seq.* The fee program consists of an ordinance to implement the fee on new development, a resolution adopting the regional transportation facilities list, and a transportation impact fee schedule. When first adopted, the facilities list included only those projects which were considered too large for individual developers to fund and construct on their own. The fee program was updated in 1997 and the facilities list was expanded to include roadway segments and traffic signals.

The transportation impact fee pays for the construction of both regional and local facilities that are required to maintain a traffic level of service "C" for the metropolitan Bakersfield transportation system. Only those facilities required by new development as allowed by the Metropolitan Bakersfield General Plan are covered by this transportation impact fee program. The fee schedule and/or list of projects have since been updated in 2002, 2003 and 2009.

The Phase IV Transportation Impact Fee regional transportation facilities list and transportation impact fee schedule were adopted by the Kern County Board of Supervisors on May 19, 2009; and by the Bakersfield City Council on July 7, 2009. Elements of the transportation impact fee program are illustrated on Figure 3-5. Together, these two sets of improvements constitute the roadway network assumptions.

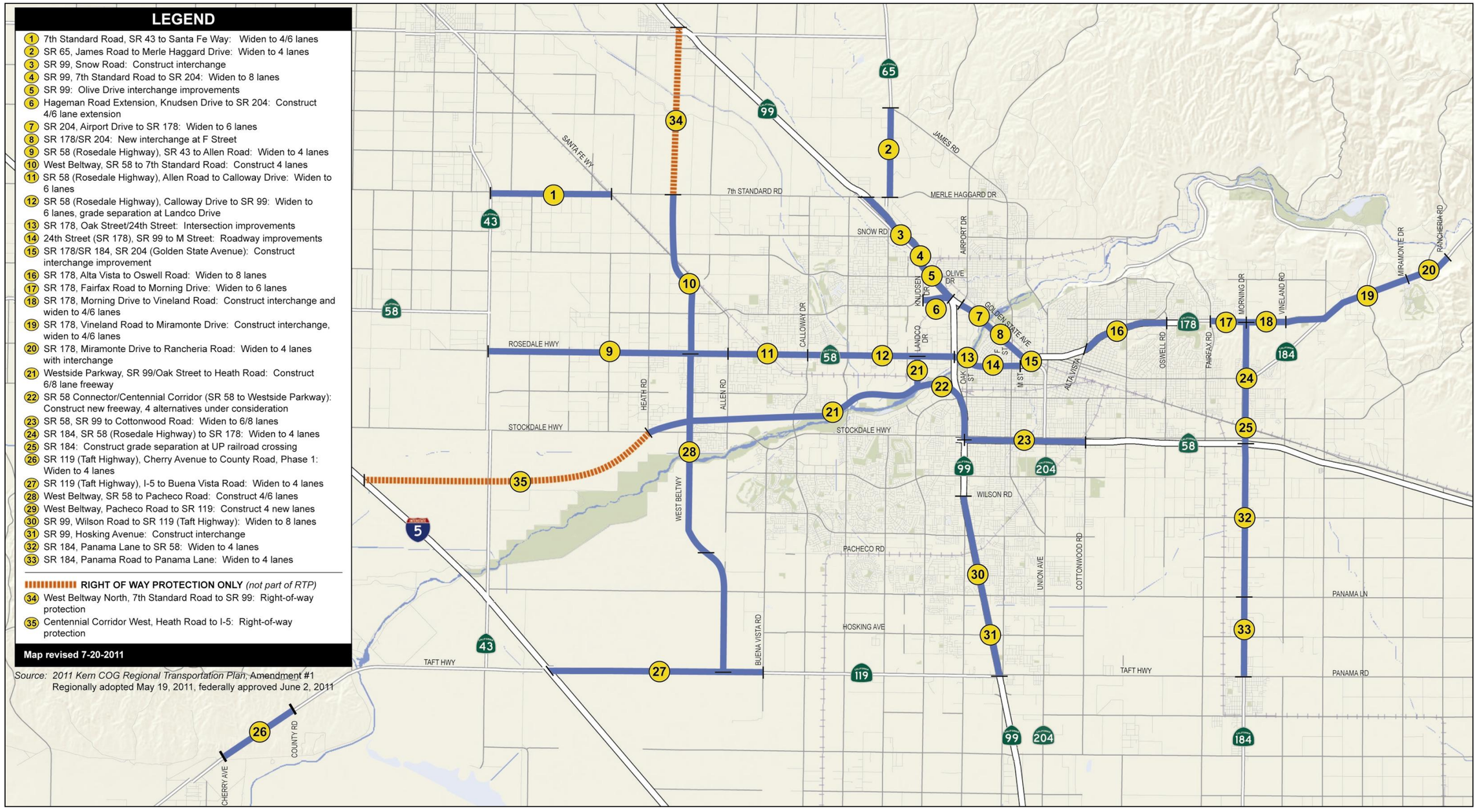


Figure 3-4:
2011 Regional Transportation Plan, Amendment #1, Constrained Projects
(2011 to 2035)

Table 3-3. 2011 Regional Transportation Plan, Amendment #1, Regional Roadway Project List (2010 to 2035)

TABLE 4.1 - Constrained Program of Projects

2011 through 2015 - Major Highway Improvements

Project	Location		YOE Cost	Project ID	Start
Route 14	Inyokern	Redrock / Inyokern Rd to Rt 178 - widen to four lanes (Phase1)	42,000,000	KER08RTP006	2014
Route 46	Lost Hills	SLO County Line to Brown Material Rd - widen to four lanes (Phases 1 -3)	232,070,000	KER08RTP003	2009
Route 58	**Metro Bkfd**	**Rosedale Hwy - Calloway Dr to Rt 99 - widen existing highway**	**24,226,000**	**KER08RTP007**	**2013**
Route 58	**Metro Bkfd**	**Rosedale Hwy - Allen Rd to Calloway Dr - widen existing highway**	**8,800,000**	**KER08RTP090**	**2013**
Route 58	Bakersfield	Rt 99 to Cottonwood Rd. - widen to six lanes	50,000,000	KER08RTP019	2015
Route 99	**Metro Bkfd**	**Hosking Ave - construct interchange**	**35,000,000**	**KER08RTP009**	**2014**
Route 99	Bakersfield	Wilson Rd to Rt 119 - widen to eight lanes	52,000,000	KER08RTP077	2012
Route 99	Bakersfield	Olive Drive - construct interchange upgrades	6,100,000	KER08RTP091	2012
Route 99	Bakersfield	Rt 204 to 7th Standard Rd - widen to eight lanes (Phase 1)	12,000,000	KER08RTP104	2012
Route 99	Delano	Woollomes Ave - construct interchange upgrades	5,000,000	KER08RTP114	2010
Route 178	**Bakersfield**	**Morning Dr to Vineland Rd - new interchange with freeway**	**58,800,000**	**KER08RTP010**	**2013**
Route 178	**Bakersfield**	**Vineland Rd to east of Miramonte Dr - widen existing highway**	**50,000,000**	**KER08RTP011**	**2014**
Challenger Dr. Ext.	Tehachapi	Viena St to Dennison Rd - construct new street	1,500,000	KER08RTP015	2011
W Ridgecrest Blvd	Ridgecrest	Mahan St to China Lake Blvd - widen to four lanes	10,200,000	KER08RTP001	2011
Westside Parkway	Metro Bkfd	Rt 99 / Oak St to Heath Rd - construct local freeway	340,000,000	KER08RTP004	2009
Hageman Flyover	**Bakersfield**	**Knudsen Dr to Rt 204 - construct extension**	**68,900,000**	**KER08RTP013**	**2013**
Hageman Grade Sep	Metro Bkfd	Hageman/Santa Fe Way @ BNSF - construct grade separation	39,500,000	KER08RTP117	2011
Oak St/24th Street	Bakersfield	Rt 178 (24th St) and Oak St - construct improvements	19,100,000	KER08RTP012	2012
Centennial Corridor	**Bakersfield**	**I-5 to Rt-58/99 - element of the Bakersfield Beltway System - construct new freeway and/or operational improvements**	**645,000,000**	**KER08RTP020**	**2015**
24th Street	**Bakersfield**	**Rt 178 (24th and 23rd St) Oak St to M Street - widen existing highway**	**34,000,000**	**KER08RTP014**	**2013**
		Sub-total	**$1,734,196,000**		

2016 through 2020 - Major Highway Improvements

Project	Location	Scope	YOE Cost	Project ID	Start
Route 14	Inyokern	Redrock / Inyokern Rd to Rt 178 - widen to four lanes (Phase 2)	42,000,000	KER08RTP017	2018
		Sub-total	**$42,000,000**		

2021 through 2025 - Major Highway Improvements

Project	Location	Scope	YOE Cost	Project ID	Start
Route 14	Inyokern	Redrock / Inyokern Rd to Rt 178 - widen to four lanes (Phase 3)	$32,000,000	KER08RTP024	2022
Route 58	**Bakersfield**	**Rosedale Hwy - Rt 43 to Allen Rd - widen existing highway**	**59,000,000**	**KER08RTP092**	**2025**
Route 58	**Metro Bkfd**	**Rosedale Hwy @ Minkler Spur / Landco - construct grade separation**	**27,000,000**	**KER08RTP118**	**2025**
Route 58	Bakersfield	Rt 99 to Cottonwood Rd - widen to eight lanes	47,400,000	KER08RTP093	2025
Route 65	Bakersfield	James Rd to Merle Haggard Dr - widen to four lanes	3,000,000	KER08RTP094	2021
Route 119	Taft	Cherry Ave to Elk Hills Rd (Phase 1, bypass) - widen to four lanes	115,000,000	KER08RTP022	2022
Route 178	Bakersfield	At Rt 204 - construct interchange	25,700,000	KER08RTP095	2025
Route 184	Bakersfield	At Union Pacific Railroad - construct grade separation	26,400,000	KER08RTP108	2025
US 395	Ridgecrest	Between Rt 178 and China Lake Blvd - construct passing lanes	20,000,000	KER08RTP089	2022
7th Standard Rd	**Shafter/Bkfd**	**Rt 43 to Santa Fe Way - widen existing roadway**	**14,000,000**	**KER08RTP113**	**2025**
West Beltway	**Metro Bkfd**	**Rosedale Hwy to Westside Parkway - construct new facility**	**93,500,000**	**KER08RTP016**	**2025**
		Sub-total	**$463,000,000**		

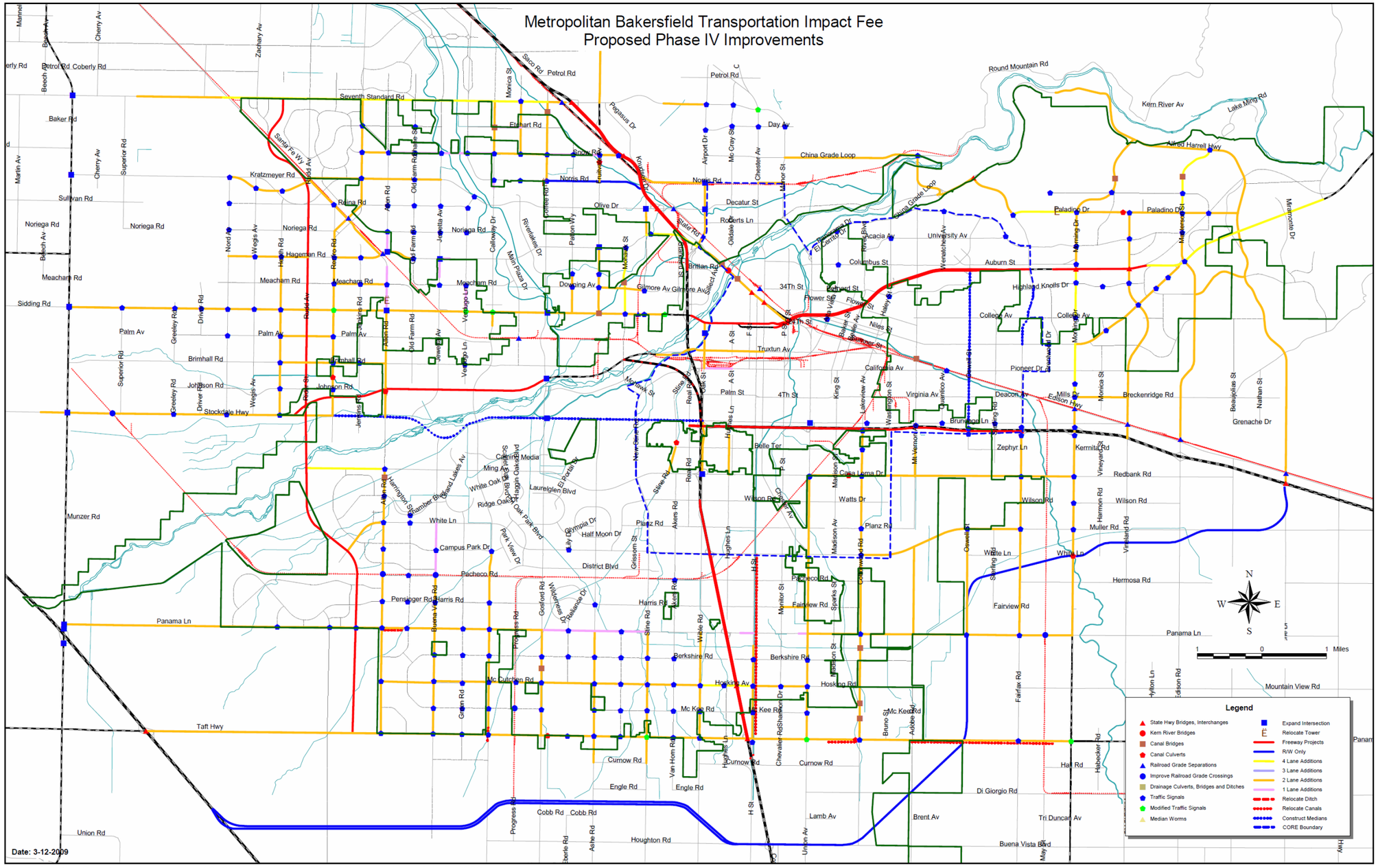
2026 through 2030 - Major Highway Improvements

Project	Location	Scope	YOE Cost	Project ID	Start
Route 46	Lost Hills	Brown Material Rd to I-5 - interchange upgrade at I-5 (Phase 4)	$97,000,000	KER08RTP018	2026
Route 119	Bakersfield	I-5 to Buena Vista - widen to four lanes	31,300,000	KER08RTP099	2026
Route 178	**Metro Bkfd**	**West of Fairfax Rd to Vineland Rd - widen existing freeway**	**17,000,000**	**KER08RTP111**	**2028**
Route 178	Bakersfield	Existing west terminus to Oswell St - widen to eight lanes	140,500,000	KER08RTP026	2026
Route 184	Bakersfield	Panama Rd to Rt 58 - widen to four lanes	10,500,000	KER08RTP100	2029
Route 184	Bakersfield	Morning Dr to Rt 178 - widen to four lanes	5,000,000	KER08RTP101	2026
Route 204	**Bakersfield**	**Airport Drive to Rt 178 - widen existing highway**	**55,000,000**	**KER08RTP083**	**2030**
Route 204	**Bakersfield**	**F St - construct interchange**	**36,000,000**	**KER08RTP081**	**2030**
		Sub-total	**$392,300,000**		

2031 through 2035 - Major Highway Improvements

Project	Location	Scope	YOE Cost	Project ID	Start
Route 58	Bakersfield	At various locations - ramp improvements	$32,600,000	KER08RTP103	2033
Route 99	Bakersfield	At Olive Drive - reconstruct interchange	108,000,000	KER08RTP021	2033
Route 99	Bakersfield	At Snow Rd - construct new interchange	138,200,000	KER08RTP115	2033
Route 99	Bakersfield	Rt 204 to 7th Standard Rd - widen to eight lanes (Phase 2)	90,800,000	KER08RTP138	2033
Route 99	Bakersfield	At various locations - ramp improvements	37,000,000	KER08RTP105	2033
Route 119	Taft	Elk Hills - County Rd to Tupman Ave - widen to four lanes (Phase 2)	48,000,000	KER08RTP086	2033
Route 178	**Metro Bkfd**	**Vineland to Miramonte - new interchange; widen existing freeway**	**119,000,000**	**KER08RTP025**	**2033**
Route 178	**Bakersfield**	**Miramonte to Rancheria - widen existing highway**	**19,800,000**	**KER08RTP084**	**2033**
Route 178	Bakersfield	At Rt 204 and 178 - reconstruct freeway ramps	50,000,000	KER08RTP085	2033
Route 178	Bakersfield	At various locations - ramp improvements	37,000,000	KER08RTP106	2033
Route 184	Lamont	Rt 58 to Rt 178 - widen to four lanes	90,000,000	KER08RTP045	2033
West Beltway	**Metro Bkfd**	**Pacheco Rd to Westside Parkway - construct new facility**	**115,793,000**	**KER08RTP139**	**2033**
West Beltway	**Metro Bkfd**	**Rosedale Hwy to 7th Standard Rd - construct new facility**	**115,793,000**	**KER08RTP102**	**2033**
West Beltway	**Metro Bkfd**	**Taft Hwy to Pacheco Rd - construct new facillity**	**90,000,000**	**KER08RTP097**	**2033**
		Sub-total	**$1,091,986,000**		
		Total Major Highway Improvements	**$3,723,482,000**		

Source: Kern Council of Governments *2011 Regional Transportation Plan,* Amendment #1; regionally adopted May 19, 2011; federally approved June 2, 2011



Adopted by the County of Kern on May 19, 2009 and by the City of Bakersfield on July 7, 2009

Figure 3-5: Metropolitan Bakersfield Transportation Impact Fee—Proposed Phase IV Improvements

3.4 Design Year and Opening Year Peak Hour and Daily Traffic Volumes

Daily, AM and PM peak period traffic forecasts were prepared by Parsons for the design year (2038) and opening year (2018) of the Centennial Corridor project. The traffic forecasts were based on the land use assumptions and demographic conditions discussed in Section 3.2 and the highway network summarized in Section 3.3. Parsons utilized the Kern COG Regional Travel Demand Model to prepare the traffic forecasts. This model was first developed and calibrated in 1998, and has been continually monitored for accuracy and updated since that time. In 2007, Kern COG undertook a comprehensive recalibration of the model based on year 2006 information, as discussed previously in Section 3.1.

For the purpose of the Centennial Corridor project, Parsons prepared a set of year 2006 model validation forecasts and compared these with traffic counts collected along State Route 58, State Route 99, and study area arterial and collector streets. Model validation, in essence, "forecasts" existing conditions based on current estimates of population and employment. Traffic generated from land uses is assigned to the road network and compared with ground traffic counts. Balanced sets of freeway and local street link volumes were next computed from each mainline and street intersection traffic count location. A consensus estimate of existing traffic was then derived based on a convergence of data points.

The consensus estimates of existing traffic volumes were subsequently used as pivot points for adjusting future year traffic volume forecasts on an intersection approach link basis.

The Kern Council of Governments model estimates peak period and off-peak traffic volumes in variable length time slices depending on time of day. For the AM and PM peak time periods, 2-hour or 3-hour forecasts are computed covering 7:00 to 9:00 a.m. and 3:00 to 6:00 p.m. To convert the AM 2-hour forecasts to a single hour, Parsons applied a factor of 55 percent across the board to all freeway mainline and intersection link forecasts. For the PM peak period, Parsons applied a factor of 37 percent to the 3-hour forecasts to derive a single peak hour. While this simplifying assumption reduced the closeness of fit to individual links, it was consistent with methods used for other locally sponsored corridor studies.

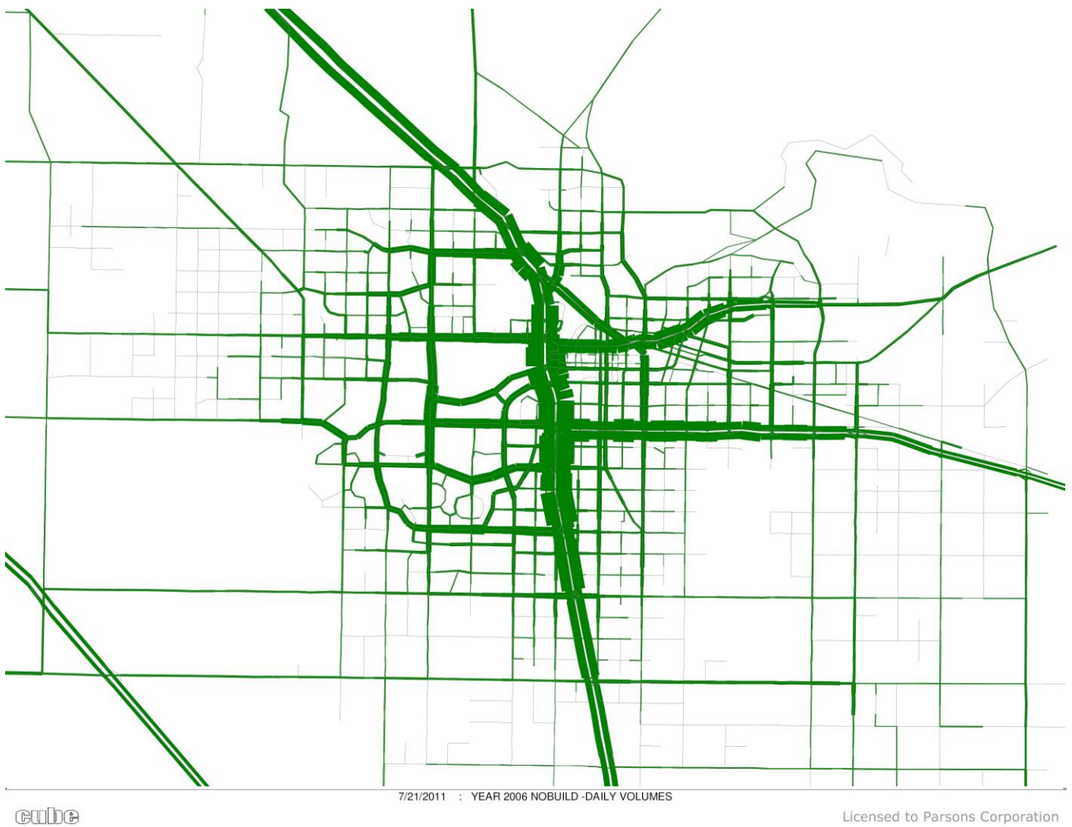
The resulting design year (2038) and opening year (2018) forecasts of weekday peak hour and daily traffic are presented in this section for the four build alternatives (A, B, C and transportation systems management/ transit) and a no-build alternative.

No-Build Alternative

The no-build alternative for year 2038 includes all projects identified in Table 3-3 and Figures 3-4 and 3-5 except for the State Route 58 Connector/Centennial Corridor (State Route 58 to Westside Parkway) as identified on Figure 3-4 and Project #22.

Figure 3-6 illustrates the concentration of daily traffic on freeways and major arterial streets. State Route 99, State Route 58 and State Route 178 all attract high volumes of daily traffic. The left portion of Figure 3-6 illustrates the modeled assignment of traffic to the metropolitan Bakersfield highway network as of 2006, whereas the right portion illustrates 2038 forecast conditions, based on the no-build alternative.

2006 Daily Traffic Volumes



Source: Parsons

2038 No-Build Alternative Daily Traffic Volumes

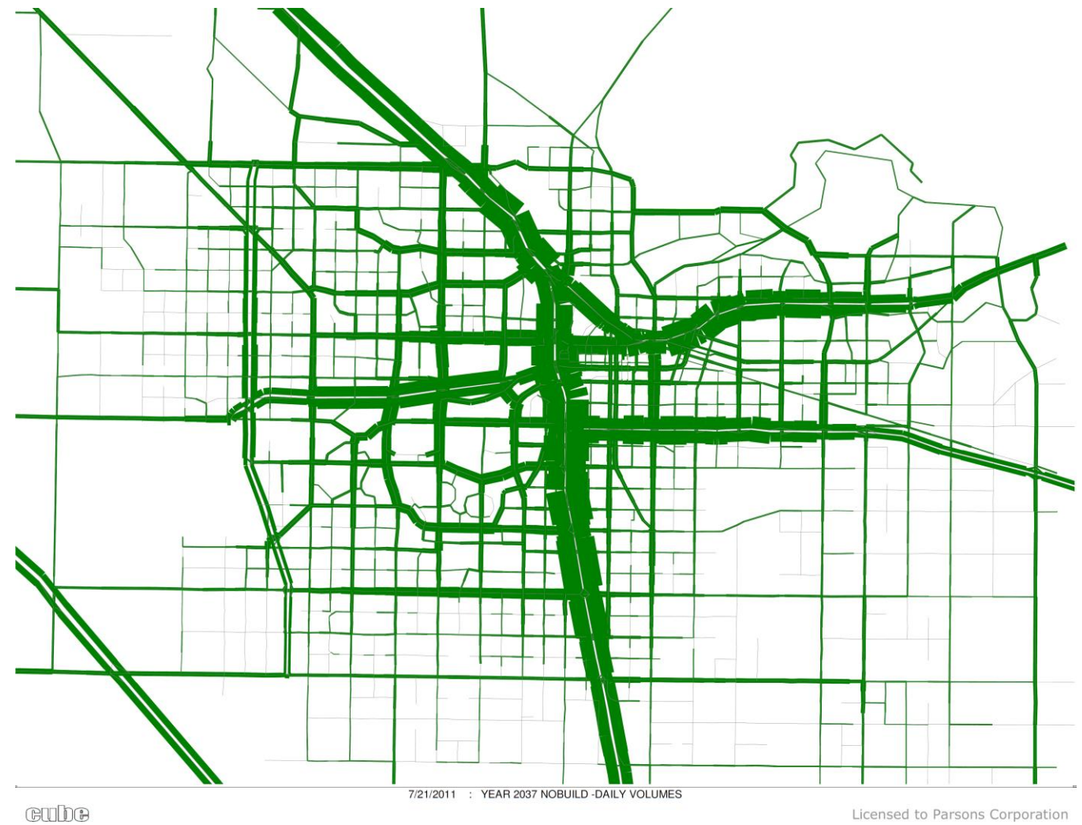


Figure 3-6: Difference between Year 2006 and Year 2038 Daily Traffic Volumes

A comparison of these two graphics clearly illustrates the growth in traffic projected for these state highways along with virtually all other arterial streets within metropolitan Bakersfield. Figure 3-7 depicts the adjusted design year (2038) traffic forecasts for State Route 99, State Route 58 and the Westside Parkway under no-build conditions. Peak hour and daily volumes are reported for all freeway mainline segments and ramps within the study area affected by the Centennial Corridor project.

Figure 3-8 similarly reports the AM and PM peak hour design year (2038) turning movement traffic volumes for all study intersections identified previously in Figure 2-13.

Figures 3-9 and 3-10 present the same traffic volume information for opening year 2018 conditions.

Alternative A

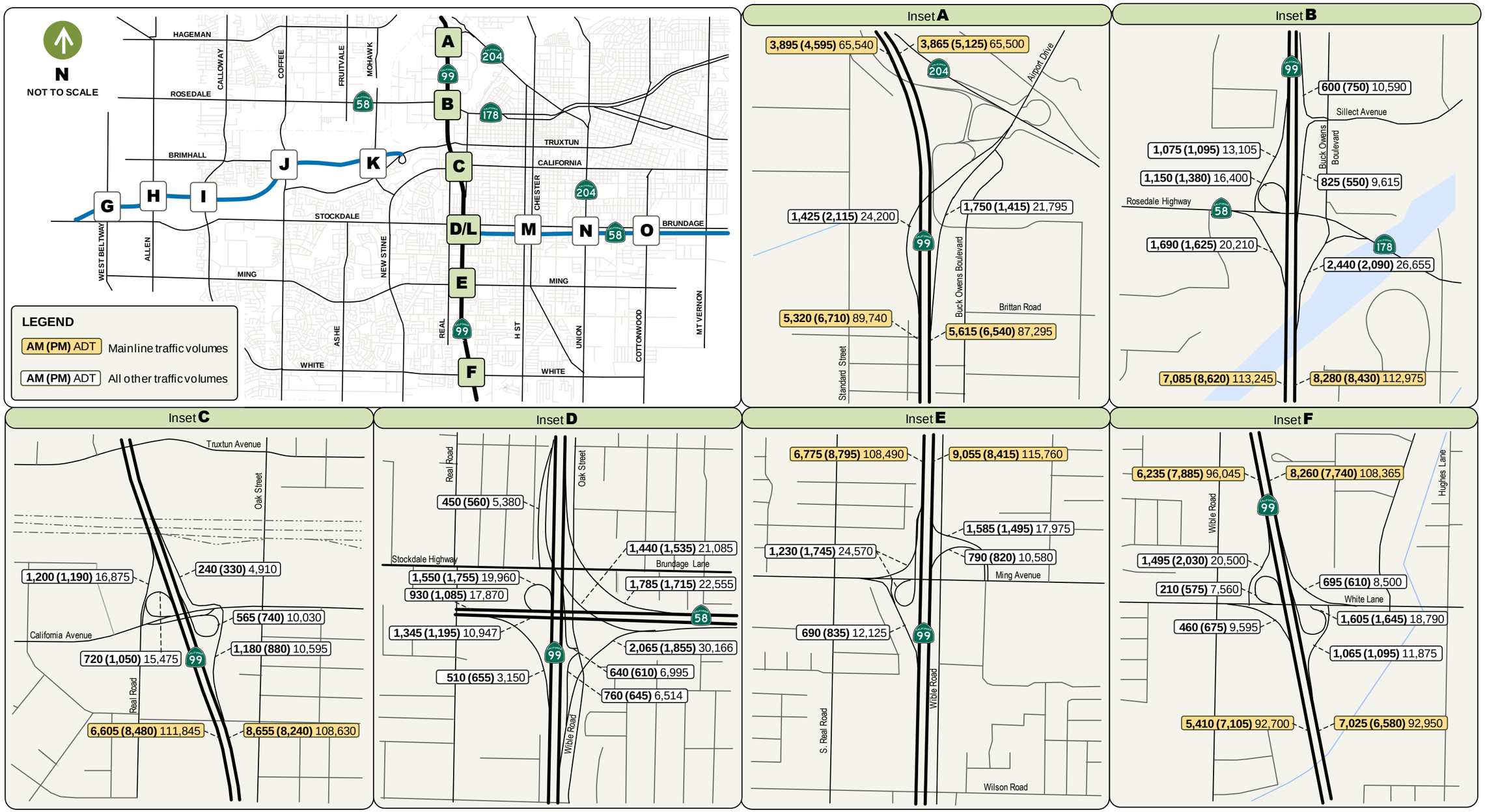
Alternative A proposes to connect the Westside Parkway to State Route 58 east near Cottonwood Road by means of a new freeway. Alternative A would begin at the Westside Parkway in between the Mohawk Street interchange and the Coffee Road interchange and turn in a southeasterly direction. It would then span the Kern River, Truxtun Avenue, Carrier Canal, and Stockdale Highway before joining the existing State Route 58 east at its existing terminus near the State Route 58/State Route 99 interchange. Improvements on State Route 58 would continue to extend through the H Street and Chester Avenue interchange to Cottonwood Road.

State Route 58 would maintain its existing connections to State Route 99 by means of freeway to freeway connectors. The existing westbound State Route 58 to northbound State Route 99 connector, southbound State Route 99 to eastbound State Route 58 connector, and northbound State Route 99 to eastbound State Route 58 would be preserved with modifications. New branch connectors would be constructed for the eastbound State Route 58 to southbound State Route 99, and northbound State Route 99 to westbound State Route 58 movements.

Auxiliary lanes would be provided on State Route 99 to accommodate the additional traffic from these branch connectors. The limits of improvements on State Route 99 would extend from the interchange at State Route 58 to the Wilson Road overcrossing. All ramps in this vicinity would have to be realigned to provide for the additional lanes. The Wible Road on and off ramps south of the existing State Route 99/State Route 58 interchange would be removed to accommodate the northbound State Route 99 on ramp from Ming Avenue. The Stockdale Avenue off ramp from the southbound State Route 99 to the eastbound State Route 58 connector would be removed. Local access from Real Road to State Route 58 and to southbound State Route 99 would also be removed.

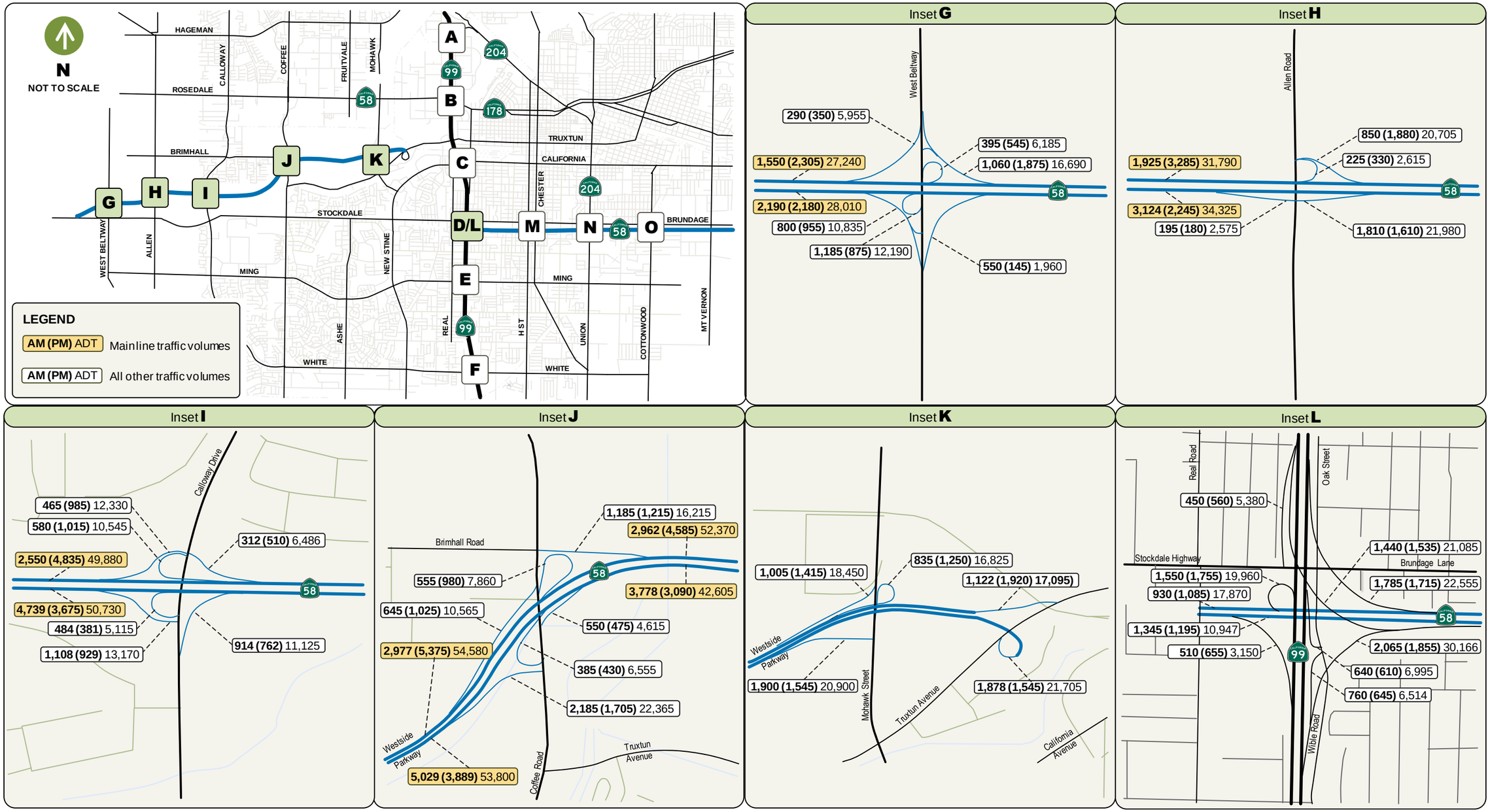
The new freeway would bisect existing business parks and residential neighborhoods. The following roads would cross under or over the proposed freeway alignment:

- Truxtun Avenue
- Lennox Avenue and California Avenue
- Business Center Drive
- Stockdale Highway and Montclair Street
- Stine Road
- South Real Road



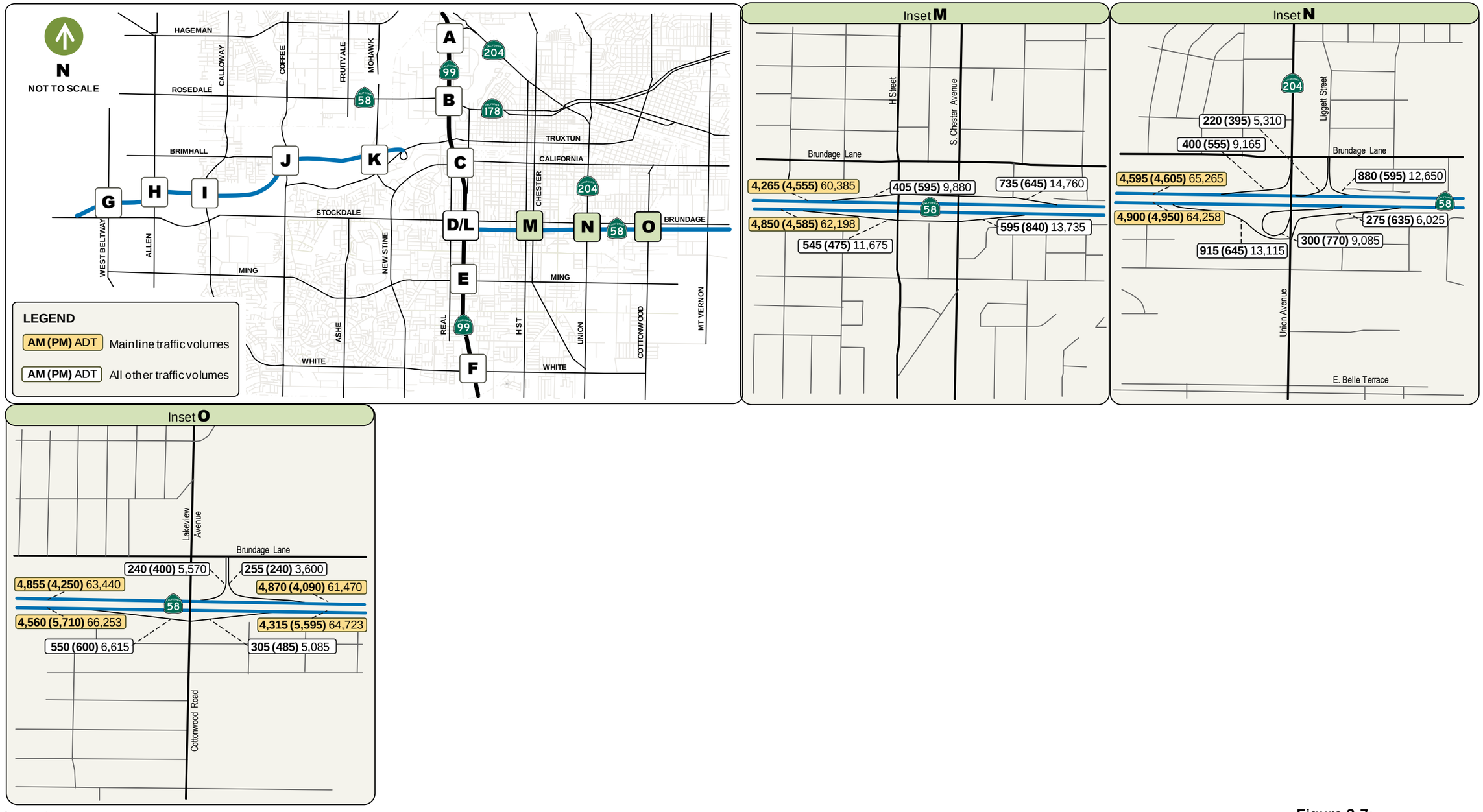
Source: Parsons

Figure 3-7:
Year 2038 Peak Hour and Daily Freeway Volumes—No-Build Alternative
(1 of 3)



Source: Parsons

Figure 3-7:
Year 2038 Peak Hour and Daily Freeway Volumes—No-Build Alternative
(2 of 3)



Source: Parsons

Figure 3-7:
Year 2038 Peak Hour and Daily Freeway Volumes—No-Build Alternative
(3 of 3)

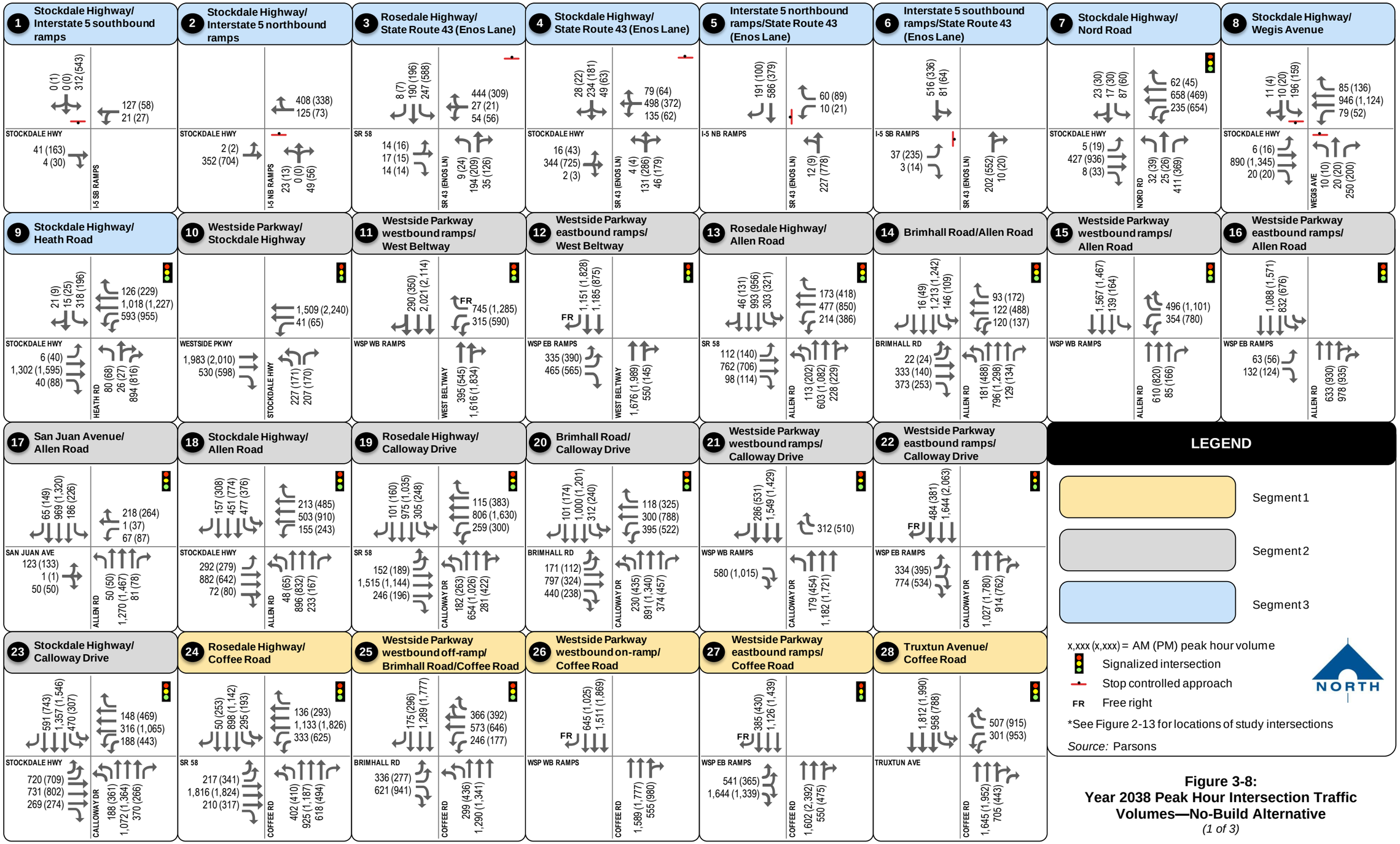


Figure 3-8:
Year 2038 Peak Hour Intersection Traffic Volumes—No-Build Alternative
(1 of 3)

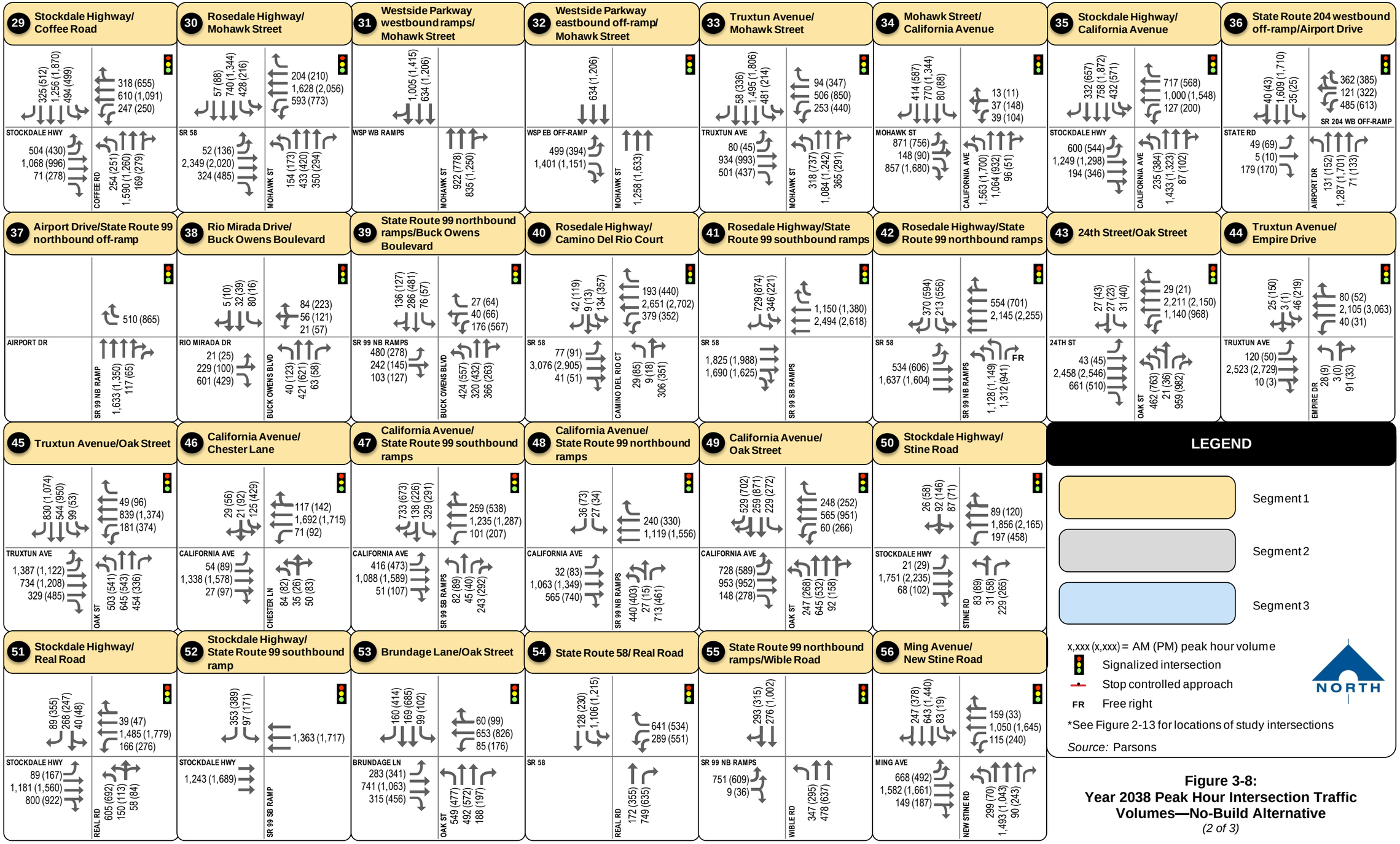


Figure 3-8:
Year 2038 Peak Hour Intersection Traffic Volumes—No-Build Alternative
(2 of 3)

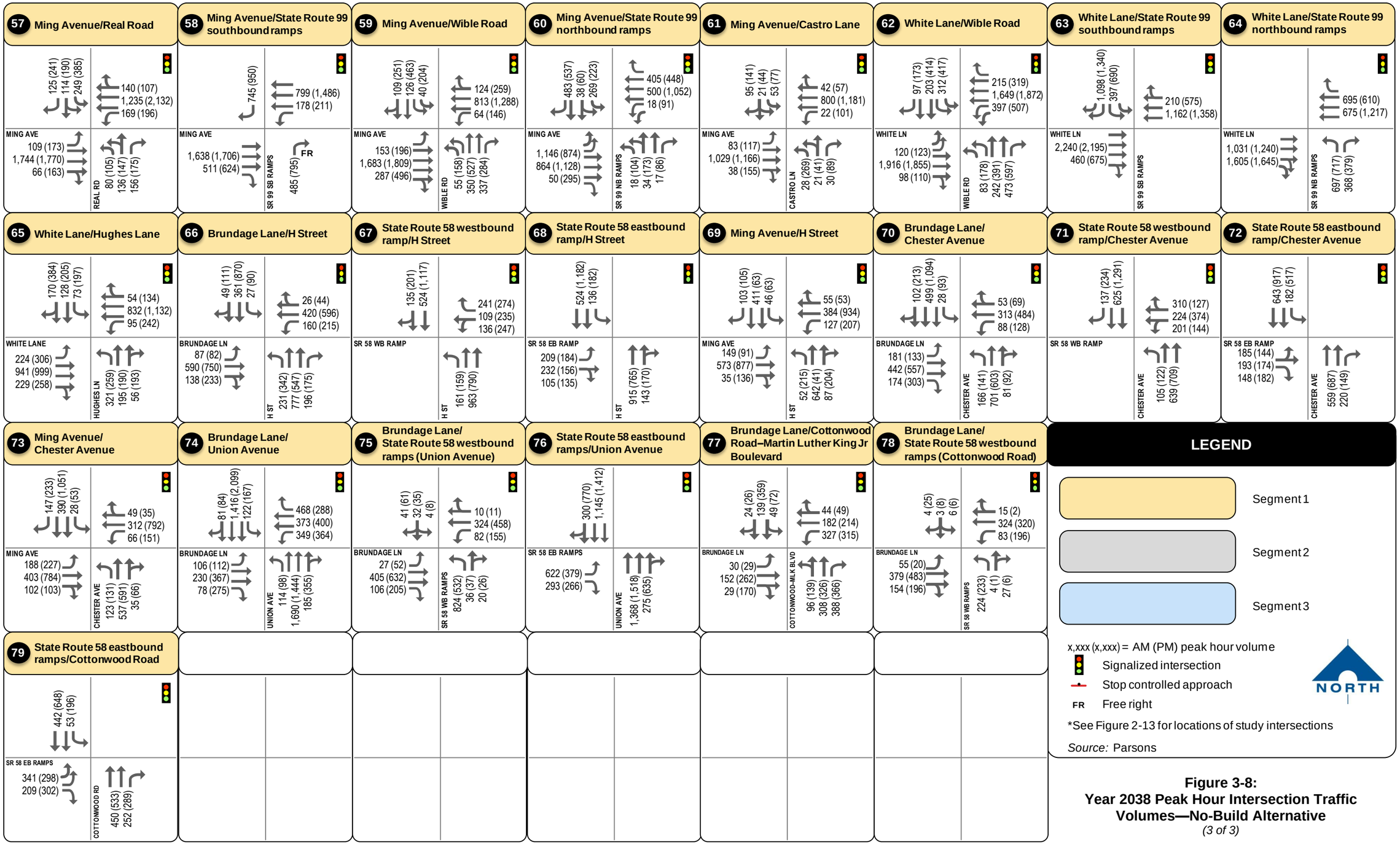
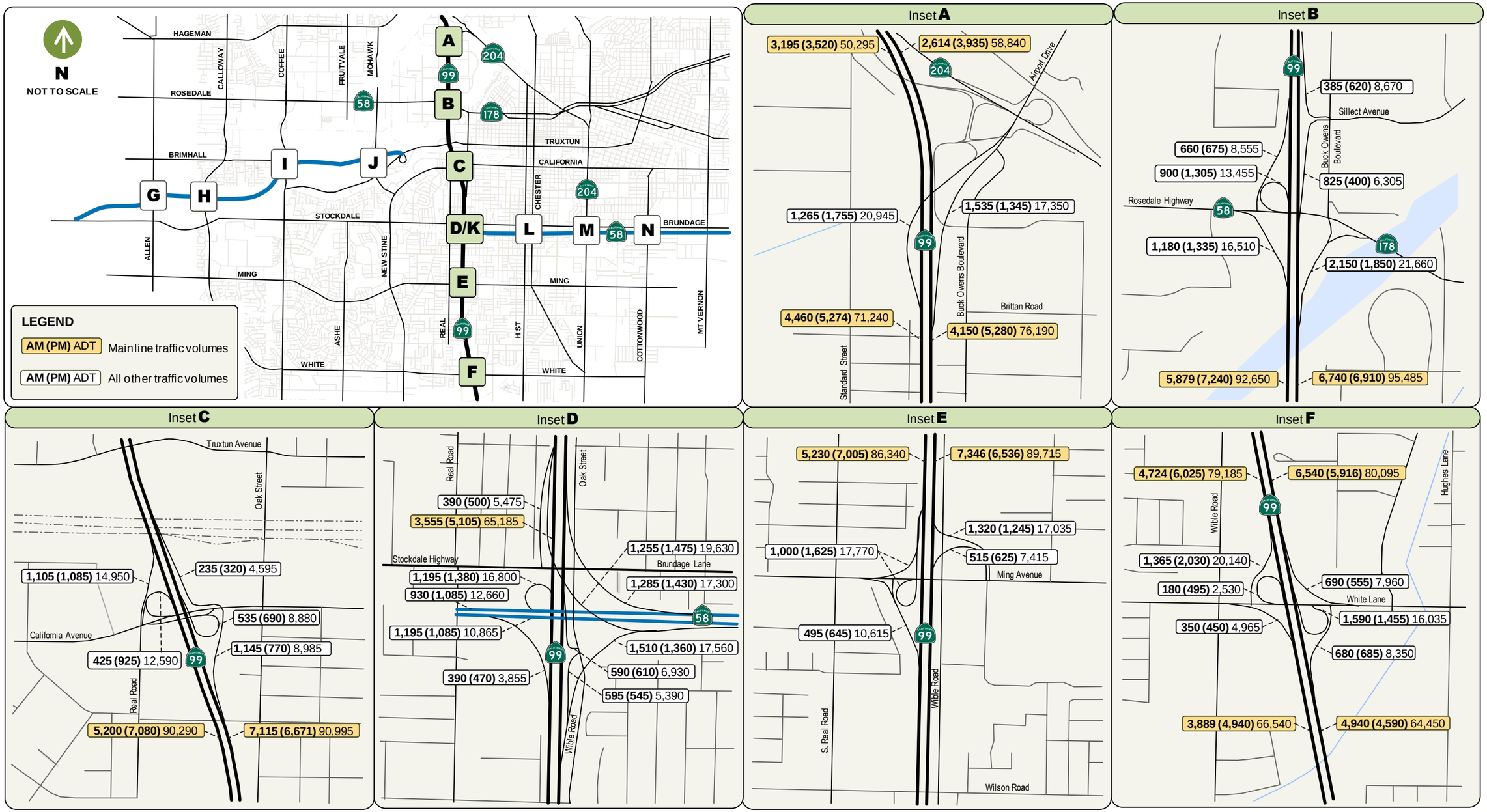
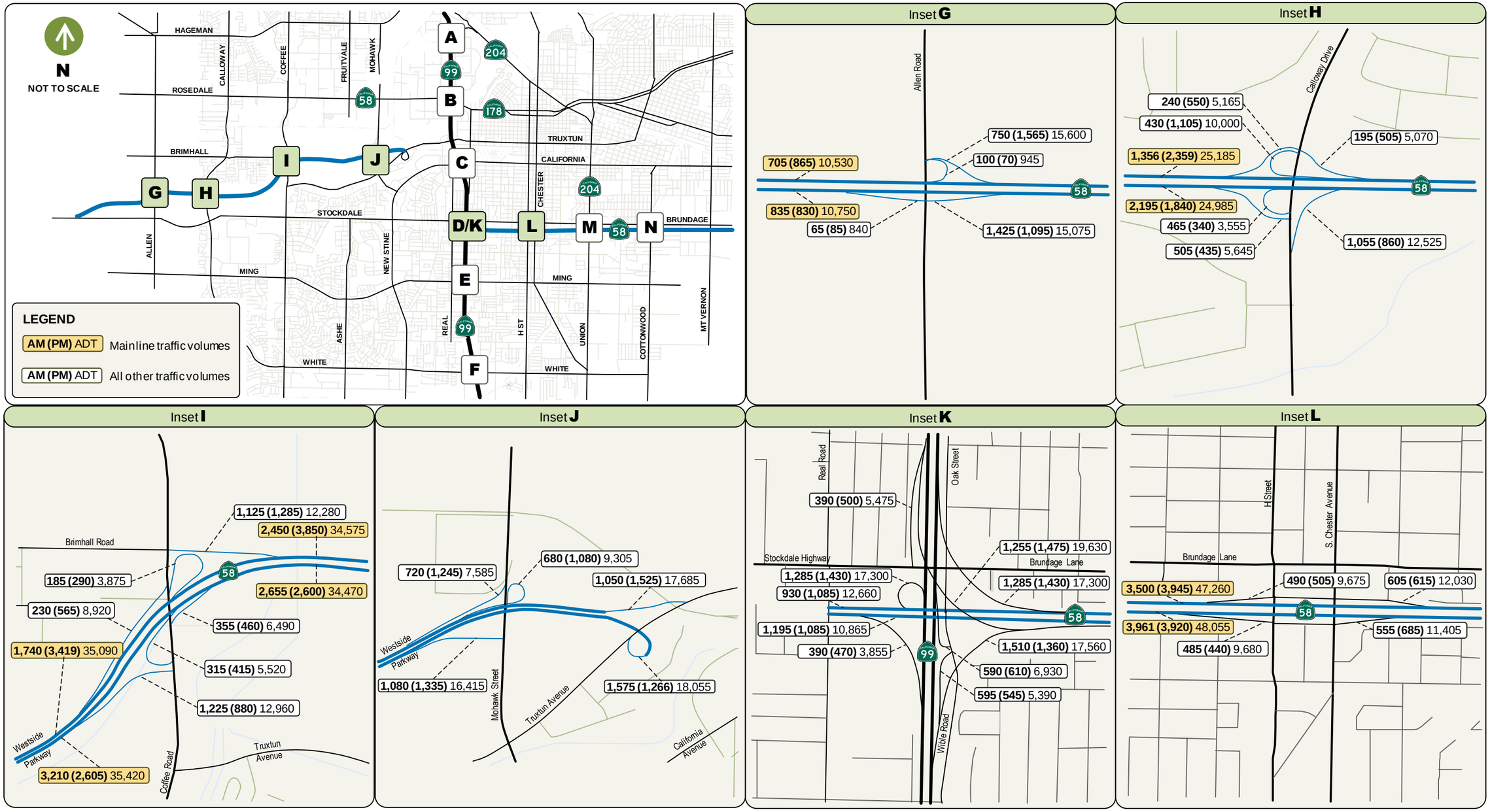


Figure 3-8:
Year 2038 Peak Hour Intersection Traffic Volumes—No-Build Alternative
(3 of 3)



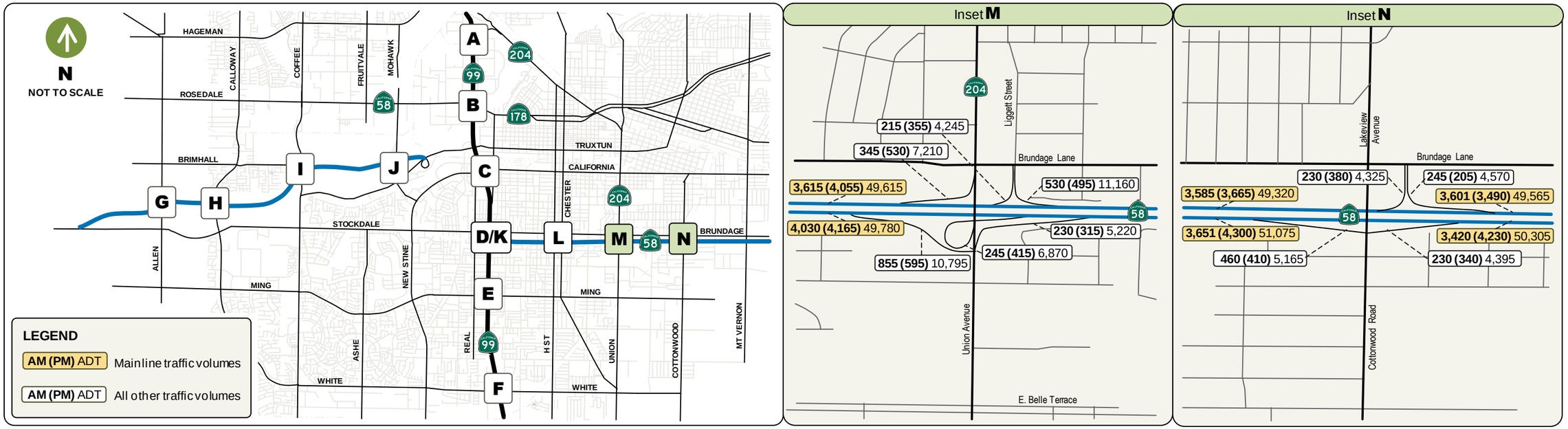
Source: Parsons

Figure 3-9:
Year 2018 Peak Hour and Daily Freeway Volumes—No-Build Alternative
(1 of 3)



Source: Parsons

Figure 3-9:
Year 2018 Peak Hour and Daily Freeway Volumes—No-Build Alternative
(2 of 3)



Source: Parsons

Figure 3-9:
Year 2018 Peak Hour and Daily Freeway Volumes—No-Build Alternative
(3 of 3)

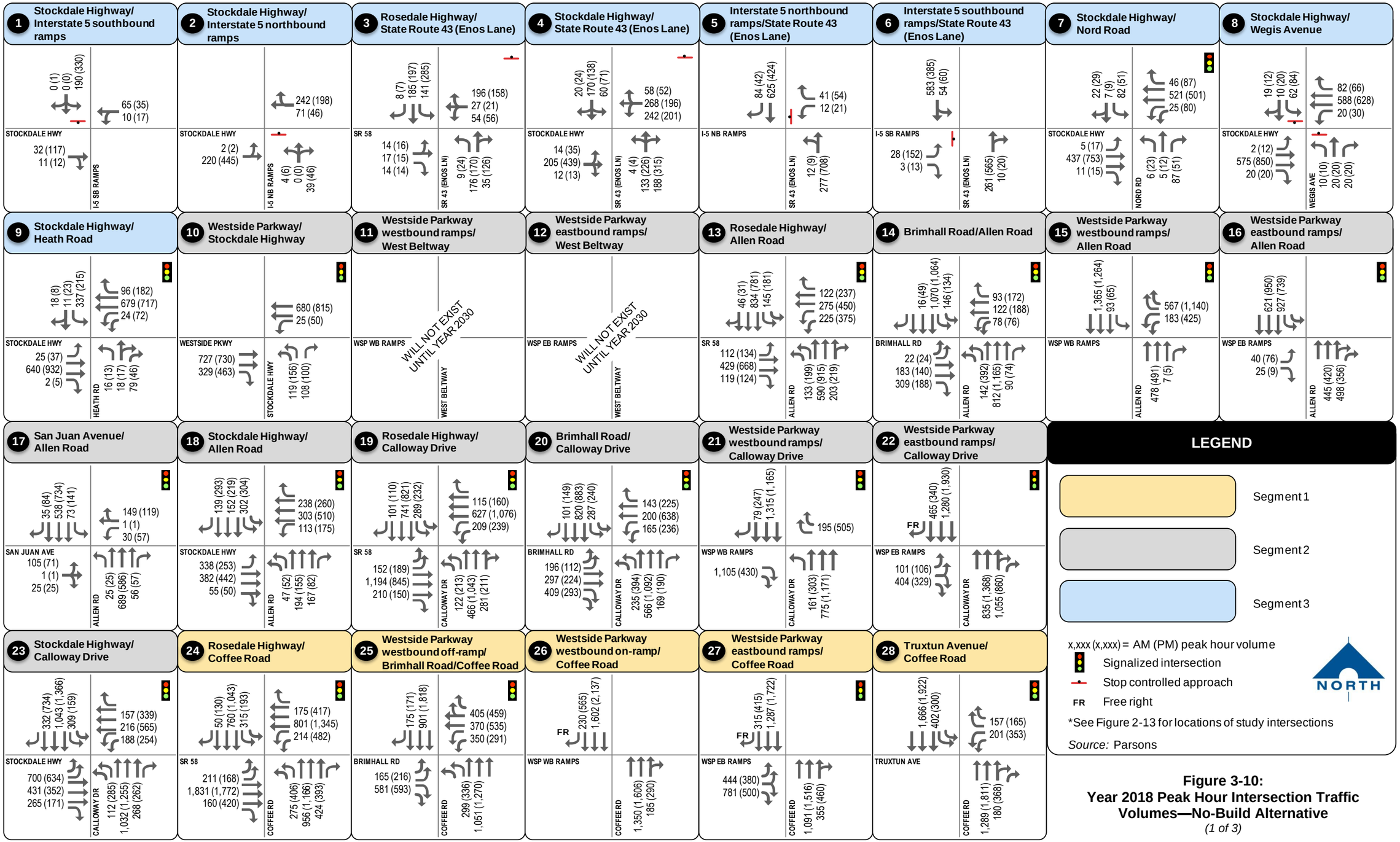


Figure 3-10:
Year 2018 Peak Hour Intersection Traffic Volumes—No-Build Alternative
(1 of 3)

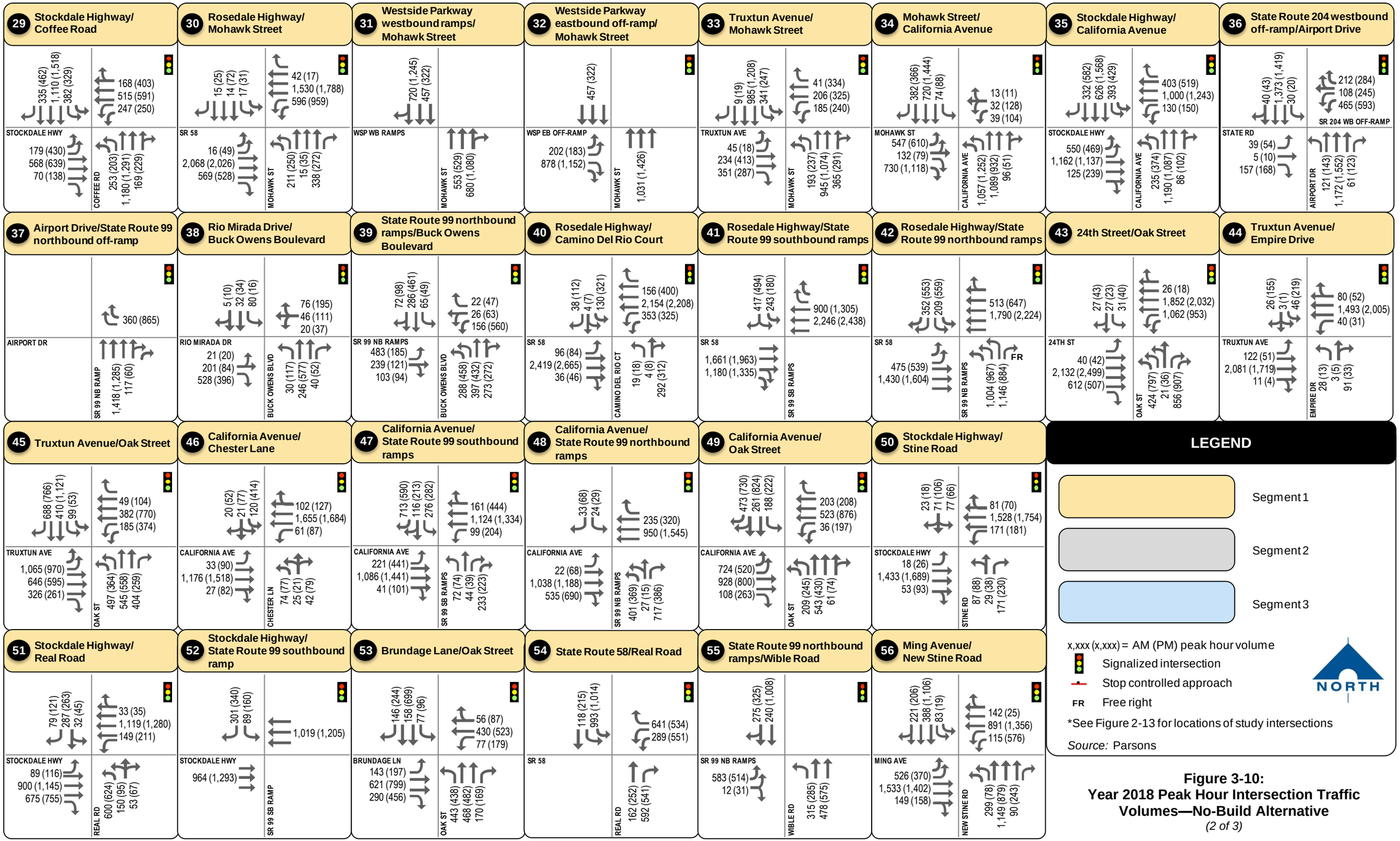


Figure 3-10:
Year 2018 Peak Hour Intersection Traffic Volumes—No-Build Alternative
(2 of 3)

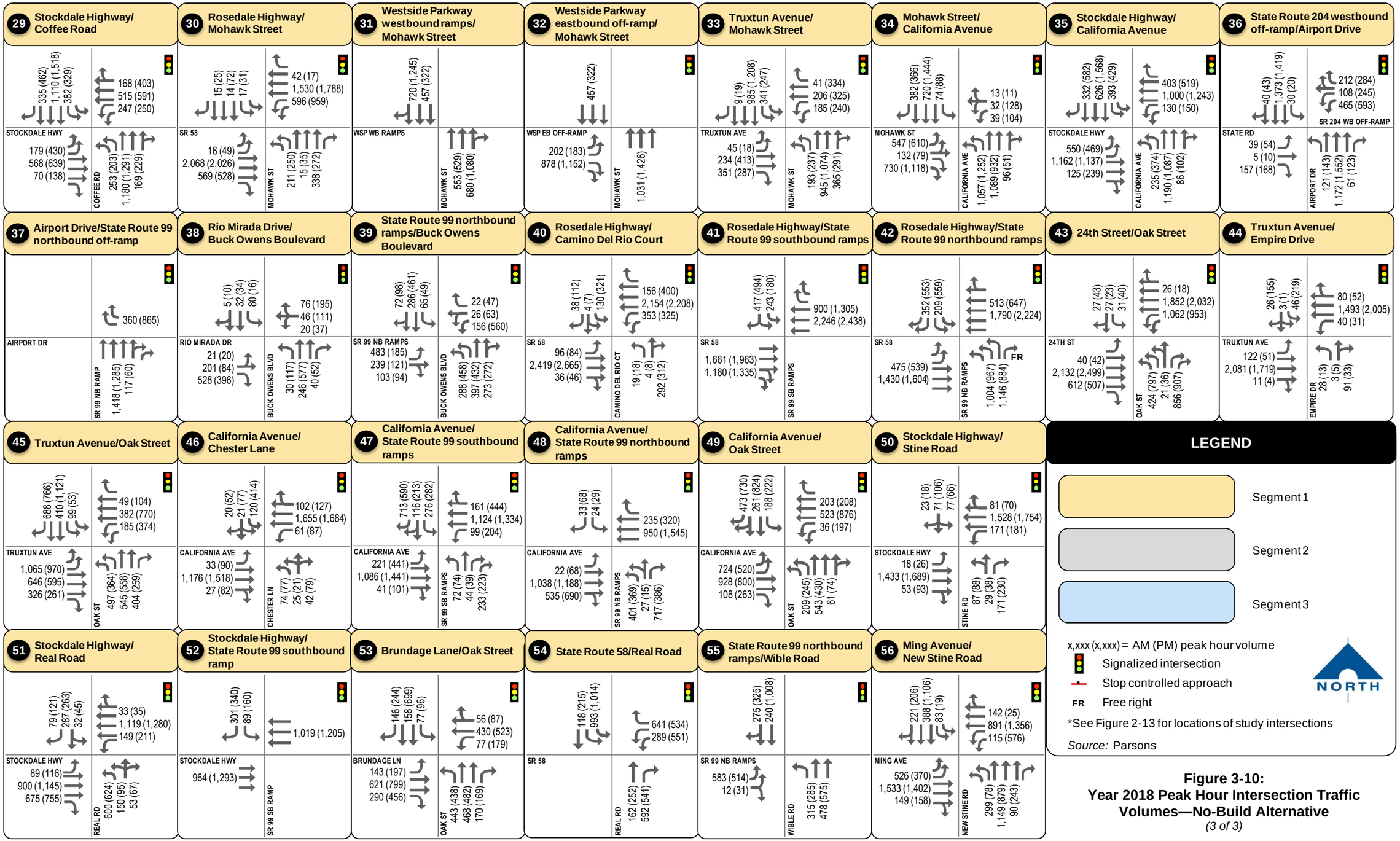


Figure 3-10:
Year 2018 Peak Hour Intersection Traffic Volumes—No-Build Alternative
(3 of 3)

The potential closure of Frazier Avenue, Westwood Way, McDonald Way, Curran Street, Griffith Street, Jones Street and Williamson Way would modify existing circulation. Pedestrian and bicycle crossing would be limited to the proposed undercrossings, increasing neighborhood travel distances. No Golden Empire Transit District (GET) bus routes use the roads that would potentially be closed. Therefore, alternative A would not directly affect existing transit service.

To provide an overall indication of the impact of constructing the Westside Parkway to State Route 58 east connector along the alternative A alignment, a computer generated map is provided as Figure 3-11, which illustrates the difference between the 2038 alternative A and no-build daily traffic volumes, as assigned by the travel forecast model. The bandwidths illustrated in red depict roadways which receive additional volumes of traffic as a result of constructing the freeway-to-freeway connector. Roadways having bandwidths illustrated in blue indicate roadways receiving less traffic as a result of building the freeway connector. The difference plot clearly indicates that alternative A attracts more traffic volume to State Route 58/ Westside Parkway while reducing traffic on parallel roadways.

Figure 3-12 depicts the adjusted design year (2038) traffic forecasts for State Route 99 and State Route 58/Westside Parkway under alternative A conditions. Peak hour and daily volumes are reported for all freeway mainline segments and ramps within the Centennial Corridor project study area.

Figure 3-13 reports AM and PM peak hour design year (2038) turning movement volumes for all study intersections.

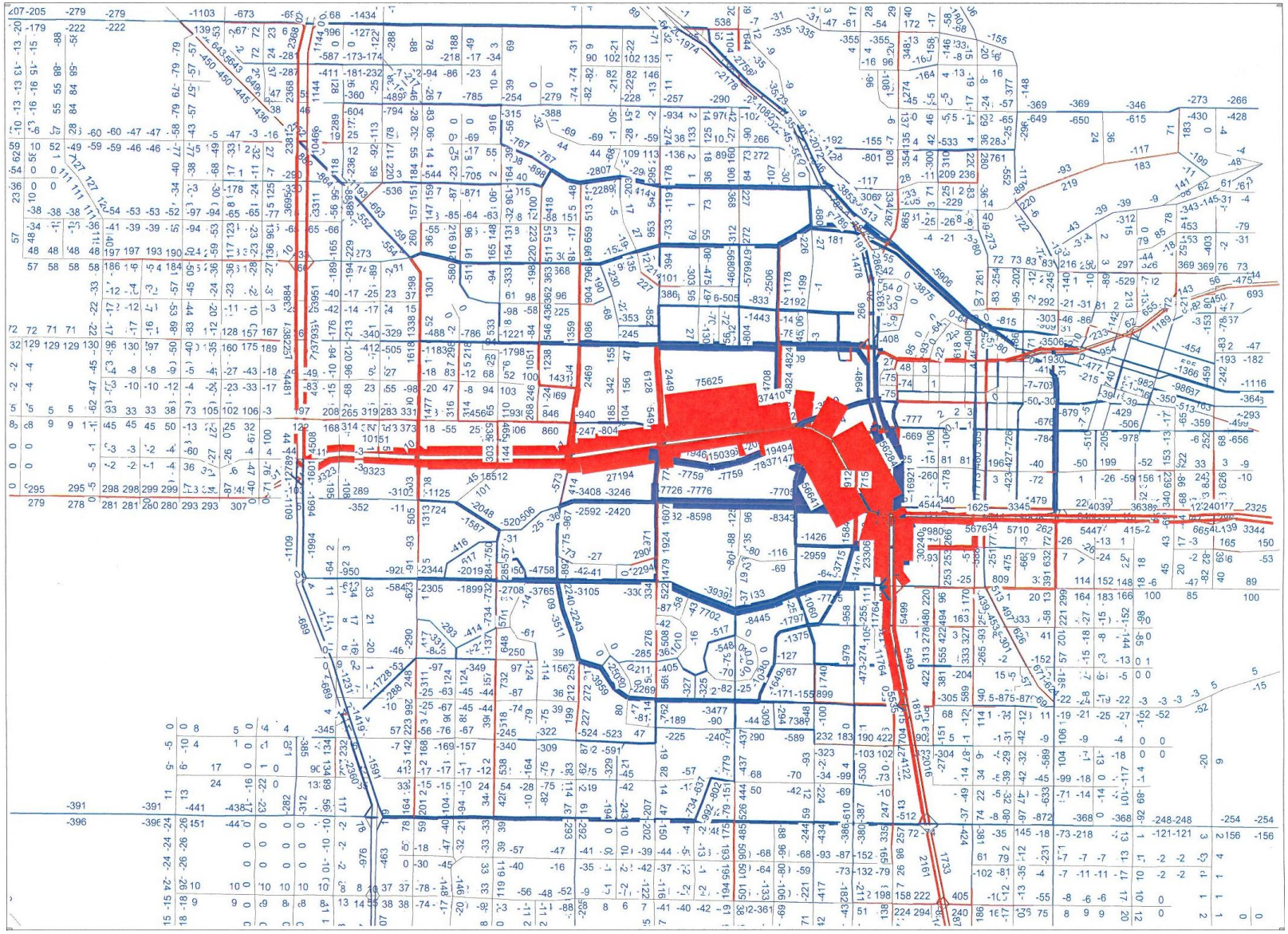
Figures 3-14 and 3-15 present the same traffic volume information for opening year 2018 conditions.

Alternative B

Alternative B proposes to connect the east end of the Westside Parkway to State Route 58 east near Cottonwood Road by means of a new freeway. This proposed alternative would begin at the Mohawk Street interchange and turn in a southeasterly direction. It would span the Kern River, Truxtun Avenue, Carrier Canal, California Avenue and Stockdale Highway before joining the existing State Route 58 east at its existing terminus near the State Route 58/State Route 99 interchange. Improvements on State Route 58 would continue to extend through the H Street and Chester Avenue interchange to Cottonwood Road.

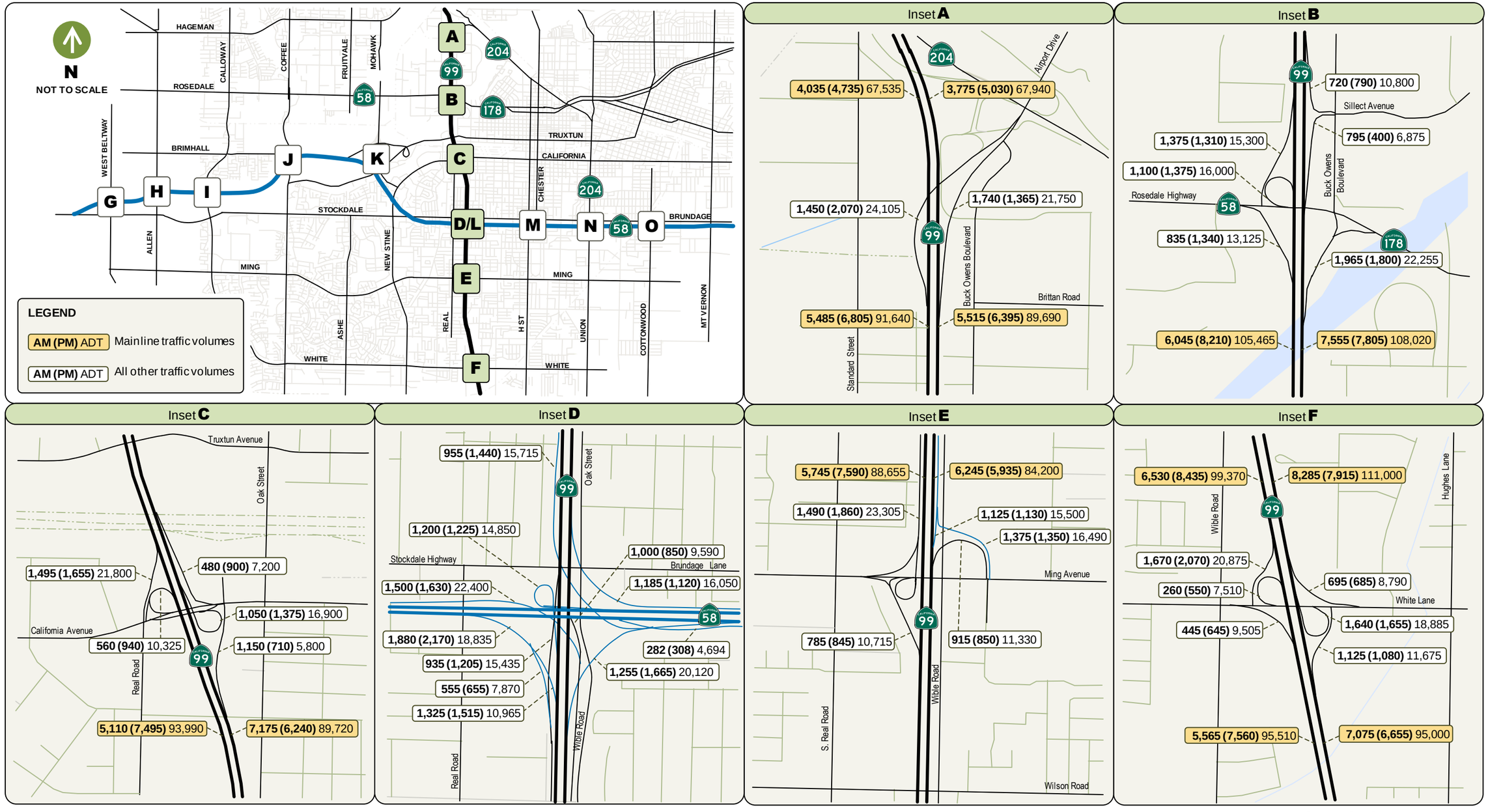
State Route 58 would maintain its existing connections to State Route 99 by means of freeway to freeway connectors. The existing westbound State Route 58 to northbound State Route 99 connector, southbound State Route 99 to eastbound State Route 58 connector, and northbound State Route 99 to eastbound State Route 58 would be preserved with modifications. New branch connectors would be constructed for the eastbound State Route 58 to southbound State Route 99, and northbound State Route 99 to westbound State Route 58 movements.

Auxiliary lanes would be provided on State Route 99 to accommodate the additional traffic from these branch connectors. The limits of improvements on State Route 99 would extend from the interchange at State Route 58 to the Wilson Road overcrossing. All ramps in this vicinity would have to be realigned to provide for the additional lanes. The Wible Road on and off ramps south of the existing State Route 99/State Route 58 interchange would be removed to accommodate the northbound State Route 99 on ramp from Ming Avenue. The Stockdale Avenue off ramp from



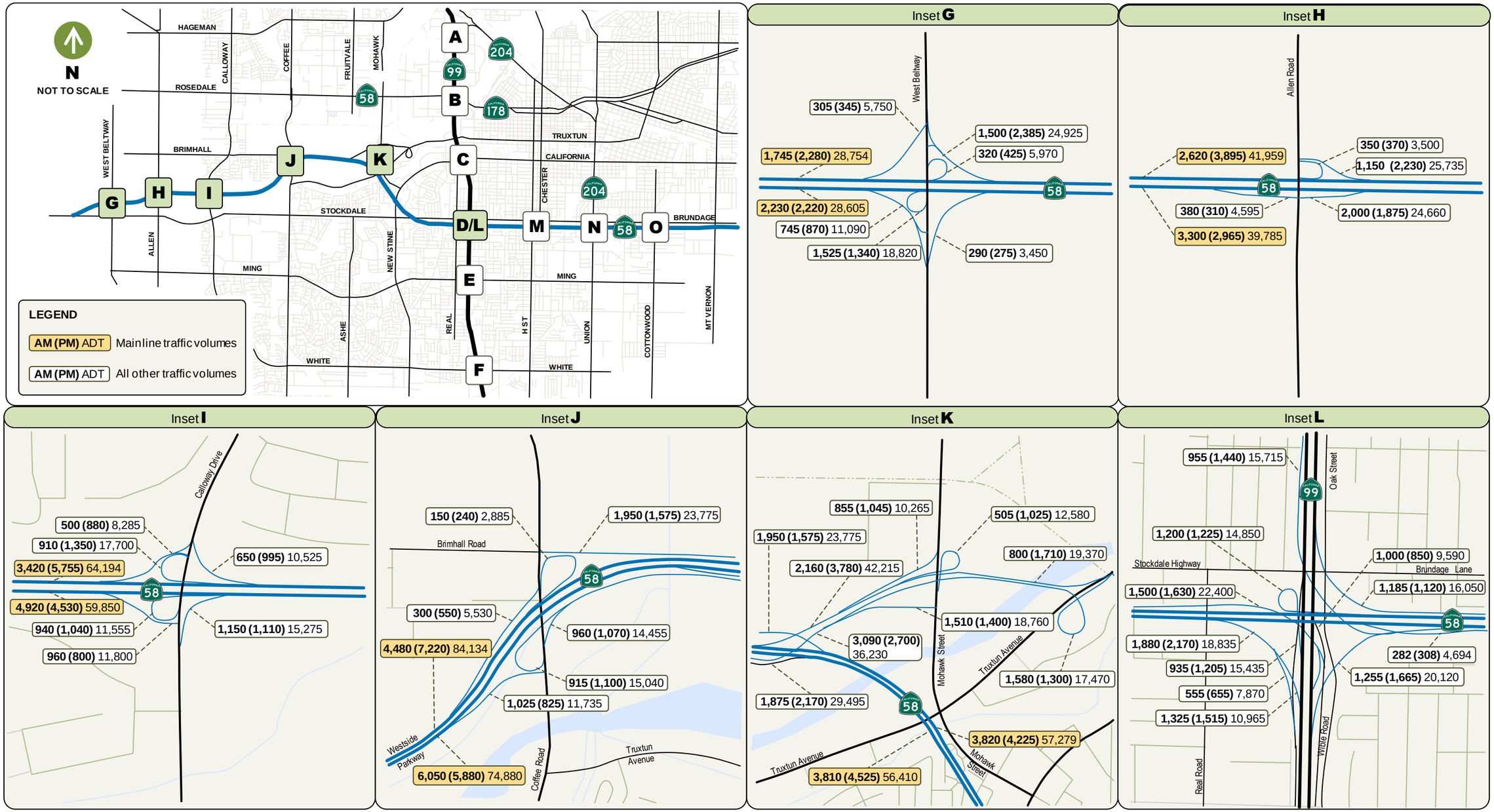
Source: Parsons

Figure 3-11: Difference between Year 2038 Alternative A and the No-Build Alternative Daily Traffic Volumes



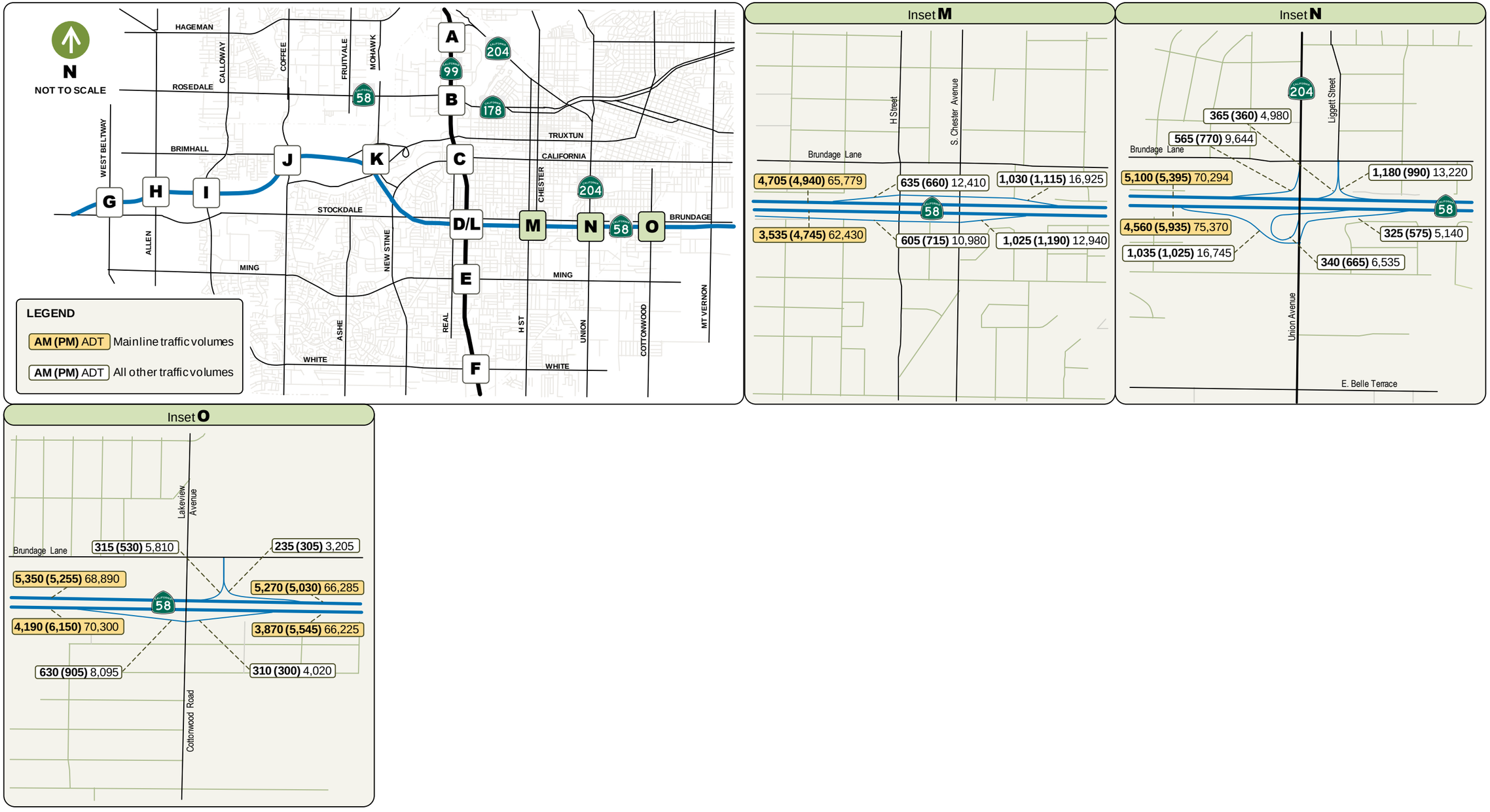
Source: Parsons

Figure 3-12:
Year 2038 Peak Hour and Daily Freeway Volumes—Alternative A
(1 of 3)



Source: Parsons

Figure 3-12:
Year 2038 Peak Hour and Daily Freeway Volumes—Alternative A
(2 of 3)



Source: Parsons

Figure 3-12:
Year 2038 Peak Hour and Daily Freeway Volumes—Alternative A
(3 of 3)

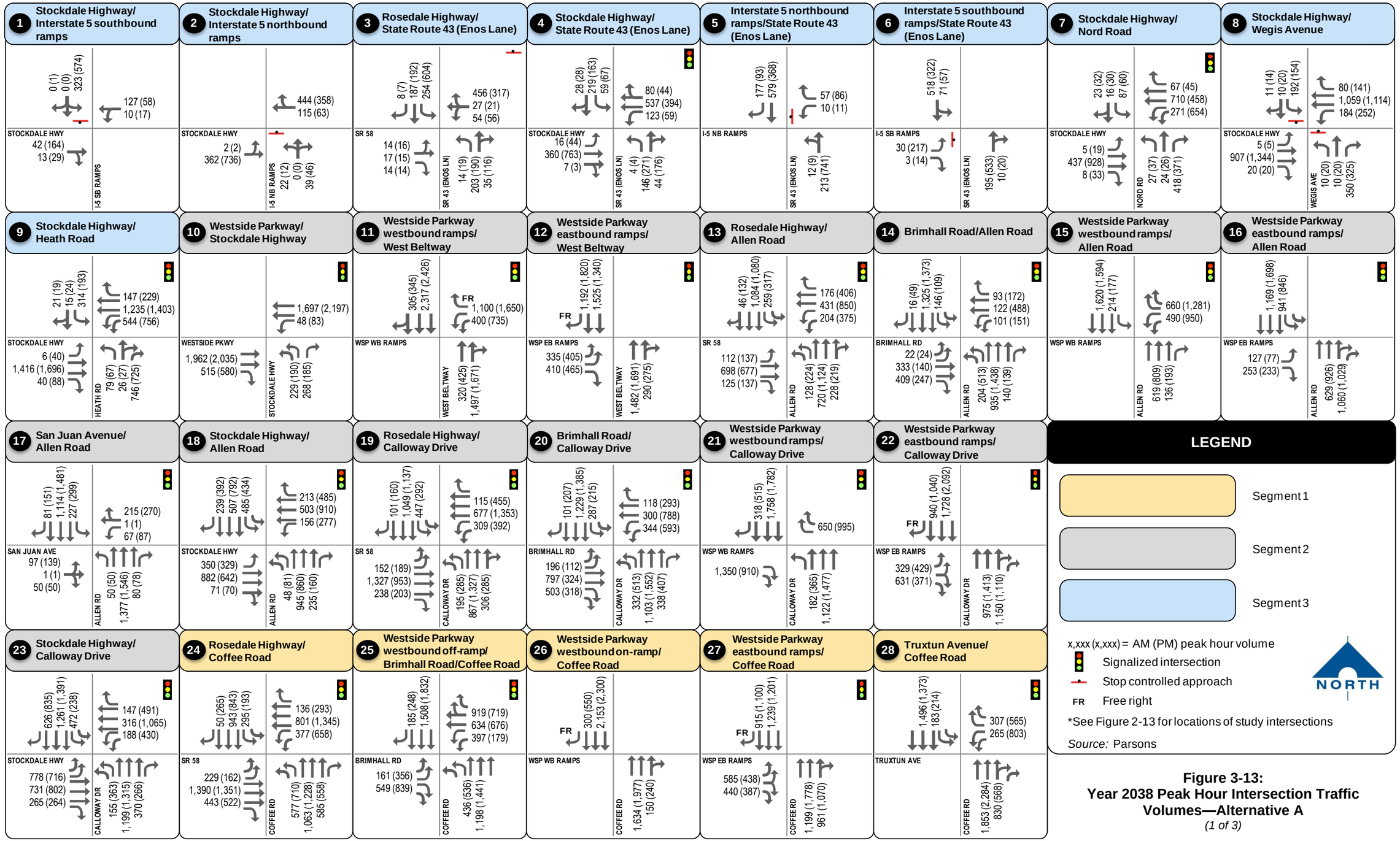


Figure 3-13:
Year 2038 Peak Hour Intersection Traffic Volumes—Alternative A
(1 of 3)

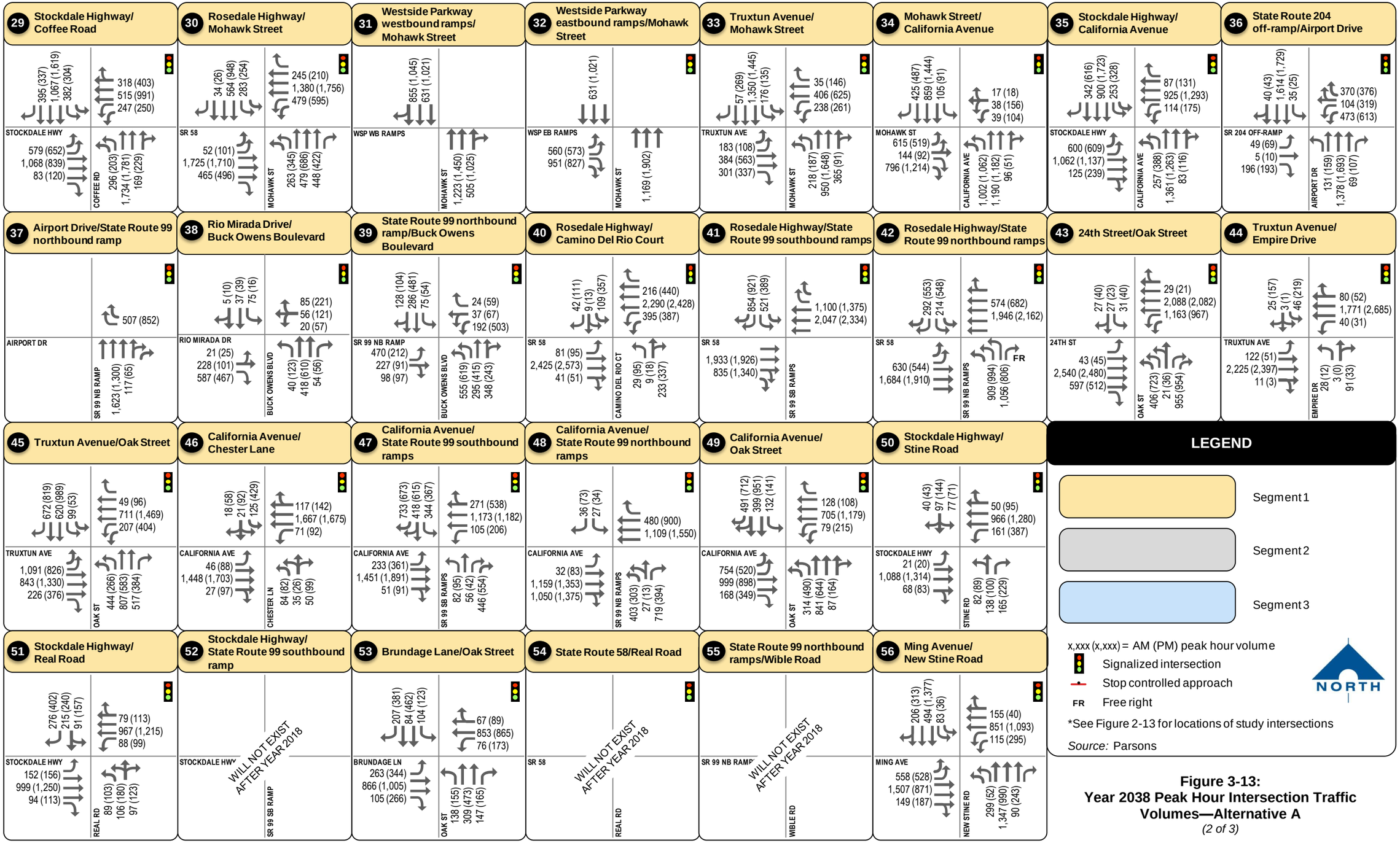


Figure 3-13:
Year 2038 Peak Hour Intersection Traffic Volumes—Alternative A
(2 of 3)

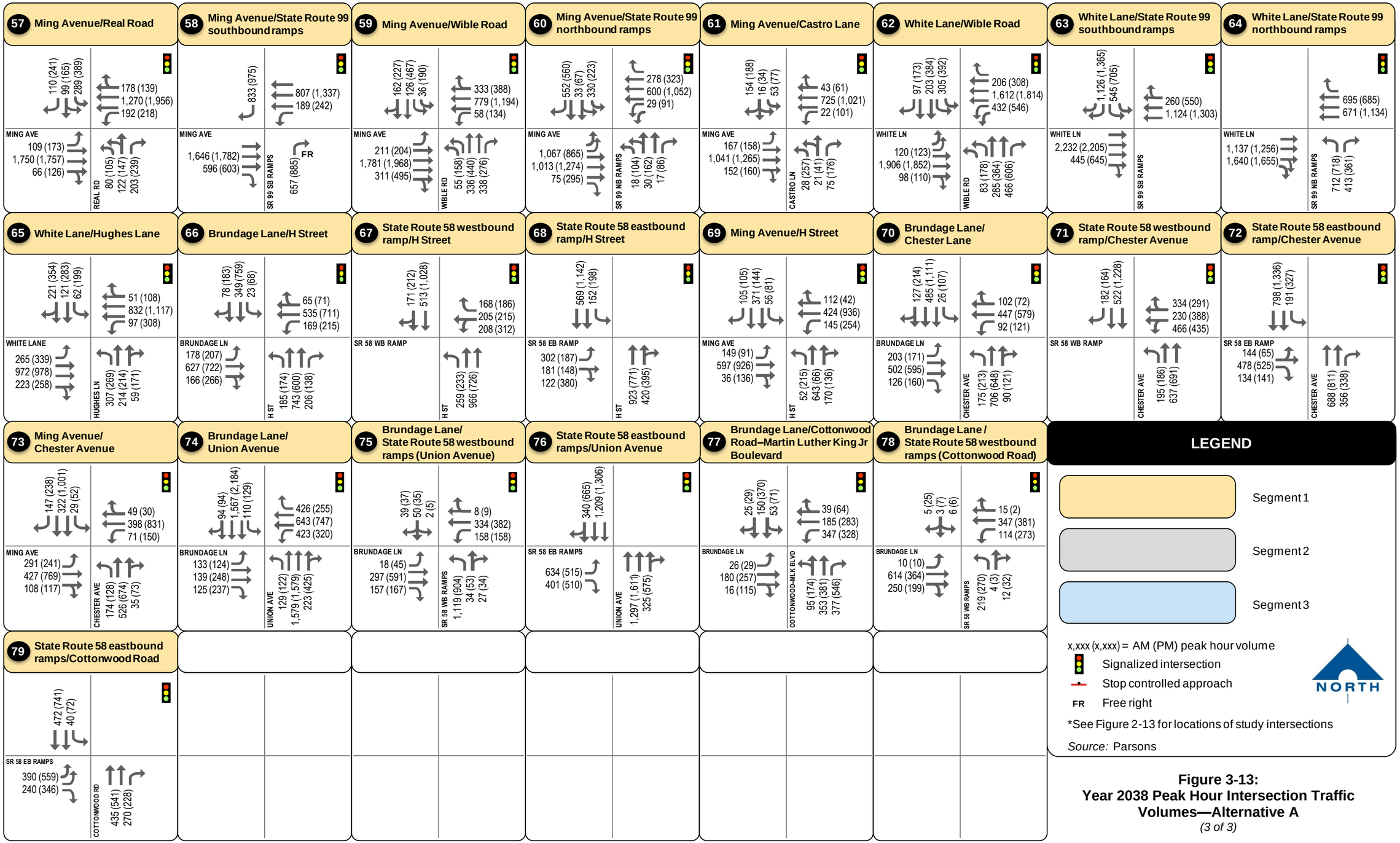


Figure 3-13:
Year 2038 Peak Hour Intersection Traffic Volumes—Alternative A
(3 of 3)

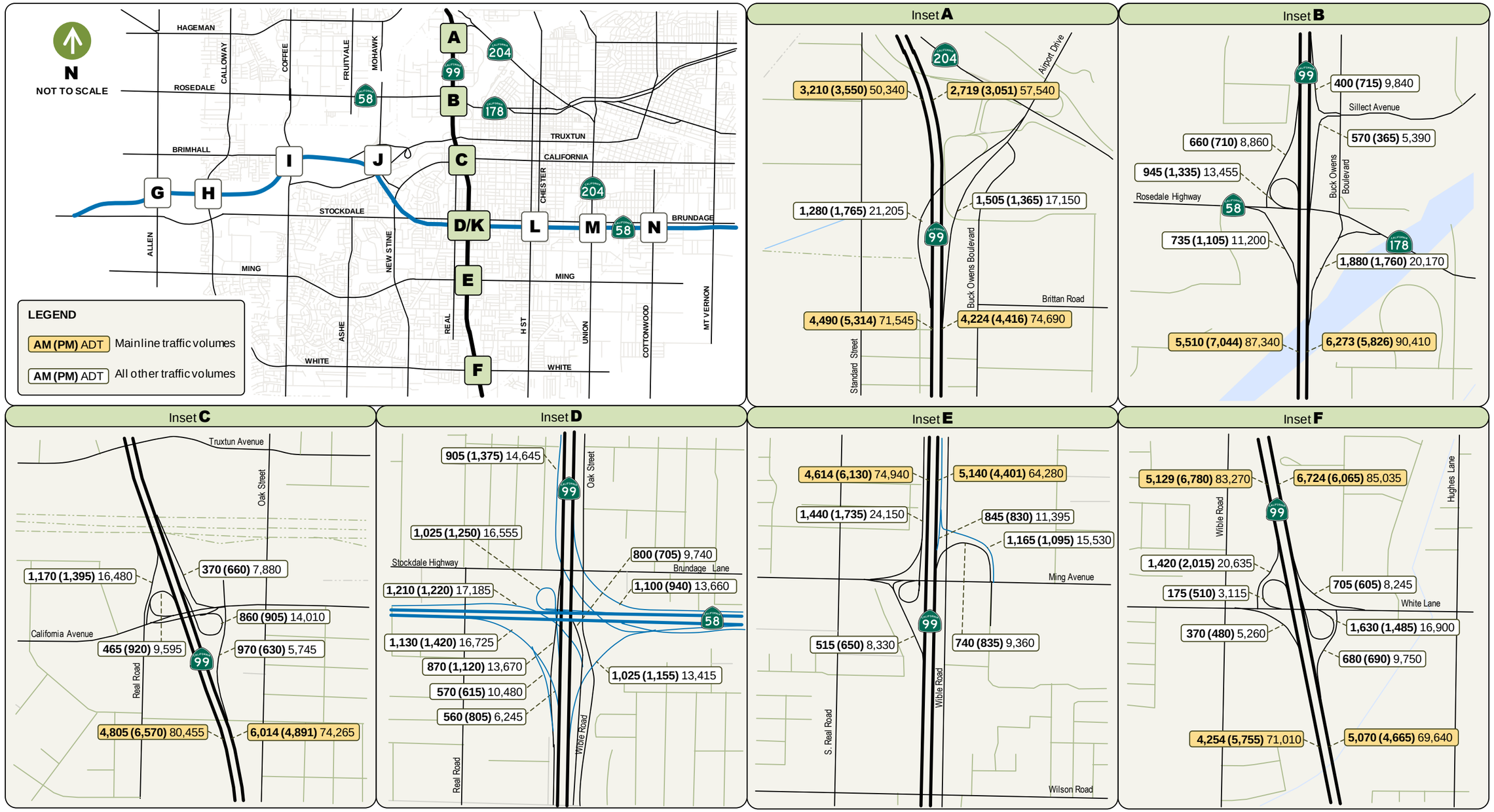


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Figure 3-14:
Year 2018 Peak Hour and Daily Freeway Volumes—Alternative A
(1 of 3)

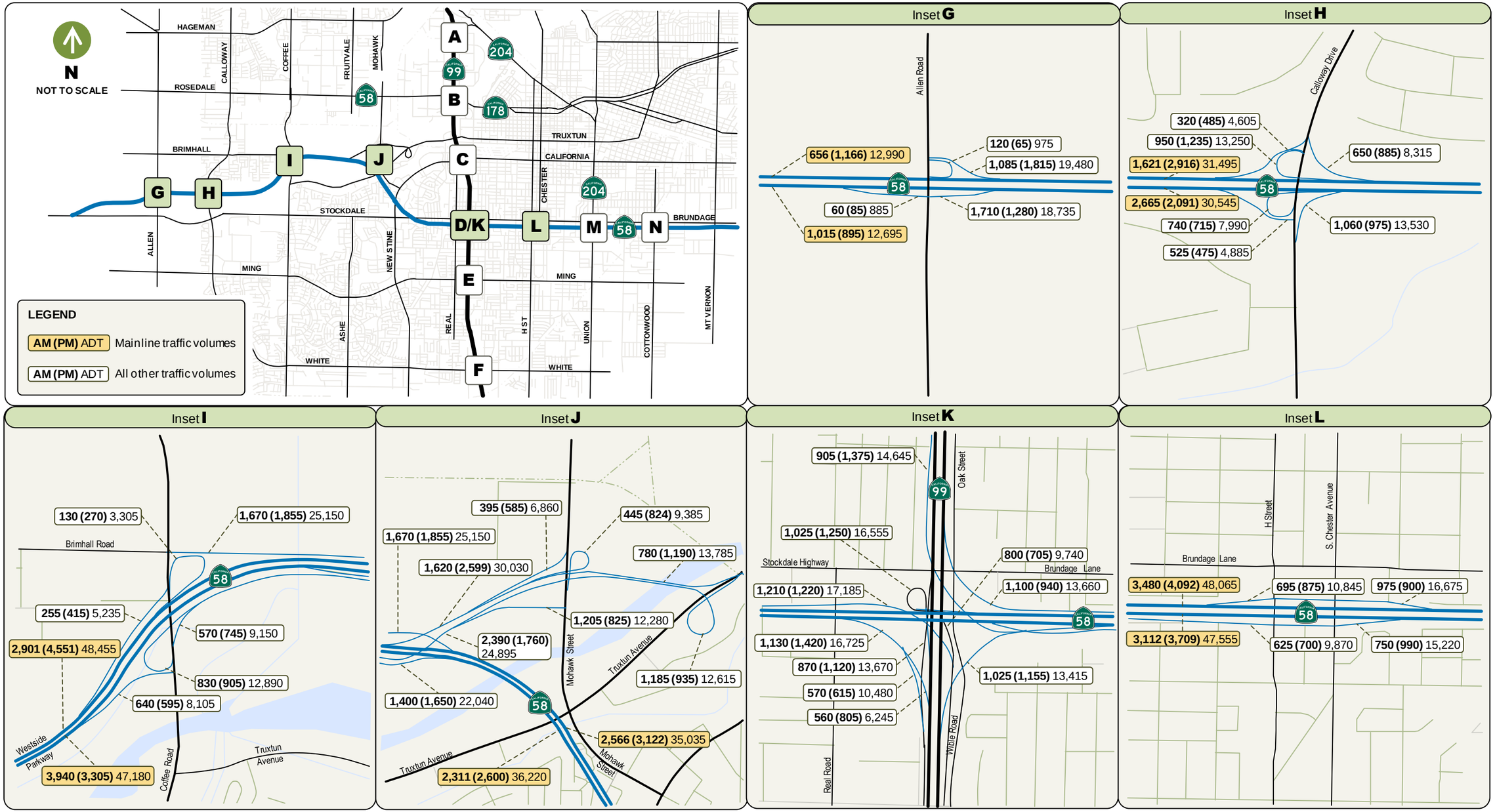

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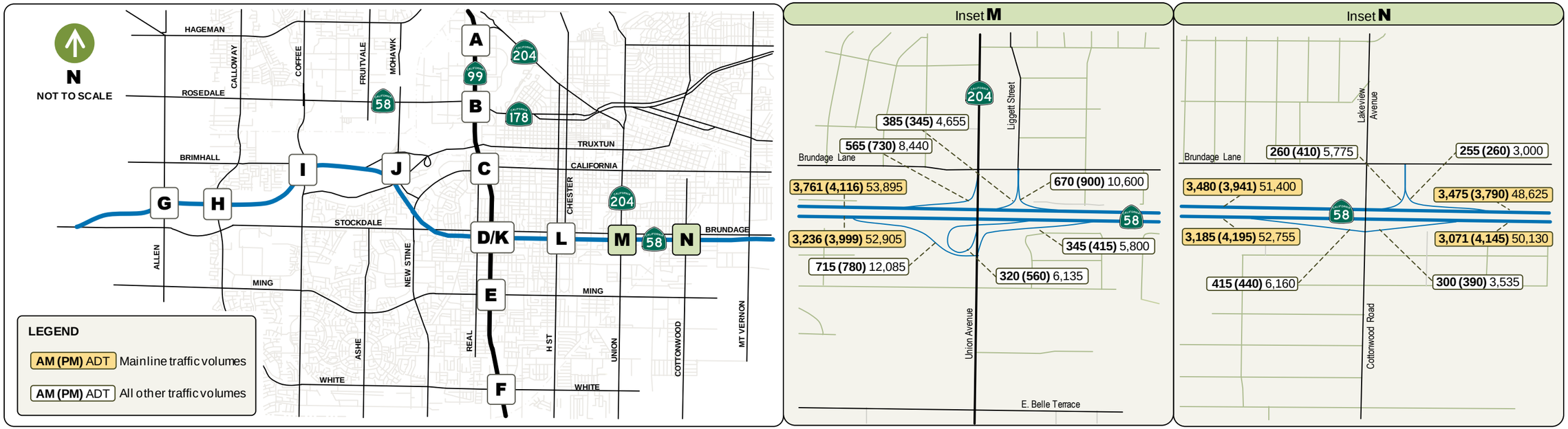
Figure 3-14:
Year 2018 Peak Hour and Daily Freeway Volumes—Alternative A
(2 of 3)



Source: Parsons

Figure 3-14:
Year 2018 Peak Hour and Daily Freeway Volumes—Alternative A
(3 of 3)

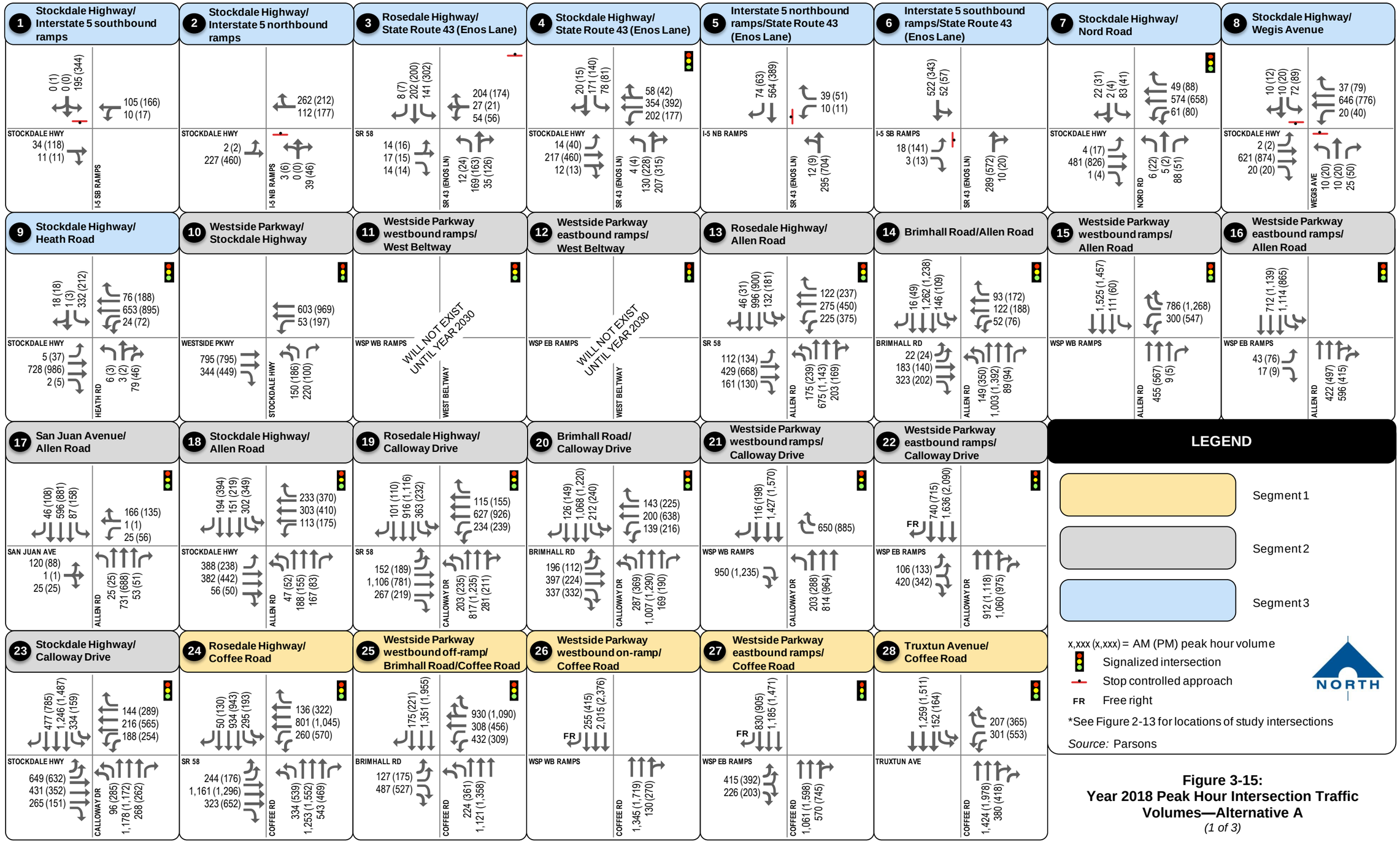


Figure 3-15:
Year 2018 Peak Hour Intersection Traffic Volumes—Alternative A
(1 of 3)

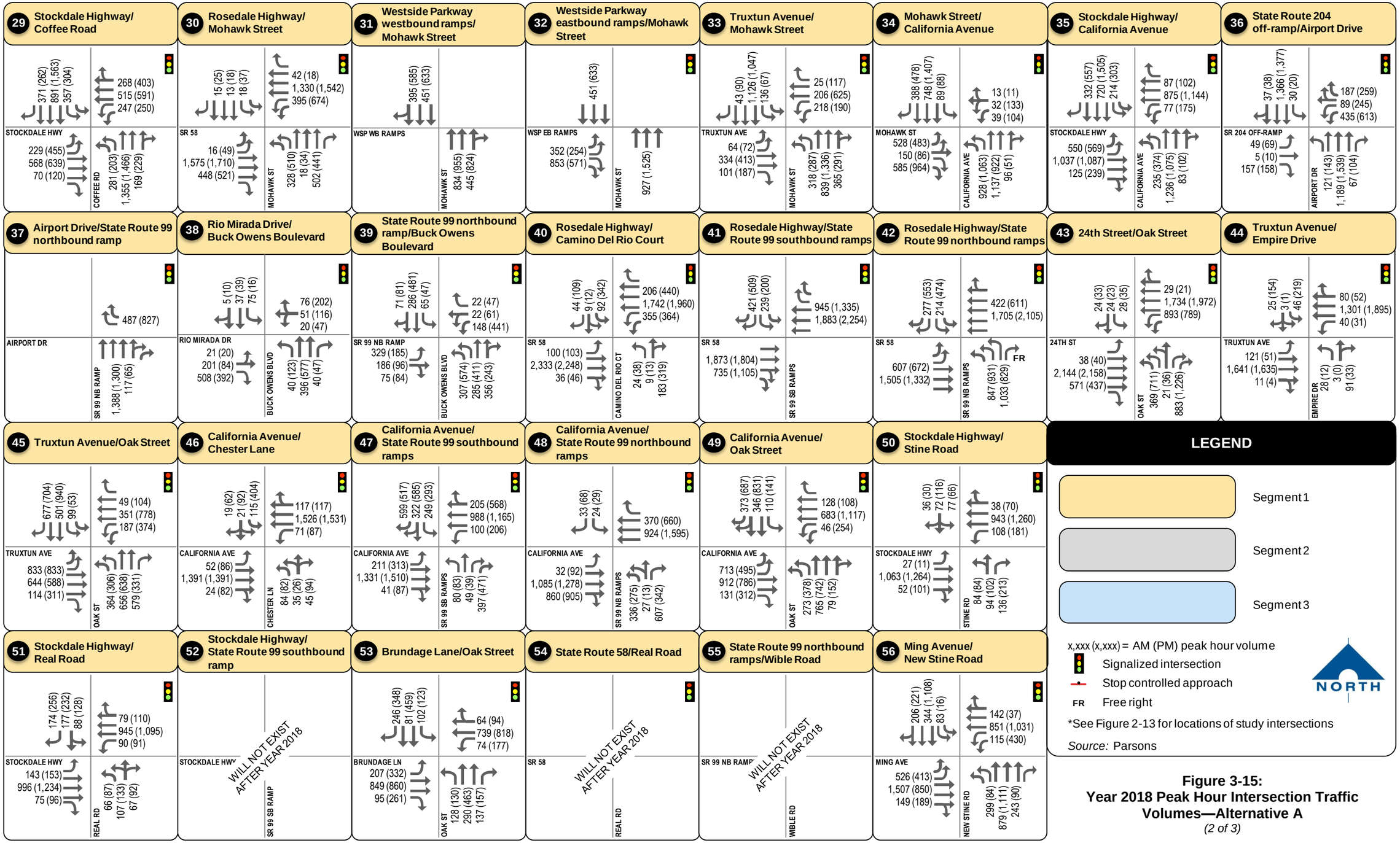


Figure 3-15:
Year 2018 Peak Hour Intersection Traffic Volumes—Alternative A
(2 of 3)

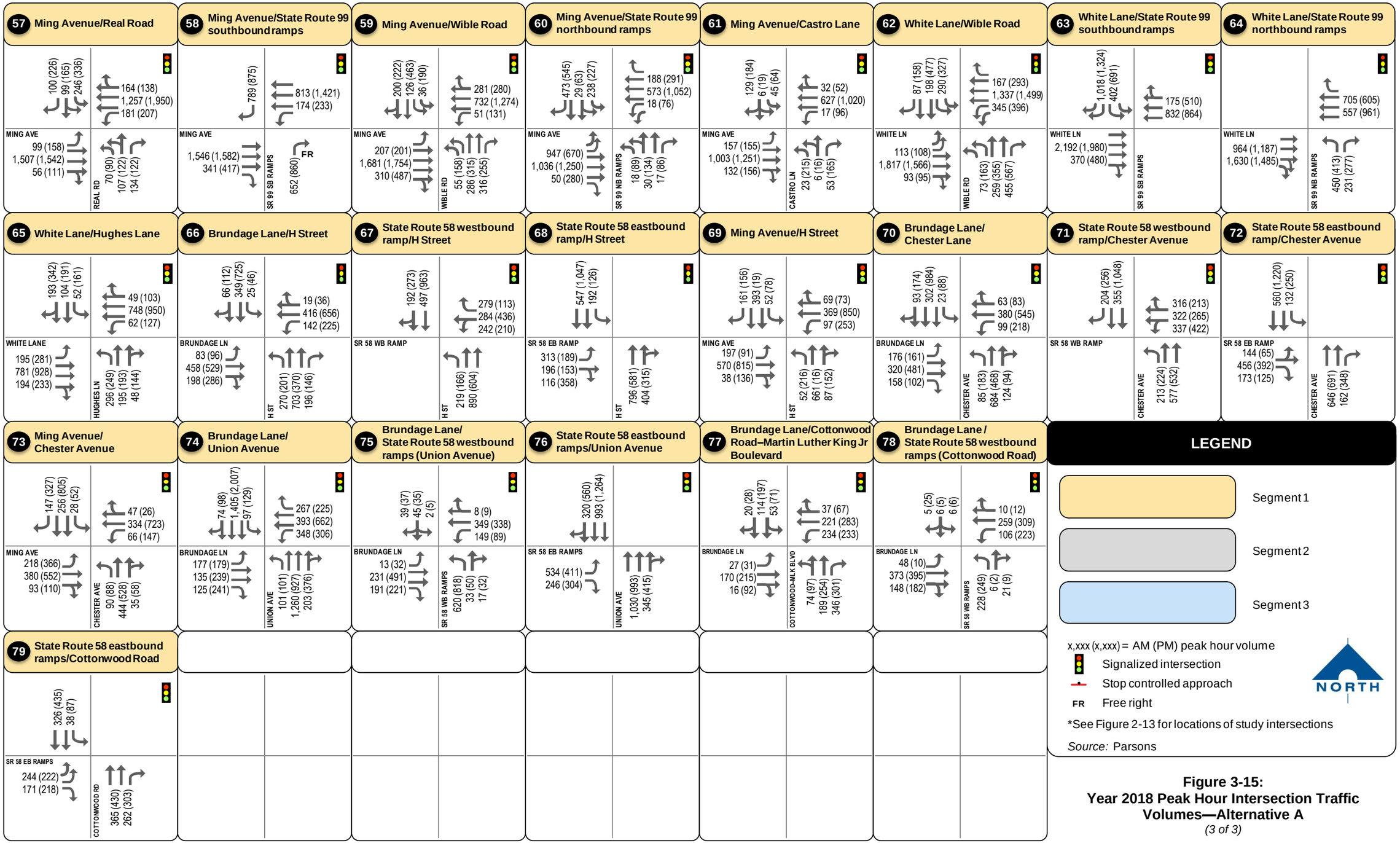


Figure 3-15:
Year 2018 Peak Hour Intersection Traffic Volumes—Alternative A
(3 of 3)

the southbound State Route 99 to the eastbound State Route 58 connector would be removed. Local access from Real Road to State Route 58 and to southbound State Route 99 would also be removed.

The alternative B new freeway would bisect existing business parks and residential neighborhoods. The following roads are proposed to cross over or under the proposed freeway alignment:

- Truxtun Avenue
- Commerce Drive
- California Avenue
- Marella Way
- La Mirada Drive
- Stockdale Highway and Stine Road
- South Real Road

The potential closure of Monclair Street, Woodlake Drive, Kensington Avenue, Hillsborough Drive, Kentfield Drive, Joseph Drive, Dunlap Street, Ford Avenue, and Williamson Way would modify existing circulation. Pedestrian and bicycle crossing would be limited to the proposed undercrossings or overcrossings, increasing neighborhood travel distances. No GET bus routes use the roadways that would potentially be closed. Therefore, alternative B would not directly affect existing transit service.

Figure 3-16 illustrates the difference between 2038 alternative B and no-build daily traffic volumes, as assigned by the travel forecast model. The bandwidths illustrated in red depict roadways which receive additional volumes of traffic as a result of the constructing the freeway-to-freeway Centennial Project connector. Roadways having bandwidths illustrated in blue indicate roadways receiving less traffic as a result of building the freeway connector. The difference plot is very similar to that provided for alternative A, as the change in mobility and accessibility offered by alternatives A and B is virtually the same.

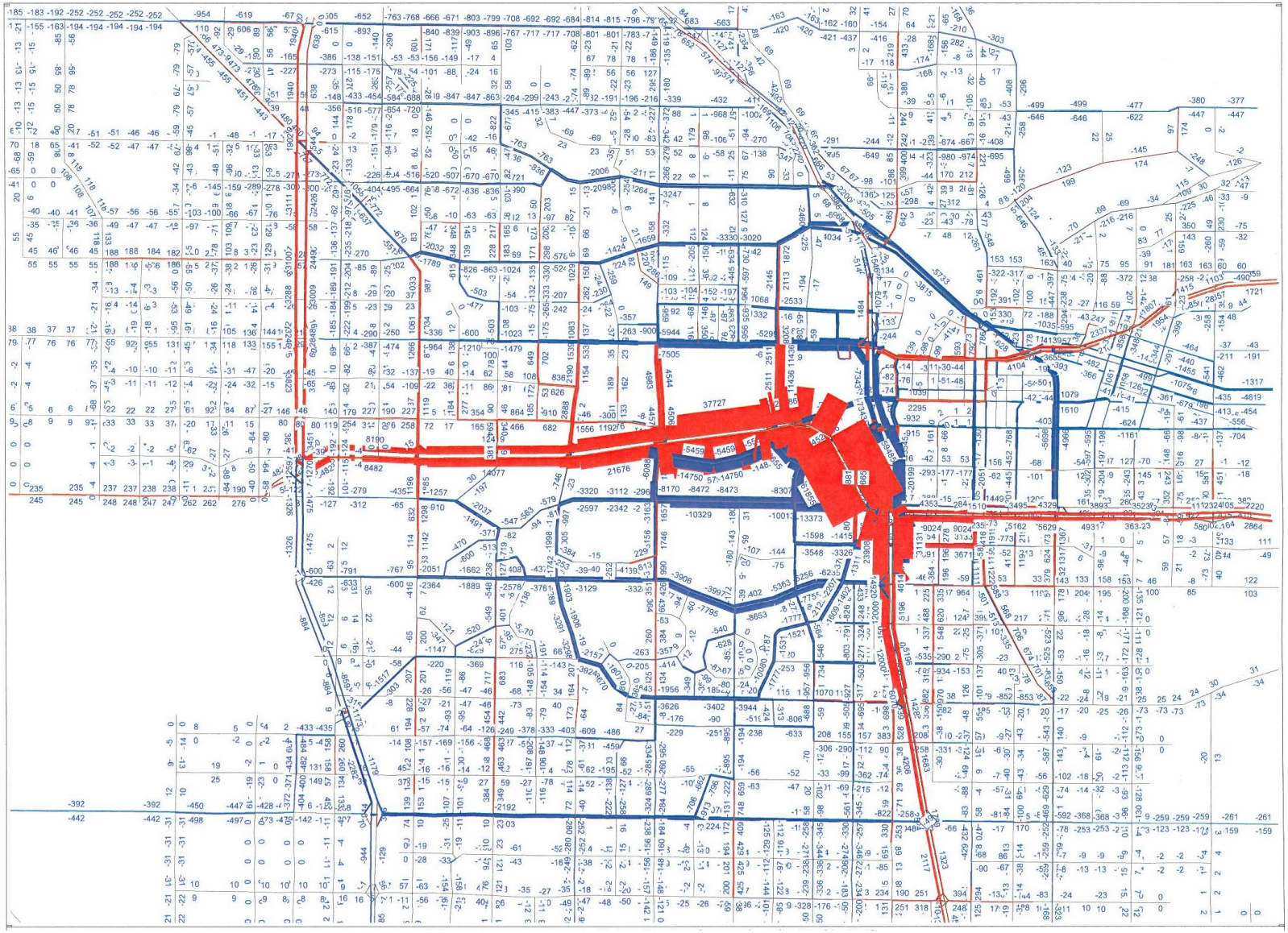
Figure 3-17 depicts the adjusted design year (2038) traffic forecasts for State Route 99 and State Route 58/Westside Parkway under alternative B conditions. Peak hour and daily volumes are reported for all freeway mainline segments and ramps within the Centennial Project study area.

Figure 3-18 reports AM and PM peak hour design year (2038) turning movement volumes for all study intersections.

Figures 3-19 and 3-20 present the same traffic volume information for opening year 2018 conditions.

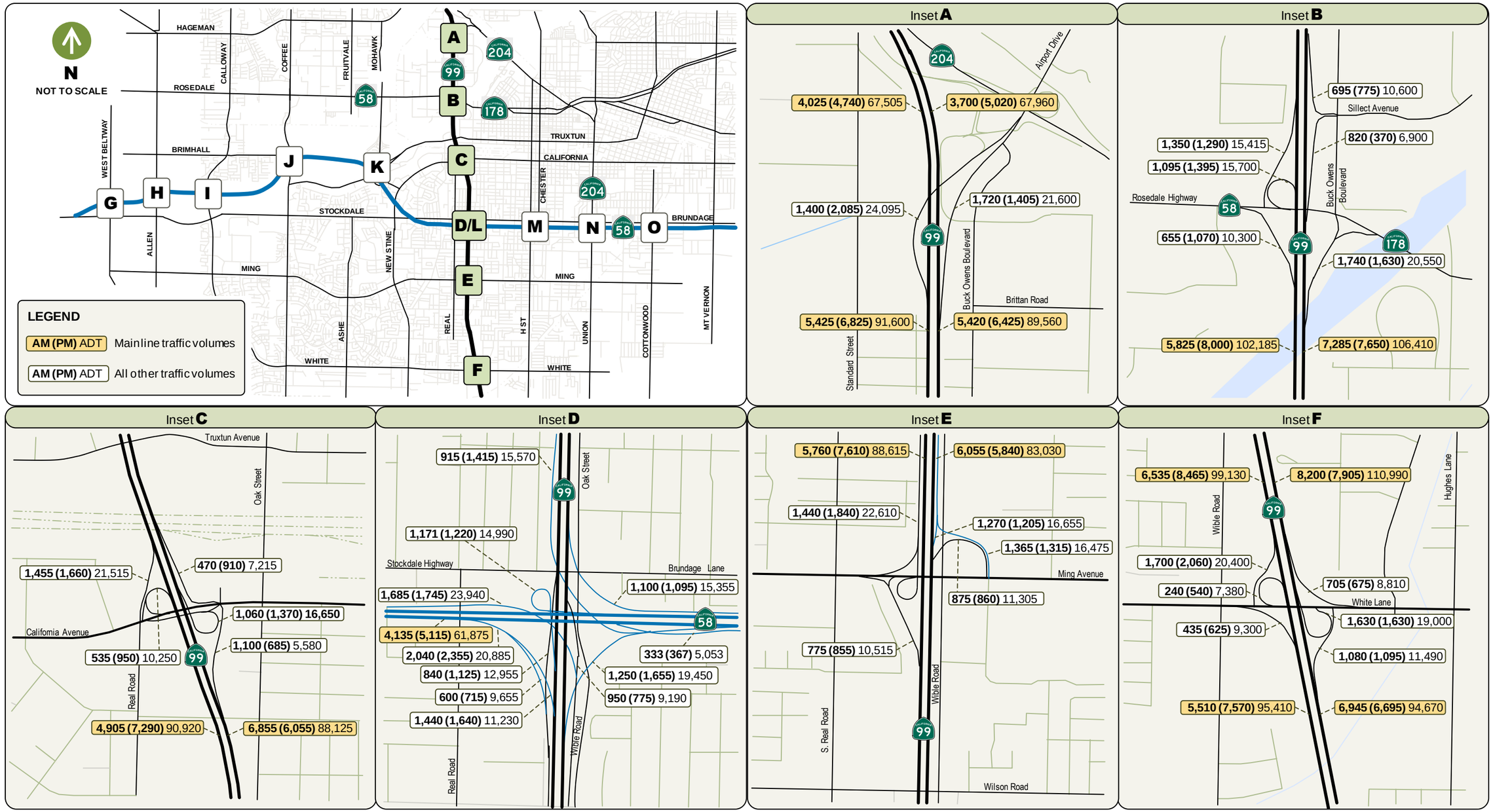
Alternative C

Alternative C proposes to connect the east end of the Westside Parkway to State Route 58 east near Cottonwood Road by means of a new freeway. Starting at the Mohawk Street interchange, this alternative would traverse easterly, spanning the Kern River and Truxtun Avenue, and continue parallel to and south of the BNSF Railway tracks. It would then turn south and continue parallel to and west of State Route 99 for approximately one mile and connect with State Route 58 near the existing State Route 58/State Route 99 interchange. This alternative proposes undercrossings at California Avenue, Palm Avenue, State Route 99, Oak Street and Brundage Lane.



