



SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS

IVAG
Imperial Valley Association of Governments

Caltrans

# FORRESTER ROAD INTERREGIONAL CORRIDOR STUDY (REPORT APRIL 2009)

**PREPARED FOR SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS (SCAG)**
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# FORRESTER ROAD INTERREGIONAL CORRIDOR STUDY
## COUNTY OF IMPERIAL, CALIFORNIA

**April 22, 2009**

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# EXECUTIVE SUMMARY

Growth in the Imperial Valley has highlighted the need to identify current and future traffic conditions along key regional roadway corridors. In collaboration with the Imperial Valley Association of Governments (IVAG), California Department of Transportation (CALTRANS), and the Southern California Association of Governments (SCAG), an Interregional Corridor Study along Forrester Road has been undertaken to forecast short term and long term traffic conditions and establish a sustainable strategic plan to alleviate potential traffic impacts caused by intraregional and interregional growth and increasing border traffic between Mexico and the United States.

The primary goal of the Forrester Road Interregional Corridor Study is to evaluate the transportation demands and resulting infrastructure needs required to serve existing and future needs for intra regional, interregional, and international travel within Forrester Road between SR- 98 to the south and SR-78/86 to the north. The findings of the study identify the required improvements needed to facilitate commercial and commuter traffic in Imperial County. The overall project goal is accomplished through the completion of several separate study objectives, including the gathering and analysis of traffic data and other supporting information.

Forrester Road is one of Imperial County's most heavily travelled off-system route and a vital north-south arterial running parallel to State Route 86 and State Route 111. Exhibit ES 1 illustrates the overall study area. As indicated on the location map, Forrester Road provides a key linkage to Riverside County (via SR-78/86), San Diego County (via Interstate 8), and Mexico (via Interstate 8 and SR-98). Within Imperial Valley, Forrester Road is a key junction connecting the City of Westmorland to Interstate 8. Within the city limits of Westmorland, Forrester Road is known as Center Street. Center Street continues north of Westmorland and ends at Walker Road. At the south end of the corridor, the paved section of Forrester Road ends at McCabe Road. However, a limited amount of north-south travel occurs along Forrester Road, south of McCabe Road via a dirt road, ultimately terminating at the junction of Nichols Road-Wahl Road in the County of Imperial.

Forrester Road offers connections to other major facilities within Imperial Valley providing regional (inter and intra) travel such as:

> **Interstate 8** – A state facility that traverses from San Diego County, through Imperial County and onto Arizona in the east.

**SR-98** - An east west state facility located south of Interstate 8. SR-98 intersects with Interstate 8 at the western edge of the valley and traverses through the City of Calexico. SR-98 reconnects with Interstate 8 towards the eastern edge of the valley.

**SR-78/86** is a north-south roadway west of Highway 111 traverses through the cities of El Centro, Imperial, and Brawley and connects with Interstate 10 in Coachella Valley.

In addition to Forrester Road's connectivity to other major facilities, a parallel north-south route with close proximity to Forrester Road includes:

**Highway 111** A north-south state facility that provides interconnectivity from the United States-Mexico Border to the Coachella Valley region. Highway 111 intersects with key east-west travel routes such as Interstate 8 and SR-98 thereby providing connections to other Imperial Valley arterials.

These roadways are heavily travelled facilities vital to the mobility of the thriving agricultural sector, local economy and international trade within the Imperial Valley region and beyond. Forrester Road's connectivity to Interstate 8, SR-98 and SR-86 and its proximity to Highway 111 provides an alternate north-south route serving the local area and the ever increasing cross-border trade traffic. Although Forrester Road's traditional function is to facilitate agricultural traffic, its purpose has since evolved to include accommodating international cross border trade traffic. Its latent function has brought about a conflicting perspective regarding the future of Forrester Road. Can this roadway continue to operate efficiently to serve its traditional agricultural base and commercial truck traffic? This interregional corridor study explores the operational performance of Forrester Road accounting for the impacts of future developments along this roadway, and the diverse utilization of the roadway by commuter, agricultural and commercial traffic.

The increase in cross border traffic will have future direct impacts on Forrester Road since the location of this corridor provides a strategic route for commercial trucks travelling between the Coachella Valley and U.S. – Mexico border. Calexico West and Calexico East are two Port of Entries located approximately 16 miles southeast of Forrester Road. It is important for this study to recognize the future growth of cross-border traffic and its affect on Forrester Road's commuter and agricultural traffic.

## CROSS-BORDER TRAFFIC

Cross-border activities are essential to the state and national economic growth. Caltrans has prepared a report entitled California – *Baja California Border Infrastructure Update* (April 2008) that identifies projects and activities pertaining to the current and planned Ports of Entry (POE) in the San Diego and

Imperial County areas. According to the *California – Baja California Border Infrastructure Update* (April 2008), current 2007 statistics indicate that approximately 6,524,028 vehicles entered the Calexico West/ Mexicali I Port of Entry (POE) to the United States. A second POE approximately 6 miles east of the Calexico West POE, indicates that 3,736,735 vehicles entered the Calexico East/ Mexicali II Port of Entry in 2007. Recognizing that long cross-border wait times directly impacts goods movements and personal trips, the *Baja California Border Infrastructure Update* provides recommendations in terms of operational and infrastructure improvements. Forrester Road is anticipated to continue to be a key corridor as a new POE (Silicon Border) is proposed to the west and the existing POEs in Calexico I (west) and Calexico II (East) is further enhanced to increase trade traffic capacity. The extension of Forrester Road to SR-98 will provide access to these POEs, subsequently increasing traffic throughout the corridor. To analyze the impacts of cross-border traffic, identifying the types of vehicles accessing Forrester Road are required to distinguish commercial truck traffic from commuter and agricultural traffic.

## CURRENT TRAFFIC CONDITIONS

Analyzing the roadway operations of Forrester Road requires an accurate representation of current traffic conditions, which includes the collection of traffic counts, roadway lane configurations and accident data. Existing traffic counts provides the baseline traffic volumes, current travel patterns and the types of vehicles (classification) utilizing Forrester Road. Peak hour traffic counts were commissioned by Urban Crossroads, Inc. and approved by the technical review committee for the following study area intersections:

Forrester Road (NS) at:

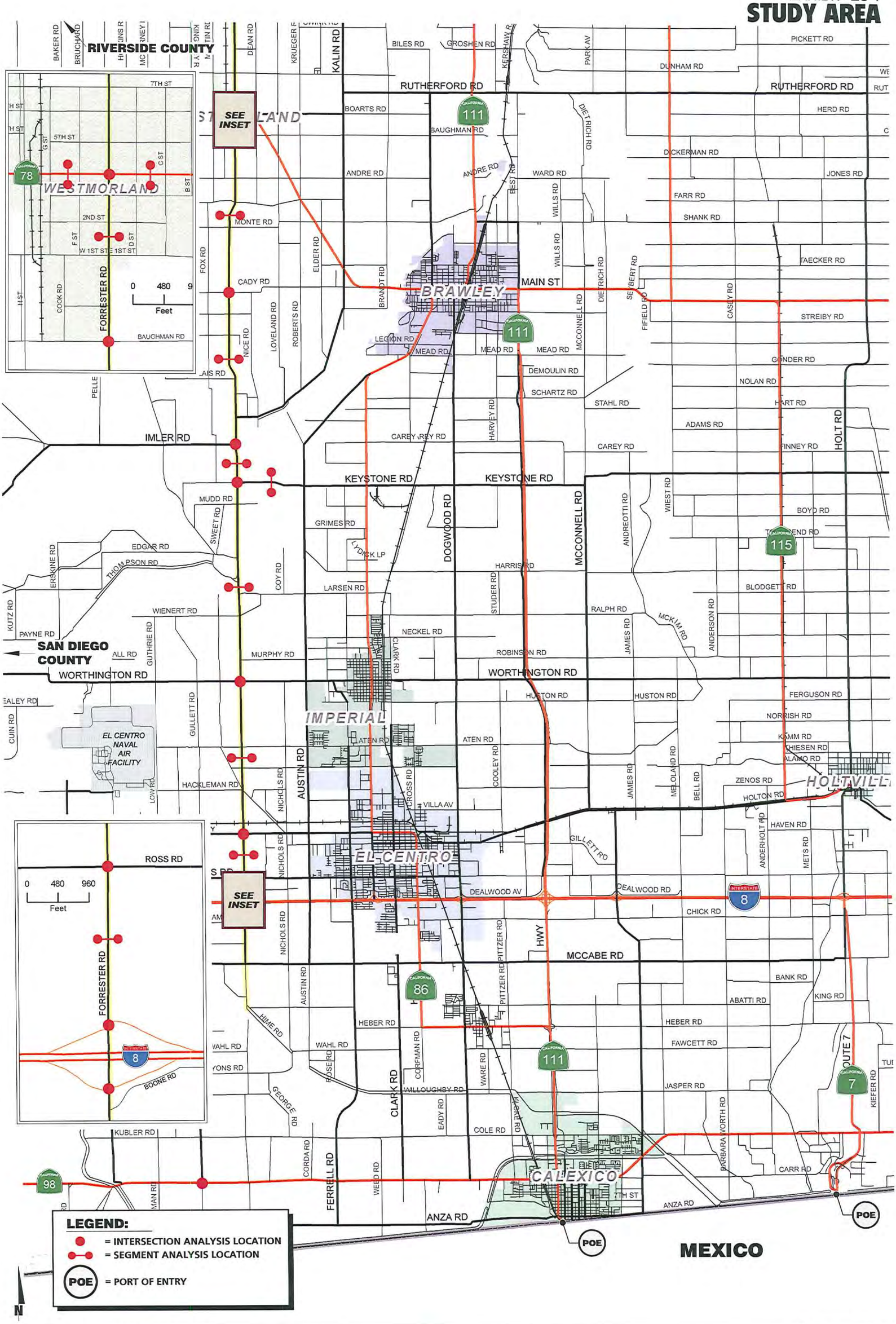
- SR-78/86 (EW)
- Baughman Road (EW)
- Cady Road (EW)
- Imler Road (EW)
- Keystone Road (EW)
- Worthington Road (EW)
- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

Brockman Road (NS) at:

- SR-98 (EW)

EXHIBIT ES-1

# STUDY AREA



Peak hour traffic conditions for all the scenarios are analyzed in the report as they are the worst-case traffic conditions throughout the day. Off-peak intersection operations are anticipated to operate equal to or better than peak hour conditions since traffic volumes are generally lower during the off-peak period.

Daily counts were conducted for one week for the following study area roadway segments:

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road
- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8

Brockman Road (NS):

- North of SR-98

Keystone Road (EW) between:

- Forrester Road and Austin Road

SR-78/SR-86 (EW):

- West of Forrester Road
- East of Forrester Road

SR-98 (EW) between:

- West of Brockman Road
- East of Brockman Road

The weeklong daily traffic counts indicate that traffic volumes are at its peak during Thursday. Hence, the roadway segment analyses conducted in this report are based on the peak weekday traffic volumes.

## ACCIDENT ANALYSIS

Current traffic conditions along Forrester Road are not entirely dependent upon the level of traffic volumes on the roadway. Roadway safety is a major concern in evaluating a regional corridor.

Therefore, accident data has been analyzed to identify the frequency, location and type of accident. The results of the accident analysis identify current roadway deficiencies and the probable causes of each type of accident. The cause of each type of accident substantiates the recommendations to enhance safety along Forrester Road. By analyzing the existing traffic counts with the vehicular accidents along Forrester Road, the current traffic conditions can be determined.

## EXISTING TRAFFIC COUNTS

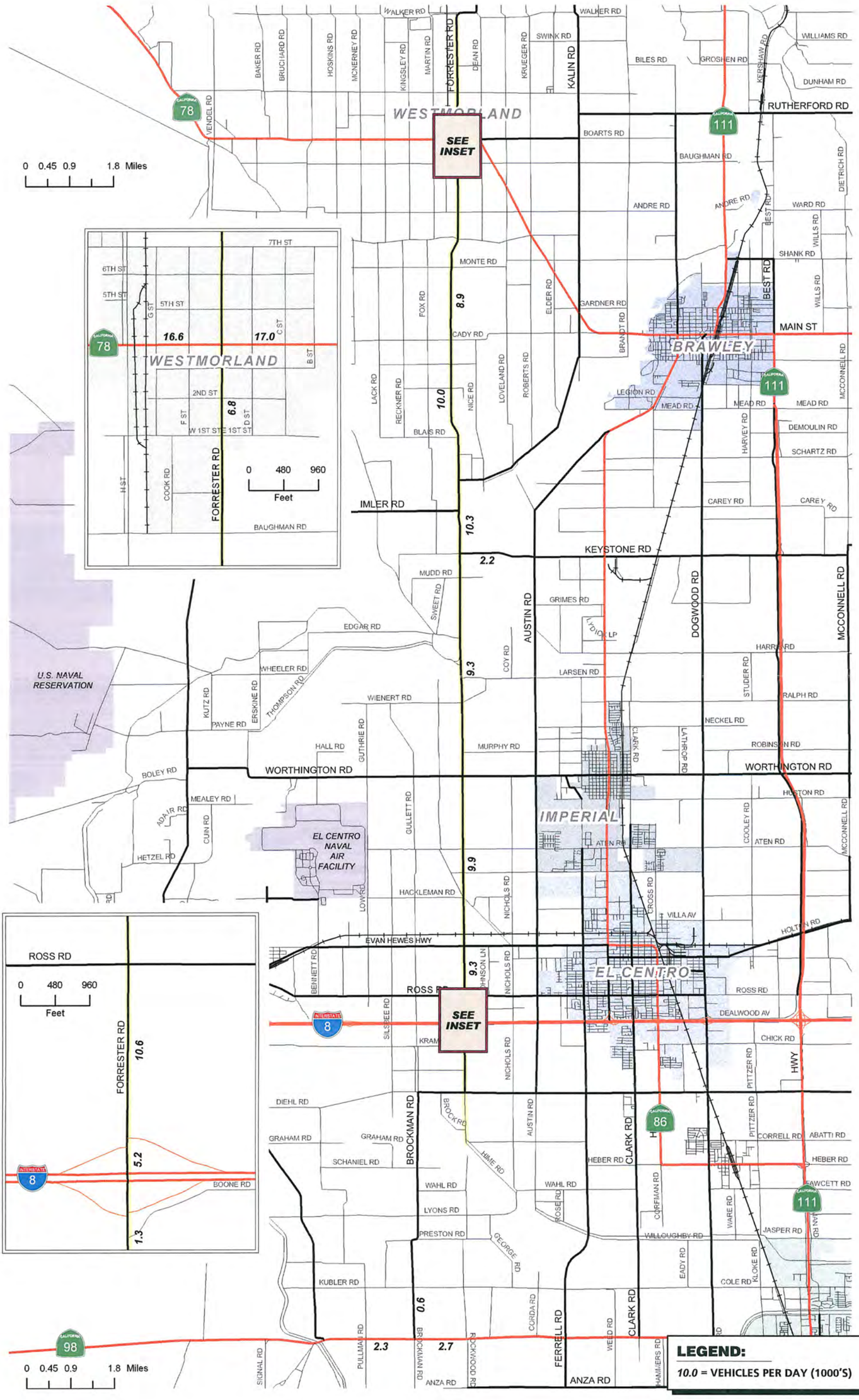
The traffic count data relating to existing conditions is analyzed and the results of the existing conditions analysis are indicative of the current intersection and road segment level of service (LOS). For intersection operations, level of service is measured by the delay in second's motorist experience at each approach leg. The seconds in delay are organized into LOS ranges with a corresponding level of service rating of "A" to "F". Acceptable level of service for County of Imperial is based on an LOS ranging from LOS "A" to LOS "C" during the peak hours. LOS "D" through LOS "F" is considered an unacceptable level of service.

The delay value calculated at the study area intersection is based on increases in traffic volumes. An increase in passenger car traffic volumes at an approach will result in longer delays for a motorist at the adjacent conflicting movement. However, the diverse vehicle mix accessing Forrester Road includes traffic associated with agricultural activities and commercial transport trucks. This necessitates assigning a passenger car equivalence (P.C.E) to farm vehicles and commercial trucks. Traffic volumes are increased to reflect longer delays at the approach for each intersection based on the specific type of vehicle. This approach accurately represents the operational characteristics of the intersection. At a full stop at the approach leg, a farm vehicle accelerates slower than a passenger vehicle and typically travel at speeds less than or equal to approximately 30 miles per hour (mph). Although the acceleration for commercial trucks are typically faster than farm vehicles at full stop and reach speeds greater than the posted speed limit, the acceleration rate for commercial trucks are generally slower than a passenger car.

The traffic counts were conducted by denoting the number of axles of each vehicle and classified into 15 vehicle classification types as described by the Federal Highway Administration (FHWA). Each classification type is divided into three categories: passenger and light trucks, medium trucks and heavy trucks. It has been assumed that 25% of medium sized vehicles are farm related trucks, which has been assigned a P.C.E factor of 6. At the approach of each intersection it is assumed that the effect of a farm vehicle is equal to 6 passenger vehicles accessing the intersection. Similarly, a medium sized trucks (non-farm related) has been assigned a P.C.E factor of 2 and heavy commercial trucks has been assigned a passenger car equivalence of 3. Accounting for the effects of slow moving trucks allows for a more accurate representation of current roadway conditions along Forrester Road.

EXHIBIT ES-2

# EXISTING AVERAGE DAILY TRAFFIC (ADT)





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## EXISTING OPERATING CONDITIONS

The existing conditions analysis are based on the existing peak hour P.C.E adjusted volumes and existing intersection lane configuration. Existing peak hour traffic operations are evaluated for the eleven study area intersections. In summary, the study area intersections are currently operating at acceptable levels of service during the peak hours (see ES-3).

Daily traffic operations are analyzed using the same P.C.E adjustments to account for the effects of slow-moving vehicles at the study area roadway segments. These trucks typically travel slower than passenger vehicles, subsequently affecting the roadway operations. In determining roadway segment performance, the County of Imperial's *Circulation and Scenic Highway Element (2006)* indicates Level of Service "C" capacity as the acceptable capacity threshold for all County roadway segments. It is assumed that Forrester Road is currently functioning as a two-lane local collector with an LOS "C" capacity of 7,100 average vehicle trips per day. Therefore, roadway segments operating with average daily traffic volumes of more than 7,100 vehicles per day are considered unacceptable. ADT volume-to-capacity ratios (V/C) illustrate the level of saturation the particular roadway segment is experiencing. The V/C is calculated through a comparison of actual traffic volumes in relation to the capacity of the roadway. Roadway segments operating with V/C values greater than 1.00 denotes that the roadway segment is operating at or exceeding its capacity. The V/C ratio for Forrester Road was calculated based on the LOS "E" capacity of 16,200. The study area roadways are analyzed with existing lane configurations and average daily traffic (ADT) volumes (see Exhibit ES-2). In summary, the following study area roadways are currently operating at daily volume levels which exceed acceptable County thresholds (see ES-3):

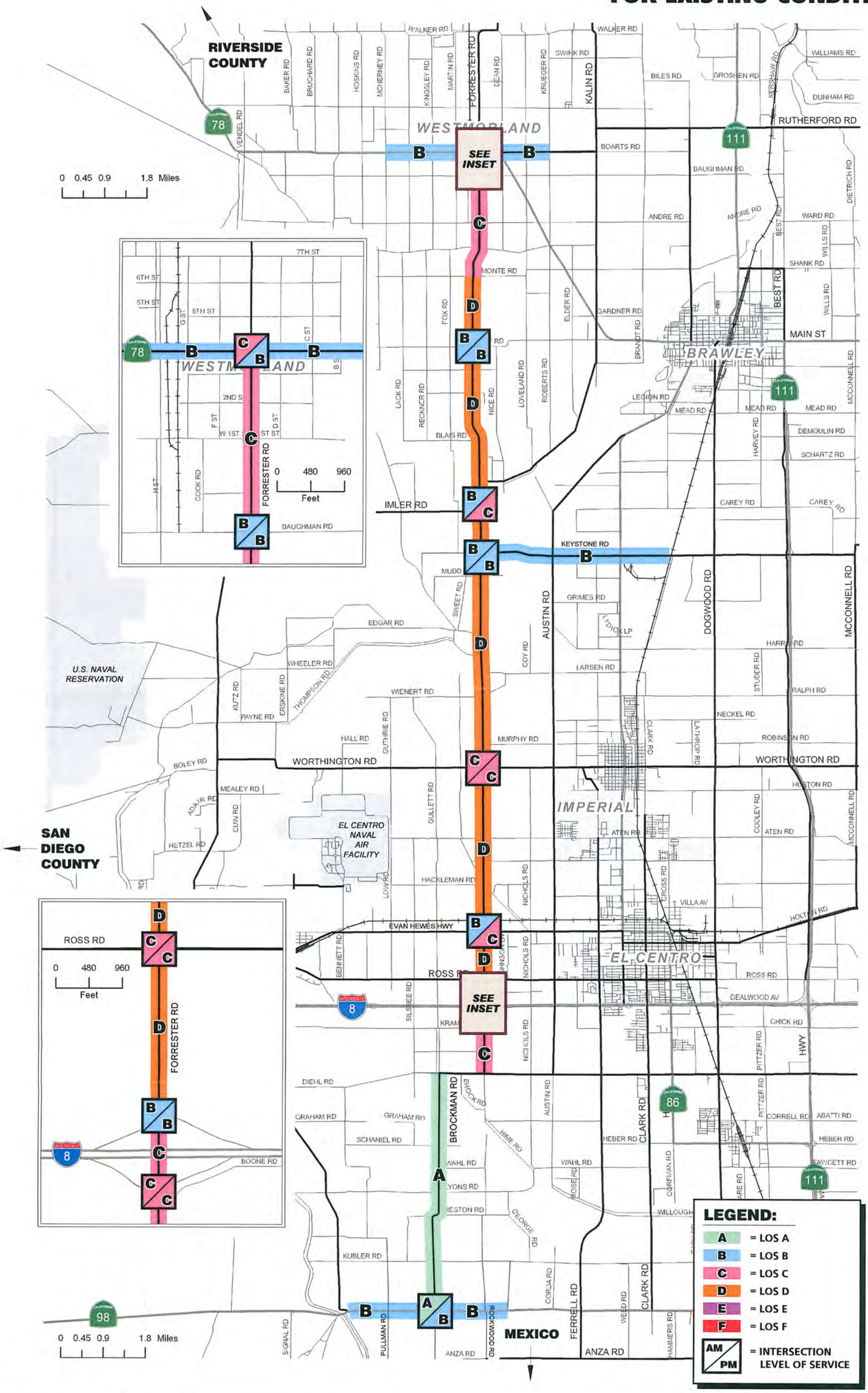
Forrester Road (NS) between:

- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road
- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8

Existing traffic conditions represents the basis in projecting future traffic conditions. The existing vehicle mix of passenger cars, farm vehicles and commercial trucks are applied in the future conditions analysis. Incorporating the vehicle mix in the future traffic volumes assumes that the agricultural and commercial truck traffic will continue to utilize Forrester Road.

EXHIBIT ES-3

# LEVEL OF SERVICE SUMMARY FOR EXISTING CONDITIONS



## FUTURE TRAFFIC CONDITIONS

To estimate future traffic volumes, traffic generated by cumulative projects that are approved or pending approval is combined with existing traffic and area wide growth. Information regarding cumulative projects were derived from the County of Imperial and the Cities of Westmorland, Brawley, Imperial, El Centro, and Calexico. Each individual project was analyzed to determine the amount of trips generated, and its trip distribution patterns. Its overall traffic impact on Forrester Road depends on the land use type, size, trip distribution pattern of each project, and its proximity to Forrester Road. Cumulative projects are generally indicative of regional growth as these projects typically rely on the demand of the local area.

The Imperial Valley region is anticipating growth in population and employment. Based on SCAG and CALTRANS statistics, it is anticipated that the Imperial Valley region is expecting an approximate annual increase in employment between 2.3% and 2.6% and an increase in population of approximately 2% from 2008 to 2035. Some of these growth estimates are based on the employment generated by cumulative commercial projects in the area and population growth that has been attributed to residential development. In addition to the forecasted regional growth in employment and population, the proposed Silicon Border POE trade traffic is anticipated to add additional traffic to the estimated 37% increase in trade traffic by 2030 at the Calexico West/ Mexicali I Port of Entry (POE) and 188% at the Calexico East/ Mexicali II Port of Entry.

An ambient growth rate of 1% per year has been applied to existing (P.C.E adjusted) traffic volumes to account for the anticipated growth in the Imperial Valley region. Since the compounded ambient growth rate is applied to the existing P.C.E adjusted traffic volumes, future traffic volumes assumes that agricultural and commercial truck traffic will propionate increase. Although the SCAG and Caltrans statistics anticipates a compounded growth of over 2% per year, most of the growth projection is attributed to cumulative developments. In addition, a 1% compounded growth to the existing (P.C.E) traffic volumes has been applied to account for growth not associated with cumulative development. The anticipated increase in trade traffic compounded with agricultural traffic and estimated growth within the Imperial Valley region necessitates an analysis of future conditions along Forrester Road. It is essential to accurately portray future traffic conditions to adequately plan infrastructure improvements to accommodate the increase in travel demand for short term (2015) and long range (2035) conditions.

Short Term (2015) conditions represent the future forecast traffic conditions along Forrester Road by the year 2015. These traffic projections are calculated by the growth factor applied to existing traffic volumes, and traffic generated from cumulative projects. Smaller scale projects have been assumed to be fully completed by 2015 and only half of the traffic generated by larger scale projects is considered in the short term traffic projections. Evaluating 2015 conditions demonstrates whether the current

facility could adequately accommodate the anticipated 2015 traffic volumes. The results of the short term (2015) analysis scenario illustrate the potential short term transportation deficiencies. In this regard, roadway improvements could be in place before traffic conditions deteriorate to unacceptable levels of service.

Short Term (2015) Intersection Analysis

The intersection delay analysis has been conducted for short term (2015) traffic conditions. In summary, for 2015 traffic conditions, the following study area intersections are anticipated to operate at an unacceptable level of service during the peak hours with existing lane geometry (see Exhibit ES-4):

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)
- Cady Road (EW)
- Imler Road (EW)
- Keystone Road (EW)
- Worthington Road (EW)
- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

These study area intersections are projected to operate at acceptable levels of service during the peak hours for 2015 traffic conditions with the recommended improvements listed illustrated on Exhibit ES-5.

The intersection of Imler Road and Forrester Road does not meet planning level traffic signal warrants for 2015 conditions. Improvements to address the LOS deficiencies include the construction of northbound and eastbound left turn lanes. A striped median lane along Forrester Road in the vicinity of this intersection will provide a sanctuary and an acceleration lane for motorists turning to and from Forrester Road at Imler Road.

Short Term (2015) Roadway Segment Analysis

The study area roadways are analyzed with Year 2015 ADT volumes with existing lane configurations. Year 2015 (ADT) volume-to-capacity ratios have been calculated to determine the anticipated service levels for the roadway segments. In summary, roadway segments are anticipated to operate with volume-to-capacity ratios which exceed County thresholds based on a single lane in each direction (see Exhibit ES-4):

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road
- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8

Keystone Road (EW) between:

- Forrester Road and Austin Road

These study area road segments are projected to operate at acceptable levels of service with the recommended improvement of enhancing Forrester Road to a four lane (2 lanes in each direction) roadway from Baughman Road to the Interstate 8 Ramps (see ES-5).

Exhibit ES-6 illustrates that the study area intersections and roadways segments levels of service with the implementation of the recommended improvements.

However, the road segment at Forrester Road between Ross Road and Interstate 8 is anticipated to exceed capacity with the recommended four lane improvement. If the adjacent intersections are improved to achieve an acceptable level of service, the improvements at these locations are anticipated to allow the roadway segment to flow at acceptable conditions since the adjacent intersections reflect constriction points for the road segment. As previously discussed in the intersection analysis, the intersections of Forrester Road/ Ross Road and Forrester Road/ Interstate 8 westbound ramps are anticipated to operate at LOS "C" or better with the installation of the warranted traffic signals and geometric modifications.

Long Range (2035) Analysis

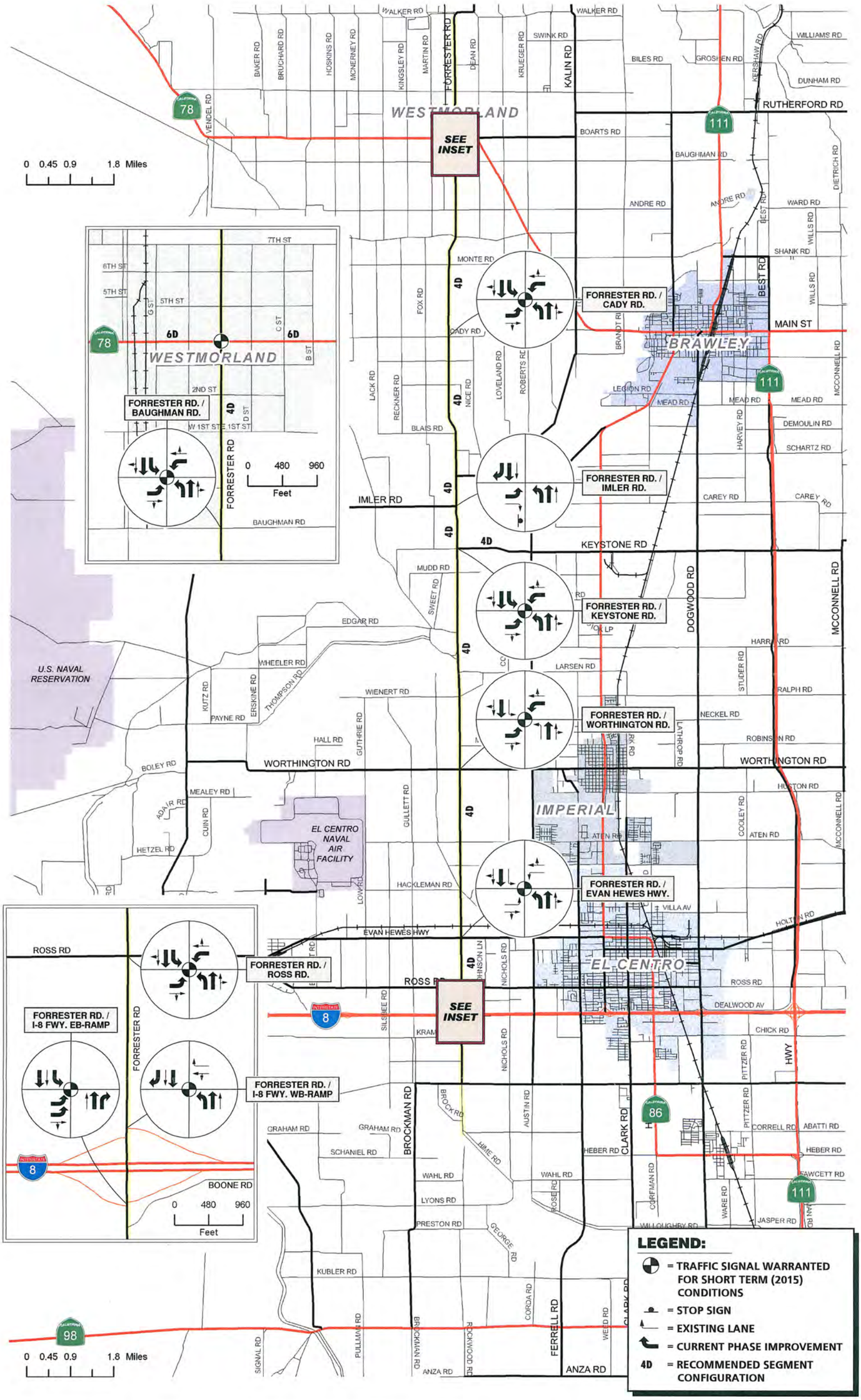
A long range (2035) analysis is required to assess if the recommended improvements for 2015 will adequately accommodate the increase in traffic by 2035. Long Range (2035) conditions represent the future traffic conditions for the year 2035. An ambient growth rate of 1% per year was applied to existing (P.C.E) adjusted traffic volumes for the 27 year time span. In addition, 100% of the traffic generated by all other developments has been added to the existing (P.C.E) adjusted volumes. The following discussion of the long range (2035) conditions provides the anticipated intersection and roadway operations with the existing lane configuration and the necessary improvements to satisfy County of Imperial LOS standards.

EXHIBIT ES-4

# LEVEL OF SERVICE SUMMARY FOR SHORT TERM (2015) CONDITIONS (WITHOUT IMPROVEMENTS)

EXHIBIT ES-5

# SHORT TERM (2015) RECOMMENDED IMPROVEMENTS



Long Range (2035) Intersection Delay Analysis

The intersection delay analysis results have been determined for Long Range (2035) traffic conditions. The following study area intersections (shown on Exhibit ES-7) are anticipated to operate at an unacceptable level of service during the peak hours with existing lane geometry:

Forrester Road (NS) at:

- SR-78/SR-86 (EW)
- Baughman Road (EW)
- Cady Road (EW)
- Imler Road (EW)
- Keystone Road (EW)
- Worthington Road (EW)
- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

These study area intersections are projected to operate at acceptable levels of service during the peak hours with the recommended improvements illustrated on Exhibit ES-8.

Similar to the findings for 2015 conditions, the intersection of Imler Road and Forrester Road is not anticipated to meet planning level traffic signal warrants for 2035 conditions. Therefore, improvements to address the LOS deficiencies still require the construction of northbound and eastbound left turn lanes. A striped median lane along Forrester Road in the vicinity of this intersection will provide a sanctuary and an acceleration lane for motorists turning to and from Forrester Road at Imler Road.

Long Range (2035) Roadway Segment Analysis

Long Range (2035) average daily traffic (ADT) volume-to-capacity ratios have been calculated to determine the roadway operation service levels. In summary, the following roadway segments are anticipated to operate with unacceptable levels of service with existing lane configurations:

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road

- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8 WB Ramp
- Interstate 8 WB Ramp and Interstate 8 EB Ramp
- South of Interstate 8 EB Ramp

Keystone Road (EW) between:

- Forrester Road and Austin Road

SR-78/86 (EW):

- West of Forrester Road

Recommended link improvements are based on the required improvements to satisfy County of Imperial LOS and V/C standards. The general recommended 2035 improvements for Forrester Road include the widening of the roadway to a 4 lane facility from SR-78/86 to Keystone Road, and a 6 lane facility south of Keystone Road to the I-8 ramps. Between the Interstate 8 eastbound ramps and McCabe Road, Forrester Road is recommended to be widened to four lanes. These improvements are shown on Exhibit ES-8.

Exhibit ES-9 illustrates the intersection and roadway segment level of service with the recommended improvements.

## LONG RANGE FUTURE NETWORK ALTERNATIVES

In addition to the long range analysis previously discussed, four long range future network alternatives are considered in this report: The alternatives were based on the input and feedback received from the stake holders meeting and the public outreach. The following provides a summary of each alternative and the results of the analysis:

- Alternative 1: Forrester Road as a Caltrans Facility
- Alternative 2: Forrester Road with the Westmorland Bypass
- Alternative 3: Forrester Road with the Eastern Bypass
- Alternative 4: Silicon Border Port of Entry

EXHIBIT ES-6

# LEVEL OF SERVICE SUMMARY FOR SHORT TERM (2015) CONDITIONS (WITH IMPROVEMENTS)

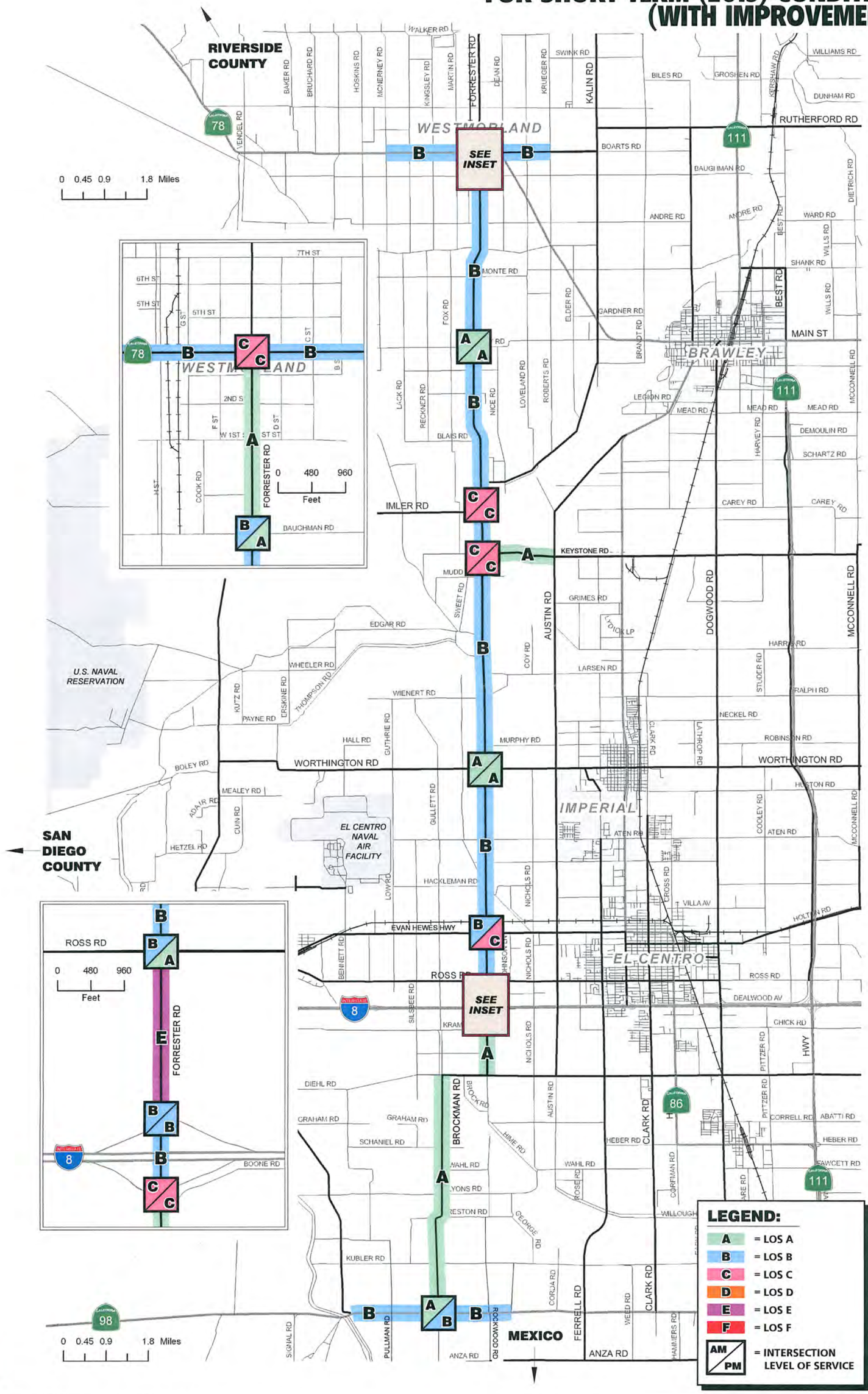


EXHIBIT ES-7

# LEVEL OF SERVICE SUMMARY FOR LONG RANGE (2035) CONDITIONS (WITHOUT IMPROVEMENTS)

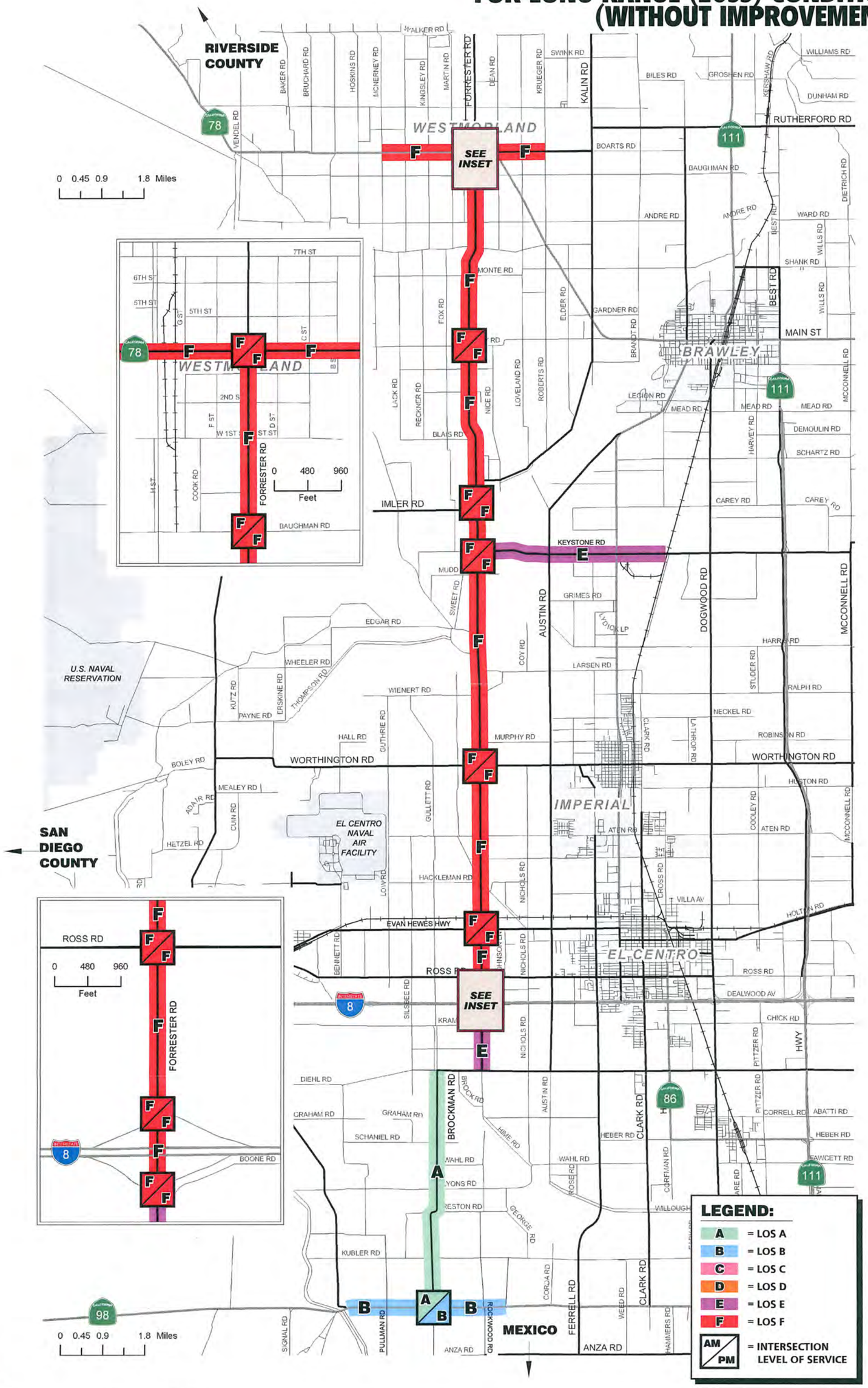


EXHIBIT ES-8

# LONG-RANGE (2035) RECOMMENDED IMPROVEMENTS

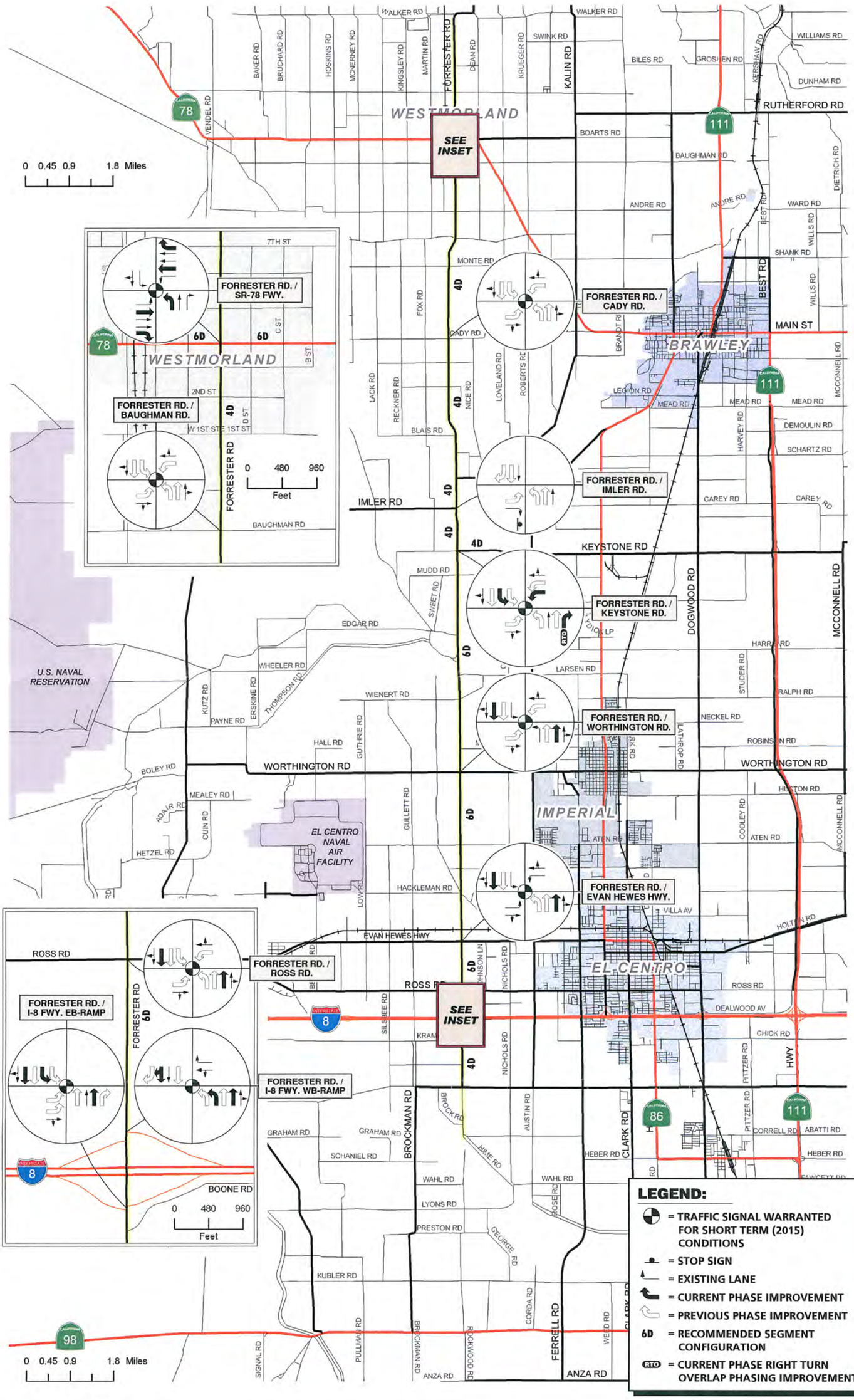
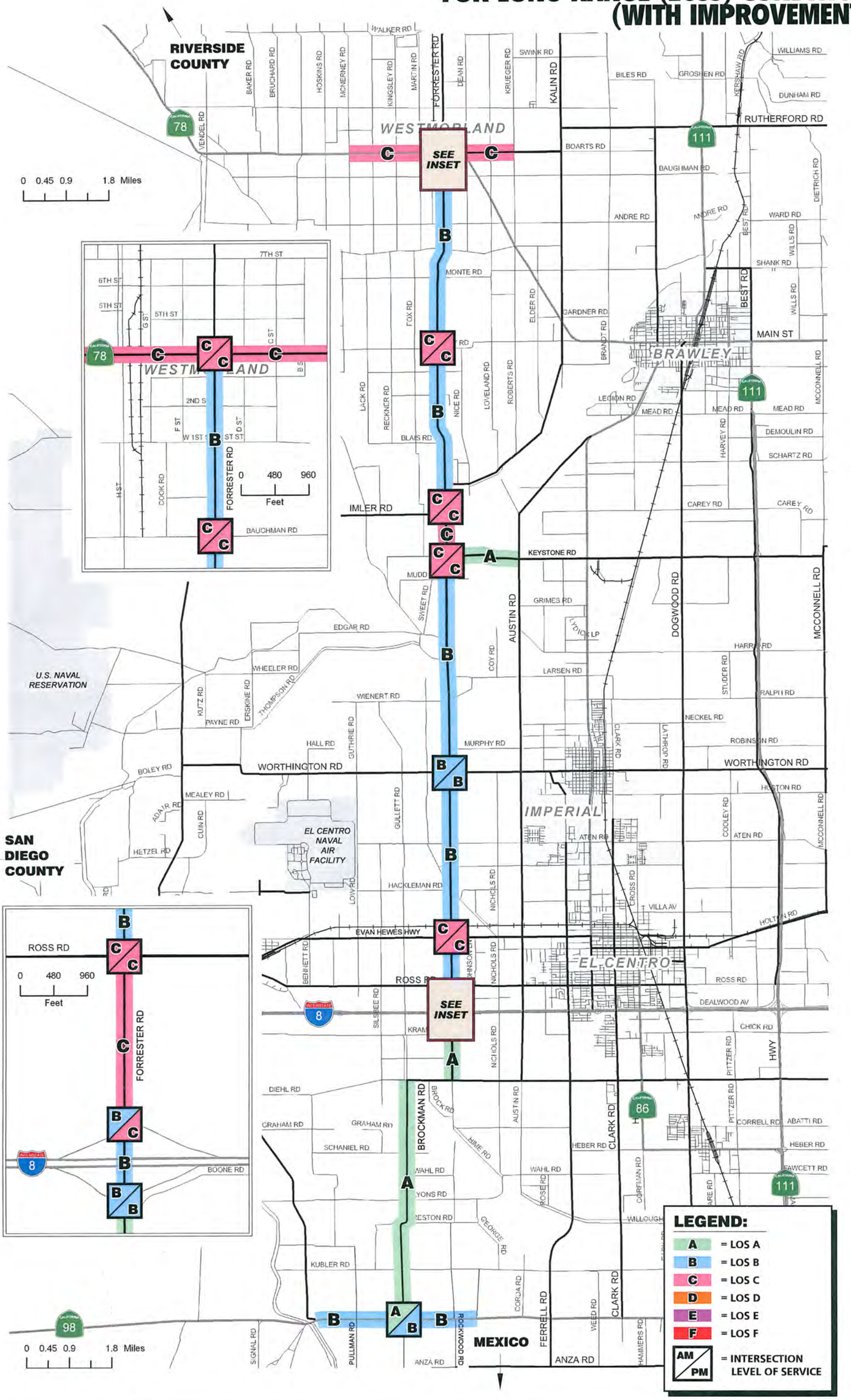


EXHIBIT ES-9

# LEVEL OF SERVICE SUMMARY FOR LONG RANGE (2035) CONDITIONS (WITH IMPROVEMENTS)



Alternative 1: Forrester Road as a Caltrans Facility

A future alternative scenario for Forrester Road is the transfer of jurisdictional authority of Forrester Road to Caltrans and to relinquish authority over SR-86 to the County of Imperial. Currently, Forrester Road is under the jurisdiction of Imperial County and a formal relinquishment process needs to be initiated and approved by the California Transportation Commission in order to transfer authority to Caltrans. The following three types of relinquishments are identified by Caltrans:

1. Relinquishment by legislative enactment
2. Relinquishment by superseding with a new state highway
3. Relinquishment of collateral facilities

For this transfer to occur, the second relinquishment process would be the most appropriate for SR-86 since Forrester Road would become a new state facility.

In terms of level of services requirements, the levels of service analyses prepared for this report are calculated on the basis of LOS "C" operations. Both County of Imperial and Caltrans requirements stipulates a minimum of LOS "C" operations for arterials within their respective jurisdictions and the recommended improvements outlined in this report are measures to ensure that this criterion is satisfied. Regardless of the controlling authority of Forrester Road and SR-86, the recommended four and six lane configurations along Forrester Road and SR-86 (Long Range 2035 configuration)are necessary to satisfy LOS "C" for both jurisdictions. Whether the transfer of jurisdictional authority to Caltrans occurs or control of Forrester Road maintains the status quo, the findings and recommendations of this report provides a future traffic forecast of Forrester Road and the necessary improvements required to satisfy operational jurisdictional standards.

In addition to level of service standards, Alternative 1 was analyzed by a comparison of the required right-of-way requirements for Imperial County and Caltrans. Through a comparative analysis, the required right-of-way standard for each jurisdiction illustrates the required roadway width for the expansion of Forrester Road to a four lane or six lane facility. This ensures that the necessary right of way is available to meet jurisdictional roadway standards for either Caltrans and/or County of Imperial and outlines whether additional or less right of way is required with the transfer of authority.

To satisfy County of Imperial standards, a four lane facility requires 82 feet of roadbed width, as opposed to the 76 feet of roadbed required for Caltrans. The total right-of way required by the County of Imperial for a four lane minor arterial is 102 feet. Caltrans requires a total of 116 feet of right of way

for a 4 lane arterial. Differences between the two jurisdictions in roadway requirements for a four lane facility differ in the median and parkway strip standards. County of Imperial has wider median standards of 18 feet compared to Caltrans requirement of 12 feet. In terms of the required parkway strip, Caltrans requires 40 feet of parkway strip compared to the County's requirement of 20 feet.

For a 6 lane facility, County of Imperial and Caltrans require a total right of way of 126 feet and 140 feet, respectively. To satisfy County of Imperial roadway standards for a six lane prime arterial, 106 feet from curb to curb is required. In contrast, Caltrans require less roadway width of 100 feet from curb to curb. However, the parkway strip requirement for County of Imperial requires 10 feet compared to the Caltrans requirement of 20 feet. To transfer the jurisdictional control of Forrester Road to Caltrans, it is anticipated that approximately 140 feet of right of way must be acquired to accommodate a 6 lane facility. The rough order magnitude cost for proposed improvements is $158.6 million to $165.9 million as shown in Section 8 of the detailed report.

Key issues regarding the transferring of jurisdictional control of Forrester Road and SR-86 must be addressed before initiating the relinquishment process. Coordination with the California Transportation Commission, Caltrans, County Staff and local Cities to initiate the transfer process of Forrester Road through "Relinquishment by superseding with a new state highway" is essential to explore the cost/ benefit of transferring authoritative control of Forrester Road to Caltrans and the SR-86 to County of Imperial. A multilateral approach from all stakeholders is necessary to resolve roadway standard issues as previously mentioned in the differences in median and parkway strip widths between Caltrans and County of Imperial. A more focused transportation planning and traffic engineering report along Forrester Road is advised to dictate the most suitable roadway design to serve local residents, agriculture, and cross-border trade activities as well as enhancing safety in the Forrester Road corridor.

Alternative 2: Westmorland Bypass

The *Imperial County 2007 Transportation Plan Highway Element* has recognized this project as a mid-term project (2015-2025) with an estimated project expenditure of $167.8 million. The Westmorland Bypass is anticipated to divert truck traffic away from the City of Westmorland and reduce traffic volumes along Forrester Road between the SR-78/SR-86 and the SR-78 within the City of Westmorland's City limits. For Alternative 2, a proposed Truck Bypass south of the City of Westmorland in Imperial County is analyzed. Exhibit ES-10 illustrates the proposed alignment of Alternative 2. To accommodate future 2035 traffic volumes, Andre Road is proposed to connect with the SR-78/86 via Kingsley Road west of the City of Westmorland, and to re-connect with the SR-78/86 southeast of the City of Westmorland. Added traffic volumes on Andre Road due to the truck bypass route require that

the capacity of the existing Andre Road is increased to adequately facilitate the projected travel demand.

