

5. Environmental Analysis

TRANSPORTATION AND TRAFFIC

5.13 TRANSPORTATION AND TRAFFIC

This section of the recirculated Draft Environmental Impact Report (DEIR) evaluates potential transportation impacts from the implementation of the Irvine Business Complex Vision Plan and Overlay Zoning Code (proposed project) in the City of Irvine and adjacent cities. The analysis in this section is based in part on the following technical report:

- *Irvine Business Complex Vision Plan Traffic Study*, Parsons Brinckerhoff, December 2009.

A complete copy of this study is included in Appendix N to this Draft EIR.

5.13.1 Environmental Setting

5.13.1.1 Study Area

The Irvine Business Complex, also referred to within the City of Irvine as Planning Area 36, is a mixed-use area that encompasses approximately 2,800 acres, located wholly within the City of Irvine. The proposed project traffic study area consists of the current boundaries of the IBC and its surroundings in the City of Irvine, as well as portions of the Cities of Newport Beach (including the entirety of the “airport area” of Newport Beach), Tustin, Santa Ana, Costa Mesa, and unincorporated Orange County. To determine appropriate study area limits, a peak hour difference plot was developed between the No Project and the origination and termination points for forecasted traffic trips were then used to inform and define the outer limit of the traffic study area. In addition to the study area boundaries identified using the above described method, adjoining cities asked, and the City agreed, that the following additional intersections also be included in the traffic study area: those along Bryan Avenue between Newport Avenue in the City of Tustin and Culver Drive in the City of Irvine. Figure 5.13-1 displays the study area, with studied intersections highlighted. The study area is served by five freeways: State Route 73 (SR-73), SR-55, Interstate 405 (I-405), I-5, and SR-261.



The IBC land use changes are based around the reallocation of trips within each geographical traffic analysis zone (TAZ), with the TAZ trip cap remaining the same. Thus the increase in residential uses is a reallocation of development intensity for the IBC area. Figure 5.13-2 displays the IBC Study Area (Study Area) with each TAZ annotated.

5.13.1.2 Transfer of Development Rights

Since 1992, the IBC Planning Area has had provisions in place to allow for Transfers of Development Rights (TDRs) through the creation of a trip budget system in which an allocation of AM, PM and ADT trip budget were assigned to each property in the IBC. Portions of these budgets could be transferred to other properties through a process specified in the Zoning Code, which process requires, among other things, the preparation and traffic study. In this manner, the overall IBC development intensity would be maintained, but would still allow developers the flexibility to build the types of projects they desire. In this manner, the overall IBC trip cap would be maintained, but would still allow developers the flexibility to build the types of projects they desire. Although the land use assumptions for the Vision Plan will supersede the 1992 assumptions, the existing TDR mechanism, and the existing development intensity, i.e. “trip”, budgets will remain in place. The current IBC development intensity database will not change as a result of the IBC Vision Plan; however, as new land uses are proposed, the database will be updated accordingly and reconciled with the City's traffic model, which assumes buildout of the land use assumptions of the Vision Plan. Pending TDRs are assumed in the traffic analysis and the pending TDR assumptions are summarized in Appendix J of the Traffic Study (the Traffic Study is included as Appendix N to this DEIR) and also in previous Figure 3-5.

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5.13.1.3 Transportation Setting

Rail

The City of Irvine and study area are currently served by rail transit at the Irvine Station off Barranca Parkway. The Tustin Metrolink Station, located on Edinger Avenue also provides connections to the IBC area. There are ~~several~~ almost sixty Amtrak and Metrolink trains per weekday serving the Irvine station and 25 Metrolink trains per weekday serving the Tustin station ~~both stations, and Irvine Station is also served by Amtrak.~~ There is a current planning effort underway to implement a service expansion program by Metrolink by the year 2010. This expansion will reduce the headways of trains between Fullerton Metrolink station to the north of the study area and Laguna Niguel/Mission Viejo station to the south of the study area. This expansion will improve services at both the Irvine and Tustin Metrolink Stations.

Local Bus

The IBC is currently served by a number of local buses, operated by Orange County Transportation Authority (OCTA). The major routes and locations that serve the IBC are presented in Figure 5.13-3. **The i Shuttle** is another bus that serves the IBC as discussed below.

Bicycle and Riding and Hiking Trails

There is an extensive network of bicycle and riding and hiking trails that connect to destinations within the IBC area. Businesses within the IBC are required to provide bicycle racks or the provision of racks at their offices. Within the City of Irvine, there are 44.5 miles of off-street bikeways and 282 miles of on-street bikeways. The City of Irvine's Zoning ordinance requires at least five bicycle parking spaces for retail or office developments over 100,000 square feet. Additionally, community facilities, banks/savings and loans, restaurants, shopping centers over 50,000 square feet, hospitals, medical/dental offices, and churches also require bicycle parking. The Orange County Bicycle Master Plan, the City of Irvine Bicycle Transportation Plan, and the City of Irvine Circulation Element all address bicycle networks in the study area. The City of Irvine's bicycle system is shown in the Figure 5.13-4.

Pedestrian

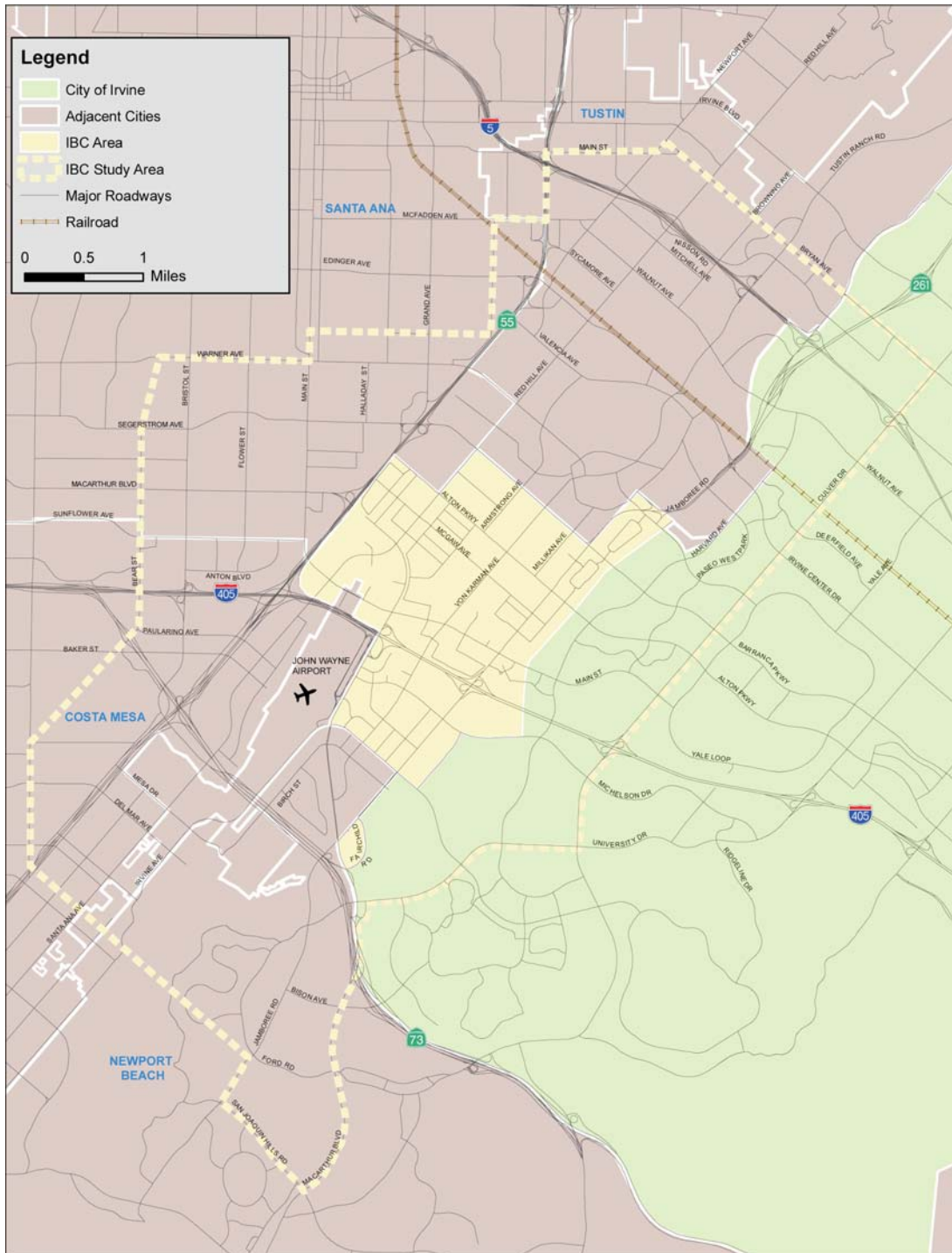
With the addition of residential units among the existing predominant office uses at the IBC, there is a growing need for pedestrian transportation amenities such as sidewalks, crosswalks, and other important connections throughout the study area. Development fees are expected to contribute to the enhancement of pedestrian facilities in the IBC area as the residential uses increase.

The i Shuttle

The Irvine Shuttle (**The i Shuttle**) is a clean fuel, rubber tire shuttle bus that operates adjacent to and within the study area, primarily transporting commuters and residents throughout the IBC area and offering connections to the Tustin Metrolink Station and John Wayne Airport. The service began operation on June 9, 2008. The shuttle meets the morning and afternoon Metrolink trains and provides 30 minute headway frequent service from 5:30 AM to 9:30 AM and 2:30 PM to 7:30 PM on weekdays. The shuttle network consists of two main routes; A & B. Route A connects the Tustin Metrolink Station to John Wayne Airport via Von Karman Avenue. Route B connects the Tustin Metrolink Station to the IBC via Jamboree Road and Michelson Drive. Metrolink and OCTA Pass holders ride the shuttle free. Other commuters are charged one dollar fares. There is no weekend service for either of these routes. Previous Figure 4-2 displays **The i Shuttle** routes.

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IBC Study Area



Source: Parsons Brinckerhoff 2009

IBC Vision Plan and Mixed Use Overlay Zoning Code Recirculated DEIR

City of Irvine • **Figure 5.13-1**

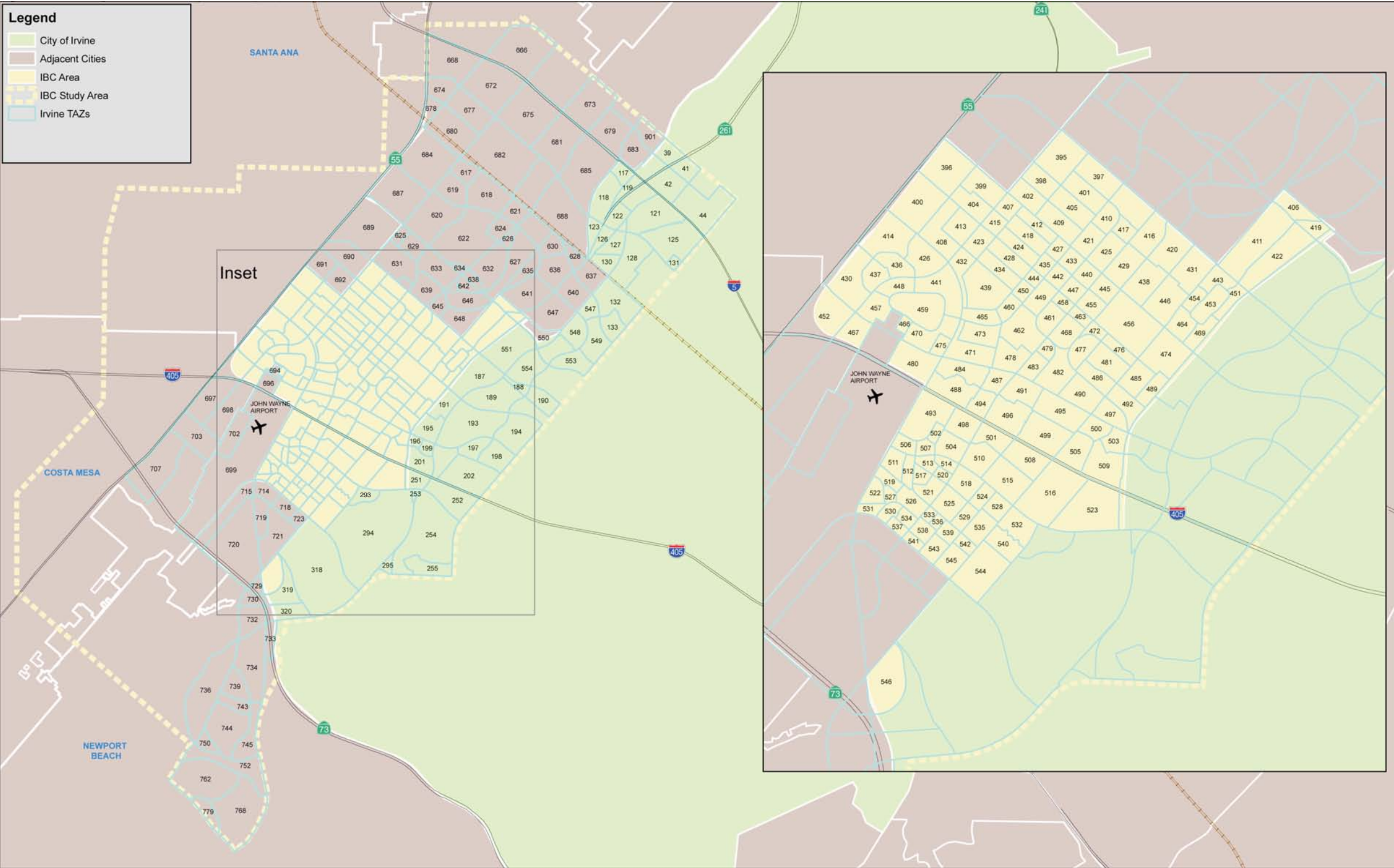


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IBC Study Area Traffic Analysis Zones (TAZ)



Source: Parsons Brinckerhoff 2009

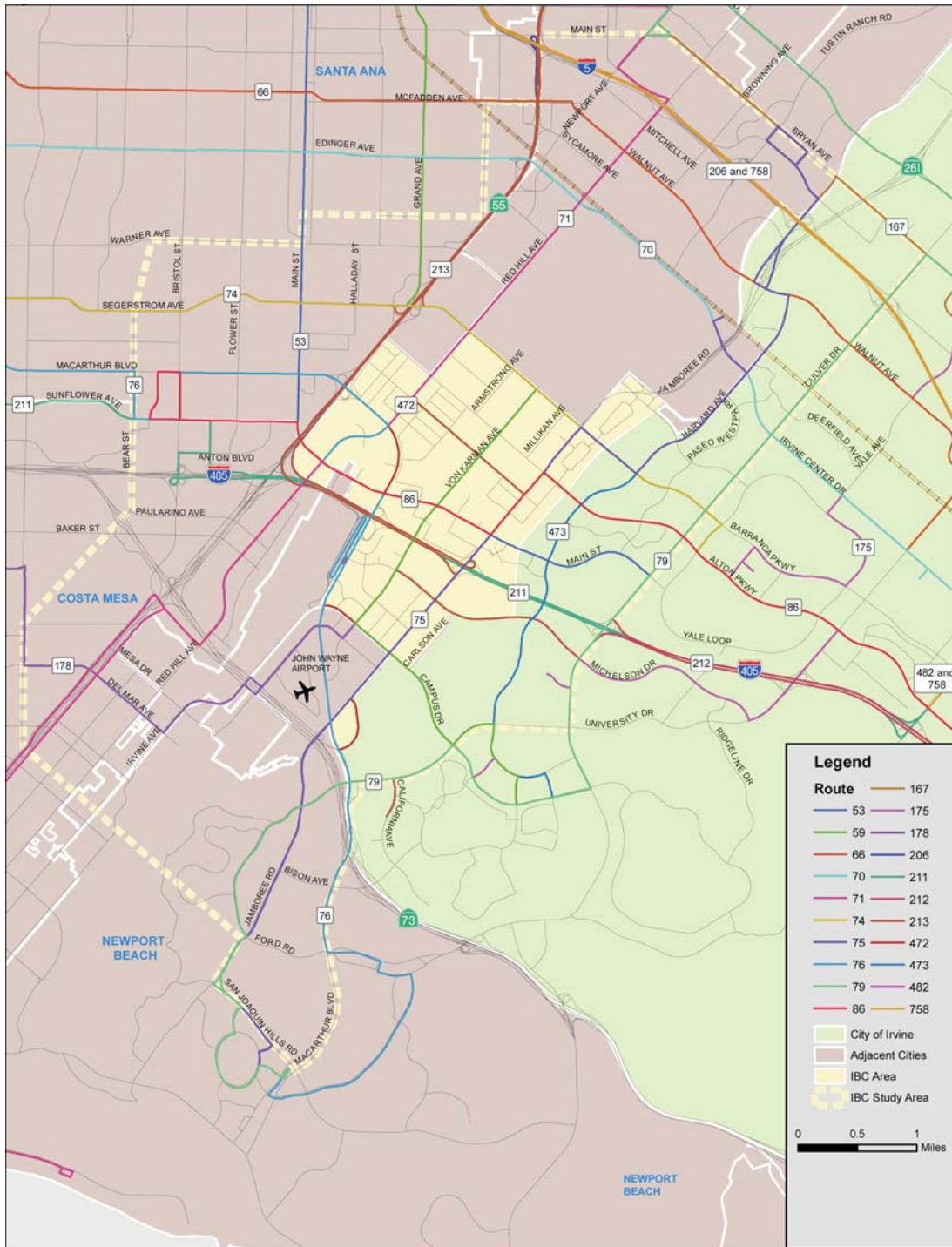
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OCTA Bus Routes



Source: Parsons Brinckerhoff 2009

IBC Vision Plan and Mixed Use Overlay Zoning Code Recirculated DEIR

City of Irvine • **Figure 5.13-3**

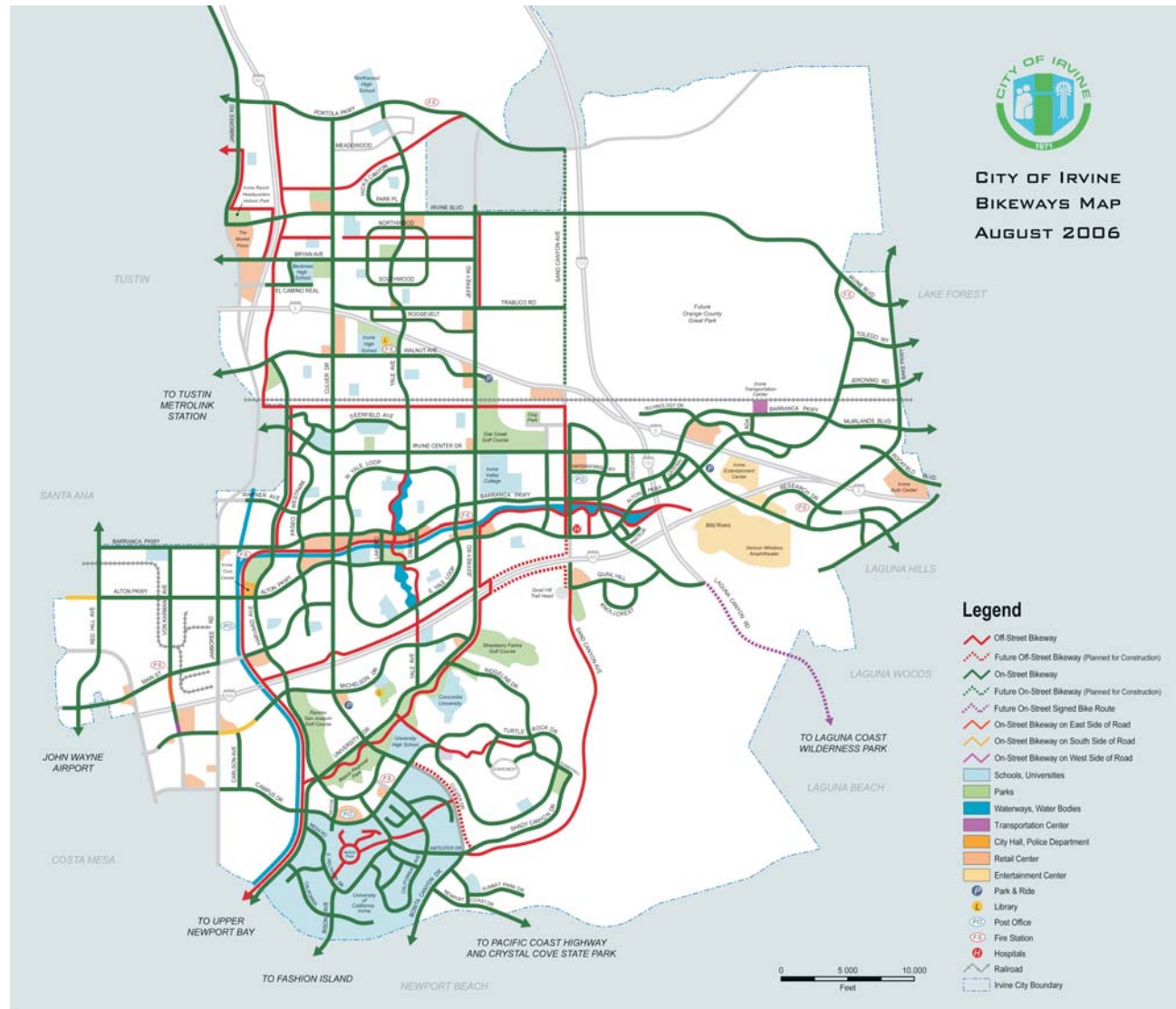
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City of Irvine Bicycle System



Source: Parsons Brinckerhoff 2009

IBC Vision Plan and Mixed Use Overlay Zoning Code Recirculated DEIR

City of Irvine • **Figure 5.13-4**

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5.13.1.4 Traffic Analysis Methodology

The primary objective of the IBC Vision Plan Traffic Study is to determine the potential traffic impacts of the influx of residential units into the IBC area as a result of a General Plan and Zoning Code Amendment to establish a cap of 15,000 dwelling units for the IBC area (17,038 dwelling units including density bonus units pursuant to state law), with a corresponding reduction of non-residential office equivalency square footage. The study utilizes current and forecasted land use data, as well as the current and forecasted circulation system within the study area, to reach its conclusions. In order to assess potential impacts associated with the proposed project, the following analyses were performed:

- Daily arterial segment volume-to-capacity (V/C) analysis
- Peak hour arterial segment V/C analysis (for deficient daily segments in the City of Irvine)
- AM and PM peak hour intersection analysis using Intersection Capacity Utilization (ICU)
- Freeway peak hour mainline segment V/C & Highway Capacity Manual (HCM) analysis using Highway Capacity Software (HCS)
- Freeway peak hour ramp V/C analysis & HCM analysis

Traffic Forecasting

The Irvine Transportation Analysis Model (ITAM) Version 8.4 was developed in accordance with the Orange County Transportation Authority Subarea Modeling Guidelines and is consistent with the Orange County Transportation Analysis Model (OCTAM). Land use assumptions include input from the development community. Traffic counts were provided by the various jurisdictions and incorporated into the model. Future forecast volumes from ITAM are post-processed based on standard techniques that use existing count volumes as the basis for development of future daily and peak hour forecast volumes. The post-processing methodology, which applies the growth between the existing and future year model forecasts to existing count volume to develop future year forecast volumes, is consistent with standard practices and OCTAM methodology.



Mode Choice

Subarea traffic models are generally vehicle-based models and hence, do not include a mode choice component. ITAM is a vehicle-based model that incorporates vehicle trip tables from the mode choice module of OCTAM.

Traffic Assignment

Trips in the origin-destination (O/D) trip tables are assigned to ITAM roadway network for each time period using a 25 iteration equilibrium assignment. The trip tables in ITAM maintain two trip types for the purpose of assignment: drive alone and carpool.

Trip Budget

This traffic study has been prepared to address potential impacts from implementation of the Irvine Business Complex (IBC) Residential Mixed Use Vision Plan and Overlay Zoning. The analysis focuses on the identification of traffic impacts imposed on current circulation system as it is transformed into a mixed-use community from its current offerings of office, commercial, and industrial uses. Under consideration is a General Plan Amendment and Zoning Code to establish a cap of 15,000 dwelling units (DU) for the IBC area, with a corresponding reduction of non-residential square footage.

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To identify the required amount of reduction in non-residential square footage under the buildout of the Vision Plan, the number of trips associated with the increase in residential units was calculated using the IBC database land use trip rates for multi-family residential units. The most conservative (highest) peak hour trip rate for each land use category from the IBC database expected to be reduced was multiplied by the appropriate quantity being reduced for industrial and office land uses. To calculate traffic for various land uses within the IBC, the most conservative peak hour trip rate was utilized, which is the AM peak hour trip rate for industrial land uses and the PM peak hour trip rate for all other land uses. ~~For industrial land uses the AM peak hour trip rate was utilized, for all other land use categories the PM peak hour trip rate was utilized.~~ By reducing the quantities of the non-residential land uses to accommodate the increased number of residential units under the Vision Plan, the proposed project is trip neutral. Detailed information for specific reductions in land use quantities is included in Section 3, *Project Description*, of this recirculated DEIR.

Since it is assumed that known pending units (with the exception of 776 units at Park Place projected to be built by Post-2030) will be completed by 2015 and the remaining units will be completed Post-2030, this traffic study provides an assessment of the existing conditions without project, existing conditions with project, and six different future scenarios. The total residential units approved under the current General Plan maximum are 9,015 (based on 4,779 existing, 1,814 under construction, and 2,422 approved but not yet constructed). The proposed new maximum would be 15,000 residential units, thereby allowing for an additional 5,985 units (consisting of 2,035 units currently in process and 3,950 potential new units). These figures are exclusive of additional density bonus units, which are exempt by state law from local intensity limitations. There are currently 232 existing density bonus units, 78 under construction, 130 approved but not yet built and 215 within current pending projects. Moreover, assuming the density bonus potential for each of the 3,950 potential new units is maximized at 35 percent of the base total, an additional 1,383 density bonus units are possible, for a total of 2,038 density bonus units above the 15,000 unit cap. This overall total of 17,038 units (15,000 base plus 2,038 density bonus) is the total unit count analyzed in this traffic study. There are no current applications pending for the potential 3,950 units (and 1,383 associated density bonus units), thus the location, density, and design are unknown at this time. The potential residential units were assumed in the traffic study to be located within the same geographical area in which existing unused development potential, or “zoning potential” is identified.

Traffic Counts

The intersection counts for the IBC Vision Traffic Study were collected from a variety of sources to ensure the most accurate counts were represented in the ITAM model. The peak period counts, as determined by the City are generally between 7:00 - 10:00 AM in the morning peak period, and 3:30 - 6:30 PM in the evening peak period. For this study, the peak period was 7:00 - 9:00 AM and 4:00 - 6:30 PM for counts within the City of Irvine and 7:00 - 9:00 AM and 4:00 - 6:00 PM for counts outside the City of Irvine.

Intersection Analysis

ICU Intersection Analysis

For both existing and future conditions, levels of service at intersections were calculated through application of the Intersection Capacity Utilization (ICU) method, which quantifies the LOS for an intersection. The methodology calculates the ratio of the sum of critical turning movement volumes to saturated flow rates. The ICU output is analogous to the intersection's V/C ratio.

ICU analysis is performed through a stand alone program written for the City of Irvine. The program was applied to existing traffic counts or forecast turning movement volumes generated through ITAM to develop ICU worksheets and summary table for all study intersections for existing and future scenarios. ICU worksheets are included within the traffic appendices (Appendix N to this DEIR). HCM ramp termini intersection worksheets are included within the traffic study appendices (Appendix N to this DEIR) for Caltrans planning purposes. Developed by Austin Foust

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Associates (AFA); the assumptions for this analysis are consistent with the countywide Congestion Management Program (CMP) assumptions as follows:

- 1,700 vehicles per hour of green time in through lanes (1,600 for Newport Beach and Costa Mesa)
- 1,700 vehicles per hour of green time in turn lanes (1,600 for Newport Beach and Costa Mesa)
- 5 percent of total intersection capacity is lost due to the clearance interval (Newport Beach and Costa Mesa did not assume a 5% clearance interval)
- De-facto right-turn lane is assumed in the ICU calculation if 19 feet from edge of outside of through-lane exists and parking is prohibited during peak periods.
- A credit of 0.05 is applied to the ICU if an intersection is identified with an Advanced Traffic Management System (ATMS) (ATMS credit is not applied to intersections within IBC)

Arterial Analysis

The arterial roadway criteria involve the use of ADT V/C ratios supplemented by the City of Irvine's Link Capacity Analysis guidelines that require that arterial deficiencies identified based on ADT V/C ratios be further examined using peak hour data. LOS E (V/C not to exceed 1.00) is the performance standard specified in the CMP for arterials that are part of the CMP roadway network and is applied in this analysis as the performance standard for CMP arterials outside the City of Irvine. LOS E is also the adopted performance standard for arterials in City of Irvine Planning Area 36, the IBC area. LOS D (V/C not to exceed 0.90) is the performance standard that has been adopted for the remainder of the study area circulation system by the local jurisdictions in the study area.



The City's Traffic Impact Analysis Guidelines mandate a peak hour link analysis on all links that exceed the permissible LOS threshold applicable to the segment. The peak hour link analysis methodology was approved in 1996 by the City's Transportation and Infrastructure Commission.

A peak hour link analysis determines directional AM and PM peak hour V/C ratios for each link that exceeds the daily LOS threshold. The peak hour capacity is determined by multiplying the mid-block number of lanes for each direction by a lane capacity of 1,600 vehicles per hour, except when the distance between controlled intersections is greater than a mile. In such situations, the peak hour lane capacity is assumed to be 2,000 vehicles per hour. Existing peak hour segment volumes are determined from the peak hour intersection directional approach and departure count volumes. Future forecast peak hour analysis is based on intersection approach and departure volumes of the upstream and downstream intersections. In order to be consistent with the methodology applied to determine Future Interim Year 2015 peak hour segment volumes, intersection count volumes were used to determine arterial segment peak hour volumes for the existing peak hour segment analysis. The peak hour link analysis is only applied to roadway segments within the City of Irvine. The Cities of Newport Beach, Tustin, and Costa Mesa evaluate daily ADT and assess impacts at the intersection. The City of Santa Ana evaluates both daily LOS and impacted segments.

If the directional peak hour V/C surpasses the City's LOS threshold, additional lanes are required. The determination whether the additional lanes will be through lanes or auxiliary lanes is based on the ICU analysis as well as improvement needs of the downstream intersection.

Freeway and Ramp Volume/Capacity & HCM Density Analysis

Freeway Mainlines

As there are several major state and interstate highways that traverse the study area, including sections of I-5, I-405, SR-55, SR-73, and SR-261, an analysis of project impacts on freeway mainline segments and ramps was performed.

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Data was collected for the freeway mainline volumes from the Freeway Performance Measurement System (PeMS) which is a joint operation between the University of California, Berkeley and Caltrans. Average weekday peak period data was extracted and averaged over three days to obtain peak hour freeway volumes. An effort was made to extract data from PeMS consistent with the count dates for much of the arterial segment and intersection count volumes throughout the study area. Future forecast peak hour traffic volumes were obtained from the citywide traffic model.

The freeway mainline and freeway ramp criteria are based on peak hour V/C ratios. The freeway mainline capacities applied in this analysis of 2,000 vehicles per lane are based on information contained in the Caltrans Highway Design Manual and the Caltrans Ramp Meter Design Manual and has been verified through discussions with Caltrans staff. The LOS D/E cusp (V/C not to exceed 0.89) has been established by Caltrans as the operating standard for freeway mainline segments and freeway ramps within the study area.