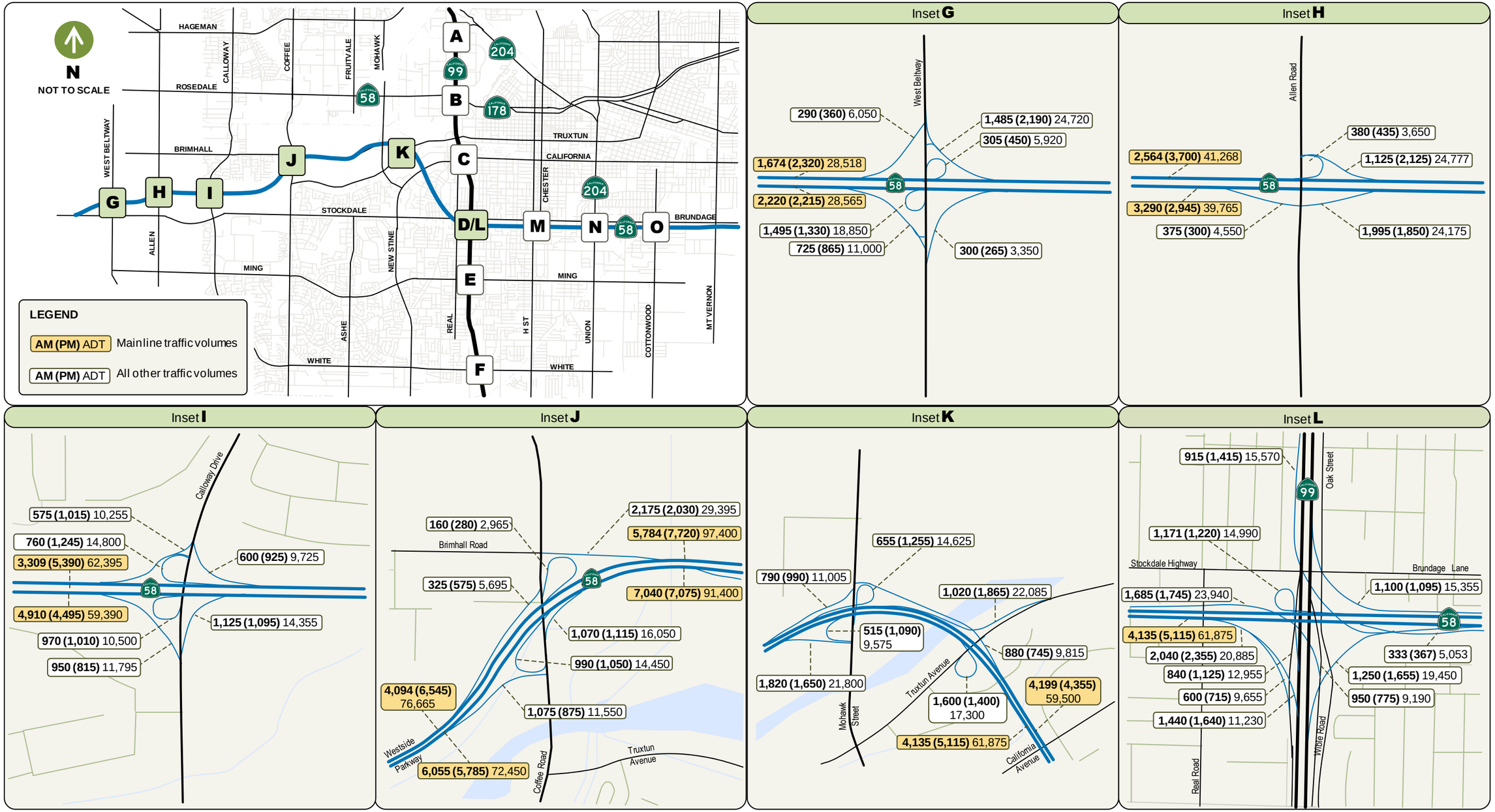
Source: Parsons

Figure 3-16: Difference between Year 2038 Alternative B and the No-Build Alternative Daily Traffic Volumes



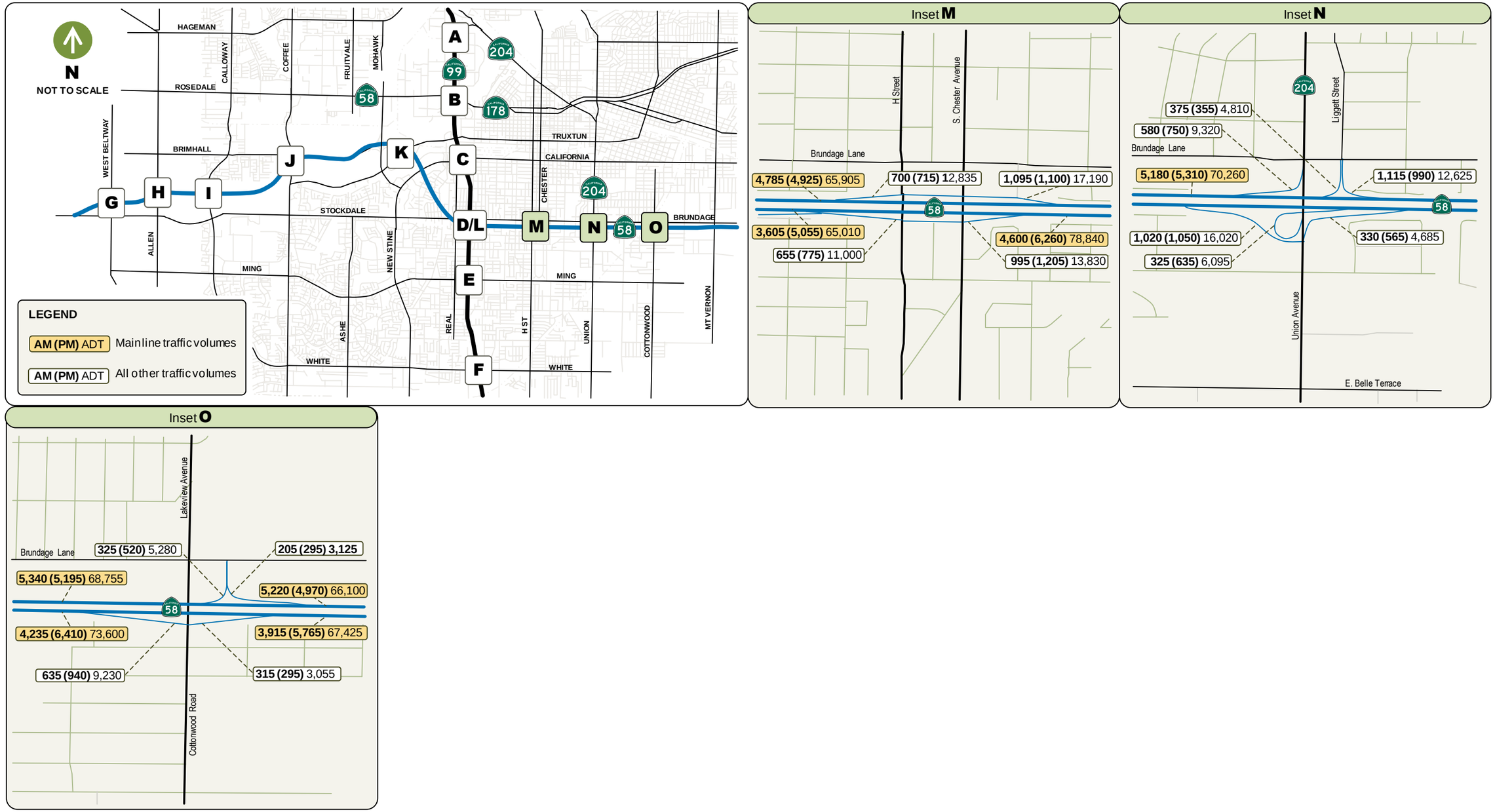
Source: Parsons

Figure 3-17:
Year 2038 Peak Hour and Daily Freeway Volumes—Alternative B
(1 of 3)



Source: Parsons

Figure 3-17:
Year 2038 Peak Hour and Daily Freeway Volumes—Alternative B
(2 of 3)



Source: Parsons

Figure 3-17:
Year 2038 Peak Hour and Daily Freeway Volumes—Alternative B
(3 of 3)

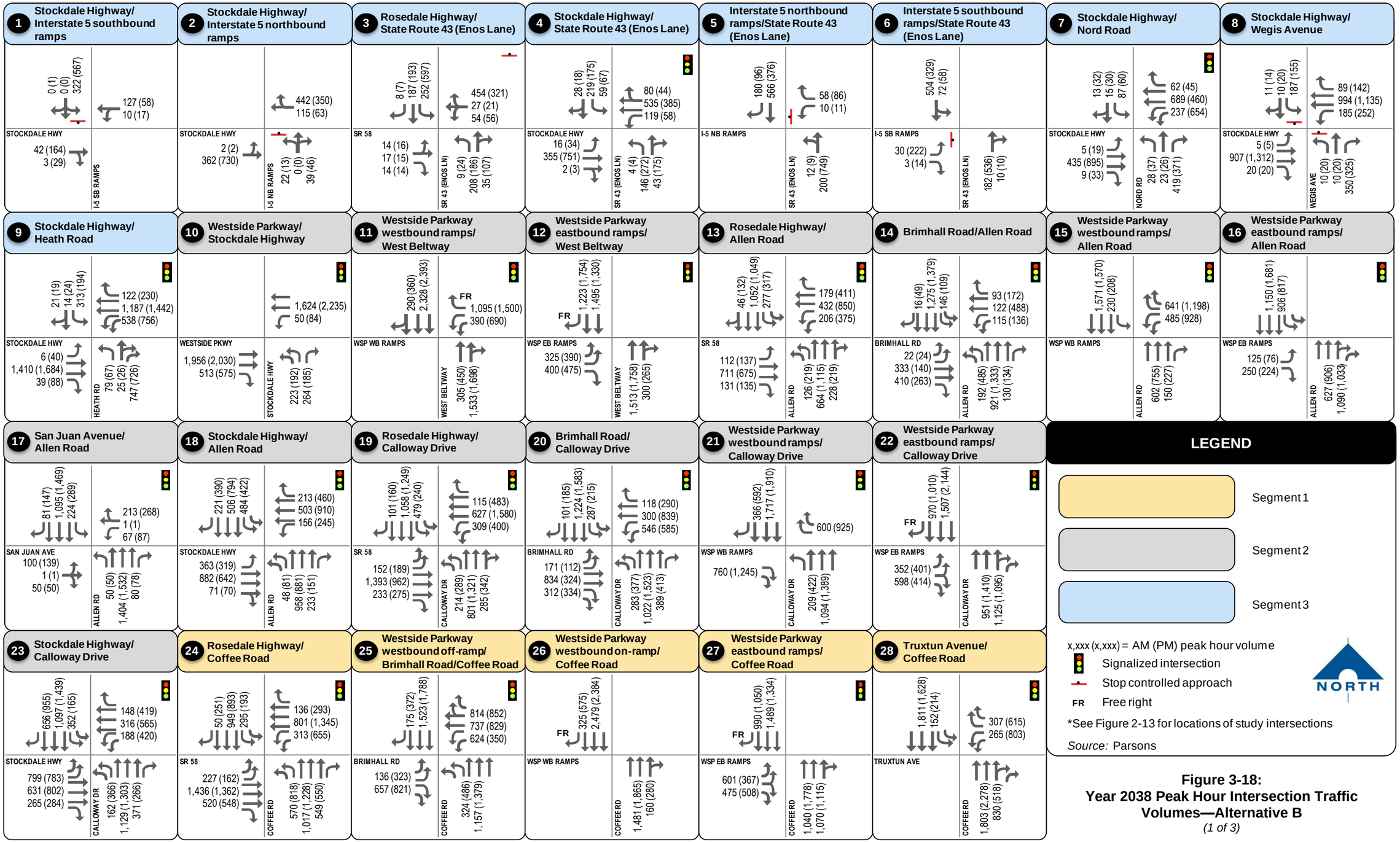


Figure 3-18:
Year 2038 Peak Hour Intersection Traffic Volumes—Alternative B
(1 of 3)

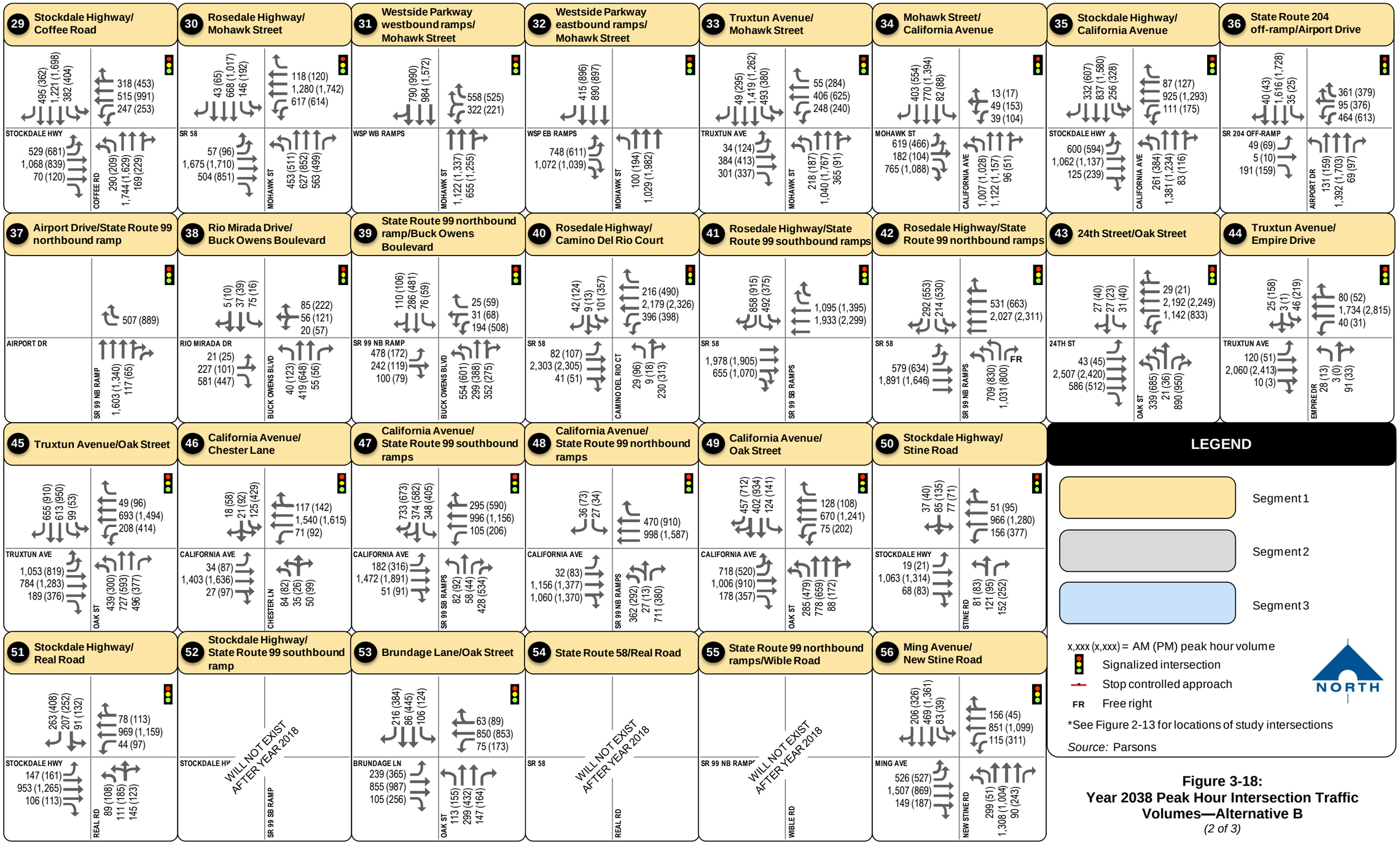


Figure 3-18:
Year 2038 Peak Hour Intersection Traffic Volumes—Alternative B
(2 of 3)

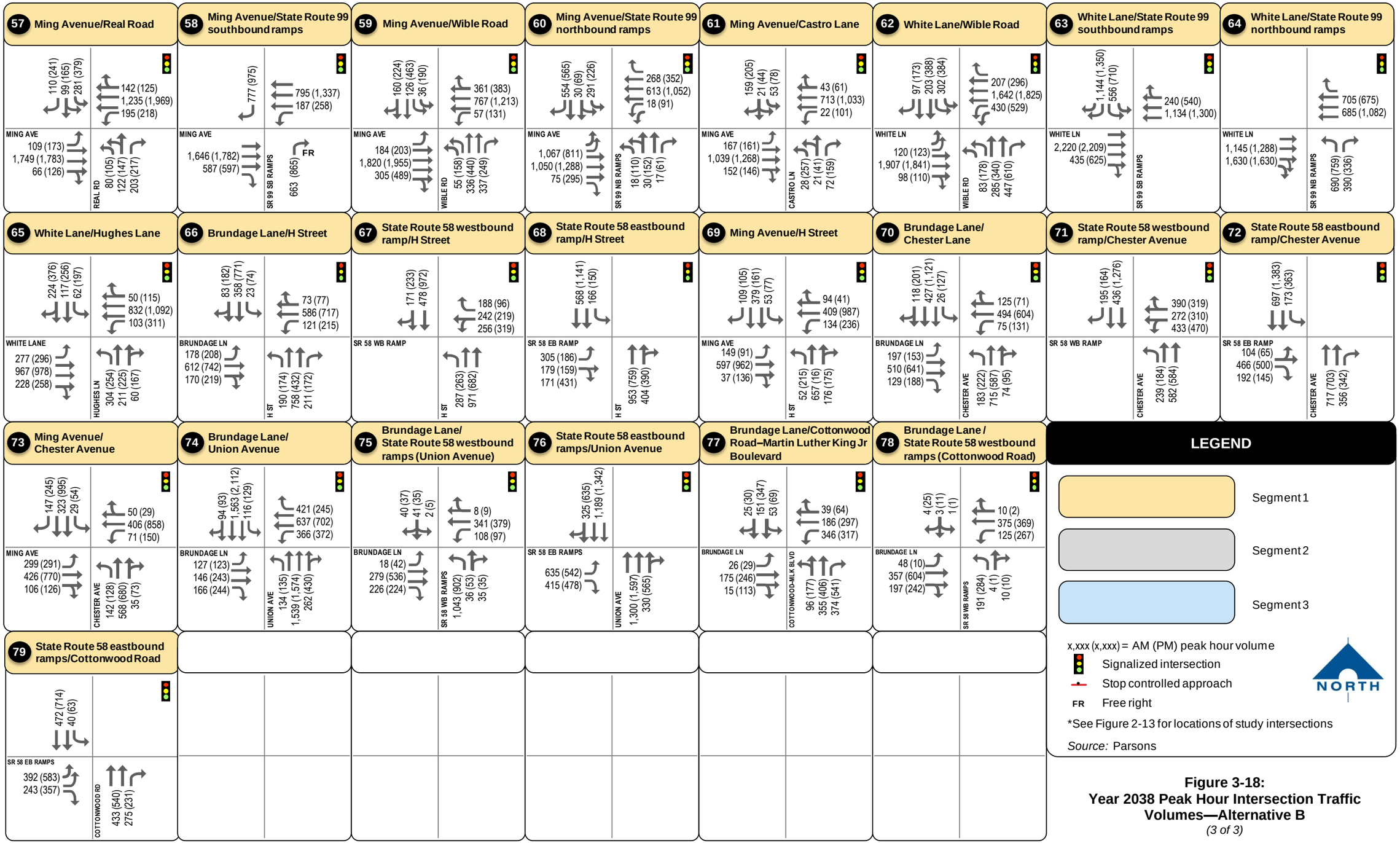
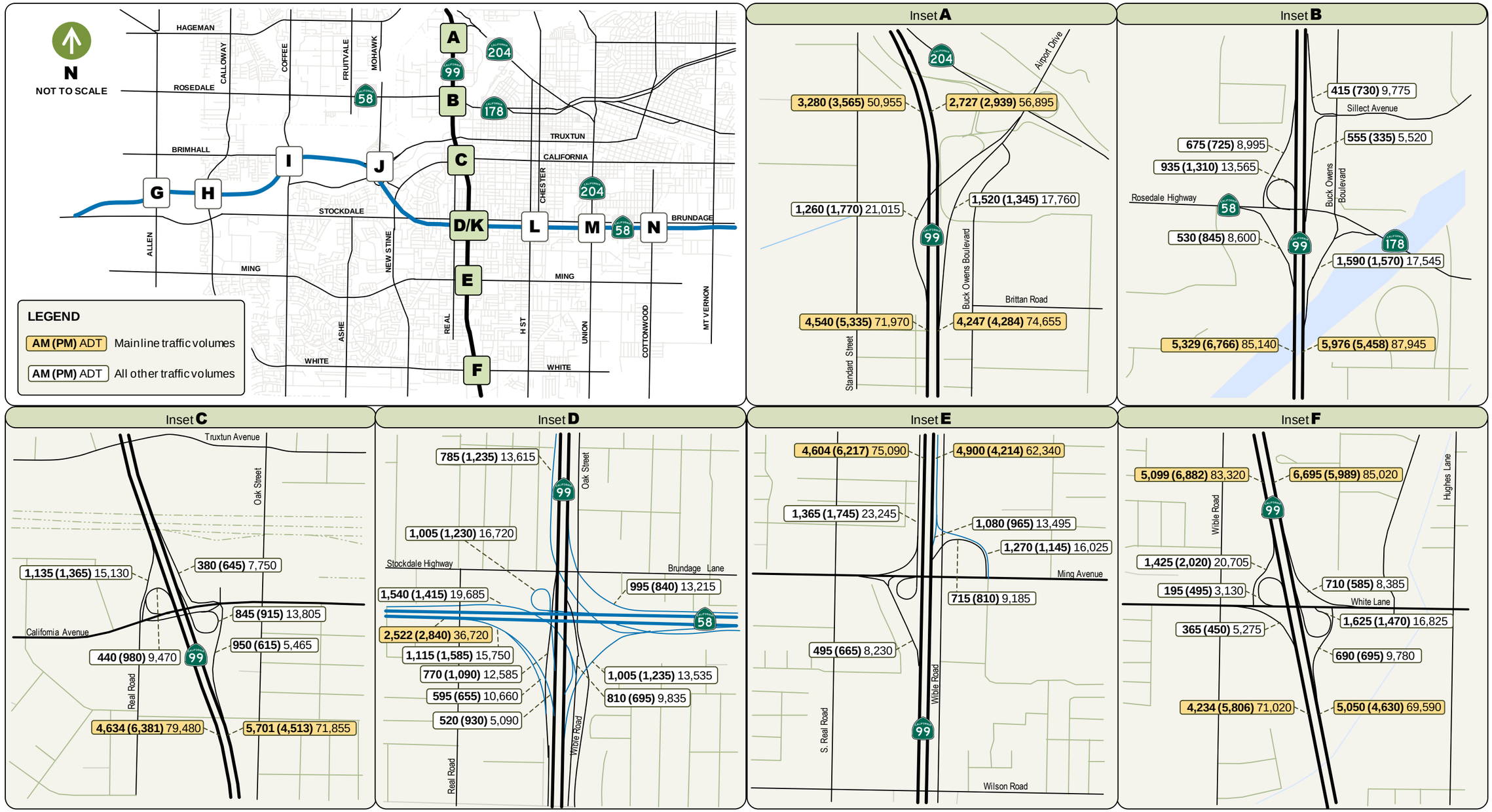


Figure 3-18:
Year 2038 Peak Hour Intersection Traffic Volumes—Alternative B
(3 of 3)



Source: Parsons

Figure 3-19:
Year 2018 Peak Hour and Daily Freeway Volumes—Alternative B
(1 of 3)

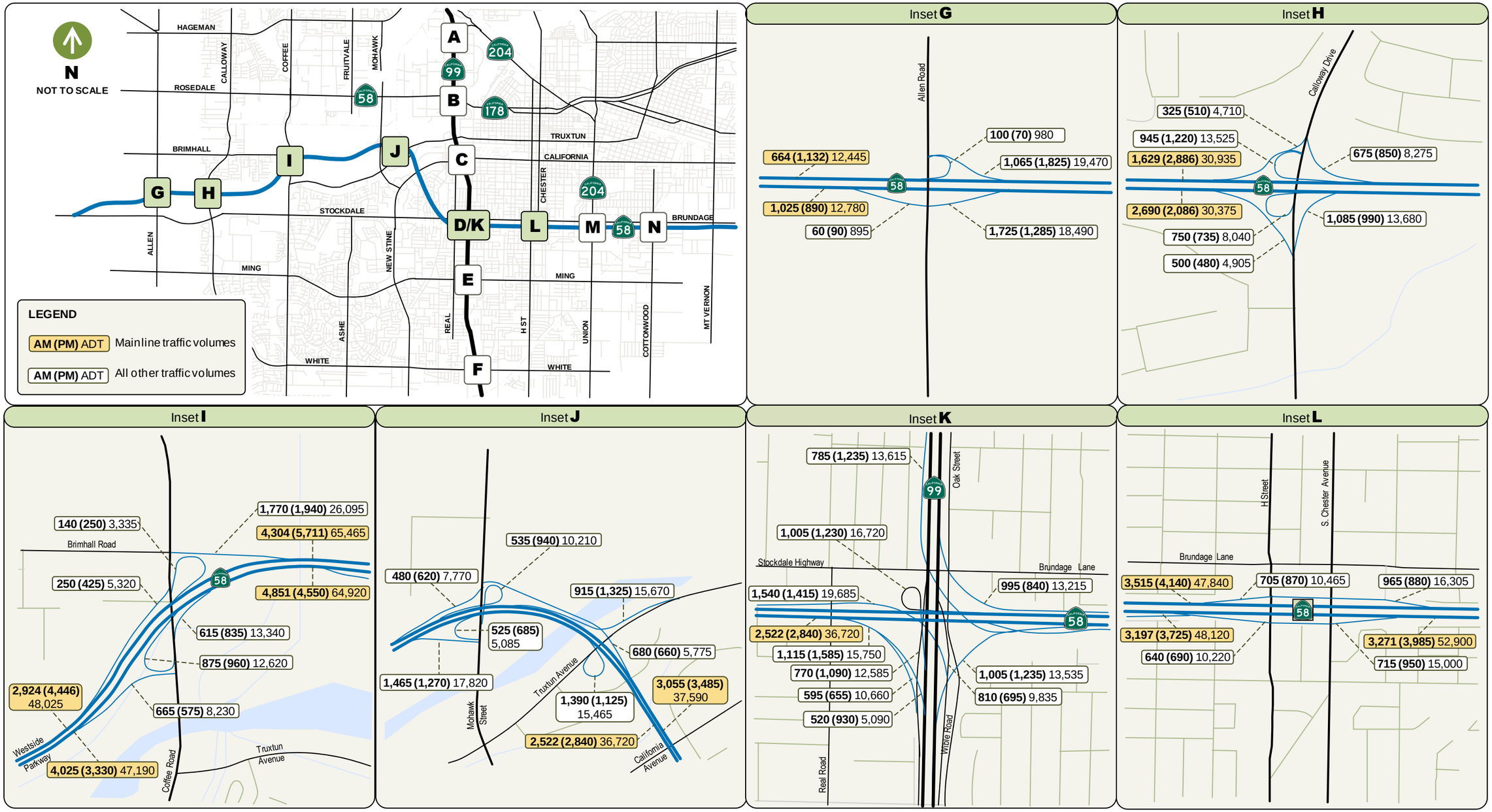


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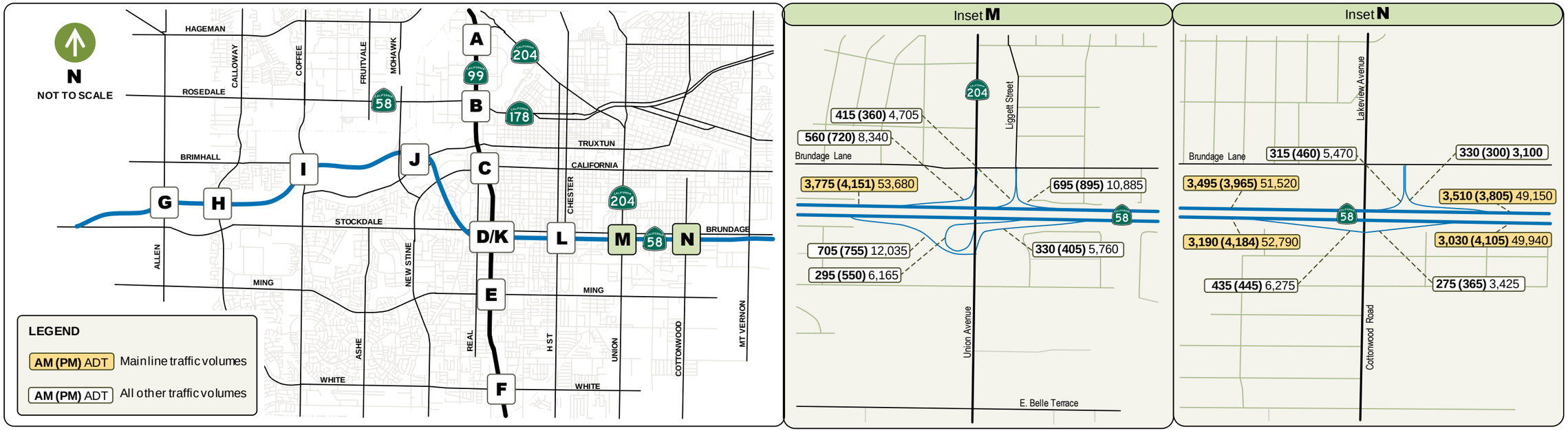
Figure 3-19:
Year 2018 Peak Hour and Daily Freeway Volumes—Alternative B
(2 of 3)



Source: Parsons

Figure 3-19:
Year 2018 Peak Hour and Daily Freeway Volumes—Alternative B
(3 of 3)

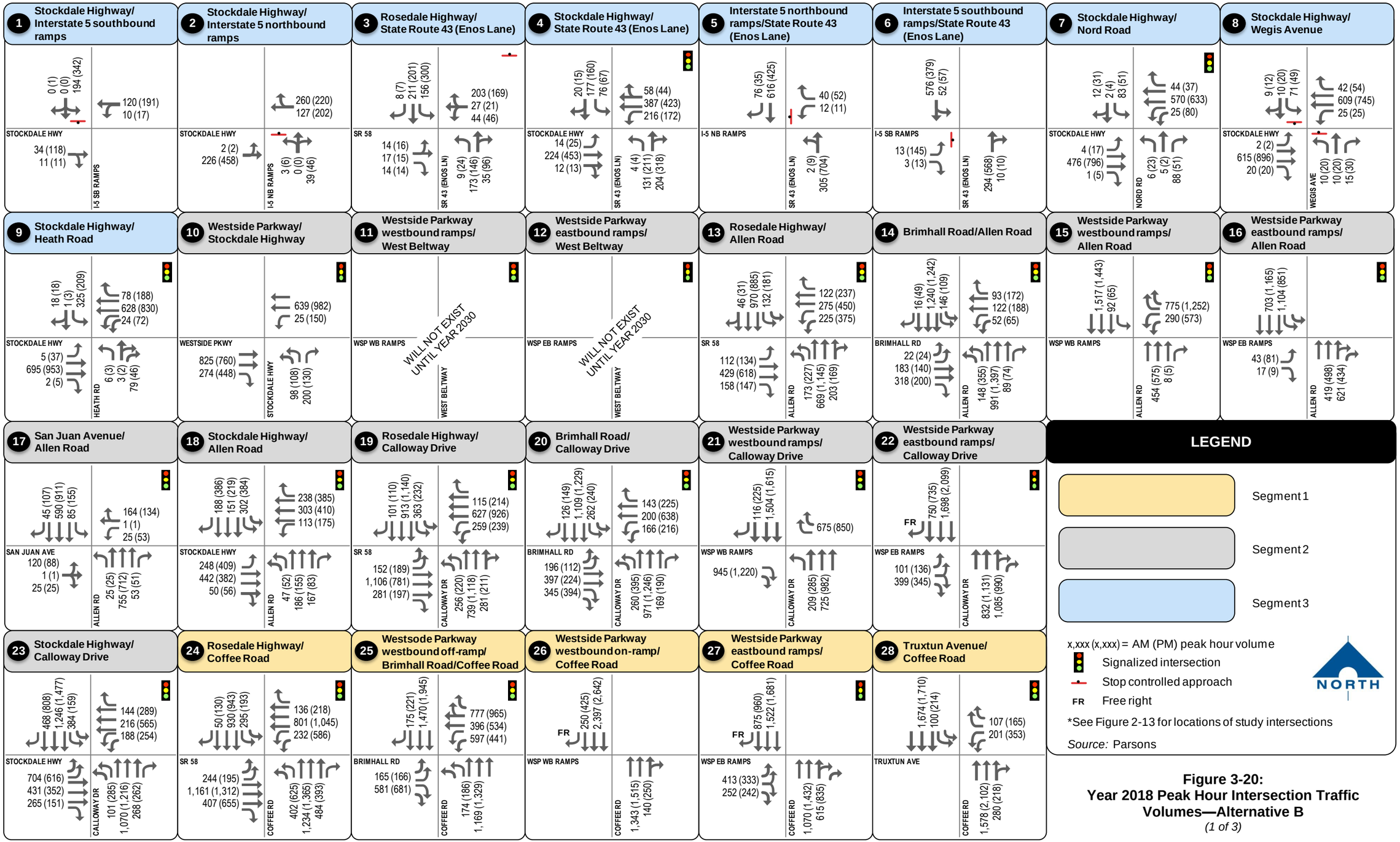


Figure 3-20:
Year 2018 Peak Hour Intersection Traffic Volumes—Alternative B
(1 of 3)

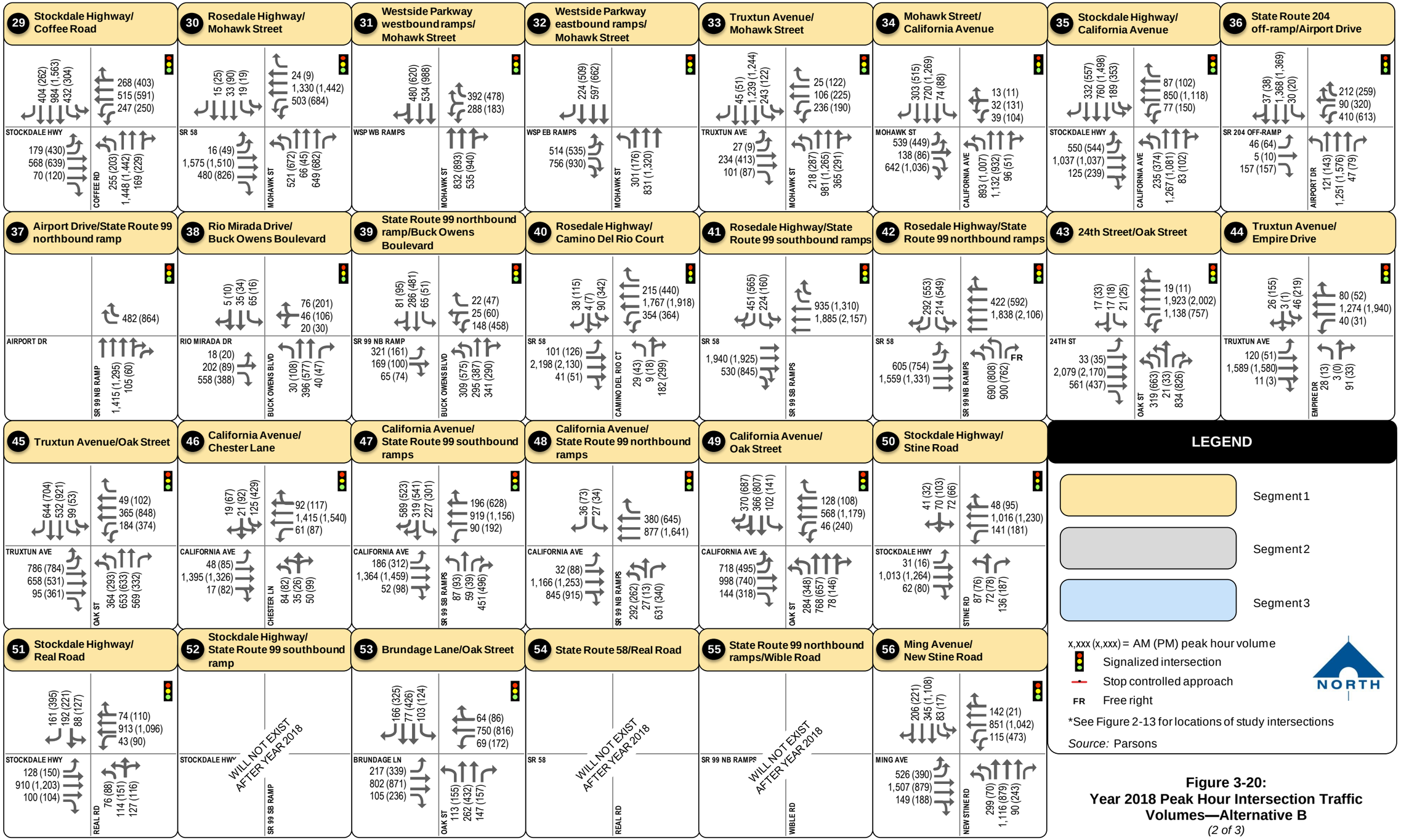


Figure 3-20:
Year 2018 Peak Hour Intersection Traffic Volumes—Alternative B
(2 of 3)

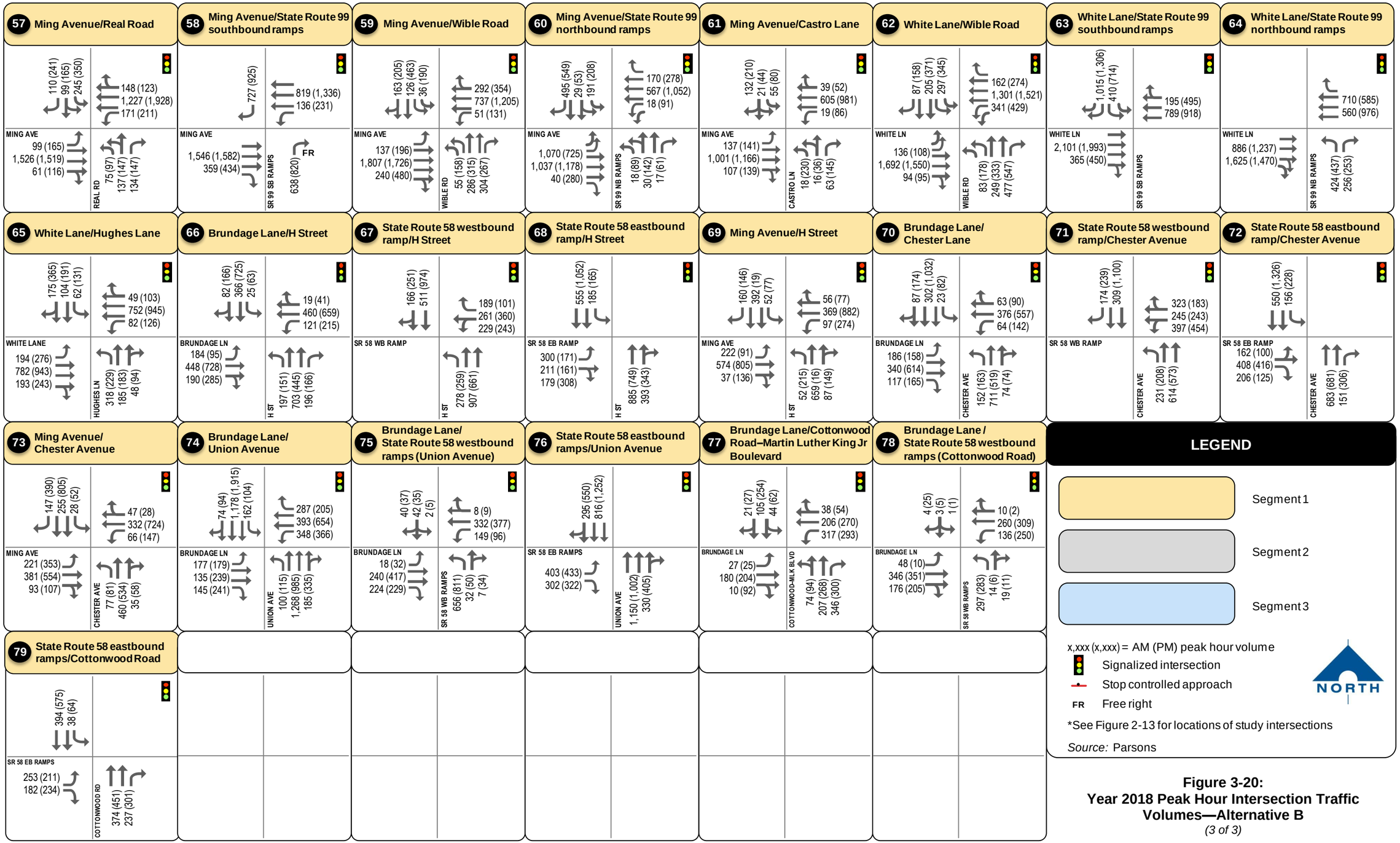


Figure 3-20:
Year 2018 Peak Hour Intersection Traffic Volumes—Alternative B
(3 of 3)

New branch connectors would be constructed for the eastbound State Route 58 to southbound State Route 99 and the northbound State Route 99 to westbound State Route 58 movements. Auxiliary lanes would be provided on State Route 99 to accommodate the additional traffic from State Route 58. Improvements on State Route 99 would extend from the Wilson Road overcrossing to the Gilmore Avenue overcrossing. A collector-distributor road system would provide access from westbound State Route 58 to northbound State Route 99 as well as from northbound State Route 99 to westbound State Route 58. The Wible Road on and off ramps south of the existing State Route 99/State Route 58 interchange would be removed to accommodate the northbound State Route 99 auxiliary lane. The Stockdale Avenue off ramp from the southbound State Route 99 to the eastbound State Route 58 connector would be removed. Local access from Real Road to southbound State Route 99 would be removed as well.

The following are locations where the new structures would be required for this alternative to allow the listed road to pass under or over the proposed new freeway alignment:

- Truxtun Avenue
- California Avenue
- Palm Street
- Brundage Lane
- Stockdale Highway

As the new freeway would be aligned adjacent to the BNSF railyard and the State Route 99 freeway, it would not bisect existing business parks or residential neighborhoods. The potential closure of Easton Drive would modify existing circulation, however. No GET bus routes use Easton Drive. Therefore, alternative C would not directly affect existing transit service.

Figure 3-21 illustrates the difference between 2038 alternative C and no-build daily traffic volumes, as assigned by the travel forecast model. The bandwidths illustrated in red depict roadways which receive additional volumes of traffic as a result of constructing the freeway-to-freeway Centennial Corridor project connector. Roadways having bandwidths illustrated in blue indicate roads receiving less traffic as a result of building the freeway connector. The difference plot is similar to that provide for alternatives A and B. The wide red bandwidth along State Route 99 reflects the proposed alignment of the alternative C connector, which runs immediately west and parallel to existing State Route 99.

Figure 3-22 depicts the adjusted design year (2038) traffic forecasts for State Route 99 and State Route 58/Westside Parkway under alternative C conditions. Peak hour and daily volumes are reported for all freeway mainline segments and ramps within the Centennial Corridor project study area.

Figure 3-23 reports AM and PM peak hour turning movement volumes for all study intersections.

Figures 3-24 and 3-25 present the same traffic volume information for opening year 2018 conditions.

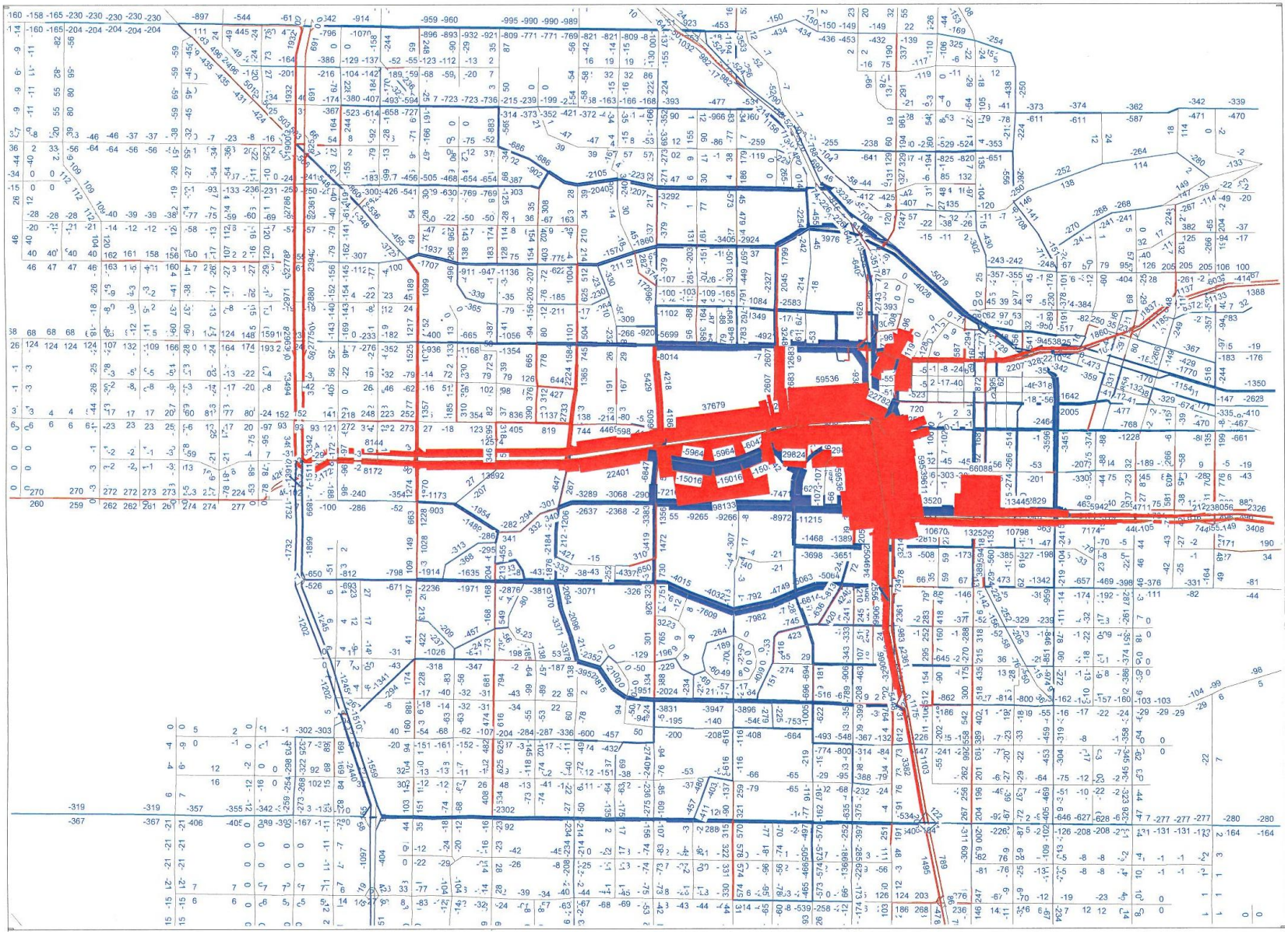
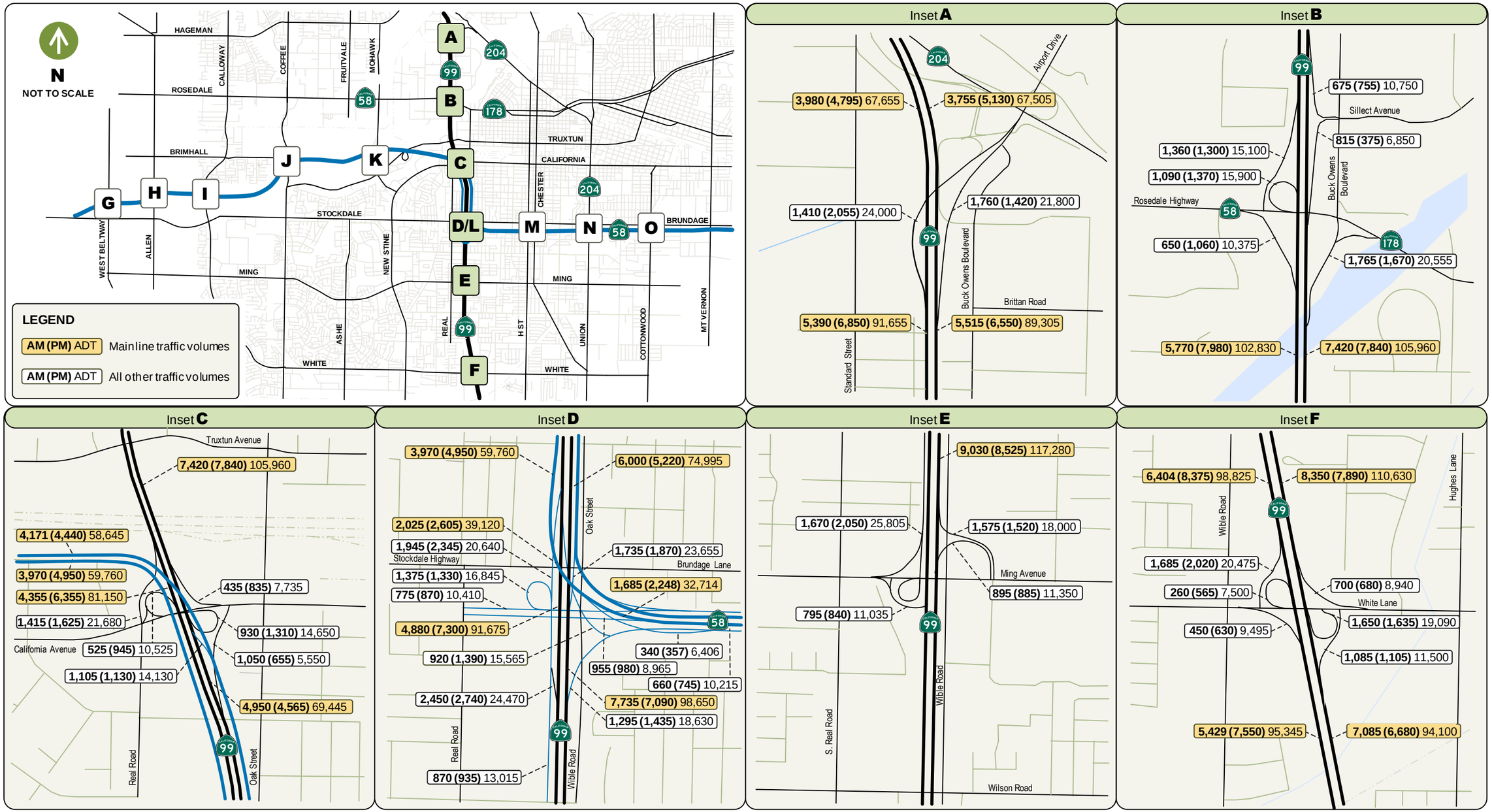
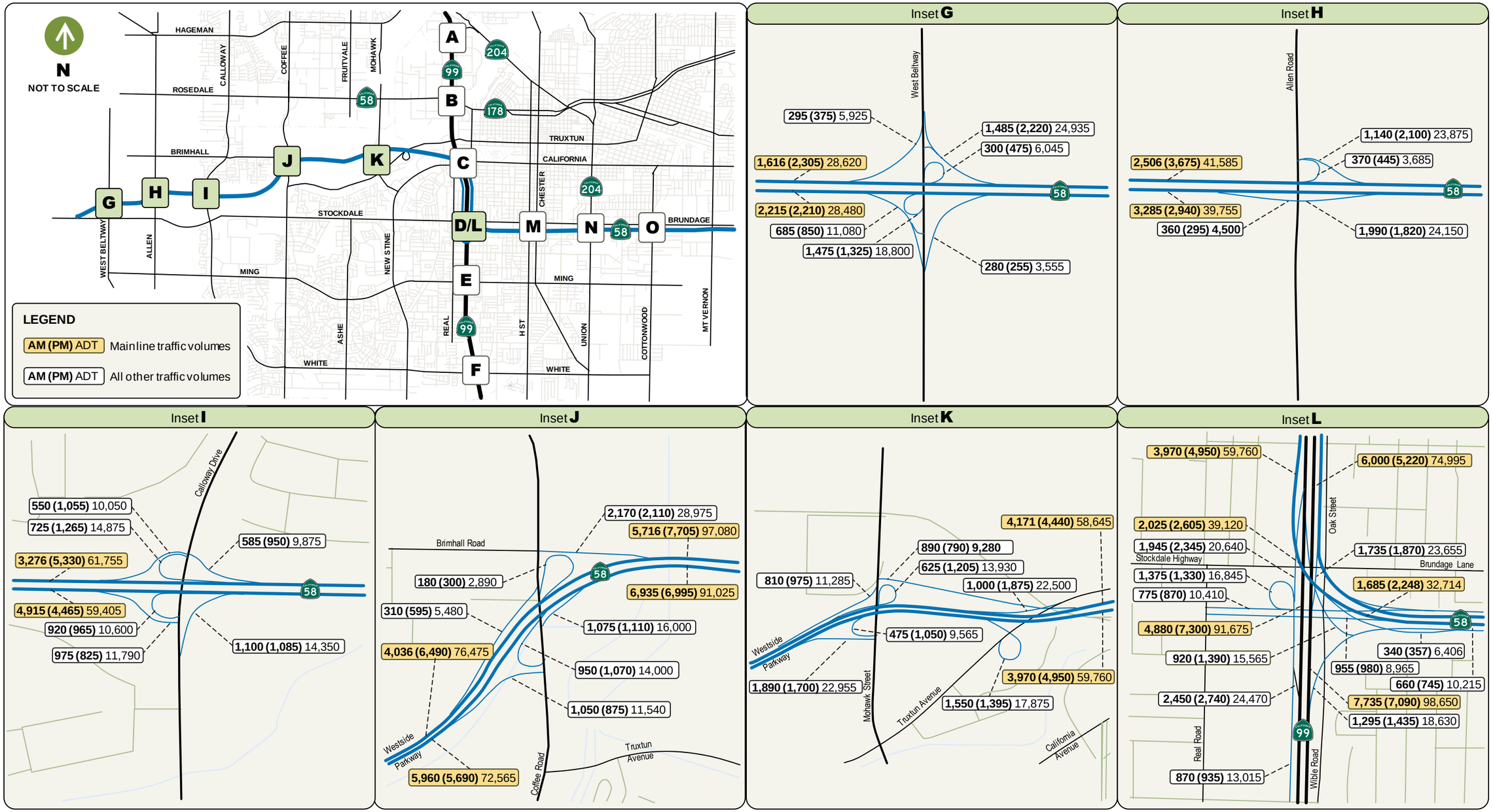


Figure 3-21: Difference between Year 2038 Alternative C and the No-Build Alternative Daily Traffic Volumes



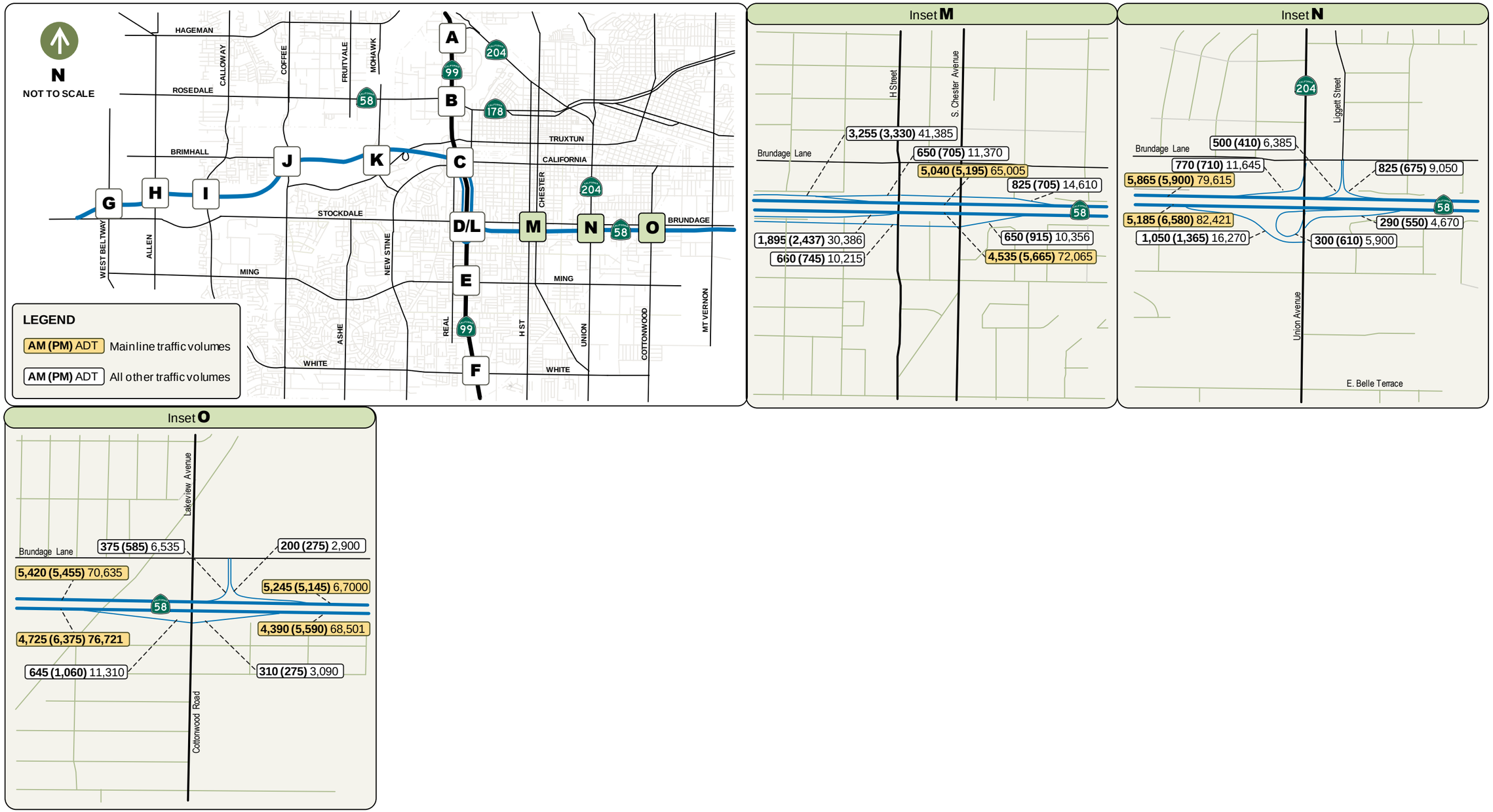
Source: Parsons

Figure 3-22:
Year 2038 Peak Hour and Daily Freeway Volumes—Alternative C
(1 of 3)



Source: Parsons

Figure 3-22:
Year 2038 Peak Hour and Daily Freeway Volumes—Alternative C
(2 of 3)



Source: Parsons

Figure 3-22:
Year 2038 Peak Hour and Daily Freeway Volumes—Alternative C
(3 of 3)

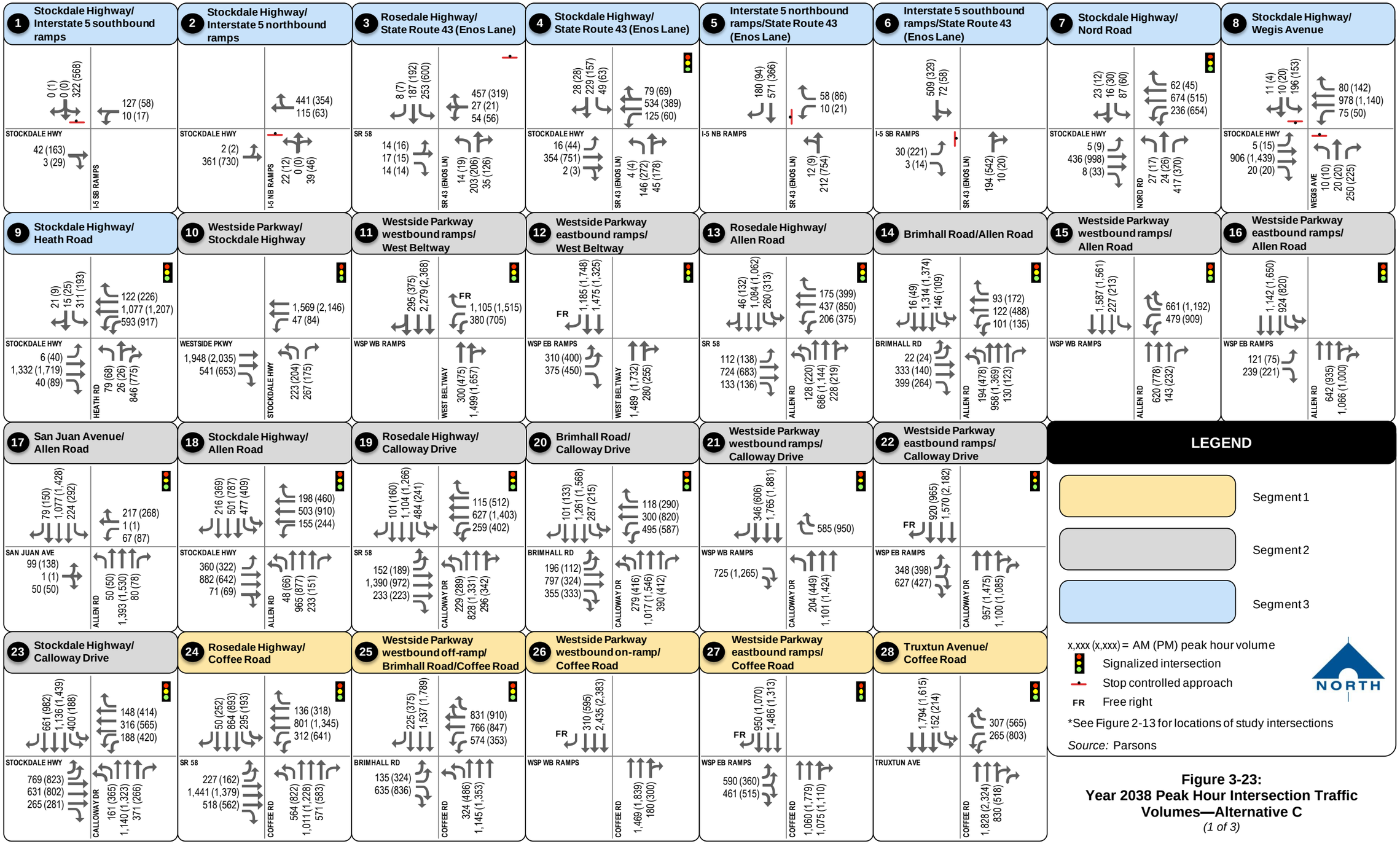


Figure 3-23:
Year 2038 Peak Hour Intersection Traffic Volumes—Alternative C
(1 of 3)

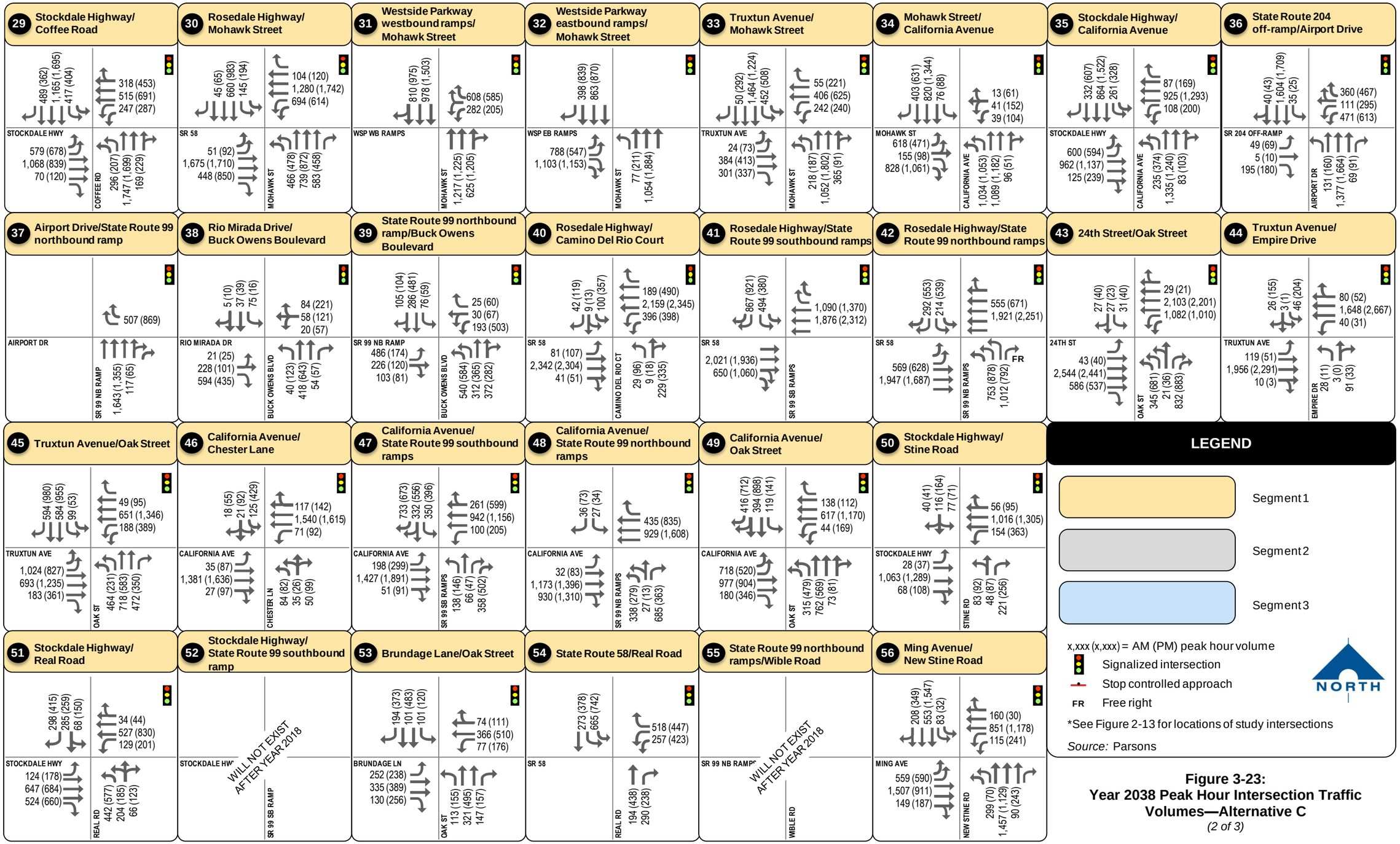


Figure 3-23:
Year 2038 Peak Hour Intersection Traffic Volumes—Alternative C
(2 of 3)

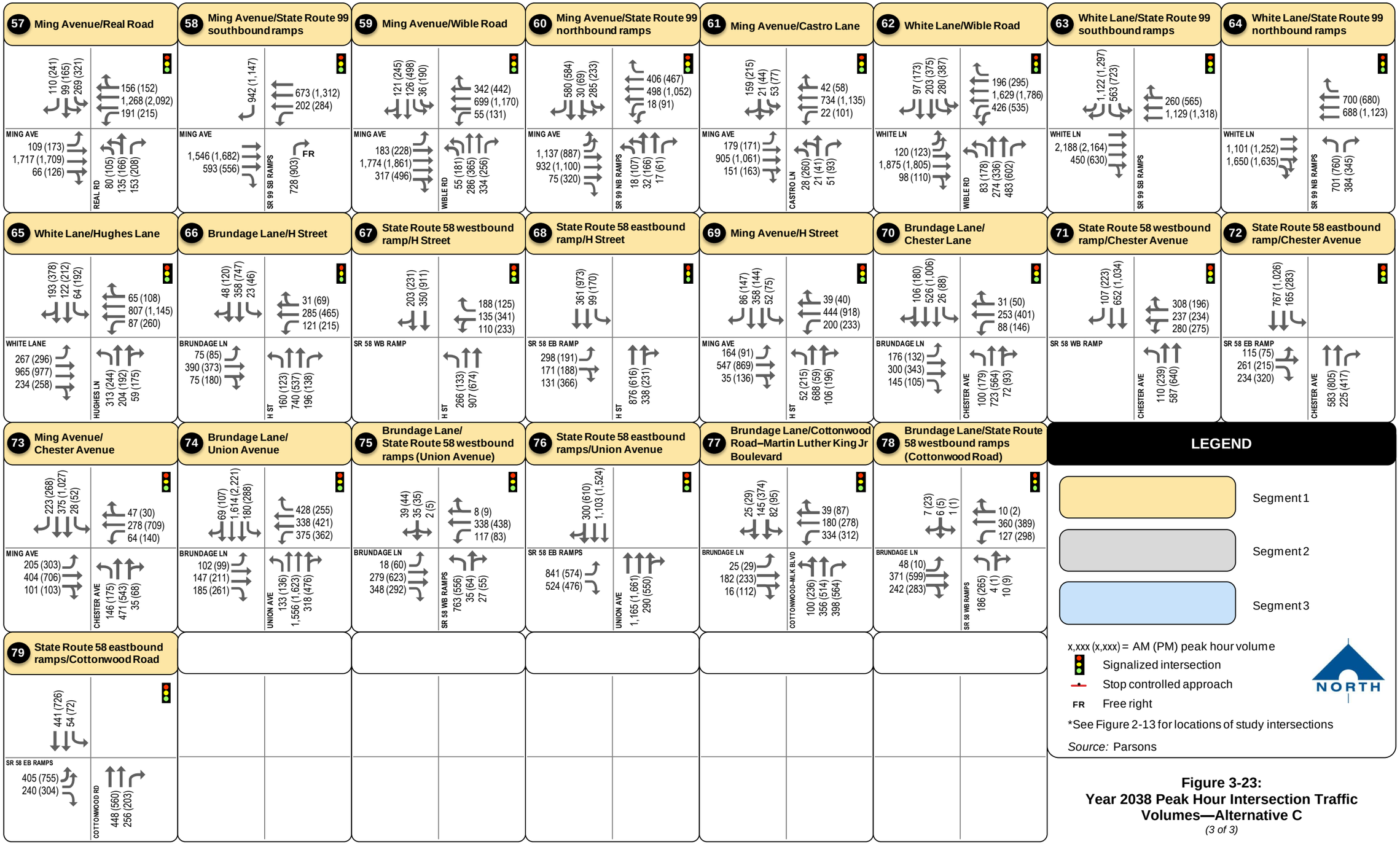
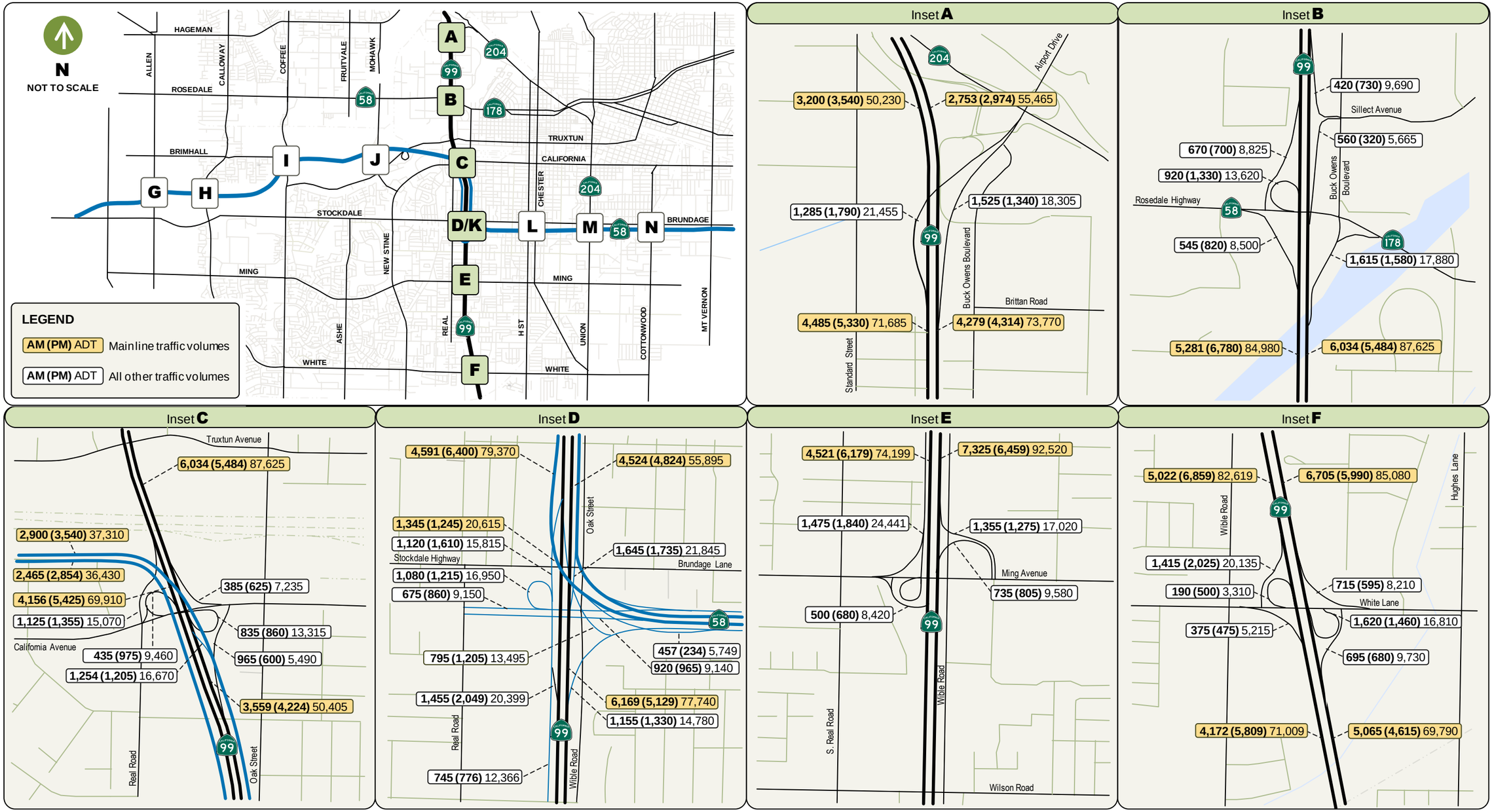


Figure 3-23:
Year 2038 Peak Hour Intersection Traffic Volumes—Alternative C
(3 of 3)



Source: Parsons

Figure 3-24:
Year 2018 Peak Hour and Daily Freeway Volumes—Alternative C
(1 of 3)

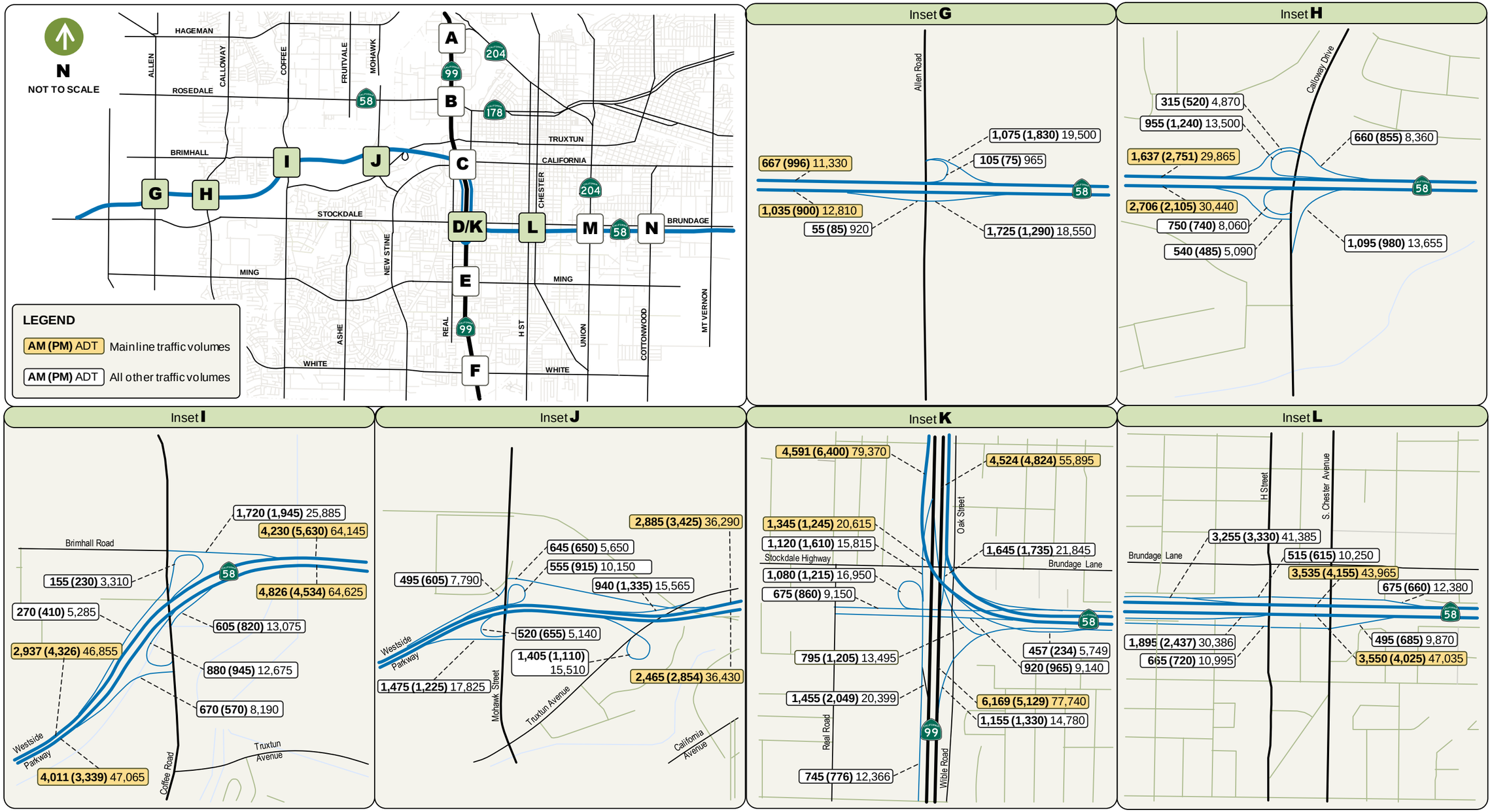


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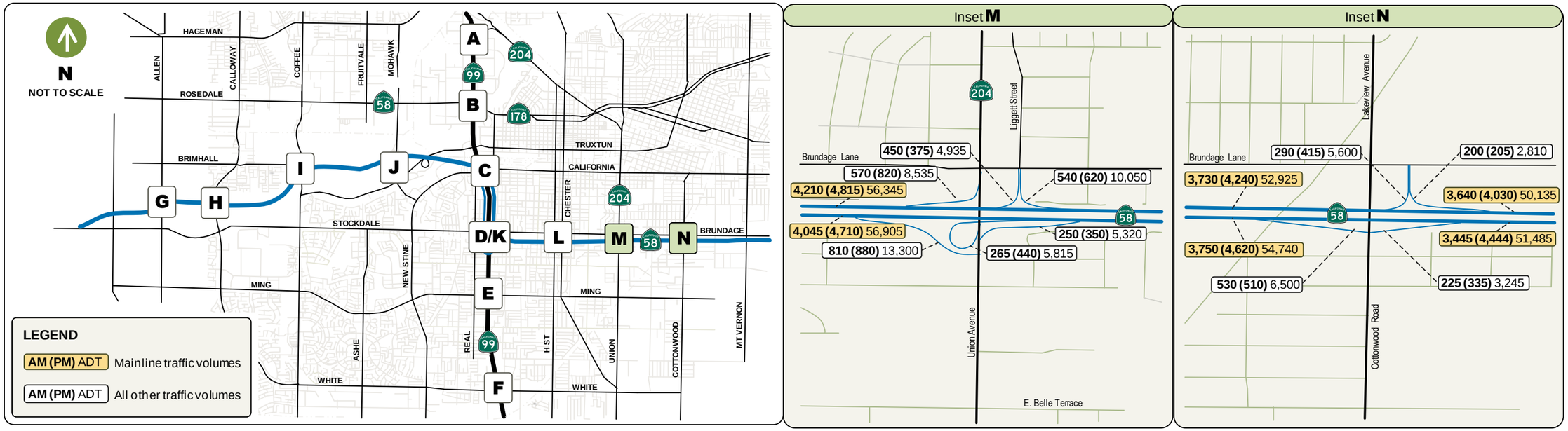
Figure 3-24:
Year 2018 Peak Hour and Daily Freeway Volumes—Alternative C
(2 of 3)



Source: Parsons

Figure 3-24:
Year 2018 Peak Hour and Daily Freeway Volumes—Alternative C
(3 of 3)

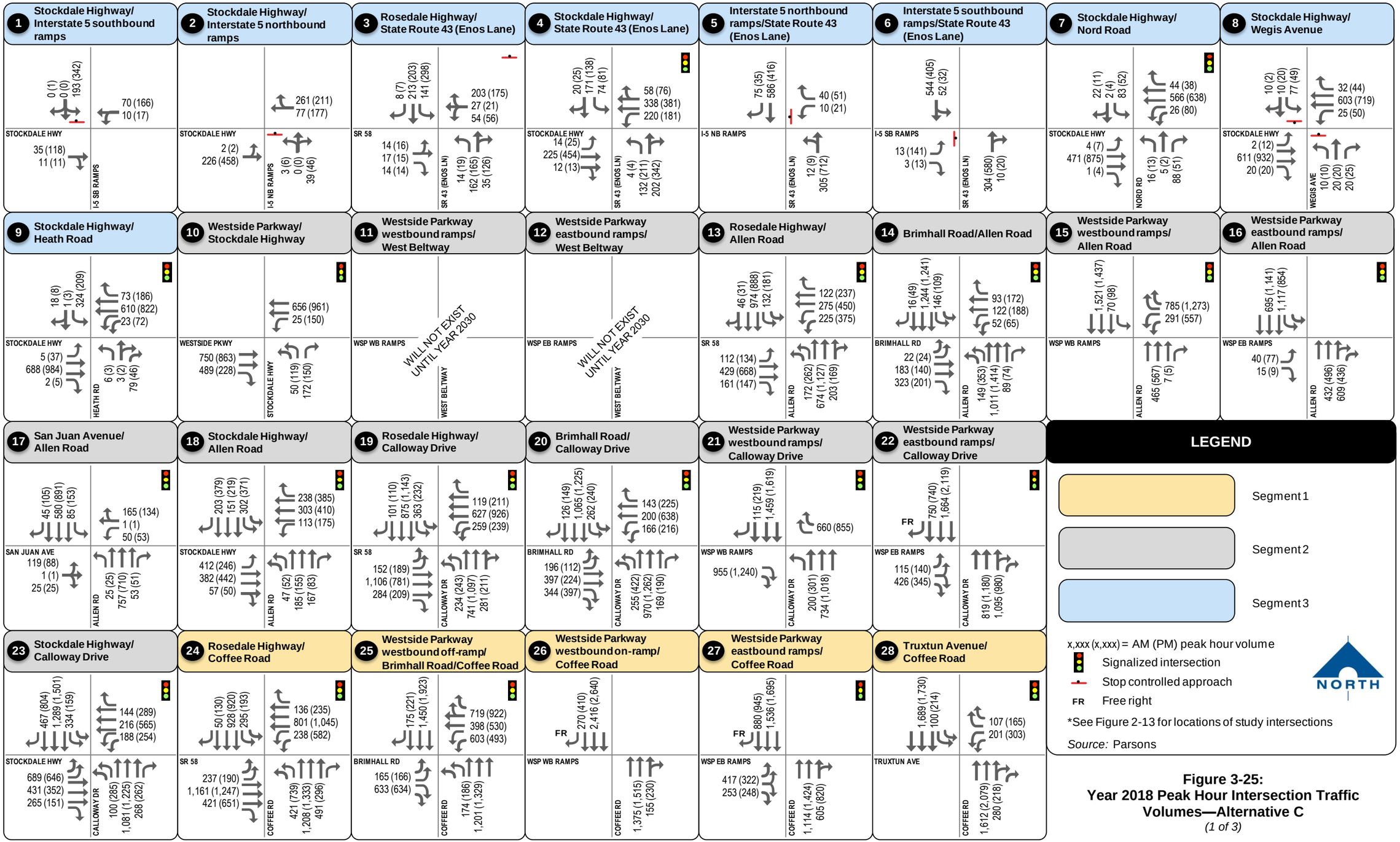


Figure 3-25:
Year 2018 Peak Hour Intersection Traffic Volumes—Alternative C
(1 of 3)

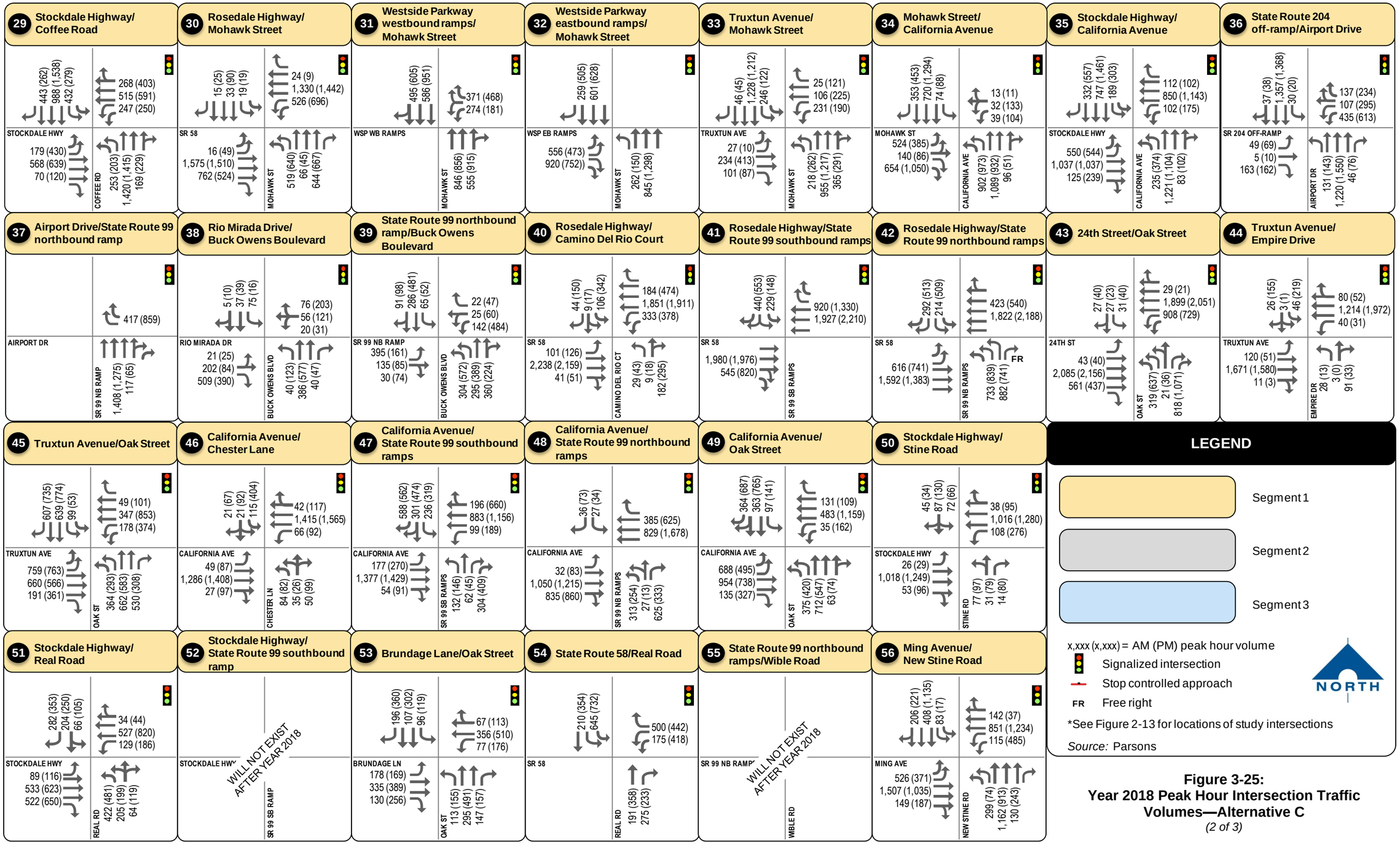
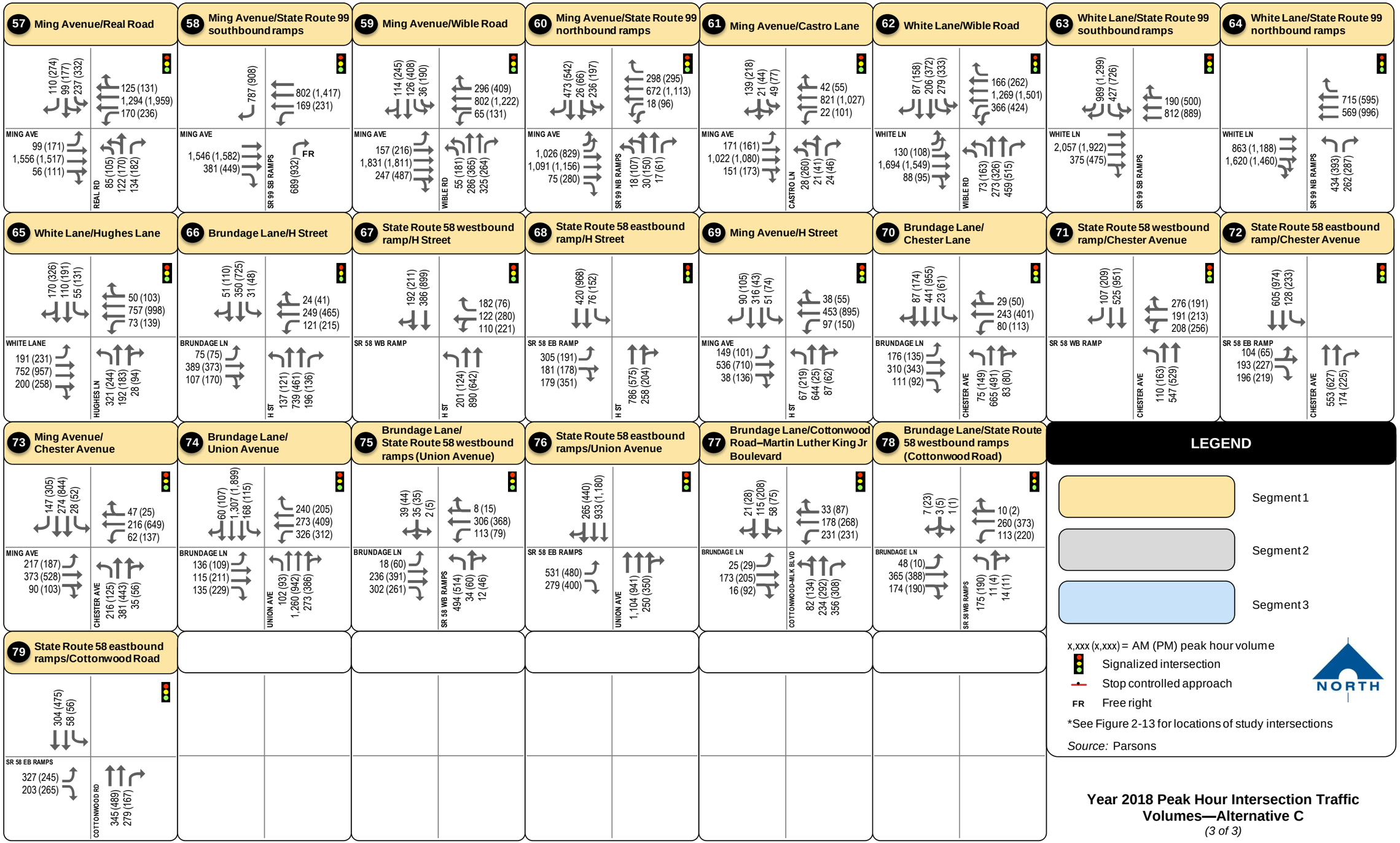


Figure 3-25:
Year 2018 Peak Hour Intersection Traffic Volumes—Alternative C
(2 of 3)



Year 2018 Peak Hour Intersection Traffic Volumes—Alternative C
(3 of 3)

Transportation Systems Management/Transit Alternative (Alternative M)

Alternative M proposes to utilize transportation systems management strategies to improve capacity and potentially reduce demand on the east–west arterial links and selected north–south connections to facilitate regional and local east–west traffic.

Low-cost improvements include traffic signal optimization, intersection widening, and bus turnouts to reduce delay and increase the capacity along the following corridors:

- Hageman Road from Calloway Drive to State Route 99
- Rosedale Highway from Enos Lane (State Route 43) to State Route 99
- Truxtun Avenue from the Westside Parkway to Oak Street
- Stockdale Highway from Old River Road to Oak Street/Wible Road
- Ming Avenue from Old River Road to State Route 99
- Coffee Road from Stockdale Highway to Westside Parkway
- California Avenue from Stockdale Highway to Mohawk Street
- Mohawk Street from California Avenue to the Westside Parkway

These low-cost improvements are also assumed for the no-build alternative, and are therefore not specifically studied as a new component of the transportation system for alternative M.

To further increase capacity, higher cost improvements are proposed for Rosedale Highway. These include widening Rosedale Highway from Enos Lane (State Route 43) to State Route 99 and constructing grade separations at the following intersections along Rosedale Highway:

- Rosedale Highway/Allen Road
- Rosedale Highway/Coffee Road
- Rosedale Highway/Calloway Drive
- Rosedale Highway/Mohawk Street
- Rosedale Highway/San Joaquin Valley Railroad crossing

Additionally, improvements on State Route 99 to be considered include adding auxiliary lanes between State Route 58 and California Avenue or providing an additional (fifth) mainline lane to accommodate the increased north–south traffic demand.

Roadway operational improvements would include deploying intelligent transportation systems strategies to improve mobility and reduce fuel consumption and green house gas emissions.

This alternative would also include increasing transit service along Rosedale Highway and Stockdale Highway to reduce the overall vehicular demand in these east–west corridors and other potential travel demand management techniques. The transit improvements would primarily focus on an increase in frequency of service that would result in reduced auto demand. Finally, area-wide transportation demand management strategies would be considered to reduce

travel demand through establishing parking fees, encouraging carpool formation, and encouraging flextime for employees.

These improvements to transit service and implementation of travel demand management techniques are also assumed for the no-build alternative, and are therefore not specifically studied as a new component for alternative M.

Figure 3-26 illustrates the future year forecasts of peak hour traffic volumes and lane geometry assumptions reported for the Rosedale Highway Widening Project.[1] This project assumes that the Centennial Corridor project build alternative A, B, or C is constructed. Figure 3-27 illustrates future year forecasts of peak hour traffic volumes and lane geometry assumptions for the no-build alternative. The lane geometry is the same as defined for the Rosedale Highway Widening project; however, traffic volumes are different as motorists select different route choices to traverse the roadway network, seeking to minimize travel times by avoiding congestion. Figure 3-28 illustrates future year forecasts of peak hour traffic volumes and lane geometry assumptions for the transportation systems management/transit alternative. For reference, alternative M would increase capacity and reduce delays along Rosedale Highway by constructing grade separations over major north–south arterial streets which cross Rosedale Highway between State Route 99 and Allen Road. In addition, the number of signalized intersections along Rosedale Highway would be decreased. Figure 3-28 indicates two lane geometry options for the transportation systems management/transit alternative—a six-lane option and an eight-lane option. These options are discussed at length in Chapter 4.

To provide an overall indication of the impact of upgrading Rosedale Highway (State Route 58 west) to a "super-arterial" between State Route 99 and Allen Road, a computer generated map is provided as Figure 3-29, which illustrates the difference between the 2038 transportation systems management/transit alternative and no-build daily traffic volumes, as assigned by the travel forecast model. The bandwidths illustrated in red depict roadways which receive additional volumes of traffic as a result of grade separating major north–south arterials crossing Rosedale Highway and reducing the number of signalized intersections along the facility. Roadways having bandwidths illustrated in blue indicate roads receiving less traffic as a result of improving State Route 58 west. The difference plot clearly indicates that the transportation systems management/transit alternative attracts more traffic volume to Rosedale Highway, while reducing traffic on parallel roadways.

The transportation systems management/transit alternative (alternative M) is not analyzed for year 2018 conditions; hence, no traffic volume forecasts are reported for that scenario.

[1] Projects 11 and 12 illustrated on Figure 3-4.

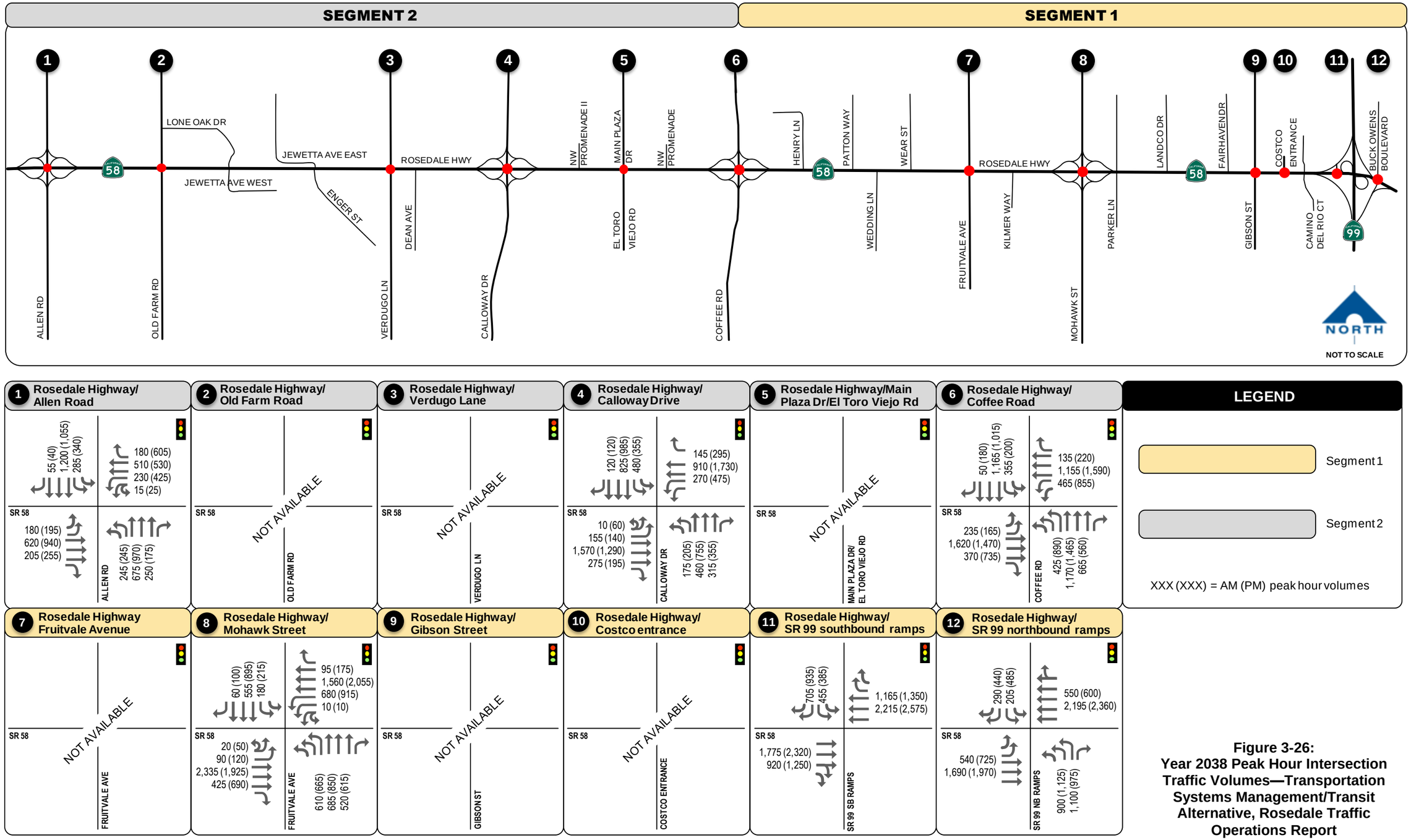


Figure 3-26: Year 2038 Peak Hour Intersection Traffic Volumes—Transportation Systems Management/Transit Alternative, Rosedale Traffic Operations Report

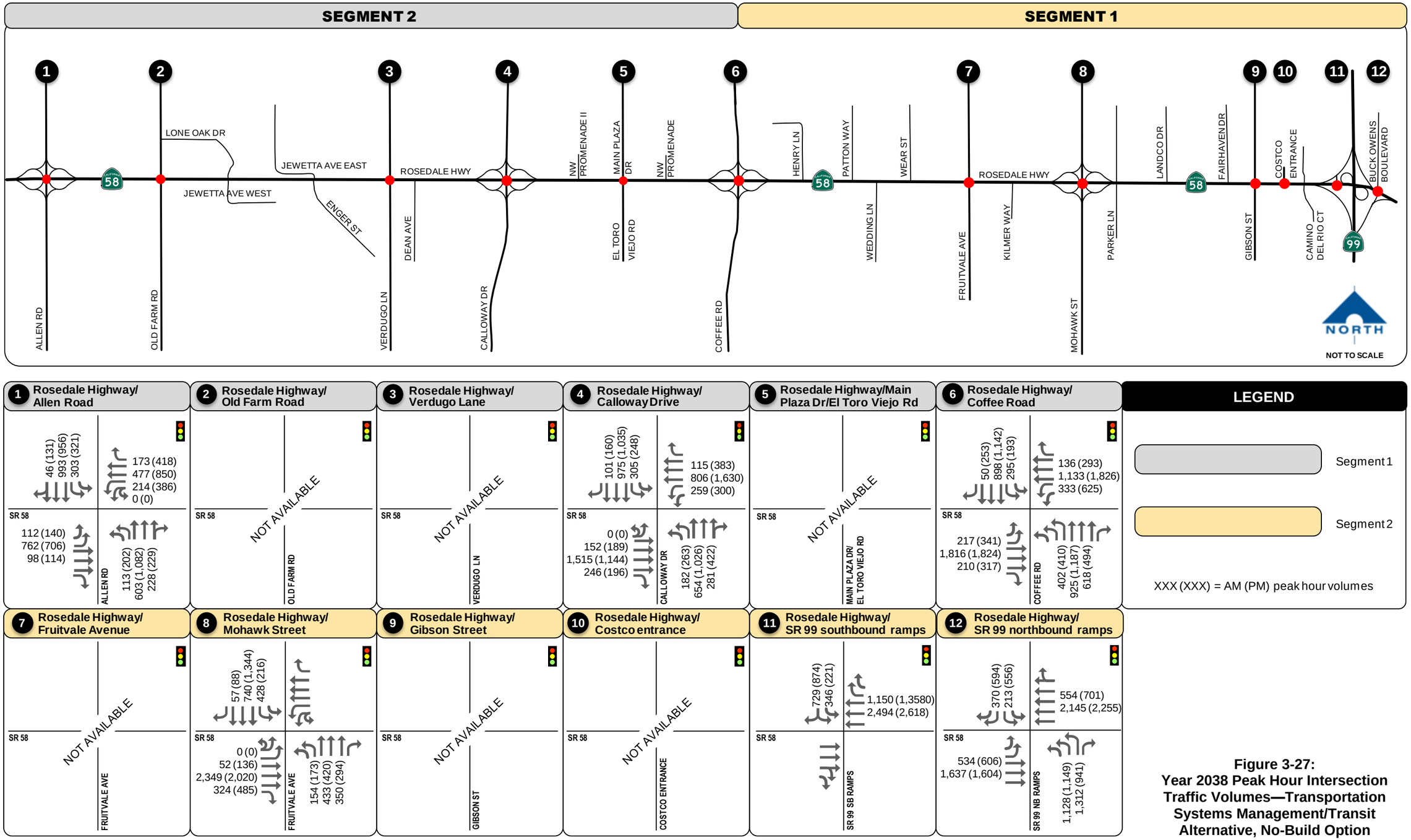


Figure 3-27:
Year 2038 Peak Hour Intersection Traffic Volumes—Transportation Systems Management/Transit Alternative, No-Build Option

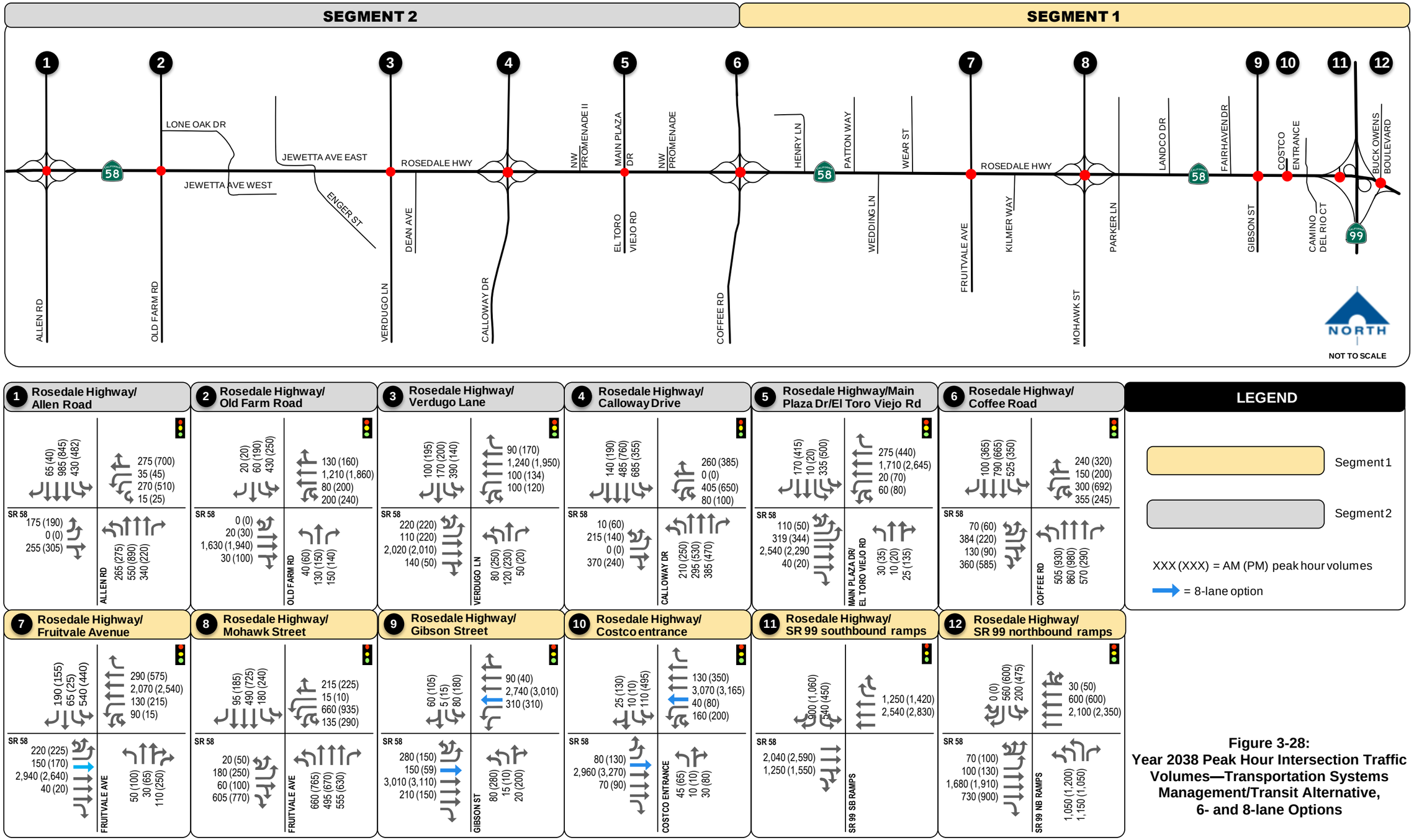
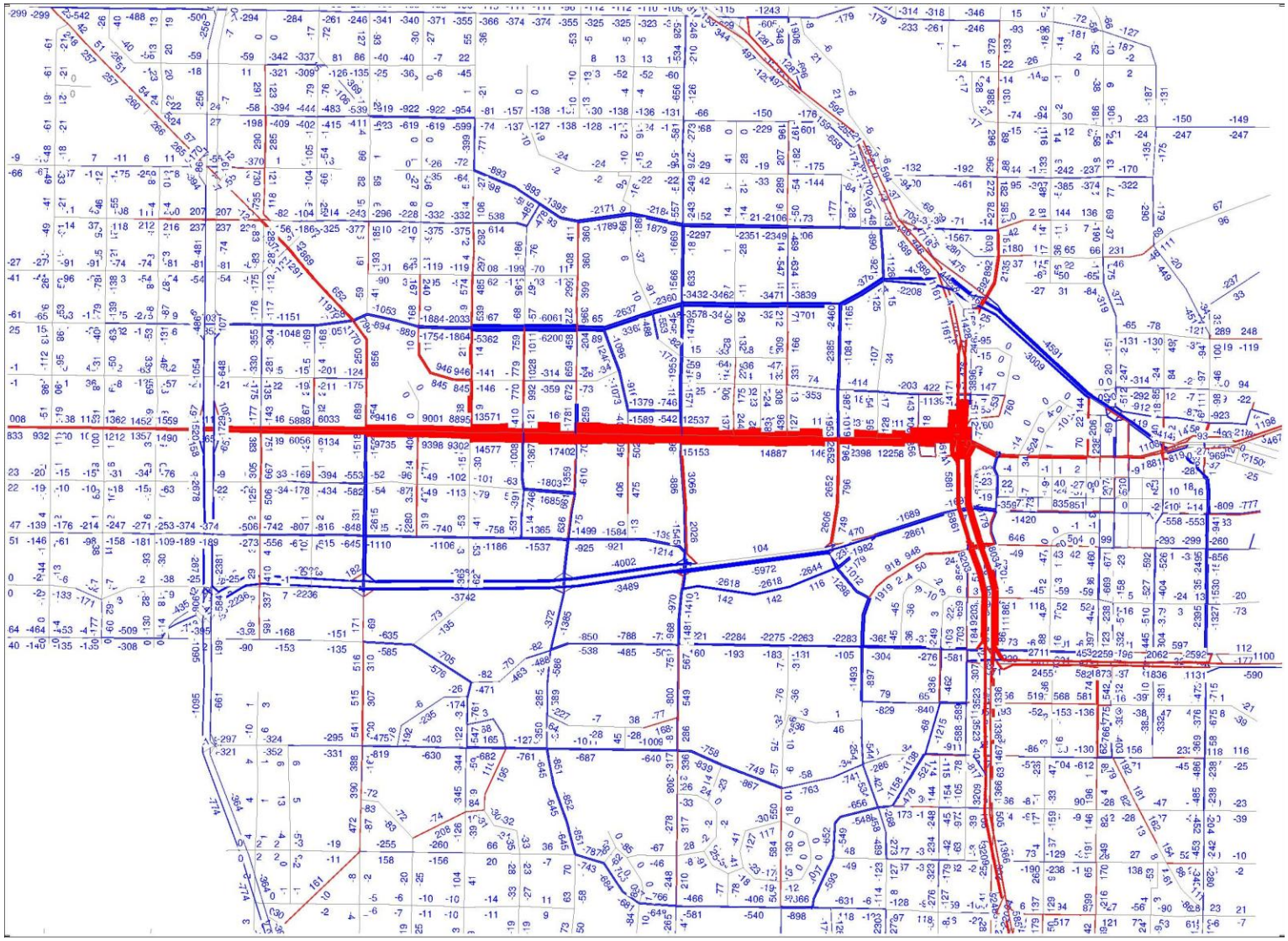


Figure 3-28: Year 2038 Peak Hour Intersection Traffic Volumes—Transportation Systems Management/Transit Alternative, 6- and 8-lane Options



Source: Parsons

Figure 3-29: Difference between Year 2038 Transportation Systems Management/Transit Alternative and the No-Build Alternative Daily Traffic Volume Difference

3.5 Future Year Truck Volumes

The Kern Council of Governments 2006 Regional Travel Demand Model forecasts three components of trucking activity.

- Internal–internal trips, having both an origin and destination within Kern County, are estimated based on employment type and employment distribution. Trip "production" rates are listed in Table 3-4, while trip "attraction" rates are listed in Table 3-5. The estimated rates are based on the number of employees per type of employment (basic, basic warehousing, retail high, retail medium, service office, and service commercial). The truck trip rates reported in these tables are based on axle types and are estimated as vehicle trips expressed as passenger car equivalents.
- Internal–external trips are based on the 2001 Caltrans Statewide Model. A separate trip purpose is provided for trucks; however, the model does not subdivide the truck trips by type of truck. Truck trips are expressed as passenger car equivalents.
- External–external vehicle trips are forecast using the 2001 Caltrans Statewide Model. These external–external vehicle trips are origin–destination based and are added to the internal Kern county trips prior to trip assignment, after factoring for each time-of-day period. As with the internal–external trips, there is no separate accounting of truck trips as they are included within the whole.

Table 3-4. Internal Truck Trip Production Model

TYPE OF TRUCK	BASIC PRODUCTION (BASIC_EMP)	BASIC WARE-HOUSING (BWOTH_EMP)	RETAIL HIGH (RHRET_EMP)	RETAIL MEDIUM (RMRET_EMP)	SERVICE OFFICE (SOSER_EMP)	SERVICE COMMERCIAL (SCSER_EMP)
2-axle	0.0554	0.0610	0.0464	0.0464	0.0610	0.0610
3-axle	0.0059	0.0058	0.0040	0.0040	0.0058	0.0058
4- or more axle	0.0123	0.0129	0.0073	0.0073	0.0129	0.0129

Table 3-5. Internal Truck Trip Attraction Model

TYPE OF TRUCK	BASIC PRODUCTION (BASIC_EMP)	BASIC WARE-HOUSING (BWOTH_EMP)	RETAIL HIGH (RHRET_EMP)	RETAIL MEDIUM (RMRET_EMP)	SERVICE OFFICE (SOSER_EMP)	SERVICE COMMERCIAL (SCSER_EMP)
2-axle	0.0502	0.0502	0.0502	0.0502	0.0502	0.0502
3-axle	0.0051	0.0051	0.0051	0.0051	0.0051	0.0051
4- or more axle	0.0188	0.0188	0.0188	0.0188	0.0188	0.0188

Given the limitations of the Kern COG 2006 Regional Travel Demand Model insofar as forecasting truck trips, Parsons used the San Joaquin Valley Truck Model to aid in establishing future year truck volumes. Parsons used the Kern COG model to generally confirm overall traffic volumes and travel patterns for the 2006 model validation year and the 2018 and 2038 forecast years under consideration.

The San Joaquin Valley Truck Model was developed by Cambridge Systematics using a combination of commodity-based and vehicle-based modeling techniques. The study area

included eight counties in the San Joaquin region: San Joaquin, Stanislaus, Merced, Fresno, Madera, Tulare, Kings and Kern. The truck model was developed using the Caltrans Statewide Model road network and zone structure.

The Caltrans Intermodal Transportation Management System (ITMS) commodity flow data was used to obtain detailed origin-destination information about commodity flows in to, out of, and through the valley counties as the basis for estimating intercity freight movements. County-level ITMS commodity flow truck trip data were then allocated to zip codes using employment data from 2000. The truck trips were allocated to zip codes based on matching the commodity codes in the truck trip table with the employment categories in the database for each code and each zip code. For outbound flows, one-to-one correspondences were made between commodity codes in the two databases. For inbound flows, tons were allocated based on employment in the consuming industries for each commodity.

The zip code-level trips were then allocated to the traffic analysis zones in the truck model. A truck trip table for "through" trips was created through visual observation of origin–destination combinations that crossed through the San Joaquin Valley. The truck tonnage for each of the relevant origin-destination combinations was collected from ITMS data. For each pair of relevant external regions, all of the truck tons in associated counties were summed. These tonnage values were converted into truck trips using the same payload matrix used for the other truck trip tables.

Trip production rates were developed primarily from the *Quick Response Freight Manual*, which provides trip rates based on national averages for medium and heavy trucks. Truck trip consumption rates were developed to estimate the relative number of trucks that are attracted to each zone in the valley. The tables for the State of California were then disaggregated to represent truck trip rates for medium and heavy truck trips.

The truck model is designed to generate truck volumes based on average daily traffic. The truck model output reports truck volumes based on truck classes defined as medium–heavy duty, which have a gross vehicle weight rating between 14,001 and 33,000 pounds; and heavy–heavy duty, with a gross vehicle weight rating of 33,001 pounds or more.

The ITMS database provides commodity flow forecasts for 2006, 2016, and 2026, which are derived using economic activity trends and forecasts from Global Insight, Inc., and county-level forecasts from the California Transportation Economics Unit. The first step in the process was the estimation of annual growth rates from ITMS forecasts for the time periods of (1) 2000 to 2006, (2) 2006 to 2016, and (3) 2016 to 2026. Year 2030 forecasts were then extrapolated based on the 2016 to 2026 annual average growth factors. As these growth factors were based on pre-2007 economic recession trends, the year 2030 forecasts were assumed for the 2038 Centennial Corridor project planning horizon. Table 3-6 shows the growth rates by commodity type, while Tables 3-7 and 3-8 show the total productions and consumptions in the non-ITMS trip generation procedure. Growth in population and employment leads to an increased need for commodities, which results in increased productions and consumptions. There is an overall growth of more than 70 percent for both productions and consumptions. This is in line with the growth in households and employment. Table 3-9 shows the growth in ITMS truck trips. ITMS trips grow at a higher rate than the local trips, because the valley is a big generator and consumer of goods for California and the rest of the nation.

Table 3-6. Intermodal Transportation Systems Management Growth Rates by Commodity Type

STCC2*	COMMODITY DESCRIPTION	AVERAGE ANNUAL GROWTH FACTOR		
		2000–2006	2006–2016	2016–2030
01	Farm products	1.0358	1.0320	1.0262
08	Forest products	1.0405	1.0333	1.0166
09	Fresh fish and marine products	1.0612	1.0504	1.0250
10	Metallic ores	1.0612	1.0504	1.0250
11	Coal	1.0917	1.0519	1.0133
13	Crude petroleum and natural gas	1.0456	1.0376	1.0187
14	Nonmetallic minerals	1.0354	1.0252	1.0173
20	Food products	1.0433	1.0405	1.0328
21	Tobacco products	1.0457	1.0501	1.0280
22	Textile mill products	1.0553	1.0389	1.0257
23	Apparel	1.0732	1.0411	1.0282
24	Lumber products	1.0386	1.0324	1.0246
25	Furniture	1.0527	1.0470	1.0372
26	Pulp and paper products	1.0393	1.0341	1.0250
27	Printed matter	1.0430	1.0380	1.0297
28	Chemical products	1.0436	1.0359	1.0298
29	Petroleum and coal products	1.0451	1.0343	1.0245
30	Rubber and miscellaneous plastics	1.0535	1.0426	1.0313
31	Leather products	1.0505	1.0414	1.0273
32	Clay, concrete, glass or stone products	1.0612	1.0504	1.0250
33	Primary metal products	1.0498	1.0390	1.0270
34	Fabricated metal products	1.0443	1.0371	1.0272
35	Machinery	1.0639	1.0486	1.0402
36	Electrical equipment	1.0780	1.0543	1.0430
37	Transportation equipment	1.0405	1.0340	1.0290
38	Instruments, photo and optical equipment	1.0740	1.0654	1.0525
39	Miscellaneous manufacturing products	1.0528	1.0437	1.0399
40	Waste and scrap materials	1.0557	1.0467	1.0275
50	Secondary traffic	1.0656	1.0399	1.0285

*Two-digit standard transportation commodity classification
Source: Cambridge Systematics, Inc., *San Joaquin Valley Goods Movement Study Truck Model Documentation*

Table 3-7. Growth in Non-Intermodal Transportation Systems Management Productions

EMPLOYMENT CATEGORY	PRODUCTION TRIPS 2000		PRODUCTION TRIPS 2030		GROWTH	
	MEDIUM	HEAVY	MEDIUM	HEAVY	MEDIUM	HEAVY
Agriculture	4,993	7,622	8,797	13,430	76%	76%
Mining	166	364	346	762	109%	109%
Construction	262	1,436	427	2,336	63%	63%
Manufacturing—products	28	4,304	46	7,125	66%	66%
Manufacturing—equipment	20	1,127	33	1,838	63%	63%
TCU	1,741	6,656	2,895	11,070	66%	66%
Wholesale	610	2,063	954	3,228	56%	56%
Retail trade	13,092	1,963	23,106	3,463	76%	76%
FIRES	1,557	362	2,797	650	80%	80%
Education/government	1,576	236	2,920	437	85%	85%
Households	34,572	74,420	60,721	130,712	76%	76%
Total	***58,616***	***100,554***	***103,043***	***175,049***	***76%***	***74%***

Source: Cambridge Systematics, Inc., *San Joaquin Valley Goods Movement Study Truck Model Documentation*

Table 3-8. Growth in Non-Intermodal Transportation Systems Management Consumptions

EMPLOYMENT CATEGORY	2000 CONSUMPTIONS		2030 CONSUMPTIONS		GROWTH	
	MEDIUM	HEAVY	MEDIUM	HEAVY	MEDIUM	HEAVY
Agriculture	2,911	2,221	5,130	3,914	76%	76%
Mining	97	5,550	202	11,599	109%	109%
Construction	190	1,919	308	3,120	63%	63%
Manufacturing—products	29	3,539	48	5,859	66%	66%
Manufacturing—equipment	21	2,582	35	4,210	63%	63%
TCU	737	6,859	1,226	11,407	66%	66%
Wholesale	62	498	97	780	56%	56%
Retail trade	3,817	408	6,736	720	76%	76%
FIRES	9,045	2,195	16,248	3,943	80%	80%
Education/government	920	712	1,704	1,319	85%	85%
Households	40,354	82,633	70,878	145,135	76%	76%
Total	***58,183***	***109,116***	***102,613***	***192,006***	***76%***	***76%***

Source: Cambridge Systematics, Inc., *San Joaquin Valley Goods Movement Study Truck Model Documentation*

Table 3-9. Growth in Intermodal Transportation Systems Management Trips

EMPLOYMENT CATEGORY	2000 ITMS		2030 ITMS		GROWTH	
	MEDIUM	HEAVY	MEDIUM	HEAVY	MEDIUM	HEAVY
Exports	2,153	17,742	5,708	43,484	165%	145%
Imports	2,153	17,742	5,708	43,484	165%	145%
Internal trips	12,600	17,235	17,153	39,403	36%	129%
Through trips	1,326	9,516	3,226	21,815	143%	129%
Total	***18,231***	***62,234***	***31,796***	***148,145***	***74%***	***138%***

Source: Cambridge Systematics, Inc., *San Joaquin Valley Goods Movement Study Truck Model Documentation*

Table 3-10 shows the growth in truck traffic by county based on the estimated growth in employment and population. As shown in Table 3-10, the model predicts that medium-heavy truck traffic in Kern County will increase by 48 percent, while heavy–heavy truck traffic will increase by 87 percent. One notes that the San Joaquin Valley truck model indicates that the average increase in the category of medium trucks for the San Joaquin Valley is 91 percent.

Table 3-10. Growth in Truck Traffic by County

COUNTY	NUMBER OF COUNTS	2000 MODEL		2030 MODEL		PERCENT DIFFERENCE	
		MEDIUM	HEAVY	MEDIUM	HEAVY	MEDIUM	HEAVY
Fresno	58	17,896	83,630	35,489	168,382	98%	101%
Kern	10	30,143	106,756	44,762	199,110	48%	87%
Kings	20	2,708	12,361	6,943	29,906	156%	142%
Madera	121	3,983	32,326	7,762	57,160	95%	77%
Merced	12	5,440	47,972	10,955	94,497	101%	97%
San Joaquin	18	29,039	195,691	61,927	415,107	113%	112%
Stanislaus	22	5,821	44,362	11,005	84,949	89%	91%
Tulare	220	6,157	41,676	14,073	89,682	129%	115%
Total		***101,186***	***564,774***	***192,914***	***1,138,792***	***91%***	***102%***

Source: Cambridge Systematics, Inc., *San Joaquin Valley Goods Movement Study Truck Model Documentation*

The medium–heavy truck traffic is assumed to correspond to the 2 to 3 axle classification of trucks used by Caltrans. For the most part, these trucks are assumed to make internal–internal trips. Heavy–heavy trucks are assumed to correspond to the 4 to 5+ axle classification of trucks used by Caltrans. A portion of these truck volumes are assumed to be external–external, while a portion are internal–external or external–internal.

Future Truck Volumes under the No-Build and Transportation Systems Management Alternatives

While the model does not identify "through-trips" as a percentage of overall vehicle trips, the model's distribution of medium–heavy and heavy–heavy trucks provides a basis for making a reasonable estimate of the amount of increase of these trips. Table 3-14 indicates the volumes of trucks using different segments of State Route 58 west (Rosedale Highway), reported from east to west. Because there is a dramatic difference in truck traffic volumes between the count location east of Enos Lane/State Route 43 (1,118 total trucks) and west of Mohawk Street (5,327 total trucks), it is assumed that the vehicle counts east of Enos Lane/State Route 43 represent primarily "through-trips." According to this method, there are a total of 1,118 through-trip trucks; 481 of which are 2 to 3 axle trucks, and 637 are 4 to 5+ axle trucks.

Using these vehicle classification counts conducted along Rosedale Highway, one knows the breakdown of vehicles according to the 13 classifications established by the Federal Highway Administration. Parsons has used the 2 to 3 axle truck volumes to correspond to the medium–heavy trucks, most of which are assumed to be primarily local in their origins and destinations. These truck volumes are assumed to increase proportionally with the overall increase in traffic volumes using Rosedale Highway. The through-trip trucks that are 4 to 5+ axles are projected to increase by 87 percent over the study period.

Given the continuation of signalized intersections along Rosedale Highway under both the no-build and the transportation systems management/transit alternatives, this facility is not expected to draw or attract a significant number of truck trips from alternate routes, such as State Route 46, Lerdo Highway, 7th Standard Road, or State Route 119. Hence, the existing truck volumes along Rosedale Highway serve as an excellent benchmark for estimating future year truck volumes under both the no-build and transportation systems management/transit conditions.

Table 3-11 presents 2008 traffic count data along with the 2038 estimated volumes of trucks utilizing Rosedale Highway on weekdays.

Insofar as other east–west roadways connecting Interstate 5 with State Route 99, Table 3-12 reports existing heavy truck volumes on roadway links immediately east of Interstate 5 and those immediately west of State Route 99. Unlike State Route 58, heavy truck volumes both east of Interstate 5 and west of State Route 99 are very similar, indicating a likelihood that these truck movements are primarily through trips (external–external) in nature.

Projected heavy truck traffic using the existing roadway network is also shown in Table 3-12. In this case, the truck volumes are increased by 87 percent across the board—a conservative assumption.

Table 3-11. Comparison of State Route 58 West (Rosedale Highway) Year 2008 Truck Traffic Counts with Year 2038 Truck Traffic Projections

LOCATION TIME	2008 TRAFFIC COUNT DATA							2038 FORECAST VOLUMES	
	ADT TOTAL	TOTAL TRUCKS	TOTAL TRUCK PERCENT	TOTAL 2-3 AXLE VOLUME	TOTAL 2-3 AXLE PERCENT	TOTAL 4-5+ AXLE VOLUME	4-5+ AXLE PERCENT OF ADT	TOTAL 2-3 AXLE VOLUME	TOTAL 4-5+ AXLE VOLUME
West of Mohawk Street									
Weekday average	42,511	5,327	12.5%	2,554	6.0%	2,773	6.5%	3,780	4,352
West of Calloway Drive									
Weekday average	30,708	3,263	10.6%	1,164	3.8%	2,099	6.8%	1,723	3,355
West of Allen Road									
Weekday average	16,425	1,803	11.0%	765	4.7%	1,038	6.3%	1,132	1,785
East of Enos Lane (State Route 43)									
Weekday average	7,105	1,118	15.7%	481	6.8%	637	9.0%	712	1,191

Notes:

1. Weekday average of Monday, February 11, 2008 through Friday, February 15, 2008.
2. Through truck traffic with 4–5+ axles increases by 87 percent. Other truck traffic increases by 48 percent over this time period.

Table 3-12. Vehicle and Truck Traffic on Kern County East–West Roadways *(2010 and 2038)*

ROADWAY	EAST OF INTERSTATE 5				WEST OF STATE ROUTE 99			
	2010			2038	2010			2038
	TOTAL VOLUME	HEAVY TRUCK VOLUME*	PERCENT HEAVY TRUCKS	HEAVY TRUCK VOLUME*	TOTAL VOLUME	HEAVY TRUCK VOLUME*	PERCENT HEAVY TRUCKS	HEAVY TRUCK VOLUME*
State Route 46	5,830	1,820	31.20%	3,403	6,710	1,976	29.40%	3,695
Lerdo Highway	2,103	240	11.40%	449	11,455	263	2.30%	492
7th Standard Road	2,597	418	16.10%	782	10,667	1,048	9.80%	1,960
Stockdale Highway	3,649	179	4.90%	335	33,527	506	1.51%	946
State Route 119	10,000	1,182	11.80%	2,210	10,572	935	8.80%	1,748
Total Volumes	***24,179***	***3,839***	***15.88%***	***7,179***	***72,931***	***4,728***	***12.12%***	***8,841***

*Heavy trucks are defined as 4 to 5+ axles.

Future Truck Volumes under Build Alternatives and A, B and C

Using a function provided with the Cube software (Citilabs) in the Kern COG traffic model, Parsons conducted a select link analysis of truck traffic volumes using State Route 58. This tool allows the user to pick a single point on the roadway network and illustrate the origin and destination of the traffic that passes through that point. The select link is akin to a count station which identifies the origin and destination of every vehicle that passes through that location. Figure 3-30 illustrates how the select link tool operates as a count station.

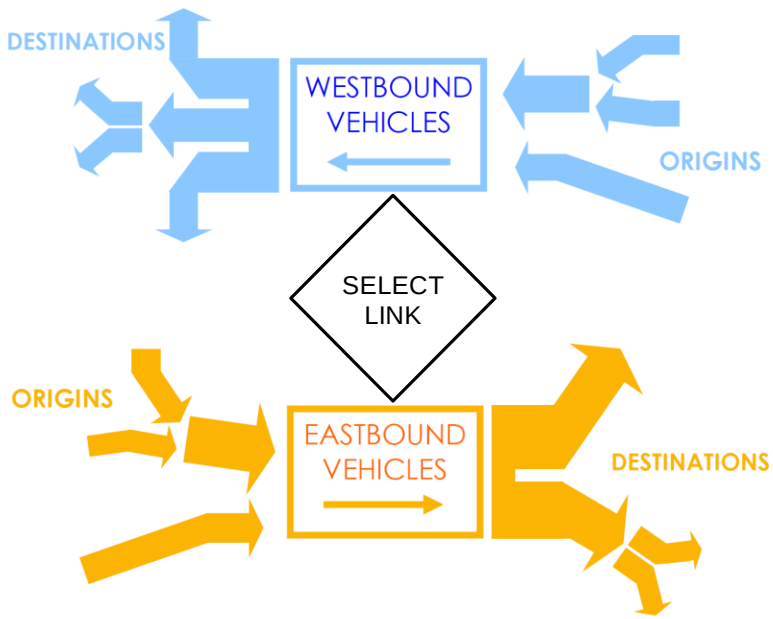


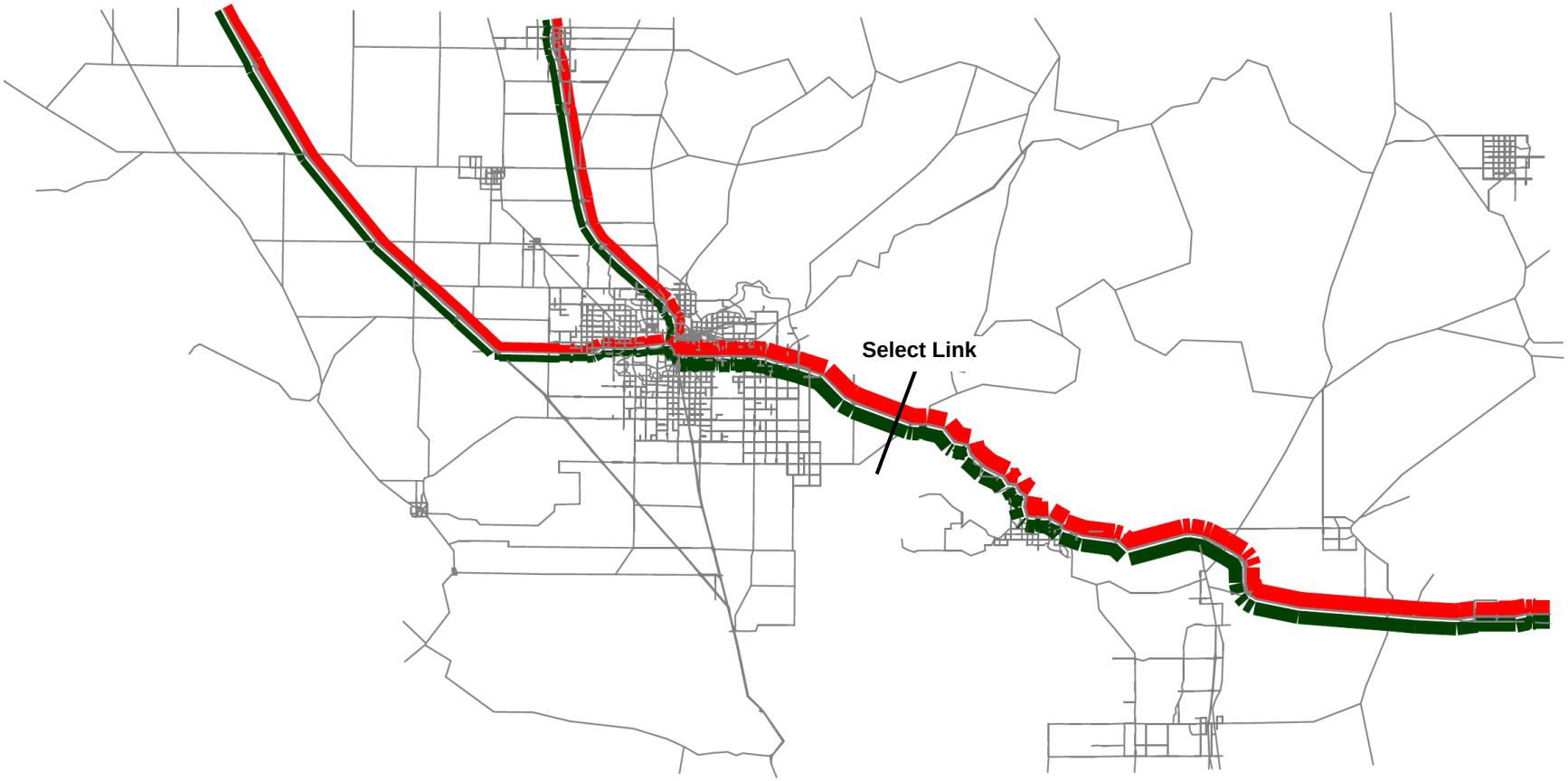
Figure 3-30: How Select Link Analysis Works

For this analysis, a point on State Route 58 west of the State Route 223 intersection and east of State Route 184 was selected. The select link tool tracked all traffic that flowed through this point as assigned by the Kern COG Regional Transportation Forecast Model. This location was chosen because it serves as a gateway to and from metropolitan Bakersfield for virtually all east–west truck traffic.

Figure 3-31 illustrates the assignment of truck traffic flowing through the "select link" on State Route 58 east of State Route 184. The Centennial Corridor freeway connector is assumed, connecting the State Route 58 freeway on the east with the Westside Parkway freeway on the west side of State Route 99. The graphic is instructive, because it illustrates that the Centennial Corridor would be the clear minimum time path for State Route 58 east truckers traveling to and from Interstate 5.

Based on the select link analysis, a diversion of trucks from their existing (no-build) routes of choice would be expected.

Table 3-13 indicates the proportion of heavy trucks and the year 2038 volume of trucks estimated to be attracted to the Centennial corridor, assuming build alternatives A, B, or C. These truck flow diversions are based on engineering judgment, based on the following rationale.



Source: Parsons

Figure 3-31: Year 2038 Daily Select Link Truck Traffic Volumes on State Route 58

Table 3-13. Projected Truck Traffic on Centennial Corridor Build Alternatives A, B, and C

LOCATION	EAST OF INTERSTATE 5			WEST OF STATE ROUTE 99		
	ESTIMATED HEAVY TRUCK VOLUME NO-BUILD	PERCENT ATTRACTED TO CENTENNIAL CORRIDOR	ESTIMATED HEAVY TRUCKS ON CENTENNIAL CORRIDOR	ESTIMATED HEAVY TRUCK VOLUME NO-BUILD	PERCENT ATTRACTED TO CENTENNIAL CORRIDOR	ESTIMATED HEAVY TRUCKS ON CENTENNIAL CORRIDOR
State Route 46	3,403	70.0%	2,382	3,695	60.0%	2,217
Lerdo Highway	449	70.0%	314	492	60.0%	295
7th Standard Road	782	80.0%	626	1,960	60.0%	1,176
State Route 58	1,191	80.0%	953	4,352	70.0%	3,046
Stockdale Highway	335	80.0%	268	376	70.0%	263
State Route 119	2,210	40.0%	884	1,748	30.0%	524
Total Volumes	***8,370***		***5,427***	***12,623***		***7,521***

Source: Parsons

Analysis of the no-build and transportation systems management/transit alternative estimates of future year truck activity provides a baseline for estimating route choice diversions to the proposed higher speed, and shorter travel time offered by the Centennial Corridor build alternatives A, B, or C. It stands to reason that freight movement that is traveling closest to the Centennial Corridor will be more attracted to the new roadway, freight traffic that is currently traveling on a route further away, will be less attracted. This diversion will also be influenced based on whether the traffic is closest to Interstate 5 or State Route 99. Truckers bound to or from Interstate 5 are more likely to be through traffic, and will likely have a greater attraction to the new facility, which will be significantly faster and shorter than the existing routes.

The movement of light and medium duty trucks (2- and 3-axle trucks, FHWA classifications 4, 5, and 6) on the Centennial Corridor, will have a significantly different attraction pattern than the heavy duty trucks (4- and 5+-axle) projected to use this facility. The light and medium duty trucks primarily carry local freight, with less through movement than the regional and interregional travel pattern of the heavy-duty trucks. Because they serve a different purpose, it is projected that these trucks will be attracted to the Centennial Corridor facility in proportion to the overall use of the corridor by mixed traffic, excluding heavy (through) trucks.

Table 3-14 provides a comparison of the 2008 truck counts on Rosedale Highway with the year 2038 projections for Centennial build alternatives A, B, and C. Table 3-15 provides a similar set of data for year 2018 conditions.

Table 3-14. Comparison of State Route 58 West (Rosedale Highway) Year 2008 Truck Traffic Counts with Centennial Corridor Year 2038 Forecasts

LOCATION	2008 TRAFFIC COUNT DATA ON STATE ROUTE 58				CENTENNIAL CORRIDOR YEAR 2038 FORECASTS ALTERNATIVES A, B AND C			
	ADT TOTAL	TOTAL 2-3 AXLE	TOTAL 4-5+ AXLE	TOTAL TRUCKS	ADT TOTAL	TOTAL 2-3 AXLE	TOTAL 4-5+ AXLE	TOTAL TRUCKS
West of State Route 99								
Weekday average	42,511	2,554	2,773	5,327	121,375	7,275	8,250	15,525
West of Calloway								
Weekday average	30,708	1,164	2,099	3,263	121,785	4,675	6,900	11,575
West of Allen Road								
Weekday average	16,425	765	1,038	1,083	81,033	3,725	6,250	9,975
East of Enos Lane (State Route 43)								
Weekday average	7,105	481	637	1,118	57,083	3,800	5,950	9,750
East of Interstate 5								
Weekday average	7,043	453	819	1,272	14,580	825	3,325	4,150

Source: Parsons

Notes:
1. Trucks with 2-3 axles are primarily local traffic. Trucks with 4-5+ axles are primarily interregional traffic.
2. Rosedale Highway in 2008 does not include Westside Parkway or Centennial Corridor facilities.

Table 3-15. Comparison of State Route 58 West (Rosedale Highway) Year 2008 Truck Traffic Counts with Centennial Corridor Year 2018 Forecasts

LOCATION	2008 TRAFFIC COUNT DATA ON STATE ROUTE 58				CENTENNIAL CORRIDOR YEAR 2018 FORECASTS ALTERNATIVES A, B AND C			
	ADT TOTAL	TOTAL 2-3 AXLE	TOTAL 4-5+ AXLE	TOTAL TRUCKS	ADT TOTAL	TOTAL 2-3 AXLE	TOTAL 4-5+ AXLE	TOTAL TRUCKS
West of State Route 99								
Weekday average	42,511	2,554	2,773	5,327	74,310	4,454	5,051	9,505
West of Calloway								
Weekday average	30,708	1,164	2,099	3,263	61,310	2,354	3,474	5,827
West of Allen Road								
Weekday average	16,425	765	1,038	1,083	25,225	1,160	1,946	3,105
East of Enos Lane (State Route 43)								
Weekday average	7,105	481	637	1,118	14,210	946	1,481	2,427
East of Interstate 5								
Weekday average	7,043	453	819	1,272	9,555	541	2,179	2,720

Source: Parsons

Notes:
1. Trucks with 2-3 axles are primarily local traffic. Trucks with 4-5+ axles are primarily interregional traffic.
2. Rosedale Highway in 2008 does not include Westside Parkway or Centennial Corridor facilities.

3.6 Comparison of Build Alternative versus No-build Traffic Performance

The build alternatives allow more vehicles to utilize State Route 58 compared with the no-build alternative; meaning that vehicles traverse fewer miles on parallel arterial streets and more miles on the State Route 58/Westside Parkway freeway under alternatives A, B, or C, or on Rosedale Highway, which is reclassified as an expressway between State Route 99 and Allen Road under the transportation systems management/transit alternative. Under the no-build alternative, traffic cascades across the highway network seeking available capacity; hence, traffic volume impacts are regional in addition to the study area.

To provide a regional comparison of the transportation systems management/transit build versus no-build traffic-related impacts, Parsons calculated regional benefits using the Kern COG 2006 Regional Travel Demand Model (Update 1) and STEAM 2.0, a system-wide analysis tool.

Table 3-16 reports daily travel statistics produced by the Kern COG 2006 Regional Travel Demand Model (Update 1) for year 2038 no-build and build alternative conditions. The table indicates that overall daily vehicle miles traveled increase for the four build alternatives compared to the no-build condition. The table indicates that the build alternatives have less overall vehicle hours traveled (VHT) than the no-build alternative. Average speeds increase from the no-build condition to the build alternatives.

In addition to the regional travel model, Parsons used STEAM 2.0 to calculate annual performance statistics. The Federal Highway Administration (FHWA) introduced the first version of the Surface Transportation Efficiency Analysis Model (STEAM) in 1997. STEAM was the first FHWA impact analysis product to use input directly from the four-step travel demand modeling process for detailed, system wide analysis of alternative transportation investments. STEAM 2.0 was released in 2000 to expand the scope of the program to address environmental justice measures.

"Like STEAM, STEAM 2.0 is based on the principles of economic analysis, and allows development of monetized impact estimates for a wide range of transportation and investments and policies, including major capital projects, pricing and travel demand management. Impact measures are monetized to the extent feasible, but quantitative estimates of natural resources usage (i.e., energy consumption) and environmental impacts (i.e., emissions) are also provided. Net monetary benefits (or costs) of alternatives can then be used to evaluate trade-offs against non-monetizable benefits, including sustainability and community livability."[2]

An important feature of STEAM 2.0 is that the software program post-processes the traffic assignment volumes generated from conventional four-step travel forecasting models. The purpose of this feature is to compute benefits based on more accurate highway travel speeds, and to provide FHWA with a more consistent basis of comparison between urban areas.

[2]Surface Transportation Efficiency Analysis Model (STEAM 2.0): User Manual, Cambridge Systematics, Inc., December 2000.