**Alternative 2 Long Range (2035) Intersection Delay Analysis**

The intersection delay analysis results have been calculated for Long Range (2035) Alternative 2 traffic conditions and are illustrated in Exhibit ES-11. In summary, the following study area intersections affected by the Westmorland Bypass are anticipated to operate at an unacceptable level of service during the peak hours with existing lane geometry:

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)

These study area intersections are projected to operate at acceptable levels of service during the peak hours with the installation of warranted traffic signals and recommended geometric improvements shown on Exhibit ES-12.

**Alternative 2 Long Range (2035) Roadway Segment Analysis**

Long Range (2035) Alternative 2 average daily traffic (ADT) volume-to-capacity ratios have been calculated to determine the service levels of the study area roadway segments affected by this alternative. The following roadway segments affected by the Westmorland Bypass are anticipated to operate with unacceptable volume-to-capacity ratios with current lane configurations (see Exhibit ES-12):

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road

Recommended Alternative 2 link improvements are based on the required improvements to satisfy County of Imperial LOS and V/C standards. It is anticipated that a 4 lane facility between SR-78/86 and Keystone Road will accommodate the projected 2035 traffic volumes for Alternative 2. The roadway improvements are shown on Exhibit ES-12. The rough order magnitude cost for proposed improvements is $248.1 million to $255.4 million as shown in Section 8 of the detailed report.

EXHIBIT ES-10

# PROPOSED WESTMORLAND BYPASS CONFIGURATION (OFFICIALLY ADOPTED IVAG OPTION)

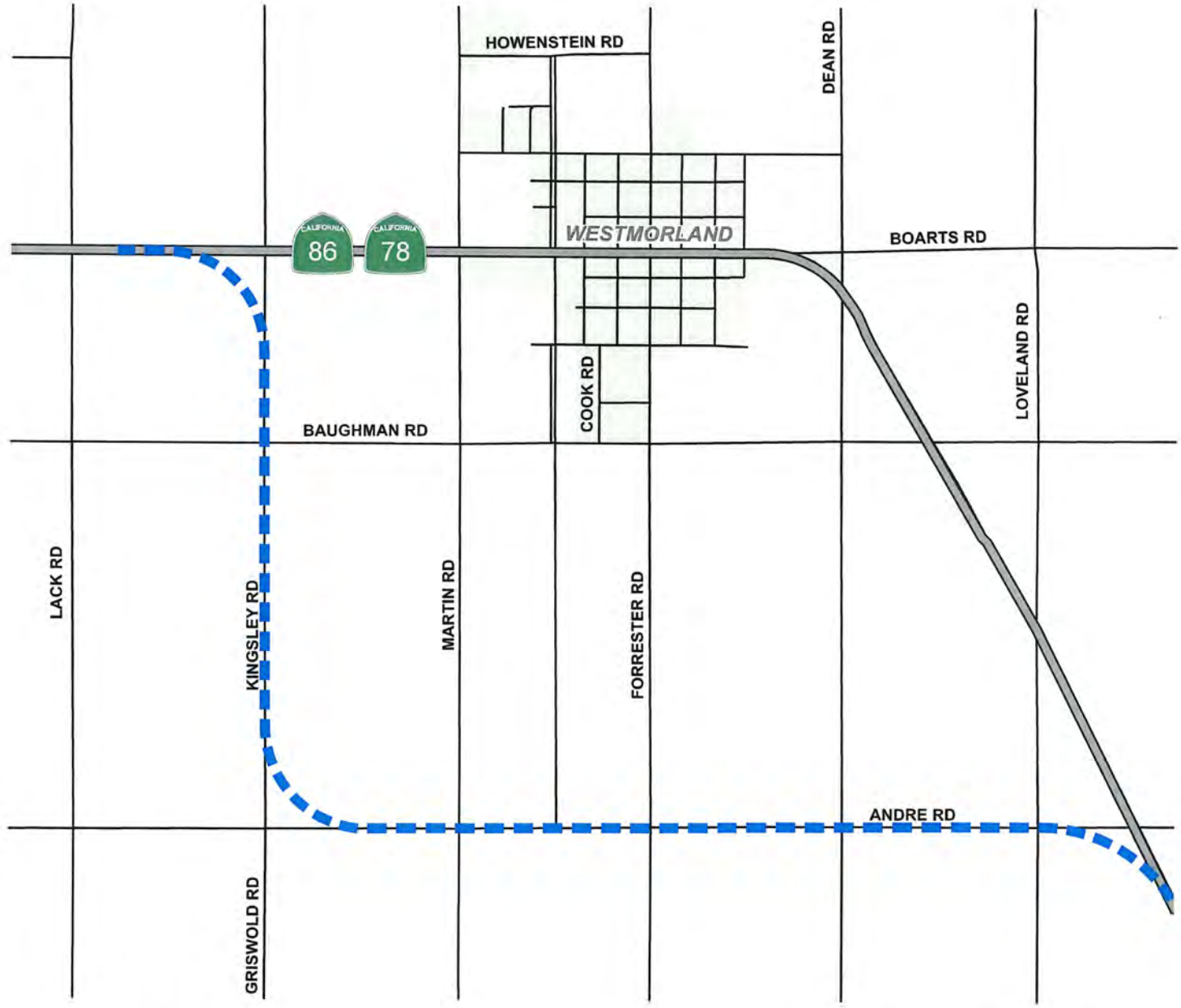
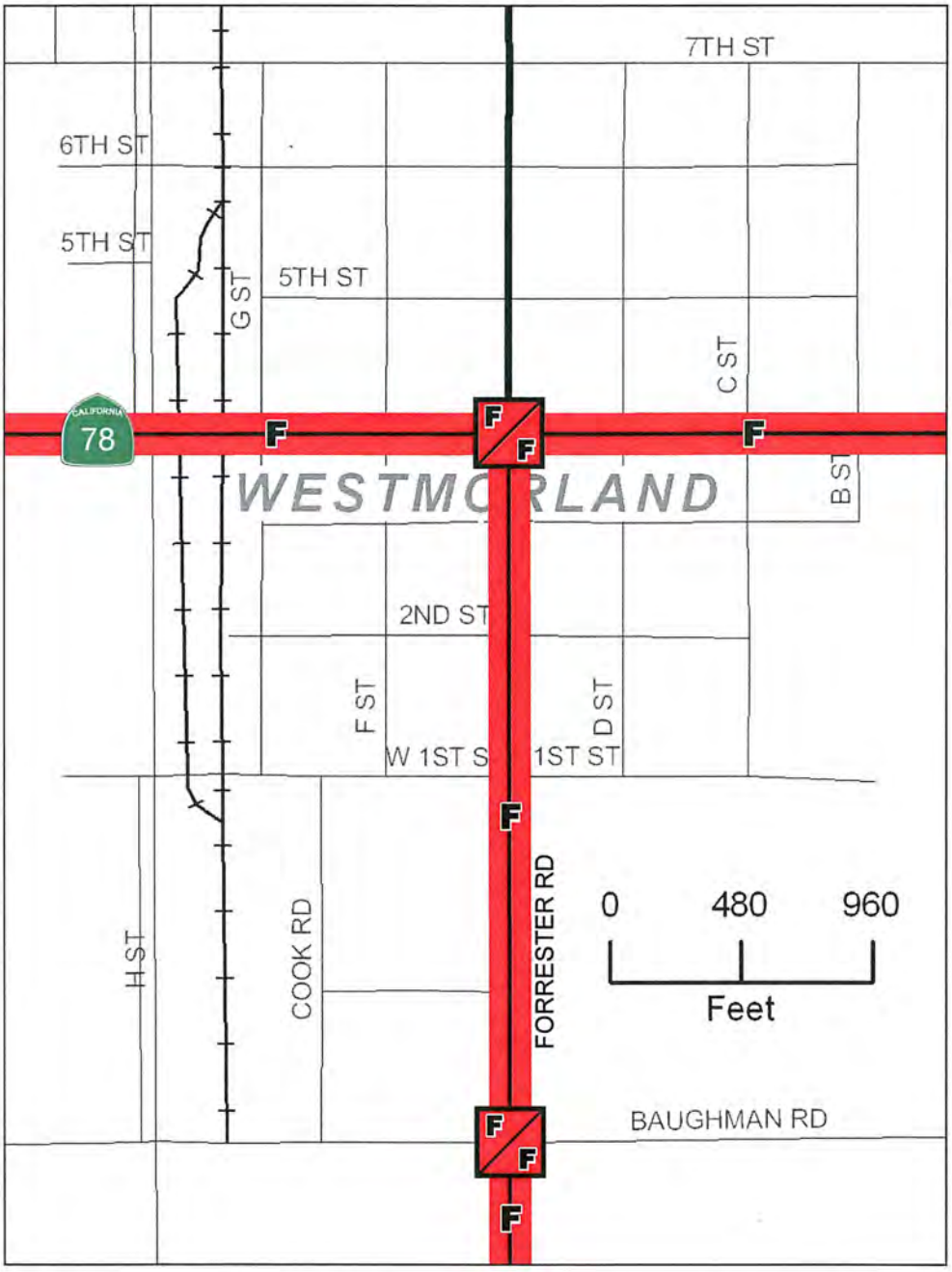


EXHIBIT ES-11

# LEVEL OF SERVICE SUMMARY FOR LONG RANGE (2035) ALTERNATIVE 2 CONDITIONS



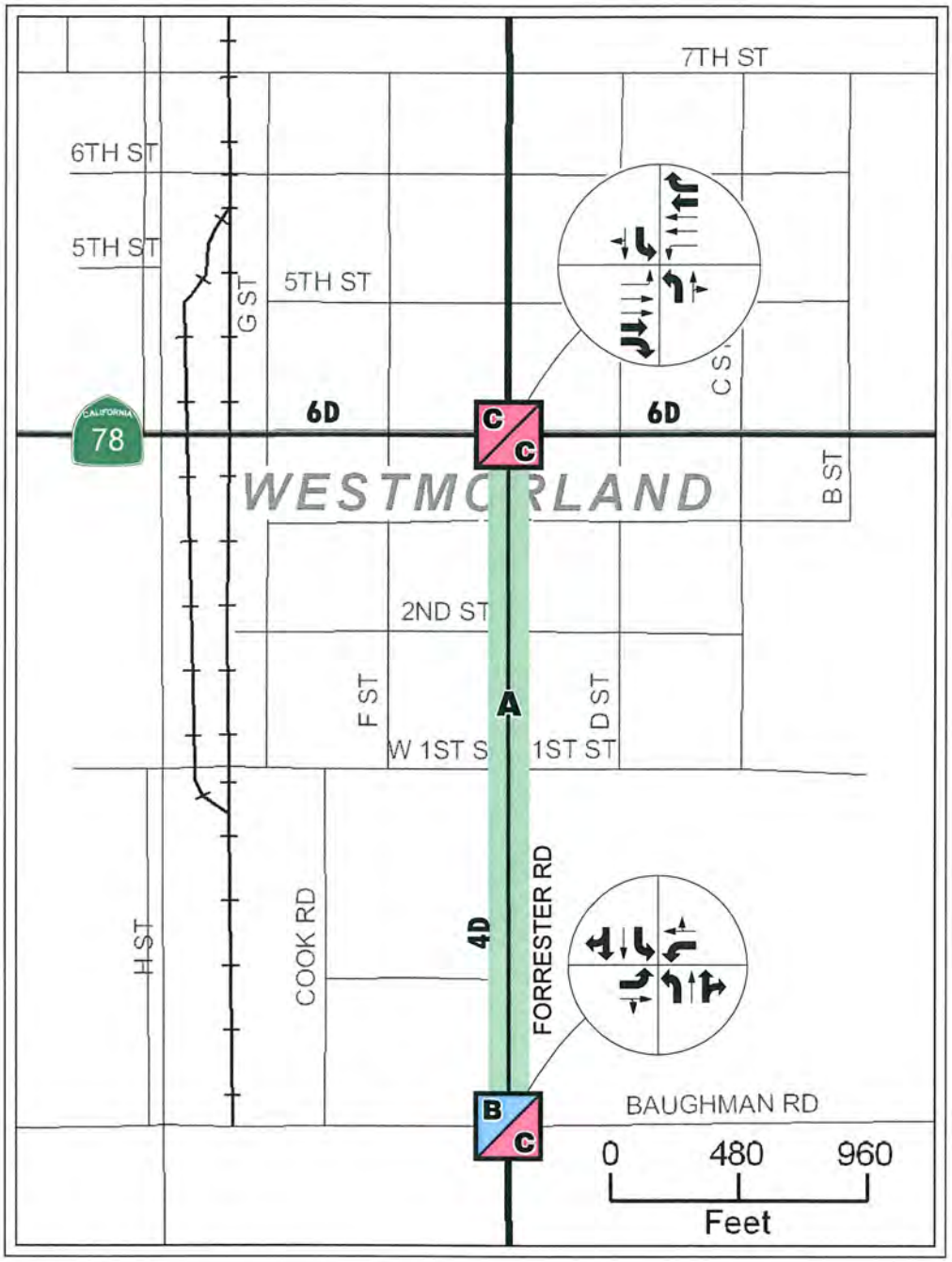

**LEGEND:**

| | | | | | |
|---|---|---|---|---|---|
| A | = LOS A | D | = LOS D | AM/PM | = INTERSECTION LEVEL OF SERVICE |
| B | = LOS B | E | = LOS E | | |
| C | = LOS C | F | = LOS F | | |

N

EXHIBIT ES-12

# RECOMMENDED IMPROVEMENTS FOR LONG RANGE (2035) ALTERNATIVE 2 CONDITIONS




**LEGEND:**

- A = LOS A
- B = LOS B
- C = LOS C
- AM/PM = INTERSECTION LEVEL OF SERVICE
- = EXISTING LANE
- = CURRENT PHASE IMPROVEMENT
- 6D = RECOMMENDED SEGMENT CONFIGURATION

N

The primary function of the Westmorland Bypass is to reduce the industrial truck traffic travelling through the southern City limits of Westmorland. This Bypass configuration will also reduce traffic along the SR-78/86 within the City of Westmorland.

Alternative 3: Eastern Bypass at Baughman Road

Alternative 3 is a City of Westmoreland recommendation that would provide a Truck Bypass at the southern city limits. The Eastern Bypass would restrict truck traffic traveling through the City of Westmorland via Forrester Road (Center Street).Northbound truck traffic on Forrester Road would be redirected easterly on Baughman Road and continue to SR-78/86. Truck traffic would then continue northwesterly back through the City. Exhibit ES-13 illustrates the proposed Eastern Bypass.

**Alternative 3 Long Range (2035) Intersection Delay Analysis**

The intersection delay analysis results are illustrated on Exhibit ES-14 for Long Range 2035 Alternative 3 traffic conditions. For Long Range 2035 Alternative 3 traffic conditions, the following study area intersections affected by the Eastern Bypass are anticipated to operate at an unacceptable level of service during the peak hours with existing lane geometry:

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)

For 2035 Alternative 3 traffic conditions, these study area intersections are projected to operate at acceptable levels of service during the peak hours with the installation of warranted traffic signals and recommended geometric improvements listed on Exhibit ES-15.

**Alternative 3: Long Range (2035) Roadway Segment Analysis**

The results of the Long Range (2035) Alternative 3 average daily traffic (ADT) volume-to-capacity ratios are shown on Exhibit ES-14. In summary, the following roadway segments affected by the Westmorland Bypass are anticipated to operate with unacceptable volume-to-capacity ratios with current lane configurations:

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road

SR-78/86 (EW):

- East of Forrester Road

Recommended Alternative 3 link improvements (shown on Exhibit ES-15) are based on the required improvements to satisfy County of Imperial LOS and V/C standards. It is anticipated that a 4 lane facility between SR-78/86 and Keystone Road will accommodate the projected 2035 traffic volumes. The rough order magnitude cost for proposed improvements is $181.4 million to $188.7 million as shown in Section 8 of the detailed report.

The primary function of the Eastern Bypass is to direct the industrial truck traffic travelling through the southern City limits of Westmorland. Compared to the Westmorland Bypass, this Bypass configuration is not anticipated to reduce traffic volumes along the SR-78/86 within the City of Westmorland, but accomplishes the primary function of reducing traffic volumes along Forrester Road/ Center Street, north of Baughman Road. Truck traffic travelling west towards Riverside County are diverted east on to Baughman Road to the SR-86 and continues westerly through the City of Westmorland. The truck travel patterns associated with the Eastern Bypass are circuitous since trucks heading towards Riverside County are initially diverted in the opposite direction of their intended destination (via eastbound on Baughman and westbound on SR-78/86).

The proposed location of the Eastern Bypass requires the necessary right-of-way on the City of Westmorland's southern city limits. However, this Eastern Bypass configuration with only an eastern connection to the SR-86 will require fewer resources in comparison to the Westmorland Bypass (Alternative 2), which consists of a western and eastern connection to SR-78/86.

Additional Truck Bypass Considerations

The proposed truck bypass alternatives are anticipated to reduce truck traffic travelling through the City of Westmorland by diverting truck traffic to the west and east of the City's southern region. The intersection delay and LOS for Alternatives 2 and 3 have been compared at the two Westmorland study area locations: SR-78/86 / Forrester Road and Baughman Road/ Forrester Road. In summary, the comparison indicates that the intersection delays for Alternative 2 at the intersections of Forrester Road/ Baughman Road and Forrester Road/ SR-78/86 are lower than Alternative 3. The Westmorland Bypass diverts traffic volumes away from the City of Westmorland and reduces overall traffic at the two aforementioned intersections. As opposed to diverting traffic away from these two intersections, the

Eastern Bypass re-routes the northbound traffic away from the intersection of Forrester Road/ Baughman Road to travel east towards the SR-78/86.

The truck bypass alternatives are anticipated to address the City of Westmorland's concerns of large trucks passing through Center Street to SR-78/86. The outcome of the public outreach indicated that the residents' main concerns were the increased traffic congestion, safety issues, and pavement degradation. Appendix "P" contains the City of Westmorland's South Center Street Pavement Rehabilitation Report.

City of Westmorland residents are concerned with the economic visibility of some of the businesses affected by the truck diversion. Alternative 2 (Westmorland Bypass) diverts traffic away from the City of Westmorland, subsequently reducing traffic volumes east and west of Forrester Road along the SR-78/86. Reduction in traffic volumes may affect local business located along the State Route within the City of Westmorland as the anticipated decrease in traffic reduces the opportunity of motorists "passing-by" to patronize.

Alternative 4: Silicon Border Port of Entry

A high technology industrial complex on the U.S/ Mexico border is currently under discussion. The Silicon Industrial Complex at Baja California could create up to 100,000 jobs in the Mexicali/ Imperial border region over the next 20 years. A new port of entry (POE) west of Forrester Road at the U.S. – Mexico border has been proposed to accommodate the trade traffic generated by the high technology industrial complex. The Silicon Border POE will connect the industrial complex with Interstate 8. This connection will subsequently increase traffic volumes along the Interstate 8 freeway due to the termination of the proposed link at the Interstate 8 junction, which forces trade traffic to travel east or west. This will exacerbate traffic conditions to nearby north-south arterials for truck traffic travelling north because of the shorter route associated with the SR-86 to reach northern locations as opposed to travelling west on Interstate 8 and north via Interstate 5. It is anticipated that an increase in truck traffic along Forrester Road is possible since it is the nearest north-south arterial connecting to the SR-86. Unless a new north-south arterial is constructed, truck traffic associated with the proposed POE will utilize Forrester Road as a route for northern travel, subsequently increasing traffic volumes along Forrester Road.

EXHIBIT ES-13

# PROPOSED EASTERN BYPASS CONFIGURATION

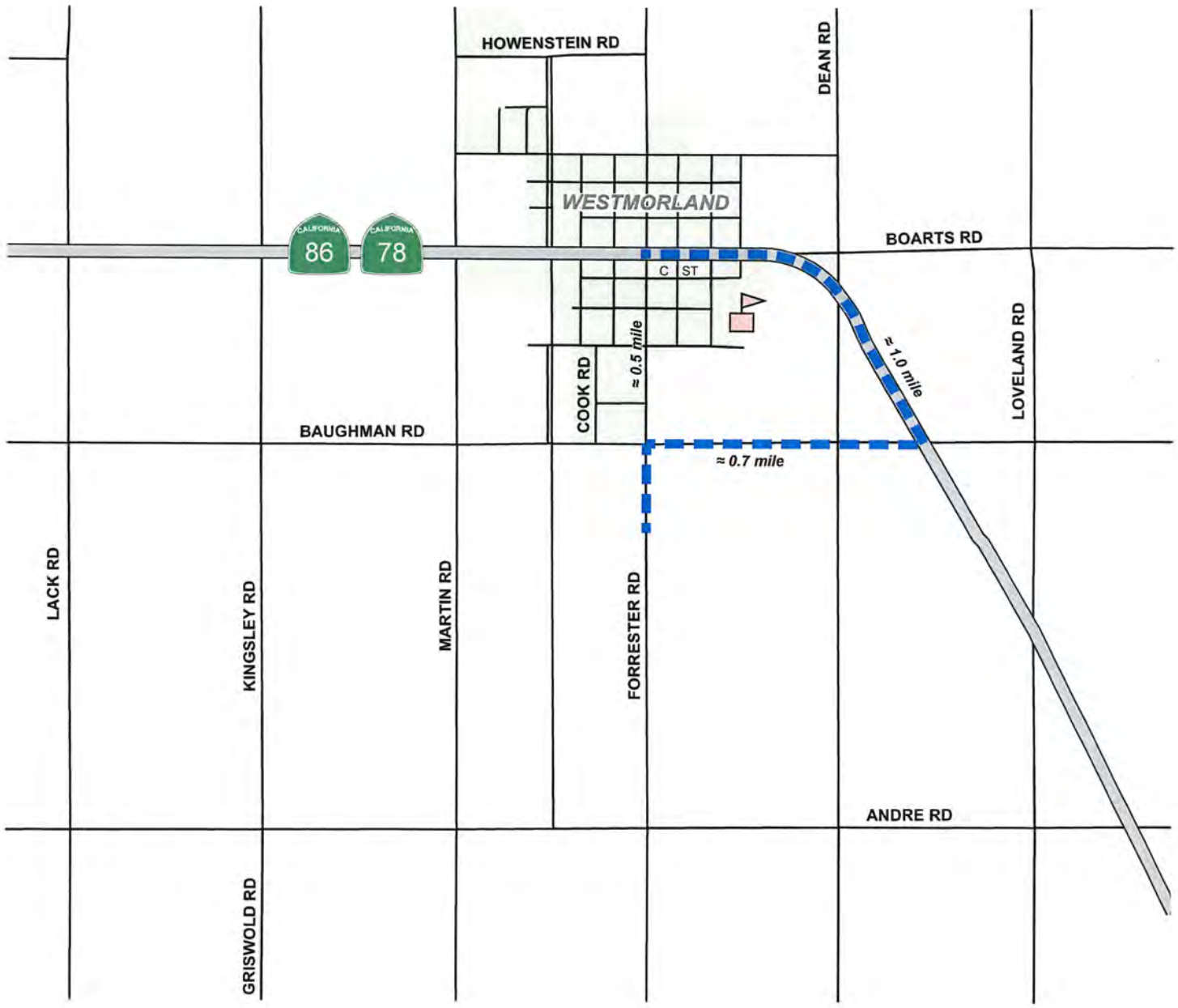
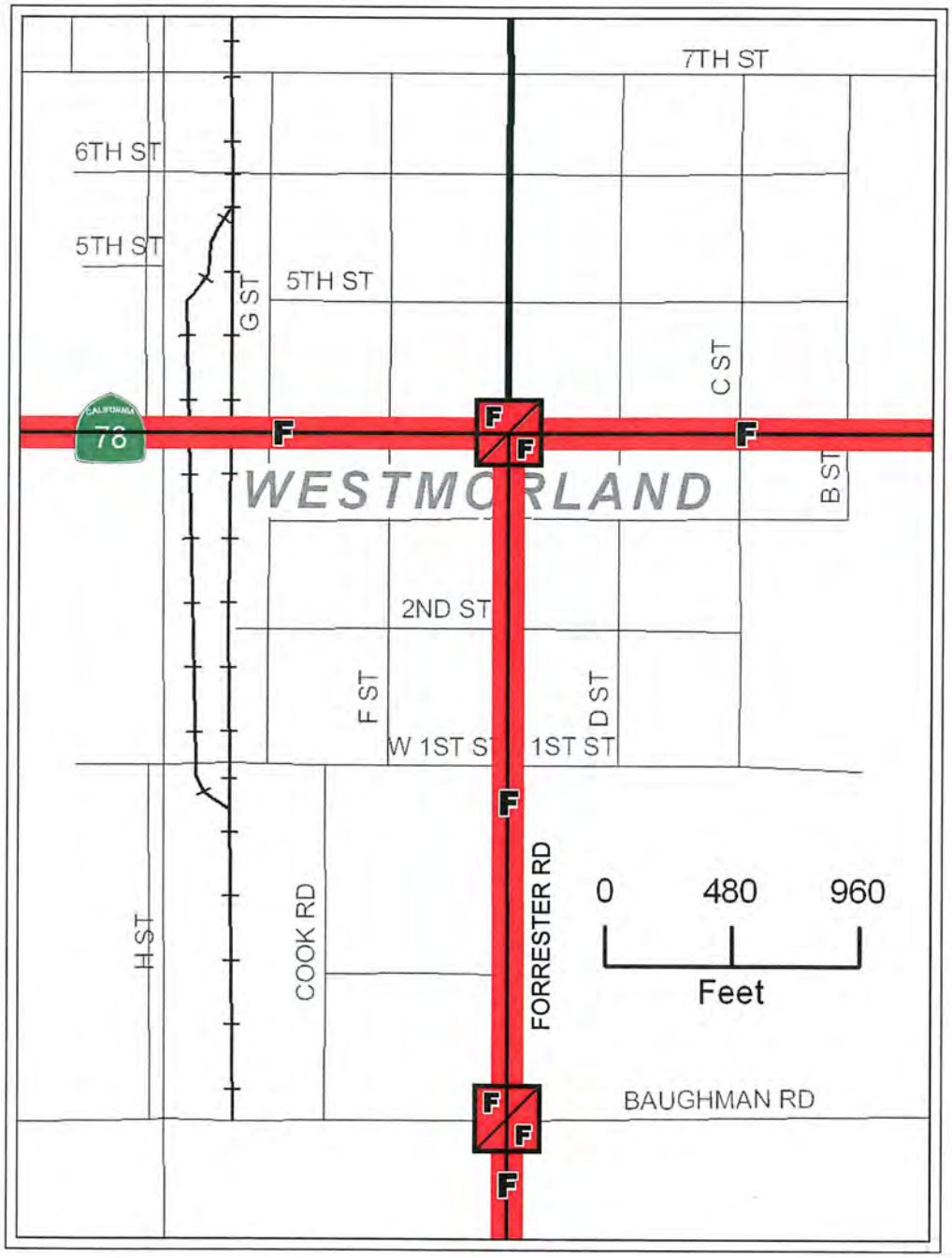


EXHIBIT ES-14

# LEVEL OF SERVICE SUMMARY FOR LONG RANGE (2035) ALTERNATIVE 3 CONDITIONS



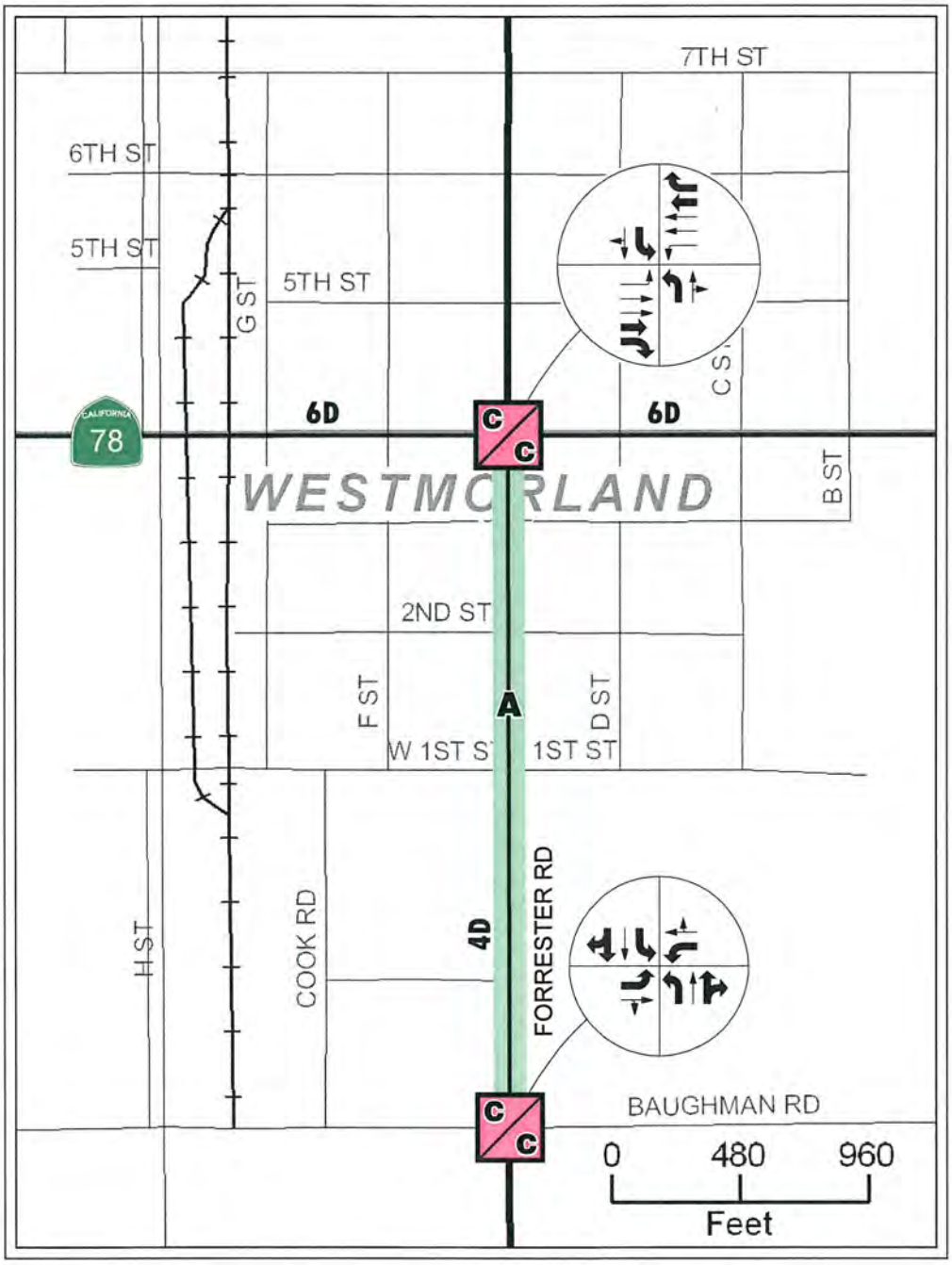

**LEGEND:**

| | | | | | |
|---|---|---|---|---|---|
| A | = LOS A | D | = LOS D | AM/PM | = INTERSECTION LEVEL OF SERVICE |
| B | = LOS B | E | = LOS E | | |
| C | = LOS C | F | = LOS F | | |

N

EXHIBIT ES-15

# RECOMMENDED IMPROVEMENTS FOR LONG RANGE (2035) ALTERNATIVE 3 CONDITIONS




**LEGEND:**

- A = LOS A
- C = LOS C
- AM / PM = INTERSECTION LEVEL OF SERVICE
- = EXISTING LANE
- = CURRENT PHASE IMPROVEMENT
- 6D = RECOMMENDED SEGMENT CONFIGURATION

N

# 1.0 INTRODUCTION

Growth in the Imperial Valley has highlighted upon the need to identify current and future traffic conditions along key regional roadway corridors. In collaboration with the Imperial Valley Association of Governments (IVAG), California Department of Transportation (CALTRANS), and the Southern California Association of Governments (SCAG), an Interregional Corridor Study along Forrester Road has been undertaken to forecast short term and long range traffic conditions and establish a sustainable strategic plan to alleviate potential traffic impacts caused by regional growth and increasing border traffic between Mexico and the United States.

Forrester Road is one of Imperial County's most heavily travelled off-system route and a vital north-south arterial running parallel to State Route 86 and State Route 111, providing regional access to neighboring Riverside and Los Angeles Counties via Interstate 10. Forrester Road was originally intended to serve agricultural activities. However, due to its strategic location within Imperial Valley, Forrester Road is a key junction connecting to the City of Westmorland to the north and Interstate 8 to the south. This 18 mile stretch of roadway provides an alternative route to SR-86 and SR-111 for trucks travelling north. The study area described below has been based on input from SCAG, IVAG, and Caltrans.

## 1.1 Regional Setting

Forrester Road is a north/ south arterial generally located east of the San Diego County – Imperial County line, west of SR-111, south of the Salton Sea, and north of SR-98 in the County of Imperial. North of Baughman Road, within the city limits of Westmorland, Forrester Road is known as Center Street, which continues north of Westmorland and ends at Walker Road. At the south end of the corridor, the paved section of Forrester Road ends at McCabe Road. However, a limited amount of north-south travel occurs along Forrester Road south of McCabe via a dirt road. Ultimately, Forrester Road terminates at the junction of Nichols Road-Wahl Road in the County of Imperial.

Three regional roadways consisting of SR-78/86, Interstate 8 and SR-98 are accessible via Forrester Road. Within the City of Westmorland, SR-86 /SR-78 provide east-west travel at the junction of Forrester Road. Southeast of the Salton Sea, SR- 86 provides north-south travel to Riverside County and the SR-78 grants east-west travel to San Diego County. In addition, Forrester Road intersects with Interstate 8, which provides interregional and intraregional access

Forrester Road intersects with Interstate 8, which provides interregional and intraregional access and goods movement to San Diego County to the west and Yuma, Arizona to the east. Forrester Road provides indirect access to SR-98 via McCabe Road to Brockman Road or McCabe to Austin Road.

## 1.2 Site Location and Study Area

Forrester Road is located in Imperial County and extends from south of Interstate 8 to the City of Westmorland to the north. As indicated in Exhibit 1-A, the study area along Forrester Road is bounded by McCabe Road to the south and SR-78/86 to the north. Through a general consensus from IVAG, CALTRANS, SCAG and County of Imperial, the study area along Forrester Road consists of the following intersections:

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)
- Cady Road (EW)
- Imler Road (EW)
- Keystone Road (EW)
- Worthington Road (EW)
- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

Brockman Road (NS) at:

- SR-98 (EW)

The study area also consists of the following roadway segments:

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road

- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8

Brockman Road (NS):

- North of SR-98

Keystone Road (EW) between:

- Forrester Road and Austin Road

SR-78/86 (EW):

- West of Forrester Road
- East of Forrester Road

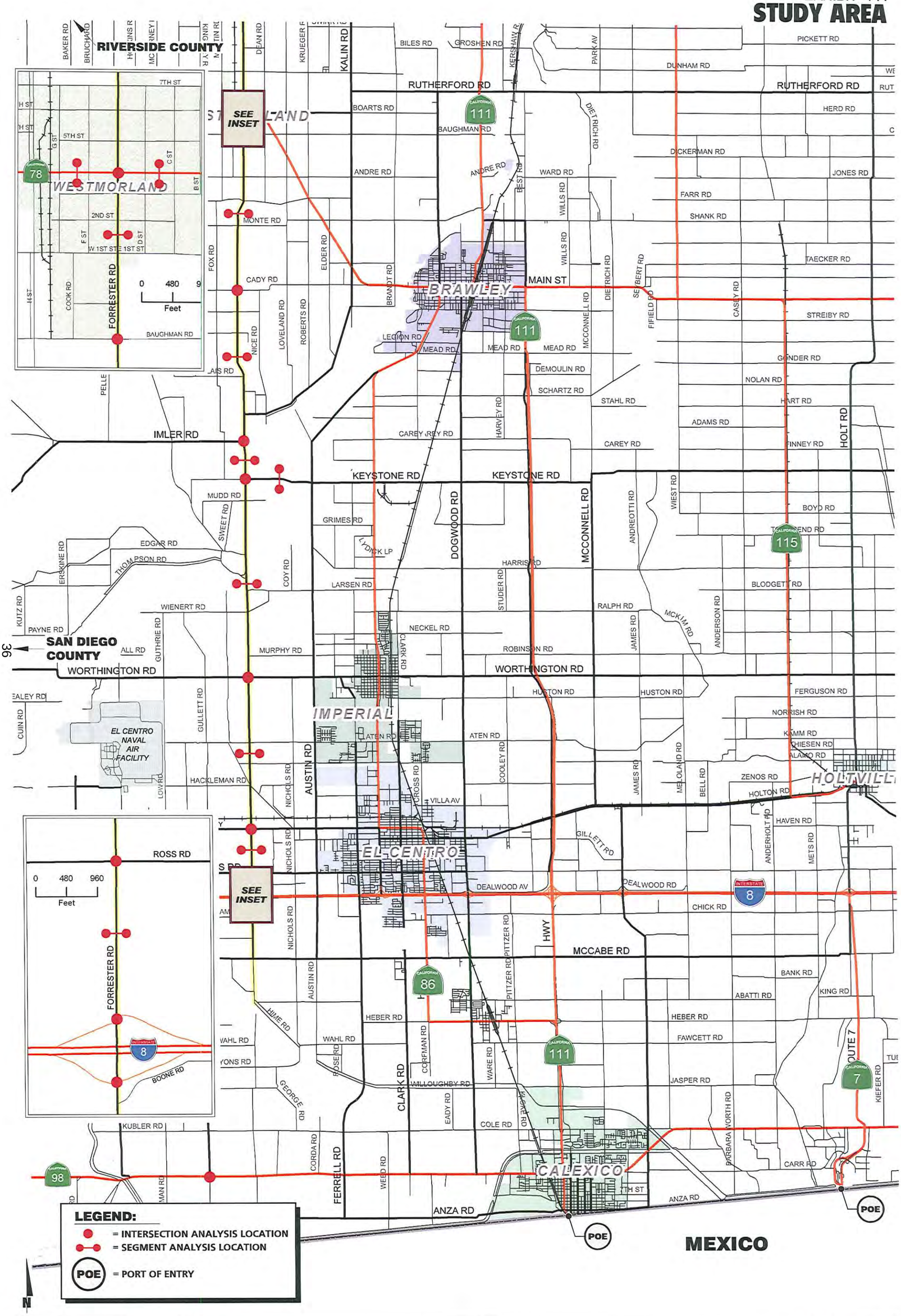
SR-98 (EW) between:

- West of Brockman Road
- East of Brockman Road

According to census data, the current population has increased by 30% since 1990, and recent SCAG projections for 2030 indicate a countywide growth of 84%. In addition to the projected population increase, cross border trade initiated by NAFTA has resulted in industrial development, urbanization and heavy truck traffic. According to the California – Baja California Border Infrastructure Update (April 2008), current 2007 statistics indicate that approximately a total of 6,524,028 vehicles entered the Calexico West/ Mexicali I Port of Entry (P.O.E) to the United States. In addition, the Calexico East/ Mexicali II Port of Entry indicates that 3,736,735 vehicles entered this P.O.E in 2007, which includes 1,170 buses and 317,588 commercial vehicles. In the Year 2030, Caltrans is predicting a 16% increase in cross border traffic in the Calexico West/ Mexicali I P.O.E with 7,560,000 vehicles anticipated to cross the border annually. Cross-border traffic projections to Calexico East/Mexicali II P.O.E predicts a more substantial increase of 188% to a total of 10,458,000 vehicles which includes a 90% increase in commercial truck traffic to 603,000 trucks by the year 2030. The projected increase at these two P.O.E as well as regional growth in Imperial County places the future of Forrester Road as a multi-faceted roadway adhering to its traditional purpose of serving the predominant agricultural community, while facilitating intraregional and interregional travel as a junction for cross border traffic to southern California and beyond.

EXHIBIT 1-A

# STUDY AREA




*Forrester Road Interregional Corridor Study*
*County of Imperial, CA (JN - 05555:005)*

URBAN CROSSROADS

It is essential to plan infrastructure needs today for a sustainable future in the Imperial Valley region. Through a cooperative effort among local and regional agencies, The Forrester Road Interregional Corridor Study identifies current traffic conditions and future transportation demands along Forrester Road. Both short term future and long range future strategies are included to enhance local and regional mobility for people and goods.

In order to thoroughly evaluate the current conditions and future needs of Forrester Road, the following tasks have been developed in subsequent sections in this report:

- Project Administration and Management
- Project Goals and Objectives
- Data Collection
- Analyze Data
- Development Alternatives
- Public Outreach
- Cost Estimates
- Funding

# 2.0 PROJECT ADMINISTRATION AND MANAGEMENT

This section of the study report presents the project work program to complete the Forrester Road Interregional Corridor Study. Quality control procedures during the several phases of the study are summarized. Furthermore, the role of the technical review committee (TRC) and the public are discussed as an integrated resource towards preparation of the report.

## 2.1 Project Work Program

The project work program consists of the specific work assignments for each task, schedules, personnel assignments, costs, milestones, and quality control measures. Upon the receipt of authorization to initiate the Forrester Road Interregional Corridor Study, Urban Crossroads, Inc. finalized the work scope associated with the traffic study with project mangers and representatives from the following agencies: IVAG, Caltrans-District 11 and SCAG. In addition, representatives from the County of Imperial and the Cities of Westmorland, Imperial, El Centro and Calexico were in attendance. Appendix "A" provides a list of the attendees at the Forrester Road Interregional Corridor Study Initial Stakeholders Meeting. The project work program identifies the scope of work necessary to complete the study as outlined in the following table:

**TABLE 2-1**

| PROJECT WORK PROGRAM | |
|---|---|
| **Task** | **Description** |
| 1 | Project Administration & Management |
| 2 | Establish Goals & Objectives |
| 3 | Data Collection, Review Existing Data and Documentation and Identify Existing Conditions, Site Description, Traffic / Environmental Conditions, Needs Assessment, and Key Development Parameters. |
| 4 | Determine Other Data Needs to Develop Methods to Quantify Outside Data and Incorporate As Appropriate. |
| 5 | Analyze Data. A Comprehensive Listing of Current / Future Conditions For Traffic, Socio-Economic, Population, Etc. |
| 6 | Create Development Alternatives (Identifying Viable Alternatives, Developing Viable Alternatives, Access to Forrester Road, and Developing Options). |
| 7 | Identify Cost Estimates (Cost Overview for Development Options, Comparison of Viable Alternatives, and Implementation Strategy). |
| 8 | Identify Financial Assumptions, Funding and Transportation Trends, Funding Revenues, and Funding Sources to include Private Funding Sources. |
| 9 | Public Outreach. Solicit Public Input and Ideas and Capture Comments. |
| 10 | Produce Draft Report to be Distributed to IVAG TAC, IVAG Management, IVAG Regional Council, and Others as Appropriate to Receive and Address Comments. |
| 11 | Prepare Final Report: Make Presentations to IVAG TAC, IVAG Management Committee and IVAG Regional Council. |

The initial stakeholder's meeting was held on May 29, 2008, and the necessary scope of work involved to complete the tasks was discussed. Urban Crossroads, Inc. solicited comments from the agencies during the meeting, which aimed to refine the work scope during the initial stages of the study ensuring that the needs and issues of the various jurisdictions are addressed in the study. The list of the stakeholders for the Forrester Road Interregional Study including their affiliations, are provided in Appendix "A".

The initial stakeholder's meeting also addressed quality control measures and deadlines for each specific task to ensure that the analysis is accurate and completed in an acceptable schedule. Appendix "A" contains the information presented during the initial stakeholder's meeting.

### 2.1.1 Technical Review Committee (TRC)

The technical review committee comprises of representatives from the stake holders: IVAG, SCAG and Caltrans – District 11. On behalf of the several jurisdictions partaking in the Forrester Road Interregional Corridor Study, the TRC oversees the implementation of the project work program and review of technical documents, data, and the analysis methodology utilized in the study. The TRC ensures the accuracy of the findings and recommendations as well as provide objectives of the study to reassure that all issues and concerns from all jurisdictions and the public are addressed.

Meetings were arranged with the TRC to solicit comments and to refine the products for each corresponding tasks. Monthly working group meetings were organized to discuss project approach, status, and findings. The involvement of the TRC was central in the preparation of the study as each representative's insight to the analysis offers a different perspective. Appendix "B" provides the meeting minutes from April 2008 to October 2008.

### 2.1.2 Quality Control Measures

As each task was completed by Urban Crossroads, Inc., the findings and the products were given to the technical review committee (TRC) for their review and comments before moving to the next task. After the review of each completed task, the products were further refined to address TRC comments and revisions. This process of refinement continued until the TRC was satisfied with the product. By providing a monthly progress report to the

TRC, the issues and comments iterated by the TRC were tracked as the work involved for each task was disclosed in the monthly report. This series of checks and balances reaffirms that the findings in this study are consistent with the accepted methodologies and guidelines as well as a nexus with adopted recommendations within the Imperial Valley region. Appendix "C" provides the monthly progress reports from April 2008 to October 2008.

### 2.1.3 Public Outreach

Public workshops were held on July 16, 2008 at the Imperial County Administrative Center and July 17, 2008 at the City of Westmorland Council Chambers. The purposes of the workshops were to identify the needs of the public regarding Forrester Road, develop alternatives to the future configuration of Forrester Road, and refine the methodologies developed through interaction with the TRC. At the public workshops, the project approach was explained to the general public and constructive feedback and comments were provided by those in attendance. Section 7 of the report discusses the Public Outreach efforts in detail. Information regarding the Public Outreach Workshop, attendees and the comments from the public are provided in Appendix "D."

# 3.0 PROJECT GOALS AND OBJECTIVES

As outlined in the project work program, the final product of the Forrester Road Interregional Corridor Study is a report on the current and future roadway conditions, roadway improvements as well as possible infrastructure alternatives to Forrester Road in the future. The overall project goal is accomplished through the completion of several separate study objectives, including the gathering and analysis of traffic data and other supporting information.

Project Goal

The primary goal of the Forrester Road Interregional Corridor Study is to evaluate the transportation demands and resulting infrastructure needs required to serve existing and future demands for regional, interregional, and international travel within Forrester Road between State Routes 78/86 and south of Interstate 8. The findings of the study identify the required improvements needed to facilitate commercial and commuter traffic in Imperial County, while fostering the development of a comprehensive and sustainable multi-modal transportation system that benefits the Imperial Valley region and the neighboring regions of San Diego and Riverside Counties, Yuma, Arizona and Baja California, Mexico. Improvements identified in the study include the enhancement of safety, capacity, congestion management, and possible truck routes along Forrester Road. To accomplish these goals, study objectives are identified and its findings are used to reinforce the recommended improvements.

## 3.1 Study Objectives

To accomplish the project goals, individual study objectives were determined to reinforce the findings and recommendation to serve the purposes of the overall project goal. In a collaborative effort with IVAG, SCAG, and Caltrans, the study objectives of the Forrester Road Interregional Corridor Traffic study include:

(1) Documentation of existing traffic conditions;
(2) Evaluation of existing traffic conditions at the study area intersections and roadway segments;
(3) Evaluation of short term (2015) traffic conditions at the study area intersections and roadway segments;
(4) Evaluation of long range (2035) traffic conditions at the study area intersections and roadway segments;

(5) Determination of improvements and system management actions needed to achieve County of Imperial and Caltrans level of service requirements for 2015 conditions and 2035 conditions;
(6) Evaluation of 2035 Alternative traffic conditions at the study area intersections and roadway segments
(7) Develop cost estimates for each alternative;
(8) Identify funding sources; and
(9) Summarize the comments and feedback from the public outreach workshops.

### 3.1.1 Documentation of Existing Conditions

Data collection efforts have been conducted to identify existing conditions along Forrester Road. These efforts included the collection of:

- Traffic counts
- Field inventory of existing lane/ road configuration,
- Research of pertinent General Plan Policies
- Accident data
- Transit routes
- Traffic Studies
- Cumulative development

*Traffic counts* are essential to quantify the existing vehicular traffic traveling on Forrester Road. Empirical data form the basis of the traffic analysis included in this report as traffic volume are utilized to determine current level of service at intersections and road segments.

*Field inventory of existing lane/ road configuration* requires a field research of the existing study area intersections and road segments. The research includes the documentation of the number of lanes at intersections and road segments, traffic controls, speed limits, and potential sight distance issues. Determining current lane and roadway configuration, and intersection controls are required in level of service (LOS) analyses, which calculates the intersection delay and its corresponding level of service designation of LOS A to F. Level of service definitions are discussed in Section 5 of the report.

*Research of County of Imperial literature* undertaken in the initial commencement of the project includes the following:

- *County of Imperial's Circulation and Scenic Highways Element*
- *Imperial County 2007 Transportation Plan Highway Element*
- *Department of Public Works Traffic Study and Report Policy (2007)*

The *Circulation and Scenic Highways Element* (Revised 2006), contains "the latest information about the transportation needs of the County and the various modes available to meet these needs" and provides "a plan to accommodate a pattern of concentrated growth, providing both regional and local linkage systems between unique communities and its neighboring metropolitan regions." The currently adopted Circulation and Scenic Highways Element identifies the ultimate configuration of Forrester Road and outlines the acceptable road segment capacities and corresponding level of service for each roadway.

The *Draft 2007 Transportation and Highway Element Plan* was utilized in the Forrester Road Interregional Corridor Study as a guide to the general planned improvements for Forrester Road. This study integrates the general improvements outlined in the Transportation Element and provides a more focused evaluation and mitigation measures.

The County of Imperial's *Traffic Study and Report Policy* (2007) serves as a guide for the preparation of traffic reports and to meet the criteria set by the County of Imperial. Published by the County of Imperial's Public Works Department, the traffic guideline is utilized in the Forrester Road study in its analysis methodology, LOS standards, traffic forecasts (trip generation and trip distribution) and general report format and requirements.

*Accident data* was acquired from the California Highway Patrol Office in Sacramento. An evaluation of the accident data illustrates the frequency and location of accidents on Forrester Road. This data can be used to determine the causality of each incident.

Based on the accident data, possible mitigation measures are determined to decrease the frequency of vehicular accidents.

*Cumulative project research* was conducted in several local city jurisdictions and in the County of Imperial. This research of current pending and approved development projects are central in deriving future traffic forecasts for short term (2015) conditions and long range (2035) Conditions.

### 3.1.2 Evaluation of Existing Conditions

An evaluation of existing traffic conditions in the study area is the basis for the traffic impact analysis. This analysis scenario quantifies current intersection traffic conditions in terms of delay in seconds which corresponds to a qualitative level of service (LOS) rating system of A through F. For road segments, the current traffic volume and the acceptable capacity for a particular road as classified in the County of Imperial's General Plan is utilized to calculate the volume to capacity ratio (V/C) with a corresponding LOS for each V/C threshold. This ranking system allows jurisdictional staff to determine the necessary improvements to satisfy level of service standards.

Results of the existing conditions analysis represent the baseline conditions essential to a comparative analysis. Future analysis scenarios in this report assume the existing road configuration with the existing volumes as the foundation of future traffic volumes (ambient growth and traffic generated by future developments are added on existing traffic volumes). The evaluation of future conditions yields an average delay and an LOS rating, revealing the effects of the added volumes with the existing geometric configuration in terms of the change in average intersection delay, intersection LOS, and road segment LOS operation. In essence, the evaluation of existing conditions provides current intersection and road segment performance and serves as the benchmark for future scenarios in determining the effect of added traffic volumes on the roadways.

### 3.1.3 Evaluation of Short Term (2015) Conditions

Short term (2015) conditions are evaluated to determine the intersection and roadway performance. Evaluating the 2015 conditions demonstrates whether the current (existing) facility can accommodate the projected travel associated with ambient growth

and pending and/or approved cumulative projects (anticipated to be completed by 2015) within the study area. The results of the 2015 scenario level of service analysis illustrate the potential short term transportation deficiencies.

3.1.4 Evaluation of Long Range (2035) Conditions

Long range (2035) conditions are evaluated to determine the intersection and roadway performance. Evaluating the 2035 conditions demonstrates whether the current (existing) facility is adequate to facilitate the projected travel projections based on additional ambient growth and pending and/or approved cumulative projects within the study area and the forecasts from the regional travel demand model. The results of the 2035 scenario level of service analysis illustrate the potential intersection and roadway deficiencies for long range future conditions.

3.1.5 Determination of Improvements and System Management Actions Needed to Achieve County of Imperial and Caltrans Level of Service Requirements for Short Term (2015) Conditions and Long Range (2035) conditions

Recommended improvements for short term (2015) conditions and long range (2035) conditions are determined based on County of Imperial and Caltrans acceptable level of service standards, safety considerations and feasibility of the improvement. For 2015 "With Improvement" conditions, it is essential to determine adequate improvement measures needed to maintain an acceptable level of service within the next seven years. The improvements required for (2035) conditions are determined to allow acceptable intersection and road segment performance for the next 27 years.

3.1.6 Evaluation of Long Range (2035) Alternative traffic conditions at the study area intersections and roadway segments

Public opinion, increases in industrial truck traffic, and other economic and safety concerns may dictate alternative network scenarios in the study area. Long range (2035) alternatives are based on the input from the TRC, public outreach, and the County of Imperial's General Plan. These alternatives scenarios include:

- Alternative 1 - Relinquishing jurisdiction of Forrester Road to Caltrans
- Alternative 2 - Westmorland Truck Bypass
- Alternative 3 - Eastern Bypass (located near the Westmorland City limits)
- Alternative 4 - The proposed Silicon Border P.O.E.

3.1.7 Develop Cost Estimates for Each Alternative

Recommended improvements mentioned in the Forrester Road Interregional Study are *suggested* measures to mitigate the anticipated increase in traffic in the future, which may or may not come to fruition. The decision process whether to undergo improvements hinges upon the cost-benefit of a particular improvement and necessitates a cost estimate. *How much will this improvement cost? What are the benefits of this improvement? Compared to other improvements will this improvement mitigate traffic better than the other viable alternatives? Compared to the other viable improvements, how much will this cost?* These are some of the fundamental questions that have been addressed so that informed decisions are possible.

3.1.8 Identifying Funding Sources

Roadway improvement projects require extensive financial resources. Funding sources must be identified in order to implement the recommended improvement and to consider the improvement as a viable project. If funding sources are not identified, the interest in the improvement project may wane and may not come to fruition.

3.1.9 Summarize the Comments and Feedback from the Public Outreach Workshops

Opinions of local citizens are important in the preparation of the study. After all, they are the daily commuters most affected by increases in traffic on Forrester Road and experience the deficiencies of the local roadway system first hand. Public participation in the planning process of Forrester Road is encouraged as local issues are best solved by local people who understand the social, economic and political implications. Public Outreach Workshops have been held to solicit comments from the public.

# 4.0 DATA COLLECTION, REVIEW EXISTING DATA, AND DOCUMENTATION AND IDENTIFY EXISTING CONDITIONS, SITE DESCRIPTION, TRAFFIC/ ENVIRONMENTAL CONDITIONS, NEEDS ASSESSMENT, AND KEY DEVELOPMENT PARAMETERS

This section of the Forrester Road Interregional Corridor Study presents the data on regional transportation plans collected from the County of Imperial and other jurisdictions. Current conditions are also provided in terms of roadway geometry, updated traffic counts, and accident statistics along Forrester Road.