Additionally, select Caltrans freeway mainlines and ramps were analyzed using HCM density analysis criteria. The analysis itself consists of utilizing HCS software and processes inputs of speed, peak hour factor, peak hour volume, truck and RV percentages, and number of lanes to produce a traffic density measures by the number of passenger vehicles per mile per lane which correlates to an LOS indicating the amount of congestion on a particular facility. The HCS software package applies HCM methodology and formulae for the various types of HCM analyses. For ramps, similar inputs produce the density measure but with the added element of adjacent freeway mainline and ramp volumes. Adjacent mainline and ramp volumes contribute to congestion levels on the ramps that are evaluated as higher volumes result in increased difficulty in merging to or diverging from the mainline facility. HCM analysis is developed for Caltrans planning purposes and was not used to identify project impacts.

Freeway Ramps

For freeway ramps, a similar methodology was employed to collect data for ramps that were within the study area but not associated with any intersection counts taken for the study. Ramp volumes collected from PeMS, were taken on the same dates as the mainlines. For existing conditions with the proposed project, the existing counts were added to the difference in the raw model data between existing conditions and Post-2030 Cumulative With Project. The freeway ramps that corresponded to intersection counts collected under the count program were post-processed in the model and the volume output utilized in the freeway ramp analysis.

The freeway ramp criteria are based on peak hour V/C ratios. The freeway ramp capacities applied in this analysis are based on information contained in the Caltrans Highway Design Manual and the Caltrans Ramp Meter Design Manual and have been verified through discussions with Caltrans staff. The LOS D/E cusp (V/C not to exceed 0.89) has been established by Caltrans as the operating standard for freeway ramps within the study area. The V/C and LOS relationship for freeway ramps are identical to those used for freeway mainline segments.

Performance Criteria

For the neighboring cities of Santa Ana, Costa Mesa, Tustin, and Newport Beach, there are slightly different classifications for the levels of service, volume to capacity relationships and intersection capacity utilization (ICU). Circulation system performance is defined by its LOS. LOS analysis is performed for arterial segments, intersections, freeway mainline segments and freeway ramps. Arterial segment LOS calculations are based on a V/C ratio, while the City adopted ICU methodology is applied for intersections, and V/C ratio combined with HCM density analysis is applied for freeway segments and ramps.

The City of Irvine and adjacent communities have established performance criteria for circulation system operations. The list below describes the LOS at each level, based on the City of Irvine's Traffic Performance Criteria, located within the City's General Plan.

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- LOS A— V/C ratio ranges from 0.0 to 0.60. Traffic volumes are generally low and speed is not restricted by other vehicles. All signal cycles clear with no vehicles waiting through more than one original cycle
- LOS B— V/C ratio ranges from 0.61 to 0.70. At this LOS, traffic volumes begin to be affected by other traffic. Between one and ten percent of the signal cycles have one or more vehicles that have to wait through more than one signal cycle during peak traffic periods
- LOS C— V/C ratio ranges from 0.71 to 0.80. At this LOS, operating speeds and maneuverability are controlled by other traffic. Between 11 and 30 % of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak periods
- LOS D— V/C ratio ranges from 0.81 to 0.90. At this LOS, traffic will operate at tolerable operating speeds, although with restricted maneuverability
- LOS E— V/C ratio ranges from 0.91 to 1.00. Traffic will experience restricted speeds and vehicles will frequently have to wait through two or more cycles at signalized intersections. Any additional traffic will result in the breakdown of the carrying capacity of the system
- LOS F— V/C ratio exceeds 1.00. Long traffic queues, unstable traffic flow, heavy congestion, overall traffic volumes are less than at LOS E

Table 5.13-1 summarizes the V/C ranges that correspond to LOS A through F for arterial roadways and freeway segments and ramps. The V/C ranges listed for arterial roads are designated in the Orange County Congestion Management Program (CMP) as well as the General Plans for the County of Orange and the Cities within the study area.



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Table 5.13-1
Arterial Segment V/C Ratio LOS

LOS	Arterial Segment V/C Ratio	Freeway Segment/Ramp V/C Ratio
A	0-0.60	0-0.30
B	0.61-0.70	0.31-0.50
C	0.71-0.80	0.51-0.71
D	0.81-0.90	0.72-0.89
E	0.91-1.0	0.90-1.0
F	>1.0	>1.0

Source: City of Irvine Traffic Impact Analysis Guidelines, 2006 and HCM 2000.

The arterial roadway criteria involves the use of average daily traffic (ADT) V/C ratios supplemented by the City of Irvine's Link Capacity Analysis guidelines which require that arterial deficiencies identified based on ADT V/C ratios be further examined using peak hour data. LOS E (V/C not to exceed 1.00) is the performance standard specified in the CMP for arterials that are part of the CMP roadway network and is applied in this analysis as the performance standard for CMP arterials outside the City of Irvine. LOS D (V/C not to exceed 0.90) is the performance standard that has been adopted for the remainder of the study area arterial segments by the local jurisdictions in the study area.

The intersection criteria involve the use of peak hour ICU values. The ICU ranges that correspond to LOS A through F are the same as the V/C ranges shown in Table 5.13-1 for arterial roads. The local jurisdictions within the study area have adopted various parameters for calculating ICU values and intersection LOS standards. LOS E (ICU not to exceed 1.00) is the performance standard specified in the Orange County Congestion Management Program (CMP) for CMP intersections. Additionally the LOS E standard is applied to all intersections within the IBC and certain intersections in the City of Santa Ana along MacArthur Boulevard. LOS D (ICU not to exceed 0.90) is the performance standard that has been adopted by the local jurisdictions for all of the other intersections in the study area.

Deficient intersections within the IBC study area fall under two categories of deficiencies, project related impact and cumulative deficiency. Project impacts are determined using the definition of significant impacts from each city's traffic impact analysis protocol. For Costa Mesa, Santa Ana, and Tustin, significant impacts are identified as an increase in intersection ICU of 0.01 or greater under With Project conditions of a deficient intersection when compared between the With Project and No Project scenarios. For the City of Newport Beach, a project impact is identified as an increase of 0.01 or more of the critical movement of a deficient intersection. Cumulative deficiencies are identified as those intersections that fail in both the No Project and With Project conditions but do not have a project impact as identified by the above noted criteria and therefore do not require improvements. The City of Irvine threshold for defining project impacts is an increase of 0.02 or greater of an intersection ICU. For intersections with shared jurisdictional boundaries, the more conservative methodology was employed.

V/C ratios describe the overall volume on the facility based on the available capacity. The freeway V/C ranges that are used to identify freeway deficiencies correspond to LOS A through F and are shown in Table 5.13-1. In consultation with Caltrans staff, project impact thresholds for freeway mainlines and ramps are based on a methodology that utilizes V/C ratios and project trip contribution to a facility. Project impacts are identified by determining whether or not a freeway mainline segment or ramp is near deficiency (LOS D/E cusp, or V/C=0.89) and calculating the difference in peak hour trips between the No Project and With Project scenarios. If the Proposed Project causes a mainline segment or ramp to deteriorate from better than the LOS D/E cusp (V/C<0.89) to worse than the LOS D/E cusp and adds 200 peak hour trips (mainline segments) or 30 peak hour trips (ramps) once beyond the D/E cusp, then the location has a project impact. Additionally, if the mainline segment or ramp under the No Project condition is operating worse than the LOS D/E cusp (V/C>=0.89) and the Proposed Project adds 200 peak hour trips or greater (mainline segment) or 30 peak hour trips or greater (ramps), then the location has a project impact.

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In addition to the V/C analysis, if a freeway mainline or ramp operates at worse than LOS D/E cusp ($V/C > 0.89$), but better than the LOS E/F cusp ($V/C < 1.00$), and the project contributes greater than 200 vehicles per hour to the mainline or 30 vehicles per hour to the ramps, a peak hour density analysis based on the Highway Capacity Manual (HCM) was conducted to account for number of lanes, speed, large vehicle volume, and type of terrain. No HCM analysis was conducted for mainline segments or ramps with a V/C ratio of < 0.89 or > 1.00 and no HCM analysis was conducted for locations between the V/C range of the LOS D/E cusp ($V/C > 0.89$), but better than the LOS E/F cusp ($V/C < 1.00$) if the project does not contribute greater than 200 vehicles per hour to the mainline or 30 vehicles per hour to the ramps. This additional level of analysis for locations just over the V/C LOS deficiency threshold was conducted to evaluate operating conditions for Caltrans planning purposes. Resulting densities from the HCM analysis indicate how well traffic flow is accommodated by a freeway or ramp. Higher densities indicate greater congestion on the facility and less ability for vehicles to weave and pass, as well as limiting speed. The output or density is the number of passenger vehicles per mile per lane of freeway. The LOS thresholds for freeway mainline segments and ramps are shown in Tables 5.13-2 and 5.13-3. According to the HCM, LOS E (> 45.0 for freeway mainlines segments, > 35.0 for ramps) is the maximum density at which sustained flows at capacity are expected to occur. The HCM density analysis does not take into account high-occupancy vehicle (HOV) lanes, as those are classified as separate facilities by the HCM. The analysis also does not take into consideration metering on the ramps. For both freeway mainlines and ramps, the HCM analysis is not used to identify project impacts but only for Caltrans operations planning purposes.

Table 5.13-2
Freeway Mainline Segment Density LOS

Freeway Mainline Segment Density (pc/mi/ln)	LOS
0–11.0	A
11.0–18.0	B
18.0–26.0	C
26.0–35.0	D
35.0–45.0	E
>45.0	F

Source: Highway Capacity Manual, 2000

Table 5.13-3
Freeway Ramps Density LOS

Freeway Ramp Density (pc/mi/ln)	LOS
0–10.0	A
10.0–20.0	B
20.0–28.0	C
28.0–35.0	D
>35.0	E
Exceeds HCM Limits	F

Source: Highway Capacity Manual, 2000

Tables 5.13-4, 5.13-5, and 5.13-6 summarize the arterial segment, intersection, and freeway and ramp performance criteria for all five jurisdictions within the study area.

Table 5.13-4
Circulation System Performance Criteria — Arterial Segments

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City of Irvine	Major Arterial	8 lane	72,000
		6 lane	54,000
	Primary Arterial	4 lane	32,000
	Secondary Arterial	4 lane	28,000
	Commuter	2 lane	13,000
City of Santa Ana	Principal Arterial	8 lane	75,000
	Major Arterial	6 lane	56,300
	Primary Arterial	4 lane	37,500
	Secondary Arterial	4 lane	24,000
	Collector/Commuter	2 lane	12,500
City of Tustin	Major Arterial	8 lane	75,000
		6 lane	56,300
	Primary Arterial	4 lane	37,500
	Secondary Arterial	4 lane	25,000
	Commuter	2 lane	12,500
City of Costa Mesa	Major Arterial	8 lane	75,000
		6 lane	56,000
	Primary Arterial	4 lane	38,000
	Secondary Arterial	4 lane	25,000
	Commuter	2 lane	12,500
City of Newport Beach	Principal Arterial	8 lane	68,000
	Augmented Arterial	6 lane	58,000*
	Primary Arterial	4 lane	40,000
	Secondary Arterial	4 lane	23,000
	Commuter	2 lane	10,000

Arterial Roads V/C Calculation Methodology

Level of service to be based on average daily traffic (ADT) volume/capacity (V/C) ratios calculated using the following capacities:

As required by the City of Irvine and Neighboring Cities Link Capacity Analysis guidelines, ADT is the standard reference; however, arterial deficiencies identified based on ADT V/C ratios were further examined using peak hour data.

Performance Standard:

Level of Service E for segments within the Planning Area 36 (IBC area), CMP arterials inside and outside the City of Irvine, and Smart Streets (Irvine Boulevard, Edinger Avenue, Jamboree Road South of Irvine Boulevard) in the City of Tustin.

All other arterials: Level of Service D (peak hour V/C less than or equal to 0.90).

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Table 5.13-5

Circulation System Performance Criteria — Intersections

Intersections ICU Calculation Methodology

Level of service to be based on peak hour intersection capacity utilization (ICU) values calculated using the following assumptions:

Saturation Flow Rate: 1,700 vehicles/hour/lane (1,600 for the City of Newport Beach and Costa Mesa)

Clearance Interval: 0.05 (no clearance interval for the City of Newport Beach and Costa Mesa)

Right-Turn-On-Red Utilization Factor*: 0.00 for County of Orange intersections, 0.75 for intersections in all other jurisdictions. (applies to all jurisdictions in the study area—defaulted in the ICU analysis)

* “De-facto” right-turn lane is assumed in the ICU calculation if 19 feet from edge of outside of through-lane exists and parking is prohibited during peak periods.

Performance Standard:

IBC Area, CMP, Airport intersections between IBC and Newport Beach, and certain intersections in Santa Ana, including Main at MacArthur and SR-55 at MacArthur: Level of Service E (peak hour ICU less than or equal to 1.00). All other locations within the study area: Level of Service D (peak hour ICU less than or equal to 0.90)

Mitigation Requirement:

For peak hour ICU within the City of Irvine greater than the acceptable level of service, mitigation of the project contribution is required to bring location back to acceptable level of service or to existing conditions if project contribution is greater than or equal to 0.02. The Cities of Santa Ana, Tustin, and Costa Mesa require mitigation for deficient intersections that fail under peak hour conditions and the project contribution is greater than or equal to 0.01. Newport Beach requires mitigation for deficient intersections where the intersection critical movement increases by greater than or equal to 0.01.



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Table 5.13-6

Circulation System Performance Criteria — Freeway Mainlines and Ramps (V/C Analysis)

Freeway Segment and Freeway Ramp Calculation Methodology

Level of service to be based on peak hour volume/capacity (V/C) ratios calculated using the following assumptions:

V/C Calculation Methodology**Freeway Mainline Segments**

General purpose lane capacity of 2,000 passenger cars per hour per lane.

Metered On-Ramps

- A maximum capacity of 900 vehicles per hour for a one-lane metered on-ramp with only one mixed-flow lane at the meter.
- A maximum capacity of 1,080 (20% greater than 900) vph for a one-lane metered on-ramp with one mixed-flow lane at the meter plus one high occupancy vehicle (HOV) preferential lane at the meter.
- A maximum capacity of 1,500 vph for a one-lane metered on-ramp with two mixed-flow lanes at the meter.
- A maximum capacity of 1,800 vph for a two-lane metered on-ramp with two-mixed flow lanes at the meter

Toll Ramps (On-Ramps and Off-Ramps)

- A maximum capacity of 1,500 vph for a one-lane toll ramp with one cash (stopped) lane and one FasTrak (unstopped) lane.

Non-Metered and Non-Tolled On-Ramps and Off-Ramps

- A maximum capacity of 1,500 vph for a one-lane ramp.
- A maximum capacity of 2,250 (50% greater than 1,500) vph for a two-lane on-ramp that tapers to one merge lane at or beyond the freeway mainline gore point and for a two-lane off-ramp with only one auxiliary lane.
- A maximum capacity of 3,000 vph for a two-lane on-ramp that does not taper to one merge lane and for a two-lane off-ramp with two auxiliary lanes.

Performance Standard:

Mainlines: Level of Service D/E cusp (peak hour V/C less than or equal to 0.89).

Ramps: Level of Service D/E cusp (peak hour V/C less than or equal to 0.89).

Mitigation Requirement:

For the locations identified as project impacts resulting from the impact threshold methodology agreed to by the City of Irvine and Caltrans, opportunities for feasible mitigation alternatives including Intelligent Transportation Management Strategies (ITMS) will be considered in order to mitigate the project impacts to pre-project conditions.

Freeway Mainline Segments: A significant impact occurs when:

- a. The segment LOS is better than D/E cusp (<0.89) without the project and the project adds additional trips that degrades the segment beyond the LOS D/E cusp and the project contributes more than 200 vehicles per hour once beyond the LOS D/E cusp, or
- b. The segment is at LOS D/E cusp or worse (≥ 0.89) without project and the project contributes greater than 200 vehicle trips per hour.

Off-Ramps and On-Ramps: A significant impact occurs when:

- a. The ramp LOS is better than D/E cusp (<0.89) without the project and the project adds additional trips that degrades the segment beyond the LOS D/E cusp and the project contributes more than 30 vehicles per hour once beyond the LOS D/E cusp, or
 - b. The ramp is at LOS D/E cusp or worse (≥ 0.89) without the project and the project contributes greater than 30 vehicle trips per hour.
-

Advanced Traffic Management System (ATMS) Credit

The following intersections were afforded an ATMS credit through approved traffic studies. Four different intersections have ATMS already paid under the program and ATMS credit applied in 2013 and six intersections have ATMS applied for purposes of post-2030 traffic performance analysis. None of the intersections utilizing ATMS are located in Planning Area 36 (IBC area). No ATMS or improvements will be applied as mitigation to impacted intersections within the IBC area.

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2013 ATMS Applied

- 190 - University Drive at Campus Drive
- 229 - Culver Drive at Alton Parkway
- 226 - Culver Drive at Irvine Center Drive
- Post-2030 ATMS Applied

235 - Culver Drive at University Drive

- 190 - University Drive at Campus Drive
- 226 - Culver Drive at Irvine Center Drive
- 229 - Culver Drive at Alton Parkway
- 224 - Culver Drive at Walnut Avenue
- 228 - Culver Drive at Barranca Parkway
- 235 - Culver Drive at University Drive

5.13.1.5 Existing Conditions

This section describes the current state of the existing land uses and circulation system within the study area. The City of Irvine's traffic model, the Irvine Transportation Analysis Model (ITAM) 8-4 8.4 was applied to forecast future traffic conditions for the study area. While the IBC mostly encompasses streets and intersections within the City of Irvine, key intersections from the surrounding cities, within the sphere of influence of the IBC area were included in the study area to provide an appropriate assessment of the potential impacts of the proposed project to surrounding jurisdictions. There are 275 different arterial segments, 224 intersections, 30 northbound and southbound freeway mainline segments, and 98 freeway ramps within the study area that are analyzed as part of the IBC Vision traffic analysis.



Existing Land Use

The current setting for land use is focused on the IBC as a major employment center and office park complex. Recent development patterns have been slowly transforming the IBC into a mixed-use community, through integration of residential and supporting land uses. Land use quantities for 2008 Existing Conditions (No Project) have been developed by the City of Irvine and are illustrated in Table 5.13-7.

Table 5.13-7
Existing Land Use in the IBC

Scenario	Multi-family Residential (DU)	Retail mix (TSF)	Hotel (Room)	Office mix (TSF)	Industrial Mix (TSF)	Mini-Warehouse (TSF)	Extended Stay Hotel (Room)
2008 No Project	5,011	1,341	2,322	26,381	14,701	348	174

Source: City of Irvine, ITAM

Existing Daily Arterial Segment Analysis

Under existing conditions, traffic within the City and adjacent jurisdictions is generally heaviest in the north-south direction, with Jamboree Road and Culver Drive being the City's highest utilized north-south corridors. In addition, other heavily traveled north-south arterials include MacArthur Boulevard, University Drive, Main Street in Santa Ana, Edinger Avenue in the City of Tustin, MacArthur Boulevard in Newport Beach and Bristol Street in Costa Mesa. The heaviest traveled segments on these arterials served up to 78,500 vehicles per day (vpd). Along the east-west direction, the main thoroughfares are Main Street and Barranca Parkway, where some of the heavily used

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segments carry on average between 25,000 and 38,700 vehicles daily.

The following were some of the most heavily traveled arterial segments within the Study Area:

Jamboree Road (Irvine)

- El Camino Real to I-5 NB On-Ramp (61,500 vpd)
- I-5 NB Ramps to I-5 SB Off-Ramp (65,000 vpd)
- Warner Avenue to Edinger Avenue (78,500 vpd)
- Edinger Avenue to Walnut Avenue (71,900 vpd)
- Warner Avenue to Barranca Parkway (69,500 vpd)
- Michelson Drive to I-405 southbound off-ramp (69,500 vpd)

MacArthur Boulevard (Newport Beach)

- Bison to Ford (75,900 vpd)

Bristol Street (Costa Mesa)

- Anton Boulevard to I-405 NB Ramps (62,500 vpd)
- I-405 NB Ramps to I-405 SB Ramps (63,000 vpd)

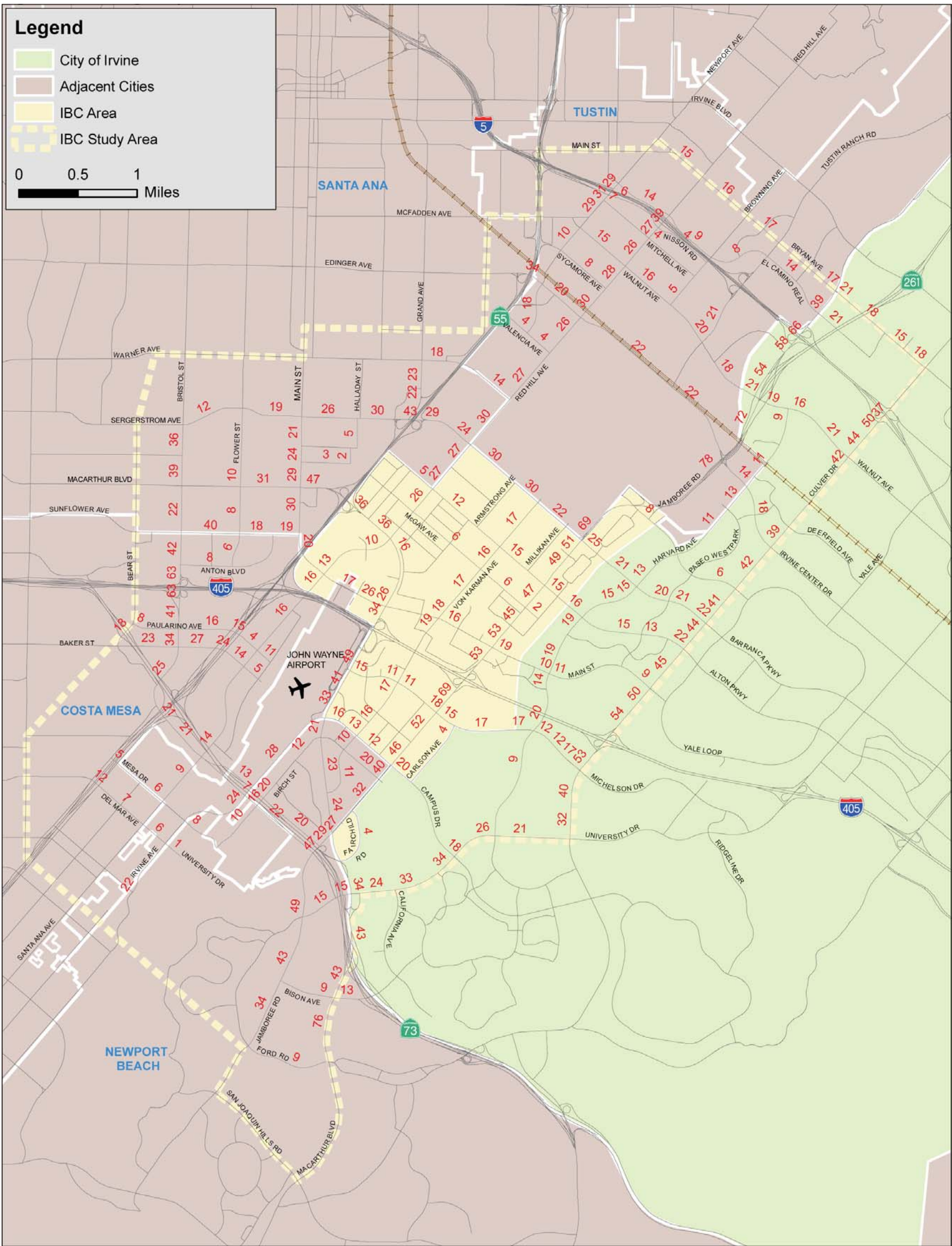
Figures 5.13-5 and 5.13-6 present the daily Existing ADT and LOS for all major arterials within the IBC study area. Existing arterial traffic conditions were analyzed based on the existing counts and lane configurations. Alternative methodologies by other cities within the study area called for a different analysis approach. As noted, LOS E or F indicates a deficient segment for all arterial segments outside Planning Area (PA) 36 within the City of Irvine. PA 36 segments are considered deficient at LOS F.

The arterial analysis indicates that the following 12 segments are deficient under the Existing Year 2008 daily conditions:

- 879—Campus Drive from Carlson Avenue to University Drive (Irvine)
- 213—Culver Drive from I-5 SB Off-Ramp to Scottsdale Drive (Irvine)
- 221—Culver Drive from Main Street to San Leandro (Irvine)
- 222—Culver Drive from San Leandro to I-405 NB On-Ramp (Irvine)
- 224—Culver Drive from I-405 SB On-Ramp to Michelson Drive (Irvine)
- 130—Jamboree Road from El Camino Real to I-5 NB On-Ramp (Irvine)
- 958—Jamboree Road from I-5 NB Ramps to I-5 SB Off-Ramp (Irvine)
- 131—Jamboree Road from I-5 SB Off-Ramp to Michelle Drive (Irvine)
- 133—Jamboree Road from Michelle Drive to Walnut Avenue (Irvine)
- 188—University Drive from California Avenue to Mesa Road (Irvine)
- 187—University Drive from Mesa Road to Campus Drive (Irvine)
- 1301—MacArthur Boulevard from Bison Avenue to Ford Road (Newport Beach)

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Existing Daily Arterial ADT



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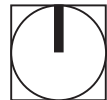
Existing Arterial Daily Deficiencies



Source: Parsons Brinckerhoff 2009

IBC Vision Plan and Mixed Use Overlay Zoning Code Recirculated DEIR

City of Irvine • **Figure 5.13-6**



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Existing Peak Hour Link Analysis

The City's *Traffic Impact Analysis Guidelines* mandate a peak hour link analysis on all links that exceed the permissible daily LOS threshold applicable to the segment. The City's acceptable threshold is LOS D, unless the arterial segment is located within the IBC area (Planning Area #36), where LOS E is acceptable. Based on the findings presented above, deficient arterial segments within Irvine were further evaluated under peak hour conditions. Adjacent jurisdictions do not evaluate segments under peak hour conditions.

Peak hour directional traffic volumes were directly obtained from peak hour counts for upstream and downstream intersections for each deficient arterial segment. When analyzing an arterial link for peak hour analysis, directional traffic volumes were obtained from turning movement counts reported at the adjacent intersections.

All arterial segments that are deficient under daily conditions operate at an acceptable LOS in both peak hours, performing at LOS C or better, and hence no mitigation measures are recommended at this time for these facilities for segments within the City of Irvine.

There are no segments within the City of Irvine that fail under peak hour existing conditions. For segments outside the City of Irvine, the jurisdiction's segment analysis guidelines are applied. Costa Mesa, Newport Beach, and Tustin, outside the City of Irvine assesses segment impacts at the intersection level. Improvements at the intersections that feed into deficient arterial segments should eliminate deficiencies. For segments in the City of Santa Ana, deficiencies are addressed in the daily condition. There are no arterial segments in Santa Ana that are deficient under existing conditions.

Existing Intersection Analysis

As part of this study, 224 intersections were analyzed for peak hour conditions under existing conditions with the exception of 20 future intersections that are expected to be built in the City of Tustin as a part of the Tustin Legacy development. The City's acceptable LOS threshold for intersections is LOS D or better, while in Planning Area 36 (IBC area) and for CMP intersections outside the City of Irvine, the acceptable LOS is LOS E or better. Figures 5.13-7 and 5.13-8 graphically depict intersection performance under existing conditions. For existing conditions, turning movement counts were collected in late 2007 and 2008 on a typical weekday to best reflect traffic activity during the peak hour. The intersection analysis reports intersection ICU and the corresponding level of service. For shared jurisdictions, the more conservative methodology was utilized.

Based on existing count volumes, there is one intersection within the study area are currently operating at a deficient level of service. In order to meet the growing demand for travel within the study area, this intersection will need to be improved to operate efficiently. These deficiencies establish a baseline for future land use changes and growth in the IBC study area. Although there are some intersections operating at LOS E, such as Jamboree at Michelson (intersection #145) those intersections are not considered deficient because they are either within the City of Irvine's Planning Area 36 or are CMP intersections where LOS E is acceptable. The deficient intersection is:

- #36: Red Hill Avenue at El Camino Real (Tustin)—PM Peak Hour LOS 1.11

Existing Freeway Mainline Analysis

There are five major freeways that traverse the study area, either in the IBC itself or the adjacent areas. Existing freeway count data was extracted for a typical weekday from the California Department of Transportation (Caltrans) Performance Management System (PeMS). The PeMS system is managed by the Department of Electrical Engineering and Computer Science at the University of California, Berkeley, in cooperation with Caltrans, the California Partners for Advanced Transit and Highways, and the Berkeley Transportation System. As directed by the City of Irvine's *Traffic Impact Analysis Guidelines*, V/C analysis was conducted to identify deficiencies. Caltrans Highway Capacity Manual (HCM) Analysis was performed for both the freeway mainlines and ramps for Caltrans



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planning purposes. The HCM analysis generates a density for each freeway segment based on the volume and lane configuration. The density output represents the number of passenger cars, per mile, per lane (pc/mi/ln) and provides an indication of congestion levels. Figures 5.13-9 and 5.13-10 show the deficiencies for the freeway mainlines and ramps for the 2008 Existing Conditions.