Table 3-16. Regional Travel Model Measures of Effectiveness

FACILITY TYPE	2038 NO-BUILD ALTERNATIVE			TRANSPORTATION SYSTEMS MANAGEMENT/ TRANSIT ALTERNATIVE			BUILD ALTERNATIVE A			BUILD ALTERNATIVE B			BUILD ALTERNATIVE C		
	VMT	VHT	AVG SPEED	VMT	VHT	AVG SPEED	VMT	VHT	AVG SPEED	VMT	VHT	AVG SPEED	VMT	VHT	AVG SPEED
Freeways	19,424,678	301,424	64.44	19,381,198	298,924	64.84	19,902,411	308,027	64.61	19,970,560	309,097	64.61	20,004,215	310,239	64.48
Expressways	939,844	20,462	45.93	1,538,010	36,488	42.15	951,632	20,734	45.90	953,046	20,784	45.85	951,366	20,718	45.92
Major arterials	15,746,341	452,289	34.81	15,201,145	431,083	35.26	15,288,008	436,522	35.02	15,278,278	437,271	34.94	15,244,957	436,299	34.94
Minor arterials	1,825,513	67,724	26.96	1,815,597	67,360	26.95	1,766,960	65,039	27.17	1,760,345	64,789	27.17	1,766,001	65,370	27.02
Collectors	762,494	38,448	19.83	755,071	38,046	19.85	725,959	35,759	20.30	724,242	35,701	20.29	733,412	36,330	20.19
Centroids	2,429,247	110,402	22.00	2,429,655	110,416	22.00	2,429,851	110,429	22.00	2,430,041	110,434	22.00	2,429,589	110,404	22.01
Diamond ramps	417,504	26,220	15.92	425,257	25,313	16.8	513,792	22,985	22.35	482,343	22,948	21.02	455,281	22,368	20.35
Loop ramps	37,300	2,103	17.74	34,709	2,096	16.56	35,507	1,755	20.23	36,565	1,890	19.35	35,106	1,765	19.89
Cordon	655,308	32,767	20.00	655,308	32,767	20.00	655,308	32,767	20.00	655,308	32,767	20.00	655,308	32,767	20.00
All Facilities	**42,238,229**	**1,051,840**	**40.16**	**42,235,949**	**1,042,494**	**40.51**	**42,269,429**	**1,034,017**	**40.88**	**42,290,728**	**1,035,681**	**40.83**	**42,275,236**	**1,036,259**	**40.80**

Source: Parsons

The STEAM 2.0 speed models account for delays due to incidents, using data on the frequency, severity, and duration of incidents. Incidents account for a large share of total travel delays due to congestion, especially on freeways. The models also account for peak spreading that occurs when facilities become more congested. The traffic temporal distributions used in developing the models were based on data collected from 579 urban automatic traffic recorders across the nation. Separate temporal distributions were developed for freeways and arterials with low, moderate, and high ratios of average daily traffic to capacity. The models further account for day-to-day variations in traffic. The relationship between delays due to congestion and traffic volumes are highly non-linear in nature, especially when the ratio of demand volume to capacity is close to 1.0. Lastly, the STEAM 2.0 speed models account for the decrease in highway capacity that occurs after demand volumes exceed capacity. The 1994 Highway Capacity Manual notes that observations of freeway queue departure rates range from 1,500 to 2,000 passenger cars per hour per lane. In contrast, freeway capacities for 12-foot lanes with no lateral obstructions are 2,200 to 2,300 passenger cars per hour per lane. Not accounting for the fact that queue departure rates are generally lower than freeway capacities can result in a large understatement of the delays due to queuing.[3]

Table 3-17 reports measures of effectiveness computed with STEAM 2.0, based on travel demand forecast input from the Kern COG regional travel model. Monetized benefits and costs are reported in Section 5 of this document along with assumptions used in the STEAM 2.0 computations.

The data reported in Table 3-17 indicates that like the regional travel model performance statistics, annual vehicle miles traveled (VMT) increase with the build alternatives as motorists take advantage of higher speed routes to travel east–west across town. Travel time decreases, however, due to more efficient route choices and less congestion.

Crashes are forecast to decrease by implementing the build alternative improvements, as the accident rates for urban principal arterials, such as the no-build version of Rosedale Highway, are higher than expressways and freeways. The build alternatives also result in reduced fuel consumption.

[3]Ibid.

Table 3-17. STEAM 2.0 Measures of Effectiveness *(Year 2038)*

	NO-BUILD ALTERNATIVE	TRANSPORTATION SYSTEMS MANAGEMENT/ TRANSIT ALTERNATIVE	BUILD ALTERNATIVE		
			A	B	C
1. Travel Demand					
VMT *(million VMT/year)*	9,951.4	9,955.1	9,994.3	10,004.0	10,006.8
Travel time *(million person hours/year)*	397.43	395.95	391.57	391.93	391.53
2. Tons of Emissions *(tons/year)*					
VMT Related Emissions	Please see detailed technical studies				
HC					
CO					
NO_X					
PM_{10}					
Cold start emissions					
3. Greenhouse Gas Emissions					
Btu energy consumption *(100 billion Btu/year)*	Please see detailed technical studies				
CO_2 emissions *(1,000 tons/year)*					
4. Accidents					
Fatalities	68.3	68.2	67.8	67.9	67.9
Injuries	7,409.1	7,373.1	7,351.6	7,367.8	7,367.7
Property damage only	12,336.7	12,292.5	12,300.2	12,322.9	12,327.4
5. Fuel Consumption					
Gallons *(1,000 gallons/year)*	490,911.3	490,030.0	488,715.5	489,141.6	488,885.5

Source: Parsons (based on STEAM 2.0)

CHAPTER 4. TRAFFIC OPERATIONS ANALYSIS

4.1 Introduction

As indicated in Section 1.1, Caltrans, in cooperation with the City of Bakersfield, proposes to provide a continuous route along State Route 58 from Interstate 5 to existing State Route 58 east of State Route 99. The proposed continuous route has been divided into three distinct segments. The combination of these three segments comprises the Centennial Corridor project. Segment 1 is the eastern segment that would connect the Westside Parkway (Segment 2) to the existing State Route 58 east freeway. Segment 2 is comprised of what is locally known as the Westside Parkway and extends from Heath Road to Truxtun Avenue. Segment 3 is the western segment that extends from Interstate 5 to Heath Road.

The project's segments are numbered from east to west as shown on Figure 4-1.

Segment 1 extends from the easterly terminus of Segment 2 near Truxtun Avenue to the existing State Route 58 east freeway in the vicinity of Cottonwood Road. It is the only segment where construction alternatives A, B and C are being considered. These three build alternatives plus a transportation systems management/transit alternative (alternative M) and a no-build alternative are being considered.

Segment 2 encompasses a local freeway facility known as the Westside Parkway. As part of the Centennial Corridor project, it is anticipated that the Westside Parkway would be successfully adopted as State Route 58 (under build alternatives A, B, or C).

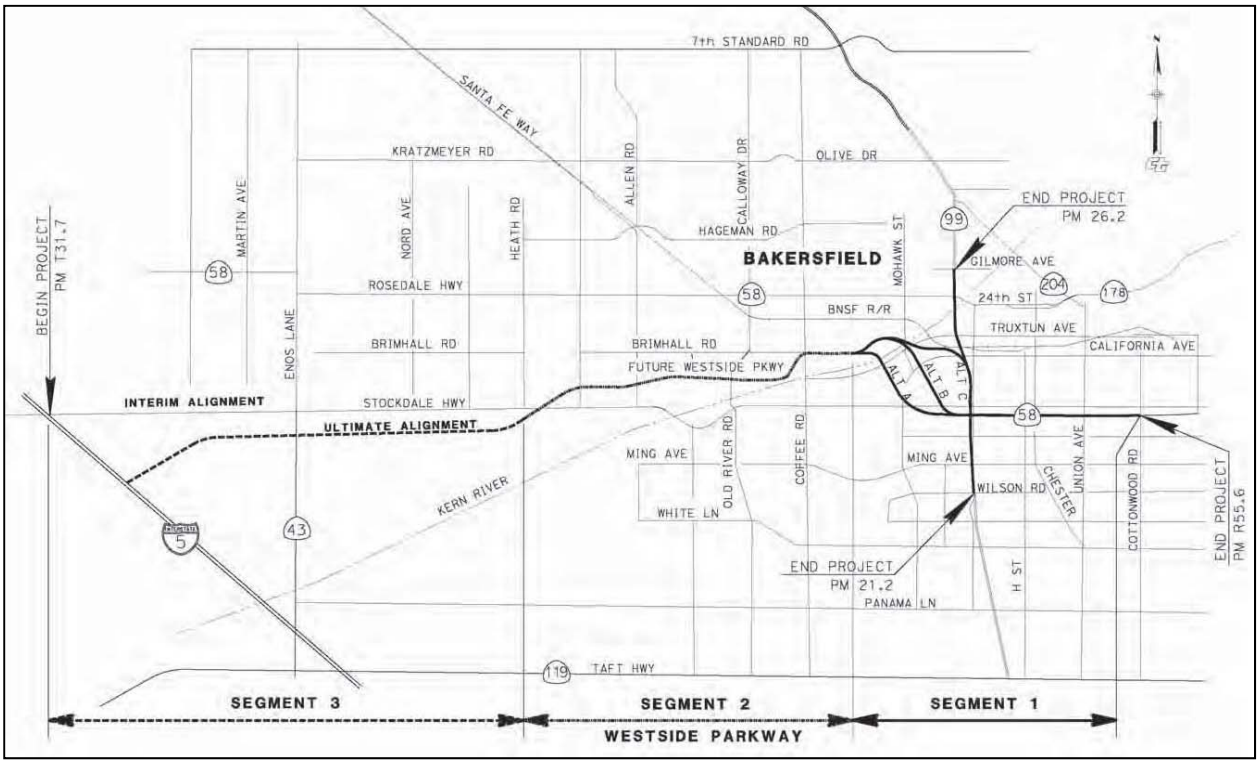


Figure 4-1: Segments for the Centennial Corridor

Westside Parkway is a local, access controlled, multilane freeway that extends from its western terminus near the intersection of Stockdale Highway near Heath Road to its eastern terminus near Mohawk Street, Truxtun Avenue and the Kern River.

Segment 3 extends from Interstate 5, approximately two miles south of the Stockdale Highway/ Interstate 5 interchange, to the intersection of Heath Road and Stockdale Highway. The Centennial Corridor project proposes an interim connection to Interstate 5 via Stockdale Highway from the end of Segment 2 near Heath Road under build alternatives A, B, or C. Under alternative M, the connection to Interstate 5 would remain on existing State Route 58, known locally as Rosedale Highway.

This traffic operations analysis is focused on Segment 1, as the limits of construction primarily occur within this segment along with the majority of potential traffic related impacts. The traffic operations analysis addresses Segment 2 to determine if the freeway connector project (Segment 1) will impact the design requirements of the Westside Parkway. The analysis of Segment 3 traffic operations is limited to the interim connection to Interstate 5 via Stockdale Highway under build alternatives A, B, or C.

The no-build alternative, build alternatives A, B, and C, and the transportation systems management/transit alternative (alternative M) are addressed in this chapter. A summary comparison of the alternatives is provided at the end of the chapter.

4.2 Methodology

The traffic operations analysis considers the overall performance of the highway network, the performance of the freeways affected by the project, specifically State Route 99 and State Route 58, local street intersections impacted by the project, and local traffic circulation impacts. These areas of interest are addressed for the opening year of the project, 2018, and a horizon year of 2038, which constitutes the design year for new construction related to the Centennial Corridor project.

The overall performance of the highway network was gauged using the Kern Council of Governments Regional Transportation Travel Forecasting Model, as previously discussed and reported in Chapter 3.

Freeway operational performance was measured using the CORSIM traffic simulation model. CORSIM (corridor simulation) is the traffic modeling and simulation software package funded by the Federal Highway Administration (FHWA) and is widely used for analyzing existing conditions and evaluating plans for new construction. To apply the simulation model, the physical features of the highway network must first be coded. This as-built condition was ascertained using an aerial photography base map and ground level reconnaissance. Traffic volumes and volume-weighted origin-destination matrices were then entered and the simulation model was calibrated to replicate existing conditions as measured by observed versus modeled traffic volumes, speeds, and traffic queues. Volume II (part 1 of 2) of this report documents the calibration of the CORSIM model for local conditions in metropolitan Bakersfield.

The calibration goal was to replicate local drivers' behavior and traffic characteristics to within ±10 percent of the existing count and travel time data collected. As CORSIM is a stochastic model, traffic response is simulated on random seeds. Thus, each scenario of network conditions

(AM and PM) is simulated 10 times with different random seeds. The final result is based on the average of the 10 runs. Once the model is calibrated, it can be used to analyze both existing conditions and future scenarios.

To gauge traffic operational performance, level of service (LOS) is a qualitative measure used to describe the driver's experience within a traffic stream, generally in terms of service measures such as speed and travel time, freedom to maneuver, traffic interruptions and delay, and comfort and convenience. Six levels of service are defined by the Highway Capacity Manual (HCM) 2000. Letters designate each level—from LOS A (indicating traffic flows with little or no delay) to LOS F (indicating over-saturated conditions where traffic flow exceeds freeway capacity, generally resulting in long queues and delays). The level of service criteria for density on freeways are presented in Table 4-1.

Table 4-1. Mainline and Ramp Level of Service Definitions

LOS	DESCRIPTION	DENSITY (pc/mi/ln)	
		MAINLINE	RAMPS
A	Describes free-flow operations. Free-flow speeds prevail.	<11	<10
B	Represents reasonably free-flow operations and free-flow speeds are maintained.	>11 and <18	>10 and <20
C	Provides for flow with speeds at or near the free-flow speed of the freeway.	>18 and <26	>20 and <28
D	Describes the level at which speeds begin to decline slightly with increasing flows and density begins to increase somewhat more quickly.	>26 and <35	>28 and <35
E	At this level's highest density value, it describes operation that is at capacity of the freeway.	>35 and <45	>35
F	Describes breakdown in vehicular flow and queues forming behind the breakdown points.	>45	Demand exceeds capacity

Source: Highway Capacity Manual 2000

To determine freeway level of service, the density of each mainline segment was extracted from the CORSIM output and compared to the criteria listed on Table 4-1.

It must be noted that CORSIM does not output HCM level of service. Simulation model measures of effectiveness are usually not directly translatable into HCM LOS measures, because the HCM bases hourly level of service on the performance of the facility during the peak 15-consecutive-minute period within the analysis hour. Also, most all simulation tools such as CORSIM report the density of vehicles; while the density used in HCM LOS for uninterrupted flow facilities (no signals or stop signs) is the passenger car equivalent in passenger car units of the actual density of vehicles on the facility.

Since each microscopic and macroscopic analysis tool (including the HCM method) has notably different definitions of what constitutes stopped and queued vehicles, and because the tools also vary significantly in the determination of which vehicles to include in the computations (vehicles that both entered and exited during the analysis period, vehicles that did neither, or vehicles that either entered or exited, but not both, during the analysis period), it is not feasible for an analyst to take the macroscopic output from one tool, apply a conversion factor (or procedure) and compare the results to that of another tool.

This conclusion means that looking up HCM levels of service using measures of effectiveness (MOE) produced by a different analytical method is not completely accurate.

The CORSIM derived LOS determinations are therefore considered approximations, to be viewed along with density and speed MOEs.

Insofar as existing conditions, Tables 4-2 through 4-5 list the freeway segment LOS computed via the HCM Highway Capacity Software, versus that estimated based on CORSIM microsimulation.

A comparison of the HCM versus CORSIM results indicates the following: For northbound State Route 99, the basic freeway level of service results are similar or better when the freeway is uncongested, operating at LOS D or better. For merge/diverge sections, CORSIM densities (and therefore LOS) are similar or higher than HCM calculations. Similar findings were also noticed for the southbound direction of State Route 99.

Examining the density parameter, upon which the level of service is graded, indicates the following:

- On State Route 58, which is less congested than State Route 99, the HCM High Capacity Software provides indications of higher densities, and thus more congestion, compared to the more extensive microsimulation of existing traffic operations using the CORSIM model.
- On State Route 99, CORSIM yields higher densities than HCS in segments which experience LOS D or worse traffic operations.

The HCM High Capacity Software software analyzes traffic operations based on isolated link conditions, whereas CORSIM analyzes freeway conditions taking downstream congestion and spillback into account.

For future year conditions, freeway traffic performance will be measured using a traffic simulation program, such as CORSIM, as recommended by FHWA for saturated traffic conditions in an urban setting.[1]

In addition to level of service, additional measures of effectiveness can be extracted from the CORSIM traffic simulation model output. These include link volumes served by the facility (throughput), speed, delay time, vehicle miles traveled, vehicle hours traveled, and overall vehicle delay. These are defined on Figure 4-2, which presents an example table of CORSIM analysis results.

In addition to evaluating the performance of the State Route 99 and State Route 58/Westside Parkway freeway segments in the study corridor, interchange ramp termini intersections were evaluated as part of this study. The CORSIM software was again used for the intersection analysis, as both freeway and the ramp intersections were modeled as an integrated system. CORSIM is capable of analyzing both unsignalized and signalized intersections and was used to compute control delay per vehicle. HCM 2000-defined levels of service criteria for intersections are presented in Table 4-6.

Table 4-7 lists the 79 intersections selected for study and Figure 4-3 illustrates their locations. As noted above, ramp terminal and adjacent intersections were analyzed using the CORSIM microsimulation software. The remaining isolated intersections were analyzed using SYNCHRO, version 6.0 software.

[1] Interstate System Access Informational Guide, August 2010.

Table 4-2. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions—State Route 58 Eastbound

LOCATION	LANES	TYPE	HCM[1]						CORSIM[2]					
			AM PEAK HOUR			PM PEAK HOUR			AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY	SPEED	LOS	DENSITY	SPEED	LOS	DENSITY	SPEED	LOS	DENSITY	SPEED
SR 99 to H Street	3	Weave	D	—	—	D	—	—	D	31.9	57	D	29.9	57
H Street off-ramp to Chester Ave on-ramp	2	Basic	D	29.0	63.5	D	27.0	64.3	C	20.7	59	C	20.8	61
Chester Avenue on-ramp	2	Merge	D	34.9	52.5	D	33.8	53.3	D	32.7	57	D	32.5	55
Chester Avenue to Union Avenue	2	Basic	D	34.3	60.3	D	33.7	60.7	D	33.3	53	D	33.6	52
Union Avenue off-ramp	2	Diverge	E	38.5	56.2	E	38.1	56.8	E	35.5	53	E	36.1	51
Union Avenue off-ramp to on-ramp	2	Basic	C	24.7	64.9	D	27.4	64.2	C	24.1	60	C	25.8	59
Union Avenue SB on-ramp	2	Merge	D	29.1	55.4	D	31.8	54.3	C	25.4	60	C	27.6	59
Union Avenue NB on-ramp	2	Merge	D	30.5	55.3	D	33.5	53.6	C	26.9	60	D	29.4	60
Union Avenue to Cottonwood Road	2	Basic	D	28.1	63.9	D	33.2	61.0	C	25.9	61	D	28.2	61

[1]*Source:* Fehr & Peers, 2010. See Table 2-6 for notes.
[2]*Source:* Parsons, 2011
Level of service E or F

Table 4-3. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions—State Route 58 Westbound

LOCATION	LANES	TYPE	HCM[1]						CORSIM[2]					
			AM PEAK HOUR			PM PEAK HOUR			AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY	SPEED	LOS	DENSITY	SPEED	LOS	DENSITY	SPEED	LOS	DENSITY	SPEED
Cottonwood Road to Union Avenue	2	Basic	D	30.4	62.8	D	26.9	64.4	D	34.7	50	C	24.5	62
Brundage Lane off-ramp	2	Diverge	E	35.7	50.9	D	32.7	51.3	E	48.2	32	C	24.9	61
Brundage Lane off-ramp to on-ramp	2	Basic	C	24.8	64.9	C	23.6	65.0	C	22.9	57	C	22.1	62
Brundage Lane on-ramp	2	Merge	D	29.4	55.3	D	28.5	55.6	C	23.6	59	C	24.9	60
Union Avenue SB on-ramp	2	Merge	D	31.3	54.4	D	31.0	54.5	D	30.3	54	D	30.7	54
Chester Avenue off-ramp	2	Diverge	E	35.2	57.0	E	35.0	57.1	D	34.5	48	D	34.7	48
Chester Ave off-ramp to H Street on-ramp	2	Basic	C	24.7	64.9	C	24.8	64.9	C	21.4	60	C	23.8	60
H Street on-ramp	2	Merge	D	29.8	55.5	D	31.0	55.0	C	24.8	58	D	28.9	57
H Street to SR 99	2	Basic	D	27.9	64.0	D	29.4	63.3	C	23.4	59	D	27.2	58
SR 99 NB off-ramp	2	Diverge	D	33.6	58.2	D	34.8	58.4	C	24.3	60	D	28.1	59
SR 99 NB off-ramp to SB off-ramp	2	Basic	B	17.0	65.0	C	18.6	65.0	B	15.9	58	C	19.5	57
SR 99 SB off-ramp	2	Diverge	C	22.2	49.9	C	24.1	49.5	B	17.1	53	C	21.0	53

[1]*Source:* Fehr & Peers, 2010. See Table 2-7 for notes.
[2]*Source:* Parsons, 2011
Level of service E or F

Table 4-4. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions—State Route 99 Northbound

LOCATION	LANES	TYPE	HCM[1]						CORSIM[2]					
			AM PEAK HOUR			PM PEAK HOUR			AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY	SPEED	LOS	DENSITY	SPEED	LOS	DENSITY	SPEED	LOS	DENSITY	SPEED
Panama Lane to White Lane	3	Basic	C	21.9	65.0	B	15.1	65.0	C	18.8	63	B	12.8	64
White Lane off-ramp	3	Diverge	C	27.3	61.2	C	21.0	60.8	B	18.6	63	B	13.0	64
White Lane off-ramp to loop on-ramp	3	Basic	C	20.6	65.0	B	13.1	65.0	B	17.9	62	B	11.1	63
White Lane EB loop on-ramp	3	Merge	E	35.6	53.9	C	25.0	58.1	E	47.9	38	C	24.4	50
White Lane WB on-ramp	3	Merge	E	35.3	54.0	C	23.9	58.6	E	38.3	53	C	23.7	59
White Lane to Ming Avenue	3	Basic	D	34.9	59.8	C	21.5	65.0	D	29.3	59	C	18.3	61
Ming Avenue off-ramp	4	Diverge	C	27.6	59.4	C	20.4	59.6	D	32.6	59	C	22.2	61
Ming Avenue off-ramp to on-ramp	4	Basic	C	22.8	65.0	B	14.6	65.0	D	29.7	45	B	14.4	56
Ming Avenue on-ramp	4	Merge	D	31.2	57.3	C	24.0	59.5	E	48.9	43	D	32.4	52
SR 58 off-ramp	4	Diverge	E	40.6	61.4	D	30.0	62.4	E	48.9	43	D	32.5	52
SR 58 off-ramp to Wible Road on-ramp	4	Basic	C	21.0	65.0	B	13.6	65.0	C	19.7	60	B	12.1	63
Wible Road on-ramp	4	Merge	C	23.3	59.0	B	17.7	60.2	C	26.9	49	C	20.5	57
SR 58 on-ramp	4	Merge	D	31.1	57.4	C	24.8	59.4	D	34.0	56	D	32.0	53
SR 58 to California Avenue	4	Basic	D	28.8	63.6	C	20.9	65.0	D	26.3	58	C	19.6	59
California Avenue off-ramp	4	Diverge	E	36.7	60.9	C	27.0	62.4	E	35.9	55	C	27.8	59
California Avenue off-ramp to on-ramp	4	Basic	C	23.4	65.0	B	18.0	65.0	C	24.1	54	B	17.7	57
California Avenue EB on-ramp	4	Merge	C	25.3	58.5	C	22.2	59.4	D	31.7	51	D	28.9	53
California Avenue WB on-ramp	4	Merge	C	24.8	58.5	C	21.4	59.5	E	35.9	54	D	34.9	52
California Avenue to Rosedale Highway	4	Basic	D	26.5	64.5	C	22.1	65.0	D	26.0	55	C	20.9	56
Rosedale Highway off-ramp	4	Diverge	E	38.2	59.5	D	34.3	59.2	E	40.1	51	D	32.8	55
Buck Owens Boulevard off-ramp	4	Diverge	C	26.3	57.7	B	18.9	59.9	C	21.0	58	B	15.6	61
Buck Owens Boulevard off-ramp to on-ramp	4	Basic	B	16.5	65.0	B	13.6	65.0	B	13.2	63	B	11.2	63
Buck Owens Boulevard on-ramp	4	Merge	B	18.6	60.0	B	17.8	60.2	C	20.6	60	B	19.9	59
Airport Drive off-ramp	4	Diverge	C	27.9	59.2	C	23.8	60.3	C	22.8	60	C	20.9	60
Airport Drive to Golden State Avenue	3	Basic	B	14.4	65.0	B	14.2	65.0	A	9.7	64	A	9.6	63

[1]*Source:* Fehr & Peers, 2010. See Table 2-8 for notes.
[2]*Source:* Parsons, 2011
Level of service E or F

Table 4-5. Freeway Mainline and Ramp Junction Level of Service—Existing Conditions—State Route 99 Southbound

LOCATION	LANES	TYPE	HCM[1]						CORSIM[2]					
			AM PEAK HOUR			PM PEAK HOUR			AM PEAK HOUR			PM PEAK HOUR		
			LOS	DENSITY	SPEED	LOS	DENSITY	SPEED	LOS	DENSITY	SPEED	LOS	DENSITY	SPEED
Golden State Avenue to Airport Drive	3	Basic	C	19.8	65.0	C	19.7	65.0	B	15.5	64	B	16.6	64
Airport Drive on-ramp	4	Merge	C	23.9	59.5	D	29.2	58.1	C	27.2	57	D	33.9	55
Airport Drive to Rosedale Highway	4	Basic	C	19.4	65.0	C	22.6	65.0	B	16.9	59	C	21.0	57
Rosedale Highway off-ramp	4	Diverge	C	25.4	62.6	D	28.5	62.4	C	25.5	60	D	32.0	57
Rosedale Highway off-ramp to on-ramp	4	Basic	B	16.7	65.0	C	19.7	65.0	B	14.9	58	C	25.4	42
Rosedale Highway WB on-ramp	4	Merge	C	21.9	59.5	D	28.9	57.9	C	25.7	55	D	33.7	49
Rosedale Highway EB on-ramp	4	Merge	C	25.9	58.9	D	32.4	56.6	D	33.0	59	E	37.2	58
Rosedale Highway to California Avenue	4	Basic	C	23.4	65.0	D	30.5	62.7	C	20.8	59	D	29.9	54
California Avenue off-ramp	4	Diverge	D	31.8	61.2	E	37.1	61.1	D	33.6	58	E	42.7	52
California Avenue off-ramp to on-ramp	4	Basic	C	18.7	65.0	C	25.2	64.8	B	16.1	62	D	31.2	45
California Avenue on-ramp	4	Merge	C	20.4	59.6	D	29.9	57.4	D	29.2	57	D	34.8	56
California Avenue to SR 58	4	Basic	C	20.0	65.0	D	29.4	63.3	B	17.9	59	D	27.4	57
SR 58 off-ramp	4	Diverge	D	31.0	61.9	F	—	—	D	28.1	59	E	41.1	53
SR 58 off-ramp to on-ramp	4	Basic	B	13.2	65.0	C	20.1	65.0	B	11.5	63	C	20.6	56
SR 58 on-ramp	4	Merge	C	20.5	59.8	C	27.3	58.2	D	28.9	49	D	31.4	51
Real Road on-ramp	4	Merge	B	18.3	60.1	C	24.6	58.6	C	26.6	56	D	34.2	55
Ming Avenue off-ramp	4	Diverge	C	24.7	62.1	E	36.2	60.0	C	24.7	59	E	39.0	52
Ming Avenue off-ramp to on-ramp	4	Basic	B	14.8	65.0	C	19.5	65.0	B	12.7	63	B	17.5	63
Ming Avenue on-ramp	3	Merge	C	22.0	58.9	D	29.3	57.0	B	18.2	60	C	25.2	59
Ming Avenue to White Lane	3	Basic	C	21.4	65.0	D	30.6	62.6	B	16.3	62	C	24.0	59
White Lane off-ramp	3	Diverge	B	15.1	59.1	C	24.7	57.3	C	22.3	61	D	34.6	56
White Lane off-ramp to on-ramp	3	Basic	B	13.5	65.0	B	17.7	65.0	B	11.2	63	B	15.3	63
White Lane WB on-ramp	3	Merge	B	16.1	59.6	C	20.1	58.9	B	12.0	62	B	15.5	61
White Lane EB on-ramp	3	Merge	B	16.2	59.8	C	20.0	59.2	B	12.3	62	B	16.1	62
White Lane to Panama Lane	3	Basic	B	14.7	65.0	C	19.1	65.0	B	11.8	63	B	16.0	62

[1]*Source:* Fehr & Peers, 2010. See Table 2-9 for notes.

[2]*Source:* Parsons, 2011

Level of service E or F

Demand: Horizon year traffic volume (vehicles per hour) on freeway segment

Served: Traffic volume accommodated by freeway segment, taking traffic operational factors into account

% Served: Served volume/demand volume

Vehicle Miles: Served volume × segment length

Vehicle Hours: Served volume × segment travel time

Vehicle Hours of Delay: Served volume × delay time

FREEWAY SEGMENT	SOV											
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)
SR-99 NB Mainline												
SR-99 NB south end of the network to White Ln Off Ramp	6,580	6,394	97%	69	20	46	35	D	69	5607	123	35
White Ln Off Ramp to White Ln Loop On Ramp	5,485	5,281	96%	31	12	39	34	D	100	1769	46	18
White Ln Loop On Ramp to White Ln Direct On Ramp	7,130	5,797	81%	16	10	23	55	F	116	610	26	16
White Ln Direct On Ramp to Ming Ave Off Ramp	7,740	6,092	79%	230	158	20	75	F	346	7805	389	267
Ming Ave Off Ramp to Ming Ave On Ramp	6,920	5,160	75%	85	59	18	71	F	431	2208	121	85
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	8,415	6,490	77%	20	9	31	46	F	451	1139	36	17
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	5,915	4,565	77%	32	2	61	19	C	483	2498	41	2
Wible Rd On Ramp to SR58 WB On Ramp	6,525	5,079	78%	10	1	60	19	C	493	812	13	1
SR58 WB On Ramp to California Ave Off Ramp	8,240	6,129	74%	36	4	58	26	C	529	3539	61	7
California Ave Off Ramp to California Ave Loop On Ramp	7,360	5,432	74%	17	1	62	22	C	545	1534	25	1
California Ave Loop On Ramp to California Ave Direct On Ramp	8,100	6,083	75%	9	1	56	25	C	555	904	16	2
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	8,430	6,003	71%	24	3	57	23	C	579	2287	40	4
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	6,340	4,305	68%	16	1	62	17	B	594	1167	19	1
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	5,790	3,904	67%	33	1	62	16	B	628	2259	36	1
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	6,540	4,625	71%	34	3	60	19	C	662	2628	44	3
Airport Dr Off Ramp to SR99 NB north end of the network	5,125	3,621	71%	41	1	62	15	B	703	2557	41	1
SR-99 SB Mainline												
SR99 SB north end of the network to Airport Dr On Ramp	4,595	4,548	99%	55	8	57	20	C	55	3950	69	10
Airport Dr On Ramp to Rosedale Hwy Off Ramp	6,710	5,386	80%	70	39	28	48	F	125	2917	105	59
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	5,615	4,452	79%	26	2	59	19	C	152	1915	33	3
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	6,995	5,458	78%	14	2	58	21	C	166	1241	21	2
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	8,620	6,862	80%	38	8	52	32	D	204	3744	72	16
California Ave Off Ramp to California Ave On Ramp	7,430	5,802	78%	15	2	55	27	D	219	1350	25	4
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	8,480	6,554	77%	36	10	48	34	D	255	3145	66	19
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	6,385	4,782	75%	57	17	45	27	D	312	3364	75	23
SR58 WB On Ramp to Real Rd On Ramp	8,140	5,566	68%	11	6	24	49	F	323	402	17	10
Real Rd On Ramp to Ming Ave Off Ramp	8,795	5,953	68%	34	13	39	36	E	357	2200	56	21
Ming Ave Off Ramp to Ming Ave On Ramp	7,050	4,814	68%	60	26	38	33	D	417	3030	80	34
Ming Ave On Ramp to White Ln Off Ramp	7,885	4,834	61%	178	118	21	55	F	594	5016	238	158
White Ln Off Ramp to White Ln Loop On Ramp	5,855	3,494	60%	20	1	62	14	B	614	1171	19	1
White Ln Loop On Ramp to White Ln Direct On Ramp	6,430	4,041	63%	10	1	61	15	B	624	684	11	1
White Ln Direct On Ramp to SR99 SB south end of the network	7,105	4,280	60%	52	2	62	17	B	676	3864	62	3

LOS: Approximate level of service. Note that CORSIM's computation of density differs from the Highway Capacity Manual

Density: The indicator of level of service according to the *2000 Highway Capacity Manual*

Speed: An indicator of level of service according to the *1994 Highway Capacity Manual*

Delay Time: Travel time in excess of "free flow," uncongested travel time

Travel Time: Time to traverse freeway segment (seconds per vehicle)

Figure 4-2: Measures of Effectiveness Derived from CORSIM Traffic Simulation Model

Table 4-6. Level of Service Definitions for Intersections

LOS	DESCRIPTION	CONTROL DELAY PER VEHICLE (sec/veh)	
		UNSIGNALIZED	SIGNALIZED
A	Traffic flows with very little delay and optimal speeds. Most vehicles do not stop at all.	0–10	<10
B	Traffic flows with very little delay and speeds may be slightly reduced. Very infrequent and short waits at traffic signals. More vehicles stop at intersections than for LOS A.	>10–15	>10–20
C	Traffic speeds continue to slow. Some vehicles may stop at this level, although many vehicles still pass through the intersection without stopping.	>15–25	>20–35
D	Congestion becomes more noticeable. Many vehicles stop and the proportion of vehicles not stopping declines.	>25–35	>35–55
E	Low speeds and traffic backups at intersections. Often considered to be the limit of acceptable delay.	>35–50	>55–80
F	Very slow speeds and congestion. Long traffic backups. Very likely to wait for multiple greens to get through an intersection. This is considered to be unacceptable to most drivers.	>50	>80

Source: Highway Capacity Manual 2000

Table 4-7. List of Study Intersections

NO.	INTERSECTION
Segment 3	
1	I-5 southbound ramps/Stockdale Highway
2	I-5 northbound ramps/Stockdale Highway
3	SR 43 (Enos Lane)/Rosedale Highway
4	SR 43 (Enos Lane)/Stockdale Highway
5	SR 43 (Enos Lane)/I-5 northbound ramps
6	SR 43 (Enos Lane)/I-5 southbound ramps
7	Stockdale Highway/Nord Road
8	Stockdale Highway/Wegis Avenue
Segment 2	
9	Stockdale Highway/Heath Road
10	Stockdale Highway/Westside Parkway
11	West Beltway/Westside Parkway westbound ramp
12	West Beltway/Westside Parkway eastbound ramp
13	Allen Road/Rosedale Highway
14	Allen Road/Brimhall Road
15	Allen Road/Westside Parkway westbound ramps
16	Allen Road/Westside Parkway eastbound ramps
17	Allen Road/San Juan Avenue
18	Allen Road/Stockdale Highway
19	Calloway Drive/Rosedale Highway
20	Calloway Drive/Brimhall Road
21	Calloway Drive/Westside Parkway westbound ramps
22	Calloway Drive/Westside Parkway eastbound ramps
23	Calloway Drive/Stockdale Highway
Segment 1	
24	Coffee Road/Rosedale Highway
25	Coffee Road/Brimhall Road
26	Coffee Road/Westside Parkway westbound ramps
27	Coffee Road/Westside Parkway eastbound ramps
28	Coffee Road/Truxtun Avenue
29	Coffee Road/Stockdale Highway
30	Mohawk Street/Rosedale Highway
31	Mohawk Street/Westside Parkway westbound ramps
32	Mohawk Street/Westside Parkway eastbound ramps
33	Mohawk Street/Truxtun Avenue
34	Mohawk Street/California Avenue
35	Stockdale Highway/California Avenue

NO.	INTERSECTION
36	Airport Drive/State Road–SR 204 off-ramp
37	Airport Drive/SR 99 northbound ramp
38	Buck Owens Boulevard/Rio Mirada Drive
39	SR 99 northbound ramps/Buck Owens Boulevard
40	Rosedale Highway/Camino Del Rio Court
41	Rosedale Highway/SR 99 southbound ramps
42	Rosedale Highway/SR 99 northbound ramps
43	24th Street/Oak Street
44	Truxtun Avenue/Empire Drive
45	Truxtun Avenue/Oak Street
46	California Avenue/Chester Lane
47	California Avenue/SR 99 southbound ramps
48	California Avenue/SR 99 northbound ramps
49	California Avenue/Oak Street
50	Stockdale Highway/Stine Road
51	Stockdale Highway/Real Road
52	Stockdale Highway/SR 99 southbound ramp
53	Brundage Lane/Oak Street
54	Real Road/SR 58
55	Wible Road/SR 99 northbound ramps
56	Ming Avenue/New Stine
57	Ming Avenue/Real Road
58	Ming Avenue/SR 99 southbound ramps
59	Ming Avenue/Wible Road
60	Ming Avenue/SR 99 northbound ramps
61	Ming Avenue/Castro Lane
62	White Lane/Wible Road
63	Ming Avenue/SR 99 southbound ramps
64	Ming Avenue/SR 99 northbound ramps
65	Ming Avenue/Hughes Lane
66	H Street/Brundage Lane
67	H Street/SR 58 westbound ramp
68	H Street/SR 58 eastbound ramp
69	H Street/Ming Avenue
70	Chester Avenue/Brundage Lane
71	Chester Avenue/SR 58 westbound ramp
72	Chester Avenue/SR 58 eastbound ramp
73	Chester Avenue/Ming Avenue
74	Union Avenue/Brundage Lane
75	Brundage Lane/SR 58 westbound ramps
76	Union Avenue/SR 58 eastbound ramps
77	Cottonwood Road-MLK/Brundage Lane
78	Cottonwood Road–Brundage Lane/SR 58 westbound ramps
79	Cottonwood Road/SR 58 eastbound ramps

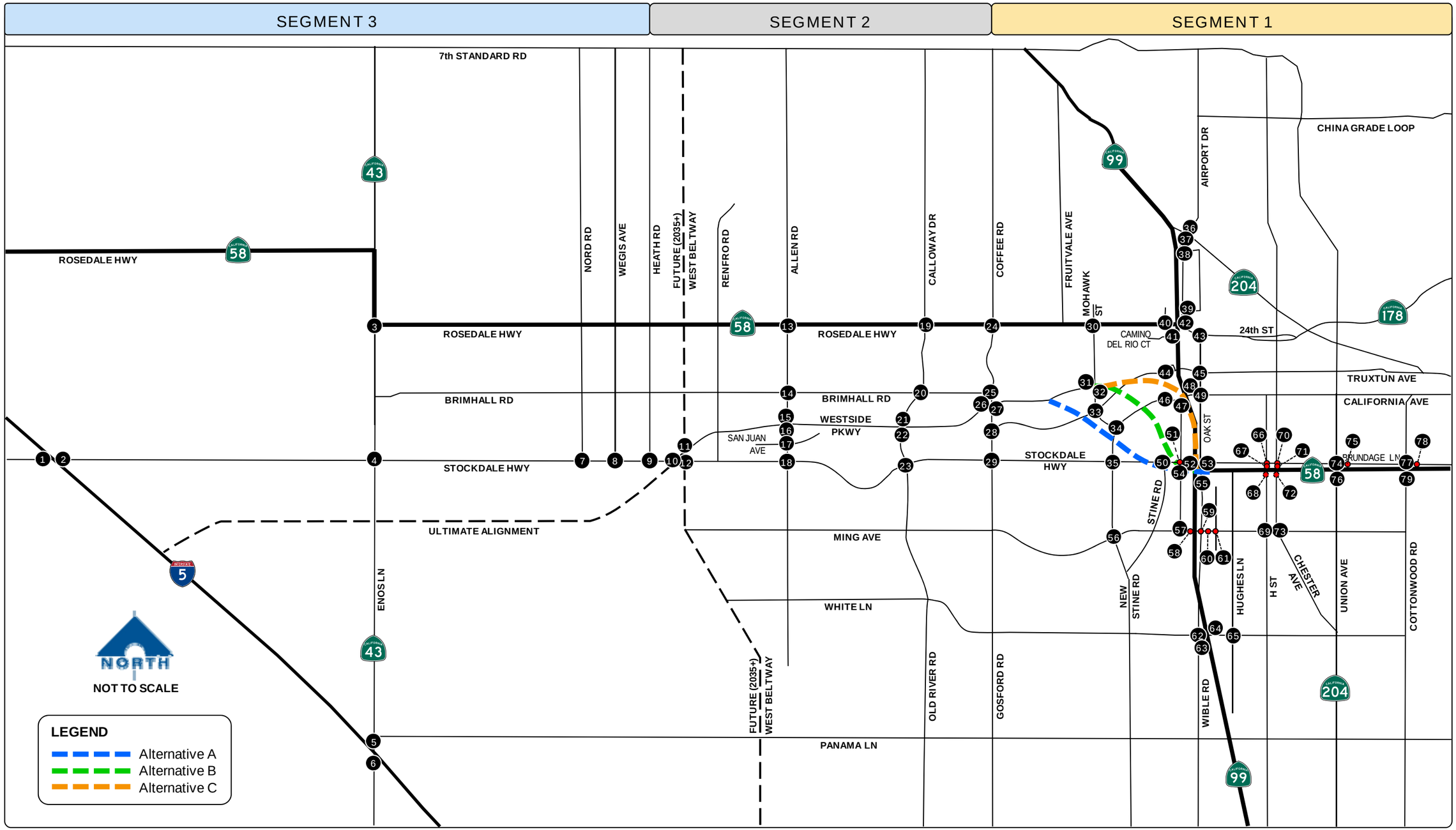


Figure 4-3: Location Map of Study Intersections

4.3 Traffic Performance of the No-build Alternative

The no-build alternative was described in Section 3.4, but is repeated here for reference.

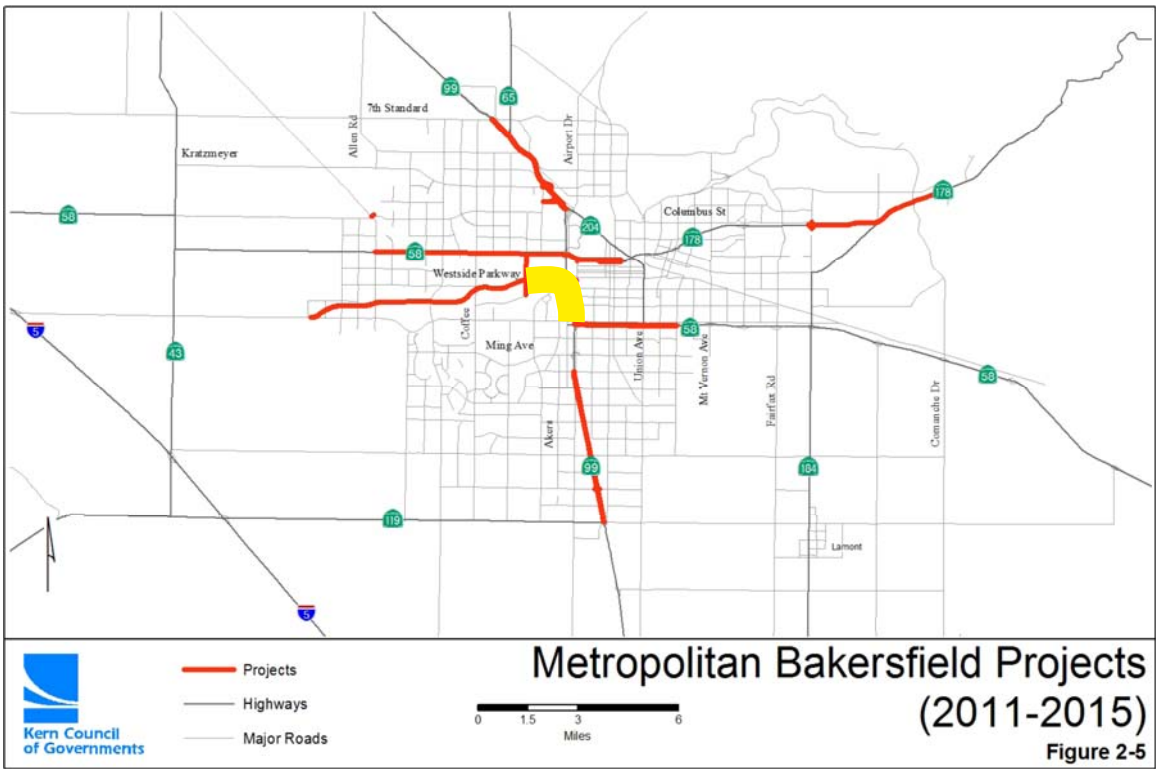
The no-build alternative includes all projects identified in Table 3-3 and Figures 3-4 and 3-5 except for the State Route 58 Connector/Centennial Corridor (State Route 58 to Westside Parkway) as identified on Figure 3-4 as project number 22.

Key projects included with the no-build alternative, all of which are identified in Amendment 1 to the *2011 Regional Transportation Plan* and the associated *Air Quality Conformity Determination*, are listed below with the locations of the projects illustrated on Figure 4-4.

Project	Location	Start
Route 58	Rosedale Highway—Calloway Drive to Route 99—Widen existing highway	2013
Route 58	Rosedale Highway—Allen Road to Calloway Drive—Widen existing highway	2013
Route 58	Route 99 to Cottonwood Road—Widen to six lanes	2015
Route 99	Wilson Road to Route 119—Widen to eight lanes	2012
Route 99	Route 204 to 7th Standard Road—Widen to eight lanes (Phase 1)	2012
Westside Parkway	Route 99/Oak Street to Heath Road—Construct local freeway	2009
Hageman Flyover	Knudsen Drive to Route 204—Construct extension	2013
Oak St/24th St	Route 178 (24th Street) and Oak Street—Construct improvements	2012
24th Street	Route 178 (24th and 23rd St) Oak Street to M Street—Widen existing highway	2013
Route 58	Rosedale Highway—Route 43 to Allen Road—Widen existing highway	2025
West Beltway	Rosedale Highway to Westside Parkway—Construct new facility	2025
Route 204	Airport Drive to Route 178—Widen existing highway	2030
Route 204	F Street—Construct interchange	2030
Route 58	At various locations—ramp improvements	2033
Route 99	Route 204 to 7th Standard Road—Widen to eight lanes (Phase 2)	2033
Route 99	At various locations—ramp improvements	2033
West Beltway	Pacheco Road to Westside Parkway—Construct new facility	2033
West Beltway	Rosedale Highway to 7th Standard Road—Construct new facility	2033
West Beltway	Taft Highway to Pacheco Road—Construct new facility	2033

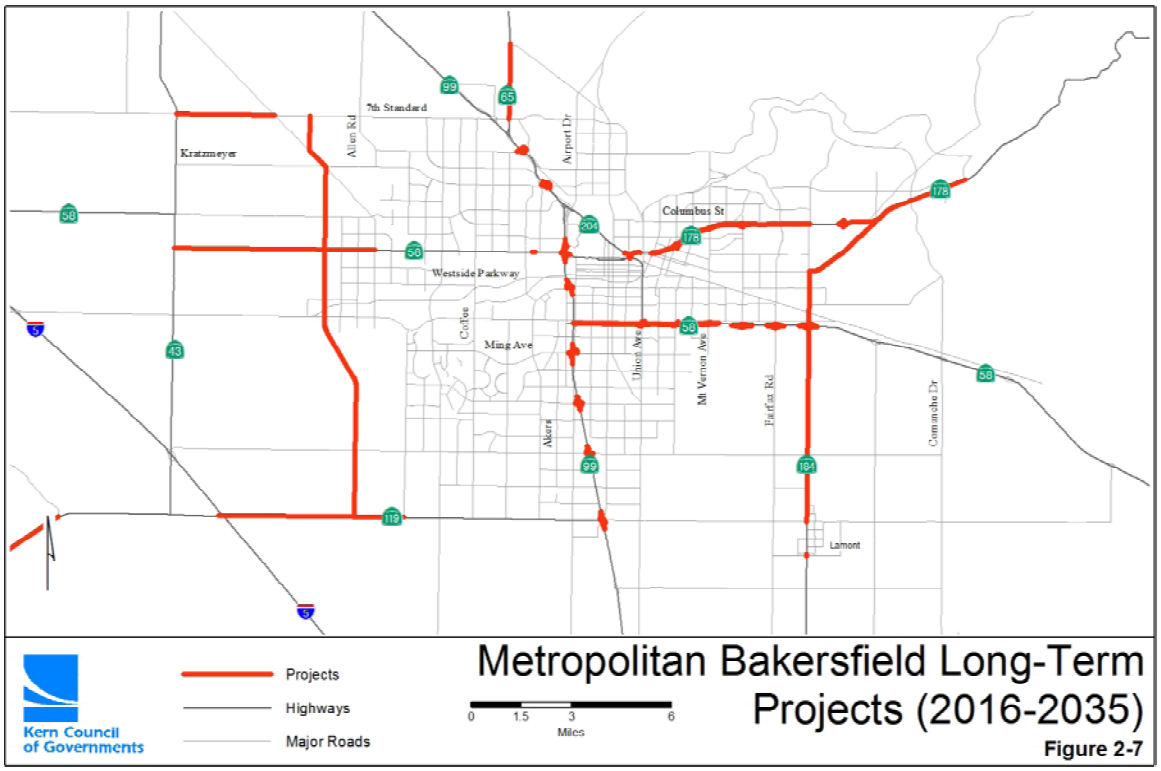
Given these investments, the roadway network will experience congestion along Rosedale Highway, 24th Street, the Truxtun Avenue extension west of Oak Street, portions of Stockdale Highway, State Route 99, portions of State Route 178, Coffee Road, Mohawk Street, and Union Avenue. The severity of congestion, as measured by level of service grade (D, E, or F), and location of congestion are depicted on Figure 4-5.

As indicated above, the CORSIM traffic simulation model was used to quantify the performance of the State Route 58 and State Route 99 freeway segments and ramps located within the study area. The configuration of these freeway segments, insofar as the number of lanes and interchange on- and off-ramps, and traffic demand volumes for 2038 are illustrated on Figure 4-6.



Source: Final Regional Transportation Plan Amendment No. 1, Kern Council of Governments, May 2011

Centennial Corridor Project



Source: Final Regional Transportation Plan Amendment No. 1, Kern Council of Governments, May 2011

Figure 4-4: Locations of Key No-Build Alternative Projects

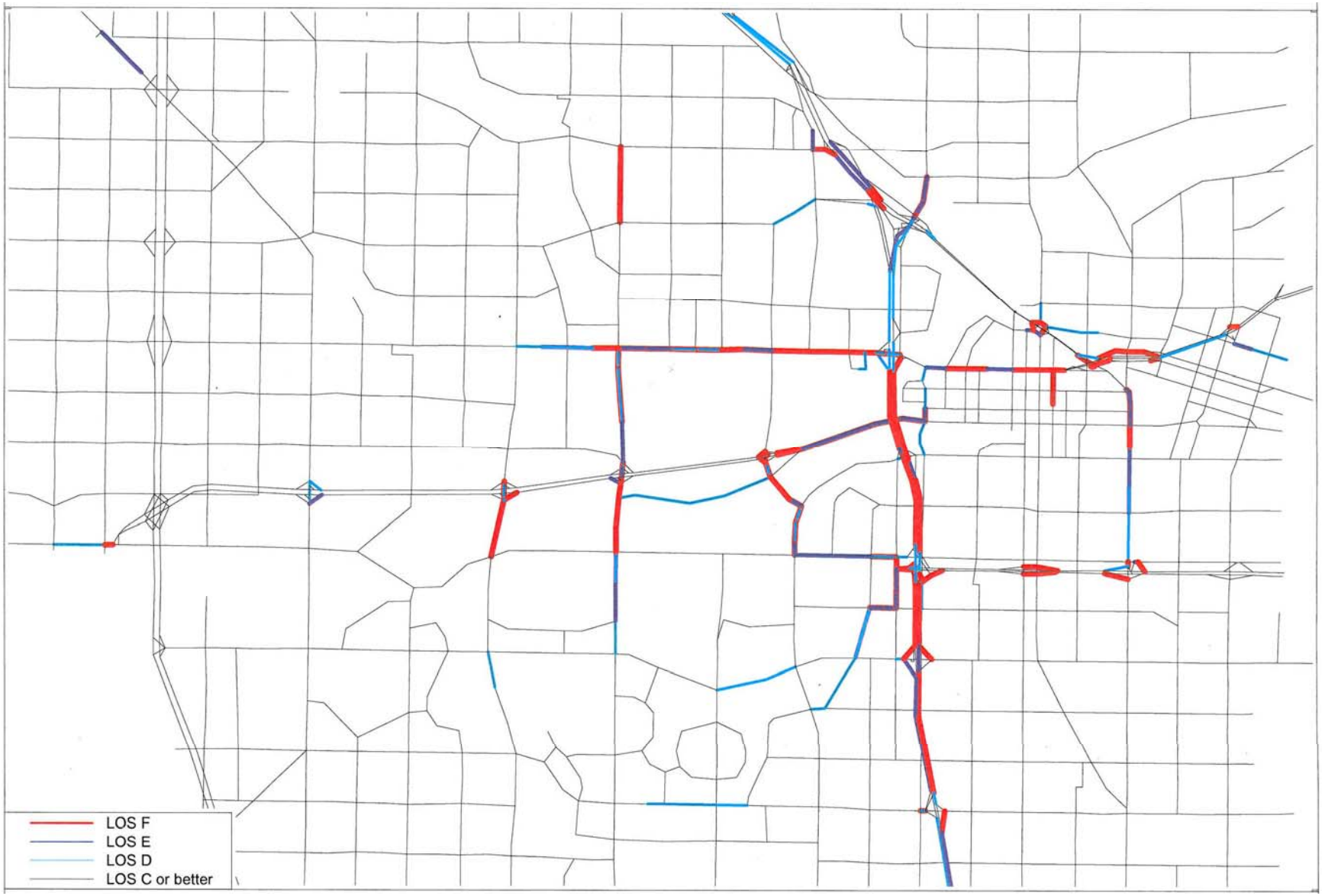
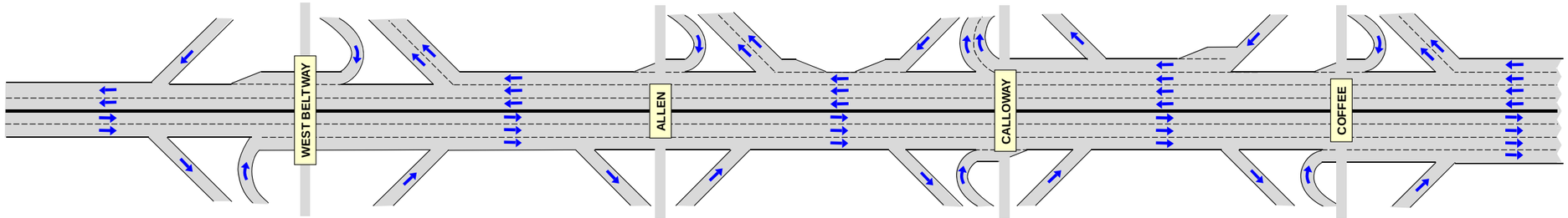


Figure 4-5: Locations of Congestion for the No-Build Alternative

A. State Route 58 and Westside Parkway

State Route 58 Westbound		MAINLINE	WEST BELTWAY ON	WEST BELTWAY MAINLINE	WEST BELTWAY ON	WEST BELTWAY MAINLINE	WEST BELTWAY OFF	MAINLINE	ALLEN ROAD ON	ALLEN ROAD MAINLINE	ALLEN ROAD OFF	MAINLINE	CALLOWAY DRIVE ON	CALLOWAY DRIVE MAINLINE	CALLOWAY DRIVE OFF	CALLOWAY DRIVE MAINLINE	CALLOWAY DRIVE OFF	MAINLINE	COFFEE ROAD ON	COFFEE ROAD MAINLINE	COFFEE ROAD ON	COFFEE ROAD MAINLINE	COFFEE ROAD OFF	MAINLINE
NO-BUILD ALTERNATIVE	AM Peak	**1,550**	290	**1,260**	395	**1,575**	1,060	**1,925**	225	**1,700**	850	**2,550**	465	**2,085**	580	**2,665**	312	**2,977**	645	**2,332**	555	**1,777**	1,185	**2,962**
	PM Peak	**2,305**	350	**1,955**	545	**2,545**	1,875	**3,285**	330	**2,955**	1,880	**4,835**	985	**3,850**	1,015	**4,865**	510	**5,375**	1,025	**4,350**	980	**3,370**	1,215	**4,585**
	ADT	**27,240**	5,955	**21,285**	6,185	**25,810**	16,690	**31,790**	2,615	**29,175**	20,705	**49,880**	12,330	**37,550**	10,545	**48,095**	6,486	**54,580**	10,565	**44,015**	7,860	**36,155**	16,215	**52,370**

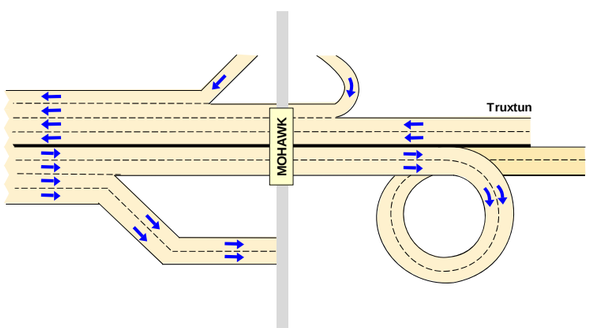


N

NOT TO SCALE

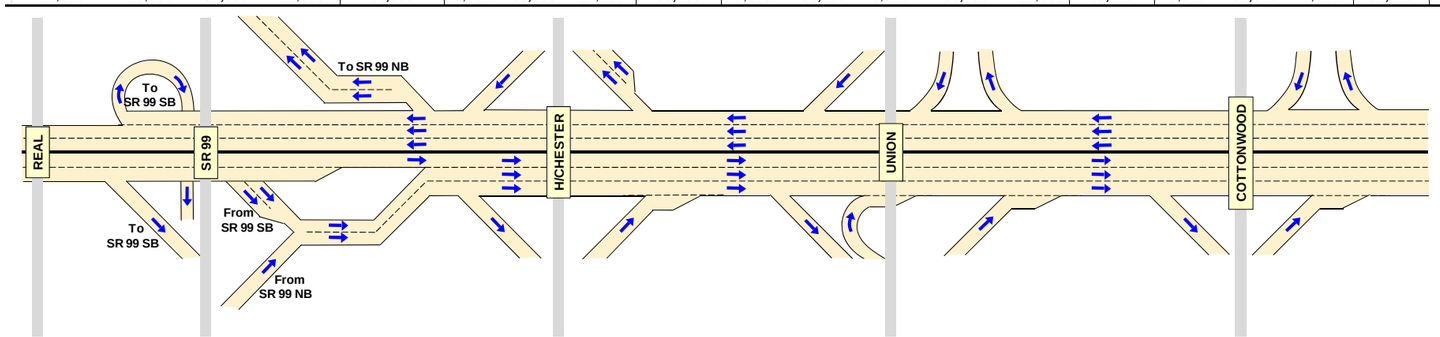
State Route 58 Eastbound		MAINLINE	WEST BELTWAY OFF	WEST BELTWAY MAINLINE	WEST BELTWAY ON	WEST BELTWAY MAINLINE	WEST BELTWAY ON	MAINLINE	ALLEN ROAD OFF	ALLEN ROAD MAINLINE	ALLEN ROAD ON	MAINLINE	CALLOWAY DRIVE OFF	CALLOWAY DRIVE MAINLINE	CALLOWAY DRIVE ON	CALLOWAY DRIVE MAINLINE	CALLOWAY DRIVE ON	MAINLINE	COFFEE ROAD OFF	COFFEE ROAD MAINLINE	COFFEE ROAD ON	COFFEE ROAD MAINLINE	COFFEE ROAD ON	MAINLINE
NO-BUILD ALTERNATIVE	AM Peak	**2,190**	800	**1,725**	1,185	**2,910**	550	**3,124**	195	**2,929**	1,810	**4,739**	1,108	**3,631**	484	**4,115**	914	**5,029**	2,185	**2,844**	385	**3,229**	550	**3,778**
	PM Peak	**2,180**	955	**1,615**	875	**2,490**	145	**2,245**	180	**2,065**	1,610	**3,675**	929	**2,745**	381	**3,127**	762	**3,889**	1,705	**2,184**	430	**2,614**	475	**3,090**
	ADT	**28,010**	10,835	**21,675**	12,190	**33,865**	1,960	**31,325**	2,575	**28,750**	21,980	**50,730**	13,170	**37,560**	5,115	**42,675**	11,125	**53,800**	22,365	**31,435**	6,555	**37,990**	4,615	**42,605**

MOHAWK STREET/TRUXTUN AVENUE				
MOHAWK ON	MAINLINE	MOHAWK ON	MAINLINE	TRUXTUN ON
1,005	**1,957**	835	**1,122**	1,122
1,415	**3,170**	1,250	**1,920**	1,920
18,450	**33,920**	16,825	**17,095**	17,095



MOHAWK STREET/TRUXTUN AVENUE	
MOHAWK OFF	TRUXTUN OFF
1,900	1,878
1,545	1,545
20,900	21,705

STATE ROUTE 99 SYSTEM INTERCHANGE				MAINLINE	H ST/CHESTER AVE ON	H ST/CHESTER AVE MAINLINE	H ST/CHESTER AVE OFF	MAINLINE	UNION AVENUE ON	UNION AVENUE MAINLINE	UNION AVENUE ON	UNION AVENUE MAINLINE	UNION AVENUE OFF	MAINLINE	COTTONWOOD ROAD ON	COTTONWOOD ROAD MAINLINE	COTTONWOOD ROAD OFF	MAINLINE	State Route 58 WB	
TO REAL RD OFF	OFF	MAINLINE	OFF		ON	MAINLINE	OFF		ON	MAINLINE	ON	MAINLINE	OFF		ON	MAINLINE	OFF			
930	1,550	**2,480**	1,785	**4,265**	405	**3,860**	735	**4,595**	400	**4,195**	220	**3,975**	880	**4,855**	240	**4,615**	255	**4,870**	AM Peak	NO-BUILD ALTERNATIVE
1,085	1,755	**2,840**	1,715	**4,555**	595	**3,960**	645	**4,605**	555	**4,050**	395	**3,655**	595	**4,250**	400	**3,850**	240	**4,090**	PM Peak	
17,870	19,960	**37,830**	22,555	**60,385**	9,880	**50,505**	14,760	**65,265**	9,165	**56,100**	5,310	**50,790**	12,650	**63,440**	5,570	**57,870**	3,600	**61,470**	ADT	



STATE ROUTE 99 SYSTEM INTERCHANGE		MAINLINE	H ST/CHESTER AVE OFF	H ST/CHESTER AVE MAINLINE	H ST/CHESTER AVE ON	MAINLINE	UNION AVENUE OFF	UNION AVENUE MAINLINE	UNION AVENUE ON	UNION AVENUE MAINLINE	UNION AVENUE ON	MAINLINE	COTTONWOOD ROAD OFF	COTTONWOOD ROAD MAINLINE	COTTONWOOD ROAD ON	MAINLINE	State Route 58 WB	
FROM REAL RD ON	ON																	
1,345	3,505	**4,850**	545	**4,305**	595	**4,900**	915	**3,985**	300	**4,285**	275	**4,560**	550	**4,010**	305	**4,315**	AM Peak	NO-BUILD ALTERNATIVE
1,195	3,390	**4,585**	475	**4,110**	840	**4,950**	645	**4,305**	770	**5,075**	635	**5,710**	600	**5,110**	485	**5,595**	PM Peak	
10,947	51,251	**62,198**	11,675	**50,523**	13,735	**64,258**	13,115	**51,143**	9,085	**60,228**	6,025	**66,253**	6,615	**59,638**	5,085	**64,723**	ADT	

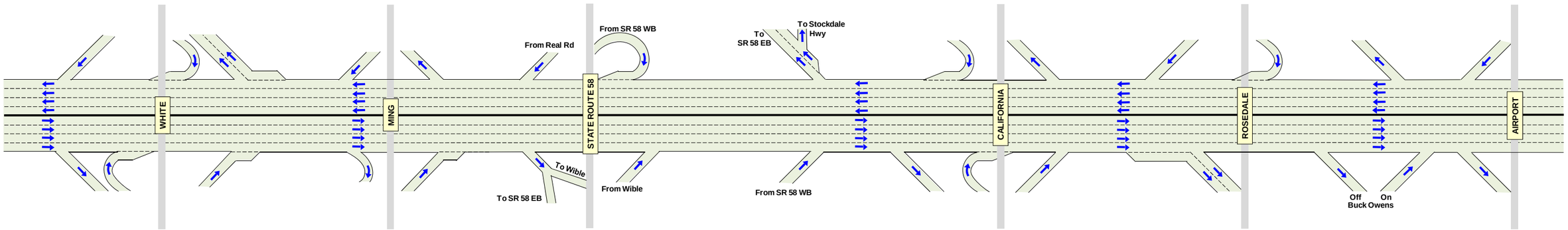
Figure 4-6: Year 2038 No-Build Alternative Freeway Lane Configuration and Forecast Traffic Volumes *(1 of 2)*

B. State Route 99

N

NOT TO SCALE

State Route 99 Southbound		MAINLINE	WHITE LANE					MAINLINE	MING AVENUE/REAL ROAD/STATE ROUTE 58									MAINLINE	CALIFORNIA AVENUE			MAINLINE	ROSEDALE HIGHWAY					MAINLINE	AIRPORT DRIVE	MAINLINE
			ON	MAINLINE	ON	MAINLINE	OFF		MING ON	MAINLINE	MING OFF	MAINLINE	REAL ON	MAINLINE	SR 58 WB ON	MAINLINE	SR 58 EB		ON	MAINLINE	OFF		ON	MAINLINE	ON	MAINLINE	OFF		ON	
2038 NO-BUILD ALTERNATIVE	AM Peak	**5,410**	460	**4,950**	210	**4,740**	1,495	**6,235**	690	**5,545**	1,230	**6,775**	510	**6,265**	1,550	**4,715**	1,890	**6,605**	720	**5,885**	1,200	**7,085**	1,690	**5,395**	1,150	**4,245**	1,075	**5,320**	1,425	**3,895**
	PM Peak	**7,105**	675	**6,430**	575	**5,855**	2,030	**7,885**	835	**7,050**	1,745	**8,795**	655	**8,140**	1,755	**6,385**	2,095	**8,480**	1,050	**7,430**	1,190	**8,620**	1,625	**6,995**	1,380	**5,615**	1,095	**6,710**	2,115	**4,595**
	ADT	**92,700**	9,595	**83,105**	7,560	**75,545**	20,500	**96,045**	12,125	**83,920**	24,570	**108,490**	3,150	**105,340**	19,960	**85,380**	26,465	**111,845**	15,475	**96,370**	16,875	**113,245**	20,210	**93,035**	16,400	**76,635**	13,105	**89,740**	24,200	**65,540**



State Route 99 Northbound		MAINLINE	WHITE LANE					MAINLINE	MING AVENUE/WIBLE ROAD/STATE ROUTE 58									MAINLINE	CALIFORNIA AVENUE					MAINLINE	ROSEDALE HIGHWAY					MAINLINE	AIRPORT DRIVE	MAINLINE
			OFF	MAINLINE	ON	MAINLINE	ON		MING OFF	MAINLINE	MING ON	MAINLINE	WIBLE/ SR 58 EB OFF	MAINLINE	WIBLE ON	MAINLINE	SR 58 WB ON		OFF	MAINLINE	ON	MAINLINE	ON		OFF	MAINLINE	OFF	MAINLINE	ON		OFF	
2038 NO-BUILD ALTERNATIVE	AM Peak	**7,025**	1,065	**5,960**	1,605	**7,565**	695	**8,260**	790	**7,470**	1,585	**9,055**	2,825	6,230	640	**6,870**	1,785	**8,655**	1,180	**7,475**	565	**8,040**	240	**8,280**	2,440	**5,840**	825	**5,015**	600	**5,615**	1,750	**3,865**
	PM Peak	**6,580**	1,095	**5,485**	1,645	**7,130**	610	**7,740**	820	**6,920**	1,495	**8,415**	2,500	5,915	610	**6,525**	1,715	**8,240**	880	**7,360**	740	**8,100**	330	**8,430**	2,090	**6,340**	550	**5,790**	750	**6,540**	1,415	**5,125**
	ADT	**92,950**	11,875	**81,075**	18,790	**99,865**	8,500	**108,365**	10,580	**97,785**	17,975	**115,760**	36,680	79,080	6,995	**86,075**	22,555	**108,630**	10,595	**98,035**	10,030	**108,065**	4,910	**112,975**	26,655	**86,320**	9,615	**76,705**	10,590	**87,295**	21,795	**65,500**

Figure 4-6: 2038 No-Build Alternative Freeway Lane Configuration and Forecast Traffic Volumes *(2 of 2)*

Table 4-8 presents AM peak hour measures of effectiveness performance data for the freeway mainline segments while Table 4-9 presents PM peak hour measures of effectiveness. Segments with level of service E or F performance in the design year of 2038 are highlighted.

Insofar as year 2038 AM peak hour traffic operations, Table 4-8 indicates that all segments along the Westside Parkway operate at LOS D or better, with served volumes nearly equaling the demand volumes (95 percent or higher). Regarding State Route 58 east of State Route 99, all segments are expected to operate at LOS D or better. Along State Route 99, year 2038 traffic congestion prevails in the northbound direction from south of White Lane to State Route 58. This congestion creates a bottleneck condition whereby the traffic volumes served are significantly lower than demand volumes (70 to 82 percent). Southbound, all segments operate at LOS D or better.

During the PM peak hour, Table 4-9 indicates that all segments along the Westside Parkway are expected to operate at LOS C or better in year 2038, with served volumes nearly equaling demand volumes (91 percent or higher). Along State Route 58 east of State Route 99, all but two freeway segments will operate at LOS D or better. Bottleneck conditions along State Route 99 will affect traffic flows to and from State Route 58 east. As with the AM conditions, PM LOS F conditions are expected along State Route 99 in the northbound direction from White Lane to State Route 58. Southbound, four segments are expected to operate at LOS E and two segments will operate at LOS F. The volume of traffic served will be significantly lower than the demand volume in the northbound direction as of year 2038 (below 90 percent).

In addition to analyzing freeway mainline segments, freeway merging/diverging conditions and on-ramp and off-ramp performance of the freeways were analyzed using the same CORSIM traffic simulation model. These results are reported in Tables 4-10 through 4-13. In cases where a low percentage of on-ramp traffic is served, such as the White Lane loop on-ramp to northbound State Route 99, traffic would be expected to spill back onto local streets until such time that motorists divert to alternate routes.

Traffic level of service at ramp termini and study area intersections are reported in Table 4-14 for no-build conditions. The locations of the study intersections are illustrated on Figure 4-3 and the proposed traffic lane geometric configurations and demand traffic volumes are illustrated on Figure 3-8. For the ramp terminal and other study intersections reported in Table 4-14, under year 2038 conditions, all intersections perform at LOS D or better except for 11 of 79 study intersections during the AM peak hour and 22 locations during the PM peak hour (9 with LOS E and 13 with LOS F).

These conditions are expected, due in part to freeway mainline constraints spilling back onto the arterial street system, as well as the overall intensity of land development located at the nodes of high volume freeway interchanges with arterial streets.

Detailed level of service input parameters and output results are provided in Volume II (part 1 of 2) of this report.

Table 4-8. AM Peak Hour Measures of Effectiveness for the No-Build Alternative—Freeway Mainline Segments

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)
State Route 99 NB Mainline																										
SR 99 NB south end of the network to White Lane off-ramp	4,940	4,940	100%	50	1	63	20	C	50	4346	69	2	1237	7,025	6,570	94%	86	36	38	44	E	86	5886	156	66	1643
White Lane off-ramp to White Lane loop on-ramp	4,260	4,242	100%	19	1	63	17	B	69	1420	23	1	1061	5,960	5,527	93%	30	11	41	34	D	115	1850	46	17	1382
White Lane loop on-ramp to White Lane direct on-ramp	5,850	5,156	88%	7	1	56	23	C	76	542	10	1	1289	7,565	5,850	77%	14	8	28	53	F	129	615	22	13	1463
White Lane diagonal on-ramp to Ming Avenue off-ramp	6,540	5,977	91%	76	5	60	25	C	152	7566	126	9	1494	8,260	6,159	75%	197	125	23	66	F	326	7838	337	214	1540
Ming Avenue off-ramp to Ming Avenue on-ramp	6,025	5,519	92%	34	10	51	28	D	185	2658	52	15	1380	7,470	5,204	70%	85	59	18	72	F	411	2232	123	85	1301
Ming Avenue on-ramp to SR 58 EB/Wible Road off-ramp	7,345	6,867	93%	19	8	33	45	F	204	1205	36	16	1717	9,055	6,807	75%	20	9	32	47	F	431	1194	37	17	1702
SR 58 EB/Wible Road off-ramp to Wible Road on-ramp	5,240	4,775	91%	32	2	62	19	C	236	2614	42	2	1194	6,230	4,624	74%	32	2	61	19	C	463	2531	41	2	1156
Wible Road on-ramp to SR 58 WB on-ramp	5,830	5,272	90%	9	0	61	21	C	246	843	14	1	1318	6,870	5,135	75%	9	1	61	21	C	472	820	13	1	1284
SR 58 WB on-ramp to California Avenue off-ramp	7,115	6,551	92%	35	4	59	27	D	281	3753	64	6	1638	8,655	6,950	80%	36	4	58	29	D	508	4020	69	8	1738
California Avenue off-ramp to California Avenue loop on-ramp	5,970	5,524	93%	16	1	62	22	C	297	1560	25	1	1381	7,475	5,982	80%	16	1	62	24	C	525	1689	27	1	1496
California Avenue loop on-ramp to California Avenue diagonal on-ramp	6,505	6,007	92%	9	1	61	25	C	306	893	15	1	1502	8,040	6,396	80%	9	1	60	26	D	534	951	16	1	1599
California Avenue diagonal on-ramp to Rosedale Highway off-ramp	6,740	5,959	88%	32	2	60	23	C	338	3128	52	3	1324	8,280	6,349	77%	32	2	60	25	C	565	3333	56	3	1411
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	4,590	4,217	92%	17	1	62	17	B	354	1198	19	1	1054	5,840	4,599	79%	17	1	62	19	C	582	1307	21	1	1150
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	3,765	3,458	92%	24	1	63	14	B	378	1437	23	1	865	5,015	3,917	78%	24	1	63	16	B	606	1628	26	1	979
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	4,150	3,824	92%	33	2	61	16	B	411	2173	35	2	956	5,615	4,451	79%	34	2	61	18	C	639	2531	42	3	1113
Airport Drive off-ramp to SR 99 NB north end of the network	2,615	2,411	92%	40	1	63	9	A	451	1702	27	1	603	3,865	3,168	82%	40	1	63	13	B	680	2237	35	1	792
State Route 99 SB Mainline																										
SR 99 SB north end of the network to Airport Drive on-ramp	3,195	3,195	100%	48	1	64	13	B	48	2741	43	1	804	3,895	3,895	100%	48	1	64	15	B	48	3342	52	1	980
Airport Drive on-ramp to Rosedale Highway off-ramp	4,460	4,455	100%	31	2	61	18	C	79	2379	39	2	1114	5,320	5,320	100%	32	3	60	22	C	80	2859	48	4	1332
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	3,800	3,800	100%	25	1	63	15	B	104	1637	26	1	952	4,245	4,245	100%	25	1	63	17	B	105	1848	30	1	1074
Rosedale Highway loop on-ramp to Rosedale Highway diagonal on-ramp	4,700	4,700	100%	9	1	58	18	B	113	719	12	1	1187	5,395	5,395	100%	9	1	59	19	C	114	833	14	1	1375
Rosedale Highway diagonal on-ramp to California Avenue off-ramp	5,880	5,880	100%	38	4	58	25	C	152	3608	63	7	1476	7,085	7,085	100%	40	6	55	30	D	155	4460	81	13	1798
California Avenue off-ramp to California Avenue on-ramp	4,775	4,770	100%	13	1	62	19	C	165	1111	18	1	1193	5,885	5,885	100%	14	1	62	23	C	168	1379	22	1	1482
California Avenue on-ramp to SR 58 EB/Stockdale Highway off-ramp	5,200	5,179	100%	28	2	59	21	C	193	2388	40	3	1295	6,605	6,605	100%	30	5	55	27	D	199	3076	56	8	1657
SR 58 EB/Stockdale Highway off-ramp to SR 58 WB on-ramp	3,555	3,555	100%	40	1	63	14	B	233	2504	40	1	890	4,715	4,715	100%	41	2	62	18	B	239	3326	53	2	1182
SR 58 WB on-ramp to Real Road on-ramp	4,840	4,484	93%	5	1	51	22	C	238	323	6	1	1121	6,265	5,829	93%	6	2	52	34	D	245	420	10	4	1457
Real Road on-ramp to Ming Avenue off-ramp	5,230	5,110	98%	23	2	58	20	C	261	1877	32	3	1277	6,775	6,721	99%	24	4	54	28	D	270	2469	45	7	1680
Ming Avenue off-ramp to Ming Avenue on-ramp	4,230	4,106	97%	35	1	63	16	B	296	2525	40	1	1026	5,545	5,410	98%	36	1	62	21	C	305	3327	53	2	1353
Ming Avenue on-ramp to White Lane off-ramp	4,725	4,598	97%	60	3	62	18	B	356	4714	76	3	1150	6,235	6,043	97%	60	3	61	24	C	366	6198	101	6	1511
White Lane off-ramp to White Lane loop on-ramp	3,360	3,248	97%	19	0	63	13	B	375	1089	17	0	812	4,740	4,628	98%	19	1	63	18	C	385	1552	25	1	1157
White Lane loop on-ramp to White Lane diagonal on-ramp	3,540	3,411	96%	10	0	63	14	B	385	577	9	0	853	4,950	4,828	98%	10	0	62	19	C	395	818	13	1	1207
White Lane diagonal on-ramp to SR 99 SB south end of the network	3,890	3,581	92%	52	1	63	14	B	436	3239	51	1	895	5,410	4,952	92%	52	2	62	20	C	447	4478	72	3	1238
Westside Parkway EB Mainline																										
Westside Parkway west end of the network to West Beltway off-ramp	— NOT APPLICABLE —													2,190	2,190	100%	6	2	47	24	C	6	183	4	1	1117
West Beltway off-ramp to West Beltway loop on-ramp														1,390	1,341	96%	14	1	61	11	B	20	315	5	0	671
West Beltway loop on-ramp to West Beltway diagonal on-ramp														2,574	2,518	98%	9	1	61	14	B	29	393	6	0	839
West Beltway diagonal on-ramp to Allen Road off-ramp	835	779	93%	55	1	64	4	A	55	766	12	0	260	3,124	3,031	97%	56	2	63	16	B	86	2981	48	1	1010
Allen Road off-ramp to Allen Road on-ramp	770	740	96%	115	3	62	5	A	170	1461	24	1	247	2,929	2,842	97%	33	1	63	15	B	118	1618	26	1	947
Allen Road on-ramp to Calloway Drive off-ramp	2,195	2,133	97%	58	2	63	11	B	228	2160	34	1	711	4,739	4,642	98%	61	5	60	26	C	179	4720	78	6	1547
Calloway Drive off-ramp to Calloway Drive loop on-ramp	1,690	1,681	99%	24	0	64	9	A	252	728	11	0	560	3,631	3,583	99%	25	1	63	19	C	204	1553	25	1	1194
Calloway Drive loop on-ramp to Calloway Drive diagonal on-ramp	2,155	2,080	97%	11	0	63	11	B	263	394	6	0	693	4,115	4,034	98%	11	1	62	22	C	215	764	12	1	1345
Calloway Drive diagonal on-ramp to Coffee Road off-ramp	3,210	3,148	98%	49	3	61	17	B	312	2616	43	3	1049	5,029	4,989	99%	51	5	59	28	D	266	4154	71	7	1663
Coffee Road off-ramp to Coffee Road loop on-ramp	1,985	1,921	97%	23	0	64	10	A	335	768	12	0	640	2,844	2,844	100%	23	1	64	15	B	289	1154	18	0	962
Coffee Road loop on-ramp to Coffee Road diagonal on-ramp	2,300	2,212	96%	11	0	64	9	A	345	419	7	0	553	3,229	3,229	100%	11	0	63	13	B	299	620	10	0	819
Coffee Road diagonal on-ramp to Mohawk Street off-ramp	2,655	2,544	96%	53	1	63	10	A	399	2392	38	1	636	3,779	3,779	100%	54	2	63	15	B	354	3578	57	2	951
Westside Parkway WB Mainline																										
Mohawk Street loop on-ramp to Mohawk Street diagonal ramp	1,730	1,730	100%	14	1	63	9	A	40	431	7	0	581	1,957	1,957	100%	14	1	63	11	A	40	487	8	0	657
Mohawk Street diagonal ramp to Coffee Road off-ramp	2,450	2,370	97%	42	1	62	9	A	82	1728	28	1	527	2,962	2,919	99%	42	1	62	11	B	82	2131	34	1	834
Coffee Road off-ramp to Coffee Road loop on-ramp	1,325	1,264	95%	35	0	64	5	A	117	791	12	0	316	1,777	1,757	99%	35	0	64	7	A	117	1100	17	0	586
Coffee Road loop on-ramp to Coffee Road diagonal on-ramp	1,510	1,426	94%	12	0	64	6	A	130	311	5	0	356	2,332	2,225	95%	12	0	63	9	A	130	485	8	0	742
Coffee Road diagonal on-ramp to Calloway Drive diagonal off-ramp	1,740	1,658	95%	47	1	64	7	A	177	1392	22	0	415	2,977	2,840	95%	48	2	63	12	B	178	2386	38	1	710
Calloway Drive diagonal off-ramp to Calloway Drive loop off-ramp	1,545	1,450	94%	11	0	63	8	A	188	274	4	0	363	2,665	2,550	96%	11	0	62	14	B	189	483	8	0	638
Calloway Drive loop off-ramp to Calloway Drive on-ramp	1,115	1,066	96%	24	0	64	6	A	212	456	7	0	355	2,085	1,996	96%	24	0	64	10	A	213	853	13	0	665
Calloway Drive on-ramp to Allen Road off-ramp	1,355	1,322	98%	56	1	64	7	A	268	1315	21	0	441	2,550	2,446	96%	57	2	63	13	B	270	2432	39	1	815
Allen Road off-ramp to Allen Road on-ramp	605	605	100%	26	0	64	3	A	295	292	5	0	208	1,700	1,643	97%	26	0	64	9	A	296	770	12	0	548
Allen Road on-ramp to West Beltway off-ramp	705	705	100%	89	1	64	5	A	383	1168	18	0	246	1,925	1,864	97%	56	1	63	10	A	353	1840	29	1	621
West Beltway off-ramp to West Beltway loop on-ramp	— NOT APPLICABLE —													865	825	95%	22	0	64	6	A	375	328	5	0	413
West Beltway loop on-ramp to West Beltway diagonal on-ramp														1,260	1,158	92%	6	0	62	9	A	381	115	2	0	579
West Beltway diagonal on-ramp to Westside Parkway west end of the network														1,550	1,452	94%	6	0	60	12	B	387	140	2	0	726
State Route 58 EB Mainline																										
SR 58 west end of the network to SR 99 on-ramp	1,195	1,195	100%	42	3	56	11	B	42	823	15	1	625	1,345	1,345	100%	42	3	56	12	B	42	890	16	1	1352
SR 99 on-ramp to H Street off-ramp	3,960	3,960	100%	10	1	59	23	C	52	655	11	1	1321	4,850	4,300	89%	10	1	58	25	C	52	710	12	1	1433
H Street off-ramp to Chester Avenue on-ramp	3,475	3,475	100%	36	1	62	19	C	88	2163	35	1	1166	4,305	3,815	89%	36	2	62	21	C	88	2359	38	2	1272
Chester Avenue on-ramp to Union Avenue off-ramp	4,030	3,993	99%	27	2	60	22	C	115	1833	30	2	1331	4,900	4,494	92%	28	2	59	25	C	116	2065	35	3	1498
Union Avenue off-ramp to Union Avenue loop on-ramp	3,175	3,168	100%	17	1	63	17	B	132	920	15	0	1056	3,985	3,718	93%	17	1	62	20	C	133	1080	17	1	1239
Union Avenue loop on-ramp to Union Avenue diagonal on-ramp	3,420	3,388	99%	8	0	62	18	C	140	474	8	0	1129	4,285	3,969	93%	8	0	62	22	C	141	556	9	0	1323
Union Avenue diagonal on-ramp to Cottonwood Road off-ramp	3,650	3,641	100%	31	1	62	20	C	171	1934	31	1	1214	4,560	4,249	93%	31	2	61	23	C	172	2257	37	2	1416
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,190	3,190	100%	28	1	63	17	B	199	1546	25	1	1066	4,010	3,751	94%	28	1	62	20	C	200	1814	29	1	1250
Cottonwood Road on-ramp to SR 58 east end of the network	3,420	3,420	100%	25	1	62	18	C	224	1496	24	1	1143	4,315	4,052	94%	25	1	62	22	C	226	1768	29	1	1351
State Route 58 WB Mainline																										
SR 58 east end of the network to Cottonwood Road off-ramp	3,600	3,600	100%	26	1	64	19	C	26	1646	26	1	1206	4,870	4,870	100%	26	1	63	26	D	26	2227	35	1	1633
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,355	3,336	99%	18	1	63	18	B	43	1025	16	0	1112	4,615	4,615	100%	18	1	62	25	C	44	1423	23	1	1543
Cottonwood Road on-ramp to Brundage Lane off-ramp	3,585	3,550	99%	38	1	63	19	C	81	2349	38	1	1183	4,855	4,855	100%	39	2	61	27	D	83	3218	53	3	1622
Brundage Lane off-ramp to Brundage Lane on-ramp	3,055	3,035	99%	17	1	63	16	B	98	896	14	1	1012	3,975	3,931	99%	17	1	62	21	C	100	1160	19	1	1310
Brundage Lane on-ramp to Union Avenue on-ramp	3,270	3,239	99%	12	1	62	17	B	110	664	11	0	1080	4,195	4,123	98%	12	1	61	23	C	112	845	14	1	1374
Union Avenue on-ramp to Chester Avenue off-ramp	3,615	3,555	98%	23	1	61	19	C	133	1385	23	1	1185	4,595	4,505	98%	23	2	60	25	C	136	1754	29	2	1502
Chester Avenue off-ramp to H Street on-ramp	3,010	2,990	99%	39	1	63	16	B	172	2026	32	1	997	3,860	3,778	98%	39	2	62	20	C	175	2561	41	2	1259
H Street on-ramp to SR 99 NB off-ramp	3,500	3,391	97%	27	2	60	19	C	199	1511	25	2	1130	4,265	4,265	100%	29	4	56	26	C	204	1916	34	5	1431
SR 99 NB off-ramp to SR 99 SB off-ramp	2,215	2,172	98%	25	1	60	12	B	223	898	15	1	724	2,480	2,480	100%	26	2	58	14	B	229	1045	18	1	844

Bottleneck

Queue

Table 4-9. PM Peak Hour Measures of Effectiveness for the No-Build Alternative—Freeway Mainline Segments

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/LANES (vphl)
State Route 99 NB Mainline																										
SR 99 NB south end of the network to White Lane off-ramp	4,590	4,604	100%	50	1	63	18	C	50	4043	64	2	1151	6,580	6,570	100%	52	4	60	28	D	52	5698	95	6	1642
White Lane off-ramp to White Lane loop on-ramp	3,905	3,899	100%	19	1	63	15	B	69	1305	21	1	975	5,485	5,360	98%	21	2	59	23	C	73	1795	31	3	1340
White Lane loop on-ramp to White Lane direct on-ramp	5,360	5,139	96%	7	1	57	23	C	76	540	10	1	1285	7,130	6,226	87%	8	2	47	33	D	81	655	14	4	1557
White Lane diagonal on-ramp to Ming Avenue off-ramp	5,915	5,875	99%	75	5	61	24	C	151	7434	123	8	1469	7,740	6,805	88%	152	81	31	57	F	233	8911	287	153	1701
Ming Avenue off-ramp to Ming Avenue on-ramp	5,290	5,290	100%	28	4	58	23	C	179	2373	41	6	1331	6,920	5,857	85%	76	51	20	73	F	309	2515	124	83	1464
Ming Avenue on-ramp to SR 58 EB/Wible Road off-ramp	6,535	6,535	100%	17	6	38	38	E	195	1151	30	11	1640	8,415	7,374	88%	19	8	34	48	F	328	1293	38	16	1844
SR 58 EB/Wible Road off-ramp to Wible Road on-ramp	4,630	4,630	100%	32	1	62	19	C	227	2554	41	2	1166	5,915	5,185	88%	32	2	61	21	C	360	2838	47	3	1296
Wible Road on-ramp to SR 58 WB on-ramp	5,240	5,190	99%	9	1	61	21	C	237	830	14	1	1298	6,525	5,683	87%	9	1	61	23	C	370	908	15	1	1421
SR 58 WB on-ramp to California Avenue off-ramp	6,670	6,611	99%	35	3	59	27	D	272	3797	64	6	1653	8,240	7,383	90%	36	4	58	31	D	405	4260	73	8	1846
California Avenue off-ramp to California Avenue loop on-ramp	5,900	5,832	99%	16	1	62	24	C	288	1647	27	1	1458	7,360	6,598	90%	17	1	61	27	D	422	1863	30	2	1650
California Avenue loop on-ramp to California Avenue diagonal on-ramp	6,590	6,435	98%	9	1	60	27	D	297	957	16	1	1609	8,100	7,058	87%	9	1	60	29	D	431	1049	17	1	1765
California Avenue diagonal on-ramp to Rosedale Highway off-ramp	6,910	6,507	94%	32	2	59	26	C	329	3397	58	4	1446	8,430	7,026	83%	32	3	58	28	D	463	3654	63	5	1561
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	5,060	4,889	97%	16	1	62	20	C	345	1389	22	1	1222	6,340	5,365	85%	17	1	62	22	C	480	1524	25	1	1341
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	4,660	4,469	96%	24	1	63	18	B	369	1857	30	1	1117	5,790	4,923	85%	24	1	62	20	C	504	2046	33	1	1231
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	5,280	5,065	96%	34	2	60	21	C	403	2879	48	3	1266	6,540	5,607	86%	34	3	60	24	C	538	3187	53	4	1402
Airport Drive off-ramp to SR 99 NB north end of the network	3,935	3,764	96%	40	1	63	15	B	443	2657	42	1	941	5,125	4,390	86%	41	2	62	18	B	579	3100	50	2	1097
State Route 99 SB Mainline																										
SR 99 SB north end of the network to Airport Drive on-ramp	3,520	3,520	100%	48	1	64	14	B	48	3013	47	1	883	4,595	4,595	100%	49	2	63	18	C	49	3957	63	2	1155
Airport Drive on-ramp to Rosedale Highway off-ramp	5,275	5,275	100%	32	3	60	22	C	80	2836	47	4	1326	6,710	6,412	96%	46	17	42	39	E	96	3440	83	30	1603
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	4,600	4,600	100%	25	1	62	18	C	105	1982	32	1	1152	5,615	5,417	96%	26	2	60	23	C	121	2329	39	3	1354
Rosedale Highway loop on-ramp to Rosedale Highway diagonal on-ramp	5,905	5,905	100%	12	3	46	28	D	116	916	20	5	1511	6,995	6,891	99%	12	3	47	32	D	133	1044	22	6	1723
Rosedale Highway diagonal on-ramp to California Avenue off-ramp	7,240	7,240	100%	41	7	55	33	D	157	4661	85	15	1867	8,620	8,240	96%	43	9	52	39	E	176	5035	97	20	2060
California Avenue off-ramp to California Avenue on-ramp	6,155	6,155	100%	14	1	59	27	D	172	1483	25	2	1593	7,430	7,076	95%	21	8	40	45	E	197	1647	41	16	1769
California Avenue on-ramp to SR 58 EB/Stockdale Highway off-ramp	7,080	7,080	100%	35	9	49	36	E	207	3450	71	19	1804	8,480	8,048	95%	39	13	46	44	E	235	3989	86	28	2012
SR 58 EB/Stockdale Highway off-ramp to SR 58 WB on-ramp	5,105	5,105	100%	41	2	62	21	C	248	3623	58	3	1288	6,385	6,089	95%	46	7	55	28	D	281	4282	78	12	1522
SR 58 WB on-ramp to Real Road on-ramp	6,535	6,105	93%	7	3	39	39	E	254	440	11	5	1526	8,140	7,219	89%	10	6	26	70	F	291	521	20	12	1805
Real Road on-ramp to Ming Avenue off-ramp	7,005	6,961	99%	26	5	52	32	D	280	2564	50	10	1740	8,795	8,258	94%	32	11	42	47	F	323	3063	74	26	2065
Ming Avenue off-ramp to Ming Avenue on-ramp	5,380	5,346	99%	36	1	62	21	C	316	3287	53	2	1337	7,050	6,578	93%	36	2	61	27	D	360	4048	67	4	1644
Ming Avenue on-ramp to White Lane off-ramp	6,025	6,018	100%	61	4	61	24	C	377	6184	102	7	1504	7,885	7,452	95%	62	5	60	30	D	422	7664	128	11	1863
White Lane off-ramp to White Lane loop on-ramp	3,995	3,995	100%	19	1	63	16	B	396	1340	21	1	999	5,855	5,522	94%	20	1	62	22	C	441	1851	30	1	1381
White Lane loop on-ramp to White Lane diagonal on-ramp	4,490	4,446	99%	10	0	62	18	B	406	753	12	1	1112	6,430	6,018	94%	10	1	61	25	C	451	1019	17	1	1505
White Lane diagonal on-ramp to SR 99 SB south end of the network	4,940	4,739	96%	52	2	62	19	C	458	4284	69	3	1185	7,105	6,430	90%	53	3	61	26	D	505	5803	95	5	1608
Westside Parkway EB Mainline																										
Westside Parkway west end of the network to West Beltway off-ramp	— NOT APPLICABLE —													2,180	2,155	99%	7	2	54	24	C	7	176	4	1	1078
West Beltway off-ramp to West Beltway loop on-ramp														1,225	1,130	92%	14	1	61	9	A	21	265	4	0	565
West Beltway loop on-ramp to West Beltway diagonal on-ramp														2,100	1,985	95%	9	0	61	11	A	30	310	5	0	662
West Beltway diagonal on-ramp to Allen Road off-ramp	830	783	94%	83	2	62	6	A	83	1107	18	0	261	2,245	2,120	94%	56	2	63	11	B	86	2085	33	1	707
Allen Road off-ramp to Allen Road on-ramp	745	721	97%	32	0	65	4	A	114	410	6	0	240	2,065	1,967	95%	32	1	63	10	A	118	1120	18	0	656
Allen Road on-ramp to Calloway Drive off-ramp	1,840	1,812	98%	58	2	63	10	A	172	1836	29	1	604	3,675	3,524	96%	59	3	61	19	C	178	3571	58	3	1175
Calloway Drive off-ramp to Calloway Drive loop on-ramp	1,405	1,405	100%	24	0	64	7	A	197	612	10	0	471	2,746	2,627	96%	25	1	64	14	B	202	1138	18	0	876
Calloway Drive loop on-ramp to Calloway Drive diagonal on-ramp	1,745	1,710	98%	11	0	63	9	A	208	324	5	0	570	3,127	2,974	95%	11	0	62	16	B	213	563	9	0	991
Calloway Drive diagonal on-ramp to Coffee Road off-ramp	2,605	2,567	99%	48	2	62	13	B	256	2133	34	2	856	3,889	3,706	95%	49	3	61	20	C	262	3074	51	3	1235
Coffee Road off-ramp to Coffee Road loop on-ramp	1,725	1,716	99%	23	0	64	9	A	278	686	11	0	572	2,184	2,058	94%	22	0	64	11	A	285	823	13	0	686
Coffee Road loop on-ramp to Coffee Road diagonal on-ramp	2,140	2,118	99%	11	0	63	8	A	289	401	6	0	530	2,614	2,469	94%	11	0	64	10	A	295	468	7	0	617
Coffee Road diagonal on-ramp to Mohawk Street off-ramp	2,600	2,551	98%	54	1	63	10	A	343	2399	38	1	638	3,089	2,920	95%	54	1	63	11	B	349	2747	44	1	730
Westside Parkway WB Mainline																										
Mohawk Street loop on-ramp to Mohawk Street diagonal ramp	2,605	2,435	93%	14	1	62	13	B	40	602	10	0	812	3,170	2,973	94%	14	1	62	16	B	40	735	12	0	991
Mohawk Street diagonal ramp to Coffee Road off-ramp	3,850	3,502	91%	42	1	62	13	B	83	2558	41	1	778	4,585	4,160	91%	42	1	62	16	B	83	3039	49	2	1189
Coffee Road off-ramp to Coffee Road loop on-ramp	2,565	2,282	89%	35	0	64	9	A	118	1430	22	0	571	3,370	3,199	95%	35	1	64	13	B	118	2004	31	1	1066
Coffee Road loop on-ramp to Coffee Road diagonal on-ramp	2,855	2,533	89%	12	0	64	10	A	130	552	9	0	633	4,350	4,109	94%	13	1	62	17	B	131	895	14	1	1370
Coffee Road diagonal on-ramp to Calloway Drive diagonal off-ramp	3,420	3,067	90%	48	2	63	13	B	178	2587	41	2	767	5,375	5,148	96%	50	3	61	22	C	180	4342	71	4	1287
Calloway Drive diagonal off-ramp to Calloway Drive loop off-ramp	2,915	2,598	89%	11	0	61	14	B	190	492	8	0	650	4,865	4,614	95%	11	1	61	25	C	191	874	14	1	1154
Calloway Drive loop off-ramp to Calloway Drive on-ramp	1,810	1,653	91%	24	0	64	9	A	214	707	11	0	551	3,850	3,670	95%	25	1	63	20	C	216	1570	25	1	1223
Calloway Drive on-ramp to Allen Road off-ramp	2,360	2,225	94%	58	2	62	11	B	272	2220	36	1	742	4,835	4,628	96%	59	4	60	26	C	275	4612	76	5	1543
Allen Road off-ramp to Allen Road on-ramp	795	795	100%	26	0	64	4	A	298	373	6	0	266	2,955	2,825	96%	27	1	63	15	B	302	1323	21	1	942
Allen Road on-ramp to West Beltway off-ramp	865	865	100%	89	1	64	6	A	386	1377	21	0	291	3,285	3,138	96%	57	2	62	17	B	359	3098	50	2	1046
West Beltway off-ramp to West Beltway loop on-ramp	— NOT APPLICABLE —													1,410	1,363	97%	23	0	63	11	A	382	542	9	0	682
West Beltway loop on-ramp to West Beltway diagonal on-ramp														1,955	1,831	94%	6	0	61	15	B	388	183	3	0	916
West Beltway diagonal on-ramp to Westside Parkway west end of network														2,305	2,181	95%	6	1	58	19	C	394	209	4	0	1091
State Route 58 EB Mainline																										
SR 58 west end of the network to SR 99 on-ramp	1,085	1,083	100%	42	2	56	10	A	42	712	13	1	542	1,195	1,039	87%	42	2	57	9	A	42	683	12	1	1039
SR 99 on-ramp to H Street off-ramp	3,920	3,920	100%	10	1	58	23	C	52	655	11	1	1321	4,585	4,138	90%	10	1	59	24	C	52	684	12	1	1379
H Street off-ramp to Chester Avenue on-ramp	3,480	3,480	100%	36	1	62	19	C	88	2181	35	1	1176	4,110	3,701	90%	36	1	62	20	C	88	2288	37	1	1234
Chester Avenue on-ramp to Union Avenue off-ramp	4,165	4,149	100%	27	2	60	23	C	115	1904	32	2	1383	4,950	4,535	92%	28	2	60	25	C	115	2083	35	3	1512
Union Avenue off-ramp to Union Avenue loop on-ramp	3,570	3,567	100%	17	1	62	19	C	132	1035	17	1	1189	4,305	3,967	92%	17	1	62	21	C	132	1152	19	1	1322
Union Avenue loop on-ramp to Union Avenue diagonal on-ramp	3,985	3,873	97%	8	0	61	21	C	140	542	9	0	1291	5,075	4,555	90%	8	1	60	25	C	140	637	11	1	1518
Union Avenue diagonal on-ramp to Cottonwood Road off-ramp	4,300	4,217	98%	31	2	61	23	C	171	2241	36	2	1406	5,710	5,226	92%	32	2	60	29	D	172	2785	46	3	1742
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,890	3,794	98%	28	1	62	20	C	199	1835	30	1	1265	5,110	4,698	92%	28	1	62	25	C	201	2272	37	2	1566
Cottonwood Road on-ramp to SR 58 east end of the network	4,230	4,123	97%	25	1	62	22	C	225	1799	29	1	1374	5,595	5,169	92%	26	2	61	28	D	226	2255	37	2	1723
State Route 58 WB Mainline																										
SR 58 east end of the network to Cottonwood Road off-ramp	3,490	3,490	100%	26	1	64	18	C	26	1597	25	0	1171	4,090	4,090	100%	26	1	63	22	C	26	1873	30	1	1373
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,285	3,268	99%	18	0	63	17	B	43	1004	16	0	1089	3,850	3,830	99%	18	1	63	20	C	44	1176	19	1	1277
Cottonwood Road on-ramp to Brundage Lane off-ramp	3,665	3,659	100%	38	2	62	20	C	82	2421	39	2	1220	4,250	4,226	99%	39	2	62	23	C	82	2797	45	2	1409
Brundage Lane off-ramp to Brundage Lane on-ramp	3,170	3,147	99%	17	1	62	17	B	99	929	15	1	1049	3,655	3,655	100%	17	1	62	20	C	99	1081	17	1	1221
Brundage Lane on-ramp to Union Avenue on-ramp	3,525	3,453	98%	12	1	62	19	C	111	707	11	1	1151	4,050	4,008	99%	12	1	61	22	C	111	821	13	1	1336
Union Avenue on-ramp to Chester Avenue off-ramp	4,055	3,906	96%	23	1	61	21	C	134	1522	25	1	1302	4,605	4,527	98%	23	2	60	25	C	135	1764	29	2	1509
Chester Avenue off-ramp to H Street on-ramp	3,440	3,352	97%	39	1	62	18	B	173	2272	36	1	1117	3,960	3,850	97%	55	17	46	29	D	190	2719	59	18	1283
H Street on-ramp to SR 99 NB off-ramp	3,945	3,785	96%	27	2	60	21	C	200	1688	28	2	1262	4,555	4,323	95%	42	16	39	37	E	231	1930	50	20	1441
SR 99 NB off-ramp to SR 99 SB off-ramp	2,515	2,423	96%	25	1	60	14	B	225	1002	17	1	808	2,840	2,677	94%	70	47	23	40	E	301	1191	52	35	892

Bottleneck

Queue

Table 4-10. AM Peak Hour Measures of Effectiveness for the No-Build Alternative—Merging/Diverging Conditions

LOCATION	ANALYSIS TYPE	YEAR 2018 SPEED (mph)	YEAR 2018 DENSITY (veh/ln/mi)	YEAR 2018 LOS (HCM 2000)	YEAR 2038 SPEED (mph)	YEAR 2038 DENSITY (veh/ln/mi)	YEAR 2038 LOS (HCM 2000)
State Route 99 NB							
White Lane loop on-ramp	Merging	51	27.6	C	16	54.7	**E**
White Lane diagonal on-ramp	Merging	53	32.1	D	16	66.4	**F**
Ming Avenue on to SR 58/Wible Road off	Merging	26	64.8	**F**	22	61.0	**F**
Wible Road on-ramp	Merging	60	21.2	C	61	16.1	B
SR 58 WB on-ramp	Merging	54	32.1	D	50	34.1	D
California Avenue loop on-ramp	Merging	59	28.3	D	59	28.7	D
California Avenue diagonal on-ramp	Merging	58	28.3	D	58	29.3	D
Buck Owens Boulevard/Sillect Avenue on-ramp	Merging	61	15.7	B	61	18.5	B
White Lane off-ramp	Diverging	62	21.3	C	28	48.3	**E**
Ming Avenue off-ramp	Diverging	60	28.4	D	11	76.0	**F**
Ming Avenue on to SR 58/Wible Road off	Diverging	26	64.8	**F**	22	61.0	**F**
California Avenue off-ramp	Diverging	58	35.2	**E**	58	34.8	D
Rosedale Highway off-ramp	Diverging	58	24.0	C	58	25.0	C
Buck Owens Boulevard/Sillect Avenue off-ramp	Diverging	60	19.2	B	60	20.1	C
Airport Drive off-ramp	Diverging	58	21.7	C	57	24.7	C
State Route 99 SB							
Airport Drive on-ramp	Merging	60	22.4	C	58	27.7	C
Rosedale Highway loop on-ramp	Merging	55	21.1	C	56	21.1	C
Rosedale Highway diagonal on-ramp	Merging	54	35.3	**E**	51	42.9	**E**
California Avenue on-ramp	Merging	57	29.5	D	50	39.3	**E**
SR 58 WB on-ramp	Merging	47	33.7	D	36	53.3	**E**
Real Road on-ramp	Merging	55	27.6	C	48	38.9	**E**
Ming Avenue on-ramp	Merging	60	22.6	C	59	28.7	D
White Lane loop on-ramp	Merging	61	15.5	B	61	20.3	C
White Lane diagonal on-ramp	Merging	61	16.4	B	61	21.4	C
Rosedale Highway off-ramp	Diverging	61	23.8	C	59	29.8	D
California Drive off-ramp	Diverging	57	36.8	**E**	56	42.5	**E**
SR 58 EB/Stockdale Highway off-ramp	Diverging	58	31.8	D	55	39.0	**E**
Ming Avenue off-ramp	Diverging	58	30.1	D	55	39.5	**E**
White Lane off-ramp	Diverging	60	19.2	B	60	23.6	C
Westside Parkway EB							
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			61	13.7	B
West Beltway diagonal on-ramp	Merging				62	18.5	B
Allen Road on-ramp	Merging	61	14.4	B	55	32.0	D
Calloway Drive loop on-ramp	Merging	62	13.5	B	60	23.7	C
Calloway Drive diagonal on-ramp	Merging	60	18.4	B	56	27.8	C
Mohawk Street on-ramp	Merging	64	11.4	B	63	14.3	B
West Beltway off-ramp	Diverging				47	23.9	C
Allen Road off-ramp	Diverging	65	3.8	A	62	18.2	B
Calloway Drive off-ramp	Diverging	62	15.0	B	60	30.7	D
Coffee Road off-ramp	Diverging	61	23.1	C	60	33.9	D
Coffee Road on-ramp to Mohawk Street/Truxtun Avenue off-ramp	Weaving	63	10.2	B	62	14.4	B
Westside Parkway WB							
Mohawk Street loop on-ramp	Merging	62	9.6	A	62	10.9	B
Mohawk Street diagonal on-ramp	Merging	62	10.1	B	62	13.0	B
Coffee Road loop on-ramp	Merging	62	6.3	A	62	10.7	B
Coffee Road diagonal on-ramp	Merging	63	6.9	A	62	12.4	B
Calloway Drive on-ramp	Merging	63	7.4	A	62	14.4	B
Allen Road on-ramp	Merging	63	4.5	A	63	10.4	B
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			62	9.3	A
West Beltway diagonal on-ramp	Merging				60	12.0	B
Coffee Road off-ramp	Diverging	61	10.2	B	61	12.0	B
Calloway Drive diagonal off-ramp	Diverging	63	10.2	B	62	18.3	B
Calloway Drive loop off-ramp	Diverging	62	8.7	A	61	16.0	B
Allen Road off-ramp	Diverging	62	6.6	A	61	16.0	B
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			62	10.0	A
State Route 58 EB							
SR 99 NB and SB on-ramp	Merging	57	23.2	C	57	25.3	C
Chester Avenue on-ramp	Merging	59	25.8	C	57	29.4	D
Union Avenue loop on-ramp	Merging	62	19.2	B	61	22.3	C
Union Avenue diagonal on-ramp	Merging	62	22.0	C	61	25.4	C
Cottonwood Road on-ramp	Merging	62	19.4	B	61	22.9	C
H Street off-ramp	Diverging	60	23.4	C	59	25.4	C
Union Avenue off-ramp	Diverging	61	25.1	C	60	28.1	D
Cottonwood Road off-ramp	Diverging	62	22.0	C	61	25.3	C
State Route 58 WB							
Cottonwood Road on-ramp	Merging	63	18.6	B	61	27.0	C
Brundage Lane on-ramp	Merging	62	18.0	B	61	23.0	C
Union Avenue on-ramp	Merging	61	21.7	C	59	27.6	C
H Street on-ramp	Merging	60	23.0	C	54	32.0	D
Cottonwood Road off-ramp	Diverging	64	17.9	B	63	25.0	C
Brundage Lane off-ramp	Diverging	62	20.1	C	60	29.1	D
Chester Avenue off-ramp	Diverging	61	21.8	C	60	27.2	C
SR 99 NB off-ramp	Diverging	60	23.3	C	56	31.5	D
SR 99 SB off-ramp	Diverging	59	12.3	B	57	14.7	B

Note: Merge/diverge calculations are based on 1,500 feet from on-/off-ramp. These calculations also include two right-most lanes within 1,500 feet.

Table 4-11. PM Peak Hour Measures of Effectiveness for the No-Build Alternative—Merging/Diverging Conditions

LOCATION	ANALYSIS TYPE	YEAR 2018 SPEED (mph)	YEAR 2018 DENSITY (veh/ln/mi)	YEAR 2018 LOS (HCM 2000)	YEAR 2038 SPEED (mph)	YEAR 2038 DENSITY (veh/ln/mi)	YEAR 2038 LOS (HCM 2000)
State Route 99 NB							
White Lane loop on-ramp	Merging	53	28.4	D	38	41.3	**E**
White Lane diagonal on-ramp	Merging	56	31.8	D	34	52.0	**E**
Ming Avenue on to SR 58/Wible Road off	Merging	32	53.7	**E**	24	61.7	**F**
Wible Road on-ramp	Merging	60	22.9	C	60	18.5	B
SR 58 WB on-ramp	Merging	54	33.4	D	51	34.1	D
California Avenue loop on-ramp	Merging	57	33.1	D	59	31.3	D
California Avenue diagonal on-ramp	Merging	56	32.7	D	56	33.0	D
Buck Owens Boulevard/Sillect Avenue on-ramp	Merging	60	22.1	C	60	23.7	C
White Lane off-ramp	Diverging	63	19.8	B	53	34.2	D
Ming Avenue off-ramp	Diverging	60	29.5	D	15	81.5	**F**
Ming Avenue on to SR 58/Wible Road off	Diverging	32	53.7	**E**	24	61.7	**F**
California Avenue off-ramp	Diverging	59	35.6	**E**	59	34.9	D
Rosedale Highway off-ramp	Diverging	57	26.6	C	56	27.7	C
Buck Owens Boulevard/Sillect Avenue off-ramp	Diverging	61	21.1	C	61	21.3	C
Airport Drive off-ramp	Diverging	57	28.1	D	56	29.6	D
State Route 99 SB							
Airport Drive on-ramp	Merging	59	28.3	D	35	51.1	**E**
Rosedale Highway loop on-ramp	Merging	41	37.2	**E**	39	38.2	**E**
Rosedale Highway diagonal on-ramp	Merging	49	46.9	**E**	45	51.6	**E**
California Avenue on-ramp	Merging	39	54.3	**E**	35	62.1	**F**
SR 58 WB on-ramp	Merging	33	59.7	**F**	17	107.5	**F**
Real Road on-ramp	Merging	43	42.9	**E**	33	59.2	**F**
Ming Avenue on-ramp	Merging	59	26.4	C	59	29.3	D
White Lane loop on-ramp	Merging	60	19.5	B	60	25.1	C
White Lane diagonal on-ramp	Merging	61	21.5	C	60	28.0	C
Rosedale Highway off-ramp	Diverging	60	29.3	D	34	53.7	**E**
California Drive off-ramp	Diverging	55	44.7	**E**	49	51.9	**E**
SR 58 EB/Stockdale Highway off-ramp	Diverging	50	46.2	**E**	48	47.4	**E**
Ming Avenue off-ramp	Diverging	52	41.2	**E**	38	57.6	**F**
White Lane off-ramp	Diverging	58	25.0	C	58	28.0	D
Westside Parkway EB							
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			61	10.8	B
West Beltway diagonal on-ramp	Merging				63	12.2	B
Allen Road on-ramp	Merging	61	12.2	B	59	23.9	C
Calloway Drive loop on-ramp	Merging	62	11.1	B	61	17.9	B
Calloway Drive diagonal on-ramp	Merging	61	14.6	B	60	20.1	C
Mohawk Street on-ramp	Merging	64	9.4	A	64	10.9	B
West Beltway off-ramp	Diverging				44	24.2	C
Allen Road off-ramp	Diverging	64	3.9	A	63	12.5	B
Calloway Drive off-ramp	Diverging	63	12.5	B	61	24.1	C
Coffee Road off-ramp	Diverging	61	18.5	B	60	26.4	C
Coffee Road loop on-ramp to Mohawk Street/Truxtun Avenue off-ramp	Weaving	62	10.6	B	62	11.6	B
Westside Parkway WB							
Mohawk Street loop on-ramp	Merging	62	13.6	B	62	16.5	B
Mohawk Street diagonal on-ramp	Merging	61	15.2	B	61	18.6	B
Coffee Road loop on-ramp	Merging	62	10.4	B	61	18.5	B
Coffee Road diagonal on-ramp	Merging	63	12.4	B	60	21.6	C
Calloway Drive on-ramp	Merging	62	13.1	B	60	27.4	C
Allen Road on-ramp	Merging	63	5.6	A	62	17.1	B
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			61	15.0	B
West Beltway diagonal on-ramp	Merging				58	18.8	B
Coffee Road off-ramp	Diverging	61	12.9	B	61	14.2	B
Calloway Drive diagonal off-ramp	Diverging	60	21.0	C	59	33.1	D
Calloway Drive loop off-ramp	Diverging	60	17.0	B	61	27.8	C
Allen Road off-ramp	Diverging	61	12.0	B	60	31.4	D
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			61	17.1	B
State Route 58 EB							
SR 99 NB and SB on-ramp	Merging	57	23.3	C	57	24.4	C
Chester Avenue on-ramp	Merging	59	26.6	C	58	29.5	D
Union Avenue loop on-ramp	Merging	61	22.6	C	59	27.7	C
Union Avenue diagonal on-ramp	Merging	61	25.6	C	59	33.1	D
Cottonwood Road on-ramp	Merging	61	23.5	C	59	30.3	D
H Street off-ramp	Diverging	60	23.7	C	60	25.1	C
Union Avenue off-ramp	Diverging	61	25.9	C	60	28.3	D
Cottonwood Road off-ramp	Diverging	61	25.4	C	60	31.9	D
State Route 58 WB							
Cottonwood Road on-ramp	Merging	62	19.5	B	61	22.9	C
Brundage Lane on-ramp	Merging	62	19.6	B	61	22.8	C
Union Avenue on-ramp	Merging	60	24.3	C	59	28.5	D
H Street on-ramp	Merging	59	26.0	C	35	45.9	**E**
Cottonwood Road off-ramp	Diverging	64	17.0	B	63	20.4	C
Brundage Lane off-ramp	Diverging	62	20.9	C	61	24.3	C
Chester Avenue off-ramp	Diverging	61	24.1	C	60	28.0	C
SR 99 NB off-ramp	Diverging	60	26.2	C	35	46.3	**E**
SR 99 SB off-ramp	Diverging	58	14	B	19	46	**E**

Note: Merge/diverge calculations are based on 1,500 feet from on-/off-ramp. These calculations also include two right-most mainline lanes within 1,500 feet.

Table 4-12. AM Peak Hour Measures of Effectiveness for the No-Build Alternative—On-Ramp and Off-Ramp Performance

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
State Route 99 NB Off-ramps								
White Lane	680	680	100%	62	1,065	935	88%	15
Ming Avenue	515	460	89%	54	790	622	79%	30
SR 58 EB/Wible Road	2,105	2,105	100%	46	2,825	2,206	78%	45
California Avenue	1,145	1,025	90%	52	1,180	974	83%	52
Rosedale Highway	2,150	1,946	91%	53	2,440	1,999	82%	53
Buck Owens Boulevard/Sillect Avenue	825	747	91%	53	825	682	83%	53
Airport Drive	1,535	1,417	92%	52	1,750	1,287	74%	52
State Route 99 NB On-ramps								
White Lane loop	1,590	1,086	68%	44	1,605	520	32%	15
White Lane diagonal	690	658	95%	52	695	493	71%	11
Ming Avenue	1,320	1,320	100%	47	1,585	1,585	100%	43
Wible Road	590	551	93%	50	640	544	85%	50
SR 58 WB	1,285	1,227	95%	45	1,785	1,775	99%	37
California Avenue loop	535	514	96%	44	565	460	81%	44
California Avenue diagonal	235	118	50%	51	240	147	61%	50
Buck Owens Boulevard/Sillect Avenue	385	371	96%	33	600	547	91%	33
State Route 99 SB Off-ramps								
Rosedale Highway	660	660	100%	53	1,075	1,066	99%	52
California Avenue	1,105	1,105	100%	52	1,200	1,200	100%	52
SR 58 EB/Stockdale Highway	1,645	1,642	100%	52	1,890	1,795	95%	52
Ming Avenue	1,000	1,000	100%	53	1,230	1,230	100%	52
White Lane	1,365	1,357	99%	54	1,495	1,436	96%	53
State Route 99 SB On-ramps								
Airport Drive	1,265	1,265	100%	47	1,425	1,425	100%	46
Rosedale Highway loop	900	900	100%	38	1,150	805	70%	41
Rosedale Highway diagonal	1,180	1,174	99%	36	1,690	1,690	100%	30
California Avenue	425	401	94%	51	720	720	100%	50
SR 58 WB	1,285	1,215	95%	51	1,550	1,550	100%	48
Real Road	390	342	88%	51	510	505	99%	51
Ming Avenue	495	490	99%	52	690	690	100%	51
White Lane loop	180	178	99%	52	210	170	81%	52
White Lane diagonal	350	162	46%	53	460	370	80%	53
Westside Parkway EB Off-ramps								
West Beltway	*— NOT APPLICABLE —*				800	800	100%	50
Allen Road	65	61	94%	56	195	187	96%	53
Calloway Drive	505	472	93%	54	1,108	1,087	98%	53
Coffee Road loop	1,225	1,225	100%	51	2,185	2,107	96%	51
Mohawk Street	1,080	1,080	100%	54	1,900	1,900	100%	53
Westside Parkway EB On-ramps								
West Beltway loop	*— NOT APPLICABLE —*				1,185	1,177	99%	48
West Beltway diagonal					550	525	95%	53
Allen Road	1,425	1,394	98%	45	1,810	1,810	100%	44
Calloway Drive loop	465	421	91%	47	484	479	99%	47
Calloway Drive diagonal	1,055	1,055	100%	51	914	914	100%	51
Coffee Road loop	315	287	91%	49	385	385	100%	48
Coffee Road diagonal	355	328	92%	54	550	527	96%	54
Mohawk Street	—	—	—	—	—	—	—	—
Westside Parkway WB Off-ramps								
Coffee Road	1,125	1,125	100%	54	1,185	1,185	100%	54
Calloway Drive diagonal	195	195	100%	54	312	294	94%	54
Calloway Drive loop	430	385	90%	54	580	551	95%	54
Allen Road	750	698	93%	54	850	806	95%	52
West Beltway	*— NOT APPLICABLE —*				1,060	1,030	97%	54
Westside Parkway WB On-ramps								
Mohawk Street loop	680	671	99%	47	835	835	100%	47
Mohawk Street diagonal	720	661	92%	51	1,005	1,005	100%	51
Coffee Road loop	185	175	95%	51	555	487	88%	50
Coffee Road diagonal	230	228	99%	54	645	601	93%	54
Calloway Drive	240	240	100%	53	465	454	98%	53
Allen Road	100	100	100%	50	225	225	100%	50
West Beltway loop	*— NOT APPLICABLE —*				395	369	93%	49
West Beltway diagonal					290	286	99%	54
State Route 58 EB Off-ramps								
H Street	485	465	96%	54	545	485	89%	52
Union Avenue	855	833	97%	53	915	800	87%	53
Cottonwood Road	460	445	97%	53	550	504	92%	54
State Route 58 EB On-ramps								
SR 99 NB and SR 99 SB	2,765	2,731	99%	52	3,505	2,967	85%	52
Chester Avenue	555	510	92%	51	595	595	100%	51
Union Avenue loop	245	237	97%	53	300	278	93%	53
Union Avenue diagonal	230	230	100%	53	275	264	96%	53
Cottonwood Road	230	230	100%	52	305	305	100%	52
State Route 58 WB Off-ramps								
Cottonwood Road	245	245	100%	54	255	234	92%	55
Brundage Lane	530	517	98%	54	880	880	100%	50
Chester Avenue	605	585	97%	53	735	735	100%	53
SR 99 NB	1,285	1,231	96%	53	1,785	1,785	100%	52
SR 99 SB	1,285	1,213	94%	42	1,550	1,550	100%	41
State Route 58 WB On-ramps								
Cottonwood Road	230	217	94%	51	240	240	100%	50
Brundage Lane	215	215	100%	49	220	204	93%	49
Union Avenue	345	327	95%	51	400	391	98%	51
H Street	490	421	86%	51	405	405	100%	50

Table 4-13. PM Peak Hour Measures of Effectiveness for the No-Build Alternative—On-Ramp and Off-Ramp Performance

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
State Route 99 NB Off-ramps								
White Lane	685	685	100%	61	1,095	1,095	100%	33
Ming Avenue	625	574	92%	54	820	702	86%	32
SR 58 EB/Wible Road	1,905	1,898	100%	47	2,500	2,220	89%	46
California Avenue	770	770	100%	53	880	784	89%	52
Rosedale Highway	1,850	1,850	100%	53	2,090	1,978	95%	53
Buck Owens Boulevard/Sillect Avenue	400	400	100%	52	550	453	82%	53
Airport Drive	1,345	1,329	99%	52	1,415	1,224	87%	52
State Route 99 NB On-ramps								
White Lane loop	1,455	1,435	99%	42	1,645	1,214	74%	40
White Lane diagonal	555	555	100%	53	610	603	99%	45
Ming Avenue	1,245	1,245	100%	48	1,495	1,495	100%	44
Wible Road	610	582	95%	51	610	518	85%	51
SR 58 WB	1,430	1,375	96%	43	1,715	1,666	97%	35
California Avenue loop	690	674	98%	44	740	527	71%	45
California Avenue diagonal	320	253	79%	51	330	232	70%	51
Buck Owens Boulevard/Sillect Avenue	620	600	97%	33	750	696	93%	31
State Route 99 SB Off ramps								
Rosedale Highway	675	675	100%	53	1,095	1,003	92%	15
California Avenue	1,085	1,085	100%	52	1,190	1,168	98%	50
SR 58 EB/Stockdale Highway	1,975	1,975	100%	51	2,095	1,982	95%	51
Ming Avenue	1,625	1,604	99%	50	1,745	1,669	96%	17
White Lane	2,030	2,012	99%	54	2,030	1,925	95%	45
State Route 99 SB On-ramps								
Airport Drive	1,755	1,755	100%	45	2,115	2,012	95%	30
Rosedale Highway loop	1,305	1,305	100%	34	1,380	1,380	100%	33
Rosedale Highway diagonal	1,335	1,335	100%	34	1,625	1,343	83%	34
California Avenue	925	860	93%	50	1,050	962	92%	49
SR 58 WB	1,430	1,410	99%	47	1,755	1,631	93%	13
Real Road	470	426	91%	51	655	532	81%	50
Ming Avenue	645	645	100%	51	835	835	100%	51
White Lane loop	495	488	99%	51	575	540	94%	51
White Lane diagonal	450	274	61%	53	675	573	85%	52
Westside Parkway EB Off-ramps								
West Beltway	*— NOT APPLICABLE —*				955	936	98%	49
Allen Road	85	82	96%	53	180	164	91%	54
Calloway Drive	435	402	92%	54	929	916	99%	53
Coffee Road loop	880	842	96%	52	1,705	1,638	96%	51
Mohawk Street	1,335	1,332	100%	53	1,545	1,504	97%	54
Westside Parkway EB On-ramps								
West Beltway loop	*— NOT APPLICABLE —*				875	860	98%	48
West Beltway diagonal					145	145	100%	54
Allen Road	1,095	1,095	100%	48	1,610	1,581	98%	48
Calloway Drive loop	340	317	93%	47	381	362	95%	47
Calloway Drive diagonal	860	838	97%	52	762	719	94%	53
Coffee Road loop	415	400	96%	48	430	410	95%	48
Coffee Road diagonal	460	439	95%	54	475	456	96%	54
Mohawk Street	—	—	—	—	—	—	—	—
Westside Parkway WB Off-ramps								
Coffee Road	1,285	1,206	94%	54	1,215	1,122	92%	54
Calloway Drive diagonal	505	463	92%	54	510	510	100%	54
Calloway Drive loop	1,105	941	85%	53	1,015	935	92%	54
Allen Road	1,565	1,435	92%	54	1,880	1,796	96%	51
West Beltway	*— NOT APPLICABLE —*				1,875	1,772	95%	53
Westside Parkway WB On-ramps								
Mohawk Street loop	1,080	1,047	97%	47	1,250	1,250	100%	47
Mohawk Street diagonal	1,245	1,076	86%	50	1,415	1,366	97%	50
Coffee Road loop	290	278	96%	51	980	952	97%	50
Coffee Road diagonal	565	512	91%	53	1,025	1,001	98%	53
Calloway Drive	550	550	100%	53	985	983	100%	52
Allen Road	70	70	100%	51	330	322	98%	50
West Beltway loop	*— NOT APPLICABLE —*				545	531	97%	48
West Beltway diagonal					350	334	95%	53
State Route 58 EB Off-ramps								
H Street	440	423	96%	53	475	435	92%	53
Union Avenue	595	595	100%	53	645	604	94%	54
Cottonwood Road	410	410	100%	54	600	522	87%	54
State Route 58 EB On-ramps								
SR 99 NB and SR 99 SB	2,835	2,835	100%	52	3,390	3,114	92%	52
Chester Avenue	685	651	95%	51	840	840	100%	50
Union Avenue loop	415	335	81%	53	770	656	85%	53
Union Avenue diagonal	315	315	100%	52	635	628	99%	52
Cottonwood Road	340	340	100%	52	485	484	100%	51
State Route 58 WB Off-ramps								
Cottonwood Road	205	205	100%	54	240	240	100%	54
Brundage Lane	495	495	100%	53	595	565	95%	52
Chester Avenue	615	576	94%	53	645	620	96%	53
SR 99 NB	1,430	1,375	96%	53	1,715	1,672	97%	49
SR 99 SB	1,430	1,407	98%	41	1,755	1,652	94%	13
State Route 58 WB On-ramps								
Cottonwood Road	380	380	100%	50	400	394	99%	50
Brundage Lane	355	325	92%	49	395	368	93%	49
Union Avenue	530	470	89%	51	555	522	94%	51
H Street	505	443	88%	51	595	595	100%	22

Table 4-14. Ramp Termini and Intersection Level of Service for the No-build Alternative *(1 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
1. I-5 SB ramps/Stockdale Highway	NB/SB two-way stop	A	4.1	A	7.3	A	6.4	**F**	**92.0**
	Imp-Signal*	N/A				B	12.2	B	11.6
2. I-5 NB ramps/Stockdale Highway	NB/SB two-way stop	A	4.6	A	8.4	A	4.0	B	14.0
3. SR 43 (Enos Lane)/Rosedale Highway	4-way stop	B	13.3	D	28.3	D	25.8	**F**	**77.0**
	Imp-Signal	N/A				C	24.5	C	31.9
4. SR 43 (Enos Lane)/Stockdale Highway	4-way stop	**F**	**45.9**	**F**	**66.2**	**F**	**>150**	**F**	**>150**
	Imp-Signal	D	37.1	D	39.2	C	24.2	C	23.0
5. SR 43 (Enos Lane)/I-5 NB ramps	EB/WB two-way stop	A	5.4	B	11.5	A	3.4	B	10.7
6. SR 43 (Enos Lane)/I-5 SB ramps	EB/WB two-way stop	A	7.1	C	16.1	A	5.7	C	19.8
7. Stockdale Highway/Nord Road	Signal	D	40.0	C	28.6	C	31.8	C	29.1
8. Stockdale Highway/Wegis Avenue	NB/SB two-way stop	A	7.1	B	10.4	**F**	**>150**	**F**	**>150**
	Imp-Signal*	N/A				C	21.5	C	23.2
9. Stockdale Highway/Heath Road	Stop (existing) Signal (future)	C	21.1	C	20.5	C	29.2	C	27.6
10. Stockdale Highway/Westside Parkway	Signal	A	5.6	A	6.4	A	7.6	A	9.0
11. West Beltway/Westside Parkway WB ramp	Signal	*Does not exist in 2018*				A	6.5	B	14.7
12. West Beltway/Westside Parkway EB ramp	Signal	*Does not exist in 2018*				B	11.2	B	18.2
13. Allen Road/Rosedale Highway	Signal*	C	33.2	D	43.3	D	40.7	D	47.1
14. Allen Road/Brimhall Road	Signal	C	25.6	C	30.4	C	25.9	C	33.5
15. Allen Road/Westside Parkway WB ramps	Signal	B	12.7	C	24.8	B	15.0	C	28.0
16. Allen Road/Westside Parkway EB ramps	Signal	B	15.7	A	5.1	B	10.2	A	3.7
17. Allen Road/San Juan Avenue	Signal*	C	22.3	C	20.3	C	22.6	C	28.8
18. Allen Road/Stockdale Highway	Signal	C	26.5	C	28.0	C	29.8	C	32.5
19. Calloway Drive/Rosedale Highway	Signal*	D	40.3	D	40.6	D	49.4	D	54.8
20. Calloway Drive/Brimhall Road	Signal	C	25.7	C	29.2	C	29.9	C	28.5
21. Calloway Drive/Westside Parkway WB ramps	Signal	A	7.9	A	8.6	B	10.8	C	20.5
22. Calloway Drive/Westside Parkway EB ramps	Signal	B	16.7	A	7.8	B	18.4	A	8.9
23. Calloway Drive/Stockdale Highway	Signal	D	40.8	C	34.1	D	52.3	D	39.7
24. Coffee Road/Rosedale Highway*	Signal*	E	69.2	**F**	**87.6**	**F**	**81.7**	**F**	**92.6**

Table 4-14. Ramp Termini and Intersection Level of Service for the No-build Alternative *(2 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
25. Coffee Road/Brimhall Road	Signal	C	26.9	C	33.9	C	27.3	D	43.2
26. Coffee Road/Westside Parkway WB ramps	Unsignalized	N/A				N/A			
27. Coffee Road/Westside Parkway EB ramps	Signal	C	27.3	B	13.4	C	28.7	B	19.0
28. Coffee Road/Truxtun Avenue	Signal	B	18.0	B	18.1	C	20.5	C	24.5
29. Coffee Road/Stockdale Highway	Signal*	D	35.5	D	53.5	E	56.3	**F**	**99.8**
30. Mohawk Street/Rosedale Highway	Stop (existing)* Signal (future)*	E	57.0	**F**	**111.9**	**F**	**103.6**	**F**	**123.2**
31. Mohawk Street/WSP WB ramps	Signal	N/A				N/A			
32. Mohawk Street/WSP EB ramps	Signal	C	26.4	B	14.3	C	24.4	B	19.5
33. Mohawk Street/Truxtun Avenue	Signal	C	27.1	C	24.7	C	31.1	E	59.8
34. Mohawk Street/California Avenue	Signal*	C	30.7	**F**	**88.7**	**F**	**106.3**	**F**	**162.3**
35. Stockdale Highway/California Avenue	Signal*	E	64.7	D	49.0	**F**	**92.6**	**F**	**99.9**
36. Airport Drive/State Road–SR 204 off-ramp	Signal	C	20.4	C	22.9	C	20.2	C	21.9
37. Airport Drive/SR 99 NB ramp	Signal	A	7.1	B	11.3	A	7.1	B	10.6
38. Buck Owens Boulevard/Rio Mirada Drive	Signal	C	21.1	C	24.3	C	29.1	C	28.6
39. SR 99 NB ramps/Buck Owens Boulevard	Signal	D	41.2	D	43.8	D	37.5	D	46.2
40. Rosedale Highway/Camino Del Rio Court	Signal	C	34.6	D	44.8	C	20.9	D	49.9
41. Rosedale Highway/SR 99 SB ramps	Signal	B	16.1	C	21.4	C	22.7	D	37.6
42. Rosedale Highway/SR99 NB ramps	Signal	C	25.8	C	27.2	C	26.6	C	30.0
43. 24th Street/Oak Street	Signal	C	26.5	C	30.3	D	37.5	C	29.5
44. Truxtun Avenue/Empire Drive	Signal*	C	32.8	C	33.8	C	21.4	D	47.6
45. Truxtun Avenue/Oak Street	Signal	D	35.5	D	52.7	E	61.9	E	73.9
46. California Avenue/Chester Lane	Signal	C	23.3	C	29.2	C	23.7	C	30.1
47. California Avenue/SR 99 SB ramps	Signal	D	43.6	E	61.0	D	54.6	E	76.1
48. California Avenue/SR 99 NB ramps	Signal	C	26.7	C	28.6	C	28.5	D	51.5
49. California Avenue/Oak Street	Signal	C	25.3	E	56.0	C	28.3	E	61.5
50. Stockdale Highway/Stine Road	Signal*	D	40.0	E	75.8	**F**	**89.2**	**F**	**>150**
51. Stockdale Highway/Real Road	Signal	E	59.1	E	58.2	D	48.3	**F**	**94.0**
52. Stockdale Highway/SR 99 SB ramp	Signal	B	14.3	B	10.7	B	16.8	B	18.0

Table 4-14. Ramp Termini and Intersection Level of Service for the No-build Alternative *(3 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
53. Brundage Lane/Oak Street	Signal	C	27.4	D	42.4	C	31.9	D	40.3
54. Real Road/SR 58	Signal	C	23.6	C	23.8	C	21.8	D	39.3
55. Wible Road/SR 99 NB ramps	Signal	B	14.3	C	31.4	B	15.5	C	28.4
56. Ming Avenue/New Stine Road	Signal*	D	47.2	D	47.7	D	46.9	E	70.3
57. Ming Avenue/Real Road	Signal	C	24.7	C	32.2	C	25.3	E	64.5
58. Ming Avenue/SR 99 SB ramps	Signal	A	2.5	A	2.8	A	3.2	B	15.6
59. Ming Avenue/Wible Road	Signal	C	21.6	C	23.4	C	23.2	C	24.5
60. Ming Avenue/SR 99 NB ramps	Signal	C	24.9	C	30.3	D	36.4	C	28.3
61. Ming Avenue/Castro Lane	Signal	C	23.1	C	26.6	C	25.3	D	38.9
62. White Lane/Wible Road	Signal*	E	55.5	E	77.1	**F**	**82.7**	**F**	**131.6**
63. White Lane/SR 99 SB ramps	Signal*	C	20.2	**F**	**95.5**	C	28.7	**F**	**96.8**
64. White Lane/SR 99 NB ramps	Signal*	A	9.3	A	9.8	B	20.0	B	19.7
65. White Lane/Hughes Lane	Signal*	D	36.3	D	45.2	D	37.3	C	29.5
66. H Street/Brundage Lane	Signal	C	26.1	D	38.7	C	29.2	E	68.0
67. H Street/SR 58 WB ramp	Signal	B	17.6	E	66.2	C	20.6	E	64.3
68. H Street/SR 58 EB ramp	Signal	D	39.7	C	29.7	D	40.0	C	29.0
69. H Street/Ming Avenue	Signal*	C	30.3	D	43.3	C	33.7	D	37.0
70. Chester Avenue/Brundage Lane	Signal	C	22.1	C	26.5	C	23.2	E	68.0
71. Chester Avenue/SR 58 WB ramp	Signal	C	23.4	C	24.6	C	26.0	C	28.5
72. Chester Avenue/SR 58 EB ramp	Signal	C	32.8	C	25.5	C	30.7	C	25.7
73. Chester Avenue/Ming Avenue	Signal*	D	39.4	D	36.6	C	34.1	D	48.5
74. Union Avenue/Brundage Lane	Signal	C	29.4	C	25.7	D	46.8	D	43.4
75. Brundage Lane/SR 58 WB ramps	Signal	C	34.5	C	28.7	C	23.4	D	41.0
76. Union Avenue/SR 58 EB ramps	Signal	B	13.8	B	12.4	B	18.0	B	15.8
77. Cottonwood Road–MLK/Brundage Lane	Signal	C	23.4	C	24.8	C	28.8	C	27.5
78. Cottonwood Road–Brundage Lane/SR 58 WB ramps	Signal	C	26.0	D	35.7	C	27.3	C	32.9
79. Cottonwood Road/SR 58 EB ramps	Signal	B	16.9	B	14.1	B	15.8	B	15.7

*LOS summary based on SYNCHRO 6
Source: Parsons

4.4 Traffic Performance of Build Alternative A

Alternative A proposes to connect the Westside Parkway to State Route 58 east near Cottonwood Road by means of a new freeway. Alternative A would begin at the Westside Parkway in between the Mohawk Street interchange and the Coffee Road interchange and turn in a southeasterly direction. It would then span the Kern River, Truxtun Avenue, Carrier Canal, and Stockdale Highway before joining the existing State Route 58 east at its existing terminus near the State Route 58/State Route 99 interchange. Improvements on State Route 58 would continue to extend through the H Street and Chester Avenue interchange to Cottonwood Road. Figure 4-7 illustrates the proposed alignment of build alternative A and the limits of new construction on State Route 58, State Route 99 and the Westside Parkway.

State Route 58 would maintain its existing connections to State Route 99 by means of freeway to freeway connectors. The existing westbound State Route 58 to northbound State Route 99 connector, southbound State Route 99 to eastbound State Route 58 connector, and northbound State Route 99 to eastbound State Route 58 would be preserved with modifications. New branch connectors would be constructed for the eastbound State Route 58 to southbound State Route 99, and northbound State Route 99 to westbound State Route 58 movements.

Auxiliary lanes would be provided on State Route 99 to accommodate the additional traffic from these branch connectors. The limits of improvements on State Route 99 would extend from the interchange at State Route 58 to the Wilson Road overcrossing. All ramps in this vicinity would have to be realigned to provide for the additional lanes. The Wible Road on- and off-ramps south of the existing State Route 99/State Route 58 interchange would be removed to accommodate the northbound State Route 99 on ramp from Ming Avenue. The Stockdale Avenue off ramp from southbound State Route 99 to the eastbound State Route 58 connector would be removed. Local access from Real Road to State Route 58 and to southbound State Route 99 would also be removed. The configuration of these freeway segments, insofar as the number of lanes, interchange on- and off-ramps and traffic demand volumes, are illustrated on Figure 4-8.

The new freeway would bisect existing business parks and residential neighborhoods. The following roads would cross under or over the proposed freeway alignment:

- Truxtun Avenue
- Lennox Avenue and California Avenue
- Business Center Drive
- Stockdale Highway and Montclair Street
- Stine Road
- South Real Road

The potential closure of Frazier Avenue, Westwood Way, McDonald Way, Curran Street, Griffith Street, Jones Street and Williamson Way would modify existing circulation.