## 4.1 General Plan Circulation Network

The currently adopted County of Imperial General Plan Circulation Element is shown on Exhibit 4-A and the County of Imperial General Plan Roadway Cross-Section widths are illustrated on Exhibit 4-B. Based on the County of Imperial's General Plan, Forrester Road is classified as a Prime Arterial. However, the current configuration of Forrester Road functions as a two lane arterial roadway. The general plan roadway descriptions described below are derived from the Circulation and Scenic Highways Element (Revised 2006).

### 4.1.1 State Highways

Existing regional access to the County of Imperial is provided via Interstate 8, State Route 111, State Route 78, State Route 86, State Routes 115, State Route 7 and State Route 186. Within the parameters of this analysis the following descriptions below describes the Highway facilities linked to Forrester Road.

**Interstate 8 (I-8)** is the primary east/west route through the County of Imperial between San Diego and Yuma, Arizona. Providing two travel lanes in each direction, I-8 has complete grade separations at all intersections. In this area, I-8 serves as an interregional route for people and goods movement, provides connections to other states, and provides access to desert recreational activities. Caltrans is currently evaluating the placement of a new Changeable Message Sign (CMS) on westbound I-8. The new CMS would either augment or replace the existing CMS near Ocotillo, and would provide advance notification to the traveling public (including trucks and other high profile vehicles) traveling to San Diego County of route and weather conditions/advisories. Placement of the CMS east of Forrester Road would provide motorists with the option of exiting the

freeway and using alternative routes or modifying their trip making decisions as necessary.

**State Route 86 (SR-86)** is generally a north-south route and begins near Heber as a two lane conventional highway and extends to the Riverside County line as a four-lane expressway. In Riverside County, SR-86 continues to Interstate 10. This 67.8-mile route primarily provides travel for interregional, intra-regional and international trips. SR-86 north of SR-78 is a major goods movement corridor serving the Los Angeles area and other California goods movement centers from the Imperial County region.

**State Route 78 (SR-78)** serves as an east-west route and traverses a distance of 81.8 miles through Imperial County. The route is generally a two lane conventional highway throughout its alignment, although some portions of the alignment have been upgraded to a four-lane expressway and four-lane conventional highway as a result of recent improvement projects.

**State Route 98 (SR-98)** is an east-west route that is entirely contained within Imperial County. Traversing a distance of 56.9 miles, SR-98 is mostly a two-lane conventional highway route serving interregional, intra-regional and international travel. However, through the City of Calexico, SR-98 is a four-lane facility. In order to accommodate an increase in traffic due to NAFTA, interregional, and local traffic arriving from the Calexico East Federal P.O.E, Caltrans has initiated a Project Report/Environmental Document to widen SR-98 (from SR-111 to SR-7) to four or six lanes. The Project Report/Environmental Document study has one alternative considering realignment along Jasper & Bowker Roads.

### 4.1.2 County Street Classifications

The County of Imperial's existing roadway network consists of a highly integrated combination of street types, as follows:

**Prime Arterial** classification generally provides four travel lanes within a 126 foot right-of-way with no parking permitted and a raised median. Its primary purpose is to carry through traffic and provide a direct connection to the State Highway system.

**Minor Arterial** classification generally provides four travel lanes within a 102 foot right-of-way width. The primary function of a minor arterial is to carry through traffic and its secondary purpose is to provide access to abutting property.

**Major Collector** classification generally provides two to four travel lanes within an 84-foot right-of-way width. Its primary purpose is to provide for local traffic movement and access to abutting property, and for movement between local streets and streets of higher classification. Major Collectors provide traffic circulation service within residential, commercial, and industrial areas.

**Minor Collector Road** classification generally provides one lane in each direction with a 40-foot paved width and a 70-foot right-of-way width, allowing for provision for parking or bike lanes. Its primary purpose is to provide for local traffic movement and direct property access. Many Collectors serve industrial and business areas.

4.1.3 County of Imperial Arterials

The descriptions of Imperial County arterials are derived from Circulation and Scenic Highways Element (Revised 2006). These following roadways provide mobility throughout the study area and are described below:

**Forrester Road** provides a connection between SR-78/86 in Westmorland and I-8, and continues southerly to McCabe Road. This facility currently consists of one travel lane in each direction and functions as a two-lane local collector. In the County of Imperial's General Plan, Forrester Road is classified as a six-lane prime arterial. Forrester Road also provides a diamond-type interchange at I-8 with stop sign controls on both the east and westbound off ramps. Field observations and traffic counts confirm a high percentage of heavy vehicles traversing this roadway. In the City of Westmorland, north of Baughman Road, Forrester Road is also known as South Center Street.

**Evan Hewes Highway (S80)/Adams Street/SR-115** parallels I-8 to the north and serves as the primary travel route between San Diego County and Arizona prior to the construction of I-8. Through the City of El Centro, Evan Hewes Highway connects to Adams Street and is constructed with two travel lanes in each direction. Most portions of this facility are constructed with one travel lane in each direction. In the County of Imperial's General Plan, this roadway is classified as a six-lane prime arterial. West of the City of Holtville, the road corridor becomes SR-115 for approximately one mile. Evan Hewes Highway is located approximately 1.5 miles north of Interstate 8.

**McCabe Road** is located south of I-8 between Brockman Road (S30) and Orchard Road. Portions of McCabe Road between SR-111 and Clark Road are intended to be upgraded to a four lane road (minimum). Within the parameters of the study, McCabe Road is classified/ constructed as a two-lane major collector.

**Ross Road** connects the communities of Seeley and Holtville traversing through the City of El Centro. In the County of Imperial's General Plan, Ross Road is classified/ constructed as a major collector roadway.

**Worthington Road** commences north of Seeley and terminates just east of Highline Road north of the City of Holtville. Currently, it is a two lane undivided roadway and traverses the northernmost section of the City of Imperial. In the County of Imperial's General Plan, Worthington Road is classified as a major collector roadway.

**Keystone Road** connects Forrester Road and Highline Road through central Imperial Valley. Keystone Road is currently configured as a two lane undivided roadway. In the County of Imperial's General Plan, this roadway is classified as a six-lane prime arterial.

## 4.2 Existing Area Roadway System

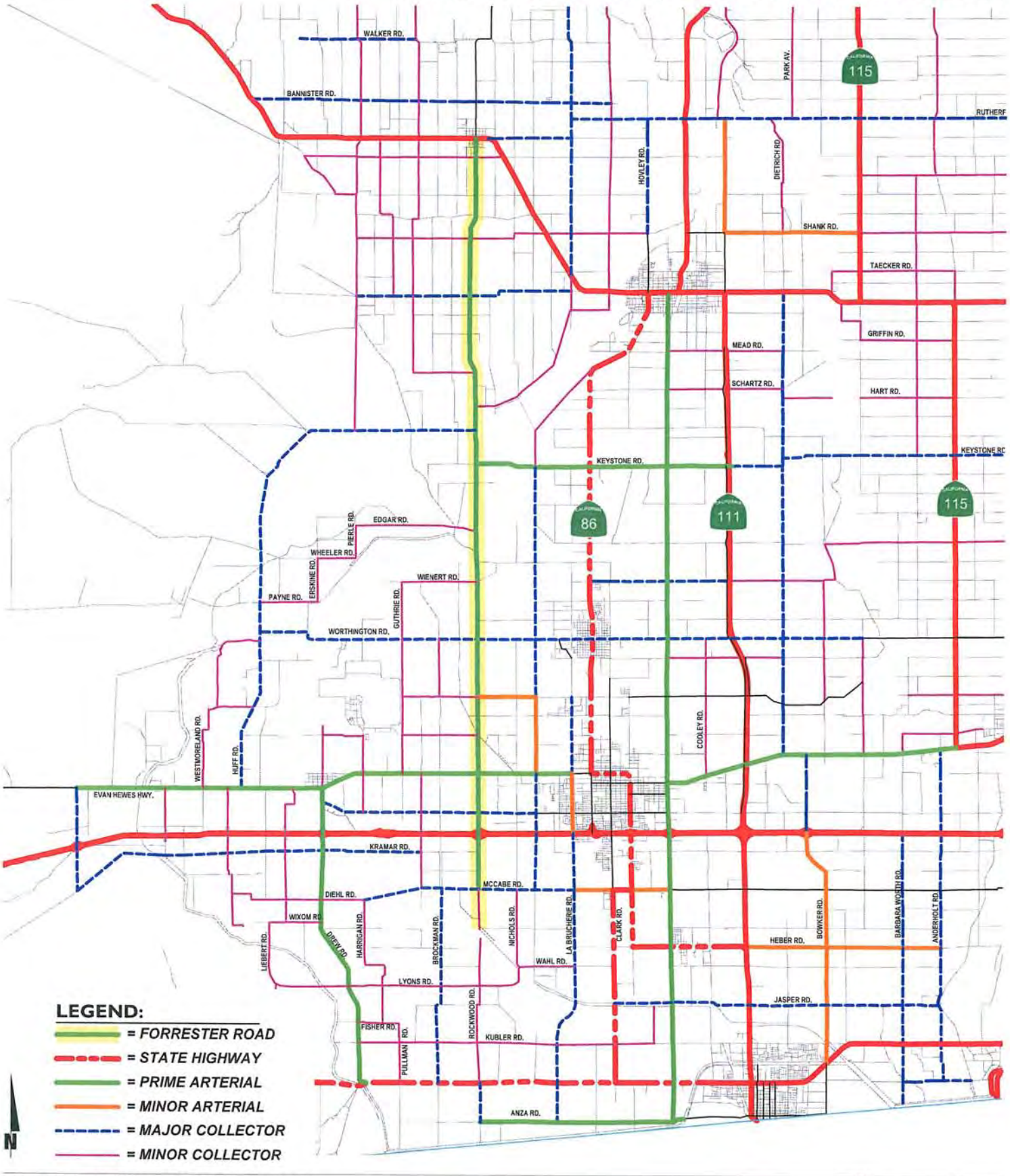
A field survey of the existing intersection controls and lane geometry at the study area was conducted in April 2008. Exhibit 4-C identifies the existing roadway conditions for the study area. The number of through traffic lanes for existing roadways and the existing intersection controls are identified. Where no explicit right turn lane is provided, and the outside through lane is 19 feet wide or greater, a "de facto" right turn lane is assumed.

## 4.3 Existing Traffic Volumes

Existing intersection level of service calculations are based upon manual AM and PM peak hour turning movement counts conducted for Urban Crossroads, Inc. in April 2008. The raw traffic counts conducted between the hours of 6:00 AM and 9:00 AM for AM conditions and between 3:00 PM and 6:00 PM for PM conditions are illustrated in Exhibit 4-D and Exhibit 4-E, respectively. It should be noted that the timing of the traffic counts coincided with considerable vacationing activities as well as the harvesting of sugar beets. Therefore, the traffic counts included in this study can be considered conservatively high in comparison to the rest of the year. Intersection turning movement traffic counts collected within the study area are classified into three types: cars and light trucks, medium trucks, and heavy vehicles.

EXHIBIT 4-A

# COUNTY OF IMPERIAL
# GENERAL PLAN CIRCULATION ELEMENT

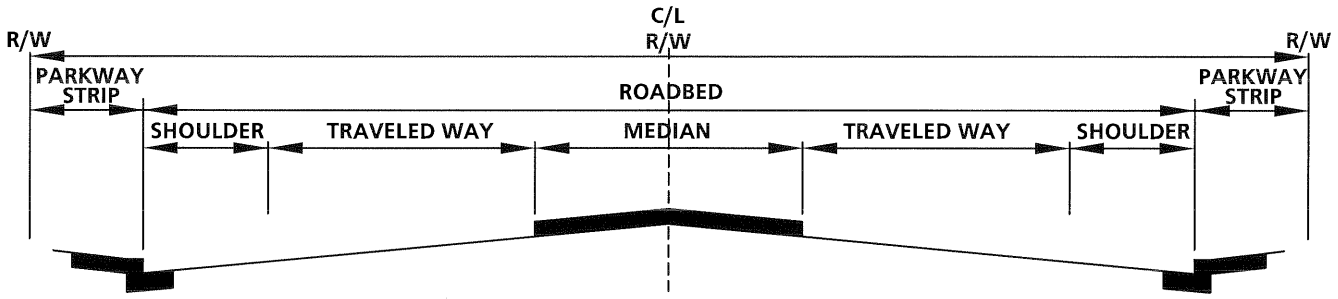



*Forrester Road Interregional Corridor Study*
*County of Imperial, CA (JN - 05555:ce)*

URBAN CROSSROADS

EXHIBIT 4-B

# IMPERIAL COUNTY
# GENERAL PLAN ROADWAY CROSS SECTIONS



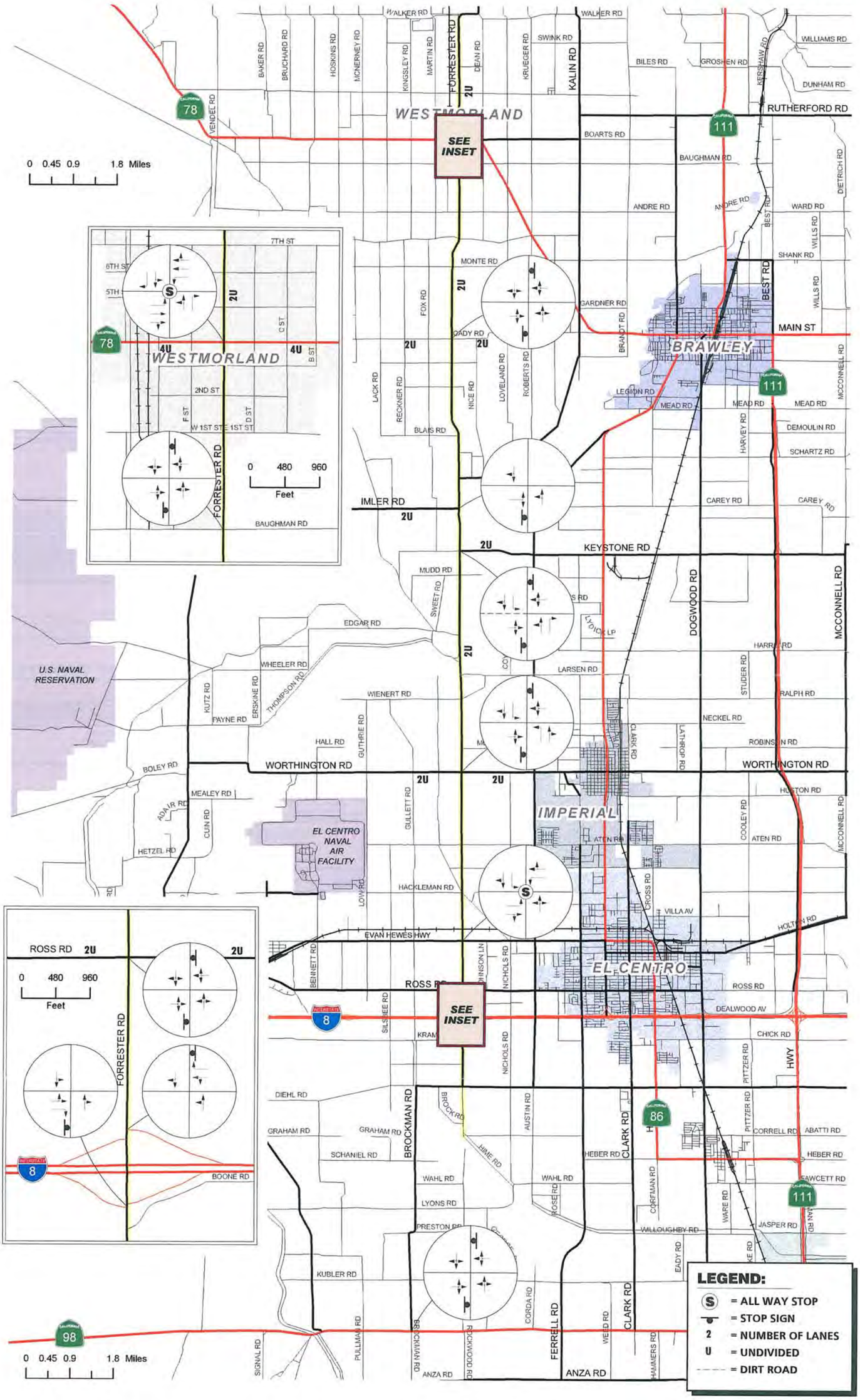

| CORRIDOR CLASSIFICATION | MEDIAN | TRAVELED WAY | SHOULDER | PARKWAY STRIP | ROADBED | R/W |
|---|---|---|---|---|---|---|
| PRIME ARTERIAL | 18 | 36 | 8 | 10 | 106 | 126 |
| MINOR ARTERIAL | 18 | 24 | 8 | 10 | 82 | 102 |
| MAJOR COLLECTOR | 0 | 24 | 8 | 10 | 64 | 84 |
| MINOR COLLECTOR | 0 | 12 | 8 | 15 | 40 | 70 |
| LOCAL STREET | 0 | 12 | 8 | 10 | 40 | 60 |
| RESIDENTIAL STREET | 0 | 12 | 8 | 10 | 40 | 60 |
| RESIDENTIAL CUL-DE-SAC OR LOOP STREET | 0 | 12 | 8 | 10 | 40 | 60 |

*NOTE: COUNTY ROADS WITHIN URBAN AREA BOUNDARY SHALL BE DESIGNED TO APPROPRIATE CITY STANDARDS WHERE POSSIBLE, SUBJECT TO COUNTY ROAD COMMISSIONER DETERMINATION AND APPROVAL.*

*SOURCE: COUNTY OF IMPERIAL*

EXHIBIT 4-C

# EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS








URBAN CROSSROADS

EXHIBIT 4-D

# EXISTING AM PEAK HOUR INTERSECTION VOLUMES

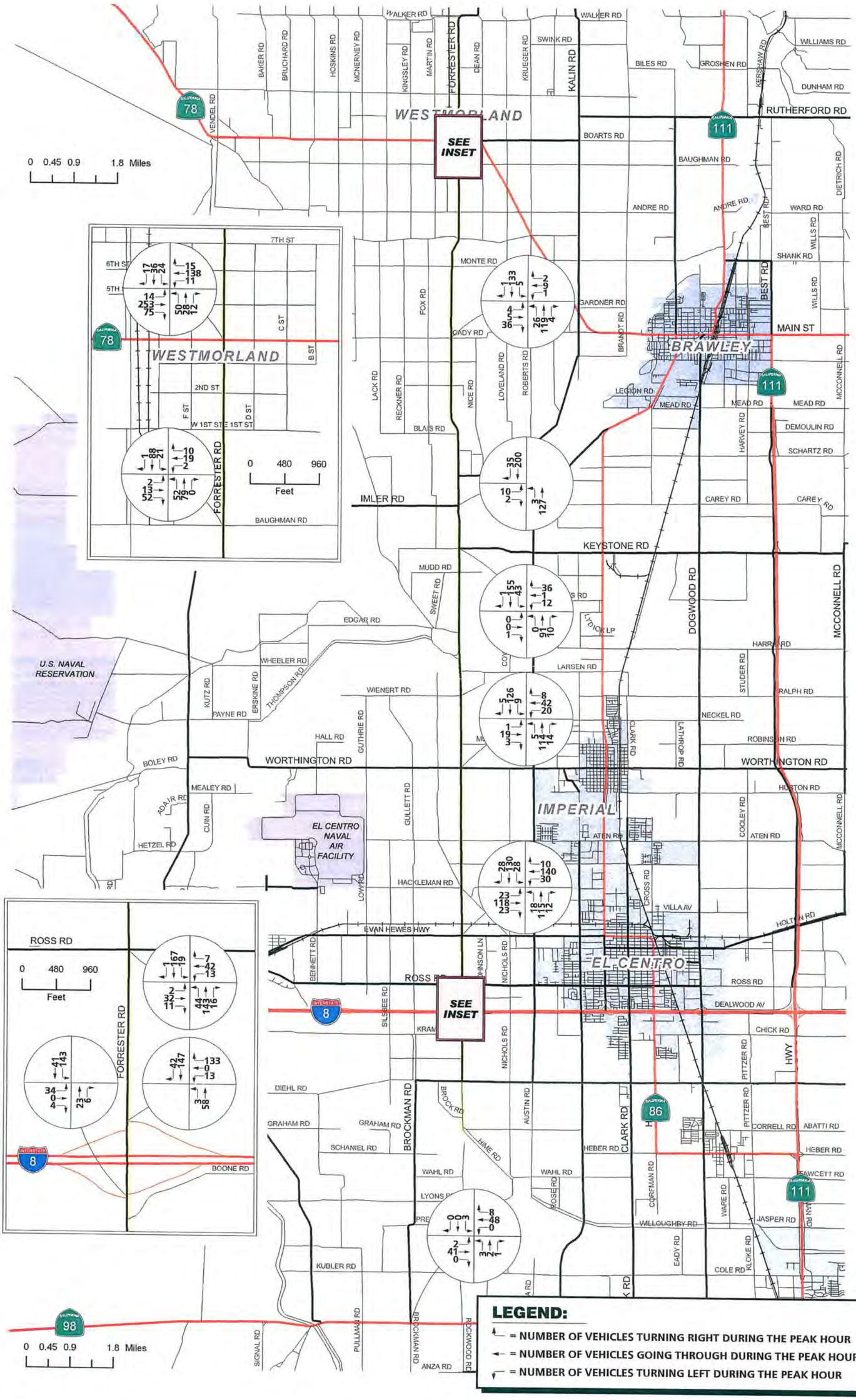
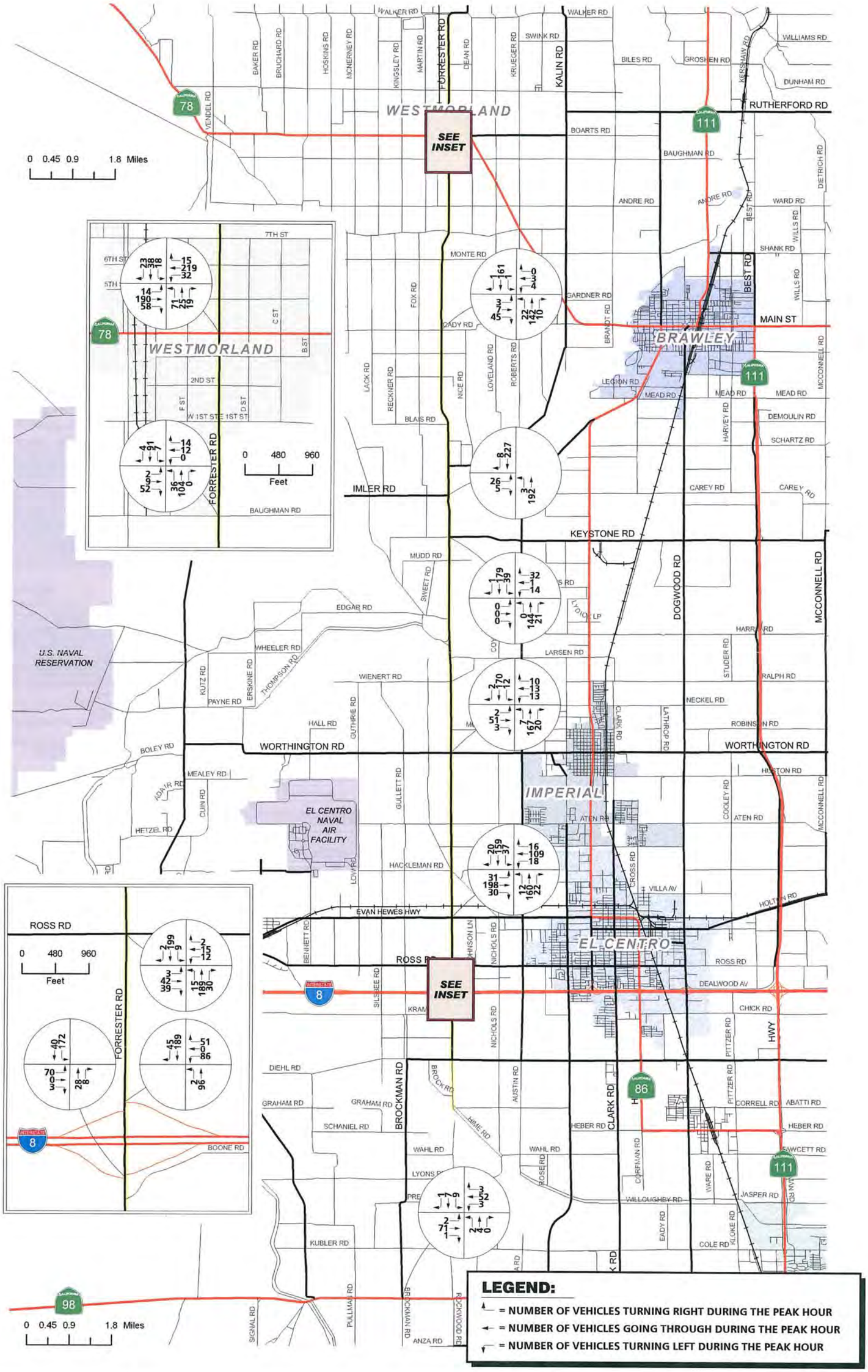


EXHIBIT 4-E

# EXISTING PM PEAK HOUR INTERSECTION VOLUMES








URBAN CROSSROADS

Existing (raw) average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 4-F. Daily traffic counts collected within the study area are classified into three types: cars and light trucks, medium trucks, and heavy vehicles. Daily traffic counts were conducted from Monday (7am) to Friday (7am) for each study area road segment. Based on internal review of the daily traffic volumes, it has been determined that daily traffic counts on Thursday yielded the highest traffic volume during the weekday period and presented the most conservative volumes for analysis purposes. Existing ADT volumes are from daily counts commissioned by Urban Crossroads, Inc. in April and May 2008 or are factored up from peak hour counts conducted for Urban Crossroads, Inc. using the following formula for each intersection leg:

PM Peak Hour (Approach Volume + Exit Volume) x 12 = Leg Volume.

Traffic count worksheets are included in Appendix "E".

### 4.3.1 Passenger Car Equivalence

Existing traffic volumes were adjusted to account for truck traffic through passenger car equivalence (P.C.E). Passenger car equivalence is the representation of larger vehicles, such as trucks and buses, as equal to a quantity of passenger cars for use in level of service and capacity analyses. The magnitude of the equivalency is dependent upon vehicle size and weight, vehicle operating characteristics, vehicle speeds, and roadway characteristics. For cars and light trucks, no P.C.E is applied to existing traffic volumes. Medium trucks utilized a P.C.E factor of 6.0 or 2.0 depending on the vehicle type. A 6.0 P.C.E factor denotes slow moving vehicles such as farm tractors. Due to the speed of farm related trucks, it is assumed that an equivalence of 6 passenger cars will equal one oversized farm vehicle.

The speed survey conducted along Forrester Road has been used to determine an approximate number of farm vehicles accessing Forrester Road. By isolating key variables in the speed survey such as speed and vehicle gap, the slow moving farm vehicles can be identified. Vehicle speed is the primary indicator of a farm vehicle. Farm vehicles characteristically travel under 30 miles per hour (mph) and vehicles captured in the speed survey travelling less than 30 mph are initially identified as a farm vehicle. After deriving the number of vehicles travelling under 30 mph, further refinement and analysis to the traffic volumes were conducted by considering the vehicle headway. The vehicle

headway is defined as the time between two vehicles passing the same point traveling in the same direction on a given route. A slow moving farm vehicle travelling at 30 mph in a 55 mph zone along Forrester Road will cause vehicles to queue behind the slow moving vehicle. Vehicles indicating travel speeds of less than 30 mph with short headway intervals were not considered as farm vehicles as they are most likely queued behind a slow moving vehicle. This criterion indicates that less than 1% of the total ADT volumes along Forrester Road are farm vehicles. Appendix "F" contains the speed survey volumes.

Since the speed surveys were conducted at various locations along Forrester Road, they may not entirely capture all farm vehicles entering Forrester Road. Therefore to account for farm vehicles that may not have been included in the speed survey. It is assumed that 25% of medium trucks consist of farm vehicles and the remaining 75% are comprised of commercial/ industrial trucks. Heavy trucks traveling along the study area were assigned a P.C.E factor of 3.0. Exhibit 4-G and Exhibit 4-H illustrates the P.C.E adjusted AM and PM intersection turning movement traffic volumes. Exhibit 4-I depicts the P.C.E adjusted average daily traffic volumes. P.C.E. adjusted traffic volumes are utilized to determine the level of service for existing conditions, short term (2015) conditions and long range (2035) conditions.

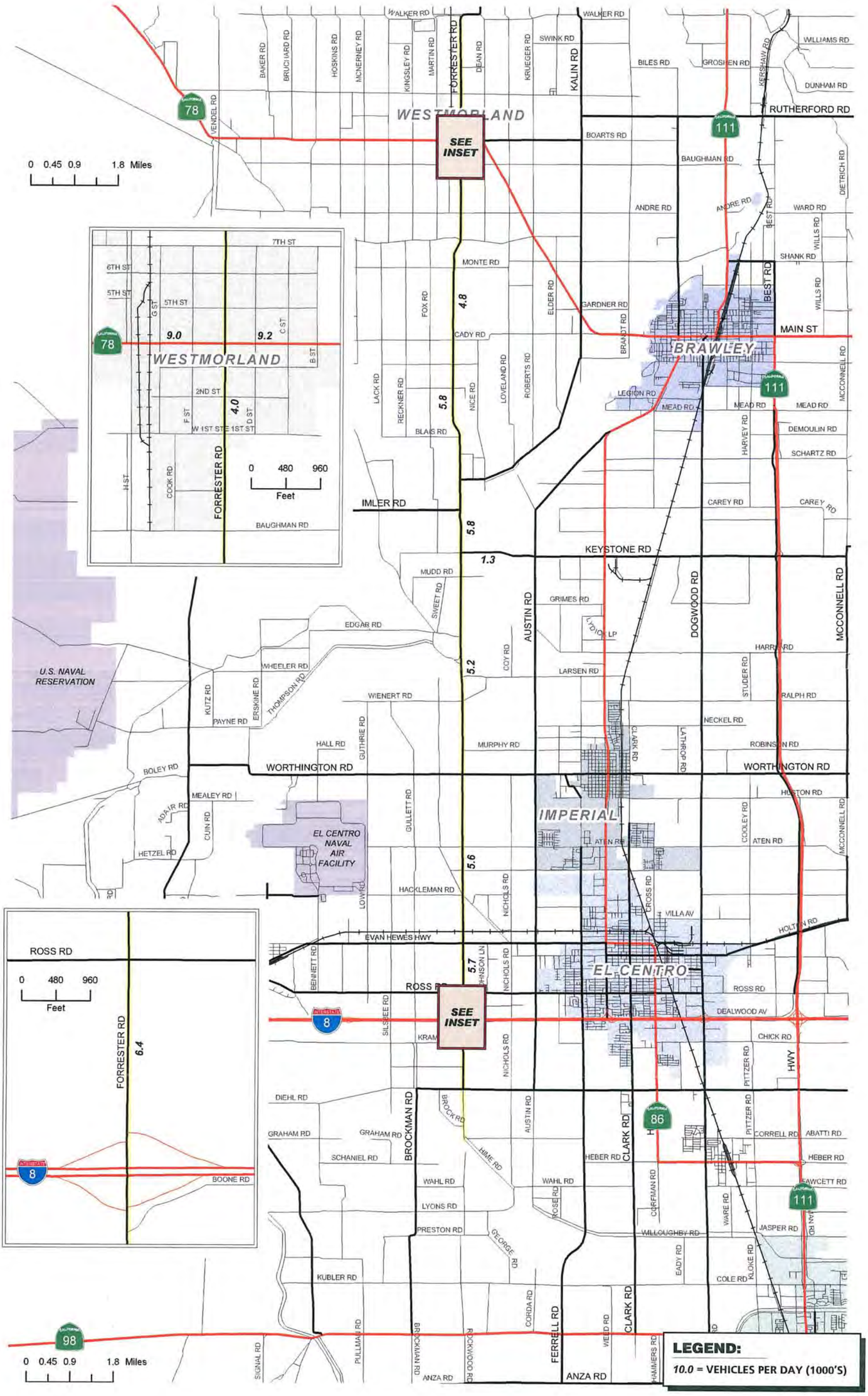
## 4.4 Accident Data

The California Highway Patrol Office in Sacramento, California provided accident data along Forrester Road. Reported accidents during the three year period from January 2005 thru October 2007 were provided. The accident reports provide information for each incident such as: date and time, location, type of accident, weather, cause of accident, and accident related injuries/ fatalities. Table 4-1 summarizes the accident data provided by the California Highway Patrol. A total of 102 reported accidents occurred during the three year time frame with the following totals for each type of accident:

- Rear-end 13
- Hit object 32
- Broadside 18
- Overturned 17
- Sideswipe 18
- Head-on 4

EXHIBIT 4-F

# EXISTING AVERAGE DAILY TRAFFIC (ADT)








URBAN CROSSROADS

EXHIBIT 4-G

# EXISTING AM PEAK HOUR INTERSECTION PCE VOLUMES

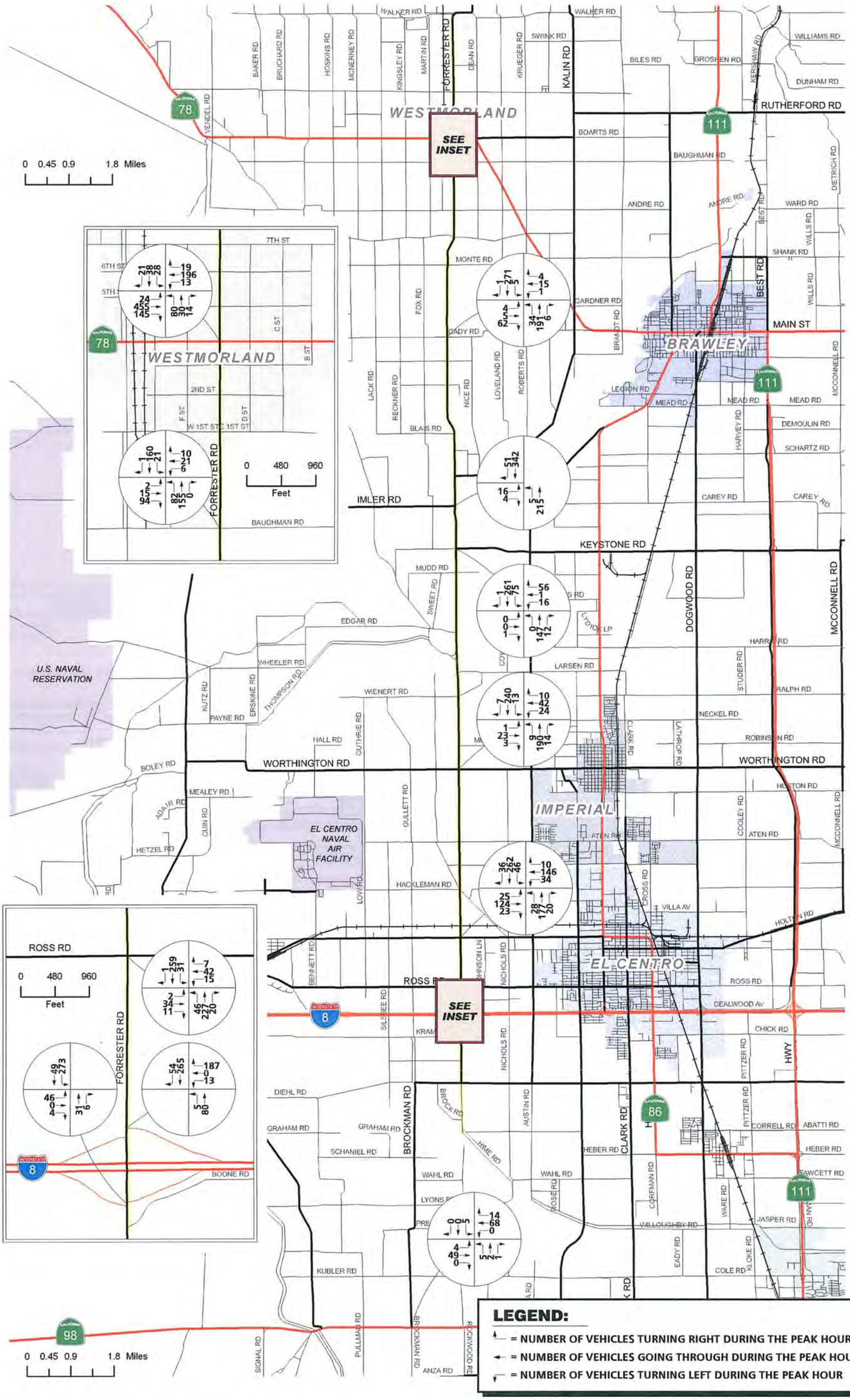
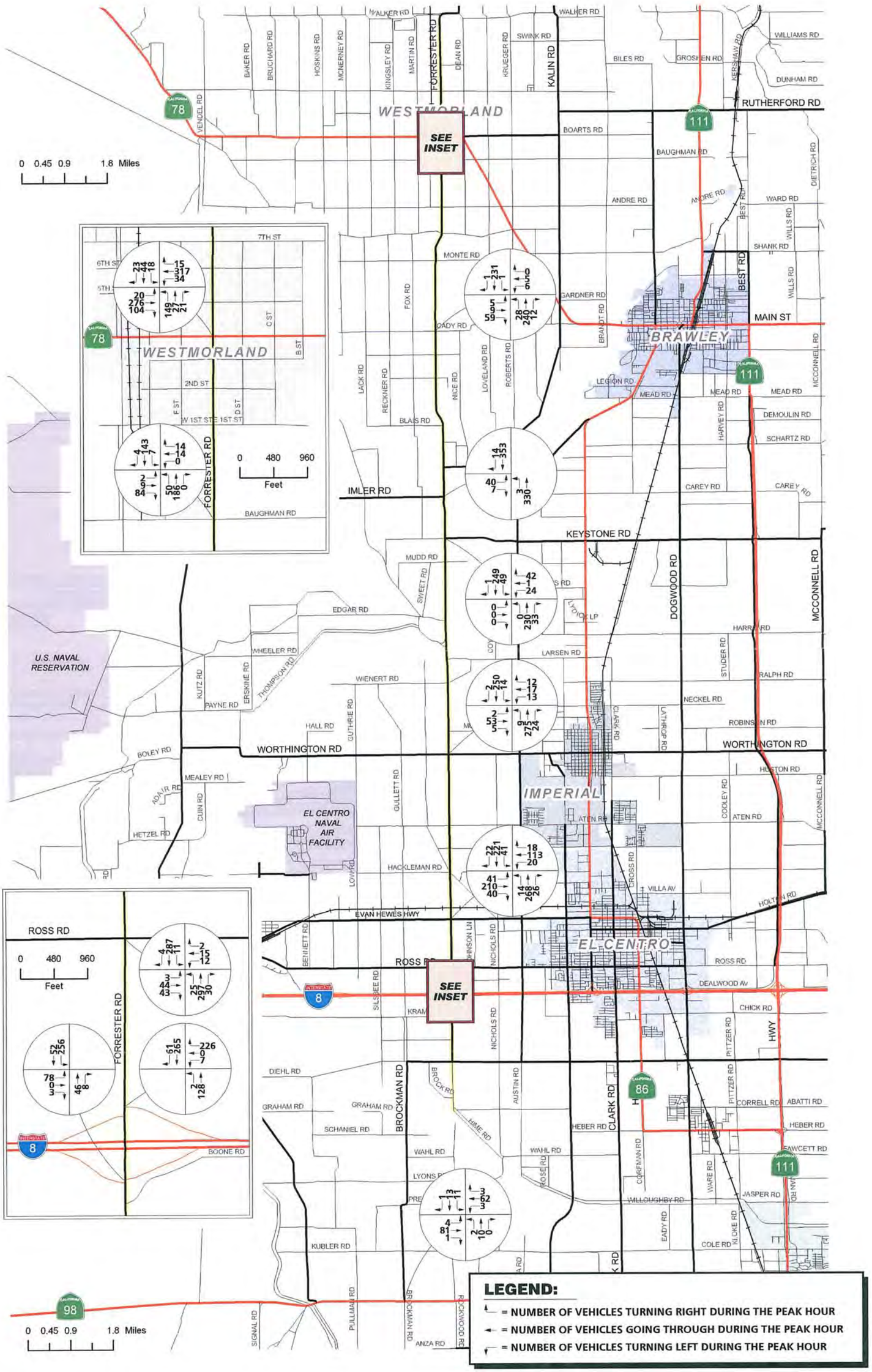
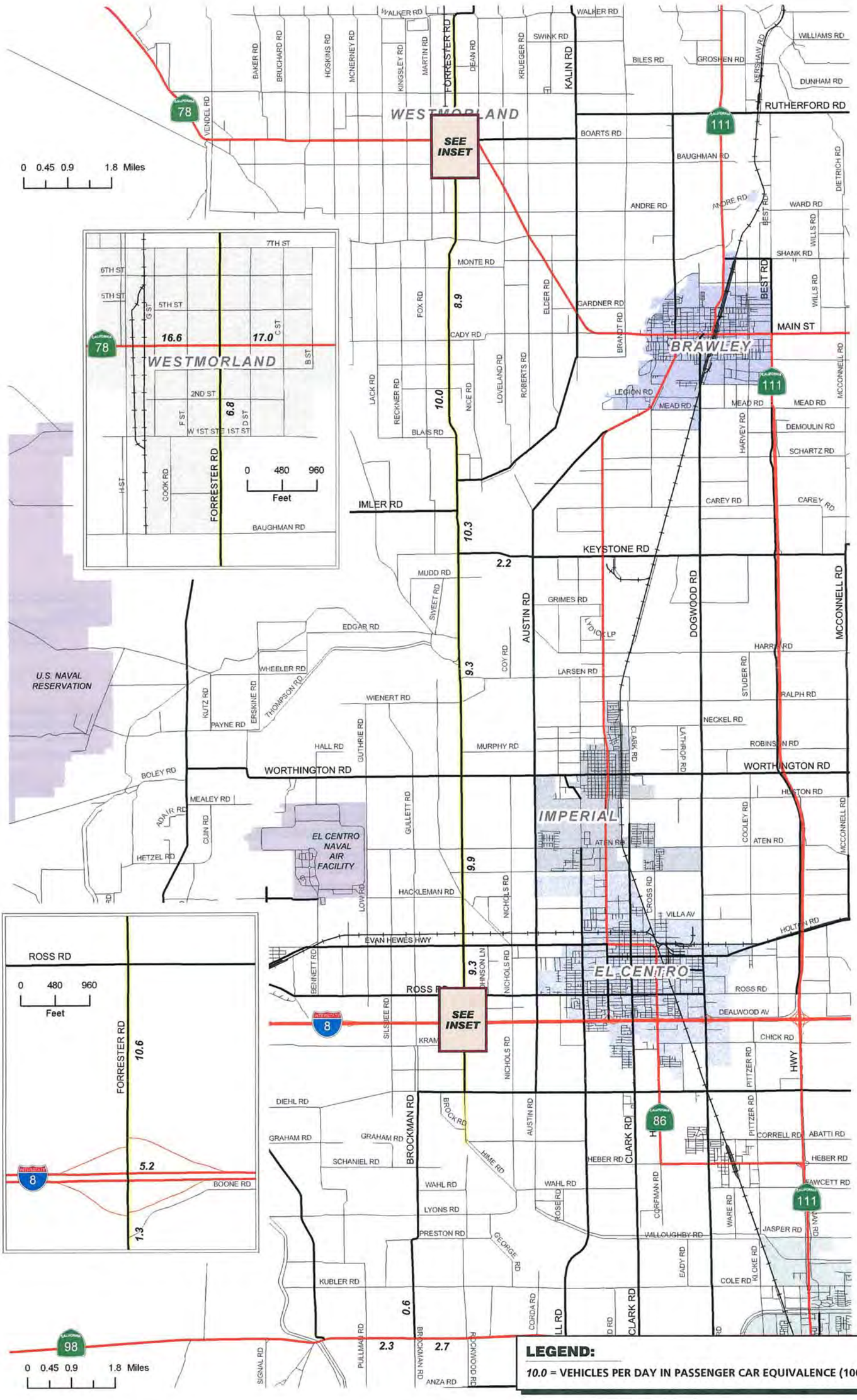


EXHIBIT 4-H

# EXISTING PM PEAK HOUR INTERSECTION PCE VOLUMES



# EXISTING AVERAGE DAILY TRAFFIC (ADT) PCE








URBAN CROSSROADS

TABLE 4-1 (1 of 2)

FORRESTER ROAD (BETWEEN INTERSTATE 8 AND BAUGHMAN ROAD)
ACCIDENT SUMMARY

| INCIDENT # | ACCIDENT TYPE | TRUCK TYPE[1] | LOCATION | DATE | TIME | CONDITION | KILLED | INJURED |
|---|---|---|---|---|---|---|---|---|
| YEAR 2005 | | | | | | | | |
| 1 | Rear-end | - | 67 ft. n/o Interstate 8 | 1/7 /2005 | 1410 | Cloudy | 0 | 0 |
| 2 | Hit object | - | 1056 ft. n/o Keystone Rd. | 1/20 /2005 | 1200 | Cloudy | 0 | 0 |
| 3 | Rear-end | - | 50 ft. n/o Mudd Rd. | 2/4 /2005 | 1649 | Clear | 0 | 0 |
| 4 | Broadside | - | Intersection of Mudd Rd. | 2/4 /2005 | 1648 | Clear | 0 | 0 |
| 5 | Overturned | - | 1058 ft. n/o Thompson Rd. | 2/4 /2005 | 2125 | Clear | 0 | 1 |
| 6 | Rear-end | 25 | 1584 ft. n/o Donovan Rd. | 2/12 /2005 | 105 | Cloudy | 0 | 0 |
| 7 | Hit object | - | 1144 ft. s/o Donovan Rd. | 2/15 /2005 | 2122 | Clear | 0 | 0 |
| 8 | Broadside | 26;25 | 2112 ft. n/o Cady Rd. | 2/17 /2005 | 2035 | Clear | 0 | 0 |
| 9 | Broadside | - | Intersection of Carter Rd. | 3/1 /2005 | 700 | Windy | 0 | 3 |
| 10 | Hit object | - | 2640 ft. s/o Worthington Rd. | 3/5 /2005 | 820 | Clear | 0 | 0 |
| 11 | Sideswipe | - | 755 ft. s/o Ross Rd. | 3/10 /2005 | 617 | Clear | 0 | 1 |
| 12 | Hit object | - | 5280 ft. n/o Worthington Rd. | 3/22 /2005 | 1300 | Clear | 0 | 0 |
| 13 | Hit object | - | 2640 ft. n/o Evan Hewes Hwy. | 3/30 /2005 | 713 | Clear | 0 | 0 |
| 14 | Overturned | 25 | 2112 ft. n/o Evan Hewes Hwy. | 4/8 /2005 | 30 | Clear | 0 | 0 |
| 15 | Hit object | - | 500 ft. s/o Imler Rd. | 4/30 /2005 | 2025 | Clear | 0 | 0 |
| 16 | Head-on | - | 1320 ft. n/o Hackleman Rd. | 5/1 /2005 | 1807 | Clear | 0 | 3 |
| 17 | Hit object | - | 1934 ft. s/o Hackleman Rd. | 5/7 /2005 | 1005 | Clear | 0 | 1 |
| 18 | Broadside | - | Intersection of Ross Rd. | 5/18 /2005 | 1455 | Clear | 0 | 0 |
| 19 | Sideswipe | 25 | 13 ft. n/o Johnson Rd. | 5/29 /2005 | 455 | Clear | 0 | 1 |
| 20 | Broadside | - | Intersection of Ross Rd. | 6/7 /2005 | 1055 | Clear | 0 | 1 |
| 21 | Hit object | - | 2000 ft. n/o Evan Hewes Hwy. | 6/8 /2005 | 2040 | Clear | 0 | 1 |
| 22 | Hit object | - | 800 ft. n/o Evan Hewes Hwy. | 6/18 /2005 | 1300 | Clear | 0 | 0 |
| 23 | Broadside | 25 | 3696 ft. n/o Edgar Rd. | 6/22 /2005 | 730 | Clear | 0 | 1 |
| 24 | Overturned | 26 | 1366 ft. n/o Imler Rd. | 6/22 /2005 | 1300 | Clear | 0 | 2 |
| 25 | Rear-end | - | 1320 ft. n/o Evan Hewes Hwy. | 6/27 /2005 | 1350 | Clear | 0 | 2 |
| 26 | Hit object | - | 472 ft. s/o Blais Rd. | 7/10 /2005 | 720 | Clear | 0 | 1 |
| 27 | Broadside | - | Intersection of Aten Rd. | 7/13 /2005 | 2328 | Clear | 0 | 3 |
| 28 | Head-on | - | 4224 ft. s/o Andre Rd. | 7/17 /2005 | 250 | Clear | 0 | 3 |
| 29 | Hit object | - | 320 ft. n/o Murphy Rd. | 7/26 /2005 | 2130 | Clear | 0 | 0 |
| 30 | Broadside | - | Intersection of Baughman Rd. | 8/11 /2005 | 840 | Clear | 0 | 2 |
| 31 | Sideswipe | 25 | 26 ft. n/o Evan Hewes Hwy. | 8/11 /2005 | 1040 | Clear | 0 | 0 |
| 32 | Hit object | - | 14 ft. n/o Carter Rd. | 8/17 /2005 | 2220 | Clear | 0 | 0 |
| 33 | Broadside | - | Intersection of Interstate 8 | 9/26 /2005 | 1840 | Clear | 0 | 0 |
| 34 | Hit object | - | 300 ft. n/o Carter Rd. | 10/1 /2005 | 1415 | Clear | 0 | 0 |
| 35 | Hit object | - | 3696 ft. s/o Andre Rd. | 10/7 /2005 | 2200 | Clear | 0 | 0 |
| 36 | Overturned | - | 290 ft. n/o Cady Rd. | 11/6 /2005 | 1310 | Clear | 0 | 2 |
| 37 | Sideswipe | 25 | Intersection of Murphy Rd. | 11/11 /2005 | 745 | Clear | 0 | 0 |
| 38 | Broadside | - | Intersection of Evan Hewes Hwy. | 11/22 /2005 | 1344 | Cloudy | 0 | 0 |
| 39 | Sideswipe | - | 45 ft. s/o Worthington Rd. | 11/26 /2005 | 940 | Clear | 0 | 0 |
| 40 | Sideswipe | 25 | 1111 ft. s/o Imler Rd. | 12/3 /2005 | 835 | Clear | 0 | 0 |
| 41 | Overturned | - | 3696 ft. s/o Andre Rd. | 12/17 /2005 | 215 | Clear | 0 | 0 |
| 42 | Rear-end | - | 500 ft. n/o Aten Rd. | 12/17 /2005 | 1445 | Clear | 0 | 0 |
| 43 | Overturned | - | 685 ft. s/o Edgar Rd. | 12/25 /2005 | 1800 | Clear | 0 | 0 |
| 44 | Sideswipe | - | 2378 ft. s/o Hackleman Rd. | 12/28 /2005 | 2106 | Clear | 0 | 0 |
| 45 | Sideswipe | - | 4488 ft. s/o Andre Rd. | 12/30 /2005 | 1745 | Clear | 0 | 1 |
| 46 | Rear-end | - | Intersection of Edgar Rd. | 12/30 /2005 | 715 | Clear | 0 | 1 |
| YEAR 2006 | | | | | | | | |
| 47 | Hit object | - | 2745 ft. n/o Edgar Rd. | 1/11 /2006 | 1030 | Clear | 0 | 1 |
| 48 | Overturned | - | 4752 ft. s/o Andre Rd. | 2/2 /2006 | 310 | Clear | 0 | 1 |
| 49 | Hit object | - | 2363 ft. n/o Monte Rd. | 2/11 /2006 | 628 | Clear | 0 | 3 |
| 50 | Head-on | 25;25 | Intersection of Evan Hewes Hwy. | 2/13 /2006 | 1100 | Clear | 0 | 0 |
| 51 | Broadside | - | Intersection of Ross Rd. | 2/21 /2006 | 1224 | Cloudy | 0 | 0 |

TABLE 4-1 (2 of 2)

FORRESTER ROAD (BETWEEN INTERSTATE 8 AND BAUGHMAN ROAD)
ACCIDENT SUMMARY

| INCIDENT # | ACCIDENT TYPE | TRUCK TYPE[1] | LOCATION | DATE | TIME | CONDITION | KILLED | INJURED |
|---|---|---|---|---|---|---|---|---|
| 52 | Hit object | - | 1500 ft. s/o Monte Rd. | 2/25 /2006 | 1900 | Clear | 0 | 0 |
| 53 | Rear-end | - | 528 ft. n/o Evan Hewes Hwy. | 2/27 /2006 | 1450 | Cloudy | 0 | 1 |
| 54 | Broadside | 25 | Intersection of Worthington Rd. | 3/10 /2006 | 1235 | Cloudy | 0 | 5 |
| 55 | Overturned | - | 2152 ft. n/o Larsen Rd. | 3/11 /2006 | 200 | Clear | 0 | 1 |
| 56 | Sideswipe | 25 | 5280 ft. n/o Cady Rd. | 3/19 /2006 | 15 | Clear | 0 | 1 |
| 57 | Rear-end | 46 | 528 ft. s/o Mudd Rd. | 4/13 /2006 | 1645 | Clear | 0 | 0 |
| 58 | Broadside | - | Intersection of Ross Rd. | 4/20 /2006 | 1700 | Clear | 0 | 7 |
| 59 | Sideswipe | - | 1056 ft. n/o Blais Rd. | 5/10 /2006 | 1305 | Clear | 0 | 0 |
| 60 | Overturned | 26 | 528 ft. s/o Aten Rd. | 5/18 /2006 | 1455 | Clear | 0 | 0 |
| 61 | Sideswipe | 25 | 2112 ft. n/o Cady Rd. | 6/6 /2006 | 200 | Clear | 0 | 0 |
| 62 | Hit object | 25 | 1320 ft. n/o Evan Hewes Hwy. | 6/13 /2006 | 1430 | Clear | 0 | 0 |
| 63 | Overturned | - | 2937 ft. s/o Monte Rd. | 6/13 /2006 | 1218 | Clear | 0 | 1 |
| 64 | Overturned | 25 | 500 ft. n/o Hackleman Rd. | 6/26 /2006 | 1455 | Clear | 0 | 0 |
| 65 | Broadside | 25 | 17 ft. n/o Aten Rd. | 6/29 /2006 | 1250 | Clear | 0 | 0 |
| 66 | Overturned | - | 3696 ft. n/o Edgar Rd. | 7/22 /2006 | 1713 | Clear | 0 | 3 |
| 67 | Sideswipe | - | 1056 ft. n/o Larsen Rd. | 7/30 /2006 | 405 | Clear | 0 | 5 |
| 68 | Hit object | - | 3696 ft. n/o Cady Rd. | 8/2 /2006 | 2140 | Clear | 0 | 0 |
| 69 | Rear-end | 27 | 14 ft. n/o Johnson Rd. | 8/17 /2006 | 410 | Clear | 0 | 2 |
| 70 | Hit object | - | 6864 ft. s/o Andre Rd. | 8/26 /2006 | 250 | Clear | 0 | 0 |
| 71 | Hit object | - | 1584 ft. s/o Imler Rd. | 9/8 /2006 | 350 | Clear | 0 | 0 |
| 72 | Hit object | - | 2640 ft. s/o Evan Hewes Hwy. | 9/15 /2006 | 1743 | Clear | 0 | 1 |
| 73 | Rear-end | - | 36 ft. n/o Evan Hewes Hwy. | 10/4 /2006 | 1630 | Clear | 0 | 0 |
| 74 | Overturned | - | 2376 ft. n/o Murphy Rd. | 10/8 /2006 | 245 | Clear | 1 | 0 |
| 75 | Hit object | - | 1056 ft. s/o Imler Rd. | 11/8 /2006 | 1540 | Clear | 0 | 1 |
| 76 | Hit object | - | 210 ft. s/o Imler Rd. | 11/10 /2006 | 1040 | Clear | 0 | 0 |
| 77 | Broadside | - | Intersection of Hackleman Rd. | 11/13 /2006 | 1840 | Clear | 0 | 1 |
| 78 | Hit object | - | 79 ft. s/o Carter Rd. | 11/22 /2006 | 1310 | Clear | 0 | 3 |
| 79 | Hit object | - | 3168 ft. s/o Weinert Rd. | 12/3 /2006 | 320 | Clear | 0 | 0 |
| 80 | Rear-end | - | 60 ft. n/o Interstate 8 | 12/21 /2006 | 2050 | Clear | 0 | 0 |
| 81 | Broadside | - | Intersection of Ross Rd. | 12/28 /2006 | 725 | Clear | 0 | 0 |
| 82 | Broadside | - | Intersection of Carter Rd. | 12/30 /2006 | 1613 | Clear | 0 | 2 |
| | | | **YEAR 2007** | | | | | |
| 83 | Hit object | - | Intersection of Edgar Rd. | 2/5 /2007 | 2015 | Clear | 0 | 0 |
| 84 | Hit object | - | 1278 ft. s/o Imler Rd. | 3/24 /2007 | 1205 | Clear | 0 | 0 |
| 85 | Overturned | 25;25 | 1584 ft. s/o Hackleman Rd. | 3/26 /2007 | 930 | Clear | 0 | 0 |
| 86 | Hit object | - | 528 ft. s/o Johnson Rd. | 3/26 /2007 | 637 | Cloudy | 0 | 0 |
| 87 | Overturned | - | 3168 ft. n/o Keystone Rd. | 3/29 /2007 | 45 | Clear | 0 | 4 |
| 88 | Broadside | - | Intersection of Ross Rd. | 4/21 /2007 | 1618 | Clear | 0 | 1 |
| 89 | Sideswipe | 25 | 7932 ft. s/o Andre Rd. | 5/19 /2007 | 2125 | Clear | 0 | 0 |
| 90 | Sideswipe | 26 | 2640 ft. n/o Evan Hewes Hwy. | 5/28 /2007 | 2335 | Clear | 0 | 0 |
| 91 | Overturned | - | 2640 ft. s/o Baughman Rd. | 6/20 /2007 | 1415 | Clear | 0 | 4 |
| 92 | Rear-end | - | 275 ft. s/o Stranlund Rd. | 7/6 /2007 | 1215 | Clear | 0 | 2 |
| 93 | Sideswipe | 26;27 | 2217 ft. n/o Aten Rd. | 7/14 /2007 | 640 | Clear | 0 | 1 |
| 94 | Sideswipe | - | 528 ft. s/o Blais Rd. | 7/25 /2007 | 1535 | Clear | 0 | 0 |
| 95 | Hit object | - | 10 ft. n/o Carter Rd. | 7/25 /2007 | 1700 | Clear | 0 | 0 |
| 96 | Head-on | - | 1848 ft. n/o Monte Rd. | 7/29 /2007 | 705 | Clear | 1 | 3 |
| 97 | Hit object | - | 5808 ft. s/o Keystone Rd. | 8/14 /2007 | 640 | Raining | 0 | 0 |
| 98 | Sideswipe | - | Intersection of Interstate 8 | 8/18 /2007 | 1350 | Clear | 0 | 2 |
| 99 | Sideswipe | 26 | 1056 ft. n/o Weinert Rd. | 8/22 /2007 | 1330 | Clear | 0 | 0 |
| 100 | Hit object | - | 12 ft. n/o Carter Rd. | 9/5 /2007 | 1418 | Clear | 0 | 0 |
| 101 | Overturned | - | 60 ft. s/o Monte Rd. | 10/13 /2007 | 2200 | Clear | 0 | 0 |
| 102 | Rear-end | 25 | 150 ft. s/o Cady Rd. | 10/29 /2007 | 620 | Clear | 1 | 5 |
| **TOTAL NUMBER OF FATALITIES/INJURIES** | | | | | | | **3** | **91** |

Source: Department of California Highway Patrol Information Services Unit

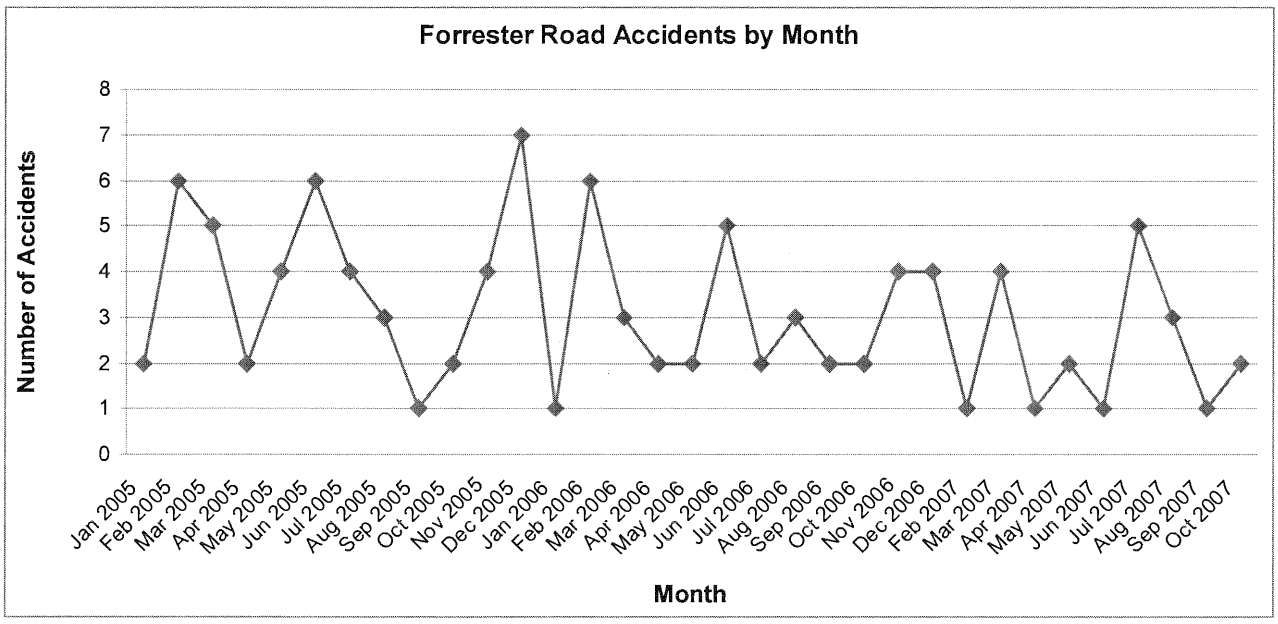
[1] Accidents involving commercial trucks. Truck Types based on CHP classification:
25 = Truck Tractor; 26 = Two Axle Truck; 27 = three axle or more truck

As a result of the accidents during the three year period from January 2005 thru October 2007, the California Highway Patrol reports 91 injuries and 3 fatalities.