There are several freeway segments that currently operate at a deficient LOS. The deficient segments include:

AM Peak Hour:

- I-5 Northbound between Red Hill Avenue and Newport Avenue
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Southbound between Newport Avenue and SR-55
- I-405 Southbound between Culver Drive and Jamboree Road
- I-405 Southbound between Jamboree Road and MacArthur Boulevard
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-73 Southbound between Campus Drive and SR-55

PM Peak Hour:

- I-5 Southbound between Newport Avenue and SR-55
- I-405 Southbound between Culver Drive and Jamboree Road
- SR-73 Southbound between Campus Drive and SR-55

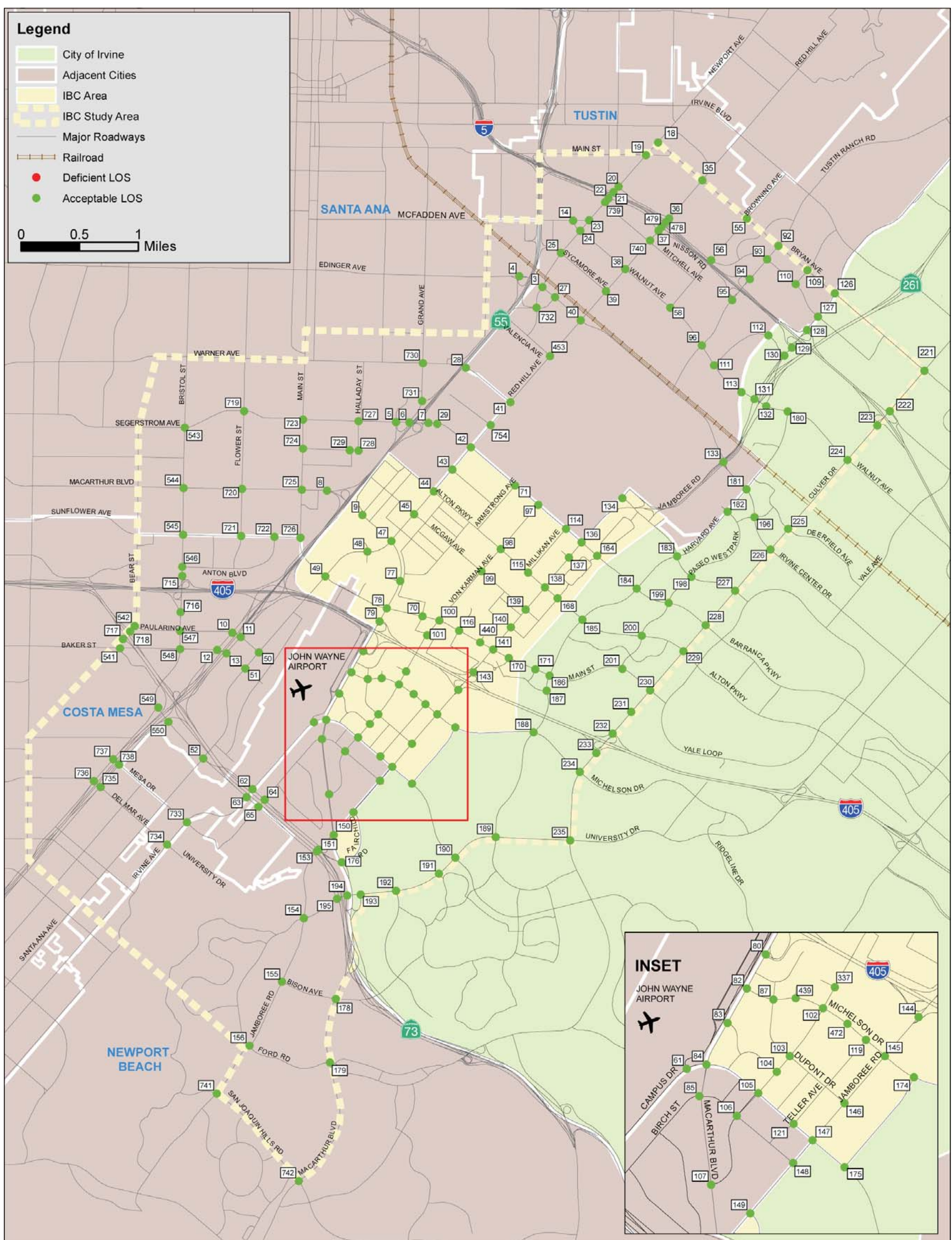
Existing Freeway Ramp Analysis

The following ramps are deficient under existing conditions:

AM Peak Hour:

- I-405 Southbound Off-Ramp to Jamboree Road
- I-405 Northbound Off-Ramp to Jamboree Road
- I-405 Northbound Off-Ramp to MacArthur Boulevard
- SR-55 Northbound On-Ramp from Paularino Avenue
- SR-55 Southbound Off-Ramp to MacArthur Boulevard
- SR-55 Northbound Off-Ramp to Dyer Road
- SR-73 Northbound On-Ramp from MacArthur Boulevard
- SR-73 Southbound Off-Ramp to Campus Drive
- SR-261 Southbound On-Ramp from Jamboree Road

Existing AM Peak Hour Intersection Deficiencies

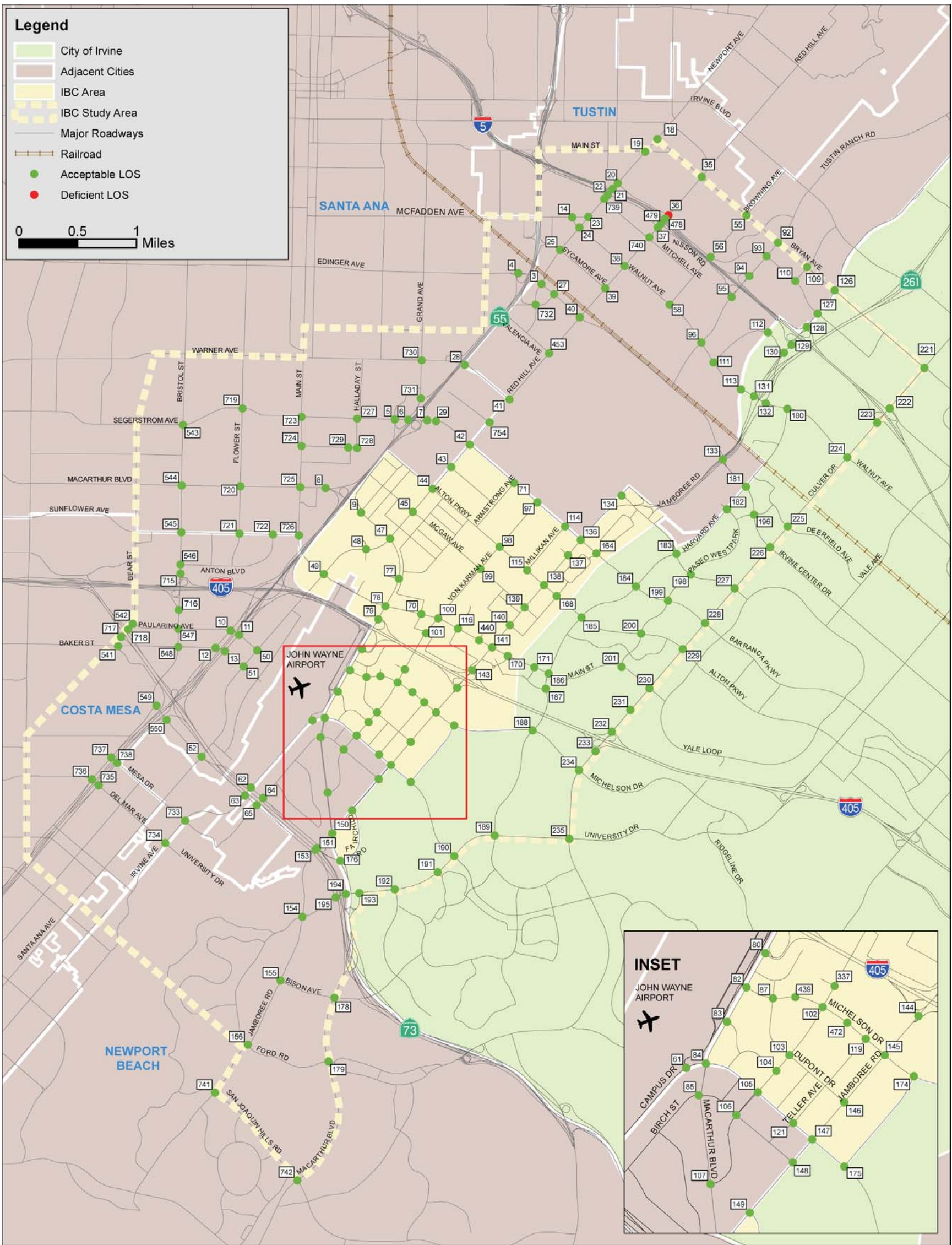


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Existing PM Peak Hour Intersection Deficiencies



Source: Parsons Brinckerhoff 2009

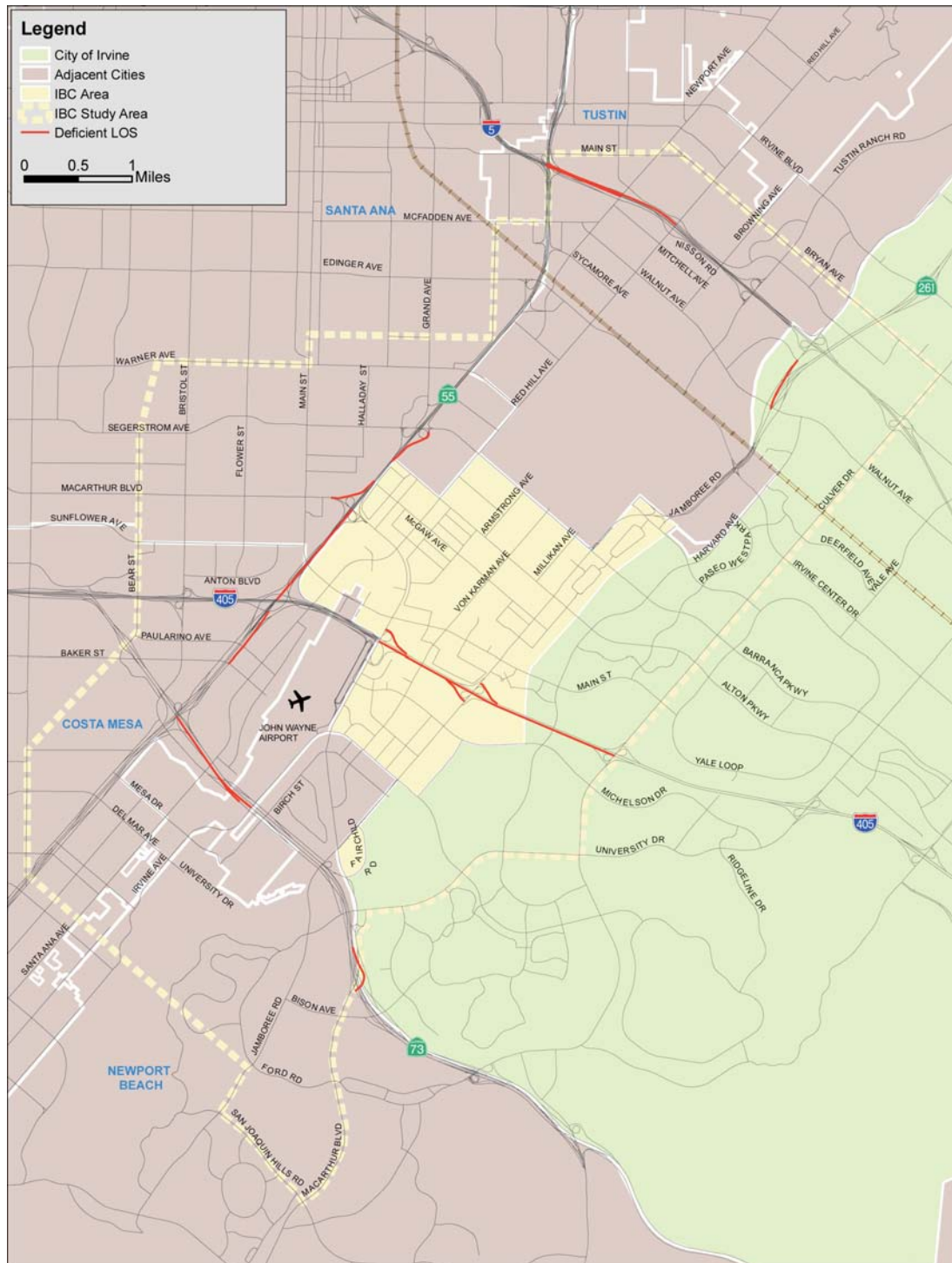
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Existing Freeway AM Peak Hour Deficiencies



Source: Parsons Brinckerhoff 2009

IBC Vision Plan and Mixed Use Overlay Zoning Code Recirculated DEIR

City of Irvine • **Figure 5.13-9**

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PM Peak Hour:

- I-405 Southbound Off-Ramp to Jamboree Road
- I-405 Northbound On-Ramp from MacArthur Boulevard
- SR-55 Northbound On-Ramp from Paularino Avenue
- SR-55 Southbound Direct On-Ramp from MacArthur Boulevard
- SR-55 Northbound Loop On-Ramp from Dyer Road
- SR-73 Northbound On-Ramp from MacArthur Boulevard
- SR-73 Southbound Off-Ramp to Bison Avenue
- SR-73 Northbound On-Ramp from Campus Drive
- SR-261 Northbound Off-Ramp to Jamboree Road

5.13.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project could:

- | | |
|-----|---|
| T-1 | Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections). |
| T-2 | Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways. |
| T-3 | Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. |
| T-4 | Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). |
| T-5 | Result in inadequate emergency access. |
| T-6 | Result in inadequate parking capacity. |
| T-7 | Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks). |



Both Initial Studies, included as Appendix A and B, substantiate that impacts associated with the following thresholds would be less than significant:

- Threshold T-3 and T-4.

These impacts will not be addressed in the following analysis.

5.13.3 Environmental Impacts

Existing Plans, Programs, and Policies

The following measures are existing plans, programs, or policies (PPPs) that apply to the proposed project and will help to reduce and avoid potential impacts related to transportation and traffic:

- PPP 13-1 **IBC Development Fee Program:** A Development Fee program was established to fund area-wide circulation improvements within the IBC area. The improvements are required due to potential

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circulation impacts associated with buildout of the IBC area. Fees are assessed when there is new construction or when there is an increase in square footage within an existing building or the conversion of existing square footage to a more intensive use. The development fees collected are used strictly for circulation improvements right-of-way acquisition and transportation monitoring measures in the IBC area. Fees are calculated by multiplying the proposed square footage, dwelling unit or hotel room by the appropriate rate. The IBC Fees are included with any other applicable fees payable at the time the building permit is issued.

Project Design Features

PDF 13-1 **Transportation Management Association:** As part of the proposed project, the City shall form of a Transportation Management Association (TMA) for the Irvine Business Complex. The goals and objectives of the TMA are as follows:

- Monitor travel demand at employment sites and provide reports on trip generation to the City of Irvine.
- Offer employers and property owners assistance with transportation services on a voluntary basis.
- Deliver transportation services to commuters. Services include:
 - a) Provide ridematching, transit and Metrolink information
 - b) Inform commuters of incentives that may be available from public agencies
 - c) Formation of vanpools
- Represent the IBC in local transportation matters
- Oversee and fund the implementation and expansion of **The i Shuttle**, a clean fuel rubber tire shuttle system.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

IMPACT 5.13-1: BUILDOUT OF THE IBC PURSUANT TO THE PROPOSED PROJECT WOULD GENERATE ADDITIONAL TRAFFIC VOLUMES AND IMPACT LEVELS OF SERVICE FOR THE EXISTING AREA ROADWAY SYSTEM. [THRESHOLD T-1, T-2]

Impact Analysis:

5.13.3.1 Trip Generation

Trip rates by socioeconomic data type are applied to calculate trip generation by trip purpose (home-based work, home-based other, home-based university and not home-based) for each Traffic Analysis Zone (TAZ) within the City. Trip generation calculates trips by production and attraction for each trip purpose. The number of trips generated by residential uses is a function of the number of occupied dwelling units, dwelling unit population density, number of employed residents and median household income, while that of non-residential uses is a function of the type of employees (retail, service and other). For schools, colleges and universities trip generation is a function of employees and students. Appendix N (see Appendix A of the traffic study) presents ITAM trip generation rates by trip purpose for each Socio-Economic Data (SED) category. Consistent with OCTAM, the ITAM

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trip generation module calculates trips based on five trip purposes: home-based work, home-based other, work-based other, other-based and home-based school trips.

5.13.3.2 Trip Distribution

ITAM trip distribution is based on OCTAM trip distribution output. Once trip generation productions and attractions are developed for the primary and secondary ITAM study areas based on land use and SED for the City, regional trip tables are factored to retain the trips generated within the primary and secondary study areas. The factoring process, referred to as the fratar process, maintains trip distribution patterns of the regional model while factoring to the revised study area trips generated by subarea model trip generation component. The outcome of the fratar process and subsequent trip table expansion into the refined ITAM traffic analysis zones is a set of trip matrices by trip purpose, which reflect the ITAM trip generation and OCTAM trip distribution patterns. The resulting trip production and attraction (P/A) tables by trip purpose are then converted to origin and destination (O/D) trip tables for four time periods (A.M., P.M., midday and night).

Table 5.13-8 shows the socioeconomic (SED)-based trip rates for the IBC study area, and Table 5.13-9 shows the trip generation for each alternative within Planning Area 36. Detailed trip generation assessment by ITAM TAZ can be found in Appendix N.



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Table 5.13-8
Socioeconomic-Based Trip Rates

Trip Type	Production/Attraction	Single Family	Multi-Family	Population	Employed Residents	Retail Employee	Service Employee	Other Employee	Students	Income
Home Based	Production	0.00	0.00	0.00	1.27	0.00	0.00	0.00	0.00	0.00
Work	Attraction	0.10	0.10	0.00	0.00	1.24	1.24	1.26	0.00	0.00
Other Based	Production	1.05	0.60	0.24	0.00	0.00	0.00	0.00	0.00	13.00
Work	Attraction	0.40	0.39	0.00	0.00	3.46	0.90	0.10	0.00	1.00
Home Based	Production	1.05	0.60	0.24	0.00	0.00	0.00	0.00	0.00	13.00
Other	Attraction	0.40	0.39	0.00	0.00	3.46	0.90	0.10	0.00	1.00
Home Based	Production	0.89	0.46	0.11	0.00	0.00	0.00	0.00	0.00	11.00
Shop	Attraction	0.00	0.00	0.00	0.00	5.54	0.00	0.00	0.00	0.00
Other Based	Production	0.44	0.43	0.00	0.00	5.20	1.08	0.24	0.00	2.00
Other	Attraction	0.41	0.45	0.00	0.00	4.84	1.10	0.20	0.00	2.00
Home Based	Production	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
University	Attraction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Home Based	Production	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00
School	Attraction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.00

Table 5.13-9
Trip Generation Summary for Future Forecast Scenarios

Time Period	2015 Cumulative Baseline No Project	2015 Cumulative With Project	Post-2030 Cumulative Baseline No Project	Post-2030 Cumulative With Project
AM Out	11,206	14,858	11,199	19,336
AM In	28,973	30,962	28,959	36,105
PM Out	27,304	29,982	27,283	35,513
PM In	17,378	20,793	17,363	25,795
ADT	508,790	578,825	508,798	697,308

5.13.3.3 Study Area Committed Roadway Improvements

The IBC area has a number of circulation system improvements that have been programmed into the model for each of the respective analysis years. Tables 5.13-10 and 5.13-11 indicate the committed roadway and intersection improvements for the IBC area for the 2015 and buildout scenarios. Only IBC improvements identified in the 1992 IBC Rezone EIR that are already built or fully funded are assumed in the future No Project and With Project scenarios studied to identify impacts and mitigations. Each scenario analyzed incorporates the intersection improvements programmed for the scenario year. A full listing of all intersection improvements is included in Appendix N (see Appendix E of the traffic study).

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Table 5.13-10
Study Area Committed Roadway Improvements

Stage	Location	Improvements	Status [1]
Stage I			
	Main – Sunflower to San Diego Creek	Widen to 6 lanes	Complete
	Jamboree – Barranca to Michelson including the I-405 interchange	Widen to 8 lanes	Complete
	MacArthur – Main to Douglas including I-405 interchange	Widen to 8 lanes	Complete
	Dyer – SR-55 to Red Hill	Widen to 8 lanes	Not Funded
	MacArthur – SR-55 to Red Hill	Widen to 8 lanes – Phase II (4th EBT; 4th WBT)	Not Funded
	Barranca – Red Hill to Jamboree	Widen to 7 lanes (4th WBT)	Fully Funded
	Barranca – Red Hill to Jamboree	Widen to 8 lanes (4th EBT)	Not Funded
Stage II			
	Michelson @ San Diego Creek	Widen bridge to 4 lanes	Complete
	Red Hill @ I-405	Widen overcrossing to 6 lanes	Not Funded
	MacArthur - Red Hill to Main	Widen to 8 lanes (only 7 lanes done)	Not Funded
	Red Hill – Barranca to Main	Widen to 8 lanes (4th NBT; 4th SBT)	Not Funded
	Alton – San Diego Creek to Red Hill	Widen to 6 lanes	Not Funded
	Alton @ SR-55	Construct 5 lane overcrossing	Not Funded
	Main – Jamboree to Harvard	Add EB and WB auxiliary lanes	Not Funded
Stage III			
	Von Karman – Main to Michelson	Widen overcrossing to 6 lanes	Not Funded
	Dyer - SR 55 to Red Hill	Widen to 8 lanes - Phase II	Not Funded
	Von Karman/I-405 and Alton/SR-55	Estimated IBC Cost Share - HOV Ramps	Not Funded
	Red Hill – Edinger to Barranca	Valencia to Barranca—Widen to 7 lanes (4th NBT)	Not Funded
		Valencia to Edinger (4th NBT)	Not Funded
		Edinger to Barranca (4th SBT)	Not Funded
	Von Karman – Barranca to Main	Widen to 6 lanes (3rd NBT; 3rd SBT)	Not Funded
	Jamboree – Barranca to McGaw	Widen to 10 lanes (5th NBT; 5th SBT)	Not Funded
	Barranca – Von Karman to Jamboree	Add EB auxiliary lane	Not Funded
	Main – Red Hill to Harvard	Add EB and WB auxiliary lanes	Not Funded

Notes: [1] Status as of March 2008

Legend:

EBT = Eastbound Through Lane
WBT = Westbound Through Lane
NBT = Northbound Through Lane
EBR = Eastbound Right
SBR = Southbound Right
SBT = Southbound Through Lane

EBL = Eastbound Left
WBR = Westbound Right
WBL = Westbound Left
NBL = Northbound Left
VLD = Variable Lane Deployment
NBR = Northbound Right



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Table 5.13-11

Study Area Committed Intersection Improvements

Funding Status of 1992 IBC Intersection Improvements - March 2008				
Stage	ID	Location	Improvements	Status [1]
Stage I				
	49	Red Hill & Main	3rd EBT; 3rd WBT	Complete
	78	MacArthur & Main	4th SBT; 3rd EBT; Free WBR	Complete
	79	MacArthur & I-405 NB Ramp	Free 2nd NBR; 4th SBT; 4th NBT; Free 2nd	Complete
	80	MacArthur & I-405 SB	2nd SBL; 4th SBT; 4th NBT	Complete
	82	MacArthur & Michelson	4th SBT; 4th NBT; NBR; WBT	Complete
	84	MacArthur & Campus	4th SBT; 3rd EBT; 3rd WBT	Complete
	138	Jamboree & Alton	3rd WBT; 4th NBT; 4th SBT	Complete
	141	Jamboree & Main	4th SBT; 4th NBT; 3rd WBT; 3rd EBT	Complete
	143	Jamboree & I-405 NB Ramp	3rd NBT & 4th SBT	Complete
	144	Jamboree & I-405 SB	4th SBT; 3rd & 4th NBT	Complete
	145	Jamboree & Michelson	4th SBT; 4th NBT	Complete
	188	Harvard & Michelson	2nd EBL	Complete
	42	Red Hill & Dyer/Barranca	2nd WBL; 4th EBT; 4th WBT	Fully Funded ¹
	47	Red Hill & MacArthur	3rd WBT; 3rd EBT	Fully Funded ¹
	47	Red Hill & MacArthur	4th WBT; 4th EBT	Not Funded
	82	MacArthur & Michelson	2nd NBL	Not Funded
	84	MacArthur & Campus	EBR	Not Funded
	143	Jamboree & I-405 NB Ramp	4th NBT	Not Funded
	145	Jamboree & Michelson	EBR	Not Funded
	188	Harvard & Michelson	Free SBR	Not Funded
Stage II				
	133	Jamboree & ICD	Grade Separation	Complete
	138	Jamboree & Alton	2nd NBL; 2nd SBL; 3rd EBT	Complete
	150	MacArthur & Jamboree	NBR; 2nd NBL	Complete
	42	Red Hill & Dyer/Barranca	4th SBT; 4th NBT; 2nd EBL	Fully Funded
	47	Red Hill & MacArthur	3rd SBT; 3rd NBT; 2nd NBL	Fully Funded
	47	Red Hill & MacArthur	4th NBT	Not Funded
	49	Red Hill & Main	3rd & 4th SBT; 3rd NBT; Free NBR	Not Funded
	78	MacArthur & Main	Replace 1 WBT (VLD) with 3rd WBL (VLD)	Not Funded
	136	Jamboree & Barranca	Grade Separation	Not Funded
	138	Jamboree & Alton	5th NBT; 5th SBT	Not Funded
	184	Harvard & Barranca	WBR; 2nd SBL; 2nd NBL	Not Funded
	186	Harvard & Main	Free SBR	Not Funded
Stage III				
	234	Culver & Michelson	2nd NBL; SBR; WBR	Complete
	47	Red Hill & MacArthur	Replace 1 SBT (VLD) with 3rd SBL (VLD); Replace 1 EBT (VLD) with 3rd EBL (VLD)	Not Funded
	97	Von Karman & Barranca	Free NBR; 2nd WBL; 4th WBT; 4th EBT	Not Funded
	136	Jamboree & Barranca	Free EBR	Not Funded
	141	Jamboree & Main	4th EBT	Not Funded
Tustin Legacy				
	49	Red Hill & Main	Free SBR	Committed
	102	Von Karman & Michelson	2nd EBL	Committed
Funding Status of 1999 IBC Intersection Improvements				
Stage	ID	Location	Improvements	Status (1)
	138	Jamboree & Alton	5th NBT	Committed
	185	Harvard & Alton	2nd NBL	Committed
	227	Culver & Warner	2nd EBL	Committed

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Notes: [1] Status as of March 2008

¹ The two fully funded improvements at Red Hill & MacArthur and Red Hill & Dyer/Barranca (both funded in part by the 1992 IBC Fees) will be constructed by 2015 and are assumed to be in-place in the 2015 interim year analysis.

Legend:

EBT = Eastbound Through Lane
WBT = Westbound Through Lane
NBT = Northbound Through Lane
EBR = Eastbound Right
SBR = Southbound Right
SBT = Southbound Through Lane

EBL = Eastbound Left
WBR = Westbound Right
WBL = Westbound Left
NBL = Northbound Left
VLD = Variable Lane Deployment
NBR = Northbound Right

5.13.3.4 Existing With Project Scenario

As required under the California Environmental Quality Act (CEQA), an evaluation of existing conditions with the project scenario overlaid is required. This theoretical scenario provides an early glimpse of potential impacts associated with implementation of the proposed project. The impacts are considered theoretical because it is impossible for the entire project to be constructed instantly, without requisite circulation system improvements as new projects are built. Although this is not a feasible scenario for the IBC Vision, as the project cannot be implemented immediately, it provides a basis for evaluation of potential project impacts. In the analysis, the difference in the number of trips between the proposed project and Existing No Project forecasts were added to the existing counts to determine the Existing With Project conditions. The Existing With Project is intended to identify project trips and not the trips from other ambient land uses through the buildout of the project (those ambient trips are added for purposes of a cumulative impact analysis). Since it is unreasonable to assume that all the project trips from the full buildout of the IBC Vision will happen at once, the anticipated project impacts should be considered only within the context of a full buildout of the roadway system servicing the IBC and surrounding areas. Table 5.13-12 presents the land use quantities by ITAM code for the IBC traffic study area, while Appendix N (see Appendix J of the traffic study) presents land use quantities by type and by IBC TAZ as well as a land use summary by individual project. Land use quantities for 2008 Existing Conditions (With Project) have been developed by the City of Irvine. Figures 5.13-11 through 5.13-13 demonstrate the total quantities and percentage differences in three main land use categories, Residential Units, Office Mix, and Industrial Mix between Existing No Project and Existing With Project scenarios.



Table 5.13-12
Existing With Project Land Use Summary

Scenario	Multi-family Residential (DU)	Retail mix (TSF)	Hotel (Room)	Office mix (TSF)	Industrial Mix (TSF)	Mini-Warehouse (TSF)	Extended Stay Hotel (Room)
2008 No Project	5,011	1,341	2,322	26,381	14,701	348	174
2008 With Project	17,038	1,731	2,880	33,716	13,180	164	598
Percent Growth (2008 With Project vs. 2008 No Project)	240%	29%	24%	28%	-10%	-53%	244%

Existing With Project Daily Arterial Segment Analysis

Under Existing With Project conditions, traffic patterns throughout the city are generally consistent with existing conditions. Figures 5.13-14 and 5.13-15 present the Existing With Project ADT and daily arterial deficiencies for study area arterials. The peak hour analysis methodology is consistent with existing conditions.

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The arterial analysis indicates that the following segments are deficient when the proposed project trips are added to the existing traffic volumes:

- 879—Campus Drive from Carlson Avenue to University Drive (Irvine)
- 213—Culver Drive from I-5 SB Off-Ramp to Scottsdale Drive (Irvine)
- 221—Culver Drive from Main Street to San Leandro (Irvine)
- 222—Culver Drive from San Leandro to I-405 NB On-Ramp (Irvine)
- 224—Culver Drive from I-405 SB On-Ramp to Michelson Drive (Irvine)
- 130—Jamboree Road from El Camino Real to I-5 NB On-Ramp (Irvine)
- 958—Jamboree Road from I-5 NB Ramps to I-5 SB Off-Ramp (Irvine)
- 131—Jamboree Road from I-5 SB Off-Ramp to Michelle Drive (Irvine)
- 133—Jamboree Road from Michelle Drive to Walnut Avenue (Irvine)
- 148—Jamboree Road from I-405 On-Ramp to Michelson Drive (Irvine)
- 188—University Drive from California Avenue to Mesa Road (Irvine)
- 187—University Drive from Mesa Road to Campus Drive (Irvine)
- 1301—MacArthur Boulevard from Bison Avenue to Ford Road (Newport Beach)

Existing With Project Peak Hour Link Analysis

All arterial segments operate at an acceptable LOS in both peak hours, operating at LOS C or better, and hence no mitigation measures are recommended at this time for these facilities.

There are no segments within the City of Irvine that fail under peak hour Existing With Project conditions. For segments outside the City of Irvine, the jurisdiction's segment analysis guidelines are applied. Costa Mesa, Newport Beach, and Tustin, outside the City of Irvine assess segment impacts at the intersection level. Improvements at the intersections that feed into deficient arterial segments should eliminate deficiencies. For segments in the City of Santa Ana, deficiencies are addressed in the daily condition. There are no arterial segments in Santa Ana that are deficient under Existing With Project conditions.