To provide an overall indication of the impact of constructing the Westside Parkway to State Route 58 east connector along the alternative A alignment, a computer generated map was provided previously as Figure 3-9 which illustrates the difference between the 2038 alternative A and no-build daily traffic volumes, as assigned by the travel forecast model. Given this reassignment or rearrangement of travel patterns, Figure 4-9 illustrates the resulting location and severity of traffic congestion along Westside Parkway, Rosedale Highway/24th Street, State Route 99 and connecting roadway lengths.

Insofar as specific freeway performance data, Table 4-15 presents AM peak hour measures of effectiveness for mainline segments, while Table 4-16 reports PM peak hour results as simulated

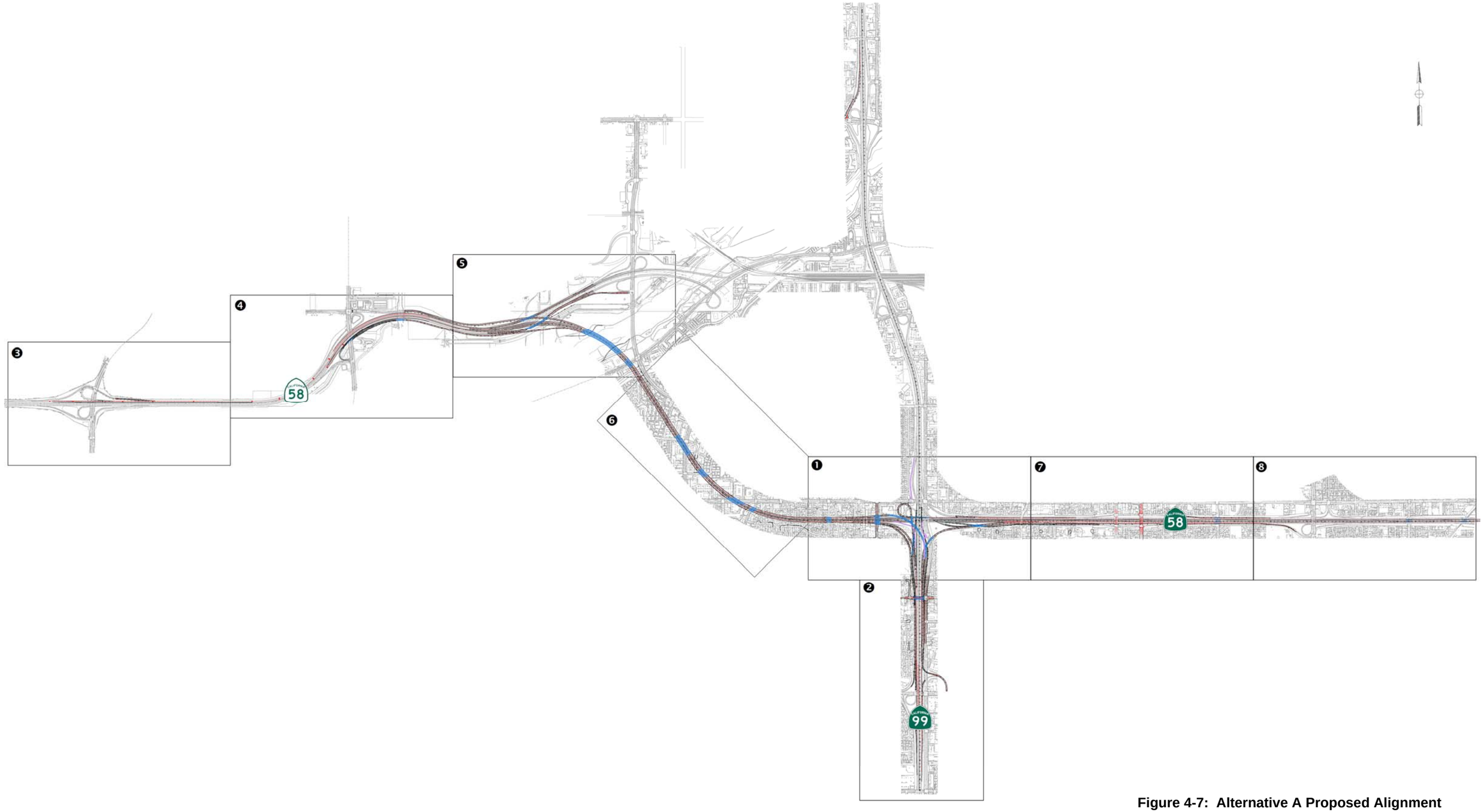


Figure 4-7: Alternative A Proposed Alignment

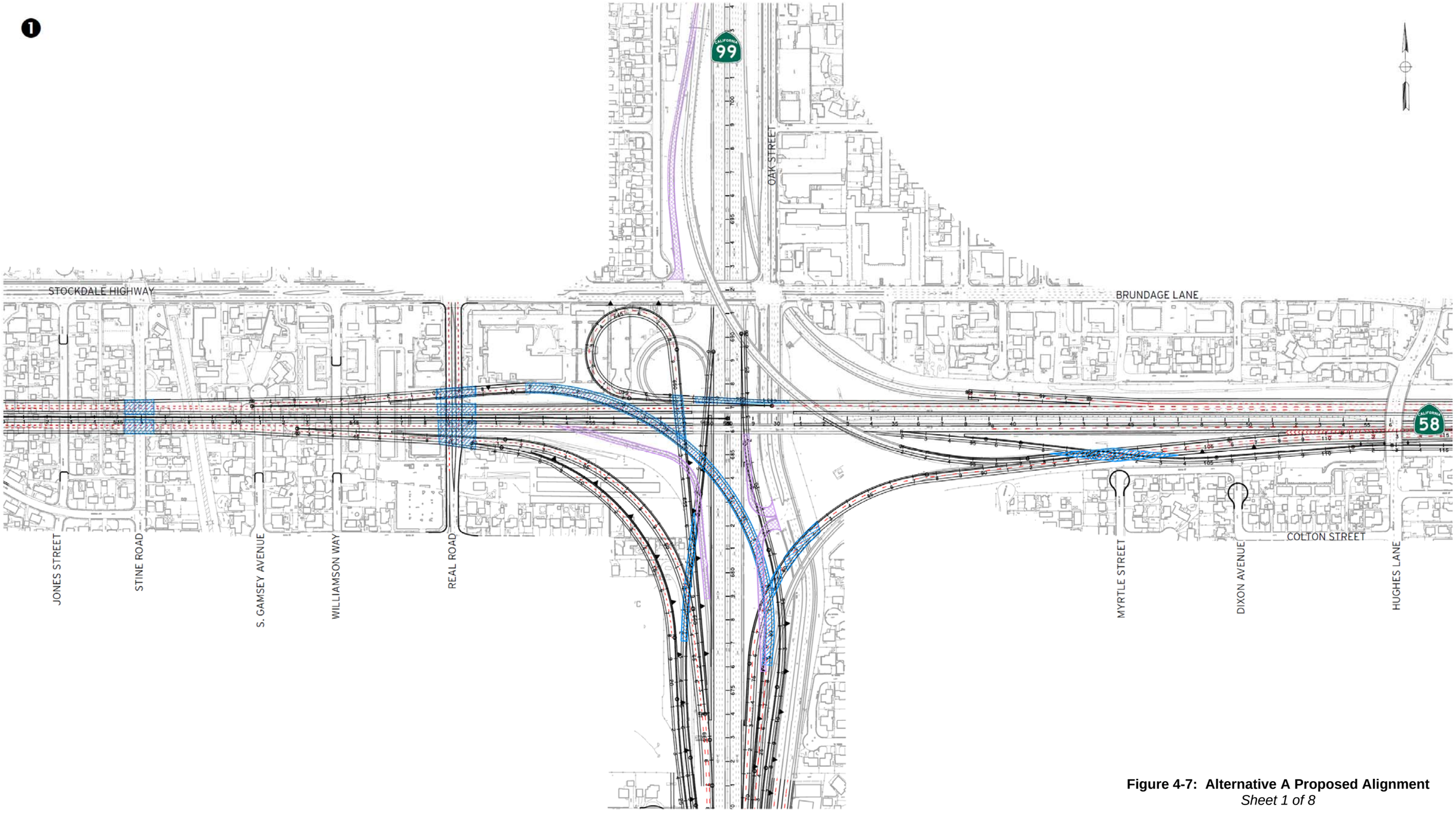


Figure 4-7: Alternative A Proposed Alignment
Sheet 1 of 8

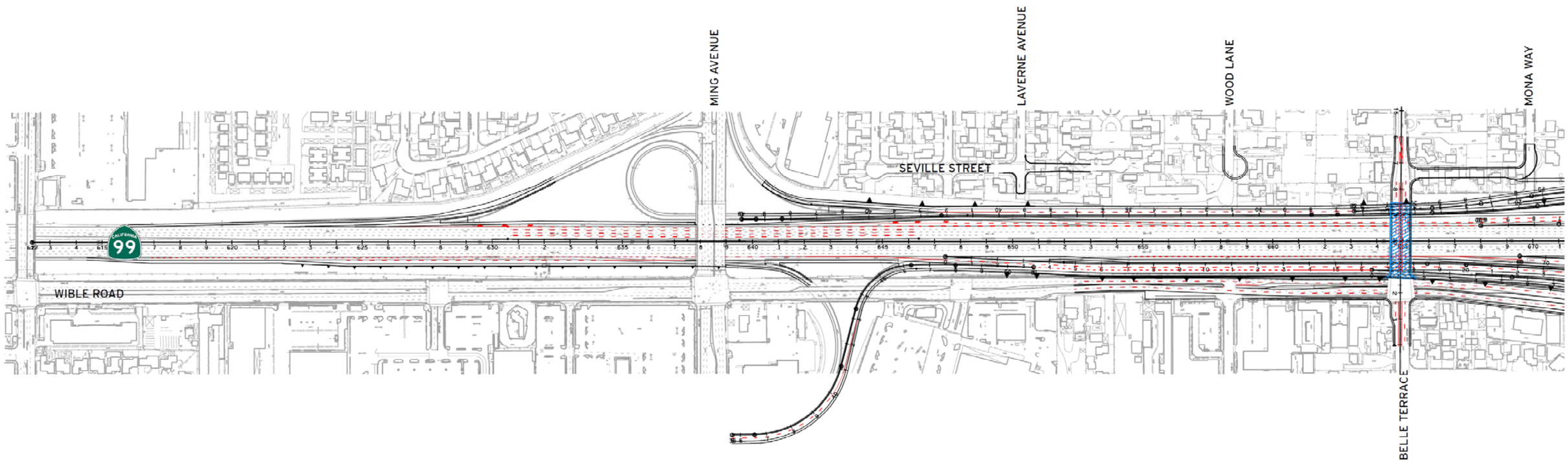


Figure 4-7: Alternative A Proposed Alignment
Sheet 2 of 8

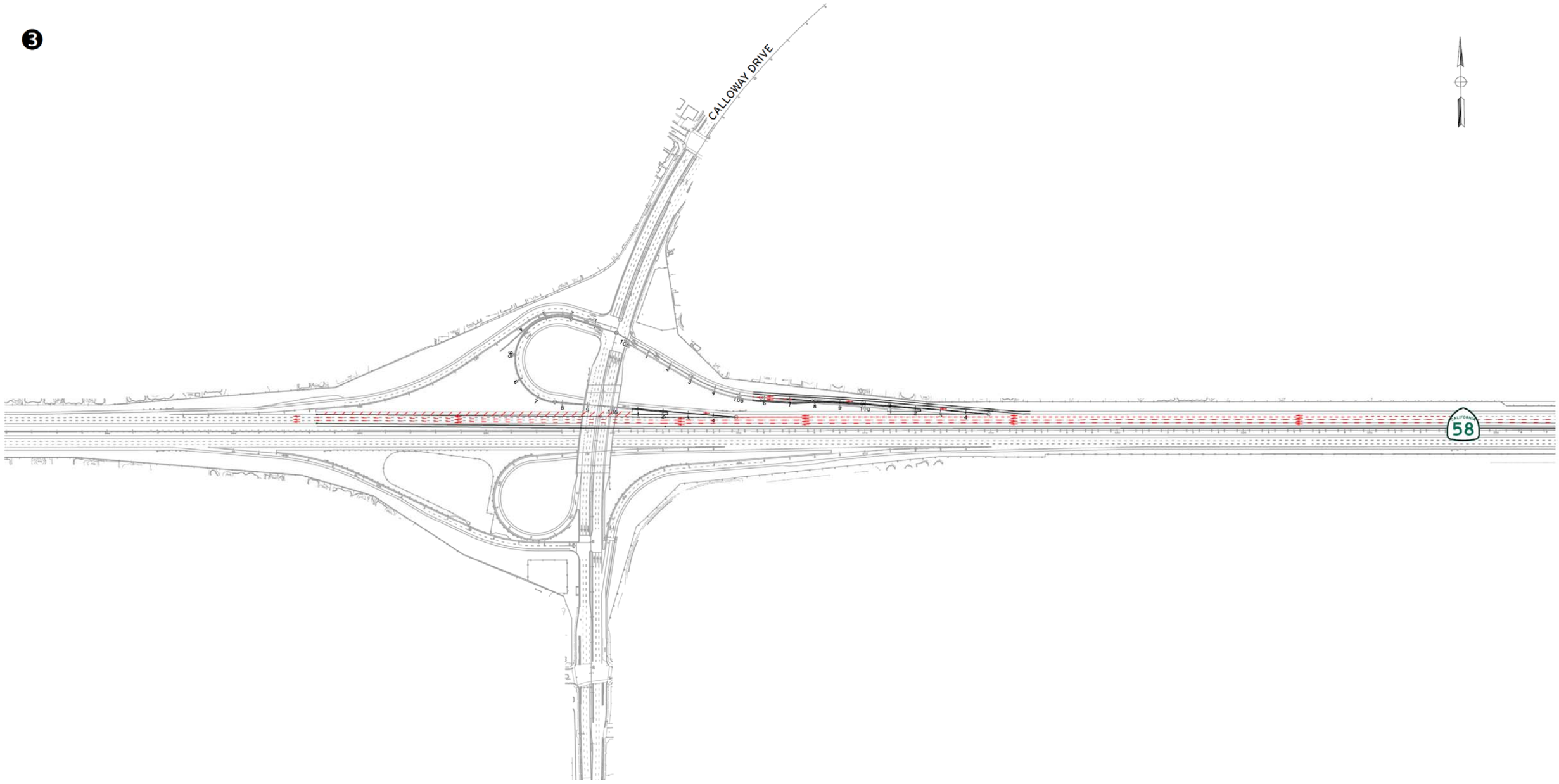


Figure 4-7: Alternative A Proposed Alignment
Sheet 3 of 8

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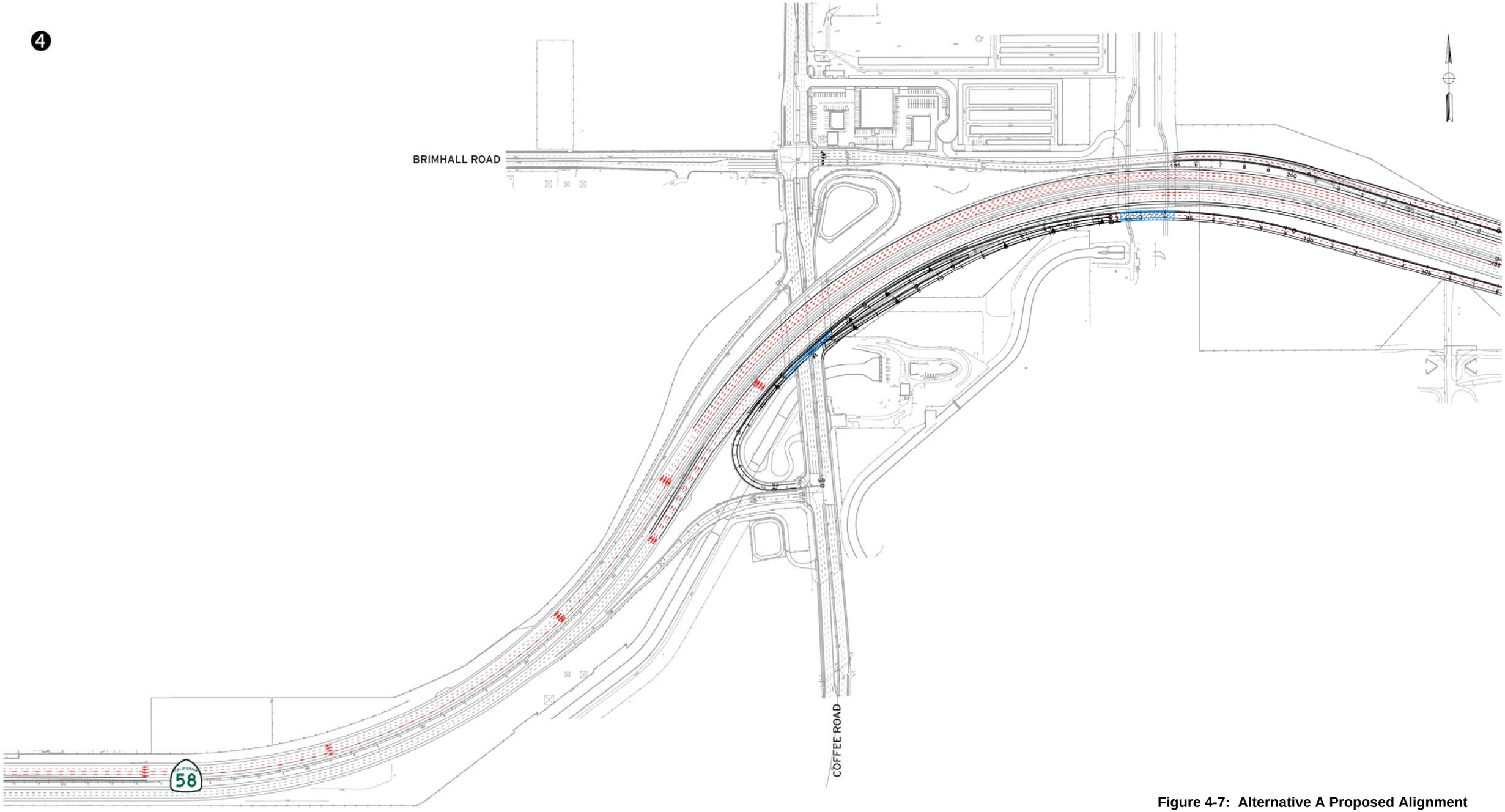

Figure 4-7: Alternative A Proposed Alignment
Sheet 4 of 8

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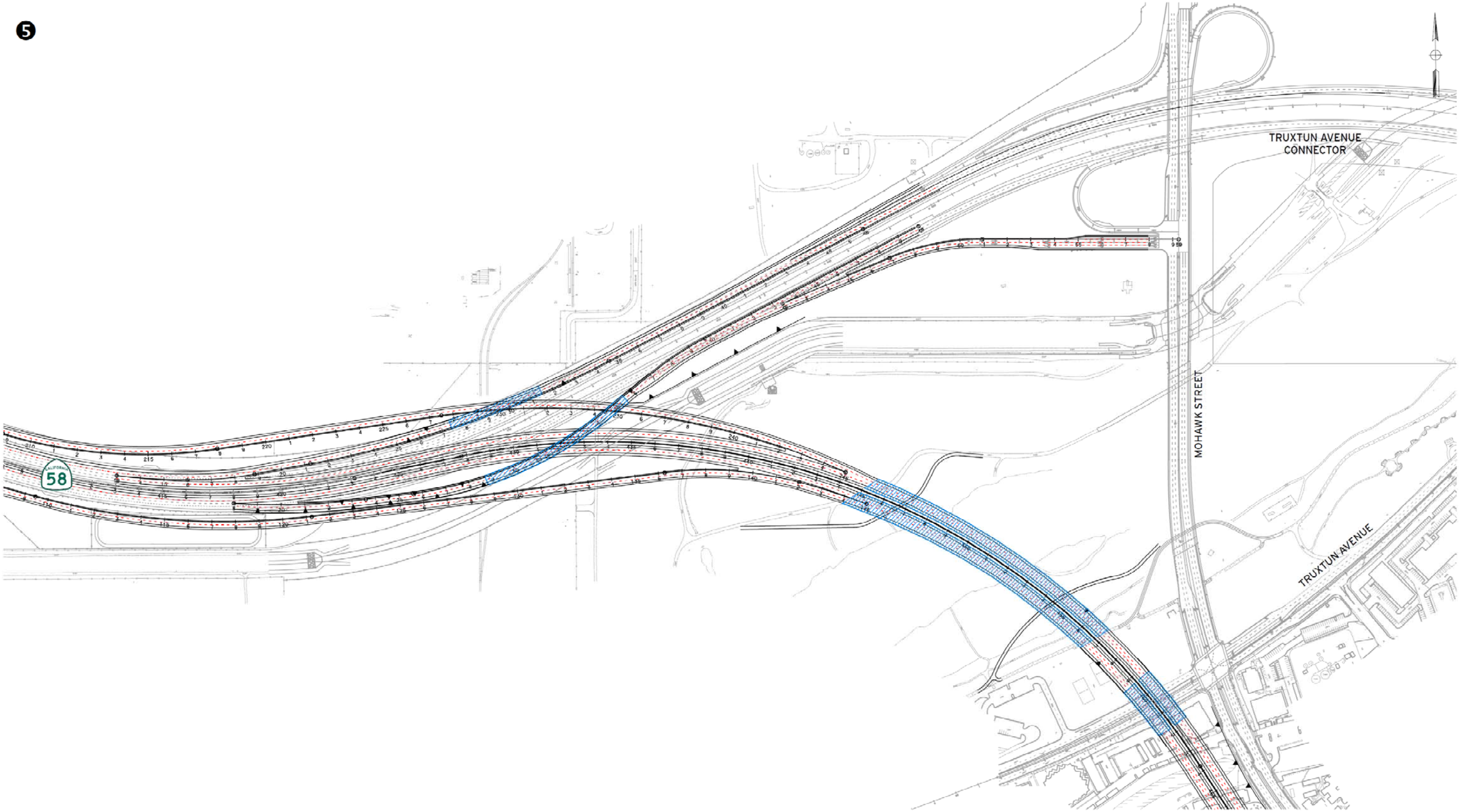


Figure 4-7: Alternative A Proposed Alignment
Sheet 5 of 8

Figure 4-7: Alternative A Proposed Alignment
Sheet 6 of 8

Figure 4-7: Alternative A Proposed Alignment
Sheet 7 of 8

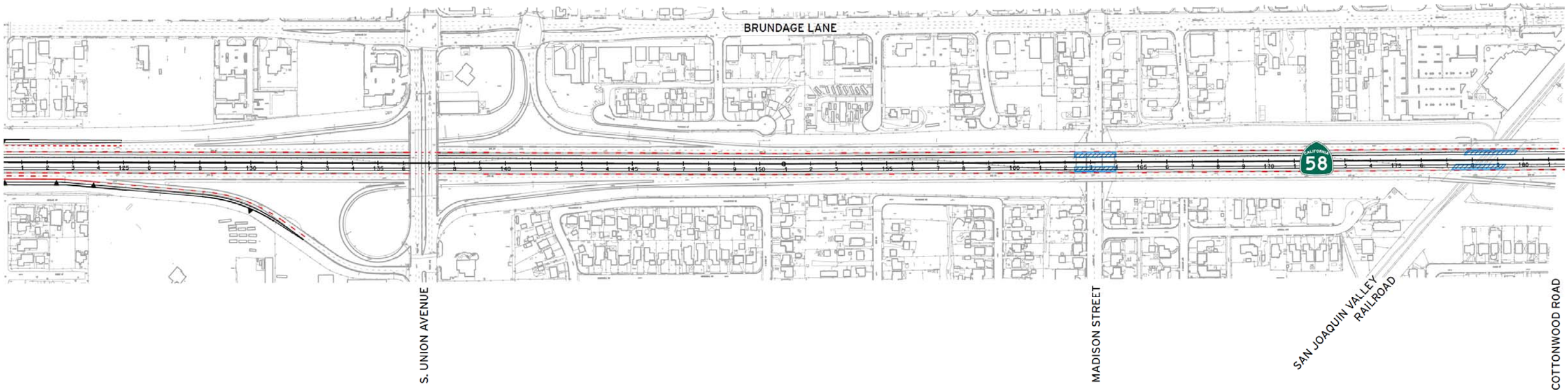
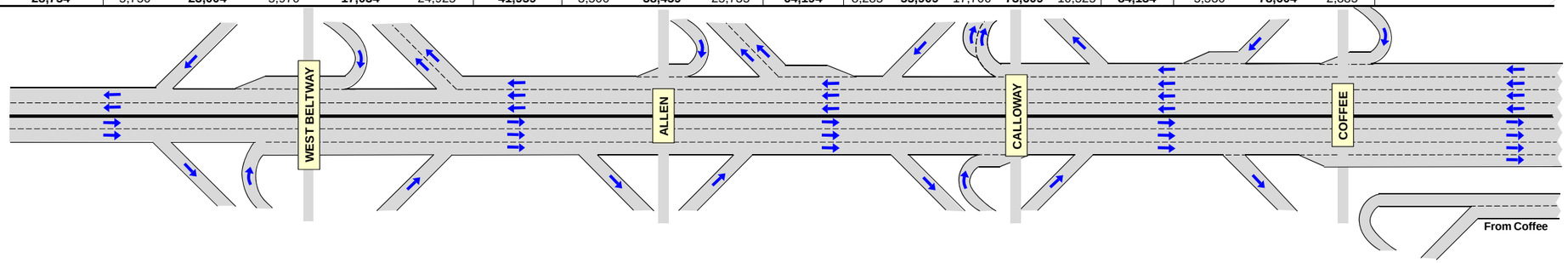


Figure 4-7: Alternative A Proposed Alignment
Sheet 8 of 8

A. State Route 58 and Westside Parkway

State Route 58 Westbound		MAINLINE	WEST BELTWAY					MAINLINE	ALLEN ROAD			MAINLINE	CALLOWAY DRIVE					MAINLINE	COFFEE ROAD			MAINLINE
			ON	MAINLINE	ON	MAINLINE	OFF		ON	MAINLINE	OFF		ON	MAINLINE	OFF	MAINLINE	OFF		ON	MAINLINE	ON	
2038 ALTERNATIVE A	AM Peak	**1,745**	305	**1,440**	320	**1,120**	1,500	**2,620**	350	**2,270**	1,150	**3,420**	500	**2,920**	910	**3,830**	650	**4,480**	300	**4,180**	150	
	PM Peak	**2,280**	345	**1,935**	425	**1,510**	2,385	**3,895**	370	**3,525**	2,230	**5,755**	880	**4,875**	1,350	**6,225**	995	**7,220**	550	**6,670**	240	
	ADT	**28,754**	5,750	**23,004**	5,970	**17,034**	24,925	**41,959**	3,500	**38,459**	25,735	**64,194**	8,285	**55,909**	17,700	**73,609**	10,525	**84,134**	5,530	**78,604**	2,885	



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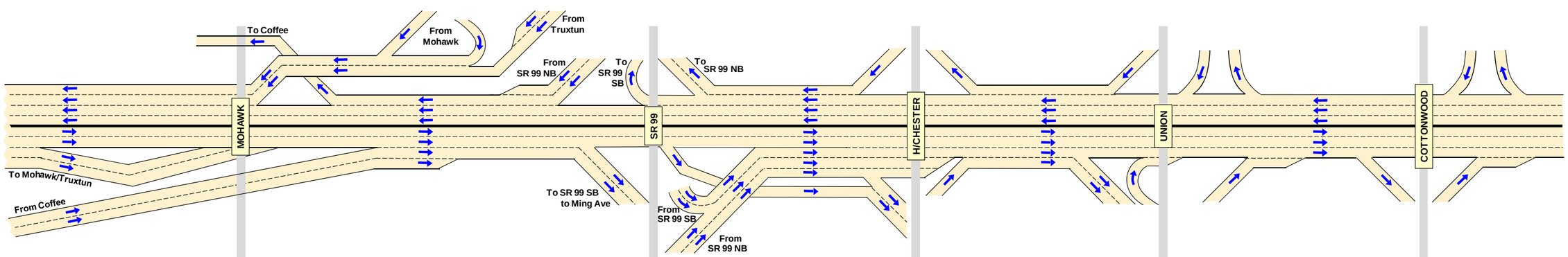
State Route 58 Eastbound		MAINLINE	WEST BELTWAY					MAINLINE	ALLEN ROAD			MAINLINE	CALLOWAY DRIVE					MAINLINE	COFFEE ROAD	MAINLINE
			OFF	MAINLINE	ON	MAINLINE	ON		OFF	MAINLINE	ON		OFF	MAINLINE	ON	MAINLINE	ON		OFF	
2038 ALTERNATIVE A	AM Peak	**2,230**	745	**1,485**	1,525	**3,010**	290	**3,300**	380	**2,920**	2,000	**4,920**	960	**3,960**	940	**4,900**	1,150	**6,050**	1,025	**5,025**
	PM Peak	**2,220**	870	**1,350**	1,340	**2,690**	275	**2,965**	310	**2,655**	1,875	**4,530**	800	**3,730**	1,040	**4,770**	1,110	**5,880**	825	**5,055**
	ADT	**28,605**	11,090	**17,515**	18,820	**36,335**	3,450	**39,785**	4,595	**35,190**	24,660	**59,850**	11,800	**48,050**	11,555	**59,605**	15,275	**74,880**	11,735	**63,145**

MAINLINE	MOHAWK STREET/TRUXTUN AVENUE			MAINLINE	STATE ROUTE 99 SYSTEM INTERCHANGE					MAINLINE	H ST/CHESTER AVE			MAINLINE	UNION AVENUE					MAINLINE	COTTONWOOD ROAD			MAINLINE	State Route 58 Westbound	
	MOHAWK/ TRUXTUN ON	MAINLINE	COFFEE OFF		ON	MAINLINE	OFF	MAINLINE	OFF		ON	MAINLINE	OFF		ON	MAINLINE	ON	MAINLINE	OFF		ON	MAINLINE	OFF			
4,030	2,160	**1,870**	1,950	**3,820**	1,500	**2,320**	1,200	**3,520**	1,185	**4,705**	635	**4,070**	1,030	**5,100**	565	**4,535**	365	**4,170**	1,180	**5,350**	315	**5,035**	235	**5,270**	AM Peak	2038
6,430	3,780	**2,650**	1,575	**4,225**	1,630	**2,595**	1,225	**3,820**	1,120	**4,940**	660	**4,280**	1,115	**5,395**	770	**4,625**	360	**4,265**	990	**5,255**	530	**4,725**	305	**5,030**	PM Peak	ALTERNATIVE
75,719	42,215	**33,504**	23,775	**57,279**	22,400	**34,879**	14,850	**49,729**	16,050	**65,779**	12,410	**53,369**	16,925	**70,294**	9,644	**60,650**	4,980	**55,670**	13,220	**68,890**	5,810	**63,080**	3,205	**66,285**	ADT	A



MOHAWK STREET/TRUXTUN AVENUE/COFFEE ROAD			MAINLINE	STATE ROUTE 99 SYSTEM INTERCHANGE					MAINLINE	H ST/CHESTER AVE			MAINLINE	UNION AVENUE					MAINLINE	COTTONWOOD ROAD			MAINLINE	State Route 58 Eastbound	
MOHAWK/TRUXTUN OFF	MAINLINE	COFFEE ON		OFF	MAINLINE	TO H/CHESTER	MAINLINE	ON		OFF	MAINLINE	ON		OFF	MAINLINE	ON	MAINLINE	ON		OFF	MAINLINE	ON			
3,090	**1,935**	1,875	**3,810**	1,880	**1,930**	282	**1,648**	2,210	**3,858**	323	**3,535**	1,025	**4,560**	1,035	**3,525**	340	**3,865**	325	**4,190**	630	**3,560**	310	**3,870**	AM Peak	2038
2,700	**2,355**	2,170	**4,525**	2,170	**2,355**	308	**2,047**	3,105	**5,152**	407	**4,745**	1,190	**5,935**	1,025	**4,910**	665	**5,575**	575	**6,150**	905	**5,245**	300	**5,545**	PM Peak	ALTERNATIVE
36,230	**26,915**	29,495	**56,410**	18,835	**37,575**	4,694	**32,881**	35,835	**68,716**	6,286	**62,430**	12,940	**75,370**	16,745	**58,625**	6,535	**65,160**	5,140	**70,300**	8,095	**62,205**	4,020	**66,225**	ADT	A

Figure 4-8: Year 2038 Alternative A Freeway Lane Configuration and Forecast Traffic Volumes *(1 of 2)*

B. State Route 99

N

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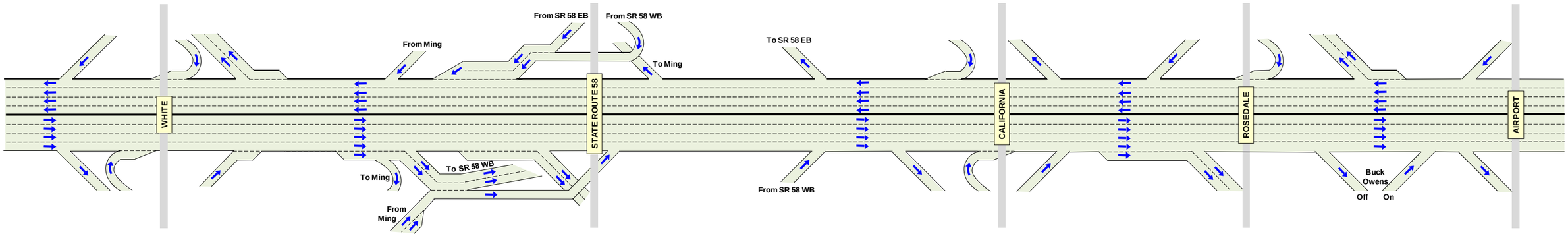
State Route 99 Southbound		MAINLINE	WHITE LANE					MAINLINE	MING AVENUE/STATE ROUTE 58							MAINLINE	CALIFORNIA AVENUE			MAINLINE	ROSEDALE HIGHWAY					MAINLINE	AIRPORT DRIVE	MAINLINE
			ON	MAINLINE	ON	MAINLINE	OFF		MING ON	MAINLINE	SR 58 ON	MAINLINE	MING OFF	MAINLINE	SR 58 EB OFF		ON	MAINLINE	OFF		ON	MAINLINE	ON	MAINLINE	OFF		ON	
2038 ALTERNATIVE A	AM Peak	**5,565**	445	**5,120**	260	**4,860**	1,670	**6,530**	785	**5,745**	2,525	**3,220**	935	**4,155**	955	**5,110**	560	**4,550**	1,495	**6,045**	835	**5,210**	1,100	**4,110**	1,375	**5,485**	1,450	**4,035**
	PM Peak	**7,560**	645	**6,915**	550	**6,365**	2,070	**8,435**	845	**7,590**	2,740	**4,850**	1,205	**6,055**	1,440	**7,495**	940	**6,555**	1,655	**8,210**	1,340	**6,870**	1,375	**5,495**	1,310	**6,805**	2,070	**4,735**
	ADT	**95,510**	9,505	**86,005**	7,510	**78,495**	20,875	**99,370**	10,715	**88,655**	25,815	**62,840**	15,435	**78,275**	15,715	**93,990**	10,325	**83,665**	21,800	**105,465**	13,125	**92,340**	16,000	**76,340**	15,300	**91,640**	24,105	**67,535**



State Route 99 Northbound		MAINLINE	WHITE LANE					MAINLINE	MING AVENUE/STATE ROUTE 58									MAINLINE	CALIFORNIA AVENUE					MAINLINE	ROSEDALE HIGHWAY/BUCK OWENS BLVD					MAINLINE	AIRPORT DRIVE	MAINLINE
			OFF	MAINLINE	ON	MAINLINE	ON		MING OFF	MAINLINE	SR 58 WB OFF	MAINLINE	SR 58 EB OFF	MAINLINE	MING ON	MAINLINE	SR 58 WB ON		OFF	MAINLINE	ON	MAINLINE	ON		OFF	MAINLINE	OFF	MAINLINE	ON		OFF	
2038 ALTERNATIVE A	AM Peak	**7,075**	1,125	**5,950**	1,640	**7,590**	695	**8,285**	915	**7,370**	1,125	**6,245**	1,255	**4,990**	1,000	**5,990**	1,185	**7,175**	1,150	**6,025**	1,050	**7,075**	480	**7,555**	1,965	**5,590**	795	**4,795**	720	**5,515**	1,740	**3,775**
	PM Peak	**6,655**	1,080	**5,575**	1,655	**7,230**	685	**7,915**	850	**7,065**	1,130	**5,935**	1,665	**4,270**	850	**5,120**	1,120	**6,240**	710	**5,530**	1,375	**6,905**	900	**7,805**	1,800	**6,005**	400	**5,605**	790	**6,395**	1,365	**5,030**
	ADT	**95,000**	11,675	**83,325**	18,885	**102,210**	8,790	**111,000**	11,300	**99,700**	15,500	**84,200**	20,120	**64,080**	9,590	**73,670**	16,050	**89,720**	5,800	**83,920**	16,900	**100,820**	7,200	**108,020**	22,255	**85,765**	6,875	**78,890**	10,800	**89,690**	21,750	**67,940**

Figure 4-8: Year 2038 Alternative A Freeway Lane Configuration and Forecast Traffic Volumes *(2 of 2)*

by the CORSIM traffic model. Segments experiencing LOS E or F performance in the design year of 2038 are highlighted.

With respect to 2038 AM peak hour conditions, Table 4-15 indicates that only one short segment of the freeway system, northbound State Route 99 between the White Lane loop on-ramp and the White Lane diagonal on-ramp, will operate at LOS E. Of the 74 freeway segments analyzed, 61 will operate at LOS C or better, 12 at LOS D, and one at LOS E, as mentioned above. Speeds will range between 55 and 64 mph and nearly all of the demand volumes will be served.

During the PM peak hour, traffic operations will be nearly as good as AM peak hour conditions. Of the 74 freeway segments analyzed, 50 will operate at LOS C or better, 21 segments will operate at LOS D, and three segments will operate at LOS E or F.

- Southbound State Route 99 between the Rosedale Highway loop on-ramp and the Rosedale Highway diagonal on-ramp (LOS E)
- Southbound State Route 99 between the Rosedale Highway diagonal on-ramp and the California Avenue off-ramp (LOS F)
- Southbound State Route 99 between the Ming Avenue on-ramp and the White Lane off-ramp (LOS F).

The percentage of demand traffic volumes served will fall below 90 percent in two reaches of State Route 99.

- Northbound between the California loop on-ramp and the Airport Drive off-ramp (85 to 88 percent served)
- Southbound between the Ming Avenue on-ramp and south of the White Lane diagonal on-ramp (86 to 89 percent served).

Along the Westside Parkway/State Route 58, speeds will range between 58 and 63 mph. Along State Route 99, speeds, for the most part, will range between 51 and 63 mph.

Motorists will experience slower speeds, below 50 mph, on four segments of southbound State Route 99 during the PM peak hour.

In addition to analyzing freeway mainline segments, freeway on-ramp and off-ramp performance and merge/diverging conditions of the freeways were analyzed using the same CORSIM traffic simulation model. These results are reported in Tables 4-17 through 4-20. In cases where a low percentage of on-ramp traffic is served, such as the White Lane loop on-ramp to northbound State Route 99, traffic would be expected to spill back onto local streets until such time that motorists divert to alternate routes.

Traffic level of service at ramp termini and study area intersections are reported in Table 4-21 for build alternative A conditions. The proposed traffic lane geometric configurations and demand traffic volumes are illustrated on Figure 3-11. For the ramp terminal and other study intersections reported in Table 4-21, all but eight intersections perform at LOS D or better during year 2038 AM peak hour demand conditions; while 16 of 79 intersections experience LOS E or F conditions during the PM peak hour. This performance is improved from the no-build condition, as discussed in Chapter 6.

Detailed level of service input parameters and output statistics for each study intersection are provided in Volume II (part 1 of 2) of this report.

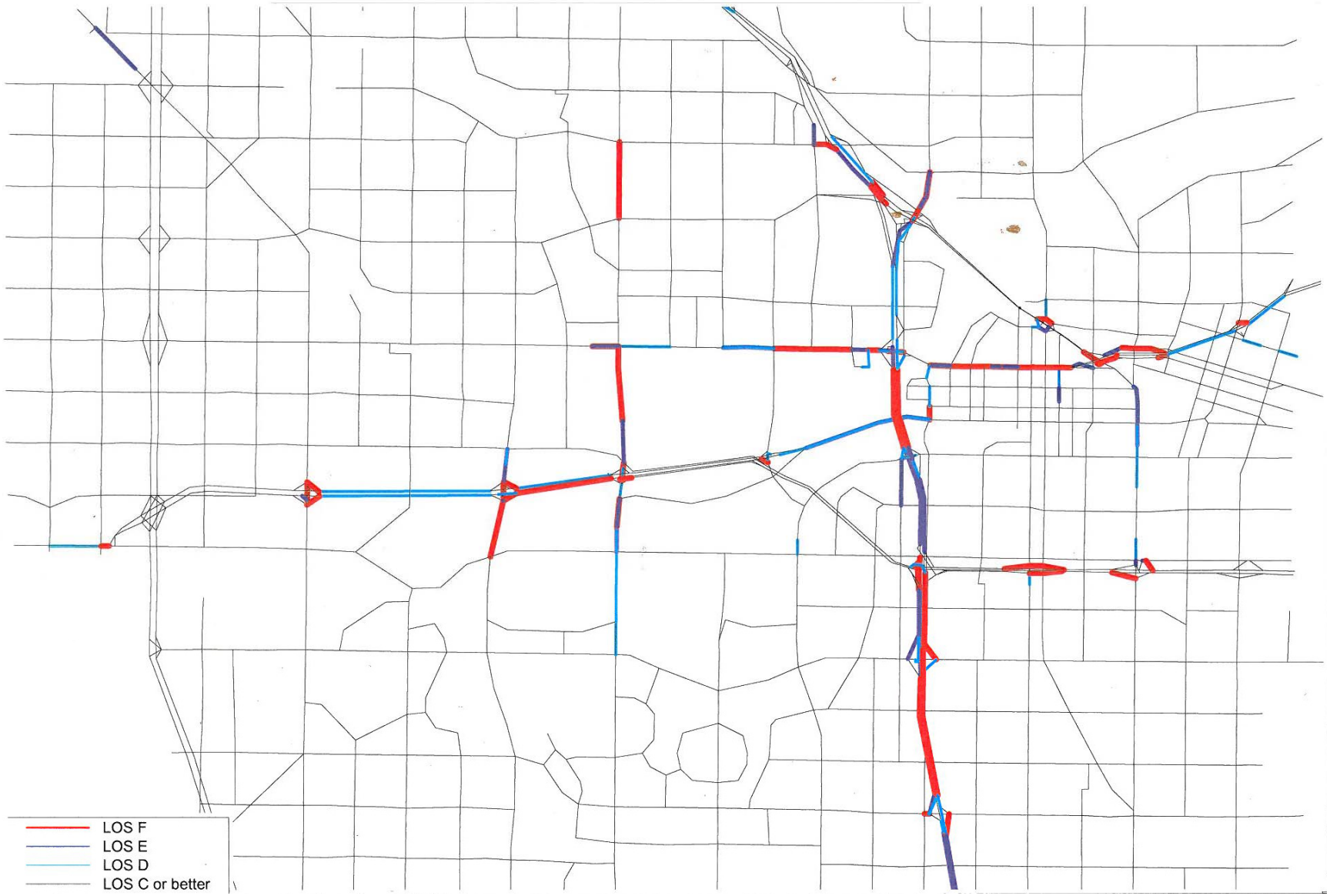


Figure 4-9: Locations of Congestion for Alternative A

Table 4-15. AM Peak Hour Measures of Effectiveness for Alternative A—Freeway Mainline Segments *(1 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)
State Route 99 NB Mainline																										
SR 99 NB south end of the network to White Lane off-ramp	5,070	5,070	100%	50	1	63	20	C	50	4462	71	2	1271	7,075	7,075	100%	55	6	59	31	D	55	6310	107	11	1772
White Lane off-ramp to White Lane loop on-ramp	4,390	4,390	100%	19	1	63	18	B	69	1473	24	1	1100	5,950	5,848	98%	20	1	61	24	C	74	1959	32	2	1462
White Lane loop on-ramp to White Lane direct on-ramp	6,020	5,845	97%	7	1	53	28	D	77	614	12	2	1461	7,590	7,162	94%	8	2	47	38	**E**	82	755	16	5	1791
White Lane direct on-ramp to Ming Avenue off-ramp	6,724	6,623	98%	77	5	60	25	C	154	8566	142	9	1325	8,285	8,015	97%	80	8	58	32	D	162	10357	178	18	1603
Ming Avenue off-ramp to C-D (SR 58 WB) off-ramp	5,985	5,985	100%	11	1	61	20	C	165	1166	19	1	1220	7,370	7,370	100%	11	1	60	25	C	174	1411	24	2	1475
SR 58 WB off-ramp to SR 58 EB off-ramp	5,140	5,140	100%	27	1	61	19	C	192	2362	39	2	1152	6,245	6,117	98%	27	2	60	23	C	201	2783	46	3	1359
SR 58 EB off-ramp to Ming Avenue on-ramp	4,114	4,114	100%	25	1	63	17	B	217	1824	29	1	1051	4,990	4,990	100%	25	1	62	20	C	226	2167	35	1	1249
Ming Avenue on-ramp to SR 58 on-ramp	4,915	4,915	100%	8	1	61	20	C	224	634	10	1	1238	5,990	5,888	98%	8	1	60	25	C	234	754	13	1	1472
SR 58 on-ramp to California Avenue off-ramp	6,014	6,014	100%	39	3	59	25	C	264	3951	67	6	1523	7,175	7,163	100%	40	5	58	30	D	274	4660	81	9	1791
California Avenue off-ramp to California Avenue loop on-ramp	5,044	5,041	100%	16	1	62	20	C	280	1424	23	1	1260	6,025	6,025	100%	16	1	62	24	C	291	1701	28	1	1506
California Avenue loop on-ramp to California Avenue direct on-ramp	5,904	5,691	96%	9	1	60	24	C	289	846	14	1	1423	7,075	6,780	96%	9	1	58	29	D	300	1008	17	2	1695
California Avenue direct on-ramp to Rosedale Highway off-ramp	6,273	5,842	93%	32	2	60	23	C	320	3060	51	3	1298	7,555	6,881	91%	33	3	57	28	D	333	3572	62	6	1529
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	4,394	4,227	96%	16	1	63	17	B	337	1201	19	1	1057	5,590	5,192	93%	17	1	61	21	C	349	1475	24	1	1298
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	3,824	3,722	97%	24	1	63	15	B	361	1547	25	1	931	4,795	4,432	92%	24	1	63	18	B	373	1842	29	1	1108
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	4,224	4,088	97%	34	2	61	17	B	394	2324	38	2	1022	5,515	5,124	93%	35	3	59	22	C	408	2914	49	4	1281
Airport Dr off-ramp to SR 99 NB north end of the network	2,719	2,609	96%	40	1	63	10	A	434	1842	29	1	652	3,775	3,556	94%	41	1	63	14	B	448	2512	40	1	889
State Route 99 SB Mainline																										
SR 99 SB north end of the network to Airport Drive on-ramp	3,210	3,210	100%	48	1	64	13	B	48	2749	43	1	806	4,035	4,035	100%	48	1	64	16	B	48	3460	54	1	1014
Airport Drive on-ramp to Rosedale Highway off-ramp	4,490	4,490	100%	31	2	62	18	B	79	2393	39	2	998	5,485	5,450	99%	32	3	60	22	C	80	2919	49	4	1211
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	3,830	3,830	100%	25	1	63	15	B	104	1650	26	1	959	4,110	4,110	100%	25	1	63	16	B	105	1769	28	1	1028
Rosedale Highway loop on-ramp to Rosedale Highway direct on-ramp	4,775	4,775	100%	10	1	57	18	C	113	727	13	1	1200	5,210	5,210	100%	10	1	55	21	C	115	796	14	2	1313
Rosedale Highway direct on-ramp to California Avenue off-ramp	5,510	5,510	100%	37	3	59	23	C	150	3361	57	5	1385	6,045	6,045	100%	38	5	57	26	D	153	3676	65	8	1518
California Avenue off-ramp to California Avenue on-ramp	4,340	4,340	100%	13	0	62	17	B	164	1011	16	1	1085	4,550	4,550	100%	13	1	62	19	C	167	1074	17	1	1154
California Avenue on-ramp to SR 58 EB off-ramp	4,805	4,805	100%	27	2	61	19	C	191	2218	37	2	1202	5,110	5,110	100%	28	2	60	21	C	194	2399	40	3	1299
SR 58 EB off-ramp to Ming Avenue off-ramp	3,900	3,825	98%	28	1	62	15	B	219	1856	30	1	956	4,155	4,155	100%	28	1	62	17	B	223	2053	33	1	1058
Ming Avenue off-ramp to SR 58 WB on-ramp	3,029	2,995	99%	22	1	63	12	B	241	1141	18	0	749	3,220	3,220	100%	22	1	63	13	B	244	1257	20	1	825
SR 58 WB on-ramp to Ming Avenue on-ramp	4,614	4,530	98%	51	2	63	14	B	292	4048	65	2	1007	5,745	5,745	100%	52	3	62	18	B	296	5174	84	4	1287
Ming Avenue on-ramp to White Lane off-ramp	5,129	5,041	98%	60	3	61	20	C	352	5172	84	4	1260	6,530	6,516	100%	63	6	59	27	D	360	6749	115	11	1629
White Lane off-ramp to White Lane loop on-ramp	3,709	3,625	98%	19	0	63	14	B	371	1215	19	0	806	4,860	4,841	100%	19	1	63	19	C	379	1623	26	1	1076
White Lane loop on-ramp to White Lane direct on-ramp	3,884	3,791	98%	10	0	63	15	B	381	642	10	0	948	5,120	4,953	97%	10	0	62	20	C	389	839	13	1	1238
White Lane direct on-ramp to SR 99 SB south end of the network	4,254	4,008	94%	52	2	63	16	B	433	3626	58	2	1002	5,565	5,193	93%	52	2	62	21	C	441	4696	75	3	1298
State Route 99 NB Collector-Distributor																										
SR 99 NB C-D on-ramp to Westside Parkway C-D off-ramp	2,010	2,010	100%	18	1	53	13	B	26	546	10	0	823	2,500	2,500	100%	18	1	53	16	B	26	674	13	0	1017
State Route 99 SB Collector-Distributor																										
Westside Parkway C-D on-ramp to SR 99 SB C-D on-ramp	1,585	1,547	98%	7	0	47	11	A	15	145	3	0	773	2,525	2,525	100%	7	1	45	19	C	16	235	5	0	1263

Bottleneck

Queue

Table 4-15. AM Peak Hour Measures of Effectiveness for Alternative A—Freeway Mainline Segments *(2 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)
Westside Parkway EB Mainline																										
Westside Parkway west end of the network to West Beltway off-ramp	*— NOT APPLICABLE —*													2,230	2,230	100%	6	2	47	24	C	6	186	4	1	1140
West Beltway off-ramp to West Beltway loop on-ramp														1,485	1,485	100%	14	1	61	12	B	20	349	6	0	743
West Beltway loop on-ramp to West Beltway direct on-ramp														3,010	2,796	93%	9	1	61	15	B	29	436	7	0	932
West Beltway direct on-ramp to Allen Road off-ramp	1,015	1,009	99%	83	3	61	8	A	83	1425	23	1	504	3,300	3,073	93%	57	2	62	16	B	86	3023	49	2	1024
Allen Road off-ramp to Allen Road on-ramp	956	956	100%	32	0	64	5	A	115	559	9	0	327	2,920	2,699	92%	33	1	63	14	B	119	1537	24	1	900
Allen Road on-ramp to Calloway Drive off-ramp	2,665	2,665	100%	59	3	62	14	B	174	2706	44	2	889	4,920	4,665	95%	61	4	60	26	C	180	4745	79	6	1555
Calloway Drive off-ramp to Calloway Drive loop on-ramp	2,140	2,138	100%	24	0	64	11	B	198	926	14	0	713	3,960	3,796	96%	25	1	63	20	C	204	1645	26	1	1265
Calloway Drive loop on-ramp to Calloway Drive direct on-ramp	2,880	2,833	98%	11	1	61	15	B	209	536	9	1	944	4,900	4,653	95%	11	1	59	26	D	216	882	15	1	1551
Calloway Drive direct on-ramp to Coffee Road off-ramp	3,940	3,907	99%	49	3	61	21	C	258	3273	53	3	1302	6,050	5,867	97%	51	5	59	32	D	267	4956	84	8	1956
Coffee Road off-ramp to Truxtun Avenue/Mohawk Street off-ramp	3,299	3,223	98%	58	2	62	13	B	316	3214	51	2	921	5,025	4,836	96%	59	3	61	21	C	326	4821	79	4	1382
Truxtun Avenue off-ramp to Coffee Road on-ramps	909	886	97%	31	0	65	7	A	347	494	8	0	443	1,935	1,839	95%	32	1	63	15	B	358	1026	16	0	919
Coffee Road on-ramps to SR 99 SB and Ming Avenue C-D off-ramp	2,311	2,254	98%	108	3	63	12	B	455	4247	68	2	751	3,810	3,700	97%	111	6	61	20	C	468	6972	114	6	1233
SR 99 SB off-ramp (and C-D Ming Avenue) to H Street off-ramp	1,181	1,134	96%	23	0	63	9	A	478	451	7	0	567	1,930	1,836	95%	23	1	63	15	B	491	729	12	0	918
H Street off-ramp to SR 99 NB and SB on-ramp	921	872	95%	30	0	64	7	A	507	463	7	0	436	1,648	1,564	95%	30	1	63	12	B	522	830	13	0	782
SR 99 NB and SB on-ramp to Chester Avenue on-ramp	2,486	2,486	100%	46	4	61	9	A	554	1959	32	2	718	3,535	3,408	96%	47	4	60	12	B	569	2662	45	4	974
Chester Avenue on-ramp to Union Avenue off-ramp	3,236	3,236	100%	27	1	62	13	B	580	1490	24	1	927	4,560	4,401	97%	27	2	61	18	C	596	2022	33	2	1257
Union Avenue off-ramp to Union Avenue loop on-ramp	2,521	2,521	100%	17	0	63	13	B	597	736	12	0	845	3,525	3,405	97%	17	1	63	18	C	613	989	16	1	1135
Union Avenue loop on-ramp to Union Avenue direct on-ramp	2,841	2,797	98%	8	0	62	15	B	605	391	6	0	932	3,865	3,698	96%	8	0	62	20	C	621	518	8	0	1233
Union Avenue direct on-ramp to Cottonwood Road off-ramp	3,185	3,165	99%	31	1	62	17	B	636	1681	27	1	1055	4,190	4,044	97%	31	2	62	22	C	652	2149	35	2	1348
Cottonwood Road off-ramp to Cottonwood Road on-ramp	2,771	2,746	99%	28	1	63	14	B	663	1328	21	1	915	3,560	3,445	97%	28	1	63	18	C	680	1666	27	1	1148
Cottonwood Road on-ramp to SR 58 east end of the network	3,071	3,061	100%	25	1	63	16	B	688	1336	21	1	1020	3,870	3,739	97%	25	1	62	20	C	705	1631	26	1	1246
Westside Parkway WB Mainline																										
SR 58 east end of the network to Cottonwood Road off-ramp	3,475	3,475	100%	26	1	64	18	C	26	1589	25	0	1165	5,270	5,270	100%	26	1	63	28	D	26	2411	38	1	1768
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,220	3,215	100%	18	1	63	17	B	43	988	16	0	1072	5,035	5,035	100%	18	1	62	27	D	44	1555	25	1	1688
Cottonwood Road on-ramp to Brundage Lane off-ramp	3,480	3,453	99%	38	1	62	18	C	81	2285	37	1	1151	5,350	5,350	100%	44	7	56	33	D	88	3657	65	10	1785
Brundage Lane off-ramp to Brundage Lane on-ramp	2,811	2,793	99%	17	1	63	15	B	98	824	13	0	931	4,170	4,082	98%	17	1	61	22	C	105	1205	20	1	1361
Brundage Lane on-ramp to Union Avenue on-ramp	3,195	3,121	98%	12	1	62	17	B	110	639	10	1	1040	4,535	4,409	97%	12	1	61	24	C	117	904	15	1	1470
Union Avenue on-ramp to Chester Avenue off-ramp	3,761	3,717	99%	23	1	62	15	B	133	1446	24	1	1062	5,100	4,963	97%	23	1	61	20	C	140	1931	32	2	1418
Chester Avenue off-ramp to H Street on-ramp	2,785	2,785	100%	37	1	63	15	B	170	1826	29	1	935	4,070	3,952	97%	38	2	62	21	C	178	2573	42	2	1317
H Street on-ramp to SR 99 NB off-ramp	3,480	3,468	100%	24	1	61	14	B	195	1443	24	1	991	4,705	4,612	98%	25	1	61	19	C	203	1920	32	2	1318
SR 99 NB off-ramp to SR 99 SB off-ramp	2,381	2,381	100%	21	1	62	13	B	216	870	14	0	796	3,520	3,444	98%	21	1	61	19	C	224	1253	20	1	1148
SR 99 SB off-ramp to SR 99 NB on-ramp	1,356	1,356	100%	23	1	64	11	A	239	570	9	0	692	2,320	2,218	96%	24	1	62	18	B	248	913	15	1	1109
SR 99 NB on-ramp to Coffee Road off-ramp	2,566	2,566	100%	105	3	63	14	B	344	4741	76	3	867	3,820	3,753	98%	107	6	61	20	C	355	6842	111	6	1251
Coffee Road off-ramp to Mohawk Street/Truxtun Avenue on-ramp	896	896	100%	23	0	64	7	A	367	374	6	0	460	1,870	1,843	99%	23	1	63	15	B	378	748	12	0	921
Mohawk Street/Truxtun Avenue on-ramp to Coffee Road loop on-ramp	2,516	2,473	98%	53	1	64	10	A	420	2301	36	1	618	4,030	3,966	98%	53	2	63	16	B	431	3688	59	2	991
Coffee Road loop on-ramp to Coffee Road direct on-ramp	2,646	2,584	98%	12	0	64	10	A	432	563	9	0	646	4,180	4,101	98%	12	0	63	16	B	444	893	14	0	1025
Coffee Road direct on-ramp to Calloway Drive direct off-ramp	2,901	2,800	97%	48	1	63	11	A	480	2357	37	1	700	4,480	4,348	97%	48	2	62	17	B	492	3653	59	2	1087
Calloway Drive direct off-ramp to Calloway Drive loop off-ramp	2,251	2,185	97%	11	0	61	9	A	491	414	7	0	546	3,830	3,689	96%	11	0	62	15	B	503	699	11	0	922
Calloway Drive loop off-ramp to Calloway Drive on-ramp	1,301	1,234	95%	24	0	64	6	A	515	528	8	0	411	2,920	2,800	96%	24	1	63	15	B	528	1197	19	1	933
Calloway Drive on-ramp to Allen Road off-ramp	1,621	1,552	96%	57	2	63	8	A	572	1545	25	1	517	3,420	3,287	96%	58	3	62	18	B	586	3270	53	3	1096
Allen Road off-ramp to Allen Road on-ramp	536	536	100%	26	0	65	3	A	598	262	4	0	187	2,270	2,168	96%	27	1	64	11	B	612	1016	16	0	723
Allen Road on-ramp to West Beltway off-ramp	656	656	100%	89	1	64	5	A	687	1091	17	0	230	2,620	2,492	95%	57	2	62	13	B	669	2460	39	1	831
West Beltway off-ramp to West Beltway loop on-ramp	*— NOT APPLICABLE —*													1,120	1,090	97%	22	0	64	9	A	692	433	7	0	545
West Beltway loop on-ramp to West Beltway direct on-ramp														1,440	1,318	92%	6	0	62	11	A	698	131	2	0	659
West Beltway direct on-ramp to Westside Parkway west end of the network														1,745	1,600	92%	6	0	60	13	B	703	154	3	0	800
Westside Parkway EB Collector-Distributor 1																										
Begin C-D (Coffee Road loop on-ramp to Coffee Road direct on-ramp)	830	830	100%	12	1	49	22	C	12	134	3	0	833	915	915	100%	12	1	49	19	C	12	149	3	0	928
Coffee Road direct on-ramp to end of C-D network (Westside Parkway EB)	1,400	1,378	98%	62	2	53	21	C	73	1248	24	1	689	1,875	1,875	100%	62	2	53	18	B	73	1699	32	1	938
Westside Parkway EB Collector-Distributor 2																										
Begin C-D to Mohawk Street off-ramp	2,390	2,353	98%	28	1	53	20	C	28	966	18	1	941	3,090	3,030	98%	28	1	52	23	C	28	1243	24	1	1212
Mohawk Street off-ramp to Mohawk Street on-ramp	1,185	1,182	100%	26	0	54	11	B	54	462	9	0	591	1,580	1,536	97%	26	1	54	14	B	55	600	11	0	768
Westside Parkway EB Collector-Distributor 3																										
Westside Parkway EB C-D on-ramp to SR 99 SB off-ramp	1,130	1,106	98%	6	0	52	17	B	6	90	2	0	553	1,880	1,851	98%	6	0	52	15	B	6	151	3	0	926
SR 99 SB off-ramp to SR 99 SB C-D on-ramp	570	557	98%	26	1	47	8	A	32	188	4	0	557	555	546	98%	26	1	47	7	A	32	184	4	0	546
SR 99 SB C-D on-ramp to Ming Avenue	1,440	1,373	95%	28	1	48	18	C	60	515	11	0	687	1,490	1,468	99%	28	1	48	15	B	60	551	11	0	734
Westside Parkway WB Collector-Distributor																										
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	780	749	96%	14	0	64	13	B	14	187	3	0	374	800	780	98%	14	0	64	6	A	14	195	3	0	390
Mohawk Street loop on-ramp to Mohawk Street direct on-ramp	1,225	1,180	96%	15	1	60	22	C	29	292	5	0	590	1,305	1,270	97%	14	1	62	10	A	28	314	5	0	635
Mohawk Street direct on-ramp to Westside Parkway on-ramp (end of C-D network)	1,620	1,555	96%	17	1	59	24	C	46	442	7	1	778	2,160	2,127	98%	17	1	61	14	B	45	604	10	1	1063

Bottleneck

Queue

Table 4-16. PM Peak Hour Measures of Effectiveness for Alternative A—Freeway Mainline Segments *(1 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)
State Route 99 NB Mainline																										
SR 99 NB south end of the network to White Lane off-ramp	4,665	4,665	100%	50	1	63	18	C	50	4106	65	2	1169	6,655	6,655	100%	51	2	62	27	D	51	5839	94	4	1664
White Lane off-ramp to White Lane loop on-ramp	3,975	3,975	100%	19	1	63	16	B	69	1334	21	1	996	5,575	5,566	100%	20	1	62	23	C	70	1864	30	2	1392
White Lane loop on-ramp to White Lane direct on-ramp	5,460	5,249	96%	7	1	56	24	C	76	552	10	1	1312	7,230	6,686	92%	7	2	51	33	D	78	703	14	3	1672
White Lane direct on-ramp to Ming Avenue off-ramp	6,065	5,919	98%	76	4	61	22	C	152	7657	125	7	1184	7,915	7,395	93%	84	12	56	30	D	161	9530	172	24	1479
Ming Avenue off-ramp to C-D (SR 58 WB) off-ramp	5,231	5,224	100%	11	1	61	17	B	163	998	16	1	1045	7,065	6,781	96%	13	2	53	26	C	175	1310	25	4	1356
SR 58 WB off-ramp to SR 58 EB off-ramp	4,401	4,332	98%	27	1	62	16	B	190	1976	32	1	963	5,935	5,456	92%	27	2	60	21	C	202	2484	42	3	1212
SR 58 EB off-ramp to Ming Avenue on-ramp	3,246	3,246	100%	25	1	63	13	B	215	1415	22	1	815	4,270	4,065	95%	25	1	63	16	B	227	1765	28	1	1016
Ming Avenue on-ramp to SR 58 on-ramp	3,951	3,915	99%	7	0	62	16	B	222	501	8	0	979	5,120	4,836	94%	8	0	61	20	C	234	619	10	1	1209
SR 58 on-ramp to California Avenue off-ramp	4,891	4,891	100%	38	2	61	19	C	260	3191	52	3	1234	6,240	6,016	96%	39	3	60	24	C	273	3897	65	5	1504
California Avenue off-ramp to California Avenue loop on-ramp	4,261	4,261	100%	16	1	63	17	B	276	1215	19	1	1076	5,530	5,308	96%	16	1	62	21	C	290	1499	24	1	1327
California Avenue loop on-ramp to California Avenue direct on-ramp	5,166	4,956	96%	9	1	60	21	C	285	737	12	1	1239	6,905	6,108	88%	9	1	57	27	D	299	911	16	2	1527
California Avenue direct on-ramp to Rosedale Highway off-ramp	5,826	5,384	92%	32	2	60	21	C	317	2833	48	3	1196	7,805	6,598	85%	36	6	53	30	D	335	3459	66	11	1466
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	4,066	3,787	93%	16	0	63	15	B	333	1076	17	0	947	6,005	5,209	87%	16	1	62	21	C	352	1480	24	1	1302
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	3,701	3,410	92%	24	1	63	13	B	357	1417	22	1	853	5,605	4,859	87%	24	1	63	19	C	375	2019	32	1	1215
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	4,416	4,124	93%	34	2	61	17	B	391	2343	39	2	1031	6,395	5,618	88%	34	3	60	24	C	410	3193	53	4	1404
Airport Dr off-ramp to SR 99 NB north end of the network	3,051	2,839	93%	40	1	63	11	B	431	2004	32	1	710	5,030	4,446	88%	41	2	62	18	B	450	3140	50	2	1112
State Route 99 SB Mainline																										
SR 99 SB north end of the network to Airport Drive on-ramp	3,550	3,550	100%	48	1	64	14	B	48	3042	48	1	892	4,735	4,735	100%	48	1	63	19	C	48	4062	64	2	1189
Airport Drive on-ramp to Rosedale Highway off-ramp	5,314	5,280	99%	32	3	60	21	C	80	2824	47	4	1173	6,805	6,805	100%	35	6	55	30	D	84	3763	68	11	1534
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	4,604	4,585	100%	25	1	62	18	C	105	1972	32	1	1146	5,495	5,495	100%	26	2	60	24	C	110	2438	41	3	1416
Rosedale Highway loop on-ramp to Rosedale Highway direct on-ramp	5,938	5,924	100%	11	2	50	26	C	116	897	18	4	1481	6,870	6,870	100%	13	5	42	36	E	123	1059	25	9	1733
Rosedale Highway direct on-ramp to California Avenue off-ramp	7,044	7,012	100%	40	6	55	31	D	155	4272	77	11	1753	8,210	8,151	99%	54	20	40	51	F	177	4868	122	45	2038
California Avenue off-ramp to California Avenue on-ramp	5,649	5,640	100%	14	1	62	23	C	169	1312	21	1	1410	6,555	6,442	98%	14	1	60	27	D	191	1500	25	2	1611
California Avenue on-ramp to SR 58 EB off-ramp	6,570	6,462	98%	29	3	57	27	D	198	2989	52	6	1615	7,495	7,202	96%	29	3	58	30	D	220	3329	58	6	1800
SR 58 EB off-ramp to Ming Avenue off-ramp	5,195	5,102	98%	28	1	62	21	C	226	2475	40	2	1276	6,055	5,814	96%	28	2	61	24	C	248	2820	46	2	1454
Ming Avenue off-ramp to SR 58 WB on-ramp	4,075	4,009	98%	22	1	63	16	B	248	1527	24	1	1002	4,850	4,617	95%	22	1	62	18	C	270	1758	28	1	1154
SR 58 WB on-ramp to Ming Avenue on-ramp	6,130	6,037	98%	52	2	62	18	C	300	5392	87	4	1341	7,590	7,109	94%	67	17	49	28	D	337	6495	131	33	1580
Ming Avenue on-ramp to White Lane off-ramp	6,780	6,685	99%	63	6	59	27	D	363	6898	117	11	1671	8,435	7,514	89%	115	57	34	56	F	452	8095	240	120	1878
White Lane off-ramp to White Lane loop on-ramp	4,765	4,678	98%	19	1	63	19	C	382	1568	25	1	1040	6,365	5,629	88%	20	1	61	23	C	471	1887	31	2	1251
White Lane loop on-ramp to White Lane direct on-ramp	5,275	5,140	97%	10	0	62	21	C	392	870	14	1	1285	6,915	6,129	89%	10	1	61	25	C	481	1038	17	1	1532
White Lane direct on-ramp to SR 99 SB south end of the network	5,755	5,449	95%	52	2	62	22	C	444	4926	79	3	1362	7,560	6,506	86%	53	3	61	27	D	534	5879	96	5	1627
State Route 99 NB Collector-Distributor																										
SR 99 NB C-D on-ramp to Westside Parkway C-D off-ramp	1,925	1,925	100%	18	0	53	12	B	26	517	10	0	779	2,480	2,480	100%	18	1	53	16	B	26	677	13	0	1021
State Route 99 SB Collector-Distributor																										
Westside Parkway C-D on-ramp to SR 99 SB C-D on-ramp	1,925	1,925	100%	7	0	47	15	B	15	191	4	0	1023	2,740	2,662	97%	8	1	42	21	C	16	251	6	1	1331

Bottleneck

Queue

Table 4-16. PM Peak Hour Measures of Effectiveness for Alternative A—Freeway Mainline Segments *(2 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)
Westside Parkway EB Mainline																										
Westside Parkway west end of the network to West Beltway off-ramp	*— NOT APPLICABLE —*													2,220	2,217	100%	7	2	44	25	C	7	181	4	1	1109
West Beltway off-ramp to West Beltway loop on-ramp														1,350	1,267	94%	14	1	60	11	A	21	297	5	0	634
West Beltway loop on-ramp to West Beltway direct on-ramp														2,690	2,586	96%	9	1	61	14	B	30	404	7	0	862
West Beltway direct on-ramp to Allen Road off-ramp	895	872	97%	83	3	61	7	A	83	1232	20	1	436	2,965	2,835	96%	57	2	63	15	B	87	2788	44	1	945
Allen Road off-ramp to Allen Road on-ramp	810	810	100%	32	0	64	4	A	115	464	7	0	272	2,655	2,543	96%	32	1	63	13	B	119	1448	23	1	848
Allen Road on-ramp to Calloway Drive off-ramp	2,091	1,982	95%	58	2	63	10	A	173	2007	32	1	661	4,530	4,351	96%	60	4	61	24	C	179	4423	73	5	1450
Calloway Drive off-ramp to Calloway Drive loop on-ramp	1,615	1,516	94%	24	0	64	8	A	197	656	10	0	505	3,730	3,606	97%	25	1	63	19	C	204	1563	25	1	1202
Calloway Drive loop on-ramp to Calloway Drive direct on-ramp	2,331	2,161	93%	11	1	61	12	B	208	409	7	0	720	4,770	4,558	96%	12	1	58	26	D	216	863	15	1	1519
Calloway Drive direct on-ramp to Coffee Road off-ramp	3,305	3,163	96%	48	2	62	16	B	256	2631	42	2	1054	5,880	5,703	97%	50	4	60	31	D	266	4776	79	6	1901
Coffee Road off-ramp to Truxtun Avenue/Mohawk Street off-ramp	2,710	2,604	96%	57	1	63	11	A	313	2599	41	1	744	5,055	4,869	96%	58	3	62	21	C	324	4857	79	3	1391
Truxtun Avenue off-ramp to Coffee Road on-ramps	950	889	94%	31	0	64	7	A	345	496	8	0	444	2,355	2,296	97%	32	1	63	18	C	356	1280	20	1	1148
Coffee Road on-ramps to SR 99 SB and Ming Avenue C-D off-ramp	2,600	2,543	98%	109	4	62	13	B	453	4793	77	3	848	4,525	4,438	98%	111	7	61	24	C	467	8361	137	8	1479
SR 99 SB off-ramp (and C-D Ming Avenue) to H Street off-ramp	1,180	1,180	100%	23	0	63	9	A	476	470	7	0	590	2,355	2,309	98%	23	1	62	19	C	490	917	15	1	1154
H Street off-ramp to SR 99 NB and SB on-ramp	890	865	97%	30	0	64	7	A	506	459	7	0	432	2,047	1,986	97%	30	1	63	16	B	521	1053	17	1	993
SR 99 NB and SB on-ramp to Chester Avenue on-ramp	3,010	2,906	97%	47	4	60	10	A	553	2270	38	3	830	4,745	4,275	90%	49	6	58	16	B	570	3357	58	7	1221
Chester Avenue on-ramp to Union Avenue off-ramp	3,999	3,836	96%	27	1	61	16	B	580	1762	29	1	1096	5,935	5,410	91%	28	2	60	23	C	598	2487	42	3	1546
Union Avenue off-ramp to Union Avenue loop on-ramp	3,219	3,079	96%	17	1	63	16	B	597	894	14	0	1026	4,910	4,517	92%	17	1	62	24	C	614	1312	21	1	1506
Union Avenue loop on-ramp to Union Avenue direct on-ramp	3,780	3,569	94%	8	0	61	19	C	605	499	8	0	1190	5,575	5,086	91%	9	1	59	29	D	623	712	12	1	1695
Union Avenue direct on-ramp to Cottonwood Road off-ramp	4,195	4,016	96%	31	1	62	22	C	636	2134	35	2	1339	6,150	5,727	93%	32	3	59	32	D	655	3047	51	4	1909
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,755	3,598	96%	28	1	63	19	C	664	1740	28	1	1199	5,245	4,893	93%	28	1	62	26	D	683	2366	38	2	1631
Cottonwood Road on-ramp to SR 58 east end of the network	4,145	3,981	96%	25	1	62	21	C	689	1737	28	1	1327	5,545	5,172	93%	26	1	61	28	D	709	2256	37	2	1724
Westside Parkway WB Mainline																										
SR 58 east end of the network to Cottonwood Road off-ramp	3,790	3,790	100%	26	1	64	20	C	26	1736	27	1	1272	5,030	5,030	100%	26	1	63	27	D	26	2302	37	1	1688
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,531	3,528	100%	18	1	63	19	C	43	1084	17	1	1176	4,725	4,717	100%	18	1	62	25	C	44	1449	23	1	1572
Cottonwood Road on-ramp to Brundage Lane off-ramp	3,941	3,932	100%	39	2	62	21	C	82	2600	42	2	1311	5,255	5,219	99%	39	3	60	29	D	83	3451	57	4	1740
Brundage Lane off-ramp to Brundage Lane on-ramp	3,041	3,040	100%	17	1	63	16	B	99	897	14	0	1013	4,265	4,222	99%	17	1	62	23	C	101	1246	20	1	1407
Brundage Lane on-ramp to Union Avenue on-ramp	3,386	3,354	99%	12	1	62	18	C	111	688	11	1	1118	4,625	4,545	98%	12	1	60	25	C	113	931	15	1	1515
Union Avenue on-ramp to Chester Avenue off-ramp	4,116	4,116	100%	23	1	61	17	B	134	1603	26	1	1177	5,395	5,323	99%	23	1	60	22	C	136	2071	34	2	1521
Chester Avenue off-ramp to H Street on-ramp	3,216	3,216	100%	37	1	63	17	B	171	2112	34	1	1081	4,280	4,249	99%	38	2	62	23	C	174	2767	45	2	1416
H Street on-ramp to SR 99 NB off-ramp	4,092	4,070	99%	25	1	61	17	B	196	1695	28	1	1163	4,940	4,901	99%	25	2	60	20	C	199	2041	34	2	1400
SR 99 NB off-ramp to SR 99 SB off-ramp	3,151	3,120	99%	21	1	62	17	B	217	1137	18	1	1040	3,820	3,795	99%	21	1	61	21	C	220	1379	23	1	1265
SR 99 SB off-ramp to SR 99 NB on-ramp	1,902	1,854	97%	23	1	63	15	B	241	763	12	0	927	2,595	2,581	99%	24	1	62	21	C	244	1063	17	1	1291
SR 99 NB on-ramp to Coffee Road off-ramp	3,122	3,068	98%	106	4	62	16	B	346	5591	90	4	1023	4,225	4,290	102%	108	7	61	23	C	352	7819	128	8	1430
Coffee Road off-ramp to Mohawk Street/Truxtun Avenue on-ramp	1,267	1,254	99%	23	1	63	10	A	369	509	8	0	627	2,650	2,650	100%	24	1	62	22	C	375	1091	18	1	1343
Mohawk Street/Truxtun Avenue on-ramp to Coffee Road loop on-ramp	3,866	3,707	96%	53	1	63	15	B	422	3448	55	1	927	6,430	6,355	99%	54	2	62	26	C	429	5911	95	4	1589
Coffee Road loop on-ramp to Coffee Road direct on-ramp	4,136	3,924	95%	13	0	63	16	B	435	855	14	0	981	6,670	6,556	98%	13	1	61	27	D	442	1428	23	1	1639
Coffee Road direct on-ramp to Calloway Drive direct off-ramp	4,551	4,328	95%	49	2	62	17	B	484	3644	59	3	1082	7,220	7,073	98%	50	4	60	29	D	493	5967	99	7	1768
Calloway Drive direct off-ramp to Calloway Drive loop off-ramp	3,666	3,484	95%	11	0	62	14	B	495	660	11	0	871	6,225	6,091	98%	11	1	61	25	C	504	1154	19	1	1523
Calloway Drive loop off-ramp to Calloway Drive on-ramp	2,431	2,285	94%	24	0	63	12	B	519	977	15	0	762	4,875	4,764	98%	25	1	62	26	C	529	2037	33	2	1588
Calloway Drive on-ramp to Allen Road off-ramp	2,916	2,800	96%	58	3	62	14	B	577	2792	45	2	933	5,755	5,589	97%	63	8	58	32	D	591	5615	97	12	1863
Allen Road off-ramp to Allen Road on-ramp	1,101	1,055	96%	26	0	64	5	A	604	494	8	0	352	3,525	3,454	98%	27	1	63	18	C	618	1618	26	1	1151
Allen Road on-ramp to West Beltway off-ramp	1,166	1,117	96%	89	1	64	8	A	693	1758	28	0	372	3,895	3,792	97%	58	3	61	21	C	676	3747	61	3	1264
West Beltway off-ramp to West Beltway loop on-ramp	*— NOT APPLICABLE —*													1,510	1,468	97%	23	0	63	12	B	699	583	9	0	734
West Beltway loop on-ramp to West Beltway direct on-ramp														1,935	1,842	95%	6	0	61	15	B	705	184	3	0	921
West Beltway direct on-ramp to Westside Parkway west end of the network														2,280	2,184	96%	6	1	59	19	C	711	210	4	0	1092
Westside Parkway EB Collector-Distributor 1																										
Begin C-D (Coffee Road loop on-ramp to Coffee Road direct on-ramp)	905	899	99%	12	1	49	22	C	12	144	3	0	899	1,100	1,100	100%	12	1	49	23	C	12	178	4	0	1106
Coffee Road direct on-ramp to end of C-D network (Westside Parkway EB)	1,650	1,650	100%	62	2	53	21	C	73	1499	28	1	828	2,170	2,155	99%	62	2	53	20	C	74	1952	37	1	1078
Westside Parkway EB Collector-Distributor 2																										
Begin C-D to Mohawk Street off-ramp	1,760	1,726	98%	28	1	53	20	C	28	708	13	1	690	2,700	2,608	97%	28	1	53	20	C	28	1070	20	1	1043
Mohawk Street off-ramp to Mohawk Street on-ramp	825	825	100%	26	0	54	11	B	54	368	7	0	471	1,300	1,250	96%	26	1	54	12	B	54	489	9	0	625
Mohawk Street on-ramp to Truxtun Avenue off-ramp (end of C-D network)	935	935	100%	32	1	51	12	B	87	432	8	0	472	1,300	1,247	96%	33	1	51	12	B	87	571	11	0	624
Westside Parkway EB Collector-Distributor 3																										
Westside Parkway EB C-D on-ramp to SR 99 SB off-ramp	1,420	1,356	95%	6	0	52	17	B	6	111	2	0	678	2,170	2,107	97%	6	0	51	17	B	6	173	3	0	1053
SR 99 SB off-ramp to SR 99 SB C-D on-ramp	615	567	92%	26	1	47	8	A	32	191	4	0	567	655	626	96%	26	1	47	8	A	32	212	5	0	626
SR 99 SB C-D on-ramp to Ming Avenue	1,735	1,668	96%	28	1	48	18	C	60	625	13	0	834	1,860	1,805	97%	34	7	44	23	C	66	756	17	4	903
Westside Parkway WB Collector-Distributor																										
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	1,190	1,124	94%	14	0	64	13	B	14	281	4	0	562	1,710	1,653	97%	14	0	64	13	B	14	414	7	0	826
Mohawk Street loop on-ramp to Mohawk Street direct on-ramp	2,014	1,909	95%	15	1	60	22	C	29	472	8	1	955	2,735	2,620	96%	15	1	60	22	C	29	648	11	1	1310
Mohawk Street direct on-ramp to Westside Parkway on-ramp (end of C-D network)	2,599	2,459	95%	17	1	59	24	C	46	699	12	1	1230	3,780	3,672	97%	17	2	59	25	C	46	1043	18	2	1836

Bottleneck

Queue

Table 4-17. AM Peak Hour Measures of Effectiveness for Alternative A—Merging/Diverging Conditions

LOCATION	ANALYSIS TYPE	YEAR 2018 SPEED (mph)	YEAR 2018 DENSITY (veh/ln/mi)	YEAR 2018 LOS (HCM 2000)	YEAR 2038 SPEED (mph)	YEAR 2038 DENSITY (veh/ln/mi)	YEAR 2038 LOS (HCM 2000)
State Route 99 NB							
White Lane loop on-ramp	Merging	48	35.9	**E**	39	49.8	**E**
White Lane diagonal on-ramp	Merging	56	36.5	**E**	51	45.0	**E**
Ming Avenue (from C-D) on-ramp	Merging	58	23.0	C	57	26.9	C
SR 58 on-ramp	Merging	56	28.2	D	53	33.7	D
California Avenue loop on-ramp	Merging	58	29.6	D	56	35.4	**E**
California Avenue diagonal on-ramp	Merging	58	29.3	D	54	35.4	**E**
Buck Owens Boulevard/Sillect Avenue on-ramp	Merging	61	17.5	B	59	22.7	C
White Lane off-ramp	Diverging	62	21.8	C	59	32.1	D
Ming Avenue off-ramp	Diverging	60	19.1	B	57	23.1	C
Westside Parkway (C-D) off-ramp	Diverging	61	21.1	C	59	25.2	C
SR 58 EB off-ramp	Diverging	61	16.9	B	61	19.0	B
California Avenue off-ramp	Diverging	58	34.9	D	56	40.4	**E**
Rosedale Highway off-ramp	Diverging	58	24.1	C	55	28.9	D
Buck Owens Boulevard/Sillect Avenue off-ramp	Diverging	61	19.2	B	60	23.4	C
Airport Drive off-ramp	Diverging	57	23.7	C	55	30.3	D
State Route 99 SB							
Airport Drive on-ramp	Merging	61	22.4	C	59	28.2	D
Rosedale Highway loop on-ramp	Merging	54	21.9	C	52	24.8	C
Rosedale Highway diagonal on-ramp	Merging	57	31.6	D	55	36.4	**E**
California Avenue on-ramp	Merging	59	25.4	C	58	27.0	C
SR 99 SB C-D on-ramp (Westside Parkway EB and SR 58 WB and H Street)	Merging	62	12.8	B	61	17.5	B
Ming Avenue on-ramp	Merging	59	26.6	C	56	37.5	**E**
White Lane loop on-ramp	Merging	61	17.0	B	60	21.7	C
White Lane diagonal on-ramp	Merging	61	18.2	B	60	23.2	C
Rosedale Highway off-ramp	Diverging	61	21.4	C	59	28.0	C
California Avenue off-ramp	Diverging	57	35.0	D	54	40.8	**E**
SR 58 EB off-ramp	Diverging	60	27.5	C	59	29.1	D
SR 99 SB C-D off-ramp (Ming Avenue)	Diverging	61	20.4	C	60	22.7	C
White Lane off-ramp	Diverging	60	21.0	C	55	29.4	D
Westside Parkway/State Route 58 EB							
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			61	15.3	B
West Beltway diagonal on-ramp	Merging				62	18.4	B
Allen Road on-ramp	Merging	60	18.5	B	55	32.6	D
Calloway Drive loop on-ramp	Merging	60	18.9	B	58	29.3	D
Calloway Drive diagonal on-ramp	Merging	57	22.9	C	51	34.3	D
SR 99 NB and SB on-ramp	Merging	63	8.1	A	62	10.5	B
Union Avenue loop on-ramp	Merging	61	17.4	B	61	22.1	C
Union Avenue diagonal on-ramp	Merging	61	20.4	C	60	25.3	C
Cottonwood Road on-ramp	Merging	61	17.8	B	61	21.0	C
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			47	24.4	C
Allen Road off-ramp	Diverging	65	5.1	A	62	19.1	B
Calloway diagonal off-ramp	Diverging	62	18.6	B	60	30.4	D
Coffee Road off-ramp	Diverging	61	25.3	C	60	35.7	**E**
Westside Parkway EB C-D off-ramp (Mohawk Street and Truxtun Avenue)	Diverging	61	16.4	B	60	22.6	C
H Street off-ramp	Diverging	63	8.9	A	63	14.6	B
Cottonwood Road off-ramp	Diverging	61	20.1	C	61	25.0	C
Coffee Road C-D on-ramp to SR 99 SB C-D off-ramp (SR 99 SB and Ming Avenue)	Weaving	63	11.8	B	61	19.8	B
Chester Avenue on-ramp to Union Avenue off-ramp	Weaving	61	15.0	B	60	19.8	B
Westside Parkway/State Route 58 WB							
Brundage Lane on-ramp (Cottonwood Road)	Merging	63	18.1	B	60	30.6	D
Brundage Lane on-ramp (Union Avenue)	Merging	62	17.9	B	60	24.7	C
Truxtun Avenue/Mohawk Street (C-D) on-ramp	Merging	63	10.8	B	63	16.4	B
Coffee Road loop on-ramp	Merging	63	12.2	B	62	18.0	B
Calloway Drive on-ramp	Merging	62	10.4	B	61	20.5	C
Allen Road on-ramp	Merging	63	4.5	A	62	14.3	B
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			62	10.6	B
West Beltway diagonal on-ramp	Merging				60	13.3	B
Brundage Lane off-ramp (Cottonwood Road)	Diverging	64	17.0	B	63	27.3	C
Brundage Lane off-ramp (Union Avenue)	Diverging	62	19.9	B	59	32.0	D
SR 99 SB off-ramp	Diverging	62	12.8	B	61	18.7	B
Allen Road off-ramp	Diverging	61	8.2	A	60	22.1	C
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			62	13.5	B
Union Avenue on-ramp to Chester Avenue off-ramp	Weaving	61	16.0	B	60	21.0	C
H Street on-ramp to SR 99 NB off-ramp	Weaving	61	16.0	B	60	20.0	C
SR 99 NB on-ramp to Coffee Road off-ramp	Weaving	63	14.0	B	61	20.0	C
Coffee Road Direct on-ramp to Calloway Drive loop off-ramp	Weaving	60	17	B	62	19	B

Note: Merge/diverge calculations are based on 1,500 feet from on/off ramp. These calculations also include two right-most mainline lanes within 1,500 feet.

Table 4-18. PM Peak Hour Measures of Effectiveness for Alternative A—Merging/Diverging Conditions

LOCATION	ANALYSIS TYPE	YEAR 2018 SPEED (mph)	YEAR 2018 DENSITY (veh/ln/mi)	YEAR 2018 LOS (HCM 2000)	YEAR 2038 SPEED (mph)	YEAR 2038 DENSITY (veh/ln/mi)	YEAR 2038 LOS (HCM 2000)
State Route 99 NB							
White Lane loop on-ramp	Merging	51	29.7	D	44	41.2	**E**
White Lane diagonal on-ramp	Merging	58	31.8	D	54	40.2	**E**
Ming Avenue (from C-D) on-ramp	Merging	60	18.2	B	59	21.1	C
SR 58 on-ramp	Merging	59	22.2	C	57	26.5	C
California Avenue loop on-ramp	Merging	58	27.4	C	53	34.9	D
California Avenue diagonal on-ramp	Merging	57	28.6	D	46	40.6	**E**
Buck Owens Boulevard/Sillect Avenue on-ramp	Merging	59	20.0	C	59	25.2	C
White Lane off-ramp	Diverging	63	19.8	B	61	30.3	D
Ming Avenue off-ramp	Diverging	60	17.5	B	50	24.7	C
Westside Parkway (C-D) off-ramp	Diverging	60	18.7	B	50	27.6	C
SR 58 EB off-ramp	Diverging	61	14.8	B	59	18.0	B
California Avenue off-ramp	Diverging	60	27.7	C	59	32.3	D
Rosedale Highway off-ramp	Diverging	59	23.0	C	52	29.0	D
Buck Owens Boulevard/Sillect Avenue off-ramp	Diverging	61	17.9	B	60	21.7	C
Airport Drive off-ramp	Diverging	58	24.4	C	56	30.3	D
State Route 99 SB							
Airport Drive on-ramp	Merging	58	28.4	D	51	41.0	**E**
Rosedale Highway loop on-ramp	Merging	45	32.6	D	34	46.7	**E**
Rosedale Highway diagonal on-ramp	Merging	52	43.0	**E**	32	73.5	**F**
California Avenue on-ramp	Merging	53	36.7	**E**	53	35.7	**E**
SR 99 SB C-D on-ramp (Westside Parkway EB and SR 58 WB and H Street)	Merging	61	16.6	B	52	23.3	C
Ming Avenue on-ramp	Merging	57	34.9	D	29	70.4	**F**
White Lane loop on-ramp	Merging	60	22.8	C	60	21.6	C
White Lane diagonal on-ramp	Merging	60	24.7	C	60	24.6	C
Rosedale Highway off-ramp	Diverging	60	26.1	C	55	33.0	D
California Avenue off-ramp	Diverging	53	45.8	**E**	33	76.2	**F**
SR 58 EB off-ramp	Diverging	57	37.6	**E**	56	36.2	**E**
SR 99 SB C-D off-ramp (Ming Avenue)	Diverging	60	26.5	C	60	27.3	C
White Lane off-ramp	Diverging	56	28.6	D	22	65.8	**F**
Westside Parkway/State Route 58 EB							
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			61	14.2	B
West Beltway diagonal on-ramp	Merging				62	17.2	B
Allen Road on-ramp	Merging	61	13.1	B	56	30.2	D
Calloway Drive loop on-ramp	Merging	60	14.7	B	56	29.8	D
Calloway Drive diagonal on-ramp	Merging	60	17.8	B	55	31.5	D
SR 99 NB and SB on-ramp	Merging	62	9.7	A	61	13.6	B
Union Avenue loop on-ramp	Merging	60	22.6	C	57	31.6	D
Union Avenue diagonal on-ramp	Merging	60	25.8	C	57	37.2	E
Cottonwood Road on-ramp	Merging	61	23.3	C	60	28.8	D
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			44	25.4	C
Allen Road off-ramp	Diverging	64	4.3	A	62	17.6	B
Calloway Drive off-ramp	Diverging	63	13.8	B	61	28.2	D
Coffee Road off-ramp	Diverging	62	21.2	C	60	34.1	D
Westside Parkway EB C-D off-ramp (Mohawk Street and Truxtun Avenue)	Diverging	62	12.3	B	61	20.8	C
H Street off-ramp	Diverging	63	9.3	A	63	18.4	B
Cottonwood Road off-ramp	Diverging	61	25.3	C	59	37.9	**E**
Coffee Road C-D on-ramp to SR 99 SB C-D off-ramp (SR 99 SB and Ming Avenue)	Weaving	62	13.4	B	61	23.9	C
Chester Avenue on-ramp to Union Avenue off-ramp	Weaving	61	17.7	B	59	23.7	C
Westside Parkway/State Route 58 WB							
Brundage Lane on-ramp (Cottonwood Road)	Merging	62	21.8	C	60	29.8	D
Brundage Lane on-ramp (Union Avenue)	Merging	61	19.4	B	60	26.6	C
Truxtun Avenue/Mohawk Street (C-D) on-ramp	Merging	63	16.9	B	62	27.5	C
Coffee Road loop on-ramp	Merging	62	19.3	B	61	30.2	D
Calloway Drive on-ramp	Merging	61	18.3	B	57	33.8	D
Allen Road on-ramp	Merging	63	6.6	A	61	19.9	B
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			61	15.0	B
West Beltway diagonal on-ramp	Merging				59	18.5	B
Brundage Lane off-ramp (Cottonwood Road)	Diverging	64	18.9	B	63	26.2	C
Brundage Lane off-ramp (Union Avenue)	Diverging	61	24.0	C	60	31.7	D
SR 99 SB off-ramp	Diverging	61	16.9	B	61	20.6	C
Allen Road off-ramp	Diverging	61	14.8	B	59	25.3	C
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			60	21.1	C
Union Avenue on-ramp to Chester Avenue off-ramp	Weaving	61	18.0	B	60	23.0	C
H Street on-ramp to SR 99 NB off-ramp	Weaving	61	18.0	B	60	21.0	C
SR 99 NB on-ramp to Coffee Road off-ramp	Weaving	62	16.0	B	61	23.0	C
Coffee Road diagonal on-ramp to Calloway Drive loop off-ramp	Weaving	60	22	C	58	31	D

Note: Merge/diverge calculations are based on 1,500 feet from on/off ramp. These calculations also include two right-most mainline lanes within 1,500 feet.

Table 4-19. AM Peak Hour Measures of Effectiveness for Alternative A—On-Ramp and Off-Ramp Performance *(1 of 2)*

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
State Route 99 NB Off-ramps								
White Lane	680	669	98%	61	1,125	1,125	100%	34
Ming Avenue	740	715	97%	53	915	904	99%	52
SR 58 WB	845	841	100%	54	1,125	1,125	100%	54
SR 58 EB	1,025	1,025	100%	54	1,255	1,228	98%	54
California Avenue	970	970	100%	52	1,150	1,134	99%	52
Rosedale Highway	1,880	1,772	94%	54	1,965	1,941	99%	53
Buck Owens Boulevard/Sillect Avenue	570	508	89%	53	795	755	95%	52
Airport Drive	1,505	1,477	98%	52	1,740	1,570	90%	51
State Route 99 NB On-ramps								
White Lane loop	1,630	1,630	100%	41	1,640	1,640	100%	41
White Lane diagonal	705	672	95%	52	695	674	97%	52
Ming Avenue (C-D on)	800	800	100%	51	1,000	1,000	100%	51
SR 58	1,100	1,074	98%	44	1,185	1,164	98%	42
California Avenue loop	860	709	82%	44	1,050	850	81%	44
California Avenue diagonal	370	309	84%	51	480	384	80%	51
Buck Owens Boulevard/Sillect Avenue	400	378	95%	34	720	719	100%	31
State Route 99 SB Off-ramps								
Rosedale Highway	660	660	100%	54	1,375	1,370	100%	54
California Avenue	1,170	1,170	100%	51	1,495	1,457	97%	43
SR 58 EB	905	905	100%	53	955	955	100%	53
SR 99 SB C-D (Ming Avenue)	870	819	94%	53	935	927	99%	53
White Lane	1,420	1,399	99%	54	1,670	1,659	99%	47
State Route 99 SB On-ramps								
Airport Drive	1,280	1,280	100%	47	1,450	1,445	100%	46
Rosedale Highway loop	945	945	100%	37	1,100	1,100	100%	34
Rosedale Highway diagonal	735	725	99%	40	835	828	99%	39
California Avenue	465	463	100%	50	560	560	100%	51
SR 99 SB C-D (SR 58 WB and H Street)	1,585	1,544	97%	51	2,525	2,520	100%	50
Ming Avenue on-ramp to SR 99 NB C-D on-ramp	515	515	100%	51	785	767	98%	50
White Lane loop	175	171	98%	53	260	255	98%	52
White Lane diagonal	370	344	93%	53	445	404	91%	53
State Route 99 NB Collector-Distributor Off-/On-ramps								
Ming Avenue C-D on-ramp	1,165	1,165	100%	31	1,375	1,375	100%	30
SR 99 NB C-D on-ramp	845	841	100%	54	1,125	1,125	100%	54
Westside Parkway C-D off-ramp	1,500	1,455	97%	54	1,500	1,500	100%	54
State Route 99 SB Collector-Distributor Off-/On-ramps								
SR 58 WB on-ramp	1,025	1,002	98%	39	1,200	1,200	100%	39
Westside Parkway C-D on-ramp	560	547	98%	44	1,325	1,305	98%	44

Table 4-19. AM Peak Hour Measures of Effectiveness for Alternative A—On-Ramp and Off-Ramp Performance *(2 of 2)*

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
Westside Parkway/State Route 58 EB Off-ramps								
West Beltway	*— NOT APPLICABLE —*				745	743	100%	50
Allen Road	60	60	100%	55	380	374	98%	53
Calloway Drive	525	525	100%	54	960	954	99%	53
Coffee Road	640	640	100%	53	1,025	1,006	98%	53
Mohawk Street/Truxtun Avenue C-D	2,390	2,371	99%	53	3,090	3,031	98%	52
SR 99 SB/Ming Avenue C-D	1,130	1,107	98%	54	1,880	1,852	99%	53
H Street	260	256	98%	54	282	268	95%	54
Union Avenue	715	709	99%	54	1,035	988	95%	54
Cottonwood Road	415	415	100%	54	630	605	96%	53
Westside Parkway/State Route 58 EB On-ramps								
West Beltway loop	*— NOT APPLICABLE —*				1,525	1,406	92%	48
West Beltway diagonal					290	282	97%	54
Allen Road	1,710	1,707	100%	42	2,000	1,990	100%	44
Calloway Drive loop	740	737	100%	47	940	933	99%	47
Calloway Drive diagonal	1,060	1,057	100%	51	1,150	1,130	98%	50
Coffee Road (C-D)	1,400	1,379	99%	53	1,875	1,874	100%	52
SR 99 NB and SR 99 SB	1,565	1,565	100%	52	1,887	1,857	98%	52
Chester Avenue	750	734	98%	51	1,025	1,008	98%	51
Union Avenue loop	320	287	90%	53	340	325	96%	52
Union Avenue diagonal	345	345	100%	52	325	325	100%	52
Cottonwood Road	300	300	100%	52	310	309	100%	52
Westside Parkway/State Route 58 WB Off-ramps								
Cottonwood Road	255	253	99%	54	235	215	91%	54
Brundage Lane	670	667	100%	52	1,180	1,180	100%	19
Chester Avenue	975	919	94%	54	1,030	1,009	98%	54
SR 99 NB	1,100	1,078	98%	54	1,185	1,167	98%	54
SR 99 SB	1,025	1,001	98%	52	1,200	1,200	100%	52
Coffee Road	1,670	1,670	100%	53	1,950	1,910	98%	53
Calloway Drive diagonal	650	611	94%	54	650	649	100%	54
Calloway Drive loop	950	948	100%	53	910	884	97%	53
Allen Road	1,085	988	91%	54	1,150	1,112	97%	52
West Beltway	*— NOT APPLICABLE —*				1,500	1,403	94%	54
Westside Parkway/State Route 58 WB On-ramps								
Cottonwood Road	260	244	94%	51	315	303	96%	50
Brundage Lane	385	343	89%	49	365	350	96%	49
Union Avenue	565	565	100%	51	565	532	94%	51
H Street	695	659	95%	50	635	635	100%	50
SR 99 NB/Ming Avenue	1,210	1,210	100%	44	1,500	1,500	100%	41
Truxtun Avenue/Mohawk Street C-D	1,620	1,551	96%	63	2,160	2,127	98%	62
Coffee Road loop	130	125	95%	51	150	150	100%	51
Coffee Road diagonal	255	242	82%	54	300	282	94%	54
Calloway Drive	320	320	100%	52	500	500	100%	53
Allen Road	120	120	100%	50	350	338	97%	50
West Beltway loop	*— NOT APPLICABLE —*				320	299	93%	49
West Beltway diagonal					305	296	97%	54
Westside Parkway EB Collector-Distributor 1 Off-/On-ramps								
Coffee Road loop on-ramp	830	830	100%	41	915	915	100%	41
Coffee Road diagonal on-ramp	570	542	95%	53	960	949	99%	52
Westside Parkway EB Collector-Distributor 2 Off-/On-ramps								
Westside Parkway C-D on-ramp	2,390	2,371	99%	53	3,090	3,031	98%	52
Mohawk Street off-ramp	1,205	1,160	96%	49	1,510	1,497	99%	49
Mohawk Street on-ramp	—	—	—	—	—	—	—	—
Truxtun Avenue off-ramp	1,185	1,185	100%	45	1,580	1,529	97%	45
Westside Parkway EB Collector-Distributor 3 Off-/On-ramps								
Westside Parkway EB C-D on-ramp	1,130	1,107	98%	53	1,880	1,852	99%	53
SR 99 SB C-D off-ramp	560	549	98%	48	1,325	1,305	98%	49
SR 99 SB C-D on-ramp	870	816	94%	47	935	926	99%	47
Westside Parkway WB Collector-Distributor Off-/On-ramps								
Truxtun Avenue on-ramp	780	751	96%	63	800	780	98%	63
Mohawk Street loop on-ramp	445	444	100%	47	505	502	99%	47
Mohawk Street direct on-ramp	395	365	92%	51	855	840	98%	51

Table 4-20. PM Peak Hour Measures of Effectiveness for Alternative A—On-Ramp and Off-Ramp Performance *(1 of 2)*

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
State Route 99 NB Off-ramps								
White Lane	690	676	98%	62	1,080	1,053	98%	60
Ming Avenue	835	835	100%	52	850	802	94%	52
SR 58 WB	830	830	100%	54	1,130	1,130	100%	54
SR 58 EB	1,155	1,105	96%	54	1,665	1,609	97%	53
California Avenue	630	626	99%	52	710	709	100%	51
Rosedale Highway	1,760	1,729	98%	53	1,800	1,673	93%	53
Buck Owens Boulevard/Sillect Avenue	365	365	100%	52	400	365	91%	53
Airport Drive	1,365	1,278	94%	52	1,365	1,275	93%	52
State Route 99 NB On-ramps								
White Lane loop	1,485	1,485	100%	44	1,655	1,476	89%	44
White Lane diagonal	605	592	98%	53	685	665	97%	52
Ming Avenue (C-D on)	705	705	100%	52	850	846	100%	51
SR 58	940	940	100%	45	1,120	1,101	98%	43
California Avenue loop	905	728	80%	45	1,375	908	66%	44
California Avenue diagonal	660	499	76%	51	900	666	74%	50
Buck Owens Boulevard/Sillect Avenue	715	715	100%	31	790	783	99%	31
State Route 99 SB Off-ramps								
Rosedale Highway	710	710	100%	54	1,310	1,292	99%	53
California Avenue	1,395	1,373	98%	44	1,655	1,655	100%	30
SR 58 EB	1,375	1,346	98%	52	1,440	1,375	95%	52
SR 99 SB C-D (Ming Avenue)	1,120	1,100	98%	53	1,205	1,199	100%	52
White Lane	2,015	2,009	100%	52	2,070	1,855	90%	9
State Route 99 SB On-ramps								
Airport Drive	1,765	1,765	100%	46	2,070	2,070	100%	40
Rosedale Highway loop	1,335	1,335	100%	34	1,375	1,350	98%	29
Rosedale Highway diagonal	1,105	1,068	97%	37	1,340	1,225	91%	32
California Avenue	920	838	91%	51	940	825	88%	50
SR 99 SB C-D (SR 58 WB and H Street)	2,055	2,041	99%	51	2,740	2,740	100%	47
Ming Avenue on-ramp to SR 99 NB C-D on-ramp	650	650	100%	51	845	845	100%	28
White Lane loop	510	504	99%	52	550	542	99%	51
White Lane diagonal	480	287	60%	53	645	555	86%	53
State Route 99 NB Collector-Distributor Off-/On-ramps								
Ming Avenue C-D on-ramp	1,095	1,095	100%	33	1,350	1,337	99%	32
SR 99 NB C-D on-ramp	830	830	100%	54	1,130	1,130	100%	54
Westside Parkway C-D off-ramp	1,220	1,220	100%	54	1,630	1,630	100%	53
State Route 99 SB Collector-Distributor Off-/On-ramps								
SR 58 WB on-ramp	1,225	1,195	98%	39	1,225	1,213	99%	39
Westside Parkway C-D on-ramp	1,515	1,457	96%	44	1,515	1,465	97%	41

Table 4-20. PM Peak Hour Measures of Effectiveness for Alternative A—On-Ramp and Off-Ramp Performance *(2 of 2)*

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
Westside Parkway/State Route 58 EB Off-ramps								
West Beltway	*— NOT APPLICABLE —*				870	861	99%	49
Allen Road	85	81	95%	54	310	294	95%	54
Calloway Drive	475	469	99%	54	800	752	94%	53
Coffee Road	595	547	92%	53	825	802	97%	53
Mohawk Street/Truxtun Avenue C-D	1,760	1,728	98%	54	2,700	2,611	97%	53
SR 99 SB/Ming Avenue C-D	1,420	1,354	95%	53	2,170	2,112	97%	52
H Street	290	290	100%	54	308	308	100%	54
Union Avenue	780	757	97%	54	1,025	994	97%	54
Cottonwood Road	440	424	96%	54	905	845	93%	53
Westside Parkway/State Route 58 EB On-ramps								
West Beltway loop	*— NOT APPLICABLE —*				1,340	1,320	99%	48
West Beltway diagonal					275	270	98%	54
Allen Road	1,280	1,170	91%	47	1,875	1,833	98%	46
Calloway Drive loop	715	690	97%	47	1,040	1,040	100%	47
Calloway Drive diagonal	975	960	98%	52	1,110	1,055	95%	52
Coffee Road (C-D)	1,650	1,650	100%	53	2,170	2,155	99%	52
SR 99 NB and SR 99 SB	2,120	2,041	96%	52	2,698	2,553	95%	51
Chester Avenue	990	952	96%	50	1,190	1,162	98%	50
Union Avenue loop	560	536	96%	53	665	655	98%	52
Union Avenue diagonal	415	415	100%	52	575	572	99%	52
Cottonwood Road	390	390	100%	52	300	300	100%	52
Westside Parkway/State Route 58 WB Off-ramps								
Cottonwood Road	260	260	100%	54	305	305	100%	54
Brundage Lane	900	894	99%	52	990	990	100%	44
Chester Avenue	900	883	98%	51	1,115	1,074	96%	52
SR 99 NB	940	940	100%	54	1,120	1,103	98%	54
SR 99 SB	1,250	1,250	100%	52	1,225	1,213	99%	52
Coffee Road	1,855	1,812	98%	53	1,575	1,575	100%	54
Calloway Drive diagonal	885	841	95%	53	995	975	98%	53
Calloway Drive loop	1,235	1,198	97%	53	1,350	1,325	98%	52
Allen Road	1,815	1,749	96%	54	2,230	2,120	95%	51
West Beltway	*— NOT APPLICABLE —*				2,385	2,308	97%	46
Westside Parkway/State Route 58 WB On-ramps								
Cottonwood Road	410	408	100%	50	530	505	95%	50
Brundage Lane	345	336	97%	49	360	351	98%	49
Union Avenue	730	730	100%	51	770	759	99%	51
H Street	875	816	93%	50	660	647	98%	50
SR 99 NB/Ming Avenue	1,220	1,217	100%	44	1,630	1,630	100%	37
Truxtun Avenue/Mohawk Street C-D	2,599	2,457	95%	62	3,780	3,672	97%	61
Coffee Road loop	270	231	86%	51	240	222	93%	51
Coffee Road diagonal	415	403	97%	54	550	513	93%	54
Calloway Drive	482	482	100%	52	880	857	97%	52
Allen Road	65	65	100%	51	370	356	96%	50
West Beltway loop	*— NOT APPLICABLE —*				425	425	100%	49
West Beltway diagonal					345	331	96%	53
Westside Parkway EB Collector-Distributor 1 Off-/On-ramps								
Coffee Road loop on-ramp	1,100	1,100	100%	41	1,100	1,100	100%	41
Coffee Road diagonal on-ramp	1,070	1,070	100%	53	1,070	1,053	98%	52
Westside Parkway EB Collector-Distributor 2 Off-/On-ramps								
Westside Parkway C-D on-ramp	2,700	2,610	97%	53	2,700	2,611	97%	53
Mohawk Street off-ramp	1,400	1,377	98%	49	1,400	1,355	97%	49
Mohawk Street on-ramp	—	—	—	—	—	—	—	—
Truxtun Avenue off-ramp	1,300	1,211	93%	45	1,300	1,247	96%	45
Westside Parkway EB Collector-Distributor 3 Off-/On-ramps								
Westside Parkway EB C-D on-ramp	2,170	2,094	96%	53	2,170	2,112	97%	52
SR 99 SB C-D off-ramp	1,515	1,462	97%	48	1,515	1,474	97%	46
SR 99 SB C-D on-ramp	1,205	1,116	93%	47	1,205	1,196	99%	46
Westside Parkway WB Collector-Distributor Off-/On-ramps								
Truxtun Avenue on-ramp	1,190	1,123	94%	63	1,710	1,653	97%	63
Mohawk Street loop on-ramp	824	808	98%	47	1,025	1,000	98%	47
Mohawk Street direct on-ramp	585	526	90%	51	1,045	1,014	97%	50

Table 4-21. Ramp Termini and Intersection Level of Service for Alternative A *(1 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
1. I-5 SB ramps/Stockdale Highway	NB/SB two-way stop	A	4.7	A	8.8	A	5.3	**F**	**66.3**
	Imp-Signal*	N/A				B	11.4	B	11.2
2. I-5 NB ramps/Stockdale Highway	NB/SB two-way stop	A	6.4	A	8.4	A	7.2	B	16.8
3. SR 43 (Enos Lane)/Rosedale Highway	4-way stop	B	14.4	D	32.0	D	28.5	**F**	**81.9**
	Imp-Signal	N/A				C	26.8	C	32.6
4. SR 43 (Enos Lane)/Stockdale Highway	4-way stop	**F**	**52.9**	**F**	**86.3**	**F**	**>150**	**F**	**>150**
	Imp-Signal	C	20.5	C	23.6	B	15.5	C	22.1
5. SR 43 (Enos Lane)/I-5 NB ramps	EB/WB two-way stop	A	5.5	B	11.1	A	4.3	B	10.1
6. SR 43 (Enos Lane)/I-5 SB ramps	EB/WB two-way stop	A	8.1	C	15.8	A	4.1	C	21.2
7. Stockdale Highway/Nord Road	Signal	D	39.5	C	29.6	C	34.5	C	32.4
8. Stockdale Highway/Wegis Avenue	NB/SB two-way stop	A	7.4	B	10.5	**F**	**>150**	**F**	**>150**
	Imp-Signal*	N/A				C	31.5	C	30.7
9. Stockdale Highway/Heath Road	Stop (existing) Signal (future)	B	14.9	B	18.0	C	23.8	C	26.7
10. Stockdale Highway/Westside Parkway	Signal	A	7.4	B	18.0	A	9.0	A	8.3
11. West Beltway/Westside Parkway WB ramp	Signal	*Does not exist in 2018*				A	8.5	B	17.2
12. West Beltway/Westside Parkway EB ramp	Signal	*Does not exist in 2018*				A	8.3	B	15.3
13. Allen Road/Rosedale Highway	Signal*	C	34.4	D	41.4	D	36.1	D	48.0
14. Allen Road/Brimhall Road	Signal	C	24.9	C	31.9	C	23.5	C	34.4
15. Allen Road/Westside Parkway WB ramps	Signal	B	14.0	C	29.4	B	17.5	C	29.3
16. Allen Road/Westside Parkway EB ramps	Signal	B	19.9	A	8.2	B	10.9	B	11.5
17. Allen Road/San Juan Avenue	Signal*	C	23.3	C	20.6	C	22.7	C	26.5
18. Allen Road/Stockdale Highway	Signal	C	24.4	C	26.0	C	31.1	C	33.0
19. Calloway Drive/Rosedale Highway	Signal*	D	47.3	D	39.7	D	53.2	E	58.6
20. Calloway Drive/Brimhall Road	Signal	C	26.4	C	30.5	C	29.8	C	35.0
21. Calloway Drive/Westside Parkway WB ramps	Signal	B	18.3	B	15.8	B	19.2	C	28.3
22. Calloway Drive/Westside Parkway EB ramps	Signal	B	15.6	A	7.4	B	11.2	A	7.5
23. Calloway Drive/Stockdale Highway	Signal	D	47.6	C	31.4	D	42.9	D	37.0
24. Coffee Road/Rosedale Highway*	Signal*	D	46.1	**F**	**92.7**	E	64.0	**F**	**83.7**

Table 4-21. Ramp Termini and Intersection Level of Service for Alternative A *(2 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
25. Coffee Road/Brimhall Road	Signal	C	22.4	C	26.4	C	32.0	C	31.6
26. Coffee Road/Westside Parkway WB ramps	Unsignalized	N/A				N/A			
27. Coffee Road/Westside Parkway EB ramps	Signal	B	16.9	A	7.2	B	18.2	B	11.0
28. Coffee Road/Truxtun Avenue	Signal	B	13.3	B	15.3	B	12.4	B	18.5
29. Coffee Road/Stockdale Highway	Signal*	D	37.7	D	52.7	E	64.7	**F**	**92.6**
30. Mohawk Street/Rosedale Highway	Stop (existing)* Signal (future)*	D	50.4	**F**	**87.0**	E	64.5	**F**	**106.9**
31. Mohawk Street/WSP WB ramps	Signal	N/A				N/A			
32. Mohawk Street/WSP EB ramps	Signal	C	21.5	B	16.4	B	11.8	B	13.8
33. Mohawk Street/Truxtun Avenue	Signal	C	26.8	C	27.1	C	26.4	C	25.5
34. Mohawk Street/California Avenue	Signal*	C	30.8	E	62.3	D	36.1	E	65.4
35. Stockdale Highway/California Avenue	Signal*	D	39.7	E	58.5	D	42.4	E	74.2
36. Airport Drive/State Road–SR 204 off-ramp	Signal	C	23.6	C	22.3	C	22.2	C	22.6
37. Airport Drive/SR 99 NB ramp	Signal	A	9.3	B	12.0	A	9.5	B	11.6
38. Buck Owens Boulevard/Rio Mirada Drive	Signal	C	23.4	C	23.4	C	21.7	C	25.0
39. SR 99 NB ramps/Buck Owens Boulevard	Signal	C	34.4	D	43.7	D	41.7	D	43.4
40. Rosedale Highway/Camino Del Rio Court	Signal	C	27.1	D	38.5	C	30.4	D	49.4
41. Rosedale Highway/SR 99 SB ramps	Signal	B	17.6	B	16.8	C	21.2	C	21.8
42. Rosedale Highway/SR99 NB ramps	Signal	C	25.9	C	28.9	C	33.2	D	42.9
43. 24th Street/Oak Street	Signal	C	32.1	C	32.2	C	25.9	D	38.4
44. Truxtun Avenue/Empire Drive	Signal*	C	29.9	C	27.0	C	29.4	C	28.1
45. Truxtun Avenue/Oak Street	Signal	C	30.3	D	44.3	D	52.0	D	46.3
46. California Avenue/Chester Lane	Signal	C	20.8	D	53.6	C	20.2	**F**	**130.7**
47. California Avenue/SR 99 SB ramps	Signal	D	43.5	E	65.9	E	57.8	**F**	**90.3**
48. California Avenue/SR 99 NB ramps	Signal	C	25.6	C	25.8	C	32.5	C	25.9
49. California Avenue/Oak Street	Signal	C	27.8	D	41.0	C	29.7	E	58.6
50. Stockdale Highway/Stine Road	Signal*	C	25.4	D	52.5	C	30.7	**F**	**89.5**
51. Stockdale Highway/Real Road	Signal	D	39.9	D	40.6	D	36.0	D	53.1
52. Stockdale Highway/SR 99 SB ramp	Signal	*Intersection does not exist in Alternative A*							

Table 4-21. Ramp Termini and Intersection Level of Service for Alternative A *(3 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
53. Brundage Lane/Oak Street	Signal	C	23.6	C	28.1	C	25.9	C	30.4
54. Real Road/SR 58	Signal	*Intersection does not exist in Alternative A*							
55. Wible Road/SR 99 NB ramps	Signal	*Intersection does not exist in Alternative A*							
56. Ming Avenue/New Stine Road	Signal*	C	34.4	D	37.0	D	42.1	D	44.4
57. Ming Avenue/Real Road	Signal	C	30.4	C	30.2	C	30.6	C	29.9
58. Ming Avenue/SR 99 SB ramps	Signal	A	7.6	A	2.8	A	8.8	B	15.7
59. Ming Avenue/Wible Road	Signal	B	15.6	C	25.9	C	25.8	C	28.2
60. Ming Avenue/SR 99 NB ramps	Signal	C	24.4	C	33.1	C	25.1	C	33.6
61. Ming Avenue/Castro Lane	Signal	C	30.0	C	29.9	C	30.1	D	39.8
62. White Lane/Wible Road	Signal*	E	64.8	E	71.9	**F**	**83.6**	**F**	**138.7**
63. White Lane/SR 99 SB ramps	Signal*	C	20.6	**F**	**90.0**	C	29.0	**F**	**88.8**
64. White Lane/SR 99 NB ramps	Signal*	B	10.7	B	12.3	C	23.9	C	20.1
65. White Lane/Hughes Lane	Signal*	D	36.6	D	45.2	D	42.6	D	48.3
66. H Street/Brundage Lane	Signal	C	24.2	D	40.0	C	26.2	D	53.8
67. H Street/SR 58 WB ramp	Signal	C	23.9	D	45.4	B	15.7	D	35.1
68. H Street/SR 58 EB ramp	Signal	C	24.6	C	21.0	C	23.2	C	25.7
69. H Street/Ming Avenue	Signal*	C	30.0	D	40.5	D	35.0	D	42.1
70. Chester Avenue/Brundage Lane	Signal	C	31.1	D	40.5	C	26.2	D	53.8
71. Chester Avenue/SR 58 WB ramp	Signal	B	19.4	C	24.9	C	23.9	C	27.2
72. Chester Avenue/SR 58 EB ramp	Signal	C	25.7	B	17.2	C	29.9	C	31.1
73. Chester Avenue/Ming Avenue	Signal*	D	36.0	D	42.8	D	36.4	D	47.6
74. Union Avenue/Brundage Lane	Signal	C	32.7	C	28.5	D	42.7	D	47.8
75. Brundage Lane/SR 58 WB ramps	Signal	C	32.9	C	22.4	C	24.8	D	41.8
76. Union Avenue/SR 58 EB ramps	Signal	B	13.9	B	12.5	B	19.9	B	18.9
77. Cottonwood Road–MLK/Brundage Lane	Signal	C	23.1	C	25.9	C	25.2	C	27.6
78. Cottonwood Road–Brundage Lane/SR 58 WB ramps	Signal	C	23.1	C	27.3	C	23.3	C	33.1
79. Cottonwood Road/SR 58 EB ramps	Signal	B	11.2	B	19.2	B	11.0	B	18.8

*LOS summary based on SYNCHRO 6
Source: Parsons

4.5 Traffic Performance of Build Alternative B

Alternative B proposes to connect the east end of the Westside Parkway to State Route 58 east near Cottonwood Road by means of a new freeway. This proposed alternative would begin at the Mohawk Street interchange and turn in a southeasterly direction. As illustrated on Figure 4-10, it would span the Kern River, Truxtun Avenue, Carrier Canal, California Avenue and Stockdale Highway before joining the existing State Route 58 east at its existing terminus near the State Route 58/State Route 99 interchange. Improvements on State Route 58 would continue to extend through the H Street and Chester Avenue interchange to Cottonwood Road.

State Route 58 would maintain its existing connections to State Route 99 by means of freeway to freeway connectors. The existing westbound State Route 58 to northbound State Route 99 connector, southbound State Route 99 to eastbound State Route 58 connector, and northbound State Route 99 to eastbound State Route 58 would be preserved with modifications. New branch connectors would be constructed for the eastbound State Route 58 to southbound State Route 99, and northbound State Route 99 to westbound State Route 58 movements.

Auxiliary lanes would be provided on State Route 99 to accommodate the additional traffic from these branch connectors. The limits of improvements on State Route 99 would extend from the interchange at State Route 58 to the Wilson Road overcrossing. All ramps in this vicinity would have to be realigned to provide for the additional lanes. The Wible Road on- and off-ramps south of the existing State Route 99/State Route 58 interchange would be removed to accommodate the northbound State Route 99 on ramp from Ming Avenue. The Stockdale Avenue off-ramp from southbound State Route 99 to the eastbound State Route 58 connector would be removed. Local access from Real Road to State Route 58 and to southbound State Route 99 would also be removed.

The traffic lane configuration of the freeway segments along State Route 58, the Westside Parkway, and State Route 99 are illustrated on Figure 4-11. Also depicted are the relative locations of freeway on- and off-ramps along with traffic demand volumes in the opening year (2018) and the design year.

The alternative B new freeway would bisect existing business parks and residential neighborhoods. The following roads are proposed to cross over or under the proposed freeway alignment:

- Truxtun Avenue
- Commerce Drive
- California Avenue
- Marella Way
- La Mirada Drive
- Stockdale Highway and Stine Road
- South Real Road

The potential closure of Monclair Street, Woodlake Drive, Kensington Avenue, Hillsborough Drive, Kentfield Drive, Joseph Drive, Dunlap Street, Ford Avenue, and Williamson Way would modify existing circulation.