Accidents along Forrester Road are concentrated at the segment south of Baughman Road to Imler Road and south of Worthington Road to the Interstate 8 freeway Ramps. Exhibit 4-J illustrates the location of each accident along Forrester Road.

The table below illustrates the month and frequency of the accidents.

**TABLE 4-2**




Recommended improvements discussed in Section 6 are intended to improve safety and minimize vehicular accidents.

Accident Data Reports are included in Appendix "G".

## 4.5 Transit

The Imperial Valley Transit schedule indicates Route 50 Niland–El Centro and Route 200 El Centro-Niland traverses along SR-78/86 to Niland via Forrester Road (north of the intersection of Forrester Road/ SR-78/86. Route 50 and Route 200 bypasses all the study area intersections

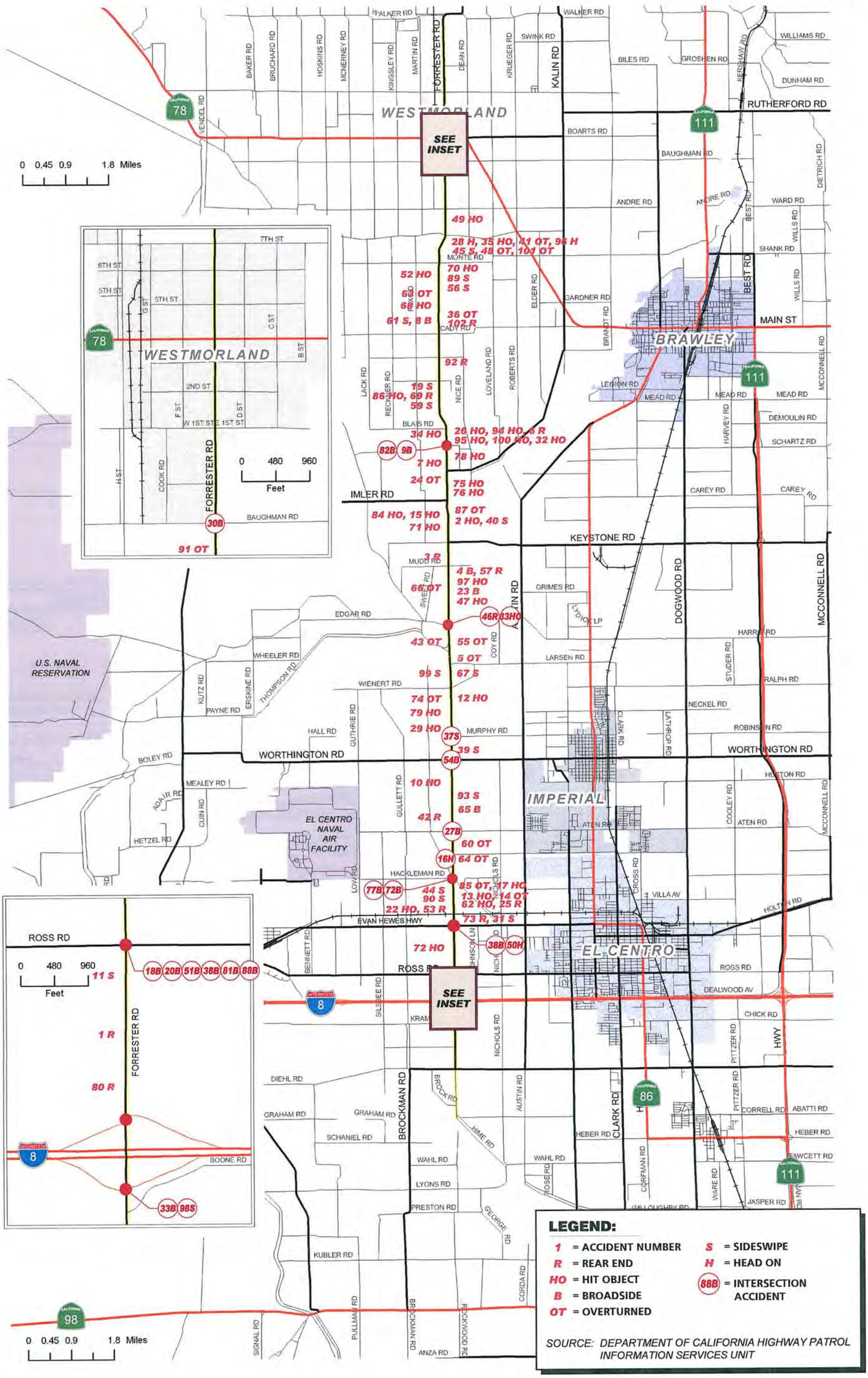
along Forrester Road, south of SR-78/86. Bus transit routes are typically determined by the demand of the service by the public. Land uses along Forrester Road are primarily agriculture and do not create enough demand for a bus route to serve the community along Forrester Road, south of SR-78/86 to Interstate 8. A bus route along Forrester Road may pose operational issues since sections of Forrester Road do not provide sidewalks and shoulders. Bus transit may be possible in the future when Forrester Road is built according to its full General Plan configuration.

## 4.6 City of Westmorland Pavement Rehabilitation

The City of Westmorland has commissioned a report outlining the conditions of South Center Street between Highway 86 and Baughman Road. The City of Westmorland's *South Center Street Pavement Rehabilitation* focused on the increase in industrial truck traffic due to the inception of the North American Free Trade Agreement (NAFTA) between the United States and Mexico, and its impact on South Center Street. The report finds that the increase in truck traffic has deteriorated pavement conditions, especially 18-wheel industrial trucks which exacerbate the "rutting" of the pavement due to the deceleration of heavy 18-wheel industrial trucks. In addition, the report also included a traffic study which recommends the installation of a traffic signal at the intersection of South Center Street/ SR-78/86 in 2006 and the widening of the South Center Street to 70 feet in width. Recommended improvements along Forrester Road (South Center Street) will be discussed in Section 6.0 of this report.

EXHIBIT 4-J

# FORRESTER ROAD ACCIDENT SUMMARY (JANUARY 2005 - OCTOBER 2007)



# 5.0 ANALYZE DATA: A COMPREHENSIVE LISTING OF CURRENT/ FUTURE CONDITIONS FOR TRAFFIC, SOCIO-ECONOMIC AND POPULATION

This section presents the methodologies for the analyses prepared in this assessment, including intersection delay for intersections, roadway segment analyses and traffic signal warrant analyses for Existing Conditions, short term (2015) traffic conditions, and long range (2035) conditions. Methodologies and Criteria outlined in this chapter are obtained from the County of Imperial Department of Public Works *Traffic Study and Report Policy* (Revised June 29, 2007) and the *Circulation and Scenic Highways Element* (Revised 2006). Socio-economic and population data are discussed in this section to verify the growth rate utilized to forecast future traffic volumes.

## 5.1 Intersection Delay Analysis Methodology

Intersection delay analyses are performed using the 2000 Highway Capacity Manual (HCM) methodology. The HCM defines Level of Service (LOS) as a qualitative measure that describes operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate LOS conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted.

The definitions of level of service for uninterrupted flow (flow unrestrained by the existence of traffic control devices) are:

- LOS "A" represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.
- LOS "B" is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.
- LOS "C" is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users

becomes significantly affected by interactions with others in the traffic stream.

- LOS "D" represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.

- LOS "E" represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.

- LOS "F" is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations.

The definitions of level of service for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control.

The level of service is typically dependent on the quality of traffic flow at the intersections along a roadway. The HCM methodology expresses the level of service at an intersection in terms of delay time for the various intersection approaches. The HCM uses different procedures depending on the type of intersection control. The levels of service determined in this study are calculated using the HCM methodology.

For signalized intersections, average total delay per vehicle for the overall intersection is used to determine level of service. Levels of service at signalized study area intersections are evaluated using the HCM intersection analysis program.

The study area intersections which are currently stop sign controlled, with stop control on the minor street only, is analyzed using the unsignalized intersection methodology of the HCM. For these intersections, the calculation of level of service is dependent on the

occurrence of gaps occurring in the traffic flow of the main street. The level of service is calculated using collected data that describes the intersection configuration and indicates traffic volumes in the study area. The level of service criteria for this type of intersection analysis is based on average total delay per vehicle for the worst minor street movement.

The levels of service are defined for the various analysis methodologies as follows:

| LEVEL OF SERVICE | AVERAGE TOTAL DELAY PER VEHICLE (SECONDS) | |
|---|---|---|
| | SIGNALIZED | UNSIGNALIZED |
| A | 0 to 10.00 | 0 to 10.00 |
| B | 10.01 to 20.00 | 10.01 to 15.00 |
| C | 20.01 to 35.00 | 15.01 to 25.00 |
| D | 35.01 to 55.00 | 25.01 to 35.00 |
| E | 55.01 to 80.00 | 35.01 to 50.00 |
| F | 80.01 and up | 50.01 and up |

The LOS analysis for signalized intersections is performed using optimized signal timing. This analysis assumes a lost time of four seconds per phase. Signal timing optimization considers pedestrian safety requirements and signal coordination. Initial saturation flow rates of 1,900 vehicles per hour of green (vphg) are utilized for the capacity analyses.

## 5.2 Roadway Segment Analysis Methodology

Roadway classification is based on the currently adopted *County of Imperial Circulation and Scenic Highways Element (Revised 2006)*. The roadway segment capacities utilized for the road segment analysis are derived from the Imperial County Standard Street Classification Average Daily Vehicle Trips Roadway Segment Standards. The following table identifies the daily capacities based on the roadway classification:

**TABLE 5-1**

| IMPERIAL COUNTY STANDARD STREET CLASSIFICATION AVERAGE DAILY VEHICLE TRIPS | | | | | | |
|---|---|---|---|---|---|---|
| Road | | Level of Service | | | | |
| Class | X-Section | A | B | C | D | E |
| Expressway | 154/210 | 30,000 | 42,000 | 60,000 | 70,000 | 80,000 |
| Prime Arterial | 106/136 | 22,200 | 37,000 | 44,600 | 50,000 | 57,000 |
| Minor Arterial | 82/102 | 14,800 | 24,700 | 29,600 | 33,400 | 37,000 |
| Collector | 64/84 | 13,700 | 22,800 | 27,400 | 30,800 | 34,200 |
| Local Collector | 40/70 | 1,900 | 4,100 | 7,100 | 10,900 | 16,200 |
| Residential Street | 40/60 | * | * | <1500 | * | * |
| Residential Cul-de-Sac or Loop Street | 40/60 | * | * | <200 | * | * |
| Industrial Collector | 76/96 | 5,000 | 10,000 | 14,000 | 17,000 | 20,000 |
| Industrial Local Street | 44/64 | 2,500 | 5,000 | 7,000 | 8,500 | 10,000 |
| * Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors. | | | | | | |

Source: *County of Imperial Circulation and Scenic Highways Element (Revised 2006)*

These roadway segment standards establish Level of Service capacities for various types of roadway classifications. Level of Service "C" capacity is established as the acceptable capacity threshold for all roadway segments in the County of Imperial. Volume-to-Capacity is calculated utilizing the ADT volumes and dividing by the corresponding roadway classification's capacity. Although a study area roadway may be classified as a particular designation in the County's Circulation Element, the roadway may not be currently constructed to its ultimate classification. Hence, the functional classification of the street segment is considered rather than the general plan designation. The functional classification is determined by the existing lane configurations, the capacity the roadway is intended to provide, and the degree of land access that they allow.

## 5.3 County of Imperial Level of Service Criteria

According to County of Imperial's *Circulation and Scenic Highways Element* (2006) performance criteria, LOS "C" or better is an acceptable traffic service level standard for all County maintained roads during the AM and PM peak periods for all intersections and roadway segments.

## 5.4 Traffic Signal Warrants

The requirements for determining the need for a traffic signal in this study is based on the CALTRANS Peak hour warrants for existing conditions. Future traffic conditions were based on planning level (daily) traffic signal warrants.

## 5.5 Existing Intersection Delay Analysis

The HCM methodology identifies the amount of delay experienced by drivers in seconds at the approach of an intersection. For signalized and all way stop controlled intersections, the average delay at all approaches is utilized to calculate the intersection delay. Unsignalized intersections that are cross street stop controlled as the case for most of the intersections along Forrester Road, the worst approach delay are reported. For each corresponding delay range, a corresponding level of service is assigned as a qualitative measure of the intersection performance.

Existing peak hour traffic operations are evaluated for the eleven study area intersections. Table 5-2 identifies the existing traffic control devices, existing intersection lane configuration, peak hour delays and corresponding service levels at the study area intersections. In summary, the analysis indicates that the study area intersections are currently operating at acceptable levels of service (LOS "C" or better) during the peak hours. Exhibit 5-A summarizes the intersection and road segment levels of service.

Intersection delay analysis calculation worksheets for existing traffic conditions are included in Appendix "H".

## 5.6 Traffic Signal Warrant Analysis for Existing Conditions

For existing traffic conditions, traffic signal warrants do not appear to be met at the unsignalized study area intersections (see Appendix "I").

## 5.7 Existing Roadway Segment Analysis

Based on the County of Imperial's *Circulation and Scenic Highway Element (2006)*, Level of Service "C" capacity is considered as the acceptable capacity threshold for all County roadway segments.

The study area roadways are analyzed with existing lane configurations and ADT volumes. ADT volume-to-capacity ratios are shown on Table 5-3. Table 5-3 indicates that the following study area roadways are currently operating at an unacceptable level of service:

Forrester Road (NS) between:

- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road

- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8

EXHIBIT 5-A

# LEVEL OF SERVICE SUMMARY FOR EXISTING CONDITIONS

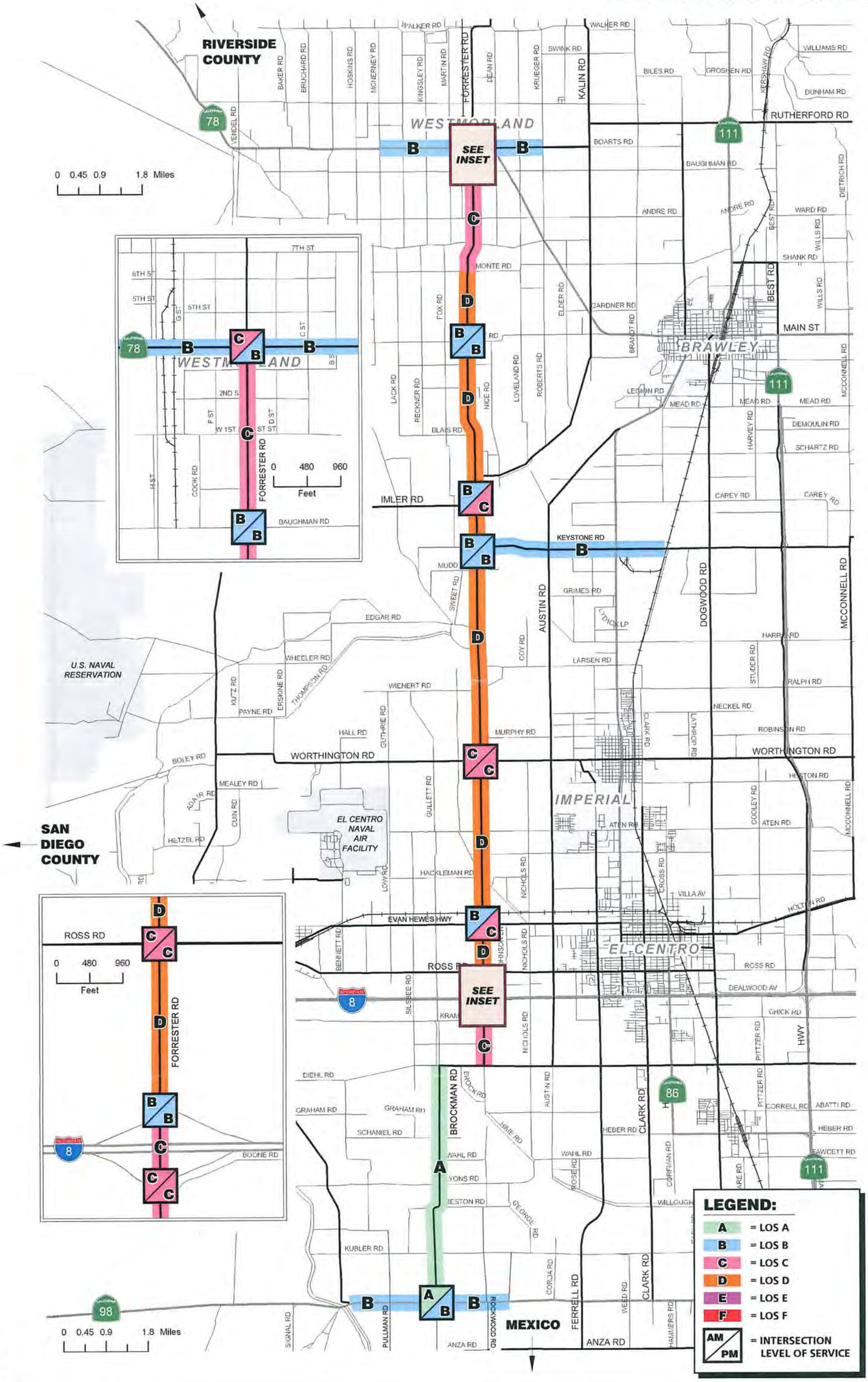


TABLE 5-2

INTERSECTION ANALYSIS FOR EXISTING CONDITIONS

| INTERSECTION | TRAFFIC CONTROL[3] | INTERSECTION APPROACH LANES[1] | | | | | | | | | | | | DELAY[2] (SECS.) | | LEVEL OF SERVICE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NORTH-BOUND | | | SOUTH-BOUND | | | EAST-BOUND | | | WEST-BOUND | | | | | | |
| | | L | T | R | L | T | R | L | T | R | L | T | R | AM | PM | AM | PM |
| Forrester Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-78/ SR-86 (EW) | AWS | 0.5 | 0.5 | 1 | 0.5 | 0.5 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | 15.4 | 12.6 | C | B |
| • Baughman Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 14.4 | 11.6 | B | B |
| • Cady Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 13.7 | 14.3 | B | B |
| • Imler Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 0 | 0 | 13.6 | 15.4 | B | C |
| • Keystone Road (EW) | CSS | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 11.1 | 11.6 | B | B |
| • Worthington Road (EW) | CSS | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 17.0 | 15.9 | C | C |
| • Evan Hewes Highway (EW) | AWS | 0 | 1! | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 13.5 | 16.7 | B | C |
| • Ross Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 20.4 | 19.8 | C | C |
| • Interstate 8 WB Ramp (EW) | CSS | 0.5 | 0.5 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.5 | 0.5 | 1 | 11.4 | 11.8 | B | B |
| • Interstate 8 EB Ramp (EW) | CSS | 0 | 1 | 0 | 0.5 | 0.5 | 0 | 0.5 | 0.5 | 1 | 0 | 0 | 0 | 22.2 | 23.0 | C | C |
| Brockman Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-98 (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 9.5 | 10.1 | A | B |

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1! = Shared left, thru and right lane

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9 R3 (2007). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for individual movement (or movements sharing a single lane) are shown.

[3] CSS = Cross Street Stop
AWS = All Way Stop

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TABLE 5-3

ROADWAY SEGMENT ANALYSIS FOR EXISTING CONDITIONS

| ROADWAY SEGMENT | EXISTING FUNCTIONAL ROAD CLASSIFICATION [2] | LOS "E" CAPACITY | EXISTING NUMBER OF LANES | EXISTING ADT[1] (PCE) | VOLUME / CAPACITY | LEVEL OF SERVICE |
|---|---|---|---|---|---|---|
| Forrester Road (NS) at: | | | | | | |
| • Between SR-78/ SR-86 and Baughman Rd | Local Collector | 16,200 [3] | 2 | 6,800 [4] | 0.42 | C |
| • Between Baughman Road and Cady Road | Local Collector | 16,200 [3] | 2 | 8,900 [4] | 0.55 | D |
| • Between Cady Road and Carter Road | Local Collector | 16,200 [3] | 2 | 10,000 [4] | 0.62 | D |
| • Between Imler Road and Keystone Road | Local Collector | 16,200 [3] | 2 | 10,300 [4] | 0.64 | D |
| • Between Keystone Road and Worthington Road | Local Collector | 16,200 [3] | 2 | 9,300 [4] | 0.57 | D |
| • Between Worthington Road and Even Hewes Hwy. | Local Collector | 16,200 [3] | 2 | 9,900 [4] | 0.61 | D |
| • Between Evan Hewes Hwy. and Ross Road | Local Collector | 16,200 [3] | 2 | 9,300 [4] | 0.57 | D |
| • Between Ross Road and Interstate 8 | Local Collector | 16,200 [3] | 2 | 10,600 [4] | 0.65 | D |
| • Between Interstate 8 WB Ramps and Interstate 8 EB Ramps | Local Collector | 16,200 [3] | 2 | 5,200 | 0.32 | C |
| • South of Interstate 8 EB Ramps | Local Collector | 16,200 [3] | 2 | 1,300 | 0.08 | A |
| Brockman Road (NS) at: | | | | | | |
| • North of SR-98 | Local Collector | 16,200 [3] | 2 | 600 [4] | 0.04 | A |
| Keystone Road (EW) at: | | | | | | |
| • Between Forrester Road and Austin Road | Local Collector | 16,200 [3] | 2 | 2,200 [4] | 0.14 | B |
| SR-86/SR-78 (EW) at: | | | | | | |
| • West of Forrester Road | Minor Arterial | 37,000 [3] | 4 | 16,600 [4] | 0.45 | B |
| • East of Forrester Road | Minor Arterial | 37,000 [3] | 4 | 17,000 [4] | 0.46 | B |
| SR-98 (EW) at: | | | | | | |
| • West of Brockman Road | Local Collector | 16,200 [3] | 2 | 2,300 [4] | 0.14 | B |
| • East of Brockman Road | Local Collector | 16,200 [3] | 2 | 2,700 [4] | 0.17 | B |

[1] Average Daily Traffic (ADT) expressed in vehicles per day.

[2] Road Classification based on the *Circulation and Scenic Highways Element*. Prepared by Imperial County Pubilc Works Department ( Revised August 2006)

[3] Although Level of Service (LOS) "C" capacity is the current target LOS indicated in the *Circulation and Scenic Highways Element* (REVISED August 2006), County of Imperial and CALTRANS staff have indicated LOS "E" as the standard acceptable capacity.

[4] Average Daily Traffic reflects passenger car equivalence (P.C.E) adjustments. Passenger Car Equivalence denotes the number of typical passenger cars to equal the length of an oversized vehicle. For medium sized trucks, 75% of the total number of trucks are assigned a P.C.E. factor of 2. The remaining 25% of trucks are assumed to be slow moving farming related trucks and were given a P.C.E factor of 6.0. Heavy trucks were assigned a P.C.E factor of 3.0.

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County of Imperial Population and Socio Economic Data

Population and Socio economic data indicate County-wide increase in both population and employment. The data presented below indicates the compound average growth rates for these metrics.

**TABLE 5-4**

| IMPERIAL COUNTY POPULATION AND SOCIO ECONOMIC DATA COMPOUND AVERAGE GROWTH RATES | | | | | | |
|---|---|---|---|---|---|---|
| | TOTAL POPULATION | | | | | |
| | 2005 [1] | 2008 [2] | 2030 [1] | 2035 [2] | CALTRANS GROWTH ESTIMATE 2005-2030 [1] | SCAG GROWTH ESTIMATE 2008-2035 [2] |
| **Total Population** | 165,430 | 187,000 | 269,871 | 320,000 | 2.0% | 2.0% |
| **Total Employment** | 61,051 | 67,000 | 108,687 | 133,000 | 2.3% | 2.6% |

[1] Population and Employment Data derived from *California-Baja California Master Plan*, *Final Report,* SANDAG & CALTRANS, September 2008

[2] Population and Employment Data derived from SCAG *2008 RTP*

According to the data included in the *California-Baja California Master Plan (Final Report),* consistent growth is anticipated from 2005 to 2030, which includes a 2% per year average population growth and a 2.3% per year average employment growth is anticipated in Imperial County. Based on the data, it is assumed that traffic volumes are expected to increase as a result of the population and employment growth in 2030. Similar population and employment projections have been calculated by SCAG with 2% per year growth in population and 2.3% per year growth in employment from 2008 to 2035. Growth in these demographic areas subsequently increases local traffic. Compared to the countywide growth increase in employment and population, increase in traffic is mostly predicated on the proximity of future development to Forrester Road. Traffic generated by future developments are routed to access nearby roadways onto their destination. The type of cumulative development is another factor on the traffic growth along Forrester Road. Commercial land uses generate more traffic compared to residential uses. Hence, assigning a growth rate to traffic volumes based on demographics is not entirely accurate. Since the rate is based on countywide growth, it does not take into account other factors

that may increase traffic volumes such as an increase in trade traffic between the United States and Mexico. For the purposes of this study, 1% per year growth has been applied to forecast future traffic volumes to account for trade and inter-regional traffic. Traffic generated by cumulative developments has also been routed through the study area and is intended to account for the remainder of the growth.

Calexico Port of Entry

Two Port of Entries are in the immediate vicinity of Forrester Road. According to the *California – Baja California Infrastructure Update*, Calexico West/ Mexicali I is the most important P.O.E. in Imperial County with significant passenger car traffic which has lead to "substantial congestion at this P.O.E. and along the state highways which access the international border. "Approximately 7 miles east of the Calexico West/ Mexicali I Port of Entry, the second P.O.E within the Imperial County, Calexico East/ Mexicali II serves all commercial truck traffic crossing. The data below summarizes existing border traffic and projected future conditions.

**TABLE 5-5**

| CALEXICO / MEXICALI PORT OF ENTRIES ANNUAL STATISTICS [1] | | | |
|---|---|---|---|
| **VEHICLE TYPE** | **CURRENT 2007 STATISTICS** | **FUTURE 2030 CONDITIONS** | **% INCREASE** |
| **CALEXICO WEST/ MEXICALI I P.O.E.** | | | |
| Passenger Vehicles | 5,747,309 | 7,560,000 | 32% |
| Buses | 996 | N/A | N/A |
| SENTRI | 775,723 | N/A | N/A |
| **CALEXICO WEST/ MEXICALI I TOTAL** | **6,524,028** | **7,560,000** | **37%** |
| **CALEXICO EAST/ MEXICALI II P.O.E.** | | | |
| Passenger Vehicles | 3,417,977 | 9,855,000 | 188% |
| Buses | 1,170 | N/A | N/A |
| Commercial Vehicles | 317,588 | 603,000 | 90% |
| **CALEXICO EAST/ MEXICALI II TOTAL** | **3,736,735** | **10,458,000** | **188%** |

[1] Source: *California- Baja California Border Infrastructure Update* (April 2008)

Current 2007 statistics indicate that approximately 6.5 million vehicles and 3.7 million vehicles enter through the Calexico West and Calexico East Port of Entries, respectively. Although the 2007 cross border activities indicate substantial traffic, cross-border traffic volumes are reflected in the existing conditions traffic counts. Traffic originating from the U.S.-Mexico Port of entries is dispersed to other nearby north-south arterials and highways

such as SR-111, SR-86, SR-115 and SR-7, and east-west roadways such as Interstate 8 and SR-98. By the year 2030, Caltrans predicts cross border traffic will increase by 37% to 7.6 million at the Calexico West P.O.E and 188% to 10.5 million at the Calexico East P.O.E. It has been assumed that cross-border traffic for long range (2035) will progressively increase as Forrester Road is widened to accept the added capacity of the projected cross-border traffic. This increase in trade traffic is encapsulated in the 1% per year annual compounded growth rate applied to existing traffic volumes.

Future projects are currently planned to alleviate congestion at the Calexico West P.O.E including the Calexico West Reconfiguration Project, which will provide operational improvements along SR-111 from the P.O.E to SR-98 and overpass railroad crossings at SR-98 and Cesar Chavez. A traffic impact study is currently underway to determine traffic impacts and mitigation measures on the proposed improvements at the vicinity of the P.O.E. Outside the immediate area of the Calexico West P.O.E, the construction of the SR-78/ Brawley Bypass is underway which will construct an 8 mile, four lane divided expressway from SR-86 north of the City of Brawley to 1.5 miles south of the eastern junction of SR-111 and SR-78. The construction is phased in three stages. Stage 1 was scheduled to be completed in May 2005 and Stage 2 scheduled to commence in early 2008. Stage 3 is anticipated to begin in 2008. The estimated completion of the Brawley Bypass is 2011.

At the Calexico East/ Mexicali II Port of Entry, a collaborative effort between the GSA and Caltrans are underway to identify and implement low cost, high impact, and expedited vehicular capacity enhancing projects. Low costs projects are estimated to be completed by 2015 and longer term expansion after 2015. Roadway improvement projects outside the immediate area of the Calexico East P.O.E include the SR-98 east widening from SR-111 to SR-7 which will widen and/or realign SR-98 over a length of approximately 8 miles. The project is currently under preliminary engineering phase and anticipated to be fully completed by 2015.

## 5.8 Short Term (2015) Method of Projection

For future short term (2015) traffic volumes, an ambient growth rate is applied to existing P.C.E adjusted traffic volumes and combined with traffic volumes generated by other development. For future scenarios, the same vehicle proportions (percentage of automobiles, farm vehicles, and trucks) for existing conditions were assumed for both Year 2015 and 2035 traffic conditions.

### 5.8.1 Ambient Growth Rate

Due to the economic climate at the time of the preparation of this report, a regional decline in development is currently being experienced throughout the Imperial Valley region. In addition, Caltrans traffic data suggests a declining trend in traffic volumes along the state routes within the study area. However, it is speculative to assume that the decline will persist for the next seven years up to 2015 conditions. Hence, to conservatively account for ambient growth on roadways, future traffic volumes are calculated based on a 1.0 percent annual growth rate of existing traffic volumes. A total of 7% is assumed for short term (2015) conditions and 31% ambient growth is assumed for long range (2035) conditions are added to peak hour traffic volumes on surrounding roadways, in addition to traffic generated by cumulative developments.

### 5.8.2 Cumulative Development

As part of the analysis for future 2015 and 2035 traffic conditions, cumulative land use developments need to be analyzed. Intensive research of these projects and their land uses were conducted during the initial stages of the project. Information regarding these projects was obtained from the County of Imperial, City of Westmorland, City of Brawley, City of Imperial, City of El Centro, and the City of Calexico. Each of the cumulative developments from their respective jurisdictions was individually verified with County and City staff whether the project has been built, under construction or withdrawn. Some of the cumulative projects identified in the County/City list were not included in the list of projects analyzed in this report due to the associated travel patterns of certain land uses, the distance of the project from the study area intersections or projects not anticipated to generate traffic. It should be noted that the proposed developments are projects that have been approved or pending approval from their respective jurisdictions. During the cumulative research process, Urban Crossroads, Inc. has obtained traffic studies

from different jurisdictions, which has been incorporated in the traffic study trip rates, trip generation, and trip distribution patterns. The following traffic studies have been considered in the report:

- *Currier Subdivision (295 Residential Lots) Draft Traffic Impact Analysis* by LOS Engineering, Inc., October 31, 2007.
- *Dickerson Subdivision Traffic Impact Analysis* by Linscott Law & Greenspan Engineers, March 16, 2007.
- *The World Petrol Travel Plaza Draft Mitigated Negative Declaration* by The Holt Group, March 2008.
- *101 Ranch Traffic Impact Analysis* by Urban Systems Associates, Inc., May 2008.
- *Mesquite Lake Specific Plan Traffic Impact Analysis* by Linscott Law & Greenspan Engineers, February 2005.
- *Barioni Lakes Estates Traffic Impact Analysis* by Linscott Law & Greenspan Engineers, February 2007.
- *Las Flores Estates Traffic Impact Analysis* by Linscott Law & Greenspan Engineers, June 2007.
- *Rosswood Draft Environmental Impact Report* by Mooney Jones & Stokes, February 2006.
- *Desert Lakes Mixed-Use Development Traffic Impact Analysis* by Darnell & Asociates, Inc., July 2007.
- *Las Aldeas Specific Plan Draft Environmental Impact Report* by Mooney Jones & Stokes, October 2006.
- *Lotus Ranch Plan Draft Environmental Impact Report* by Mooney Jones & Stokes, December 2006.
- *Colace Brothers Industrial Park Traffic Impact Analysis* by Linscott Law & Greenspan Engineers, April 2007.
- *Imperial Valley Commons Traffic Impact Analysis* by Linscott Law & Greenspan Engineers, August 2005.
- *Imperial Plaza Traffic Impact Analysis* by Linscott Law & Greenspan Engineers, December 2004.
- *Eight Street Industrial Park/Residential Project Traffic Impact Analysis* by Linscott Law & Greenspan Engineers, June 2005.
- *Desert Village #6 Draft Environmental Impact Report* by Mooney Jones & Stokes, February 2005.
- *The Plaza at Imperial Valley Draft Environmental Impact Report* by Mooney Jones & Stokes, June 2006.
- *Imperial Valley Mall Traffic Impact Analysis* by Linscott Law & Greenspan Engineers, January 2003.

Cumulative projects considered in the traffic analysis are proposed developments that have been approved or pending approval from their respective jurisdictions, which is not completed or generating traffic at the time existing conditions traffic counts were conducted. Appendix "J", Table J-1 lists the proposed land uses and proposed trip generation rates for cumulative developments obtained from the County of Imperial, City of Westmorland, City of Brawley, City of Imperial, City of El Centro, and the City of Calexico. Each of the cumulative developments from their respective jurisdictions was individually verified with County and City staff whether the project has been built, under construction or withdrawn. Some of the cumulative projects identified in the County/City list were not included in the list of projects analyzed in this report due to the associated travel patterns of certain land uses, the

distance of the project from the study area intersections or projects not anticipated to generate traffic. It should be noted that the approximate location of the cumulative developments considered in this report are illustrated on Exhibit 5-B.

5.8.3 Trip Generation

Trip generation represents the amount of traffic that is attracted and produced by a development. The traffic generation estimates for current and future projects are based upon the specific land uses which are planned for each development.

Some cumulative project trip generation rates are based on traffic studies prepared for those specific developments. Traffic generation rates for the cumulative developments are previously shown in Appendix "J", Table J-1. They are based on the Institute of Transportation Engineers (ITE), Trip Generation Manual, 7th Edition and San Diego Association of Governments (SANDAG). SANDAG has developed localized trip generation rates for land uses within the County of San Diego. SANDAG rates were considered in the trip generation due to the lack of empirical data and trip generation in the ITE trip generation manual.

The developments identified in this report are proposing to develop a considerable acreage of land with significant numbers of dwelling units and commercial square footages. The cumulative projects considered in this study are in different stages of the development process, and some proposed projects are still in the planning stages, which may later reduce or change the project description due to market conditions. An absorption of 50% of the total cumulative projects considered in this report is analyzed for short term (2015) conditions. For cumulative smaller scale projects, it has been assumed that 100% of these projects will be completed and generating traffic by 2015.

The daily and peak hour vehicle trips generated by the cumulative developments being processed concurrently in the study area are shown on Appendix "J", Table J-2. In addition, traffic interactions between the residential and non-residential cumulative developments are assumed and accounted for in the analysis. This reduction in trips is based on the compatibility of land uses within the project site, which assumes that the traffic generated by the project is internally captured and

does not travel out of external streets. Moreover, a "pass-by" reduction has also been assumed to account for traffic that will access the site as an intermediate to stop on the way to a primary destination.

It should be noted that some of the trip generation data provided in Appendix "J", Table J-2 were derived from approved traffic studies conducted for projects throughout the Imperial Valley region. These studies include: As indicated in Appendix "J", Table J-2, for short term (2015) conditions, cumulative developments are projected to generate approximately 463,478 trip ends per day with 44,818 vehicles per hour during the AM peak hour and 52,205 vehicles per hour during the PM peak hour. For long range (2035) conditions, cumulative developments are projected to generate approximately 745,555 trip ends per day with 75,211 vehicles per hour during the AM peak hour and 85,600 vehicles per hour during the PM peak hour.

### 5.8.4 Trip Distribution

Trip distribution represents the directional orientation of traffic to and from the project site. Trip distribution is heavily influenced by the geographical location of the site, the proximity to residential, commercial, employment, and recreational opportunities and the distance to the regional freeway system. The directional orientation of traffic is determined by evaluating existing land uses and highways within the community. Some of the project trip distributions were derived from approved traffic studies obtained by Urban Crossroads, Inc. The directional distributions of the cumulative developments are shown in Appendix "K".

### 5.8.5 Modal Split

The traffic reducing potential of public transit is not considered in this report. Essentially the traffic projections are "conservative" in that public transit might be able to reduce the traffic volumes.

### 5.8.6 Trip Assignment

The assignment of traffic from each cumulative project to the adjoining roadway system is based upon the site's trip generation, trip distribution, existing arterial highway and local street systems. For short term (2015) conditions, Exhibits 5-

C and 5-D illustrate the cumulative traffic volumes during the AM and PM peak hours, respectively. Cumulative average daily traffic volumes for short term (2015) conditions are depicted in Exhibit 5-E. For long range (2035) conditions, Exhibits 5-F and 5-G illustrate the cumulative traffic volumes during the AM and PM peak hours, respectively. Cumulative average daily traffic volumes for long range (2035) conditions are depicted in Exhibit 5-H.

5.9 Short Term (2015) Traffic Volumes

Exhibits 5-I and 5-J illustrate the AM and PM peak hour volumes expected for short term (2015) conditions, respectively. Exhibit 5-K shows the ADT volumes expected for short term (2015) traffic conditions. Short term (2015) traffic volume projections are based on existing traffic volumes with the cumulative traffic volumes along with the 7% ambient growth. Short term (2015) traffic volumes form the basis in assessing intersection and roadway performance and in determining the appropriate mitigation measures to satisfy LOS standards and enhance safety along Forrester Road.

5.10 Short Term (2015) Intersection Delay Analysis

In assessing short term (2015) intersection performance, the study area intersections are analyzed utilizing the HCM methodology, which identifies the amount of delay experienced by drivers in seconds at the approach of an intersection. For signalized and all way stop controlled intersections, the average delay at all approaches is utilized to calculate the intersection delay. The HCM methodology calculates the amount of delay based on the short term (2015) traffic volume projections for each study area intersection. The intersection delay analysis results are summarized on Table 5-6 for short term (2015) traffic conditions. With existing geometry, the following study area intersections are anticipated to operate at an unacceptable level of service during short term (2015) peak hours:

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)
- Cady Road (EW)
- Imler Road (EW)
- Keystone Road (EW)
- Worthington Road (EW)

- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

Intersection delay analysis calculation worksheets for short term (2015) traffic conditions are included in Appendix "L".

5.11 Short Term (2015) Roadway Segment Analysis

Roadway segments are analyzed through determining the volume to capacity ratio of the study area road segments. The volume to capacity ratio is determined by dividing the projected short term (2015) daily volumes for each roadway link by the maximum LOS "E" capacity as determined by the respective jurisdiction to quantify the full saturation of a particular roadway. Forrester Road is generally considered as a two-lane local collector with an LOS "E" capacity of 16,200 trips per day. The ratio indicates the relation of the projected Year 2015 traffic volumes in terms of the maximum capacity of the particular roadway segment. LOS "C" has been determined as the maximum acceptable threshold for Imperial County and Caltrans roadways.

The study area roadways are analyzed with Year 2015 ADT volumes with existing lane configurations. Year 2015 (ADT) volume-to-capacity ratios are shown on Table 5-7. Table 5-4 indicates that the following roadway segments are anticipated to operate at an unacceptable level of service, exceeding the County of Imperial's LOS "C" average daily traffic volume threshold:

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road
- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8

Keystone Road (EW) between:

- Forrester Road and Austin Road

Exhibit 5-L summarizes the intersection and road segment levels of service for Short Term (2015) Conditions.

## 5.12 Long Range (2035) Traffic Volumes

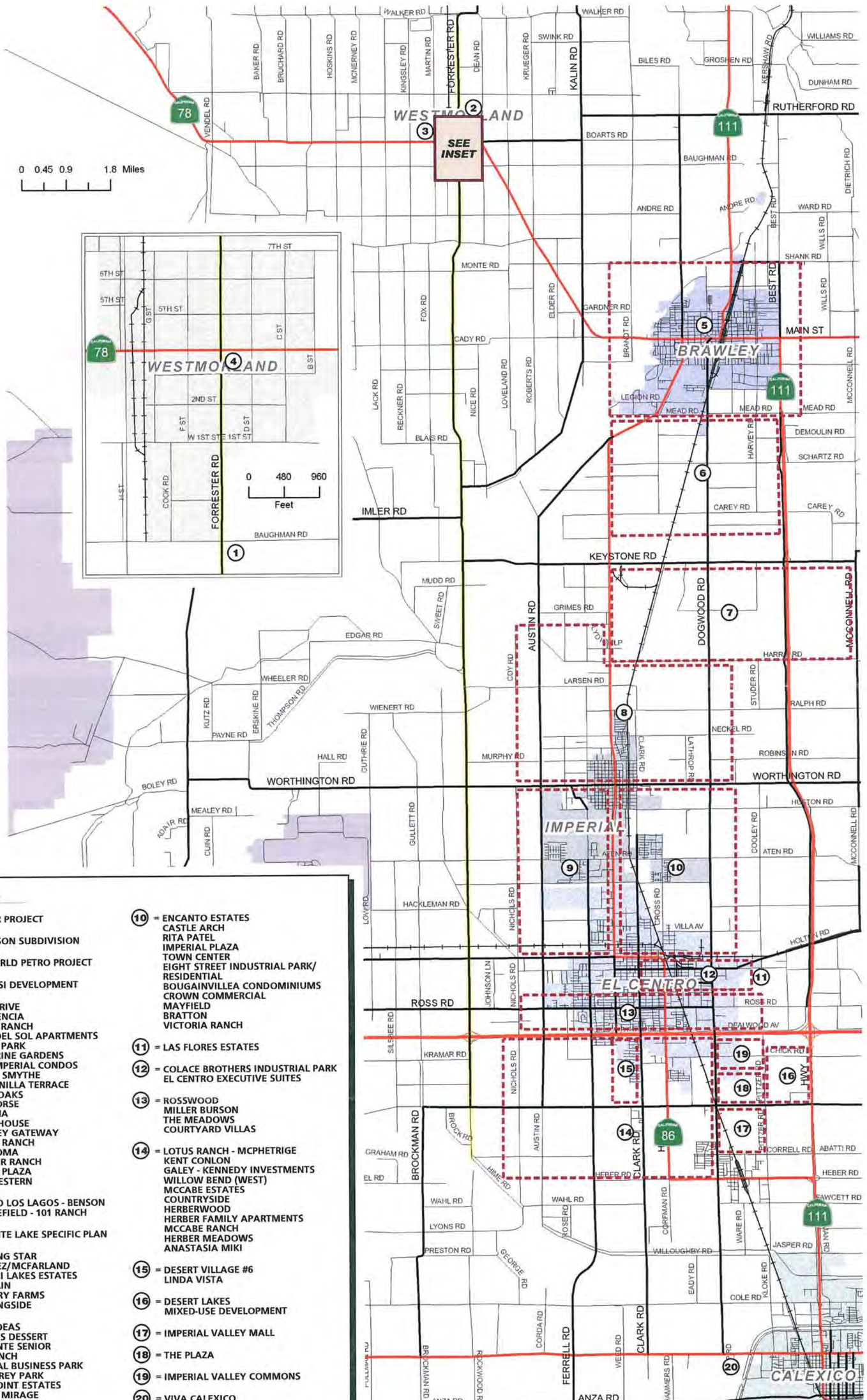
A thorough research effort has been conducted of approved and proposed projects located in the unincorporated region of Imperial County and the cities of Westmorland, Brawley, Imperial, El Centro, and Calexico. It has been assumed that 100% of the smaller scale projects and 50% of the larger scale projects will be completed by 2015. For long range (2035) conditions, it has been assumed that the remaining 50% of the larger scale cumulative projects will be completed. In addition, existing traffic volumes (P.C.E adjusted) are factored with a 1% per year growth for a total of 31% for long range (2035) conditions. Farm vehicles accessing Forrester Road for long rage (2035) conditions has been considered within the P.C.E adjustments. Exhibit 5-M and 5-N illustrates the AM and PM peak hour volumes for long range (2035) conditions.

The Imperial County Transportation Element (2007) and the Caltrans 2025 model were utilized as the volume benchmark for 2035 conditions. Exhibit 5-O illustrates the average daily traffic volumes for long range (2035) conditions. As indicated in Exhibit 5-O, the average daily traffic volumes developed from the methodology described above are consistent with the ADT forecasted volumes shown in the *Imperial County 2007 Transportation Plan Highway Element.*

The projected 2035 traffic volumes are the basis for evaluating long range (2035) intersection delay and roadway segment operations. Through the results of long range analyses with current lane configuration, appropriate mitigation measures are recommended.