Existing With Project Intersection Analysis

Using the Existing With Project forecast volumes, an ICU analysis was developed for study area intersections. The thresholds are consistent with existing conditions. Detailed ICU worksheets are presented in Appendix N (see Appendix B of the traffic study). Figures 5.13-16 and 5.13-17 graphically display the AM and PM peak hour intersection deficiencies. The Existing With Project analysis determined that four intersections within the study area would operate at a deficient LOS. Many of the deficiencies are temporary and are addressed as part of already planned circulation improvements within the study area. The deficient intersections include:

PM Peak Hour:

- #145: Jamboree Road at Michelson Drive (Irvine)—PM Peak Hour LOS 1.21
- #42: Red Hill Avenue at Barranca Parkway/Dyer Road (Irvine/Santa Ana/Tustin)—PM Peak Hour LOS 1.01
- #36: Red Hill Avenue at El Camino Real (Tustin)—PM Peak Hour LOS 1.12
- #111: Franklin and Walnut Avenue (Tustin)—PM Peak Hour LOS 0.91

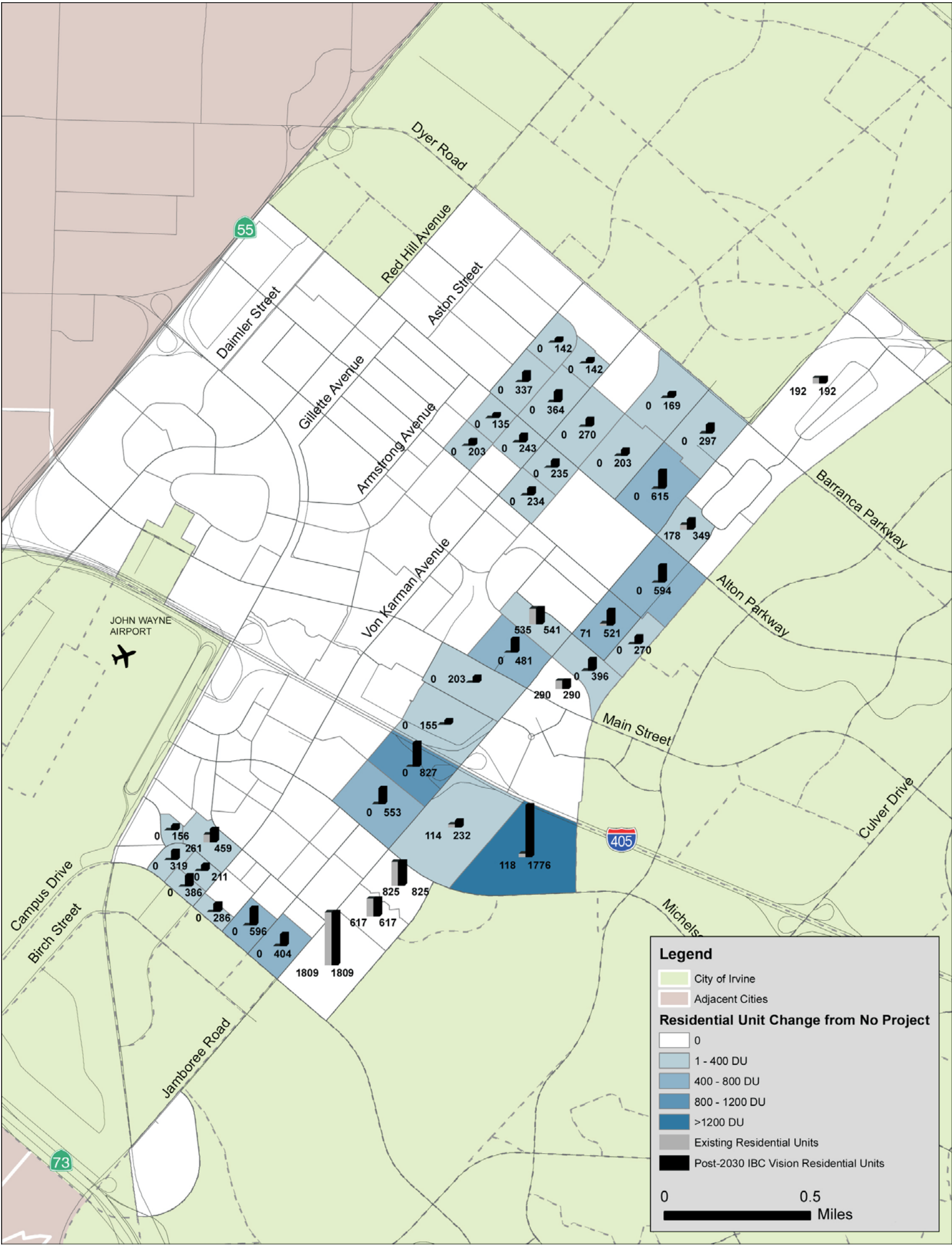
Mitigation measures and improvements will be discussed in Section 5.13.6, *Mitigation Measures*.

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Land Use Comparison between IBC Vision Plan
and Existing No Project (Residential Units)



Source: Parsons Brinckerhoff 2009



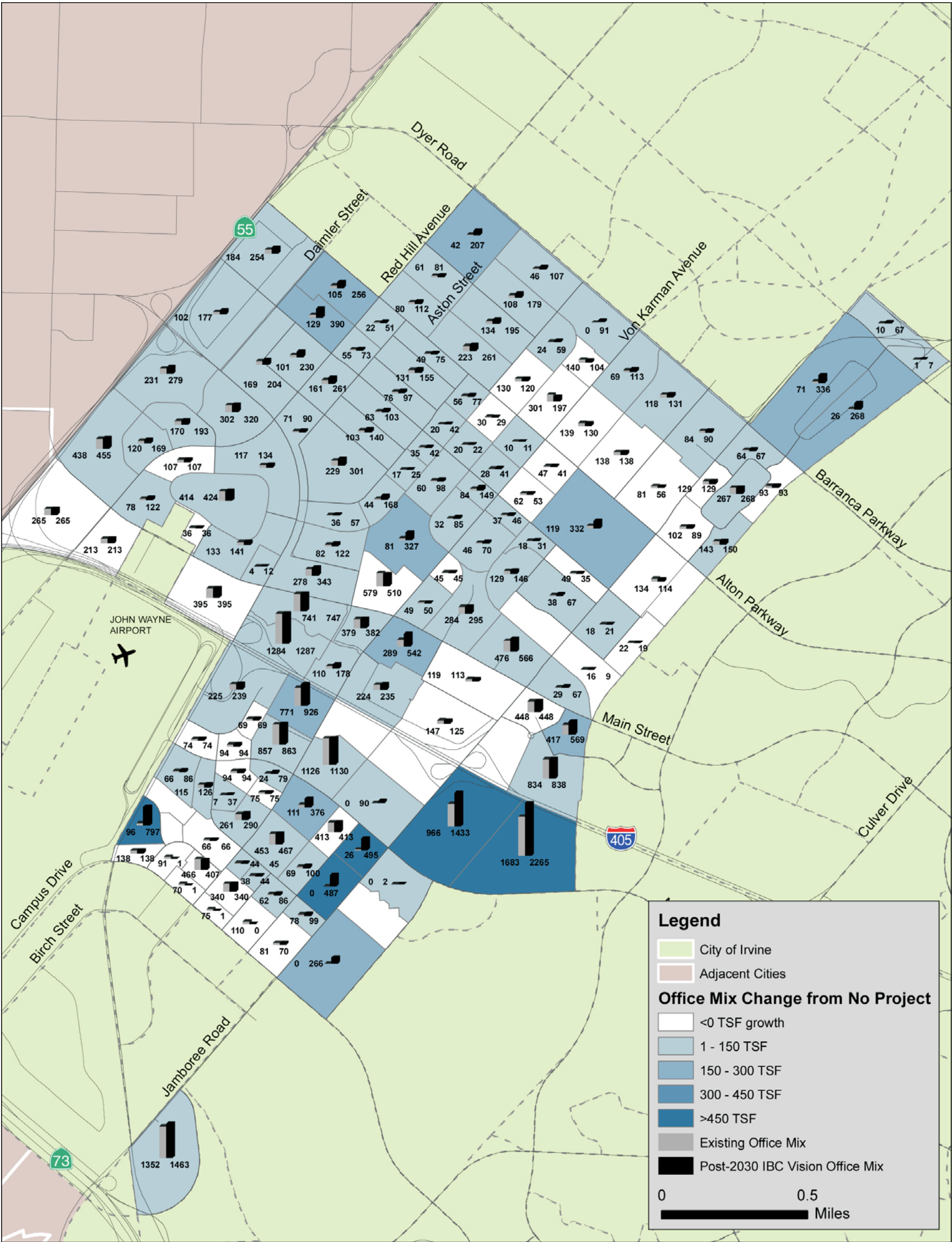
5. *Environmental Analysis*

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Land Use Comparison between IBC Vision Plan
and Existing No Project (Office Mix)



Source: Parsons Brinckerhoff 2009



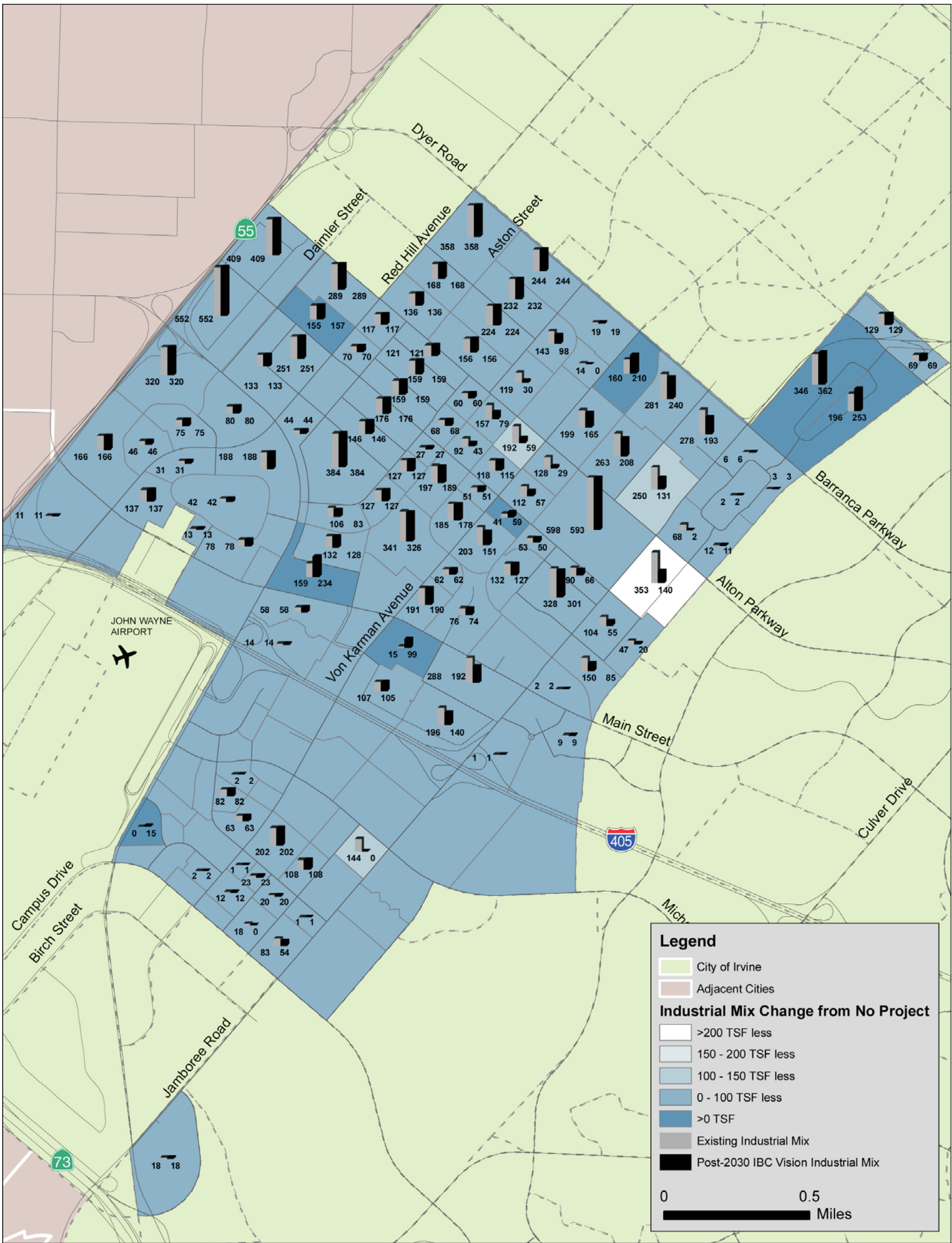
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Land Use Comparison between IBC Vision Plan
and Existing No Project (Industrial Mix)



Source: Parsons Brinckerhoff 2009

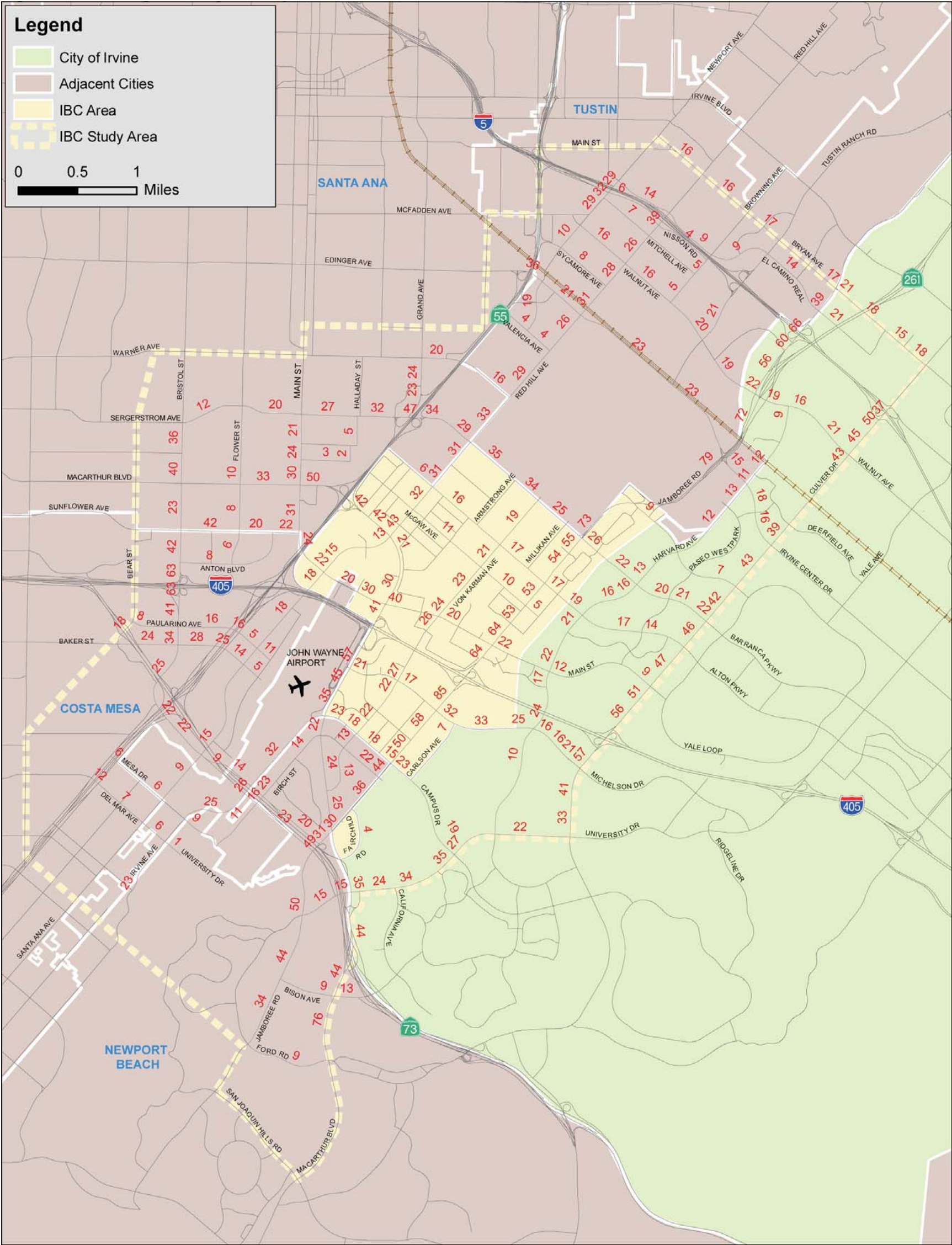
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Existing With Project Daily Arterial ADT



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Existing With Project Daily Arterial Deficiencies



Source: Parsons Brinckerhoff 2009

IBC Vision Plan and Mixed Use Overlay Zoning Code Recirculated DEIR

City of Irvine • **Figure 5.13-15**



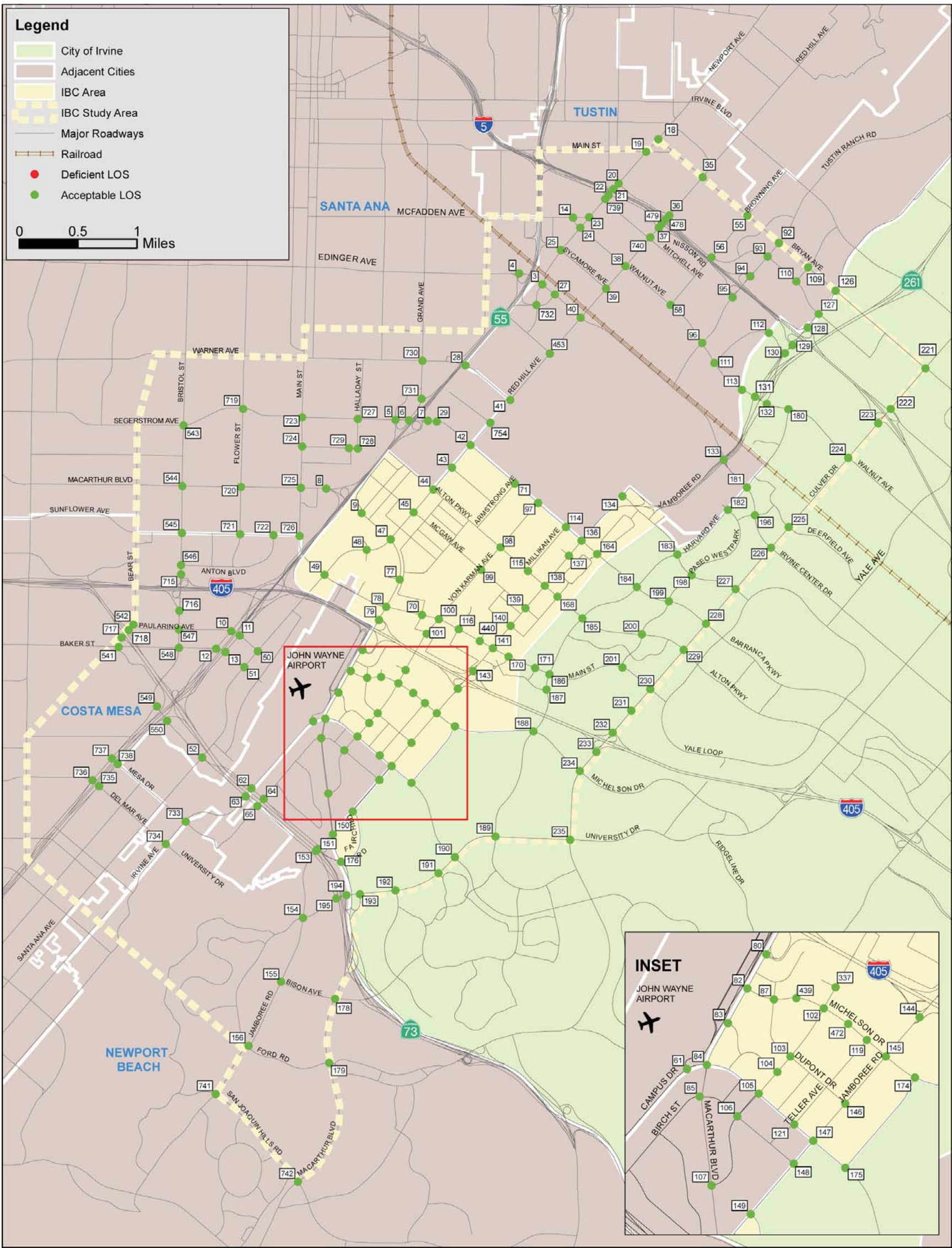
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Existing With Project Intersection AM Peak Hour Deficiencies



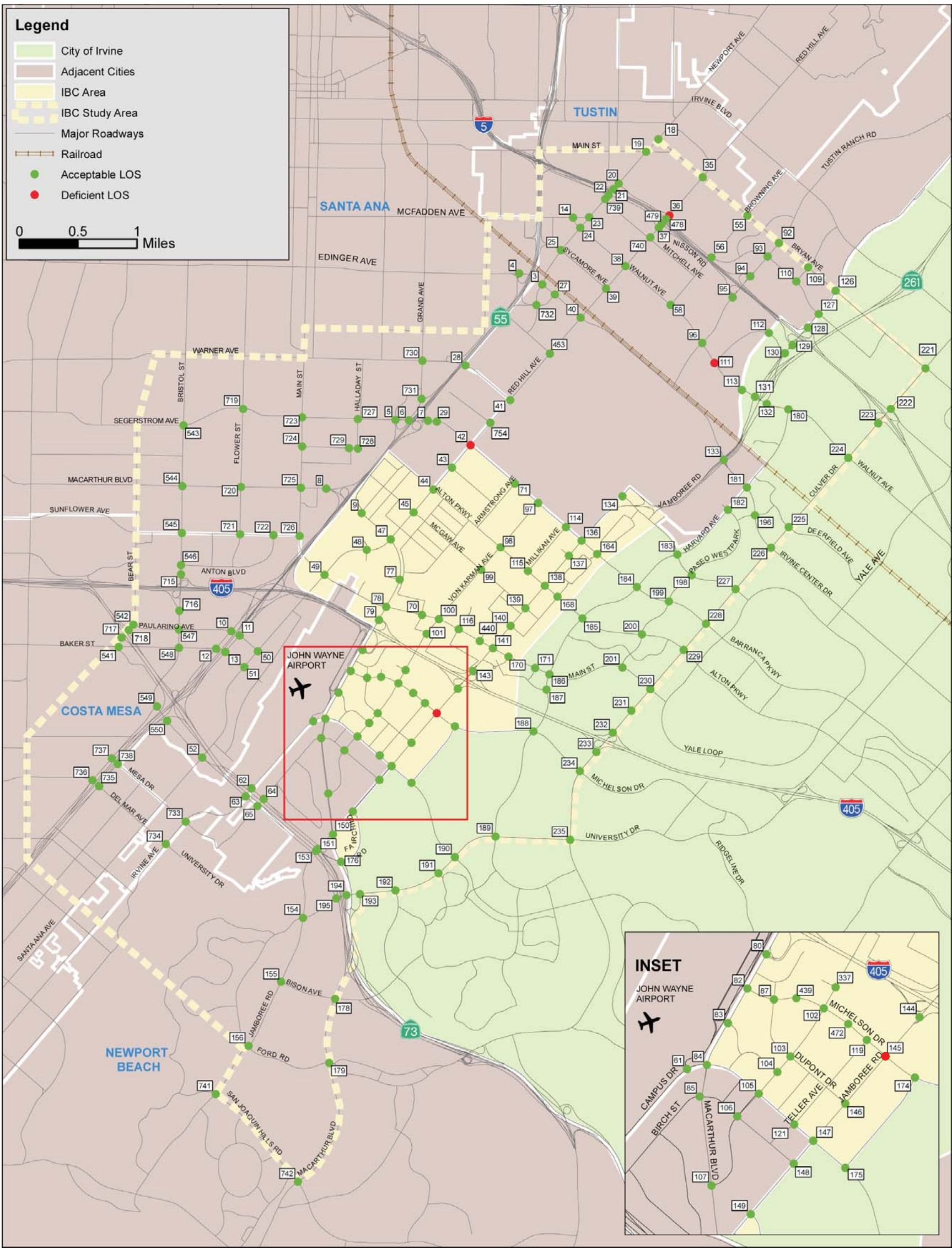
5. *Environmental Analysis*

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Existing With Project Intersection PM Peak Hour Deficiencies



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Existing With Project Freeway Mainline Analysis

In order to forecast the project trips to be added by the proposed project, the difference between the ITAM 2008 Existing No Project and Existing With Project forecast volumes was added to the existing counts from PeMS. The volumes are similar for the existing conditions no project scenario, with some increases and decreases representing the redistribution of trips with the increased residential land use under the IBC Vision Plan. Figures 5.13-15 and 5.13-16 show the deficiencies for the freeway mainlines and ramps for the 2008 Existing With Project scenario.

Several freeway segments are forecast to operate at a deficient LOS under the Existing With Project scenario including the following:

AM Peak Hour:

- I-5 Northbound between Red Hill Avenue and Newport Avenue
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Southbound between Newport Avenue and SR-55
- I-405 Northbound between Culver Drive and Jamboree Road
- I-405 Southbound between Culver Drive and Jamboree Road
- I-405 Northbound between Jamboree Road and MacArthur Boulevard
- I-405 Southbound between Jamboree Road and MacArthur Boulevard
- I-405 Southbound between MacArthur Boulevard and SR-55
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-55 Northbound between MacArthur Boulevard and Dyer Road
- SR-73 Southbound between Campus Drive and SR-55

PM Peak Hour:

- I-5 Southbound between Newport Avenue and SR-55
- I-405 Southbound between Culver Drive and Jamboree Road
- SR-73 Southbound between Campus Drive and SR-55

The analysis demonstrates that four additional mainline segments become deficient under the Existing With Project V/C analysis: I-405 northbound between Culver Drive and Jamboree Road (AM peak hour), I-405 northbound between Jamboree Road and MacArthur Boulevard (AM peak hour), I-405 southbound between MacArthur Boulevard and SR-55 (AM peak hour), and SR-55 northbound between MacArthur Boulevard and Dyer Road (AM peak hour).

Existing With Project Freeway Ramp Analysis

Similar to the mainline analysis the Existing With Project scenario is determined by adding the difference between the ITAM Traffic Model 2008 Existing No Project and Existing with Project model forecasts to the existing counts from PeMS.

The following freeway ramps are forecast to operate at a deficient LOS under the Existing With Project scenario:

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AM Peak Hour:

- I-405 Southbound Off-Ramp to Jamboree Road
- I-405 Northbound Off-Ramp to Jamboree Road
- I-405 Northbound Off-Ramp to MacArthur Boulevard
- SR-55 Northbound On-Ramp from Paularino Avenue
- SR-55 Southbound Off-Ramp to MacArthur Boulevard
- SR-55 Northbound Off-Ramp to Dyer Road
- SR-73 Northbound On-Ramp from MacArthur Boulevard
- SR-73 Southbound Off-Ramp to Campus Drive
- SR-261 Southbound On-Ramp from Jamboree Road

PM Peak Hour:

- I-405 Southbound Off-Ramp to Jamboree Road
- I-405 Northbound On-Ramp from MacArthur Boulevard
- I-405 Southbound Loop On-Ramp from Bristol Street
- SR-55 Northbound On-Ramp from Paularino Avenue
- SR-55 Southbound Direct On-Ramp from MacArthur Boulevard
- SR-55 Northbound Loop On-Ramp from Dyer Road
- SR-73 Northbound On-Ramp from MacArthur Boulevard
- SR-73 Southbound Off-Ramp to Bison Avenue
- SR-73 Northbound On-Ramp from Campus Drive
- SR-261 Northbound Off-Ramp to Jamboree Road

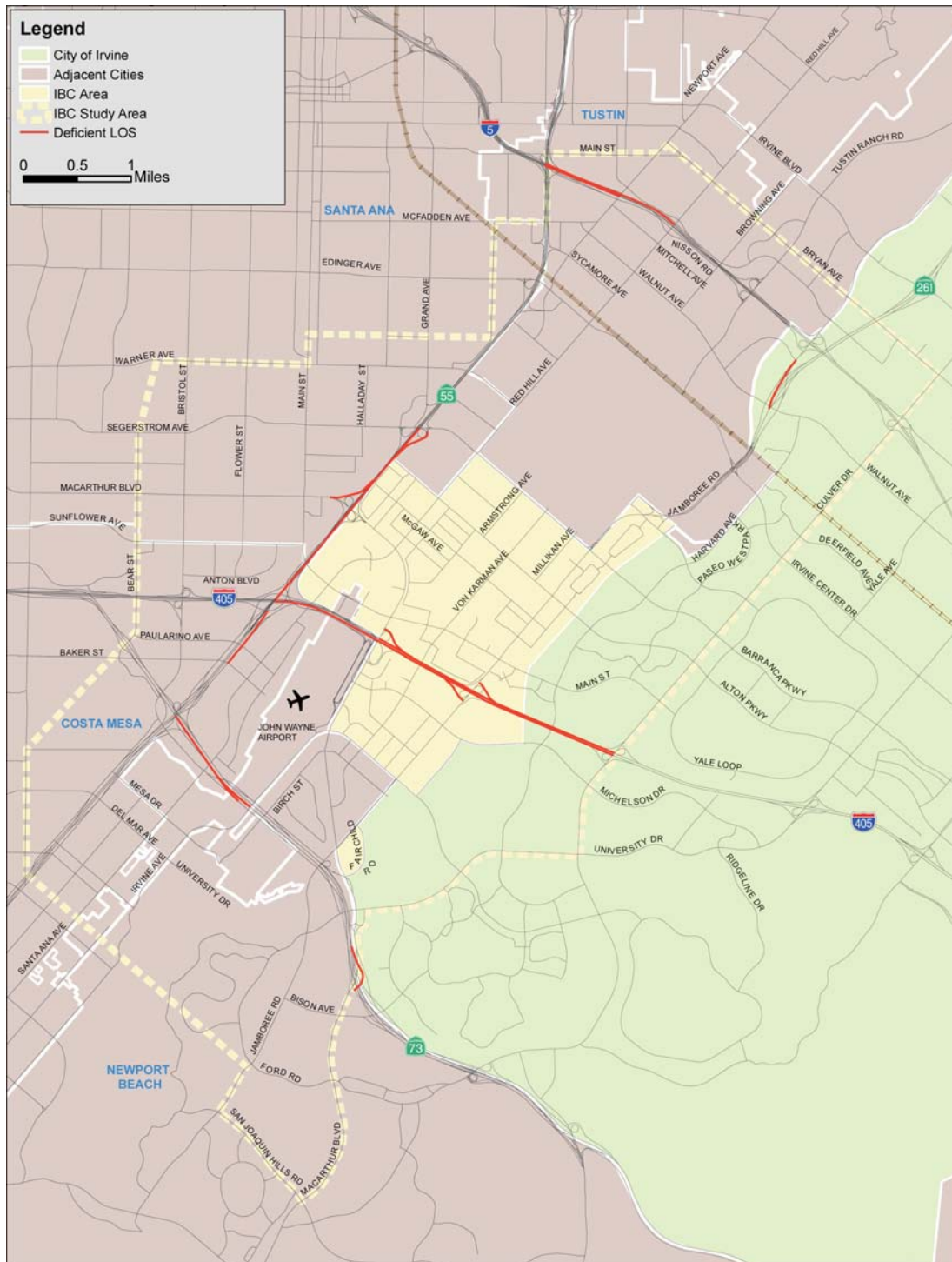


When compared to the Existing Conditions No Project, scenario, there is one additional ramp, which becomes deficient when the project trips are added to the existing network.

The Existing and Existing With Project analysis shows that while much of the study area is operating within acceptable traffic thresholds, there are several segments and intersections that are operating under a deficient LOS during daily and peak hour conditions. While the Existing With Project scenario is a theoretical exercise, the results indicate where project related trips are likely to be most concentrated in the future alternatives. Between the Existing and Existing With Project scenarios, there are a number of additional deficiencies. For intersections, in the Existing With Project condition there are three additional intersections that operate deficiently in the PM peak hour, besides Intersection #36 Red Hill Avenue at El Camino Real. These include Intersection #62 Campus Drive at Bristol Street NB, Intersection #145 Jamboree Road at Michelson Drive, and Intersection # 42 Red Hill Avenue at Barranca Parkway/Dyer Road, all located within the City of Irvine. For arterial segments, one additional segment fails under daily conditions (Jamboree Road from I-405 to Michelson) in the City of Irvine. For freeway mainlines four additional segments and one additional ramp become deficient under the With Project scenario in the AM and PM peak hours as shown in Figure 5.13-18 and Figure 5.13-19. Project related impacts and mitigation strategies will be discussed in Section 5.13.6, *Mitigation Measures*.