Figure 3-12, shown previously, illustrated the difference between 2038 alternative B and no-build daily traffic volumes, as assigned by the travel forecast model. The bandwidths illustrated in red depicted roadways which receive additional volumes of traffic as a result of constructing the freeway-to-freeway Centennial Project connector. Bandwidths illustrated in

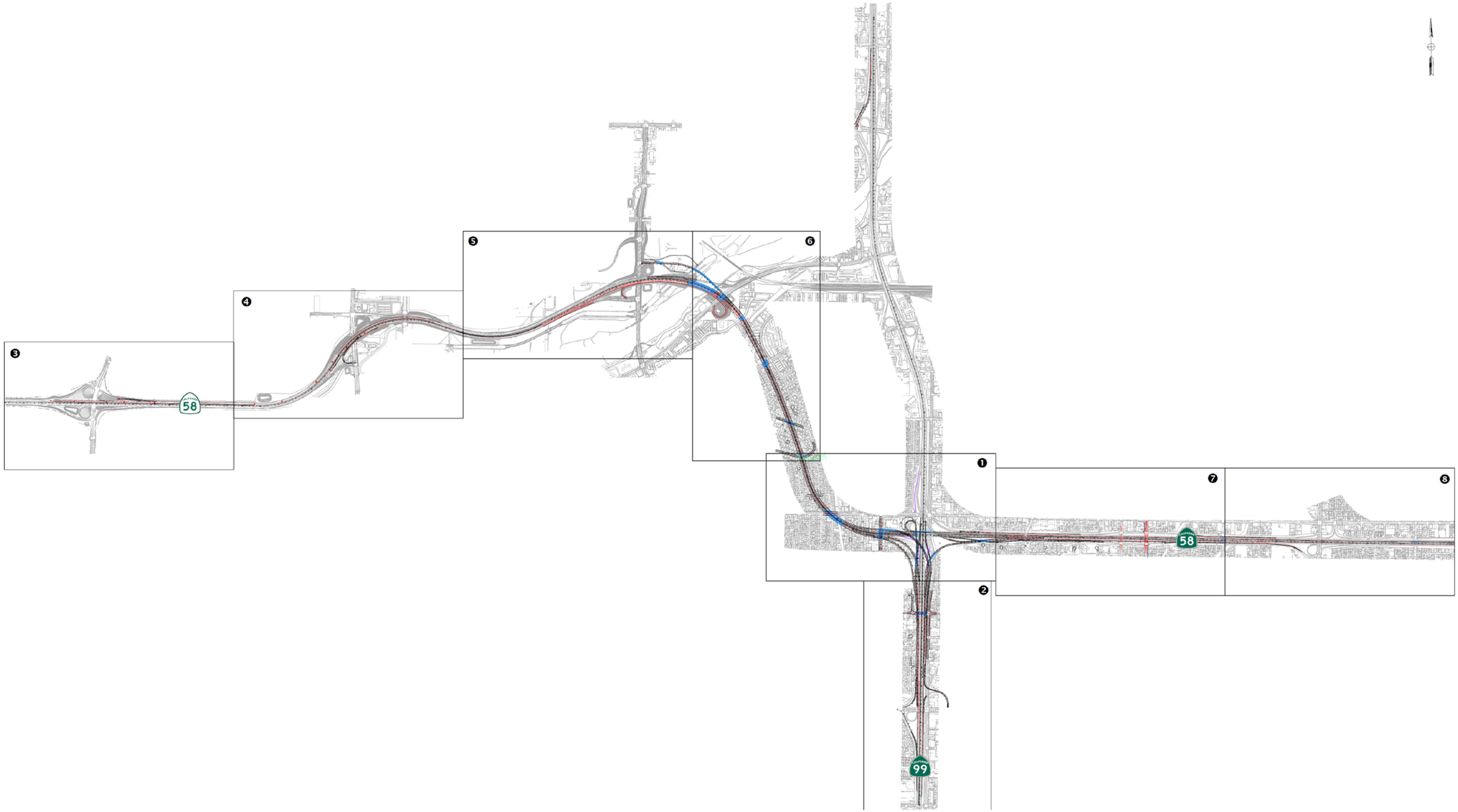


Figure 4-10: Alternative B Proposed Alignment

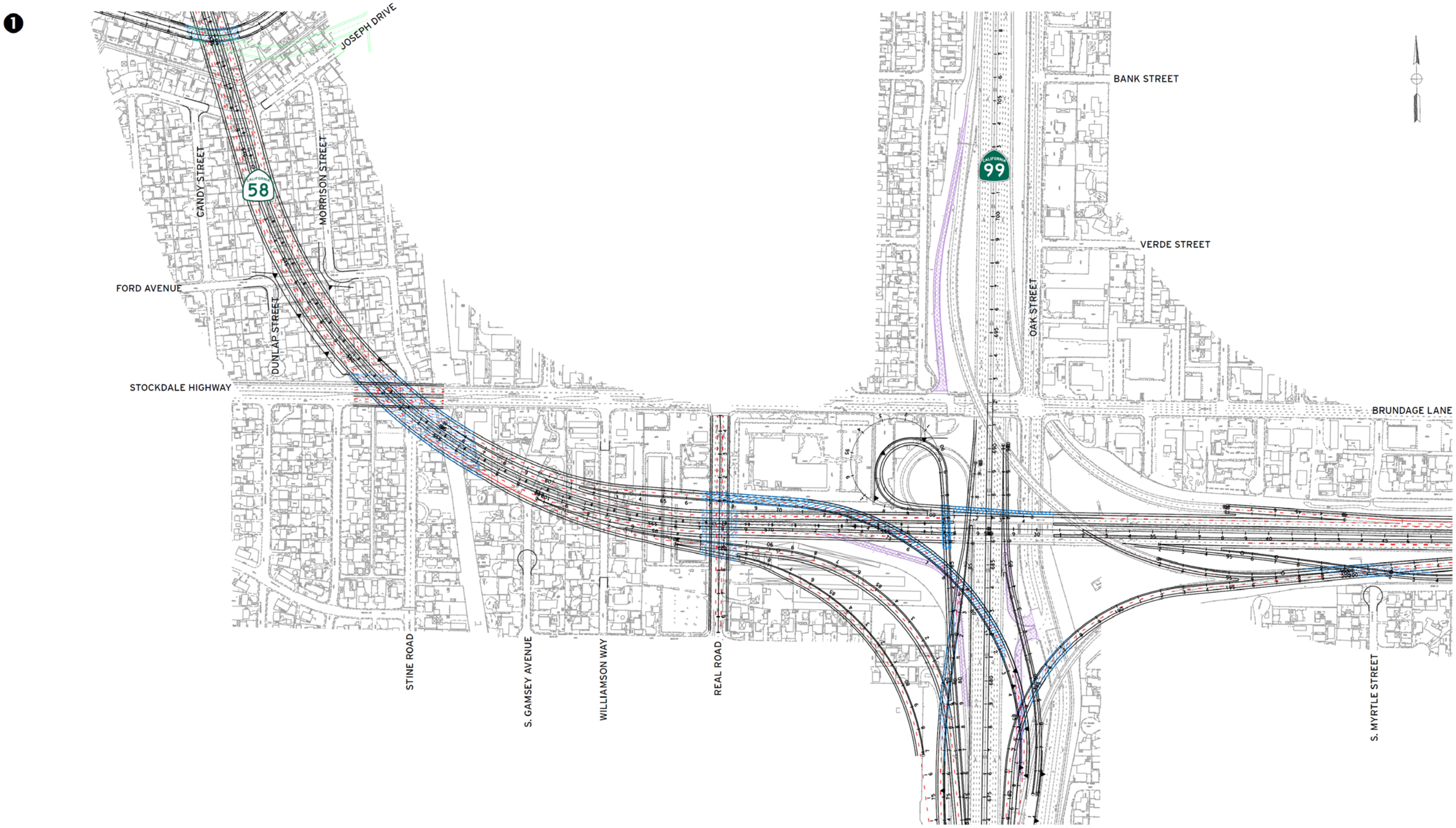


Figure 4-10: Alternative B Proposed Alignment
Sheet 1 of 8

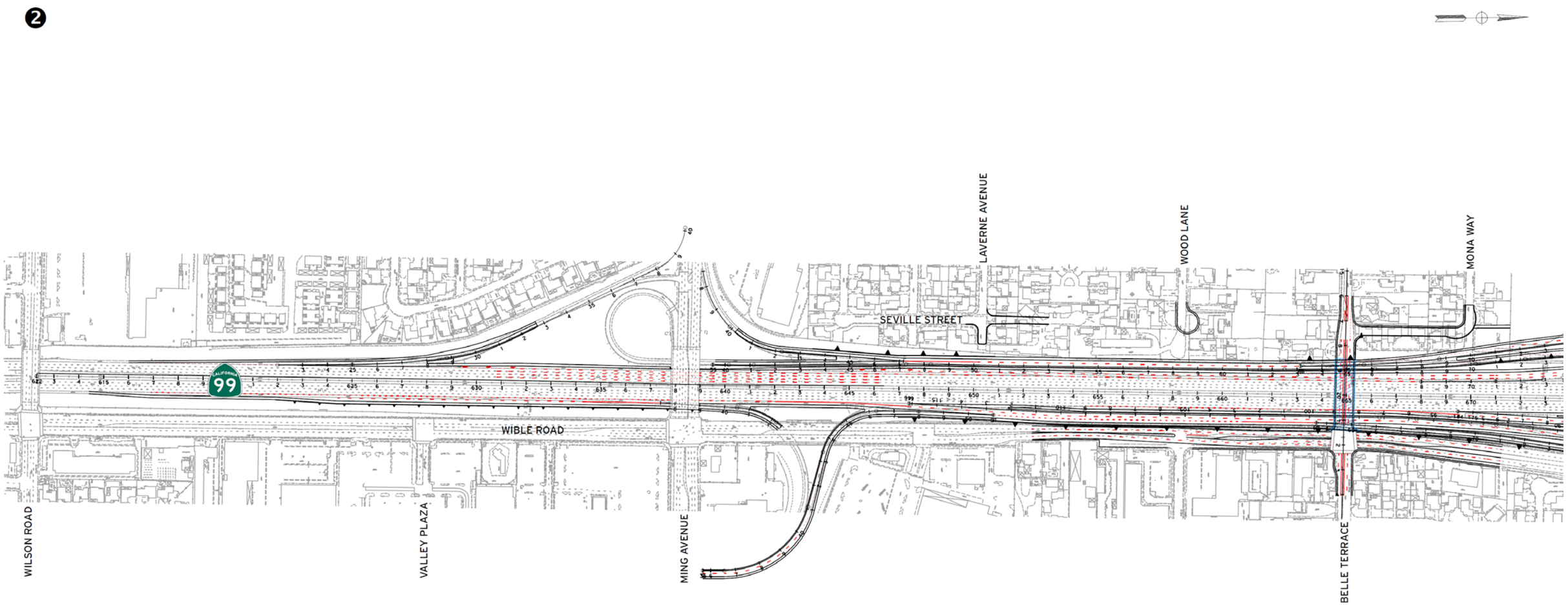


Figure 4-10: Alternative B Proposed Alignment
Sheet 2 of 8

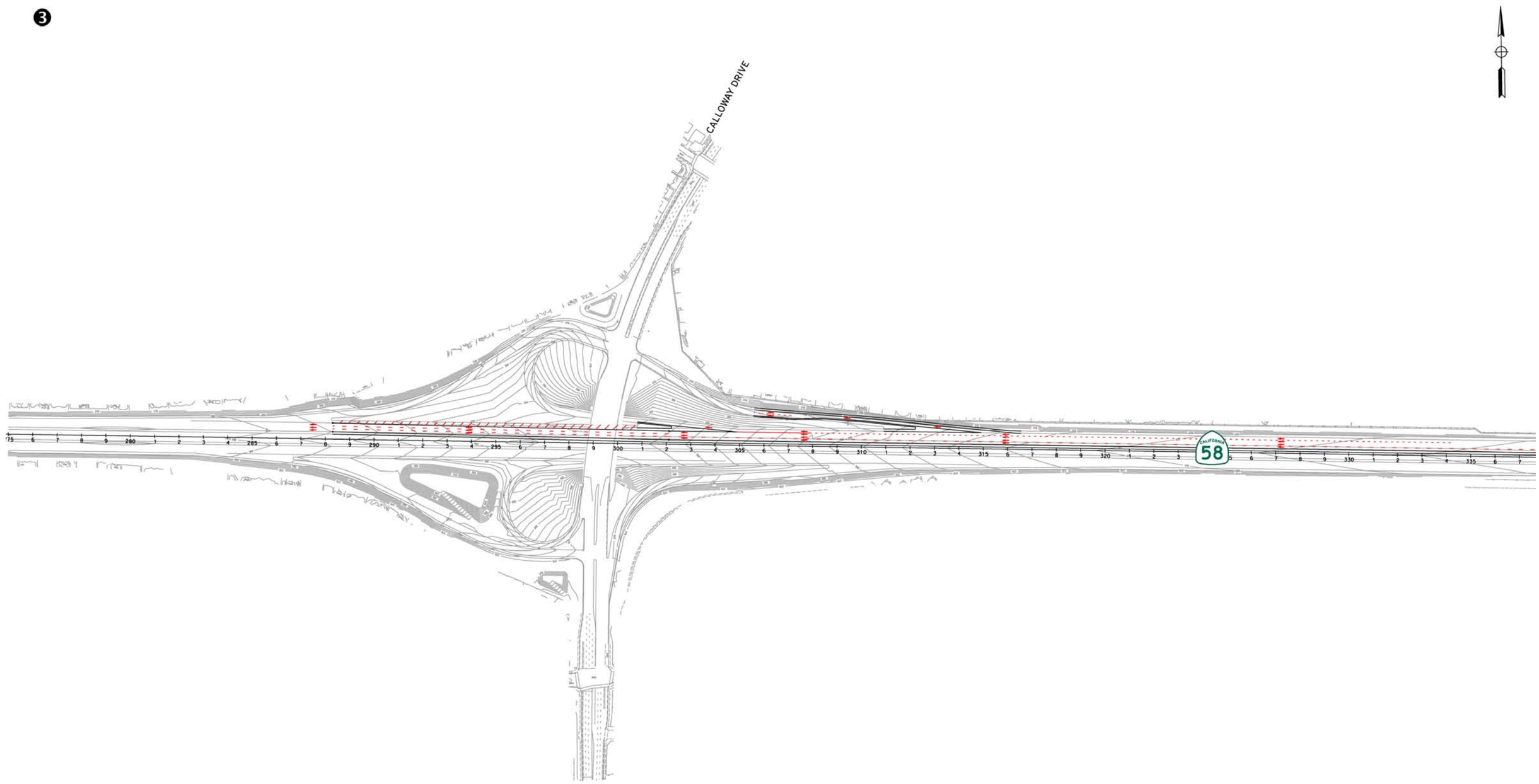


Figure 4-10: Alternative B Proposed Alignment
Sheet 3 of 8

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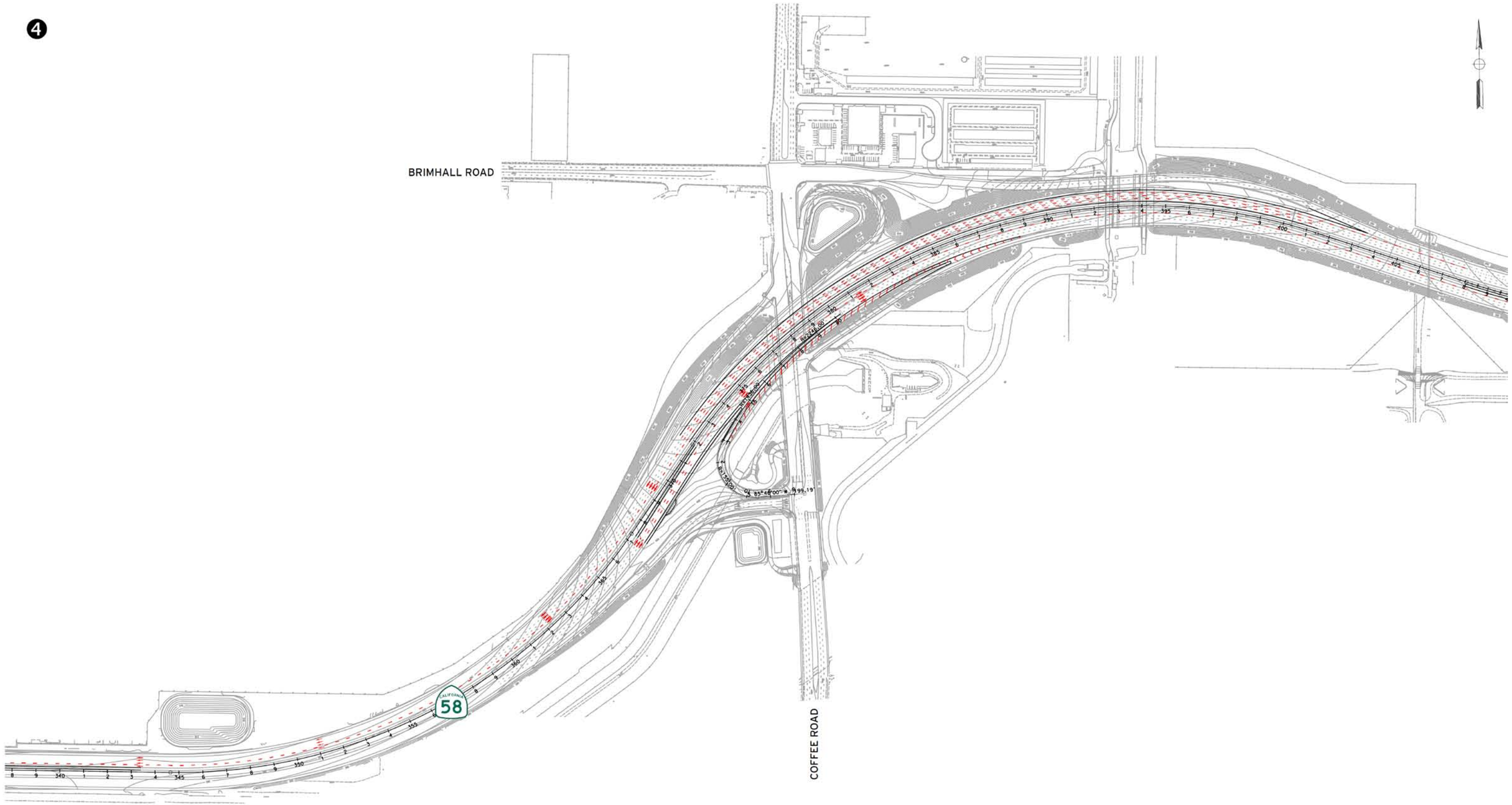

Figure 4-10: Alternative B Proposed Alignment
Sheet 4 of 8

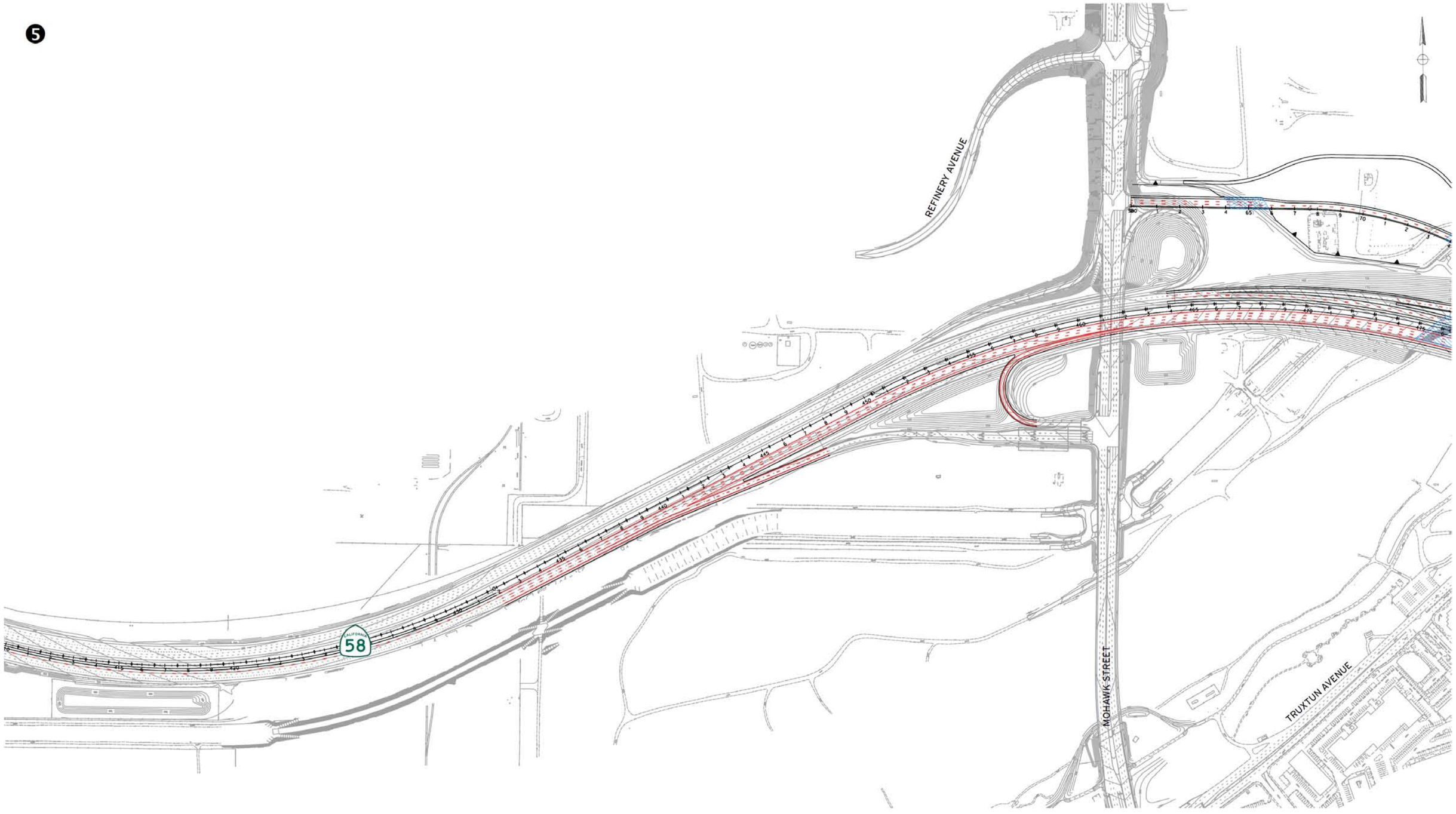

Figure 4-10: Alternative B Proposed Alignment
Sheet 5 of 8

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Figure 4-10: Alternative B Proposed Alignment
Sheet 6 of 8

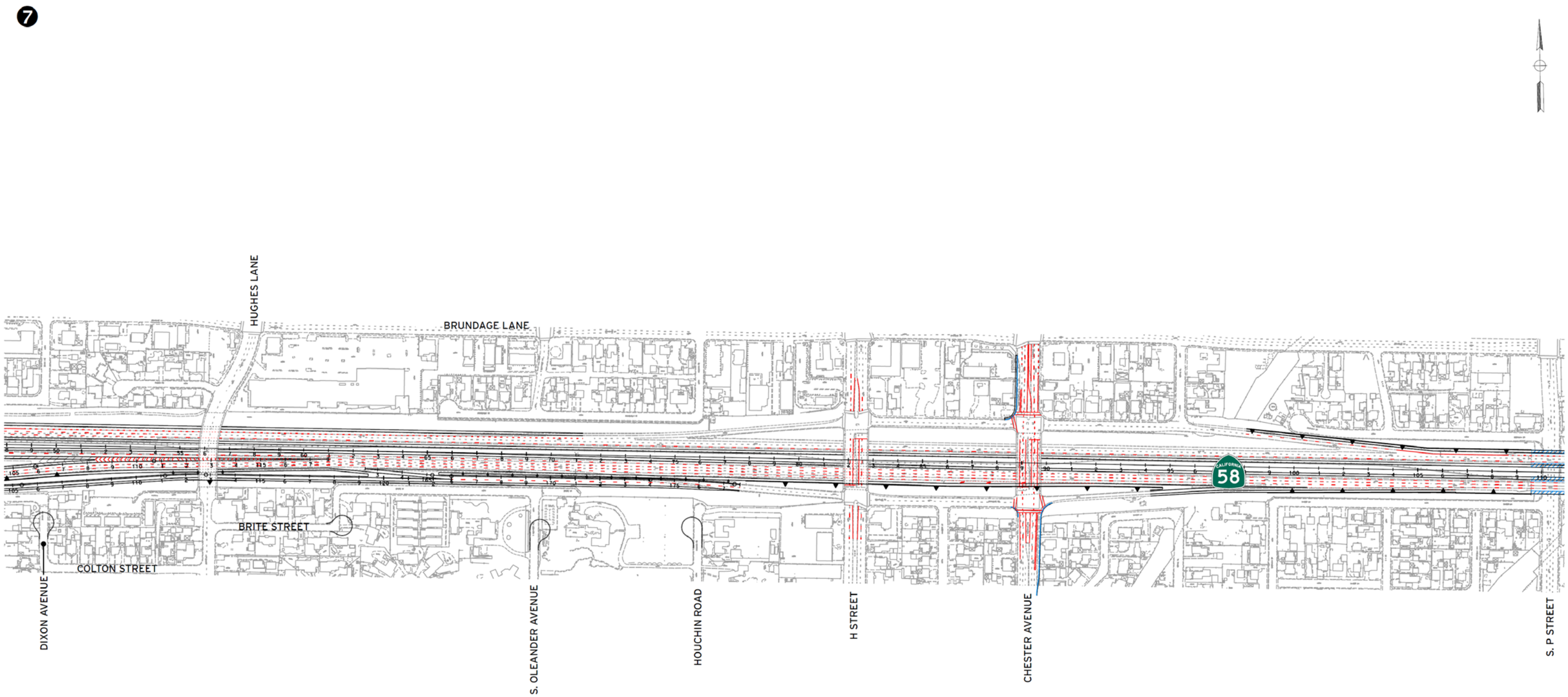

Figure 4-10: Alternative B Proposed Alignment
Sheet 7 of 8

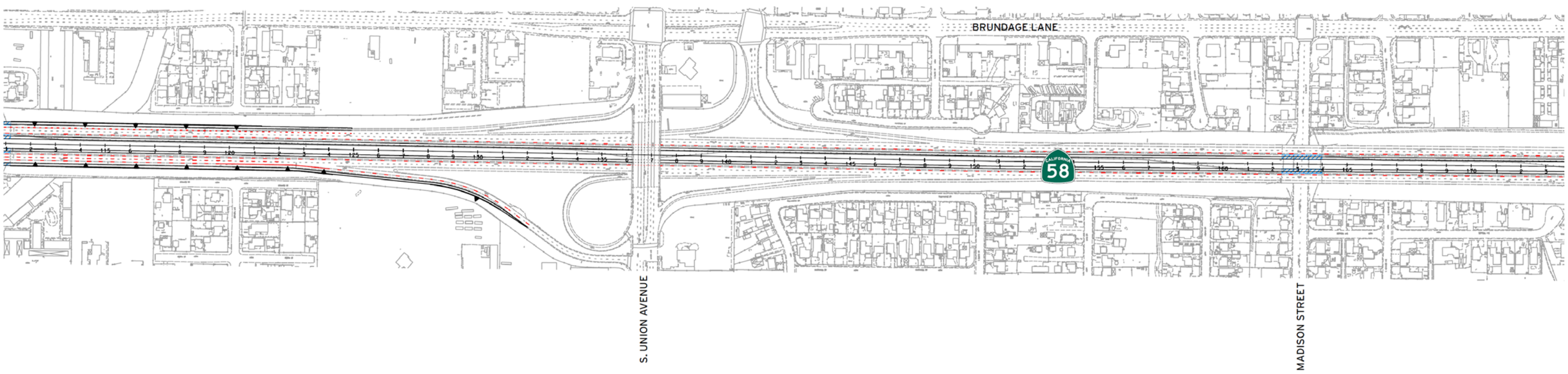

Figure 4-10: Alternative B Proposed Alignment
Sheet 8 of 8

A. State Route 58 and Westside Parkway

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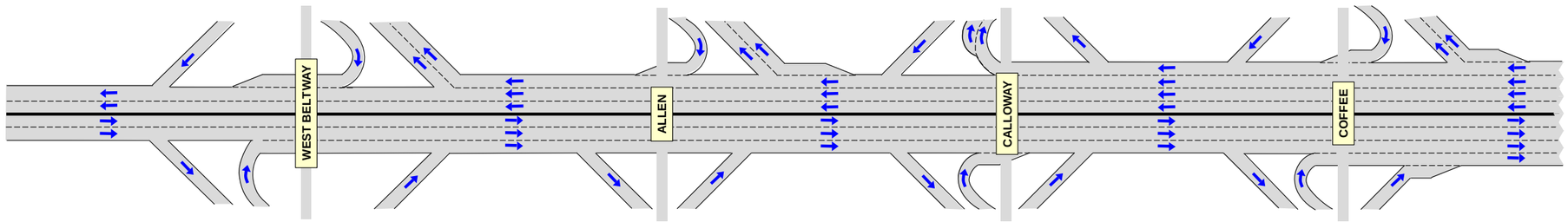
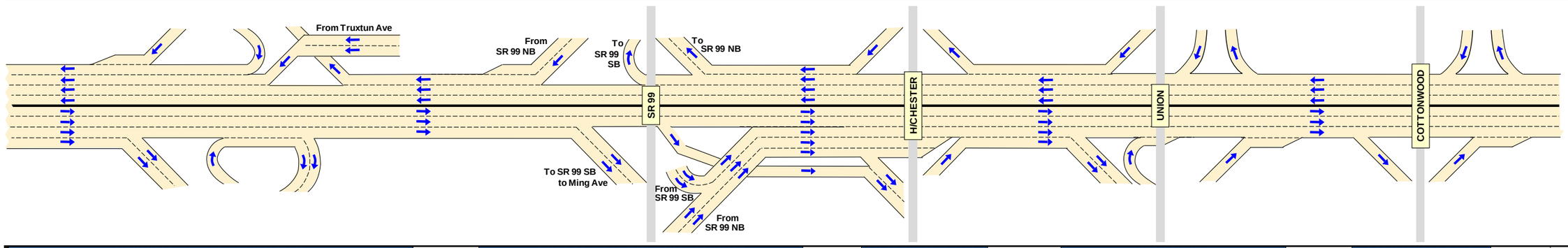
State Route 58 Westbound		MAINLINE	WEST BELTWAY					MAINLINE	ALLEN ROAD			MAINLINE	CALLOWAY DRIVE					MAINLINE	COFFEE ROAD					MAINLINE
			ON	MAINLINE	ON	MAINLINE	OFF		ON	MAINLINE	OFF		ON	MAINLINE	OFF	MAINLINE	OFF		ON	MAINLINE	ON	MAINLINE	OFF	
2038 ALTERNATIVE B	AM Peak	**1,674**	290	**1,384**	305	**1,079**	1,485	**2,564**	380	**2,184**	1,125	**3,309**	575	**2,734**	760	**3,494**	600	**4,094**	325	**3,769**	160	**3,609**	2,175	**5,784**
	PM Peak	**2,320**	360	**1,960**	450	**1,510**	2,190	**3,700**	435	**3,265**	2,125	**5,390**	1,015	**4,375**	1,245	**5,620**	925	**6,545**	575	**5,970**	280	**5,690**	2,030	**7,720**
	ADT	**28,518**	6,050	**22,468**	5,920	**16,548**	24,720	**41,268**	3,650	**37,618**	24,777	**62,395**	10,255	**52,140**	14,800	**66,940**	9,725	**76,665**	5,695	**70,970**	2,965	**68,005**	29,395	**97,400**



State Route 58 Eastbound		MAINLINE	WEST BELTWAY					MAINLINE	ALLEN ROAD			MAINLINE	CALLOWAY DRIVE					MAINLINE	COFFEE ROAD					MAINLINE
			OFF	MAINLINE	ON	MAINLINE	ON		OFF	MAINLINE	ON		OFF	MAINLINE	ON	MAINLINE	ON		OFF	MAINLINE	ON	MAINLINE	ON	
2038 ALTERNATIVE B	AM Peak	**2,220**	725	**1,495**	1,495	**2,990**	300	**3,290**	375	**2,915**	1,995	**4,910**	950	**3,960**	970	**4,930**	1,125	**6,055**	1,075	**4,980**	990	**5,970**	1,070	**7,040**
	PM Peak	**2,215**	865	**1,350**	1,330	**2,680**	265	**2,945**	300	**2,645**	1,850	**4,495**	815	**3,680**	1,010	**4,690**	1,095	**5,785**	875	**4,910**	1,050	**5,960**	1,115	**7,075**
	ADT	**28,565**	11,000	**17,565**	18,850	**36,415**	3,350	**39,765**	4,550	**35,215**	24,175	**59,390**	11,795	**47,595**	10,500	**58,095**	14,355	**72,450**	11,550	**60,900**	14,450	**75,350**	16,050	**91,400**

MOHAWK STREET/TRUXTUN AVENUE							MAINLINE	STATE ROUTE 99 SYSTEM INTERCHANGE					MAINLINE	H ST/CHESTER AVE			MAINLINE	UNION AVENUE					MAINLINE	COTTONWOOD ROAD			MAINLINE	State Route 58 WB	
MOHAWK ON	MAINLINE	MOHAWK ON	MAINLINE	TRUXTUN ON	MAINLINE	MOHAWK OFF		ON	MAINLINE	OFF	MAINLINE	OFF		ON	MAINLINE	OFF		ON	MAINLINE	ON	MAINLINE	OFF		ON	MAINLINE	OFF			
790	**4,994**	655	**4,339**	1,020	**3,319**	880	**4,199**	1,685	**2,514**	1,171	**3,685**	1,100	**4,785**	700	**4,085**	1,095	**5,180**	580	**4,600**	375	**4,225**	1,115	**5,340**	325	**5,015**	205	**5,220**	AM Peak	2038 ALTERNATIVE B
990	**6,730**	1,255	**5,475**	1,865	**3,610**	745	**4,355**	1,745	**2,610**	1,220	**3,830**	1,095	**4,925**	715	**4,210**	1,100	**5,310**	750	**4,560**	355	**4,205**	990	**5,195**	520	**4,675**	295	**4,970**	PM Peak	
11,005	**86,395**	14,625	**71,770**	22,085	**49,685**	9,815	**59,500**	23,940	**35,560**	14,990	**50,550**	15,355	**65,905**	12,835	**53,070**	17,190	**70,260**	9,320	**60,940**	4,810	**56,130**	12,625	**68,755**	5,780	**62,975**	3,125	**66,100**	ADT	



MOHAWK STREET/TRUXTUN AVENUE				MAINLINE	STATE ROUTE 99 SYSTEM INTERCHANGE					MAINLINE	H ST/CHESTER AVE			MAINLINE	UNION AVENUE					MAINLINE	COTTONWOOD ROAD			MAINLINE	State Route 58 EB	
MOHAWK OFF	MOHAWK ON	TRUXTUN OFF	MOHAWK ON		OFF	MAINLINE	H ST/TO CHESTER	MAINLINE	ON		OFF	MAINLINE	ON		OFF	MAINLINE	ON	MAINLINE	ON		OFF	MAINLINE	ON			
1,820	515	1,600	**515**	**4,135**	2,040	**2,095**	333	**1,762**	2,165	**3,927**	322	**3,605**	995	**4,600**	1,020	**3,580**	325	**3,905**	330	**4,235**	635	**3,600**	315	**3,915**	AM Peak	2038 ALTERNATIVE B
1,650	1,090	1,400	**1,090**	**5,115**	2,355	**2,760**	367	**2,393**	3,070	**5,463**	408	**5,055**	1,205	**6,260**	1,050	**5,210**	635	**5,845**	565	**6,410**	940	**5,470**	295	**5,765**	PM Peak	
21,800	9,575	17,300	**9,575**	**61,875**	20,885	**40,990**	5,653	**35,937**	35,020	**70,957**	5,947	**65,010**	13,830	**78,840**	16,020	**62,820**	6,095	**68,915**	4,685	**73,600**	9,230	**64,370**	3,055	**67,425**	ADT	

Figure 4-11: Alternative B Freeway Lane Configuration and Forecast Traffic Volumes *(1 of 2)*

B. State Route 99

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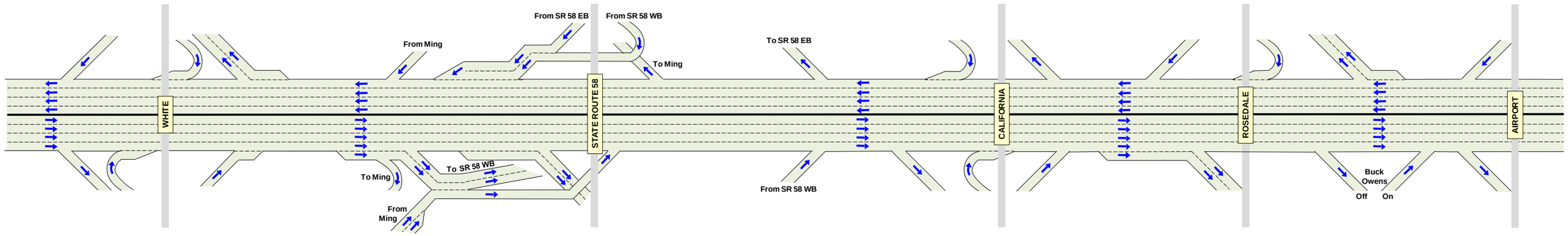
State Route 99 Southbound		MAINLINE	WHITE LANE					MAINLINE	MING AVENUE/STATE ROUTE 58							MAINLINE	CALIFORNIA AVENUE			MAINLINE	ROSEDALE HIGHWAY					MAINLINE	AIRPORT DRIVE	MAINLINE
			ON	MAINLINE	ON	MAINLINE	OFF		MING ON	MAINLINE	SR 58 ON	MAINLINE	MING OFF	MAINLINE	SR 58 EB OFF		ON	MAINLINE	OFF		ON	MAINLINE	ON	MAINLINE	OFF		ON	
2038 ALTERNATIVE B	AM Peak	**5,510**	435	**5,075**	240	**4,835**	1,700	**6,535**	775	**5,760**	2,610	**3,150**	840	**3,990**	915	**4,905**	535	**4,370**	1,455	**5,825**	655	**5,170**	1,095	**4,075**	1,350	**5,425**	1,400	**4,025**
	PM Peak	**7,570**	625	**6,945**	540	**6,405**	2,060	**8,465**	855	**7,610**	2,860	**4,750**	1,125	**5,875**	1,415	**7,290**	950	**6,340**	1,660	**8,000**	1,070	**6,930**	1,395	**5,535**	1,290	**6,825**	2,085	**4,740**
	ADT	**95,410**	9,300	**86,110**	7,380	**78,730**	20,400	**99,130**	10,515	**88,615**	26,220	**62,395**	12,955	**75,350**	15,570	**90,920**	10,250	**80,670**	21,515	**102,185**	10,300	**91,885**	15,700	**76,185**	15,415	**91,600**	24,095	**67,505**



State Route 99 Northbound		MAINLINE	WHITE LANE					MAINLINE	MING AVENUE/STATE ROUTE 58									MAINLINE	CALIFORNIA AVENUE					MAINLINE	ROSEDALE HIGHWAY					MAINLINE	AIRPORT DRIVE	MAINLINE
			OFF	MAINLINE	ON	MAINLINE	ON		MING OFF	MAINLINE	SR 58 WB OFF	MAINLINE	SR 58 EB OFF	MAINLINE	MING ON	MAINLINE	SR 58 WB ON		OFF	MAINLINE	ON	MAINLINE	ON		OFF	MAINLINE	OFF	MAINLINE	ON		OFF	
2038 ALTERNATIVE A	AM Peak	**6,945**	1,080	**5,865**	1,630	**7,495**	705	**8,200**	875	**7,325**	1,270	**6,055**	1,250	**4,805**	950	**5,755**	1,100	**6,855**	1,100	**5,755**	1,060	**6,815**	470	**7,285**	1,740	**5,545**	820	**4,725**	695	**5,420**	1,720	**3,700**
	PM Peak	**6,695**	1,095	**5,600**	1,630	**7,230**	675	**7,905**	860	**7,045**	1,205	**5,840**	1,655	**4,185**	775	**4,960**	1,095	**6,055**	685	**5,371**	1,370	**6,740**	910	**7,650**	1,630	**6,020**	370	**5,650**	775	**6,425**	1,405	**5,020**
	ADT	**94,670**	11,490	**83,180**	19,000	**102,180**	8,810	**110,990**	11,305	**99,685**	16,655	**83,030**	19,450	**63,580**	9,190	**72,770**	15,355	**88,125**	5,580	**82,545**	16,650	**99,195**	7,215	**106,410**	20,550	**85,860**	6,900	**78,960**	10,600	**89,560**	21,600	**67,960**

Figure 4-11: Alternative B Freeway Lane Configuration and Forecast Traffic Volumes *(2 of 2)*

illustrated in blue indicated roadways receiving less traffic as a result of building the freeway connector. The difference plot was very similar to that provided for alternative A, as the change in mobility and accessibility offered by alternatives A and B is virtually the same.

In a like manner, Figure 4-12 illustrates the location and severity of traffic congestion on the alternative B road network, much the same as identified for alternative A. In other words, very little difference would be expected between alternatives A and B insofar as regional traffic accommodation. Differences would be expected, however, in local, neighborhood circulation patterns.

Similar to the information reported for the no-build and build alternatives, Table 4-22 presents measures of effectiveness performance data for alternative B AM peak hour conditions, while Table 4-23 presents PM peak hour data. Both sets of data are extracted from the CORSIM traffic simulation model output and pertain to freeway mainline segments. Segments expected to operate with LOS E or F performance in the design year of 2038 are highlighted.

Alternative B freeway performance results are similar to those reported earlier for alternative A. With respect to 2038 AM peak hour conditions, Table 4-22 indicates that only one short segment of the freeway system, northbound State Route 99 between the White Lane loop on-ramp and the White Lane diagonal on-ramp, will operate at LOS E. Of the 80 freeway segments analyzed, 63 will operate at LOS C or better, 16 at LOS D, and one at LOS E, as mentioned above. Speeds will range between 55 and 64 mph and nearly all of the demand volumes will be served.

During the PM peak hour, traffic operations will be nearly as good as AM peak hour conditions. Of the 80 freeway segments analyzed, 53 will operate at LOS C or better, 25 segments will operate at LOS D, and three segments will operate at LOS E or LOS F.

- Southbound State Route 99 between the Rosedale Highway loop on-ramp to the diagonal on-ramp (LOS E)
- Southbound State Route 99 between the Rosedale Highway diagonal on-ramp and the California Avenue off-ramp (LOS F)
- Southbound State Route 99 between the Ming Avenue on-ramp and the White Lane off-ramp (LOS F).

The percentage of demand traffic volumes served will fall below 90 percent in one reach of State Route 99.

- Northbound between the California loop on-ramp and the Airport Drive off-ramp (85 to 88 percent served)

Along the Westside Parkway/State Route 58, speeds will range between 57 and 64 mph. Along State Route 99, speeds will range between 51 and 63 mph for the most part.

Motorists will experience slower speeds, below 50 mph, on three segments of southbound State Route 99 during the PM peak hour.

Freeway on-ramp and off-ramp performance and interchange merge/diverge conditions are reported in Tables 4-24 and 4-25, and 4-26 and 4-27, respectively, for AM and PM peak hours. Ramp terminal and other study intersection level of service performance are provided in Table 4-28. The results are similar to those reported for build alternative A.

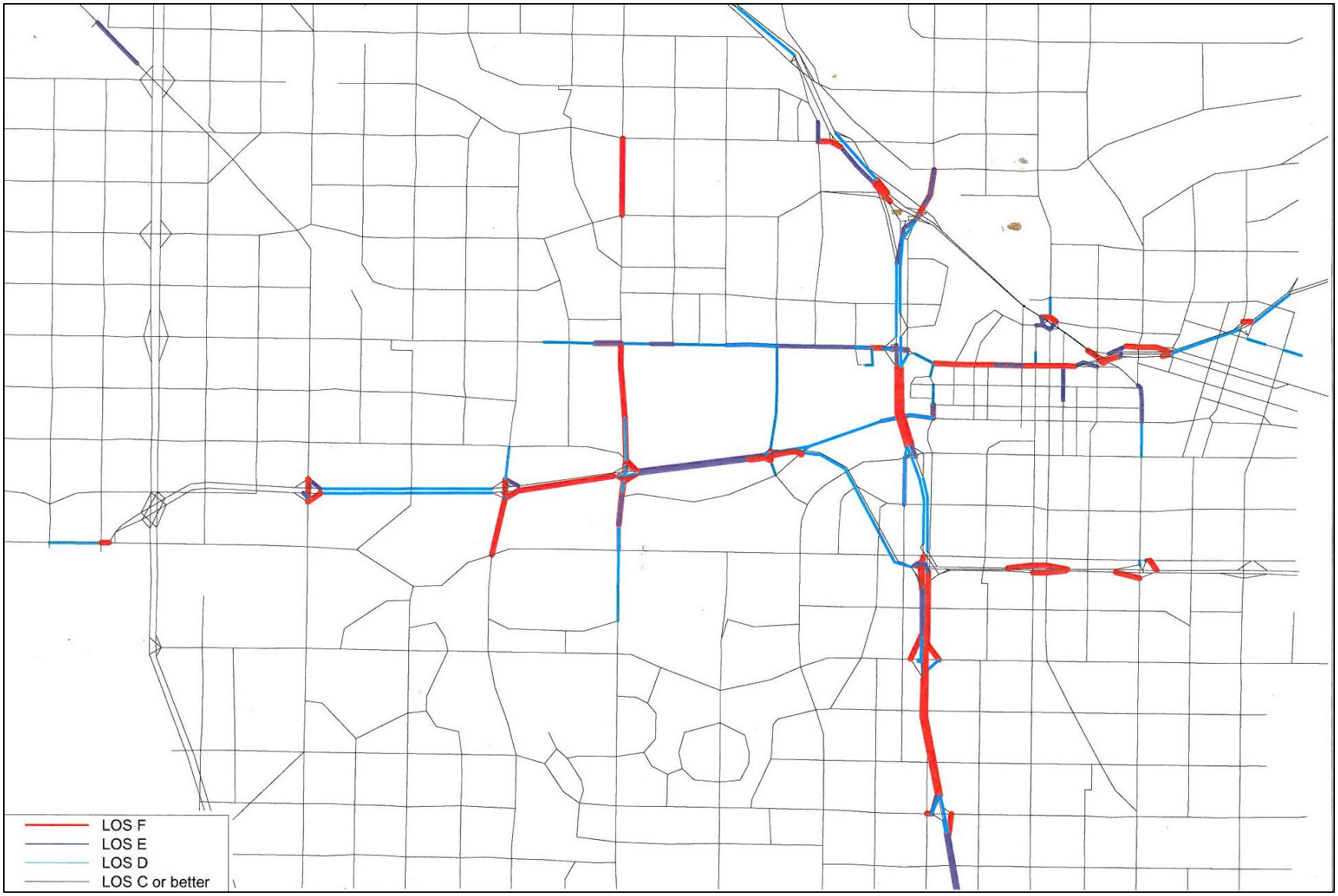


Figure 4-12: Locations of Congestion for Alternative B

Table 4-22. AM Peak Hour Measures of Effectiveness for Alternative B—Freeway Mainline Segments *(1 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)
State Route 99 NB Mainline																										
SR-99 NB south end of the network to White Lane off-ramp	5,050	5,050	100%	50	1	63	20	C	50	4444	70	2	1265	6,945	6,945	100%	51	2	62	28	D	51	6096	99	5	1739
White Lane off-ramp to White Lane loop on-ramp	4,360	4,360	100%	19	1	63	17	B	69	1461	23	1	1090	5,865	5,865	100%	20	1	61	24	C	71	1969	32	2	1470
White Lane loop on-ramp to White Lane diagonal on-ramp	5,985	5,676	95%	7	2	52	28	D	77	597	12	2	1419	7,495	7,133	95%	8	3	46	39	E	79	750	16	5	1783
White Lane diagonal on-ramp to Ming Avenue off-ramp	6,695	6,518	97%	78	6	60	25	C	154	8428	141	11	1449	8,200	8,094	99%	81	8	58	32	D	160	10462	181	19	1619
Ming Avenue off-ramp to C-D (SR 58 WB) off-ramp	5,980	5,980	100%	11	1	61	19	C	166	1143	19	1	1197	7,325	7,325	100%	11	1	61	25	C	171	1417	23	1	1483
SR 58 WB off-ramp to SR 58 EB off-ramp	4,900	4,848	99%	27	1	61	18	B	192	2209	36	2	970	6,055	5,970	99%	27	2	60	22	C	198	2717	45	3	1327
SR 58 EB off-ramp to Ming Avenue on-ramp	3,896	3,896	100%	25	1	63	16	B	217	1695	27	1	977	4,805	4,784	100%	25	1	62	19	C	223	2076	33	1	1196
Ming Avenue on-ramp to SR 58 on-ramp	4,706	4,652	99%	8	0	61	19	C	225	596	10	1	1163	5,755	5,668	98%	8	1	60	23	C	231	725	12	1	1417
SR 58 on-ramp to California Avenue off-ramp	5,701	5,669	99%	39	3	60	23	C	263	3669	61	4	1417	6,855	6,855	100%	40	4	59	28	D	271	4467	76	8	1719
California Avenue off-ramp to California Avenue loop on-ramp	4,751	4,751	100%	16	1	62	19	C	279	1342	22	1	1189	5,755	5,753	100%	16	1	62	23	C	287	1624	26	1	1438
California Avenue loop on-ramp to California Avenue diagonal on-ramp	5,596	5,441	97%	9	1	60	23	C	288	809	14	1	1360	6,815	6,674	98%	9	1	56	30	D	297	992	18	2	1669
California Avenue diagonal on-ramp to Rosedale Highway off-ramp	5,976	5,624	94%	32	2	60	22	C	320	2950	50	3	1250	7,285	6,933	95%	33	4	56	29	D	330	3576	64	7	1541
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	4,386	4,211	96%	16	1	62	17	B	337	1197	19	1	1053	5,545	5,454	98%	17	1	61	22	C	347	1550	25	1	1364
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	3,832	3,685	96%	24	1	63	15	B	360	1531	24	1	921	4,725	4,646	98%	24	1	62	19	C	371	1931	31	1	1162
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	4,247	4,070	96%	34	2	61	17	B	394	2314	38	2	1018	5,420	5,271	97%	35	4	58	23	C	406	3003	52	6	1318
Airport Drive off-ramp to SR 99 NB north end of the network	2,727	2,587	95%	40	1	63	10	A	434	1827	29	1	647	3,700	3,591	97%	41	1	63	14	B	447	2537	41	1	898
State Route 99 SB Mainline																										
SR 99 SB north end of the network to Airport Drive on-ramp	3,280	3,280	100%	48	1	64	13	B	48	2811	44	1	824	4,025	4,025	100%	48	1	64	16	B	48	3454	54	1	1012
Airport Drive on-ramp to Rosedale Highway off-ramp	4,540	4,522	100%	31	2	62	18	B	79	2409	39	2	1131	5,425	5,425	100%	32	3	60	22	C	80	2947	49	4	1225
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	3,864	3,864	100%	25	1	63	15	B	104	1670	27	1	971	4,075	4,075	100%	25	1	63	17	B	105	1786	28	1	1038
Rosedale Highway loop on-ramp to Rosedale Highway direct on-ramp	4,799	4,799	100%	10	1	57	18	C	113	733	13	2	1211	5,170	5,170	100%	10	1	55	21	C	115	808	15	2	1334
Rosedale Highway direct on-ramp to California Avenue off-ramp	5,329	5,329	100%	37	3	60	22	C	150	3252	55	4	1337	5,825	5,825	100%	38	5	57	26	C	153	3620	64	8	1494
California Avenue off-ramp to California Avenue on-ramp	4,194	4,173	99%	13	1	62	17	B	163	971	16	1	1043	4,370	4,370	100%	13	1	62	18	B	166	1042	17	1	1120
California Avenue on-ramp to SR 58 EB off-ramp	4,634	4,597	99%	27	1	61	18	B	190	2121	35	2	1021	4,905	4,905	100%	27	2	61	20	C	194	2306	38	2	1250
SR 58 EB off-ramp to Ming Avenue off-ramp	3,849	3,817	99%	28	1	62	15	B	218	1852	30	1	954	3,990	3,990	100%	28	1	62	16	B	222	1960	31	1	1010
Ming Avenue off-ramp to SR 58 WB on-ramp	3,080	3,045	99%	22	1	63	12	B	240	1159	18	0	761	3,150	3,150	100%	22	1	63	13	B	243	1219	19	0	800
SR 58 WB on-ramp to Ming Avenue on-ramp	4,604	4,535	99%	51	2	63	14	B	291	4054	65	2	1008	5,760	5,664	98%	52	2	62	17	B	295	5066	82	4	1259
Ming Avenue on-ramp to White Lane off-ramp	5,099	5,028	99%	60	3	61	20	C	352	5159	84	5	1257	6,535	6,447	99%	63	6	59	26	D	358	6644	113	10	1612
White Lane off-ramp to White Lane loop on-ramp	3,674	3,627	99%	19	1	63	14	B	371	1216	19	1	907	4,835	4,752	98%	19	1	63	19	C	378	1593	25	1	1188
White Lane loop on-ramp to White Lane diagonal on-ramp	3,869	3,813	99%	10	0	63	15	B	380	646	10	0	953	5,075	4,975	98%	10	0	62	20	C	387	842	14	1	1244
White Lane diagonal on-ramp to SR 99 SB south end of the network	4,234	4,029	95%	52	2	63	16	B	432	3644	58	2	1007	5,510	5,243	95%	52	2	62	21	C	440	4743	76	3	1311
State Route 99 NB Collector-Distributor																										
SR 99 NB C-D on-ramp to Westside Parkway C-D off-ramp	2,350	2,350	100%	18	1	53	15	B	26	631	12	0	794	2,635	2,635	100%	18	1	53	17	B	26	732	14	1	1104
State Route 99 SB Collector-Distributor																										
Westside Parkway C-D on-ramp to SR 99 SB C-D on-ramp	1,525	1,499	98%	7	0	47	11	A	15	140	3	0	600	2,610	2,503	96%	7	1	46	18	C	16	233	5	0	1252

Bottleneck

Queue

Table 4-22. AM Peak Hour Measures of Effectiveness for Alternative B—Freeway Mainline Segments *(2 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)
Westside Parkway EB Mainline																										
Westside Parkway west end of the network to West Beltway off-ramp	*— NOT APPLICABLE —*													2,220	2,220	100%	6	2	47	24	C	6	188	4	1	1147
West Beltway off-ramp to West Beltway loop on-ramp														1,495	1,468	98%	14	1	61	12	B	20	345	6	0	734
West Beltway loop on-ramp to West Beltway diagonal on-ramp														2,990	2,956	99%	9	1	61	16	B	29	461	8	0	985
West Beltway diagonal on-ramp to Allen Road off-ramp	1,025	976	95%	83	3	61	7	A	83	1376	23	1	488	3,290	3,233	98%	57	2	62	17	B	86	3181	51	2	1078
Allen Road off-ramp to Allen Road on-ramp	965	944	98%	32	0	65	5	A	115	537	8	0	315	2,915	2,861	98%	33	1	63	15	B	119	1629	26	1	954
Allen Road on-ramp to Calloway Drive off-ramp	2,690	2,680	100%	59	3	62	14	B	174	2717	44	2	893	4,910	4,909	100%	61	5	60	27	D	180	5001	83	6	1636
Calloway Drive off-ramp to Calloway Drive Loop on-ramp	2,190	2,179	99%	25	1	64	11	B	198	944	15	0	726	3,960	3,940	99%	25	1	63	21	C	204	1707	27	1	1313
Calloway Drive loop on-ramp to Calloway Drive diagonal on-ramp	2,940	2,845	97%	11	1	61	16	B	209	539	9	1	948	4,930	4,821	98%	12	1	59	27	D	216	913	15	1	1607
Calloway Drive diagonal on-ramp to Coffee Road off-ramp	4,025	3,971	99%	48	2	62	21	C	258	3303	53	3	1324	6,055	6,018	99%	50	4	60	32	D	266	5013	83	6	2006
Coffee Road off-ramp to Coffee Road loop on-ramp	3,360	3,320	99%	23	1	63	18	B	280	1328	21	1	1107	4,980	4,936	99%	23	1	62	26	D	289	1974	32	1	1645
Coffee Road loop on-ramp to Coffee Road diagonal on-ramp	4,235	4,203	99%	11	0	62	17	B	291	796	13	0	1051	5,970	5,892	99%	11	1	62	24	C	300	1116	18	1	1473
Coffee Road diagonal on-ramp to Mohawk Street off-ramp	4,851	4,803	99%	55	3	61	19	C	347	4511	74	4	1067	7,040	6,691	95%	58	6	59	28	D	358	6323	108	11	1673
Mohawk Street off-ramp to Mohawk Street on-ramp	3,386	3,368	99%	20	1	62	18	C	366	1140	18	1	1123	5,220	4,918	94%	20	1	60	27	D	378	1656	27	2	1639
Mohawk Street on-ramp to Truxtun Avenue off-ramp	3,911	3,901	100%	20	1	61	16	B	386	1320	22	1	1300	5,735	5,422	95%	20	1	60	24	C	398	1832	30	2	1549
Truxtun Avenue off-ramp to SR 99 SB C-D off-ramp (SR 99 SB and Ming Ave)	2,522	2,522	100%	84	2	63	13	B	471	3752	60	1	846	4,135	3,835	93%	86	3	62	21	C	484	5664	91	4	1278
SR 99 SB C-D off-ramp (SR 99 SB and Ming Ave) to H Street off-ramp	1,407	1,407	100%	28	1	63	11	B	498	696	11	0	713	2,095	1,934	92%	28	1	63	15	B	512	941	15	0	967
H Street off-ramp to SR 99 NB and SB on-ramp	972	972	100%	30	1	64	8	A	528	523	8	0	492	1,762	1,625	92%	30	1	63	13	B	542	862	14	0	812
SR 99 NB and SB on-ramp to Chester Avenue on-ramp	2,556	2,556	100%	44	2	63	9	A	573	1996	32	1	737	3,605	3,487	97%	44	2	63	13	B	587	2696	43	1	996
Chester Avenue on-ramp to Union Avenue off-ramp	3,271	3,271	100%	27	1	62	14	B	599	1529	25	1	952	4,600	4,462	97%	27	1	61	18	C	614	2049	33	2	1275
Union Avenue off-ramp to Union Avenue loop on-ramp	2,566	2,566	100%	17	0	63	14	B	616	766	12	0	880	3,580	3,456	97%	17	1	63	18	C	630	1004	16	1	1152
Union Avenue loop on-ramp to Union Avenue diagonal on-ramp	2,860	2,860	100%	8	0	62	15	B	624	404	6	0	961	3,905	3,705	95%	8	0	62	20	C	639	519	8	0	1235
Union Avenue diagonal on-ramp to Cottonwood Road off-ramp	3,190	3,190	100%	31	1	62	17	B	655	1708	27	1	1072	4,235	4,032	95%	31	2	62	22	C	670	2142	35	2	1344
Cottonwood Road off-ramp to Cottonwood Road on-ramp	2,755	2,738	99%	28	1	63	14	B	682	1324	21	1	913	3,600	3,413	95%	28	1	63	18	C	697	1650	26	1	1138
Cottonwood Road on-ramp to SR 58 east end of the network	3,030	3,024	100%	25	1	63	16	B	707	1319	21	1	1008	3,915	3,717	95%	25	1	63	20	C	722	1622	26	1	1239
Westside Parkway WB Mainline																										
SR 58 east end of the network to Cottonwood Road off-ramp	3,510	3,510	100%	26	0	64	19	C	26	1605	25	0	1176	5,220	5,220	100%	26	1	63	28	D	26	2387	38	1	1750
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,180	3,159	99%	18	0	63	17	B	43	970	15	0	1053	5,015	5,015	100%	18	1	62	27	D	44	1553	25	1	1686
Cottonwood Road on-ramp to Brundage Lane off-ramp	3,495	3,448	99%	38	1	62	18	C	81	2282	37	1	1149	5,340	5,340	100%	39	3	60	30	D	83	3559	59	4	1795
Brundage Lane off-ramp to Brundage Lane on-ramp	2,800	2,753	98%	17	1	63	15	B	98	812	13	0	918	4,225	4,225	100%	17	1	62	23	C	101	1267	21	1	1431
Brundage Lane on-ramp to Union Avenue on-ramp	3,215	3,117	97%	12	1	62	17	B	110	639	10	0	1039	4,600	4,597	100%	12	1	61	25	C	113	942	15	1	1532
Union Avenue on-ramp to Chester Avenue off-ramp	3,775	3,688	98%	23	1	62	15	B	133	1435	23	1	1054	5,180	5,180	100%	23	1	61	21	C	136	2020	33	2	1484
Chester Avenue off-ramp to H Street on-ramp	2,810	2,724	97%	37	1	63	14	B	170	1773	28	1	908	4,085	4,085	100%	38	2	62	22	C	174	2667	43	2	1365
H Street on-ramp to SR 99 NB off-ramp	3,515	3,364	96%	24	1	62	14	B	195	1401	23	1	961	4,785	4,785	100%	25	1	61	20	C	199	1994	33	2	1369
SR 99 NB off-ramp to SR 99 SB off-ramp	2,520	2,432	97%	21	1	62	13	B	216	887	14	0	811	3,685	3,680	100%	21	1	61	20	C	220	1338	22	1	1227
SR 99 SB off-ramp to SR 99 NB on-ramp	1,515	1,479	98%	28	1	63	12	B	243	723	11	0	740	2,514	2,471	98%	28	1	62	20	C	248	1208	19	1	1235
SR 99 NB on-ramp to Mohawk Street off-ramp	3,055	3,036	99%	67	3	62	16	B	311	3525	57	2	1012	4,199	4,199	100%	69	4	61	23	C	317	4933	81	5	1417
Mohawk Street off-ramp to Truxtun Avenue on-ramp	2,375	2,372	100%	27	1	62	19	C	338	1124	18	1	1186	3,319	3,319	100%	28	2	61	27	D	345	1588	26	1	1677
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	3,290	3,265	99%	11	1	62	18	B	349	618	10	1	1088	4,339	4,336	100%	11	1	61	24	C	356	821	14	1	1445
Mohawk Street loop on-ramp to Mohawk Street diagonal ramp	3,824	3,790	99%	14	1	63	15	B	363	934	15	1	948	4,994	4,975	100%	14	1	62	20	C	370	1226	20	1	1244
Mohawk Street diagonal ramp to Coffee Road off-ramp	4,304	4,122	96%	42	2	62	15	B	406	3006	49	2	916	5,784	5,521	95%	43	2	61	21	C	413	4026	66	4	1227
Coffee Road off-ramp to Coffee Road loop on-ramp	2,534	2,529	100%	35	1	64	10	A	441	1584	25	0	632	3,609	3,518	97%	36	1	63	14	B	449	2204	35	1	880
Coffee Road loop on ramp to Coffee Road diagonal on-ramp	2,674	2,642	99%	12	0	64	10	A	453	575	9	0	661	3,769	3,657	97%	12	0	63	14	B	462	797	13	0	914
Coffee Road diagonal on-ramp to Calloway Drive diagonal off-ramp	2,924	2,889	99%	48	1	63	11	B	501	2433	38	1	722	4,094	3,892	95%	48	2	63	15	B	510	3267	52	2	973
Calloway Drive diagonal off-ramp to Calloway Drive loop off-ramp	2,249	2,169	96%	11	0	62	9	A	512	411	7	0	542	3,494	3,319	95%	11	0	62	13	B	520	629	10	0	830
Calloway Drive loop off-ramp to Calloway Drive on-ramp	1,304	1,273	98%	24	0	64	7	A	536	544	8	0	424	2,734	2,544	93%	24	1	63	13	B	545	1088	17	0	848
Calloway Drive on-ramp to Allen Road off-ramp	1,629	1,604	98%	57	2	63	8	A	593	1599	25	1	535	3,309	3,056	92%	58	2	62	16	B	602	3040	49	2	1019
Allen Road off-ramp to Allen Road on-ramp	564	564	100%	26	0	65	3	A	619	266	4	0	189	2,184	2,046	94%	27	1	64	11	A	629	958	15	0	682
Allen Road on-ramp to West Beltway off-ramp	664	664	100%	88	1	64	4	A	708	1055	16	0	223	2,564	2,396	93%	57	2	62	13	B	686	2365	38	1	799
West Beltway off-ramp to West Beltway loop on-ramp	*— NOT APPLICABLE —*													1,079	992	92%	22	0	64	8	A	708	394	6	0	496
West Beltway loop on-ramp to West Beltway direct on-ramp														1,384	1,268	92%	6	0	62	10	A	714	126	2	0	634
West Beltway direct on-ramp to Westside Parkway west end of the network														1,674	1,555	93%	6	0	60	13	B	720	150	2	0	778
Westside Parkway EB Collector-Distributor																										
Westside Parkway EB C-D on-ramp to SR 99 SB off-ramp	1,115	1,104	99%	6	0	53	9	A	6	100	2	0	552	2,040	1,886	92%	6	0	52	15	B	6	171	3	0	943
SR 99 SB off-ramp to SR 99 SB C-D on-ramp	595	543	91%	32	1	47	6	A	38	226	5	0	543	600	577	96%	32	1	47	6	A	38	240	5	0	385
SR 99 SB C-D on-ramp to Ming Avenue	1,365	1,299	95%	27	1	48	13	B	65	467	10	0	649	1,440	1,418	98%	27	1	48	15	B	65	510	11	0	709

Bottleneck

Queue

Table 4-23. PM Peak Hour Measures of Effectiveness for Alternative B—Freeway Mainline Segments *(1 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)
State Route 99 NB Mainline																										
SR 99 NB south end of the network to White Lane off-ramp	4,630	4,630	100%	50	1	63	18	C	50	4073	64	2	1159	6,695	6,695	100%	51	2	62	27	D	51	5892	95	4	1679
White Lane off-ramp to White Lane loop on-ramp	3,935	3,935	100%	19	1	63	16	B	69	1323	21	1	988	5,600	5,558	99%	20	1	62	23	C	71	1861	30	1	1390
White Lane loop on-ramp to White Lane diagonal on-ramp	5,405	5,162	96%	7	1	57	23	C	76	543	9	1	1291	7,230	6,610	91%	7	2	51	32	D	78	695	14	3	1653
White Lane diagonal on-ramp to Ming Avenue off-ramp	5,989	5,862	98%	77	5	60	22	C	153	7574	126	9	1303	7,905	7,433	94%	79	7	59	29	D	157	9609	164	15	1487
Ming Avenue off-ramp to C-D (SR 58 WB) off-ramp	5,179	5,139	99%	11	0	62	17	B	164	982	16	1	1028	7,045	6,861	97%	11	1	61	23	C	169	1311	21	1	1372
SR 58 WB off-ramp to SR 58 EB off-ramp	4,214	4,125	98%	27	1	62	15	B	191	1883	30	1	825	5,840	5,645	97%	27	1	61	21	C	196	2572	42	2	1254
SR 58 EB off-ramp to Ming Avenue on-ramp	2,979	2,979	100%	25	1	63	12	B	216	1337	21	0	770	4,185	4,106	98%	25	1	63	16	B	221	1781	28	1	1026
Ming Avenue on-ramp to SR 58 on-ramp	3,674	3,674	100%	7	0	62	15	B	223	477	8	0	932	4,960	4,828	97%	8	0	61	20	C	228	618	10	1	1207
SR 58 on-ramp to California Avenue off-ramp	4,513	4,513	100%	38	2	61	18	C	261	2996	49	2	1159	6,055	5,965	99%	39	3	60	24	C	267	3861	64	5	1491
California Avenue off-ramp to California Avenue loop on-ramp	3,898	3,898	100%	16	1	63	16	B	277	1136	18	1	1006	5,371	5,191	97%	16	1	62	21	C	283	1466	24	1	1298
California Avenue loop on-ramp to California Avenue diagonal on-ramp	4,813	4,738	98%	9	1	60	20	C	286	704	12	1	1185	6,740	6,024	89%	9	1	58	26	C	292	896	15	2	1506
California Avenue diagonal on-ramp to Rosedale Highway off-ramp	5,458	5,157	94%	32	2	60	20	C	318	2717	45	3	1146	7,650	6,545	86%	35	5	54	29	D	327	3413	64	10	1454
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	3,888	3,712	95%	16	0	63	15	B	334	1054	17	0	928	6,020	5,283	88%	16	1	62	21	C	344	1501	24	1	1321
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	3,553	3,402	96%	24	1	63	13	B	358	1414	22	1	851	5,650	4,934	87%	24	1	63	20	C	368	2051	33	1	1234
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	4,284	4,116	96%	34	3	59	17	B	392	2342	39	3	1029	6,425	5,719	89%	34	3	60	24	C	402	3250	54	4	1430
Airport Drive off-ramp to SR 99 NB north end of the network	2,939	2,802	95%	40	1	63	11	B	432	1978	31	1	700	5,020	4,502	90%	41	2	62	18	C	443	3179	51	2	1126
State Route 99 SB Mainline																										
SR 99 SB north end of the network to Airport Drive on-ramp	3,565	3,565	100%	48	1	64	14	B	48	3058	48	1	896	4,740	4,740	100%	48	1	63	19	C	48	4073	64	2	1192
Airport Drive on-ramp to Rosedale Highway off-ramp	5,335	5,335	100%	32	2	60	21	C	80	2867	48	4	1340	6,825	6,825	100%	35	5	56	30	D	83	3750	67	10	1537
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	4,611	4,611	100%	25	1	62	19	C	105	1996	32	1	1161	5,535	5,535	100%	25	1	61	23	C	108	2428	40	2	1411
Rosedale Highway loop on-ramp to Rosedale Highway diagonal on-ramp	5,921	5,921	100%	10	2	52	25	C	115	910	17	3	1501	6,930	6,930	100%	12	4	44	35	**E**	121	1070	24	7	1765
Rosedale Highway diagonal on-ramp to California Avenue off-ramp	6,766	6,766	100%	39	5	56	29	D	154	4112	73	10	1696	8,000	8,000	100%	49	15	43	45	**F**	169	4742	109	33	2014
California Avenue off-ramp to California Avenue on-ramp	5,401	5,374	100%	14	1	62	22	C	168	1251	20	1	1344	6,340	6,323	100%	14	1	60	26	D	183	1472	24	2	1581
California Avenue on-ramp to SR 58 EB off-ramp	6,381	6,296	99%	29	3	58	26	C	196	2909	50	5	1399	7,290	7,175	98%	29	3	57	30	D	212	3315	58	7	1794
SR 58 EB off-ramp to Ming Avenue off-ramp	5,147	5,089	99%	28	1	62	21	C	224	2470	40	2	1272	5,875	5,796	99%	28	1	61	24	C	241	2810	46	2	1449
Ming Avenue off-ramp to SR 58 WB on-ramp	4,057	4,015	99%	22	1	63	16	B	246	1529	24	1	1004	4,750	4,750	100%	22	1	62	19	C	263	1813	29	1	1190
SR 58 WB on-ramp to Ming Avenue on-ramp	6,217	6,168	99%	52	2	62	19	C	298	5513	89	4	1371	7,610	7,551	99%	55	5	59	24	C	317	6755	114	10	1678
Ming Avenue on-ramp to White Lane off-ramp	6,882	6,834	99%	63	6	59	28	D	361	7056	120	12	1709	8,465	8,044	95%	103	45	37	53	**F**	420	8440	229	101	2011
White Lane off-ramp to White Lane loop on-ramp	4,861	4,821	99%	19	1	63	19	C	381	1616	26	1	1205	6,405	6,075	95%	20	1	61	25	C	440	2036	33	2	1519
White Lane loop on-ramp to White Lane diagonal on-ramp	5,356	5,254	98%	10	1	62	21	C	391	890	14	1	1314	6,945	6,550	94%	10	1	61	27	D	450	1109	18	1	1638
White Lane diagonal on-ramp to SR 99 SB south end of the network	5,806	5,555	96%	53	2	62	22	C	443	5018	81	4	1389	7,570	6,939	92%	53	3	61	28	D	503	6272	103	6	1735
State Route 99 NB Collector-Distributor																										
SR 99 NB C-D on-ramp to Westside Parkway C-D off-ramp	2,110	2,110	100%	18	1	53	13	B	26	570	11	0	717	2,520	2,434	97%	18	1	53	15	B	26	645	12	0	974
State Route 99 SB Collector-Distributor																										
Westside Parkway C-D on-ramp to SR 99 SB C-D on-ramp	2,160	2,160	100%	7	0	47	16	B	15	205	4	0	877	2,860	2,860	100%	8	1	46	22	C	16	269	6	1	1445

Bottleneck

Queue

Table 4-23. PM Peak Hour Measures of Effectiveness for Alternative B—Freeway Mainline Segments *(2 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/ LANES (vphl)
Westside Parkway EB Mainline																										
Westside Parkway west end of the network to West Beltway off-ramp	— NOT APPLICABLE —													2,215	2,176	98%	6	2	46	24	C	6	178	4	1	1088
West Beltway off-ramp to West Beltway loop on-ramp														1,350	1,260	93%	14	1	60	10	A	20	296	5	0	630
West Beltway loop on-ramp to West Beltway diagonal on-ramp														2,680	2,551	95%	9	1	61	14	B	30	398	7	0	850
West Beltway diagonal on-ramp to Allen Road off-ramp	890	819	92%	83	3	61	6	A	83	1157	19	1	410	2,945	2,824	96%	57	2	63	15	B	86	2778	44	2	941
Allen Road off-ramp to Allen Road on-ramp	800	753	94%	32	0	64	4	A	115	428	7	0	251	2,645	2,541	96%	32	1	63	13	B	119	1447	23	1	847
Allen Road on-ramp to Calloway Drive off-ramp	2,086	2,010	96%	58	2	63	11	A	173	2035	32	1	670	4,495	4,356	97%	60	4	61	24	C	179	4434	73	5	1452
Calloway Drive off-ramp to Calloway Drive Loop on-ramp	1,605	1,551	97%	24	0	64	8	A	197	672	10	0	517	3,680	3,570	97%	25	1	63	19	C	204	1547	25	1	1190
Calloway Drive loop on-ramp to Calloway Drive diagonal on-ramp	2,340	2,229	95%	11	1	62	12	B	208	422	7	0	743	4,690	4,516	96%	11	1	60	25	C	215	855	14	1	1505
Calloway Drive diagonal on-ramp to Coffee Road off-ramp	3,330	3,220	97%	48	2	62	17	B	257	2680	43	2	1073	5,785	5,677	98%	50	4	60	31	D	265	4756	79	7	1892
Coffee Road off-ramp to Coffee Road loop on-ramp	2,755	2,668	97%	23	0	64	14	B	279	1067	17	0	889	4,910	4,803	98%	23	1	62	26	C	288	1921	31	1	1601
Coffee Road loop on-ramp to Coffee Road diagonal on-ramp	3,715	3,617	97%	11	0	62	14	B	290	685	11	0	904	5,960	5,874	99%	11	1	61	24	C	299	1112	18	1	1469
Coffee Road diagonal on-ramp to Mohawk Street off-ramp	4,550	4,430	97%	55	3	61	17	B	345	4152	68	3	985	7,075	6,961	98%	58	6	58	29	D	358	6576	113	12	1740
Mohawk Street off-ramp to Mohawk Street on-ramp	3,280	3,201	98%	20	1	62	17	B	365	1087	17	1	1067	5,425	5,379	99%	20	1	61	30	D	378	1817	30	2	1793
Mohawk Street on-ramp to Truxtun Avenue off-ramp	3,965	3,906	99%	20	1	61	15	B	385	1334	22	1	1302	6,515	6,410	98%	21	2	57	29	D	398	2185	37	3	1832
Truxtun Avenue off-ramp to SR 99 SB C-D off-ramp (SR 99 SB and Ming Ave)	2,840	2,840	100%	85	2	63	15	B	469	4211	67	2	952	5,115	5,020	98%	87	5	61	28	D	486	7392	122	7	1673
SR 99 SB C-D off-ramp (SR 99 SB and Ming Ave) to H Street off-ramp	1,255	1,255	100%	28	1	63	10	A	497	612	10	0	628	2,760	2,690	97%	28	1	62	22	C	514	1309	21	1	1345
H Street off-ramp to SR 99 NB and SB on-ramp	800	800	100%	30	0	64	6	A	527	436	7	0	411	2,393	2,353	98%	31	1	62	19	C	544	1248	20	1	1177
SR 99 NB and SB on-ramp to Chester Avenue on-ramp	3,034	2,911	96%	44	2	63	10	A	571	2251	36	1	832	5,055	4,957	98%	45	3	61	18	C	590	3839	62	3	1416
Chester Avenue on-ramp to Union Avenue off-ramp	3,985	3,804	95%	27	1	62	15	B	598	1747	28	1	1087	6,260	6,160	98%	28	3	59	26	D	618	2835	48	4	1760
Union Avenue off-ramp to Union Avenue loop on-ramp	3,230	3,071	95%	17	0	63	16	B	615	892	14	0	1024	5,210	5,088	98%	17	1	62	28	D	635	1477	24	1	1696
Union Avenue loop on-ramp to Union Avenue diagonal on-ramp	3,779	3,549	94%	8	0	62	19	C	623	497	8	0	1183	5,845	5,625	96%	9	1	59	32	D	643	787	13	1	1875
Union Avenue diagonal on-ramp to Cottonwood Road off-ramp	4,184	3,987	95%	31	1	62	21	C	654	2120	34	2	1329	6,410	6,242	97%	33	3	59	33	D	676	3319	56	5	2081
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,740	3,607	96%	28	1	63	19	C	681	1744	28	1	1202	5,470	5,317	97%	28	1	62	29	D	704	2571	42	2	1772
Cottonwood Road on-ramp to SR 58 east end of the network	4,105	3,979	97%	25	1	62	21	C	707	1737	28	1	1326	5,765	5,578	97%	26	1	61	30	D	730	2433	40	2	1859
Westside Parkway WB Mainline																										
SR 58 east end of the network to Cottonwood Road off-ramp	3,805	3,805	100%	26	1	63	20	C	26	1742	28	1	1277	4,970	4,970	100%	26	1	63	26	D	26	2273	36	1	1666
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,505	3,478	99%	18	1	63	18	C	43	1068	17	1	1159	4,675	4,641	99%	18	1	62	25	C	44	1426	23	1	1547
Cottonwood Road on-ramp to Brundage Lane off-ramp	3,965	3,927	99%	39	2	62	21	C	82	2598	42	2	1309	5,195	5,129	99%	39	3	61	28	D	83	3392	56	4	1710
Brundage Lane off-ramp to Brundage Lane on-ramp	3,070	3,070	100%	17	1	63	17	B	99	915	15	0	1034	4,205	4,166	99%	17	1	62	22	C	100	1229	20	1	1389
Brundage Lane on-ramp to Union Avenue on-ramp	3,430	3,398	99%	12	1	62	18	C	111	697	11	1	1133	4,560	4,472	98%	12	1	61	24	C	112	916	15	1	1491
Union Avenue on-ramp to Chester Avenue off-ramp	4,151	4,140	100%	23	1	61	17	B	134	1611	26	1	1183	5,310	5,267	99%	23	2	60	22	C	135	2048	34	2	1505
Chester Avenue off-ramp to H Street on-ramp	3,270	3,270	100%	37	1	63	18	B	171	2153	34	1	1102	4,210	4,210	100%	38	2	62	23	C	173	2741	44	2	1403
H Street on-ramp to SR 99 NB off-ramp	4,140	4,140	100%	24	1	61	17	B	196	1738	28	1	1192	4,925	4,925	100%	25	1	61	20	C	198	2069	34	2	1419
SR 99 NB off-ramp to SR 99 SB off-ramp	3,301	3,301	100%	21	1	62	18	B	217	1209	20	1	1107	3,830	3,830	100%	21	1	61	21	C	219	1407	23	1	1290
SR 99 SB off-ramp to SR 99 NB on-ramp	2,070	2,070	100%	28	1	63	17	B	245	1027	16	1	1050	2,610	2,610	100%	28	1	62	21	C	248	1280	21	1	1309
SR 99 NB on-ramp to Mohawk Street off-ramp	3,485	3,485	100%	68	3	62	19	C	312	4106	66	3	1179	4,355	4,286	98%	68	4	61	23	C	316	4972	82	5	1429
Mohawk Street off-ramp to Truxtun Avenue on-ramp	2,826	2,826	100%	28	1	62	23	C	340	1363	22	1	1440	3,610	3,585	99%	28	2	61	29	D	344	1696	28	2	1792
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	4,151	4,123	99%	11	1	61	23	C	351	781	13	1	1374	5,475	5,429	99%	11	1	60	30	D	355	1028	17	1	1810
Mohawk Street loop on-ramp to Mohawk Street diagonal ramp	5,091	5,046	99%	14	1	62	20	C	366	1245	20	1	1262	6,730	6,629	98%	15	1	61	27	D	370	1635	27	1	1657
Mohawk Street diagonal ramp to Coffee Road off-ramp	5,711	5,375	94%	43	2	61	20	C	409	3920	64	4	1194	7,720	7,230	94%	45	4	59	28	D	415	5280	90	8	1607
Coffee Road off-ramp to Coffee Road loop on-ramp	3,771	3,656	97%	36	1	63	14	B	444	2289	36	1	914	5,690	5,565	98%	36	1	62	22	C	451	3487	56	2	1391
Coffee Road loop on ramp to Road Drive diagonal on-ramp	4,021	3,867	96%	12	0	63	15	B	457	842	13	0	967	5,970	5,820	97%	13	1	62	23	C	464	1267	20	1	1455
Coffee Road diagonal on-ramp to Calloway Drive diagonal off-ramp	4,446	4,257	96%	49	2	62	17	B	506	3586	58	3	1064	6,545	6,360	97%	50	3	61	26	C	513	5356	88	5	1590
Calloway Drive diagonal off-ramp to Calloway Drive loop off-ramp	3,596	3,411	95%	11	0	61	14	B	517	646	11	0	853	5,620	5,358	95%	11	1	61	22	C	524	1015	17	1	1340
Calloway Drive loop off-ramp to Calloway Drive on-ramp	2,376	2,195	92%	24	1	64	11	B	541	939	15	0	732	4,375	4,166	95%	25	1	62	22	C	549	1782	29	1	1389
Calloway Drive on-ramp to Allen Road off-ramp	2,886	2,700	94%	58	3	62	14	B	599	2693	44	2	900	5,390	5,094	95%	61	6	59	29	D	610	5097	86	8	1698
Allen Road off-ramp to Allen Road on-ramp	1,062	1,023	96%	26	0	64	5	A	625	479	7	0	341	3,265	3,119	96%	27	1	63	16	B	637	1461	23	1	1040
Allen Road on-ramp to West Beltway off-ramp	1,132	1,108	98%	89	1	64	7	A	715	1749	27	0	369	3,700	3,549	96%	58	3	62	19	C	695	3506	57	3	1183
West Beltway off-ramp to West Beltway loop on-ramp	— NOT APPLICABLE —													1,510	1,441	95%	22	0	64	11	B	717	573	9	0	721
West Beltway loop on-ramp to West Beltway diagonal on-ramp														1,960	1,815	93%	6	0	61	15	B	723	181	3	0	908
West Beltway diagonal on-ramp to Westside Parkway west end of the network														2,320	2,173	94%	6	1	58	19	C	729	209	4	0	1087
Westside Parkway EB Collector-Distributor																										
Westside Parkway EB C-D on-ramp to SR 99 SB off-ramp	1,585	1,585	100%	6	0	53	12	B	6	145	3	0	795	2,355	2,315	98%	6	0	52	18	C	6	210	4	0	1157
SR 99 SB off-ramp to SR 99 SB C-D on-ramp	655	601	92%	32	1	47	6	A	38	249	5	0	601	715	682	95%	32	1	47	7	A	38	283	6	0	455
SR 99 SB C-D on-ramp to Ming Avenue	1,745	1,682	96%	27	1	48	17	B	65	604	13	0	841	1,840	1,705	93%	27	1	48	18	B	65	613	13	0	853

Bottleneck

Queue

Table 4-24. AM Peak Hour Measures of Effectiveness for Alternative B—Merging/Diverging Conditions

LOCATION	ANALYSIS TYPE	YEAR 2018 SPEED (mph)	YEAR 2018 DENSITY (veh/ln/mi)	YEAR 2018 LOS (HCM 2000)	YEAR 2038 SPEED (mph)	YEAR 2038 DENSITY (veh/ln/mi)	YEAR 2038 LOS (HCM 2000)
State Route 99 NB							
White Lane loop on-ramp	Merging	46	35.6	**E**	38	52.1	**E**
White Lane diagonal on-ramp	Merging	53	36.9	**E**	48	47.7	**E**
Ming Avenue (from C-D) on-ramp	Merging	59	21.0	C	59	25.0	C
SR 58 on-ramp	Merging	58	25.0	C	54	31.6	D
California Avenue loop on-ramp	Merging	57	28.8	D	53	37.8	**E**
California Avenue diagonal on-ramp	Merging	57	28.4	D	52	37.7	**E**
Buck Owens Boulevard/Sillect Avenue on-ramp	Merging	61	17.8	B	59	23.5	C
White Lane off-ramp	Diverging	62	21.4	C	60	31.9	D
Ming Avenue off-ramp	Diverging	60	18.6	B	58	23.0	C
Westside Parkway (C-D) off-ramp	Diverging	61	20.7	C	60	24.9	C
SR 58 EB off-ramp	Diverging	61	15.3	B	61	18.5	B
California Avenue off-ramp	Diverging	59	31.4	D	57	38.6	**E**
Rosedale Highway off-ramp	Diverging	58	23.1	C	54	29.7	D
Buck Owens Boulevard/Sillect Avenue off-ramp	Diverging	61	19.6	B	59	25.2	C
Airport Drive off-ramp	Diverging	57	24.1	C	51	33.5	D
State Route 99 SB							
Airport Drive on-ramp	Merging	61	22.2	C	59	28.4	D
Rosedale Highway loop on-ramp	Merging	54	22.0	C	51	25.5	C
Rosedale Highway diagonal on-ramp	Merging	59	25.6	C	58	29.5	D
California Avenue on-ramp	Merging	60	23.3	C	59	25.6	C
SR 99 SB C-D on-ramp (Westside Parkway EB and SR 58 WB and H Street)	Merging	62	13.7	B	61	18.1	B
Ming Avenue on-ramp	Merging	59	26.7	C	53	39.5	**E**
White Lane loop on-ramp	Merging	61	17.5	B	60	22.5	C
White Lane diagonal on-ramp	Merging	61	18.8	B	60	24.1	C
Rosedale Highway off-ramp	Diverging	61	21.1	C	59	28.2	D
California Avenue off-ramp	Diverging	56	33.8	D	54	41.4	**E**
SR 58 EB off-ramp	Diverging	60	25.4	C	60	27.7	C
SR 99 SB C-D off-ramp (Ming Avenue)	Diverging	61	20.5	C	61	21.4	C
White Lane off-ramp	Diverging	60	21.0	C	58	27.4	C
Westside Parkway/State Route 58 EB							
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			61	16.2	B
West Beltway diagonal on-ramp	Merging				62	19.8	B
Allen Road on-ramp	Merging	60	18.9	B	55	34.3	D
Calloway Drive Loop on-ramp	Merging	60	18.8	B	57	30.4	D
Calloway Drive diagonal on-ramp	Merging	60	22.1	C	57	32.1	D
SR 99 NB and SB on-ramp	Merging	63	8.0	A	63	10.6	B
Union Avenue Loop on-ramp	Merging	61	18.0	B	61	22.1	C
Union Avenue diagonal on-ramp	Merging	61	20.7	C	60	25.4	C
Cottonwood Road on-ramp	Merging	61	17.4	B	61	21.0	C
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			47	24.3	C
Allen Road off-ramp	Diverging	65	5.0	A	62	20.2	C
Calloway Drive off-ramp	Diverging	62	18.4	B	60	31.9	D
Coffee Road off-ramp	Diverging	61	26.1	C	60	35.4	**E**
Mohawk Street off-ramp	Diverging	62	13.6	B	58	29.4	D
SR 99 SB C-D off-ramp (SR 99 SB and Ming Ave)	Diverging	63	11.3	B	61	20.9	C
H Street off-ramp	Diverging	61	20.5	C	63	15.4	B
Cottonwood Road off-ramp	Diverging	60	20.3	C	61	25.0	C
Coffee Road loop on-ramp to Mohawk Street off-ramp	Weaving	60	18.8	B	57	27.7	C
Mohawk Street on-ramp to Truxtun Avenue off-ramp	Weaving	61	15.5	B	56	25.4	D
Chester Avenue on-ramp to Union Avenue off-ramp	Weaving	65	5.0	A	61	20.3	C
Westside Parkway/State Route 58 WB							
Brundage Lane on-ramp (Cottonwood Road)	Merging	62	18.2	B	60	30.3	D
Brundage Lane on-ramp (Union Avenue)	Merging	62	18.3	B	61	26.6	C
SR 99 NB on-ramp	Merging	61	16.6	B	60	23.5	C
Truxtun Avenue on-ramp	Merging	62	17.7	B	61	23.8	C
Mohawk Street loop on-ramp	Merging	62	12.3	B	62	15.6	B
Mohawk Street diagonal on-ramp	Merging	63	12.0	B	62	16.3	B
Coffee Road loop on-ramp	Merging	63	9.5	A	63	13.0	B
Calloway Drive on-ramp	Merging	63	10.2	B	61	18.8	B
Allen Road on-ramp	Merging	63	4.3	A	62	13.9	B
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			62	10.2	B
West Beltway diagonal on-ramp	Merging				60	13.0	B
Brundage Lane off-ramp (Cottonwood Road)	Diverging	63	17.5	B	63	26.7	C
Brundage Lane off-ramp (Union Avenue)	Diverging	62	20.3	C	60	32.8	D
SR 99 SB off-ramp	Diverging	62	13.1	B	61	20.1	C
Coffee Road off-ramp	Diverging	61	16.1	B	60	21.2	C
Allen Road off-ramp	Diverging	61	8.6	A	61	20.5	C
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			62	13.0	B
Union Avenue on-ramp to Chester Avenue off-ramp	Weaving	61	16.2	B	60	22.0	C
H Street on-ramp to SR 99 NB off-ramp	Weaving	61	15.1	B	60	20.8	C
SR 99 NB on-ramp to Mohawk Street off-ramp	Weaving	62	16.3	B	61	23.2	C
Coffee Road diagonal on-ramp to Calloway Drive loop off-ramp	Weaving	62	14.5	B	62	15.5	B

Note: Merge/diverge calculations are based on 1,500 feet from on/off ramp. These calculations also include two right most mainline lanes within 1,500 feet.

Table 4-25. PM Peak Hour Measures of Effectiveness for Alternative B—Merging/Diverging Conditions

LOCATION	ANALYSIS TYPE	YEAR 2018 SPEED (mph)	YEAR 2018 DENSITY (veh/ln/mi)	YEAR 2018 LOS (HCM 2000)	YEAR 2038 SPEED (mph)	YEAR 2038 DENSITY (veh/ln/mi)	YEAR 2038 LOS (HCM 2000)
State Route 99 NB							
White Lane loop on-ramp	Merging	54	27.6	C	44	40.2	**E**
White Lane diagonal on-ramp	Merging	54	33.0	D	50	42.3	**E**
Ming Avenue (from C-D) on-ramp	Merging	60	17.2	B	60	20.5	C
SR 58 on-ramp	Merging	60	20.6	C	57	25.8	C
California Avenue loop on-ramp	Merging	58	26.2	C	55	32.8	D
California Avenue diagonal on-ramp	Merging	58	27.1	C	48	38.6	**E**
Buck Owens Boulevard/Sillect Avenue on-ramp	Merging	60	20.1	C	58	26.2	C
White Lane off-ramp	Diverging	63	19.8	B	61	30.9	D
Ming Avenue off-ramp	Diverging	59	17.2	B	59	20.7	C
Westside Parkway (C-D) off-ramp	Diverging	61	18.2	B	60	22.8	C
SR 58 EB off-ramp	Diverging	61	14.1	B	61	18.8	B
California Avenue off-ramp	Diverging	60	25.7	C	59	31.6	D
Rosedale Highway off-ramp	Diverging	59	21.8	C	53	28.0	D
Buck Owens Boulevard/Sillect Avenue off-ramp	Diverging	61	17.4	B	61	22.1	C
Airport Drive off-ramp	Diverging	55	26.4	C	57	31.2	D
State Route 99 SB							
Airport Drive on-ramp	Merging	58	28.8	D	53	40.1	E
Rosedale Highway loop on-ramp	Merging	48	31.5	D	38	43.9	E
Rosedale Highway diagonal on-ramp	Merging	54	35.6	**E**	37	58.6	F
California Avenue on-ramp	Merging	55	35.0	D	53	36.4	E
SR 99 SB C-D on-ramp (Westside Parkway EB and SR 58 WB and H Street)	Merging	61	18.9	B	60	23.0	C
Ming Avenue on-ramp	Merging	55	37.5	**E**	35	64.9	F
White Lane loop on-ramp	Merging	59	23.9	C	59	22.3	C
White Lane diagonal on-ramp	Merging	60	25.7	C	60	25.4	C
Rosedale Highway off-ramp	Diverging	60	26.6	C	56	33.5	D
California Avenue off-ramp	Diverging	53	44.2	**E**	38	64.4	F
SR 58 EB off-ramp	Diverging	58	36.2	**E**	56	38.3	E
SR 99 SB C-D off-ramp (Ming Avenue)	Diverging	60	27.2	C	60	27.4	C
White Lane off-ramp	Diverging	56	29.5	D	23	63.5	F
Westside Parkway/State Route 58 EB							
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			61	14.0	B
West Beltway diagonal on-ramp	Merging				62	17.2	B
Allen Road on-ramp	Merging	61	13.7	B	56	30.5	D
Calloway Drive Loop on-ramp	Merging	61	15.2	B	58	28.6	D
Calloway Drive diagonal on-ramp	Merging	60	18.4	B	55	31.7	D
SR 99 NB and SB on-ramp	Merging	62	9.4	A	62	15.4	B
Union Avenue Loop on-ramp	Merging	60	22.9	C	57	34.2	D
Union Avenue diagonal on-ramp	Merging	61	25.9	C	56	36.6	E
Cottonwood Road on-ramp	Merging	61	23.3	C	60	30.3	D
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			46	23.6	C
Allen Road off-ramp	Diverging	64	4.3	A	62	17.7	B
Calloway Drive off-ramp	Diverging	62	14.1	B	61	28.1	D
Coffee Road off-ramp	Diverging	62	21.7	C	60	34.0	D
SR 99 SB C-D off-ramp (SR 99 SB and Ming Ave)	Diverging	62	15.5	B	60	27.7	C
H Street off-ramp	Diverging	63	10.0	A	62	21.6	C
Cottonwood Road off-ramp	Diverging	61	25.4	C	59	38.8	E
Coffee Road loop on-ramp to Mohawk Street off-ramp	Weaving	60	19.0	B	57	29.1	D
Mohawk Street on-ramp to Truxtun Avenue off-ramp	Weaving	61	18.6	B	58	29.0	D
Chester Avenue on-ramp to Union Avenue off-ramp	Weaving	61	17.9	B	58	27.7	C
Westside Parkway/State Route 58 WB							
Brundage Lane on-ramp (Cottonwood Road)	Merging	62	21.7	C	60	29.0	D
Brundage Lane on-ramp (Union Avenue)	Merging	62	19.7	B	61	26.1	C
SR 99 NB on-ramp	Merging	61	19.3	B	61	23.6	C
Truxtun Avenue on-ramp	Merging	61	22.6	C	60	30.3	D
Mohawk Street loop on-ramp	Merging	62	18.0	B	61	24.6	C
Mohawk Street diagonal on-ramp	Merging	61	17.2	B	59	25.8	C
Coffee Road loop on-ramp	Merging	62	14.6	B	62	21.9	C
Calloway Drive on-ramp	Merging	62	17.1	B	58	32.0	D
Allen Road on-ramp	Merging	63	6.7	A	61	19.5	B
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			61	14.8	B
West Beltway diagonal on-ramp	Merging				58	18.6	B
Brundage Lane off-ramp (Cottonwood Road)	Diverging	63	19.4	B	63	25.7	C
Brundage Lane off-ramp (Union Avenue)	Diverging	61	23.8	C	60	31.0	D
SR 99 SB off-ramp	Diverging	62	18.0	B	61	21.0	C
Coffee Road off-ramp	Diverging	60	20.0	C	59	25.3	C
Allen Road off-ramp	Diverging	61	14.2	B	60	24.2	C
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			61	19.4	B
Union Avenue on-ramp to Chester Avenue off-ramp	Weaving	61	18.0	B	60	22.7	C
H Street on-ramp to SR 99 NB off-ramp	Weaving	61	18.4	B	60	21.6	C
SR 99 NB on-ramp to Mohawk Street off-ramp	Weaving	62	19.1	B	61	23.4	C
Coffee Road diagonal on-ramp to Calloway Drive loop off-ramp	Weaving	61	19.4	B	60	26.1	C

Note: Merge/diverge calculations are based on 1,500 feet from on/off ramp. These calculations also include two right most mainline lanes within 1,500 feet.

Table 4-26. AM Peak Hour Measures of Effectiveness for Alternative B—On-Ramp and Off-Ramp Performance *(1 of 2)*

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
State Route 99 NB Off-ramps								
White Lane	690	684	99%	61	1,080	1,075	100%	59
Ming Avenue	715	666	93%	53	875	869	99%	52
SR 58 WB	1,080	1,069	99%	54	1,270	1,270	100%	54
SR 58 EB	1,005	1,005	100%	54	1,250	1,250	100%	54
California Avenue	950	915	96%	52	1,100	1,100	100%	52
Rosedale Highway	1,590	1,590	100%	53	1,740	1,725	99%	53
Buck Owens Boulevard/Sillect Avenue	555	527	95%	52	820	809	99%	51
Airport Drive	1,520	1,474	97%	51	1,720	1,709	99%	50
State Route 99 NB On-ramps								
White Lane loop	1,625	1,618	100%	42	1,630	1,630	100%	41
White Lane diagonal	710	683	96%	52	705	705	100%	52
Ming Avenue (C-D on)	810	810	100%	50	950	950	100%	51
SR 58	995	938	94%	44	1,100	1,100	100%	43
California Avenue loop	845	776	92%	48	1,060	860	81%	47
California Avenue diagonal	380	327	86%	50	470	383	81%	50
Buck Owens Boulevard/Sillect Avenue	415	400	96%	32	695	640	92%	31
State Route 99 SB Off-ramps								
Rosedale Highway	675	673	100%	54	1,350	1,350	100%	54
California Avenue	1,135	1,135	100%	48	1,455	1,455	100%	35
SR 58 EB	785	782	100%	53	915	915	100%	53
SR 99 SB C-D (Ming Avenue)	770	758	98%	53	840	840	100%	53
White Lane	1,425	1,391	98%	54	1,700	1,699	100%	54
State Route 99 SB On-ramps								
Airport Drive	1,260	1,260	100%	48	1,400	1,400	100%	47
Rosedale Highway loop	935	935	100%	36	1,095	1,095	100%	34
Rosedale Highway diagonal	530	502	95%	40	655	650	99%	40
California Avenue	440	426	97%	51	535	526	98%	51
SR 99 SB C-D (SR 58 WB and H Street)	1,525	1,499	98%	51	2,610	2,494	96%	50
Ming Avenue	495	495	100%	51	775	775	100%	50
White Lane loop	195	191	98%	52	240	240	100%	52
White Lane direct	365	340	93%	53	435	392	90%	53
State Route 99 NB Collector-Distributor Off-/On-ramps								
Ming Avenue C-D on-ramp	1,270	1,270	100%	30	1,365	1,365	100%	28
SR 99 NB C-D on-ramp	1,080	1,069	99%	54	1,270	1,270	100%	54
Westside Parkway C-D off-ramp	1,540	1,540	100%	54	1,685	1,685	100%	54
State Route 99 SB Collector-Distributor Off-/On-ramps								
SR 58 WB on-ramp	1,005	945	94%	39	1,170	1,170	100%	39
Westside Parkway C-D on-ramp	520	520	100%	44	1,440	1,403	97%	44

Table 4-26. AM Peak Hour Measures of Effectiveness for Alternative B—On-Ramp and Off-Ramp Performance *(2 of 2)*

FREEWAY RAMPS	YEAR 2018 DEMAND VOLUME (vph)	YEAR 2018 CORSIM SERVED VOLUME (vph)	YEAR 2018 PERCENTAGE SERVED IN CORSIM MODEL (%)	YEAR 2018 SPEED (mph)	YEAR 2038 DEMAND VOLUME (vph)	YEAR 2038 CORSIM SERVED VOLUME (vph)	YEAR 2038 PERCENTAGE SERVED IN CORSIM MODEL (%)	YEAR 2038 SPEED (mph)
Westside Parkway/State Route 58 EB Off-ramps								
West Beltway	*— NOT APPLICABLE —*				725	725	100%	51
Allen Road	60	54	90%	53	375	375	100%	54
Calloway Drive	500	498	100%	54	950	950	100%	53
Coffee Road	665	637	96%	54	1,075	1,075	100%	53
Mohawk Street	1,465	1,448	99%	54	1,820	1,759	97%	54
Truxtun Avenue	1,390	1,359	98%	54	1,600	1,573	98%	54
SR 99 SB/Ming Avenue C-D	1,115	1,105	99%	54	2,040	1,990	98%	53
H Street	435	435	100%	54	333	320	96%	54
Union Avenue	705	682	97%	54	1,020	1,004	98%	54
Cottonwood Road	435	435	100%	54	635	612	96%	53
Westside Parkway/State Route 58 EB On-ramps								
West Beltway loop	*— NOT APPLICABLE —*				1,495	1,488	100%	48
West Beltway diagonal					300	285	95%	54
Allen Road	1,725	1,725	100%	41	1,995	1,995	100%	44
Calloway Drive loop	750	701	93%	47	970	964	99%	47
Calloway Drive diagonal	1,085	1,071	99%	51	1,125	1,105	98%	51
Coffee Drive loop	875	875	100%	48	990	961	97%	47
Coffee Drive diagonal	615	599	97%	53	1,070	807	75%	53
Mohawk Street	525	525	100%	42	515	512	99%	43
SR 99 NB and SR 99 SB	1,585	1,585	100%	52	1,843	1,843	100%	52
Chester Avenue	715	715	100%	50	995	977	98%	51
Union Avenue loop	295	275	93%	53	325	312	96%	53
Union Avenue diagonal	330	318	96%	52	330	317	96%	52
Cottonwood Road	275	275	100%	52	315	314	100%	52
Westside Parkway/State Route 58 WB Off-ramps								
Cottonwood Road	330	330	100%	54	205	200	98%	55
Brundage Lane	695	695	100%	53	1,115	1,093	98%	42
Chester Avenue	965	965	100%	54	1,095	1,095	100%	54
SR 99 NB	995	936	94%	54	1,100	1,100	100%	54
SR 99 SB	1,005	947	94%	52	1,171	1,171	100%	52
Mohawk Street	680	648	95%	53	880	880	100%	52
Coffee Road	1,770	1,747	99%	53	2,175	2,175	100%	53
Calloway Drive diagonal	675	675	100%	53	600	561	94%	53
Calloway Drive loop	945	895	95%	53	760	760	100%	53
Allen Road	1,065	1,037	97%	51	1,125	1,107	98%	52
West Beltway	*— NOT APPLICABLE —*				1,485	1,400	94%	54
Westside Parkway/State Route 58 WB On-ramps								
Cottonwood Road	315	295	94%	50	325	325	100%	50
Brundage Lane	415	381	92%	49	375	338	90%	49
Union Avenue	560	554	99%	51	580	580	100%	51
H Street	705	642	91%	51	700	700	100%	50
SR 99 NB/Ming Avenue	1,540	1,540	100%	48	1,685	1,685	100%	46
Truxtun Avenue	915	895	98%	52	1,020	999	98%	51
Mohawk Street loop	535	518	97%	47	655	645	98%	47
Mohawk Street diagonal	480	480	100%	52	790	755	96%	51
Coffee Road loop	140	122	87%	51	160	154	96%	51
Coffee Road diagonal	250	250	100%	54	325	310	95%	54
Calloway Drive	325	325	100%	53	575	552	96%	53
Allen Road	100	100	100%	50	380	371	98%	50
West Beltway loop	*— NOT APPLICABLE —*				305	305	100%	49
West Beltway direct					290	286	99%	54
Westside Parkway EB Collector-Distributor Off-/On-ramps								
Westside Parkway EB C-D on-ramp	1,115	1,105	99%	54	2,040	1,890	93%	53
SR 99 SB C-D off-ramp	520	520	100%	49	1,440	1,407	98%	49
SR 99 SB C-D on-ramp	770	759	99%	48	840	840	100%	48

Table 4-27. PM Peak Hour Measures of Effectiveness for Alternative B—On-Ramp and Off-Ramp Performance *(1 of 2)*

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
State Route 99 NB Off-ramps								
White Lane	695	671	97%	61	1,095	1,095	100%	59
Ming Avenue	810	806	100%	52	860	777	90%	53
SR 58 WB	965	965	100%	54	1,205	1,129	94%	54
SR 58 EB	1,235	1,119	91%	54	1,655	1,634	99%	53
California Avenue	615	607	99%	52	685	685	100%	52
Rosedale Highway	1,570	1,570	100%	54	1,630	1,535	94%	53
Buck Owens Boulevard/Sillect Avenue	335	307	92%	53	370	338	91%	53
Airport Drive	1,345	1,339	100%	50	1,405	1,318	94%	52
State Route 99 NB On-ramps								
White Lane loop	1,470	1,404	96%	44	1,630	1,568	96%	45
White Lane diagonal	585	585	100%	52	675	675	100%	52
Ming Avenue (C-D on)	695	695	100%	52	775	771	99%	51
SR 58	840	840	100%	45	1,095	1,088	99%	43
California Avenue loop	915	790	86%	48	1,370	895	65%	48
California Avenue diagonal	645	486	75%	50	910	677	74%	50
Buck Owens Boulevard/Sillect Avenue	730	727	100%	32	775	775	100%	30
State Route 99 SB Off-ramps								
Rosedale Highway	725	725	100%	54	1,290	1,290	100%	53
California Avenue	1,365	1,365	100%	38	1,660	1,660	100%	29
SR 58 EB	1,235	1,196	97%	53	1,415	1,379	97%	52
SR 99 SB C-D (Ming Avenue)	1,090	1,082	99%	53	1,125	1,100	98%	53
White Lane	2,020	2,009	99%	54	2,060	1,829	89%	9
State Route 99 SB On-ramps								
Airport Drive	1,770	1,770	100%	45	2,085	2,085	100%	41
Rosedale Highway loop	1,310	1,310	100%	34	1,395	1,395	100%	33
Rosedale Highway diagonal	845	793	94%	39	1,070	982	92%	38
California Avenue	980	918	94%	51	950	847	89%	51
SR 99 SB C-D (SR 58 WB and H Street)	2,160	2,160	100%	51	2,860	2,860	100%	49
Ming Avenue	665	665	100%	50	855	855	100%	49
White Lane loop	495	463	94%	51	540	513	95%	52
White Lane direct	450	410	91%	53	625	557	89%	53
State Route 99 NB Collector-Distributor Off-/On-ramps								
Ming Avenue C-D on-ramp	1,145	1,145	100%	33	1,315	1,307	99%	34
SR 99 NB C-D on-ramp	965	965	100%	54	1,205	1,189	99%	54
Westside Parkway C-D off-ramp	1,415	1,415	100%	54	1,745	1,710	98%	53
State Route 99 SB Collector-Distributor Off-/On-ramps								
SR 58 WB on-ramp	1,230	1,208	98%	39	1,220	1,220	100%	39
Westside Parkway C-D on-ramp	930	930	100%	44	1,640	1,639	100%	44

Table 4-27. PM Peak Hour Measures of Effectiveness for Alternative B—On-Ramp and Off-Ramp Performance *(2 of 2)*

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
Westside Parkway/State Route 58 EB Off-ramps								
West Beltway					865	855	99%	50
Allen Road	90	90	100%	53	300	286	95%	53
Calloway Drive	480	467	97%	54	815	795	98%	53
Coffee Road	575	544	95%	53	875	875	100%	53
Mohawk Street	1,270	1,219	96%	63	1,650	1,572	95%	54
Truxtun Avenue	1,125	1,048	93%	63	1,400	1,379	99%	55
SR 99 SB/Ming Avenue C-D	1,585	1,585	100%	53	2,355	2,313	98%	53
H Street	455	430	95%	54	367	334	91%	54
Union Avenue	755	737	98%	54	1,050	1,050	100%	53
Cottonwood Road	445	418	94%	54	940	920	98%	53
Westside Parkway/State Route 58 EB On-ramps								
West Beltway loop					1,330	1,294	97%	48
West Beltway diagonal					265	265	100%	54
Allen Road	1,285	1,279	100%	46	1,850	1,850	100%	46
Calloway Drive loop	735	714	97%	47	1,010	1,010	100%	47
Calloway Drive diagonal	990	953	96%	52	1,095	1,075	98%	51
Coffee Drive loop	960	948	99%	47	1,050	1,050	100%	47
Coffee Drive diagonal	835	826	99%	53	1,115	1,108	99%	53
Mohawk Street	685	685	100%	43	1,090	1,058	97%	43
SR 99 NB and SR 99 SB	2,235	2,098	94%	52	2,662	2,623	99%	51
Chester Avenue	950	900	95%	51	1,205	1,205	100%	50
Union Avenue loop	550	522	95%	53	635	630	99%	52
Union Avenue diagonal	405	405	100%	52	565	555	98%	52
Cottonwood Road	365	365	100%	52	295	281	95%	52
Westside Parkway/State Route 58 WB Off-ramps								
Cottonwood Road	300	300	100%	54	295	295	100%	54
Brundage Lane	895	832	93%	49	990	974	98%	46
Chester Avenue	880	826	94%	54	1,100	1,065	97%	54
SR 99 NB	840	840	100%	55	1,095	1,089	99%	54
SR 99 SB	1,230	1,213	99%	52	1,220	1,220	100%	52
Mohawk Street	660	653	99%	53	745	697	94%	53
Coffee Road	1,940	1,916	99%	54	2,030	2,000	99%	53
Calloway Drive diagonal	850	847	100%	53	925	925	100%	53
Calloway Drive loop	1,220	1,212	99%	53	1,245	1,186	95%	53
Allen Road	1,825	1,667	91%	54	2,125	1,974	93%	51
West Beltway					2,190	2,093	96%	53
Westside Parkway/State Route 58 WB On-ramps								
Cottonwood Road	460	451	98%	50	520	498	96%	50
Brundage Lane	360	317	88%	49	355	321	90%	49
Union Avenue	720	720	100%	51	750	750	100%	51
H Street	870	870	100%	50	715	715	100%	50
SR 99 NB/Ming Avenue	1,415	1,415	100%	48	1,745	1,660	95%	47
Truxtun Avenue	1,325	1,246	94%	51	1,865	1,836	98%	49
Mohawk Street loop	940	927	99%	47	1,255	1,205	96%	47
Mohawk Street diagonal	620	554	89%	51	990	957	97%	50
Coffee Road loop	250	230	92%	51	280	272	97%	51
Coffee Road diagonal	425	392	92%	54	575	534	93%	54
Calloway Drive	510	510	100%	52	1,015	970	96%	52
Allen Road	70	70	100%	51	435	435	100%	50
West Beltway loop					450	433	96%	48
West Beltway direct					360	348	97%	53
Westside Parkway EB Collector-Distributor Off-/On-ramps								
Westside Parkway EB C-D on-ramp	1,585	1,585	100%	53	2,355	2,313	98%	53
SR 99 SB C-D off-ramp	930	930	100%	49	1,640	1,633	100%	49
SR 99 SB C-D on-ramp	1,090	1,081	99%	47	1,125	1,028	91%	47

Table 4-28. Ramp Termini and Intersection Level of Service for Alternative B *(1 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
1. I-5 SB ramps/Stockdale Highway	NB/SB two-way stop	A	3.8	A	8.9	A	5.7	F	69.0
	Imp-Signal*	N/A				B	11.7	B	11.3
2. I-5 NB ramps/Stockdale Highway	NB/SB two-way stop	A	4.4	A	9.3	A	6.1	B	19.9
3. SR 43 (Enos Lane)/Rosedale Highway	4-way stop	B	14.7	D	30.2	D	28.4	F	78.7
	Imp-Signal	N/A				C	26.0	C	32.8
4. SR 43 (Enos Lane)/Stockdale Highway	4-way stop	F	51.5	F	87.0	F	>150	F	>150
	Imp-Signal	C	23.0	C	22.8	B	17.0	C	23.7
5. SR 43 (Enos Lane)/I-5 NB ramps	EB/WB two-way stop	A	4.9	B	10.3	A	3.7	B	14.6
6. SR 43 (Enos Lane)/I-5 SB ramps	EB/WB two-way stop	A	8.0	C	16.2	A	3.9	C	21.9
7. Stockdale Highway/Nord Road	Signal	D	38.5	C	31.0	C	31.8	C	28.2
8. Stockdale Highway/Wegis Avenue	NB/SB two-way stop	A	8.0	B	11.9	F	>150	F	>150
	Imp-Signal*	N/A				C	31.2	C	28.6
9. Stockdale Highway/Heath Road	Stop (existing) Signal (future)	B	16.7	B	19.7	C	25.5	C	26.6
10. Stockdale Highway/Westside Parkway	Signal	A	5.9	B	16.2	A	8.4	A	7.8
11. West Beltway/Westside Parkway WB ramp	Signal	*Does not exist in 2018*				A	7.4	B	19.5
12. West Beltway/Westside Parkway EB ramp	Signal	*Does not exist in 2018*				A	8.8	B	13.7
13. Allen Road/Rosedale Highway	Signal*	C	34.2	D	40.4	D	37.5	D	47.7
14. Allen Road/Brimhall Road	Signal	C	23.0	C	32.5	C	23.1	C	33.1
15. Allen Road/Westside Parkway WB ramps	Signal	B	13.9	C	30.2	B	17.2	C	30.1
16. Allen Road/Westside Parkway EB ramps	Signal	B	18.5	A	7.2	B	10.2	B	12.3
17. Allen Road/San Juan Avenue	Signal*	C	23.4	C	20.0	C	22.2	C	25.6
18. Allen Road/Stockdale Highway	Signal	C	25.7	C	27.3	C	30.0	C	33.7
19. Calloway Drive/Rosedale Highway	Signal*	D	43.2	D	38.5	E	55.6	E	60.9
20. Calloway Drive/Brimhall Road	Signal	C	31.8	C	30.0	C	34.9	C	33.2
21. Calloway Drive/Westside Parkway WB ramps	Signal	B	15.1	B	15.3	B	13.1	C	25.6
22. Calloway Drive/Westside Parkway EB ramps	Signal	B	16.5	A	8.3	B	15.9	A	8.9
23. Calloway Drive/Stockdale Highway	Signal	D	46.6	C	30.7	D	44.9	D	38.2
24. Coffee Road/Rosedale Highway*	Signal*	D	45.4	F	108.6	E	67.1	F	135.6

Table 4-28. Ramp Termini and Intersection Level of Service for Alternative B *(2 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
25. Coffee Road/Brimhall Road	Signal	C	24.9	C	23.4	C	30.9	C	31.9
26. Coffee Road/Westside Parkway WB ramps	Unsignalized	N/A				N/A			
27. Coffee Road/Westside Parkway EB ramps	Signal	B	17.2	A	9.8	B	18.1	B	14.3
28. Coffee Road/Truxtun Avenue	Signal	B	13.1	B	14.5	B	13.4	B	16.7
29. Coffee Road/Stockdale Highway	Signal*	D	44.0	D	50.5	E	57.1	**F**	**82.8**
30. Mohawk Street/Rosedale Highway	Stop (existing)* Signal (future)*	E	60.5	**F**	**154.0**	**F**	**84.0**	**F**	**108.7**
31. Mohawk Street/WSP WB ramps	Signal	A	9.6	A	7.6	B	10.9	A	8.9
32. Mohawk Street/WSP EB ramps	Signal	C	21.8	B	16.9	B	18.3	B	12.3
33. Mohawk Street/Truxtun Avenue	Signal	C	32.6	C	30.6	C	33.6	C	28.8
34. Mohawk Street/California Avenue	Signal*	C	34.1	E	55.4	D	40.6	E	62.4
35. Stockdale Highway/California Avenue	Signal*	D	43.2	E	57.4	D	46.2	E	60.4
36. Airport Drive/State Road–SR 204 off-ramp	Signal	C	20.9	C	23.9	C	21.9	C	26.7
37. Airport Drive/SR 99 NB ramp	Signal	A	8.1	B	10.1	A	9.1	B	12.0
38. Buck Owens Boulevard/Rio Mirada Drive	Signal	C	26.8	C	27.1	C	30.9	C	29.4
39. SR 99 NB ramps/Buck Owens Boulevard	Signal	D	38.3	D	43.0	D	45.3	D	42.3
40. Rosedale Highway/Camino Del Rio Court	Signal	C	21.1	D	40.2	C	33.7	D	45.3
41. Rosedale Highway/SR 99 SB ramps	Signal	B	16.3	B	16.1	C	20.5	C	20.9
42. Rosedale Highway/SR99 NB ramps	Signal	C	23.4	C	30.5	C	24.2	D	36.3
43. 24th Street/Oak Street	Signal	C	30.6	C	30.0	C	33.2	D	39.0
44. Truxtun Avenue/Empire Drive	Signal*	C	34.2	C	30.0	C	26.6	D	52.4
45. Truxtun Avenue/Oak Street	Signal	C	29.2	D	45.7	D	52.7	D	45.3
46. California Avenue/Chester Lane	Signal	C	28.8	D	47.8	C	28.7	**F**	**123.6**
47. California Avenue/SR 99 SB ramps	Signal	D	45.5	E	64.6	E	60.1	**F**	**83.2**
48. California Avenue/SR 99 NB ramps	Signal	C	28.9	C	28.9	C	28.1	C	21.2
49. California Avenue/Oak Street	Signal	C	25.7	D	40.5	C	27.5	E	57.9
50. Stockdale Highway/Stine Road	Signal*	C	24.9	D	47.8	C	28.7	**F**	**83.8**
51. Stockdale Highway/Real Road	Signal	D	42.2	D	39.2	D	42.8	D	50.7
52. Stockdale Highway/SR 99 SB ramp	Signal	*Intersection does not exist in Alternative B*							

Table 4-28. Ramp Termini and Intersection Level of Service for Alternative B *(3 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
53. Brundage Lane/Oak Street	Signal	C	24.5	C	29.9	C	25.3	C	31.4
54. Real Road/SR 58	Signal	*Intersection does not exist in Alternative B*							
55. Wible Road/SR 99 NB ramps	Signal	*Intersection does not exist in Alternative B*							
56. Ming Avenue/New Stine Road	Signal*	D	38.6	D	38.8	C	38.0	D	44.6
57. Ming Avenue/Real Road	Signal	C	29.7	C	32.2	C	30.5	C	30.6
58. Ming Avenue/SR 99 SB ramps	Signal	A	6.7	A	5.6	A	7.9	B	15.2
59. Ming Avenue/Wible Road	Signal	B	15.4	C	24.2	C	26.3	C	24.1
60. Ming Avenue/SR 99 NB ramps	Signal	C	28.3	C	32.6	C	27.8	C	34.3
61. Ming Avenue/Castro Lane	Signal	C	28.7	C	34.6	C	28.9	D	36.8
62. White Lane/Wible Road	Signal*	E	61.4	E	72.9	E	78.3	**F**	**136.6**
63. White Lane/SR 99 SB ramps	Signal*	C	20.1	**F**	**81.4**	C	29.8	**F**	**89.0**
64. White Lane/SR 99 NB ramps	Signal*	A	9.0	B	10.3	C	22.7	C	21.4
65. White Lane/Hughes Lane	Signal*	D	38.6	D	44.1	D	40.9	D	53.3
66. H Street/Brundage Lane	Signal	C	25.5	D	51.1	C	26.9	D	47.9
67. H Street/SR 58 WB ramp	Signal	C	24.2	D	46.8	B	13.5	D	36.0
68. H Street/SR 58 EB ramp	Signal	C	21.9	C	21.6	C	24.7	C	27.5
69. H Street/Ming Avenue	Signal*	C	30.0	D	45.2	D	32.9	D	40.9
70. Chester Avenue/Brundage Lane	Signal	C	30.4	D	45.8	C	26.9	D	47.9
71. Chester Avenue/SR 58 WB ramp	Signal	B	18.8	C	23.0	C	20.6	C	27.5
72. Chester Avenue/SR 58 EB ramp	Signal	C	28.8	B	15.1	C	28.6	C	29.1
73. Chester Avenue/Ming Avenue	Signal*	D	37.8	D	49.2	D	39.5	D	52.7
74. Union Avenue/Brundage Lane	Signal	C	31.8	C	26.8	D	45.6	D	49.4
75. Brundage Lane/SR 58 WB ramps	Signal	C	30.9	C	24.6	C	23.6	D	43.4
76. Union Avenue/SR 58 EB ramps	Signal	B	15.4	B	12.7	B	19.8	B	20.0
77. Cottonwood Road–MLK/Brundage Lane	Signal	C	26.3	C	26.7	C	23.6	C	28.9
78. Cottonwood Road–Brundage Lane/SR 58 WB ramps	Signal	C	23.3	C	25.2	C	21.2	C	30.3
79. Cottonwood Road/SR 58 EB ramps	Signal	B	11.1	B	17.6	B	10.7	B	19.6

*LOS summary based on SYNCHRO 6

Source: Parsons

4.6 Traffic Performance of Build Alternative C

Alternative C proposes to connect the east end of the Westside Parkway to State Route 58 east near Cottonwood Road by means of a new freeway. Starting at the Mohawk Street interchange, this alternative would traverse easterly, spanning the Kern River and Truxtun Avenue, and continue parallel to and south of the BNSF railroad tracks. It would then turn south and continue parallel to and west of State Route 99 for approximately one mile and connect with State Route 58 near the existing State Route 58/State Route 99 interchange. This alignment is illustrated on Figure 4-13. This alternative proposes undercrossings at California Avenue, Palm Avenue, State Route 99, Oak Street and Brundage Lane.

New branch connectors would be constructed for the eastbound State Route 58 to southbound State Route 99 and the northbound State Route 99 to westbound State Route 58 movements. Auxiliary lanes would be provided on State Route 99 to accommodate the additional traffic from State Route 58. Improvements on State Route 99 would extend from the Wilson Road overcrossing to the Gilmore Avenue overcrossing. A collector-distributor road system would provide access from westbound State Route 58 to northbound State Route 99 as well as from northbound State Route 99 to westbound State Route 58. The Wible Road on- and off-ramps south of the existing State Route 99/State Route 58 interchange would be removed to accommodate the northbound State Route 99 auxiliary lane. The Stockdale Avenue off-ramp from southbound State Route 99 to the eastbound State Route 58 connector would be removed. Local access from Real Road to southbound State Route 99 would be removed as well.

The traffic lane configuration of the freeway segments along State Route 58, the Westside Parkway, and State Route 99 are illustrated on Figure 4-14. Traffic demand volumes and interchange ramp configurations are also depicted on the graphic.

The following are locations where the new structures would be required for this alternative to allow the listed road to pass under or over the proposed new freeway alignment:

- Truxtun Avenue
- California Avenue
- Palm Street
- Brundage Lane
- Stockdale Highway

As the new freeway would be aligned adjacent to the BNSF railyard and the State Route 99 freeway, it would not bisect existing business parks or residential neighborhoods. The potential closure of Easton Drive would modify existing circulation, however.

Figure 3-15, shown previously, illustrated the difference between year 2038 alternative C and no-build daily traffic volumes, as assigned by the travel forecast model. In a like manner, Figure 4-16 illustrates the location and severity of traffic congestion on the alternative C road network. Comparison of this system-wide level of service “plot” to those prepared for alternative A (Figure 4-9) and alternative B (Figure 4-12) indicates very little difference among these three

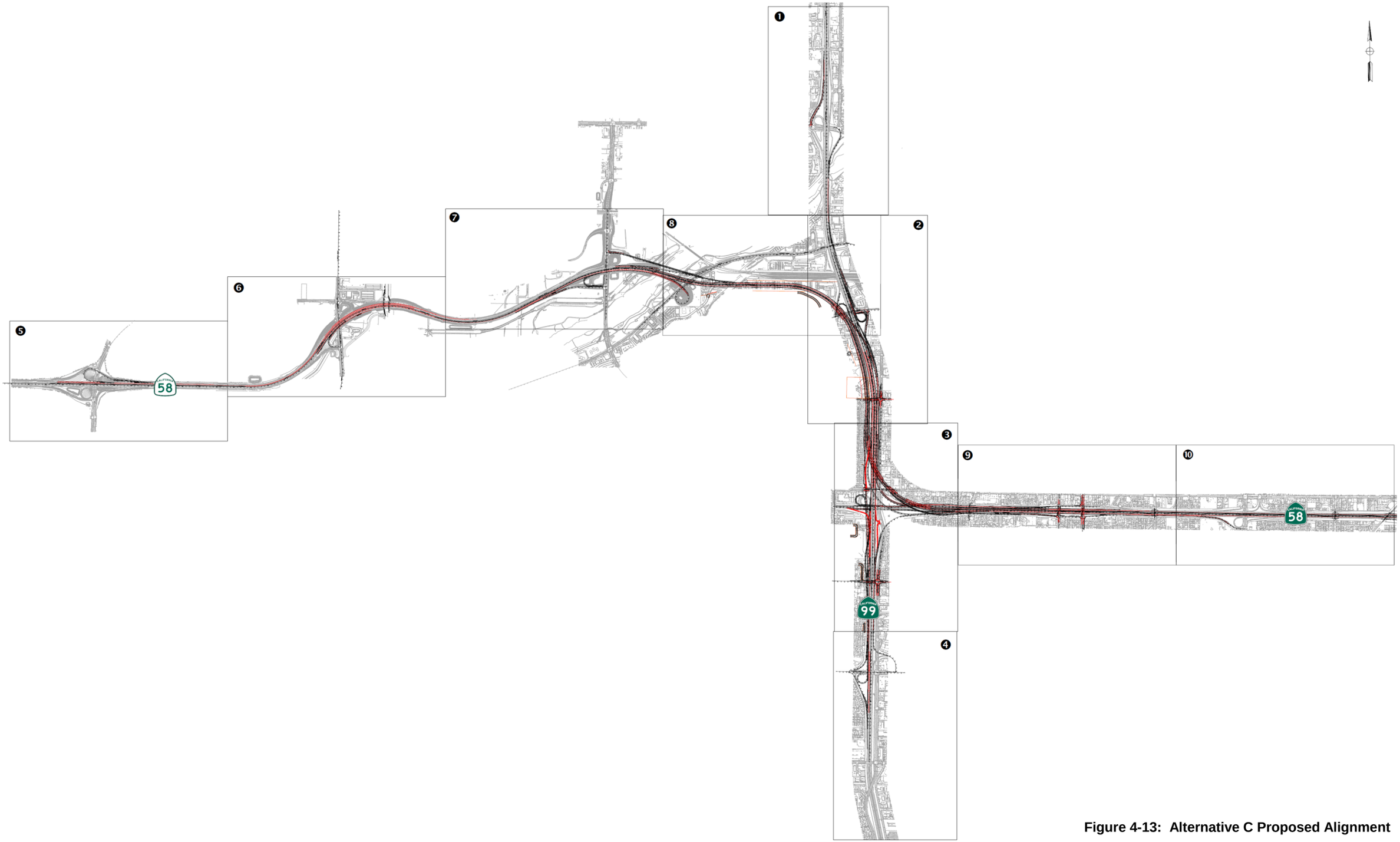


Figure 4-13: Alternative C Proposed Alignment

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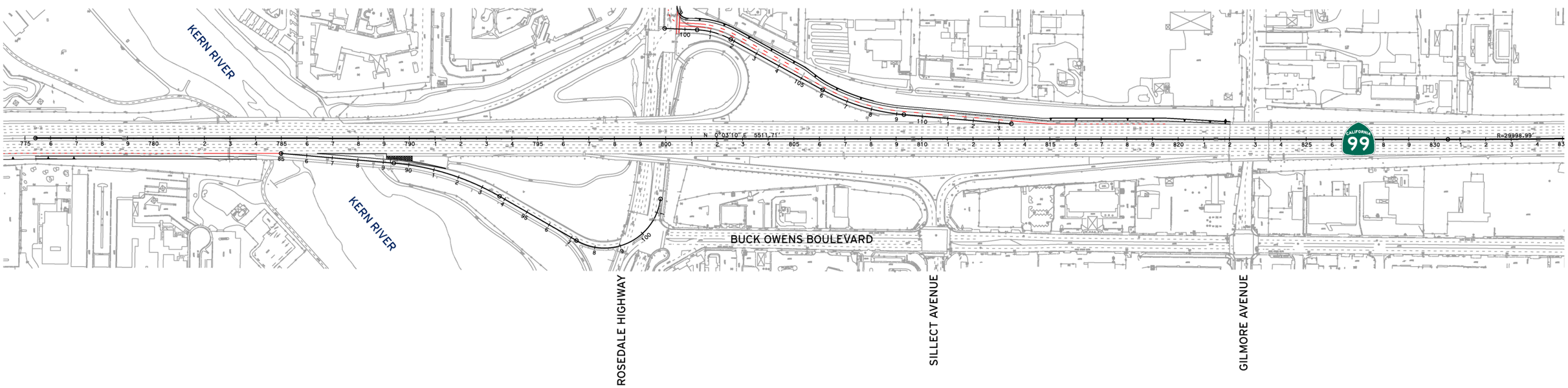

Figure 4-13: Alternative C Proposed Alignment
Sheet 1 of 10

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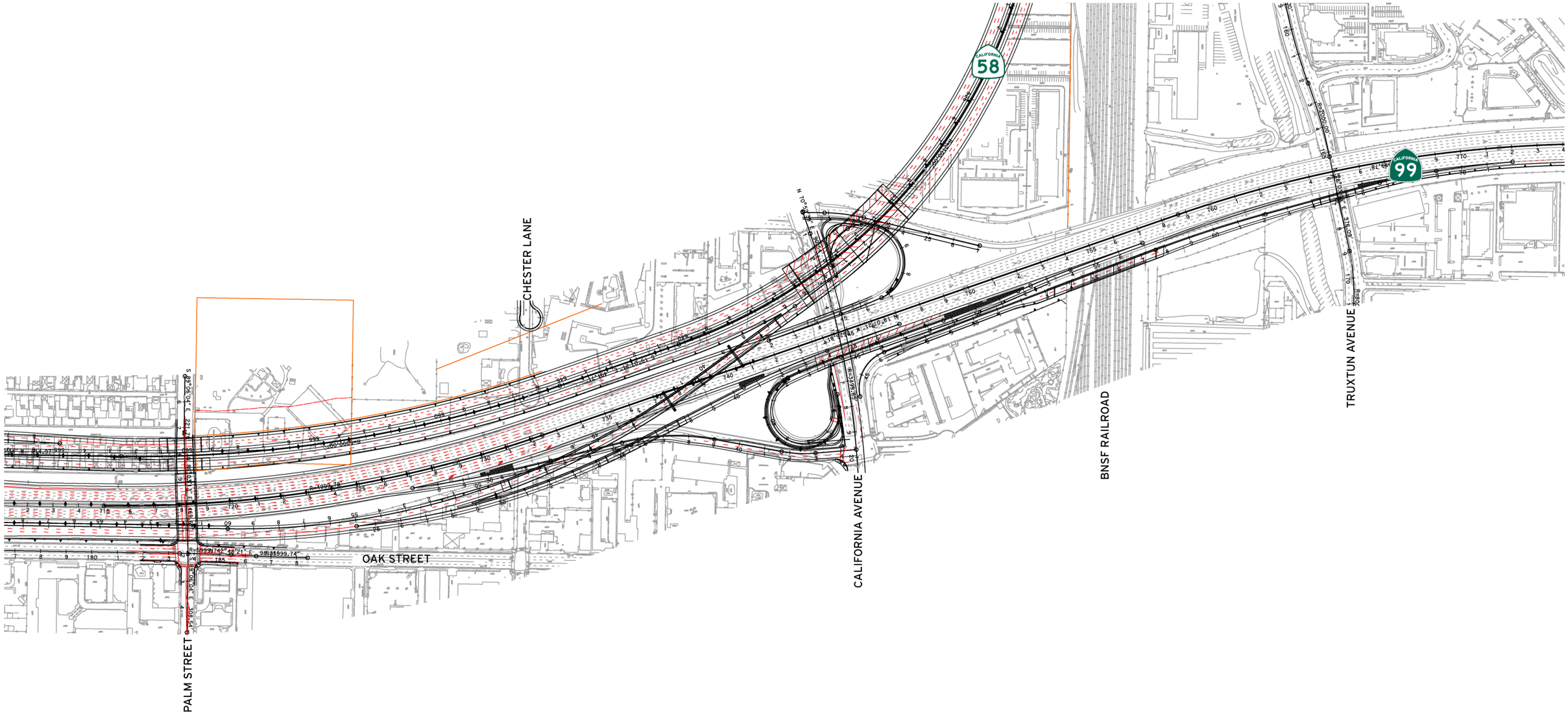

Figure 4-13: Alternative C Proposed Alignment
Sheet 2 of 10

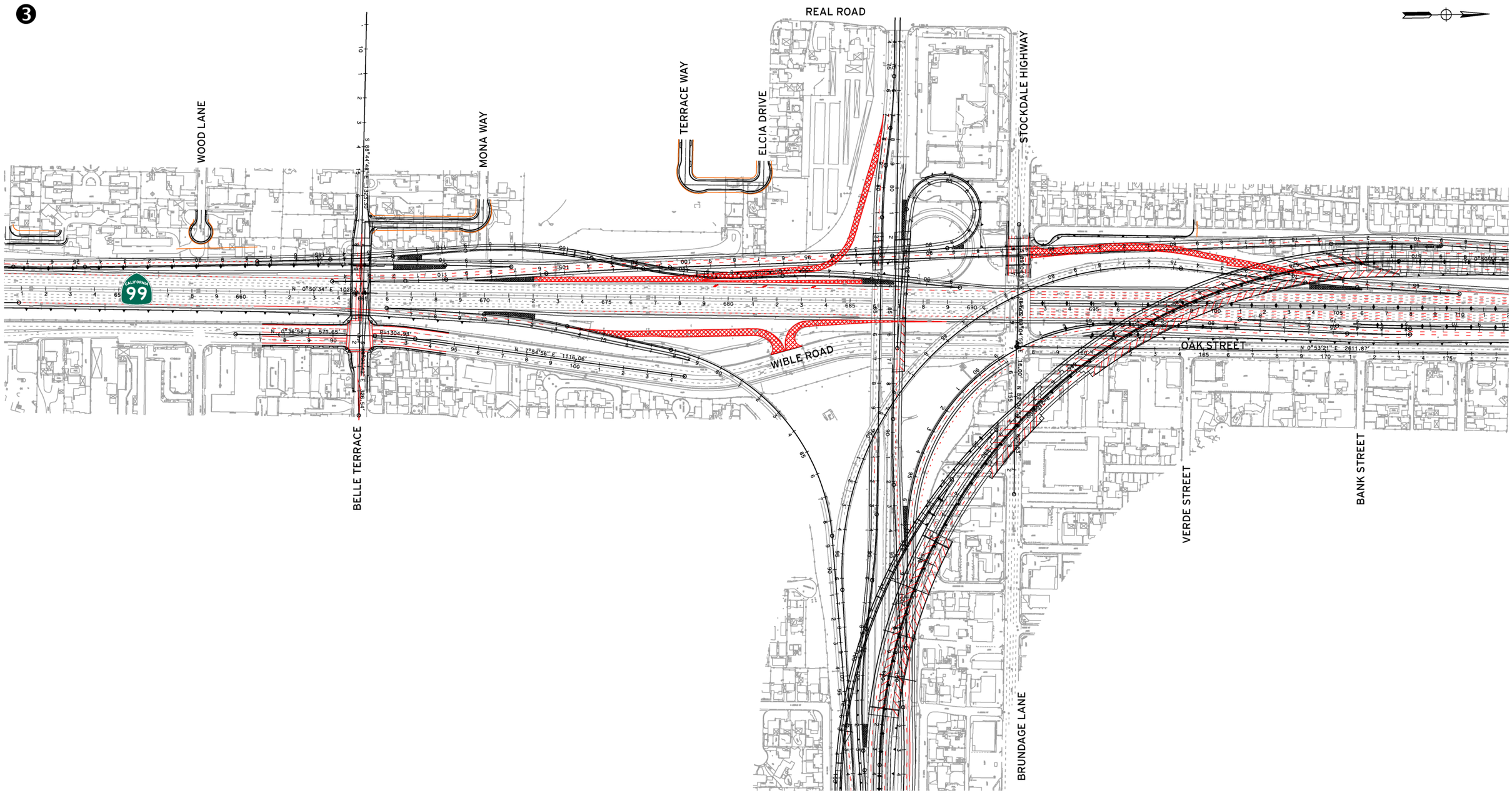

Figure 4-13: Alternative C Proposed Alignment
Sheet 3 of 10

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Figure 4-13: Alternative C Proposed Alignment
Sheet 4 of 10

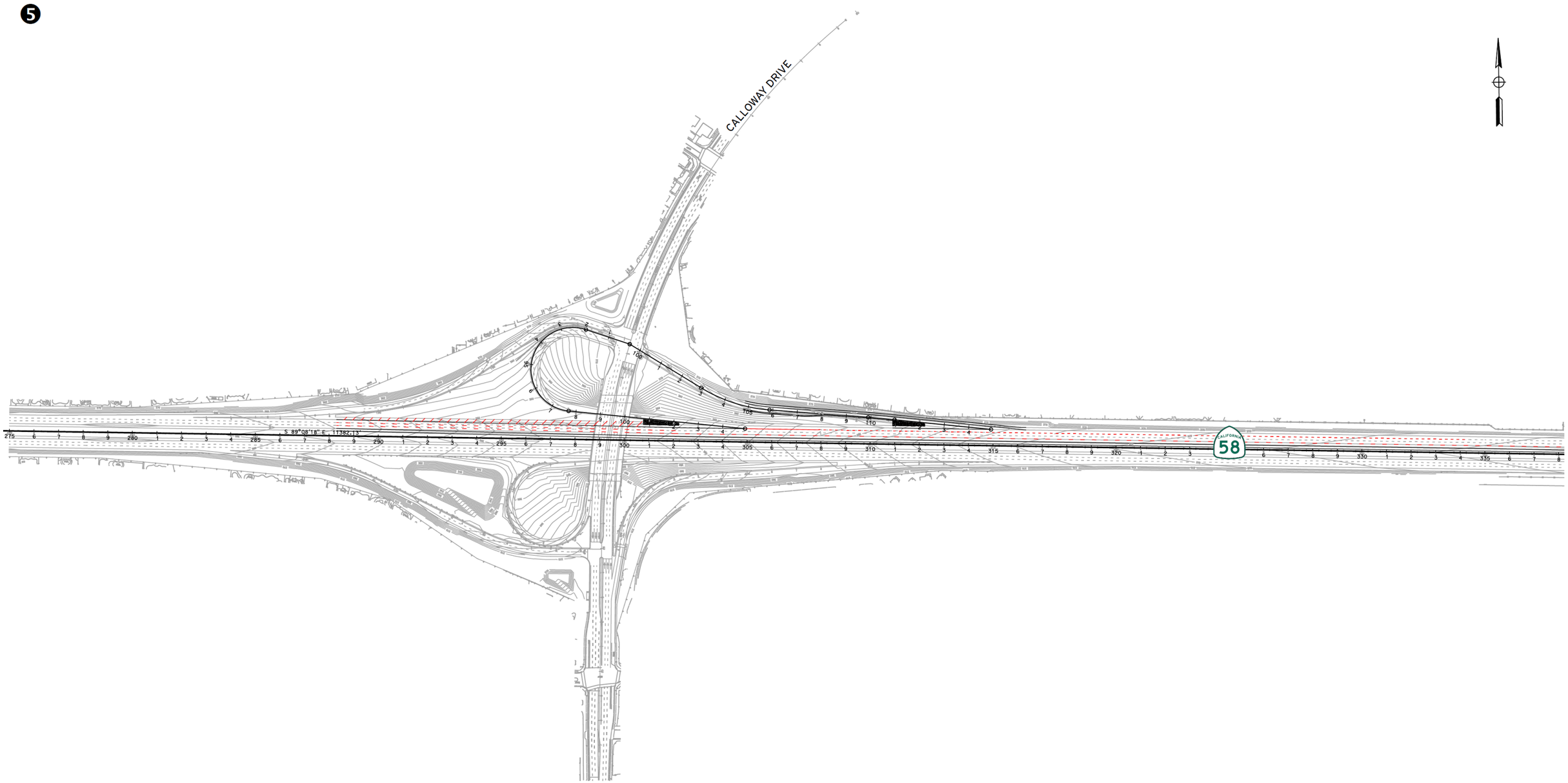

Figure 4-13: Alternative C Proposed Alignment
Sheet 5 of 10

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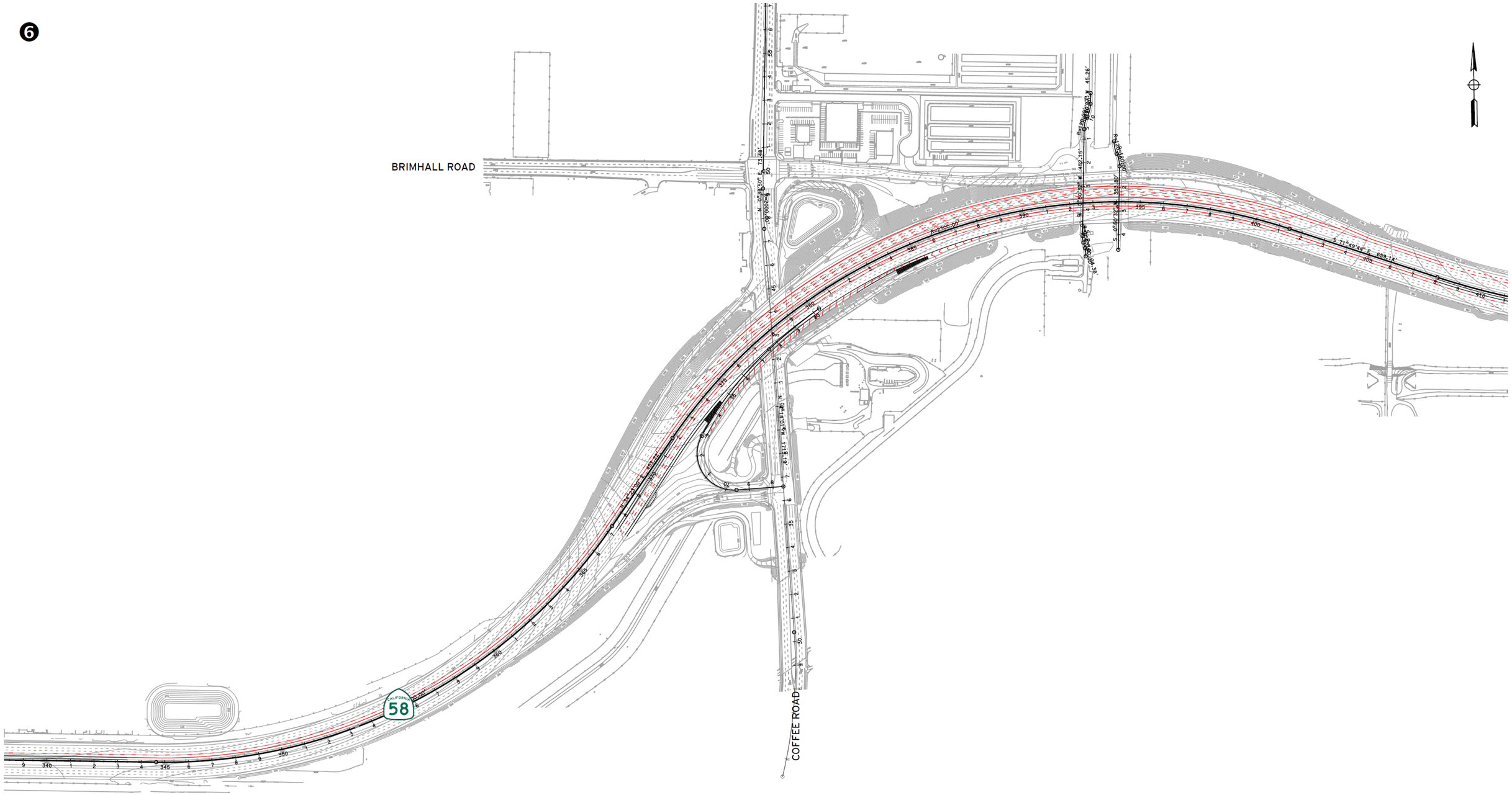

Figure 4-13: Alternative C Proposed Alignment
Sheet 6 of 10

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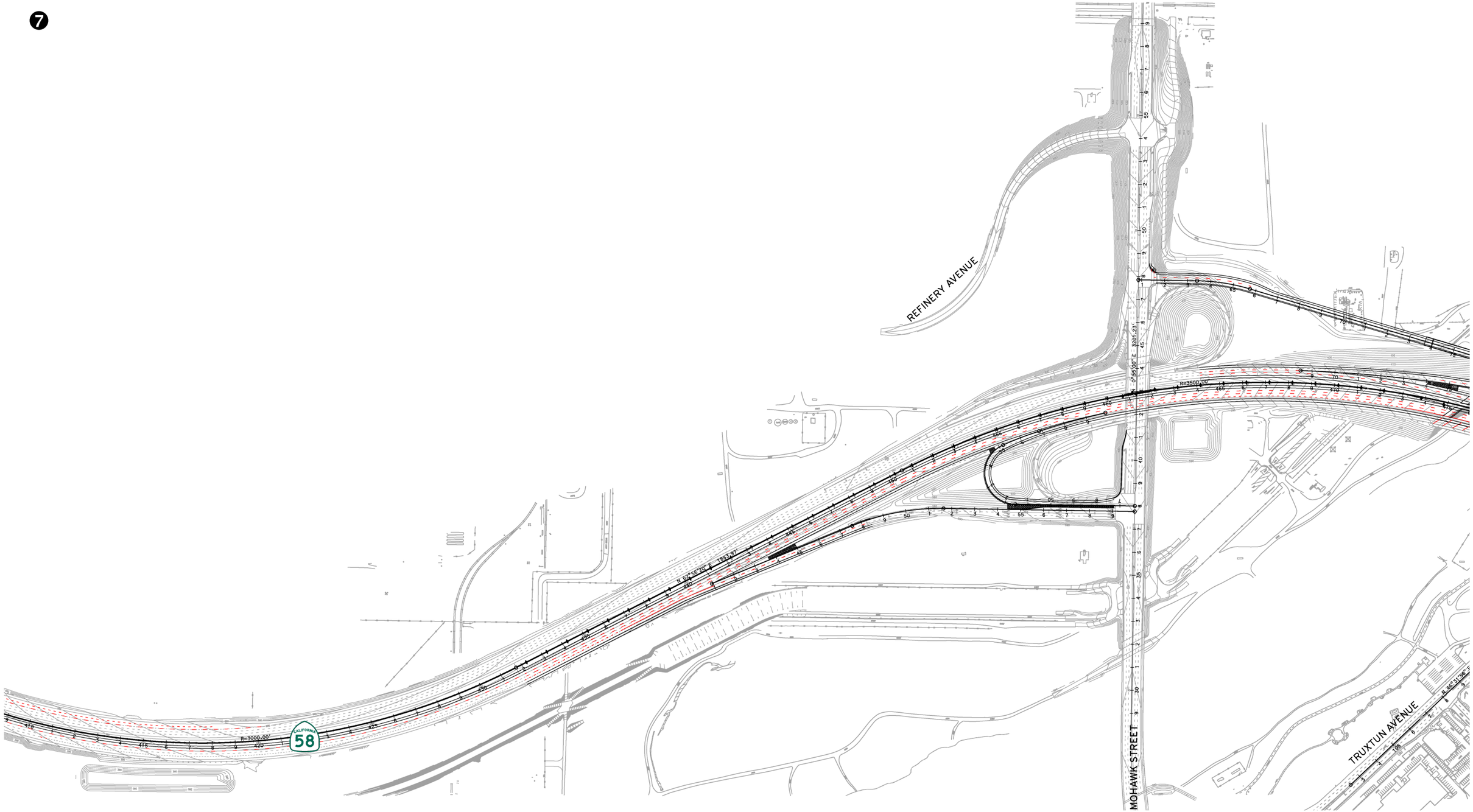

Figure 4-13: Alternative C Proposed Alignment
Sheet 7 of 10

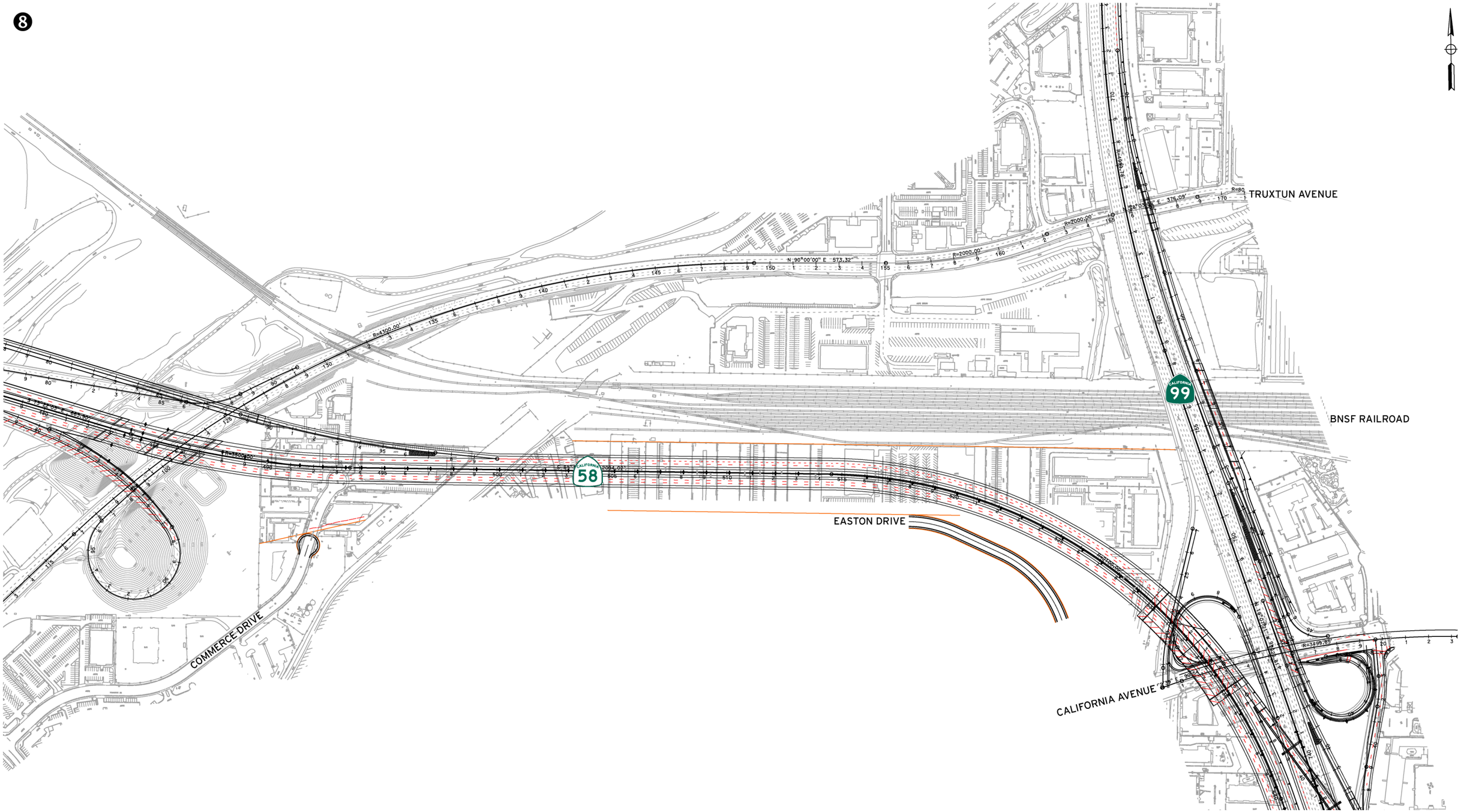

Figure 4-13: Alternative C Proposed Alignment
Sheet 8 of 10

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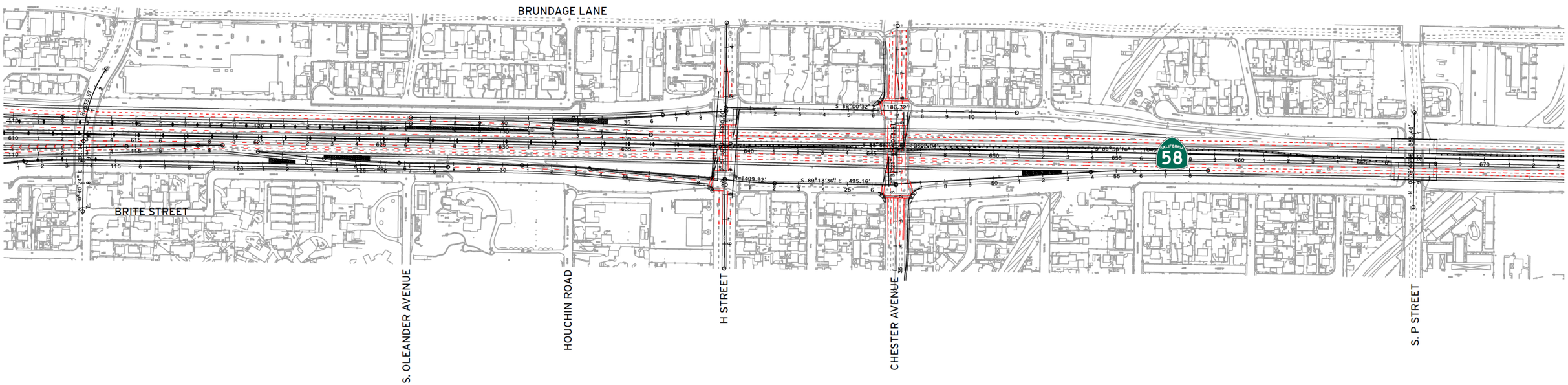


Figure 4-13: Alternative C Proposed Alignment
Sheet 9 of 10

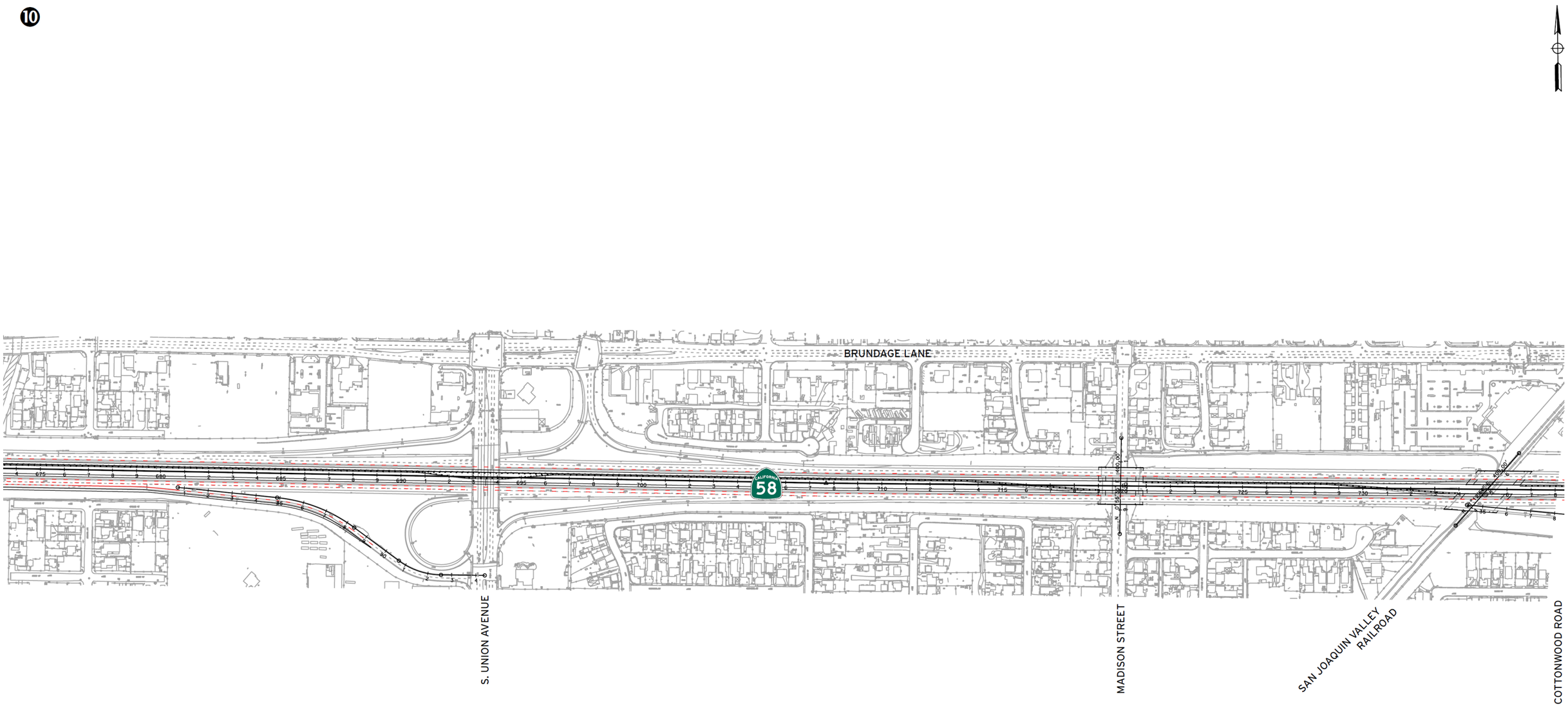
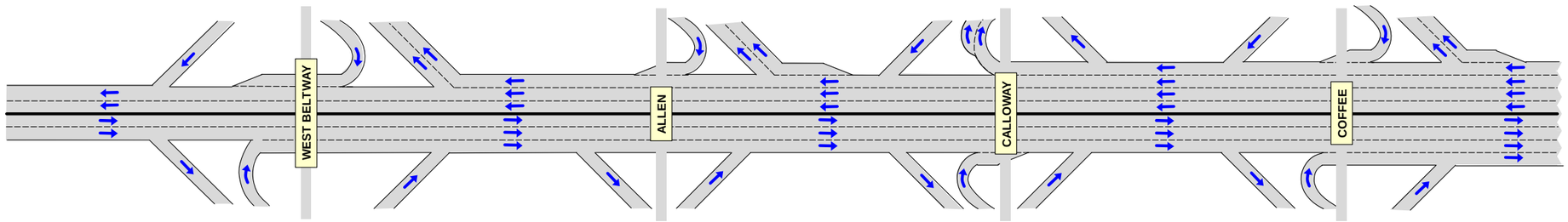


Figure 4-13: Alternative C Proposed Alignment
Sheet 10 of 10

A. State Route 58 and Westside Parkway

State Route 58 Westbound		MAINLINE	WEST BELTWAY					MAINLINE	ALLEN ROAD			MAINLINE	CALLOWAY DRIVE					MAINLINE	COFFEE ROAD					MAINLINE
			ON	MAINLINE	ON	MAINLINE	OFF		ON	MAINLINE	OFF		ON	MAINLINE	OFF	MAINLINE	OFF		ON	MAINLINE	ON	MAINLINE	OFF	
2038 ALTERNATIVE C	AM Peak	**1,616**	295	**1,321**	300	**1,021**	1,485	**2,506**	370	**2,136**	1,140	**3,276**	550	**2,726**	725	**3,451**	585	**4,036**	310	**3,726**	180	**3,546**	2,170	**5,716**
	PM Peak	**2,305**	375	**1,930**	475	**1,455**	2,220	**3,675**	445	**3,230**	2,100	**5,330**	1,055	**4,275**	1,265	**5,540**	950	**6,490**	595	**5,895**	300	**5,595**	2,110	**7,705**
	ADT	**28,620**	5,925	**22,695**	6,045	**16,650**	24,935	**41,585**	3,685	**37,900**	23,875	**61,775**	10,050	**51,725**	14,875	**66,600**	9,875	**76,475**	5,480	**70,995**	2,890	**68,105**	28,975	**97,080**



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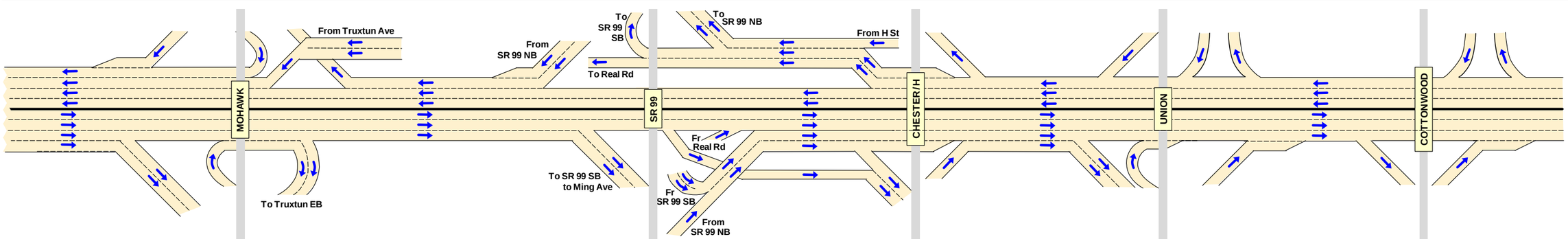
State Route 58 Eastbound		MAINLINE	WEST BELTWAY					MAINLINE	ALLEN ROAD			MAINLINE	CALLOWAY DRIVE					MAINLINE	COFFEE ROAD					MAINLINE
			OFF	MAINLINE	ON	MAINLINE	ON		OFF	MAINLINE	ON		OFF	MAINLINE	ON	MAINLINE	ON		OFF	MAINLINE	ON	MAINLINE	ON	
2038 ALTERNATIVE C	AM Peak	**2,215**	685	**1,530**	1,475	**3,005**	280	**3,285**	360	**2,925**	1,990	**4,915**	975	**3,940**	920	**4,860**	1,100	**5,960**	1,050	**4,910**	950	**5,860**	1,075	**6,935**
	PM Peak	**2,210**	850	**1,360**	1,325	**2,685**	255	**2,940**	295	**2,645**	1,820	**4,465**	825	**3,640**	965	**4,605**	1,085	**5,690**	875	**4,815**	1,070	**5,885**	1,110	**6,995**
	ADT	**28,480**	11,080	**17,400**	18,800	**36,200**	3,555	**39,755**	4,500	**35,255**	24,150	**59,405**	11,790	**47,615**	10,600	**58,215**	14,350	**72,565**	11,540	**61,025**	14,000	**75,025**	16,000	**91,025**

MOHAWK STREET/TRUXTUN AVENUE							MAINLINE	STATE ROUTE 99 SYSTEM INTERCHANGE			MAINLINE	H ST/CHESTER AVE			MAINLINE	UNION AVENUE					MAINLINE	COTTONWOOD ROAD			MAINLINE	State Route 58 WB	
MOHAWK ON	MAINLINE	MOHAWK ON	MAINLINE	TRUXTUN ON	MAINLINE	MOHAWK OFF		ON	MAINLINE	OFF		ON	MAINLINE	OFF		ON	MAINLINE	ON	MAINLINE	OFF		ON	MAINLINE	OFF			
810	**4,906**	625	**4,281**	1,000	**3,281**	890	**4,171**	1,735	**2,435**	2,605	**5,690**	650	**5,040**	825	**5,865**	770	**5,095**	500	**4,595**	825	**5,420**	375	**5,045**	200	**5,245**	AM Peak	2038 ALTERNATIVE C
975	**6,730**	1,205	**5,525**	1,875	**3,650**	790	**4,440**	1,870	**2,570**	2,625	**5,900**	705	**5,195**	705	**5,900**	710	**5,190**	410	**4,780**	675	**5,455**	585	**4,870**	275	**5,145**	PM Peak	
11,285	**85,795**	13,930	**71,865**	22,500	**49,365**	9,280	**58,645**	23,655	**34,990**	30,015	**76,375**	11,370	**65,005**	14,610	**79,615**	11,645	**67,970**	6,385	**61,585**	9,050	**70,635**	6,535	**64,100**	2,900	**67,000**	ADT	



MOHAWK STREET/TRUXTUN AVENUE					MAINLINE	STATE ROUTE 99 SYSTEM INTERCHANGE				MAINLINE	H ST/CHESTER AVE			MAINLINE	UNION AVENUE					MAINLINE	COTTONWOOD ROAD			MAINLINE	State Route 58 EB	
MOHAWK OFF	MAINLINE	MOHAWK ON	MAINLINE	TRUXTUN OFF		OFF	MAINLINE	FROM REAL RD ON	ON		OFF	MAINLINE	ON		OFF	MAINLINE	ON	MAINLINE	ON		OFF	MAINLINE	ON			
1,890	**5,045**	475	**5,520**	1,550	**3,970**	1,945	**2,025**	955	2,215	**5,195**	660	**4,535**	650	**5,185**	1,050	**4,135**	300	**4,435**	290	**4,725**	645	**4,080**	310	**4,390**	AM Peak	2038 ALTERNATIVE C
1,700	**5,295**	1,050	**6,345**	1,395	**4,950**	2,345	**2,605**	980	2,825	**6,410**	745	**5,665**	915	**6,580**	1,365	**5,215**	610	**5,825**	550	**6,375**	1,060	**5,315**	275	**5,590**	PM Peak	
22,955	**68,070**	9,565	**77,635**	17,875	**59,760**	20,640	**39,120**	8,965	34,195	**82,280**	10,215	**72,065**	10,356	**82,421**	16,270	**66,151**	5,900	**72,051**	4,670	**76,721**	11,310	**65,411**	3,090	**68,501**	ADT	

Figure 4-14: Alternative C Freeway Lane Configuration and Forecast Traffic Volumes *(1 of 2)*

B. State Route 99

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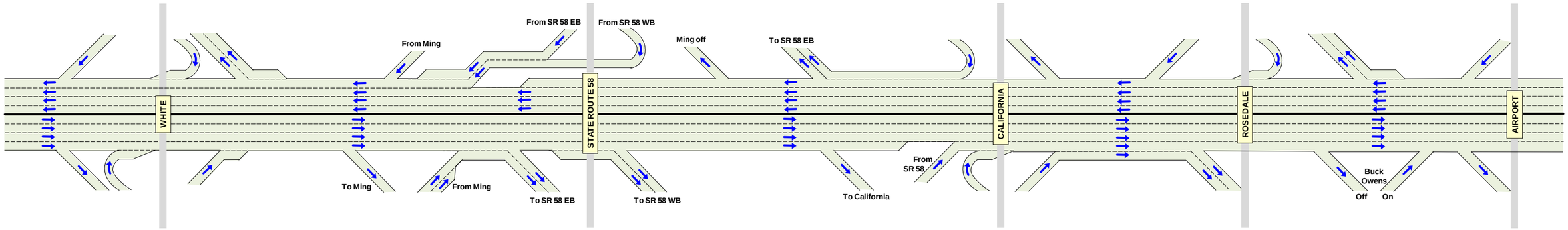
State Route 99 Southbound		MAINLINE	WHITE LANE ON	WHITE LANE MAINLINE	WHITE LANE ON	WHITE LANE MAINLINE	WHITE LANE OFF	MAINLINE	MING AVENUE ON	MAINLINE	STATE ROUTE 58 ON	MAINLINE	MING AVENUE OFF	MAINLINE	STATE ROUTE 58 EB OFF	MAINLINE	CALIFORNIA AVENUE ON	CALIFORNIA AVENUE MAINLINE	CALIFORNIA AVENUE OFF	MAINLINE	ROSEDALE HIGHWAY ON	ROSEDALE HIGHWAY MAINLINE	ROSEDALE HIGHWAY ON	ROSEDALE HIGHWAY MAINLINE	ROSEDALE HIGHWAY OFF	MAINLINE	AIRPORT DRIVE ON	MAINLINE
2038 ALTERNATIVE C	AM Peak	**5,429**	450	**4,979**	260	**4,719**	1,685	**6,404**	795	**5,610**	2,450	**3,160**	800	**3,960**	920	**4,880**	525	**4,355**	1,415	**5,770**	650	**5,120**	1,090	**4,030**	1,360	**5,390**	1,410	**3,980**
	PM Peak	**7,550**	630	**6,920**	565	**6,355**	2,020	**8,375**	840	**7,535**	2,740	**4,795**	1,115	**5,910**	1,390	**7,300**	945	**6,355**	1,625	**7,980**	1,060	**6,920**	1,370	**5,550**	1,300	**6,850**	2,055	**4,795**
	ADT	**95,345**	9,495	**85,850**	7,500	**78,350**	20,475	**98,825**	11,035	**87,790**	24,470	**63,320**	12,790	**76,110**	15,565	**91,675**	10,525	**81,150**	21,680	**102,830**	10,375	**92,455**	15,900	**76,555**	15,100	**91,655**	24,000	**67,655**



State Route 99 Northbound		MAINLINE	WHITE LANE OFF	WHITE LANE MAINLINE	WHITE LANE ON	WHITE LANE MAINLINE	WHITE LANE ON	MAINLINE	MING AVENUE OFF	MING AVENUE MAINLINE	MING AVENUE ON	MAINLINE	STATE ROUTE 58 EB OFF	MAINLINE	STATE ROUTE 58 WB OFF	MAINLINE	CALIFORNIA AVENUE OFF	MAINLINE	STATE ROUTE 58 WB ON	MAINLINE	CALIFORNIA AVENUE ON	CALIFORNIA AVENUE MAINLINE	CALIFORNIA AVENUE ON	MAINLINE	ROSEDALE HIGHWAY OFF	ROSEDALE HIGHWAY MAINLINE	ROSEDALE HIGHWAY OFF	ROSEDALE HIGHWAY MAINLINE	ROSEDALE HIGHWAY ON	MAINLINE	AIRPORT DRIVE OFF	MAINLINE
2038 ALTERNATIVE C	AM Peak	**7,085**	1,085	**6,000**	1,650	**7,650**	700	**8,350**	895	**7,455**	1,575	**9,030**	1,295	**7,735**	1,735	**6,000**	1,050	**4,950**	1,105	**6,055**	930	**6,985**	435	**7,420**	1,765	**5,655**	815	**4,840**	675	**5,515**	1,760	**3,755**
	PM Peak	**6,680**	1,105	**5,575**	1,635	**7,210**	680	**7,890**	885	**7,005**	1,520	**8,525**	1,435	**7,090**	1,870	**5,220**	655	**4,565**	1,130	**5,695**	1,310	**7,005**	835	**7,840**	1,670	**6,170**	375	**5,795**	755	**6,550**	1,420	**5,130**
	ADT	**94,100**	11,500	**82,600**	19,090	**101,690**	8,940	**110,630**	11,350	**99,280**	18,000	**117,280**	18,630	**98,650**	23,655	**74,995**	5,550	**69,445**	14,130	**83,575**	14,650	**98,225**	7,735	**105,960**	20,555	**85,405**	6,850	**78,555**	10,750	**89,305**	21,800	**67,505**

Figure 4-14: Alternative C Freeway Lane Configuration and Forecast Traffic Volumes *(2 of 2)*

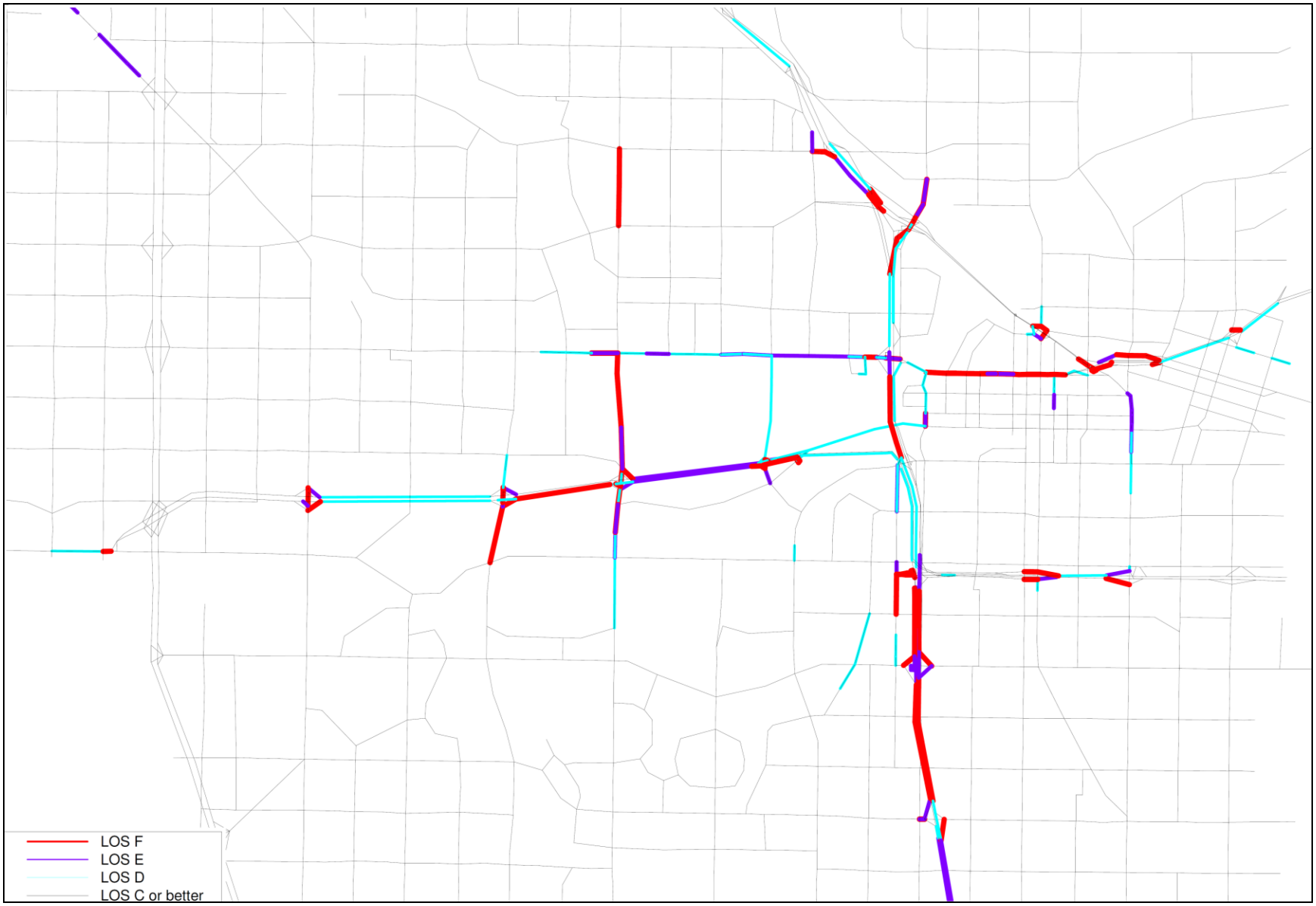


Figure 4-15: Locations of Congestion for Alternative C

build alternatives. As noted for alternative B, differences in traffic impacts would be expected in local, neighborhood circulation patterns.