EXHIBIT 5-B

# CUMULATIVE PROJECTS LOCATION MAP




## LEGEND:

1. = CURRIER PROJECT
2. = DICKERSON SUBDIVISION
3. = THE WORLD PETRO PROJECT
4. = VERTUSSI DEVELOPMENT
5. = RIVER DRIVE
   - LA VALENCIA
   - LATIGO RANCH
   - VALLE DEL SOL APARTMENTS
   - MALAN PARK
   - TANGERINE GARDENS
   - PARK IMPERIAL CONDOS
   - GRIFFIN SMYTHE
   - MANZANILLA TERRACE
   - SILVER OAKS
   - WILDHORSE
   - TOSCANA
   - SPRINGHOUSE
   - BRAWLEY GATEWAY
   - LUCKEY RANCH
   - LA PALOMA
   - WEBSTER RANCH
   - BADRIA PLAZA
   - BEST WESTERN
6. = RANCHO LOS LAGOS - BENSON
   - BROOKEFIELD - 101 RANCH
7. = MESQUITE LAKE SPECIFIC PLAN
8. = MORNING STAR
   - SANCHEZ/MCFARLAND
   - BARIONI LAKES ESTATES
   - MCMILLIN
   - DREWERY FARMS
   - MORNINGSIDE
9. = LAS ALDEAS
   - CHARLES DESSERT
   - LA FUENTE SENIOR
   - SKY RANCH
   - IMPERIAL BUSINESS PARK
   - MONTEREY PARK
   - SANDPOINT ESTATES
   - DESERT MIRAGE
10. = ENCANTO ESTATES
    - CASTLE ARCH
    - RITA PATEL
    - IMPERIAL PLAZA
    - TOWN CENTER
    - EIGHT STREET INDUSTRIAL PARK/ RESIDENTIAL
    - BOUGAINVILLEA CONDOMINIUMS
    - CROWN COMMERCIAL
    - MAYFIELD
    - BRATTON
    - VICTORIA RANCH
11. = LAS FLORES ESTATES
12. = COLACE BROTHERS INDUSTRIAL PARK
    - EL CENTRO EXECUTIVE SUITES
13. = ROSSWOOD
    - MILLER BURSON
    - THE MEADOWS
    - COURTYARD VILLAS
14. = LOTUS RANCH - MCPHETRIGE
    - KENT CONLON
    - GALEY - KENNEDY INVESTMENTS
    - WILLOW BEND (WEST)
    - MCCABE ESTATES
    - COUNTRYSIDE
    - HERBERWOOD
    - HERBER FAMILY APARTMENTS
    - MCCABE RANCH
    - HERBER MEADOWS
    - ANASTASIA MIKI
15. = DESERT VILLAGE #6
    - LINDA VISTA
16. = DESERT LAKES
    - MIXED-USE DEVELOPMENT
17. = IMPERIAL VALLEY MALL
18. = THE PLAZA
19. = IMPERIAL VALLEY COMMONS
20. = VIVA CALEXICO

EXHIBIT 5-C

# CUMULATIVE DEVELOPMENT (2015) AM PEAK HOUR INTERSECTION VOLUMES

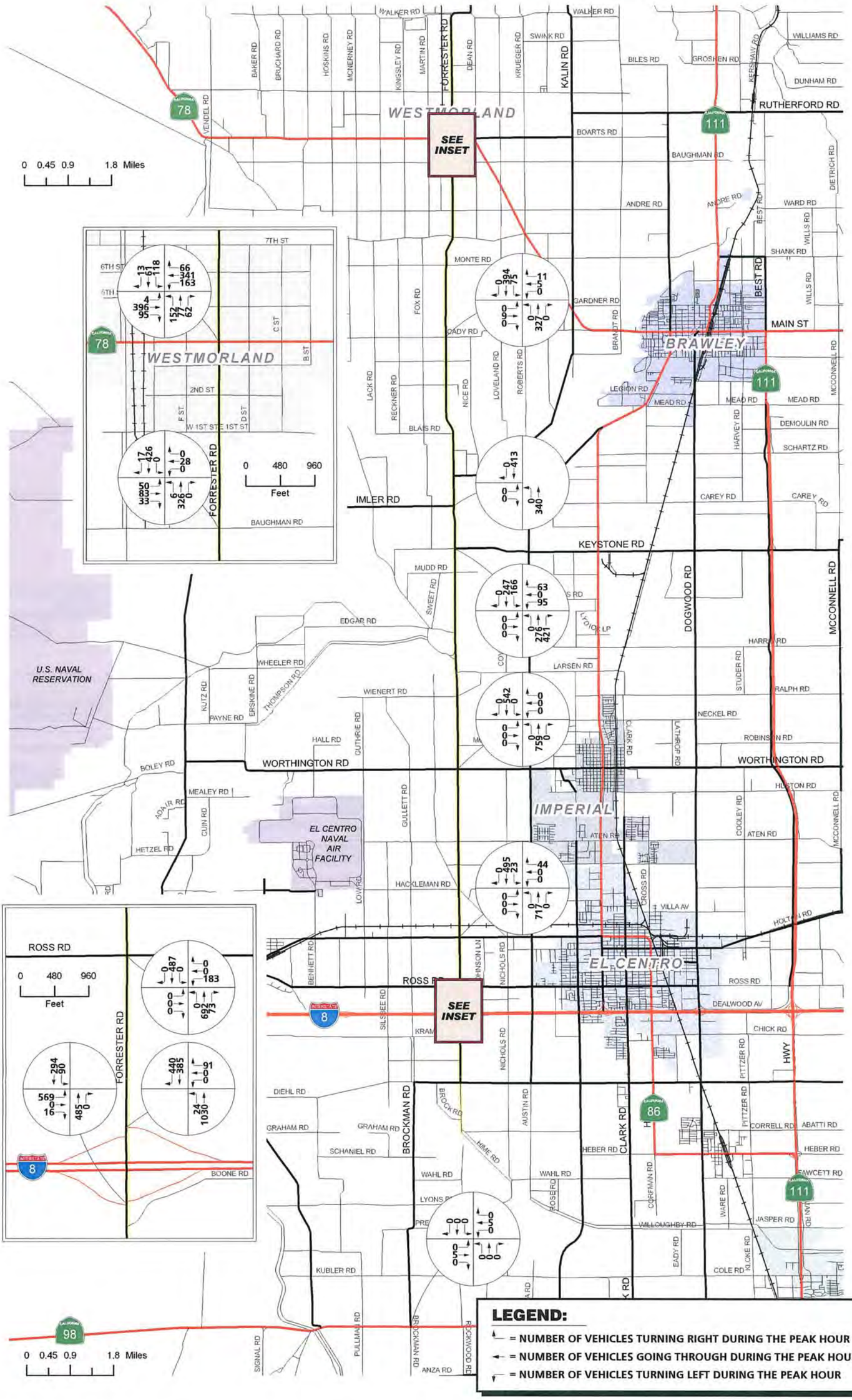
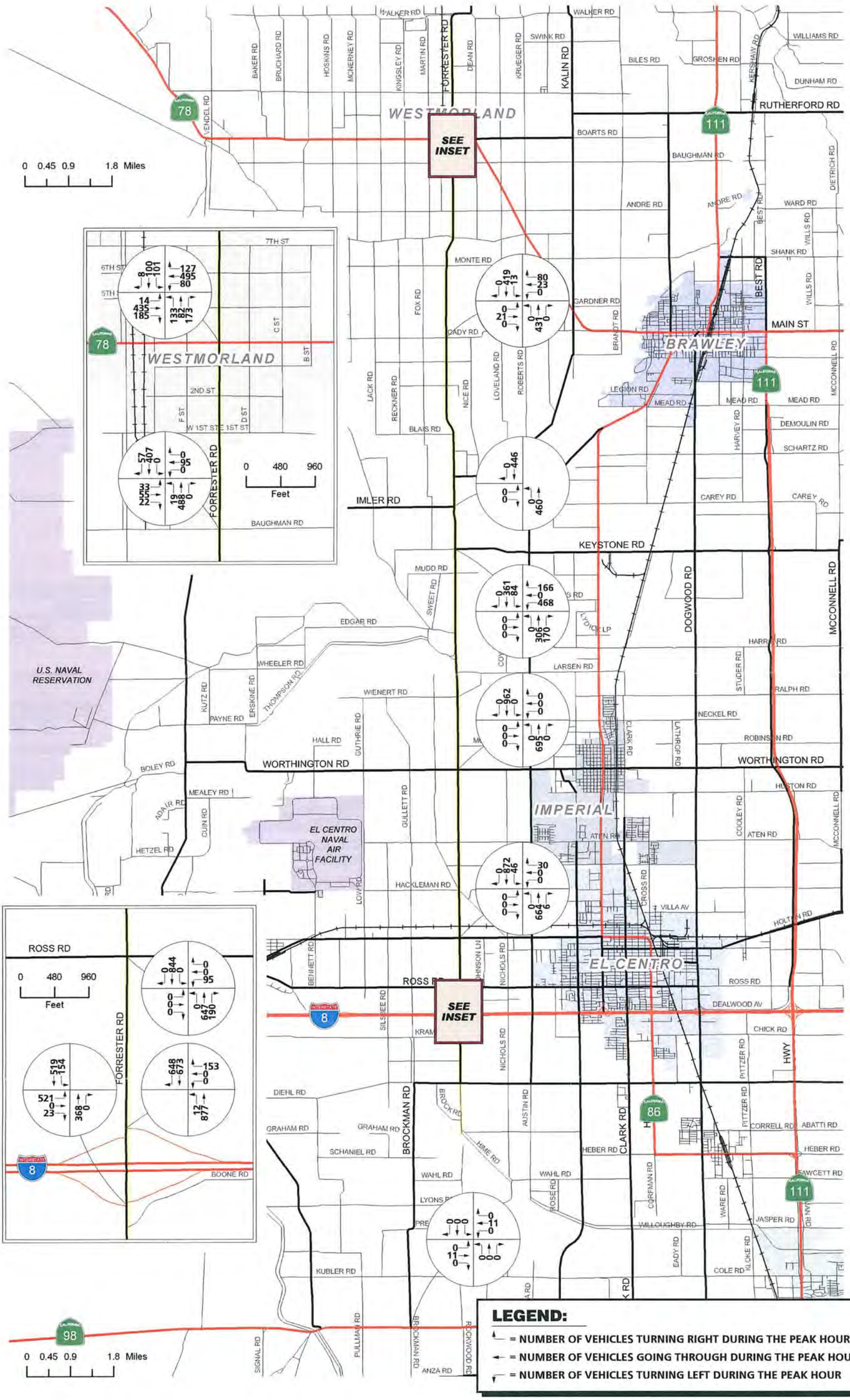


EXHIBIT 5-D

# CUMULATIVE DEVELOPMENT (2015) PM PEAK HOUR INTERSECTION VOLUMES

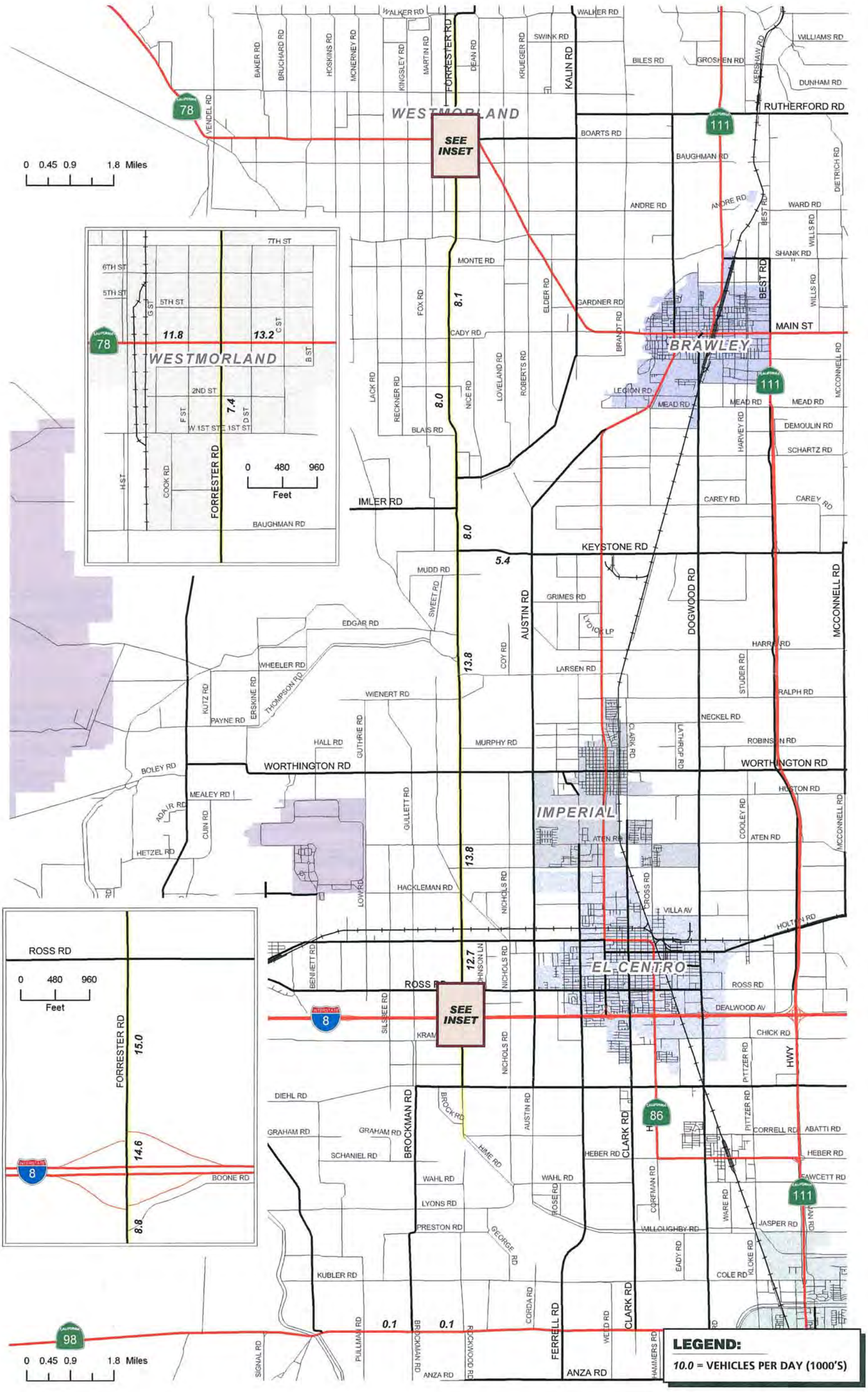



**LEGEND:**

- = NUMBER OF VEHICLES TURNING RIGHT DURING THE PEAK HOUR
- = NUMBER OF VEHICLES GOING THROUGH DURING THE PEAK HOUR
- = NUMBER OF VEHICLES TURNING LEFT DURING THE PEAK HOUR

EXHIBIT 5-E

# CUMULATIVE DEVELOPMENT (2015) AVERAGE DAILY TRAFFIC (ADT)



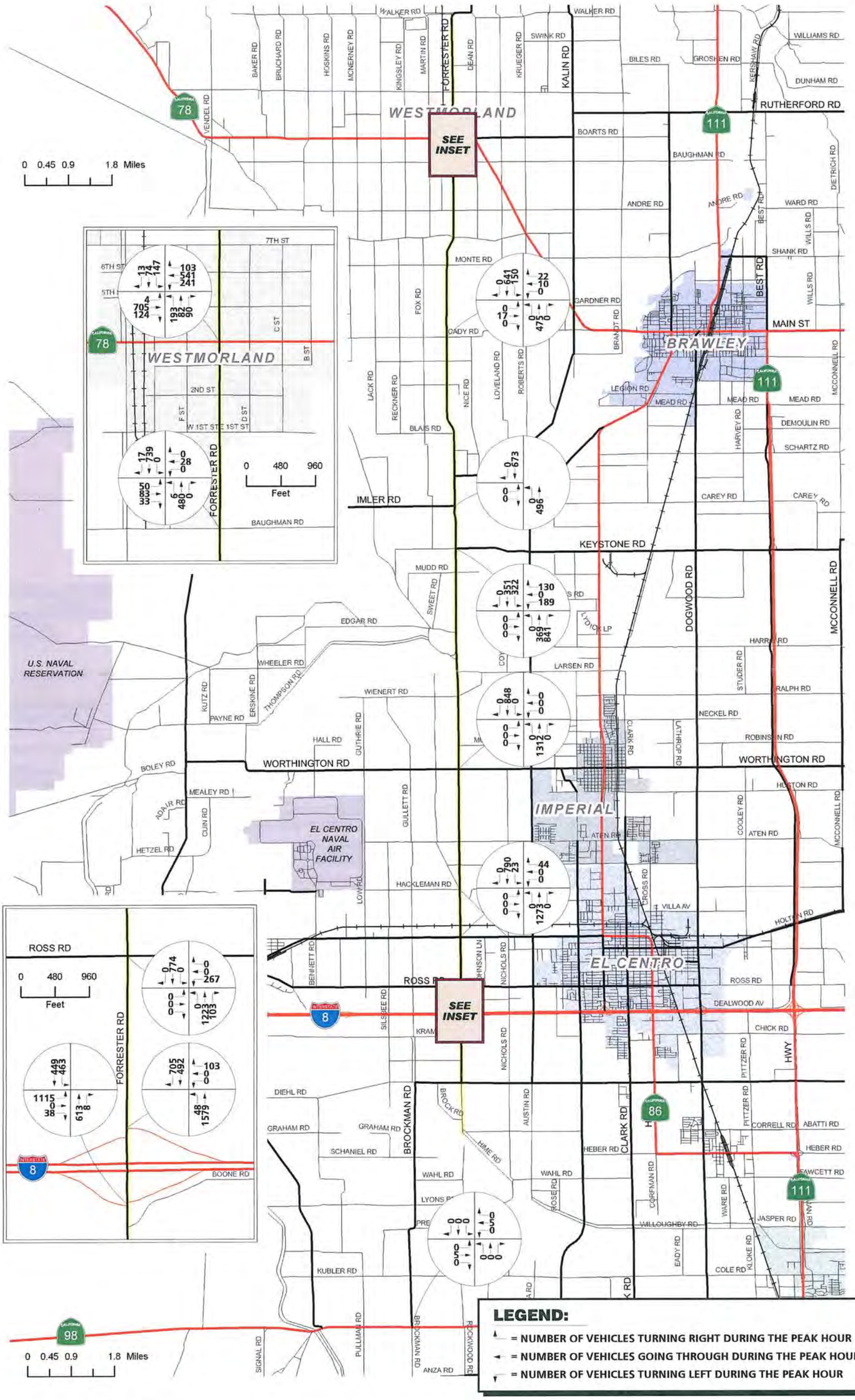





URBAN CROSSROADS

EXHIBIT 5-F

# CUMULATIVE DEVELOPMENT (2035) AM PEAK HOUR INTERSECTION VOLUMES



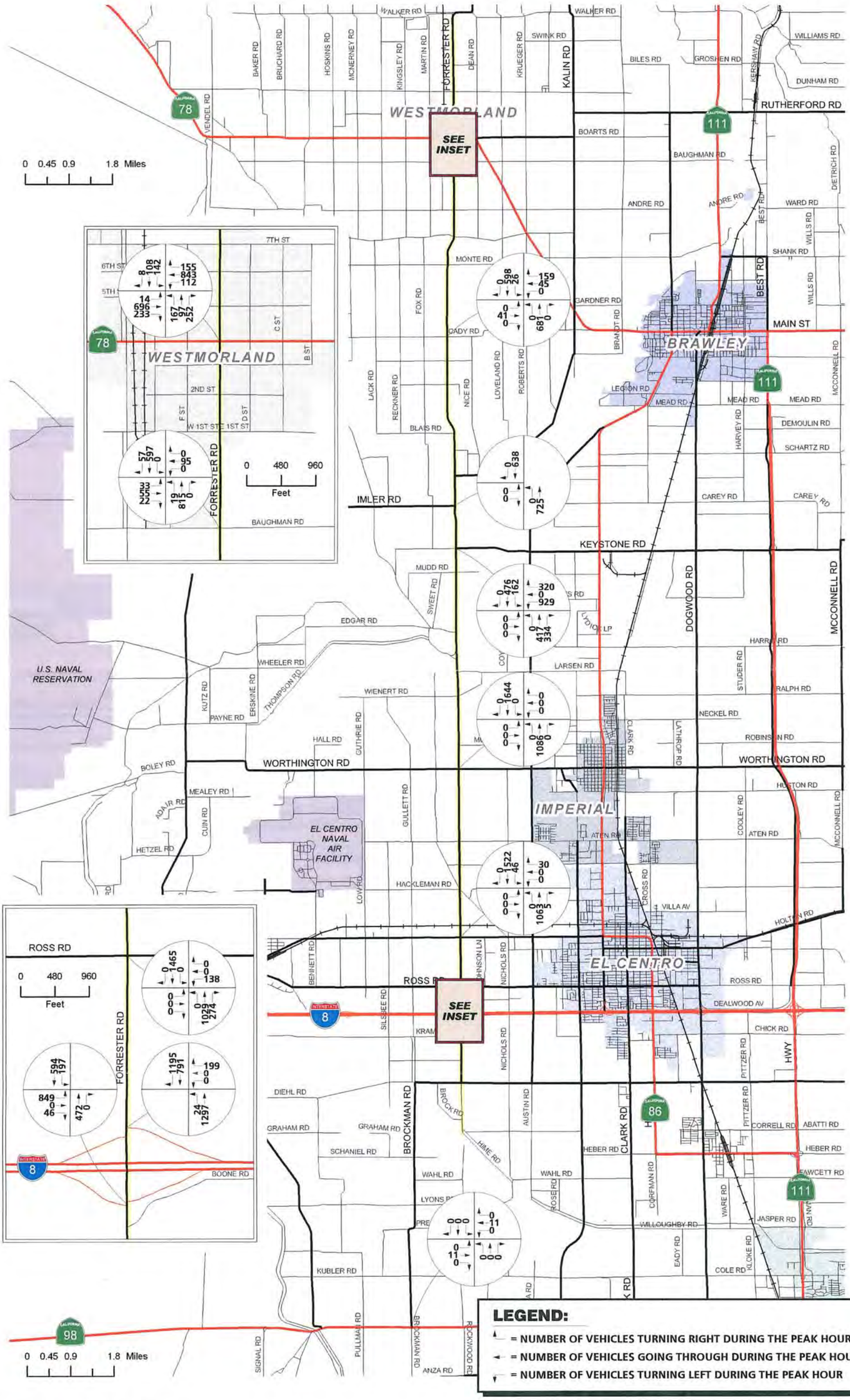





URBAN CROSSROADS

EXHIBIT 5-G

# CUMULATIVE DEVELOPMENT (2035) PM PEAK HOUR INTERSECTION VOLUMES




**LEGEND:**

- = NUMBER OF VEHICLES TURNING RIGHT DURING THE PEAK HOUR
- = NUMBER OF VEHICLES GOING THROUGH DURING THE PEAK HOUR
- = NUMBER OF VEHICLES TURNING LEFT DURING THE PEAK HOUR

EXHIBIT 5-H

# CUMULATIVE DEVELOPMENT (2035) AVERAGE DAILY TRAFFIC (ADT)

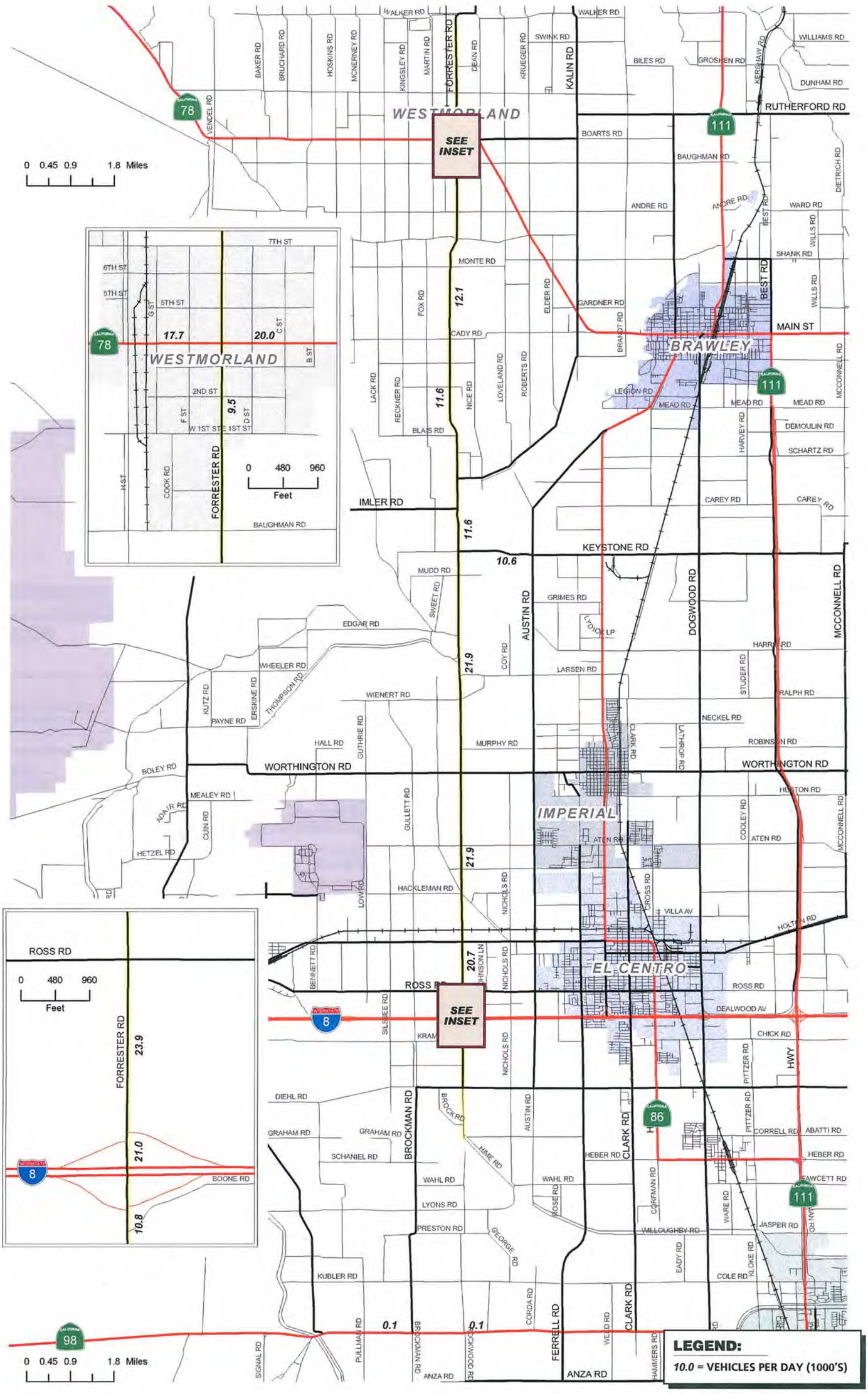
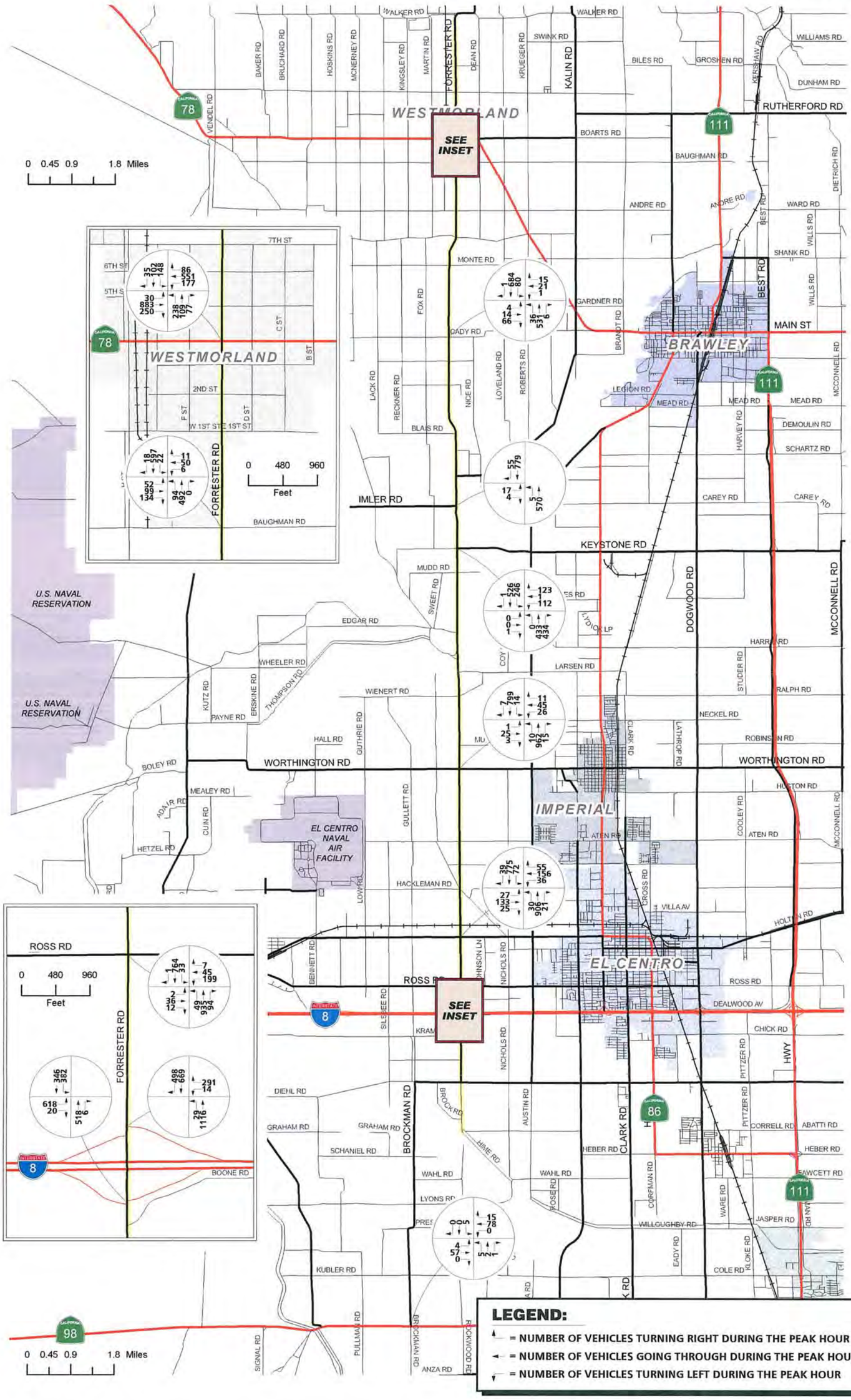


EXHIBIT 5-I

# SHORT TERM 2015
# AM PEAK HOUR INTERSECTION VOLUMES








URBAN CROSSROADS

EXHIBIT 5-J

# SHORT TERM 2015
# PM PEAK HOUR INTERSECTION VOLUMES

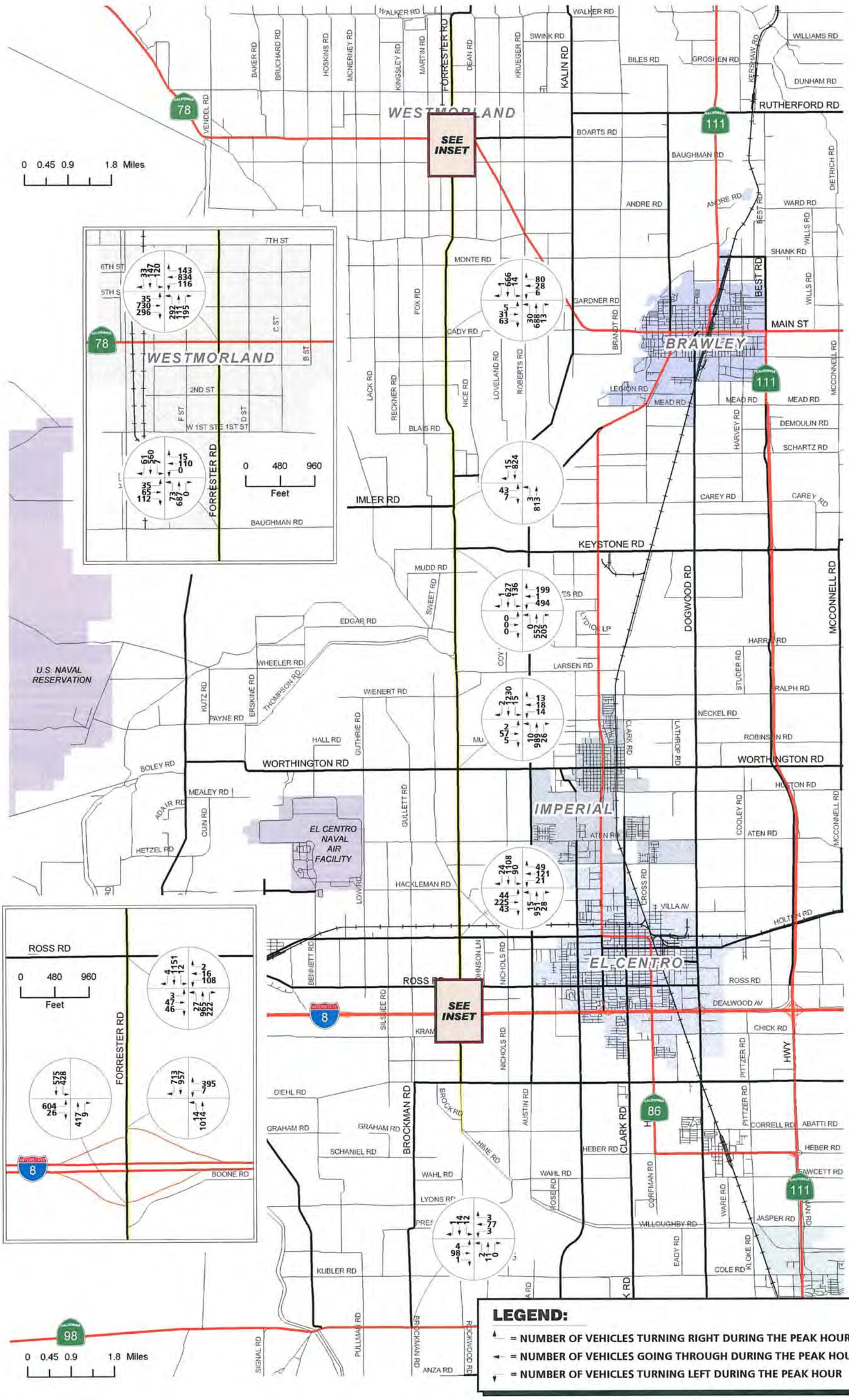
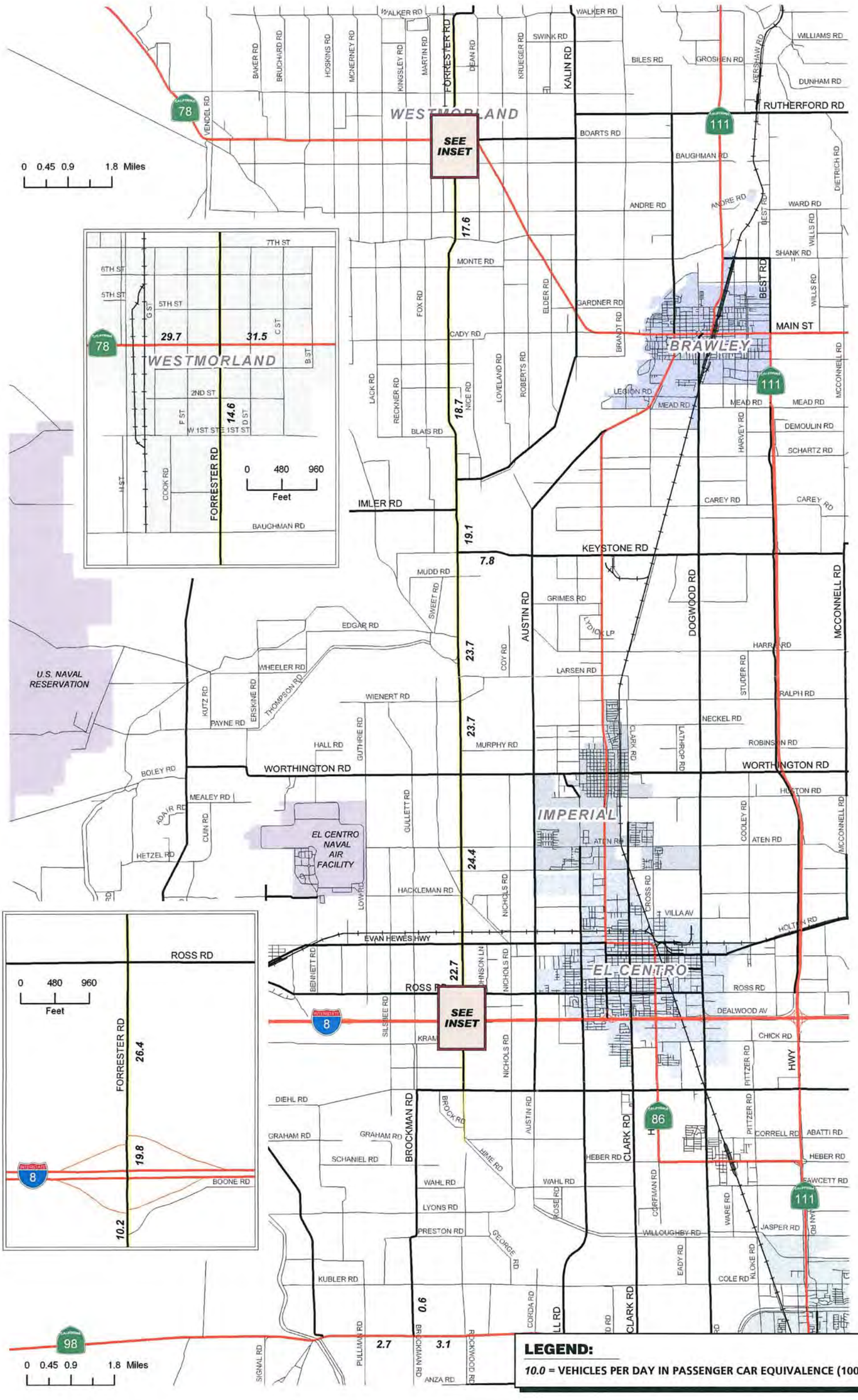


EXHIBIT 5-K

# SHORT TERM 2015 AVERAGE DAILY TRAFFIC (ADT) PCE








URBAN CROSSROADS

EXHIBIT 5-L

# LEVEL OF SERVICE SUMMARY FOR SHORT TERM (2015) CONDITIONS (WITHOUT IMPROVEMENTS)

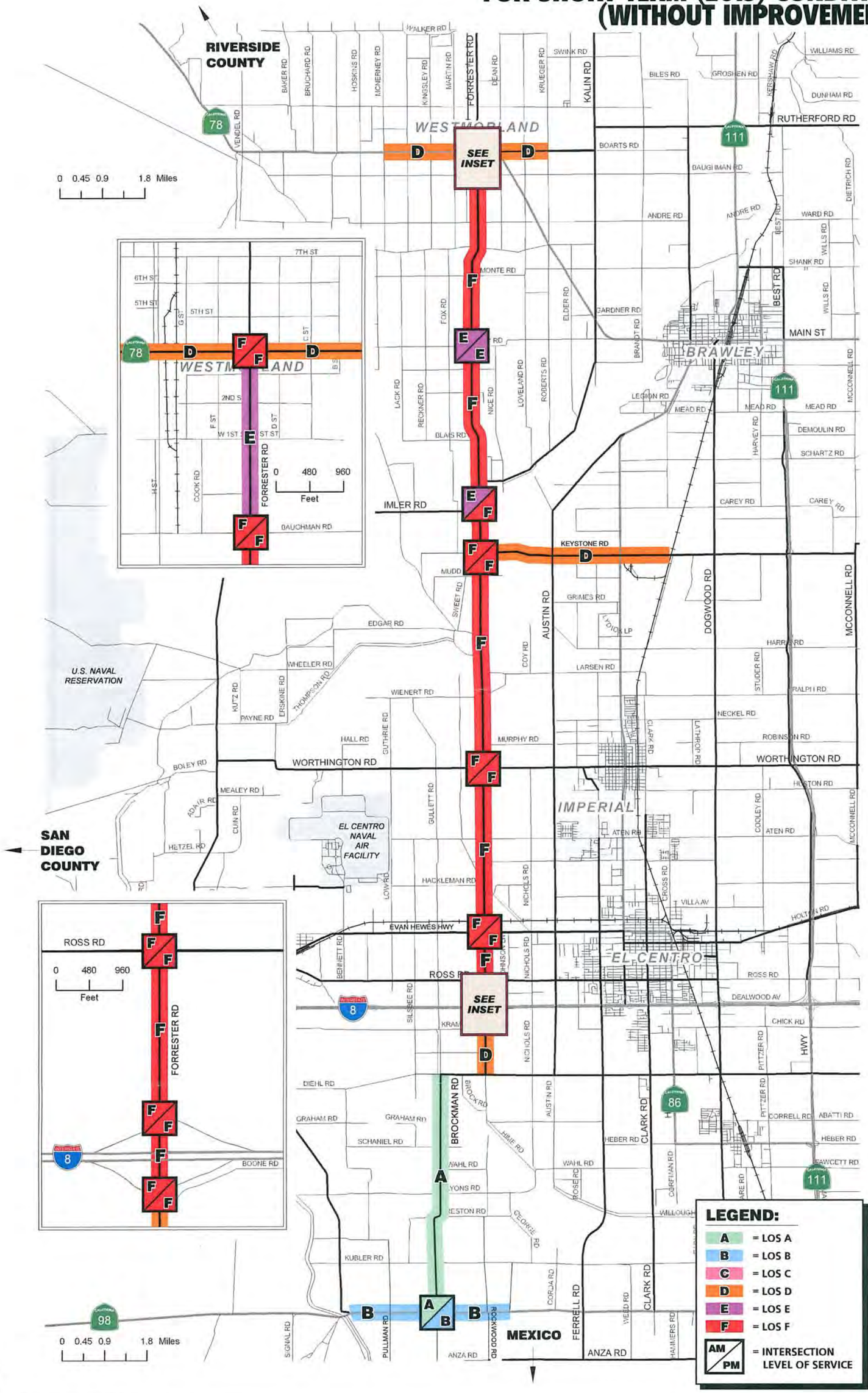


TABLE 5-6

INTERSECTION ANALYSIS FOR SHORT TERM 2015 CONDITIONS

| INTERSECTION | TRAFFIC CONTROL[3] | INTERSECTION APPROACH LANES[1] | | | | | | | | | | | | DELAY[2] (SECS.) | | LEVEL OF SERVICE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NORTH-BOUND | | | SOUTH-BOUND | | | EAST-BOUND | | | WEST-BOUND | | | | | | |
| | | L | T | R | L | T | R | L | T | R | L | T | R | AM | PM | AM | PM |
| Forrester Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-78/ SR-86 (EW) | AWS | 0.5 | 0.5 | 1 | 0.5 | 0.5 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | --[4] | --[4] | F | F |
| • Baughman Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| • Cady Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 48.4 | 41.5 | E | E |
| • Imler Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 0 | 0 | 39.3 | 84.1 | E | F |
| • Keystone Road (EW) | CSS | 0.5 | 0.5 | 1 | 1 | 1 | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| • Worthington Road (EW) | CSS | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| • Evan Hewes Highway (EW) | AWS | 0 | 1! | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | --[4] | --[4] | F | F |
| • Ross Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| • Interstate 8 WB Ramp (EW) | CSS | 0.5 | 0.5 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.5 | 0.5 | 1 | --[4] | --[4] | F | F |
| • Interstate 8 EB Ramp (EW) | CSS | 0 | 1 | 0 | 0.5 | 0.5 | 0 | 0.5 | 0.5 | 1 | 0 | 0 | 0 | --[4] | --[4] | F | F |
| Brockman Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-98 (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 9.6 | 10.4 | A | B |

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1! = Shared left, thru and right lane

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9 R3 (2007) and SYNCHRO, Version 7 (2007). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] CSS = Cross Street Stop
AWS = All Way Stop

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

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TABLE 5-7

ROADWAY SEGMENT ANALYSIS FOR SHORT TERM 2015 CONDITIONS

| ROADWAY SEGMENT | WITHOUT IMPROVEMENTS | | | | | |
|---|---|---|---|---|---|---|
| | EXISTING FUNCTIONAL ROAD CLASSIFICATION [2] | LOS "E" CAPACITY | EXISTING NUMBER OF LANES | NEAR TERM 2015 ADT[1](PCE) | NEAR TERM VOLUME / CAPACITY | LEVEL OF SERVICE |
| Forrester Road (NS) at: | | | | | | |
| • Between SR-78/ SR-86 and Baughman Rd | Local Collector | 16,200 [3] | 2 | 14,600 [6] | 0.90 | E |
| • Between Baughman Road and Cady Road | Local Collector | 16,200 [3] | 2 | 17,600 [6] | ***1.09*** | F |
| • Between Cady Road and Carter Road | Local Collector | 16,200 [3] | 2 | 18,700 [6] | ***1.15*** | F |
| • Between Imler Road and Keystone Road | Local Collector | 16,200 [3] | 2 | 19,100 [6] | ***1.18*** | F |
| • Between Keystone Road and Worthington Road | Local Collector | 16,200 [3] | 2 | 23,700 [6] | ***1.46*** | F |
| • Between Worthington Road and Even Hewes Hwy. | Local Collector | 16,200 [3] | 2 | 24,400 [6] | ***1.51*** | F |
| • Between Evan Hewes Hwy. and Ross Road | Local Collector | 16,200 [3] | 2 | 22,700 [6] | ***1.40*** | F |
| • Between Ross Road and Interstate 8 WB Ramps | Local Collector | 16,200 [3] | 2 | 31,300 [6] | ***1.93*** | F |
| • Between Interstate 8 WB Ramps and Interstae 8 EB Ramps | Local Collector | 16,200 [3] | 2 | 19,800 [6] | ***1.22*** | F |
| • South of Interstate 8 EB Ramps | Local Collector | 16,200 [3] | 2 | 10,200 [6] | 0.63 | D |
| Brockman Road (NS) at: | | | | | | |
| • North of SR-98 | Local Collector | 16,200 [3] | 2 | 600 [6] | 0.04 | A |
| Keystone Road (EW) at: | | | | | | |
| • Between Forrester Road and Austin Road | Local Collector | 16,200 [3] | 2 | 7,800 [6] | 0.48 | D |
| SR-86/SR-78 (EW) at: | | | | | | |
| • West of Forrester Road | Minor Arterial | 37,000 [3] | 4 | 29,700 [6] | 0.80 | D |
| • East of Forrester Road | Minor Arterial | 37,000 [3] | 4 | 31,500 [6] | 0.85 | D |
| SR-98 (EW) at: | | | | | | |
| • West of Brockman Road | Local Collector | 16,200 [3] | 2 | 2,700 [6] | 0.17 | B |
| • East of Brockman Road | Local Collector | 16,200 [3] | 2 | 3,100 [6] | 0.19 | B |

[1] Average Daily Traffic (ADT) expressed in vehicles per day.

[2] Road Classification based on the *Circulation and Scenic Highways Element*.
Prepared by Imperial County Pubilc Works Department ( Revised August 2006)

[3] Although Level of Service (LOS) "C" capacity is the current target LOS indicated in the *Circulation and Scenic Highways Element* (REVISED August 2006), County of Imperial and CALTRANS staff have indicated LOS "E" as the standard acceptable capacity.

[4] Minimum required roadway classification needed to satisfy County of Imperial Volume to Capacity Standards.

[5] The requried number of lanes corresponding with the County of Imperial road classification

[6] Average Daily Traffic reflects passenger car equivalence (P.C.E) adjustments. Passenger Car Equivalence denotes the number of typical passenger cars to equal the length of an oversized vehicle. For medium sized trucks, 75% of the total number of trucks are assigned a P.C.E. factor of 2. The remaining 25% of trucks are assumed to be slow moving farming related trucks and were given a P.C.E factor of 6.0. Heavy trucks were assigned a P.C.E factor of 3.0.

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## 5.13 Long Range (2035) Intersection Delay Analysis

An analysis of the study area intersections has been conducted for long range conditions. This analysis evaluates the operations of the intersections based on current lane configurations. Depending on how well the intersections are anticipated to operate, a determination can be made on whether improvements are required. Any location operating at worse than LOS "C" will require improvements.

The intersection delay analysis results are summarized on Table 5-8 for long range (2035) traffic conditions based on the HCM methodology. For long range (2035) traffic conditions, the following study area intersections are anticipated to operate at an unacceptable level of service during the peak hours with existing lane geometry:

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)
- Cady Road (EW)
- Imler Road (EW)
- Keystone Road (EW)
- Worthington Road (EW)
- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

Intersection delay analysis calculation worksheets for long range (2035) traffic conditions are included in Appendix "M".

## 5.14 Long Range (2035) Roadway Segment Analysis

A long range analysis has been conducted for the road segments between the study area intersections. This evaluation is intended to identify locations where the future traffic volumes will exceed the current capacities.

Long range (2035) average daily traffic (ADT) volume-to-capacity ratios are shown on Table 5-9. Table 5-9 indicates that the following roadway segments are anticipated to operate with unacceptable levels of service "D" or worse with the current number of lanes.

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road
- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8
- South of Interstate 8 EB Ramp

Keystone Road (EW) between:

- Forrester Road and Austin Road

SR-78/86 (EW):

- West of Forrester Road

Exhibit 5-P summarizes the intersection and road segment levels of service for Long Range (2035) Conditions.

## 5.15 Accident Analysis

Currently, traffic flows along Forrester Road are controlled by stop signs on the minor legs. These types of controls are generally adequate when the minor and major street volumes are relatively low. However, as traffic volumes increase, the potential for more severe types of accidents (such as broadsides) also increases. The situation is further amplified as the intersection becomes more congested since drivers will tend to accept a smaller gap in the opposing traffic in order to proceed. At the intersection of Ross Road/ Forrester Road, it is possible that broadside accidents occur with more frequency due to the absence of a traffic signal at the intersection. Although a traffic signal does not appear to currently be warranted at this location for existing conditions, traffic volumes at this location should be closely monitored.