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Existing With Project Freeway AM Peak Hour Deficiencies



Source: Parsons Brinckerhoff 2009

IBC Vision Plan and Mixed Use Overlay Zoning Code Recirculated DEIR

City of Irvine • **Figure 5.13-18**



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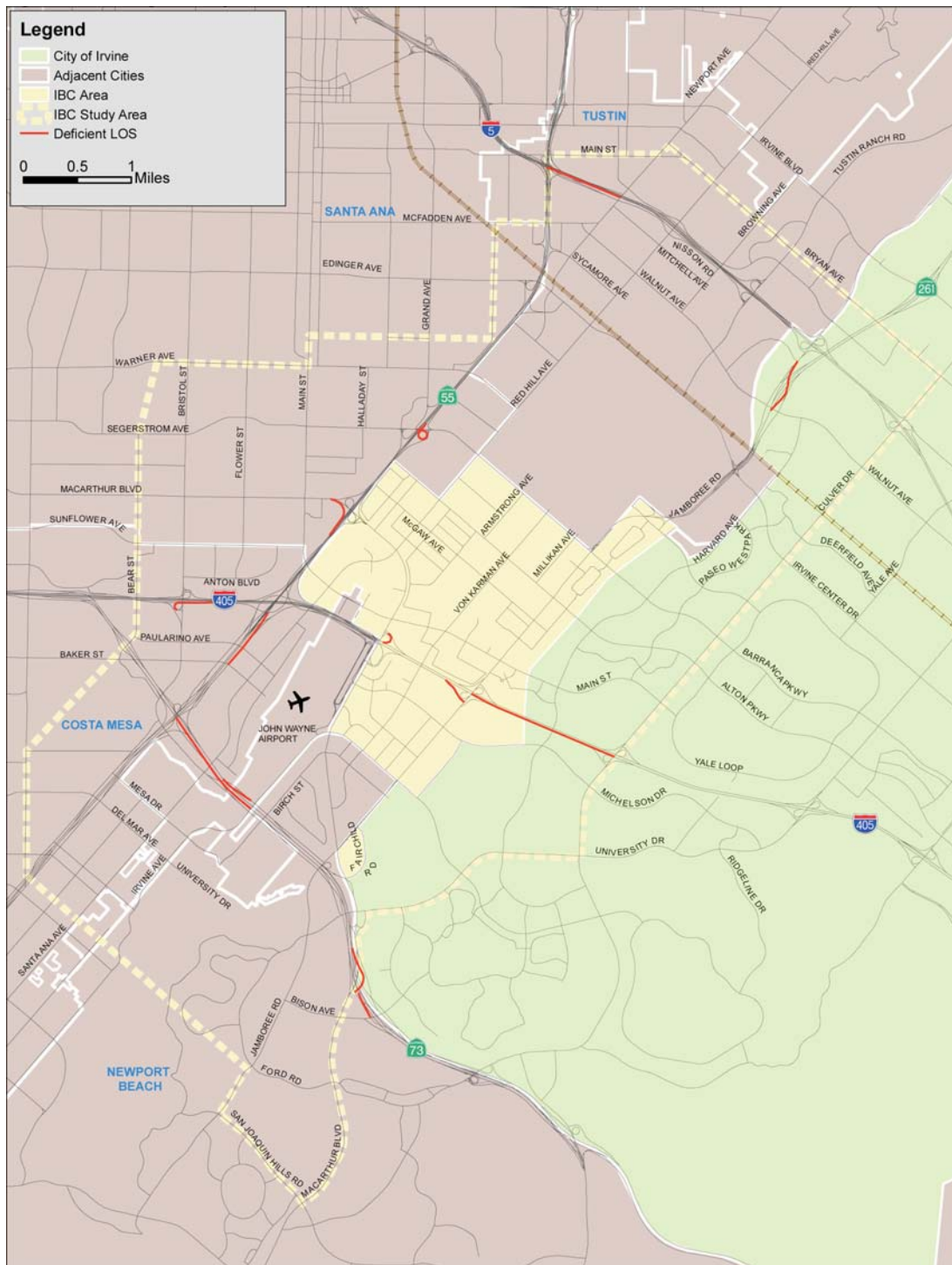
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Existing With Project Freeway PM Peak Hour Deficiencies



Source: Parsons Brinckerhoff 2009

IBC Vision Plan and Mixed Use Overlay Zoning Code Recirculated DEIR

City of Irvine • **Figure 5.13-19**



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5.13.3.5 2015 Future Conditions

The City of Irvine's traffic model, the Irvine Traffic Analysis Model (ITAM) 8.4, was used to forecast the traffic data for the various horizon years and scenarios evaluated within the study area. In addition, key intersections from the surrounding cities, which are within the study area, were coded into the model to provide an appropriate assessment of the potential impacts of the proposed General Plan Amendment and Zoning Code to surrounding jurisdictions. The following describes the change in trips generated within the study area as a result of land use assumptions and development. Additionally, an assessment of deficiencies in the study area circulation system was performed to determine the appropriate mitigation requirements for implementing this IBC Vision General Plan Amendment and Zoning Code. Using the existing conditions as a baseline, two scenarios were developed for analysis under 2015 conditions.

As part of the IBC Vision plan, the 2,035 known pending residential units currently in process and associated 215 density bonus units (with the exception of 776 units at Park Place projected to be built by Post-2030) would be expected to be completed by 2015; the remaining 3,950 units under the existing general plan cap and associated 1,383 potential density bonus units are expected to be completed by project buildout or the Post-2030 timeframe. Each proposed scenario evaluates impacts to the circulation system based on the land use assumptions. For the interim year 2015 scenarios, only those circulation improvements that are 100% funded have been assumed to be constructed. Unfunded or partially funded improvements in the IBC are not included in the traffic study. The assumed 2015 circulation system is consistent for both of the 2015 scenarios.

The results of the 2015 Cumulative Baseline No Project and 2015 Cumulative with Project scenarios are summarized below. Please refer to Appendix N for a complete discussion of these scenarios.

2015 Cumulative Baseline No Project

Under the 2015 Cumulative Baseline No Project scenario, the circulation system consists of the roadway network of interstate and state highways, major arterials, primary arterials, secondary arterials, and commuter roadways. The assumed 2015 circulation system is consistent for both the No Project and With Project scenarios. There are 275 different segments, 224 intersections, 30 freeway mainline segments, and 98 northbound and southbound freeway ramps that were analyzed as part of the IBC Vision Traffic Study. The 2015 Cumulative Baseline No Project scenario analyzes the effects on the circulation system of future forecast growth in the study area, without the proposed project.

2015 Cumulative Baseline No Project Land Use and Trip Generation

The 2015 No Project scenario assumes existing on-the-ground land uses within the IBC area and estimated 2015 land use growth outside the IBC area. Table 5.13-13 displays the 2015 Cumulative Baseline No Project land use assumed in the model for the IBC. Table 5.13-14 displays the Trip Generation table from ITAM for the 2015 Cumulative Baseline No Project scenario.

The No Project analysis will display expected circulation system deficiencies in 2015, without the project. Following the No Project analysis, project impacts can be determined through a comparison with the With Project scenario.

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Table 5.13-13
2015 Cumulative Baseline No Project Land Use Summary

Scenario	Multi-family Residential (DU)	Retail mix (TSF)	Hotel (Room)	Office Mix (TSF)	Industrial Mix (TSF)	Mini-Warehouse (TSF)	Extended Stay Hotel (Room)
2008 No Project	5,011	1,341	2,322	26,381	14,701	348	174
2008 With Project	17,038	1,731	2,880	33,716	13,180	164	598
2015 No Project	5,011	1,341	2,322	26,381	14,701	348	174
Percent Growth (2015 No Project vs. 2008 No Project)	0%	0%	0%	0%	0%	0%	0%

Source: City of Irvine
* Note: Condominium and Apartment unit totals include density bonus units.

Table 5.13-14
2015 Cumulative Baseline No Project Trip Generation

Scenario	AM-Out	AM-In	PM-Out	PM-In	ADT
2008 No Project	11,191	28,990	27,316	17,367	508,690
2008 With Project	19,336	36,105	35,513	25,795	697,308
2015 No Project	11,191	28,990	27,316	17,367	508,690
Percent Growth (2015 No Project vs. 2008 No Project)	0%	0%	0%	0%	0%

Source: ITAM



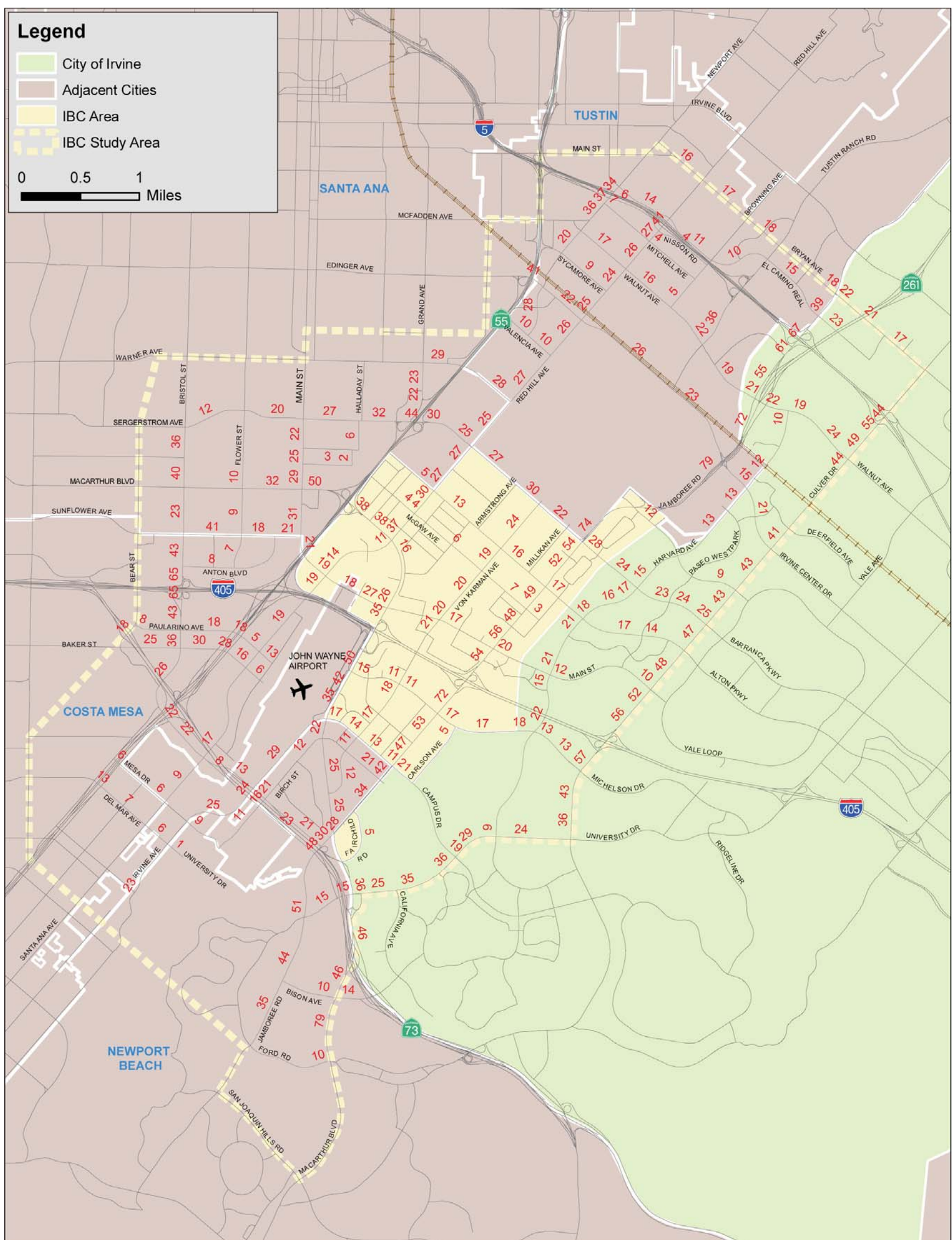
2015 Cumulative Baseline No Project Daily Arterial Segment Analysis

Under the 2015 Cumulative Baseline No Project scenario, traffic within the City shows some growth related to development of the study area as a whole. Typical north-south and east-west movements are consistent with existing conditions.

Figures 5.13-20 and 5.13-21 graphically depict the ADT Traffic Volumes and deficient segment LOS, respectively, for the 2015 Cumulative Baseline No Project scenario. The analysis indicates that ~~twelve~~ eleven segments are deficient under the 2015 Cumulative Baseline No Project daily conditions, with 10 of the segments in the City of Irvine. As noted above, LOS E indicates a deficient segment for all arterial segments outside Planning Area (PA) 36 within the City of Irvine. It should be noted that daily V/C ratio analysis arterial segments in Costa Mesa, Newport Beach, and Tustin are not evaluated further and any deficiencies are addressed at the intersections. PA 36 segments are considered deficient at LOS F. Deficient segments under daily Year 2015 Cumulative Baseline No Project conditions include:

- 879—Campus Drive from Carlson Avenue to University Drive (Irvine)
- 213—Culver Drive from I-5 SB Off-Ramp to Scottsdale Drive (Irvine)
- 221—Culver Drive from Main Street to San Leandro (Irvine)
- 222—Culver Drive from San Leandro to I-405 NB On-Ramp (Irvine)
- 224—Culver Drive from I-405 SB On-Ramp to Michelson Drive (Irvine)
- 130—Jamboree Road from El Camino Real to I-5 NB On-Ramp (Irvine)
- 958—Jamboree Road from I-5 NB Ramps to I-5 SB Off-Ramp (Irvine)
- 133—Jamboree Road from Michelle Drive to Walnut Avenue (Irvine)
- 188—University Drive from California Avenue to Mesa Road (Irvine)

2015 Cumulative Baseline No Project Daily Arterial ADT



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- 187—University Drive from Mesa Road to Campus Drive (Irvine)
- 1301—MacArthur Boulevard from Bison Avenue to Ford Road (Newport Beach)*
- ~~1585—Newport Avenue from Valencia Avenue to Edinger Avenue (Tustin)*~~

*Deficient locations under daily conditions—no further analysis required.

2015 Cumulative Baseline No Project Peak Hour Link Analysis

Peak hour directional traffic volumes were directly obtained from peak hour forecast intersection turning movement volumes for intersections upstream and downstream for each deficient arterial segment. The analysis indicates that all City of Irvine arterial segments operate at acceptable LOS in both peak hours (see Table 4.4 in Appendix N), performing at LOS D or better, and hence no mitigation measures are recommended at this time for these facilities.

2015 Cumulative Baseline No Project Intersection Analysis

Using the turning movement volumes from each intersection within the study area assumed to be built by 2015, ICU analysis was developed for every intersection within the study area. These intersections are evaluated under all future scenarios. The intersection analysis includes both a reporting of intersection ICU and the corresponding LOS. For shared jurisdictions, the more conservative methodology was utilized. Figures 5.13-22 and 5.13-23 graphically present the AM and PM Peak Hour Intersection ICU for deficient intersections. Detailed ICU worksheets for each 2015 alternative are available in Appendix N.

For the intersections that are deficient, further discussion of specific project related impacts or cumulative deficiencies and mitigation will be addressed in Section 5.13.6, *Mitigation Measures*. A total of six intersections are deficient in the 2015 Cumulative Baseline No Project scenario:

AM Peak Hour:

- #93: Tustin Ranch Road at El Camino Real (Tustin)

PM Peak Hour:

- #145: Jamboree Road at Michelson Drive (Irvine)
- #134: Loop Road/Park Avenue at Warner Avenue (Irvine/Tustin)
- #36: Red Hill Avenue at El Camino Real (Tustin)
- #111: Franklin Avenue at Walnut Avenue (Tustin)
- #732: SR-55 Northbound Ramps/Del Amo Avenue at Newport Avenue (Tustin)

2015 Cumulative Baseline No Project Freeway Mainline Analysis

Future freeway mainline volumes are forecast by ITAM. There are no freeway mainline capacity increases anticipated between the existing conditions and Year 2015. Figures 5.13-24 and 5.13-25 graphically depict the 2015 Cumulative Baseline No Project freeway and ramp deficiencies. Using the methodology prescribed by the Orange County *Congestion Management Plan* (CMP), the following segments are forecast to operate at LOS E or F. The deficient segments include:

AM Peak Hour:

- I-5 Northbound between Culver Drive and Jamboree Road
- I-5 Northbound between Jamboree Road and Tustin Ranch Road
- I-5 Northbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Northbound between Red Hill Avenue and Newport Avenue

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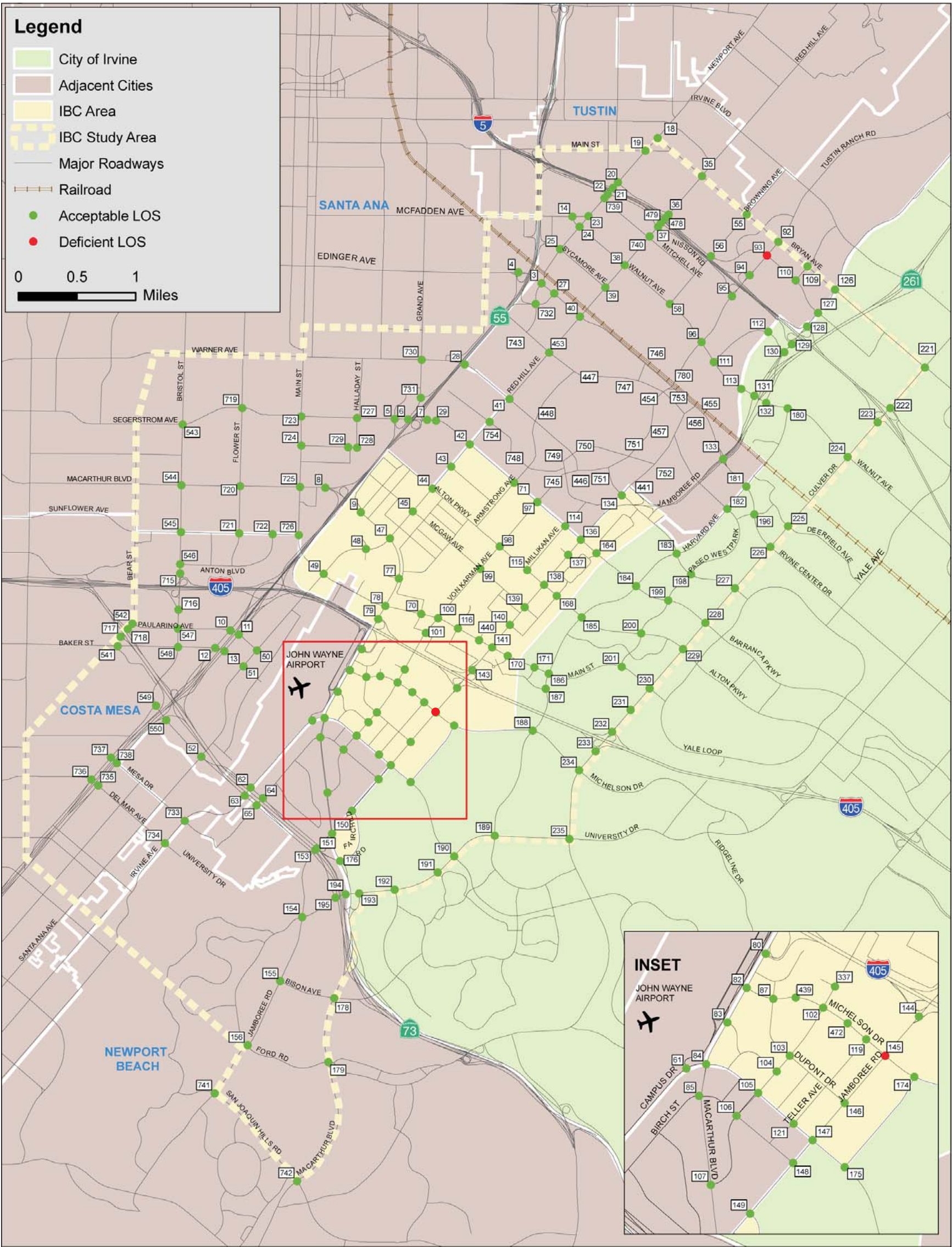
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Northbound between North of SR-55
- I-5 Southbound between North of SR-55
- I-405 Northbound between Culver Drive and Jamboree Road
- I-405 Northbound between Jamboree Road and MacArthur Boulevard
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between MacArthur Boulevard and Dyer Road
- SR-55 Southbound between Dyer Road and Edinger Avenue
- SR-55 Southbound between Edinger Avenue and McFadden Street/Sycamore Avenue
- SR-55 Southbound between McFadden Street/Sycamore Avenue and I-5
- SR-55 Southbound between North of I-5
- SR-73 Northbound between MacArthur Boulevard and University Drive
- SR-73 Northbound between University Drive and Jamboree Road
- SR-73 Northbound between Jamboree Road and Birch Street
- SR-73 Northbound between Birch Street and Campus Drive
- SR-73 Northbound between Campus Drive and SR-55
- SR-73 Southbound between Campus Drive and SR-55
- SR-73 Northbound between SR-55 and Bear Street
- SR-73 Northbound between Bear Street and I-405
- SR-261 Southbound South and El Camino Real

PM Peak Hour:

- I-5 Northbound between Culver Drive and Jamboree Road
- I-5 Northbound between Jamboree Road and Tustin Ranch Road
- I-5 Northbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Northbound between Red Hill Avenue and Newport Avenue
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Northbound North of SR-55
- I-5 Southbound North of SR-55
- I-405 Southbound between Culver Drive and Jamboree Road
- I-405 Northbound between Jamboree Road and MacArthur Boulevard
- I-405 Southbound between Jamboree Road and MacArthur Boulevard
- I-405 Southbound between MacArthur Boulevard and SR-55
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between I-405 and MacArthur Boulevard
- SR-55 Northbound between MacArthur Boulevard and Dyer Road
- SR-55 Northbound between Dyer Road and Edinger Avenue
- SR-55 Northbound between Edinger Avenue and McFadden Street/Sycamore Avenue
- SR-55 Northbound between McFadden Street/Sycamore Avenue and I-5
- SR-73 Southbound between MacArthur Boulevard and University Drive
- SR-73 Northbound between Jamboree Road and Birch Street
- SR-73 Southbound between Jamboree Road and Birch Street
- SR-73 Southbound between Birch Street and Campus Drive
- SR-73 Northbound between Campus Drive and SR-55
- SR-73 Southbound between Campus Drive and SR-55
- SR-73 Northbound between SR-55 and Bear Street



2015 Cumulative Baseline No Project AM Peak Hour
Intersection Deficiencies



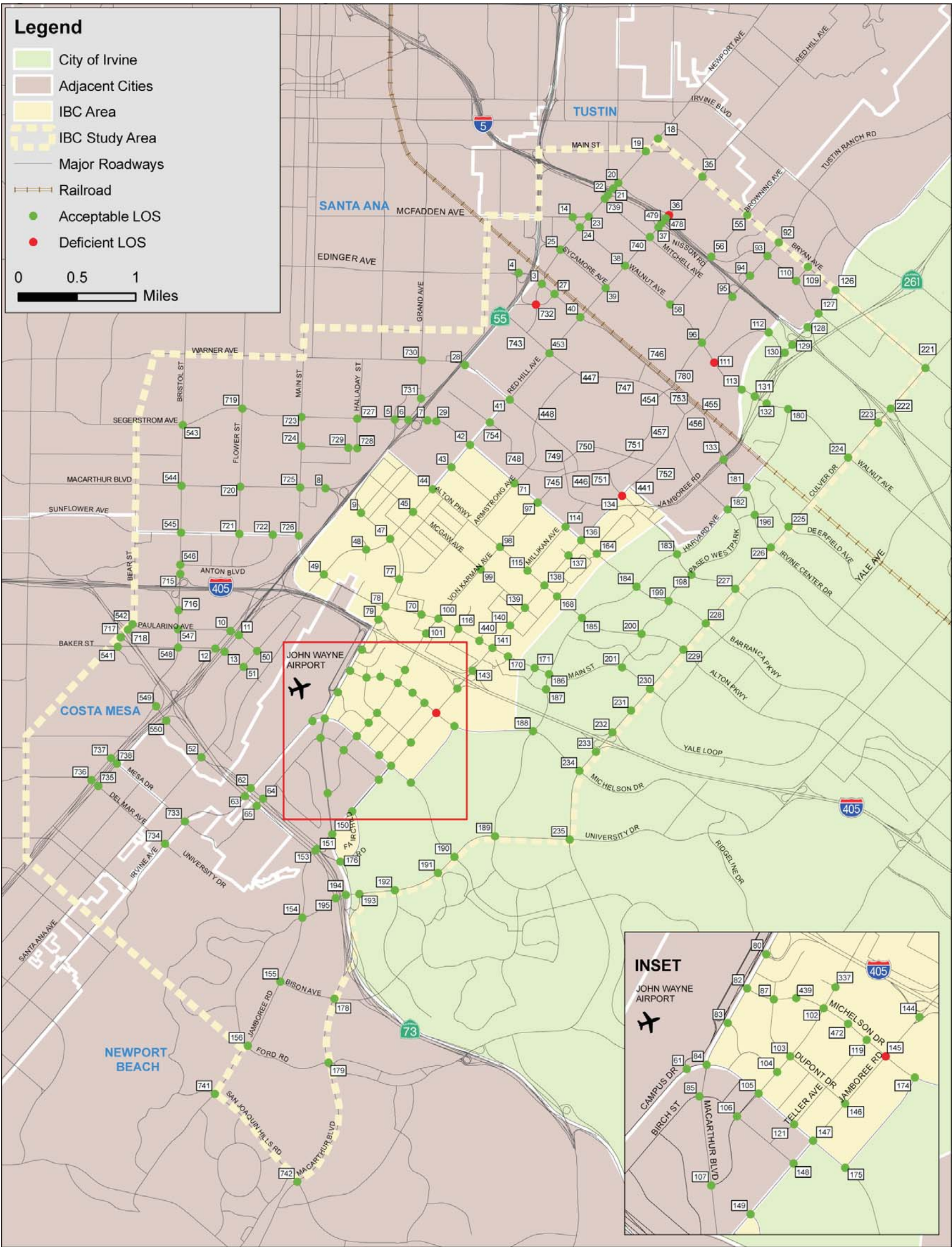
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2015 Cumulative Baseline No Project PM Peak Hour
Intersection Deficiencies



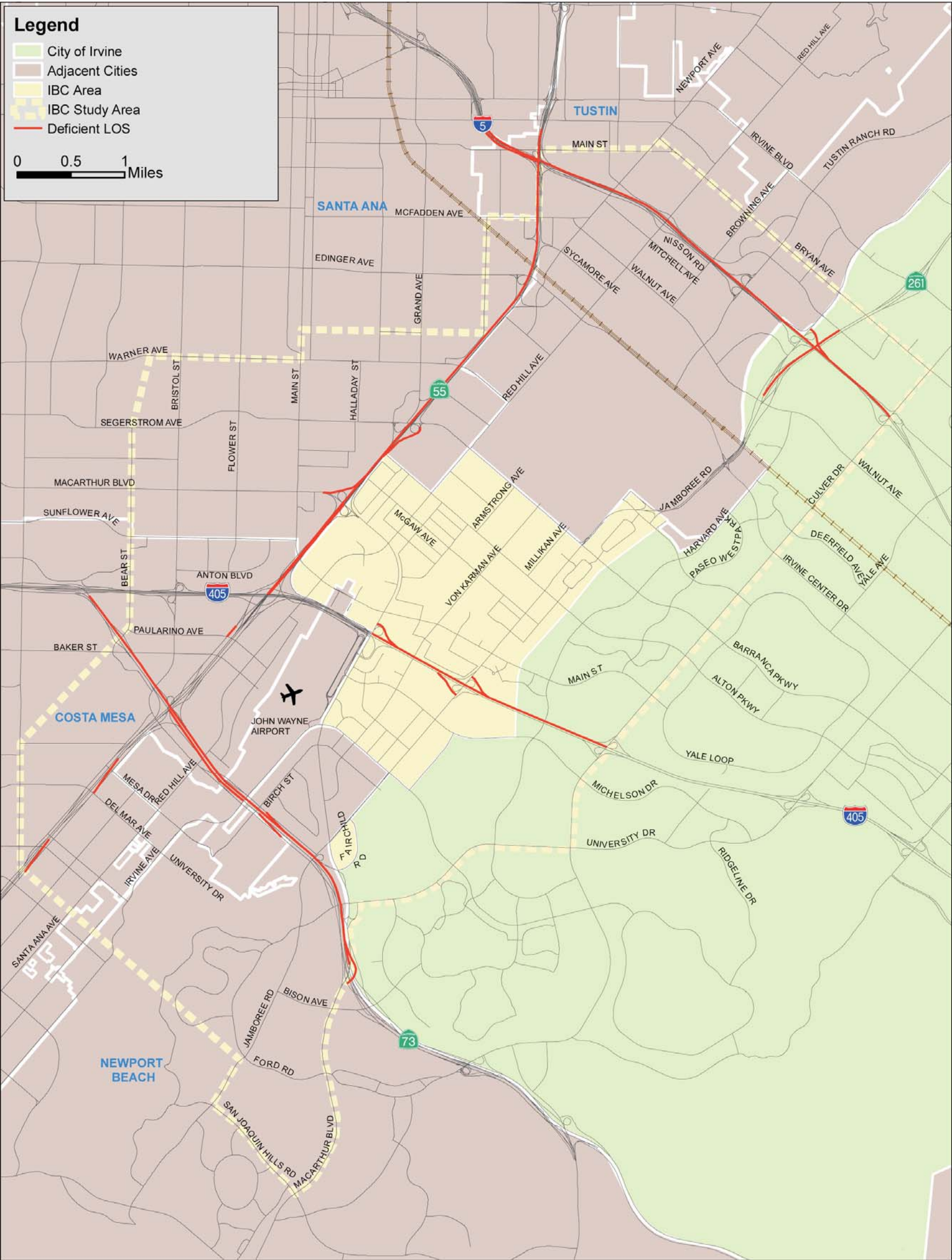
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2015 Cumulative Baseline No Project Freeway AM Peak Hour Deficiencies



Source: Parsons Brinckerhoff 2009



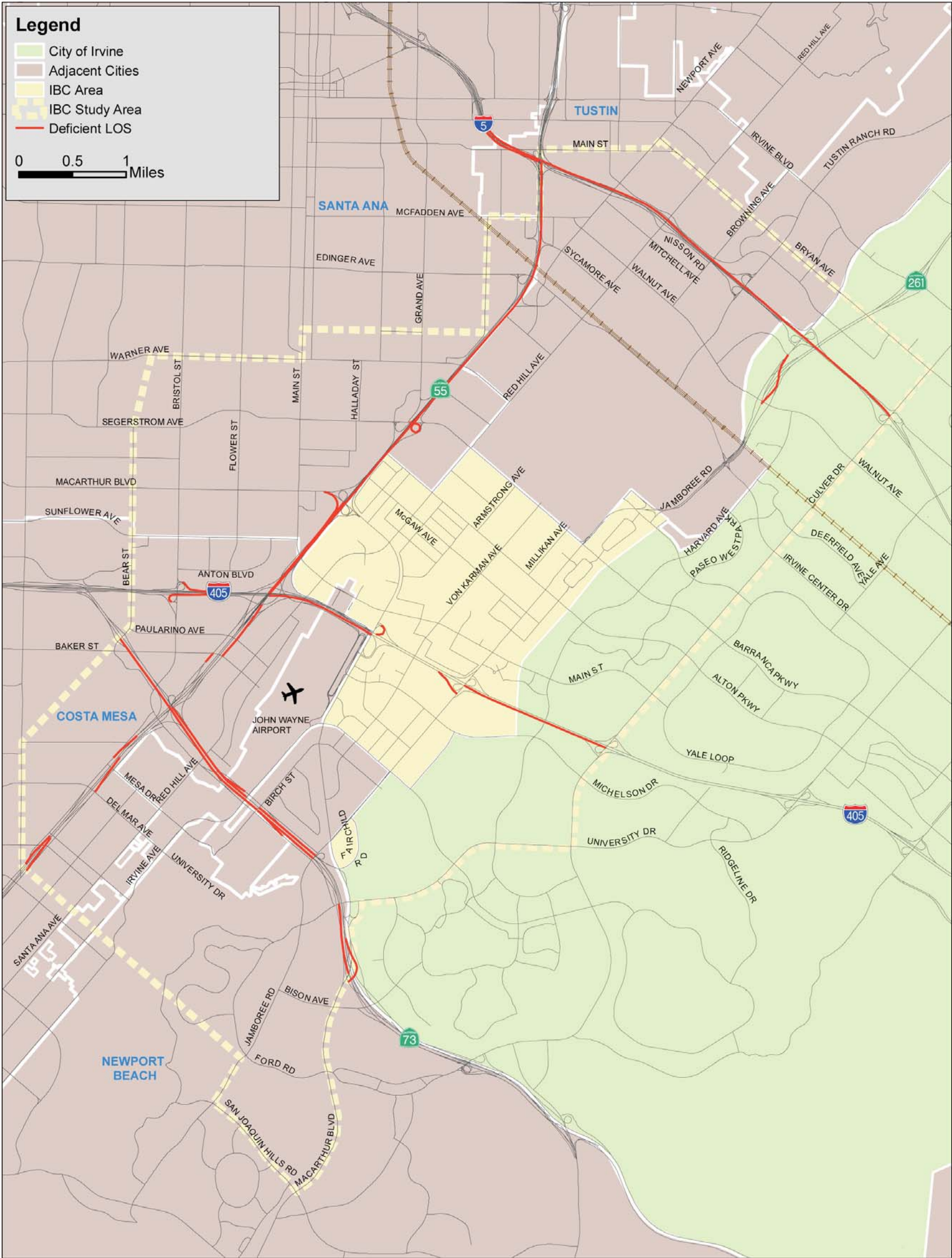
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2015 Cumulative Baseline No Project Freeway PM Peak Hour Deficiencies



Source: Parsons Brinckerhoff 2009



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2015 Cumulative Baseline No Project Freeway Ramp Analysis

The freeway ramp volumes were forecast using the ITAM model. Most ramps in the network are associated with intersection legs in the model. The post-processed volume from that leg of the intersection provides the forecast volume for the freeway ramp. Of the ramps analyzed in the 2015 Cumulative Baseline No Project scenario, the following are forecast to be deficient during the AM or PM peak hour:

AM Peak Hour:

- Northbound I-5 Direct Off-Ramp from Jamboree Road
- Southbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 Off-Ramp to MacArthur Boulevard
- Northbound SR-55 Direct On-Ramp from Victoria Street
- Northbound SR-55 Direct On-Ramp from Fair Drive
- Southbound SR-55 Off-Ramp to Paularino Avenue
- Southbound SR-55 Off-Ramp to MacArthur Boulevard
- Northbound SR-55 Off-Ramp to Dyer Road
- Northbound SR-73 On-Ramp from MacArthur Boulevard
- Southbound SR-73 Off-Ramp to Jamboree Road
- Northbound SR-73 Off-Ramp to Birch Street

PM Peak Hour:

- Southbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 On-Ramp from MacArthur Boulevard
- Southbound I-405 Loop On-Ramp from Bristol Street
- Northbound I-405 Off-Ramp to Bristol Street
- Southbound SR-55 Off-Ramp to Victoria Street
- Northbound SR-55 Direct On-Ramp from Victoria Street
- Southbound SR-55 Off-Ramp to Fair Drive
- Northbound SR-55 Direct On-Ramp from Fair Drive
- Southbound SR-55 On-Ramp from Baker Street
- Northbound SR-55 On-Ramp from Paularino Avenue
- Southbound SR-55 Direct On-Ramp from MacArthur Boulevard
- Northbound SR-55 Loop On-Ramp from Dyer Road
- Northbound SR-73 On-Ramp from MacArthur Boulevard
- Southbound SR-73 Off-Ramp to Jamboree Road
- Northbound SR-73 On-Ramp from Campus Drive
- Northbound SR-261 Northbound Off-Ramp to Jamboree Road

2015 Cumulative With Project

As with the Cumulative Baseline No Project scenario, the 2015 Cumulative With Project circulation system consists of the roadway network of interstate and state highways, major arterials, primary arterials, secondary arterials, and commuter roadways. The 2015 Cumulative With Project scenario analyzes the effects on the circulation system caused by the change in traffic patterns resulting from the expansion of the IBC as a mixed-use/residential community in Year 2015.