Similar to the information reported for the build A and B alternatives, Table 4-29 presents measures of effectiveness performance data for Alternative C AM peak hour conditions, while Table 4-30 presents PM peak hour data. Both sets of data are extracted from the CORSIM traffic simulation model output and pertain to freeway mainline segments. Segments expected to operate with LOS E or F performance in the design year of 2038 are highlighted.

With respect to 2038 AM peak hour conditions, Table 4-29 indicates that only two segments of the freeway system, northbound State Route 99 between the White Lane loop on-ramp and the Ming Avenue off-ramp, will operate at LOS E. Of the 79 freeway segments analyzed, 61 will operate at LOS C or better, 16 at LOS D, and two at LOS E, as mentioned above. Speeds will range between 55 and 64 mph and nearly all of the demand volumes will be served.

During the PM peak hour, traffic operations will be nearly as good as AM peak hour conditions. Of the 79 freeway segments analyzed, 44 will operate at LOS C or better, 32 segments will operate at LOS D, and three segments will operate at LOS E or F.

- Southbound State Route 99 between the Rosedale Highway loop on-ramp and the Rosedale Highway diagonal on-ramp (LOS E)
- Southbound State Route 99 between the Rosedale Highway diagonal on-ramp and the California Avenue off-ramp (LOS F)
- Southbound State Route 99 between the Ming Avenue on-ramp and the White Lane off-ramp (LOS F).

The percentage of demand traffic volumes served will fall below 90 percent in one reach of State Route 99.

- Northbound between the California Avenue diagonal on-ramp and north of the Airport Drive off-ramp (87 to 89 percent served)

Along the Westside Parkway/State Route 58, speeds will range between 57 and 64 mph. Along State Route 99, speeds will range between 51 and 63 mph for the most part.

Motorists will experience slower speeds, below 50 mph, on three segments of southbound State Route 99 during the PM peak hour.

Freeway on-ramp and off-ramp performance, and interchange merge/diverge conditions are reported in Tables 4-31 through 4-34. Ramp terminal and other study intersection level of service performance are provided in Table 4-35. The results are similar to those reported for build alternative A.

Table 4-29. AM Peak Hour Measures of Effectiveness for Alternative C—Freeway Mainline Segments *(1 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/LANES (vphl)
State Route 99 NB Mainline																										
SR-99 NB south end of the network to White Lane off-ramp	5,065	5,065	100%	50	1	63	20	C	50	4458	71	2	1269	7,085	7,085	100%	51	2	62	29	D	51	6226	101	5	1774
White Lane off-ramp to White Lane loop on-ramp	4,370	4,370	100%	19	1	63	17	B	69	1466	23	1	1095	6,000	6,000	100%	20	1	61	24	C	71	2013	33	2	1503
White Lane loop on-ramp to White Lane diagonal on-ramp	5,990	5,812	97%	7	1	53	27	D	76	611	12	2	1453	7,650	7,241	95%	8	3	45	40	**E**	79	761	17	5	1810
White Lane diagonal on-ramp to Ming Avenue off-ramp	6,705	6,705	100%	77	6	59	29	D	153	8542	144	12	1689	8,350	8,324	100%	79	8	58	36	**E**	158	10524	182	19	2081
Ming Avenue off-ramp to Ming Avenue on-ramp	5,970	5,970	100%	25	1	62	25	C	179	2629	43	2	1514	7,455	7,455	100%	26	2	61	31	D	183	3241	53	3	1869
Ming Avenue on-ramp to SR 58 EB off-ramp	7,325	7,325	100%	11	1	59	25	C	189	1308	22	2	1657	9,030	9,030	100%	11	1	59	31	D	194	1591	27	3	2016
SR 58 EB off-ramp to SR 99 NB C-D off-ramp (WSP WB)	6,170	5,879	95%	42	2	61	21	C	231	4155	68	3	1306	7,735	7,303	94%	42	3	60	27	D	237	5161	86	6	1623
SR9 9 NB C-D off-ramp (WSP WB) to California Avenue off-ramp	4,525	4,525	100%	33	2	62	19	C	264	2659	43	2	1171	6,000	5,948	99%	34	2	61	24	C	270	3380	56	3	1487
California Avenue off-ramp to SR 99 NB C-D on-ramp (SR 58 WB and H Street)	3,560	3,560	100%	17	1	61	15	B	280	1036	17	1	1049	4,950	4,933	100%	17	2	59	21	C	287	1393	24	2	1409
SR 99 NB C-D on-ramp (SR 58 WB and H Street) to California Avenue loop on-ramp	4,815	4,815	100%	11	1	61	20	C	292	936	15	1	1236	6,055	5,986	99%	11	1	60	25	C	299	1134	19	1	1497
California Avenue loop on-ramp to California Avenue diagonal on-ramp	5,650	5,650	100%	18	2	58	25	C	309	1609	28	3	1417	6,985	6,688	96%	18	2	58	29	D	316	1898	33	3	1672
California Avenue diagonal on-ramp to Rosedale Highway off-ramp	6,035	6,003	99%	13	1	59	20	C	322	1250	21	2	1334	7,420	7,057	95%	13	1	59	24	C	329	1470	25	2	1568
Rosedale Highway off-ramp to Buck Owens Blvd/Sillect Avenue off-ramp	4,420	4,339	98%	17	1	62	18	B	338	1233	20	1	1085	5,655	5,349	95%	17	1	61	22	C	346	1519	25	2	1337
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	3,860	3,776	98%	24	1	63	15	B	362	1569	25	1	944	4,840	4,595	95%	24	1	62	18	C	370	1909	31	1	1149
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	4,280	4,154	97%	34	2	61	17	B	396	2362	39	2	1038	5,515	5,253	95%	35	3	59	22	C	405	2987	51	5	1313
Airport Drive off-ramp to SR 99 NB north end of the network	2,755	2,639	96%	40	1	63	10	A	436	1864	29	1	660	3,755	3,518	94%	41	1	63	14	B	445	2484	40	1	880
State Route 99 SB Mainline																										
SR 99 SB north end of the network to Airport Drive on-ramp	3,200	3,200	100%	48	1	64	13	B	48	2745	43	1	805	3,980	3,980	100%	48	1	64	16	B	48	3413	53	1	1000
Airport Drive on-ramp to Rosedale Highway off-ramp	4,485	4,388	98%	31	1	62	17	B	79	2335	38	2	975	5,390	5,314	99%	32	2	60	21	C	80	2841	47	4	1181
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	3,815	3,696	97%	25	1	63	15	B	103	1590	25	1	924	4,030	4,009	99%	25	1	63	16	B	105	1724	27	1	1002
Rosedale Highway loop on-ramp to Rosedale Highway direct on-ramp	4,735	4,633	98%	9	1	58	17	B	113	702	12	1	1158	5,120	5,120	100%	10	1	55	20	C	114	782	14	2	1290
Rosedale Highway direct on-ramp to California Avenue off-ramp	5,280	5,190	98%	36	3	60	21	C	149	3144	52	4	1298	5,770	5,770	100%	38	4	58	24	C	152	3502	60	6	1447
California Avenue off-ramp to California Avenue on-ramp	4,155	4,097	99%	13	0	63	16	B	162	954	15	1	1024	4,355	4,355	100%	13	1	62	18	B	165	1022	16	1	1098
California Avenue on-ramp to SR 58 EB off-ramp	4,590	4,515	98%	27	1	62	15	B	189	2084	34	1	1003	4,880	4,880	100%	27	1	62	16	B	192	2253	36	2	1085
SR58 EB off-ramp to SR 99 SB off-ramp (Ming Avenue)	3,795	3,699	97%	28	1	62	15	B	217	1794	29	1	925	3,960	3,935	99%	28	1	62	16	B	220	1909	31	1	984
SR 99 SB off-ramp (Ming Avenue) to SR 99 SB on-ramp (Westside Parkway EB and SR 58 WB and H Street)	3,065	3,005	98%	30	1	63	12	B	247	1557	25	1	859	3,160	3,118	99%	30	1	63	12	B	250	1615	26	1	891
SR 99 SB on-ramp (Westside Parkway EB and SR 58 WB and H Street) to Ming Avenue on-ramp	4,520	4,410	98%	44	2	63	14	B	291	3346	53	2	980	5,609	5,509	98%	45	2	61	18	B	295	4186	68	4	1224
Ming Avenue on-ramp to White Lane off-ramp	5,020	4,927	98%	60	3	62	19	C	350	5053	82	4	1095	6,404	6,284	98%	64	7	58	26	C	358	6489	111	12	1396
White Lane off-ramp to White Lane loop on-ramp	3,605	3,523	98%	19	1	63	14	B	370	1181	19	0	881	4,719	4,653	99%	19	1	62	19	C	378	1559	25	1	1163
White Lane loop on-ramp to White Lane diagonal on-ramp	3,795	3,689	97%	10	0	63	15	B	379	625	10	0	922	4,979	4,766	96%	10	0	62	19	C	387	807	13	0	1192
White Lane diagonal on-ramp to SR 99 SB south end of the network	4,049	3,928	97%	52	2	63	16	B	431	3551	57	2	982	5,246	5,063	97%	52	2	62	20	C	440	4578	74	3	1266
State Route 99 NB Collector-Distributor																										
SR 99 NB C-D on-ramp to SR 99 NB C-D off-ramp	3,375	3,336	99%	27	1	52	21	C	54	1297	25	1	1334	3,490	3,490	100%	27	1	53	22	C	53	1363	26	1	1402
State Route 99 SB Collector-Distributor																										
SR 58 WB C-D on-ramp to SR 99 SB C-D off-ramp	2,200	2,129	97%	13	1	52	14	B	40	401	8	0	710	3,320	3,236	97%	13	1	52	21	C	41	610	12	1	1079
SR 99 SB C-D off-ramp to SR 99 SB C-D on-ramp	745	718	96%	10	0	49	15	B	50	97	2	0	718	870	840	97%	10	0	49	17	B	51	113	2	0	840
SR 99 SB C-D on-ramp to Ming Avenue off-ramp	1,455	1,409	97%	17	0	48	15	B	68	328	7	0	704	1,670	1,664	100%	17	1	48	17	B	68	388	8	0	832

Table 4-29. AM Peak Hour Measures of Effectiveness for Alternative C—Freeway Mainline Segments *(2 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/LANES (vphl)
Westside Parkway EB Mainline																										
Westside Parkway west end of the network to West Beltway off-ramp	*— NOT APPLICABLE —*													2,215	2,215	100%	6	2	46	25	C	6	187	4	1	1143
West Beltway off-ramp to West Beltway loop on-ramp														1,530	1,517	99%	14	1	60	13	B	20	356	6	0	759
West Beltway loop on-ramp to West Beltway Direct on-ramp														3,005	2,966	99%	9	1	61	16	B	30	463	8	0	989
West Beltway diagonal on-ramp to Allen Road off-ramp	1,035	970	94%	83	3	61	7	A	83	1370	22	1	485	3,285	3,209	98%	57	2	62	17	B	87	3157	51	2	1070
Allen Road off-ramp to Allen Road on-ramp	980	946	97%	32	0	64	5	A	115	538	8	0	315	2,925	2,843	97%	33	1	63	15	B	119	1619	26	1	948
Allen Road on-ramp to Calloway Drive off-ramp	2,705	2,694	100%	59	3	62	14	B	174	2733	44	2	898	4,915	4,870	99%	62	6	60	27	D	181	5003	84	8	1623
Calloway Drive off-ramp to Calloway Drive loop on-ramp	2,165	2,165	100%	24	1	64	12	B	198	959	15	0	738	3,940	3,940	100%	25	1	63	21	C	206	1715	27	1	1320
Calloway Drive Loop on-ramp to Calloway Drive diagonal on-ramp	2,915	2,890	99%	11	1	61	16	B	209	547	9	1	963	4,860	4,806	99%	12	1	59	27	D	218	910	15	2	1602
Calloway Drive diagonal on-ramp to Coffee Road off-ramp	4,010	4,010	100%	49	3	61	21	C	258	3379	55	3	1349	5,960	5,960	100%	50	4	60	32	D	268	5017	84	7	1999
Coffee Road off-ramp to Coffee Road loop on-ramp	3,340	3,340	100%	23	1	63	18	B	281	1354	21	1	1128	4,910	4,872	99%	23	1	62	26	D	291	1948	31	1	1624
Coffee Road loop on-ramp to Coffee Road diagonal on-ramp	4,220	4,216	100%	11	0	62	17	B	292	799	13	0	1054	5,860	5,811	99%	11	1	62	24	C	302	1101	18	1	1453
Coffee Road diagonal on-ramp to Mohawk Street off-ramp	4,825	4,760	99%	56	3	61	19	C	348	4476	74	5	1190	6,935	6,878	99%	62	10	55	31	D	365	6541	119	19	1720
Mohawk Street off-ramp to Mohawk Street on-ramp	3,350	3,311	99%	20	1	61	18	B	368	1118	18	1	1104	5,045	5,009	99%	20	1	61	27	D	385	1693	28	1	1670
Mohawk Street on-ramp to Truxtun Avenue off-ramp	3,870	3,838	99%	20	1	61	16	B	388	1297	21	1	1096	5,520	5,471	99%	20	1	60	23	C	405	1849	31	2	1563
Truxtun Avenue off-ramp to SR 99 SB C-D off-ramp (SR 99 SB and Ming Avenue)	2,465	2,420	98%	82	2	63	13	B	469	3448	55	1	807	3,970	3,899	98%	83	4	62	21	C	488	5550	90	4	1300
SR 99 SB C-D off-ramp (SR 99 SB and Ming Avenue) to H Street off-ramp	1,345	1,327	99%	37	1	63	11	A	506	864	14	0	663	2,025	1,964	97%	37	1	63	16	B	525	1280	20	1	982
H Street off-ramp to Real Road on-ramp	888	888	100%	18	0	64	7	A	524	285	4	0	457	1,685	1,652	98%	18	1	63	13	B	543	515	8	0	826
Real Road on-ramp to SR 99 NB and SB on-ramp	1,808	1,805	100%	10	1	62	15	B	534	311	5	0	902	2,663	2,560	96%	10	1	60	22	C	554	442	7	1	1280
SR 99 NB and SB on-ramp to Chester Avenue on-ramp	3,550	3,550	100%	45	2	63	15	B	579	2816	45	2	1039	4,535	4,535	100%	45	2	62	18	C	599	3516	57	3	1297
Chester Avenue on-ramp to Union Avenue off-ramp	4,045	4,045	100%	27	1	62	17	B	605	1873	30	1	1166	5,185	5,185	100%	27	2	61	21	C	626	2381	39	2	1481
Union Avenue off-ramp to Union Avenue loop on-ramp	3,235	3,235	100%	17	1	63	17	B	622	940	15	0	1080	4,135	4,135	100%	17	1	62	22	C	643	1217	20	1	1397
Union Avenue loop on-ramp to Union Avenue diagonal on-ramp	3,500	3,460	99%	8	0	62	19	C	630	484	8	0	1153	4,435	4,434	100%	8	0	62	24	C	651	620	10	1	1478
Union Avenue diagonal on-ramp to Cottonwood Road off-ramp	3,750	3,715	99%	31	1	62	20	C	661	1973	32	1	1238	4,725	4,715	100%	31	2	61	26	C	682	2504	41	2	1572
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,220	3,150	98%	28	1	63	17	B	689	1523	24	1	1050	4,080	4,058	99%	28	1	62	22	C	710	1962	31	1	1353
Cottonwood Road on-ramp to SR 58 east end of the network	3,445	3,374	98%	25	1	63	18	B	714	1472	24	1	1125	4,390	4,344	99%	25	1	62	23	C	735	1896	31	2	1448
Westside Parkway WB Mainline																										
SR 58 east end of the network to Cottonwood Road off-ramp	3,640	3,640	100%	26	0	63	19	C	26	1665	26	0	1220	5,245	5,245	100%	26	1	63	28	D	26	2397	38	1	1758
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,440	3,440	100%	18	1	63	18	C	43	1059	17	1	1149	5,045	5,017	99%	18	1	62	27	D	44	1541	25	1	1672
Cottonwood Road on-ramp to Brundage Lane off-ramp	3,730	3,718	100%	38	2	62	20	C	82	2460	40	2	1239	5,420	5,372	99%	39	3	61	30	D	83	3551	59	4	1791
Brundage Lane off-ramp to Brundage Lane on-ramp	3,190	3,174	99%	17	1	62	17	B	99	936	15	1	1058	4,595	4,592	100%	17	1	61	25	C	101	1355	22	1	1531
Brundage Lane on-ramp to Union Avenue on-ramp	3,640	3,541	97%	12	1	61	19	C	111	725	12	1	1180	5,095	4,984	98%	12	1	60	28	D	113	1022	17	1	1661
Union Avenue on-ramp to Chester Avenue off-ramp	4,210	4,149	99%	23	1	61	17	B	134	1615	26	1	1185	5,865	5,784	99%	23	2	60	24	C	136	2253	38	3	1653
Chester Avenue off-ramp to SR 58 WB C-D off-ramp (SR 99 NB and SB and Real Road)	3,535	3,476	98%	30	2	60	17	B	164	1747	29	2	993	5,040	4,792	95%	30	2	59	23	C	167	2406	40	3	1369
SR 58 WB C-D off-ramp (SR 99 NB and SB and Real Road) to SR 99 NB C-D on-ramp (SR 99 NB and H Street)	765	765	100%	112	2	64	6	A	276	1545	24	0	388	1,785	1,785	100%	114	4	63	14	B	281	3563	57	2	895
SR99 NB C-D on-ramp (SR 99 NB and H Street) to Mohawk Street off-ramp	2,885	2,840	98%	39	2	61	16	B	315	1856	30	2	1136	4,171	4,171	100%	40	3	59	24	C	321	2756	47	4	1692
Mohawk Street off-ramp to Truxtun Avenue on-ramp	2,240	2,209	99%	27	1	63	18	B	342	1046	17	1	1105	3,281	3,266	100%	28	1	61	27	D	349	1547	25	1	1633
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	3,180	3,135	99%	11	1	62	17	B	353	594	10	0	1045	4,281	4,235	99%	11	1	61	23	C	360	802	13	1	1412
Mohawk Street loop on-ramp to Mohawk Street direct ramp	3,735	3,633	97%	14	1	63	15	B	367	896	14	1	908	4,906	4,853	99%	14	1	62	20	C	374	1197	19	1	1213
Mohawk Street direct ramp to Coffee Road off-ramp	4,230	3,970	94%	43	2	62	15	B	410	2896	47	2	882	5,716	5,378	94%	43	2	61	20	C	417	3924	65	4	1195
Coffee Road off-ramp to Coffee Road loop on-ramp	2,510	2,370	94%	35	1	64	9	A	445	1485	23	0	593	3,546	3,522	99%	36	1	63	14	B	453	2206	35	1	880
Coffee Road loop on-ramp to Coffee Road direct on-ramp	2,665	2,503	94%	12	0	64	10	A	457	545	9	0	626	3,726	3,656	98%	12	0	63	14	B	465	796	13	0	914
Coffee Road direct on-ramp to Calloway Drive direct off-ramp	2,935	2,791	95%	48	1	63	11	A	505	2349	37	1	698	4,036	3,903	97%	48	2	63	15	B	514	3278	52	2	976
Calloway Drive direct off-ramp to Calloway Drive loop off-ramp	2,275	2,206	97%	11	0	62	9	A	516	418	7	0	552	3,451	3,335	97%	11	0	62	13	B	525	631	10	0	834
Calloway Drive loop off-ramp to Calloway Drive on-ramp	1,320	1,297	98%	24	0	64	7	A	540	555	9	0	432	2,726	2,656	97%	24	1	63	14	B	549	1135	18	1	885
Calloway Drive on-ramp to Allen Road off-ramp	1,635	1,613	99%	57	2	63	8	A	597	1606	25	1	538	3,276	3,168	97%	58	3	62	17	B	607	3151	51	3	1056
Allen Road off-ramp to Allen Road on-ramp	560	560	100%	26	0	65	3	A	623	269	4	0	192	2,136	2,064	97%	27	1	64	11	A	634	967	15	0	688
Allen Road on-ramp to West Beltway off-ramp	665	665	100%	89	1	64	5	A	712	1108	17	0	234	2,506	2,419	97%	57	2	62	13	B	691	2387	38	1	806
West Beltway off-ramp to West Beltway loop on-ramp	*— NOT APPLICABLE —*													1,021	990	97%	22	0	64	8	A	713	394	6	0	495
West Beltway loop on-ramp to West Beltway direct on-ramp														1,321	1,269	96%	6	0	62	10	A	719	127	2	0	635
West Beltway direct on-ramp to Westside Parkway west end of the network														1,616	1,549	96%	6	0	60	13	B	725	149	2	0	774
State Route 58 WB Collector-Distributor																										
SR 58 WB C-D on-ramp to SR 99 NB C-D off-ramp	3,285	3,277	100%	35	2	53	21	C	45	1683	32	1	1311	3,905	3,793	97%	35	2	52	24	C	45	1949	37	2	1517
SR 99 NB C-D off-ramp to SR 99 SB off-ramp	1,555	1,513	97%	22	1	51	15	B	67	483	9	0	757	2,150	2,120	99%	23	1	51	21	C	67	677	13	1	1060
SR 99 SB off-ramp to Real Road off-ramp	475	461	97%	2	0	50	5	A	69	16	0	0	307	775	775	100%	3	0	49	8	A	70	27	1	0	523

Table 4-30. PM Peak Hour Measures of Effectiveness for Alternative C—Freeway Mainline Segments *(1 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/LANES (vphl)
State Route 99 NB Mainline																										
SR-99 NB south end of the network to White Lane off-ramp	4,615	4,615	100%	50	1	63	18	C	50	4067	64	2	1157	6,680	6,680	100%	51	2	62	27	D	51	5874	95	4	1674
White Lane off-ramp to White Lane loop on-ramp	3,935	3,930	100%	19	1	63	16	B	69	1316	21	1	983	5,575	5,524	99%	19	1	62	22	C	70	1850	30	1	1381
White Lane loop on-ramp to White Lane diagonal on-ramp	5,395	5,122	95%	7	1	57	22	C	76	539	9	1	1281	7,210	6,578	91%	7	2	51	32	D	78	692	14	3	1645
White Lane diagonal on-ramp to Ming Avenue off-ramp	5,990	5,884	98%	75	5	60	24	C	151	7443	123	8	1471	7,890	7,598	96%	78	7	59	32	D	155	9605	164	15	1899
Ming Avenue off-ramp to Ming Avenue on-ramp	5,185	5,103	98%	25	1	62	21	C	176	2215	36	2	1276	7,005	6,754	96%	26	2	61	28	D	181	2929	48	3	1689
Ming Avenue on-ramp to SR 58 EB off-ramp	6,460	6,388	99%	11	1	60	21	C	187	1121	19	1	1420	8,525	8,291	97%	11	1	59	28	D	192	1453	25	2	1842
SR 58 EB off-ramp to SR 99 NB C-D off-ramp (WSP WB)	5,130	4,849	95%	41	2	61	18	B	228	3424	56	3	1078	7,090	6,490	92%	42	3	61	24	C	233	4586	76	5	1442
SR9 9 NB C-D off-ramp (WSP WB) to California Avenue off-ramp	3,395	3,395	100%	33	1	62	14	B	261	1936	31	1	853	5,220	5,112	98%	33	2	62	21	C	267	2905	47	2	1278
California Avenue off-ramp to SR 99 NB C-D on-ramp (SR 58 WB and H Street)	2,795	2,795	100%	16	1	62	11	B	277	796	13	0	806	4,565	4,404	96%	17	1	60	18	C	284	1244	21	2	1258
SR 99 NB C-D on-ramp (SR 58 WB and H Street) to California Avenue loop on-ramp	4,000	4,000	100%	11	1	61	17	B	289	768	13	1	1013	5,695	5,493	96%	11	1	61	23	C	295	1041	17	1	1373
California Avenue loop on-ramp to California Avenue diagonal on-ramp	4,860	4,754	98%	17	2	58	20	C	306	1349	23	2	1188	7,005	6,287	90%	18	2	58	27	D	312	1785	31	3	1572
California Avenue diagonal on-ramp to Rosedale Highway off-ramp	5,485	5,260	96%	13	1	59	18	B	319	1096	19	2	1169	7,840	6,948	89%	13	1	58	24	C	325	1448	25	2	1544
Rosedale Highway off-ramp to Buck Owens Blvd/Sillect Avenue off-ramp	3,905	3,700	95%	16	1	62	15	B	335	1051	17	1	925	6,170	5,380	87%	17	1	61	22	C	342	1529	25	1	1345
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	3,585	3,386	94%	24	1	63	13	B	359	1407	22	1	847	5,795	5,030	87%	24	1	62	20	C	366	2090	34	1	1258
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	4,315	4,056	94%	34	2	60	17	B	393	2306	38	3	1014	6,550	5,747	88%	35	3	59	24	C	401	3266	56	5	1437
Airport Drive off-ramp to SR 99 NB north end of the network	2,975	2,799	94%	40	1	63	11	B	433	1977	31	1	700	5,130	4,482	87%	41	2	62	18	B	442	3166	51	2	1121
State Route 99 SB Mainline																										
SR 99 SB north end of the network to Airport Drive on-ramp	3,540	3,540	100%	48	1	64	14	B	48	3038	47	1	890	4,795	4,795	100%	49	1	63	19	C	49	4116	65	2	1205
Airport Drive on-ramp to Rosedale Highway off-ramp	5,330	5,317	100%	31	2	61	21	C	79	2836	46	3	1182	6,850	6,850	100%	36	7	55	31	D	85	3828	70	13	1555
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	4,630	4,628	100%	25	1	62	19	C	104	1991	32	1	1157	5,550	5,550	100%	26	2	60	24	C	110	2483	41	3	1443
Rosedale Highway loop on-ramp to Rosedale Highway direct on-ramp	5,960	5,960	100%	11	2	51	25	C	115	909	18	3	1500	6,920	6,920	100%	13	4	43	36	**E**	123	1080	25	8	1782
Rosedale Highway direct on-ramp to California Avenue off-ramp	6,780	6,766	100%	39	6	55	30	D	154	4077	74	10	1692	7,980	7,980	100%	52	18	41	48	**F**	175	4753	116	40	2018
California Avenue off-ramp to California Avenue on-ramp	5,425	5,411	100%	14	1	62	22	C	168	1259	20	1	1353	6,355	6,354	100%	14	1	60	27	D	189	1479	25	2	1589
California Avenue on-ramp to SR 58 EB off-ramp	6,400	6,305	99%	27	2	61	21	C	195	2910	48	3	1401	7,300	7,177	98%	27	2	61	24	C	216	3312	55	3	1595
SR58 EB off-ramp to SR 99 SB off-ramp (Ming Avenue)	5,195	5,170	100%	28	2	61	21	C	223	2507	41	2	1293	5,910	5,815	98%	29	2	61	24	C	245	2819	46	2	1454
SR 99 SB off-ramp (Ming Avenue) to SR 99 SB on-ramp (Westside Parkway EB and SR 58 WB and H Street)	4,130	4,130	100%	30	2	62	17	B	254	2158	35	2	1187	4,795	4,763	99%	30	2	61	19	C	275	2471	40	2	1361
SR 99 SB on-ramp (Westside Parkway EB and SR 58 WB and H Street) to Ming Avenue on-ramp	6,180	6,180	100%	44	2	62	20	C	298	4692	76	3	1373	7,535	7,465	99%	45	3	61	24	C	320	5675	94	6	1659
Ming Avenue on-ramp to White Lane off-ramp	6,860	6,860	100%	63	6	59	28	D	361	7122	121	11	1533	8,375	8,224	98%	78	21	39	55	**F**	398	8769	178	48	1828
White Lane off-ramp to White Lane loop on-ramp	4,835	4,835	100%	19	1	63	19	C	380	1626	26	1	1213	6,355	6,244	98%	20	1	61	26	C	418	2094	34	2	1561
White Lane loop on-ramp to White Lane diagonal on-ramp	5,335	5,283	99%	10	1	62	21	C	390	894	15	1	1321	6,920	6,732	97%	10	1	61	28	D	428	1140	19	1	1683
White Lane diagonal on-ramp to SR 99 SB south end of the network	5,691	5,572	98%	52	2	62	22	C	442	5036	81	3	1393	7,333	7,116	97%	53	3	61	29	D	481	6426	105	6	1779
State Route 99 NB Collector-Distributor																										
SR 99 NB C-D on-ramp to SR 99 NB C-D off-ramp	3,430	3,394	99%	27	1	53	22	C	51	1319	25	1	1358	3,705	3,548	96%	27	1	52	23	C	52	1380	26	1	1419
State Route 99 SB Collector-Distributor																										
SR 58 WB C-D on-ramp to SR 99 SB C-D off-ramp	2,825	2,796	99%	13	1	52	18	C	41	526	10	1	932	3,675	3,638	99%	13	1	52	24	C	41	685	13	1	1213
SR 99 SB C-D off-ramp to SR 99 SB C-D on-ramp	775	754	97%	10	0	49	15	B	51	102	2	0	754	935	898	96%	10	0	49	18	C	51	121	2	0	898
SR 99 SB C-D on-ramp to Ming Ave off-ramp	1,840	1,761	96%	17	1	48	18	C	68	410	9	0	881	2,050	1,965	96%	17	1	48	20	C	68	457	10	0	982

Table 4-30. PM Peak Hour Measures of Effectiveness for Alternative C—Freeway Mainline Segments *(2 of 2)*

FREEWAY SEGMENT	YEAR 2018													YEAR 2038												
	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/LANES (vphl)	DEMAND (vph)	SERVED (vph)	% SERVED	TRAVEL TIME (sec/veh)	DELAY TIME (sec/veh)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	CUMULATIVE TIME (sec/veh)	VEHICLE MILES (VMT)	VEHICLE HOURS (VHT)	VEHICLE DELAY (VHD)	CORSIM SERVED VOLUMES/LANES (vphl)
Westside Parkway EB Mainline																										
Westside Parkway west end of the network to West Beltway off-ramp	*— NOT APPLICABLE —*													2,210	2,210	100%	7	2	46	27	D	7	185	4	2	1134
West Beltway off-ramp to West Beltway loop on-ramp														1,360	1,318	97%	14	1	60	11	A	21	309	5	0	659
West Beltway loop on-ramp to West Beltway Direct on-ramp														2,685	2,608	97%	9	1	61	14	B	30	407	7	0	869
West Beltway diagonal on-ramp to Allen Road off-ramp	900	857	95%	84	3	61	6	A	84	1208	20	1	429	2,940	2,850	97%	57	2	63	15	B	87	2804	45	1	950
Allen Road off-ramp to Allen Road on-ramp	815	804	99%	32	0	64	4	A	116	457	7	0	268	2,645	2,547	96%	33	1	63	13	B	119	1450	23	1	849
Allen Road on-ramp to Calloway Drive off-ramp	2,105	2,035	97%	58	2	63	11	A	174	2062	33	1	678	4,465	4,383	98%	60	4	61	24	C	180	4464	73	5	1461
Calloway Drive off-ramp to Calloway Drive loop on-ramp	1,620	1,605	99%	24	0	64	8	A	198	695	11	0	535	3,640	3,631	100%	25	1	63	19	C	204	1573	25	1	1210
Calloway Drive Loop on-ramp to Calloway Drive diagonal on-ramp	2,360	2,293	97%	11	1	62	12	B	209	434	7	0	764	4,605	4,525	98%	12	1	59	25	C	216	857	14	1	1508
Calloway Drive diagonal on-ramp to Coffee Road off-ramp	3,340	3,304	99%	48	2	62	17	B	258	2746	44	2	1101	5,690	5,652	99%	50	4	61	30	D	266	4722	78	6	1884
Coffee Road off-ramp to Coffee Road loop on-ramp	2,770	2,770	100%	23	0	63	15	B	280	1109	17	0	925	4,815	4,815	100%	23	1	62	26	C	289	1929	31	1	1607
Coffee Road loop on-ramp to Coffee Road diagonal on-ramp	3,715	3,676	99%	11	0	62	15	B	291	696	11	0	919	5,885	5,885	100%	11	1	61	24	C	300	1118	18	1	1476
Coffee Road diagonal on-ramp to Mohawk Street off-ramp	4,535	4,476	99%	55	3	62	18	B	346	4201	68	3	1119	6,995	6,995	100%	61	8	56	31	D	361	6681	118	17	1753
Mohawk Street off-ramp to Mohawk Street on-ramp	3,310	3,247	98%	20	1	62	17	B	366	1101	18	1	1082	5,295	5,287	100%	20	1	61	29	D	380	1790	29	1	1762
Mohawk Street on-ramp to Truxtun Avenue off-ramp	3,965	3,864	97%	20	1	61	16	B	386	1308	21	1	1104	6,345	6,279	99%	20	1	58	29	D	401	2130	36	3	1794
Truxtun Avenue off-ramp to SR 99 SB C-D off-ramp (SR 99 SB and Ming Avenue)	2,855	2,783	97%	82	2	63	15	B	467	3963	63	2	928	4,950	4,940	100%	84	5	61	27	D	485	7016	115	6	1647
SR 99 SB C-D off-ramp (SR 99 SB and Ming Avenue) to H Street off-ramp	1,245	1,231	99%	37	1	64	10	A	504	802	13	0	615	2,605	2,486	95%	38	1	63	20	C	523	1620	26	1	1243
H Street off-ramp to Real Road on-ramp	1,011	998	99%	17	0	64	8	A	522	311	5	0	499	2,248	2,132	95%	18	1	63	17	B	540	665	11	0	1066
Real Road on-ramp to SR 99 NB and SB on-ramp	1,976	1,817	92%	10	1	60	15	B	532	314	5	0	908	3,228	2,896	90%	11	1	58	25	C	551	500	9	1	1448
SR 99 NB and SB on-ramp to Chester Avenue on-ramp	4,025	3,835	95%	45	2	62	15	B	577	2971	48	2	1096	5,665	5,332	94%	46	3	61	22	C	597	4138	67	4	1524
Chester Avenue on-ramp to Union Avenue off-ramp	4,710	4,483	95%	27	1	61	18	C	604	2059	34	2	1281	6,580	6,236	95%	28	2	59	26	D	625	2869	48	4	1782
Union Avenue off-ramp to Union Avenue loop on-ramp	3,830	3,632	95%	17	1	63	19	C	620	1055	17	1	1211	5,215	4,939	95%	17	1	62	27	D	641	1434	23	1	1646
Union Avenue loop on-ramp to Union Avenue diagonal on-ramp	4,270	4,042	95%	8	0	61	22	C	629	565	9	0	1347	5,825	5,471	94%	8	1	60	31	D	650	766	13	1	1824
Union Avenue diagonal on-ramp to Cottonwood Road off-ramp	4,620	4,427	96%	31	2	62	24	C	660	2352	38	2	1476	6,375	6,054	95%	32	3	59	34	D	682	3218	54	5	2018
Cottonwood Road off-ramp to Cottonwood Road on-ramp	4,110	3,923	95%	28	1	62	21	C	688	1897	30	1	1308	5,315	5,014	94%	28	1	62	27	D	710	2425	39	2	1671
Cottonwood Road on-ramp to SR 58 east end of the network	4,445	4,235	95%	25	1	62	23	C	713	1848	30	1	1412	5,590	5,246	94%	26	1	61	29	D	736	2289	37	2	1749
Westside Parkway WB Mainline																										
SR 58 east end of the network to Cottonwood Road off-ramp	4,030	4,030	100%	26	1	63	21	C	26	1844	29	1	1352	5,145	5,145	100%	26	1	63	28	D	26	2353	38	1	1725
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,825	3,798	99%	18	1	63	20	C	43	1167	19	1	1266	4,870	4,870	100%	18	1	62	26	D	44	1501	24	1	1628
Cottonwood Road on-ramp to Brundage Lane off-ramp	4,240	4,208	99%	39	2	62	23	C	82	2785	45	2	1403	5,455	5,394	99%	39	2	61	30	D	83	3570	59	4	1798
Brundage Lane off-ramp to Brundage Lane on-ramp	3,620	3,615	100%	17	1	62	19	C	99	1067	17	1	1205	4,780	4,705	98%	17	1	61	26	C	100	1388	23	1	1568
Brundage Lane on-ramp to Union Avenue on-ramp	3,995	3,942	99%	12	1	61	21	C	111	808	13	1	1314	5,190	5,047	97%	12	1	60	28	D	113	1034	17	1	1682
Union Avenue on-ramp to Chester Avenue off-ramp	4,815	4,724	98%	24	2	59	26	D	135	1841	31	2	1350	5,900	5,713	97%	24	2	59	33	D	137	2228	38	4	1632
Chester Avenue off-ramp to SR 58 WB C-D off-ramp (SR 99 NB and SB and Real Road)	4,155	3,980	96%	30	2	60	19	C	165	2000	33	2	1137	5,195	4,847	93%	30	2	60	24	C	167	2433	41	3	1385
SR 58 WB C-D off-ramp (SR 99 NB and SB and Real Road) to SR 99 NB C-D on-ramp (SR 99 NB and H Street)	1,200	1,169	97%	113	2	64	9	A	277	2326	37	1	585	1,865	1,826	98%	114	4	63	15	B	281	3633	58	2	913
SR99 NB C-D on-ramp (SR 99 NB and H Street) to Mohawk Street off-ramp	3,425	3,315	97%	39	2	61	18	C	316	2165	36	2	1326	4,440	4,290	97%	40	3	59	24	C	321	2794	47	4	1716
Mohawk Street off-ramp to Truxtun Avenue on-ramp	2,775	2,709	98%	27	1	62	22	C	343	1283	21	1	1354	3,650	3,563	98%	28	2	61	29	D	349	1688	28	2	1782
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	4,110	4,046	98%	11	1	61	22	C	355	766	13	1	1349	5,525	5,432	98%	11	1	60	30	D	360	1028	17	1	1811
Mohawk Street loop on-ramp to Mohawk Street direct ramp	5,025	4,965	99%	14	1	62	20	C	369	1225	20	1	1241	6,730	6,652	99%	15	1	61	27	D	375	1640	27	1	1663
Mohawk Street direct ramp to Coffee Road off-ramp	5,630	5,288	94%	43	2	61	20	C	412	3857	63	3	1175	7,705	7,235	94%	45	4	59	28	D	419	5277	90	8	1608
Coffee Road off-ramp to Coffee Road loop on-ramp	3,685	3,559	97%	36	1	63	14	B	447	2230	35	1	890	5,595	5,546	99%	36	1	62	22	C	456	3475	56	2	1386
Coffee Road loop on-ramp to Coffee Road direct on-ramp	3,915	3,766	96%	12	0	63	15	B	460	821	13	0	942	5,895	5,814	99%	13	1	62	23	C	468	1267	20	1	1454
Coffee Road direct on-ramp to Calloway Drive direct off-ramp	4,325	4,183	97%	49	2	62	16	B	508	3523	57	2	1046	6,490	6,351	98%	50	3	61	25	C	518	5346	87	5	1588
Calloway Drive direct off-ramp to Calloway Drive loop off-ramp	3,470	3,365	97%	11	0	62	14	B	520	637	10	0	841	5,540	5,402	98%	11	1	61	22	C	529	1024	17	1	1351
Calloway Drive loop off-ramp to Calloway Drive on-ramp	2,230	2,167	97%	24	0	64	11	B	544	927	15	0	722	4,275	4,162	97%	25	1	62	22	C	554	1780	29	1	1387
Calloway Drive on-ramp to Allen Road off-ramp	2,750	2,669	97%	58	3	62	14	B	602	2663	43	2	890	5,330	5,180	97%	61	6	59	29	D	615	5180	88	9	1727
Allen Road off-ramp to Allen Road on-ramp	920	930	101%	26	0	64	5	A	628	436	7	0	310	3,230	3,179	98%	27	1	63	17	B	642	1490	24	1	1060
Allen Road on-ramp to West Beltway off-ramp	995	1,003	101%	89	1	64	7	A	717	1585	25	0	334	3,675	3,577	97%	58	3	61	19	C	700	3533	57	3	1192
West Beltway off-ramp to West Beltway loop on-ramp	*— NOT APPLICABLE —*													1,455	1,440	99%	23	0	64	11	B	723	573	9	0	720
West Beltway loop on-ramp to West Beltway direct on-ramp														1,930	1,855	96%	6	0	61	15	B	728	185	3	0	928
West Beltway direct on-ramp to Westside Parkway west end of the network														2,305	2,202	96%	6	1	57	19	C	734	211	4	0	1101
State Route 58 WB Collector-Distributor																										
SR 58 WB C-D on-ramp to SR 99 NB C-D off-ramp	3,570	3,553	100%	35	1	53	22	C	44	1823	34	1	1421	4,035	3,901	97%	35	2	52	25	C	45	2002	38	2	1561
SR 99 NB C-D off-ramp to SR 99 SB off-ramp	1,875	1,852	99%	22	1	51	18	B	67	591	11	1	926	2,200	2,100	95%	22	1	51	20	C	67	670	13	1	1050
SR 99 SB off-ramp to Real Road off-ramp	660	613	93%	3	0	49	6	A	69	21	0	0	409	870	870	100%	3	0	49	9	A	70	30	1	0	581

Table 4-31. AM Peak Hour Measures of Effectiveness for Alternative C—Merging/Diverging Conditions

LOCATION	ANALYSIS TYPE	YEAR 2018 SPEED (mph)	YEAR 2018 DENSITY (veh/ln/mi)	YEAR 2018 LOS (HCM 2000)	YEAR 2038 SPEED (mph)	YEAR 2038 DENSITY (veh/ln/mi)	YEAR 2038 LOS (HCM 2000)
State Route 99 NB							
White Lane loop on-ramp	Merging	48	35.7	**E**	37	54.0	**E**
White Lane diagonal on-ramp	Merging	50	39.5	**E**	48	47.3	**E**
SR 99 NB C-D on-ramp (SR 58 WB and H Street) on-ramp	Merging	60	23.0	C	60	28.3	D
California Avenue loop on-ramp	Merging	55	33.7	D	56	35.9	**E**
Buck Owens Boulevard/Sillect Avenue on-ramp	Merging	61	19.1	B	58	23.9	C
White Lane off-ramp	Diverging	62	21.8	C	61	32.4	D
Ming Avenue off-ramp	Diverging	59	34.0	D	58	41.2	**E**
SR 99 NB C-D off-ramp (Westside Parkway WB)	Diverging	60	22.7	C	59	28.3	D
California Avenue off-ramp	Diverging	60	24.0	C	60	29.3	D
Buck Owens Boulevard/Sillect Avenue off-ramp	Diverging	60	22.2	C	59	26.3	C
Airport Drive off-ramp	Diverging	56	25.5	C	54	32.2	D
Ming Avenue on-ramp to SR-58 off-ramp	Weaving	58	27.4	C	57	32.6	D
California Avenue diagonal on-ramp to Rosedale Highway off-ramp	Weaving	57	24.6	C	55	32.0	D
State Route 99 SB							
Airport Drive on-ramp	Merging	61	21.8	C	59	27.3	C
Rosedale Highway loop on-ramp	Merging	55	20.7	C	52	24.6	C
Rosedale Highway diagonal on-ramp	Merging	58	25.6	C	56	29.2	D
SR 99 SB C-D on-ramp (WSP EB and SR 58 WB and H Street)	Merging	61	15.2	B	60	19.9	B
Ming Avenue on-ramp	Merging	60	25.0	C	55	38.4	**E**
White Lane loop on-ramp	Merging	61	16.8	B	61	21.3	C
White Lane diagonal on-ramp	Merging	61	18.3	B	60	23.4	C
Rosedale Highway off-ramp	Diverging	61	21.0	C	59	27.1	C
California Avenue off-ramp	Diverging	58	31.7	D	56	39.5	**E**
SR 99 SB C-D off-ramp (Ming Avenue)	Diverging	61	19.7	B	61	21.3	C
White Lane off-ramp	Diverging	60	20.5	C	51	30.3	D
California Avenue on-ramp to SR 58 EB off-ramp	Weaving	61	16.9	B	61	18.3	B
Westside Parkway/State Route 58 EB							
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			61	16.2	B
West Beltway diagonal on-ramp	Merging				62	19.6	B
Allen Road on-ramp	Merging	60	18.7	B	53	33.3	D
Calloway Drive loop on-ramp	Merging	60	19.2	B	57	30.1	D
Calloway Drive diagonal on-ramp	Merging	58	23.0	C	55	32.7	D
Real Road on-ramp	Merging	62	14.6	B	60	21.5	C
SR 99 NB and SB on-ramp	Merging	62	14.5	B	62	17.2	B
Union Avenue loop on-ramp	Merging	61	20.3	C	61	25.5	C
Union Avenue diagonal on-ramp	Merging	61	23.1	C	60	28.8	D
Cottonwood Road on-ramp	Merging	61	18.8	B	61	24.2	C
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			46	24.9	C
Allen Road off-ramp	Diverging	65	4.7	A	62	20.1	C
Calloway Drive off-ramp	Diverging	62	18.4	B	60	31.1	D
Coffee Road off-ramp	Diverging	61	26.2	C	60	35.8	**E**
SR 99 SB C-D off-ramp (SR 99 SB and Ming Avenue)	Diverging	62	13.0	B	61	21.2	C
H Street off-ramp	Diverging	63	10.6	B	62	15.7	B
Cottonwood Road off-ramp	Diverging	61	23.0	C	61	28.5	D
Coffee Road Loop on-ramp to Mohawk Street off-ramp	Weaving	60	20.0	C	54	31.1	D
Mohawk Street on-ramp to Truxtun Avenue off-ramp	Weaving	60	18.5	B	55	25.9	D
Chester Avenue on-ramp to Union Avenue off-ramp	Weaving	61	17.9	B	60	22.5	C
Westside Parkway/State Route 58 WB							
Brundage Lane on-ramp (Cottonwood Rd)	Merging	62	19.9	B	61	30.0	D
Brundage Lane on-ramp (Union Ave)	Merging	61	20.6	C	60	28.7	D
Union Avenue on-ramp	Merging	59	27.3	C	54	34.5	D
Truxtun Avenue on-ramp	Merging	62	17.0	B	61	23.2	C
Mohawk Street loop on-ramp	Merging	62	12.0	B	62	15.0	B
Mohawk Street diagonal on-ramp	Merging	62	11.8	B	61	15.9	B
Coffee Road loop on-ramp	Merging	63	9.1	A	63	12.9	B
Calloway Drive on-ramp	Merging	63	10.3	B	61	19.3	B
Allen Road on-ramp	Merging	63	4.6	A	62	14.1	B
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			62	10.2	B
West Beltway diagonal on-ramp	Merging				60	13.0	B
Brundage Lane off-ramp (Cottonwood Road)	Diverging	64	18.1	B	63	27.1	C
Brundage Lane off-ramp (Union Avenue)	Diverging	62	21.6	C	61	31.5	D
Chester Avenue off-ramp	Diverging	*— NOT APPLICABLE —*			60	23.7	C
SR 58 WB C-D off-ramp (SR99 NB and SB and Real Road)	Diverging	60	14.7	B	60	20.7	C
Coffee Road off-ramp	Diverging	61	15.5	B	60	20.0	C
Allen Road off-ramp	Diverging	62	8.5	A	61	21.3	C
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			61	13.1	B
SR 99 NB C-D on-ramp (SR99 NB and H Street) to Mohawk Street off-ramp	Weaving	61	16.3	B	60	23.4	C
Coffee Road diagonal on-ramp to Calloway Drive loop off-ramp	Weaving	63	12.5	B	62	15.5	B

Note: Merge/diverge calculations are based on 1,500 feet from on-/off-ramp. These calculations also include the two right-most mainline lanes within 1,500 feet.

Table 4-32. PM Peak Hour Measures of Effectiveness for Alternative C—Merging/Diverging Conditions

LOCATION	ANALYSIS TYPE	YEAR 2018			YEAR 2038		
		SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)	SPEED (mph)	DENSITY (veh/ln/mi)	LOS (HCM 2000)
State Route 99 NB							
White Lane loop on-ramp	Merging	54	27.6	C	44	40.2	**E**
White Lane diagonal on-ramp	Merging	55	31.9	D	51	42.1	**E**
SR 99 NB C-D on-ramp (SR 58 WB and H Street) on-ramp	Merging	61	16.7	B	61	24.0	C
California Avenue loop on-ramp	Merging	56	29.7	D	56	34.6	D
Buck Owens Boulevard/Sillect Avenue on-ramp	Merging	59	21.3	C	57	27.9	C
White Lane off-ramp	Diverging	63	19.9	B	61	30.6	D
Ming Avenue off-ramp	Diverging	60	30.2	D	58	38.1	E
SR 99 NB C-D off-ramp (Westside Parkway WB)	Diverging	60	20.1	C	59	25.2	C
California Avenue off-ramp	Diverging	61	17.3	B	61	24.6	C
Buck Owens Boulevard/Sillect Avenue off-ramp	Diverging	61	19.9	B	59	26.1	C
Airport Drive off-ramp	Diverging	56	25.8	C	55	33.0	D
Ming Avenue on-ramp to SR-58 off-ramp	Weaving	58	24.3	C	58	33.4	D
California Avenue diagonal on-ramp to Rosedale Highway off-ramp	Weaving	57	23.3	C	55	32.1	D
State Route 99 SB							
Airport Drive on-ramp	Merging	60	27.9	C	51	42.3	**E**
Rosedale Highway loop on-ramp	Merging	47	32.3	D	36	45.4	**E**
Rosedale Highway diagonal on-ramp	Merging	53	36.3	**E**	36	59.2	**F**
SR 99 SB C-D on-ramp (WSP EB and SR 58 WB and H Street)	Merging	60	21.1	C	59	25.7	C
Ming Avenue on-ramp	Merging	57	35.9	**E**	32	67.8	F
White Lane loop on-ramp	Merging	59	23.7	C	59	26.6	C
White Lane diagonal on-ramp	Merging	60	25.4	C	59	29.7	D
Rosedale Highway off-ramp	Diverging	61	26.0	C	55	33.2	D
California Avenue off-ramp	Diverging	52	44.4	**E**	36	66.8	F
SR 99 SB C-D off-ramp (Ming Avenue)	Diverging	60	28.0	C	60	27.8	C
White Lane off-ramp	Diverging	56	29.5	D	26	65.5	F
California Avenue on-ramp to SR 58 EB off-ramp	Weaving	60	23.8	C	59	23.9	C
Westside Parkway/State Route 58 EB							
West Beltway loop on-ramp	Merging	*— NOT APPLICABLE —*			61	14.3	B
West Beltway diagonal on-ramp	Merging				62	17.3	B
Allen Road on-ramp	Merging	61	13.9	B	55	30.5	D
Calloway Drive loop on-ramp	Merging	61	15.7	B	58	29.0	D
Calloway Drive diagonal on-ramp	Merging	61	18.8	B	57	30.7	D
Real Road on-ramp	Merging	60	15.0	B	58	24.8	C
SR 99 NB and SB on-ramp	Merging	62	15.4	B	62	20.6	C
Union Avenue loop on-ramp	Merging	60	24.3	C	58	32.4	D
Union Avenue diagonal on-ramp	Merging	60	27.4	C	57	36.2	**E**
Cottonwood Road on-ramp	Merging	61	24.1	C	60	28.5	D
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			43	26.7	C
Allen Road off-ramp	Diverging	64	4.5	A	62	17.6	B
Calloway Drive off-ramp	Diverging	62	14.2	B	61	27.9	C
Coffee Road off-ramp	Diverging	62	22.7	C	60	34.3	D
SR 99 SB C-D off-ramp (SR 99 SB and Ming Avenue)	Diverging	62	15.1	B	60	27.2	C
H Street off-ramp	Diverging	63	9.7	A	62	19.9	B
Cottonwood Road off-ramp	Diverging	61	27.1	C	59	38.0	**E**
Coffee Road Loop on-ramp to Mohawk Street off-ramp	Weaving	61	19.1	B	56	30.8	D
Mohawk Street on-ramp to Truxtun Avenue off-ramp	Weaving	60	18.2	B	57	32.9	D
Chester Avenue on-ramp to Union Avenue off-ramp	Weaving	60	19.8	B	58	27.5	C
Westside Parkway/State Route 58 WB							
Brundage Lane on-ramp (Cottonwood Rd)	Merging	62	23.2	C	60	30.4	D
Brundage Lane on-ramp (Union Ave)	Merging	58	30.8	D	60	29.4	D
Union Avenue on-ramp	Merging	57	30.6	D	57	35.9	**E**
Truxtun Avenue on-ramp	Merging	61	22.1	C	60	30.3	D
Mohawk Street loop on-ramp	Merging	62	18.0	B	61	24.9	C
Mohawk Street diagonal on-ramp	Merging	61	17.0	B	59	25.9	C
Coffee Road loop on-ramp	Merging	62	13.8	B	62	21.6	C
Calloway Drive on-ramp	Merging	61	16.8	B	57	33.3	D
Allen Road on-ramp	Merging	63	6.0	A	61	19.3	B
West Beltway loop on-ramp	Merging				61	15.1	B
West Beltway diagonal on-ramp	Merging				57	19.2	B
Brundage Lane off-ramp (Cottonwood Road)	Diverging	63	20.2	C	63	26.5	C
Brundage Lane off-ramp (Union Avenue)	Diverging	62	24.6	C	61	31.5	D
Chester Avenue off-ramp	Diverging	*— NOT APPLICABLE —*			59	35.7	**E**
SR 58 WB C-D off-ramp (SR99 NB and SB and Real Road)	Diverging	61	16.9	B	61	20.8	C
Coffee Road off-ramp	Diverging	61	19.7	B	59	25.3	C
Allen Road off-ramp	Diverging	61	14.2	B	59	24.2	C
West Beltway off-ramp	Diverging	*— NOT APPLICABLE —*			61	19.6	B
SR 99 NB C-D on-ramp (SR99 NB and H Street) to Mohawk Street off-ramp	Weaving	61	20.8	C	60	27.5	C
Coffee Road diagonal on-ramp to Calloway Drive loop off-ramp	Weaving	61	15.8	B	60	24.0	C

Table 4-33. AM Peak Hour Measures of Effectiveness for Alternative C—On-Ramp and Off-Ramp Performance *(1 of 2)*

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
State Route 99 NB Off-ramps								
White Lane	695	686	99%	61	1,085	1,076	99%	48
Ming Avenue	735	735	100%	53	895	884	99%	53
SR 58 EB	1,155	1,155	100%	53	1,295	1,295	100%	53
SR 99 NB C-D (Westside Parkway WB)	1,645	1,568	95%	54	1,735	1,735	100%	54
California Avenue	965	965	100%	52	1,050	1,014	97%	52
Rosedale Highway	1,615	1,615	100%	53	1,765	1,709	97%	53
Buck Owens Boulevard/Sillect Avenue	560	560	100%	53	815	772	95%	52
Airport Drive	1,525	1,521	100%	52	1,760	1,741	99%	51
State Route 99 NB On-ramps								
White Lane loop	1,620	1,620	100%	42	1,650	1,650	100%	41
White Lane diagonal	715	695	97%	52	700	656	94%	52
Ming Avenue	1,355	1,355	100%	51	1,575	1,575	100%	52
SR 99 NB C-D (SR 58 WB and H Street)	1,255	1,255	100%	51	1,105	1,061	96%	52
California Avenue loop	835	767	92%	50	930	747	80%	51
California Avenue diagonal	385	292	76%	51	435	348	80%	51
Buck Owens Boulevard/Sillect Avenue	420	383	91%	34	675	666	99%	30
State Route 99 SB Off-ramps								
Rosedale Highway	670	670	100%	55	1,360	1,332	98%	53
California Avenue	1,125	1,095	97%	52	1,415	1,400	99%	50
SR 58 EB	795	795	100%	55	920	920	100%	54
SR 99 SB C-D (Ming Avenue)	730	692	95%	53	800	800	100%	53
White Lane	1,415	1,371	97%	54	1,685	1,664	99%	16
State Route 99 SB On-ramps								
Airport Drive	1,285	1,205	94%	49	1,410	1,361	97%	48
Rosedale Highway loop	920	920	100%	38	1,090	1,090	100%	34
Rosedale Highway diagonal	545	542	99%	40	650	639	98%	39
California Avenue	435	417	96%	51	525	504	96%	51
SR 99 SB C-D (SR 58 WB and H Street)	1,455	1,411	97%	54	2,450	2,401	98%	53
Ming Avenue	500	500	100%	51	795	795	100%	50
White Lane loop	190	183	96%	53	260	254	98%	53
White Lane diagonal	375	349	93%	53	450	410	91%	53
State Route 99 NB Collector-Distributor Off-/On-ramps								
SR 99 NB C-D on-ramp	1,645	1,568	95%	54	1,735	1,735	100%	54
SR 99 NB C-D off-ramp	1,255	1,255	100%	51	1,105	1,060	96%	52
State Route 99 SB Collector-Distributor Off-/On-ramps								
SR 58 WB on-ramp	1,080	1,055	98%	40	1,375	1,338	97%	40
SR 99 SB off-ramp	1,455	1,411	97%	54	2,450	2,401	98%	53
SR 99 SB on-ramp	730	691	95%	48	800	800	100%	47
Ming Avenue off-ramp	1,475	1,409	96%	49	1,670	1,665	100%	48

Table 4-33. AM Peak Hour Measures of Effectiveness for Alternative C—On-Ramp and Off-Ramp Performance *(2 of 2)*

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
Westside Parkway/State Route 58 EB Off-ramps								
West Beltway	*— NOT APPLICABLE —*				685	685	100%	50
Allen Road	55	50	91%	55	360	360	100%	53
Calloway Drive	540	482	89%	54	975	944	97%	53
Coffee Road	670	637	95%	53	1,050	1,050	100%	53
Mohawk Street	1,475	1,445	98%	54	1,890	1,878	99%	54
Truxtun Avenue	1,405	1,405	100%	54	1,550	1,550	100%	54
SR 99 SB/Ming Avenue C-D	1,120	1,076	96%	54	1,945	1,900	98%	53
H Street	457	411	90%	54	340	334	98%	54
Union Avenue	810	810	100%	54	1,050	1,008	96%	54
Cottonwood Road	530	530	100%	53	645	644	100%	53
Westside Parkway/State Route 58 EB On-ramps								
West Beltway loop	*— NOT APPLICABLE —*				1,475	1,459	99%	53
West Beltway diagonal					280	258	92%	54
Allen Road	1,725	1,725	100%	40	1,990	1,990	100%	39
Calloway Drive loop	750	718	96%	53	920	920	100%	53
Calloway Drive diagonal	1,095	1,095	100%	51	1,100	1,100	100%	51
Coffee Drive loop	880	847	96%	53	950	942	99%	53
Coffee Road diagonal	605	556	92%	53	1,075	1,073	100%	53
Mohawk Street	520	520	100%	48	475	459	97%	49
Real Road	920	920	100%	58	955	955	100%	57
SR 99 NB and SR 99 SB	1,742	1,742	100%	51	1,895	1,895	100%	50
Chester Avenue	495	466	94%	52	650	650	100%	51
Union Avenue loop	265	249	94%	53	300	291	97%	53
Union Avenue diagonal	250	240	96%	52	290	281	97%	52
Cottonwood Road	225	225	100%	52	310	307	99%	52
Westside Parkway/State Route 58 WB Off-ramps								
Cottonwood Road	200	189	95%	54	200	200	100%	54
Brundage Lane	540	540	100%	52	825	791	96%	39
Chester Avenue	675	598	89%	54	825	783	95%	54
SR 99 NB and SB/Real Road	2,770	2,770	100%	53	3,255	3,203	98%	52
Mohawk Street	645	625	97%	53	890	890	100%	52
Coffee Road	1,720	1,720	100%	54	2,170	2,074	96%	53
Calloway Drive diagonal	660	587	89%	54	585	563	96%	54
Calloway Drive loop	955	910	95%	53	725	678	94%	53
Allen Road	1,075	1,030	96%	54	1,140	1,098	96%	52
West Beltway	*— NOT APPLICABLE —*				1,485	1,431	96%	53
Westside Parkway/State Route 58 WB On-ramps								
Cottonwood Road	290	268	92%	51	375	364	97%	51
Brundage Lane	450	385	86%	49	500	500	100%	49
Union Avenue	570	570	100%	51	770	770	100%	51
SR 99 NB/H Street	2,120	2,074	98%	47	2,385	2,385	100%	40
Truxtun Avenue	940	934	99%	51	1,000	977	98%	51
Mohawk Street loop	555	495	89%	51	625	620	99%	51
Mohawk Street diagonal	495	483	98%	52	810	783	97%	51
Coffee Road loop	155	133	86%	55	180	174	97%	55
Coffee Road direct	270	270	100%	54	310	310	100%	54
Calloway Drive	315	315	100%	53	550	529	96%	53
Allen Road	105	105	100%	52	370	370	100%	52
West Beltway loop	*— NOT APPLICABLE —*				300	300	100%	54
West Beltway diagonal					295	285	97%	54
Westside Parkway WB Collector-Distributor Off-/On-ramps								
H Street on-ramp	515	501	97%	51	650	625	96%	51
SR 58 WB C-D on-ramp	2,770	2,770	100%	53	3,255	3,203	98%	52
SR 99 SB off-ramp	1,730	1,730	100%	53	1,755	1,677	96%	53
SR 99 SB off-ramp	1,080	1,054	98%	42	1,375	1,338	97%	41
Real Road off-ramp	475	461	97%	50	775	775	100%	49

Table 4-34. PM Peak Hour Measures of Effectiveness for Alternative C—On-Ramp and Off-Ramp Performance *(1 of 2)*

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
State Route 99 NB Off-ramps								
White Lane	680	680	100%	62	1,105	1,105	100%	58
Ming Avenue	805	785	98%	53	885	880	99%	53
SR 58 EB	1,330	1,265	95%	53	1,435	1,404	98%	53
SR 99 NB C-D (Westside Parkway WB)	1,735	1,705	98%	54	1,870	1,760	94%	53
California Avenue	600	593	99%	52	655	655	100%	52
Rosedale Highway	1,580	1,563	99%	53	1,670	1,563	94%	53
Buck Owens Boulevard/Sillect Avenue	320	318	99%	52	375	339	90%	52
Airport Drive	1,340	1,284	96%	52	1,420	1,300	92%	52
State Route 99 NB On-ramps								
White Lane loop	1,460	1,349	92%	44	1,635	1,447	89%	44
White Lane diagonal	595	594	100%	52	680	680	100%	52
Ming Avenue	1,275	1,275	100%	51	1,520	1,520	100%	52
SR 99 NB C-D (SR 58 WB and H Street)	1,205	1,205	100%	51	1,130	1,089	96%	52
California Avenue loop	860	741	86%	51	1,310	836	64%	51
California Avenue diagonal	625	478	76%	51	835	621	74%	50
Buck Owens Boulevard/Sillect Avenue	730	705	97%	32	755	755	100%	31
State Route 99 SB Off-ramps								
Rosedale Highway	700	700	100%	54	1,300	1,291	99%	53
California Avenue	1,355	1,355	100%	49	1,625	1,625	100%	28
SR 58 EB	1,205	1,140	95%	54	1,390	1,373	99%	54
SR 99 SB C-D (Ming Avenue)	1,065	1,014	95%	53	1,115	1,062	95%	53
White Lane	2,025	2,025	100%	53	2,020	1,836	91%	15
State Route 99 SB On-ramps								
Airport Drive	1,790	1,790	100%	46	2,055	2,055	100%	37
Rosedale Highway loop	1,330	1,330	100%	32	1,370	1,370	100%	31
Rosedale Highway diagonal	820	783	95%	39	1,060	1,008	95%	36
California Avenue	975	898	92%	51	945	836	88%	51
SR 99 SB C-D (SR 58 WB and H Street)	2,050	2,040	100%	54	2,740	2,733	100%	53
Ming Avenue	680	680	100%	51	840	840	100%	51
White Lane loop	500	468	94%	51	565	542	96%	51
White Lane diagonal	475	456	96%	53	630	563	89%	53
State Route 99 NB Collector-Distributor Off-/On-ramps								
SR 99 NB C-D on-ramp	1,735	1,705	98%	54	1,870	1,760	94%	53
SR 99 NB C-D off-ramp	1,205	1,205	100%	52	1,130	1,090	96%	52
State Route 99 SB Collector-Distributor Off-/On-ramps								
SR 58 WB on-ramp	1,215	1,215	100%	40	1,330	1,232	93%	40
SR 99 SB off-ramp	2,050	2,040	100%	54	2,740	2,733	100%	53
SR 99 SB on-ramp	1,065	1,012	95%	47	1,115	1,064	95%	47
Ming Avenue off-ramp	1,840	1,761	96%	48	2,050	1,967	96%	48

Table 4-34. PM Peak Hour Measures of Effectiveness for Alternative C—On-Ramp and Off-Ramp Performance *(2 of 2)*

FREEWAY RAMPS	YEAR 2018				YEAR 2038			
	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)	DEMAND VOLUME (vph)	CORSIM SERVED VOLUME (vph)	PERCENTAGE SERVED IN CORSIM MODEL (%)	SPEED (mph)
Westside Parkway/State Route 58 EB Off-ramps								
West Beltway	*— NOT APPLICABLE —*				850	850	100%	49
Allen Road	85	73	86%	53	295	295	100%	54
Calloway Drive	485	439	91%	54	825	764	93%	53
Coffee Road	570	528	93%	53	875	856	98%	53
Mohawk Street	1,225	1,194	97%	54	1,700	1,700	100%	54
Truxtun Avenue	1,110	1,067	96%	55	1,395	1,311	94%	54
SR 99 SB/Ming Avenue C-D	1,610	1,550	96%	53	2,345	2,345	100%	53
H Street	234	232	99%	54	357	348	97%	54
Union Avenue	880	832	95%	54	1,365	1,329	97%	45
Cottonwood Road	510	498	98%	54	1,060	1,050	99%	53
Westside Parkway/State Route 58 EB On-ramps								
West Beltway loop	*— NOT APPLICABLE —*				1,325	1,290	97%	48
West Beltway diagonal					255	250	98%	54
Allen Road	1,290	1,260	98%	46	1,820	1,820	100%	43
Calloway Drive loop	740	721	97%	47	965	965	100%	47
Calloway Drive diagonal	980	979	100%	52	1,085	1,056	97%	51
Coffee Drive loop	945	904	96%	47	1,070	1,070	100%	47
Coffee Road diagonal	820	814	99%	53	1,110	1,110	100%	53
Mohawk Street	655	613	94%	43	1,050	1,002	95%	43
Real Road	965	874	91%	58	980	940	96%	58
SR 99 NB and SR 99 SB	2,049	1,962	96%	50	2,437	2,381	98%	50
Chester Avenue	685	677	99%	51	915	915	100%	51
Union Avenue loop	440	440	100%	53	610	610	100%	53
Union Avenue diagonal	350	350	100%	52	550	526	96%	52
Cottonwood Road	335	327	98%	52	275	249	91%	52
Westside Parkway/State Route 58 WB Off-ramps								
Cottonwood Road	205	205	100%	54	275	253	92%	55
Brundage Lane	620	606	98%	52	675	675	100%	52
Chester Avenue	660	657	100%	53	705	700	99%	53
SR 99 NB and SB/Real Road	2,955	2,930	99%	53	3,330	3,213	96%	52
Mohawk Street	650	596	92%	53	790	720	91%	53
Coffee Road	1,945	1,918	99%	54	2,110	2,006	95%	53
Calloway Drive diagonal	855	809	95%	53	950	906	95%	53
Calloway Drive loop	1,240	1,193	96%	52	1,265	1,235	98%	53
Allen Road	1,830	1,736	95%	53	2,100	1,982	94%	51
West Beltway	*— NOT APPLICABLE —*				2,220	2,129	96%	53
Westside Parkway/State Route 58 WB On-ramps								
Cottonwood Road	415	415	100%	50	585	553	95%	50
Brundage Lane	375	350	93%	49	410	400	98%	49
Union Avenue	820	810	99%	51	710	684	96%	51
SR 99 NB/H Street	2,225	2,145	96%	47	2,575	2,470	96%	40
Truxtun Avenue	1,335	1,335	100%	50	1,875	1,874	100%	49
Mohawk Street loop	915	915	100%	47	1,205	1,205	100%	47
Mohawk Street diagonal	605	534	88%	51	975	951	98%	51
Coffee Road loop	230	213	93%	51	300	288	96%	51
Coffee Road direct	410	410	100%	54	595	552	93%	54
Calloway Drive	520	519	100%	52	1,055	1,043	99%	53
Allen Road	75	75	100%	51	445	427	96%	51
West Beltway loop	*— NOT APPLICABLE —*				475	468	99%	48
West Beltway diagonal					375	354	94%	53
Westside Parkway WB Collector-Distributor Off-/On-ramps								
H Street on-ramp	615	615	100%	52	705	693	98%	51
SR 58 WB C-D on-ramp	2,955	2,930	99%	53	3,330	3,213	96%	52
SR 99 SB off-ramp	1,695	1,695	100%	54	1,835	1,795	98%	53
SR 99 SB off-ramp	1,215	1,215	100%	42	1,330	1,228	92%	42
Real Road off-ramp	660	613	93%	49	870	870	100%	49

Table 4-35. Ramp Termini and Intersection Level of Service for Alternative C *(1 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
1. I-5 SB ramps/Stockdale Highway	NB/SB two-way stop	A	3.6	A	7.5	A	5.4	F	52.1
	Imp-Signal*	N/A				B	11.7	B	11.3
2. I-5 NB ramps/Stockdale Highway	NB/SB two-way stop	A	3.5	A	9.9	A	4.0	B	11.6
3. SR 43 (Enos Lane)/Rosedale Highway	4-way stop	B	14.9	D	32.1	D	28.1	F	83.1
	Imp-Signal	N/A				C	26.9	C	33.0
4. SR 43 (Enos Lane)/Stockdale Highway	4-way stop	F	53.6	F	82.3	F	>150	F	>150
	Imp-Signal	C	20.1	C	21.9	B	15.9	C	29.8
5. SR 43 (Enos Lane)/I-5 NB ramps	EB/WB two-way stop	A	4.5	B	12.2	A	3.3	B	13.5
6. SR 43 (Enos Lane)/I-5 SB ramps	EB/WB two-way stop	A	8.7	C	15.5	A	4.6	C	18.1
7. Stockdale Highway/Nord Road	Signal	D	36.7	C	29.8	C	34.6	C	22.1
8. Stockdale Highway/Wegis Avenue	NB/SB two-way stop	A	7.0	B	11.1	F	>150	F	>150
	Imp-Signal*	N/A				C	27.8	C	33.0
9. Stockdale Highway/Heath Road	Stop (existing) Signal (future)	B	17.0	B	20.0	C	28.5	C	23.6
10. Stockdale Highway/Westside Parkway	Signal	A	6.2	B	14.2	A	9.5	A	6.4
11. West Beltway/Westside Parkway WB ramp	Signal	*Does not exist in 2018*				A	9.6	B	16.3
12. West Beltway/Westside Parkway EB ramp	Signal	*Does not exist in 2018*				A	7.9	B	14.2
13. Allen Road/Rosedale Highway	Signal*	C	32.1	D	41.1	D	36.2	D	47.3
14. Allen Road/Brimhall Road	Signal	C	26.0	C	30.0	C	26.9	C	27.8
15. Allen Road/Westside Parkway WB ramps	Signal	B	17.6	C	27.6	B	19.3	C	20.5
16. Allen Road/Westside Parkway EB ramps	Signal	B	17.8	A	9.7	B	17.1	B	13.8
17. Allen Road/San Juan Avenue	Signal*	C	25.5	C	20.1	C	24.9	C	22.1
18. Allen Road/Stockdale Highway	Signal	C	24.1	C	26.6	C	33.6	C	28.1
19. Calloway Drive/Rosedale Highway	Signal*	D	52.0	D	38.5	D	54.3	E	61.8
20. Calloway Drive/Brimhall Road	Signal	C	29.7	C	30.6	C	31.7	C	31.2
21. Calloway Drive/Westside Parkway WB ramps	Signal	B	15.4	B	15.7	B	14.2	C	20.2
22. Calloway Drive/Westside Parkway EB ramps	Signal	B	13.5	A	7.8	B	13.5	A	8.7
23. Calloway Drive/Stockdale Highway	Signal	D	43.1	C	9.4	D	44.0	D	35.9
24. Coffee Road/Rosedale Highway*	Signal*	D	41.0	F	129.4	E	65.3	F	94.2

Table 4-35. Ramp Termini and Intersection Level of Service for Alternative C *(2 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
25. Coffee Road/Brimhall Road	Signal	C	24.7	C	24.5	C	27.6	C	31.1
26. Coffee Road/Westside Parkway WB ramps	Unsignalized	N/A				N/A			
27. Coffee Road/Westside Parkway EB ramps	Signal	B	16.6	A	8.8	B	11.1	B	14.1
28. Coffee Road/Truxtun Avenue	Signal	B	13.5	B	14.0	B	12.5	B	17.8
29. Coffee Road/Stockdale Highway	Signal*	D	38.4	D	50.0	E	65.3	**F**	**103.9**
30. Mohawk Street/Rosedale Highway	Stop (existing)* Signal (future)*	E	68.6	**F**	**138.5**	E	76.8	**F**	**106.0**
31. Mohawk Street/WSP WB ramps	Signal	A	9.7	A	8.1	B	11.4	A	8.0
32. Mohawk Street/WSP EB ramps	Signal	C	23.4	B	19.7	B	18.2	B	14.4
33. Mohawk Street/Truxtun Avenue	Signal	C	29.5	C	26.0	C	33.5	C	29.7
34. Mohawk Street/California Avenue	Signal*	C	28.7	E	55.9	D	38.1	**F**	**81.7**
35. Stockdale Highway/California Avenue	Signal*	D	42.6	E	61.5	D	43.3	E	64.4
36. Airport Drive/State Road–SR 204 off-ramp	Signal	C	21.7	C	22.1	C	21.5	C	21.9
37. Airport Drive/SR 99 NB ramp	Signal	A	9.1	B	12.0	A	8.9	B	11.0
38. Buck Owens Boulevard/Rio Mirada Drive	Signal	C	30.6	C	24.2	C	32.6	C	27.5
39. SR 99 NB ramps/Buck Owens Boulevard	Signal	D	37.5	D	45.5	D	42.4	D	42.6
40. Rosedale Highway/Camino Del Rio Court	Signal	C	23.7	D	41.9	C	32.8	D	46.4
41. Rosedale Highway/SR 99 SB ramps	Signal	B	15.3	B	15.9	C	20.7	C	22.6
42. Rosedale Highway/SR99 NB ramps	Signal	C	28.1	C	28.8	C	26.1	D	37.7
43. 24th Street/Oak Street	Signal	C	26.4	C	29.7	C	30.4	D	36.9
44. Truxtun Avenue/Empire Drive	Signal*	C	32.4	C	32.3	C	23.7	C	27.7
45. Truxtun Avenue/Oak Street	Signal	C	32.3	D	43.8	D	51.8	D	48.1
46. California Avenue/Chester Lane	Signal	C	22.6	D	51.9	C	21.1	**F**	**121.3**
47. California Avenue/SR 99 SB ramps	Signal	D	41.7	E	62.3	E	58.9	**F**	**83.2**
48. California Avenue/SR 99 NB ramps	Signal	C	26.6	C	25.1	C	30.7	C	24.5
49. California Avenue/Oak Street	Signal	C	31.5	D	39.8	C	28.2	E	58.1
50. Stockdale Highway/Stine Road	Signal*	C	22.6	D	52.0	C	34.2	**F**	**80.8**
51. Stockdale Highway/Real Road	Signal	D	50.9	**F**	**81.8**	D	45.2	**F**	**91.3**
52. Stockdale Highway/SR 99 SB ramp	Signal	*Intersection does not exist in Alternative C*							

Table 4-35. Ramp Termini and Intersection Level of Service for Alternative C *(3 of 3)*

INTERSECTION	SIGNAL CONTROL	YEAR 2018				YEAR 2038			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)	LOS	AVG DELAY (sec/veh)
53. Brundage Lane/Oak Street	Signal	C	27.3	C	29.9	C	29.9	C	30.6
54. Real Road/SR 58	Signal	C	22.7	C	26.7	C	21.1	D	39.9
55. Wible Road/SR 99 NB ramps	Signal	*Intersection does not exist in Alternative C*							
56. Ming Avenue/New Stine Road	Signal*	D	37.4	D	39.8	D	44.4	E	55.0
57. Ming Avenue/Real Road	Signal	C	26.5	C	33.7	C	25.7	C	28.4
58. Ming Avenue/SR 99 SB ramps	Signal	A	4.1	A	2.0	A	4.9	B	15.8
59. Ming Avenue/Wible Road	Signal	B	15.9	C	26.5	C	28.1	C	27.4
60. Ming Avenue/SR 99 NB ramps	Signal	C	28.8	C	30.2	C	33.8	C	34.5
61. Ming Avenue/Castro Lane	Signal	C	28.2	C	34.2	C	28.6	D	35.9
62. White Lane/Wible Road	Signal*	E	58.2	E	71.5	**F**	**81.1**	**F**	**129.8**
63. White Lane/SR 99 SB ramps	Signal*	B	19.7	**F**	**85.9**	C	20.9	**F**	**93.9**
64. White Lane/SR 99 NB ramps	Signal*	B	10.2	A	9.6	B	23.2	C	26.5
65. White Lane/Hughes Lane	Signal*	D	38.8	D	43.5	D	45.9	D	49.6
66. H Street/Brundage Lane	Signal	C	23.7	C	26.2	C	24.9	C	25.8
67. H Street/SR 58 WB ramp	Signal	C	26.2	C	33.8	B	14.7	D	35.9
68. H Street/SR 58 EB ramp	Signal	C	21.8	B	19.4	C	24.6	C	26.2
69. H Street/Ming Avenue	Signal*	C	29.8	D	43.2	D	36.7	D	40.8
70. Chester Avenue/Brundage Lane	Signal	C	23.9	D	36.2	C	24.9	C	25.8
71. Chester Avenue/SR 58 WB ramp	Signal	B	17.7	B	19.2	C	20.7	C	28.1
72. Chester Avenue/SR 58 EB ramp	Signal	C	26.0	B	16.5	C	27.7	C	21.8
73. Chester Avenue/Ming Avenue	Signal*	D	44.4	D	40.5	D	40.0	D	51.2
74. Union Avenue/Brundage Lane	Signal	C	34.8	C	25.1	E	56.9	D	51.0
75. Brundage Lane/SR 58 WB ramps	Signal	C	21.8	C	20.8	C	25.1	D	42.6
76. Union Avenue/SR 58 EB ramps	Signal	B	16.2	B	11.6	B	19.7	B	18.5
77. Cottonwood Road–MLK/Brundage Lane	Signal	C	22.9	C	24.1	C	23.9	C	25.2
78. Cottonwood Road–Brundage Lane/SR 58 WB ramps	Signal	C	20.8	C	24.7	C	20.2	C	33.9
79. Cottonwood Road/SR 58 EB ramps	Signal	B	12.3	B	12.1	B	12.1	B	17.4

*LOS summary based on SYNCHRO 6
Source: Parsons

4.7 Traffic Performance of the Build Transportation Systems Management/Transit Alternative

The build/transportation systems management/transit alternative investments are concentrated along Rosedale Highway, from west of Allen Road to the interchange with State Route 99. The proposed roadway configuration is illustrated on Figures 4-16 and 4-17. The transportation systems management/transit alternative is intended to increase the capacity of Rosedale Highway (State Route 58 west) and transform the facility into a higher speed, expressway-type facility. By offering reduced delays at signalized intersections, via the construction of grade separations at high volume north–south arterial streets and the removal of intermediate signalized intersections and cross traffic interruptions, motorists and commercial vehicles would be more likely to select Rosedale Highway as their route choice, thereby relieving traffic volumes and congestion on parallel routes.

The paragraphs below describe the build transportation systems management/transit alternative, moving from west to east. As mentioned in Section 3.3, low-cost intersection and transit service improvements are assumed for all build and no-build alternatives. These enhancements, common to all alternatives, are not described in this section.

From Enos Lane to Allen Road, all build and no-build alternatives assume that Rosedale Highway will be widened from two lanes (one lane per direction) to a four-lane facility. This widening is illustrated on Figure 3-4 as Project #9.

Passing Jenkins Road, the footprint of Rosedale Highway would be widened to allow for a four-lane grade separation over or under Allen Road. One-way frontage roads would be constructed to accommodate at-grade right turns in and out of adjacent driveways, Froehlich Street, and Van Buren Place. A U-turn lane would be provided at Allen Road to allow frontage road traffic to reverse their direction of travel without stopping at the at-grade intersection with Allen Road. All turns to and from Allen Road would be accommodated at grade. Figures 4-18 and 4-19 provide representative illustrations of what the grade separation options would look like at Allen Road.

Continuing east, the four-lane divided Rosedale Highway would return to grade, flanked by one or two-lane, one-way frontage roads, which would serve as on-off ramps to Rosedale Highway. Right turn in and out movements would be maintained at driveways, Central Avenue and Maher Way. East of Maher Way, the frontage roads would merge with the through traffic lanes forming a median separated six-lane facility.

From west of Lassen Drive through the Old Farm Road and Verdugo Lane intersections, past Dean Avenue and Mosasco Street, Rosedale Highway would remain the same as constructed for the no-build alternative. That is, widened from four lanes to six lanes under Project #11 identified on Figure 3-4.

After passing Mosasco Street, the six-lane roadway would split to provide two mainline lanes in each direction, descending or ascending to pass under or over Calloway Drive, flanked by one lane, transitioning to two-lane one-way frontage roads at grade. U-turn connector roads would permit reverse direction travel for vehicles entering the frontage roads. **Note that the number of through and turning lanes on the intersecting streets illustrated on Figure 4-15 are generic. Figure 3-20 must be consulted for actual intersection traffic lane requirements.**

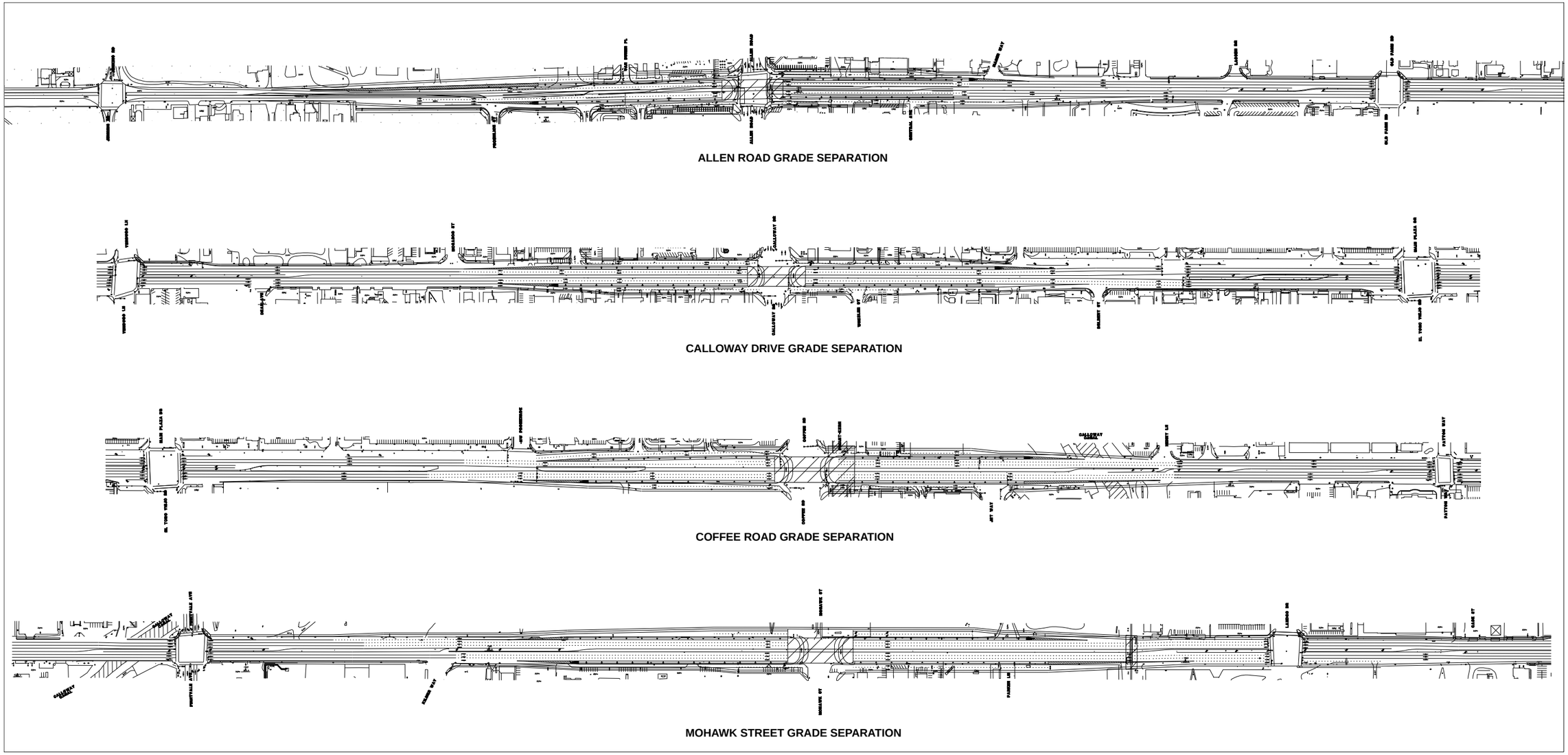


Figure 4-16: Transportation Systems Management/Transit Alternative Improvements along Rosedale Highway

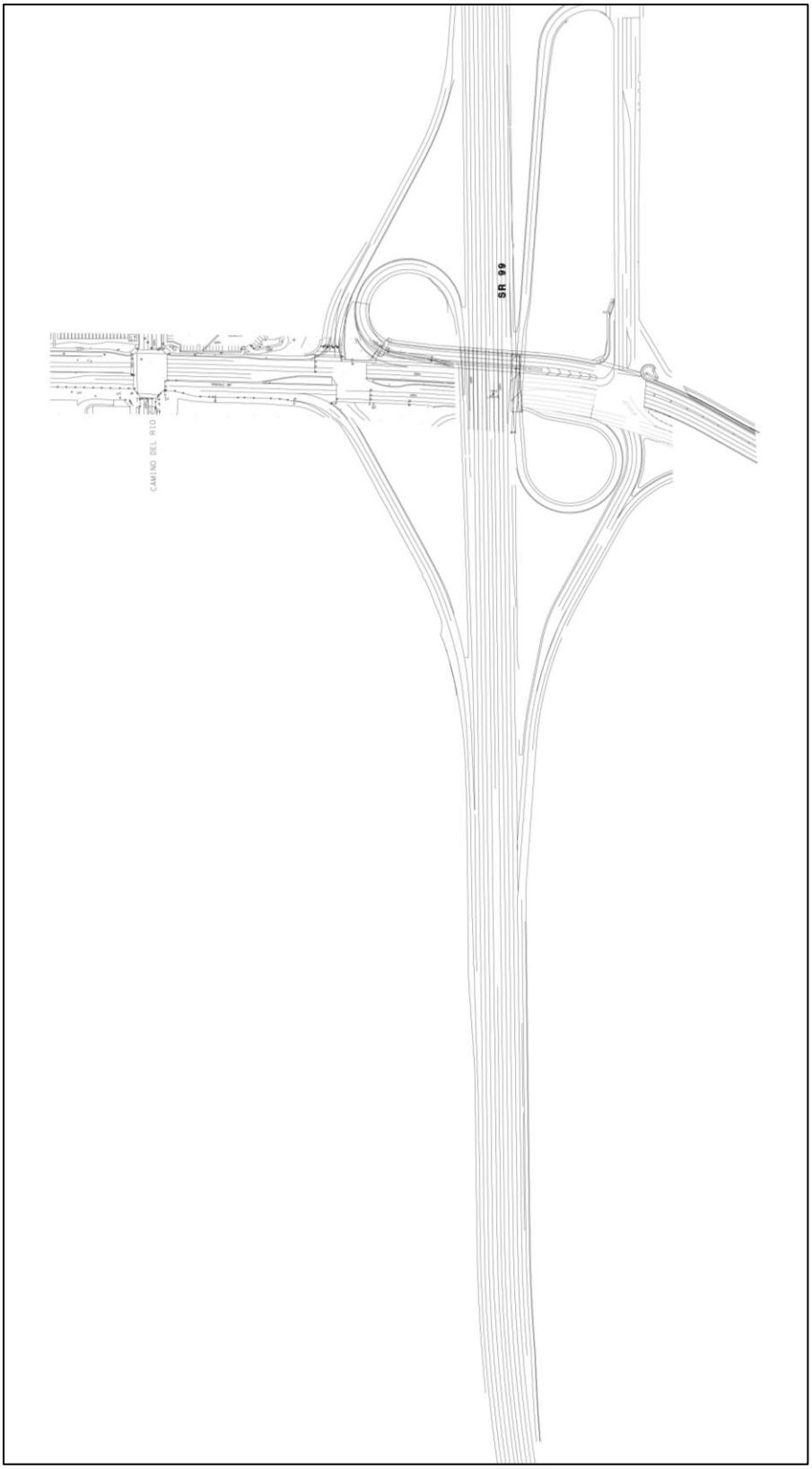


Figure 4-17: Transportation Systems Management/Transit Alternative Improvements at State Route 58/State Route 99 Interchange

Figure 4-18: Grade Separation Concept A

Figure 4-19: Grade Separation Concept B

Continuing east from Calloway Drive, access to Wheeler Street would be right-turn in and right-turn out from the eastbound one-way frontage road. The two-lane frontage roads would transition to one lane each, merging or diverging with the through traffic lanes as the latter reach grade level. East of Delbert Street, Rosedale Highway would continue as constructed (widened to six lanes) for the no-build alternative, past the various driveways to the Northwest Promenade Shopping Plaza and the signalized Main Plaza Drive/El Toro Viejo Road intersection to just west of the next main driveway to the Northwest Promenade. At this location, the six through lanes would ascend on a grade separation structure passing over Coffee Road and the Friant–Kern Canal. The grade separation would be flanked by one-way frontage roads transitioning between one and two lanes wide.

Continuing east, Jet Way would be accessed by the eastbound frontage road permitting right-turn in and right-turn out movements. Access to the Lowe's home improvement center would be via Jet Way, while convenient egress could occur via Coffee Road as existing. Upon crossing the Calloway Canal, the frontage and through lanes would merge just west of Henry Lane.

From Henry Lane east, past Patton Way and Fruitvale Avenue to Kilmer Way, Rosedale Highway would continue as widened to six lanes under the no-build alternative. East of Kilmer Way, six through movement traffic lanes would be carried over Mohawk Street on a grade separation structure, flanked by one-way frontage roads. The grade separation would continue over the San Joaquin Valley Railroad industrial lead track, which crosses Rosedale Highway just east of Parker Lane.

Approaching Landco Drive, Rosedale Highway would return to grade as constructed for the no-build alternative. This no-build, six-lane with median configuration would continue past Case Street, Fairhaven Drive and Gibson Street to the Costco westerly entrance road.

The easterly entrance road to Costco along with the opposing local street, Camino del Rio Court, would both be converted to right-turn in and right-turn out access under the build transportation systems management/transit alternative. The southbound off-ramp from State Route 99 would be widened, and an eastbound Rosedale Highway to northbound loop on-ramp to State Route 99 would be constructed as part of this alternative.

Figure 3-21, depicted earlier, indicated that Rosedale Highway is expected to attract traffic compared to the no-build alternative, based on higher speeds offered by the upgraded expressway type facility. Given this additional traffic demand, the facility will operate at LOS D, E, or F, depending on location, as illustrated on Figure 4-20. More precise analysis statistics, based on individual intersection operations is reported below.

The locations of the study area intersections along Rosedale Highway were previously illustrated on Figures 3-8, 3-19 and 3-20, along with the design year (2035 or 2038) final adjusted forecast turning movement volumes. Based on these traffic volumes and the number of traffic lanes assumed for each movement, level of service has been computed based on the criteria reported in Section 4-2.

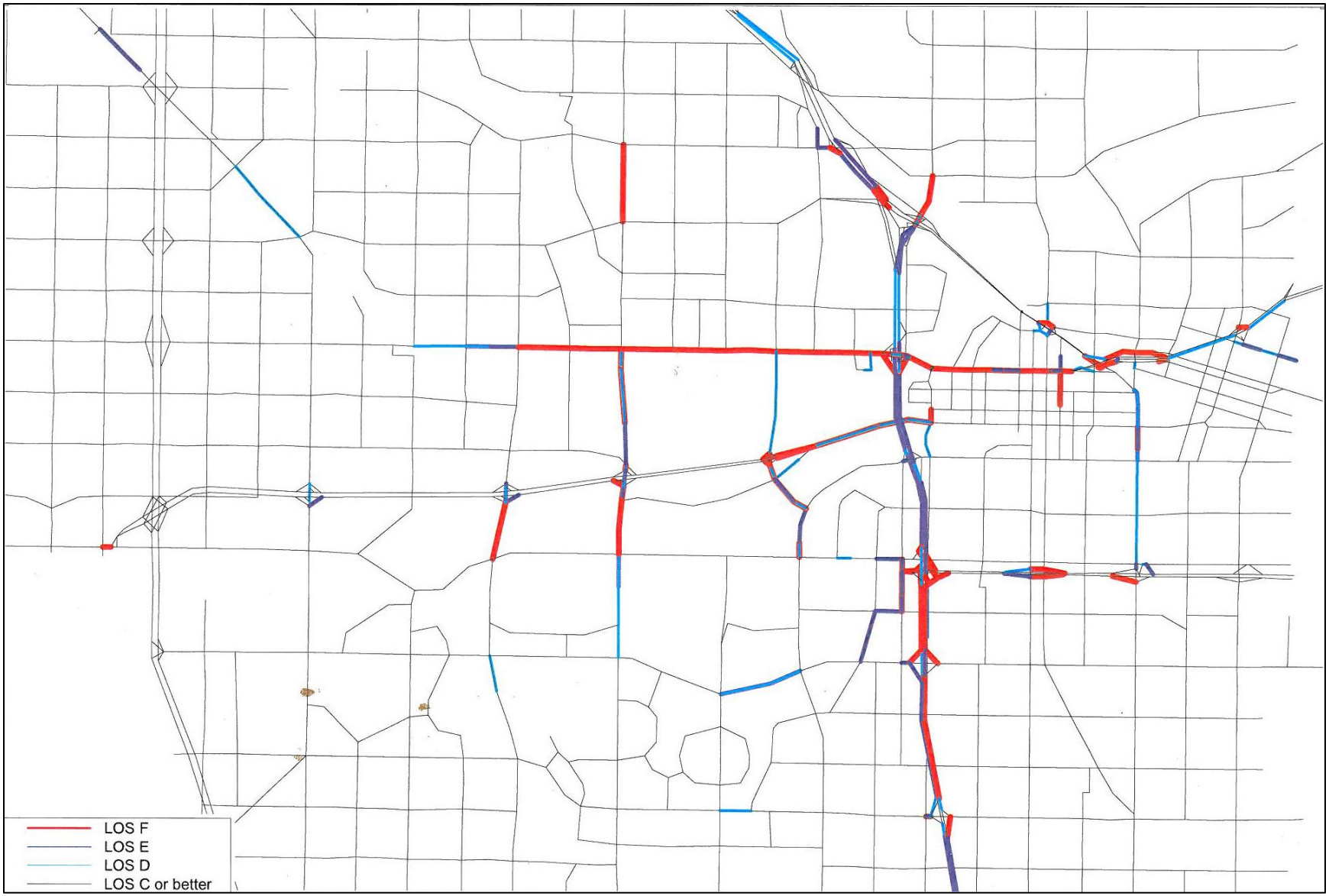


Figure 4-20: Locations of Congestion for the Transportation Systems Management/Transit Alternative

Table 4-36 summarizes the analysis results of the intersection performance under design year conditions. The first set of statistics comes from the recently completed *Rosedale (Widening Project) Traffic Operations Report*. Insofar as the design year, that analysis assumed that the Centennial Connector project (build alternative B) was constructed by 2017, and fully operational thereafter, including the 2035 horizon year assumed for the analysis. The methods used to compute the design year volumes were similar, but not identical, to those used for the no-build transportation systems management/transit (no Centennial connection) and build transportation systems management/transit scenarios. The results are therefore provided for reference purposes only.

Under the Rosedale widening scenario, which includes construction of the Centennial Connector project, Rosedale Highway would experience LOS E or LOS F conditions at its intersections with Coffee Road and Mohawk Street.

Under the no-build Centennial Connector scenario, these two intersections would continue to operate at LOS F, with increased delay. The southbound State Route 99 off-ramp terminal intersection with Rosedale Highway would additionally operate at a poor LOS E or LOS F condition.

Under the TSM alternative, Table 4-30 reports level of service conditions for two design options. The six-lane option assumes three through lanes per direction along Rosedale Highway at Fruitvale Avenue, Gibson Street, and the westerly Costco signalized intersection. Under these traffic lane assumptions, these intersections all operate at LOS E or LOS F during AM or PM peak hours or both. The southbound State Route 99 off-ramp terminal intersection with Rosedale Highway would additionally operate at LOS E during the PM peak hour.

As these performance characteristics are worse than the Caltrans District 6 LOS D design standard for a build alternative, an eight-lane option was also tested. As indicated on Figure 3-19, a fourth through lane per direction would be added to the intersections at Fruitvale Avenue, Gibson Street and the Costco entrance, including the intermediary roadway sections and grade separation structures at Mohawk Street and the San Joaquin Valley Railroad crossing located just east of Mohawk Street.

Given the addition of a fourth through lane, intersection level of service performance would improve compared to the no-build or transportation systems management/transit six-lane option. At Fruitvale Avenue, level of service would improve from LOS E to D. At Mohawk Street, no change to the at-grade intersection is proposed; hence, the level of service performance would be identical to the six-lane option (LOS D during the AM peak hour and LOS E during the PM peak hour).

At Gibson Street, level of service would improve from LOS E/F to LOS C/D during the AM/PM peak hours. At the Costco west signalized intersection, level of service would improve from LOS C/F to LOS B/C during the AM/PM peak hours.

Based on these traffic operational results, the transportation systems management/transit eight-lane option would be the appropriate definition of the build transportation systems management/ transit alternative, to meet Caltrans District 6 design standards for principal arterial roadways.

Insofar as screenline traffic diversion, Section 3.4 of this traffic study report presented peak hour and daily traffic volume forecasts for the build transportation systems management/transit and no-build alternatives. Figure 3-21 was presented, indicating the difference between the 2038

Table 4-36. 2038 Peak Hour Intersection Level of Service

INTERSECTION	ROSEDALE WIDENING PROJECT (2035)[1]				NO-BUILD CENTENNIAL CORRIDOR PROJECT				TRANSPORTATION SYSTEMS MANAGEMENT/TRANSIT							
									6-LANE OPTION				8-LANE OPTION			
	AM		PM		AM		PM		AM		PM		AM		PM	
	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
1. Allen Road and SR 58	38.0	D	45.0	D	40.7	D	47.1	D	40.2	D	54.7	D	40.2	D	54.7	D
2. Old Farm Road and SR 58	—	—	—	—	—	—	—	—	41.2	D	38.5	D	41.2	D	38.5	D
3. Verdugo Lane and SR 58	—	—	—	—	—	—	—	—	48.7	D	37.4	D	48.7	D	37.4	D
4. Calloway Drive and SR 58	44.0	D	49.0	D	49.4	D	54.8	D	48.1	D	48.9	D	48.1	D	48.9	D
5. Main Plaza Drive/El Toro Viejo Road and SR 58	—	—	—	—	—	—	—	—	28.0	C	47.7	D	28.0	C	47.7	D
6. Coffee Road and SR 58	68.0 (58.0)[2]	E (E)[2]	97.0 (70.0)[2]	F (E)[2]	83.1	F	98.0	F	57.1	E	61.3	E	57.1	E	61.3	E
7. Fruitvale Avenue and SR 58	—	—	—	—	—	—	—	—	77.6	E	57.6	E	47.3	D	49.9	D
8. Mohawk Street and SR 58	99.0 (95.0)[2]	F (F)[2]	99.0 (88.0)[2]	F (F)[2]	116.4	F	100.2	F	41.8	D	69.1	E	41.8	D	69.1	E
9. Gibson Street and SR 58	—	—	—	—	—	—	—	—	63.3	E	117.6	F	31.7	C	35.5	D
10. Costco Entrance and SR 58	—	—	—	—	—	—	—	—	29.4	C	108.0	F	15.5	B	34.0	C
11. SR 99 southbound ramps and SR 58	14.0	B	33.0	C	60.2	E	93.7	F	23.6	C	72.8	E	9.8	A	8.8	A
12. SR 99 northbound ramps and SR 58	28.0	C	48.0	D	29.7	C	49.8	D	52.7	D	75.5	E	52.7	D	75.5	E

Source: Parsons, except where noted

1. *Source:* Fehr & Peers, March 2011
2. With mitigation measures delay, level of service and impact determination

transportation system management/transit and no-build daily traffic volumes, as assigned by the travel forecast model. Given the intersection level of service performance reported above, it appears that the eight-lane transportation systems management/transit option will be able to accommodate the diversion of traffic illustrated on Figure 3-21.

Table 4-37 provides a quantification of traffic diversion attributable to the transportation systems management/transit eight-lane option compared to the no-build alternative.

Table 4-37. 2038 Volume Difference—Transportation Systems Management/Transit versus No-Build

EAST–WEST FACILITY	SCREENLINE				
	WEST OF STATE ROUTE 99	WEST OF MOHAWK STREET/ CALIFORNIA AVENUE	WEST OF COFFEE ROAD	WEST OF CALLOWAY DRIVE	WEST OF ALLEN ROAD
Olive Drive	(1,815)	(2,462)	(4,063)	(2,618)	(620)
Hageman Road	(6,289)	(7,501)	(5,408)	(12,261)	(2,109)
Rosedale Highway	23,704	26,384	27,020	34,338	11,399
Westside Parkway and Truxtun Extension	(4,569)	(8,394)	(7,491)	(7,726)	(4,332)
Stockdale Highway	(3,084)	(2,388)	(1,245)	(570)	(286)
Ming Avenue	(524)	(775)	(1,649)	(2,036)	(626)
Other	(7,423)	(4,864)	(7,164)	(9,127)	(3,426)

In addition to the intersection and screenline analysis conducted for State Route 58 West, Rosedale Highway, an analysis was conducted for the shared portion of State Route 99 between State Route 58 West and State Route 58 East.

Figure 3-21, presented earlier, indicated that upgrading Rosedale Highway to a super-arterial east of Allen Road will attract traffic from parallel east–arterials and the Westside Parkway. The graphic also indicated that traffic volumes would increase along State Route 99 as a result of constructing the transportation system management/transit alternative improvements, particularly in the shared section of State Route 99 between State Route 58 West and State Route 58 East.

Insofar as the magnitude of increased traffic along State Route 99, that volume is forecast to be approximately 20,000 vehicles per day over and above the no-build alternative year 2038 average daily traffic.

Table 4-38 lists the peak hour traffic volume comparison for the no-build and transit systems management/transit alternatives, while Table 4-33 lists the level of service computed for the State Route 99 freeway mainline segments between State Route 58 east and the Airport Drive interchange.

Table 4-39 indicates that the level of service will decline by one letter grade in the northbound direction of State Route 99 during one of the two peak periods, resulting in LOS F conditions during both AM and PM peak hours under the transportation systems management/transit alternative. In the southbound direction, congestion will remain at LOS F conditions during the

PM peak period, but will worsen from LOS D to LOS E during the AM peak period in the segment from Rosedale Highway to California Avenue.

As a build alternative, it would be appropriate to address the poor level of service along State Route 99 between State Route 58 west and State Route 58 east, and to mitigate the impacts of attracting higher volumes to State Route 99 as a result of upgrading Rosedale Highway to a super-arterial east of Allen Road. **Auxiliary lanes running in each direction along State Route 99 between State Route 58 west and State Route 58 east would therefore be required to implement the transportation systems management/transit alternative.**

Table 4-38. Transportation Systems Management/Transit Alternative Freeway Segment Forecast Volumes

SEGMENT	DIRECTION	YEAR 2038 NO-BUILD			YEAR 2038 TSM		
		AM PEAK	PM PEAK	ADT	AM PEAK	PM PEAK	ADT
SR 99 from SR 58 to California Avenue	NB	8,655	8,240	108,630	9,546	9,089	119,816
SR 99 from California Avenue to Rosedale Highway	NB	8,280	8,430	112,975	9,025	9,189	123,146
SR 99 from Rosedale Highway to Airport Drive	NB	5,615	6,540	87,295	5,866	6,832	91,191
SR 99 from Airport Drive to Rosedale Highway	SB	5,320	6,710	89,740	5,567	7,022	93,911
SR 99 from Rosedale Highway to California Avenue	SB	7,085	8,620	113,245	7,452	9,066	119,106
SR 99 from California Avenue to SR 58	SB	6,605	8,480	111,845	7,148	9,178	121,048
SR 58 from SR 99 to H Street	EB	4,850	4,585	62,198	5,209	4,925	66,808
SR 58 from H Street to Union Avenue	EB	4,900	4,950	64,258	5,207	5,260	68,286
SR 58 from Union Avenue to H Street	WB	4,595	4,605	65,295	4,959	4,969	70,462
SR 58 from H Street to SR 99	WB	4,265	4,555	60,385	4,664	4,981	66,035

Table 4-39. Transportation Systems Management/Transit Alternative Freeway Segment Analysis

SEGMENT	DIRECTION	YEAR 2038 NO-BUILD				YEAR 2038 TSM			
		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
		LOS	DENSITY	LOS	DENSITY	LOS	DENSITY	LOS	DENSITY
SR 99 from SR 58 to California Avenue	NB	F	—	E	44.0	F	—	F	—
SR 99 from California Avenue to Rosedale Highway	NB	E	44.5	F	—	F	—	F	—
SR 99 from Rosedale Highway to Airport Drive	NB	C	24.5	D	29.1	C	25.6	D	30.9
SR 99 from Airport Drive to Rosedale Highway	SB	C	23.1	D	30.1	C	24.2	D	32.1
SR 99 from Rosedale Highway to California Avenue	SB	D	32.6	F	—	E	35.5	F	—
SR 99 from California Avenue to SR 58	SB	D	29.5	F	—	D	33.1	F	—
SR 58 from SR 99 to H Street	EB	D	28.7	D	26.8	D	31.6	D	29.3
SR 58 from H Street to Union Avenue	EB	D	29.1	D	29.5	D	31.6	D	32.1
SR 58 from Union Avenue to H Street	WB	D	26.9	D	27.0	D	29.5	D	29.6
SR 58 from H Street to SR 99	WB	C	24.8	D	26.6	D	27.4	D	29.7

4.8 Local Roadway Access Modifications

In the case of alternatives A, B, and C, modifications to the local streets and properties are required as part of the project and affect travel access. The adjustments differ in degree depending on the alternative examined. While a number of local streets will be shortened, modified, or removed, little or no disruption to the existing circulation patterns is expected. A number of the street modifications will involve shortening an existing cul-de-sac to accommodate the project right-of-way. In cases where through traffic is eliminated on an existing local roadway, an adjacent or nearby street will provide an alternative route.

Adjustments to local roadways as a result of the proposed project are not expected to impact the provision of transit or emergency services, such as fire or police, or affect access to health care facilities. Some minor adjustments with respect to route maps and patrol duties for fire and police personnel, however, will be necessary to ensure quick response times. Disruptions in access to local schools are expected to be very minimal, with safe and efficient alternatives to currently used routes readily available.

Local roadway modifications and their ramifications for vehicular, bicycle and pedestrian circulation; transit, emergency and health services provision; and the location of schools for each of the build alternatives is detailed below.

Alternative A

Street Closures and General Circulation

Existing roadways requiring access modifications with respect to alternative A are discussed below, and as illustrated in the corresponding graphic representations.

> *As presented in **Figure 4-7 (sheets 1 and 6),** the following roadways and adjacent property will be affected in the vicinity of the State Route 99/State Route 58 interchange.*

NORTH OF STATE ROUTE 58

On the north side of State Route 58 and west of State Route 99, the following existing through streets will be terminated south of Stockdale Highway and north of the proposed right-of-way:

- Jones Street
- Williamson Way

Jones Street will be closed both south of Stockdale Highway and north of Peckham Avenue. Nearby north–south access is available at Stine Road. Williamson Way will be also closed both south of the proposed roadway. Nearby north–south access is available at Real Road.

SOUTH OF STATE ROUTE 58

On the south side of State Route 58 and west of State Route 99, the following existing through streets will be terminated just south of the proposed right-of-way:

- Jones Street
- South Gamsey Avenue
- Williamson Way

South Montclair Street and Stine Road will continue as through streets, forming an underpass at the proposed roadway. Real Road, will form a traffic-divided underpass of the mainline, in addition to the eastbound on-ramps and westbound off-ramps of the proposed highway. South Gamsey Avenue is an existing cul-de-sac that will be shortened to accommodate the roadway right-of-way, with access and circulation not affected.

On the south side of State Route 58 and east of State Route 99, the following existing through streets will be converted to cul-de-sacs just south of the proposed right-of-way, with an existing connecting street eliminated:

- Myrtle Street
- Dixon Avenue

Myrtle Street and Dixon Avenue are currently connected at their northern termini by a connecting street. The street will be eliminated and converted to cul-de-sacs to accommodate the proposed roadway. Both streets will be minimally affected in terms of circulation due to nearby Hughes Lane, which will continue as a major through street.

> *As presented in **Figure 4-7 (Sheet 2),** the following roadways and adjacent property will be affected in the vicinity of the State Route 99, south of the State Route 99/ State Route 58 interchange.*

WEST OF STATE ROUTE 99

On the west side of State Route 99, the following existing streets will be terminated just west of State Route 99:

- Wood Lane
- Laverne Avenue

Eastbound traffic on Wood Lane and Laverne Avenue has access to Belle Terrace or Ming Avenue, streets in close proximity which provide through movements east of State Route 99. Seville Street will be extended north just past Laverne Avenue to serve existing properties. A frontage road connection between Mona Way and Belle Terrace will be established. Belle Terrace will form an underpass of State Route 99. Affects on circulation in this area will be very limited.

EAST OF STATE ROUTE 99

On the east side of State Route 99 and west of State Route 99, no local roadways are effected with the exception of construction at the Belle Terrace overpass.

> *As presented in **Figure 4-7 (Sheet 6),** the following roadways and adjacent property will be affected in the vicinity of the State Route 58 improvement project.*

NORTH OF STATE ROUTE 58
On the north side of State Route 58, the following existing through streets will be terminated just north of the proposed right-of-way:

- McDonald Way
- Business Park South

Existing north–south traffic on McDonald Way will be diverted to Cunan Street to the east and South Montclair Street to the west and result in little circulation impact. Business Park South will be shortened to the north to accommodate the roadway project and traffic will be diverted to adjacent Business Center Drive.

SOUTH OF STATE ROUTE 58
On the south side of State Route 58, the following existing through streets will be terminated just south of the proposed right-of-way:

- Frazier Avenue
- Westwood Street
- McDonald Way

Frazier Avenue and Westwood Street will be terminated; but the connecting street between the two, just south of the proposed roadway, will be retained. McDonald Way will be terminated and traffic diverted east to become Peckham Avenue. North–south traffic will be served by South Montclair Street to the east and Stine Road to the west.

> *As presented in **Figure 4-7 (Sheet 7),** the following roadways and adjacent property will be affected in the vicinity of the State Route 58 improvement project.*

NORTH OF STATE ROUTE 58
Local roadways north of State Route 58 are not affected.

SOUTH OF STATE ROUTE 58
On the south side of State Route 58, the following existing through streets will be converted to cul-de-sacs just south of the proposed right-of-way:

- Brite Street
- South Oleander Avenue
- Houchin Road

Brite Street, an east–west street, will be terminated and the connecting road between Brite Street and South Oleander Avenue eliminated. The existing Houchin Road cul-de-sac will be moved slightly to the south to accommodate the proposed roadway. North–south traffic will still access H Street as currently used.

Transit and Emergency Service Access

Golden Empire Transit bus routes, specifically Routes 9, 11 and 15, are not impacted by alternative A. One health care center and two fire stations are located within the immediate vicinity of the proposed alternative A right-of-way (see Figure 2-7). HealthSouth Bakersfield Rehab is located at 5501 Commerce Drive. Fire stations are located at 3400 Palm Street (City 3) and 7000 Stockdale Highway (City 11). In each case, the expected minimal change in existing local circulation patterns will not unduly affect traffic or the provision of local emergency services as a result of the proposed project. Service provision from the closest police station, Bakersfield Central Receiving Station at 1415 Truxtun Avenue, is not expected to be affected.

Pedestrian and Bicycle Access to Schools

Two schools, Van Horn Elementary at 5501 Kleinpell Street and Henrietta Well Child Guidance Center at 5300 California Avenue, are in the immediate vicinity of the alternative A right-of-way (see Figure 4-21), with at least some students likely forced to access the school via a nearby local alternative to the route currently used. Because the actual closures of streets are minimal and the opportunities for alternate access readily available, situations in which functional access to either facility would be materially affected is not expected.

Alternative B

Street Closures and General Circulation

Existing roadways requiring access modifications with respect to alternative B are discussed below, and as illustrated in corresponding graphic representations.

> *As presented in **Figure 4-10 (Sheet 1),** the following roadways and adjacent property will be affected in the vicinity of the State Route 99/ State Route 58 interchange.*

NORTH OF STATE ROUTE 58
Local roadways on the north side of State Route 58, both east and west of State Route 99, are not affected by the proposed project.

SOUTH OF STATE ROUTE 58
On the south side of State Route 58, and east of State Route 99, the following existing through street will be converted to a cul-de-sac just south of the proposed right-of-way:

- South Myrtle Street

On the south side of State Route 58, and west of State Route 99, the following existing through street will be converted to a cul-de-sac just south of the proposed right-of-way:

- South Gamsey Avenue

Stine Road and Williamson Way, one street on either side from South Gamsey Avenue, will remain as north–south through streets and retain easy access north to Stockdale Highway. Real Road as a major north–south divided collector roadway.

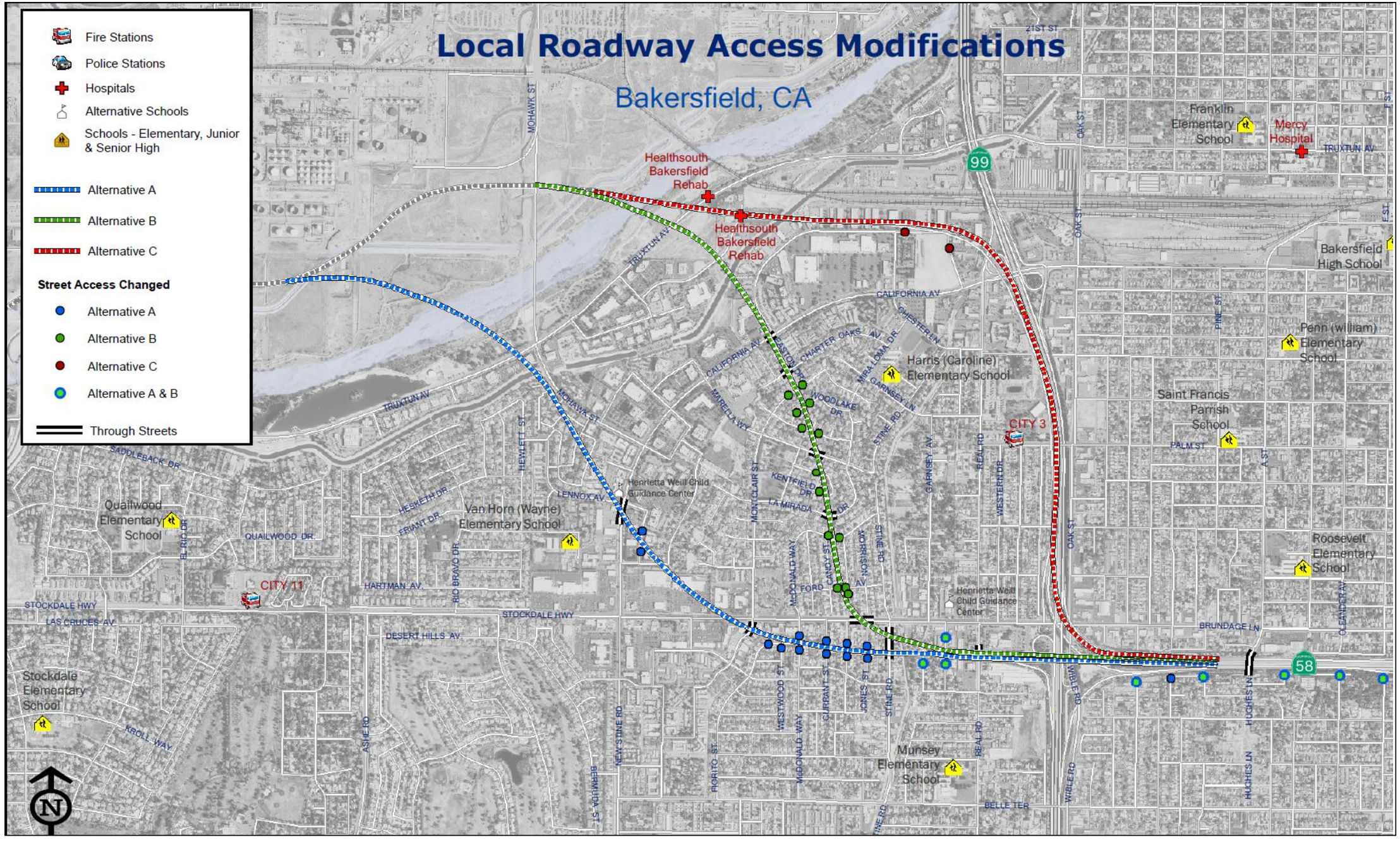


Figure 4-21: Local Roadway Access Modifications

*As presented in **Figure 4-10 (Sheet 2),** the following roadways and adjacent property will be affected in the vicinity of the State Route 99, south of the State Route 99/ State Route 58 interchange.*

WEST OF STATE ROUTE 99
On the west side of State Route 99, the following existing through streets will be terminated just west of State Route 99:

- Wood Lane
- Laverne Avenue

Seville Street will be extended north just past Laverne Avenue to serve existing properties. A frontage road connection between Mona Way and Belle Terrace will be established. Belle Terrace will form an overpass of State Route 99. The existing Wood Lane cul-de-sac would be moved slightly to the west. North–south through access will remain at Belle Terrace.

EAST OF STATE ROUTE 99
On the east side of State Route 99, and west of State Route 99, no local roadways are affected with the exception of temporary construction activities at the Belle Terrace overpass.

*As presented in **Figure 4-10 (Sheet 6),** the following roadways and adjacent property will be affected in the vicinity of the State Route 58 improvement project.*

North of State Route 58
On the north side of State Route 58, the following existing through streets will be terminated just north of the proposed right-of-way:

- Kentfield Drive
- Hillsborough Drive

Southbound traffic on Kentfield Drive and Hillsborough Drive would be diverted a short distance east or west to Marella Way or La Mirada Drive, both of which provide through movements via underpasses of the proposed roadway.

SOUTH OF STATE ROUTE 58
On the south side of State Route 58, the following existing through streets will be terminated just south of the proposed right-of-way:

- Kensington Avenue
- Woodlake Drive
- Montclair Street
- Charter Oaks Avenue

Northbound traffic on Kensington Avenue, Woodlake Drive, Montclair Street, and Charter Oaks Avenue will be diverted either east or west to California Avenue or either Marella Way or La

Mirada Drive, respectively. California Avenue remains as a major north–south divided arterial roadway.

> *As presented in **Figure 4-10 (Sheet 7),** the following roadways and adjacent property will be affected in the vicinity of the State Route 58 improvement project.*

NORTH OF STATE ROUTE 58
Local roadways north of State Route 58 are not affected.

SOUTH OF STATE ROUTE 58
On the south side of State Route 58, the following existing streets will be converted to cul-de-sacs just south of the proposed right-of-way:

- Dixon Avenue
- Brite Street
- South Oleander Avenue
- Houchin Road

Brite Street, an east–west street, will be terminated and the connecting road between Brite Street and South Oleander Avenue eliminated. Northbound traffic on Dixon Avenue will be directed one block east to Hughes Lane. Northbound traffic on South Oleander Avenue, and Houchin Road will be diverted to H Street, one and two blocks to the east, respectively. Hughes Lane, H Street, Chester Avenue, and South P Street will remain as north–south arterial roadways.

Transit and Emergency Service Access

Golden Empire Transit bus routes, specifically Routes 9 and 15, are not impacted by alternative B. One health care center and one fire station are located within the immediate vicinity of the proposed alternative A right-of-way (see Figure 2-7). HealthSouth Bakersfield Rehab is located at 5501 Commerce Drive. A fire station is located at 3400 Palm Street (City 3). In each case, the expected change in existing local circulation patterns will not unduly affect traffic or the provision of local emergency services as a result of the proposed project. Service provision from the closest police station, Bakersfield Central Receiving Station at 1415 Truxtun Avenue, is not expected to be affected.

Pedestrian and Bicycle Access to Schools

Two schools, Harris Elementary at 4110 Garnsey Lane north of Stockdale Highway and Stockdale Christian School located at the corner of Marella Way and California Avenue, are in the immediate vicinity of the alternative B right-of-way (see Figure 4-21). It is expected that some students will be required to access the school from the south for residents between Stine Road and Williamson Way, south of the proposed roadway. However, because the actual closures of streets are minimal and the opportunities for alternate access are readily available, situations in which functional access to either facility would be materially affected are not expected. A Class 3 bicycle route along Montclair Street north of Marella Way will be realigned to Mira Loma Drive to continue the provision of bike route access to the two schools.

Alternative C

Street Closures and General Circulation

Existing roadways requiring access modifications with respect to alternative C are discussed below, and as illustrated in corresponding graphic representations.

> *As presented in **Figure 4-13 (Sheet 2),** the following roadways and adjacent property will be affected in the vicinity of the State Route 99/ State Route 58 interchange.*

WEST OF STATE ROUTE 99
On the west side of State Route 99, the following existing street will be terminated just west of State Route 99:

- Chester Lane

Chester Lane currently forms a cul-de-sac at its eastern most terminus, just west of State Route 99. Traffic circulation will not be affected as the two streets on either side of Chester Lane, California Avenue and Palm Street, provide east–west through access.