EXHIBIT 5-M

# LONG RANGE 2035
# AM PEAK HOUR INTERSECTION VOLUMES

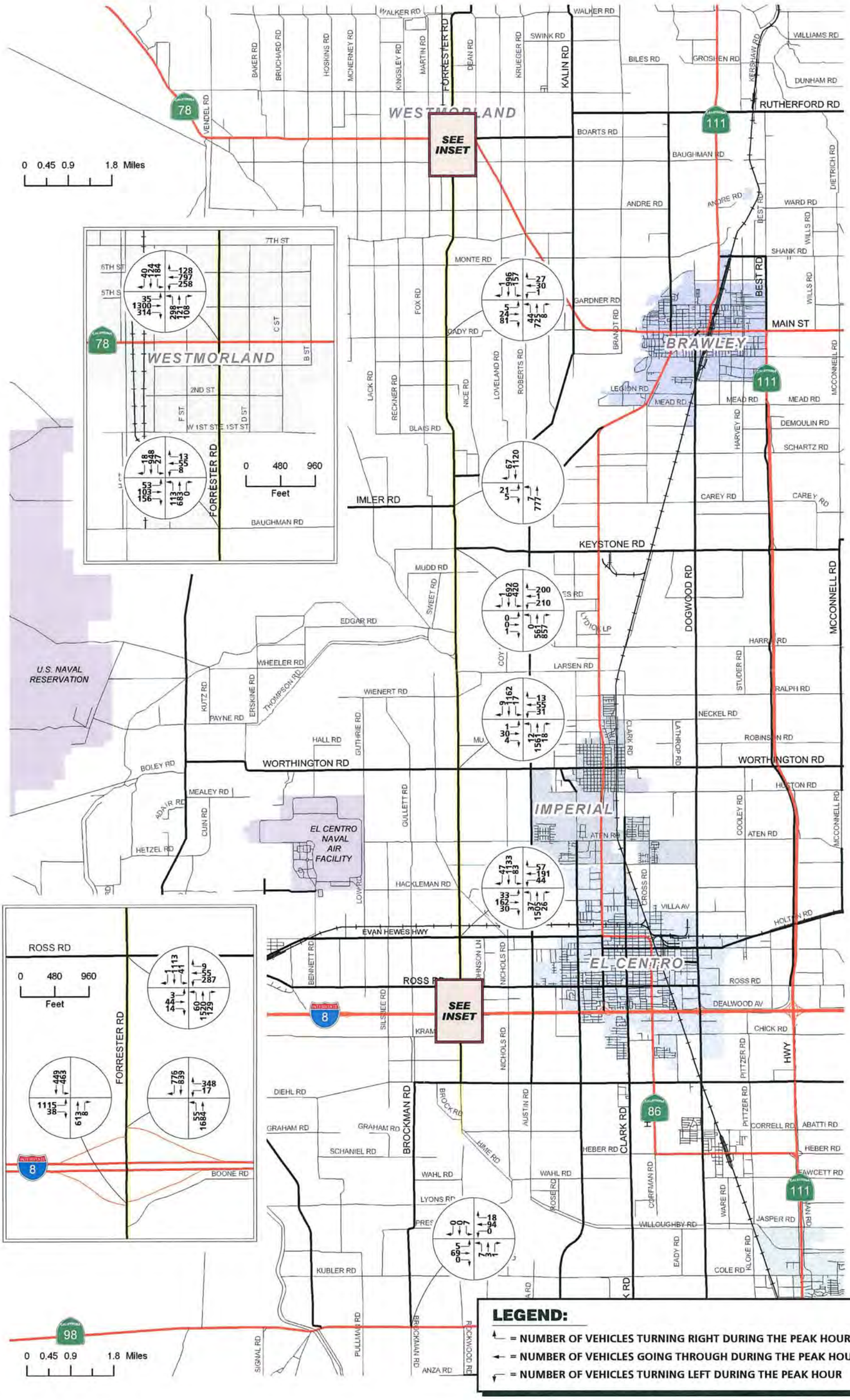
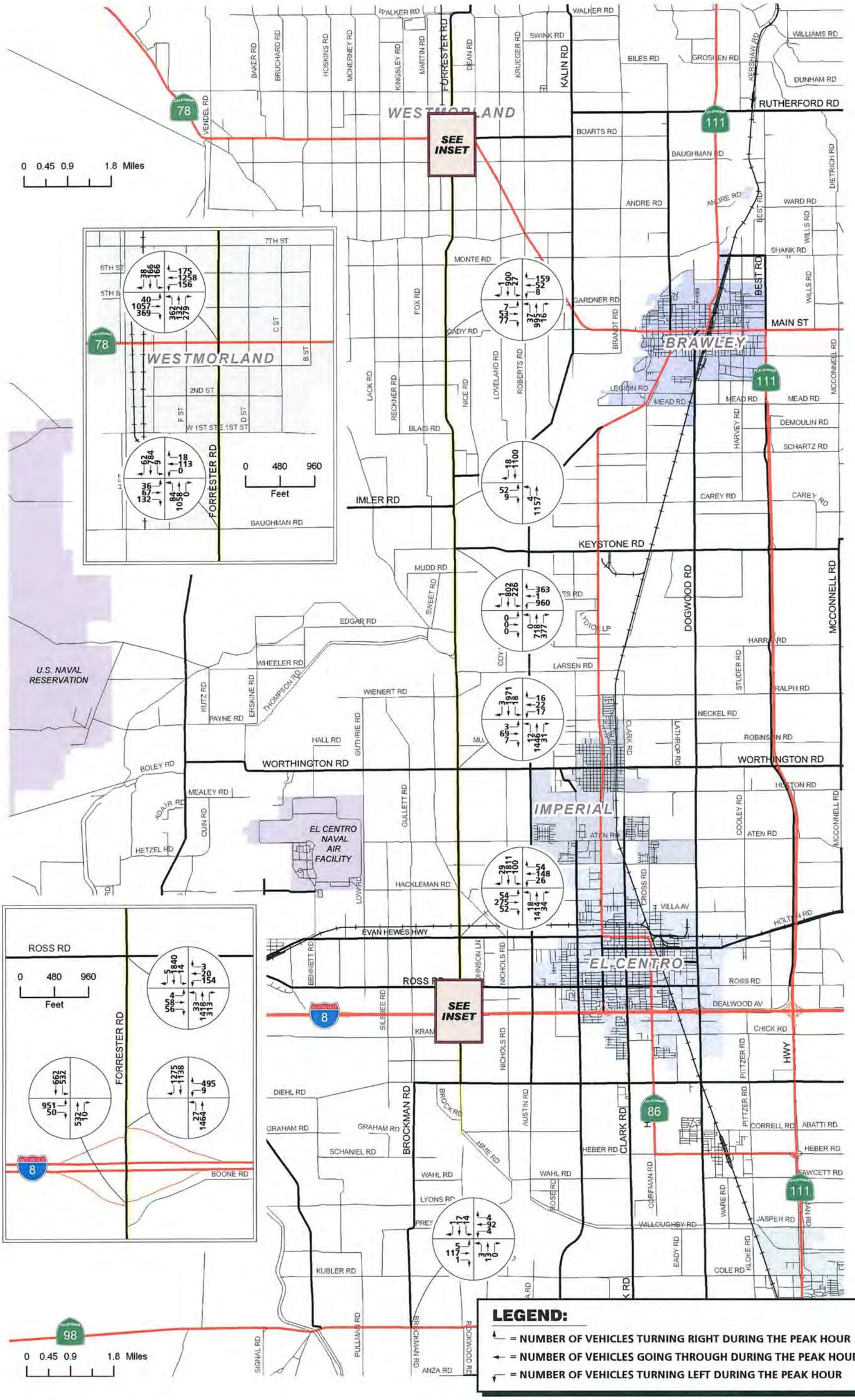


EXHIBIT 5-N

# LONG RANGE 2035
# PM PEAK HOUR INTERSECTION VOLUMES








URBAN CROSSROADS

EXHIBIT 5-O

# LONG RANGE 2035
# AVERAGE DAILY TRAFFIC (ADT) PCE

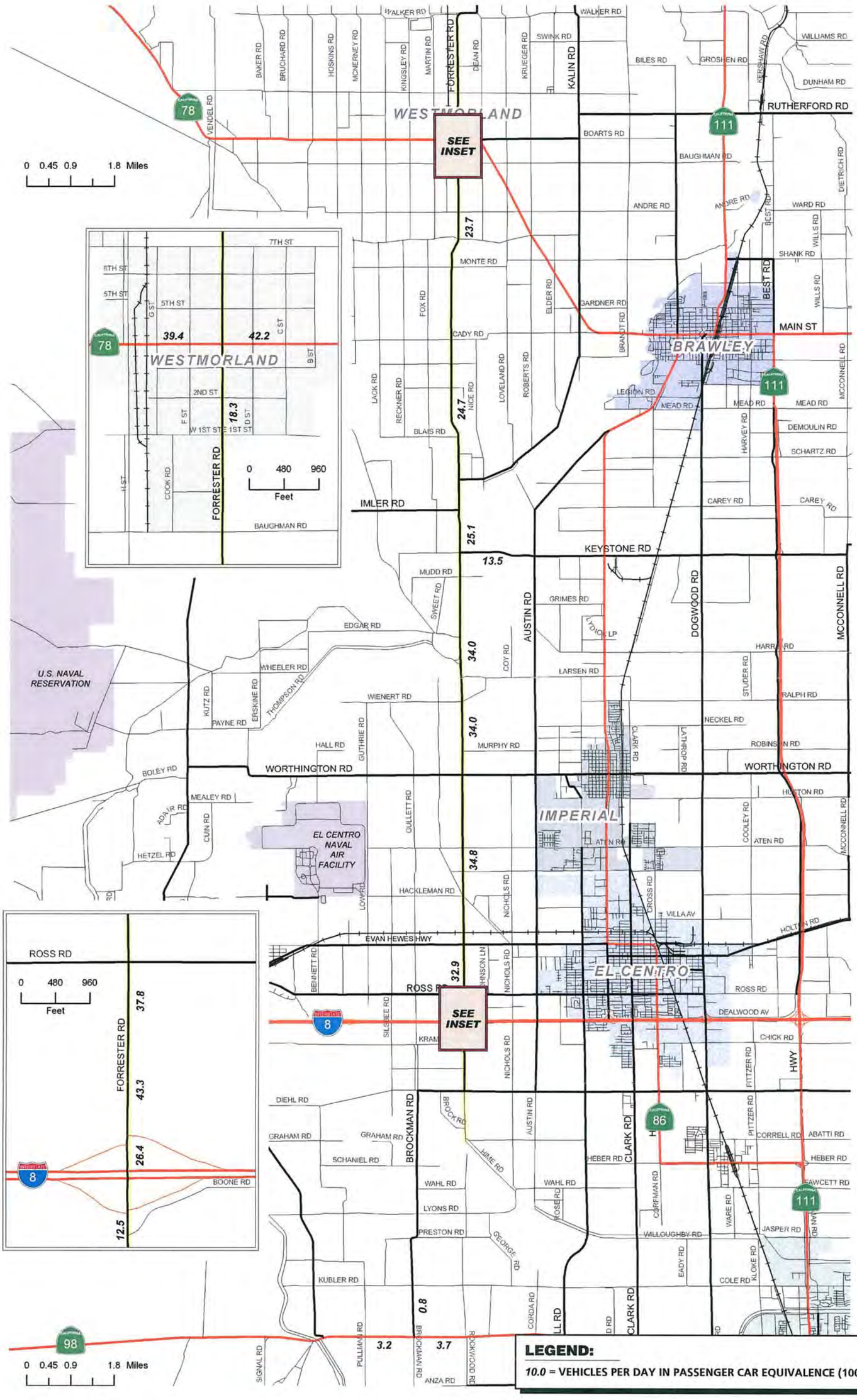


EXHIBIT 5-P

# LEVEL OF SERVICE SUMMARY FOR LONG RANGE (2035) CONDITIONS (WITHOUT IMPROVEMENTS)

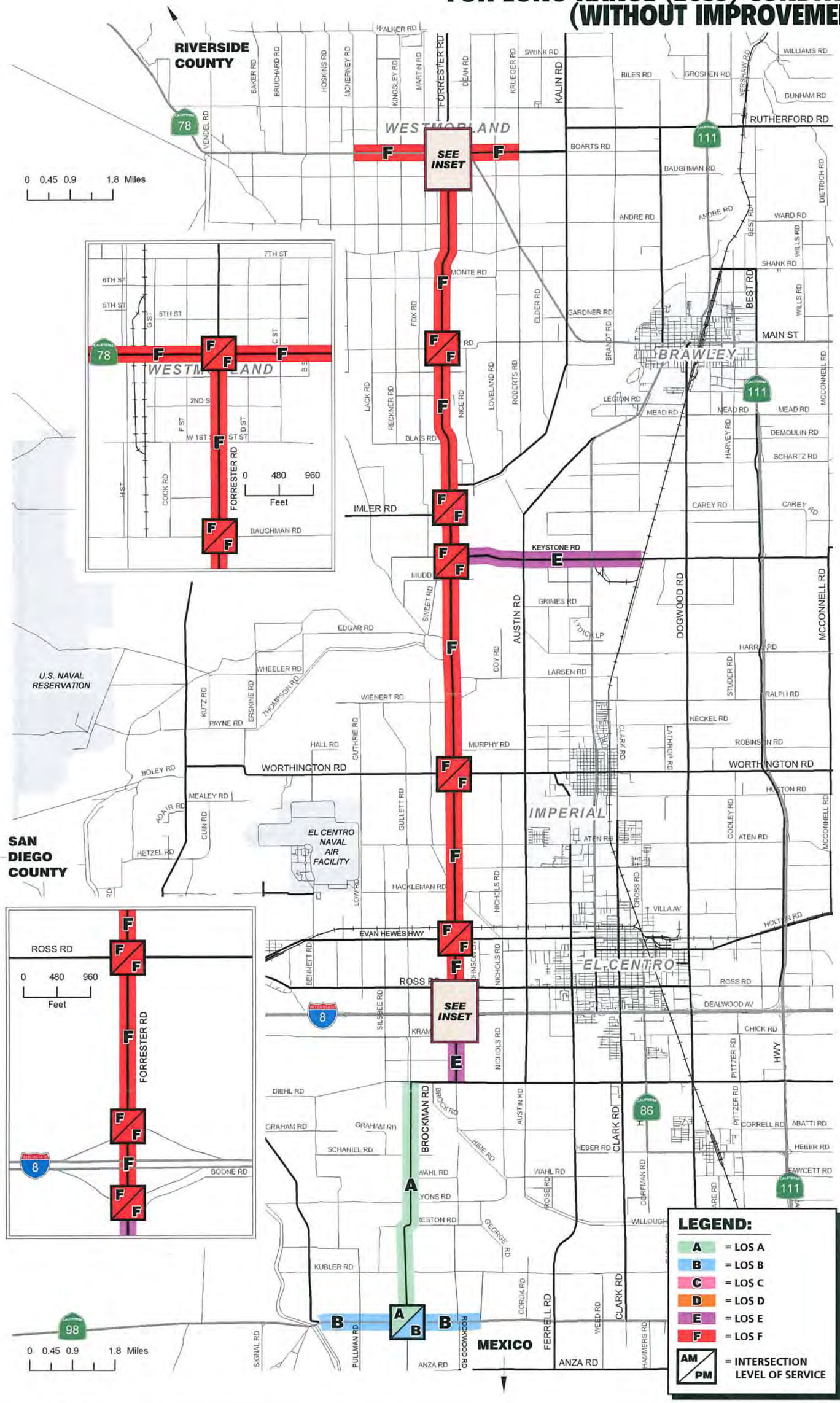


TABLE 5-8

INTERSECTION ANALYSIS FOR LONG RANGE 2035 CONDITIONS

| INTERSECTION | TRAFFIC CONTROL[3] | INTERSECTION APPROACH LANES[1] | | | | | | | | | | | | DELAY[2] (SECS.) | | LEVEL OF SERVICE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NORTH-BOUND | | | SOUTH-BOUND | | | EAST-BOUND | | | WEST-BOUND | | | | | | |
| | | L | T | R | L | T | R | L | T | R | L | T | R | AM | PM | AM | PM |
| Forrester Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-78/ SR-86 (EW) | AWS | 0.5 | 0.5 | 1 | 0.5 | 0.5 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | --[4] | --[4] | F | F |
| • Baughman Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| • Cady Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| • Imler Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 0 | 0 | 82.8 | --[4] | F | F |
| • Keystone Road (EW) | CSS | 0.5 | 0.5 | 1 | 1 | 1 | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| • Worthington Road (EW) | CSS | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| • Evan Hewes Highway (EW) | AWS | 0 | 1! | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | --[4] | --[4] | F | F |
| • Ross Road (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| • Interstate 8 WB Ramp (EW) | CSS | 0.5 | 0.5 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.5 | 0.5 | 1 | --[4] | --[4] | F | F |
| • Interstate 8 EB Ramp (EW) | CSS | 0 | 1 | 0 | 0.5 | 0.5 | 0 | 0.5 | 0.5 | 1 | 0 | 0 | 0 | --[4] | --[4] | F | F |
| Brockman Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-98 (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 9.8 | 10.8 | A | B |

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1! = Shared left, thru and right lane

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9 R3 (2007) and SYNCHRO, Version 7 (2007). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] CSS = Cross Street Stop
AWS = All Way Stop

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

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TABLE 5-9

ROADWAY SEGMENT ANALYSIS FOR LONG RANGE 2035 CONDITIONS

| ROADWAY SEGMENT | WITHOUT IMPROVEMENTS | | | | | |
|---|---|---|---|---|---|---|
| | EXISTING FUNCTIONAL ROAD CLASSIFICATION [2] | LOS "E" CAPACITY | EXISTING NUMBER OF LANES | LONG RANGE 2035 ADT[1] (PCE) | LONG RANGE VOLUME / CAPACITY | LONG RANGE LEVEL OF SERVICE |
| Forrester Road (NS) at: | | | | | | |
| • Between SR-78/ SR-86 and Baughman Rd | Local Collector | 16,200 [3] | 2 | 18,300 [6] | ***1.13*** | F |
| • Between Baughman Road and Cady Road | Local Collector | 16,200 [3] | 2 | 23,700 [6] | ***1.46*** | F |
| • Between Cady Road and Carter Road | Local Collector | 16,200 [3] | 2 | 24,700 [6] | ***1.52*** | F |
| • Between Imler Road and Keystone Road | Local Collector | 16,200 [3] | 2 | 25,100 [6] | ***1.55*** | F |
| • Between Keystone Road and Worthington Road | Local Collector | 16,200 [3] | 2 | 34,000 [6] | ***2.10*** | F |
| • Between Worthington Road and Even Hewes Hwy. | Local Collector | 16,200 [3] | 2 | 34,800 [6] | ***2.15*** | F |
| • Between Evan Hewes Hwy. and Ross Road | Local Collector | 16,200 [3] | 2 | 32,900 [6] | ***2.03*** | F |
| • Between Ross Road and Interstate 8 WB Ramps | Local Collector | 16,200 [3] | 2 | 43,300 [6] | ***2.67*** | F |
| • Between Interstate 8 WB Ramps and Interstae 8 EB Ramps | Local Collector | 16,200 [3] | 2 | 26,400 [6] | ***1.63*** | F |
| • South of Interstate 8 EB Ramps | Local Collector | 16,200 [3] | 2 | 12,500 [6] | 0.77 | E |
| Brockman Road (NS) at: | | | | | | |
| • North of SR-98 | Local Collector | 16,200 [3] | 2 | 800 [6] | 0.05 | A |
| Keystone Road (EW) at: | | | | | | |
| • Between Forrester Road and Austin Road | Local Collector | 16,200 [3] | 2 | 13,500 [6] | 0.83 | E |
| SR-86/SR-78 (EW) at: | | | | | | |
| • West of Forrester Road | Minor Arterial | 37,000 [3] | 4 | 39,400 [6] | ***1.06*** | F |
| • East of Forrester Road | Minor Arterial | 37,000 [3] | 4 | 42,200 [6] | ***1.14*** | F |
| SR-98 (EW) at: | | | | | | |
| • West of Brockman Road | Local Collector | 16,200 [3] | 2 | 3,200 [6] | 0.20 | B |
| • East of Brockman Road | Local Collector | 16,200 [3] | 2 | 3,700 [6] | 0.23 | B |

[1] Average Daily Traffic (ADT) expressed in vehicles per day.

[2] Road Classification based on the *Circulation and Scenic Highways Element*.
Prepared by Imperial County Pubilc Works Department ( Revised August 2006)

[3] Although Level of Service (LOS) "C" capacity is the current target LOS indicated in the *Circulation and Scenic Highways Element* (REVISED August 2006), County of Imperial and CALTRANS staff have indicated LOS "E" as the standard acceptable capacity.

[4] Minimum required roadway classification needed to satisfy County of Imperial Volume to Capacity Standards.

[5] The requried number of lanes corresponding with the County of Imperial road classification

[6] Average Daily Traffic reflects passenger car equivalence (P.C.E) adjustments. Passenger Car Equivalence denotes the number of typical passenger cars to equal the length of an oversized vehicle. For medium sized trucks, 75% of the total number of trucks are assigned a P.C.E. factor of 2. The remaining 25% of trucks are assumed to be slow moving farming related trucks and were given a P.C.E factor of 6.0. Heavy trucks were assigned a P.C.E factor of 3.0.

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As previously depicted in Exhibit 4-J, vehicular accidents are shown along Forrester Road. The contributing factors may be due to its current two lane undivided configuration, unsignalized cross streets, and poor lighting conditions. Accidents along Forrester Road appear to be concentrated at the segment south of Baughman Road to Imler Road and south of Worthington Road to the Interstate 8 Freeway Ramps.

The prevalence of head-on collisions along Forrester Road can be attributed to the current two lane undivided configuration and the type of vehicles travelling on the roadways. Heavy truck traffic and slow moving farm equipment frequently travel on Forrester Road. Some motorists tend to pass slow moving vehicles by switching to the on-coming travel lane to pass the slow moving vehicle, which is currently allowed along certain stretches on Forrester Road. There are several factors to consider in determining the cause of head on collisions: driver error, sight distance issues, lane configuration, speed limit and etc. From January 2005 to October 2007, four head-on collision accidents have occurred on Forrester Road which resulted in one fatality.

The picture above illustrates a slow moving farm vehicle travelling on Forrester Road

The accident data indicates that three fatalities have occured along Forrester Road from January 2005 to October 2007 as a result of a motor vehicle accident. Two of the fatalities occurred in 2007. To determine whether these fatal motor accidents are indicative of the average rate of a particular type of roadway, the Bureau of Transportation Statistics has determined that the national fatality rate for a collector

roadway is 0.80 per 100 million vehicle miles in 2002. Based on the 2007 accident data, a fatality rate is derived using the following formula:

$$\frac{\text{Number of fatalities X 32877*}}{\text{ADT X Number of Months X Segment Length}}$$

**The value of 32877 represents a conversion factor (1,000,000/ 365 x 12)*

Compared to the National average fatality rate of 0.80 per million vehicle miles for a collector road, the 2007 data suggests that the fatality rate for Forrester Road is 0.37, which is below the latest 2002 national average.

The table below compares the Forrester Road fatality rate with the National Average.

**TABLE 5-10**

| Fatal Accident Rates on Forrester Road VS. National Average | | | | |
|---|---|---|---|---|
| **Location** | **Length (Miles)** | **Number of Fatalities** | **Rates (per MVM) [1]** | **Similar Facilities (per MVM) [1]** |
| **Forrester Road from SR-78/86 to Interstate 8** | 18.1 | 2 | 0.37 | 0.8 |

*Source: Bureau of Transportation Statistics, 2003*

[1] MVM = Million Vehicle Miles

Accident Rates Compared to SR-115

The California Highway Patrol reported 102 accidents along Forrester Road between 2005 and 2007. However, the number of accidents reported along this corridor does not indicate whether driving conditions along Forrester Road are more of less prone to accidents in comparison to other roadways. SR-115 is used in the study as the comparative facility due to the similarity of its roadway characteristics with Forrester Road. Currently built as a two lane undivided roadway, SR-115 is a roadway exhibiting similar surrounding agricultural land uses as Forrester Road. This facility also connects to major roadways such as Interstate 8 to the south and SR-78 to the north. SR-115 also provides a convenient route for cross-border truck traffic due to its proximity to the Calexico East P.O.E. The absence of roadway lighting and minimal turn lanes to minor

streets are physical conditions that are shared by both SR-115 and Forrester Road. The physical similarities of the two roadways and the type of traffic are essential in an accurate comparison of the two roadways.

Caltrans provided the accident data along SR-115 for the time period between January 2005 and December 2007. The data below summarizes the results of the accident rate comparison between Forrester Road and SR-115.

**TABLE 5-11**

**Accident Rate Comparison Between Forrester Road and SR-115**

| Location | Accident Report Date | Number of Months | Length (Miles) | ADT | Number of Accidents | Accident Rate[1] |
|---|---|---|---|---|---|---|
| **Forrester Road from SR-78/86 to Interstate 8** | 2005-2007 | 35 | 18.1 | 5420 | 102 | 0.98 |
| **SR-115 from SR-78 to Interstate 8** | 2005-2007 | 36 | 19.8 | 2400 | 47 | 0.90 |

*Source: California Department of Transportation, 2009*

[1] Accident rate calculated by million vehicle miles. ADT volumes utilized in the accident rate calculation for Forrester Road consist of the average raw daily counts from SR-78/86 to Interstate 8

The comparative accident analysis between Forrester Road and SR-115 suggests that Forrester Road has a higher accident rate per million vehicle miles compared to the SR-115. Recommended improvements to improve safety and reduce accidents along Forrester Road are discussed in Section 6.0.

# 6.0 CREATE DEVELOPMENT ALTERNATIVES

This section of the report presents the measures to address motor vehicle accidents, required improvements to achieve satisfactory level of Service for short term (2015) and long range (2035) traffic conditions and long range (2035) alternatives for Forrester Road.

## 6.1 Accident Mitigation

In order to improve safety and reduce the number of accidents, the following strategies should be considered along Forrester Road:

- *Constructing a median and/or an additional lane:* Head-on collisions could be minimized by constructing a median to prevent vehicles from passing and/or providing an additional lane for vehicles to pass slow moving traffic.
- *Better illumination* along the Forrester Corridor could potentially aid in minimizing vehicles "hitting an object."
- *Separate Turning Lanes:* Left-turn and right-turn lanes remove vehicles waiting to turn left from the through-traffic stream, thus reducing the potential for rear-end collisions.
- *Installation of Traffic Signals:* Traffic signals, when warranted, can produce a more orderly movement of traffic, increased intersection capacity, a reduction in right-angle collisions and continuous movement along a route.
- *Provide Signing and Pavement Markings:* Providing lane assignment signs (or markings) to guide motorists through complex intersections can alleviate this confusion and lead to safer driving conditions. Pavement markings are often used to supplement lane assignment signs.

The proposed traffic signals, additional lanes, and enhanced capacities outlined in the short term (2015) and long range (2035) "with improvements" recommendations are intended to improve the issues described above and reduce the severity of the types of accidents by providing controls for all movements.

## 6.2 Short Term (2015) Intersection Delay Analysis

The intersection delay analysis results are summarized on Table 5-5 for short term (2015) traffic conditions. As mentioned in the previous section, the following study area intersections are anticipated to operate at an unacceptable level of service during short term (2015) peak hours with existing lane geometry:

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)
- Cady Road (EW)
- Imler Road (EW)
- Keystone Road (EW)
- Worthington Road (EW)
- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

For short term (2015) traffic conditions, the study area intersections are projected to operate at acceptable levels of service during the peak hours with the recommended improvements listed in Table 6-1 and illustrated in Exhibit 6-A.

The intersection of Imler Road and Forrester Road does not meet planning level warrants for short term (2015) conditions. Improvements to address the LOS deficiencies include the construction of a two way left turn lane. A striped median lane along Forrester Road in the vicinity of this location will provide a sanctuary and an acceleration lane for motorists turning to and from Forrester Road to Imler Road.

Intersection delay analysis calculation worksheets for short term (2015) "with improvements" traffic conditions are included in Appendix "N".

6.3 Traffic Signal Warrant Analysis for Short Term (2015) Conditions

For short term (2015) traffic conditions, traffic signals are anticipated to be warranted at the following study area intersections (see Appendix "C"):

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)
- Cady Road (EW)

- Worthington Road (EW)
- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

The location of these intersections are illustrated on Exhibit 6-A.

6.4 Short Term (2015) Roadway Segment Analysis

The study area roadways are analyzed with short term (2015) ADT volumes with existing lane configurations. The results of the analysis indicate that, the following roadway segments are anticipated to operate with volume-to-capacity ratios which exceed County thresholds:

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road
- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8

Keystone Road (EW) between:

- Forrester Road and Austin Road

Table 6-2 illustrates the recommended number of lanes to achieve an acceptable volume to capacity ratio. In summary, it is anticipated that four lanes (two lanes in each direction) is anticipated to accommodate short term (2015) traffic volumes along Forrester Road from SR-78/86 to south of the Interstate 8 eastbound ramps.

The road segment at Forrester Road between Ross Road and Interstate 8 is anticipated to exceed capacity with the recommended four lane improvement. If the adjacent intersections are improved to achieve an acceptable level of service, the improvement at this location are anticipated to allow the roadway segment to flow at acceptable conditions since the adjacent intersections reflect constriction points for the road segment. As previously discussed in the intersection analysis, the intersections of Forrester Road/ Ross Road and Forrester Road/

Interstate 8 westbound ramps are anticipated to operate at LOS "C" or better with the installation of the warranted traffic signals and geometric modifications.

Exhibit 6-B illustrates the level of service at the study area intersections and road segments with the implementation of the recommended improvements for Short Term (2015) conditions.

## 6.5 Long Range (2035) Forrester Road Configuration

For the long range (2035) scenarios, the current geometric configuration of Forrester Road is analyzed to determine the level of service along the corridor "without improvements." The improvements along Forrester Road under the "with improvements" scenario reflect the improvements proposed in the *Imperial County 2007 Transportation Plan Highway Element*, which assumes that Forrester road is proposed as a 6-lane prime arterial and as a 4 to 6 lane prime arterial as designated in the *Circulation and Scenic Highways Element*.

## 6.6 Long Range (2035) Intersection Delay Analysis

The following study area intersections are anticipated to operate at an unacceptable level of service during the peak hours for long range (2035) with existing lane geometry:

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)
- Cady Road (EW)
- Imler Road (EW)
- Keystone Road (EW)
- Worthington Road (EW)
- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

For long range (2035) traffic conditions, the study area intersections are projected to operate at acceptable levels of service during the peak hours with the recommended improvements listed in Table 6-3 and illustrated in Exhibit 6-C.

TABLE 6-1

INTERSECTION ANALYSIS FOR SHORT TERM 2015 CONDITIONS WITH IMPROVEMENTS

| INTERSECTION | TRAFFIC CONTROL[3] | INTERSECTION APPROACH LANES[1] | | | | | | | | | | | | DELAY[2] (SECS.) | | LEVEL OF SERVICE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NORTH-BOUND | | | SOUTH-BOUND | | | EAST-BOUND | | | WEST-BOUND | | | | | | |
| | | L | T | R | L | T | R | L | T | R | L | T | R | AM | PM | AM | PM |
| Forrester Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-78/ SR-86 (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | AWS | 0.5 | 0.5 | 1 | 0.5 | 0.5 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | --[4] | --[4] | F | F |
| - with improvements | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 33.4 | 29.3 | C | C |
| • Baughman Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| - with improvements | TS | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 11.2 | 9.6 | B | A |
| • Cady Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 41.4 | 25.1 | E | D |
| - with improvements | TS | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 7.3 | 9.7 | A | A |
| • Imler Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 0 | 0 | 39.3 | 84.1 | E | F |
| - with improvements[5] | CSS | 1 | 2 | 0 | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 16.8 | 18.2 | C | C |
| • Keystone Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0.5 | 0.5 | 1 | 1 | 1 | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| - with improvements | TS | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 22.4 | 22.8 | C | C |
| • Worthington Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| - with improvements | TS | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 7.2 | 6.9 | A | A |
| • Evan Hewes Highway (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | AWS | 0 | 1! | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | --[4] | --[4] | F | F |
| - with improvements | TS | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 19.9 | 21.4 | B | C |
| • Ross Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| - with improvements | TS | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 13.5 | 9.1 | B | A |
| • Interstate 8 WB Ramp (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0.5 | 0.5 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.5 | 0.5 | 1 | --[4] | --[4] | F | F |
| - with improvements | TS | 1 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0.5 | 0.5 | 1 | 13.6 | 17.9 | B | B |
| • Interstate 8 EB Ramp (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1 | 0 | 0.5 | 0.5 | 0 | 0.5 | 0.5 | 1 | 0 | 0 | 0 | --[4] | --[4] | F | F |
| - with improvements | TS | 0 | 2 | 1 | 1 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 24.8 | 20.7 | C | C |
| Brockman Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-98 (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 9.6 | 10.4 | A | B |

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1! = Shared left, thru and right lane; 1 = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9 R3 (2007) and SYNCHRO, Version 7 (2007). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] CSS = Cross Street Stop
AWS = All Way Stop
TS = Traffic Signal

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

[5] Improvement at this intersection includes the construction of an acceleration lane for left turns into Forrester Road from the minor street.

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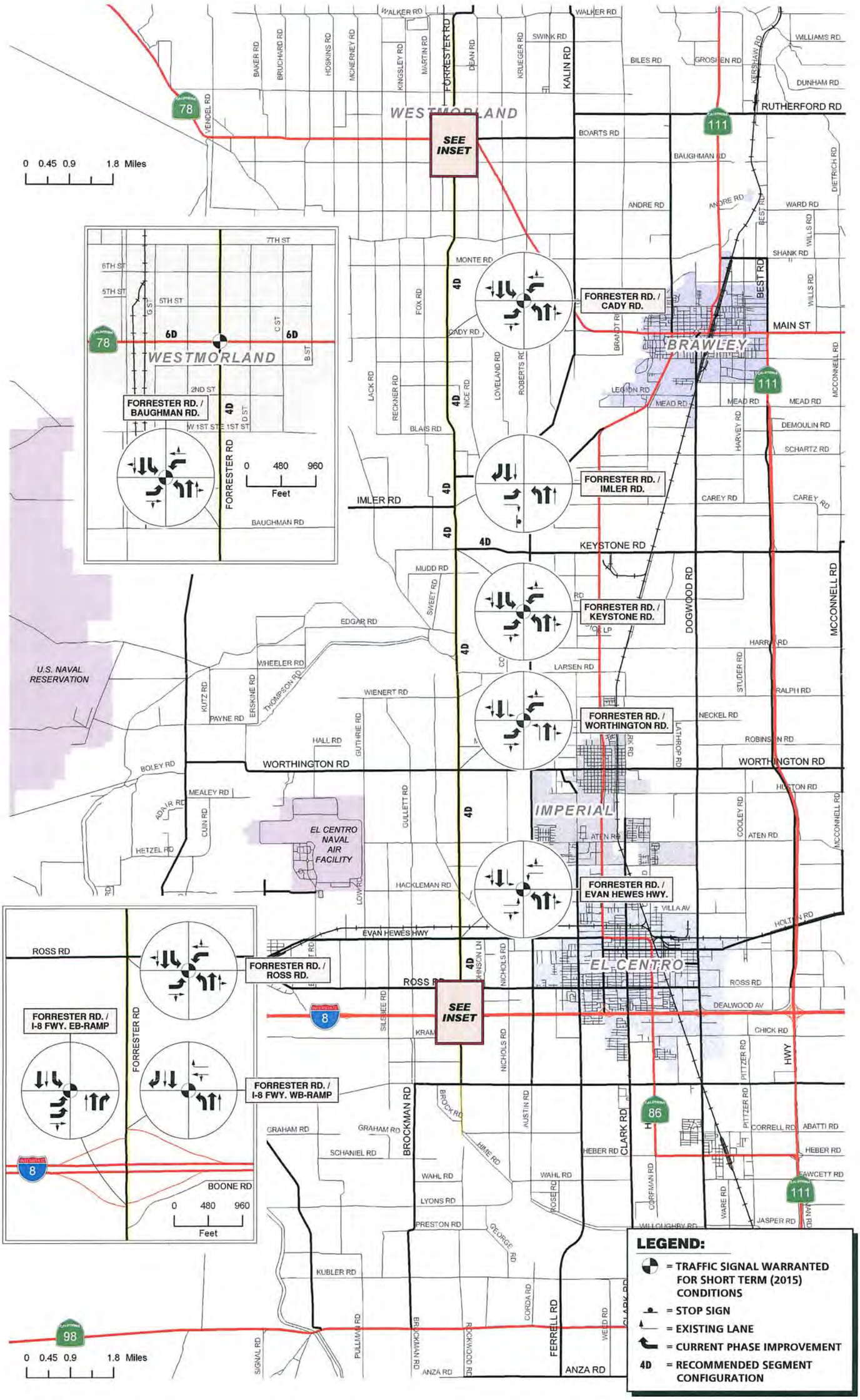
EXHIBIT 6-A

# SHORT TERM (2015) RECOMMENDED IMPROVEMENTS



## TABLE 6-2

## ROADWAY SEGMENT ANALYSIS FOR SHORT TERM 2015 CONDITIONS WITH IMPROVEMENTS

| | WITHOUT IMPROVEMENTS | | | | | | WITH IMPROVEMENTS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | NEAR TERM | | | | | | NEAR TERM | | |
| ROADWAY SEGMENT | EXISTING FUNCTIONAL ROAD CLASSIFICATION [2] | LOS "E" CAPACITY | EXISTING NUMBER OF LANES | 2015 ADT[1](PCE) | VOLUME / CAPACITY | LEVEL OF SERVICE | FUNCTIONAL ROAD CLASSIFICATION [4] | LOS "E" CAPACITY | REQUIRED NUMBER OF LANES [5] | 2015 ADT[1](PCE) | VOLUME / CAPACITY | LEVEL OF SERVICE |
| Forrester Road (NS) at: | | | | | | | | | | | | |
| • Between SR-78/ SR-86 and Baughman Rd | Local Collector | 16,200 [3] | 2 | 14,600 [6] | 0.90 | E | **Minor Arterial** | 37,000 [3] | 4 | 14,600 [6] | 0.39 | A |
| • Between Baughman Road and Cady Road | Local Collector | 16,200 [3] | 2 | 17,600 [6] | ***1.09*** | F | **Minor Arterial** | 37,000 [3] | 4 | 17,600 [6] | 0.48 | B |
| • Between Cady Road and Carter Road | Local Collector | 16,200 [3] | 2 | 18,700 [6] | ***1.15*** | F | **Minor Arterial** | 37,000 [3] | 4 | 18,700 [6] | 0.51 | B |
| • Between Imler Road and Keystone Road | Local Collector | 16,200 [3] | 2 | 19,100 [6] | ***1.18*** | F | **Minor Arterial** | 37,000 [3] | 4 | 19,100 [6] | 0.52 | B |
| • Between Keystone Road and Worthington Road | Local Collector | 16,200 [3] | 2 | 23,700 [6] | ***1.46*** | F | **Minor Arterial** | 37,000 [3] | 4 | 23,700 [6] | 0.64 | B |
| • Between Worthington Road and Even Hewes Hwy. | Local Collector | 16,200 [3] | 2 | 24,400 [6] | ***1.51*** | F | **Minor Arterial** | 37,000 [3] | 4 | 24,400 [6] | 0.66 | B |
| • Between Evan Hewes Hwy. and Ross Road | Local Collector | 16,200 [3] | 2 | 22,700 [6] | ***1.40*** | F | **Minor Arterial** | 37,000 [3] | 4 | 22,700 [6] | 0.61 | B |
| • Between Ross Road and Interstate 8 WB Ramps | Local Collector | 16,200 [3] | 2 | 31,300 [6] | ***1.93*** | F | **Minor Arterial** | 37,000 [3] | 4 | 31,300 [6] | 0.85 | E |
| • Between Interstate 8 WB Ramps and Interstae 8 EB Ramps | Local Collector | 16,200 [3] | 2 | 19,800 [6] | ***1.22*** | F | **Minor Arterial** | 37,000 [3] | 4 | 19,800 [6] | 0.54 | B |
| • South of Interstate 8 EB Ramps | Local Collector | 16,200 [3] | 2 | 10,200 [6] | 0.63 | D | **Minor Arterial** | 37,000 [3] | 4 | 10,200 [6] | 0.28 | A |
| Brockman Road (NS) at: | | | | | | | | | | | | |
| • North of SR-98 | Local Collector | 16,200 [3] | 2 | 600 [6] | 0.04 | A | -- | -- | -- | -- | -- | -- |
| Keystone Road (EW) at: | | | | | | | | | | | | |
| • Between Forrester Road and Austin Road | Local Collector | 16,200 [3] | 2 | 7,800 [6] | 0.48 | D | **Minor Arterial** | 37,000 [3] | 4 | 7,800 [6] | 0.21 | A |
| SR-86/SR-78 (EW) at: | | | | | | | | | | | | |
| • West of Forrester Road | Minor Arterial | 37,000 [3] | 4 | 29,700 [6] | 0.80 | D | **Prime Arterial** | 57,000 | 6 | 29,700 | 0.52 | B |
| • East of Forrester Road | Minor Arterial | 37,000 [3] | 4 | 31,500 [6] | 0.85 | D | **Prime Arterial** | 57,000 | 6 | 31,500 | 0.55 | B |
| SR-98 (EW) at: | | | | | | | | | | | | |
| • West of Brockman Road | Local Collector | 16,200 [3] | 2 | 2,700 [6] | 0.17 | B | -- | -- | -- | -- | -- | -- |
| • East of Brockman Road | Local Collector | 16,200 [3] | 2 | 3,100 [6] | 0.19 | B | -- | -- | -- | -- | -- | -- |

[1] Average Daily Traffic (ADT) expressed in vehicles per day.

[2] Road Classification based on the *Circulation and Scenic Highways Element*.
Prepared by Imperial County Pubilc Works Department ( Revised August 2006)

[3] Although Level of Service (LOS) "C" capacity is the current target LOS indicated in the *Circulation and Scenic Highways Element* (REVISED August 2006), County of Imperial and CALTRANS staff have indicated LOS "E" as the standard acceptable capacity.

[4] Minimum required roadway classification needed to satisfy County of Imperial Volume to Capacity Standards.

[5] The requried number of lanes corresponding with the County of Imperial road classification for a prime arterial (4 to 6 lanes).

[6] Average Daily Traffic reflects passenger car equivalence (P.C.E) adjustments. Passenger Car Equivalence denotes the number of typical passenger cars to equal the length of an oversized vehicle. For medium sized trucks, 75% of the total number of trucks are assigned a P.C.E. factor of 2. The remaining 25% of trucks are assumed to be slow moving farming related trucks and were given a P.C.E factor of 6.0. Heavy trucks were assigned a P.C.E factor of 3.0.

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EXHIBIT 6-B

# LEVEL OF SERVICE SUMMARY FOR SHORT TERM (2015) CONDITIONS (WITH IMPROVEMENTS)

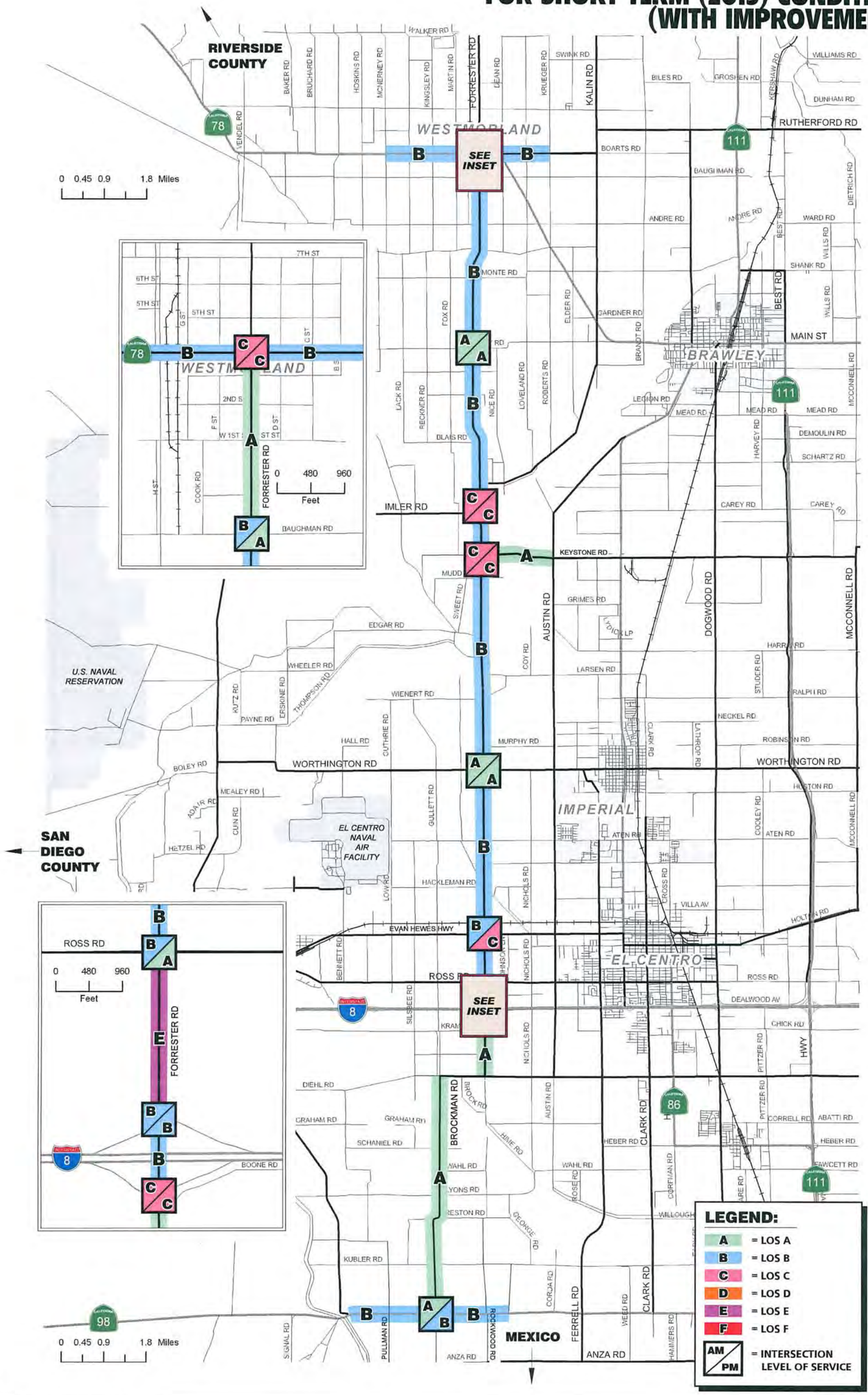

**TABLE 6-3**

**INTERSECTION ANALYSIS FOR LONG RANGE 2035 CONDITIONS WITH IMPROVEMENTS**

| INTERSECTION | TRAFFIC CONTROL[3] | INTERSECTION APPROACH LANES[1] NORTH-BOUND L | T | R | SOUTH-BOUND L | T | R | EAST-BOUND L | T | R | WEST-BOUND L | T | R | DELAY[2] (SECS.) AM | PM | LEVEL OF SERVICE AM | PM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Forrester Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-78/ SR-86 (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | AWS | 0.5 | 0.5 | 1 | 0.5 | 0.5 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | --[4] | --[4] | F | F |
| - with improvements | **TS** | **1** | 1 | 1 | **1** | 1 | 0 | 1 | **3** | **1** | **1** | **3** | **1** | 28.3 | 28.7 | C | C |
| • Baughman Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| - with improvements | **TS** | **1** | **2** | 0 | **1** | **2** | 0 | **1** | 1 | 0 | **1** | 1 | 0 | 25.1 | 21.4 | C | C |
| • Cady Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| - with improvements | **TS** | **1** | **2** | 0 | **1** | **2** | 0 | **1** | 1 | 0 | **1** | 1 | 0 | 19.2 | 19.9 | C | B |
| • Imler Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 0 | 0 | 82.8 | --[4] | F | F |
| - with improvements[5] | CSS | **1** | **2** | 0 | 0 | **2** | **1** | **1** | 0 | **1** | 0 | 0 | 0 | 21.7 | 24.9 | C | C |
| • Keystone Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0.5 | 0.5 | 1 | 1 | 1 | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| - with improvements | **TS** | **1** | **2** | **1>** | **2** | **2** | 0 | **1** | 1 | 0 | **2** | 1 | 0 | 34.3 | 29.0 | C | C |
| • Worthington Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| - with improvements | **TS** | 1 | **3** | 0 | 1 | **3** | 0 | **1** | 1 | 0 | **1** | 1 | 0 | 17.8 | 18.5 | B | B |
| • Evan Hewes Highway (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | AWS | 0 | 1! | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | --[4] | --[4] | F | F |
| - with improvements | **TS** | **1** | **3** | 0 | 1 | **3** | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 21.7 | 22.9 | C | C |
| • Ross Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| - with improvements | **TS** | **1** | **3** | 0 | **1** | **3** | 0 | **1** | 1 | 0 | **1** | 1 | 0 | 27.0 | 20.1 | C | C |
| • Interstate 8 WB Ramp (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0.5 | 0.5 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.5 | 0.5 | 1 | --[4] | --[4] | F | F |
| - with improvements | **TS** | **2** | **3** | 0 | 0 | **2.5** | **1.5** | 0 | 0 | 0 | 0.5 | 0.5 | 1 | 17.8 | 25.9 | B | C |
| • Interstate 8 EB Ramp (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1 | 0 | 0.5 | 0.5 | 0 | 0.5 | 0.5 | 1 | 0 | 0 | 0 | --[4] | --[4] | F | F |
| - with improvements | **TS** | 0 | **3** | **1** | **2** | **3** | 0 | **2** | 1 | 0 | 0 | 0 | 0 | 18.9 | 17.0 | B | B |
| Brockman Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-98 (EW) | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 9.8 | 10.6 | A | B |

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1! = Shared left, thru and right lane, 1> = Right Turn Overlap Phase, 1>> = Free Right Turn; **1** = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9 R3 (2007) and SYNCHRO, Version 7 (2007). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] CSS = Cross Street Stop
AWS = All Way Stop
TS = Traffic Signal

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

[5] Improvement at this intersection includes the construction of an accelaration lane for left turns into Forrester Road from the minor street.

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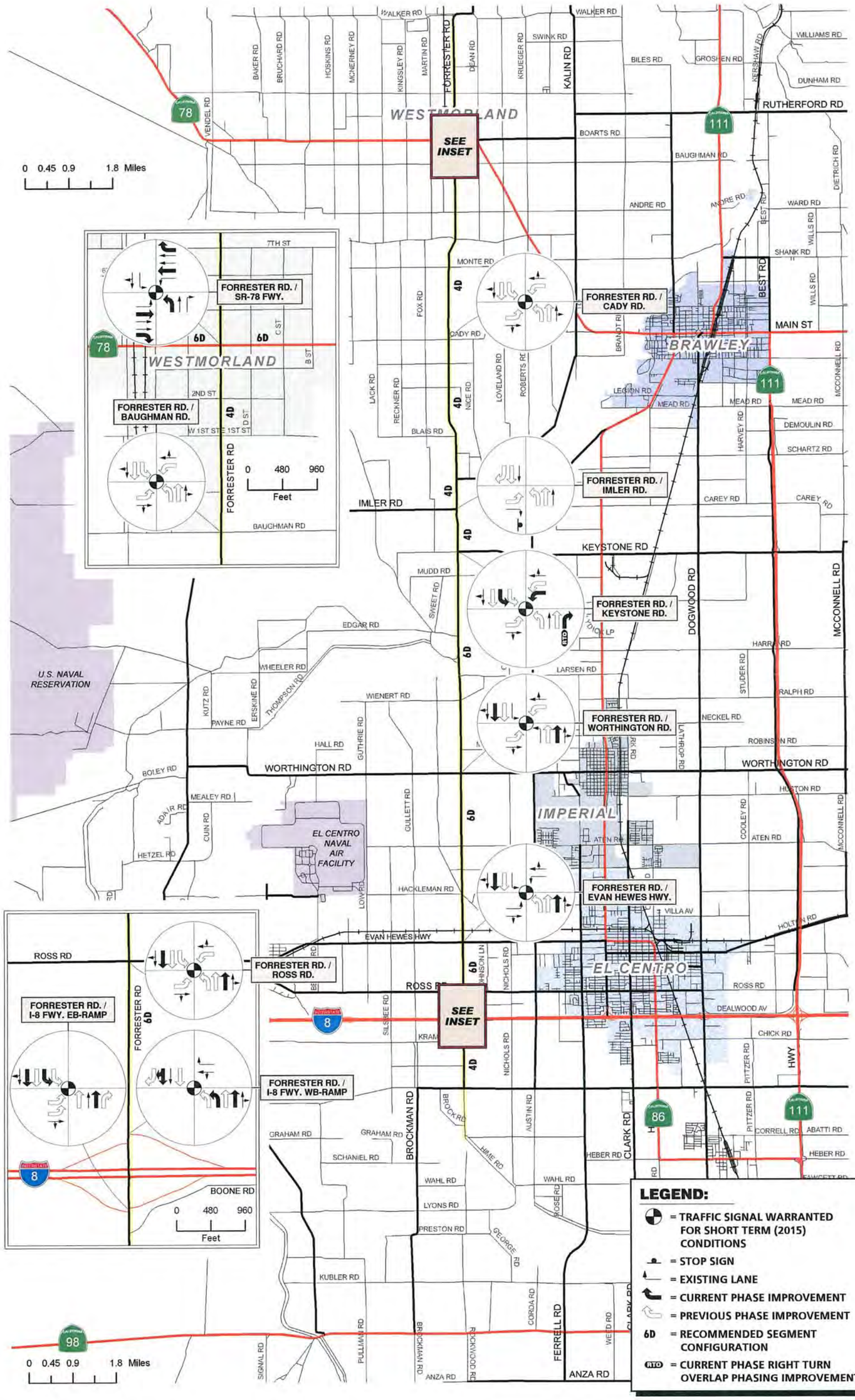
EXHIBIT 6-C

# LONG-RANGE (2035) RECOMMENDED IMPROVEMENTS



The intersection of Imler Road and Forrester Road does not meet planning level traffic signal warrants for long range (2035) conditions. Improvements to address the LOS deficiencies at this intersection include the construction of a two-way left turn lane along Forrester Road. This improvement will provide a sanctuary and an acceleration lane for motorist turning to and from Forrester Road at Imler Road.

Intersection delay analysis calculation worksheets for long range (2035) "with improvements" traffic conditions are included in Appendix "O".

## 6.7 Long Range (2035) Roadway Segment Analysis

Long range (2035) average daily traffic (ADT) volume-to-capacity ratios are shown on Table 5-4. As previously mentioned in the previous Section, the following roadway segments are anticipated to operate with volume-to-capacity ratios which exceed County thresholds:

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road
- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8
- South of Interstate 8 EB Ramp

Keystone Road (EW) between:

- Forrester Road and Austin Road

SR-78/86 (EW):

- West of Forrester Road

Table 6-4 illustrates the required number of lanes to achieve an acceptable volume to capacity ratio. Long range (2035) improvements are based on the required improvements

to satisfy County of Imperial LOS and V/C standards. The recommended improvement for Forrester Road include the widening of the roadway to a 4 lane facility along Forrester Road from SR-78/86 to Keystone Road and a 6 lane facility from south of Keystone Road to the Interstate 8 Ramps.

Exhibit 6-D illustrates the level of service at the study area intersections and road segments with the implementation of the recommended improvements for Long Range (2035) conditions.

## 6.8 Long Range Future Network Alternatives

In addition to the long range analysis previously discussed, four long range alternatives are considered in this analysis: Alternative 1: Forrester Road as a Caltrans Facility, Alternative 2: Forrester Road with the Westmorland Bypass and Alternative 3: Forrester Road with the Eastern Bypass and the proposed Silicon Border Port of Entry.

### 6.8.1 Alternative 1: Forrester Road as a Caltrans Facility

A future alternative scenario for Forrester Road is the transfer of jurisdictional authority of Forrester Road to Caltrans and to relinquish authority over SR-86 to the County of Imperial. Currently, Forrester Road is under the jurisdiction of Imperial County and a formal relinquishment process needs to be initiated and approved by the California Transportation Commission in order to transfer authority to Caltrans. The following three types of relinquishments are identified by Caltrans:

1. Relinquishment by legislative enactment
2. Relinquishment by superseding with a new state highway
3. Relinquishment of collateral facilities

For this transfer to occur, the second relinquishment process would be the most appropriate for SR-86 since Forrester Road would become a new state facility. Appendix "P": contains the Caltrans Relinquishment Guidelines.

In terms of level of services requirements, the levels of service analyses prepared for this report are calculated on the basis of LOS "C" operations.

Both County of Imperial and Caltrans requirements stipulates a minimum of LOS "C" operations for arterials within their respective jurisdictions and the recommended improvements outlined in this report are measures to ensure that this criterion is satisfied. Regardless of the controlling authority of Forrester Road and SR-86, the recommended four and six lane configurations along Forrester Road and SR-86 (long range 2035 configuration )are necessary to satisfy LOS "C" for both jurisdictions. Whether the transfer of jurisdictional authority to Caltrans occurs or control of Forrester Road maintains the status quo, the findings and recommendations of this report provides future traffic forecasts along Forrester Road and the necessary improvements required to satisfy operational standards by both County of Imperial and Caltrans.

In addition to level of service standards, Alternative 1 was analyzed by a comparison of the required right-of-way requirements for Imperial County and Caltrans. Through a comparative analysis, the required right-of-way standard for each jurisdiction illustrates the required roadway width for the expansion of Forrester Road to a four lane or six lane facility. This ensures that the necessary right of way is available to meet jurisdictional roadway standards for either Caltrans and/or County of Imperial and outlines whether additional or less right of way is required with the transfer of authority.

Table 6-5 identifies the roadway characteristics associated with the County and Caltrans standards. To satisfy County of Imperial standards, a four lane facility requires 82 feet of roadbed width, as opposed to the 76 feet of roadbed required for Caltrans. The total right-of way required by the County of Imperial for a four lane minor arterial is 102 feet. Caltrans requires a total of 116 feet of right of way for a 4 lane arterial. Differences between the two jurisdictions in roadway requirements for a four lane facility differ in the median and parkway strip standards. County of Imperial has wider median standards of 18 feet compared to Caltrans requirement of 12 feet. In terms of the required parkway strip, Caltrans requires 40 feet of parkway strip compared to the County's requirement of 20 feet.

For a 6 lane facility, County of Imperial and Caltrans require a total right of way of 126 feet and 140 feet, respectively. To satisfy County of Imperial roadway standards for a six lane prime arterial, 106 feet from curb to curb is required. In contrast, Caltrans require less roadway width of 100 feet from curb to curb. However, the parkway strip requirement for County of Imperial requires 10 feet compared to the Caltrans requirement of 20 feet. To transfer the jurisdictional control of Forrester Road to Caltrans, it is anticipated that approximately 140 feet of right of way must be acquired to accommodate a 6 lane facility. The associated costs for this widening are discussed in Section 8.0. Exhibit 6-E illustrates the required roadbed width to satisfy County of Imperial and Caltrans standards for a 4-lane and 6-lane facility. It is the goal of Caltrans as owner and operator of the State highway system to maintain and enforce an access management policy for State facilities. The preferred design for signal spacing of 1/2 mile, and right turn only access at 1/4 mile spacing.

Key issues regarding the transferring of jurisdictional control of Forrester Road and SR-86 must be addressed before initiating the relinquishment process. Coordination with the California Transportation Commission, Caltrans, County Staff and local Cities to initiate the transfer process of Forrester Road through "Relinquishment by superseding with a new state highway" is essential to explore the cost/ benefit of transferring authoritative control of Forrester Road to Caltrans and the SR-86 to County of Imperial. A multilateral approach from all stakeholders is necessary to resolve roadway standard issues as previously mentioned in the differences in median and parkway strip widths between Caltrans and County of Imperial. A more focused transportation planning and traffic engineering report along Forrester Road is advised to dictate the most suitable roadway design to serve local residents, agriculture, and cross-border trade activities as well as enhancing safety in the Forrester Road corridor regardless of the controlling authority. Fundamental issues regarding the authoritative control of these roadways address the underlying question as to the capability of the jurisdiction to respond quickly and efficiently to local and interregional needs for the immediate and future needs of roadway as well as resources to initiate projects for better roadway operations.