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2015 Cumulative With Project Land Use and Trip Generation

The current setting for land use is focused on the IBC as a major employment center and office park complex. Changes in the configuration of the IBC have been slowly transforming the complex into a mixed-use community.

Table 5.13-15 describes the land use quantities for the 2015 Cumulative Baseline No Project and With Project scenarios. The transportation networks are consistent between these two future scenarios, and all arterial, intersection, and freeway ramp improvements from existing conditions have been incorporated into the model runs. Table 5.13-16 reflects the ITAM trip generation for the 2015 Cumulative With Project scenario and compares the total number of trips between the 2015 Cumulative With Project and No Project scenarios. Figures 5.13-26 through 5.13-28 graphically display the differences in land use quantities between 2015 With Project and No Project conditions by traffic analysis zone (TAZ). It should be noted that the reason the 2008 With Project land use is greater than the 2015 With Project is that the 2008 With Project assumes full buildout of the Proposed Project while 2015 assumes a certain proportion of the ultimate buildout to be in place by 2015. Appendix N presents trip generation and land use quantities by type and IBC TAZs as well as a land use summary by individual project.

Table 5.13-15
2015 Cumulative With Project Land Use Summary

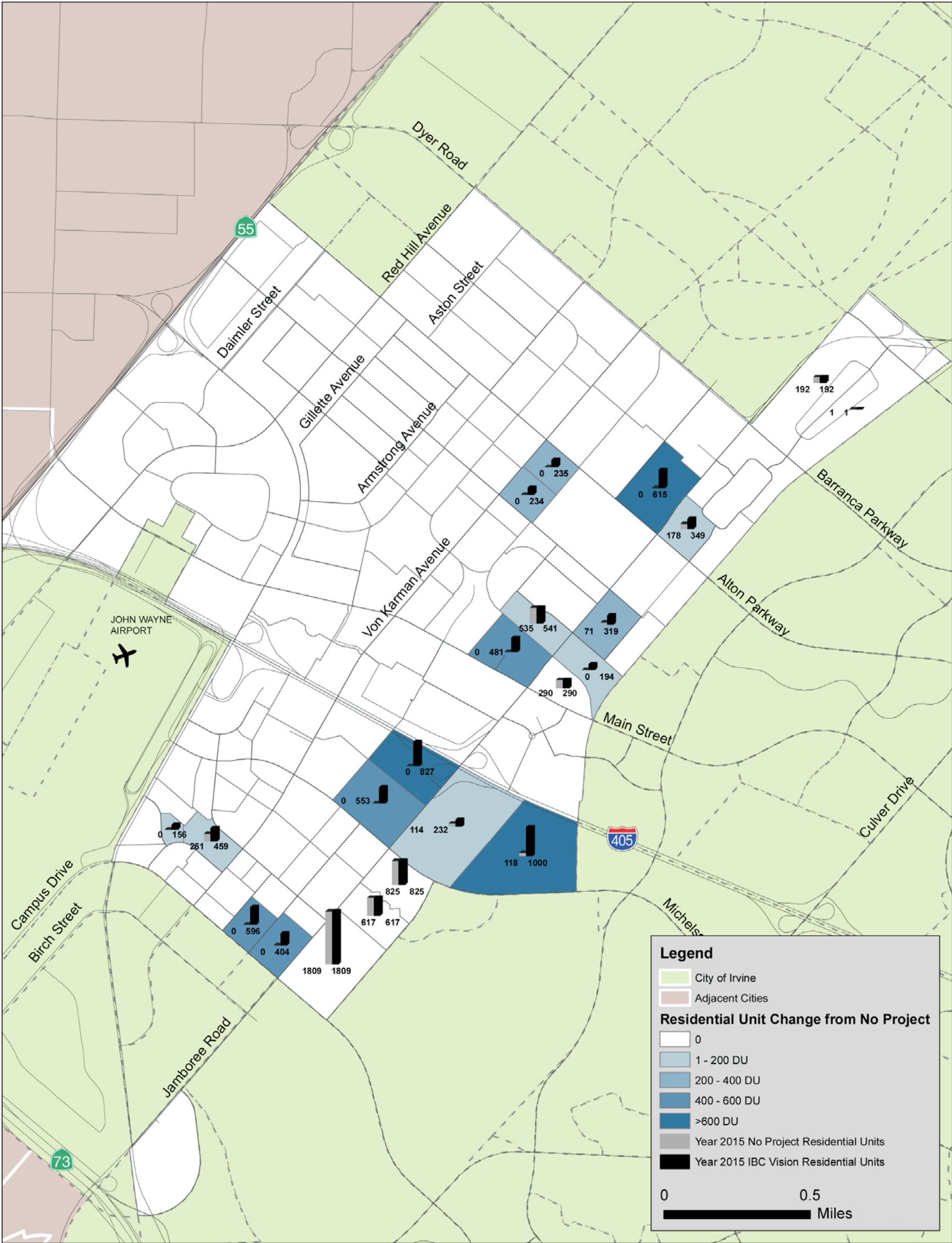
Scenario	Multi-family Residential (DU)	Retail mix (TSF)	Hotel (Room)	Office mix (TSF)	Industrial Mix (TSF)	Mini-Warehouse (TSF)	Extended Stay Hotel (Room)
2008 No Project	5,011	1,341	2,322	26,381	14,701	348	174
2008 With Project	17,038	1,731	2,880	33,716	13,180	164	598
2015 No Project	5,011	1,341	2,322	26,381	14,701	348	174
2015 With Project	10,929	1,482	2,572	27,810	14,196	348	598
Percent Growth (2015 With Project vs. 2015 No Project)	118%	11%	11%	5%	-3%	0%	244%
Percent Growth (2015 With Project vs. 2008 With Project)	-36%	-14%	-11%	-18%	8%	113%	0%



Table 5.13-16
2015 Cumulative With Project Trip Generation

Scenario	AM-Out	AM-In	PM-Out	PM-In	ADT
2008 No Project	11,191	28,990	27,316	17,367	508,690
2008 With Project	19,336	36,105	35,513	25,795	697,308
2015 No Project	11,191	28,990	27,316	17,367	508,690
2015 With Project	14,858	30,962	29,982	20,793	578,825
Percent Growth (2015 With Project vs. 2015 No Project)	33%	7%	10%	20%	14%
Percent Growth (2015 With Project vs. 2008 With Project)	-23%	-14%	-16%	-19%	-17%

Land Use Comparison between 2015 IBC Vision Plan and
2015 No Project (Residential Units)



Source: Parsons Brinckerhoff 2009

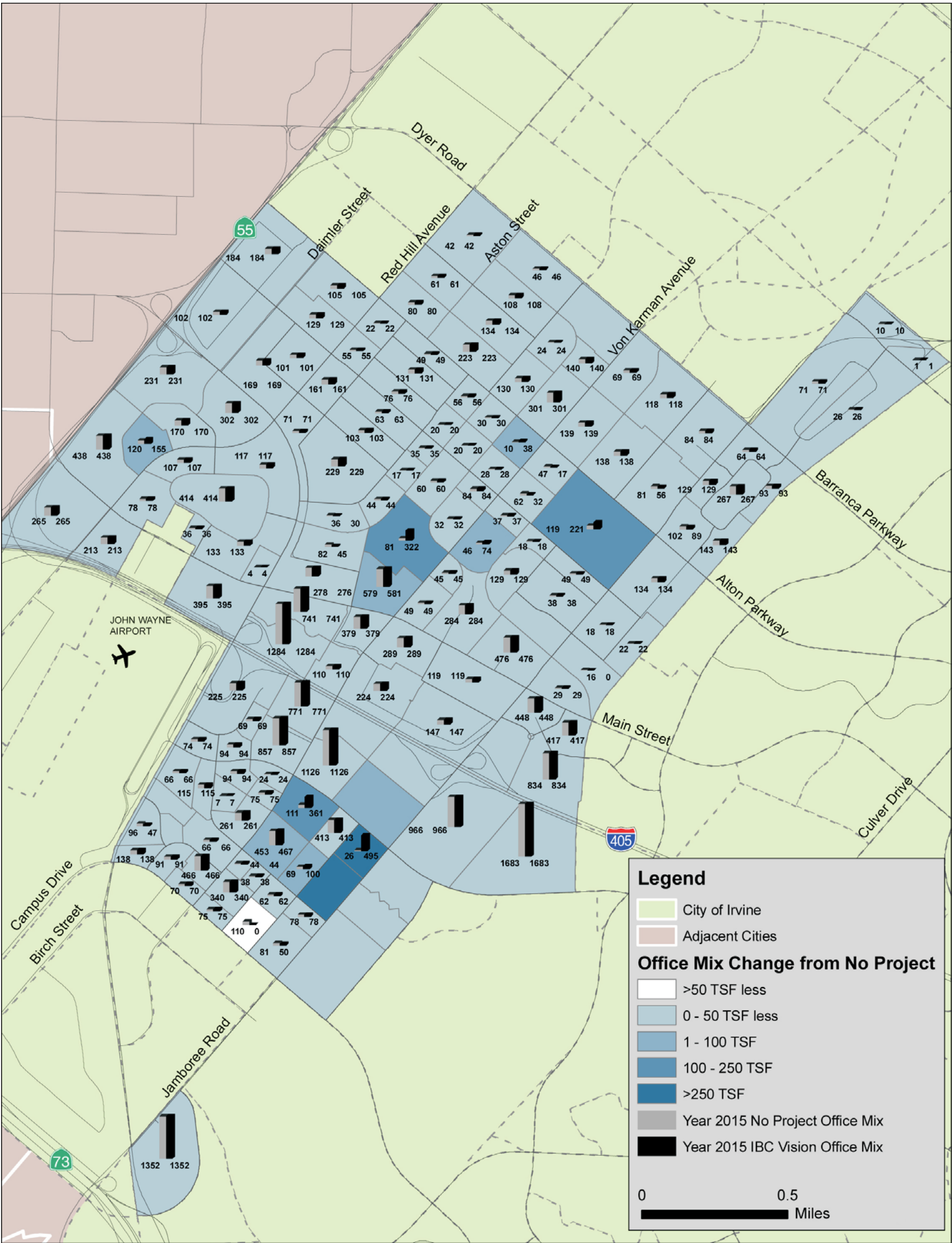
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Land Use Comparison between 2015 IBC Vision Plan and
2015 No Project (Office Mix)



Source: Parsons Brinckerhoff 2009

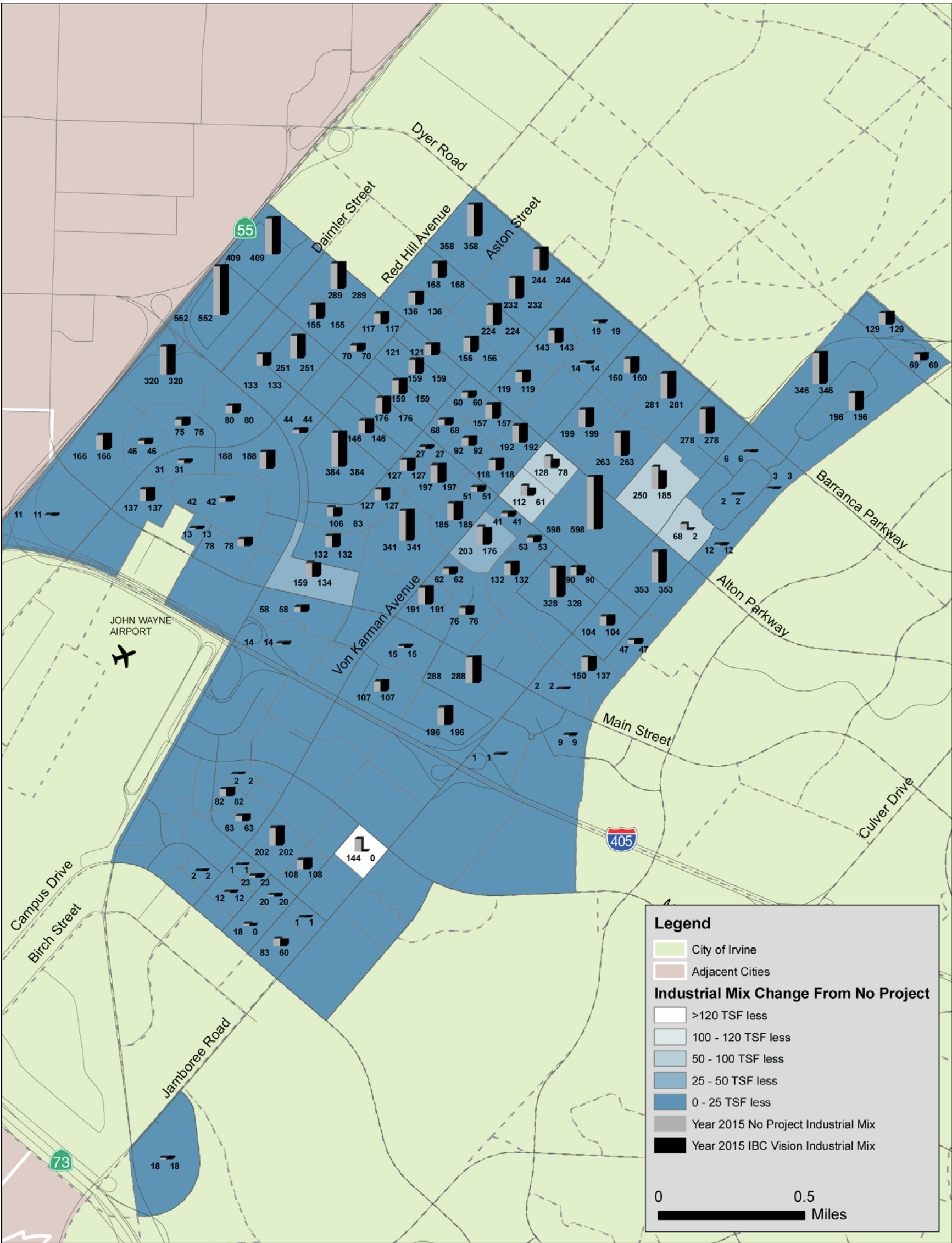
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Land Use Comparison between 2015 IBC Vision Plan and
2015 No Project (Industrial Mix)



Source: Parsons Brinckerhoff 2009

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2015 Cumulative With Project Daily Arterial Segment Analysis

The 2015 Cumulative With Project traffic patterns generally remain consistent with existing conditions and the 2015 Cumulative Baseline No Project scenario traffic patterns. For some segments, there is a net increase in ADT and for some a decrease as a result of the project. Figures 5.13-29 and 5.13-30 graphically display the ADT and arterial segment LOS deficiencies for the 2015 Cumulative With Project scenario. As noted above, LOS E indicates a deficient segment for all arterial segments outside Planning Area (PA) 36 within the City of Irvine. PA 36 segments are considered deficient at LOS F. When compared to the 2015 Cumulative Baseline No Project, there are no additional deficient segments. Deficient segments under daily Year 2015 Cumulative With Project conditions include the following:

- 879—Campus Drive from Carlson Avenue to University Drive (Irvine)
- 213—Culver Drive from I-5 SB Off-Ramp to Scottsdale Drive (Irvine)
- 221—Culver Drive from Main Street to San Leandro (Irvine)
- 222—Culver Drive from San Leandro to I-405 NB On-Ramp (Irvine)
- 224—Culver Drive from I-405 SB On-Ramp to Michelson Drive (Irvine)
- 130—Jamboree Road from El Camino Real to I-5 NB On-Ramp (Irvine)
- 958—Jamboree Road from I-5 NB Ramps to I-5 SB Off-Ramp (Irvine)
- 133—Jamboree Road from Michelle Drive to Walnut Avenue (Irvine)
- 188—University Drive from California Avenue to Mesa Road (Irvine)
- 187—University Drive from Mesa Road to Campus Drive (Irvine)
- 1301—MacArthur Boulevard from Bison Avenue to Ford Road (Newport Beach)
- ~~1585—Newport Avenue from Valencia Avenue to Edinger Avenue (Tustin)~~

2015 Cumulative With Project Peak Hour Link Analysis

Peak hour directional traffic volumes were directly obtained from peak hour forecast turning movement volumes for intersections upstream and downstream for each deficient arterial segment. The results of peak hour link analysis indicate that all arterial segments within the City of Irvine that are deficient under daily conditions operate at an acceptable LOS in both peak hours, performing at LOS D or better, and hence no mitigation measures are recommended at this time for these facilities.

2015 Cumulative With Project Intersection Analysis

Using the turning movement volumes from each intersection assumed to be built by 2015, ICU analysis was developed for every intersection within the study area. The intersection analysis includes both a reporting of intersection ICU and the corresponding LOS. For shared jurisdictions, the more conservative methodology was utilized. The differences in the ICU values between the 2015 Cumulative Baseline No Project and With Project scenarios vary by intersection. Many of the intersections experience an increase in the ICU under the With Project conditions and many experience a decrease. This is likely due to the redistribution of trips within the IBC study area under the With Project conditions, with a greater amount of residential dwelling units, and the assumption of a corresponding a reduction in commercial, office, and industrial square footage to allow for the increased residential uses, consistent with the methodology of the Vision Plan land use. For deficient intersections or intersections that become deficient with the Proposed Project within the City of Irvine where the ICU value increases by 0.02 over the No Project conditions that intersection experiences a significant project impact. For intersections outside the City of Irvine in Costa Mesa, Tustin, and Santa Ana, an increase of 0.01 over the No Project ICU constitutes a significant project impact. For deficient intersections within the City of Newport Beach, an increase of 0.01 of a critical movement constitutes a significant project impact.

Figures 5.13-31 and 5.13-32 graphically present the AM and PM Peak Hour Intersection ICU for deficient intersections. Further discussion of specific impacts, mitigation, and fair share cost analysis will be addressed in Section 5.13.6, *Mitigation Measures*. Seven intersections are deficient in the 2015 Cumulative With Project

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scenario, including one location in Irvine, one in Newport Beach, four in Tustin, and one shared location between Tustin and Irvine. Of the seven intersections, only two are significantly impacted by the Project: #93 – Tustin Ranch Road at El Camino Real (ICU increase of 0.01) in Tustin and #62 – Campus Drive at Bristol Street (ICU increase of 0.02 and ICU reduction from LOS D to LOS E) in Newport Beach). The deficient intersections include the following:

AM Peak Hour:

- #93: Tustin Ranch Road at El Camino Real (Tustin)

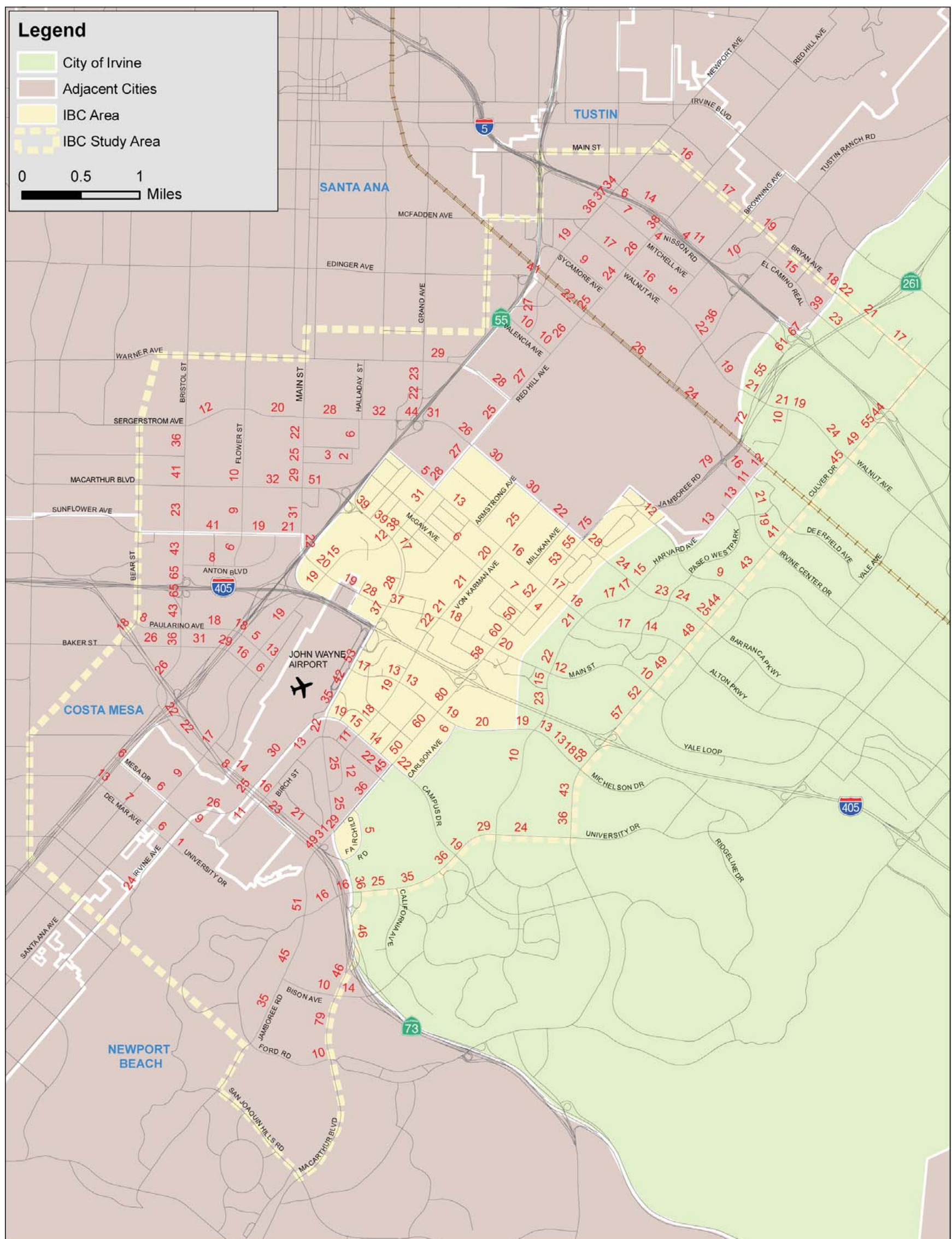
PM Peak Hour:

- #145: Jamboree Road at Michelson Drive (Irvine)
- #134: Loop Road/Park Avenue at Warner Avenue (Irvine/Tustin)
- #62: Campus Drive at Bristol Street (Newport Beach)
- #36: Red Hill Avenue at El Camino Real (Tustin)
- #111: Franklin Avenue at Walnut Avenue (Tustin)
- #732: SR-55 Northbound Ramps/Del Amo Avenue at Newport Avenue (Tustin)

When compared to the No Project scenario, there is one additional deficiency, intersection #62: Campus Drive at Bristol Street in the City of Newport Beach. All locations operating at a deficient LOS with an increase in the ICU value exceeding the significance threshold are identified as project impacts and discussed in Section 5.13.6, *Mitigation Measures*.



2015 Cumulative With Project Daily Arterial ADT



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2015 Cumulative With Project Daily Arterial Deficiencies



Source: Parsons Brinckerhoff 2009



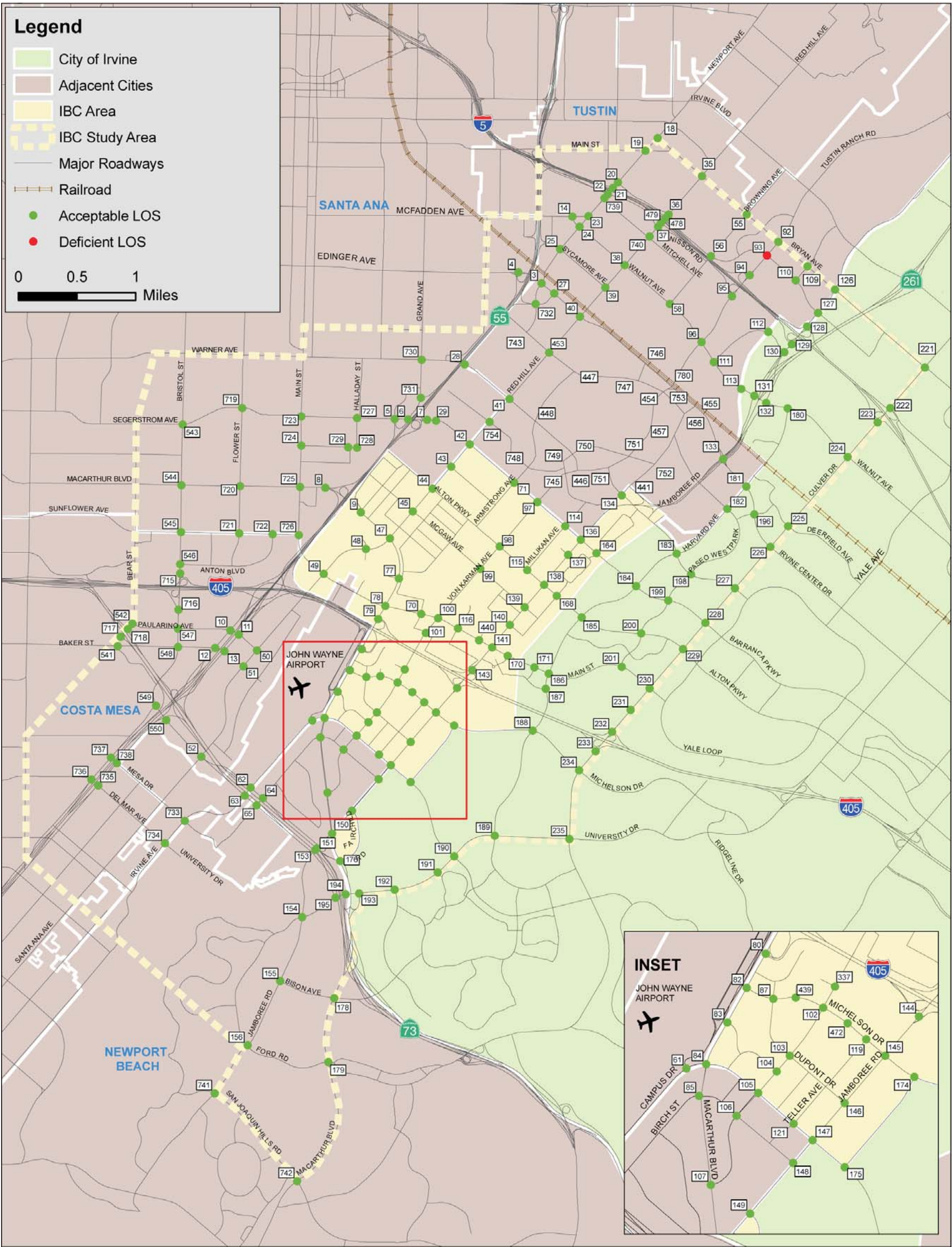
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2015 Cumulative With Project AM Peak Hour Intersection Deficiencies



Source: Parsons Brinckerhoff 2009

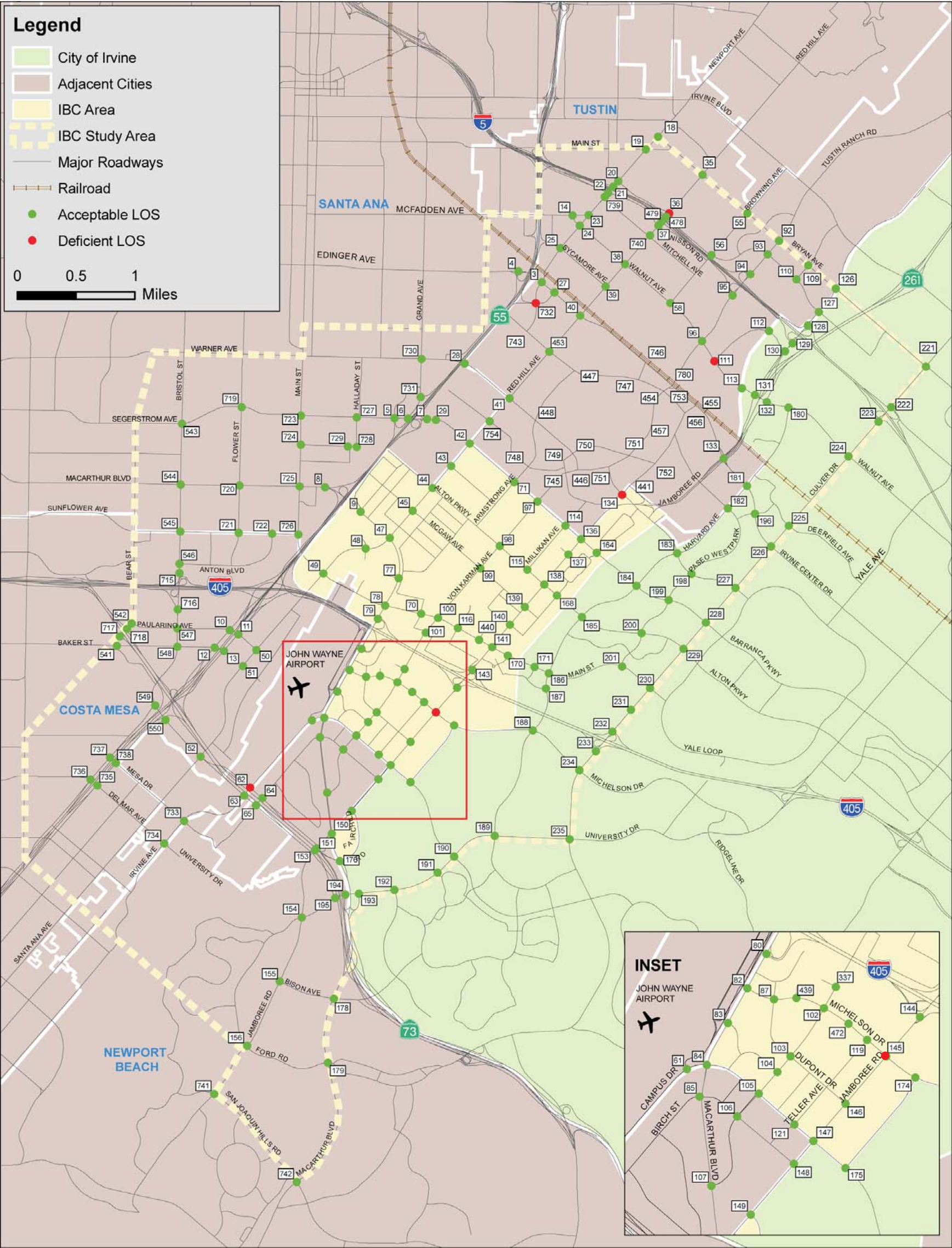
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2015 Cumulative With Project PM Peak Hour Intersection Deficiencies



Source: Parsons Brinckerhoff 2009

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2015 Cumulative With Project Freeway Mainline Analysis

Future freeway mainline volumes are based on forecast traffic using the ITAM model. The With Project scenario does not include any freeway mainline capacity improvements, consequently, the capacities are consistent with the No Project scenario. Figures 5.13-33 and 5.13-34 graphically depict the 2015 Cumulative With Project freeway and ramp deficiencies.