EAST OF STATE ROUTE 99
Local roadways east of State Route 99 are not affected.

> *As presented in **Figure 4-13 (Sheet 3),** the following roadways and adjacent property will be affected in the vicinity of State Route 99 north and south of Stockdale Highway.*

WEST OF STATE ROUTE 99
On the west side of State Route 99, the following existing streets will be terminated or modified just west of the proposed right-of-way:

- Elcia Drive
- Terrace Way
- Wood Lane

Elicia Drive and Terrace Way, two adjacent and parallel streets will be connected just west of State Route 99 to provide circulation for adjacent properties. A frontage road connection between Mona Way and Belle Terrace will be established. Belle Terrace will form an overpass of State Route 99. The existing cul-de-sac on Wood Lane would be moved slightly to the west. North–south through access will remain at Belle Terrace.

EAST OF STATE ROUTE 99
Local roadways east of State Route 99 are not affected.

> *As presented in **Figure 4-13 (Sheet 8),** the following roadway and adjacent property will be affected in the vicinity of the junction between State Route 99 and the proposed roadway.*

NORTH OF STATE ROUTE 58
Local roadways north of State Route 58 are not affected.

SOUTH OF STATE ROUTE 58
On the south side of State Route 58, an existing street will be converted to a cul-de-sac just south of the proposed right-of-way:

- Commerce Drive

Commerce Drive currently ends in a cul-de-sac south of Truxtun Avenue. Commerce Drive will be terminated farther to the south in order to accommodate the proposed roadway right-of-way, but neither circulation, nor access, is affected.

Transit and Emergency Service Access

Golden Empire Transit bus routes, specifically Routes 8 and 15, are not impacted by alternative C. One health care center and one fire station are located within the immediate vicinity of the proposed alternative C right-of-way (see Figure 2-7). HealthSouth Bakersfield Rehab is located at 5501 Commerce Drive. A fire station is located at 3400 Palm Street (City 3). In each case, the expected minimal change in existing local circulation patterns will not unduly affect traffic or the provision of local emergency services as a result of the proposed project. Service provision from the closest police station, Bakersfield Central Receiving Station at 1415 Truxtun Avenue, is not expected to be affected.

Pedestrian and Bicycle Access to Schools

Based on the location of schools in the vicinity of alternative C construction, no changes in access for students are expected as a result of the project (see Figure 4-20).

4.9 Freeway Access Modifications

Modifications to existing access ramps along State Route 99 and State Route 58 are required as part of the project and will impact travel access. Impacts will differ in degree depending on the alternative and location examined.

Freeway access modifications resulting from the proposed project are not expected to impact the provision of emergency services, such as fire or police, or affect access to health care facilities. Minor re-routing adjustments with respect to call response and patrol duties for fire and police personnel will be necessary to ensure quick response times. Disruptions in access to local schools are expected to be very minimal, with safe and efficient alternatives to currently used routes readily available.

Freeway access modifications and their ramifications for local circulation and alternative travel route recommendations are itemized below:

- The southbound State Route 99 off-ramp with direct access to Stockdale Highway will be eliminated under **alternatives A, B and C**. The provided alternative will be for vehicles to exit instead at the California Avenue interchange, just to the north. California Avenue and Oak Street provide a direct connection with the Stockdale Highway corridor.

- The northbound State Route 99 exit and entrance access points to and from Wible Road will be eliminated under **alternatives A, B and C**. Under existing and no-build conditions, these ramps provide access to and from the Stockdale Highway corridor. The provided alternative will be for vehicles to utilize either the California Avenue interchange to the north or the Ming Avenue interchange to the south, depending upon their destination.

- Access from Real Road and the Stockdale Highway corridor to southbound State Route 99 will be eliminated under **alternatives A, B and C.** The available alternative will be for drivers to utilize Real Road or Stine Road to access southbound State Route 99 via the Ming Avenue interchange.

- The connection between westbound State Route 58 to Real Road and the Stockdale Highway corridor will be eliminated under **alternatives A and B**, only. The likely alternative is for drivers to utilize the H Street/Chester Avenue interchange. The next nearest intersection to the north would be Calloway Drive in the case of alternative A and Mohawk Street in the case of alternative B.

- Ming Avenue corridor access to and from State Route 58, east of State Route 99, will be eliminated under **alternatives A and B**, only. The area is characterized by relatively heavy traffic associated with movements to and from the Valley Plaza Mall and other nearby retail businesses. The provided alternative will be for vehicles to utilize the H Street/Chester Avenue interchange.

- Access from westbound State Route 58 to California Avenue via State Route 99 will be eliminated under **alternative C,** only. Drivers will instead be required to utilize the H Street/Chester Avenue interchange to access California Avenue to the north.

4.10 Add-on Elements

The description of the transportation network in Section 3.3 identifies a large number of highway and transit elements listed in the *2011 Regional Transportation Plan (Amendment 1)* and/or the *Metropolitan Bakersfield Impact Fee—Proposed Phase IV Improvement* list of projects. These elements serve as background to the build alternatives as well as the no-build alternative.

The description of the transportation systems management/transit alternative (alternative M) indicates that a number of low cost improvements were assumed for the no-build alternative, and were therefore not specifically studied as a new component of the transportation system for alternative M. These low cost improvements include traffic signal optimization, intersection widening, and bus turnouts to reduce delay and increase the capacity along the following corridors:

- Hageman Road from Calloway Drive to State Route 99
- Rosedale Highway from Enos Lane (State Route 43) to State Route 99
- Truxtun Avenue from the Westside Parkway to Oak Street
- Stockdale Highway from Old River Road to Oak Street/Wible Road

- Ming Avenue from Old River Road to State Route 99
- Coffee Road from Stockdale Highway to Westside Parkway
- California Avenue from Stockdale Highway to Mohawk Street
- Mohawk Street from California Avenue to the Westside Parkway

Additional elements of the transportation systems management/transit alternative would include deploying intelligent transportation systems strategies to improve mobility and reduce fuel consumption and green house gas emissions.

This alternative would also include increasing transit service along Rosedale Highway and Stockdale Highway to reduce the overall vehicular demand in these east–west corridors and other potential travel demand management techniques. The transit improvements would primarily focus on an increase in frequency of service that would result in reduced automobile demand. Finally, area-wide transportation demand management strategies would be considered to reduce travel demand through establishing parking fees, encouraging carpool formation, and encouraging flextime for employees. These improvements to transit service and implementation of travel demand management techniques are also assumed for the no-build alternative, and are therefore not specifically studied as a new component for alternative M or the remaining build alternatives.

In and of themselves, these add-on elements do not fully address the purpose of the Centennial Corridor project, that being to provide continuity and associated traffic congestion relief for State Route 58 in Kern County. Also, the add-on elements do not:

- Provide interregional and regional connectivity for east–west traffic traveling within metropolitan Bakersfield and Kern County,
- Promote economic growth and international/interregional trade by improving linkages between existing segments of the interstate system, or
- Reduce commercial and regional commute time through a major freight corridor.

The add-on elements do, however, contribute to the following two objectives:

- Improve local east–west circulation and reduce congestion to accommodate existing and planned land uses in accordance with adopted growth projections.
- Improve operations and reduce congestion on the shared portion of State Route 58 and State Route 99

By virtue of this contribution, a number of add-on elements are worthy of consideration for all of the build alternatives, independent from the Centennial Corridor project.

Discussed below are potential capital investment projects that could materially contribute to improving local east–west circulation and traffic operations along the shared portion of State Route 58 and State Route 99. Not discussed are public policy initiatives which are outside the purview of this investigation.

Example Public Policy Transportation Demand Strategies that Are Beyond the Scope of the Centennial Corridor Project

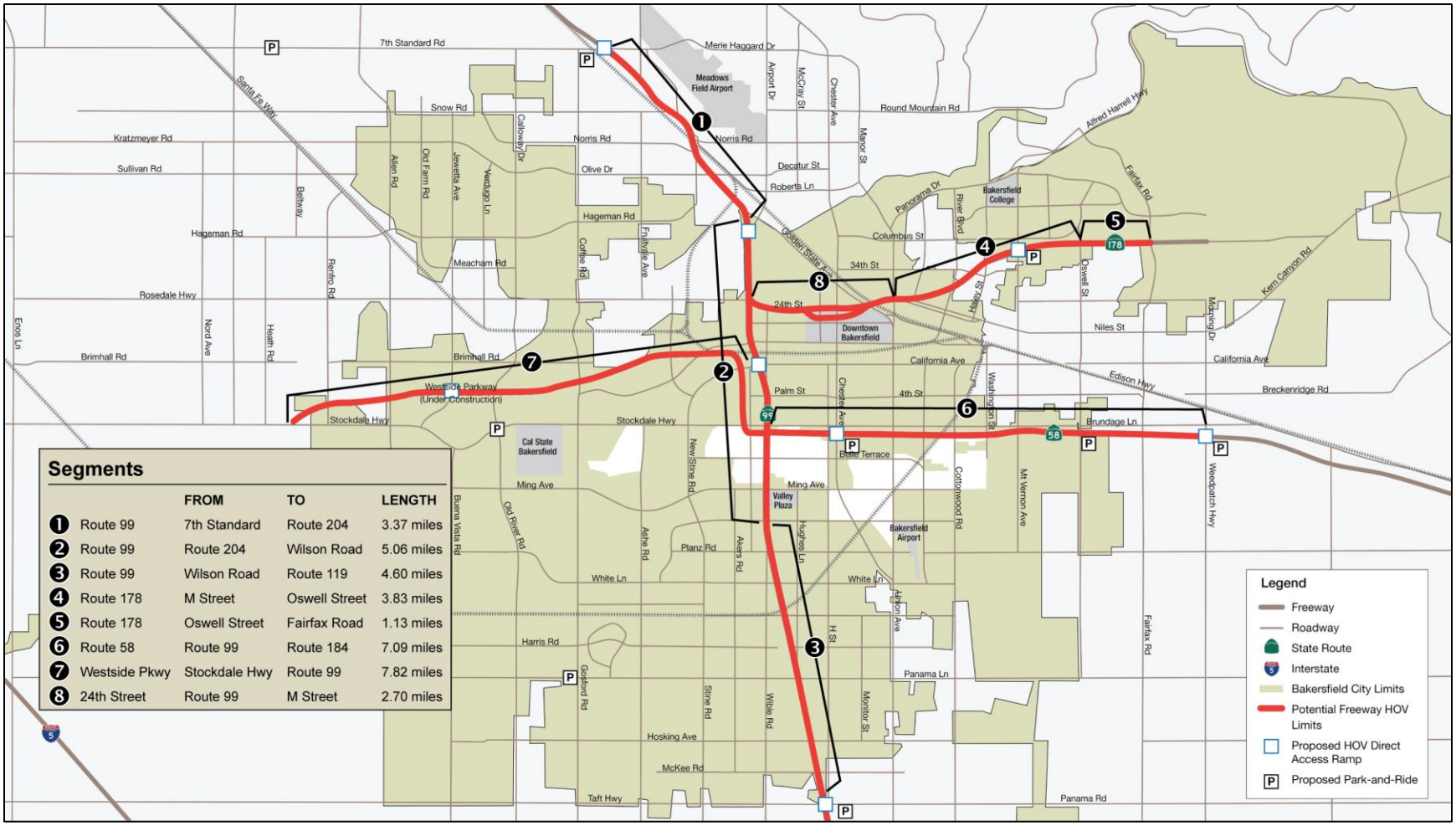
- Alternative work schedules
- Carsharing
- Flextime
- Guaranteed ride home
- Public bike systems
- Ridesharing
- Taxi service improvements
- Telecommuting
- Traffic calming
- Commuter financial incentives
- Congestion pricing
- Increasing fuel taxes
- Parking pricing
- Vehicle use restrictions
- Land use management
  - New urbanism
  - Smart growth
  - Transit oriented development
- Transportation demand management marketing
- Transportation management associations

Managed/High Occupancy Vehicle Lanes

Managed lanes are the operational designation of one or more lanes of traffic to limit use to designated vehicle user groups. These user groups can be those with high-occupancy (two or more persons per vehicle), express lanes which limit ingress and egress to longer distance trips, and/or HOT (high-occupancy toll) lanes which permit single occupant vehicles to utilize the high-occupancy lane by paying a toll. These terms are often used interchangeably.

In 2005, Caltrans prepared the "High Occupancy Vehicle Lane Viability Study for the San Joaquin Valley" to identify potential locations where HOV (high occupancy vehicle) lanes might be applicable in the San Joaquin Valley. It indicated that there were several state highway corridors, including State Route 99 and State Route 58, where HOV lanes might be considered. As a follow-up to this study and the Route 99 Business Plan, Kern COG is currently conducting a more detailed study to determine if and where HOV lanes and ramp metering systems might be appropriate within Kern County. The *Kern High Occupancy Vehicle/Bus Rapid Transit Study* (HOV/BRT Study) is investigating the feasibility of adding HOV lanes to routes 58, 99 and 178 as illustrated on Figure 4-22. Findings and recommendations are not available as of March 2012, but early indications suggest that HOV lanes will not be warranted within metropolitan Bakersfield until after 2040.

Reflecting this future potential, the Centennial Corridor project definition of State Route 58/ Westside Parkway, from Cottonwood Road to the Stockdale Highway tie-in, includes a median of sufficient width to accommodate the addition of an HOV/HOT/express managed lane per direction at a later date. While no plan currently exists for such a facility, build alternatives A, B, and C, plus the Westside Parkway will all accommodate the addition of managed lanes should they be warranted.



Source: IBI Group for the Kern Council of Governments, *HOV/BRT Study – Alternatives Evaluation,* March 14, 2012

Figure 4-22: Potential HOV Lanes

Park and Ride Lots

Caltrans managed lanes are comprised of HOV lanes, express lanes and park-and-ride facilities. The location of park-and-ride facilities located within Kern County and Caltrans District 6 are illustrated on Figure 4-23 and are listed below.

- Lot ID #4 is located along State Route 99 on the south side of Stockdale Highway between Real Road and State Route 99. The facility is owned by the state and provides 49 spaces.
- Lots ID #5 and #6 are located along State Route 58 in the northwest and southeast quadrants of the interchange with State Route 184 (Weedpatch Highway). The two lots lie within the state right-of-way and collectively provide 36 spaces.
- Lot ID #7 is located along Route 99 at the Delano Airport. The facility is part of the airport parking lot and is owned by the city. Twenty-five spaces are available for use.
- Lot ID #8 is located along State Route 119 at Ford City, near Taft. The facility is located within state right-of-way and provides 22 spaces.
- Lot ID #9 is located along State Route 155, near its junction with State Route 178 at Lake Isabella. Eleven spaces are available at this location.

In addition to these **formal** park-and-ride lots, numerous **informal** locations are used by carpoolers throughout the county. No inventory of these informal lot locations is available.

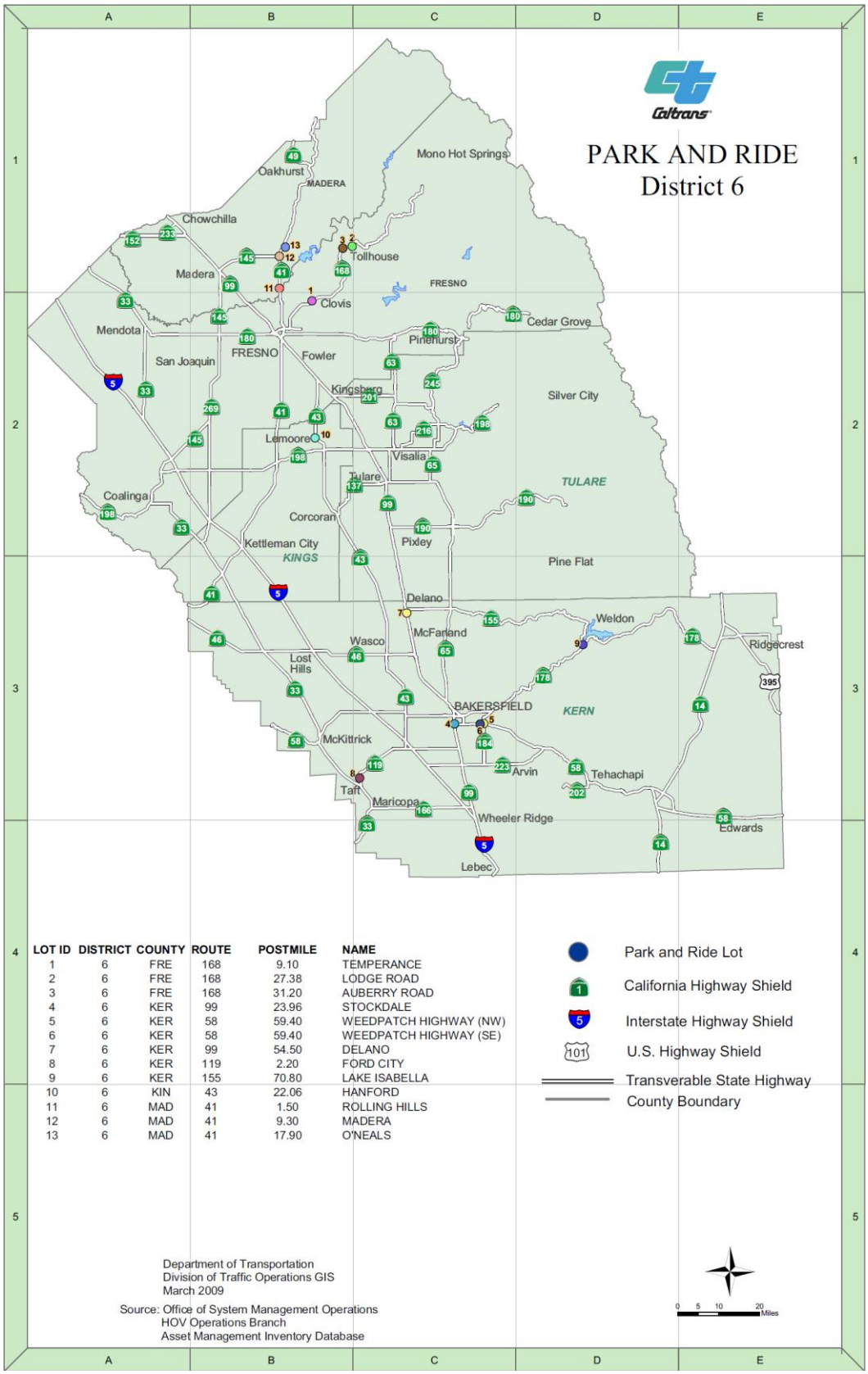
As part of the Centennial Corridor project, Lot ID #4 will be relocated from Stockdale Highway to Mohawk Street near California Avenue (alternative A), California Avenue near Easton Drive (alternative B), or Real Road near California Avenue (alternative C). Additional park-and-ride facilities may be constructed as part of future managed lane projects, as part of implementing the Kern COG HOV/BRT study findings (see Figure 4-22 for potential locations), or as part of the implementation of the Metropolitan Bakersfield Transit System Long-Range Plan.

Long-Range Transit System Enhancements

The definition of the no-build, transportation systems management/transit alternative, and build alternatives A, B and C, all assume the enhancement of Golden Empire Transit fixed route services as identified in the *2011 Final Regional Transportation Plan* (June 15, 2010) constrained program of projects. This list of projects includes the purchase of 120 full size buses and replacements for those buses over the 2011 to 2035 plan horizon. The 120 bus purchase will provide for replacement of the existing fleet and expansion of service (coverage and frequency of service) as defined by the *Metropolitan Bakersfield Major Transportation Investment Strategy*[1], adopted by the City of Bakersfield, County of Kern, Kern COG, Golden Empire Transit District, California Department of Transportation and the San Joaquin Valley Unified Air Pollution Control District.

The 120-bus fleet will allow for a deployment of 100 buses during peak hours and the mid-day, with 20 buses reserved for spares. This level of bus utilization represents roughly a doubling of service compared with existing service.

[1] Final Strategy Report, December 29, 1997, Barton-Aschman Associates, Inc.



LOT ID	DISTRICT	COUNTY	ROUTE	POSTMILE	NAME
1	6	FRE	168	9.10	TEMPERANCE
2	6	FRE	168	27.38	LODGE ROAD
3	6	FRE	168	31.20	AUBERRY ROAD
4	6	KER	99	23.96	STOCKDALE
5	6	KER	58	59.40	WEEDPATCH HIGHWAY (NW)
6	6	KER	58	59.40	WEEDPATCH HIGHWAY (SE)
7	6	KER	99	54.50	DELANO
8	6	KER	119	2.20	FORD CITY
9	6	KER	155	70.80	LAKE ISABELLA
10	6	KIN	43	22.06	HANFORD
11	6	MAD	41	1.50	ROLLING HILLS
12	6	MAD	41	9.30	MADERA
13	6	MAD	41	17.90	O'NEALS

Figure 4-23: Caltrans District 6 Park-and-Ride Lots

To provide further definition to this long-range transit strategy, the Golden Empire Transit district and Kern COG have recently prepared the *Metropolitan Bakersfield Transit System Long-Range Plan*[2]. The plan defines a route restructuring proposal as illustrated on Figure 4-23, an increase in service frequencies, the deployment of 95 buses throughout peak and mid-day periods, plus potentials for bus rapid transit, commuter rail, and supporting park-and-ride lots.

The bus rapid transit, commuter rail services, and potential conversion of bus rapid transit to light rail transit are identified in both the *2011 Final Regional Transportation Plan* and the *Metropolitan Bakersfield Transit System Long-Range Plan* as being unfunded. Hence, they cannot be included in the definition of the Centennial Corridor project, but they may be added at a later date when or if funding is available.

The construction of park-and-ride lots having some 750 spaces is identified in the constrained list of *2011 Final Regional Transportation Plan* projects. The specific location of these lots is yet to be determined; however, Figures 4-22 and 4-24 illustrate a number of potential locations.

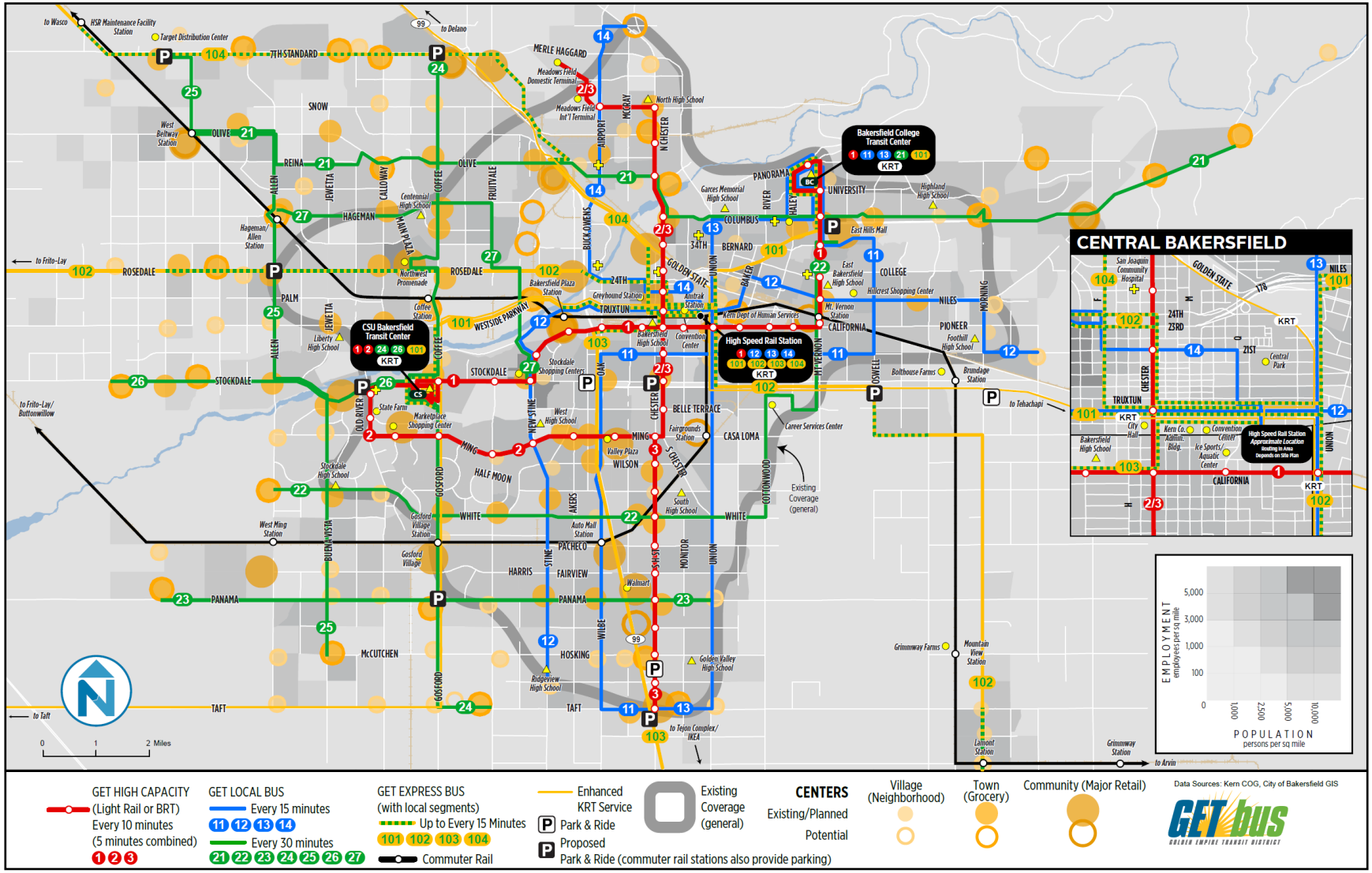
Ridership forecasts prepared for the long-range transit plan indicate that the number of bus riders would roughly double by year 2035 from current levels, to approximately 35,000 linked transit trips per day. Seven to eight percent of these trips (2,450 to 2,800) would occur during the 7:00 to 8:00 a.m. and 4:00 to 5:00 p.m. peak hours, while up to 3,300 trips would occur during the transit system peak hour from 3:00 to 4:00 p.m. (based on existing rider diurnal use). This rider use would be distributed throughout the system, with Routes 2, 12, and 21 attracting the highest volume of users (see Figure 4-24).

Intelligent Transportation Systems Strategies

Kern COG, Caltrans District 6, Caltrans New Technology and Research Program, as well as various cities and transportation agencies within the Kern County region are working to identify intelligent transportation systems application opportunities within the county. To date, six programs have been developed to integrate and expand intelligent transportation systems in the region:

- Communication Network Development Program—Connects different agencies within the region to allow coordination in operating and managing the transportation system. Examples include building communication links with Bakersfield SONET ring and developing smart call boxes.
- Traffic and Incident Management Program—Integrates various state, regional, and local agencies serving Kern County into a comprehensive, region-wide approach to traffic and incident management. Examples include census stations, system and/or incident detectors, coordinated incident management procedures, and freeway changeable message signs.
- Kern Traveler Safety Program—Combines applications that address safety, such as weather stations, smart studs, and rock-fall detection systems.

[2] Draft Final Report, November 2011, Nelson\Nygaard Consulting Associates



Source: Nelson\Nygaard Associates for Golden Empire Transit District/Kern Council of Governments, *Metropolitan Bakersfield Transit System Long-Range Plan, Draft Final Report, November 2011*

Figure 4-24: Proposed Golden Empire Transit, Enhanced Kern Regional Transit and Commuter Rail Fixed Route Service (Long-Term)

- Kern Informed Traveler Program—Uses advanced warning systems for the reduction of accidents and congestion. Examples include advanced traveler information system development, Bakersfield's transportation operations center upgrades, and interactive commuter kiosks.
- Kern Smart Transit Program—Increases transit's share of the commuting market by providing an alternative mode that is flexible, convenient, and responsive to customer demand. Examples include upgrading Golden Empire Transit service and coordinating Golden Empire Transit and Kern Regional Transit schedules.
- Enhanced Emergency Response Program—Provides police, sheriff, fire ambulance, and other service providers with tools that determine quickly and accurately which routes will be most beneficial. Examples include workstations for emergency response providers and establishing emergency corridor routes.

Insofar as the Centennial Corridor project, the Traffic and Incident Management Program is the most applicable potential add-on element for the no-build, transportation systems management/ transit alternative, and build alternatives A, B, and C.

Intelligent transportation systems elements pertaining to State Route 58 and State Route 99 freeway segments include:

- Closed circuit television to improve traffic surveillance
  Closed circuit television is used primarily to monitor traffic conditions, to respond quickly to incidents, and to provide information to motorists.
- Vehicle detection system to improve traffic surveillance
  Vehicle detection system loops are added/replaced on mainline freeway lanes to allow Caltrans to monitor traffic volume, speed and congestion.
- Ramp metering to improve traffic management
  Ramp metering can be added to existing as well as new interchange ramps to regulate the flow of vehicles from the arterial streets on to the freeway system, to optimize flow and minimize turbulence caused by heavy traffic attempting to enter the right-hand lanes of the freeway.
- Changeable message signs to improve motorist information
  These signs allow Caltrans to post travel times, incident alerts, construction/detour information and other real-time information to assist motorists in making route choice decisions.
- Adaptive traffic signal control to improve traffic management
  Links Caltrans traffic management center with city traffic management centers. Provides the capability to adapt traffic signal timing system-wide to respond dynamically to highly variable travel conditions.

Implementation of these potential ITS elements will require add-on investments in backbone communication links and systems such as fiber optics networks, custom software development and interagency agreements. Caltrans considers these types of intelligent transportation systems deployments to be **high risk.** As such, the specific definition of appropriate intelligent

transportation systems add-on elements for the freeway system serving metropolitan Bakersfield is beyond the purview of this investigation. Nevertheless, the installation of ramp metering equipment is being included in the design plans for build alternatives A, B and C. The addition of ramp meters to existing interchanges beyond the limits of the Centennial Corridor project should be considered as additional add-on investments.

Taken collectively, the add-on elements outlined above do not address the purpose of the Centennial Corridor project. As such, they do not represent a viable project alternative. The add-on elements, individually or collectively, can however, contribute to accommodating local east–west circulation and reducing congestion on the shared portion of State Route 58 and State Route 99. By virtue of this potential contribution, they are worthy of consideration for inclusion within the constrained (funded) list of projects of future regional transportation plans prepared for Kern County.

4.11 Future Projects and Interim Conditions

The description of the transportation network in Section 3.3 identifies a large number of highway and transit elements listed in the 2011 Regional Transportation Plan (Amendment 1) which are "constrained" by funding that is currently available or reasonably projected to be available by the opening (2018) and design year (2038) analysis scenarios. In addition to these constrained projects, two "unconstrained" (unfunded) projects have been considered by this traffic study:

1. The construction of segment 3 of the Centennial Corridor from the west end of the Westside Parkway to Interstate 5
2. The construction of segment 1 freeway-to-freeway connector ramps between State Route 58 (west) and State Route 99 north.

These future projects and interim conditions are discussed below.

Segment 3—Heath Road to Interstate 5

The limits of segment 3 are illustrated on Figure 4-25. The ultimate alignment is proposed as a new 7.4-mile-long freeway that would follow an east–west alignment parallel to the Cross Valley Canal. The route would be about one-third mile south of Stockdale Highway from Heath Road to about 1.2 miles west of State Route 43. The alignment would continue to follow the canal in a southwest direction and connect to Interstate 5 at a new freeway-to-freeway interchange located two miles south of the Stockdale Highway/Interstate 5 interchange. Segment 3 was evaluated in the approved *Route 58 Route Adoption Project, A Tier I Environmental Impact Statement/ Environmental Impact Report* (Caltrans, 2001). A Tier I document shows a general alignment and identifies impacts at a conceptual level and is done when there is not full funding for the improvements. An alignment known as the Cross Valley Canal alignment was identified as the "least environmentally damaging practicable alternative." Segment 3 will remain at the Tier I, route-adoption level of analysis until there is sufficient funding for construction. At that time, a project-level environmental document will be prepared.

In the interim, Stockdale Highway, from the Westside Parkway to Interstate 5, would be temporarily adopted as State Route 58, under build alternatives A, B and C. Under the no-build

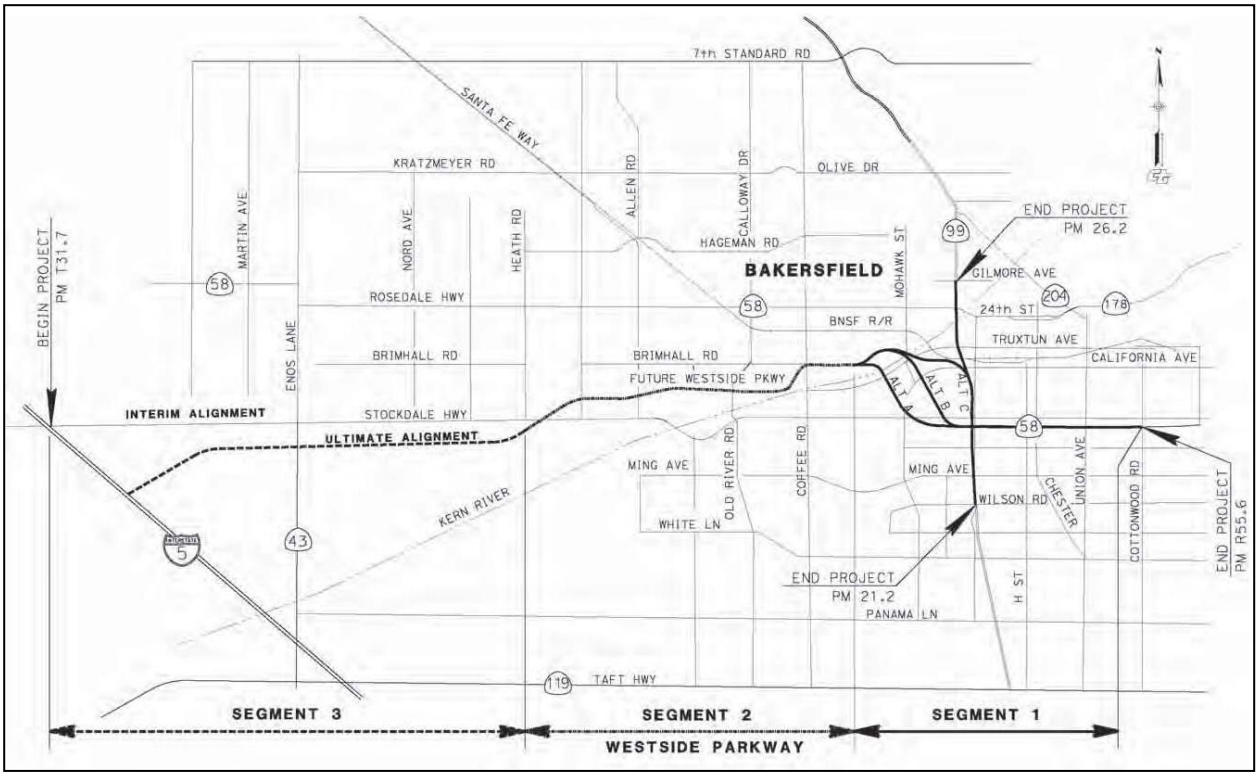


Figure 4-25: Project Location Map

and transportation system management alternatives, State Route 58 would remain on its currently alignment. With build alternatives A, B, and C, improvements would be required at the Stockdale Highway and State Route 43 (Enos Lane) intersection. The proposed improvements would widen the intersection along all approaches and add signals to control the traffic movements. Enos Lane would be widened to add a dedicated left-turn lane and a shared through/right-turn lane in both directions. Stockdale Highway would be widened to provide a dedicated left-turn lane, a dedicated through movement lane, and a shared through/right-turn lane in both directions. Though physically located in Segment 3, these improvements would be built as part of segment 1 to ensure adequate traffic operations at this intersection.

In addition to these project related improvements at Stockdale Highway and Enos Lane, land developer improvements are assumed under no-build and build alternatives A, B, and C as a condition of entitlement. These land development conditions of approval call for the widening of Stockdale Highway to four lanes from Nord Road to Enos Lane and the installation of traffic signals and intersection improvements at Stockdale Highway and Wegis Avenue and at Stockdale Highway and Nord Road. These intersection improvements and lane additions are assumed under all year 2038 no-build and build analysis scenarios.

In addition to local street intersections, the traffic analysis examined traffic operations at the two off-ramp termini intersections of Stockdale Highway and Interstate 5. The analysis results (reported earlier in Tables 4-14, 4-21, 4-28 and 4-35) indicated that by year 2038, a traffic signal would need to be installed at the Interstate 5 southbound off-ramp to Stockdale Highway. This traffic signal installation is needed for all no-build and build project scenarios for year 2038 projected traffic volumes. A signalized intersection is not needed to address opening year 2018 conditions.

The Federal Highway Administration's August 2010 *Interstate System Access Informational Guide* indicates that improvements to traffic control at ramp termini with local roads should be reviewed to ensure that the changes in traffic control (i.e., signalization) do not result in queue spillback into the mainline lanes of the interstate facility and that sufficient storage is provided. Table 4-40 addresses this analysis guideline. Information is presented for the intersections mentioned in this section that may be signalized in the future, as part of this project or by others.

It should be noted that construction of a new freeway segment from Heath Road to Interstate 5 will likely negate the need for a traffic signal installation at the southbound off-ramp to Stockdale Highway. As this traffic signal is not needed for opening year project conditions, and may never be needed under future conditions, this traffic operational analysis recommends that coordination with FHWA's Division Office be deferred until such time that traffic volumes and queue lengths approach or meet traffic signal warrants.

With the installation of traffic signals at the intersections identified above, Stockdale Highway will operate at level of service C or better conditions at all segment 3 study intersections. These LOS analysis results were reported in Tables 4-14, 4-21, 4-28, and 4-35 as noted previously. The traffic volumes and intersection lane configurations assumed for the analysis are depicted on Figures 3-8, 3-13, 3-18, and 3-23 for year 2038 peak hour conditions.

In addition to intersection analysis, highway segment analysis was conducted for the two segments lying east and west of State Route 43 which are unsignalized (uninterrupted flow) for a distance of two or more miles:

1. Interstate 5 to State Route 43
2. State Route 43 to Nord Road

As prescribed in Chapters 12 and 20 of the *2000 Highway Capacity Manual*, the LOS for two-lane, two-way rural highway segments is determined based on the following two measures of effectiveness:

1. Percent time spent following. For two-lane highways, percent time spent following is a measure of the driver's freedom to maneuver and to freely select the speed at which they wish to travel on the highway segment. Percent time spent following also serves as an indicator of the comfort and convenience of travel on the highway segment.
2. Average travel speed. Average travel speed is a measure of the mobility of the highway segment.

The two-lane, two-way highway level of service methodology categorizes highways into two functional categories for analysis:

1. Class I highways are those on which motorists expect to travel at relatively high speeds. Class I highways are primary routes that often serve long trips or serve as connecting links between facilities that serve long trips. Typically, highways that are part of major commute routes would be Class I facilities.
2. Class II highways are those on which motorists do not necessarily expect to travel at high speeds. Class II highways are not major arterials and often serve as scenic or recreational highways.

Table 4-40. Stockdale Highway Intersection Approach Queue Lengths (feet) (Year 2038)

INTERSECTION	ALTERN/ATIVE	TIME	NORTHBOUND		SOUTHBOUND		EASTBOUND		WESTBOUND	
			LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
I-5 southbound ramp	Design	N/A	N/A	N/A	1000	1000	N/A	N/A	N/A	N/A
	No-build	AM	N/A	N/A	120	120	N/A	N/A	N/A	N/A
		PM	N/A	N/A	>1000	>1000	N/A	N/A	N/A	N/A
	A	AM	N/A	N/A	120	120	N/A	N/A	N/A	N/A
		PM	N/A	N/A	178	178	N/A	N/A	N/A	N/A
	B	AM	N/A	N/A	110	110	N/A	N/A	N/A	N/A
		PM	N/A	N/A	200	200	N/A	N/A	N/A	N/A
	C	AM	N/A	N/A	116	116	N/A	N/A	N/A	N/A
		PM	N/A	N/A	170	170	N/A	N/A	N/A	N/A
I-5 northbound ramp	Design	N/A	1000	1000	N/A	N/A	N/A	N/A	N/A	N/A
	No-build	AM	50	50	N/A	N/A	N/A	N/A	N/A	N/A
		PM	68	68	N/A	N/A	N/A	N/A	N/A	N/A
	A	AM	50	50	N/A	N/A	N/A	N/A	N/A	N/A
		PM	56	56	N/A	N/A	N/A	N/A	N/A	N/A
	B	AM	50	50	N/A	N/A	N/A	N/A	N/A	N/A
		PM	54	54	N/A	N/A	N/A	N/A	N/A	N/A
	C	AM	50	50	N/A	N/A	N/A	N/A	N/A	N/A
		PM	54	54	N/A	N/A	N/A	N/A	N/A	N/A
Enos Lane	Design	N/A	N/A	N/A	N/A	N/A	100	N/A	100	100
	No-build	AM	N/A	N/A	N/A	N/A	46	N/A	100	52
		PM	N/A	N/A	N/A	N/A	62	N/A	90	52
	A	AM	N/A	N/A	N/A	N/A	44	N/A	100	46
		PM	N/A	N/A	N/A	N/A	70	N/A	82	42
	B	AM	N/A	N/A	N/A	N/A	44	N/A	98	56
		PM	N/A	N/A	N/A	N/A	64	N/A	88	50
	C	AM	N/A	N/A	N/A	N/A	48	N/A	100	56
		PM	N/A	N/A	N/A	N/A	68	N/A	80	58
Nord Road	Design	N/A	150	N/A	150	N/A	150	100	325	225
	No-build	AM	72	N/A	94	N/A	32	16	144	44
		PM	76	N/A	80	N/A	50	22	239	36
	A	AM	58	N/A	96	N/A	32	16	146	52
		PM	80	N/A	70	N/A	64	24	264	26
	B	AM	66	N/A	88	N/A	32	20	137	48
		PM	70	N/A	80	N/A	74	26	254	40
	C	AM	70	N/A	82	N/A	26	12	145	44
		PM	42	N/A	74	N/A	0	26	263	38
Wegis Avenue	Design	N/A	100	300	200	N/A	200	150	200	150
	No-build	AM	38	100	164	N/A	32	22	144	38
		PM	38	98	128	N/A	52	22	92	44
	A	AM	36	138	158	N/A	38	22	184	34
		PM	54	156	140	N/A	48	18	194	48
	B	AM	44	142	148	N/A	30	22	182	28
		PM	58	160	138	N/A	42	10	196	42
	C	AM	40	106	162	N/A	38	22	118	48
		PM	32	122	128	N/A	38	20	82	54

Notes:

1. Design equals available or proposed storage length.
2. No-build and build alternative queue lengths computed for 95th percentile (the queue length at or below which occurs 95 percent of the time).
3. Southbound I-5 and Stockdale Highway intersection is not signalized under the no-build condition, but is signalized for all of the build alternatives.

For segment 3 of Stockdale Highway, where mobility is critical, the determination of level of service on Class I highways is based on the average travel speed. On Class II highways, where mobility is less critical, the level of service is based on the percent time spent following. The correlation between these measures of effectiveness and highway level of service is shown in Table 4-41.

Table 4-41. Two-Lane Highway Level of Service Definitions

LEVEL OF SERVICE	DESCRIPTION	PERCENT TIME SPENT FOLLOWING (%)	AVERAGE TRAVEL SPEED (mph)
A	A condition of free flow, with low volumes and high speeds. Traffic density is low, with speeds controlled by driver desire, speed limits, and physical road conditions.	≤35%	>55
B	A condition of stable flow, with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed and lane of operation.	>35 to 50%	>50 to 55
C	A condition of stable flow, but speed and maneuverability are more adversely affected by higher traffic volumes. Most drivers are restricted in their freedom to select their own speed, change lanes, or pass.	>50 to 65%	>45 to 50
D	Conditions approach unstable flow, with tolerable operating speeds being maintained though considerably affected by changes in operating conditions. Fluctuation in volume and temporary restrictions may cause substantial drops in operating speeds. Drivers have little freedom to maneuver, and comfort and convenience are low, but conditions can be tolerated for short periods of time.	>65 to 80%	>40 to 45
E	Represents operation at speeds lower than in Level D, with volumes at or near the capacity of the highway.	>80%	≤40
F	Represents forced-flow operations at low speeds, where volumes are below capacity. Speeds are reduced substantially and stoppages may occur for short or long periods of time because of the downstream congestion. In the extreme, both speed and volume can drop to zero.		

The results of the highway segment analysis are presented in Table 4-42. They indicate that Stockdale Highway operates, and will continue to operate, below Caltrans (District 6) level of service threshold of the transition between LOS C and LOS D for rural roads (Stockdale Highway west of Enos Lane) or the transition between LOS D and LOS E for urban roads (Stockdale Highway east of Enos Lane).

State Route 58/State Route 99 Interim Connections

The build alternatives A, B, and C do not provide direct connector ramps to or from the north on State Route 99 as part of the Centennial Corridor project. The preliminary plans presented earlier in this chapter allow for these ramps to be constructed a future date. Interim access will be provided by the State Route 99 interchange with existing State Route 58 (west), connecting to the Westside Parkway via Mohawk Street.

As part of the build alternatives, the project will improve the southbound State Route 99 off-ramp to Rosedale Highway. To provide an acceptable level of service, the number of turn lanes will need to be improved from one left-turn plus one shared left- and right-turn lane to two left-turn lanes and two free-right turn lanes. The additional turn lanes will each be 12 feet wide.

In addition to this ramp termini intersection improvement, Rosedale Highway will be widened from two lanes per direction to three lanes per direction to the west of Gibson Street to Mohawk Street and beyond. This widening of Rosedale Highway is a separate project which will be constructed with or without the Centennial Corridor project.

Figure 4-26 illustrates the interim route connection between the Westside Parkway and State Route 99, to and from the north. The route covers 2.1 miles from the State Route 99/Rosedale Highway undercrossing to the Westside Parkway/Mohawk Street overcrossing.

Table 4-42. Highway Segment Analysis Results—Stockdale Highway*

SEGMENT	ALTERNATIVE	PEAK YOUR	PERCENT TIME SPENT FOLLOWING (%)	AVERAGE TRAVEL SPEED (mph)	VOLUME/ CAPACITY	LEVEL OF SERVICE
I-5 to State Route 43	Existing	AM	32.5%	55.2	0.14	A
		PM	42.4%	54.4	0.22	B
	No-build	AM	61.9%	50.8	0.34	B
		PM	73.6%	48.6	0.49	C
	A	AM	64.5%	50.3	0.36	B
		PM	75.7%	48.1	0.51	C
	B	AM	64.2%	50.4	0.36	B
		PM	74.4%	48.4	0.50	C
	C	AM	64.1%	50.4	0.36	B
		PM	75.2%	48.2	0.51	C
State Route 43 to Nord Road	Existing	AM	46.4%	53.0	0.23	B
		PM	55.6%	51.7	0.34	B
	No-build	AM	79.5%	45.8	0.46	C
		PM	86.6%	43.4	0.61	D
	A	AM	80.6%	45.4	0.47	C
		PM	87.5%	43.1	0.64	D
	B	AM	80.4%	45.5	0.47	C
		PM	87.3%	43.3	0.63	D
	C	AM	80.4%	45.5	0.47	C
		PM	87.1%	43.1	0.63	D

*Assumes two-lane, two-way highway

A southbound State Route 99 to westbound Westside Parkway motorist following the interim connecting route would pass through four signalized intersections; while an eastbound to northbound motorist would pass through seven signalized intersections.

The year 2038 level of service computed for these intersections is LOS D or better except at the intersection of Mohawk Street and Rosedale Highway. These expected operational conditions are summarized on Table 4-43.

Insofar as the build alternatives, providing direct connector ramps to/from the north on State Route 99 would lengthen the route traveled, but this journey would occur at a higher rate of speed. Table 4-44 summarizes the relative change in distance and travel time.

Based on this assessment of motorist delay and increased vehicle miles traveled, direct connector ramps from Westside Parkway to/from State Route 99 (north) will be deferred until sometime following year 2038, or when demand and traffic operating conditions along the interim route warrant.

Figure 4-26: Interim Connection between Westside Parkway and State Route 99

Table 4-43. Ramp Termini and Intersection Level of Service (2038)

EB/ NB	SB/ WB	INTERSECTION	NO-BUILD	A	B	C
•		Mohawk Street/Westside Parkway eastbound ramps	C/B	B/B	B/B	B/B
•	•	Mohawk Street/Westside Parkway westbound ramps	NA	NA	B/A	B/A
•	•	Mohawk Street/Rosedale Highway	F/F	E/F	E/F	E/F
•	•	Rosedale Highway/Landco Drive	C/C	B/B	B/B	B/B
•	•	Rosedale Highway/Gibson Street	C/C	B/D	B/D	B/D
•	•	Rosedale Highway/Costco Entrance	A/B	A/C	A/C	A/C
•	•	Rosedale Highway/Camino Del Rio Court	C/D	C/D	C/D	C/D
•	•	Rosedale Highway/State Route 99 southbound ramps	C/D	C/C	C/C	C/C
•		Rosedale Highway/State Route 99 northbound off-ramp	C/C	C/D	C/D	C/D
•		Buck Owens Boulevard/State Route 99 northbound ramps	D/D	D/D	D/D	D/D

Table 4-44. Comparative Distance and Travel Time from Westside Parkway to/from State Route 99 North

		DELTA	
	LENGTH (miles)*	MILES	TIME (min)**
Interim route	2.6	0	0
Alternative A (with future ramps)	4.5	+1.9	0 to –5
Alternative B (with future ramps)	4.9	+2.3	0 to –5
Alternative C (with future ramps)	2.7	+0.1	–2 to –7

*State Route 99/Rosedale Highway undercrossing to 0.55 miles west of Westside Parkway/Mohawk Street overcrossing.
**Change in travel time during off-peak and peak hours.

Independent Utility and Logical Termini

Federal Highway Administration regulations (23 Code of Federal Regulations 771.111[f]) require that (1) projects have logical limits and be long enough that the environmental analysis has a broad scope; (2) projects are usable and a reasonable use of funds, even if no additional transportation improvements in the area are made (this is known as independent utility); and (3) approval of a project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. As discussed below, the Centennial Corridor project build alternatives A, B, and C comply with these requirements.

Both the ultimate project (construction of all three roadway segments) and phased project (construction by segment) have logical limits. The ultimate project would provide a freeway facility that connects State Route 58 with State Route 99 and Interstate 5 at freeway-to-freeway interchanges. The segment 1 project would close a gap by connecting State Route 58 (east) with the new Westside Parkway (segment 2).The connecting ramps from State Route 58 (west) to and from State Route 99 (south) would be constructed as part of the Centennial Corridor project. Connecting ramps from State Route 58 (west) to and from State Route 99 (north) would be

constructed at a later date. Insofar are the connection to Interstate 5, segments 1 and 2 and Stockdale Highway would serve the developed portion of metropolitan Bakersfield by moving traffic, goods, and freight through the area, and would provide access to Interstate 5 for improved regional access. The ultimate segment 3 freeway facility would connect Interstate 5 with the west end of the Westside Parkway at the point in time when the travel demand exceeds the capacity of Stockdale Highway (a two-lane roadway). Identifying segment 3 as a future alignment for State Route 58 will allow preservation of an adequate transportation corridor in the future. Combined with the existing State Route 58 (east), the project would provide a high capacity, high level of service, east–west facility in the San Joaquin Valley.

Another important consideration is whether the project is of sufficient length to address traffic and environmental related matters on a broad scope. At 17.4 to 18.5 miles long (depending on the alternative), the study corridor extends well beyond the proposed construction limits. This ensures that the traffic issues that would be addressed in detail if construction of segment 3 and the State Route 58 (west)/State Route 99 (north) direct connector ramps, as proposed in the future, are considered at a Tier I planning level now.

The project's phased implementation would provide an effective and efficient roadway even if no additional transportation improvements are made. As discussed earlier in this chapter, the connection of segment 1 and segment 2 would provide an adequate traffic level of service through 2038 (the project's design year). Finally, there are no other projects that would be needed or are dependent on construction of the Centennial Corridor project.

CHAPTER 5. COST AND BENEFITS OF THE BUILD ALTERNATIVES

The build alternatives would provide additional capacity along State Route 58 compared with the no-build alternative. Descriptions of the build alternatives are provided in Chapter 4. This chapter identifies the costs and estimated benefits associated with implementing the build alternatives. The no-build alternative considered by this analysis is the 2035 Regional Improvements Only scenario.

5.1 Cost Estimates

Cost estimates were developed by HNTB for the *Project Study Report* and by Parsons for the *Project Report*. The preliminary cost estimate for the build alternatives ranges from $252 million to $691 million, excluding project engineering and administration. These costs reflect year of expenditure dollars.

Table 5-1 provides a summary of the capital cost for build alternatives A, B, C, and M.

Table 5-1. Capital Cost for Build Alternatives *($ 2016 mid-point of expenditure)*

ELEMENT	ALTERNATIVE M COST	ALTERNATIVE A COST	ALTERNATIVE B COST	ALTERNATIVE C COST
Roadway	$ 99,000,000	$296,505,000	$255,988,000	$275,849,000
Structures	53,000,000	140,564,000	133,958,000	176,242,000
Right-of-Way	100,000,000	253,894,000	180,000,000	213,788,000
Total Project Capital Cost *(rounded)*	**$252,000,000**	**$690,963,000**	**$569,946,000**	**$665,879,000**

5.2 Benefits Estimates

Chapter 3 identified that with the build alternatives, traffic volumes could be expected to shift from parallel arterial streets to the upgraded State Route 58, thereby relieving congestion on a system-wide basis. Because the upgrade of State Route 58 west has system-wide impacts, its benefits were computed using STEAM 2.0 (Surface Transportation Efficiency Analysis Module), a system-wide analysis tool.

As discussed in Section 3.5, the Federal Highway Administration introduced the first version of STEAM in 1997. STEAM was the first Federal Highway Administration impact analysis product to use input directly from the four-step travel demand modeling process for detailed, system wide analysis of alternative transportation investments on regional and corridor levels. The Federal Highway Administration released STEAM 2.0 in 2000 to expand the scope of the model to address environmental justice measures.

Inputs obtained for each alternative from the regional four-step models include person-trip matrices by mode and purpose and vehicle-trip matrices for personal vehicles and internal truck travel; trip time and cost matrices skimmed from the highway and transit networks; and loaded

highway network link volumes. The personal travel modes include auto, carpool, bus, walk-accessed light rail and drive-accessed light rail for trip purposes home based work, home based college, home based other, and non-home based, as well as for external-internal and external-external (through) auto trips. To simplify the STEAM analysis, all trips are combined into one aggregate person-trip matrix for each of the five modes, and one truck trip matrix. Vehicle occupancies and estimates of the proportions of zone-to-zone trips are obtained from manipulation of the available trip matrices.

Selected results categories produced through STEAM analysis include the following:

- Weekday vehicle-miles (millions)
- Average highway speed (mph)
- Annual fuel use (million gal)
- Annual user benefits
- Total agency revenues
- Emission benefits
- Other external benefits
- Total annual benefits
- Annualized capital costs
- Annual operating costs
- Total annualized costs
- Net annual worth
- Simple benefit-cost ratio

STEAM incorporates a sophisticated network speed and delay estimation technique based on off-line simulations which incorporate the dynamic effects of queuing and peak-spreading, day-to-day variations in traffic levels, as well as the impacts of incident delays, based on their expected occurrence. Accident costs are based on zone-to-zone vehicle-miles and link types, and divided into "perceived" costs, included in user benefit estimation, and “non-perceived” costs, which are included as external costs. Fuel cost savings are estimated using zone-to-zone average speeds and fuel consumption rates for autos and trucks.

Benefits are estimated based on weekday travel estimates, annualized, and expanded through the lifetime of the investment. User benefits for new users attracted by time or cost savings to an alternative, relative to the base case, are evaluated at 50% the rate applied to former users, as suggested by consumer surplus theory. Negative benefits of patronage lost due to poorer travel conditions are estimated similarly. The analysis year is chosen to be representative of benefits over the entire analysis time period. Alternatively, the program may be applied for several different analysis years, from which it determines the total stream of benefits that are then annualized. Investment costs are also annualized and combined with representative annual public agency operating costs. The program includes a large library of default unit costs and parameter values that can be modified as desired.

The STEAM 2.0 speed models account for delays due to incidents using data on the frequency, severity, and duration of incidents. Incidents account for a large share of total travel delays due to congestion, especially on freeways. The models also account for peak spreading that occurs

when facilities become more congested. The traffic temporal distributions used in developing the models were based on data collected from 579 urban automatic traffic recorders across the nation. Separate temporal distributions were developed for freeways and arterials with low, moderate, and high ratios of average daily traffic to capacity.

The models further account for day-to-day variations in traffic. The relationship between delays due to congestion and traffic volumes are highly non-linear in nature, especially when the ratio of demand volume to capacity is close to 1.0. Lastly, the STEAM 2.0 speed models account for the decrease in highway capacity that occurs after demand volumes exceed capacity.

Travel Time Savings

Vehicle hours of travel were computed for each link in the highway system. Highway link travel speeds and volumes were output directly from the Kern COG 2006 Regional Travel Demand Model TP+ software to STEAM 2.0 using a custom design interface. This program interface is now available for use with any Kern COG Model/STEAM 2.0 application.

Consistent with U.S. Department of Transportation guidance for the valuation of travel time in economic analysis, Parsons assumed local personal travel to be valued at 50 percent of the local median wage rate. Business travel by truck and bus drivers was valued at 100 percent of the mean wage for these occupations, plus fringe benefits. Kern County's mean wage for all occupations was reported by the State of California Employment Development Department to be $21.66 per hour for the first quarter of 2011; hence, a value of time equal to $10.83 per hour was used for local personal travel. The state reported that heavy truck drivers residing in Kern County earned $19.17 per hour on average in the first quarter of 2011. A fringe benefit rate of 50 percent of the mean wage was assumed by Parsons for bus and truck drivers, based on an equal mix of employees covered by teamsters (55.5 percent) and other (44.5 percent) labor agreements. The corresponding value of time for these business travelers was thus estimated to be $28.76 per hour.[1]

Computation of benefits also took vehicle occupancy into account for local personal travel. Based on the Kern COG model, the average daily vehicle occupancy for all trip purposes in Kern County is estimated to be 1.44 persons per vehicle. While this average occupancy may be lower or higher during peak periods, the average rate was assumed for the benefits calculation for lack of better data.

Crash Benefits

The frequency of accident occurrence is typically lower on freeways and expressways when compared to other types of regional roads and city streets. To compute benefits associated with the build alternative versus the no-build alternative, the number of vehicle miles traveled over the highway system was computed for each alternative, using the Kern COG Model and STEAM 2.0.

[1] Benefits for heavy and tractor-trailer truck trips are under-reported, as the Kern COG model commingles auto and truck trips in the internal-external and external-external trip matrices. To compensate, a higher value of time ($35.37) was utilized in the calculation of in-vehicle travel time cost. Auto value of time is assumed for internal-external and external-external trips.

Rates of crash occurrences resulting in fatalities, personal injuries, and property damage only were obtained from the California Highway Patrol, Caltrans for Year 2008. Statewide rates listed in Table 5-2 are for state owned facilities, and do not include the majority of urban arterial, local and collector streets.

Table 5-2. California Crash Rates on State Highways *(Year 2008)**

FUNCTIONAL CLASSIFICATION	PDO CRASH RATE	INJURY CRASH RATE	FATAL CRASH RATE
All	85.64	52.34	0.96

Source: California Highway Patrol, California Department of Transportation
*Crash rates per 100 million vehicle miles.

To develop a more comprehensive set of crash occurrence rates, statewide data available from the Nevada Department of Transportation was obtained and benchmarked to match California crash rates for similar type facilities (interstate rural, interstate urban, urban principal arterial, and principal arterial urban).

The resulting crash rates used for the STEAM 2.0 calculation of benefits are listed in Table 5-3.

Table 5-3. California Crash Rates by Functional Roadway Classification*

FUNCTIONAL CLASSIFICATION	PDO CRASH RATE	INJURY CRASH RATE	FATAL CRASH RATE
Interstate urban	105.49	52.93	0.43
Other urban freeways and expressways	83.62	46.39	0.74
Urban principal arterials	148.57	98.57	0.87
Urban minor arterials	123.65	86.61	1.33
Urban collector streets	84.91	56.02	0.65
Urban local streets	97.32	42.98	0.56

Source: Parsons, based on Caltrans 2008 and Nevada Department of Transportation 2003 data.
*Crash rates per 100 million vehicle miles.

The values of loss associated with accidents were obtained from the National Safety Council (2008) and the California Life-Cycle Benefit/Cost Analysis Model (Cal-B/C). Periodically, the National Safety Council estimates the average cost of fatal and non-fatal injuries due to motor vehicle crashes. These estimates are made using a comprehensive or willingness to pay method.

After adjusting these estimates to year 2011 using the gross domestic product deflator, values of $4,919,000 per fatality, $69,080 per injury, and $10,050 per reported property damage only (PDO) accident were derived.

Taking inflation into account, these estimates of accident costs compare favorably with values used in five computerized benefit-cost models, as reported in Table 5-4.

Table 5-4. Accident Cost Estimates

ACCIDENT TYPE	CSI* ($ 1993)	StratBENCOST** ($ 1996)	STEAM† ($ 1997)	RAILDEC‡ ($ 1997)	Cal-B/C ($ 2007)
Fatality	$3,325,095	$3,521,359	$2,726,350	$3,613,137	$4,600,000
Injury	$ 7,890	$ 83,848	$ 59,718	$ 86,033	$ 64,600
PDO	$ 5,651	$ 5,806	$ 3,322	$ 5,957	$ 9,400

* Cambridge Systematics, Inc. (CSI), Approaches for Developing Nationwide Estimates of Congestion Delay, Accidents, Emissions, and Noise Impacts: Interim Report, 1995.
** NCHRP Project 2-18(3), Development of an Innovative Highway User Cost Estimation Procedure. Midrange of costs reported.
† FHWA, Surface Transportation Efficiency Analysis Model, 1997. Total of internal and external costs.
‡ Companion to StratBENCOST which estimates the reduction in accident costs as the change in highway accidents between the base and alternative (rail) case. StratBENCOST values inflated by 2.6 percent for all accident types.
¶ California Life-Cycle Benefit/Cost Analysis Model, Technical Supplement to User's Guide, February 2009.

STEAM 2.0 calculates separate internal and external accident costs. Internal accident costs are defined as costs inflicted upon and perceived by transportation facility users. External costs are defined as costs inflicted on users, but not perceived by users. Table 5-5 identifies the breakdown of these accident cost assumptions.

Table 5-5. Accident Cost Assumptions for STEAM ($ 2011)

ACCIDENT TYPE	INTERNAL COST	EXTERNAL COST	TOTAL COST
Fatality	$4,181,150	$737,850	$4,919,000
Injury	$ 58,720	$ 10,360	$ 69,080
PDO	$ 8,540	$ 1,510	$ 10,050

Source: Parsons

Motor Vehicle Emissions and Costs

STEAM 2.0 calculates the motor vehicle emissions listed in Table 5-6. Rates of motor vehicle emissions were obtained from the Cal-B/C for carbon monoxide (CO), nitrogen oxides (NO_X), and fine particulates (PM_{10}) assuming a vehicle model year of 2027. The source of these emission rates is the California Air Resources Board EMFAC 2007 V2.3 model. STEAM 2.0's default values for hydrocarbon emissions were also used in the analysis. These rates assume a Year 2010 vehicle model year and are based on the EPA's Mobil 5a model results.

Monetary values for CO, PM_{10} and NO_X emissions were obtained from research by Donald McCubbin and Mark Delucchi reported in "The Social Cost of Health Effects of Motor-Vehicle Use in the United States," as updated for use in the Cal-B/C, and adjusting these estimates to 2011 using the gross domestic product deflator. Values reported for the Los Angeles/South Coast air basin (see Table 5-7) were used for the evaluation of benefits.

The health cost of hydrocarbon (HC) emissions was taken from a second source that also valued NO_X.[2] These values were indexed to the Cal-B/C values to estimate the per ton cost of HC.

[2] Gunnar Linberg, Benefit-Cost Analysis in a Multimodal Planning Process, "Exploring the Application of Benefit-Cost Methodologies to Transportation Decision Making," May 1995, Tampa, Florida.

Table 5-6. Vehicle Pollution Emissions

EMISSION	DESCRIPTION	SOURCE	HARMFUL EFFECTS	SCALE
Carbon monoxide, CO	A toxic gas that undermines blood's ability to carry oxygen	Engine	Human health, climate change	Very local
Nitrogen oxides, NO_X	Various compounds; some are toxic, all contribute to ozone.	Engine	Human health, ozone precursor	Regional
Fine particulates, PM_{10}	Inhalable particles consisting of bits of fuel and carbon	Diesel engines and other sources	Human health, aesthetics	Local and regional
Hydrocarbons, HC	Unburned fuel; forms ozone	Fuel production and engines	Human health, ozone precursor	Regional

Table 5-7. Health Cost of Motor Vehicle Emissions *(2010 $/ton)*

EMISSION		VALUE
Carbon monoxide	CO	$ 143
Fine particulates	PM_{10}	$486,207
Nitrogen oxides	NO_X	$ 59,325
Hydrocarbons	HC	$ 8,510

Source: Parsons, based on California Life-Cycle Benefit/Cost Analysis Model, Technical Supplement to User's Guide, 2009

While STEAM 2.0 calculates motor vehicle emissions as described above, other technical studies perform more precise calculations. As a result, the STEAM 2.0 estimates of motor vehicle emissions are not reported in this traffic report.

Global Warming

Global warming refers to the warming of Earth's atmosphere due to the greenhouse effect. Incoming solar energy, including certain wavelengths of infrared radiation, passes through Earth's atmosphere and reaches the surface of Earth, thus warming it. Some of the infrared radiation emitted from Earth's surface returns back to the atmosphere where it is absorbed by certain atmospheric gases called greenhouse gases. The absorption of infrared by these green gases warms the atmosphere of Earth in a way similar to the way a greenhouse captures solar energy and warms the air inside it.

The major greenhouse gases include carbon dioxide, water vapor (H_2O), and methane (CH_4), as well as nitrous oxide (N_2O), fluorocarbons, and ozone. Carbon dioxide (CO_2) is the greenhouse gas that is of greatest concern due to its large atmospheric concentration with respect to other greenhouse gases and the large amounts emitted.

STEAM calculates changes in greenhouse gas emissions using carbon dioxide (CO_2) emission rates per gallon of motor fuel consumed. These estimates are considered to be less precise than those computed by other technical studies reported elsewhere. As a result, the STEAM 2.0 estimates of greenhouse gas emissions are not reported in this traffic report.

Vehicle Operating Costs

Vehicle operating costs were calculated for the no-build alternative and the build alternatives using estimates of vehicle miles traveled produced by the Kern COG Regional Transportation Model and STEAM 2.0. STEAM 2.0 calculates fuel consumption per gallon based on average link speeds and vehicle miles traveled per link.

Default values for the fuel consumption rates used in STEAM come from the Institute of Transportation Engineers "Transportation Planning Handbook," 1992. However, these rates were derived from a study published by Caltrans in 1983. Non-fuel volatile organic compounds are taken from a U.S. Department of Transportation publication, "Characteristics of Urban Transportation Supply," 1992, and are converted to 1997 dollars. These costs originated in the American Automobile Association publication, "Your Driving Costs."

For the evaluation of benefits, fuel consumption was based on estimates of average fuel consumption for the Year 2007 obtained from the California Air Resources Board's Motor Vehicle Emission Inventory models. These rates, used in the Cal-B/C, are reported in Table 5-8.

Table 5-8. Fuel Consumption Rates *(gallons/mile)*

SPEED	AUTO	TRUCK
5	0.1519	0.2967
10	0.1135	0.2649
15	0.0877	0.2148
20	0.0704	0.1779
25	0.0588	0.1588
30	0.0509	0.1479
35	0.0458	0.1399
40	0.0426	0.1341
45	0.0412	0.1303
50	0.0411	0.1283
55	0.0426	0.1282
60	0.0457	0.1301
65	0.0507	0.1343
70	0.0542	0.1415

Source: Cal-B/C, California Air Resources Board, EMFAC 2007 V2.3, 2007 and 2027 average

The price-per-gallon of regular grade gasoline was assumed to be $3.689 per gallon based on prices prevailing in the Bakersfield metropolitan area in January 2012. STEAM 2.0 separates fuel costs into tax and non-tax components, using the tax portion to compute "revenue transfers." The tax rate per gallon of gasoline was assumed to be 18.4 cents Federal, 35.7 cents State excise, 2.0 cents Underground Storage Tank fee, and 21.14 cents State sales tax. These taxes total 77.24 cents per gallon. Truck fuel costs were assumed to be $3.50 per gallon for the non-tax portion and $0.6478 for the tax component.

Non-fuel costs for vehicle maintenance and tire expense were assumed to be $0.0567 per mile for automobiles based on American Automobile Association's "Your Driving Costs," 2011 edition, and $0.121 per mile for trucks based on Center for Transportation Analysis, Department of Energy statistics for calendar year 2004. The STEAM 2.0 model does not include mileage-based depreciation.

5.3 Summary of Benefits

The build alternatives will produce net savings in travel time and vehicle operating expense, and increased emissions and crashes. These findings are summarized in Table 5-9 and are discussed below.

Table 5-9. Summary of Centennial Corridor Project Benefits *(Year 2038)*

BENEFIT TYPE	BUILD ALTERNATIVE M	BUILD ALTERNATIVE A	BUILD ALTERNATIVE B	BUILD ALTERNATIVE C
User Benefits				
In-vehicle travel time	$ 16,259,900	$ 64,133,300	$ 60,348,900	$ 64,691,200
Fuel costs	2,576,200	6,395,300	5,149,700	5,898,300
Non-fuel operating costs	(213,000)	(2,248,500)	(3,002,300)	(3,159,400)
Internal accident costs	3,857,300	7,920,100	5,645,600	6,087,000
Revenue Transfers	$ (680,200)	(1,699,500)	$ (1,370,700)	$ (1,568,400)
Reduction in External Costs				
Emissions Global warming Noise	See detailed technical studies			
Accident	$ 474,500	$ 973,500	$ 694,500	$ 748,800
Other mileage based	0	0	0	0
Total Benefits $/year in 2038	**$ 22,274,700**	**$ 75,264,200**	**$ 68,836,400**	**$ 72,697,500**
Total Benefits $/year in 2018	**32,030,800**	**7,759,000**	**14,266,100**	**30,803,200**
Life Cycle Benefits 2018–2040 Total	**$605,287,000**	**$1,030,458,000**	**$1,014,868,000**	**$1,230,735,000**

Source: Parsons, based on STEAM 2.0

In Vehicle Travel Time

Travel time benefits are significant, as motorists are able to shift routes to higher speed facilities and additionally benefit from increased network capacity. This category of user benefit constitutes the majority of total benefits computed for the build alternatives.

Fuel Costs

Fuel costs decrease with the build alternatives as a result of automobiles traveling at higher speeds. As indicated in Table 5-7, automobiles consume fuel at the lowest rates while traveling between 35 mph and 60 mph.

Non-Fuel Operating Costs

Non-fuel operating costs are based on vehicle miles traveled. Vehicle miles traveled increases for the build alternatives as motorists seek higher speed routes; hence, non-fuel operating costs increase.

Accidents

As indicated in Table 5-2, crash rates for property damage and injuries are highest for urban principal arterials, and lowest for urban freeways and expressways. Table 3-3, reported earlier, indicates the proportion of vehicle miles traveled by functional roadway classification. The build alternatives shift more vehicle miles traveled to State Route 58 west, resulting in a decrease in crashes of all types.

Revenue Transfers

Revenue transfers are the tax portion of fuel costs, which are collected or not collected as a result of increased or decreased fuel consumption. Fuel cost savings produce a net loss of revenue transfers. Increased fuel use produces additional tax revenue.

Emissions

Vehicle pollution costs computed by STEAM 2.0 are not reported, but are relatively minor compared with other traffic related benefits.

Global Warming

Global warming benefits (or disbenefits) computed by STEAM 2.0 are not reported, but are positive (provide benefits) for all build alternatives.

The appendix of this document contains detailed STEAM 2.0 model output by mode and market sector.

Total Benefits

Table 5-9 indicates that benefits accrued by the transportation systems management alternative (alternative M) in year 2038 will total $22.3 million, while the benefits accrued during the first full year of operation, year 2018, will total a higher amount of $32.0 million. This anomaly results from the proposed super-arterial accommodating opening year traffic demands at higher speeds during its early years of operation, while traffic slows in later years as the facility becomes more congested. Alternatives A and B, on the other hand, are lightly used upon opening day, with traffic volumes and benefits increasing as time goes on. The benefits attributable to the full build alternatives A, B and C are thus increasing over time while the transportation systems management alternative benefits are declining.

5.4 Life Cycle Benefits and Costs

Benefits of the build alternatives will accrue over time as traffic volumes increase from the opening day (second quarter of 2018) to those forecast for 2038. A measurement of life-cycle benefits, assuming a straight line projection of traffic growth, is reported in Tables 5-10 through 5-13, with each table reporting life-cycle benefits and costs for an individual build alternative.

The benefits reported for 2018 represent three-quarters of one year; hence, the values are 75 percent of the full year estimation for 2018.

Table 5-10. Alternative M Life Cycle Benefits and Costs *($1,000)*

YEAR	TOTAL BENEFITS	TOTAL COSTS	PRESENT VALUE DISCOUNT	PRESENT VALUE BENEFITS	PRESENT VALUE COSTS
2011			1.0000		
2012			0.9804		
2013			0.9612		
2014		$ 50,000	0.9423		$ 47,115
2015		50,000	0.9238		46,190
2016		67,500	0.9057		61,135
2017		67,500	0.8880		59,940
2018	$ 24,023*	17,000	0.8706	$ 20,914	14,800
2019	31,543		0.8535	26,922	
2020	31,055		0.8368	25,987	
2021	30,567		0.8203	25,074	
2022	30,080		0.8043	24,193	
2023	29,592		0.7885	23,333	
2024	29,104		0.7730	22,497	
2025	28,616		0.7579	21,688	
2026	28,128		0.7430	20,899	
2027	27,641		0.7284	20,134	
2028	27,153		0.7142	19,393	
2029	26,665		0.7002	18,671	
2030	26,177		0.6864	17,968	
2031	25,689		0.6730	17,289	
2032	25,202		0.6598	16,628	
2033	24,714		0.6468	15,985	
2034	24,226		0.6342	15,364	
2035	23,738		0.6217	14,758	
2036	23,250		0.6095	14,171	
2037	22,763		0.5976	13,603	
2038	22,275		0.5859	13,051	
2039	21,787		0.5744	12,514	
2040	21,299		0.5631	11,993	
Totals	**$605,287**	**$252,000**		**$433,029**	**$229,180**

*Reflects 9 months of 2018

Table 5-11. Alternative A Life Cycle Benefits and Costs *($1,000)*

YEAR	TOTAL BENEFITS	TOTAL COSTS	PRESENT VALUE DISCOUNT	PRESENT VALUE BENEFITS	PRESENT VALUE COSTS
2011			1.0000		
2012			0.9804		
2013			0.9612		
2014		$ 126,947	0.9423		$119,622
2015		126,947	0.9238		117,274
2016		194,253	0.9057		175,935
2017		194,253	0.8880		172,497
2018	$ 5,819*	48,563	0.8706	$ 5,066	42,279
2019	11,134		0.8535	9,503	
2020	14,510		0.8368	12,142	
2021	17,885		0.8203	14,671	
2022	21,260		0.8043	17,099	
2023	24,635		0.7885	19,425	
2024	28,011		0.7730	21,653	
2025	31,386		0.7579	23,787	
2026	34,761		0.7430	25,827	
2027	38,136		0.7284	27,778	
2028	41,512		0.7142	29,648	
2029	44,887		0.7002	31,430	
2030	48,262		0.6864	33,127	
2031	51,637		0.6730	34,752	
2032	55,013		0.6598	36,298	
2033	58,388		0.6468	37,765	
2034	61,763		0.6342	39,170	
2035	65,138		0.6217	40,496	
2036	68,514		0.6095	41,759	
2037	71,889		0.5976	42,961	
2038	75,264		0.5859	44,097	
2039	78,639		0.5744	45,170	
2040	82,015		0.5631	46,183	
Totals	**$1,030,458**	**$690,963**		**$679,807**	**$627,607**

*Reflects 9 months of 2018

Table 5-12. Alternative B Life Cycle Benefits and Costs *($1,000)*

YEAR	TOTAL BENEFITS	TOTAL COSTS	PRESENT VALUE DISCOUNT	PRESENT VALUE BENEFITS	PRESENT VALUE COSTS
2011			1.0000		
2012			0.9804		
2013			0.9612		
2014		$ 90,000	0.9423		$ 84,807
2015		90,000	0.9238		83,142
2016		173,309	0.9057		156,966
2017		173,310	0.8880		153,899
2018	$ 10,700*	43,327	0.8706	$ 9,315	37,720
2019	16,995		0.8535	14,505	
2020	19,723		0.8368	16,504	
2021	22,452		0.8203	18,417	
2022	25,180		0.8043	20,252	
2023	27,909		0.7885	22,006	
2024	30,637		0.7730	23,682	
2025	33,366		0.7579	25,288	
2026	36,094		0.7430	26,818	
2027	38,823		0.7284	28,279	
2028	41,551		0.7142	29,676	
2029	44,280		0.7002	31,005	
2030	47,008		0.6864	32,266	
2031	49,737		0.6730	33,473	
2032	52,465		0.6598	34,616	
2033	55,194		0.6468	35,699	
2034	57,922		0.6342	36,734	
2035	60,651		0.6217	37,707	
2036	63,379		0.6095	38,630	
2037	66,108		0.5976	39,506	
2038	68,836		0.5859	40,331	
2039	71,565		0.5744	41,107	
2040	74,293		0.5631	41,834	
Totals	**$1,014,868**	**$569,946**		**$677,650**	**$516,534**

*Reflects 9 months of 2018

Table 5-13. Alternative C Life Cycle Benefits and Costs *($1,000)*

YEAR	TOTAL BENEFITS	TOTAL COSTS	PRESENT VALUE DISCOUNT	PRESENT VALUE BENEFITS	PRESENT VALUE COSTS
2011			1.0000		
2012			0.9804		
2013			0.9612		
2014		$ 106,894	0.9423		$100,726
2015		106,894	0.9238		98,749
2016		200,929	0.9057		181,981
2017		200,930	0.8880		178,426
2018	$ 23,102*	50,232	0.8706	$ 20,113	43,732
2019	32,898		0.8535	28,078	
2020	34,993		0.8368	29,286	
2021	37,087		0.8203	30,422	
2022	39,182		0.8043	31,514	
2023	41,277		0.7885	32,547	
2024	43,371		0.7730	33,526	
2025	45,466		0.7579	34,459	
2026	47,561		0.7430	35,338	
2027	49,656		0.7284	36,169	
2028	51,750		0.7142	36,960	
2029	53,845		0.7002	37,702	
2030	55,940		0.6864	38,397	
2031	58,034		0.6730	39,057	
2032	60,129		0.6598	39,673	
2033	62,224		0.6468	40,246	
2034	64,319		0.6342	40,791	
2035	66,413		0.6217	41,289	
2036	68,508		0.6095	41,756	
2037	70,603		0.5976	42,192	
2038	72,698		0.5859	42,594	
2039	74,792		0.5744	42,961	
2040	76,887		0.5631	43,295	
Totals	**$1,230,735**	**$665,879**		**$838,365**	**$603,614**

*Reflects 9 months of 2018

Tables 5-10 through 5-13 reflect a 30-year analysis period covering both expenditures (costs) and benefits. Both benefits and costs are discounted to reflect the time value of resources (or money). This time value of money represents the opportunity cost that could be earned by using the dollars for some other investment.

Each year, the U.S. Office of Management and Budget updates discount rates in accord with Office of Management and Budget Circular No. A-94, "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs." States typically use the "Real interest rates on Treasury Notes and Bonds" for discounting highway investments. These rates do not include the effects of inflation.

The real interest rate for a 30-year bond has fallen steadily over the past decade. The rate currently stands at 2.0 percent, and this rate was used for the economic analysis reported in this document.

Table 5-14 summarizes the results of the life-cycle benefits and costs. As noted above, this analysis covers a 30-year time period to encompass expenditures to acquire right-of-way and to construct the project, and benefits which accrue as a result of the project. The accumulation of benefits covers a 22.75-year time span.

Table 5-14. Summary of Life-Cycle Benefits and Costs

METRIC	BUILD ALTERNATIVE M	BUILD ALTERNATIVE A	BUILD ALTERNATIVE B	BUILD ALTERNATIVE C
Cost	$252,000,000	$ 690,963,000	$ 569,946,000	$ 665,879,000
Present value of costs	$229,180,000	$ 627,607,000	$ 516,534,000	$ 603,614,000
Total benefits (Q2 2018–2040)	$605,287,000	$1,030,458,000	$1,014,868,000	$1,230,735,000
Present value of benefits	$433,029,000	$ 679,807,000	$ 677,650,000	$ 838,365,000
Present value benefit/cost ratio	1.9	1.1	1.3	1.4
Payback period	10 years	22 years	19 years	18 years

The table indicates the following.

Transportation Systems Management (TSM) Alternative M

The TSM alternative performs well because it provides immediate traffic relief to Rosedale Highway, which is congested. Access to all roadways via the existing freeway system (as of 2018) is maintained, thus motorists do not need to rearrange their travel patterns. Over time, the overall highway system becomes increasingly congested and speeds decrease. The TSM alternative does not provide sufficient capacity enhancement to address long-range needs; hence, benefits decline over time. Due to a strong start upon project opening, benefits on average are relatively high over its life-cycle. Coupled with the lower cost of implementation, the benefit to cost ratio is high relative to the other, more expensive, build alternatives.

Alternative A

Alternative A provides the least benefits in the near-term and the most benefits in the long term compared to the other build alternatives. By virtue of the low generation of benefits in the early years and higher overall implementation costs, this alternative has the least favorable ratio of benefits to costs and requires the longest time over the 30-year analysis period to repay the investment. The lower accumulation of benefits following the opening year results from three factors.

- The highway network is least congested in the early years.
- Existing travel patterns are disrupted by the closure of State Route 58 access to Real Road and State Route 99 access to Wible Road. Both of these connections provide access to the Stockdale Highway corridor; hence, motorists must find alternate, and more time consuming routes to reach their destination.
- Alternative A provides no westbound access from State Route 58 to Mohawk Street.

In the long term, Alternative A provides the most direct east–west path, and hence, the greatest amount of travel time savings for land uses as they are forecast to exist in year 2038.

Alternative B

Alternative B is more cost-effective than alternative A, but less cost-effective than alternative C or the TSM alternative M.

Near-term benefits are higher than alternative A, because the alignment of alternative B allows for full access to Mohawk Street. While alternative B provides a more direct east–west path than alternative C, the lack of direct access to the Stockdale Highway corridor constrains travel time savings, particularly in the near term. Near-term benefits place alternative B in the middle of the build alternative performance comparison metric and in third place insofar as long-term performance.

Insofar as life-cycle costs, alternative B is less expensive than alternatives A or C; hence, it requires less front end investment. Over time, benefits accrue at a higher pace for both alternative A and alternative C.

Alternative C

Alternative C maintains access to Real Road and thus the Stockdale Highway corridor from westbound State Route 58. This access provides significant benefit compared with build alternatives A and B, particularly with respect to near-term conditions following the opening year in 2018.

A high level of initial benefits coupled with a high level of long-term benefits cause alternative C to yield a higher life-cycle benefit to cost ratio and a shorter payback period compared with alternatives A or C.

CHAPTER 6. SUMMARY OF FINDINGS

6.1 Project Overview

The California Department of Transportation (Caltrans) proposes to establish a new alignment for State Route 58, which would provide a continuous route along State Route 58 from Cottonwood Road on existing State Route 58, east of State Route 99 (post mile R55.6), to Interstate 5 (I-5) (post mile T31.7). Improvements to State Route 99 (post miles 21.2 to 26.2) and Westside Parkway would also be made to accommodate the connection with State Route 58.

The project is located at the southern end of the San Joaquin Valley in the city of Bakersfield in Kern County, California (see Figure 1-1). The study site is bound on the east by Cottonwood Road, on the west by I-5, on the north by Gilmore Avenue, and on the south by Wilson Road. Caltrans is the lead agency for the project pursuant to the California Environmental Quality Act and the National Environmental Policy Act.

The proposed continuous route is known as the Centennial Corridor.

The purpose of the Centennial Corridor project is to provide route continuity and associated traffic congestion relief along State Route 58 within metropolitan Bakersfield and Kern County from State Route 58 east (from Cottonwood Road) to Interstate 5.

The American Association of State Highway and Transportation Officials' *A Policy on Geometric Design of Highways and Streets* (2004) defines route continuity as a roadway throughout the length of a designated route. The goal of route continuity is to ease the driving task by reducing the need to change lanes and search for directional signing. Route continuity is evaluated in terms of consistent levels of service by providing an appropriate number of lanes.

State Route 58 is a critical link in the state transportation network that is used by interstate travelers, commuters, and large numbers of trucks. Under existing conditions, State Route 58 does not meet the capacity needs of the area, and this is expected to get worse as the population grows. State Route 58 lacks continuity in central Bakersfield, which results in severe traffic congestion and reduced levels of service on adjoining highways and local streets. This route is offset by about one mile at State Route 43 (Enos Lane) and by approximately two miles at State Route 99. The merging of two major state routes (58 and 99) into one alignment between the eastern and western legs of State Route 58 degrades the traffic level of service on this segment of freeway. In addition, State Route 99's close spacing between its two interchanges with State Route 58 (east and west), in addition to an interchange at California Avenue, results in vehicles aggressively changing lanes, which adds to congestion.

State Route 58 is a high volume, east–west, interregional route in Bakersfield and is critical to the economic vitality of the region and the state. It provides significant goods and freight movement connections between Interstate 5 and State Route 99 in the Central Valley. State Route 58 also links to other important goods movement corridors nationwide such as State Route 14, Interstate 15, Interstate 40 and U.S. 395.

As noted above, there are two locations within the project study area where the route is offset: approximately one mile at State Route 43 and approximately two miles at State Route 99. Because State Route 99 is a major state highway in the Central Valley and is the only north–south freeway in Bakersfield, it carries large volumes of traffic. Regional and interregional traffic using State Route 58 contribute to the already considerable volumes of traffic on State Route 99 along the segment shared by these two highways.

The population of metropolitan Bakersfield is rapidly growing. In the area east of State Route 99, three highways (State Route 204, State Route 178 and State Route 58) provide a well-developed freeway system to handle large volumes of local traffic movement. There are no freeways in the metropolitan area west of State Route 99 to support growth. The stop- and signal-controlled local highways and streets west of State Route 99 add to commute times and provide lower levels of service. The proposed project would provide the additional capacity to accommodate this growth.

6.2 Existing Conditions

State Route 58 generally travels in the east–west direction for approximately 240 miles across California and is currently one of the most significant routes going through Bakersfield. West of Bakersfield, the route is called the Blue Star Memorial Highway and runs for roughly 100 miles until terminating at Highway 101, near Santa Margarita, California. East of Bakersfield, the route is called the Barstow–Bakersfield Highway and runs for about 140 miles until terminating at Interstate 15 near Barstow, California.

Within metropolitan Bakersfield, State Route 58 is made up of four principal sections, as illustrated on Figure 6-1 and described below.

Interstate 5 to Allen Road

Starting at Interstate 5, State Route 58 is currently a conventional highway, locally identified as the Rosedale Highway. Between Interstate 5 and Allen Road, the corridor is a two-lane facility surrounded by agricultural land with some recently developed residential areas.

The alignment of State Route 58 is offset by approximately one mile where the roadway jogs, and is co-located with State Route 43. The intersections of State Route 43 with State Route 58 north and State Route 58 south are stop sign controlled. Speed limits are posted at 55 miles per hour (mph).

Allen Road to State Route 99

This section of State Route 58/Rosedale Highway is principally a business route with two lanes in each direction and outside turn pocket lanes at street intersections. The highway typically includes a slightly raised, non-landscaped median varying up to about 20 feet wide. No posted speed limits are evident, except in 25 mph school zones, but traffic generally travels at about 45 to 55 mph. Although there are very few residential areas directly along this highway, this section services the communities of Rosedale, Greenacres and Fruitvale, which surround the highway.

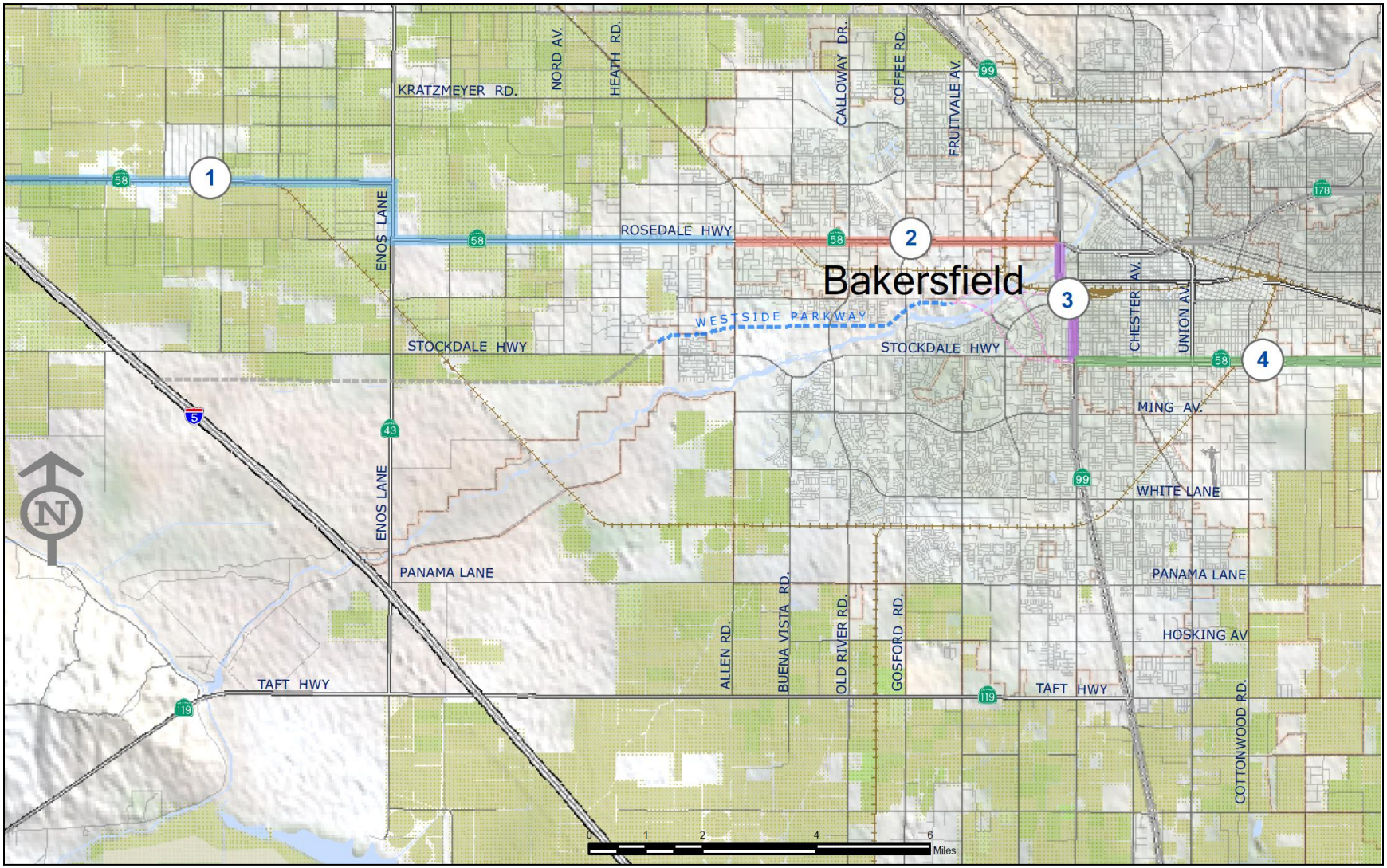


Figure 6-1: Principal Sections of State Route 58 in the Centennial Corridor Vicinity

The first two miles of Rosedale Highway east of Allen Road is a mix of undeveloped land, old homes and businesses, and a trailer park. Just east of Allen Road is a 25 mph zone for Rosedale Middle School; and just past this school is Rosedale Park. Continuing east, the highway elevates over the BNSF Railway and then returns to its previous ground level. Past the railroad and as the route approaches Calloway Drive, there are some small businesses and shopping areas. For about one mile on the north side of the highway, between Calloway Drive and Coffee Road, exists a large restaurant and shopping center made up of newer "big box" retailers called the Northwest Promenade. The south side has a few smaller businesses, auto shops and gas stations, but the majority of the land is open for overhead power line towers and petroleum storage reservoirs. Just east of Coffee Road, the highway crosses over both the Friant–Kern Canal and then the Calloway Canal. The posted speed limit is reduced to 25 mph for the Vista West High School located to the south. Farther east, the highway crosses over Calloway Canal again as the canal turns back north near Fruitvale Avenue. Just east of this, the highway crosses over Emery Ditch and still farther east, is another railroad crossing. For the two and a half miles between Coffee Road and the interchange with State Route 99, the highway services a few businesses and restaurants, but is mostly undeveloped or adjoined by light industrial land uses with some auto shops, storage facilities and warehouses. East of the railroad crossing, around Gibson Street, the speed limit is 40 mph. As the highway passes under State Route 99, it opens up to three lanes and will have additional single or double turn lanes as needed. The area surrounding this interchange is made up of numerous large restaurant and hotel chains. It also services the Bakersfield Heart Hospital located northeast of the interchange.

State Route 58 West to State Route 58 East (State Route 99)

State Route 99 is an extensive north–south route in the middle of California servicing more than 400 miles of the state. It extends north past Sacramento and terminates at its junction with Interstate 5, about 20 miles south of Bakersfield. At the north end of Bakersfield, it provides freeway access to the Meadows Field Kern County Airport. Farther south, it has a large interchange with State Route 204 and Airport Drive.

Within the study area, both east and west travel directions of State Route 58 have ramps that directly access southbound lanes of State Route 99. The two state routes combine and continue in the north–south direction for two miles until an interchange immediately south of Brundage Lane where both routes diverge. This portion of the freeway consists of four lanes with shoulders in each direction, separated by a concrete barrier with a posted speed limit of 65 mph (55 mph for trucks or haulers). Exit numbers descend in the south direction. State Route 99 Exit 26 will connect travelers to 24th Street/State Route 178. Exit 25 connects to the Civic Center and California Avenue. Exit 24 accesses Stockdale Highway or Brundage Lane and the section where State Route 58 diverges east from State Route 99. One mile farther south is the final exit in the study area, Exit 23 for Ming Avenue.

State Route 99 to Cottonwood Road

East of Bakersfield, State Route 58 is also called the Barstow–Bakersfield Highway and continues east for about 140 miles until its junction with Interstate 15 near Barstow, California. Traveling south on State Route 99, the access ramp for State Route 58 east elevates high as an overpass above Stockdale Highway, State Route 99, State Route 58 and Wible Road, before descending back down to access the eastbound lanes of State Route 58. Traveling west on State

Route 58, an exit ramp connects to the State Route 99 northbound lanes as an underpass below Brundage Lane and Oak Street. State Route 58 east is a divided highway separated by a metal barrier and a wide median. It consists of two lanes with shoulders in each direction and has a posted speed limit of 65 mph (55 mph for trucks or haulers). There are several residential areas offset from the highway on both sides up to the Union Avenue/State Route 204 exit. Exit numbers ascend in the east direction. Exit 111 provides access to Chester Avenue and downtown Bakersfield. About one-quarter mile west of Exit 114 for Mt. Vernon Avenue, the highway widens to three lanes in each direction and continues with this cross section as the road leaves the city of Bakersfield.

Figure 6-2 illustrates the location of congestion along the freeway portions of the route. State Route 58 east of State Route 99 is relatively uncongested under existing conditions except for the eastbound segment approaching Union Avenue. The shared section of State Route 99 and State Route 58 between State Route 58 east and Rosedale Highway is more congested, with slower speeds and light congestion experienced at interchange on-ramp merge areas and off-ramp diverge sections.

6.3 Future No-Build Conditions

Traffic volumes are expected to increase in the future as Kern County continues to attract new residents and Bakersfield continues its role as a crossroads of north–south and east–west interstate and intrastate personal travel and trade corridor movements. Table 6-1 and Figure 6-3 chart the history of population growth past, present and future. As has been the trend for the past 60 years, residents and jobs have been attracted to Kern County in increasing numbers. All population forecasts support a continuation of population increases once the current economic slowdown passes.

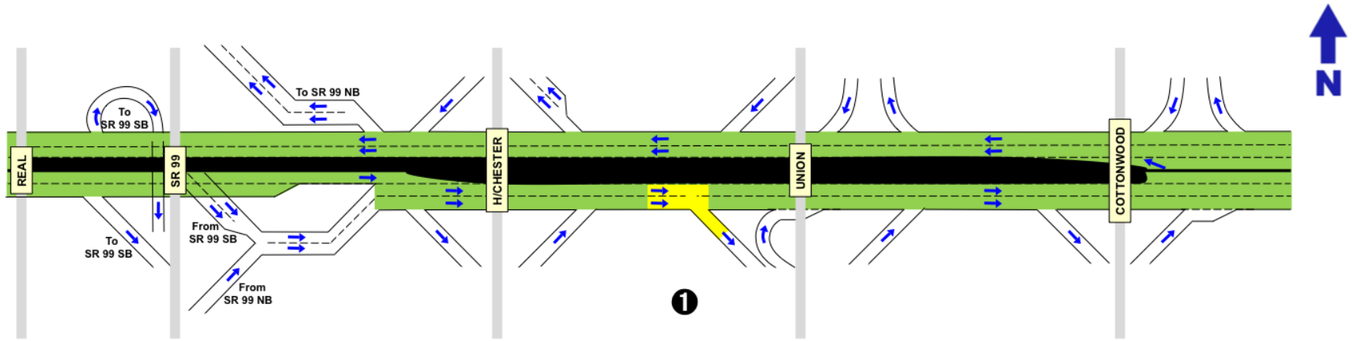
More residents, more jobs, and more trade will result in higher volumes of automobiles, trucks and trains passing through central Bakersfield. Figure 6-4 illustrates the pattern of traffic volumes using metropolitan Bakersfield's arterial streets and state highways in 2006 and 2038. State highways such as State Route 58, State Route 99 and State Route 178 are expected to experience major increases in traffic flows.

As a result of increased traffic volumes, the level of congestion along State Route 58 and the shared portion of State Route 99 (between State Route 58 east and Rosedale Highway) is expected to worsen. Figure 6-5 illustrates the location of bottlenecks, traffic queues and slower speeds anticipated to occur by year 2038, assuming no project to connect State Route 58 east with the Westside Parkway.

Congestion will be particularly heavy along State Route 99 in the vicinity of State Route 58, where speeds will slow below 40 mph due to heavy on- and off-ramp volumes and weaving conflicts. The extent of congestion is illustrated on the graphic by segments colored as red and yellow. Traffic will also slow along westbound State Route 58 as the traffic queue along southbound State Route 99 spills back to the on-ramp from westbound State Route 58.

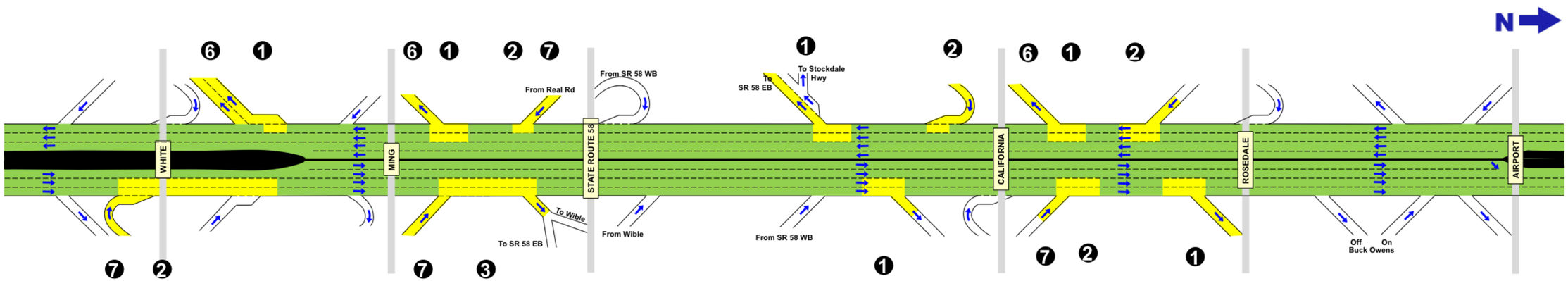
STATE ROUTE 58

Segment 1



	CONGESTION CAUSES	DESCRIPTION
1	Heavy off-ramp volume	Vehicles crowd right lanes of freeway trying to exit
2	Heavy on-ramp volume	Vehicles entering freeway crowd right lanes of freeway
3	On-ramp to off-ramp weave conflicts	Heavy volumes of traffic entering freeway conflict with heavy volumes of traffic exiting freeway
4	Spillback from bottleneck on mainline	Traffic congestion ahead causes approaching traffic to slow speed and compress space between vehicles
5	Bottleneck	Traffic volumes on mainline (combined on-ramp, weaving, off-ramp, through movements) exceed capacity, causing traffic to slow and compress space between vehicles
6	Off-ramp/arterial street bottleneck	Congestion on arterial street limits throughput of freeway off-ramp
7	On-ramp spillback	Congestion on freeway limits throughput of on-ramp to freeway

STATE ROUTE 99



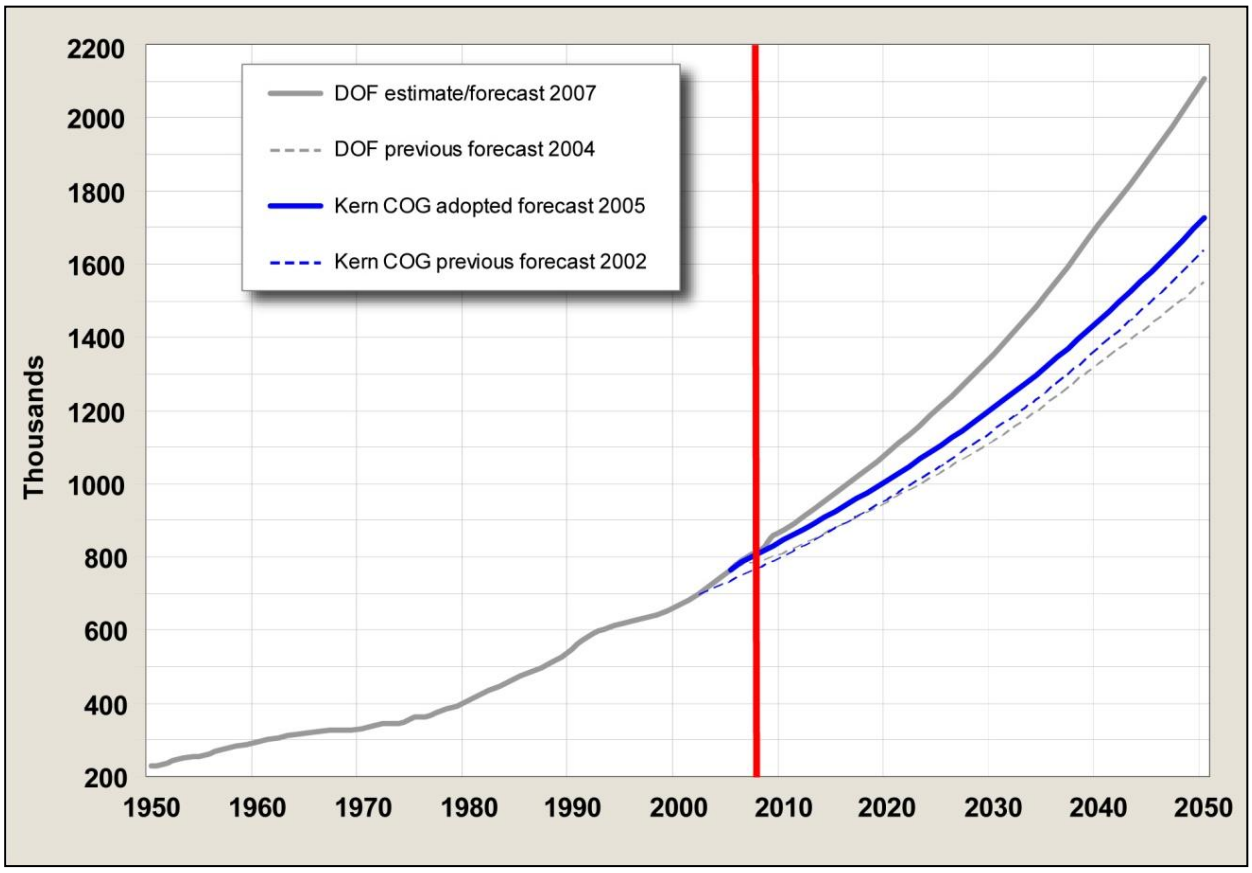
LOS A, B, C, D
LOS E
LOS F

Figure 6-2: Existing Traffic Operational Conditions on State Route 58 and State Route 99

Table 6-1. Comparison of Kern County Population Forecasts

	CA DEPARTMENT OF FINANCE[1]		CALIFORNIA ECONOMIC FORECASTS REPORT[2]					KERN COG[3]
YEAR	2004	2007	2005	2005	2007	2008	2010	2005
1995			630,300					
2000	664,694	665,519	665,367	665,373				
2005	732,800		767,764	770,424	768,928			765,600
2010	808,808	871,728	886,417	895,263	885,176	853,486	848,730	845,600
2015			1,009,368	1,036,709	1,005,806	950,991	938,042	924,533
2020	950,112	1,086,113	1,132,743	1,185,769	1,128,324	1,057,804	1,040,449	1,010,800
2025			1,255,384	1,331,953	1,241,859	1,165,153	1,148,731	1,105,094
2030	1,114,878	1,352,627		1,474,471	1,347,635	1,272,081	1,256,152	1,208,200
2035							1,367,600	1,321,000
2040	1,325,648	1,707,239						1,444,100
2050	1,549,594	2,106,024						1,726,200

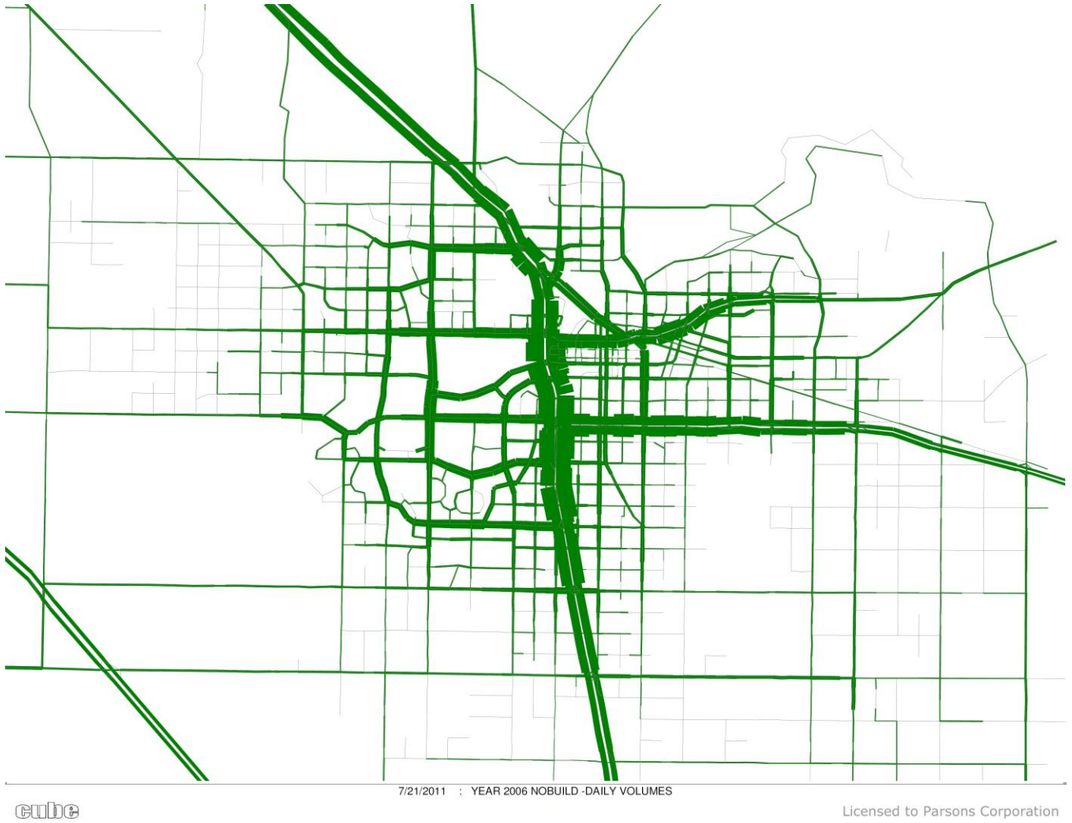
Sources:
[1]California Department of Finance, Demographic Research Unit, May 2004 and July 2007
[2]California Department of Transportation, county-level economic forecast reports from 2005, 2006, 2007, 2008 and 2010 prepared by Dr. Mark Schniepp, California Economic Forecasts, Inc.
[3]Kern Council of Governments, Kern County Travel Demand Model Population Forecast, updated 2005.



Source: Kern Council of Governments *Final Regional Growth Forecast Report*, October 2009

Figure 6-3: Comparison of Kern County Population Forecasts

2006 Daily Traffic Volumes



Source: Parsons

2038 No-Build Alternative Daily Traffic Volumes

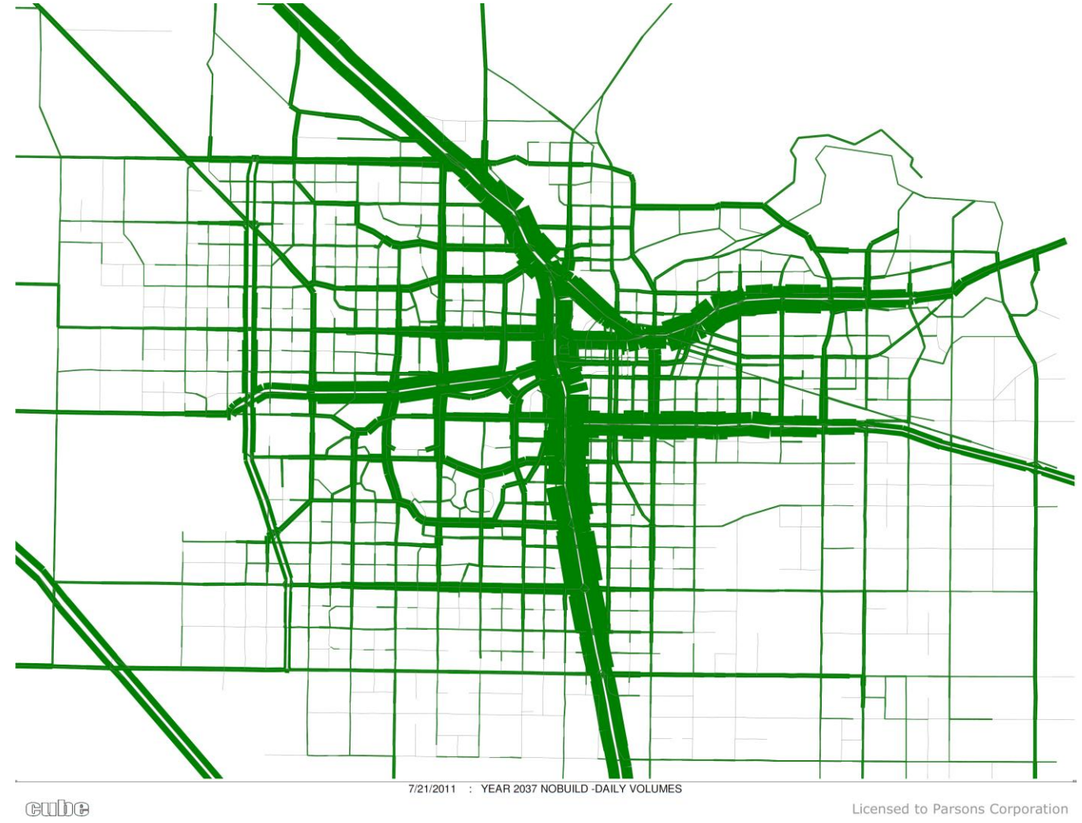
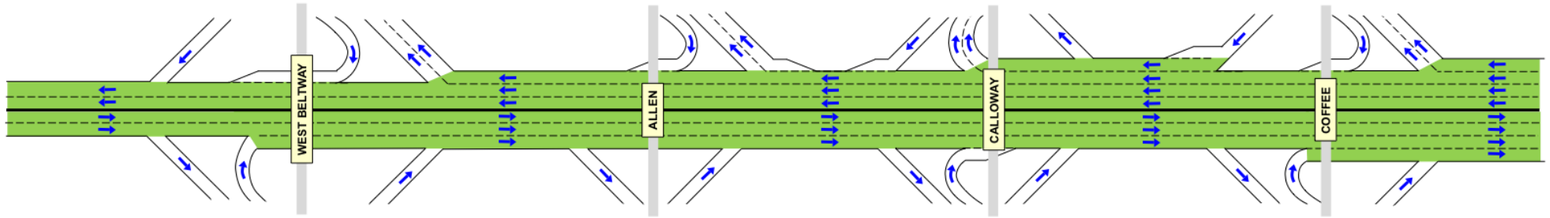


Figure 6-4: Difference between Year 2006 and Year 2038 Daily Traffic Volumes

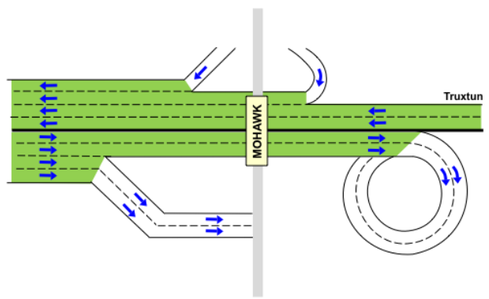
STATE ROUTE 58

Segment 2—Westside Parkway

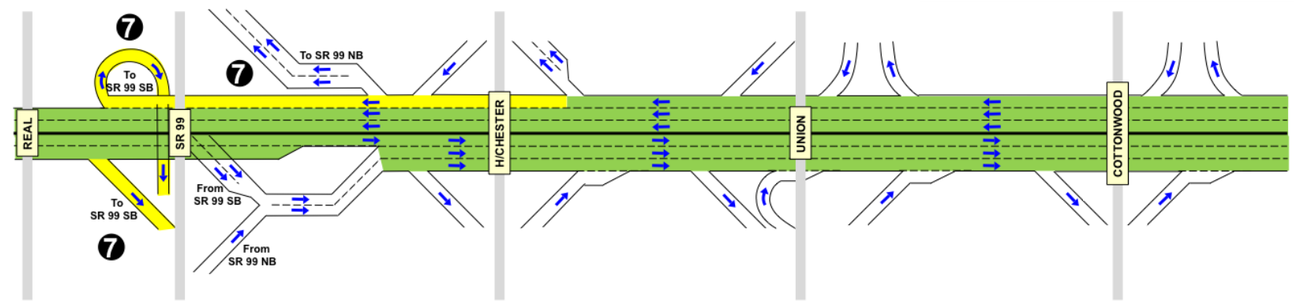


CONGESTION CAUSES		DESCRIPTION
1	Heavy off-ramp volume	Vehicles crowd right lanes of freeway trying to exit
2	Heavy on-ramp volume	Vehicles entering freeway crowd right lanes of freeway
3	On-ramp to off-ramp weave conflicts	Heavy volumes of traffic entering freeway conflict with heavy volumes of traffic exiting freeway
4	Spillback from bottleneck on mainline	Traffic congestion ahead causes approaching traffic to slow speed and compress space between vehicles
5	Bottleneck	Traffic volumes on mainline (combined on-ramp, weaving, off-ramp, through movements) exceed capacity, causing traffic to slow and compress space between vehicles
6	Off-ramp/arterial street bottleneck	Congestion on arterial street limits throughput of freeway off-ramp
7	On-ramp spillback	Congestion on freeway limits throughput of on-ramp to freeway

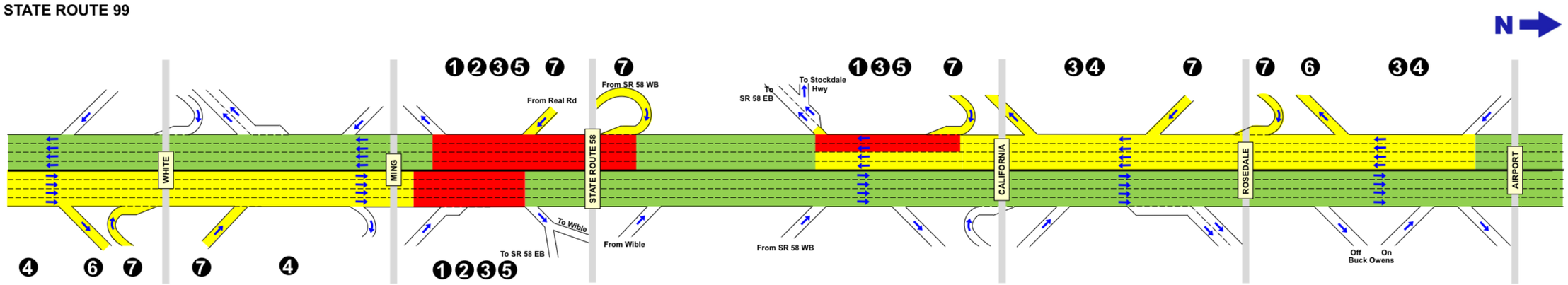
Segment 1—Westside Parkway



Segment 1—State Route 58 (East)



STATE ROUTE 99



LOS A, B, C, D
LOS E
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Figure 6-5: No-Build Year 2038 Forecast Traffic Operational Conditions on State Route 58 and State Route 99

This expected traffic congestion will impact both Kern County residents and interregional truck flows. Figure 6-6 illustrates the pattern of truck movements using interstate routes within Kern County (Interstate 5, State Route 99, and State Route 58/Interstate 40). Heavy truck volumes in Kern County are forecast to increase by 87 percent between the years 2000 and 2030 according to the *San Joaquin Valley Goods Movement Study*.

6.4 Proposed Project Alternatives

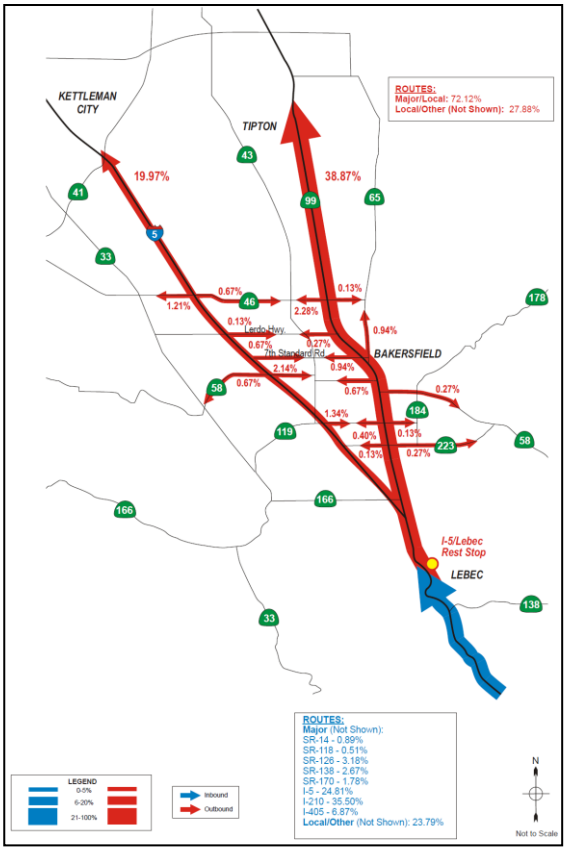
To address the anticipated increase in traffic volumes and resulting congestion, a project has been proposed to connect the segment of State Route 58 east of State Route 99 with the Westside Parkway and the western end of Stockdale Highway, and to adopt this alignment between Interstate 5 and State Route 99 as State Route 58. This project would provide continuity for State Route 58 in Kern County. In addition to providing route continuity and associated traffic congestion relief, this project would:

- Provide interregional and regional connectivity for east–west traffic traveling within metropolitan Bakersfield and Kern County
- Promote economic growth and international/interregional trade by improving linkages between existing segments of the interstate system
- Reduce commercial and regional commute time trough a major freight corridor
- Improve local east–west circulation and reduce congestion to accommodate existing and planned land uses in accordance with adopted growth projections
- Improve operations and reduce congestion on the shared portion of State Route 58 and State Route 99.

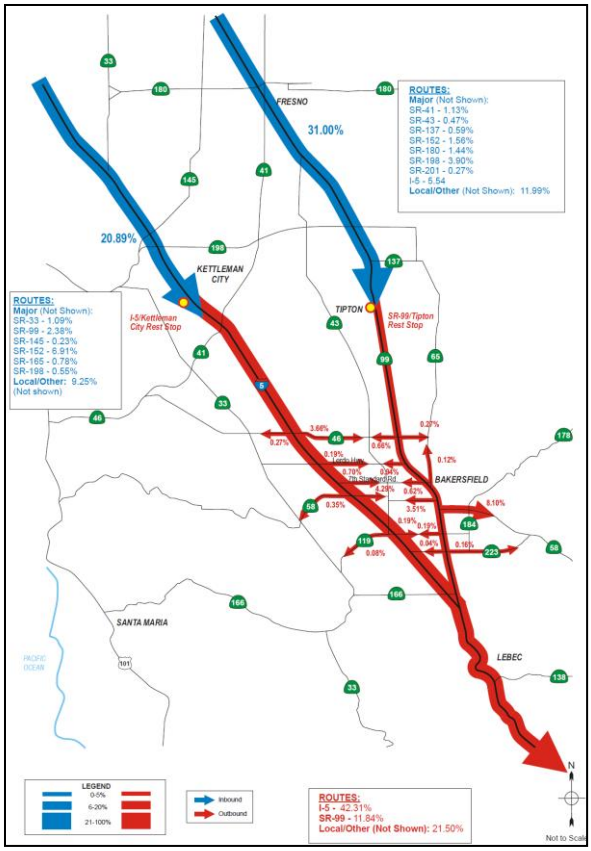
The project alternatives include three build alternatives and a no-build alternative. In addition, this traffic study report evaluates a transportation systems management alternative referenced as alternative M. These alternatives are described below.

No-build Alternative: The no-build alternative would not construct any improvements. The Westside Parkway would be constructed as a local facility, but would not connect to State Route 58, State Route 99, or Interstate 5. Rosedale Highway, the west leg of State Route 58 between State Route 99 and Interstate 5, would be widened from four lanes to six lanes between State Route 99 (Gibson Road) and Allen Road, and from two lanes to four lanes between Allen Road and Enos Lane (State Route 43).

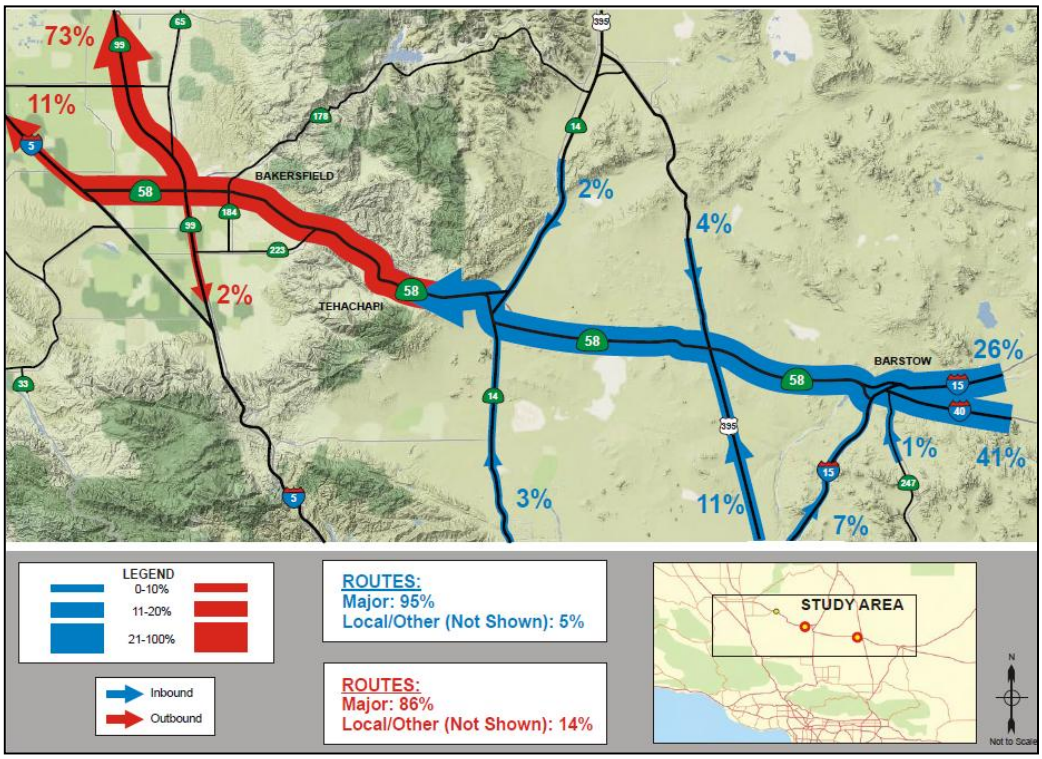
Alternative M: Alternative M, the transportation system management alternative, proposes local arterial improvements to increase the person-carrying capacity. Low-cost improvements include traffic signal optimization, intersection widening and bus service and stop improvements along all of the east–west arterial streets from Hageman Road to Ming Avenue. The same improvements are also assumed for the no-build and all build alternatives, and were therefore not specifically evaluated by this traffic study. Higher cost improvements include constructing grade separations along Rosedale Highway at four major north–south arterial streets and reducing the number of intervening signalized intersections between Allen Road and State Route 99. Detailed traffic operational analysis of the alternative indicates that Rosedale Highway would also need to



Northbound Route Choice (Lebec Rest Stop)



Southbound Route Choice (Kettleman City/Tipton Rest Stop)



Westbound Route Pattern on State Route 58 Corridor

Sources: I-5/SR-99 Origin and Destination Study, SR-58 Origin and Destination Truck Study, KOA Corporation

Figure 6-6: Interstate and Interregional Truck Flow Patterns in Kern County

be widened to eight lanes between Fruitvale Avenue and State Route 99, a distance of 1.8 miles, to accommodate forecast traffic volumes. This alternative assumes there is no new direct connection between the approved Westside Parkway and existing State Route 58/State Route 99 interchange.

Alternative A: Alternative A proposes to connect the east end of the Westside Parkway to State Route 58 by a six-lane facility on the west side of the State Route 58/State Route 99 interchange. This alternative would run parallel to and south of Stockdale Highway for approximately one mile before turning north and connecting to the Westside Parkway between Mohawk Street and Coffee Road. There would also be linkage to the Mohawk Street interchange (to and from the west) providing additional connectivity with downtown Bakersfield.

Alternative B: Alternative B proposes to connect the east end of the Westside Parkway to State Route 58 by means of a six-lane facility on the west side of the State Route 58/State Route 99 interchange. The alignment would travel in a westerly direction for approximately one-half mile on the south side of Stockdale Highway, at which point it would turn to the northwest and join the Westside Parkway just east of the Mohawk Street interchange.

Alternative C: Alternative C proposes to connect the existing State Route 58 to the Westside Parkway by means of a six-lane facility that runs parallel to the existing State Route 99. Auxiliary lanes and ramp modifications on State Route 99 would be required to accommodate weaving movements associated with the new connections.

The proposed continuous alignment for State Route 58 has been divided into three distinct segments and the combination of these three segments comprises the Centennial Corridor project. Segment 1 is the eastern segment that would connect the Westside Parkway (Segment 2) to the existing State Route 58 east freeway. Segment 2 is comprised of what is locally known as the Westside Parkway and extends from Heath Road to Truxtun Avenue. Segment 3 is the western segment that extends from Interstate 5 to Heath Road.

The project's segments are numbered from east to west as shown on Figure 6-7.

Segment 1 extends from the easterly terminus of Segment 2 near Truxtun Avenue to the existing State Route 58 east freeway in the vicinity of Cottonwood Road. It is the only segment where construction alternatives A, B and C are being considered. These three build alternatives plus a transportation systems management/transit alternative (alternative M) and a no-build alternative are being considered, as indicated above.

Segment 2 encompasses a local freeway facility known as the Westside Parkway. As part of the Centennial Corridor project, it is anticipated that the Westside Parkway would be successfully adopted as State Route 58 (under build alternatives A, B, or C).

Westside Parkway is a local, access controlled, multilane freeway that extends from its western terminus near the intersection of Stockdale Highway near Heath Road to its eastern terminus near Mohawk Street, Truxtun Avenue and the Kern River.

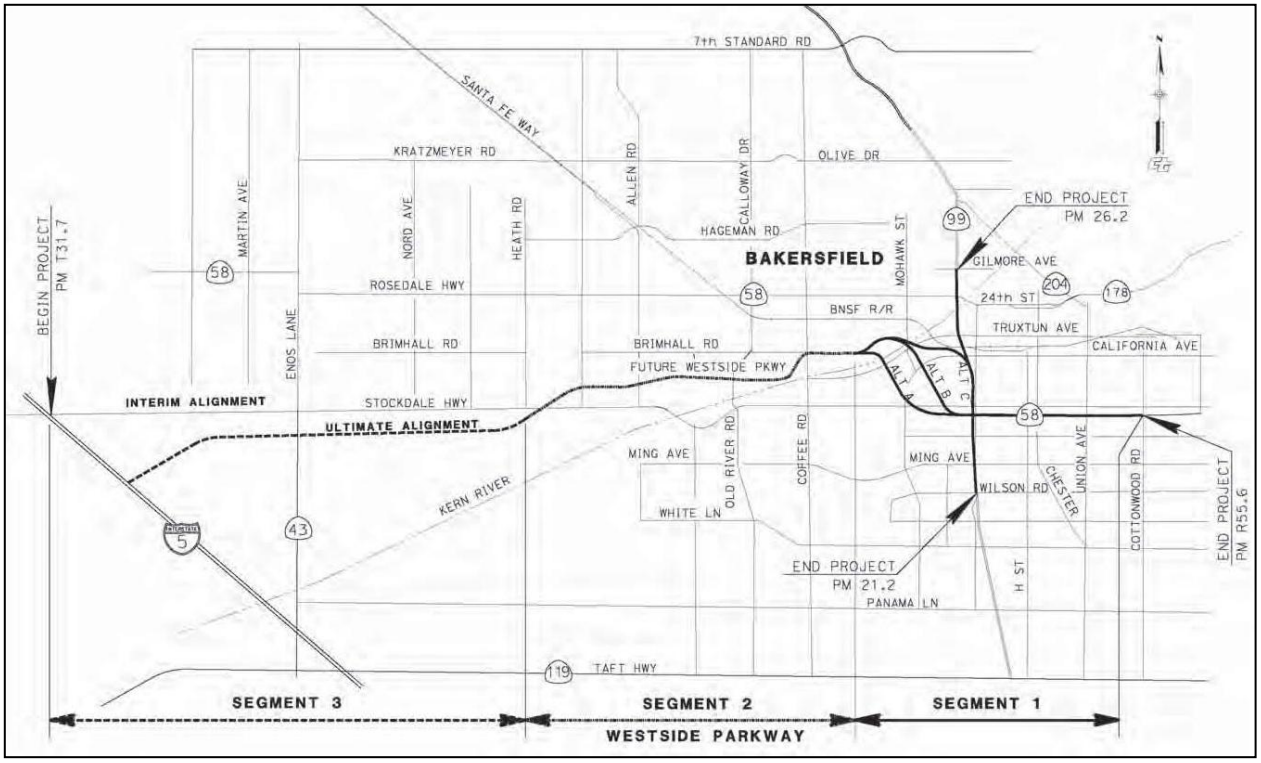


Figure 6-7: Segments for the Centennial Corridor

Segment 3 extends from Interstate 5, approximately two miles south of the Stockdale Highway/ Interstate 5 interchange, to the intersection of Heath Road and Stockdale Highway. The Centennial Corridor project proposes an interim connection to Interstate 5 via Stockdale Highway from the end of Segment 2 near Heath Road under build alternatives A, B, or C. Under alternative M, the connection to Interstate 5 would remain on existing State Route 58, known locally as Rosedale Highway.

This traffic operations analysis is focused on Segment 1, as the limits of construction primarily occur within this segment along with the majority of potential traffic related impacts. The traffic operations analysis addresses Segment 2 to determine if the freeway connector project (Segment 1) will impact the design requirements of the Westside Parkway. The analysis of Segment 3 traffic operations is limited to the interim connection to Interstate 5 via Stockdale Highway under build alternatives A, B, or C.

6.5 Qualitative Traffic Performance of the Project Alternatives

The purpose of this traffic study report is to examine the performance of the build alternatives from a traffic perspective and compare this performance to the no-build alternative.

As stated above, the no-build alternative would not construct any improvements. It would not provide interregional or regional connectivity for east–west traffic traveling within metropolitan Bakersfield and Kern County. It would not provide continuity for State Route 58 in Kern County. It would not promote economic growth and international/interregional trade by improving linkages between existing segments of the interstate system. The no-build alternative

would not reduce commercial and regional commute time through a major freight corridor; nor would it improve local east–west circulation. It would also not improve operations or reduce congestion on the shared portion of State Route 58 and State Route 99 between State Route 58 east and Rosedale Highway.

Six qualitative criteria have been defined to measure the effectiveness of the three build alternatives and the transportation system management/transit alternative for addressing the purpose of the Centennial Corridor project. These criteria are listed below along with Parsons' subjective assessment of the alternative's performance.

1. Provide continuity for State Route 58 in Kern County.

   State Route 58 is offset by approximately one mile at Enos Lane (State Route 43) and by approximately two miles at State Route 99. The improvements proposed for the transportation systems management do not address route continuity objectives, which are the fundamental purpose of the project. Build alternatives A, B and C would provide for a continuous route from Interstate 5 to points east of Kern County via Stockdale Highway, Westside Parkway, the Centennial Corridor and State Route 58 east. This assumes that Westside Parkway and a portion of Stockdale Highway west of Heath Road will be successfully adopted as State Route 58 once the proposed project is constructed.

   The transportation systems management does not meet or address this criterion, which is the purpose of the project. Build alternatives A, B and C fully meet this criterion.

2. Provide traffic congestion relief and interregional and regional connectivity for east–west traffic traveling within metropolitan Bakersfield and Kern County.

   Upgrading Rosedale Highway to a super-arterial, the backbone of the transportation systems alternative, allows the facility to attract and accommodate 11,000 to 34,000 additional vehicles per day between Allen Road and State Route 99, with 24,000 additional vehicles using the upgraded route immediately west of State Route 99. Just east of Enos Lane (State Route 43), the transportation system management alternative increases the use of State Route 58 east by 1,500 vehicles per day compared to the no-build alternative.

   Build alternatives A, B and C would attract between 113,700 to 121,400 vehicles per day in the section west of State Route 99. At Allen Road, use of the Westside Parkway would increase to 81,000 vehicles per day, compared to 66,000 vehicles per day using the Westside Parkway (west of Allen Road) under the no-build alternative. Use of State Route 58 east of State Route 99 would increase by 5,625 vehicles per day under alternative A to 14,485 vehicles per day under alternative C.

   The transportation systems management/transit alternative provides some traffic congestion relief and improves local connectivity to State Route 99, thereby partially meeting this criterion. Build alternatives A, B and C provide substantial traffic congestion relief and interregional and regionally connectivity for east–west traffic, thereby fully meeting this criterion.

3. Promote economic growth and international and interregional trade by improving linkages between existing segments of the interstate system.

   The transportation systems management alternative improves existing State Route 58 west by upgrading approximately six miles of the alignment to a super-arterial facility, from Allen Road to State Route 99. This improvement does not address or further the objective of connecting Interstate 5 to Interstate 15 and Interstate 40 (in Barstow) via a continuous State Route 58 freeway facility.

   Build alternatives A, B and C would construct a freeway between the eastern end of the Westside Parkway and the western end of the State Route 58 east freeway, thereby furthering the objective of connecting Interstate 5 with Interstate 15 via a continuous State Route 58 freeway.

   The transportation systems management alternative does not meet or address this criterion.

4. Reduce commercial and regional commute time through a major freight corridor.

   The transportation systems management alternative reduces travel time along Rosedale Highway by reducing traffic signal delays at major cross streets and reducing the number of signalized intersections between Allen Road and State Route 99. The attractiveness of State Route 58 west as a major freight corridor is relatively unchanged from the no-build condition, as more attractive alternative routes, such as State Route 46, offer less delay to commercial vehicles traveling through, but not destined to, metropolitan Bakersfield.

   Build alternatives A, B and C reduce the number of traffic signals between Interstate 5 and State Route 99 to two locations, at the intersections of Stockdale Highway with Enos Lane (State Route 43) and Heath Road. Once adopted as State Route 58, this route will become the major freight corridor for east–west heavy truck movements through Kern County.

   The transportation systems management alternative reduces travel time, but does not address interstate trucking needs. Build alternatives A, B and C provide a nearly non-stop route between Interstate 5 and State Route 99.

5. Improve local east–west circulation and reduce congestion to accommodate existing and planned land uses in accordance with adopted growth projections.

   Compared to the no-build alternative, alternative M, the transportation systems management alternative, attracts 11,000 to 34,000 additional vehicles per day to Rosedale Highway, thereby reducing traffic volumes on Hageman Road, Westside Parkway, Stockdale Highway and Ming Avenue. Planned commercial land uses along Rosedale Highway benefit from higher drive by levels of traffic, while residential serving roadways benefit from reduced traffic volumes.

   Build alternatives A, B and C each accommodate more than 100,000 vehicles per day on the segment of State Route 58 immediately west of State Route 99. These alternatives will remove through traffic from east–west local arterial streets, allowing residents the

opportunity to access commercial establishments along these roadways under less congested conditions.

The transportation systems management alternative, as well as build alternatives A, B and C, all meet this criterion.

6. Improve operations and reduce congestion of the shared portion of State Route 58 and State Route 99.

   Compared to the no-build alternative, alternative M adds more than 20,000 additional vehicles per day to State Route 99 over the shared section with State Route 58. No improvements to State Route 99 are included with the transportation systems management alternative, by virtue of the cost associated with constructing auxiliary lanes between State Route 58 west and State Route 58 east. Overall level of service degrades slightly along the shared portion of State Route 58 and State Route 99, compared to the no-build alternative.

   The transportation systems management alternative does not meet or address this criterion.

   Figures 6-8, 6-9, and 6-10 illustrate the location of congestion along State Route 58 and the portion of State Route 99 that will no longer be shared with State Route 58 under build alternatives A, B and C, respectively. Comparison of these graphics with Figure 6-5 indicates that the extent of the bottleneck surrounding the State Route 58/State Route 99 freeway system interchange will be significantly reduced in the southbound direction along State Route 99, and eliminated in the northbound direction. Poor performance will remain between Rosedale Highway and California Avenue in the southbound direction, however.

   Build alternatives A, B and C address and largely meet this criterion.

Overall, the transportation systems management alternative partially addresses the need and purpose of the Centennial Corridor project, whereas build alternatives A, B and C fully address the need and purpose of the project.