TABLE 6-4

ROADWAY SEGMENT ANALYSIS FOR LONG RANGE 2035 CONDITIONS

| | WITHOUT IMPROVEMENTS | | | | | | WITH IMPROVEMENTS (4 LANES) | | | | | | WITH IMPROVEMENTS 6 (LANES) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LONG RANGE | | | | | | LONG RANGE | | | | | | LONG RANGE | | |
| ROADWAY SEGMENT | EXISTING FUNCTIONALROAD CLASSIFICATION [2] | LOS "E" CAPACITY | EXISTING NUMBER OF LANES | 2035 ADT[1] (PCE) | VOLUME / CAPACITY | LEVEL OF SERVICE | FUNCTIONAL ROAD CLASSIFICATION [4] | LOS "E" CAPACITY | REQUIRED NUMBER OF LANES [5] | 2035 ADT[1] (PCE) | VOLUME / CAPACITY | LEVEL OF SERVICE | FUNCTIONAL ROAD CLASSIFICATION [4] | LOS "E" CAPACITY | REQUIRED NUMBER OF LANES [5] | 2035 ADT[4] (PCE) | VOLUME / CAPACITY | LEVEL OF SERVICE |
| Forrestor Road (NS) at: | | | | | | | | | | | | | | | | | | |
| • Between SR-78/ SR-86 and Baughman Rd | Local Collector | 16,200 [3] | 2 | 18,300 [6] | *1.13* | F | Minor Arterial | 37,000 [3] | 4 | 18,300 [6] | 0.49 | B | Minor Arterial | 37,000 [3] | 4 | 18,300 [6] | 0.49 | B |
| • Between Baughman Road and Cody Road | Local Collector | 16,200 [3] | 2 | 23,700 [6] | *1.46* | F | Minor Arterial | 37,000 [3] | 4 | 23,700 [6] | 0.64 | B | Minor Arterial | 37,000 [3] | 4 | 23,700 [6] | 0.64 | B |
| • Between Cody Road and Carter Road | Local Collector | 16,200 [3] | 2 | 24,700 [6] | *1.52* | F | Minor Arterial | 37,000 [3] | 4 | 24,700 [6] | 0.67 | B | Minor Arterial | 37,000 [3] | 4 | 24,700 [6] | 0.67 | B |
| • Between Imler Road and Keystone Road | Local Collector | 16,200 [3] | 2 | 25,100 [6] | *1.55* | F | Minor Arterial | 37,000 [3] | 4 | 25,100 [6] | 0.68 | C | Minor Arterial | 37,000 [3] | 4 | 25,100 [6] | 0.68 | C |
| • Between Keystone Road and Worthington Road | Local Collector | 16,200 [3] | 2 | 34,000 [6] | *2.10* | F | Minor Arterial | 37,000 [3] | 4 | 34,000 [6] | 0.92 | D | Prime Arterial | 57,000 [3] | 6 | 34,000 [6] | 0.60 | B |
| • Between Worthington Road and Evan Howes Hwy. | Local Collector | 16,200 [3] | 2 | 34,800 [6] | *2.15* | F | Minor Arterial | 37,000 [3] | 4 | 34,800 [6] | 0.94 | F | Prime Arterial | 57,000 [3] | 6 | 34,800 [6] | 0.61 | B |
| • Between Evan Howes Hwy. and Ross Road | Local Collector | 16,200 [3] | 2 | 32,900 [6] | *2.03* | F | Minor Arterial | 37,000 [3] | 4 | 32,900 [6] | 0.89 | E | Prime Arterial | 57,000 [3] | 6 | 32,900 [6] | 0.58 | B |
| • Between Ross Road and Interstate 8 WB Ramps | Local Collector | 16,200 [3] | 2 | 43,300 [6] | *2.67* | F | Minor Arterial | 37,000 [3] | 4 | 43,300 [6] | *1.17* | F | Prime Arterial | 57,000 [3] | 6 | 43,300 [6] | 0.76 | C |
| • Between Interstate 8 WB Ramps and Interstate 8 EB Ramps | Local Collector | 16,200 [3] | 2 | 26,400 [6] | *1.62* | F | Minor Arterial | 37,000 [3] | 4 | 26,400 [6] | 0.71 | C | Prime Arterial | 57,000 [3] | 6 | 26,400 [6] | 0.46 | B |
| • South of Interstate 8 EB Ramps | Local Collector | 16,200 [3] | 2 | 12,500 [6] | 0.77 | F | Minor Arterial | 37,000 [3] | 4 | 12,500 | 0.34 | A | Minor Arterial | 37,000 [3] | 4 | 12,500 [6] | 0.34 | A |
| Brockman Road (NS) at: | | | | | | | | | | | | | | | | | | |
| • North of SR-98 | Local Collector | 16,200 [3] | 2 | 800 [6] | 0.05 | A | – | – | – | – | – | – | – | – | – | – | – | – |
| Keystone Road (EW) at: | | | | | | | | | | | | | | | | | | |
| • Between Forrestor Road and Austin Road | Local Collector | 16,200 [3] | 2 | 13,500 [6] | 0.83 | F | Minor Arterial | 37,000 [3] | 4 | 13,500 [6] | 0.36 | A | – | – | – | – | – | – |
| SR-86/SR-78 (EW) at: | | | | | | | | | | | | | | | | | | |
| • West of Forrestor Road | Minor Arterial | 37,000 [3] | 4 | 39,400 [6] | *1.06* | F | Prime Arterial | 57,000 [3] | 6 | 39,400 [6] | 0.69 | C | – | – | – | – | – | – |
| • East of Forrestor Road | Minor Arterial | 37,000 [3] | 4 | 42,200 [6] | *1.14* | F | Prime Arterial | 57,000 [3] | 6 | 42,200 [6] | 0.74 | C | – | – | – | – | – | – |
| SR-98 (EW) at: | | | | | | | | | | | | | | | | | | |
| • West of Brockman Road | Local Collector | 16,200 [3] | 2 | 3,200 [6] | 0.20 | B | – | – | – | – | – | – | – | – | – | – | – | – |
| • East of Brockman Road | Local Collector | 16,200 [3] | 2 | 3,700 [6] | 0.23 | B | – | – | – | – | – | – | – | – | – | – | – | – |

[1] Average Daily Traffic (ADT) expressed in vehicles per day.

[2] Road Classification based on the *Circulation and Scenic Highways Element*. Prepared by Imperial County Public Works Department ( Revised August 2006)

[3] Although Level of Service (LOS) "C" capacity is the current target LOS indicated in the *Circulation and Scenic Highways Element* (REVISED August 2006), County of Imperial and CALTRANS staff have indicated LOS "E" as the standard acceptable capacity.

[4] Minimum required roadway classification needed to satisfy County of Imperial Volume to Capacity Standards.

[5] The requried number of lanes corresponding with the County of Imperial road classification

[6] Average Daily Traffic reflects passenger car equivalence (P.C.E) adjustments. Passenger Car Equivalence denotes the number of typical passenger cars to equal the length of an oversized vehicle. For medium sized trucks, 75% of the total number of trucks are assigned a P.C.E. factor of 2. The remaining 25% of trucks are assumed to be slow moving farming related trucks and were given a P.C.E factor of 6.0. Heavy trucks were assigned a P.C.E factor of 3.0.

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EXHIBIT 6-D

# LEVEL OF SERVICE SUMMARY FOR LONG RANGE (2035) CONDITIONS (WITH IMPROVEMENTS)

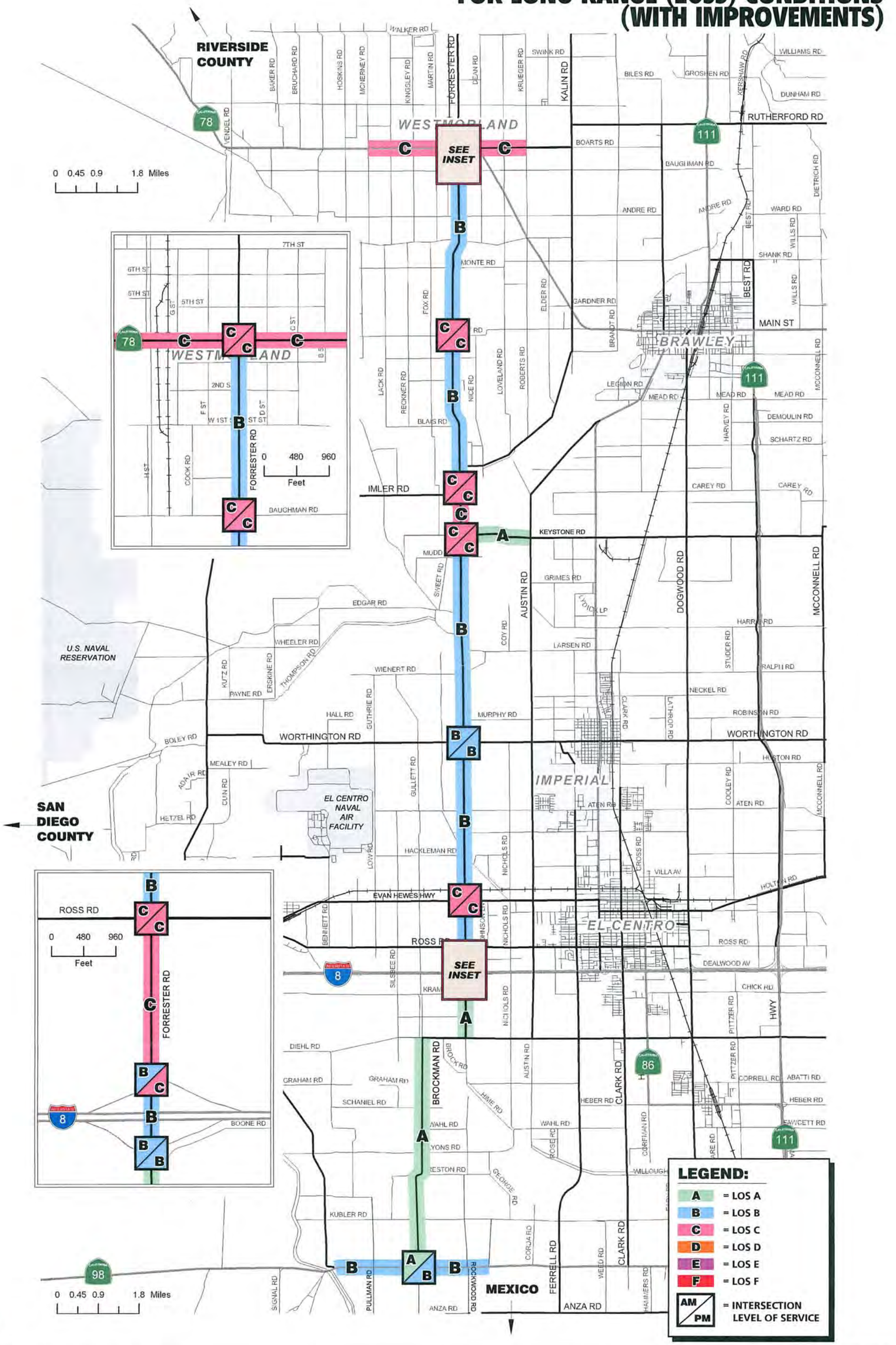


TABLE 6-5

COUNTY OF IMPERIAL ROADWAY STANDARDS VS. CALTRANS ROAD WAY STANDARDS

| COUNTY OF IMPERIAL ROADWAY STANDARDS | | | | | | | CALTRANS ROAD WAY STANDARDS [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROADWAY | CURB TO CURB | MEDIAN [2] | TRAVELED WAY [2] | SHOULDER [2] | | ROW | ROADWAY | CURB TO CURB [3] | MEDIAN [4] | TRAVELED WAY [5] | SHOULDER [6] | | ROW [1] |
| | | | | Left | Right | | | | | | Left | Right | |
| Prime Arterial | 106 | 18 | 72 | -- | 8 | 126 | 6-Lanes or More | 100 | 12 | 72 | -- | 8 | 140 |
| Minor Arterial | 82 | 18 | 48 | -- | 8 | 102 | 4-lanes | 76 | 12 | 48 | -- | 8 | 116 |
| Access Openings [7]<br>• Prime Arterial NOT ALLOWED<br>• Minor Arterial [9] 1200 ft or More | | | | | | | Access Opening [8]<br>• Expressway 1/2 mile<br>• Minor Arterial N/A | | | | | | |

[1] Per Caltrans Right of Way Standards (ROW), fixed minimum widths are not specified because dimensions of cross-sectional elements may require narrow widths. Per discusslons with Caltrans staff, a 20 ft sidewalk and landscape (Parkway Strip) is assumed.

[2] Information dervied from the County of Imperial Circulation and Scenic Highways Element, 2006

[3] The cross section is based on the minimum requirements based on the CALTRANS Highway Design Manual for a conventional highway.

[4] Per Highway Design Manual (305.1), the minimum median width for a multilane conventional highway shall be 12 feet.

[5] Per Highway Design Manual (301.1), the basic lane width for new construction on two lane and multi-lane highways, ramps, collector roads, and other appurtenant roadways shall be 12 feet.

[6] Highway Design Manual Standards for paved shoulder width indicates the required shoulder for left/right paved shoulder.

[7] Per County of Imperial Circulation and Scenic Highways Element, driveway access to Prime Arterials is prohibited unless there is no other reasonable means of access.

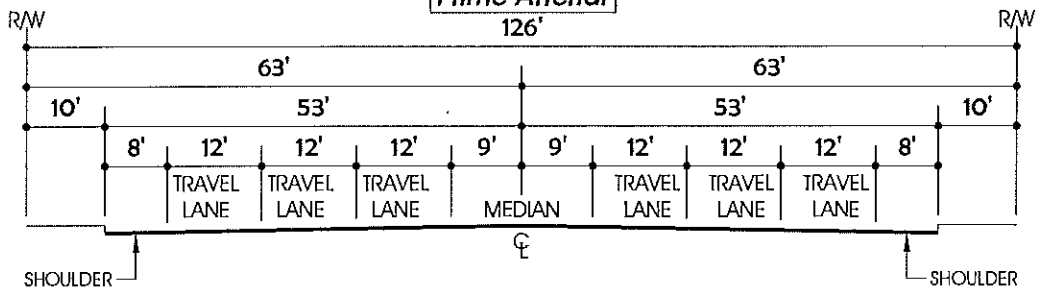
[8] The CALTRANS Highway Design Manual stiputales that access opeings on Expressways should not be spaced closer than one-half mile to an adjacent public road intersection or to another private access opening (205.1)

[9] Access to Minor Arterials shall not be permitted unless there is no other reasonable means to access the public street system. Where access to Minor Arterial or Major Collectors must be allowed, it shall be limited through the use of medians and or acccess controls in order to maintain capacity. Along Minor Arterials, access spacing shall be a standard distance of 1200 ft or more. Under special circumstances, this distance may be reduced to a minimum of 600 feet.

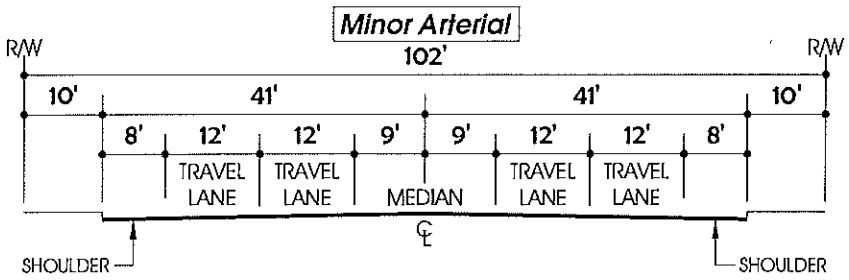
# COUNTY OF IMPERIAL CROSS-SECTION STANDARDS AND CALTRANS CROSS-SECTION STANDARDS

## COUNTY OF IMPERIAL

### *Prime Arterial*

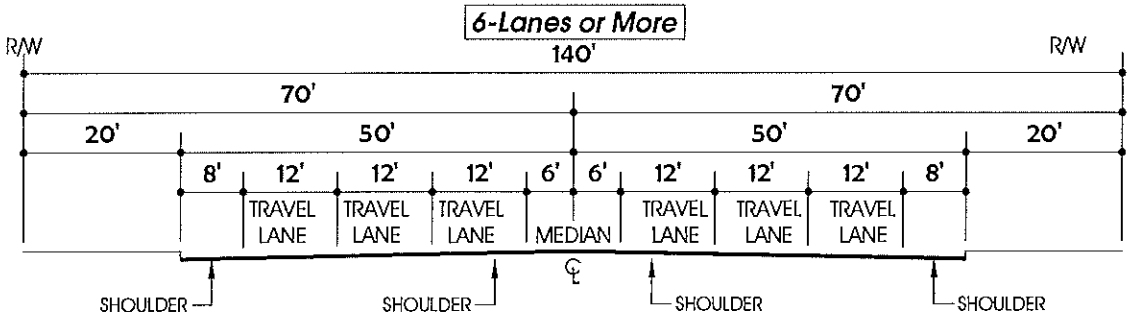



### *Minor Arterial*

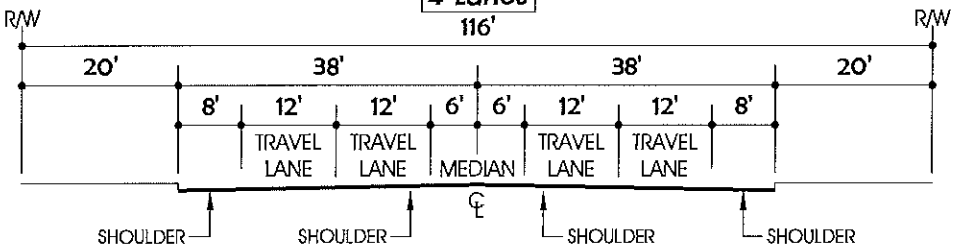



## CALTRANS ★

### *6-Lanes or More*




### *4-Lanes*




★ PER CALTRANS RIGHT-OF-WAY STANDARDS, FIXED MINIMUM WIDTHS ARE NOT SPECIFIED BECAUSE DIMENSIONS OF CROSS-SECTIONAL ELEMENTS MAY REQUIRE NARROW WIDTHS. THE SIDEWALK AND LANDSCAPE WIDTH FROM COUNTY OF IMPERIAL STANDARDS ARE UTILIZED FOR THE PURPOSES OF THIS ANALYSIS.

### 6.8.2 Alternative 2: Westmorland Bypass

The *Imperial County 2007 Transportation Plan Highway Element* has recognized this project as a mid-term project (2015-2025) with an estimated project expenditure of $167.8 million. The 4 mile truck bypass would provide 2 lanes for each direction along Andre Road and Kingsley. Exhibit 6-F illustrates the officially adopted IVAG option for the proposed bypass. The Westmorland Bypass is anticipated to divert truck traffic away from the City of Westmorland and reduce traffic volumes along Forrester Road between the SR-78/86 and the SR-78 within the City of Westmorland's City limits. To accommodate future 2035 traffic volumes, Andre Road is proposed to connect with the SR-78/86 via Kingsley Road west of the City of Westmorland, and to re-connect with the SR-78/86 southeast of the City of Westmorland. Added traffic volumes on Andre Road due to the truck bypass route require that the capacity of the existing Andre Road increased to adequately facilitate the projected travel demand.

For Alternative 2 long range (2035) scenario, a proposed Truck Bypass south of the City of Westmorland in Imperial County is analyzed. It has been assumed the trucks traveling west and east on SR-78/86 would access the proposed Westmorland Bypass. In addition, 25% of existing automobile traffic (plus 31% ambient growth) and all of the future traffic cumulative project traffic travelling westbound on SR-78 will access the proposed Westmorland Bypass. In addition, 75% of the westbound and eastbound truck traffic travelling on SR-78/86 has been diverted to access the Westmorland Bypass. It has also been assumed that the 25% of westbound and eastbound cars and light truck will access this route. Traffic volumes along Forrester Road have been adjusted accordingly for this long range alternative analysis scenario. Traffic volumes at SR-78/86 /Forrester Road and Baughman/Forrester Road have been utilized to derive traffic volumes at Andre Road. These adjustments will not affect intersections south of Andre Road/ Forrester Road. Level of service and delay results from the previously mentioned long range (2035) Analysis scenario for intersections south of Andre Road will yield the same results since the traffic volumes at these locations will remain unchanged. Peak hour long range

(2035) Traffic Volumes associated with the traffic diversion of the Westmorland Bypass is illustrated in Exhibit 6-G and Exhibit 6-H. Long range (2035) Average Daily Traffic volumes associated with the Westmorland Bypass are illustrated in Exhibit 6-I.

**Alternative 2 Long Range (2035) Intersection Delay Analysis**

The intersection delay analysis results for long range (2035) Alternative 2 traffic conditions are summarized on Table 6-6. For long range (2035) Alternative 2 traffic conditions, the following study area intersections affected by the Westmorland Bypass are anticipated to operate at an unacceptable level of service during the peak hours with existing lane geometry:

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)

For 2035 Alternative 2 traffic conditions, these study area intersections are projected to operate at acceptable levels of service during the peak hours with the installation of warranted traffic signals and recommended geometric improvements previously shown in Table 6-6.

Intersection delay analysis calculation worksheets for long range (2035) Alternative 2 traffic conditions are included in Appendix "Q".

**Alternative 2 Long Range (2035) Roadway Segment Analysis**

Long range (2035) Alternative 2 average daily traffic (ADT) volume-to-capacity ratios are shown on Table 6-7. Table 6-7 indicates that the following roadway segments affected by the Westmorland Bypass are anticipated to operate with unacceptable volume-to-capacity ratios with existing lane configurations:

Forrester Road (NS) between:

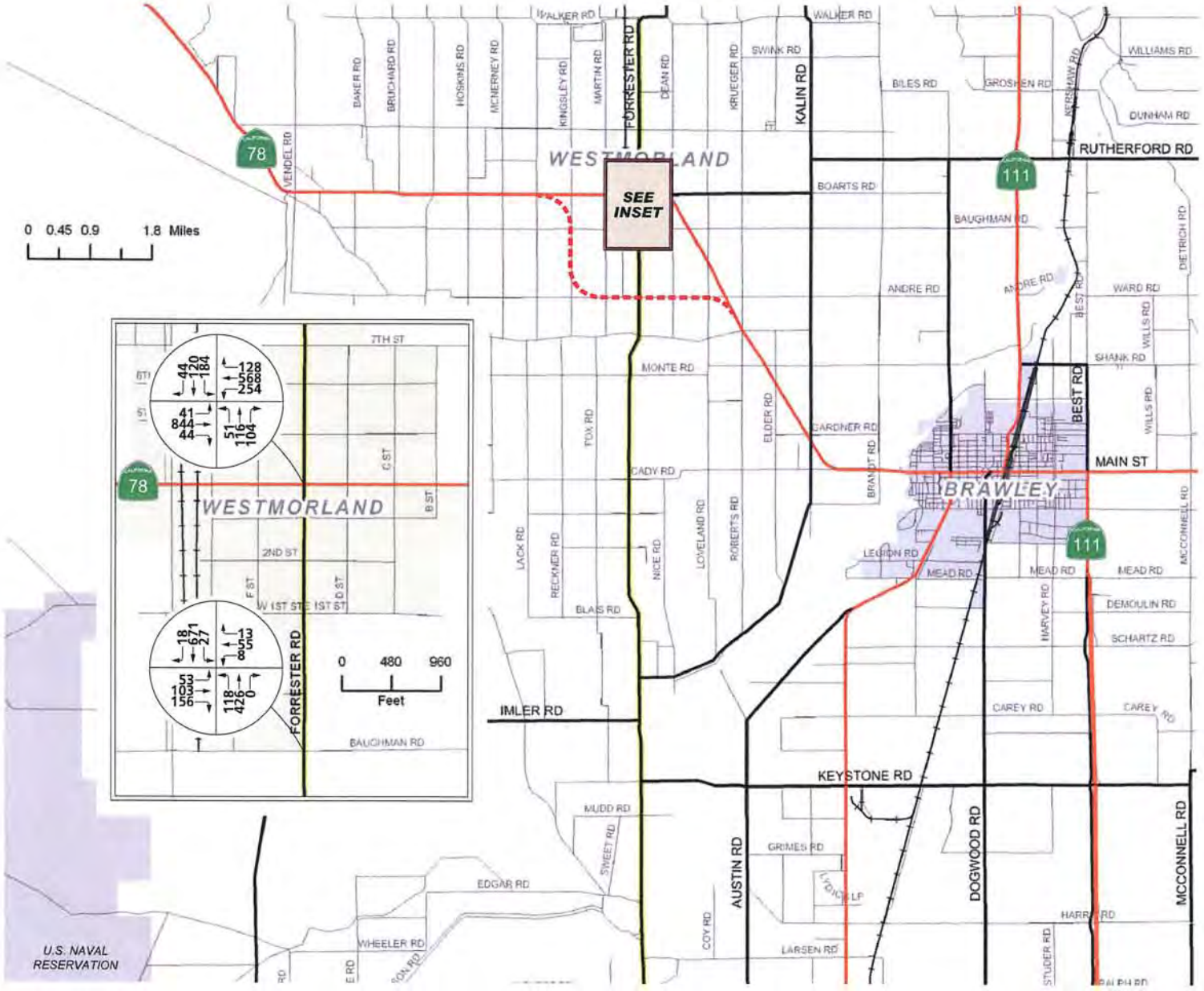
- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road

EXHIBIT 6-F

# PROPOSED WESTMORLAND BYPASS CONFIGURATION (OFFICIALLY ADOPTED IVAG OPTION)

EXHIBIT 6-G

# LONG RANGE 2035 ALTERNATIVE 2 (WITH WESTMORLAND BYPASS) AM PEAK HOUR INTERSECTION VOLUMES (NORTH STUDY AREA)



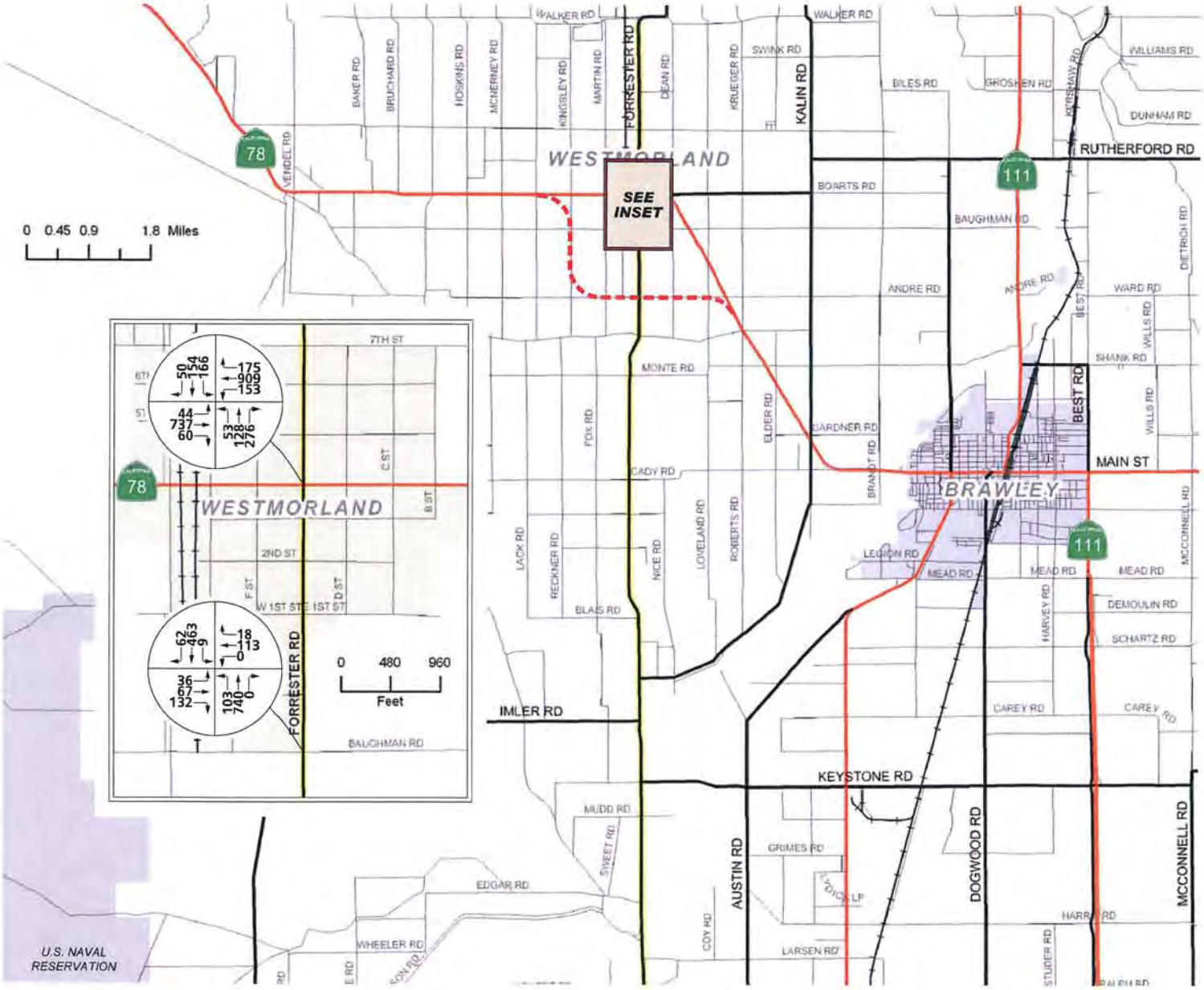

## LEGEND:

- = NEW 4-LANE EXPRESSWAY
- = NUMBER OF VEHICLES TURNING RIGHT DURING THE PEAK HOUR
- = NUMBER OF VEHICLES GOING THROUGH DURING THE PEAK HOUR
- = NUMBER OF VEHICLES TURNING LEFT DURING THE PEAK HOUR

N

EXHIBIT 6-H

# LONG RANGE 2035 ALTERNATIVE 2 (WITH WESTMORLAND BYPASS) PM PEAK HOUR INTERSECTION VOLUMES (NORTH STUDY AREA)



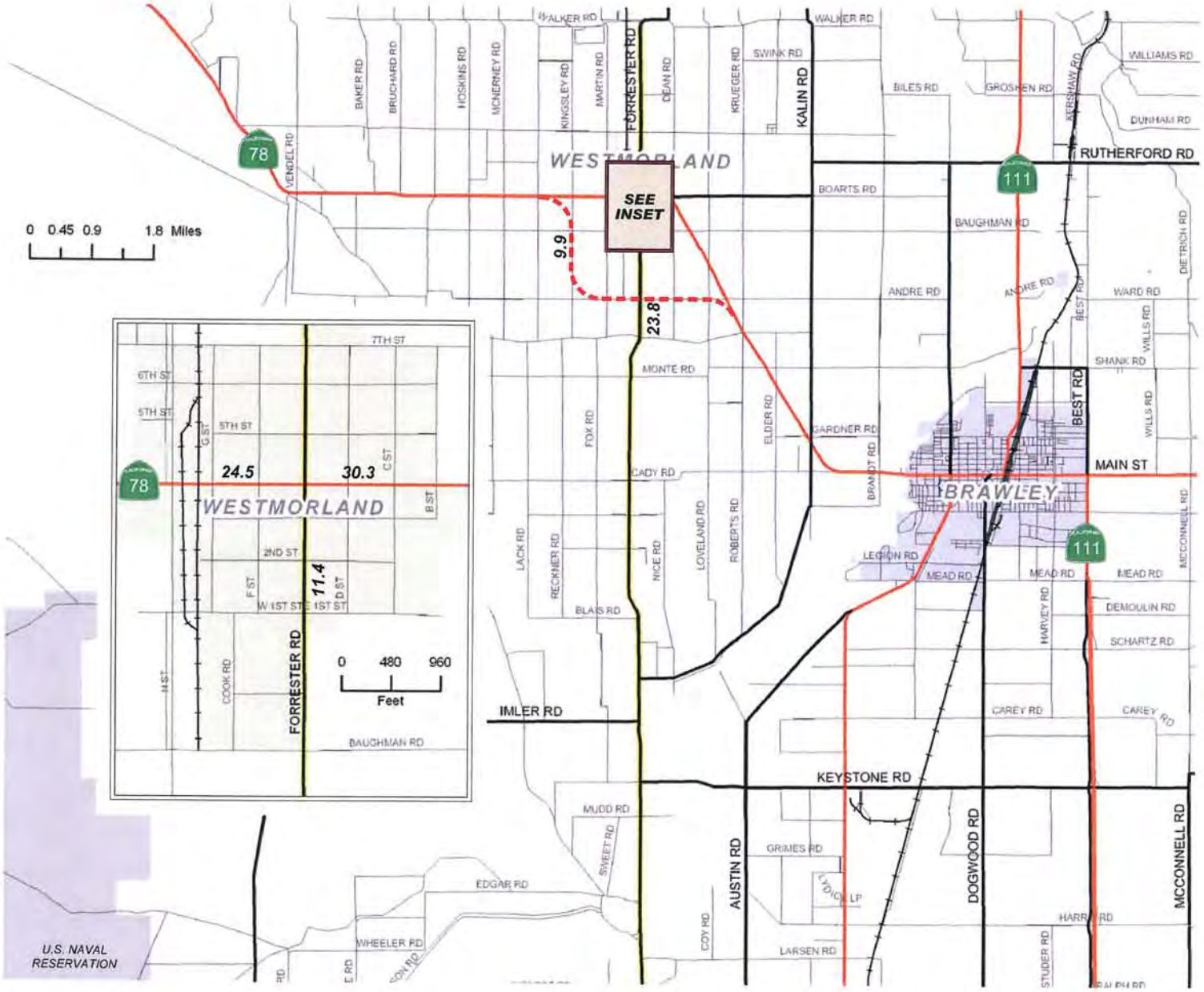

## LEGEND:

- = NEW 4-LANE EXPRESSWAY
- = NUMBER OF VEHICLES TURNING RIGHT DURING THE PEAK HOUR
- = NUMBER OF VEHICLES GOING THROUGH DURING THE PEAK HOUR
- = NUMBER OF VEHICLES TURNING LEFT DURING THE PEAK HOUR

N

EXHIBIT 6-I

# LONG RANGE 2035 ALTERNATIVE 2 (WITH WESTMORLAND BYPASS) AVERAGE DAILY TRAFFIC (ADT) PCE (NORTH STUDY AREA)




**LEGEND:**

- = NEW 4-LANE EXPRESSWAY
- *10.0* = VEHICLES PER DAY IN PASSENGER CAR EQUIVALENCE (1000'S)

N

Recommended Alternative 2 link improvements are based on the required improvements to satisfy County of Imperial LOS and V/C standards. In addition, the *Imperial County 2007 Transportation Plan Highway Element* and the *Circulation and Scenic Highways Element* was considered for the 4 lane recommendation for Forrester Road under long range (2035) conditions.

The primary function of the Westmorland Bypass is to reduce the industrial truck traffic travelling through the southern City limits of Westmorland. This Bypass configuration will also reduce traffic along the SR-78/86 within the City of Westmorland. Vehicles travelling on the SR-78/86 could possibly use the proposed Westmorland Bypass to travel east or west, completely bypassing the City of Westmorland.

### 6.8.3 Alternative 3: Eastern Bypass at Baughman Road

Alternative 2 and Alternative 3 is intended to address the truck traffic concerns in the City of Westmorland along Forrester Road, north of Baughman Road. Currently, trucks travel through the residential neighborhoods in southern city limits of Westmorland via Forrester Road between SR-78/86 to Baughman Road. Residents are concerned of the safety implications of heavy truck traffic travelling through Forrester Road. In addition, the findings in the City of Westmorland's *South Center Street Pavement Rehabilitation Report* cite *the* degradation of the street pavement due to the decelerating 18-wheel truck traffic and their heavy loads. This can lead to the structural failure of the roadway section of Center Street from 1st Street to SR-78/86. A possible solution to address local concerns is to construct a truck bypass route to alleviate truck traffic, which will ease traffic congestion along Forrester Road, north of Baughman Road. It should be noted that an official analysis has not been conducted for this alternative.

For the Alternative 3 long range scenario, a proposed Truck Bypass at the city limits of the City of Westmorland is analyzed as an alternative to the previously mentioned long range scenario. Exhibit 6-J illustrates the proposed general location of the Eastern Bypass at Baughman Road. The proposed Eastern Bypass anticipates alleviating truck traffic traveling through the City of

TABLE 6-6

INTERSECTION ANALYSIS FOR LONG RANGE 2035 CONDITIONS ALTERNATIVE 2

| INTERSECTION | TRAFFIC CONTROL[3] | INTERSECTION APPROACH LANES[1] | | | | | | | | | | | | DELAY[2] (SECS.) | | LEVEL OF SERVICE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NORTH-BOUND | | | SOUTH-BOUND | | | EAST-BOUND | | | WEST-BOUND | | | | | | |
| | | L | T | R | L | T | R | L | T | R | L | T | R | AM | PM | AM | PM |
| Forrester Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-78/ SR-86 (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | AWS | 0.5 | 0.5 | 1 | 0.5 | 0.5 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | --[4] | --[4] | F | F |
| - with Westmorland Bypass | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 3 | 1 | 1 | 3 | 1 | 25.6 | 25.4 | C | C |
| • Baughman Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| - with Westmorland Bypass | TS | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 21.5 | 21.0 | B | C |

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1! = Shared left, thru and right lane, 1> = Right Turn Overlap Phase, 1>> = Free Right Turn; 1 = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9 R3 (2007) and SYNCHRO, Version 7 (2007). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] CSS = Cross Street Stop
AWS = All Way Stop
TS = Traffic Signal

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

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TABLE 6-7

ALTERNATIVE 2 AND ALTERNATIVE 3 ROADWAY SEGMENT ANALYSIS FOR LONG RANGE 2035 CONDITIONS

| | WITHOUT IMPROVEMENTS | | | | | WITH IMPROVEMENTS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | LONG RANGE | | | | | LONG RANGE | |
| ROADWAY SEGMENT | EXISTING FUNCTIONAL ROAD CLASSIFICATION [2] | LOS "C" CAPACITY | EXISTING NUMBER OF LANES | 2035 ADT[1] (PCE) | VOLUME / CAPACITY | FUNCTIONAL ROAD CLASSIFICATION [4] | LOS "E" CAPACITY | REQUIRED NUMBER OF LANES [5] | 2035 ADT[1] (PCE) | VOLUME / CAPACITY |
| Forrester Road (NS) at: | | | | | | | | | | |
| * Between SR-78/ SR-86 and Baughman Rd (Without Truck Bypass) | Local Collector | 7,100 [3] | 2 | 18,300 [6] | ***2.58*** | **Minor Arterial** | 37,000 [3] | **4** | 18,300 [6] | 0.49 |
| - Alternative 2 (Westmorland Bypass) | -- | -- | -- | -- | -- | **Minor Arterial** | 37,000 [3] | **4** | 11,400 [6] | 0.31 |
| * - Alternative 3 (Eastern Bypass) | -- | -- | -- | -- | -- | **Minor Arterial** | 37,000 [3] | **4** | 11,700 [6] | 0.32 |

[1] Average Daily Traffic (ADT) expressed in vehicles per day.

[2] Road Classification based on the *Circulation and Scenic Highways Element*. Prepared by Imperial County Public Works Department ( Revised August 2006)

[3] Although Level of Service (LOS) "C" capacity is the current target LOS indicated in the *Circulation and Scenic Highways Element* (REVISED August 2006), County of Imperial and CALTRANS staff have indicated LOS "E" as the standard acceptable capacity.

[4] Minimum required roadway classification needed to satisfy County of Imperial Volume to Capacity Standards.

[5] The required number of lanes corresponding with the County of Imperial road classification

[6] Average Daily Traffic reflects passenger car equivalence (P.C.E) adjustments. Passenger Car Equivalence denotes the number of typical passenger cars to equal the length of an oversized vehicle. For medium sized trucks, 75% of the total number of trucks are assigned a P.C.E. factor of 2. The remaining 25% of trucks are assumed to be slow moving farming related trucks and were given a P.C.E factor of 6.0. Heavy trucks were assigned a P.C.E factor of 3.0.

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Westmorland via Forrester Road and along SR-78/86 within the Westmorland City limits. The Eastern Bypass is proposed to intersect at Forrester Road/ Baughman Road and extend to SR-78/86 to the east. It should be noted that the truck traffic would not be reduced through the City but redirected to an alternate route. This would result in an increase of approximately 1.2 vehicles miles travelled in comparison to staying on Forrester Road up to SR-78/86.

Eastbound and Westbound trucks travelling on SR-78/86 to Forrester Road has been assumed to access the proposed Eastern Bypass. Truck traffic volumes along Forrester Road have been adjusted accordingly for this long range alternative analysis scenario. Traffic volumes at the intersection of SR-78/86 /Forrester Road and Baughman/Forrester Road have been adjusted to reflect the diversion of trucks to the proposed Eastern Bypass. It is anticipated that the Bypass adjustments will not affect intersections on Forrester Road, south of Baughman Road since the truck volumes at these locations will not change. Level of service and delay results from the previously mentioned long range (2035) Analysis scenario for intersections south of Baughman Road will yield similar results since the traffic volumes at these locations will remain unchanged. Exhibit 6-K and Exhibit 6-L illustrates the AM and PM peak hour volumes for long range (2035) with the Eastern Bypass and Exhibit 6-M illustrates the average daily traffic volumes.

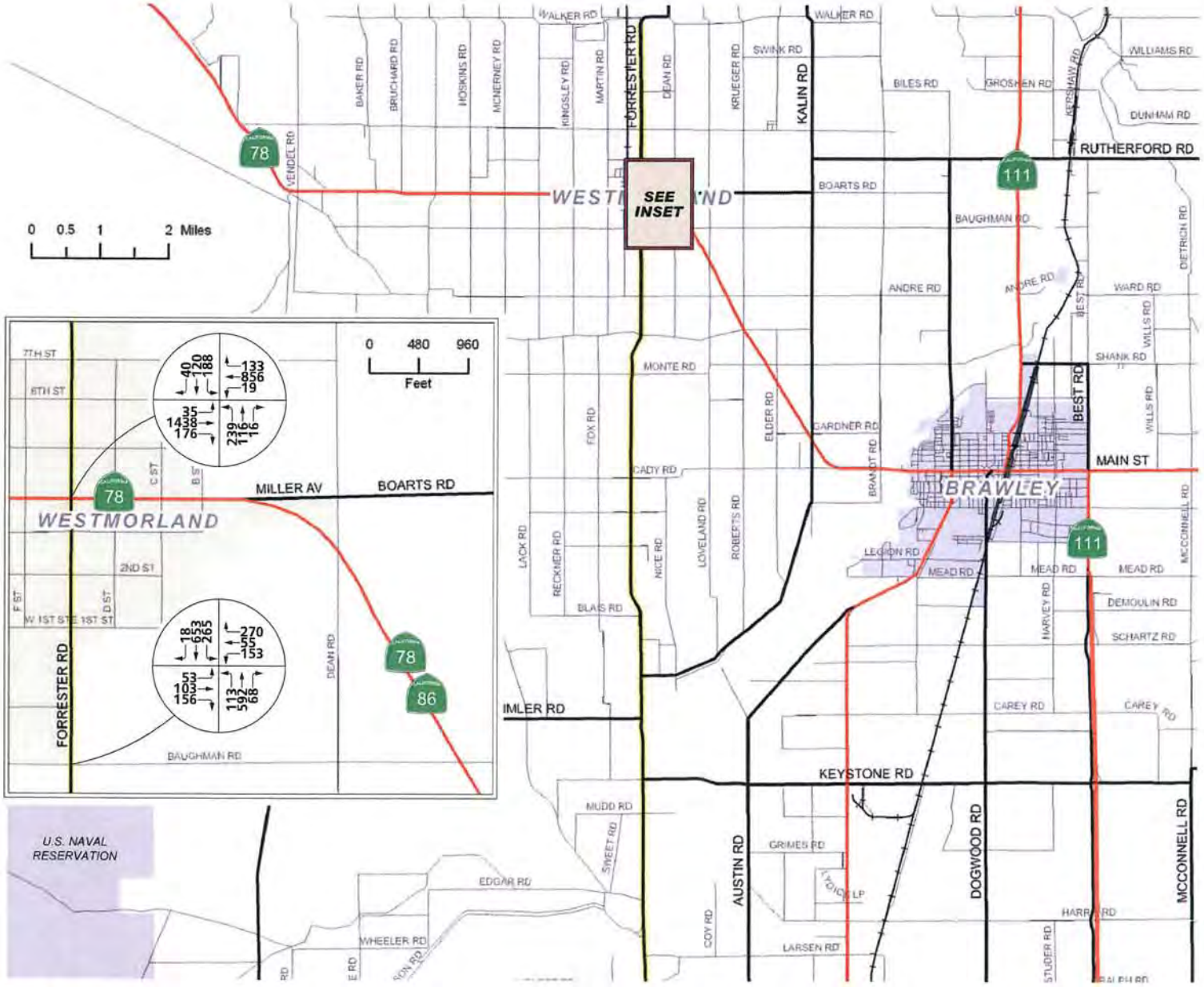
Alternative 3 is intended to redirect truck traffic from Forrester Road to SR-78/86 via Baughman Road. Safety implications are associated with the diversion of traffic on to the SR-78/86. Westmorland Elementary School is located south of SR-78/86 and east of C Street. Considering that the location of the elementary school is south of the heavily travelled SR-78/86, pedestrians may be placed at higher risk with the increase in traffic volumes. Currently, a north-south crosswalk is striped along "C" Street, which crosses SR-78/86. The proximity of the elementary school to SR-78/86 and the increase in traffic volumes may pose a potential hazard for pedestrians due to the increase in vehicular conflicts.

EXHIBIT 6-J

# PROPOSED EASTERN BYPASS CONFIGURATION

EXHIBIT 6-K

# LONG RANGE 2035 ALTERNATIVE 3 (WITH BAUGHMAN BYPASS) AM PEAK HOUR INTERSECTION VOLUMES (NORTH STUDY AREA)



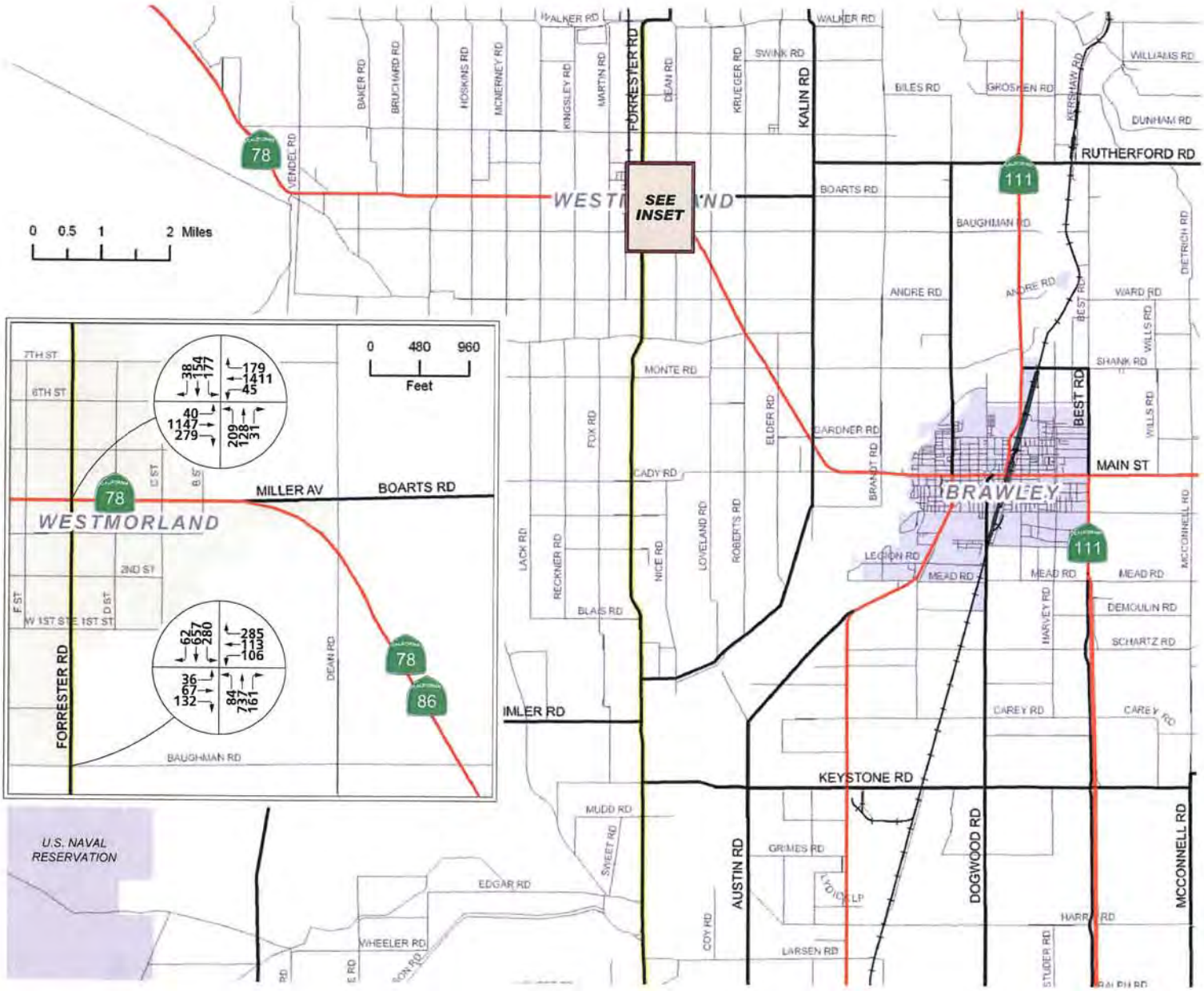

## LEGEND:

- = NUMBER OF VEHICLES TURNING RIGHT DURING THE PEAK HOUR
- = NUMBER OF VEHICLES GOING THROUGH DURING THE PEAK HOUR
- = NUMBER OF VEHICLES TURNING LEFT DURING THE PEAK HOUR

N

EXHIBIT 6-L

# LONG RANGE 2035 ALTERNATIVE 3 (WITH BAUGHMAN BYPASS) PM PEAK HOUR INTERSECTION VOLUMES (NORTH STUDY AREA)



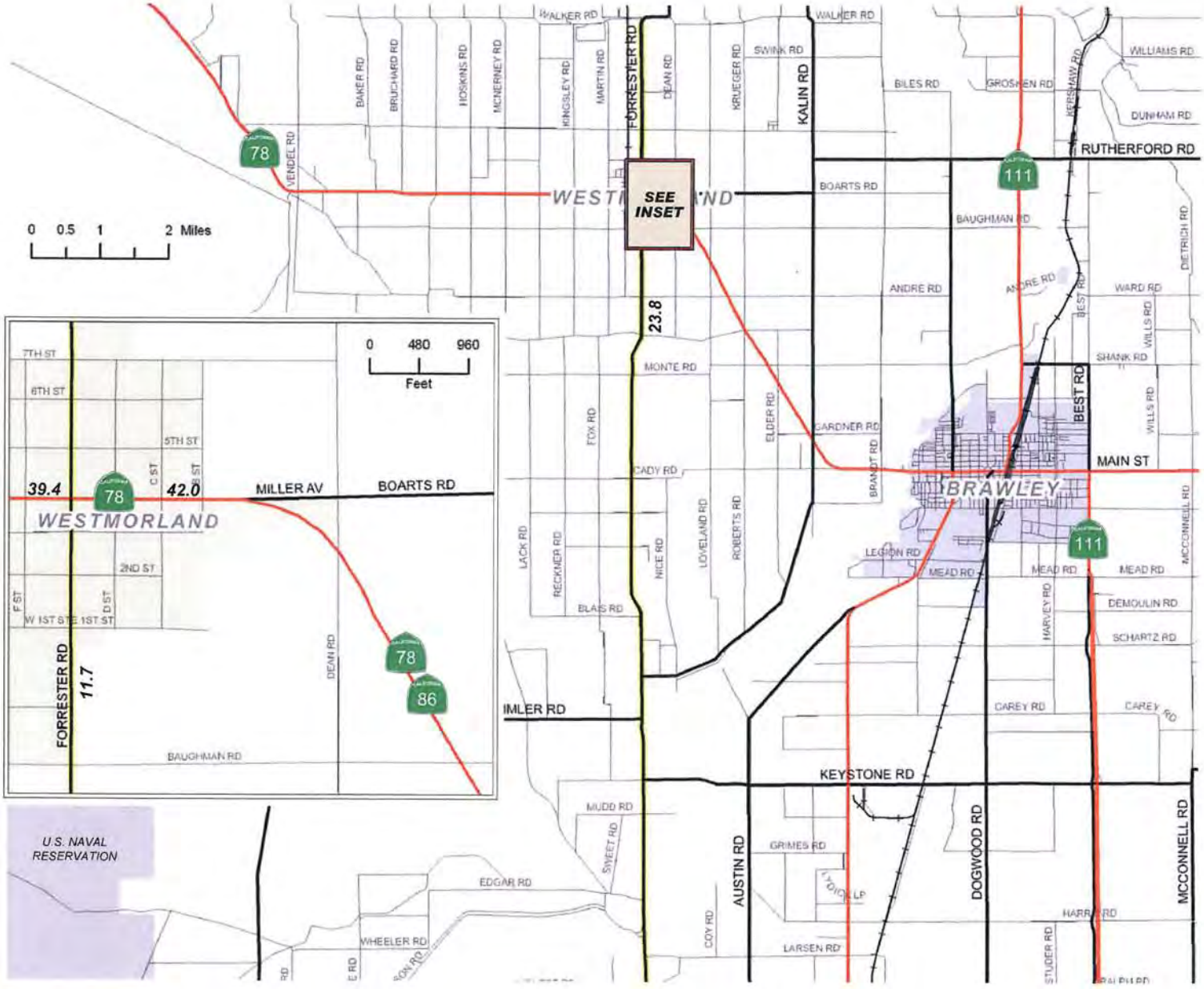

## LEGEND:

- = NUMBER OF VEHICLES TURNING RIGHT DURING THE PEAK HOUR
- = NUMBER OF VEHICLES GOING THROUGH DURING THE PEAK HOUR
- = NUMBER OF VEHICLES TURNING LEFT DURING THE PEAK HOUR

N

EXHIBIT 6-M

# LONG RANGE 2035 ALTERNATIVE 3 (WITH BAUGHMAN BYPASS) AVERAGE DAILY TRAFFIC (ADT) PCE (NORTH STUDY AREA)




## LEGEND:

*10.0* = VEHICLES PER DAY IN PASSENGER CAR EQUIVALENCE (1000'S)

**Alternative 3 Long Range (2035) Intersection Delay Analysis**

The intersection delay analysis results are summarized on Table 6-8 for long range (2035) Alternative 3 traffic conditions. The following study area intersections affected by the Eastern Bypass are anticipated to operate at an unacceptable level of service during the peak hours with existing lane geometry:

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)

For 2035 Alternative 3 traffic conditions, these study area intersections are projected to operate at acceptable levels of service during the peak hours with the installation of warranted traffic signals and recommended geometric improvements previously shown in Table 6-8.

Intersection delay analysis calculation worksheets for long range (2035) Alternative 3 traffic conditions are included in Appendix "R".

**Alternative 3: Long Range (2035) Roadway Segment Analysis**

Long range (2035) Alternative 3 average daily traffic (ADT) volume-to-capacity ratios are shown previously on Table 6-7. Table 6-7 indicates that the following roadway segments affected by the Westmorland Bypass are anticipated to operate with unacceptable volume-to-capacity ratios with current lane configurations:

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road

SR-78/86 (EW):

- East of Forrester Road

**TABLE 6-8**

**INTERSECTION ANALYSIS FOR LONG RANGE 2035 CONDITIONS ALTERNATIVE 3**

| INTERSECTION | TRAFFIC CONTROL[3] | INTERSECTION APPROACH LANES[1] | | | | | | | | | | | | DELAY[2] (SECS.) | | LEVEL OF SERVICE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NORTH-BOUND | | | SOUTH-BOUND | | | EAST-BOUND | | | WEST-BOUND | | | | | | |
| | | L | T | R | L | T | R | L | T | R | L | T | R | AM | PM | AM | PM |
| Forrester Road (NS) at: | | | | | | | | | | | | | | | | | |
| • SR-78/ SR-86 (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | AWS | 0.5 | 0.5 | 1 | 0.5 | 0.5 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | --[4] | --[4] | F | F |
| - with improvements | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 3 | 1 | 1 | 3 | 1 | 26.9 | 26.6 | C | C |
| • Baughman Road (EW) | | | | | | | | | | | | | | | | | |
| - without improvements | CSS | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | 0 | 1! | 0 | --[4] | --[4] | F | F |
| - with improvements | TS | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 24.5 | 27.2 | C | C |

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; 1! = Shared left, thru and right lane; 1> = Right Turn Overlap Phase, 1>> = Free Right Turn; 1 = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9 R3 (2007) and SYNCHRO, Version 7 (2007). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] CSS = Cross Street Stop
AWS = All Way Stop
TS = Traffic Signal

[4] Improvement at this intersection includes the construction of an accelaration lane for left turns into Forrester Road from the minor street.

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Recommended 2035 Alternative 3 link improvements are based on the required improvements to satisfy County of Imperial LOS and V/C standards. In addition, the *Imperial County 2007 Transportation Plan Highway Element* and the *Circulation and Scenic Highways Element* was considered for the 4 lane recommendation for Forrester Road under long range (2035) conditions.

The primary function of the Eastern Bypass is to redirect the industrial truck traffic travelling through the southern City limits of Westmorland. Compared to the Westmorland Bypass, this Bypass configuration is not anticipated to reduce traffic volumes along the SR-78/86 within the City of Westmorland, but accomplishes the primary function of reducing traffic volumes along Forrester Road, north of Baughman Road. Truck traffic travelling west towards Riverside County are diverted east on to Baughman Road to the SR-86 and travel west through the City of Westmorland. The truck travel patterns associated with the Eastern Bypass are somewhat circuitous as westbound trucks are diverted opposite direction of their intended destination via eastbound on Baughman and westbound on SR-78/86. In addition, safety issues regarding the Westmorland Elementary School located south of the SR-78/86 needs to be addressed before undergoing this project.

The proposed location of the Eastern Bypass requires the necessary right-of-way on the City of Westmorland's southern city limits. However, this Eastern Bypass configuration with only an eastern connection to the SR-86 will require fewer resources in comparison to the Westmorland bypass which consists of a western and eastern connection to the SR-78/86.