The following segments are forecast to be deficient in 2015. When compared to the No Project conditions, there are two additional segments that are deficient under the 2015 With Project conditions, I-405 Southbound between Culver Drive and Jamboree Road and I-405 Northbound between MacArthur Boulevard and SR-55 both in the AM peak hour. The deficient segments include the following:

AM Peak Hour:

- I-5 Northbound between Culver Drive and Jamboree Road
- I-5 Northbound between Jamboree Road and Tustin Ranch Road
- I-5 Northbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Northbound between Red Hill Avenue and Newport Avenue
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Northbound North of SR-55
- I-5 Southbound North of SR-55
- I-405 Northbound between Culver Drive and Jamboree Road
- I-405 Southbound between Culver Drive and Jamboree Road
- I-405 Northbound between Jamboree Road and MacArthur Boulevard
- I-405 Northbound between MacArthur Boulevard and SR-55
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between MacArthur Boulevard and Dyer Road
- SR-55 Southbound between Dyer Road and Edinger Avenue
- SR-55 Southbound between Edinger Avenue and McFadden Street/Sycamore Avenue
- SR-55 Southbound between McFadden Street/Sycamore Avenue and I-5
- SR-55 Southbound North of I-5
- SR-73 Northbound between MacArthur Boulevard and University Drive
- SR-73 Northbound between University Drive and Jamboree Road
- SR-73 Northbound between Jamboree Road and Birch Street
- SR-73 Northbound between Birch Street and Campus Drive
- SR-73 Northbound between Campus Drive and SR-55
- SR-73 Southbound between Campus Drive and SR-55
- SR-73 Northbound between SR-55 and Bear Street
- SR-73 Northbound between Bear Street and I-405
- SR-261 Southbound South of El Camino Real

PM Peak Hour:

- I-5 Northbound between Culver Drive and Jamboree Road
- I-5 Northbound between Jamboree Road and Tustin Ranch Road
- I-5 Northbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Northbound between Red Hill Avenue and Newport Avenue
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Northbound North of SR-55

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- I-5 Southbound North of SR-55
- I-405 Southbound between Culver Drive and Jamboree Road
- I-405 Northbound between Jamboree Road and MacArthur Boulevard
- I-405 Southbound between Jamboree Road and MacArthur Boulevard
- I-405 Southbound between MacArthur Boulevard and SR-55
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between I-405 and MacArthur Boulevard
- SR-55 Northbound between MacArthur Boulevard and Dyer Road
- SR-55 Northbound between Dyer Road and Edinger Avenue
- SR-55 Northbound between Edinger Avenue and McFadden Street/Sycamore Avenue
- SR-55 Northbound between McFadden Street/Sycamore Avenue and I-5
- SR-73 Southbound between MacArthur Boulevard and University Drive
- SR-73 Northbound between Jamboree Road and Birch Street
- SR-73 Southbound between Jamboree Road and Birch Street
- SR-73 Southbound between Birch Street and Campus Drive
- SR-73 Northbound between Campus Drive and SR-55
- SR-73 Southbound between Campus Drive and SR-55
- SR-73 Northbound between SR-55 and Bear Street

2015 Cumulative With Project Freeway Ramp Analysis

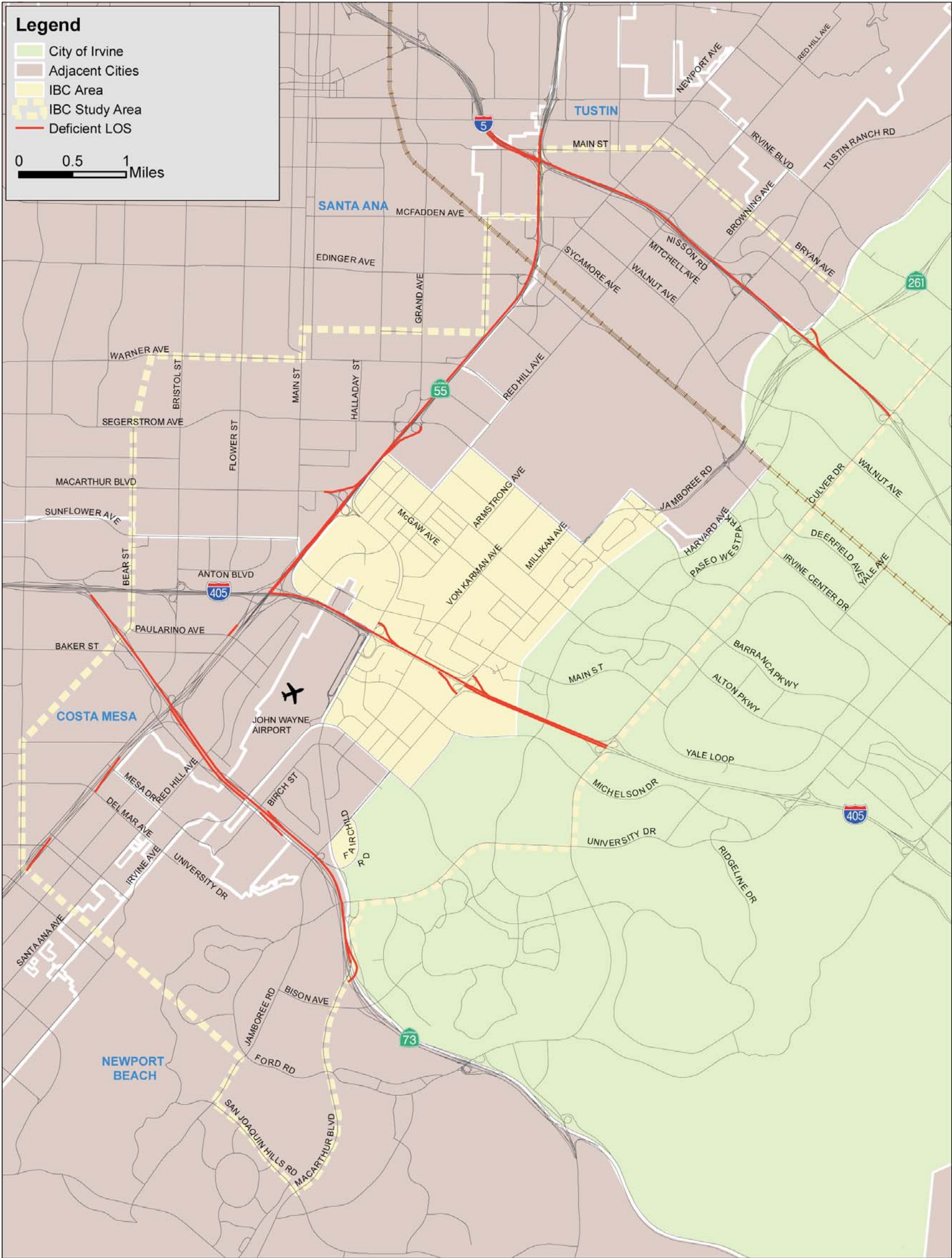
The ramp analysis methodology for 2015 Cumulative With Project is consistent with that applied for 2015 Cumulative Baseline No Project. When compared to the 2015 No Project scenario, there are no additional deficient locations; however, there are some ramps that deteriorate further as project trips are added. Project related impacts on freeway ramps are addressed in Section 5.13.6, *Mitigation Measures*. The deficient ramps include:



AM Peak Hour:

- Northbound I-5 Direct Off-Ramp to Jamboree Road
- Southbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 Off-Ramp to MacArthur Boulevard
- Northbound SR-55 Direct On-Ramp from Victoria Street
- Northbound SR-55 Direct On-Ramp from Fair Drive
- Southbound SR-55 Off-Ramp to Paularino Avenue
- Southbound SR-55 Off-Ramp to MacArthur Boulevard
- Northbound SR-55 Off-Ramp to Dyer Road
- Northbound SR-73 On-Ramp from MacArthur Boulevard
- Southbound SR-73 Off-Ramp to Jamboree Road
- Northbound SR-73 Off-Ramp to Birch Street

2015 Cumulative With Project Freeway AM Peak Hour Deficiencies



Source: Parsons Brinckerhoff 2009



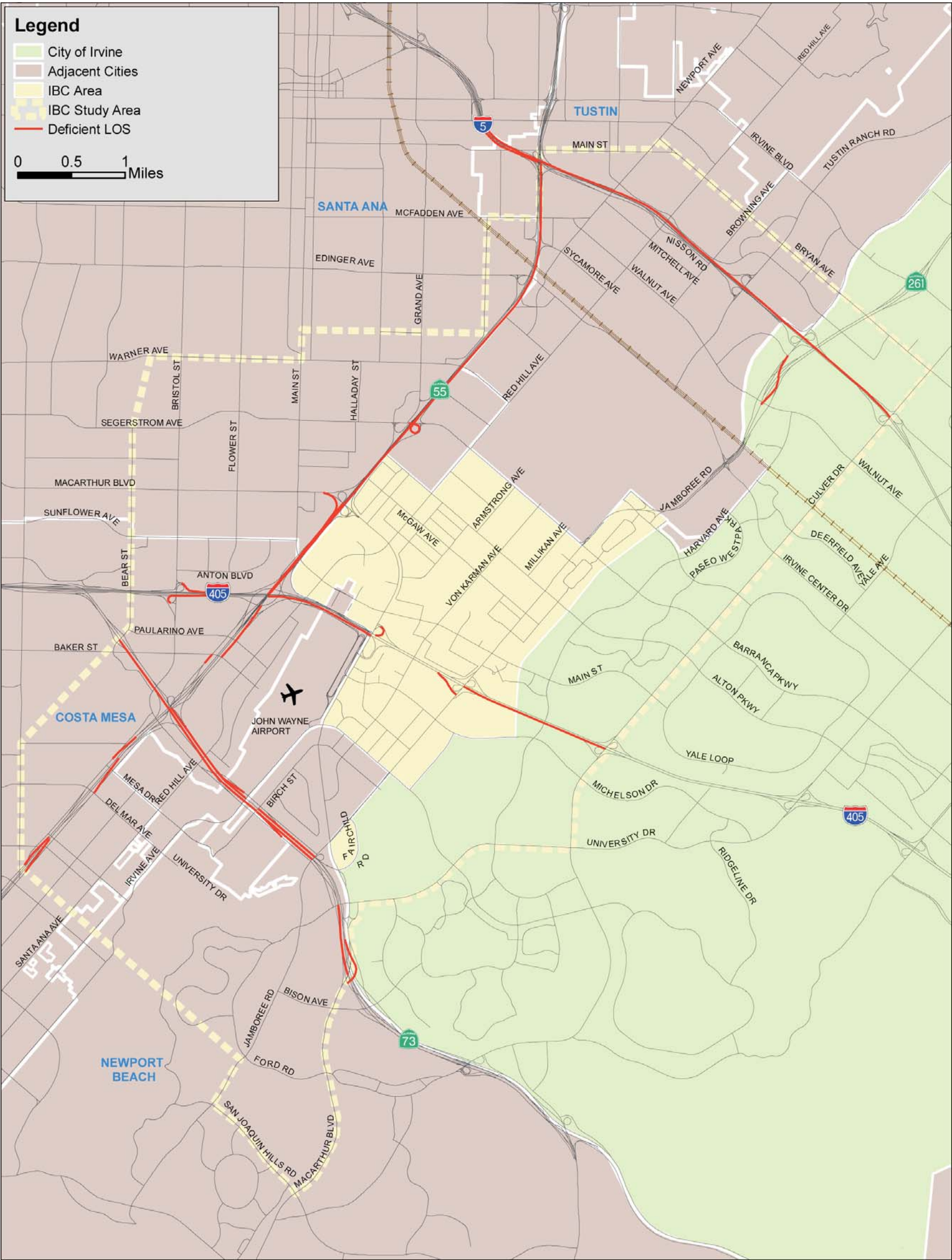
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2015 Cumulative With Project Freeway PM Peak Hour Deficiencies



Source: Parsons Brinckerhoff 2009



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PM Peak Hour:

- Southbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 On-Ramp from MacArthur Boulevard
- Southbound I-405 Loop On-Ramp from Bristol Street
- Northbound I-405 Off-Ramp to Bristol Street
- Southbound SR-55 Off-Ramp to Victoria Street
- Northbound SR-55 Direct On-Ramp from Victoria Street
- Southbound SR-55 Off-Ramp to Fair Drive
- Northbound SR-55 Direct On-Ramp from Fair Drive
- Southbound SR-55 On-Ramp from Baker Street
- Northbound SR-55 On-Ramp from Paularino Avenue
- Southbound SR-55 Direct On-Ramp from MacArthur Boulevard
- Northbound SR-55 Loop On-Ramp from Dyer Road
- Northbound SR-73 On-Ramp from MacArthur Boulevard
- Southbound SR-73 Off-Ramp to Jamboree Road
- Northbound SR-73 On-Ramp from Campus Drive
- Northbound SR-261 Northbound Off-Ramp to Jamboree Road

5.13.3.6 Post-2030 Future Conditions

Similar to the 2015 scenarios, the City of Irvine's traffic model, the Irvine Traffic Analysis Model (ITAM) 8.4, was used to forecast the traffic activity for the study area in the Post-2030 buildout scenario. The following describes the change in trips generated within the study area as a result of the Vision Plan land use assumptions. An assessment of deficiencies within the study area circulation system was performed to determine the appropriate mitigation requirements for implementation of the IBC Vision Plan.

As part of the IBC Vision Plan, the ~~2,522~~ 2,035 residential units currently in process would be expected to be completed by 2015, with the exception of 776 approved units at Park Place anticipated to be built after 2015; the remaining 3,950 units plus the 776 approved units at Park Place and associated density bonus units included as part of the Vision Plan are expected to be completed by project buildout or the Post-2030 timeframe. Please refer to Appendix N for a complete discussion of these scenarios.

Post-2030 Cumulative Baseline No Project

The Post-2030 Cumulative Baseline No Project impact analysis uses the existing land use conditions within the IBC area as a baseline for comparison to the buildout of the IBC Vision Plan land uses. The specific improvements identified in the 1992 IBC Rezone EIR that are not fully funded are not included in the baseline assumptions. Buildout circulation improvements consistent with the City of Irvine's General Plan (except those specific unfunded improvements identified in the 1992 IBC Rezone EIR) are assumed in the Post-2030 Cumulative Baseline No Project scenario. Additionally, buildout circulation improvements consistent with the adjacent Cities' General Plans as well as OCTA's buildout of arterial and freeway networks are also assumed in the Post-2030 Cumulative Baseline No Project scenario.

Post-2030 Cumulative Baseline No Project Land Use and Trip Generation

Table 5.13-17 identifies the Post-2030 Cumulative Baseline No Project land uses assumed in the IBC area. For each of the scenarios, the model uses socioeconomic trip generation of the future land uses to forecast the vehicle trips for the buildout Post-2030 horizon. Table 5.13-18 displays the Trip Generation from ITAM for the Post-2030 Cumulative Baseline No Project scenario. Similar to previous scenarios, Appendix N presents trip generation and land use quantities by type and IBC TAZs as well as a land use summary by individual project.

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Table 5.13-17
Post-2030 Cumulative No Project Land Use Summary

Scenario	Multi-family Residential (DU)	Retail mix (TSF)	Hotel (Room)	Office mix (TSF)	Industrial Mix (TSF)	Mini-Warehouse (TSF)	Extended Stay Hotel (Room)
2008 No Project	5,011	1,341	2,322	26,381	14,701	348	174
2008 With Project	17,038	1,731	2,880	33,716	13,180	164	598
2015 No Project	5,011	1,341	2,322	26,381	14,701	348	174
2015 With Project	10,929	1,482	2,572	27,810	14,196	348	598
Post-2030 No Project	5,011	1,341	2,322	26,381	14,701	348	174
Percent Growth (Post-2030 No Project vs. 2015 No Project)	0%	0%	0%	0%	0%	0%	0%
Percent Growth (Post-2030 No Project vs. 2008 No Project)	0%	0%	0%	0%	0%	0%	0%

Table 5.13-18
Post-2030 Cumulative No Project Trip Generation

Scenario	AM-Out	AM-In	PM-Out	PM-In	ADT
2008 No Project	11,191	28,990	27,316	17,367	508,690
2008 With Project	19,336	36,105	35,513	25,795	697,308
2015 No Project	11,191	28,990	27,316	17,367	508,690
2015 With Project	14,858	30,962	29,982	20,793	578,825
Post-2030 No Project	11,191	28,990	27,316	17,367	508,690
Percent Growth (Post-2030 No Project vs. 2015 No Project)	0%	0%	0%	0%	0%
Percent Growth (Post-2030 No Project vs. 2008 No Project)	0%	0%	0%	0%	0%



Post-2030 Cumulative No Project Daily Arterial Segment Analysis

The Post-2030 arterial traffic conditions are analyzed based on the forecast volumes and future lane configurations consistent with the City of Irvine's and adjacent cities' General Plan buildout assumptions, except for these specific unfunded 1992 IBC Rezone EIR arterial improvements that are not included. Study area roadway segment analysis, including information on jurisdiction, daily forecast volume, classification type, V/C ratio and LOS for each segment can be found in Traffic Study Table 5.3 (included as Appendix N of this DEIR). Deficient segments within the City of Irvine under daily conditions are analyzed for peak hour performance. A comparison between the 2015 Cumulative Baseline No Project and With Project scenarios is provided under 2015 Cumulative With Project conditions analysis. Generally only those segments where the project has a theoretical impact are required to be evaluated further by the peak hour link methodology. In this study the peak hour link methodology has been applied to all of the forecast deficient roadway segments within the City of Irvine for No Project and With Project scenarios. Alternative methodologies for adjacent cities within the study area were conducted as requested by those adjacent cities.

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Figures 5.13-35 and 5.13-36 graphically depict the ADT Traffic Volumes and deficient segment LOS, respectively, for the Post-2030 Cumulative Baseline No Project scenario. Deficient segments in the City of Irvine are evaluated under Peak Hour conditions in the following section. For arterial segments in Costa Mesa, Newport Beach, and Tustin, arterial daily LOS impacts are addressed at the intersections. Santa Ana identifies significant project impacts based on the arterial daily LOS analysis.

The analysis indicates that the following segments are deficient under the Post-2030 No Project daily conditions, including two segments in Costa Mesa, 12 in Irvine, one in Newport Beach, one in Santa Ana, and ~~two~~ one in Tustin. As noted above, LOS E indicates a deficient segment for all arterial segments outside Planning Area (PA) 36 within the City of Irvine. PA 36 segments are considered deficient at LOS F. Deficient segments under daily Post-2030 Cumulative Baseline No Project conditions include the following:

- 2728—Bristol Street from Anton Boulevard to I-405 Northbound Ramps (Costa Mesa)
- 2751—Bristol Street from I-405 Northbound Ramps to I-405 Southbound Ramps (Costa Mesa)
- 879—Campus Drive from Carlson Avenue to University Drive (Irvine)
- 726—Culver Drive from I-5 NB Ramps to I-5 SB Ramps (Irvine)
- 213—Culver Drive from I-5 SB Off-Ramp to Scottsdale Drive (Irvine)
- 214—Culver Drive from Scottsdale Drive to Walnut Avenue (Irvine)
- 219—Culver Drive from Barranca Parkway to Alton Parkway (Irvine)
- 220—Culver Drive from Alton Parkway to Main Street (Irvine)
- 221—Culver Drive from Main Street to San Leandro (Irvine)
- 222—Culver Drive from San Leandro to I-405 NB On-Ramp (Irvine)
- 224—Culver Drive from I-405 SB On-Ramp to Michelson Drive (Irvine)
- 130—Jamboree Road from El Camino Real to I-5 NB On-Ramp (Irvine)
- 958—Jamboree Road from I-5 NB Ramps to I-5 SB Off-Ramp (Irvine)
- 133—Jamboree Road from Michelle Drive to Walnut Avenue (Irvine)
- 1301—MacArthur Boulevard from Bison Avenue to Ford Road (Newport Beach)
- 1884—MacArthur Boulevard from Main Street to SR-55 Southbound (Santa Ana)
- 44—Edinger Avenue West of Newport Avenue (Tustin)
- ~~1585—Newport Avenue from Valencia Avenue to Edinger Avenue (Tustin)~~

Post-2030 Cumulative Baseline No Project Peak Hour Link Analysis

Peak hour directional traffic volumes were obtained from forecast peak hour intersection turning movement volumes for intersections upstream and downstream for each deficient arterial segment. The results of peak hour link analysis indicate that all arterial segments that are deficient within the City of Irvine under daily conditions operate at an acceptable LOS in both peak hours, performing at LOS D or better, and hence no mitigation measures are recommended at this time for these facilities.

Post-2030 Cumulative Baseline No Project Intersection Analysis

ICU analysis was developed for every intersection within the study area for the Post-2030 Cumulative Baseline No Project scenario. For shared jurisdictions, the more conservative methodology was utilized. Intersection improvements in each jurisdiction are consistent with that Cities' General Plan buildout assumptions. Within the City of Irvine, those specific unfunded intersection improvements identified in the 1992 IBC Rezone EIR were not assumed in the network. There are a considerably larger number of deficient intersections under Post-2030 conditions than the 2015 conditions largely due to increased development throughout the region.

Figures 5.13-37 and 5.13-38 graphically present the AM and PM Peak Hour Intersection ICU for deficient intersections for the Post-2030 Cumulative Baseline No Project scenario. Based on the Post-2030 Cumulative

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Baseline No Project intersection ICU analysis, the following intersections within the study area are forecast to operate at a deficient LOS:

AM Peak Hour:

- #10: SR-55 Frontage Road Southbound Ramps at Paularino Avenue (Costa Mesa)
- #12: SR-55 Southbound Frontage Road at Baker Street (Costa Mesa)
- #13: SR-55 Northbound Frontage Road at Baker Street (Costa Mesa)
- #3: Newport Avenue at Edinger Avenue (Tustin)
- #24: Newport Avenue at Walnut Avenue (Tustin)
- #93: Tustin Ranch Road at El Camino Real (Tustin)

PM Peak Hour:

- #145: Jamboree Road at Michelson Drive (Irvine)
- #188: Harvard Avenue at Michelson Drive (Irvine)
- #232: Culver Drive at I-405 Northbound Ramps (Irvine)
- #134: Loop Road/Park Avenue at Warner Avenue (Irvine/Tustin)
- #136: Jamboree Road at Barranca Avenue (Irvine/Tustin)
- #62: Campus Drive at Bristol Street (Newport Beach)
- #85: MacArthur Boulevard at Birch Street (Newport Beach)
- #543: Bristol Street at Segerstrom Avenue (Santa Ana)
- #730: Grand Avenue at Warner Avenue (Santa Ana)
- #24: Newport Avenue at Walnut Avenue (Tustin)
- #111: Franklin Avenue at Walnut Avenue (Tustin)
- #754: Red Hill Avenue at Carnegie Avenue/A Street (Tustin/Santa Ana)



Post-2030 Cumulative Baseline No Project Mainline Analysis

Freeway improvements are assumed in the Post-2030 baseline that were not assumed in 2015, consistent with information pertaining to buildout assumptions received by the Orange County Transportation Authority (OCTA) and the Department of Transportation (Caltrans). Figures 5.13-39 and 5.13-40 graphically depict the Post-2030 Cumulative Baseline No Project freeway and ramp deficiencies.



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Post-2030 Cumulative Baseline No Project Daily Arterial Deficiencies



Source: Parsons Brinckerhoff 2009



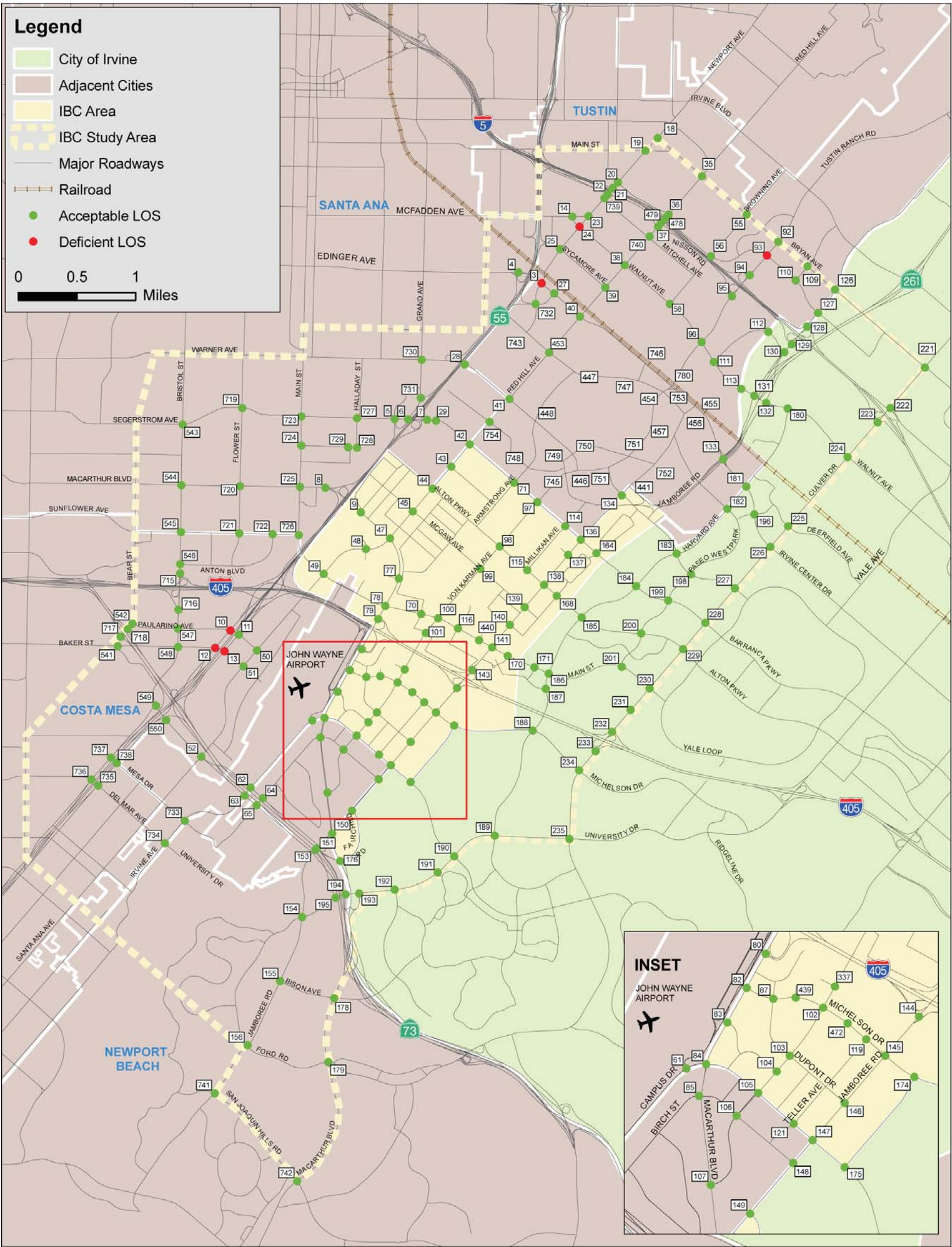
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Post-2030 Cumulative Baseline No Project AM Pk Hr
Intersection Deficiencies