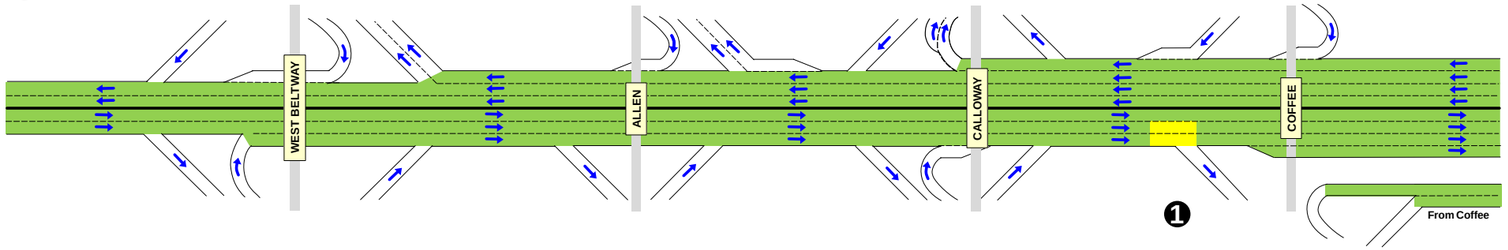
6.6 System-wide Performance of the Project Alternatives

To provide a quantified measure of overall system-wide performance, the four build alternatives were evaluated using a traffic impact analysis computer software product developed for the Federal Highway Administration. This product, the Surface Transportation Efficiency Analysis Model (STEAM) version 2.0, provides a quantitative measurement of economic impacts, natural resource usage, environmental impacts, and net monetary benefits (or costs).

The STEAM 2.0 assessment found that the transportation systems management alternative (build alternative M) provides approximately $22.3 million of monetized benefits per year assuming design year (2038) traffic conditions, compared with $75.3 million of benefits per year for build alternative A, $68.8 million of benefits per year for build alternative B, and $72.7 million of benefits per year for build alternative C, all assuming year 2038 traffic conditions. Life cycle, or

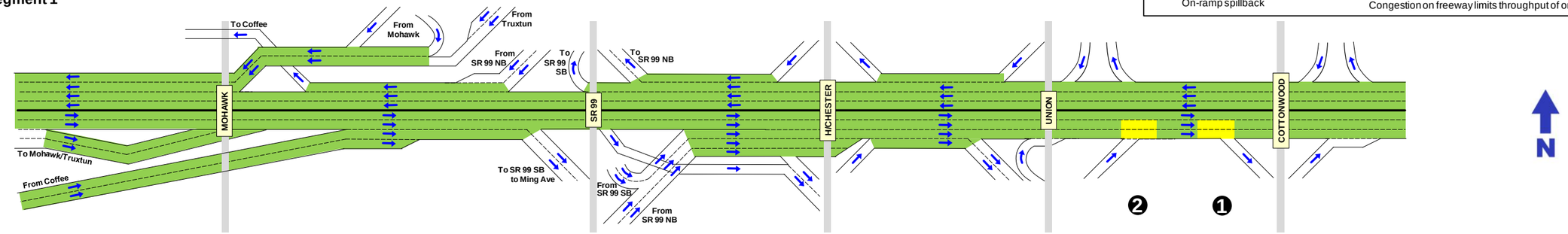
STATE ROUTE 58

Segment 2

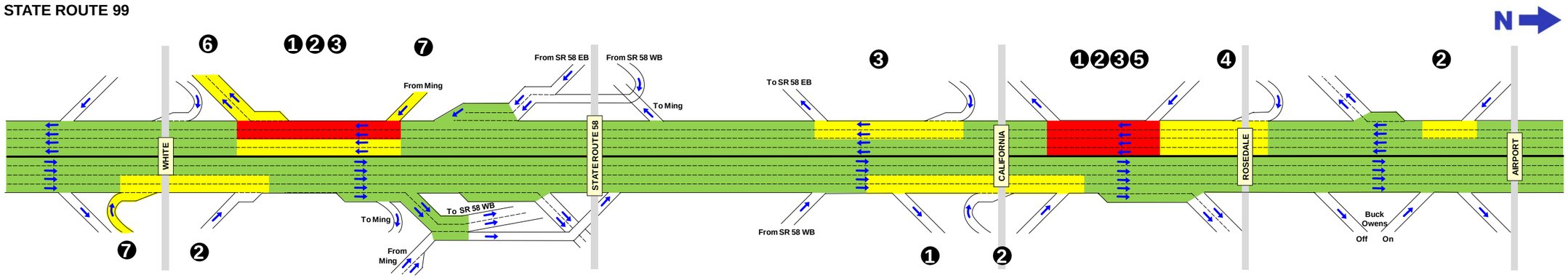


CONGESTION CAUSES	DESCRIPTION
Heavy off-ramp volume	Vehicles crowd right lanes of freeway trying to exit
Heavy on-ramp volume	Vehicles entering freeway crowd right lanes of freeway
On-ramp to off-ramp weave conflicts	Heavy volumes of traffic entering freeway conflict with heavy volumes of traffic exiting freeway
Spillback from bottleneck on mainline	Traffic congestion ahead causes approaching traffic to slow speed and compress space between vehicles
Bottleneck	Traffic volumes on mainline (combined on-ramp, weaving, off-ramp, through movements) exceed capacity, causing traffic to slow and compress space between vehicles
Off-ramp/arterial street bottleneck	Congestion on arterial street limits throughput of freeway off-ramp
On-ramp spillback	Congestion on freeway limits throughput of on-ramp to freeway

Segment 1



STATE ROUTE 99



LOS A, B, C, D
LOS E
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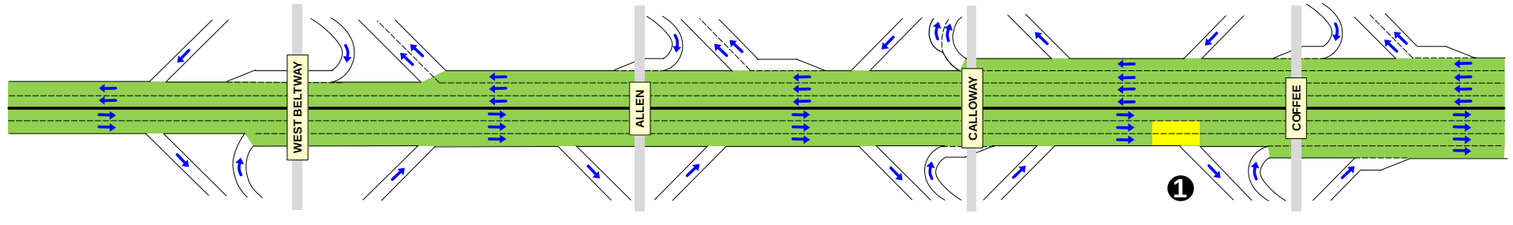
Figure 6-8: Alternative A Year 2038 Forecast Traffic Operational Conditions on State Route 58 and State Route 99

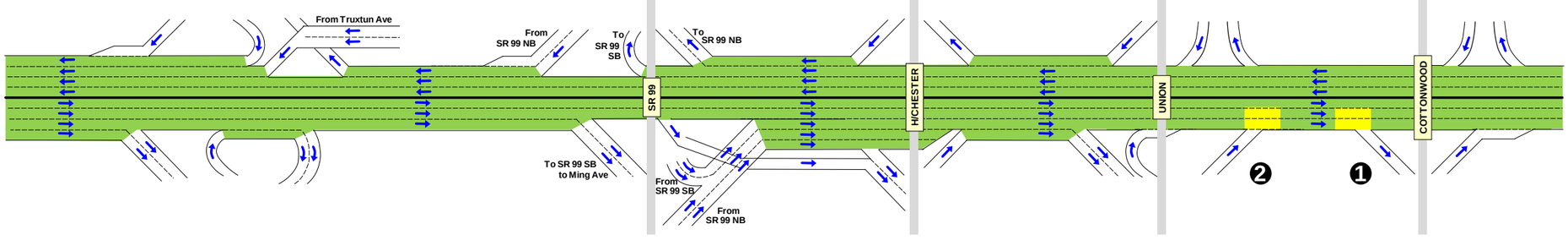
STATE ROUTE 58

Segment 2

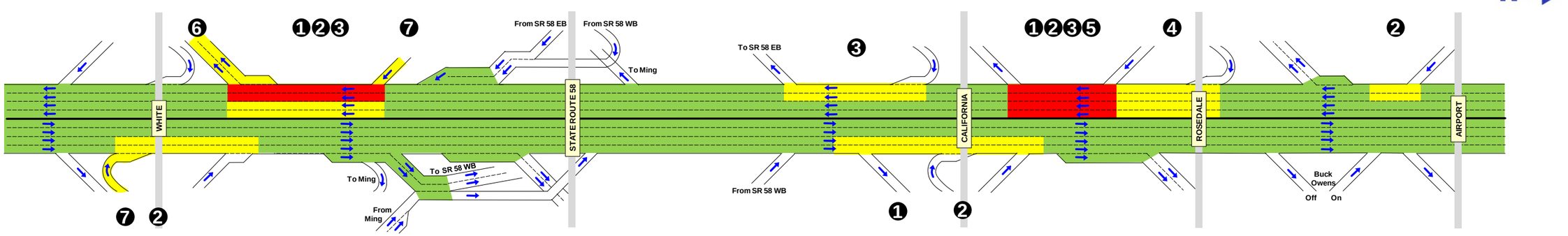


CONGESTION CAUSES	DESCRIPTION
Heavy off-ramp volume	Vehicles crowd right lanes of freeway trying to exit
Heavy on-ramp volume	Vehicles entering freeway crowd right lanes of freeway
On-ramp to off-ramp weave conflicts	Heavy volumes of traffic entering freeway conflict with heavy volumes of traffic exiting freeway
Spillback from bottleneck on mainline	Traffic congestion ahead causes approaching traffic to slow speed and compress space between vehicles
Bottleneck	Traffic volumes on mainline (combined on-ramp, weaving, off-ramp, through movements) exceed capacity, causing traffic to slow and compress space between vehicles
Off-ramp/arterial street bottleneck	Congestion on arterial street limits throughput of freeway off-ramp
On-ramp spillback	Congestion on freeway limits throughput of on-ramp to freeway

Segment 1



STATE ROUTE 99



LOS A, B, C, D
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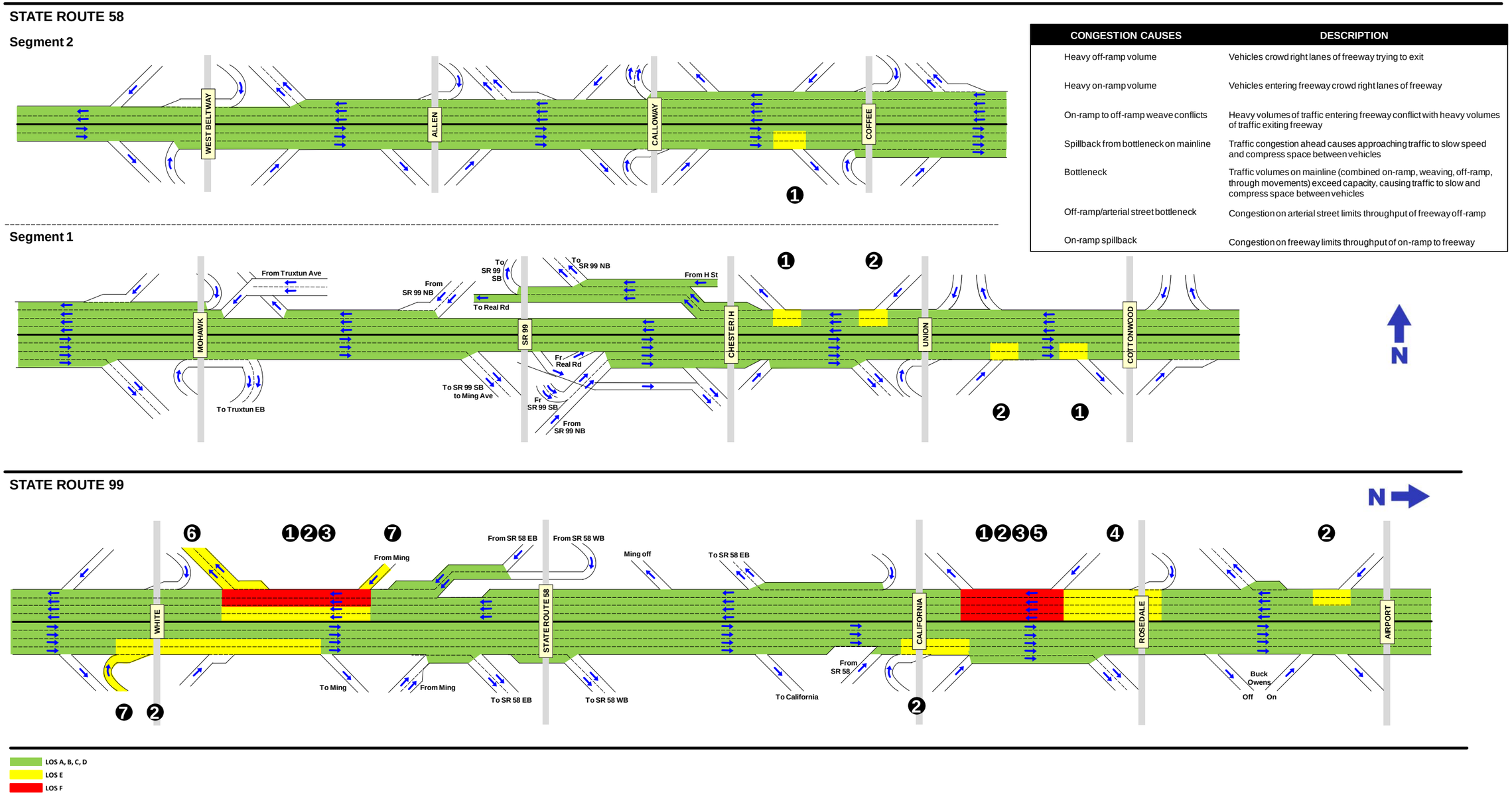
Figure 6-9: Alternative B Year 2038 Forecast Traffic Operational Conditions on State Route 58 and State Route 99



CONGESTION CAUSES	DESCRIPTION
Heavy off-ramp volume	Vehicles crowd right lanes of freeway trying to exit
Heavy on-ramp volume	Vehicles entering freeway crowd right lanes of freeway
On-ramp to off-ramp weave conflicts	Heavy volumes of traffic entering freeway conflict with heavy volumes of traffic exiting freeway
Spillback from bottleneck on mainline	Traffic congestion ahead causes approaching traffic to slow speed and compress space between vehicles
Bottleneck	Traffic volumes on mainline (combined on-ramp, weaving, off-ramp, through movements) exceed capacity, causing traffic to slow and compress space between vehicles
Off-ramp/arterial street bottleneck	Congestion on arterial street limits throughput of freeway off-ramp
On-ramp spillback	Congestion on freeway limits throughput of on-ramp to freeway

Figure 6-10: Alternative C Year 2038 Forecast Traffic Operational Conditions on State Route 58 and State Route 99

twenty years of benefits, amount to $605.3 million for the transportation systems management alternative, compared with more than $1 billion for alternatives A, B and C. The capital cost of the transportation systems management alternative has been preliminarily estimated as $252 million compared with an estimated $570 to $691 million for alternatives A, B and C. Thus, the transportation systems management alternative returns approximately 60 percent of the benefits provided by the full-build alternatives, but is more cost-effective. Over time, beyond the 20-year life cycle design year horizon, the transportation systems management alternative benefits continue to decline, year by year, while build alternatives A, B and C increase due to residual capacity being available to meet growth beyond 2038.

Table 6-2 provides specific information regarding the benefits calculated using the STEAM 2.0 computer software product, while Table 6-3 presents a summary of the cost versus benefit analysis.

Table 6-2. Summary of Centennial Corridor Project Benefits *(Year 2038)*

BENEFIT TYPE	BUILD ALTERNATIVE M	BUILD ALTERNATIVE A	BUILD ALTERNATIVE B	BUILD ALTERNATIVE C
User Benefits				
In-vehicle travel time	$ 16,259,900	$ 64,133,300	$ 60,348,900	$ 64,691,200
Fuel costs	2,576,200	6,395,300	5,149,700	5,898,300
Non-fuel operating costs	(213,000)	(2,248,500)	(3,002,300)	(3,159,400)
Internal accident costs	3,857,300	7,920,100	5,645,600	6,087,000
Revenue Transfers	$ (680,200)	(1,699,500)	$ (1,370,700)	$ (1,568,400)
Reduction in External Costs				
Emissions Global warming Noise	See detailed technical studies			
Accident	$ 474,500	$ 973,500	$ 694,500	$ 748,800
Other mileage based	0	0	0	0
Total Benefits $/year in 2038	**$ 22,274,700**	**$ 75,264,200**	**$ 68,836,400**	**$ 72,697,500**
Total Benefits $/year in 2018	**32,030,800**	**7,759,000**	**14,266,100**	**30,803,200**
Life Cycle Benefits 2018–2040 Total	**$605,287,000**	**$1,030,458,000**	**$1,014,868,000**	**$1,230,735,000**

Source: Parsons, based on STEAM 2.0

Table 6-3. Summary of Life-Cycle Benefits and Costs

METRIC	BUILD ALTERNATIVE M	BUILD ALTERNATIVE A	BUILD ALTERNATIVE B	BUILD ALTERNATIVE C
Cost	$252,000,000	$ 690,963,000	$ 569,946,000	$ 665,879,000
Present value of costs	$229,180,000	$ 627,607,000	$ 516,534,000	$ 603,614,000
Total benefits (Q2 2018–2040)	$605,287,000	$1,030,458,000	$1,014,868,000	$1,230,735,000
Present value of benefits	$433,029,000	$ 679,807,000	$ 677,650,000	$ 838,365,000
Present value benefit/cost ratio	1.9	1.1	1.3	1.4
Payback period	10 years	22 years	19 years	18 years

Given these findings, the authors of this traffic study conclude that the transportation systems management alternative is not a feasible alternative for meeting the long-term needs identified for the Centennial Corridor project.

6.7 Quantitative Traffic Performance of Build Alternatives A, B and C

Tables 6-4 through 6-7 present freeway mainline performance of AM peak hour conditions for the no-build alternative and build alternatives A, B and C. Graphic representations of these performance results were provided previously as Figures 6-5 and 6-8 through 6-10. On the whole, there is no significant difference between the build alternatives A, B and C insofar as the quality of service provided to the traveling public. None of the build alternatives stand above or below other build alternatives, except that all provide much better performance compared to the no-build alternative and the transportation system management alternative (which cannot be comparably measured).

In addition to quantifying freeway performance, level of service, a measure of traffic congestion, was calculated for 79 study area intersections. The locations of these intersections are illustrated on Figure 6-11. Level of service A through D meet quality of delay policy standards in metropolitan Bakersfield; while LOS E is on the cusp of excessive congestion, characterized by low speeds and traffic backups at intersections. As metropolitan areas increase in size and level of congestion, LOS E is often considered to be the limit of acceptable delay. At present, LOS D is the limit of acceptable delay in Kern County and metropolitan Bakersfield.

Table 6-8 provides a side-by-side comparison of intersection level of service for existing conditions versus year 2038 conditions. Alternatives A, B and C all perform, on balance, equal to the no-build alternative. There are spot locational differences due to the build alternatives reduction or elimination of bottlenecks along State Route 99, which allow more traffic to exit or enter the freeway at ramp terminal and adjacent intersections.

Comparing alternatives A, B and C with one another, alternative C yields one additional intersection failure (LOS F) compared with alternatives A and B. Intersection #51, Stockdale Highway at Real Road, fails under alternative C during the PM peak hour, as it does under no-build conditions. The intersection does not fail with alternatives A and B because the connection of Real Road to State Route 58 east is eliminated under these two build alternatives. Hence, less traffic is able to access Real Road and Stockdale Highway, in turn.

6.8 Local Circulation Impacts

In the case of each project alternative (A, B, and C), modifications to local streets and properties are required which affect travel access. The particular modifications and impacts depend on the alternative examined. Several local streets will be shortened, modified, or removed, but little or no disruption to existing circulation patterns is expected. In the limited number of cases where through traffic is eliminated on an existing local roadway, an adjacent or nearby street will provide an alternative route.

Adjustments to local roadways as a result of the proposed project are not expected to impact the provision of emergency services, such as fire or police, or affect access to health care facilities. Some minor adjustments with respect to route maps and patrol duties for fire and police

Table 6-4. No-Build Mainline Freeway Analysis Summary Results

Freeway Segment	NO-BUILD AM PEAK						NO-BUILD PM PEAK					
	Demand	Served	% Served	Speed	Density	LOS	Demand	Served	% Served	Speed	Density	LOS
	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)
SR-99 NB Mainline												
SR 99 NB south end of the network to White Lane off-ramp	7,025	6,570	94%	38	44.0	E	6,580	6,570	100%	60	28	D
White Lane off-ramp to White Lane loop on-ramp	5,960	5,527	93%	31	44.0	E	5,485	5,360	98%	59	23	C
White Lane loop on-ramp to White Lane direct on-ramp	7,565	5,850	77%	28	53.0	F	7,130	6,226	87%	47	33	D
White Lane diagonal on-ramp to Ming Avenue off-ramp	8,260	6,159	75%	23	66.0	F	7,740	6,805	88%	31	57	F
Ming Avenue off-ramp to Ming Avenue on-ramp	7,470	5,204	70%	18	72.0	F	6,920	5,857	85%	20	73	F
Ming Avenue on-ramp to SR 58 EB/Wible Road off-ramp	9,055	6,807	75%	32	47.0	F	8,415	7,374	88%	34	48	F
SR 58 EB/Wible Road off-ramp to Wible Road on-ramp	6,230	4,624	74%	61	19.0	C	5,915	5,185	88%	61	21	C
Wible Road on-ramp to SR 58 WB on-ramp	6,870	5,135	75%	61	21.0	C	6,525	5,683	87%	61	23	C
SR 58 WB on-ramp to California Avenue off-ramp	8,655	6,950	80%	58	29.0	D	8,240	7,383	90%	58	31	D
California Avenue off-ramp to California Avenue loop on-ramp	7,475	5,982	80%	62	24.0	C	7,360	6,598	90%	61	27	D
California Avenue loop on-ramp to California Avenue diagonal on-ramp	8,040	6,396	80%	60	26.0	D	8,100	7,058	87%	60	29	D
California Avenue diagonal on-ramp to Rosedale Highway off-ramp	8,280	6,349	77%	60	25.0	C	8,430	7,026	83%	58	28	D
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	5,840	4,599	79%	62	19.0	C	6,340	5,365	85%	62	22	C
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	5,015	3,917	78%	63	16.0	B	5,790	4,923	85%	62	20	C
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	5,615	4,451	79%	61	18.0	C	6,540	5,607	86%	60	24	C
Airport Drive off-ramp to SR 99 NB north end of the network	3,865	3,168	82%	63	13.0	B	5,125	4,390	86%	62	18	B
SR-99 SB Mainline												
SR 99 SB north end of the network to Airport Drive on-ramp	3,895	3,895	100%	64	15.0	B	4,595	4,595	100%	63	18	C
Airport Drive on-ramp to Rosedale Highway off-ramp	5,320	5,320	100%	60	22.0	C	6,710	6,412	96%	42	39	E
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	4,245	4,245	100%	63	17.0	B	5,615	5,417	96%	60	23	C
Rosedale Highway loop on-ramp to Rosedale Highway diagonal on-ramp	5,395	5,395	100%	59	19.0	C	6,995	6,891	99%	47	32	D
Rosedale Highway diagonal on-ramp to California Avenue off-ramp	7,085	7,085	100%	55	30.0	D	8,620	8,240	96%	52	39	E
California Avenue off-ramp to California Avenue on-ramp	5,885	5,885	100%	62	23.0	C	7,430	7,076	95%	40	45	E
California Avenue on-ramp to SR 58 EB/Stockdale Highway off-ramp	6,605	6,605	100%	55	27.0	D	8,480	8,048	95%	46	44	E
SR 58 EB/Stockdale Highway off-ramp to SR 58 WB on-ramp	4,715	4,715	100%	62	18.0	B	6,385	6,089	95%	55	28	D
SR 58 WB on-ramp to Real Road on-ramp	6,265	5,829	93%	52	34.0	D	8,140	7,419	91%	26	70	F
Real Road on-ramp to Ming Avenue off-ramp	6,775	6,721	99%	54	28.0	D	8,795	8,258	94%	42	47	F
Ming Avenue off-ramp to Ming Avenue on-ramp	5,545	5,410	98%	62	21.0	C	7,050	6,578	93%	61	27	D
Ming Avenue on-ramp to White Lane off-ramp	6,235	6,043	97%	61	24.0	C	7,885	7,452	95%	60	30	D
White Lane off-ramp to White Lane loop on-ramp	4,740	4,628	98%	63	18.0	C	5,855	5,522	94%	62	22	C
White Lane loop on-ramp to White Lane diagonal on-ramp	4,950	4,828	98%	62	19.0	C	6,430	6,018	94%	61	25	C
White Lane diagonal on-ramp to SR 99 SB south end of the network	5,410	4,952	92%	62	20.0	C	7,105	6,430	90%	61	26	D
WSP EB Mainline												
Westside Parkway west end of the network to West Beltway off-ramp	2,190	2,190	100%	47	24	C	2,180	2,155	99%	54	24	C
West Beltway off-ramp to West Beltway loop on-ramp	1,390	1,341	96%	61	11	B	1,225	1,130	92%	61	9	A
West Beltway loop on-ramp to West Beltway diagonal on-ramp	2,574	2,518	98%	61	14	B	2,100	1,985	95%	61	11	A
West Beltway diagonal on-ramp to Allen Road off-ramp	3,124	3,031	97%	63	16	B	2,245	2,120	94%	63	11	B
Allen Road off-ramp to Allen Road on-ramp	2,929	2,842	97%	63	15	B	2,065	1,967	95%	63	10	A
Allen Road on-ramp to Calloway Drive off-ramp	4,739	4,642	98%	60	26	C	3,675	3,524	96%	61	19	C
Calloway Drive off-ramp to Calloway Drive loop on-ramp	3,631	3,583	99%	63	19	C	2,746	2,627	96%	64	14	B
Calloway Drive loop on-ramp to Calloway Drive diagonal on-ramp	4,115	4,034	98%	62	22	C	3,127	2,974	95%	62	16	B
Calloway Drive diagonal on-ramp to Coffee Drive off-ramp	5,029	4,989	99%	59	28	D	3,889	3,706	95%	61	20	C
Coffee Drive off-ramp to Coffee Drive loop on-ramp	2,844	2,844	100%	64	15	B	2,184	2,058	94%	64	11	A
Coffee Drive loop on-ramp to Coffee Drive diagonal on-ramp	3,229	3,229	100%	63	13	B	2,614	2,469	94%	64	10	A
Coffee Drive diagonal on-ramp to Mohawk Street off-ramp	3,779	3,779	100%	63	15	B	3,089	2,920	95%	63	11	B
WSP WB Mainline												
Mohawk Street loop on-ramp to Mohawk Street diagonal ramp	1,957	1,957	100%	63	11	A	3,170	2,973	94%	62	16	B
Mohawk Street diagonal ramp to Coffee Drive off-ramp	2,962	2,919	99%	62	11	B	4,585	4,160	91%	62	16	B
Coffee Drive off-ramp to Coffee Drive loop on-ramp	1,777	1,757	99%	64	7	A	3,370	3,199	95%	64	13	B
Coffee Drive loop on-ramp to Coffee Drive diagonal on-ramp	2,332	2,225	95%	63	9	A	4,350	4,109	94%	62	17	B
Coffee Drive diagonal on-ramp to Calloway Drive diagonal off-ramp	2,977	2,840	95%	63	12	B	5,375	5,148	96%	61	22	C
Calloway Drive diagonal off-ramp to Calloway Drive loop off-ramp	2,665	2,550	96%	62	14	B	4,865	4,614	95%	61	25	C
Calloway Drive loop off-ramp to Calloway Drive on-ramp	2,085	1,996	96%	64	10	A	3,850	3,670	95%	63	20	C
Calloway Drive on-ramp to Allen Road off-ramp	2,550	2,446	96%	63	13	B	4,835	4,628	96%	60	26	C
Allen Road off-ramp to Allen Road on-ramp	1,700	1,643	97%	64	9	A	2,955	2,825	96%	63	15	B
Allen Road on-ramp to West Beltway off-ramp	1,925	1,864	97%	63	10	A	3,285	3,138	96%	62	17	B
West Beltway off-ramp to West Beltway loop on-ramp	865	825	95%	64	6	A	1,410	1,363	97%	63	11	A
West Beltway loop on-ramp to West Beltway diagonal on-ramp	1,260	1,158	92%	62	9	A	1,955	1,831	94%	61	15	B
West Beltway diagonal on-ramp to Westside Parkway west end of the network	1,550	1,452	94%	60	12	B	2,305	2,181	95%	58	19	C
SR58 EB Mainline												
SR 99 on-ramp to H Street off-ramp	4,850	4,300	89%	58	25	C	4,585	4,138	90%	59	24	C
H Street off-ramp to Chester Avenue on-ramp	4,305	3,815	89%	62	21	C	4,110	3,701	90%	62	20	C
Chester Avenue on-ramp to Union Avenue off-ramp	4,900	4,494	92%	59	25	C	4,950	4,535	92%	60	25	C
Union Avenue off-ramp to Union Avenue loop on-ramp	3,985	3,718	93%	62	20	C	4,305	3,967	92%	62	21	C
Union Avenue loop on-ramp to Union Avenue diagonal on-ramp	4,285	3,969	93%	62	22	C	5,075	4,575	90%	60	25	C
Union Avenue diagonal on-ramp to Cottonwood Road off-ramp	4,560	4,249	93%	61	23	C	5,710	5,226	92%	60	29	D
Cottonwood Road off-ramp to Cottonwood Road on-ramp	4,010	3,751	94%	62	20	C	5,110	4,698	92%	62	25	C
Cottonwood Road on-ramp to SR 58 east end of the network	4,315	4,052	94%	62	22	C	5,595	5,169	92%	61	28	D
SR58 WB Mainline												
SR 58 east end of the network to Cottonwood Road off-ramp	4,870	4,870	100%	63	26	D	4,090	4,090	100%	63	22	C
Cottonwood Road off-ramp to Cottonwood Road on-ramp	4,615	4,615	100%	62	25	C	3,850	3,830	99%	63	20	C
Cottonwood Road on-ramp to Brundage Lane off-ramp	4,855	4,855	100%	61	27	D	4,250	4,226	99%	62	23	C
Brundage Lane off-ramp to Brundage Lane on-ramp	3,975	3,931	99%	62	21	C	3,655	3,655	100%	62	20	C
Brundage Lane on-ramp to Union Avenue on-ramp	4,195	4,123	98%	61	23	C	4,050	4,008	99%	61	22	C
Union Avenue on-ramp to Chester Avenue off-ramp	4,595	4,505	98%	60	25	C	4,605	4,527	98%	60	25	C
Chester Avenue off-ramp to H Street on-ramp	3,860	3,778	98%	62	20	C	3,960	3,850	97%	46	29	D
H Street on-ramp to SR 99 NB off-ramp	4,265	4,265	100%	56	26	C	4,555	4,323	95%	39	37	E
SR 99 NB off-ramp to SR 99 SB off-ramp	2,480	2,480	100%	58	14	B	2,840	2,677	94%	23	40	E

Bottleneck Location

Queue

Table 6-5. Alternative A Mainline Freeway Analysis Summary Results

Freeway Segment	ALT. A AM PEAK						ALT. A PM PEAK					
	Demand	Served	%Served	Speed	Density	LOS	Demand	Served	%Served	Speed	Density	LOS
	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)
SR-99 NB Mainline												
SR 99 NB south end of the network to White Lane off-ramp	7,075	7,075	100%	59	31	D	6,655	6,655	100%	62	27	D
White Lane off-ramp to White Lane loop on-ramp	5,950	5,848	98%	61	24	C	5,575	5,566	100%	62	23	C
White Lane loop on-ramp to White Lane direct on-ramp	7,590	7,162	94%	47	38	E	7,230	6,686	92%	51	33	D
White Lane direct on-ramp to Ming Avenue off-ramp	8,285	8,015	97%	58	32	D	7,915	7,395	93%	56	30	D
Ming Avenue off-ramp to C-D (SR 58 WB) off-ramp	7,370	7,370	100%	60	25	C	7,065	6,781	96%	53	26	C
SR 58 WB off-ramp to SR 58 EB off-ramp	6,245	6,117	98%	60	23	C	5,935	5,456	92%	60	21	C
SR 58 EB off-ramp to Ming Avenue on-ramp	4,990	4,990	100%	62	20	C	4,270	4,065	95%	63	16	B
Ming Avenue on-ramp to SR 58 on-ramp	5,990	5,888	98%	60	25	C	5,120	4,836	94%	61	20	C
SR 58 on-ramp to California Avenue off-ramp	7,175	7,163	100%	58	30	D	6,240	6,016	96%	60	24	C
California Avenueoff-ramp to California Avenue loop on-ramp	6,025	6,025	100%	62	24	C	5,530	5,308	96%	62	21	C
California Avenue loop on-ramp to California Avenue direct on-ramp	7,075	6,780	96%	58	29	D	6,905	6,108	88%	57	27	D
California Avenue direct on-ramp to Rosedale Highway off-ramp	7,555	6,881	91%	57	28	D	7,805	6,598	85%	53	30	D
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	5,590	5,192	93%	61	21	C	6,005	5,209	87%	62	21	C
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	4,795	4,432	92%	63	18	B	5,605	4,859	87%	63	19	C
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	5,515	5,124	93%	59	22	C	6,395	5,618	88%	60	24	C
Airport Dr off-ramp to SR 99 NB north end of the network	3,775	3,556	94%	63	14	B	5,030	4,446	88%	62	18	B
SR-99 SB Mainline												
SR99 SB north end of the network to Airport Dr On Ramp	4,035	4,035	100%	64	16	B	4,735	4,735	100%	63	19	C
Airport Dr On Ramp to Rosedale Hwy Off Ramp	5,485	5,450	99%	60	22	C	6,805	6,805	100%	55	30	D
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	4,110	4,110	100%	63	16	B	5,495	5,495	100%	60	24	C
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	5,210	5,210	100%	55	21	C	6,870	6,870	100%	42	36	E
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	6,045	6,045	100%	57	26	D	8,210	8,151	99%	40	51	F
California Ave Off Ramp to California Ave On Ramp	4,550	4,550	100%	62	19	C	6,555	6,442	98%	60	27	D
California Ave On Ramp to SR58 EB Off Ramp	5,110	5,110	100%	60	21	C	7,495	7,202	96%	58	30	D
SR58 EB Off Ramp to Ming Ave Off Ramp	4,155	4,155	100%	62	17	B	6,055	5,814	96%	61	24	C
Ming Ave Off Ramp to SR58 WB On Ramp	3,220	3,220	100%	63	13	B	4,850	4,617	95%	62	18	C
SR58 WB On Ramp to Ming Ave On Ramp	5,745	5,745	100%	62	18	B	7,590	7,109	94%	49	28	D
Ming Ave On Ramp to White Ln Off Ramp	6,530	6,516	100%	59	27	D	8,435	7,514	89%	34	56	F
White Ln Off Ramp to White Ln Loop On Ramp	4,860	4,841	100%	63	19	C	6,365	5,629	88%	61	23	C
White Ln Loop On Ramp to White Ln Direct On Ramp	5,120	4,953	97%	62	20	C	6,915	6,129	89%	61	25	C
White Ln Direct On Ramp to SR99 SB south end of the network	5,565	5,193	93%	62	21	C	7,560	6,506	86%	61	27	D
WSP EB Mainline												
Westside Parkway west end of the network to West Beltway off-ramp	2,230	2,230	100%	47	24	C	2,220	2,217	100%	44	25	C
West Beltway off-ramp to West Beltway loop on-ramp	1,485	1,485	100%	61	12	B	1,350	1,267	94%	60	11	A
West Beltway loop on-ramp to West Beltway direct on-ramp	3,010	2,796	93%	61	15	B	2,690	2,586	96%	61	14	B
West Beltway direct on-ramp to Allen Road off-ramp	3,300	3,073	93%	62	16	B	2,965	2,835	96%	63	15	B
Allen Road off-ramp to Allen Road on-ramp	2,920	2,699	92%	63	14	B	2,655	2,543	96%	63	13	B
Allen Road on-ramp to Calloway Drive off-ramp	4,920	4,665	95%	60	26	C	4,530	4,351	96%	61	24	C
Calloway Drive off-ramp to Calloway Drive loop on-ramp	3,960	3,796	96%	63	20	C	3,730	3,606	97%	63	19	C
Calloway Drive loop on-ramp to Calloway Drive direct on-ramp	4,900	4,653	95%	59	26	D	4,770	4,558	96%	58	26	D
Calloway Drive direct on-ramp to Coffee Drive off-ramp	6,050	5,867	97%	59	32	D	5,880	5,703	97%	60	31	D
Coffee Drive off-ramp to Truxtun Avenue/Mohawk Street off-ramp	5,025	4,836	96%	61	21	C	5,055	4,869	96%	62	21	C
Truxtun Avenue off-ramp to Coffee Drive on-ramps	1,935	1,839	95%	63	15	B	2,355	2,296	97%	63	18	C
Coffee Drive on-ramps to SR 99 SB and Ming Avenue C-D off-ramp	3,810	3,700	97%	61	20	C	4,525	4,438	98%	61	24	C
SR 99 SB off-ramp (and C-D Ming Avenue) to H Street off-ramp	1,930	1,836	95%	63	15	B	2,355	2,309	98%	62	19	C
H Street off-ramp to SR 99 NB and SB on-ramp	1,648	1,564	95%	63	12	B	2,047	1,986	97%	63	16	B
SR 99 NB and SB on-ramp to Chester Avenue on-ramp	3,535	3,408	96%	60	12	B	4,745	4,275	90%	58	16	B
Chester Avenue on-ramp to Union Avenue off-ramp	4,560	4,401	97%	61	18	C	5,935	5,410	91%	60	23	C
Union Avenue off-ramp to Union Avenue loop on-ramp	3,525	3,405	97%	63	18	C	4,910	4,517	92%	62	24	C
Union Avenue loop on-ramp to Union Avenue direct on-ramp	3,865	3,698	96%	62	20	C	5,575	5,086	91%	59	29	D
Union Avenue direct on-ramp to Cottonwood Road off-ramp	4,190	4,044	97%	62	22	C	6,150	5,727	93%	59	32	D
Cottonwood Road off-ramp to Cottonwood Road on-ramp	3,560	3,445	97%	63	18	C	5,245	4,893	93%	62	26	D
Cottonwood Road on-ramp to SR 58 east end of the network	3,870	3,739	97%	62	20	C	5,545	5,172	93%	61	28	D
WSP WB Mainline												
SR 58 east end of the network to Cottonwood Road off-ramp	5,270	5,270	100%	63	28	D	5,030	5,030	100%	63	27	D
Cottonwood Road off-ramp to Cottonwood Road on-ramp	5,035	5,035	100%	62	27	D	4,725	4,717	100%	62	25	C
Cottonwood Road on-ramp to Brundage Lane off-ramp	5,350	5,350	100%	56	33	D	5,255	5,219	99%	60	29	D
Brundage Lane off-ramp to Brundage Lane on-ramp	4,170	4,082	98%	61	22	C	4,265	4,222	99%	62	23	C
Brundage Lane on-ramp to Union Avenue on-ramp	4,535	4,409	97%	61	24	C	4,625	4,545	98%	60	25	C
Union Avenue on-ramp to Chester Avenue off-ramp	5,100	4,963	97%	61	20	C	5,395	5,323	99%	60	22	C
Chester Avenue off-ramp to H Street on-ramp	4,070	3,952	97%	62	21	C	4,280	4,249	99%	62	23	C
H Street on-ramp to SR 99 NB off-ramp	4,705	4,612	98%	61	19	C	4,940	4,901	99%	60	20	C
SR 99 NB off-ramp to SR 99 SB off-ramp	3,520	3,444	98%	61	19	C	3,820	3,795	99%	61	21	C
SR 99 SB off-ramp to SR 99 NB on-ramp	2,320	2,218	96%	62	18	B	2,595	2,581	99%	62	21	C
SR 99 NB on-ramp to Coffee Drive off-ramp	3,820	3,753	98%	61	20	C	4,225	4,290	102%	61	23	C
Coffee Drive off-ramp to Mohawk Street/Truxtun Avenue on-ramp	1,870	1,843	99%	63	15	B	2,650	2,650	100%	62	22	C
Mohawk Street/Truxtun Avenue on-ramp to Coffee Drive loop on-ramp	4,030	3,966	98%	63	16	B	6,430	6,355	99%	62	26	C
Coffee Drive loop on-ramp to Coffee Drive direct on-ramp	4,180	4,101	98%	63	16	B	6,670	6,556	98%	61	27	D
Coffee Drive direct on-ramp to Calloway Drive direct off-ramp	4,480	4,348	97%	62	17	B	7,220	7,073	98%	60	29	D
Calloway Drive direct off-ramp to Calloway Drive loop off-ramp	3,830	3,689	96%	62	15	B	6,225	6,091	98%	61	25	C
Calloway Drive loop off-ramp to Calloway Drive on-ramp	2,920	2,800	96%	63	15	B	4,875	4,764	98%	62	26	C
Calloway Drive on-ramp to Allen Road off-ramp	3,420	3,287	96%	62	18	B	5,755	5,589	97%	58	32	D
Allen Road off-ramp to Allen Road on-ramp	2,270	2,168	96%	64	11	B	3,525	3,454	98%	63	18	C
Allen Road on-ramp to West Beltway off-ramp	2,620	2,492	95%	62	13	B	3,895	3,792	97%	61	21	C
West Beltway off-ramp to West Beltway loop on-ramp	1,120	1,090	97%	64	9	A	1,510	1,468	97%	63	12	B
West Beltway loop on-ramp to West Beltway direct on-ramp	1,440	1,318	92%	62	11	A	1,935	1,842	95%	61	15	B
West Beltway direct on-ramp to Westside Parkway west end of the network	1,745	1,600	92%	60	13	B	2,280	2,184	96%	59	19	C
SR99 NB C-D												
SR 99 NB C-D on-ramp to Westside Parkway C-D off-ramp	2,500	2,500	100%	53	16	B	2,480	2,480	100%	53	16	B
SR99 SB C-D												
Westside Parkway C-D on-ramp to SR 99 SB C-D on-ramp	2,525	2,525	100%	45	19	C	2,740	2,662	97%	42	21	C
WSP EB C-D 1												
Begin C-D (Coffee Drive loop on-ramp to Coffee Drive direct on-ramp)	915	915	100%	49	19	C	1,100	1,100	100%	49	23	C
Coffee Drive direct on-ramp to end of C-D network (Westside Parkway EB)	1,875	1,875	100%	53	18	B	2,170	2,155	99%	53	20	C
WSP EB C-D 2												
Begin C-D to Mohawk Street off-ramp	3,090	3,030	98%	52	23	C	2,700	2,608	97%	53	20	C
Mohawk Street off-ramp to Mohawk Street on-ramp	1,580	1,536	97%	54	14	B	1,300	1,250	96%	54	12	B
WSP EB C-D 3												
WSP EB C-D On Ramp to SR 99 SB Off Ramp	1,880	1,851	98%	52	15	B	2,170	2,107	97%	51	17	B
SR 99 SB Off Ramp to SR 99 SB C-D On Ramp	555	546	98%	47	7	A	655	626	96%	47	8	A
SR 99 SB C-D On Ramp to Ming Ave	1,490	1,468	99%	48	15	B	1,860	1,805	97%	44	23	C
WSP WB C-D												
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	800	780	98%	64	6	A	1,710	1,653	97%	64	13	B
Mohawk Street loop on-ramp to Mohawk Street direct on-ramp	1,305	1,270	97%	62	10	A	2,735	2,620	96%	60	22	C
Mohawk Street direct on-ramp to Westside Parkway on-ramp (end of C-D network)	2,160	2,127	98%	61	14	B	3,780	3,672	97%	59	25	C

Bottleneck Location

Queue

Table 6-6. Alternative B Mainline Freeway Analysis Summary Results

Freeway Segment	ALT. B AM PEAK						ALT. B PM PEAK					
	Demand	Served	%Served	Speed	Density	LOS	Demand	Served	%Served	Speed	Density	LOS
	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)
SR-99 NB Mainline												
SR-99 NB south end of the network to White Lane offramp	6,945	6,945	100%	62	28	D	6,695	6,695	100%	62	27	D
White Lane off-ramp to White Lane loop on-ramp	5,865	5,865	100%	61	24	C	5,600	5,558	99%	62	23	C
White Lane loop on-ramp to White Lane direct on-ramp	7,495	7,133	95%	46	39	E	7,230	6,610	91%	51	32	D
White Lane direct on-ramp to Ming Avenue off-ramp	8,200	8,094	99%	58	32	D	7,905	7,433	94%	59	29	D
Ming Avenue off-ramp to C-D (SR 58 WB) off-ramp	7,325	7,325	100%	61	25	C	7,045	6,861	97%	61	23	C
SR 58 WB off-ramp to SR 58 EB off-ramp	6,055	5,970	99%	60	22	C	5,840	5,645	97%	61	21	C
SR 58 EB off-ramp to Ming Avenue on-ramp	4,805	4,784	100%	62	19	C	4,185	4,106	98%	63	16	B
Ming Avenue on-ramp to SR 58 on-ramp	5,755	5,668	98%	60	23	C	4,960	4,828	97%	61	20	C
SR 58 on-ramp to California Avenue off-ramp	6,855	6,855	100%	59	28	D	6,055	5,965	99%	60	24	C
California Avenue off-ramp to California Avenue loop on-ramp	5,755	5,753	100%	62	23	C	5,371	5,191	97%	62	21	C
California Avenue loop on-ramp to California Avenue direct on-ramp	6,815	6,674	98%	56	30	D	6,740	6,024	89%	58	26	C
California Avenue direct on-ramp to Rosedale Highway off-ramp	7,285	6,933	95%	56	29	D	7,650	6,545	86%	54	29	D
Rosedale Highway off-ramp to Buck Owens Boulevard/Sillect Avenue off-ramp	5,545	5,454	98%	61	22	C	6,020	5,283	88%	62	21	C
Buck Owens Boulevard/Sillect Avenue off-ramp to Buck Owens Boulevard/Sillect Avenue on-ramp	4,725	4,646	98%	62	19	C	5,650	4,934	87%	63	20	C
Buck Owens Boulevard/Sillect Avenue on-ramp to Airport Drive off-ramp	5,420	5,271	97%	58	23	C	6,425	5,719	89%	60	24	C
Airport Drive off-ramp to SR 99 NB north end of the network	3,700	3,591	97%	63	14	B	5,020	4,502	90%	62	18	C
SR-99 SB Mainline												
SR 99 SB north end of the network to Airport Drive on-ramp	4,025	4,025	100%	64	16	B	4,740	4,740	100%	63	19	C
Airport Drive on-ramp to Rosedale Highway off-ramp	5,425	5,425	100%	60	22	C	6,825	6,825	100%	56	30	D
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	4,075	4,075	100%	63	17	B	5,535	5,535	100%	61	23	C
Rosedale Highway loop on-ramp to Rosedale Highway direct on-ramp	5,170	5,170	100%	55	21	C	6,930	6,930	100%	44	35	E
Rosedale Highway direct on-ramp to California Avenue off-ramp	5,825	5,825	100%	57	26	C	8,000	8,000	100%	43	45	F
California Avenue off-ramp to California Avenue on-ramp	4,370	4,370	100%	62	18	B	6,340	6,323	100%	60	26	D
California Avenue on-ramp to SR 58 EB off-ramp	4,905	4,905	100%	61	20	C	7,290	7,175	98%	57	30	D
SR 58 EB off-ramp to Ming Avenue off-ramp	3,990	3,990	100%	62	16	B	5,875	5,796	99%	61	24	C
Ming Avenue off-ramp to SR 58 WB on-ramp	3,150	3,150	100%	63	13	B	4,750	4,750	100%	62	19	C
SR 58 WB on-ramp to Ming Avenue on-ramp	5,760	5,664	98%	62	17	B	7,610	7,551	99%	59	24	C
Ming Avenue on-ramp to White Lane off-ramp	6,535	6,447	99%	59	26	D	8,465	8,044	95%	37	53	F
White Lane off-ramp to White Lane loop on-ramp	4,835	4,752	98%	63	19	C	6,405	6,075	95%	61	25	C
White Lane loop on-ramp to White Lane direct on-ramp	5,075	4,975	98%	62	20	C	6,945	6,550	94%	61	27	D
White Lane direct on-ramp to SR 99 SB south end of the network	5,510	5,243	95%	62	21	C	7,570	6,939	92%	61	28	D
WSP EB Mainline												
WSP west end of the network to West Beltway Off Ramp	2,220	2,220	100%	47	24	C	2,215	2,176	98%	46	24	C
West Beltway Off Ramp to West Beltway Loop On Ramp	1,495	1,468	98%	61	12	B	1,350	1,260	93%	60	10	A
West Beltway Loop On Ramp to West Beltway Direct On Ramp	2,990	2,956	99%	61	16	B	2,680	2,551	95%	61	14	B
West Beltway Direct On Ramp to Allen Rd Off Ramp	3,290	3,233	98%	62	17	B	2,945	2,824	96%	63	15	B
Allen Rd Off Ramp to Allen Rd On Ramp	2,915	2,861	98%	63	15	B	2,645	2,541	96%	63	13	B
Allen Rd On Ramp to Calloway Dr Off Ramp	4,910	4,909	100%	60	27	D	4,495	4,356	97%	61	24	C
Calloway Dr Off Ramp to Calloway Dr Loop On Ramp	3,960	3,940	99%	63	21	C	3,680	3,570	97%	63	19	C
Calloway Dr Loop On Ramp to Calloway Dr Direct On Ramp	4,930	4,821	98%	59	27	D	4,690	4,516	96%	60	25	C
Calloway Dr Direct On Ramp to Coffee Dr Off Ramp	6,055	6,018	99%	60	32	D	5,785	5,677	98%	60	31	D
Coffee Dr Off Ramp to Coffee Dr Loop On Ramp	4,980	4,936	99%	62	26	D	4,910	4,803	98%	62	26	C
Coffee Dr Loop On Ramp to Coffee Dr Direct On Ramp	5,970	5,892	99%	62	24	C	5,960	5,874	99%	61	24	C
Coffee Dr Direct On Ramp to Mohawk St Off Ramp	7,040	6,691	95%	59	28	D	7,075	6,961	98%	58	29	D
Mohawk St Off Ramp to Mohawk St On Ramp	5,220	4,918	94%	60	27	D	5,425	5,379	99%	61	30	D
Mohawk St On Ramp to Truxtun Ave Off Ramp	5,735	5,422	95%	60	24	C	6,515	6,410	98%	57	29	D
Truxtun Ave Off Ramp to SR99 SB C-D Off Ramp(SR99 SB&Ming Ave)	4,135	3,835	93%	62	21	C	5,115	5,020	98%	61	28	D
SR99 SB C-D Off Ramp(SR99 SB&Ming Ave) to H St Off Ramp	2,095	1,934	92%	63	15	B	2,760	2,690	97%	62	22	C
H St Off Ramp to SR 99 NB&SB On Ramp	1,762	1,625	92%	63	13	B	2,393	2,353	98%	62	19	C
SR99 NB&SB On Ramp to Chester Ave On Ramp	3,605	3,487	97%	63	13	B	5,055	4,957	98%	61	18	C
Chester Ave On Ramp to Union Ave Off Ramp	4,600	4,462	97%	61	18	C	6,260	6,160	98%	59	26	D
Union Ave Off Ramp to Union Ave Loop On Ramp	3,580	3,456	97%	63	18	C	5,210	5,088	98%	62	28	D
Union Ave Loop On Ramp to Union Ave Direct On Ramp	3,905	3,705	95%	62	20	C	5,845	5,625	96%	59	32	D
Union Ave Direct On Ramp to Cottonwood Rd Off Ramp	4,235	4,032	95%	62	22	C	6,410	6,242	97%	59	33	D
Cottonwood Rd Off Ramp to Cottonwood Rd On Ramp	3,600	3,413	95%	63	18	C	5,470	5,317	97%	62	29	D
Cottonwood Rd On Ramp to SR58 east end of the network	3,915	3,717	95%	63	20	C	5,765	5,578	97%	61	30	D
WSP WB Mainline												
SR 58 east end of the network to Cottonwood Road off-ramp	5,220	5,220	100%	63	28	D	4,970	4,970	100%	63	26	D
Cottonwood Road off-ramp to Cottonwood Road on-ramp	5,015	5,015	100%	62	27	D	4,675	4,641	99%	62	25	C
Cottonwood Road on-ramp to Brundage Lane off-ramp	5,340	5,340	100%	60	30	D	5,195	5,129	99%	61	28	D
Brundage Lane off-ramp to Brundage Lane on-ramp	4,225	4,225	100%	62	23	C	4,205	4,166	99%	62	22	C
Brundage Lane on-ramp to Union Avenue on-ramp	4,600	4,597	100%	61	25	C	4,560	4,472	98%	61	24	C
Union Avenue on-ramp to Chester Avenue off-ramp	5,180	5,180	100%	61	21	C	5,310	5,267	99%	60	22	C
Chester Avenue off-ramp to H Street on-ramp	4,085	4,085	100%	62	22	C	4,210	4,210	100%	62	23	C
H Street on-ramp to SR 99 NB off-ramp	4,785	4,785	100%	61	20	C	4,925	4,925	100%	61	20	C
SR 99 NB off-ramp to SR 99 SB off-ramp	3,685	3,680	100%	61	20	C	3,830	3,830	100%	61	21	C
SR 99 SB off-ramp to SR 99 NB on-ramp	2,514	2,471	98%	62	20	C	2,610	2,610	100%	62	21	C
SR 99 NB on-ramp to Mohawk Street off-ramp	4,199	4,199	100%	61	23	C	4,355	4,286	98%	61	23	C
Mohawk Street off-ramp to Truxtun Avenue on-ramp	3,319	3,319	100%	61	27	D	3,610	3,585	99%	61	29	D
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	4,339	4,336	100%	61	24	C	5,475	5,429	99%	60	30	D
Mohawk Street loop on-ramp to Mohawk Street direct ramp	4,994	4,975	100%	62	20	C	6,730	6,629	98%	61	27	D
Mohawk Street direct ramp to Coffee Drive off-ramp	5,784	5,521	95%	61	21	C	7,720	7,230	94%	59	28	D
Coffee Drive off-ramp to Coffee Drive loop on-ramp	3,609	3,518	97%	63	14	B	5,690	5,565	98%	62	22	C
Coffee Drive loop on ramp to Coffee Drive direct on-ramp	3,769	3,657	97%	63	14	B	5,970	5,820	97%	62	23	C
Coffee Drive direct on-ramp to Calloway Drive direct off-ramp	4,094	3,892	95%	63	15	B	6,545	6,360	97%	61	26	C
Calloway Drive direct off-ramp to Calloway Drive loop off-ramp	3,494	3,319	95%	62	13	B	5,620	5,358	95%	61	22	C
Calloway Drive loop off-ramp to Calloway Drive on-ramp	2,734	2,544	93%	63	13	B	4,375	4,166	95%	62	22	C
Calloway Drive on-ramp to Allen Road off-ramp	3,309	3,056	92%	62	16	B	5,390	5,094	95%	59	29	D
Allen Road off-ramp to Allen Road on-ramp	2,184	2,046	94%	64	11	A	3,265	3,119	96%	63	16	B
Allen Road on-ramp to West Beltway off-ramp	2,564	2,396	93%	62	13	B	3,700	3,549	96%	62	19	C
West Beltway off-ramp to West Beltway loop on-ramp	1,079	992	92%	64	8	A	1,510	1,441	95%	64	11	B
West Beltway loop on-ramp to West Beltway direct on-ramp	1,384	1,268	92%	62	10	A	1,960	1,815	93%	61	15	B
West Beltway direct on-ramp to Westside Parkway west end of the network	1,674	1,555	93%	60	13	B	2,320	2,173	94%	58	19	C
State Route 99 NB Collector-Distributor												
SR 99 NB C-D on-ramp to Westside Parkway C-D off-ramp	2,635	2,635	100%	53	17	B	2,520	2,434	97%	53	15	B
State Route 99 SB Collector-Distributor												
Westside Parkway C-D on-ramp to SR 99 SB C-D on-ramp	2,610	2,503	96%	46	18	C	2,860	2,860	100%	46	22	C
Westside Parkway EB Collector-Distributor												
Westside Parkway EB C-D on-ramp to SR 99 SB off-ramp	2,040	1,886	92%	52	15	B	2,355	2,315	98%	52	18	C
SR 99 SB off-ramp to SR 99 SB C-D on-ramp	600	577	96%	47	6	A	715	682	95%	47	7	A
SR 99 SB C-D on-ramp to Ming Avenue	1,440	1,418	98%	48	15	B	1,840	1,705	93%	48	18	B

Bottleneck Location

Queue

Table 6-7. Alternative C Mainline Freeway Analysis Summary Results

Freeway Segment	ALT. C AM PEAK						ALT. C PM PEAK					
	Demand	Served	%Served	Speed	Density	LOS	Demand	Served	%Served	Speed	Density	LOS
	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)	(vph)	(vph)		(MPH)	(veh/ln/mi)	(HCM 2000)
SR-99 NB Mainline												
SR-99 NB south end of the network to White Ln Off Ramp	7,085	7,085	100%	62	29	D	6,680	6,680	100%	62	27	D
White Ln Off Ramp to White Ln Loop On Ramp	6,000	6,000	100%	61	24	C	5,575	5,524	99%	62	22	C
White Ln Loop On Ramp to White Ln Direct On Ramp	7,650	7,241	95%	45	40	E	7,210	6,578	91%	51	32	D
White Ln Direct On Ramp to Ming Ave Off Ramp	8,350	8,324	100%	58	36	E	7,890	7,598	96%	59	32	D
Ming Ave Off Ramp to Ming Ave On Ramp	7,455	7,455	100%	61	31	D	7,005	6,754	96%	61	28	D
Ming Ave On Ramp to SR58 EB Off Ramp	9,030	9,030	100%	59	31	D	8,525	8,291	97%	59	28	D
SR58 EB Off Ramp to SR99 NB C-D Off Ramp(WSP WB)	7,735	7,303	94%	60	27	D	7,090	6,490	92%	61	24	C
SR99 NB C-D Off Ramp(WSP WB) to California Ave Off Ramp	6,000	5,948	99%	61	24	C	5,220	5,112	98%	62	21	C
California Ave Off Ramp to SR99 NB C-D On Ramp(SR58WB&H St)	4,950	4,933	100%	59	21	C	4,565	4,404	96%	60	18	C
SR99 NB C-D On Ramp(SR58WB&H St) to California Ave Loop On Ramp	6,055	5,986	99%	60	25	C	5,695	5,493	96%	61	23	C
California Ave Loop On Ramp to California Ave Direct On Ramp	6,985	6,688	96%	58	29	D	7,005	6,287	90%	58	27	D
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	7,420	7,057	95%	59	24	C	7,840	6,948	89%	58	24	C
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	5,655	5,349	95%	61	22	C	6,170	5,380	87%	61	22	C
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	4,840	4,595	95%	62	18	C	5,795	5,030	87%	62	20	C
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	5,515	5,253	95%	59	22	C	6,550	5,747	88%	59	24	C
Airport Dr Off Ramp to SR99 NB north end of the network	3,755	3,518	94%	63	14	B	5,130	4,482	87%	62	18	B
SR-99 SB Mainline												
SR 99 SB north end of the network to Airport Drive on-ramp	3,980	3,980	100%	64	16	B	4,795	4,795	100%	63	19	C
Airport Drive on-ramp to Rosedale Highway off-rRamp	5,390	5,314	99%	60	21	C	6,850	6,850	100%	55	31	D
Rosedale Highway off-ramp to Rosedale Highway loop on-ramp	4,030	4,009	99%	63	16	B	5,550	5,550	100%	60	24	C
Rosedale Highway loop on-ramp to Rosedale Highway direct on-ramp	5,120	5,120	100%	55	20	C	6,920	6,920	100%	43	36	E
Rosedale Highway direct on-ramp to California Avenue off-ramp	5,770	5,770	100%	58	24	C	7,980	7,980	100%	41	48	F
California Avenue off-ramp to California Avenue on-ramp	4,355	4,355	100%	62	18	B	6,355	6,354	100%	60	27	D
California Avenue on-ramp to SR 58 EB off-ramp	4,880	4,880	100%	62	16	B	7,300	7,177	98%	61	24	C
SR58 EB off-ramp to SR 99 SB off-ramp (Ming Avenue)	3,960	3,935	99%	62	16	B	5,910	5,815	98%	61	24	C
SR 99 SB off-ramp (Ming Avenue) to SR 99 SB on-ramp (Westside Parkway EB and SR 58 WB and H Street)	3,160	3,118	99%	63	12	B	4,795	4,763	99%	61	19	C
SR 99 SB on-ramp (Westside Parkway EB and SR 58 WB and H Street) to Ming Avenue on-ramp	5,609	5,509	98%	61	18	B	7,535	7,465	99%	61	24	C
Ming Avenue on-ramp to White Lane off-ramp	6,404	6,284	98%	58	26	C	8,375	8,224	98%	39	55	F
White Lane off-ramp to White Lane loop on-ramp	4,719	4,653	99%	62	19	C	6,355	6,244	98%	61	26	C
White Lane loop on-ramp to White Lane direct on-ramp	4,979	4,766	96%	62	19	C	6,920	6,732	97%	61	28	D
White Lane direct on-ramp to SR 99 SB south end of the network	5,246	5,063	97%	62	20	C	7,333	7,116	97%	61	29	D
WSP EB Mainline												
WSP west end of the network to West Beltway Off Ramp	2,215	2,215	100%	46	25	C	2,210	2,210	100%	46	27	D
West Beltway Off Ramp to West Beltway Loop On Ramp	1,530	1,517	99%	60	13	B	1,360	1,318	97%	60	11	A
West Beltway Loop On Ramp to West Beltway Direct On Ramp	3,005	2,966	99%	61	16	B	2,685	2,608	97%	61	14	B
West Beltway Direct On Ramp to Allen Rd Off Ramp	3,285	3,209	98%	62	17	B	2,940	2,850	97%	63	15	B
Allen Rd Off Ramp to Allen Rd On Ramp	2,925	2,843	97%	63	15	B	2,645	2,547	96%	63	13	B
Allen Rd On Ramp to Calloway Dr Off Ramp	4,915	4,870	99%	60	27	D	4,465	4,383	98%	61	24	C
Calloway Dr Off Ramp to Calloway Dr Loop On Ramp	3,940	3,940	100%	63	21	C	3,640	3,631	100%	63	19	C
Calloway Dr Loop On Ramp to Calloway Dr Direct On Ramp	4,860	4,806	99%	59	27	D	4,605	4,525	98%	59	25	C
Calloway Dr Direct On Ramp to Coffee Dr Off Ramp	5,960	5,960	100%	60	32	D	5,690	5,652	99%	61	30	D
Coffee Dr Off Ramp to Coffee Dr Loop On Ramp	4,910	4,872	99%	62	26	D	4,815	4,815	100%	62	26	C
Coffee Dr Loop On Ramp to Coffee Dr Direct On Ramp	5,860	5,811	99%	62	24	C	5,885	5,885	100%	61	24	C
Coffee Dr Direct On Ramp to Mohawk St Off Ramp	6,935	6,878	99%	55	31	D	6,995	6,995	100%	56	31	D
Mohawk St Off Ramp to Mohawk St On Ramp	5,045	5,009	99%	61	27	D	5,295	5,287	100%	61	29	D
Mohawk St On Ramp to Truxtun Ave Off Ramp	5,520	5,471	99%	60	23	C	6,345	6,279	99%	58	29	D
Truxtun Ave Off Ramp to SR99 SB C-D Off Ramp(SR99 SB&Ming Ave)	3,970	3,899	98%	62	21	C	4,950	4,940	100%	61	27	D
SR99 SB C-D Off Ramp(SR99 SB&Ming Ave) to H St Off Ramp	2,025	1,964	97%	63	16	B	2,605	2,486	95%	63	20	C
H St Off Ramp to Real Rd On Ramp	1,685	1,652	98%	63	13	B	2,248	2,132	95%	63	17	B
Real Rd On Ramp to SR 99 NB&SB On Ramp	2,663	2,560	96%	60	22	C	3,228	2,896	90%	58	25	C
SR99 NB&SB On Ramp to Chester Ave On Ramp	4,535	4,535	100%	62	18	C	5,665	5,332	94%	61	22	C
Chester Ave On Ramp to Union Ave Off Ramp	5,185	5,185	100%	61	21	C	6,580	6,236	95%	59	26	D
Union Ave Off Ramp to Union Ave Loop On Ramp	4,135	4,135	100%	62	22	C	5,215	4,939	95%	62	27	D
Union Ave Loop On Ramp to Union Ave Direct On Ramp	4,435	4,434	100%	62	24	C	5,825	5,471	94%	60	31	D
Union Ave Direct On Ramp to Cottonwood Rd Off Ramp	4,725	4,715	100%	61	26	C	6,375	6,054	95%	59	34	D
Cottonwood Rd Off Ramp to Cottonwood Rd On Ramp	4,080	4,058	99%	62	22	C	5,315	5,014	94%	62	27	D
Cottonwood Rd On Ramp to SR58 east end of the network	4,390	4,344	99%	62	23	C	5,590	5,246	94%	61	29	D
WSP WB Mainline												
SR 58 east end of the network to Cottonwood Road off-ramp	5,245	5,245	100%	63	28	D	5,145	5,145	100%	63	28	D
Cottonwood Road off-ramp to Cottonwood Road on-ramp	5,045	5,017	99%	62	27	D	4,870	4,870	100%	62	26	D
Cottonwood Road on-ramp to Brundage Lane off-ramp	5,420	5,372	99%	61	30	D	5,455	5,394	99%	61	30	D
Brundage Lane off-ramp to Brundage Lane on-ramp	4,595	4,592	100%	61	25	C	4,780	4,705	98%	61	26	C
Brundage Lane on-ramp to Union Avenue on-ramp	5,095	4,984	98%	60	28	D	5,190	5,047	97%	60	28	D
Union Avenue on-ramp to Chester Avenue off-ramp	5,865	5,784	99%	60	24	C	5,900	5,713	97%	59	33	D
Chester Avenue off-ramp to SR 58 WB C-D off-ramp (SR 99 NB and SB and Real Road)	5,040	4,792	95%	59	23	C	5,195	4,847	93%	60	24	C
SR 58 WB C-D off-ramp (SR 99 NB and SB and Real Road) to SR 99 NB C-D on-ramp (SR 99 NB and H Street)	1,785	1,785	100%	63	14	B	1,865	1,826	98%	63	15	B
SR99 NB C-D on-ramp (SR 99 NB and H Street) to Mohawk Street off-ramp	4,171	4,171	100%	59	24	C	4,440	4,290	97%	59	24	C
Mohawk Street off-ramp to Truxtun Avenue on-ramp	3,281	3,266	100%	61	27	D	3,650	3,563	98%	61	29	D
Truxtun Avenue on-ramp to Mohawk Street loop on-ramp	4,281	4,235	99%	61	23	C	5,525	5,432	98%	60	30	D
Mohawk Street loop on-ramp to Mohawk Street direct ramp	4,906	4,853	99%	62	20	C	6,730	6,652	99%	61	27	D
Mohawk Street direct ramp to Coffee Drive off-ramp	5,716	5,378	94%	61	20	C	7,705	7,235	94%	59	28	D
Coffee Drive off-ramp to Coffee Drive loop on-ramp	3,546	3,522	99%	63	14	B	5,595	5,546	99%	62	22	C
Coffee Drive loop on-ramp to Coffee Drive direct on-ramp	3,726	3,656	98%	63	14	B	5,895	5,814	99%	62	23	C
Coffee Drive direct on-ramp to Calloway Drive direct off-ramp	4,036	3,903	97%	63	15	B	6,490	6,351	98%	61	25	C
Calloway Drive direct off-ramp to Calloway Drive loop off-ramp	3,451	3,335	97%	62	13	B	5,540	5,402	98%	61	22	C
Calloway Drive loop off-ramp to Calloway Drive on-ramp	2,726	2,656	97%	63	14	B	4,275	4,162	97%	62	22	C
Calloway Drive on-ramp to Allen Road off-ramp	3,276	3,168	97%	62	17	B	5,330	5,180	97%	59	29	D
Allen Road off-ramp to Allen Road on-ramp	2,136	2,064	97%	64	11	A	3,230	3,179	98%	63	17	B
Allen Road on-ramp to West Beltway off-ramp	2,506	2,419	97%	62	13	B	3,675	3,577	97%	61	19	C
West Beltway off-ramp to West Beltway loop on-ramp	1,021	990	97%	64	8	A	1,455	1,440	99%	64	11	B
West Beltway loop on-ramp to West Beltway direct on-ramp	1,321	1,269	96%	62	10	A	1,930	1,855	96%	61	15	B
West Beltway direct on-ramp to Westside Parkway west end of the network	1,616	1,549	96%	60	13	B	2,305	2,202	96%	57	19	C
State Route 99 NB Collector-Distributor												
SR 99 NB C-D on-ramp to SR 99 NB C-D off-ramp	3,490	3,490	100%	53	22	C	3,705	3,548	96%	52	23	C
State Route 99 SB Collector-Distributor												
SR 58 WB C-D on-ramp to SR 99 SB C-D off-ramp	3,320	3,236	97%	52	21	C	3,675	3,638	99%	52	24	C
SR 99 SB C-D off-ramp to SR 99 SB C-D on-ramp	870	840	97%	49	17	B	935	898	96%	49	18	C
SR 99 SB C-D on-ramp to Ming Avenue off-ramp	1,670	1,664	100%	48	17	B	2,050	1,965	96%	48	20	C
State Route 58 WB Collector-Distributor												
SR 58 WB C-D on-ramp to SR 99 NB C-D off-ramp	3,905	3,793	97%	52	24	C	4,035	3,901	97%	52	25	C
SR 99 NB C-D off-ramp to SR 99 SB off-ramp	2,150	2,120	99%	51	21	C	2,200	2,100	95%	51	20	C
SR 99 SB off-ramp to Real Road off-ramp	775	775	100%	49	8	A	870	870	100%	49	9	A

Bottleneck Location

Queue

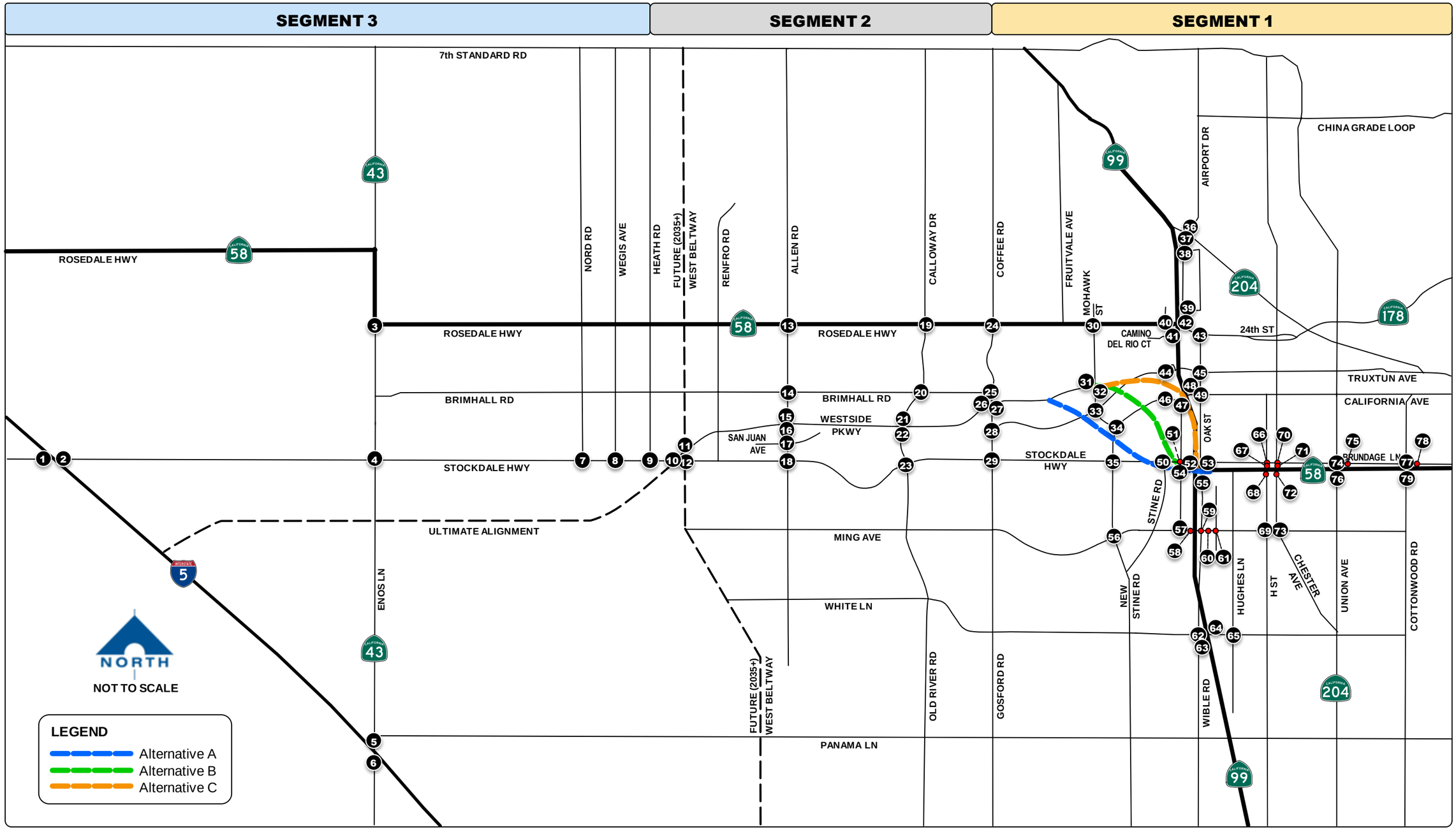


Figure 6-11. Location Map of Study Intersections

Table 6-8. Existing versus Year 2038 Comparison of Intersection Level of Service

Current Int. Number	Intersection	Type of Control	Existing (Source: F&P Associates, Inc Reported Synchro ver. 6 results)				Design Year 2038 No-Build Condition				Design Year 2038 Alternative A				Design Year 2038 Alternative B				Design Year 2038 Alternative C			
			AM PEAK		PM PEAK		AM PEAK		PM PEAK		AM PEAK		PM PEAK		AM PEAK		PM PEAK		AM PEAK		PM PEAK	
			LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	I-5 SB Ramps/Stockdale Highway	NB/SB TWSC	B	10.2	C	15.1	A	6.4	F	92.0	A	5.3	F	66.3	A	5.7	F	69.0	A	5.4	F	52.1
		Imp-Signal*	N/A				B	12.2	B	11.6	B	11.4	B	11.2	B	11.7	B	11.3	B	11.7	B	11.3
2	I-5 NB Ramps/Stockdale Highway	NB/SB TWSC	A	9.5	B	11.7	A	4.0	B	14.0	A	7.2	B	16.8	A	6.1	B	19.9	A	4.0	B	11.6
3	SR-43 (Enos Lane)/Rosedale Highway	4-way Stop	B	12.0	B	14.9	D	25.8	F	77.0	D	28.5	F	81.9	D	28.4	F	78.7	D	28.1	F	83.1
		Imp-Signal	N/A				N/A				C	26.8	C	32.6	C	26.0	C	32.8	C	26.9	C	33.0
4	SR-43 (Enos Lane)/Stockdale Highway	4-way Stop	B	14.9	D	31.7	F	>150	F	>150	F	>150	F	>150	F	>150	F	>150	F	>150	F	>150
		Imp-Signal*	N/A				C	24.2	C	23.0	B	15.5	C	22.1	B	17.0	C	23.7	B	15.9	C	29.8
5	SR-43 (Enos Lane)/I-5 NB Ramps	EB/WB TWSC	B	11.9	C	15.6	A	3.4	B	10.7	A	4.3	B	10.1	A	3.7	B	14.6	A	3.3	B	13.5
6	SR-43 (Enos Lane)/I-5 SB Ramps	EB/WB TWSC	B	14.5	D	26.9	A	5.7	C	19.8	A	4.1	C	21.2	A	3.9	C	21.9	A	4.6	C	18.1
7	Stockdale Highway/Nord Rd	Signal	N/A				C	31.8	C	29.1	C	34.5	C	32.4	C	31.8	C	28.2	C	34.6	C	22.1
8	Stockdale Highway/Wegis Avenue	NB/SB TWSC	N/A				F	>150	F	>150	F	>150	F	>150	F	>150	F	>150	F	>150	F	>150
		Imp-Signal*	N/A				C	21.5	C	23.2	C	31.3	C	30.7	C	30.9	C	28.6	C	27.7	C	33.0
9	Stockdale Highway/Heath Road	STOP-Existing SIGNAL-Future	C	18.2	C	22.2	C	29.2	C	27.6	C	23.8	C	26.7	C	25.5	C	26.6	C	28.5	C	23.6
10	Stockdale Highway/WSP	Signal	Does not Exist				A	7.6	A	9.0	A	9.0	A	8.3	A	8.4	A	7.8	A	9.5	A	6.4
11	West Beltway/WSP WB Ramp	Signal	Does not Exist				A	6.5	B	14.7	A	8.5	B	17.2	A	7.4	B	19.5	A	9.6	B	16.3
12	West Beltway/WSP EB Ramp	Signal	Doesn't Exist				B	11.2	B	18.2	A	8.3	B	15.3	A	8.8	B	13.7	A	7.9	B	14.2
13	Allen Road/Rosedale Highway	Signal*	D	37.3	E	76.9	D	40.7	D	47.1	D	36.1	D	48.0	D	37.5	D	47.7	D	36.2	D	47.3
14	Allen Road/Brimhall Rd	Signal	C	21.2	B	19.9	C	25.9	C	33.5	C	23.5	C	34.4	C	23.1	C	33.1	C	26.9	C	27.8
15	Allen Road/WSP WB Ramps	Signal	Does not Exist				B	15.0	C	28.0	B	17.5	C	29.3	B	17.2	C	30.1	B	19.3	C	20.5
16	Allen Road/WSP EB Ramps	Signal	Does not Exist				B	10.2	A	3.7	B	10.9	B	11.5	B	10.2	B	12.3	B	17.1	B	13.8
17	Allen Road/San Juan Avenue	Signal*	Does not Exist				C	22.8	C	26.5	C	22.8	C	25.0	C	22.2	C	25.6	C	22.8	C	22.3
18	Allen Road/Stockdale Highway	Signal	D	39.0	C	27.0	C	29.8	C	32.5	C	31.1	C	33.0	C	30.0	C	33.7	C	33.6	C	28.1
19	Calloway Drive/Rosedale Highway	Signal*	E	69.0	F	91.0	D	49.4	D	54.8	E	59.2	E	58.6	E	55.6	E	63.2	E	59.7	E	61.8
20	Calloway Drive/Brimhall Road	Signal	C	31.9	C	25.4	C	29.9	C	28.5	C	29.8	C	35.0	C	34.9	C	33.2	C	31.7	C	31.2
21	Calloway Drive/WSP WB Ramps	Signal	Does not Exist				B	10.8	C	20.5	B	19.2	C	28.3	B	13.1	C	25.6	B	14.2	C	20.2
22	Calloway Drive/WSP EB Ramps	Signal	Does not Exist				B	18.4	A	8.9	B	11.2	A	7.5	B	15.9	A	8.9	B	13.5	A	8.7
23	Calloway Drive/Stockdale Highway	Signal	D	36.1	D	38.5	D	52.3	D	39.7	D	42.9	D	37.0	D	44.9	D	38.2	D	44.0	D	35.9
24	Coffee Road/Rosedale Highway	Signal*	E	75.7	E	65.7	F	83.1	F	98.0	E	79.4	F	97.1	E	67.1	F	134.5	E	69.7	F	110.3
25	Coffee Road/WSP WB Ramp-Brimhall Road	Signal	E	60.1	E	72.7	C	27.3	D	43.2	C	32.0	C	31.6	C	30.9	C	31.9	C	27.6	C	31.1
26	Coffee Road/WSP WB On Ramp	Unsignalized	Does not Exist				N/A				N/A				N/A				N/A			
27	Coffee Road/WSP EB Ramps	Signal	Does not Exist				C	28.7	B	19.0	B	18.2	B	11.0	B	18.1	B	14.3	B	11.1	B	14.1
28	Coffee Road/Truxtun Ave	Signal	E	67.2	F	81.2	C	20.5	C	24.5	B	12.4	B	18.5	B	13.4	B	16.7	B	12.5	B	17.8
29	Coffee Road/Stockdale Hwy	Signal*	F	112.0	F	90.2	E	55.6	F	99.2	E	67.1	F	84.0	E	57.1	F	82.8	E	69.9	F	86.7
30	Mohawk Street/Rosedale Highway	Stop, Existing* Signal, Future*	F	62.4	F	53.2	F	103.6	F	123.2	E	78.8	F	108.2	E	73.1	F	99.5	E	76.8	F	96.7
31	Mohawk Street/WSP WB Ramps	Signal	Does not Exist				n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	B	10.9	A	8.9	B	11.4	A	8.0
32	Mohawk Street/WSP EB Ramps	Signal	Does not Exist				C	24.4	B	19.5	B	11.8	B	13.8	B	18.3	B	12.3	B	18.2	B	14.4
33	Mohawk Street/Truxtun Avenue	Signal	C	29.0	D	41.5	C	31.1	E	59.8	C	26.4	C	25.5	C	33.6	C	28.8	C	33.5	C	29.7
34	Mohawk Street/California Avenue	Signal*	C	30.5	C	34.3	F	105.5	F	175.0	D	37.1	E	70.3	D	40.6	E	62.4	D	35.2	E	65.6
35	Stockdale Hwy/California Avenue	Signal*	E	55.9	F	81.9	F	94.5	F	104.3	D	43.3	E	62.5	D	46.2	E	60.1	D	44.0	E	60.9
36	Airport Drive/State Rd-SR-204 Off	Signal	D	35.9	D	42.5	C	20.2	C	21.9	C	22.2	C	22.6	C	21.9	C	26.7	C	21.5	C	21.9
37	Airport Drive/SR-99 NB Ramp	Signal	A	8.8	C	21.9	A	7.1	B	10.6	A	9.5	B	11.6	A	9.1	B	12.0	A	8.9	B	11.0
38	Buck Owens Boulevard/Rio Mirada Drive	Signal	D	43.7	B	17.8	C	29.1	C	28.6	C	21.7	C	25.0	C	30.9	C	29.4	C	32.6	C	27.5
39	SR99 NB Ramps/Buck-Owens Boulevard	Signal	D	38.9	D	37.5	D	37.5	D	46.2	D	41.7	D	43.4	D	45.3	D	42.3	D	42.4	D	42.6
40	Rosedale Highway/Camino Del Rio Court	Signal	C	28.6	D	37.0	C	20.9	D	49.9	C	30.4	D	49.4	C	33.7	D	45.3	C	32.8	D	46.4
41	Rosedale Highway/SR 99 SB Ramps	Signal	D	41.0	D	44.5	C	22.7	D	37.6	C	21.2	C	21.8	C	20.5	C	20.9	C	20.7	C	22.6
42	Rosedale Highway/SR99 NB Ramps	Signal	D	50.9	F	125.6	C	26.6	C	30.0	C	33.2	D	42.9	C	24.2	D	36.3	C	26.1	D	37.7
43	24th Street/Oak Street	Signal	F	89.4	F	100.3	D	37.5	C	29.5	C	31.3	D	38.4	C	33.2	D	39.0	C	30.4	D	36.9
44	Truxtun Avenue/Empire Drive	Signal*	N/A				C	21.6	D	47.6	C	29.4	D	42.5	C	30.0	D	52.4	c	29.7	D	47.6
45	Truxtun Avenue/Oak Street	Signal	D	43.3	E	74.4	E	61.9	E	73.9	D	52.0	D	46.3	D	52.7	D	45.3	D	51.8	D	48.1
46	California Avenue/Chester Lane	Signal	B	17.5	C	27.8	C	23.7	C	30.1	C	20.2	F	130.7	C	28.7	F	123.6	C	21.1	F	121.3
47	California Avenue/SR99 SB Ramps	Signal	D	48.8	D	44.5	D	54.6	E	76.1	E	57.8	F	90.3	E	60.1	F	83.2	E	58.9	F	83.2
48	California Avenue/SR99 NB Ramps	Signal	E	74.8	C	25.1	C	28.5	D	51.5	C	32.5	C	25.9	C	28.1	C	21.2	C	30.7	C	24.5
49	California Avenue/Oak St	Signal	D	44.1	E	78.7	C	28.3	E	61.5	C	29.7	E	58.6	C	27.5	E	57.9	C	28.2	E	58.1
50	Stockdale Highway/Stine Road	Signal *	N/A				F	90.7	F	>150	D	36.1	F	90.0	D	38.7	F	83.8	D	35.9	F	94.0
51	Stockdale Highway/Real Road	Signal	F	95.8	F	93.2	D	48.3	F	94.0	D	36.0	D	53.1	D	42.8	D	50.7	D	45.2	F	91.3
52	Stockdale Highway/SR99 SB Ramp	Signal	B	12.2	B	10.5	B	16.8	B	18.0	***Intersection does not exist in Alternative***											
53	Brundage Lane/Oak Street	Signal	C	28.9	D	38.8	C	31.9	D	40.3	C	25.9	C	30.4	C	25.3	C	31.4	C	29.9	C	30.6
54	Real Road/SR58	Signal	C	27.0	C	27.3	C	21.8	D	39.3	***Intersection does not exist in Alternative***								C	21.1	D	39.9
55	Wible Road/SR99 NB Ramps	Signal	B	17.9	C	32.2	B	15.5	C	28.4	***Intersection does not exist in Alternative***											
56	Ming Avenue/New Stine	Signal*	E	56.5	E	79.6	E	57.2	E	70.3	D	42.1	D	44.4	D	48.0	D	44.6	D	44.4	D	44.0
57	Ming Avenue/Real Road	Signal	C	25.4	E	60.8	C	25.3	E	64.5	C	30.6	C	29.9	C	30.5	C	30.6	C	25.7	C	28.4
58	Ming Avenue/SR99 SB Ramps	Signal	A	3.4	C	29.3	A	3.2	B	15.6	A	8.8	B	15.7	A	7.9	B	15.2	A	4.9	B	15.8
59	Ming Avenue/Wible Road	Signal	E	61.3	E	68.1	C	23.2	C	24.5	C	25.8	C	28.2	C	26.3	C	24.1	C	28.1	C	27.4
60	Ming Avenue/SR99 NB Ramps	Signal	C	26.7	D	40.4	D	36.4	C	28.3	C	25.1	C	33.6	C	27.8	C	34.3	C	33.8	C	34.5
61	Ming Avenue/Castro Lane	Signal	B	16.7	C	24.7	C	25.3	D	38.9	C	30.1	D	39.8	C	28.9	D	36.8	C	28.6	D	35.9
62	White Lane/Wible Road	Signal*	D	54.7	F	83.3	E	70.3	F	115.6	E	72.6	F	115.8	E	71.7	F	118.3	E	69.9	F	114.0
63	White Lane/SR99 SB Ramps	Signal*	C	22.3	F	109.5	C	24.9	F	106.2	C	25.1	F	98.5	C	23.4	F	105.5	C	24.3	F	105.3
64	White Lane/SR99 NB Ramps	Signal*	A	5.4	A	6.9	A	9.6	B	15.5	B	10.2	B	15.6	B	10.8	B	15.7	B	10.2	B	16.9
65	White Lane/Hughes Lane	Signal*	D	35.9	D	38.3	D	42.1	C	29.5	D	36.1	D	36.2	D	35.7	D	39.4	D	37.2	D	38.9
66	H Street/Brundage Lane	Signal	C	20.7	D	35.3	C	29.2	E	68.0	C	26.2	D	53.8	C	26.9	D	47.9	C	24.9	C	25.8
67	H Street/SR58 WB Ramp	Signal	B	17.1	E	56.3	C	20.6	E	64.3	B	15.7	D	35.1	B	13.5	D	36.0	B	14.7	D	35.9
68	H Street/SR58 EB Ramp	Signal	D	41.1	C	27.2	D	40.0	C	29.0	C	23.2	C	25.7	C	24.7	C	27.5	C	24.6	C	26.2
69	H Street/Ming Ave	Signal*	C	29.6	D	35.5	D	36.0	D	47.5	D	36.6	D	44.1	D	37.9	D	40.9	D	37.2	D	43.2
70	Chester Avenue/Brundage Lane	Signal	C	21.0	C	30.7	C	23.2	E	68.0	C	26.2	D	53.8	C	26.9	D	47.9	C	24.9	C	25.8
71	Chester Avenue/SR58 WB off Ramp	Signal	B	18.0	C	23.9	C	26.0	C	28.5	C	23.9	C	27.2	C	20.6	C	27.5	C	20.7	C	28.1
72	Chester Avenue/SR58 EB on Ramp	Signal	C	28.9	C	22.2	C	30.7	C	25.7	C	29.9	C	31.1	C	28.6	C	29.1	C	27.7	C	21.8
73	Chester Avenue/Ming Ave	Signal*	C	23.7	C	24.0	D	35.1	D	47.6	D	42.2	D	50.0	D	39.5	D	52.7	D	40.0	D	51.2
74	Union Avenue/Brundage Lane	Signal	D	42.1	D	39.6	D	46.8	D	43.4	D	42.7	D	47.8	D	45.6	D	49.4	D	44.6	D	51.0
75	Brundage Lane/SR58 WB Ramps	Signal	B	19.7	B	15.1	C	23.4	D	41.0	C	24.8	D	41.8	C	23.6	D	43.4	C	25.1	D	42.6
76	Union Avenue/SR58 EB Ramps	Signal	B	16.2	B	10.9	B	18.0	B	15.8	B	19.9	B	18.9	B	19.8	B	20.0	B	19.7	B	18.5
77	Cottonwood-MLK/Brundage Lane	Signal	N/A				C	28.8	C	27.5	C	25.2	C	27.6	C	23.6	C	28.9	C	23.9	C	25.2
78	Cottonwood-Brundage/SR 58 WB Ramps	Signal	N/A				C	27.3	C	32.9	C	23.3	C	33.1	C	21.2	C	30.3	C	20.2	C	33.9
79	Cottonwood/SR 58 EB Ramps	Signal	N/A				B	15.8	B	15.7	B	11.0	B	18.8	B	10.7	B	19.6	B	12.1	B	17.4

Intersection* LOS Summary based on Synchro 6
TWSC Two-Way Stop Control
N/A Existing counts not available
LOS E Conditions
LOS F Conditions
Source: Existing LOS Calculation are done Fehr & Peers Associates Inc and Future LOS Calculation are done by Parsons

personnel will be necessary to ensure quick response times. Disruptions in access to local schools are expected to be very minimal, with safe and efficient alternatives to currently used routes readily available.

Local roadway and freeway access modifications and their ramifications for local circulation, emergency and health services provision, and the location of schools for each of the build alternatives are summarized below. Figure 6-12 illustrates the general study area, depicting the locations where access modifications will be required. It should be noted that a portion of the affected areas east of Oleander Drive and south of Belle Terrace are not visible on this map, but the streets involved are discussed below. The location and proposed treatment of each affected local street can be seen in layout drawings provided in the full body of the *Centennial Corridor Traffic Study* report.

Alternative A—Street Closures and General Circulation

NORTH OF STATE ROUTE 58

On the north side of State Route 58, the following existing through streets will be terminated or converted to cul-de-sacs just north of the proposed right-of-way:

- Jones Street
- Williamson Way
- McDonald Way
- Business Park South

Jones Street will be closed both south of Stockdale Highway and north of Peckham Avenue. Nearby north–south access is available at Stine Road. Williamson Way will be also closed south of the proposed roadway. Nearby north–south access is available at Real Road. Existing north–south traffic on McDonald Way will be diverted to Cunan Street to the east and South Montclair Street to the west. Business Park South will be shortened to the north to accommodate the roadway project and traffic will be diverted to adjacent Business Center Drive.

SOUTH OF STATE ROUTE 58

On the south side of State Route 58, the following existing through streets will be terminated or converted to a cul-de-sac just south of the proposed right-of-way:

- Jones Street
- South Gamsey Avenue
- Williamson Way
- Myrtle Street
- Dixon Avenue
- Frazier Avenue
- Westwood Street
- McDonald Way
- Brite Street
- South Oleander Avenue
- Houchin Road

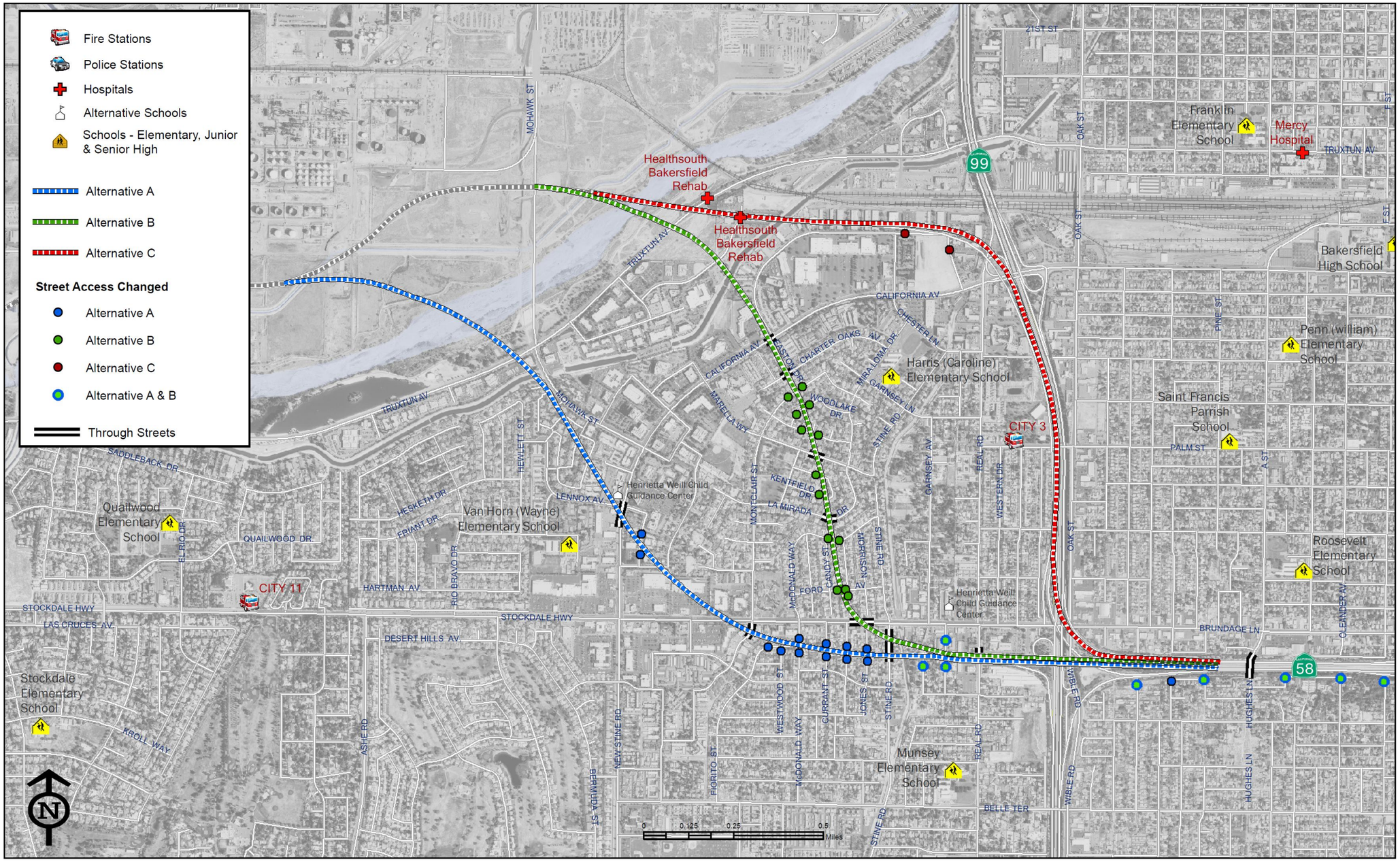


Figure 6-12. Local Roadway Access Modifications

Stine Road will continue as a through street, forming an underpass at the proposed roadway. Real Road will form a traffic-divided underpass of the mainline, in addition to the eastbound on-ramps and westbound off-ramps of the proposed highway. South Gamsey Avenue is an existing cul-de-sac which will be shortened to accommodate the roadway right-of-way. Myrtle Street and Dixon Avenue are currently linked at their northern termini by a connecting street. The street will be eliminated and converted to a cul-de-sac to accommodate the proposed roadway. Both streets will be minimally affected in terms of circulation due to nearby Hughes Lane, which will continue as a major through street. Frazier Avenue and Westwood Street will be terminated but the connecting street between the two will be retained. McDonald Way will be terminated and traffic diverted east to become Peckham Avenue. North–south traffic will be served by South Montclair Street to the east and Stine Road to the west. Brite Street, an east–west street, will be terminated and the connecting road between Brite Street and South Oleander Avenue eliminated. The existing Houchin Road cul-de-sac will be moved slightly to the south to accommodate the proposed roadway. North–south traffic will still access H Street as currently used.

WEST OF STATE ROUTE 99

On the west side of State Route 99, the following existing streets will be terminated just west of State Route 99:

- Wood Lane
- Laverne Avenue

Eastbound traffic on Wood Lane and Laverne Avenue has access to Belle Terrace or Ming Avenue, streets in close proximity which provide through movements east of State Route 99. Seville Street will be extended north, just past Laverne Avenue, to serve existing properties. A frontage road connection between Mona Way and Belle Terrace will be established. Belle Terrace will form an underpass of State Route 99. Affects on circulation in this area will be very limited.

Alternative B—Street Closures and General Circulation

NORTH OF STATE ROUTE 58

On the north side of State Route 58, the following existing through streets will be terminated just north of the proposed right-of-way:

- Kentfield Drive
- Hillsborough Drive

Southbound traffic on Kentfield Drive and Hillsborough Drive will be diverted a short distance east or west to Marella Way or La Mirada Drive, both of which provide through movements via underpasses of the proposed roadway.

SOUTH OF STATE ROUTE 58

On the south side of State Route 58, the following existing through streets will be terminated or converted to a cul-de-sac just south of the proposed right-of-way:

- South Myrtle Street
- South Gamsey Avenue

- Kensington Avenue
- Woodlake Drive
- Montclair Street
- Charter Oaks Avenue
- Dixon Avenue
- Brite Street
- South Oleander Avenue
- Houchin Road

Stine Road and Williamson Way, one street on either side of South Gamsey Avenue, will remain as north–south through streets and retain easy access north to Stockdale Highway. Real Road will remain as a major north–south divided collector roadway. Northbound traffic on Kensington Avenue, Woodlake Drive, Montclair Street, and Charter Oaks Avenue will be diverted either east or west to California Avenue or either Marella Way or La Mirada Drive, respectively. California Avenue will remain as a major north–south divided arterial roadway. Brite Street, an east–west street, will be terminated and the connecting road between Brite Street and South Oleander Avenue eliminated. Northbound traffic on Dixon Avenue will be directed one block east to Hughes Lane. Northbound traffic on South Oleander Avenue and Houchin Road will be diverted to H Street, one and two blocks to the east, respectively. Hughes Lane, H Street, Chester Avenue, and South P Street will remain as north–south arterial roadways serving the City of Bakersfield.

WEST OF STATE ROUTE 99

On the west side of State Route 99, the following existing through streets will be terminated just west of State Route 99:

- Wood Lane
- Laverne Avenue

Seville Street will be extended north just past Laverne Avenue to serve existing properties. A frontage road connection between Mona Way and Belle Terrace will be established. Belle Terrace will form an overpass of State Route 99. The existing Wood Lane cul-de-sac will be moved slightly to the west. North–south through access will remain at Belle Terrace.

Alternative C—Street Closures and General Circulation

WEST OF STATE ROUTE 99

On the west side of State Route 99, the following existing streets will be terminated just west of State Route 99:

- Chester Lane
- Elcia Drive
- Terrace Way
- Wood Lane

Chester Lane currently forms a cul-de-sac at its eastern-most terminus, just west of State Route 99. Traffic circulation will not be affected as the two streets on either side of Chester Lane

(California Avenue and Palm Street) provide east–west through access. Elicia Drive and Terrace Way, two adjacent and parallel streets will be connected just west of State Route 99 to provide circulation for adjacent properties. A frontage road connection between Mona Way and Belle Terrace will be established. Belle Terrace will form an overpass of State Route 99. The existing cul-de-sac on Wood Lane will be moved slightly to the west. North–south through access will remain at Belle Terrace.

SOUTH OF STATE ROUTE 58

On the south side of State Route 58, an existing street, Commerce Drive, will be converted to a cul-de-sac just south of the proposed right-of-way. Commerce Drive currently ends in a cul-de-sac south of Truxtun Avenue. Commerce Drive will be terminated farther to the south in order to accommodate the proposed roadway right-of-way, but neither circulation nor access is affected.

Emergency Service Access

In the case of alternative A, one health care center (HealthSouth Bakersfield Rehab) and two fire stations (City 3 and City 11) are located within the immediate vicinity of the proposed right-of way. In the case of alternatives B and C, one health care center (HealthSouth Bakersfield Rehab) and one fire station (City 3) are located within the immediate vicinity of the proposed right-of-way.

In each case, the expected change as a result of the proposed project in existing local circulation patterns will be minimal and will not unduly affect traffic or the provision of local emergency services. Service provision from the closest police station, Bakersfield Central Receiving Station at 1415 Truxtun Avenue, is not expected to be affected.

Access to Schools

Two schools, Van Horn Elementary and Henrietta Well Child Guidance Center are in the immediate vicinity of the alternative A right-of-way. Two schools, Harris Elementary and Henrietta Well Child Guidance Center, are in the immediate vicinity of the alternative B right-of-way. In each case, at least some students will be forced to access the school via a nearby local alternative to the route currently used. Because the actual closures of streets are minimal and the opportunities for alternate access readily available, however, situations are not expected in which functional access to any of these facility would be materially affected.

Based on the location of schools in the vicinity of alternative C construction, no changes in access for students are expected.

6.9 Freeway Access Modifications

Modifications to existing access ramps along State Route 99 and State Route 58 are required as part of the project and will impact travel access. Impacts will differ in degree depending on the alternative and location examined.

Freeway access modifications resulting from the proposed project are not expected to impact the provision of public safety services, such as fire or police, or affect access to health care facilities. Minor re-routing adjustments with respect to call response and patrol duties for fire and police

personnel will be necessary to ensure quick response times. Disruptions in access to local schools are expected to be very minimal, with safe and efficient alternatives to currently used routes readily available.

Freeway access modifications and their ramifications for local circulation and alternative travel route recommendations are summarized below:

- The southbound State Route 99 off-ramp with direct access to Stockdale Highway will be eliminated under **alternatives A, B and C**. The provided alternative will be for vehicles to exit instead at the California Avenue interchange, just to the north. California Avenue and Oak Street provide a direct connection with the Stockdale Highway corridor.
- The northbound State Route 99 exit and entrance access points to and from Wible Road will be eliminated under **alternatives A, B and C**. Under existing and no-build conditions, these ramps provide access to and from the Stockdale Highway corridor. The provided alternative will be for vehicles to utilize either the California Avenue interchange to the north or the Ming Avenue interchange to the south, depending upon their destination.
- Access from Real Road and the Stockdale Highway corridor to southbound State Route 99 will be eliminated under **alternatives A, B and C.** The available alternative will be for drivers to utilize Real Road or Stine Road to access southbound State Route 99 via the Ming Avenue interchange.
- The connection between westbound State Route 58 to Real Road and the Stockdale Highway corridor will be eliminated under **alternatives A and B**, only. The likely alternative is for drivers to utilize the H Street/Chester Avenue interchange. The next nearest intersection to the north would be Calloway Drive in the case of alternative A, and Mohawk Street in the case of alternative B.
- Ming Avenue corridor access to and from State Route 58, east of State Route 99, will be eliminated under **alternatives A and B**, only. The area is characterized by relatively heavy traffic associated with movements to and from the Valley Plaza Mall and other nearby retail businesses. The provided alternative will be for vehicles to utilize the Chester Avenue interchange.
- Access from westbound State Route 58 to California Avenue via State Route 99 will be eliminated under **alternative C,** only. Drivers will instead be required to utilize Chester Avenue or H Street to access California Avenue to the north.

6.10 Future Projects and Interim Conditions

The future year transportation networks assume a large number of highway and transit elements listed in the 2011 Regional Transportation Plan (Amendment 1) which are “constrained” by funding that is currently available or reasonably projected to be available by the opening (2018) and design year (2038) analysis scenarios. In addition to these constrained projects, two “unconstrained” (unfunded) projects have been considered by this traffic study:

1. The construction of Segment 3 of the Centennial Corridor from the west end of the Westside Parkway to Interstate 5
2. The construction of Segment 1 freeway-to-freeway connector ramps between State Route 58 (west) and State Route 99 north.

These future projects and interim conditions are discussed below.

Segment 3—Heath Road to Interstate 5

The limits of Segment 3 were previously illustrated on Figure 6-7. The ultimate alignment is proposed as a new 7.4-mile-long freeway that would follow an east–west alignment parallel to the Cross Valley Canal. The route would be about one-third mile south of Stockdale Highway from Heath Road to about 1.2 miles west of State Route 43. The alignment would continue to follow the canal in a southwest direction and connect to Interstate 5 at a new freeway-to-freeway interchange located two miles south of the Stockdale Highway/Interstate 5 interchange. Segment 3 was evaluated in the approved *Route 58 Route Adoption Project, A Tier I Environmental Impact Statement/ Environmental Impact Report* (Caltrans, 2001). A Tier I document shows a general alignment and identifies impacts at a conceptual level and is done when there is not full funding for the improvements. An alignment known as the Cross Valley Canal alignment was identified as the "least environmentally damaging practicable alternative." Segment 3 will remain at the Tier I, route-adoption level of analysis until there is sufficient funding for construction. At that time, a project-level environmental document will be prepared.

In the interim, Stockdale Highway, from the Westside Parkway to Interstate 5, would be temporarily adopted as State Route 58, under build alternatives A, B and C. Under the no-build and transportation system management alternatives, State Route 58 would remain on its currently alignment. With build alternatives A, B, and C, improvements would be required at the Stockdale Highway and State Route 43 (Enos Lane) intersection. The proposed improvements would widen the intersection and add signals to control the traffic movements. Enos Lane would be widened to add a dedicated left-turn lane and a shared through/right-turn lane in both directions. Though physically located in Segment 3, these improvements would be built as part of segment 1 to ensure adequate traffic operations at this intersection.

In addition to these project related improvements at Stockdale Highway and Enos Lane, land developer improvements are assumed under no-build and build alternatives A, B, and C as a condition of entitlement. These land development conditions of approval call for the widening of Stockdale Highway to four lanes from Nord Road to Enos Lane and the installation of traffic signals and intersection improvements at Stockdale Highway and Wegis Avenue and at Stockdale Highway and Nord Road. These intersection improvements and lane additions are assumed under all year 2038 no-build and build analysis scenarios.

In addition to local street intersections, the traffic analysis examined traffic operations at the two off-ramp termini intersections of Stockdale Highway and Interstate 5. The analysis results indicated that by year 2038, a traffic signal would need to be installed at the Interstate 5 southbound off-ramp to Stockdale Highway. This traffic signal installation is needed for all no-build and build project scenarios for year 2038 projected traffic volumes. A signalized intersection is not needed to address opening year 2018 conditions.

The Federal Highway Administration's August 2010 *Interstate System Access Informational Guide* indicates that improvements to traffic control at ramp termini with local roads should be reviewed to ensure that the changes in traffic control (i.e., signalization) do not result in queue spillback into the mainline lanes of the interstate facility and that sufficient storage is provided. This review has been undertaken and no spillback to the mainline will occur given the installation of a traffic signal at the southbound off-ramp termini when traffic volumes warrant.

It should be noted that construction of a new freeway segment from Heath Road to Interstate 5 will likely negate the need for a traffic signal installation at the southbound off-ramp to Stockdale Highway. As this traffic signal is not needed for opening year project conditions, and may never be needed under future conditions, this traffic operational analysis recommends that coordination with FHWA's Division Office be deferred until such time that traffic volumes and queue lengths approach or meet traffic signal warrants.

With the installation of traffic signals at the intersections identified above, Stockdale Highway will operate at level of service C or better conditions at all segment 3 study intersections.

In addition to intersection analysis, highway segment analysis was conducted for the two segments lying east and west of State Route 43 which are unsignalized (uninterrupted flow) for a distance of two or more miles:

1. Interstate 5 to State Route 43
2. State Route 43 to Nord Road

The results of the highway segment analysis indicate that Stockdale Highway operates, and will continue to operate, below Caltrans (District 6) level of service threshold of the transition between LOS C and LOS D for rural roads (Stockdale Highway west of Enos Lane) or the transition between LOS D and LOS E for urban roads (Stockdale Highway east of Enos Lane).

State Route 58/State Route 99 Interim Connections

The build alternatives A, B, and C do not provide direct connector ramps to or from the north on State Route 99 as part of the Centennial Corridor project. The preliminary plans allow for these ramps to be constructed a future date. Interim access will be provided by the State Route 99 interchange with existing State Route 58 (west), connecting to the Westside Parkway via Mohawk Street.

Figure 6-13 illustrates the interim route connection between the Westside Parkway and State Route 99, to and from the north. The route covers 2.1 miles from the State Route 99/Rosedale Highway undercrossing to the Westside Parkway/Mohawk Street overcrossing.

A southbound State Route 99 to westbound Westside Parkway motorist following the interim connecting route would pass through seven signalized intersections; while an eastbound to northbound motorist would pass through 10 signalized intersections.

Figure 6-13: Interim Connection between Westside Parkway and State Route 99

The year 2038 level of service computed for these intersections is LOS D or better except at the intersection of Mohawk Street and Rosedale Highway where LOS E and F conditions are forecast for year 2038.

Insofar as the build alternatives, providing direct connector ramps to/from the north on State Route 99 would lengthen the route traveled, but this journey would occur at a higher rate of speed. The relative change in distance and travel time is as follows:

Comparative Distance and Travel Time from Westside Parkway to/from State Route 99 North

		DELTA	
	LENGTH (miles)*	MILES	TIME (min)**
Interim route	2.6	0	0
Alternative A (with future ramps)	4.5	+1.9	0 to –5
Alternative B (with future ramps)	4.9	+2.3	0 to –5
Alternative C (with future ramps)	2.7	+0.1	–2 to –7

*State Route 99/Rosedale Highway undercrossing to 0.55 miles west of Westside Parkway/Mohawk Street overcrossing.
**Change in travel time during off-peak and peak hours.

Based on this assessment of motorist delay and increased vehicle miles traveled, direct connector ramps from Westside Parkway to/from State Route 99 (north) will be deferred until sometime following year 2038, or when demand and traffic operating conditions along the interim route warrant.

Independent Utility and Logical Termini

Federal Highway Administration regulations (23 Code of Federal Regulations 771.111[f]) require that (1) projects have logical limits and be long enough that the environmental analysis has a broad scope; (2) projects are usable and a reasonable use of funds, even if no additional transportation improvements in the area are made (this is known as independent utility); and (3) approval of a project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. As discussed below, the Centennial Corridor project build alternatives A, B, and C comply with these requirements.

Both the ultimate project (construction of all three roadway segments) and phased project (construction by segment) have logical limits. The ultimate project would provide a freeway facility that connects State Route 58 with State Route 99 and Interstate 5 at freeway-to-freeway interchanges. The segment 1 project would close a gap by connecting State Route 58 (east) with the new Westside Parkway (segment 2).The connecting ramps from State Route 58 (west) to and from State Route 99 (south) would be constructed as part of the Centennial Corridor project. Connecting ramps from State Route 58 (west) to and from State Route 99 (north) would be constructed at a later date. Insofar are the connection to Interstate 5, segments 1 and 2 and Stockdale Highway would serve the developed portion of metropolitan Bakersfield by moving traffic, goods, and freight through the area, and would provide access to Interstate 5 for improved regional access. The ultimate segment 3 freeway facility would connect Interstate 5 with the west

end of the Westside Parkway at the point in time when the travel demand exceeds the capacity of Stockdale Highway (a two-lane roadway). Identifying segment 3 as a future alignment for State Route 58 will allow preservation of an adequate transportation corridor in the future. Combined with the existing State Route 58 (east), the project would provide a high capacity, high level of service, east–west facility in the San Joaquin Valley.

Another important consideration is whether the project is of sufficient length to address traffic and environmental related matters on a broad scope. At 17.4 to 18.5 miles long (depending on the alternative), the study corridor extends well beyond the proposed construction limits. This ensures that the traffic issues that would be addressed in detail if construction of segment 3 and the State Route 58 (west)/State Route 99 (north) direct connector ramps, as proposed in the future, are considered at a Tier I planning level now.

The project's phased implementation would provide an effective and efficient roadway even if no additional transportation improvements are made as the connection of segment 1 and segment 2 would provide an adequate traffic level of service through 2038 (the project's design year). Finally, there are no other projects that would be needed or are dependent on construction of the Centennial Corridor project.

APPENDIX A

LOCAL TRAFFIC IMPACTS
for the
CENTENNIAL CORRIDOR PROJECT

Build Alternative B

INTRODUCTION

The Centennial Corridor Project Final Traffic Study Report, dated November 2012, addresses local roadway access modifications in section 4.8 of the report. The analysis presented in this document is intended to supplement the information reported in section 4.8 regarding build Alternative B.

The alignment of build Alternative B traverses the central portion of the Westpark neighborhood, as illustrated on Figure 1. The Westpark neighborhood (also known as West Park) is generally bound by California Avenue on the north and west, Stockdale Highway on the south, and State Route 99 on the east. The neighborhood is named after one of its prominent parks.

While the area bisected by Alternative B is collectively known as Westpark, a number of physical features divide the area into three, if not four, sub-neighborhoods. Foremost among the physical barriers is the Stine Canal. This canal runs in a north–south direction from north of California Avenue to south of Stockdale Highway. Only two local streets within the Westpark neighborhood cross the Stine Canal. For all practical purposes, this canal divides the neighborhood into the east of Stine Canal and west of Stine Canal sub-neighborhoods. **Local traffic circulation within the east of Stine Canal sub-neighborhood is not affected by the Centennial project build Alternative B.**

The remainder of this local circulation investigation therefore focuses on the portion of Westpark located to the west of the Stine Canal.

Supplementary traffic studies have not been conducted for build alternatives A and C because the alignments for these two options traverse the edges of residential neighborhoods, whereas Alternative B passes through the center of a neighborhood, that being Westpark.

ALTERNATIVE B ALIGNMENT AND NEIGHBORHOOD ACCESS

Figure 2 illustrates the alignment of Alternative B as it traverses the Westpark neighborhood. Commercial properties line both sides of California Avenue; thus, this investigation focuses on local circulation impacts to Westpark residents who live to the south and east of California Avenue, and west of the Stine Canal, as noted above.

The neighborhood is served by a hierarchy of roadways. California Avenue and Stockdale Highway, and Oak Street just east of State Route 99 are classified as *arterial* streets. Arterials serve longer distance trips, generally one to five miles in length and provide access to commercial land uses. None of the arterial streets surrounding the Westpark neighborhood are disrupted by the alignment of build Alternative B.

The vertical alignment of the freeway is designed to cross over Stockdale Highway on a bridge. Once over Stockdale Highway, the freeway will begin to descend to below grade, so that it will pass under La Mirada Drive and Marella Way. The freeway will then ascend in order to pass over California Avenue.

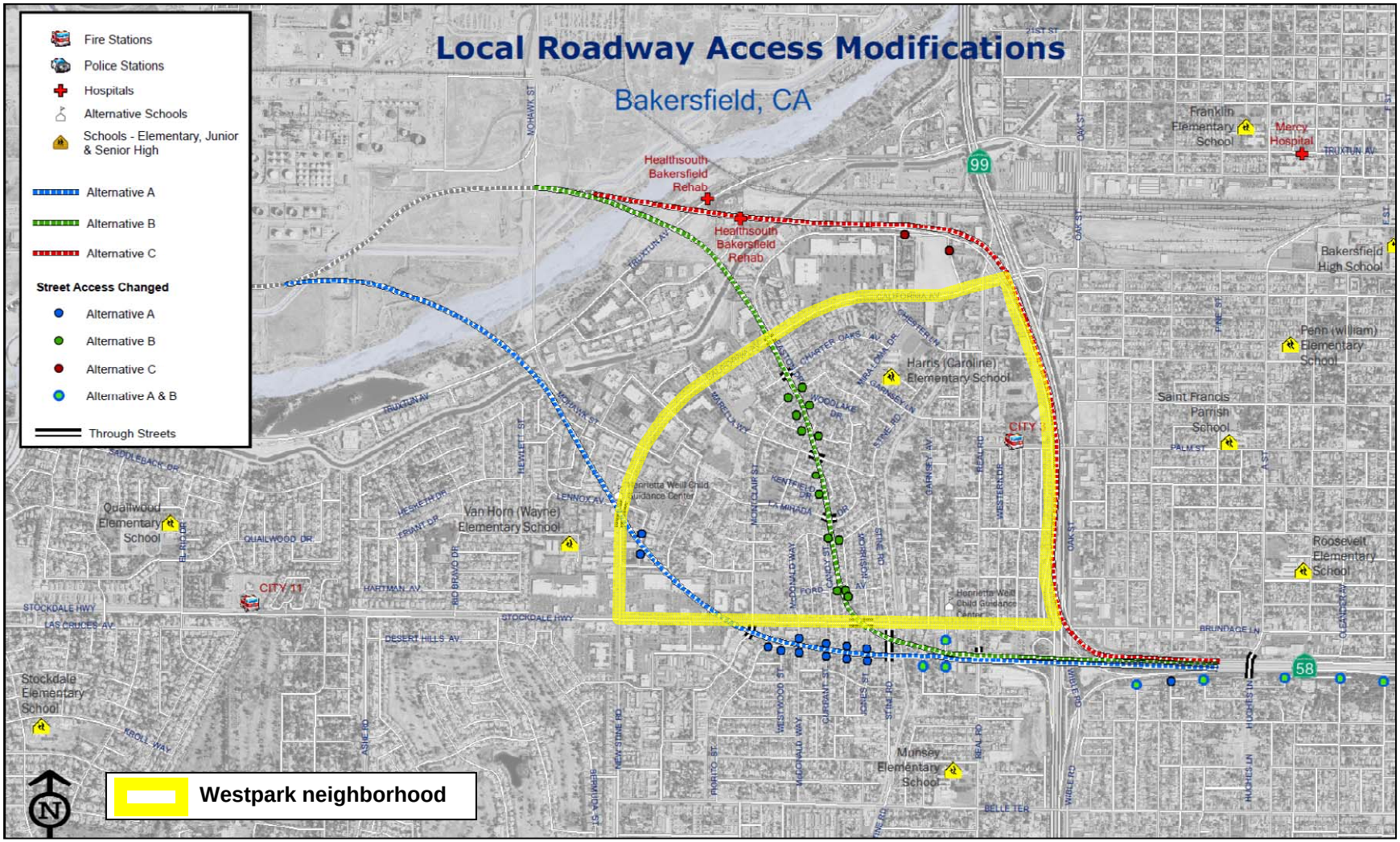


Figure 1. Local Roadway Access Modifications

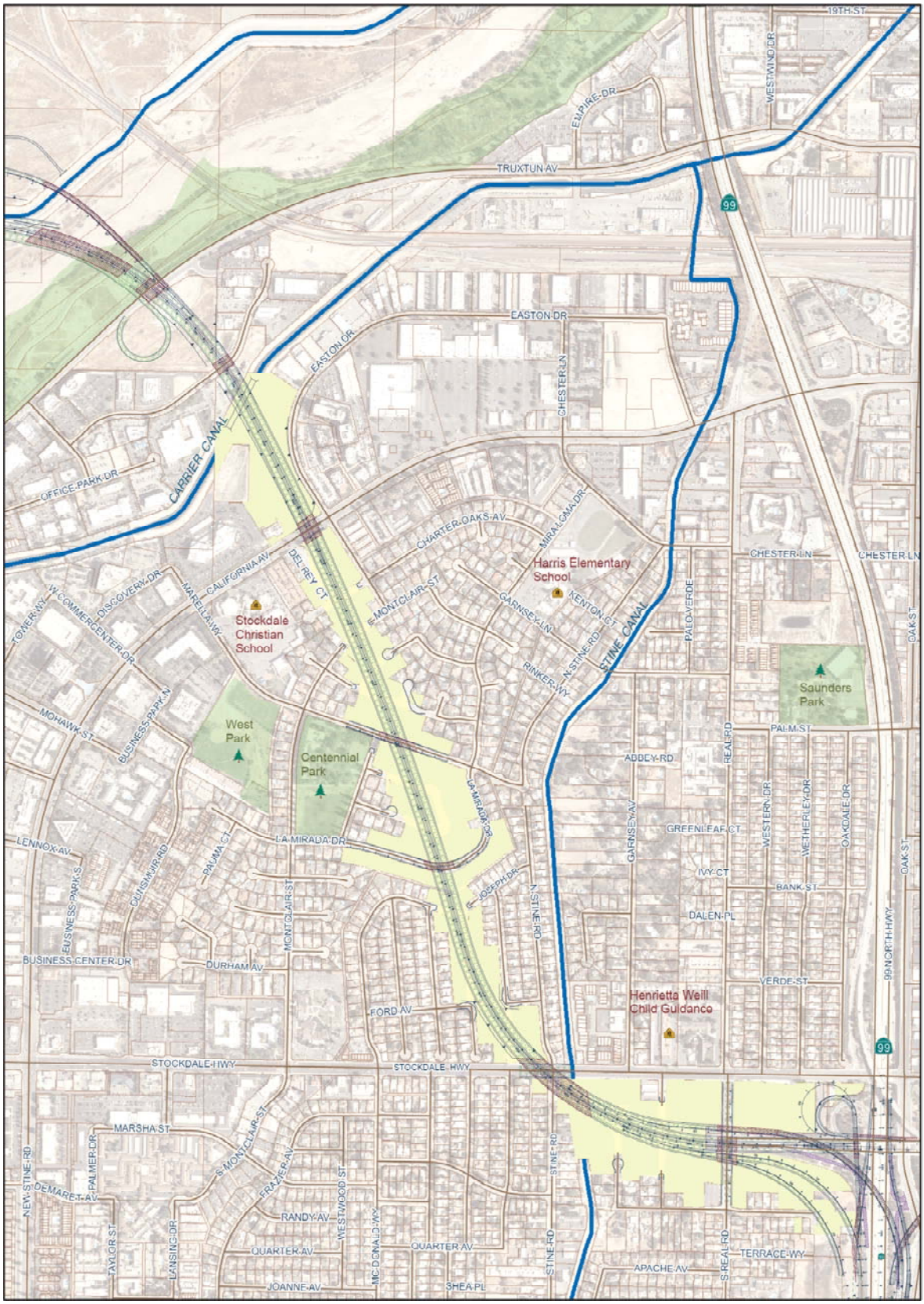


Figure 2. Centennial Alternative B Alignment

The vertical and horizontal alignment of Alternative B will affect a number of local and collector streets which serve the west of Stine Canal sub-neighborhood. Ford Avenue, just to the north of Stockdale Highway will be severed along with Joseph Drive; La Mirada Drive and Marella Way will be reconstructed to bridge over the Centennial freeway. These four named streets are all classified as *local* streets. Local streets provide access to abutting properties and are not intended to carry through, or non-local traffic. Montclair Street, the only *collector* street impacted by Alternative B, will be severed to the north of Marella Way. Collector streets are intended to collect traffic from local streets and carry this traffic to and from arterial streets.

CHANGES TO LOCAL CIRCULATION

To more fully identify local circulation impacts resulting from the Alternative B freeway alignment, Figure 3 illustrates side by side maps of the Westpark neighborhood street network before and after the insertion of the freeway. (Larger scale graphics are provided at the end of this report supplement to allow for additional comparison.) The freeway is not illustrated on the "after" portion of the graphic to allow for easier comparison of local circulation patterns.

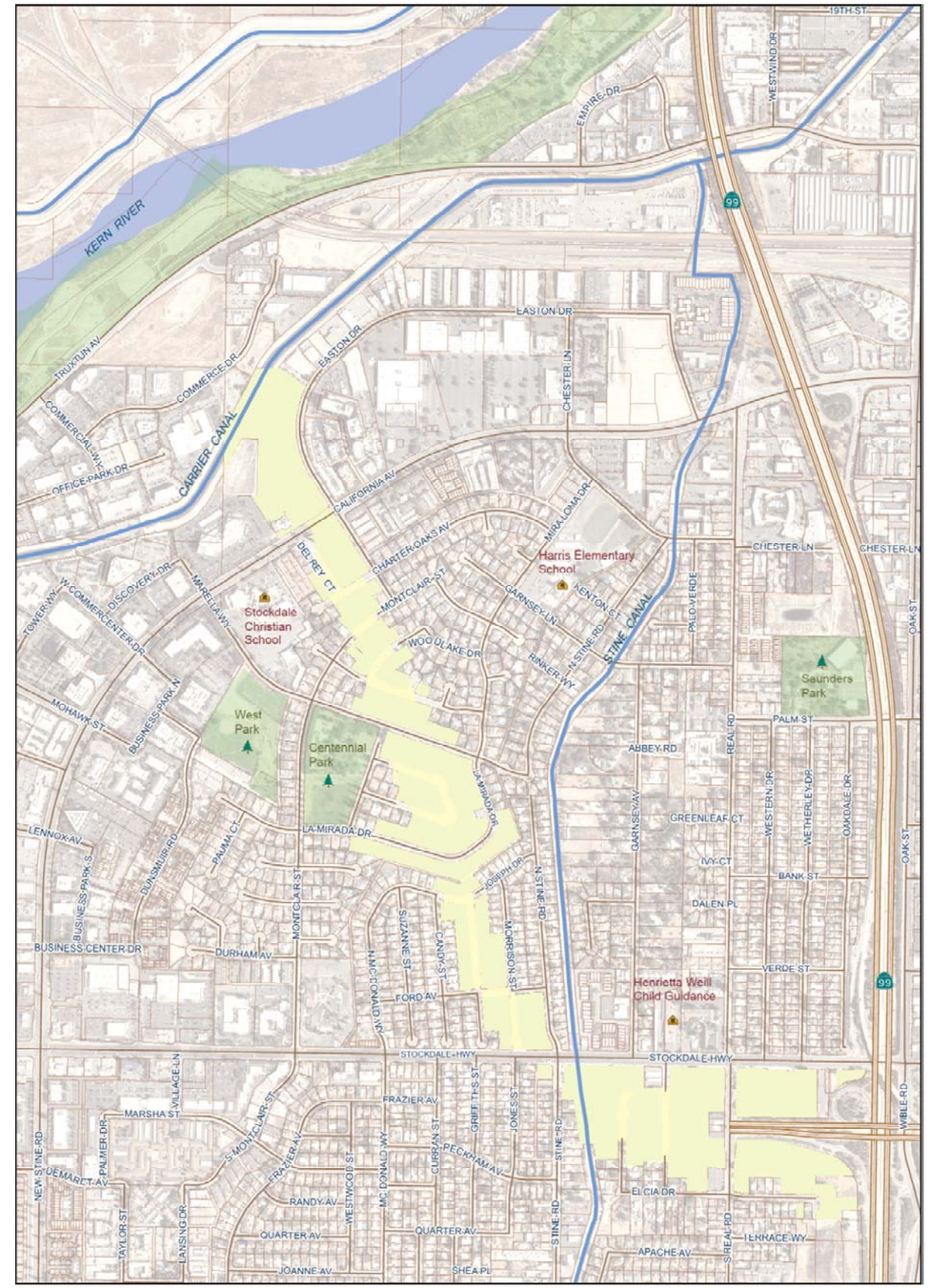
In the area between California Avenue and Stockdale Highway, the following streets will be severed east and west of the proposed right-of-way:

1. Charter Oaks Avenue
2. Montclair Street
3. Woodlake Drive
4. Kensington Avenue
5. Fallbrook Street
6. Hillsborough Drive
7. Kentfield Drive
8. Joseph Drive
9. Ford Avenue

Insofar as altered circulation patterns,

1. **Charter Oaks Avenue** residents living on the east of the alignment will use Easton Drive and Mira Loma Drive for access, while residents living on the west side of the alignment will use Del Rey Court to access California Avenue.
2. **Montclair Street** residents living on the east side of the alignment will use Mira Loma Drive, while residents living on the west side of the alignment will use Marella Way.
3. **Woodlake Drive** residents living on the east side of the alignment will use Mira Loma Drive, while residents living on the west side of the alignment will use Marella Way.
4. **Kensington Avenue** residents living on the east side of the alignment will use Mira Loma Drive, while residents living on the west side of the alignment will use Marella Way.
5. There will be no **Fallbrook Street** residents living on the east side of the alignment following construction of the freeway on the Alternative B alignment. Residents living on the west side of the alignment will use La Mirada Drive.

BEFORE



AFTER

Figure 3. Comparison of the Westpark Neighborhood with and without the Centennial Freeway (Alternative B)

6. There will be no **Hillsborough Drive** residents living on the east side of the alignment following construction of the freeway on the Alternative B alignment. Residents living on the west side of the alignment will use La Mirada Drive.
7. There will be no **Kentfield Drive** residents living on the east side of the alignment following construction of the freeway on the Alternative B alignment. Residents living on the west side of the alignment will use La Mirada Drive.
8. **Joseph Drive** residents living on the east side of the alignment will use North Stine Road, while residents living on the west side of the alignment will use McDonald Way.
9. **Ford Avenue** residents living on the east side of the alignment will use North Stine Road, while residents living on the west side of the alignment will use McDonald Way.

To more specifically identify local traffic impacts to the Westpark neighborhood, Parsons traffic engineers and transportation planners visited the neighborhood on numerous occasions to observe conditions in the field. Specifically, Parsons staff:

- Determined which streets would remain open for traffic to be diverted to after the project was built
- Measured and observed the widths of the streets to determine if they were adequate for two vehicles to safely pass one another, particularly if cars were parked on them
- Determined the number of lanes on the streets
- Determined the locations of crosswalks, stop controlled intersections and signal-controlled intersections
- Determined which streets had and did not have sidewalks
- Looked for children playing in the streets to determine how safety would be impacted
- Looked for bicycle and pedestrian activity, especially around schools and parks
- Determined if there were turn restrictions on any streets
- Looked for any unusual conditions in the field that might affect traffic flow, i.e., right turn only, cul-de-sac, local commercial development circulation, one-way streets.

In addition to the observations noted above, Parsons staff used the following methodology to quantify traffic impacts.

- Counted the number of houses affected
- Determined, for each street, the number of houses deleted from the traffic mix by virtue of the new freeway
- Identified, for each street, before and after access routes to the houses on the street—north, south, east, and west, as appropriate.
- Assigned an assumed proportion to the directions based on the location of the neighborhood relative to the metropolitan area
- Determined which directions were affected
- Determined the number of daily vehicle trips affected based on Institute for Transportation Engineers published trip generation rates

- Determined new routes for the residual trips
- Assigned trips to the impacted routes based on the new route and the proportion of trips (east, west, north, south) using the route. Trips on some roads decreased.
- Determined if houses in adjacent neighborhoods 0.5 to 0.75 mile away would be likely to use any of the streets closed by the freeway.

Based on the above field investigation and quantification of potential traffic volumes, this assessment of local circulation impacts finds the following.

1. This study concludes that the proposed project has utilized design features that will maintain reasonable circulation patterns within the Westpark neighborhood. By virtue of the original subdivision design, including many cul-de-sacs and winding streets, most of the neighborhood traffic activity is limited to a small number of local and collector streets; specifically, Easton Drive, La Mirada Drive, Mira Loma Drive, Montclair Street, and Marella Way. These streets are all completely or largely retained; and as a result, the basic traffic pattern will be maintained after the project is built.

2. Analysis of the study area has determined that there are approximately 7,325 total vehicle trips per day which occur on local streets and collectors in the study area before construction of the proposed project. According to current plans, 193 residential and commercial properties will be removed within the study area. Removal of these properties will result in a reduction of approximately 2,810 trips per day, or about 40 percent of the current traffic in the area. Table 1 provides details of this analysis. In addition to tabulating the volume of traffic reductions, likely shifts in traffic routes are noted in the table. A general conclusion from this investigation is that the reduction of overall traffic levels will more than offset shifts in traffic to alternate access routes.

3. Access through Stockdale Christian School Property for Charter Oaks Avenue residents at the western end will be affected following construction of the Centennial freeway on the Alternative B alignment. Parcel maps show a cul-de-sac at this location and street signs indicate that this is not a through street. However, this street has been opened for access to the Stockdale Christian School, the row of apartments to the east of the school, and California Avenue. This situation will need additional consideration before constructing an additional access from Del Rey Court to California Avenue.

Looking West toward Stockdale Christian School

Looking North with Stockdale Christian School on the Left and Apartments on the Right

Figure 4. Western End of Charter Oaks Drive

Table 1. Analysis of Traffic Circulation in the Westpark Neighborhood

GROUP NO.	IMPACTED LOCAL STREET NAMES	NO. OF PROPERTIES REMOVED	NO. OF PROPERTIES AFFECTED	NO. OF TRAFFIC LANES EACH DIRECTION	TRAFFIC PATTERN		DESCRIPTION/ LOCATION OF BOUNDARIES/ RESTRICTIVE FEATURES	VEHICLE TRIP GENERATION TO COLLECTORS/ ARTERIALS BEFORE PROJECT	VEHICLE TRIP GENERATION TO COLLECTORS/ ARTERIALS AFTER PROJECT	DIFFERENCE IN NUMBER OF VEHICLE TRIP
					BEST ACCESS ROUTE BEFORE PROJECT	BEST ACCESS ROUTE AFTER PROJECT				
A1	Garnsey Avenue	9	9	1	Elcia to Williamson/S Real	Elcia to S Real	To Real Rd through Elcia Dr	872	270	–602
A2	Williamson Way	13	4	1	Williamson	Elcia to S Real				
A3	Elcia Drive	1	14	1	Williamson/S Real	S Real				
B1	Suzane Street	0	10	1	Ford to McDonald/N Stine	Ford to McDonald	To Stockdale Hwy through McDonald Way	1,578	1,248	–330
B2	Candy Street	0	11	1						
B3	Dunlap Street	3	9	1						
B4	Morrison Street	13	0	—						
B5	McDonald Way	0	36	1						
B6	Suzane Street	0	25	1						
B7	Candy Street	2	21	1						
B8	Dunlap Street (W)	11	0	1						
B9	Joseph Drive (W)	4	4	1						
C1	Dunlap St (E)	11	1	1	Ford/Joseph to McDonald/N Stine	Ford/Joseph to N Stine	To Stockdale Hwy through N Stine Rd	1,090	850	–240
C2	Morrison St	6	21	1						
C3	Joseph Dr (E)	1	10	1						
C4	N Stine Rd	6	53	1	N Stine	N Stine				
D1	La Mirarda Dr	27	24	1	Fallbrook/Montclair to Marella	Montclair to Marella	To Marella Way/La Mirada Dr/Montclair St	1,244	554	–690
D2	Kentfield Dr	9	8	1	N: Fallbrook to Marella	N: Fallbrook-La Mirada to Marella				
D3	Hillsborough Dr	17	2	1	N: Fallbrook to Marella	N: Fallbrook-La Mirada to Marella				
D4	Marella Way	16	8	1	Marella	Marella				
E1	Montclair St (S)	4	16	1	N: Montclair to Easton/Mira Loma	N: Montclair-Marella to California/Mira Loma	To Marella Way through Montclair St	250	180	–70
E2	Kensington Ave (W)	3	2	1						
F1	Montclair St (N)	4	25	1	S: Montclair	S: Mira Loma-Montclair	To Mira Loma Dr/Montclair St	820	650	–170
F2	Kensington Ave (E)	5	6	1	N: Mira Loma	N: Mira Loma				
F3	Malibu Ct	2	4	1	N: Kensington-Montclair to Easton/Mira Loma	N: Kensington-Montclair-Marella to California/Mira Loma				
F4	Redondo Ct	0	6	1	N: Kensington to Mira Loma	N: Kensington to Mira Loma				
F5	Woodlake Dr	6	16	1	S: Kensington to Montclair	S: Mira Loma–Marella to Monclair				
F6	Mira Loma Dr	0	8	1	Mira Loma	Mira Loma				
G1	Charter Oaks Ave(W)	5	5	1	Easton	Del Rey	To California Ave through Del Rey Ct	220	100	–120
G2	Del Rey Ct	7	5	1						
H	Easton Dr	8	5	1	S: Montclair	S: California	To California Ave through Easton Dr	640	50	–590
I1	Charter Oaks Ave (E)	0	41	1	S: Easton to Montclair	S: Easton to California/Mira Loma-Marella to Montclair	To Easton Dr/Mira Loma Dr	610	610	0
I2	Mira Loma Ct	0	6	1	S: Mira Loma to Montclair	S: Mira Loma-Marella to Montclair				
I3	Garnsey Ln	0	14	1						
							TOTAL	**7,324**	**4,512**	**–2,812**

4. Regarding bicycle and pedestrian access within the study area, Parsons staff found that there was recurring pedestrian and bicycle activity by students arriving and departing the Harris Elementary School. However, the vast majority of trips to the elementary schools are made in motorized vehicles. Since the school is located along local streets which are unaffected by freeway construction, reasonable access is assured.

   Along La Mirada Drive and local roads to the north, residents will be able to easily cross the freeway along La Mirada Way and Marella Way which will maintain adequate width for bicycles and sidewalks. However, residents living along Joseph Drive and the local roads to the south will be required to exit their neighborhood and walk or bike along Stockdale Highway to visit their neighbors on the east or west side of the freeway.

5. There are two significant schools located within the study area: (1) Harris Elementary School at the corner of Mira Loma Drive and Garnsey Lane, and (2) Stockdale Christian School located at the corner of Marella Way and California Avenue. Stockdale Christian School is a private school which draws students from a wide region of the metropolitan Bakersfield area. Harris Elementary School is a neighborhood public school serving elementary students who live within the study area. The Westpark neighborhood is entirely within the Harris Elementary School boundary.

   Access to both schools by walking, bicycling and motorized vehicle will be unaffected (in terms of travel distance) for the vast majority of Westpark residents by the proposed alignment of Alternative B. A small number of students will be required to travel two or three blocks of extra distance to access the schools.

6. There are two significant parks in the study area west of the Stine Canal. Westpark is located on the south side of Marella Way, 150 feet west of the intersection with Montclair Street. Centennial Park is located on the southeast corner of Marella Way and Montclair Street. A row of single family residences that fronts on Montclair Street separate the two parks. Because of their location, these parks are designed to primarily serve the residents of the neighborhood. However, residents come from all over Bakersfield to use these park facilities, especially the fenced off dog park and tennis courts. Observation indicates that park users arrive by automobile, on foot and bicycle throughout the day. A number of groups arrive in private vehicles and in vans to use the picnic area under the shady oak trees. A small number of park users were observed arriving on bicycles.

   Access to both parks by walking, bicycling and motorized vehicle will be virtually unaffected (in terms of travel distance) for the vast majority of Westpark residents by the proposed alignment of Alternative B. A small number of residents will be required to travel two or three blocks of extra distance to access schools.

CONCLUSION

Implementation of Centennial Corridor Build Alternative B will have very little, if any, impact on Westpark neighborhood traffic, pedestrian, or bicycle circulation.

Westpark Neighborhood Map

Westpark Neighborhood Map with Centennial Freeway (Alternative B) Right-of-Way