Additional Truck Bypass Considerations

The proposed truck bypass alternatives are anticipated to reduce truck traffic travelling through the City of Westmorland (via Forrester Road) by diverting truck traffic to the west and east of the City's southern region. As illustrated in Exhibit 6-N, traffic volumes along Forrester Road north of Baughman road are significantly reduced with the implementation of either of the proposed Bypass configurations. The intersection delay and LOS is compared in Table 6-9, which shows the delays and Level of service at the two Westmorland study

area locations: SR-78/86 / Forrester Road and Baughman Road/ Forrester Road. The comparison indicates that the intersection delays for Alternative 2 at the intersections of Forrester Road/ Baughman Road and Forrester Road/ SR-78/86 are lower than Alternative 3. The Westmorland Bypass diverts traffic volumes away from the City of Westmorland and reduces overall traffic at the two aforementioned intersections. Instead of diverting traffic away from these two intersections, the Eastern Bypass re-routes the northbound traffic away from the intersection of Forrester Road/ Baughman Road to travel east towards the SR-78/86.

The truck bypass alternatives are anticipated to address local concerns of traffic congestion and safety, and to minimize the degradation of pavement (compared to retaining the current configuration of this road segment). The pavement rehabilitation program outlined in the report should be undertaken to accommodate the future increase in traffic volumes. Appendix "S" contains the City of Westmorland's South Center Street Pavement Rehabilitation Report.

The image above taken at 1st Street/ Forrester Road illustrates the "rutting" of the roadway.

City of Westmorland residents are concerned with the economic visibility of some of the businesses affected by the truck diversion. Alternative 2 (Westmorland Bypass) diverts traffic away from the City of Westmorland subsequently reducing traffic volumes east and west of Forrester Road along the SR-78/86. Reduction in traffic volumes may affect local business located along the State Route within the City of Westmorland as the anticipated decrease in traffic reduces the opportunity of motorists "passing-by" to patronize.

6.8.4 Alternative 4: Silicon Border Port of Entry

A high technology industrial complex on the U.S/ Mexico border is currently under discussion. The Silicon Industrial Complex at Baja California could create 100,000 jobs in the Mexicali/ Imperial border region over the next 20 years. A new port of entry (P.O.E) west of Forrester Road at the U.S. – Mexico border has been proposed to accommodate the trade traffic generated by the high technology industrial complex. Exhibit 6-O indicates the location of the proposed P.O.E and industrial complex. The Silicon Border P.O.E will connect the industrial complex with Interstate 8. This connection will subsequently increase traffic volumes along the Interstate 8 freeway due to the termination of the proposed link at the Interstate 8 junction. This in turn will force trade traffic to travel east or west along I-8. It is anticipated that this will likely increase truck traffic along Forrester Road since it is the nearest north-south arterial connecting to SR-78/86. Unless a new north-south arterial is constructed, it is expected that truck traffic associated with the proposed P.O.E will utilize Forrester Road as a route for northern travel, subsequently increasing traffic volumes along Forrester Road.

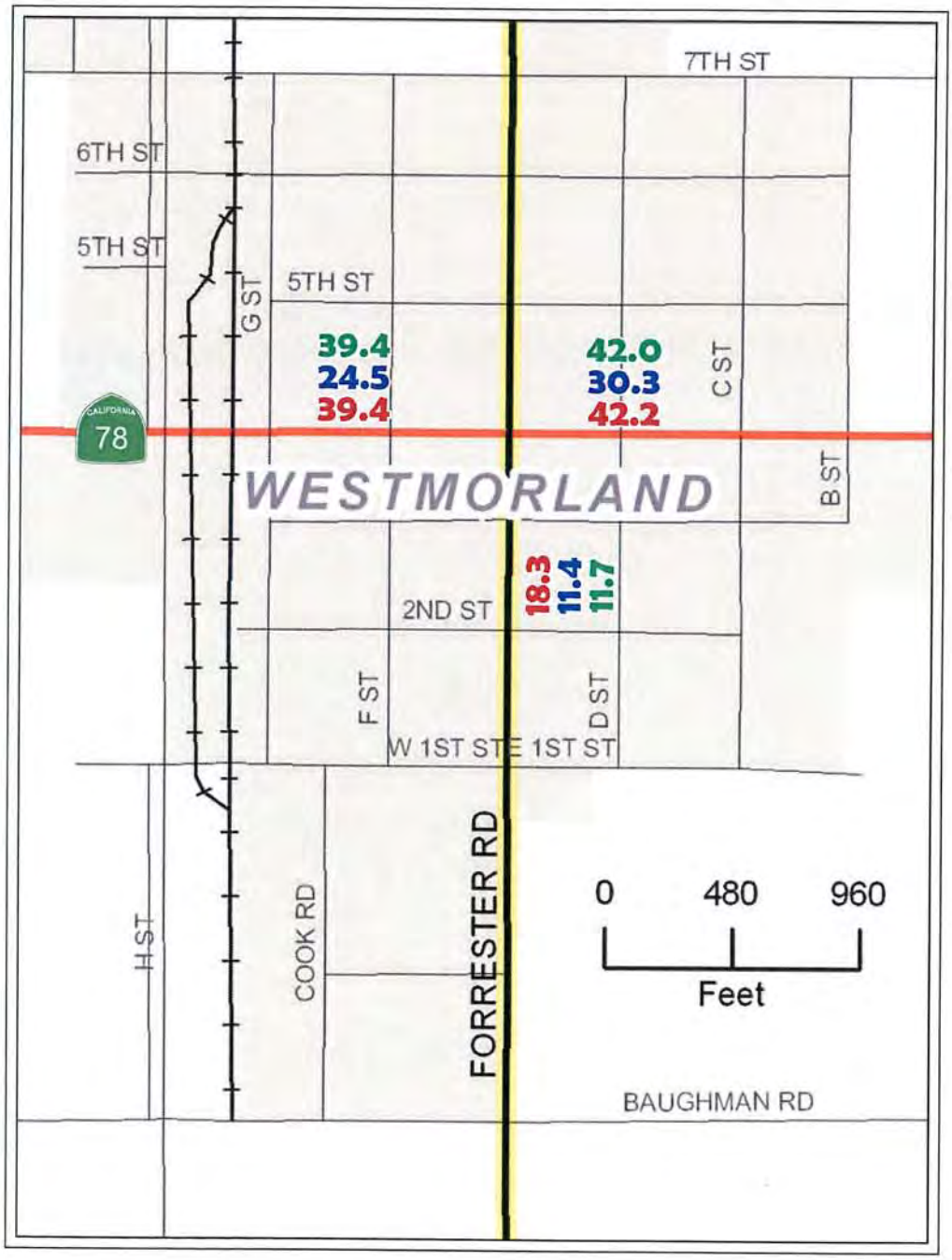
An option has been discussed to extend the proposed terminus of the new roadway between the P.O.E and at Interstate 8 to connect to SR-78/86. The construction of a new north-south roadway, west of Forrester Road will be met with major challenges including addressing logistical, topographical, and environmental issues. A north-south arterial west of Forrester Road requires support and coordination from various local, state and federal agencies. Since the Silicon Border P.O.E and the industrial complex is still under the

conceptual planning stages, a feasibility study as well as technical studies are required to determine the effects of the proposed project on Forrester Road and surrounding roadways. In addition, a technical study on the proposed roadway connection the Silicon Border P.O.E is required to determine lane configurations and connections to other arterials. This will guide the Imperial Valley region to possible mitigation measures to lessen the impacts of the proposed Silicon Border P.O.E.

Appendix "T" provides additional information regarding the Silicon Border project and the P.O.E.

EXHIBIT 6-N

# LONG RANGE 2035 AVERAGE DAILY TRAFFIC (ADT) TRUCK BYPASS ALTERNATIVE COMPARISON




**LEGEND:**

10.0 = VEHICLES PER DAY (1000'S)
X.X = LONG-RANGE 2035 WITHOUT TRUCK BYPASS
X.X = LONG-RANGE 2035 WITH WESTMORLAND BYPASS
X.X = LONG-RANGE 2035 WITH EASTERN BYPASS

N

TABLE 6-9

INTERSECTION ANALYSIS DELAY AND LOS COMPARISON FOR LONG RANGE 2035 CONDITIONS
ALTERNATIVE 2 AND ALTERNATIVE 3

| INTERSECTION | TRAFFIC CONTROL[3] | Without Truck Bypass | | | | Westmorland Bypass | | | | Eastern Bypass | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DELAY[2] (SECS.) | | LEVEL OF SERVICE | | DELAY[2] (SECS.) | | LEVEL OF SERVICE | | DELAY[2] (SECS.) | | LEVEL OF SERVICE | |
| | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| Forrester Road (NS) at: | | | | | | | | | | | | | |
| • SR-78/ SR-86 (EW) | | | | | | | | | | | | | |
| - without improvements | AWS | --[4] | --[4] | F | F | --[4] | --[4] | F | F | --[4] | --[4] | F | F |
| - with improvements [1] | **TS** | 28.3 | 28.7 | C | C | 25.6 | 25.4 | C | C | 26.9 | 26.6 | C | C |
| • Baughman Road (EW) | | | | | | | | | | | | | |
| - without improvements | CSS | --[4] | --[4] | F | F | --[4] | --[4] | F | F | --[4] | --[4] | F | F |
| - with improvements | **TS** | 25.1 | 21.4 | C | C | 21.5 | 21.0 | B | C | 24.5 | 27.2 | C | C |

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[1] Improvements based on the installation of a traffic signal and recommended geometric modifications.

L = Left; T = Through; R = Right; 1l = Shared left, thru and right lane, 1> = Right Turn Overlap Phase, 1>> = Free Right Turn; 1 = Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.9 R3 (2007) and SYNCHRO, Version 7 (2007). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] CSS = Cross Street Stop
AWS = All Way Stop
TS = Traffic Signal

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

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EXHIBIT 6-O

# PROPOSED SILICON BORDER P.O.E.


## SILICON BORDER POE

# 7.0 PUBLIC OUTREACH

Public outreach was conducted to solicit comments from the public on July 16 and July 17, 2008. A second public outreach is scheduled in February 2009. This section summarizes the comments received in the July 2008 public outreach meetings.

## 7.1 Public Outreach Meeting July 2008

During the initial stages of the Forrester Road Interregional Corridor Study, a public outreach was conducted on July 16, 2008 from 4:00 pm to 6:00 pm at the El Centro Administrative Center and July 17, 2008 from 4:00 pm to 6:00 pm at the City of Westmorland Council. The objective of the public outreach program is to solicit comments from the public regarding issues the local citizens want addressed in the study. The issues addressed in the study has taken into account the opinions and concerns of the general public, local City staff, County agencies and Caltrans.

The public outreach workshops elicited comments from residents in the nearby area and representatives neighboring city jurisdictions. Some of the comments and questions, concerns raised in the public outreach are addressed in Section 4 of this report or received an immediate response from the TRC during the workshop. Information regarding the Public Outreach Workshop, attendees and the comments from the public are provided in Appendix "D."

The following is a summary of the discussion items during the July 2008 public outreach:

- Recommend Turn Lanes/ Turnouts along Forrester Road.
- The development of Forrester Road should not wait for the completion of the Hwy.111 improvement project.
- Forrester Road for local and agricultural uses only.
- Forrester Road is not a local roadway, and is currently being used as a bypass.
- Installation of signage for tractors, especially for non-local driving.
- Acquisition of Right-of-way to expand Forrester Road.
- Truck Traffic: Passing Trucks and Passing Cars.
- Forrester Road as a Caltrans facility.
- Include California Highway Patrol accident data.

- Better transition on Forrester from Baughman Road to SR-78/86.
- Include Center Rehabilitation Report (City of Westmorland).
- Westmorland Truck Bypass and Eastern Bypass: Economic considerations for local businesses.

Appendix "D" provides the meeting minutes for July 2008 public outreach workshop.

# 8.0 COST ESTIMATES (COST OVERVIEW FOR DEVELOPMENT OPTIONS, COMPARISON OF VIABLE ALTERNATIVES, AND IMPLEMENTATION STRATEGY)

This section of the report outlines the rough order of magnitude (ROM) estimates for the improvements outlined in the short term (2015) scenario, long range (2035) scenario and the long range alternatives. The ROM estimates in this section are based on cost factors used in the IVAG's *Imperial County 2007 Transportation Plan Highway Element*.

## 8.1 Cost Estimation (Rough Order Magnitude)

The Forrester Road Interregional Corridor Study is a planning level review of transportation improvement needs, constraints, and cost analysis. Significant engineering and environmental constraints exist throughout the corridor that will influence cost of implementation which are beyond the scope of this effort. The *IVAG Imperial County 2007 Transportation Plan Highway Element* included a cost estimate of $440.3 million for the Forrester Road Corridor and $167.8 million for the Westmorland Bypass. Other transportation studies have been completed in the region, which can be used as a benchmark for cost estimation for this high level exercise.

In March 2008, IVAG published the *Imperial Valley Regional Transportation Impact Fee Study* that served as a feasibility study for select regional improvements. The authors utilized cost factors previously published and adopted by Western Riverside Council of Governments (WRCOG) in support of their Transportation Uniform Mitigation Fee (TUMF) program. The IVAG study used the 2005 TUMF cost factors with construction cost index adjustments to 2007. These factors are shown on Table 8-1.

## TABLE 8-1

| ROUGH ORDER MAGNITUDE COST FACTORS | | |
|---|---|---|
| **Code** | **Unit Cost** | **Description** |
| Terrain 1 | 640,000 | Construction cost per lane mile - level terrain |
| Terrain 2 | 990,000 | Construction cost per lane mile - rolling terrain |
| Terrain 3 | 1,340,000 | Construction cost per lane mile - mountainous terrain |
| Land Use 1 | 1,820,000 | ROW cost factor per lane mile - Urban areas (16 ft. lane allowance) |
| Land Use 2 | 850,000 | ROW cost factor per lane mile - Suburban areas (16 ft. lane allowance) |
| Land Use 3 | 485,000 | ROW cost factor per lane mile - Undeveloped areas (16 ft. lane allowance) |
| Interchange 1 | 46,500,000 | Complex new Interchange/Interchange modification total cost |
| Interchange 2 | 23,300,000 | New Interchange/Interchange modification total cost |
| Interchange 3 | 11,650,000 | Interchange improvement total cost |
| Interchange 4 | 2,330,000 | Minor interchange improvements cost (ramp widening & signalization, etc.) |
| Interchange 5 | 2,500,000 | TUMF to TUMF Intersection Grade Separation |
| Bridge 1 | 2,350 | Bridge total cost per lane per linear foot |
| Railroad Crossing 1 | 5,240,000 | New Rail Grade Crossing per lane |
| Railroad Crossing 2 | 2,620,000 | Existing Rail Grade Crossing per lane |
| Intersection Improvement | 350,000 | Improvements to an intersection where two TUMF roads intersect |
| Planning | 10% | Planning, preliminary engineering and environmental assessment |
| Engineering | 25% | Project study report, design, permitting and construction oversight |
| Contingency | 10% | Contingency costs |
| Environmental Mitigation | 5% | Regional Arterial Highway contribution to cumulative environmental mitigation |

Source: WRCOG 2005, URS Corp 2007, Imperial Valley Regional Transportation Impact Fee Study

Rough order of magnitude (ROM) cost factors, as used in this study, have limitations that are more accurately addressed through future focused engineering efforts. In particular, the cost factors used for right-of-way (ROW) are based upon Riverside County historical figures and industry input for that region. Applicability to Imperial County and the Forrester Road Corridor should be carefully reviewed to ensure reflection of the largely agricultural land uses. Additionally, the irrigation infrastructure in place within the corridor could require unique engineering and capital improvement strategies not captured in traditional roadway costing exercises. Interviews with Imperial Irrigation District (IID) personnel suggest that utility relocation costs could run as high as $4 million per centerline mile where intensive relocation is needed. IIDs experience on the recent Brawley Bypass serves as the basis for this estimate. This aggressive cost would not likely apply to the entire corridor and would focus on select locations. The cost factors used in for ROM estimates are presented in lane mile form. Where recommended improvements include widening to four lanes, approximately $900,000 per

centerline mile is used ($485,000/lane mile multiplied by two lanes). For segments widened to six lanes, this budget increases to $1.8 million per centerline mile plus contingency allowance. When combined with value engineering strategies during implementation and declining land values, these cost factors provide a realistic ROM assumption in today's market. Table 8-1 summarizes the ROM cost estimates for short term (2015) conditions, long range (2035) conditions, and other study area long range alternatives.

Rough order of magnitude cost calculations are provided in Appendix "U" for 2015 conditions, Appendix "V" 2035, and Appendix "W" for the Westmorland Bypass.

## 8.2 Forrester Road Corridor Short Term (2015) ($98 million)

Short term (2015) recommended improvements assumes a four lane arterial from State Route 78/86 in the City of Westmorland to south of Interstate 8 (W. McCabe Road). The ROM estimate does not assume a realignment of Forrester Road. In addition, improvement of the unpaved segment of Forrester Road, between W. McCabe Road and Nichols Road is not proposed. ROM magnitude cost factors produce an estimated cost of $96.8 million including planning, engineering, ROW for travel lanes and construction costs. Interchange improvements are anticipated at Interstate 8 and intersection improvements are anticipated throughout the corridor.

## 8.3 Forrester Road Corridor Long Range (2035) ($145 million to $152 million)

The Forrester Road Corridor connects SR-78/86 in the City of Westmorland to State Route 98 west of the City of Calexico. This 25-mile north-south corridor is generally aligned along an existing roadway with travel lanes ranging from four lanes (northern segment), six lanes (central segment) and two lanes (southern segment). ROM magnitude cost factors produce an estimated cost of $150-158 million including planning, engineering, ROW for travel lanes and construction costs. Interchange improvements are anticipated at Interstate 8 and intersection improvements are anticipated throughout the corridor. The cost range includes a scenario utilizing an unpaved segment of Forrester Road, between W. McCabe Road and Nichols Road.

Future planning efforts should consider, at a minimum, feasibility constraints that could affect cost, alignment decisions and regulatory challenges. The Forrester Road Corridor bisects downtown Westmorland. Increased traffic and a wider roadway will affect existing commercial and residential land uses. The region is characterized by substantial agricultural use with an extensive irrigation and drainage network adjacent to Forrester Road. The close proximity of

canals, drains and culverts may effect design, cost, and feasibility of potential road widening. Peak growing season is September 1 through November 30 and no disruptions to water delivery are permitted during this period. If relocation or enhancements are needed on any Imperial Irrigation District (IID) facilities, they would need to be appropriately coordinated and scheduled. Finally, any improvements that coincide with a state facility, such as SR-78/86, will require coordination and approval from Caltrans.

The ROM cost estimate is substantially lower than that shown in the *IVAG Imperial County 2007 Transportation Plan Highway Element* largely due to differences in basic implementation assumptions. Although the *IVAG Imperial County 2007 Transportation Plan Highway Element* assumes an ultimate six-lane prime arterial throughout the corridor for ultimate improvements, the *Forrester Road Interregional Corridor* feasibility study has identified capacity needs with a lower intensity. The recommended long range (2035) conditions along Forrester Road from SR-78/86 to Keystone Road is anticipated to satisfy the travel demand as a four lane arterial and as a six lane prime arterial south of Keystone Road to Interstate 8 eastbound ramps.

In addition, the *IVAG Imperial County 2007 Transportation Plan Highway Element* may have included freeway interchanges at SR-98 and SR-78/86as well as significant bridge facilities over New River in their ROM estimate.

The long range (2035) ROM cost estimate of $145 million to $152 million serve as foundation costs for Alternatives 1, 2, and 3 described in the following sections.

## 8.4 Alternative 1: Forrester Road as a Caltrans Facility ($158.6 million to $165.9 million)

The discussion in Section 6.0 of the report assumes the relinquishing of jurisdictional authority of Forrester Road from County of Imperial to Caltrans. In deriving the ROM cost estimate for this scenario, the additional right-of-way requirements to meet Caltrans standards have been calculated. As discussed previously regarding the Caltrans right-of-way standards, fixed minimum roadway widths are not specified because of "dimensions of cross-sectional elements [which] may require narrow widths." The park strip width from County of Imperial standards for a four lane and six lane prime arterial are utilized in the absence of a definitive sidewalk and landscape width in addition to Caltrans roadway standards of minimum lane widths, median and shoulder widths. Hence, Caltrans roadbed width plus County of Imperial's sidewalk and

landscape standards are utilized to estimate the required total right-of-way for Caltrans standards.

As mentioned in Section 6.0, an additional four feet of right-of-way is required for a four lane facility and an additional 10 feet of right-of-way is assumed for a six lane facility to estimate the ROM cost to satisfy Caltrans right-of-way standards. ROM magnitude cost factors produce an estimated additional cost of $13.5 million to meet Caltrans standards. This supplemental cost combined with the long range (2035) foundation costs result in a total ROM cost of $158.6 million to $165.9 million as shown on Table 8-2. It should be noted that these cost estimates are based upon typical road materials. Caltrans standards for a state highway could be substantially different.

8.5 Alternative 2: Westmorland Bypass ($248.1 million to $255.4 million)

The Westmorland Bypass is a standalone corridor as shown previously on Exhibit 6-F. This alternative will reduce traffic through the City of Westmorland by providing a new four-lane expressway along Andre Road and Kingsley (Griswald Road). ROM magnitude cost factors produce an estimated cost of $103 million including planning, engineering, ROW for travel lanes and construction costs. New interchanges are also included at SR-78/Andre and SR-78/Kingsley.

The Westmorland Bypass is characterized by substantial interaction with the existing SR-78/86. The proposal introduces engineering and procedural challenges that require close coordination with Caltrans. This alignment essentially "realigns" the state highway to circumvent a populated area and avoid traffic delays through downtown Westmorland which are currently experience by regional traffic. Connectivity to existing local roads, through at grade intersections or grade-separated interchanges will need to be carefully considered. The irrigation channel along Kingsley Road will need to be accommodated in the final alignment.

As previously mentioned in Section 6.0, the implementation of the Westmorland Bypass as proposed would supplement rather than replace the Forrester Road Corridor. This alternate connection has a ROM cost $103 million as shown on Table 8-1. The combined cost of this alternative is $248.1 million to $255.4 million. The ROM costs for the Westmorland Bypass segment are significantly lower than those shown in the *IVAG Imperial County 2007 Transportation Plan Highway Element.* Since the same cost factors are being applied to a

relatively short segment of road, the likely difference is in interchange configuration assumptions. The Feasibility study assumes that a "new interchange/interchange modification" should be used. The *IVAG Imperial County 2007 Transportation Plan Highway Element* may have used the cost factors for a "complex new interchange" as described on Figure 8-1. This cost category has historically been applied where major ROW constraints exist or where substantial structural improvements are needed. The current land uses, level topography and moderate traffic volumes suggest that the lower cost factor may be more appropriate. One critical constraint noted above is that the conceptual alignment assumes the northern connection to SR-78 via Kingsley Road. If not already authorized the process to establish a new connection to a state highway is lengthy.

8.6 Alternative 3: Eastern Bypass ($188.4 million to $188.7 million)

The Eastern Bypass design variation diverts around downtown Westmorland as shown on Exhibit 6-J. Baughman Road is an existing two-lane road. The primary difference in cost for this variation compared to the foundation cost for Forrester Road is the inclusion of a new interchange at SR-78/Baughman. This design variation adds approximately $36.3 million to the base cost of Forrester Road. Total ROM cost for this alternative is $188.4 million to $188.7 million including planning, engineering, ROW for travel lanes and construction costs as shown on Table 8-2. The cost range includes a scenario utilizing an unpaved segment of Forrester Road, between W. McCabe Road and Nichols Road.

The Eastern Bypass uses Baughman Road as a connection point for Forrester Road and SR-78/86. Connection to the state route will require either a new grade-separated interchange or direct connector to enable smooth transition between facilities.

## TABLE 8-2

| PROJECT COST ESTIMATES (ROM) in 2007 Dollars | | | | | | | |
|---|---|---|---|---|---|---|---|
| PROJECT | Construction | ROW | Planning | Engineering | Contingency | Mitigation | Total |
| **Intersection Signalization** | | | | | | | |
| Nine locations [1] | | | | | | | 3,150,000 |
| **Forrester Road Corridor Near Term 2015** | | | | | | | |
| Alt. A (Lyons) [2] | 50,465,000 | 20,297,000 | 5,046,000 | 12,616,000 | 7,076,000 | 2,523,000 | 98,023,000 |
| Alt. B (Brockman) [3] | 50,465,000 | 20,297,000 | 5,046,000 | 12,616,000 | 7,076,000 | 2,523,000 | 98,023,000 |
| **Forrester Road Corridor Long Range 2035** [4] | | | | | | | |
| Alt. A (Lyons) [2] | 78,164,000 | 31,922,000 | 7,816,000 | 19,541,000 | 11,009,000 | 3,908,000 | 152,360,000 |
| Alt. B (Brockman) [3] | 75,070,000 | 29,577,000 | 7,507,000 | 18,767,000 | 10,465,000 | 3,753,000 | 145,139,000 |
| **Alternative 1: Forrester Road as a Caltrans Facility ($158.6 million to $165.9 million)** | | | | | | | |
| As Caltrans Facility [5] | 6,069,000 | 4,024,000 | 607,000 | 1,517,000 | 1,009,000 | 303,000 | 13,529,000 |
| Alt. A (Lyons) [3] | 84,233,000 | 35,946,000 | 8,423,000 | 21,058,000 | 12,018,000 | 4,212,000 | 165,890,000 |
| Alt. B (Brockman) [4] | 81,139,000 | 33,601,000 | 8,114,000 | 20,285,000 | 11,474,000 | 4,057,000 | 158,670,000 |
| **Alternative 2: Westmorland Bypass ($248.1 million to $255.4 million)** | | | | | | | |
| Westmorland Bypass | 56,000,000 | 17,000,000 | 6,000,000 | 14,000,000 | 7,000,000 | 3,000,000 | 103,000,000 |
| Alt. A (Lyons) [3] | 78,164,000 | 31,922,000 | 7,816,000 | 19,541,000 | 11,009,000 | 3,908,000 | 152,360,000 |
| Alt. B (Brockman) [4] | 75,070,000 | 29,577,000 | 7,507,000 | 18,767,000 | 10,465,000 | 3,753,000 | 145,139,000 |
| **Alternative 3: Eastern Bypass [6] ($181.4 million to $188.7 million)** | | | | | | | |
| Eastern Bypass [7] | 23,593,000 | 834,000 | 2,360,000 | 5,898,000 | 2,442,000 | 1,180,000 | 36,307,000 |
| Alt. A (Lyons) [3] | 101,757,000 | 32,756,000 | 10,176,000 | 25,439,000 | 13,451,000 | 5,088,000 | 188,667,000 |
| Alt. B (Brockman) [4] | 98,663,000 | 30,411,000 | 9,866,000 | 24,666,000 | 12,907,000 | 4,933,000 | 181,446,000 |

[1] Intersection ROM cost of $350,000 per location to cover signal installation and minor capital improvements

[2] Alternative A traverses New River at Lyons Road via Nichols Road

[3] Alternative B traverses New River at Brockman Road via W. McCabe Road

[4] Forrester Road Corridor does not include an interchange at SR-78/SR-86

[5] Cost differential shown is for additional ROW and Pavement needed to meet Caltrans Standard Cross-section

[6] Eastern Bypass assumes a new interchange at Baughman Road and SR-78/SR-86

[7] Cost shown is differential compared to non-Eastern Bypass scenario. Actual segment cost is $39.2 million.

# 9.0 IDENTIFY FINANCIAL ASSUMPTIONS, FUNDING AND TRANSPORTATION TRENDS, FUNDING REVENUES AND FUNDING SOURCES TO INCLUDE PRIVATE FUNDING SOURCES

This section of the report explores funding sources and strategies that may be considered for implementation of Forrester Road corridor improvements. Funding projections for long-term discretionary projects such as Forrester Road are subject to a wide variety of influences and cannot be relied upon for programming purposes. The following discussion provides a strategic framework for future consideration.

## 9.1 Funding Sources, Types and Limitations

Transportation funding is derived from a variety of local, state and federal sources and is further categorized by discretionary and non-discretionary uses. The Imperial County 2007 Transportation Plan Highway Element study provides a detailed inventory of transportation funding sources that are commonly used for a comprehensive mobility program. Many of these sources, however, are geared toward transit, maintenance, and other activities not directly relevant to a capital improvement project such as Forrester Road. This feasibility study focuses upon those sources that could potentially be considered in the future.

*Local*

General fund, transportation sales tax measure, development impact fees and developer exactions are common forms of local funding sources. General funds are derived from property taxes and retail sales taxes. Although they can be used for transportation improvements, general fund investment in roadway improvements is typically limited to match funding for competitive regional, state and federal sources. In Imperial County, Measure D provides for a one-half percent sales tax devoted to operations and maintenance improvements. Development Impact Fee (DIF) programs are in place in several jurisdictions. These programs have specific improvements established through a Nexus study. Development mitigation through project entitlement is a common approach to roadway improvements.

*State*

Gas tax subventions, Proposition 42, Proposition 1B Bonds, State Transportation Improvement Program (STIP) derived from gas taxes, Traffic Congestion Relief Plan (TCRP), and State Highway Operations and Protection Plan (SHOPP) are derived from gas tax, sales tax on fuel and other state revenues. Gas tax subventions and Proposition 42 proceeds are distributed to local jurisdictions on a formula basis. Proposition 1B Bond proceeds, STIP, and TCRP funds are managed by state and regional agencies. SHOPP is a Caltrans program for maintaining and improving state highways.

*Federal*

Congestion Mitigation and Air Quality (CMAQ), Regional Surface Transportation Program (RSTP), Highway Bridge Replacement and Rehabilitation Program (HBRR), and project specific earmarks are examples of federal programs. Funding is derived from a combination of federal excise taxes and appropriations at the federal level through transportation legislation. CMAQ is typically geared toward non-capacity enhancements such as transit and carpool lanes aimed at vehicle emissions. RSTP is available through federal and regional agencies for specific projects. HBRR is devoted to improving specific deficient bridge structures.

## 9.2 Economic Uncertainties

Transportation programming is managed on near and long range basis. At the regional level, SCAG develops a 30-year Regional Transportation Plan (RTP) which considers all transportation funding sources, sub-area mobility needs and other factors to develop a constrained budget and slate of candidate projects. Revenue forecasts by SCAG are included in Appendix "X" for reference but should not be used for planning at the feasibility level due to its current instability. The RTP is fed by the Regional Transportation Improvement Program, a programming document that identifies specific projects planned for the next six years. Local jurisdictions utilize a multi-year Capital Improvement Plan (CIP) that follows a similar time horizon for short term projects.

The economic picture in the United States, California and the region is experiencing unprecedented pressures. Financial projections once thought conservative are being reconsidered for further reduction. At the federal level, talks of substantial infrastructure investment could position certain projects for implementation. However, these "stimulus" programs are short term and are focused upon shelf ready projects, those with environmental

clearances, approvals and substantial engineering completed. This acceleration of transportation investment will be possible only with future investment tradeoffs. State revenues for transportation have historically been redirected for other critical general fund purposes and should not be relied upon for short term (2015) needs.

Local revenue sources are similarly diminishing and creative approaches will be needed to adequately address the challenges ahead. Despite the tight economic climate facing the region today, growth through development and commerce will continue to occur and a deliberate and thoughtful plan will be needed to address future needs.

## 9.3 Potential Future Funding Sources

Major corridor improvement projects are implemented either in small segments or through focused investment. The segmentation approach is most successful when multiple stakeholders take on portions of construction either through public or private investment. The corridor approach for a project with an estimated cost of $98 million to $255.4 million, such as Forrester Road, most often relies upon a series of state, federal and local investment actions to create the funding mass needed to move the project through the planning process and into implementation.

Short term (2015) capacity needs identified in the feasibility study present unique challenges. Improvements needed by 2015 to meet projected growth have a rough order magnitude cost of $98.0 million. This improvement phase covers approximately 20 miles. Environmental clearance focused engineering studies and right of way acquisition will be a multi-year process. Existing capital resources could be developed for planning purposes if the corridor is determined to be a high priority. New funding opportunities could be explored to address construction of Forrester Road and other regionally significant facilities.

Regional impact fees, assessment districts, toll road and other funding mechanisms have been used successfully in other regions to deliver important infrastructure improvements and could be considered for Forrester Road. Additional study would be required to evaluate the most effective methods.

*Regional Impact Fees*

Keeping pace with growth over a broad area is beyond the capability of a single jurisdiction. Coordinated planning and resource management is needed to ensure cumulative impacts of development are addressed in an equitable manner and timely basis. Regional Impact Fee programs, such as the Transportation Uniform Mitigation Fee (TUMF) in Riverside County and the Foothill Circulation Phasing Plan (FCPP) in Orange County are two examples of successful programs that have helped fund and deliver critical roadway improvements. The programs require a Nexus Study and adherence to state law before they can be implemented. Stakeholder involvement early in the process is needed to identify potential projects, realistic revenue projections, and appropriate governance.

*Assessment Districts*

Land secured financing such as Community Facilities Districts (CFD) and Assessment Districts (AD) are common tools for addressing specific capital improvements. Use of CFDs and ADs are generally limited to a small area immediately adjacent to planned improvements. Funding is derived through bond proceeds with the debt assigned to individual property owners. These tools have limited applicability as they require consent of the landowner. Interchanges, bridges, and short road segments are good candidates for this type of funding.

*Toll Roads*

Orange County and San Diego County have successful toll road programs in place. Riverside County is currently pursuing two toll road projects. Toll roads are effective where high traffic volumes are projected, a travel time savings is evident and potential users are willing to pay for opportunity to use the new route. Revenues generated through tolls are used to pay off bond debt incurred in the delivery of the corridor. Toll roads are often unpopular among local residents and should be cautiously considered. A business case for this potential funding source is likely to be difficult to substantiate.

## 9.4 Overall Funding Strategy

The magnitude of the Forrester Road suggests that a comprehensive approach will be needed. Each of the existing funding sources described in this chapter should be considered for various project components. In addition, the Scenic Highway designation may be leveraged in future demonstration project funding opportunities.

Careful consideration will be required for specific elements of the overall project. Stakeholder input will be critical to address key policy issues. Are other corridors, such as SR-78 more likely to attract funding and facilitate travel? Can meaningful areas of benefit be developed for a fee Nexus study? Is there sufficient demand to utilize a toll road? Is the Westmorland Bypass a regional imperative or local preference? Is Forrester Road growth inducing or simply improving mobility for anticipated future needs?

# 10.0 CONCLUSION

The primary goal of the Forrester Road Interregional Corridor Study is to evaluate the transportation demands and resulting infrastructure needs required to serve existing and future needs for regional, interregional, and international travel within Forrester Road between Interstate 8 and SR-78/86. The findings of the study identify the required improvements needed to facilitate commercial and commuter traffic in Imperial County.

Existing Intersection Delay Analysis

Existing peak hour traffic operations are evaluated for the eleven study area intersections. Based on the existing peak hour (P.C.E) volumes and existing intersection lane configuration, the results of this analysis are summarized in Table 5-1. For existing traffic conditions, the study area intersections are currently operating at acceptable levels of service during the peak hours.

Existing Roadway Segment Analysis

Based on the County of Imperial's *Circulation and Scenic Highway Element (2006)*, Level of Service "C" capacity is considered as the acceptable capacity threshold for all County roadway segments.

The study area roadways are analyzed with existing lane configurations and ADT volumes. ADT volume-to-capacity ratios are shown on Table 5-2. Table 5-2 indicates that the following study area roadways are currently operating at an unacceptable level of service:

Forrester Road (NS) between:

- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road
- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8

Short Term (2015) Intersection Delay Analysis

The intersection delay analysis results for short term (2015) traffic conditions are summarized on Table 5-6. For short term (2015) traffic conditions, the following study area intersections are anticipated to operate at an unacceptable level of service during the peak hours with existing lane geometry:

Forrester Road (NS) at:

- SR-78/86(EW)
- Baughman Road (EW)
- Cady Road (EW)
- Imler Road (EW)
- Keystone Road (EW)
- Worthington Road (EW)
- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

For short term (2015) traffic conditions, the study area intersections are projected to operate at acceptable levels of service during the peak hours with the recommended improvements listed in Table 6-1.

For the intersection of Imler Road and Forrester Road, the intersection does not meet planning level warrants for short term (2015) conditions. Improvements to address the LOS deficiencies include the construction of a two-way left turn lane. This improvement will provide a sanctuary and an acceleration lane for motorist travelling northbound to Forrester Road from Imler Road.

Traffic Signal Warrant Analysis for Short Term (2015) Conditions

For short term (2015) traffic conditions, traffic signals are anticipated to be warranted at the following study area intersections (see Appendix "C"):

Forrester Road (NS) at:

- SR-78/86(EW)
- Baughman Road (EW)
- Cady Road (EW)

- Worthington Road (EW)
- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

Short Term (2015) Roadway Segment Analysis

The study area roadways are analyzed with Year 2015 ADT volumes with existing lane configurations. Year 2015 (ADT) volume-to-capacity ratios are shown on Table 5-7. Table 5-7 indicates that the following roadway segments are anticipated to operate with unacceptable volume-to-capacity ratios:

Forrester Road (NS) between:

- SR-78/86and Baughman Road
- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road
- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8

Keystone Road (EW) between:

- Forrester Road and Austin Road

For short term (2015) traffic conditions, the study area road segments are projected to operate at acceptable levels of service during the peak hours with the recommended improvements listed in Table 6-2. It is anticipated that 4 lanes along Forrester Road (2 lanes in each direction) can accommodate short term (2015) traffic volumes.

However, the road segment at Forrester Road between Ross Road and Interstate 8 is anticipated to exceed capacity with the recommended four lane improvement. If the adjacent intersections are improved to achieve an acceptable level of service, the improvement at this location are anticipated to allow the roadway segment to flow at acceptable conditions since the adjacent intersections reflect constriction points for the road segment. As previously discussed in the intersection analysis, the intersections of

Forrester Road/ Ross Road and Forrester Road/ Interstate 8 westbound ramps are anticipated to operate at LOS "C" or better with the installation of the warranted traffic signals and geometric modifications.

Long Range (2035) Intersection Delay Analysis

The intersection delay analysis results are summarized on Table 5-8 for long range (2035) traffic conditions. The following study area intersections are anticipated to operate at an unacceptable level of service during the peak hours with existing lane geometry:

Forrester Road (NS) at:

- SR-78/86(EW)
- Baughman Road (EW)
- Cady Road (EW)
- Imler Road (EW)
- Keystone Road (EW)
- Worthington Road (EW)
- Evan Hewes Highway (EW)
- Ross Road (EW)
- Interstate 8 WB Ramps (EW)
- Interstate 8 EB Ramps (EW)

For long range (2035) traffic conditions, the study area intersections are projected to operate at acceptable levels of service during the peak hours with the recommended improvements listed in Table 6-3.

For the intersection of Imler Road and Forrester Road, the intersection does not meet planning level warrants for long range (2035) conditions. An improvement to address the LOS deficiencies includes the construction of a two-way left turn lane. This improvement will provide a sanctuary and an acceleration lane for motorist travelling northbound to Forrester Road from Imler Road.

Long Range (2035) Roadway Segment Analysis

Long range (2035) average daily traffic (ADT) volume-to-capacity ratios are shown on Table 5-9. For long range (2035) conditions, the following roadway segments are anticipated to operate with unacceptable volume-to-capacity ratios with existing lane configurations.

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road
- Between Cady Road and Carter Road
- Imler Road and Keystone Road
- Keystone Road and Worthington Road
- Worthington Road and Evan Hewes Highway
- Evan Hewes Highway and Ross Road
- Ross Road and Interstate 8 WB Ramp
- Interstate 8 WB Ramp and Interstate 8 EB Ramp
- South of Interstate 8 EB Ramp

Keystone Road (EW) between:

- Forrester Road and Austin Road

SR-78/86 (EW):

- West of Forrester Road

Long range (2035) improvements are based on the required improvements to satisfy County of Imperial LOS and V/C standards. The general recommended improvement for Forrester Road indicates the widening of the roadway to accommodate long range (2035) traffic volumes to a 4 lane facility from SR-78/86 to Keystone Road and 6 lanes south of Keystone Road to the I-8 ramps. South of the Interstate 8 eastbound ramps to McCabe Road, Forrester Road is recommended to be widened to four lanes.

Long Range Alternatives

Aside from the long range analysis previously discussed, four long range alternatives are considered in this analysis:

- Alternative 1: Forrester Road as a Caltrans Facility
- Alternative 2: Forrester Road with the Westmorland Bypass
- Alternative 3: Forrester Road with the Eastern Bypass
- Alternative 4: Silicon Border Port of Entry

Alternative 1: Forrester Road as a Caltrans Facility

Forrester Road is currently under the jurisdiction of Imperial County. A future alternative scenario for Forrester Road is the transfer of jurisdictional authority of Forrester Road to Caltrans. This alternative was analyzed by a comparison of the required right-of-way requirements for Imperial County and Caltrans.

The total right-of way required by the County of Imperial for a 4 lane minor arterial is 102 feet and a total of 106 feet to satisfy Caltrans standards. For a 6 lane facility, it is anticipated that an additional 10 feet of right-of-way must be acquired. The total right-of way required by the County of Imperial for a 6 lane prime arterial is 126 feet and a total of 136 feet of right-of-way is required to satisfy Caltrans standards. ROM magnitude cost factors produce an estimated additional cost of $13.5 million to meet Caltrans standards. This supplemental cost combined with the long range (2035) foundation costs result in a total ROM cost of $156.9-164.1 million

Alternative 2: Westmorland Bypass

The *Imperial County 2007 Transportation Plan Highway Element* has recognized this project as a mid-term project (2015-2025) with an estimated project expenditure of $167.8 million. The Westmorland Bypass is anticipated to divert truck traffic away from the City of Westmorland which will reduce traffic volumes along Forrester Road between the SR-78/86 and the SR-78 within the City of Westmorland's City limits. For Alternative 2, a proposed Truck Bypass, south of the City of Westmorland in Imperial County is analyzed. To accommodate future 2035 traffic volumes, Andre Road is proposed to connect with the SR-78/86 via Kingsley Road, west of the City of Westmorland and re-connects to the SR-78/86, southeast of the City of Westmorland. Added traffic volumes on Andre Road due to the truck bypass route require that the capacity of the existing Andre Road is enhanced to adequately facilitate the projected travel demand.

Alternative 2 Long Range (2035) Intersection Delay Analysis

The intersection delay analysis results are summarized on Table 6-6 for long range (2035) Alternative 2 traffic conditions. For long range (2035) Alternative 2 traffic conditions, the following study area intersections affected by the Westmorland Bypass are anticipated to operate at an unacceptable level of service during the peak hours with existing lane geometry:

Forrester Road (NS) at:

- SR-78/86 (EW)
- Baughman Road (EW)

For long range (2035) Alternative 2 traffic conditions, the study area intersections are projected to operate at acceptable levels of service during the peak hours with the installation of warranted traffic signals and recommended geometric improvements listed in Table 6-6.

Alternative 2 Long Range (2035) Roadway Segment Analysis

Long range (2035) Alternative 2 average daily traffic (ADT) volume-to-capacity ratios are shown on Table 6-7. Table 6-7 indicates that the following roadway segments affected by the Westmorland Bypass are anticipated to operate with unacceptable volume-to-capacity ratios with the current lane configurations:

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road

Long range (2035) Alternative 2 improvements are based on the required improvements to satisfy County of Imperial LOS and V/C standards. It is anticipated that a 4 lane facility between SR-78/86and Keystone Road will accommodate the projected long range (2035) traffic volumes.

The primary function of the Westmorland Bypass is to reduce the industrial truck traffic travelling through the southern City limits of Westmorland. This Bypass configuration will also reduce traffic along the SR-78/86 within the City of Westmorland.

Alternative 3: Eastern Bypass at Baughman Road

For Alternative 3 long range scenario, a proposed Truck Bypass, at the southern city limits of the City of Westmorland is analyzed as an alternative to the previously mentioned long range scenario without a truck bypass. Similar to the objectives of the Westmorland Bypass, the proposed Eastern Bypass anticipates alleviating truck traffic traveling through the City of Westmorland via Forrester Road and along SR-78/86 within the Westmorland City limits. The Eastern Bypass is proposed to intersect at Forrester Road/ Baughman Road and extend to SR-78/86 to the east.

Alternative 3 Long Range (2035) Intersection Delay Analysis

The intersection delay analysis results are summarized on Table 6-8 for long range (2035) Alternative 3 traffic conditions. For long range (2035) Alternative 3 traffic conditions, the following study area

intersections affected by the Eastern Bypass are anticipated to operate at an unacceptable level of service during the peak hours with existing lane geometry:

Forrester Road (NS) at:

- SR-78/86(EW)
- Baughman Road (EW)

For long range (2035) Alternative 3 traffic conditions, the study area intersections are projected to operate at acceptable levels of service during the peak hours with the installation of warranted traffic signals and recommended geometric improvements listed in Table 6-8.

Alternative 3: Long Range (2035) Roadway Segment Analysis

Long range (2035) Alternative 3 average daily traffic (ADT) volume-to-capacity ratios are shown previously on Table 6-7. Table 6-7 indicates that the following roadway segments affected by the Westmorland Bypass are anticipated to operate with unacceptable volume-to-capacity ratios with the current lane configurations:

Forrester Road (NS) between:

- SR-78/86 and Baughman Road
- Between Baughman Road and Cady Road

SR-78/86 (EW):

- East of Forrester Road

Long range (2035) Alternative 3 improvements are based on the required improvements to satisfy County of Imperial LOS and V/C standards. It is anticipated that a 4 lane facility between SR-78/86 and Keystone Road will accommodate the projected long range (2035) traffic volumes.

The primary function of the Eastern Bypass is to reduce the industrial truck traffic travelling through the southern City limits of Westmorland. Compared to the Westmorland Bypass, this Bypass configuration is not anticipated to reduce traffic volumes along the SR-78/86 within the City of Westmorland, but accomplishes the primary function of reducing traffic volumes along Forrester Road, north of Baughman Road. Truck traffic travelling west towards Riverside County are diverted east on to Baughman Road to the SR-86 and travel west through the City of Westmorland. The truck travel patterns associated with the Eastern Bypass are circuitous as westbound trucks are diverted in the

opposite direction of their intended destination (via eastbound on Baughman and westbound on SR-78/86).

The proposed location of the Eastern Bypass requires the necessary right-of-way on the City of Westmorland's southern city limits. However, this configuration will require fewer resources as the Eastern Bypass requires only an eastern connection to the SR-86 as opposed to a western and eastern connection to SR-78/86 as proposed by the Westmorland Bypass (Alternative 2).

Truck Bypass Alternatives

The proposed truck bypass alternatives are anticipated to reduce truck traffic travelling through the City of Westmorland by diverting truck traffic to the west and east of the City's southern region. Traffic volumes along Forrester Road north of Baughman road are significantly reduced with the implementation of either of the proposed Bypass configuration. The intersection delay and LOS is compared in Table 6-9, which compares the delay and Level of service at the two Westmorland study area locations: SR-78/86 / Forrester Road and Baughman Road/ Forrester Road. The comparison indicates that the intersection delay for Alternative 2 at the intersections of Forrester Road/ Baughman Road and Forrester Road/ SR-78/86 is lower compared to Alternative 3. The Westmorland Bypass diverts traffic volumes away from the City of Westmorland and reduces overall traffic at the two aforementioned intersections. As opposed to diverting traffic away from these two intersections, the Eastern Bypass re-routes the northbound traffic away from the intersection of Forrester Road/ Baughman Road to travel east towards the SR-78/86.

The truck bypass alternatives are anticipated to address local concerns of traffic congestion, safety and minimize the degradation of the pavement compared to retaining the current configuration of this road segment. The pavement rehabilitation program outlined in the report should be undertaken to accommodate the future increase in traffic volumes. Appendix "S" contains the City of Westmorland's South Center Street Pavement Rehabilitation Report.

City of Westmorland residents are concerned with the economic visibility of some of the businesses affected by the truck diversion. Implementing Alternative 2 (Westmorland Bypass) diverts away from the City of Westmorland subsequently reducing traffic volumes east and west of Forrester Road along the SR-78/86. Reduction in traffic volumes may affect local business located along the State Route within the City of Westmorland as the anticipated decrease in traffic reduces the opportunity of motorists "passing-by" to patronize.

Alternative 4: Silicon Border Port of Entry

A high technology industrial complex on the U.S/ Mexico border is currently under discussion. The Silicon Industrial Complex at Baja California could create 100,000 jobs in the Mexicali/ Imperial border region over the next 20 years. A proposed port of entry (P.O.E) west of Forrester Road at the U.S. – Mexico border has been proposed to accommodate the trade traffic generated by the high technology industrial complex. The Silicon Border P.O.E will connect the industrial complex with Interstate 8. This connection will subsequently increase traffic volumes along the Interstate 8 freeway due to the termination of the proposed link at the Interstate 8 junction, which forces trade traffic to travel east or west. This will exacerbate traffic conditions to nearby north-south arterials for truck traffic travelling north because of the shorter route associated with the SR-86 to reach northern locations as opposed to travelling west on Interstate 8 and travel north via Interstate 5. It is anticipated that an increase in truck traffic along Forrester Road is possible since it is the nearest north-south arterial connecting to the SR-86. Unless a new north-south arterial is constructed, truck traffic associated with the proposed P.O.E will utilize Forrester Road as a route for northern travel, subsequently increasing traffic volumes along Forrester Road.

Discussion

For short term (2015) conditions, analysis results indicate that the study area intersections and roadway segments are anticipated to operate at an acceptable level of service with the recommended improvements and the widening of Forrester Road as a four lane arterial from SR-78/86 to south of Interstate 8 ramps. The implementation of the recommended improvements is anticipated to produce a ROM cost factors of $96.8 million including planning, engineering, ROW for travel lanes and construction costs.

For long range (2035) conditions, it is anticipated that the study area intersections and road segments will operate at an acceptable level of service with the recommended improvements and the widening of the facility to a four lane arterial SR-78/86 to Keystone Road for long range and as a six lane prime arterial from Keystone Road to south of the Interstate 8 eastbound ramps. It is anticipated that the road segments south of McCabe Road is anticipated to operate at an acceptable capacity as a four lane arterial for long range (2035) conditions. The implementation of the recommended improvements is anticipated to produce a ROM cost of $150-158 million including planning, engineering, ROW for travel lanes and construction costs.

Rough order of Magnitude costs of transferring jurisdictional control of Forrester Road to Caltrans for long range (2035) conditions requires the acquisition of additional right-or-way to satisfy Caltrans standards. Relinquishing the authority of Forrester Road to Caltrans (Alternative 1) is not anticipated to improve the level of service, and is estimated that ROM cost will require an additional $13.5 million to the $150-158 million roadway improvements. From a traffic circulation standpoint, the cost/benefit of transferring the jurisdictional authority of Forrester Road to Caltrans is not substantiated because the both County of Imperial and Caltrans cross section standards are similar (12 foot lanes), which the volume/capacity will remain unchanged.

The main constraint for the truck bypass alternatives are the funding sources required to initiate the projects. As discussed previously regarding the proposed truck bypass (Alternative 2 and Alternative 3), the bypass is anticipated to reduce truck traffic through Westmorland, but the implementation of the alternative projects are estimated to add an additional $103 million for Alternative 2 and $36.3 million for Alternative 3 to a projected expenditure of $150-158 million for improvements along the Forrester Road corridor. From a traffic circulation stand point, the Westmorland Bypass is anticipated to reduce truck traffic along Forrester Road from the SR-78/86 to Baughman Road, and consequently reduce east-west traffic along SR-78/86. The implementation of this project will reduce the economic visibility of local business along SR-78/86 within the City of Westmorland. Implementing Alternative 3 (Eastern Bypass) is anticipated to reduce truck traffic along Forrester Road from the SR-78/86 to Baughman Road, but the circuitous route is not anticipated to significantly reduce traffic at the intersection of Forrester Road/ SR-78/86. From a traffic circulation stand point, Alternative 2 (Westmorland Bypass) is an efficient truck bypass configuration to reduce traffic within the southern city limits along Forrester Road. This preferred alternative is anticipated to reduce truck traffic at the intersection of Forrester Road/ SR-78/86, which reduces the average delay and pavement rutting.

In terms of the cost-benefit of Alternative 2 and Alternative 3 in relation to the "no build" truck bypass scenario, the additional resources required to initiate these projects does not significantly improve traffic conditions. A "no build" truck bypass scenario requires the same improvements along Forrester Road to operate at an acceptable level of for short term (2015) and long range (2035) conditions. The 4 lane recommendation along Forrester Road within the city limits of Westmorland indicates an acceptable level of service. The construction of a truck bypass (either Alternative 2 or Alternative 3) is anticipated to reduce truck traffic in the predominantly residential area in southern Westmorland, but still requires the expansion of the current two lane configuration to four lanes. If 4 lanes along Forrester Road within the City of Westmorland address the LOS issues without the truck bypass, why construct a truck

bypass and expand Forrester Road to 4 lanes? Safety issues regarding truck traffic cannot be ignored and a qualitative observation suggests that a truck bypass may reduce future truck traffic for Alternative 2, but an increase in traffic east of Forrester Road along SR-78/86 is anticipated which will raise school pedestrian issues with the redirection of traffic.

| ACRONYMS | | |
|---|---|---|
| | | |
| AC | – | Acres |
| AD | – | Assessment Districts |
| ADT | – | Average Daily Traffic |
| AWS | – | All Way Stop |
| CALTRANS | – | California Department of Transportation |
| CFD | – | Community Facilities Districts |
| CHP | – | California Highway Patrol |
| CIP | – | Capital Improvement Plan |
| C/L | – | Centerline |
| CMAQ | – | Congestion Mitigation and Air Quality |
| CSS | – | Cross Street Stop |
| DIF | – | Development Impact Fee |
| DU | – | Dwelling Units |
| EW | – | East-West |
| FCPP | – | Foothill Circulation Phasing Plan |
| HBRR | – | Highway Bridge Replacement and Rehabilitation Program |
| HCM | – | Highway Capacity Manual |
| ITE | – | Institute of Transportation Engineers |
| IVAG | – | Imperial Valley Association of Governments |
| LOS | – | Level of Service |
| MVM | – | Million Vehicle Miles |
| NAFTA | – | North American Free Trade Agreement |
| NS | – | North-South |
| PHF | – | Peak Hour Factor |
| PCE | – | Passenger Car Equivalence |
| POE | – | Port of Entry |
| RSTP | – | Regional Surface Transportation Program |
| RTP | – | Regional Transportation Plan |
| RM | – | Rooms |
| ROM | – | Rough Order of Magnitude |
| ROW | – | Right of Way |
| SANDAG | – | San Diego Association of Governments |
| SCAG | – | Southern California Association of Governments |
| SHOPP | – | State Highway Operations and Protection Plan |
| SR | – | State Route |
| STIP | – | State Transportation Improvement Program |
| STU | – | Students |
| TCRP | – | Traffic Congestion Relief Plan |
| TRC | – | Technical Review Commitee |
| TS | – | Traffic Signal |
| TSF | – | Thousand Square Feet |
| TUMF | – | Transportation Uniform Mitigation Fee |
| WRCOG | – | Western Riverside Council of Governments |