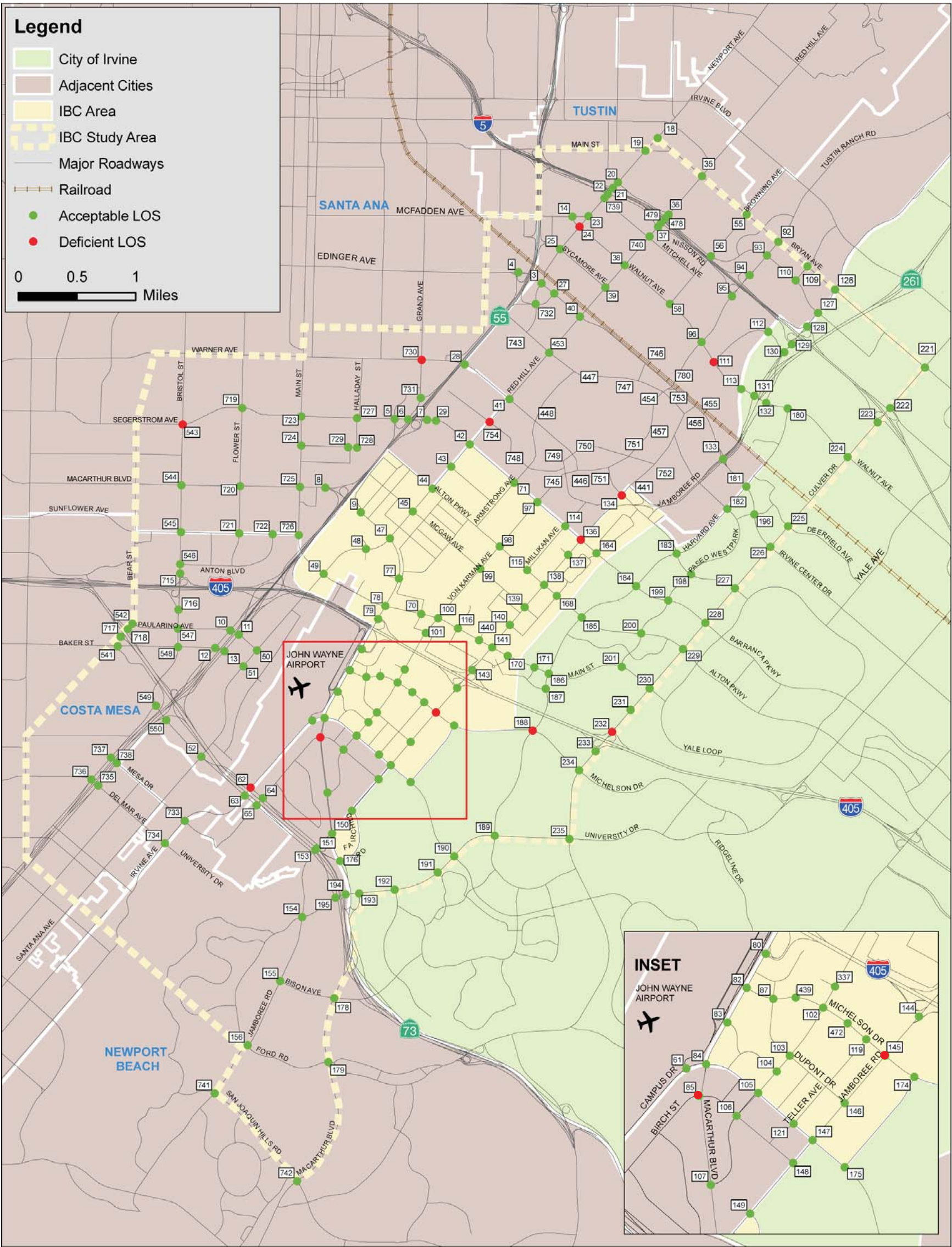
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Post-2030 Cumulative Baseline No Project PM Pk Hr
Intersection Deficiencies



Source: Parsons Brinckerhoff 2009

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Post-2030 Cumulative Baseline No Project Freeway PM Pk Hr Deficiencies



Source: Parsons Brinckerhoff 2009



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When compared to the 2015 scenarios, there are some improvements in mainline performance, mostly due to increased lane capacity assumed in the Post-2030 buildout conditions on SR-73 and SR-55. The deficient segments include the following:

AM Peak Hour:

- I-5 Northbound between Culver Drive and Jamboree Road
- I-5 Northbound between Jamboree Road and Tustin Ranch Road
- I-5 Northbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Southbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Northbound between Red Hill Avenue and Newport Avenue
- I-5 Southbound between Red Hill Avenue and Newport Avenue
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Southbound between Newport Avenue and SR-55
- I-5 Northbound North of SR-55
- I-5 Southbound North of SR-55
- I-405 Northbound between Culver Drive and Jamboree Road
- I-405 Northbound between Jamboree Road and MacArthur Boulevard
- SR-55 Northbound between Fair Drive and SR-73
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between MacArthur Boulevard and Dyer Road
- SR-55 Southbound North of I-5
- SR-73 Northbound between MacArthur Boulevard and University Drive
- SR-73 Northbound between University Drive and Jamboree Road
- SR-73 Northbound between Jamboree Road and Birch Street
- SR-73 Northbound between Birch Street and Campus Drive
- SR-73 Northbound between Campus Drive and SR-55
- SR-73 Southbound between Campus Drive and SR-55

PM Peak Hour:

- I-5 Northbound between Culver Drive and Jamboree Road
- I-5 Southbound between Culver Drive and Jamboree Road
- I-5 Northbound between Jamboree Road and Tustin Ranch Road
- I-5 Southbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Northbound between Red Hill Avenue and Newport Avenue
- I-5 Southbound between Red Hill Avenue and Newport Avenue
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Southbound between Newport Avenue and SR-55
- I-5 Northbound North of SR-55
- I-5 Southbound North of SR-55
- I-405 Southbound between Culver Drive and Jamboree Road
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between I-405 and MacArthur Boulevard
- SR-55 Northbound between MacArthur Boulevard and Dyer Road
- SR-55 Northbound between Dyer Road and Edinger Avenue
- SR-73 Southbound between MacArthur Boulevard and University Drive
- SR-73 Southbound between Jamboree Road and Birch Street

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- SR-73 Southbound between Birch Street and Campus Drive
- SR-73 Southbound between Campus Drive and SR-55

Post-2030 Cumulative Baseline No Project Freeway Ramp Analysis

The ramp LOS is based on the V/C ratio which takes into account the ramp capacity and metering. Traffic Study Table 5.7 displays the V/C ratios and levels of service for the freeway ramps within the study area (Traffic Study is continued in Appendix N to this DEIR). The ramps were also evaluated using the HCM density methodology to further analyze the operational characteristics of the ramps.

When compared to the 2015 scenarios, there are several ramps that improve under Post-2030 conditions including the SR-55 Southbound Off-Ramp to Victoria Drive, the SR-55 Northbound Direct On-Ramp from Victoria Drive, and the SR-55 Southbound Off-Ramp to Fair Drive. There are five additional deficiencies, including the SR-55 Northbound Off-Ramp to Baker Street, the SR-55 Northbound Direct On-Ramp from Dyer Road, two ramps on the SR-73, the Southbound On-Ramp and Northbound Off-Ramp at Bear Street, and the SR-261 Southbound On-Ramp from Jamboree Road. The deficient ramps include:

AM Peak Hour:

- Northbound I-5 Off-Ramp to Jamboree Road
- Southbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 Off-Ramp to MacArthur Boulevard
- Northbound SR-55 Direct On-Ramp from Fair Drive
- Northbound SR-55 Off-Ramp to Baker Street
- Southbound SR-55 Off-Ramp to Paularino Avenue
- Southbound SR-55 Off-Ramp to MacArthur Boulevard
- Northbound SR-55 Off-Ramp to Dyer Road
- Southbound SR-73 Off-Ramp to Jamboree Road
- Northbound SR-73 Off-Ramp to Birch Street
- Southbound SR-261 On-Ramp from Jamboree Road

PM Peak Hour:

- Northbound I-5 Off-Ramp to Jamboree Road
- Southbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 On-Ramp from MacArthur Boulevard
- Southbound I-405 Loop On-Ramp from Bristol Street
- Northbound I-405 Off-Ramp to Bristol Street
- Northbound SR-55 Direct On-Ramp from Fair Drive
- Southbound SR-55 On-Ramp from Baker Street
- Northbound SR-55 On-Ramp from Paularino Avenue
- Southbound SR-55 Direct On-Ramp from MacArthur Boulevard
- Northbound SR-55 Direct On-Ramp from Dyer Road
- Northbound SR-55 Loop On-Ramp from Dyer Road
- Northbound SR-73 On-Ramp from MacArthur Boulevard
- Southbound SR-73 Off-Ramp to Jamboree Road
- Northbound SR-73 On-Ramp from Campus Drive
- Southbound SR-73 On-Ramp from Bear Street
- Northbound SR-73 Off-Ramp to Bear Street



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- Northbound SR-261 Northbound Off-Ramp to Jamboree Road

Post-2030 Cumulative With Project

The Post-2030 Cumulative With Project impact analysis evaluates the buildout of the proposed IBC Vision Plan project within the study area. The circulation network for the Post-2030 Cumulative With Project analysis is identical to that of the Post-2030 Cumulative Baseline No Project condition. The analysis assesses circulation system impacts associated with the full implementation of the proposed IBC Vision Plan land uses.

Post-2030 Cumulative With Project Land Use and Trip Generation

The land use setting for Post-2030 Cumulative With Project incorporates the land use changes for Post-2030 that will result from the full implementation of the IBC Vision Plan. Table 5.13-19 provides a comparison of land use assumptions between the Post-2030 Cumulative Baseline No Project and With Project conditions as well as a comparison to 2015 and Existing conditions within the IBC area. Table 5.13-20 provides the ITAM trip generation for the Post-2030 Cumulative With Project scenario along with a comparison to 2015 and existing conditions. Detailed trip generation quantities and land use quantities by TAZs within the IBC area are included in Appendix N (see Appendix A and Appendix J, respectively in the traffic study). Figures 5.13-41 through 5.13-43 present land use comparisons between the Post-2030 Cumulative Baseline No Project and the With Project scenarios.

Table 5.13-19
Post-2030 Cumulative With Project Land Use Summary

Scenario	Multi-family Residential (DU)	Retail mix (TSF)	Hotel (Room)	Office mix (TSF)	Industrial Mix (TSF)	Mini-Warehouse (TSF)	Extended Stay Hotel (Room)
2008 No Project	5,011	1,341	2,322	26,381	14,701	348	174
2008 With Project	17,038	1,731	2,880	33,716	13,180	164	598
2015 No Project	5,011	1,341	2,322	26,381	14,701	348	174
2015 With Project	10,929	1,482	2,572	27,810	14,196	348	598
Post-2030 No Project	5,011	1,341	2,322	26,381	14,701	348	174
Post-2030 With Project	17,038	1,731	2,880	33,716	13,180	164	598
Percent Growth (Post-2030 With Project vs. Post-2030 No Project)	240%	29%	24%	28%	-10%	-53%	244%
Percent Growth (Post-2030 With Project vs. 2015 With Project)	56%	17%	12%	21%	-7%	-53%	0%
Percent Growth ((Post-2030 With Project vs. 2008 With Project)	0%	0%	0%	0%	0%	0%	0%

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Table 5.13-20
Post-2030 Approved With Project Trip Generation

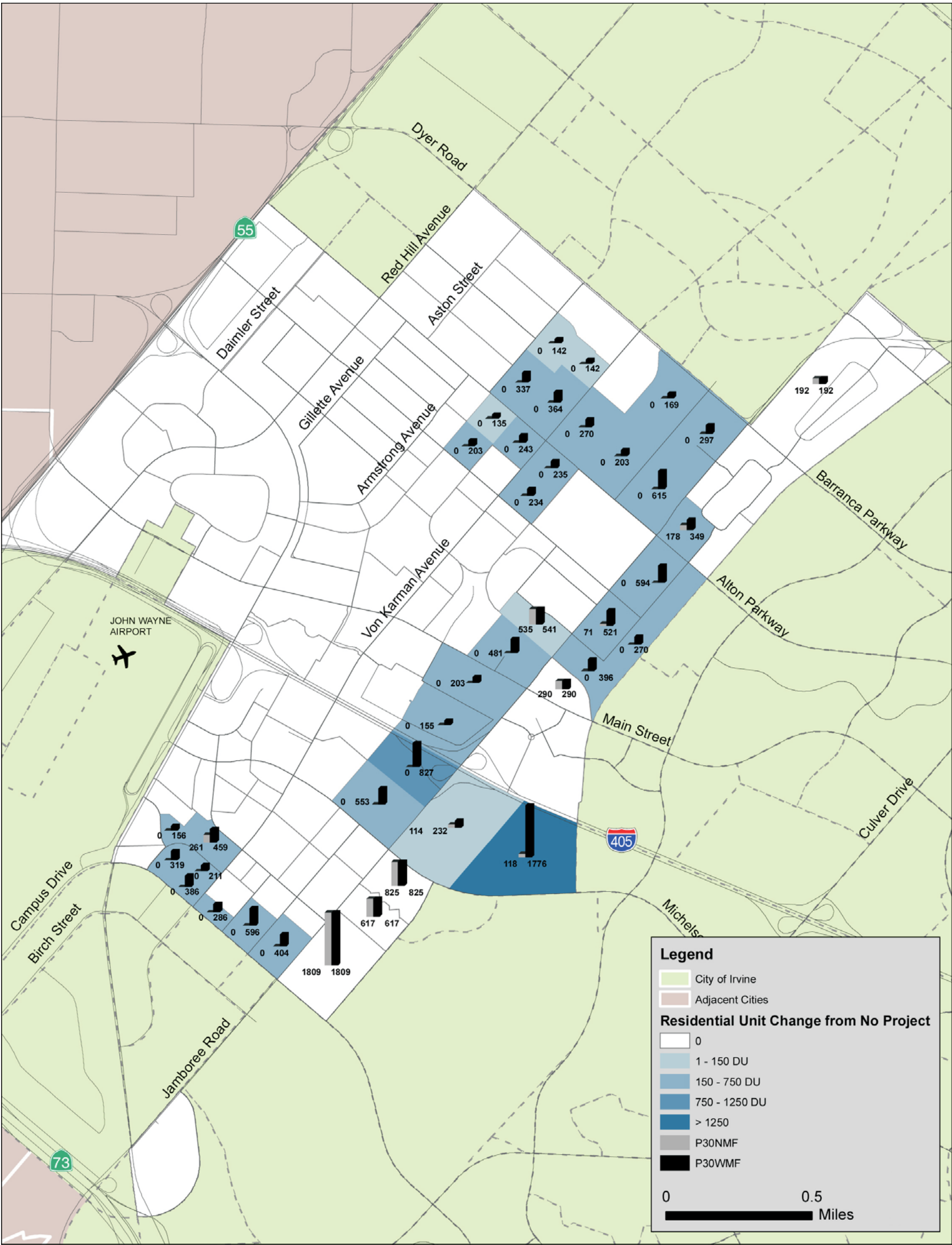
Scenario	AM-Out	AM-In	PM-Out	PM-In	ADT
2008 No Project	11,191	28,990	27,316	17,367	508,690
2008 With Project	19,336	36,105	35,513	25,795	697,308
2015 No Project	11,191	28,990	27,316	17,367	508,690
2015 With Project	14,858	30,962	29,982	20,793	578,825
Post-2030 No Project	11,191	28,990	27,316	17,367	508,690
Post-2030 With Project	19,336	36,105	35,513	25,795	697,308
Percent Growth (Post-2030 With Project vs. Post-2030 No Project)	73%	25%	30%	49%	37%
Percent Growth (Post-2030 With Project vs. 2015 With Project)	30%	17%	18%	24%	20%
Percent Growth ((Post-2030 With Project vs. 2008 With Project)	0%	0%	0%	0%	0%

Post-2030 Cumulative With Project Daily Arterial Segment Analysis

Under the Post-2030 Cumulative With Project scenario, traffic within the City shows some growth related to future development of the study area as a whole. Post-2030 arterial traffic conditions were analyzed based on the forecast volumes and future lane configurations. Figures 5.13-44 and 5.13-45 graphically depict the ADT Traffic Volumes and deficient segment LOS, respectively, for the Post-2030 Cumulative With Project scenario.



Land Use Comparison between Post-2030 IBC Vision Plan With Project
and No Project (Residential Units)



Source: Parsons Brinckerhoff 2009



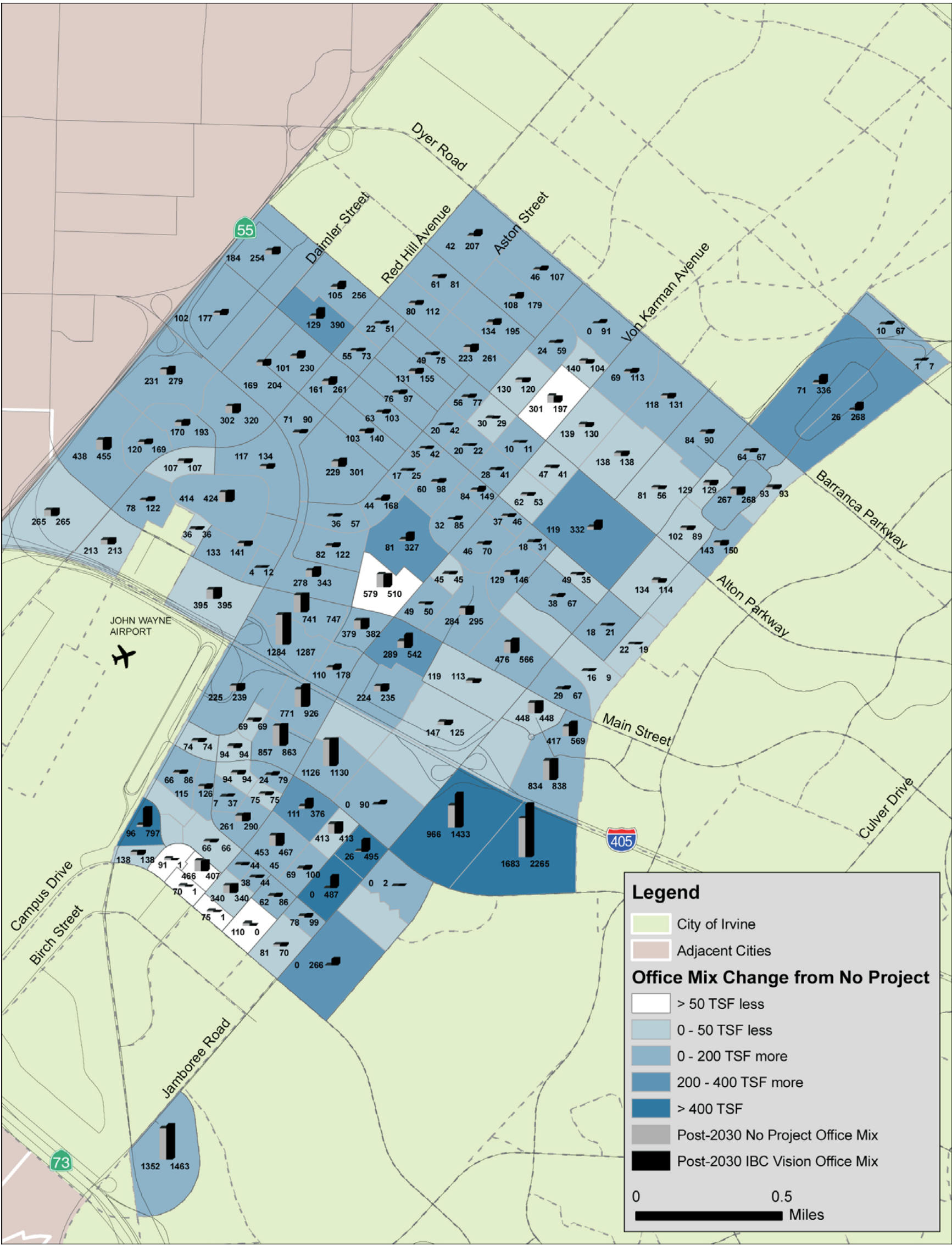
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Land Use Comparison between Post-2030 IBC Vision Plan With Project and No Project (Office Mix)



Source: Parsons Brinckerhoff 2009



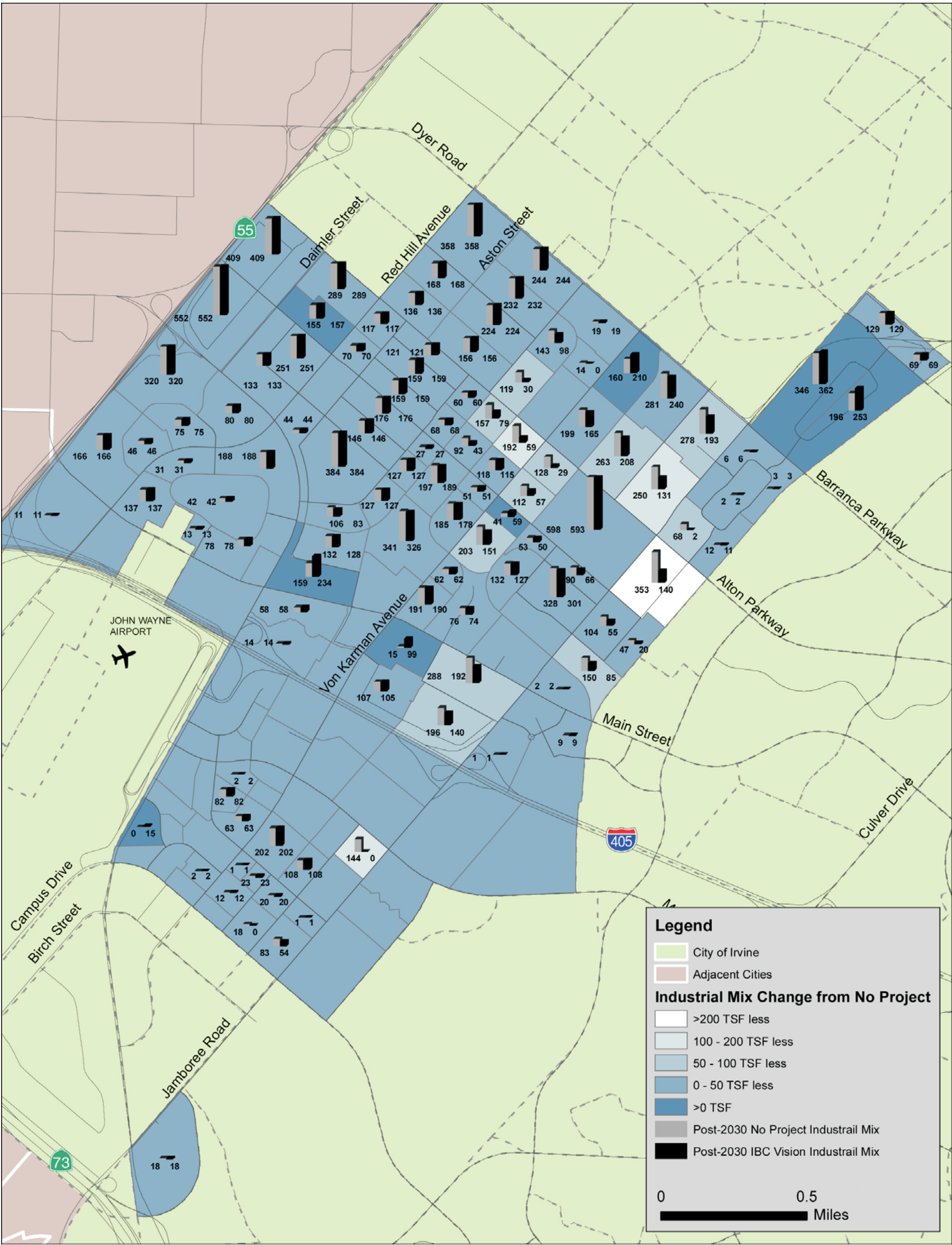
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Land Use Comparison between Post-2030 IBC Vision Plan With Project
and No Project (Industrial Mix)



Source: Parsons Brinckerhoff 2009



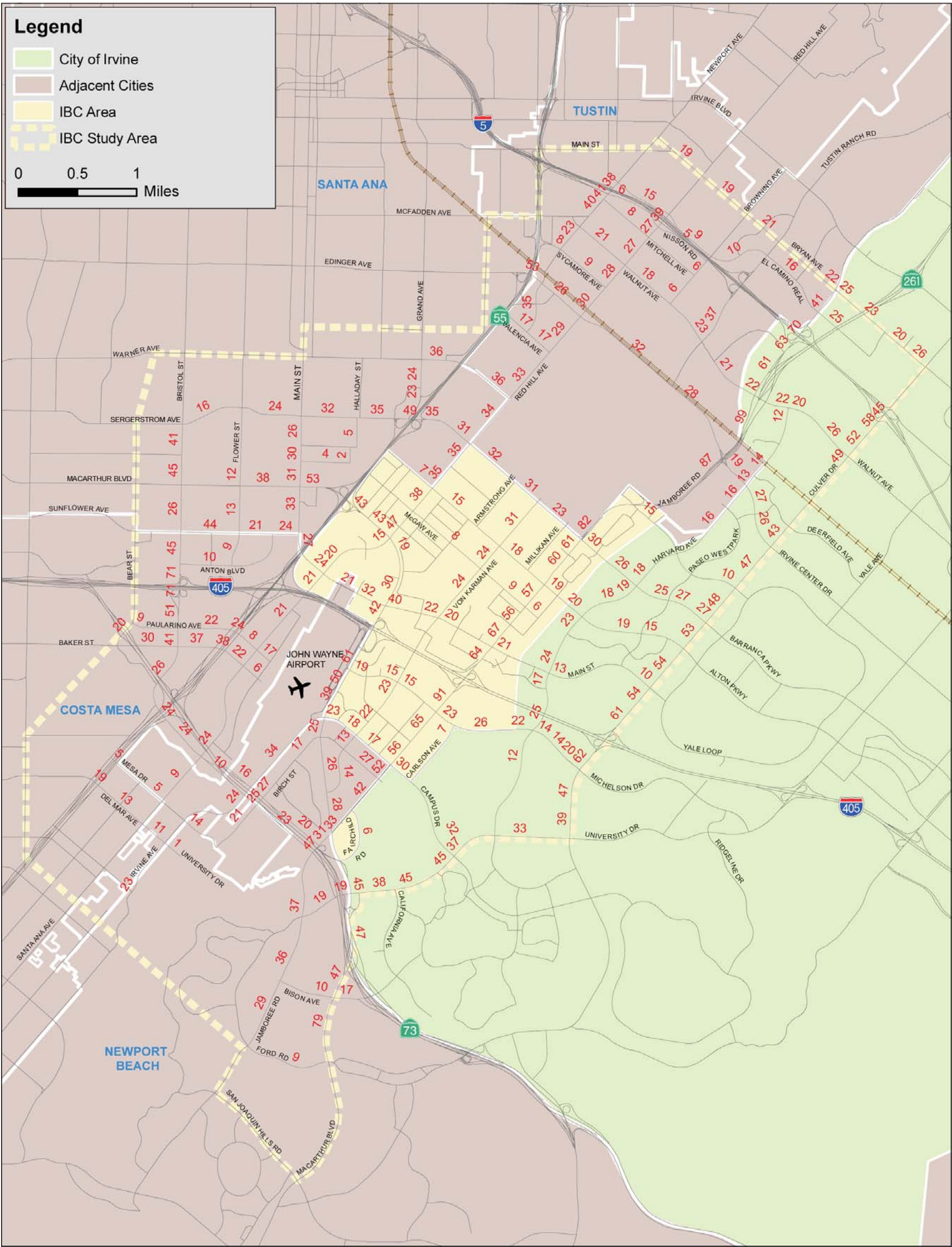
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Post-2030 Cumulative With Project Daily Arterial ADT



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Post-2030 Cumulative With Project Daily Arterial Deficiencies



Source: Parsons Brinckerhoff 2009

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The analysis indicates that several segments are deficient under the Post-2030 Cumulative With Project daily conditions including two segments located within Costa Mesa, 15 of the segments in Irvine, one segment each in Newport Beach and Santa Ana, and two segments in Tustin. Compared to the No Project scenario, there are three additional segments that are deficient under daily conditions within the City of Irvine. As noted above, LOS E indicates a deficient segment for arterial segments outside Planning Area (PA) 36 within the City of Irvine. PA 36 (IBC area) segments are considered deficient at LOS F. Deficient segments under Post-2030 Cumulative With Project conditions include the following:

- 2728—Bristol Street from Anton Boulevard to I-405 Northbound Ramps (Costa Mesa)
- 2751—Bristol Street from I-405 Northbound Ramps to I-405 Southbound Ramps (Costa Mesa)
- 879—Campus Drive from Carlson Avenue to University Drive (Irvine)
- 726—Culver Drive from I-5 NB Ramps to I-5 SB Ramps (Irvine)
- 213—Culver Drive from I-5 SB Off-Ramp to Scottsdale Drive (Irvine)
- 214—Culver Drive from Scottsdale Drive to Walnut Avenue (Irvine)
- 219—Culver Drive from Barranca Parkway to Alton Parkway (Irvine)
- 220—Culver Drive from Alton Parkway to Main Street (Irvine)
- 221—Culver Drive from Main Street to San Leandro (Irvine)
- 222—Culver Drive from San Leandro to I-405 NB On-Ramp (Irvine)
- 224—Culver Drive from I-405 SB On-Ramp to Michelson Drive (Irvine)
- 130—Jamboree Road from El Camino Real to I-5 NB On-Ramp (Irvine)
- 958—Jamboree Road from I-5 NB Ramps to I-5 SB Off-Ramp (Irvine)
- 133—Jamboree Road from Michelle Drive to Walnut Avenue (Irvine)
- 148—Jamboree Road from I-405 On-Ramp to Michelson Drive (Irvine)
- 149—Jamboree Road from Michelson Drive to Dupont Drive (Irvine)
- 151—Jamboree Road from Campus Drive to Birch Street (Irvine)
- 1301—MacArthur Boulevard from Bison Avenue to Ford Road (Newport Beach)
- 1884—MacArthur Boulevard from Main Street to SR-55 Southbound (Santa Ana)
- 44—Edinger Avenue West of Newport Avenue (Tustin)
- ~~1585—Newport Avenue from Valencia Avenue to Edinger Avenue (Tustin)~~

Deficient segments in the City of Irvine are evaluated under peak hour conditions to determine significant impacts in the following section. For arterial segments in Costa Mesa, Newport Beach, and Tustin, arterial daily LOS impacts are addressed at the adjacent intersections. Santa Ana identifies significant project impacts based on the arterial daily LOS. Arterial segment #1884 (MacArthur Boulevard from Main Street to SR-55) is deficient in the Post-2030 Cumulative With Project scenario and because there is a greater than 0.01 increase in the daily LOS between No Project and With Project conditions, a project related impact exists at this location. The Project impacts and mitigations are discussed in Chapter 5.13, *Mitigation Measures*.

Post-2030 Cumulative With Project Peak Hour Link Analysis

All arterial segments that are deficient under daily conditions operate at an acceptable LOS in both peak hours, performing at LOS D or better. Since all segments operate at an acceptable peak hour LOS there are no significant project impacts, hence no mitigation measures are recommended for these facilities.

Post-2030 Cumulative With Project Intersection Analysis

Figures 5.13-46 and 5.13-47 graphically present the AM and PM Peak Hour Intersection ICU for deficient intersections for the Post-2030 Cumulative With Project scenario. When comparing the No Project and With Project scenarios, there are two additional intersections that are deficient, #141: Jamboree Road at Main Street, and #723: Main Street at Dyer Road (Segerstrom Avenue), both in the PM peak hour. Further discussion of specific impacts, mitigation, and fair-share cost analysis is addressed in Section 5.13.6, *Mitigation Measures*. Based on the Post-2030

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Cumulative With Project intersection ICU analysis, the following intersections within the study area are forecast to operate at a deficient LOS:

AM Peak Hour:

- #10: SR-55 Frontage Road Southbound Ramps at Paularino Avenue (Costa Mesa)
- #12: SR-55 Southbound Frontage Road at Baker Street (Costa Mesa)*
- #13: SR-55 Northbound Frontage Road at Baker Street (Costa Mesa)*
- #3: Newport Avenue at Edinger Avenue (Tustin)
- #24: Newport Avenue at Walnut Avenue (Tustin)*
- #93: Tustin Ranch Road at El Camino Real (Tustin)*

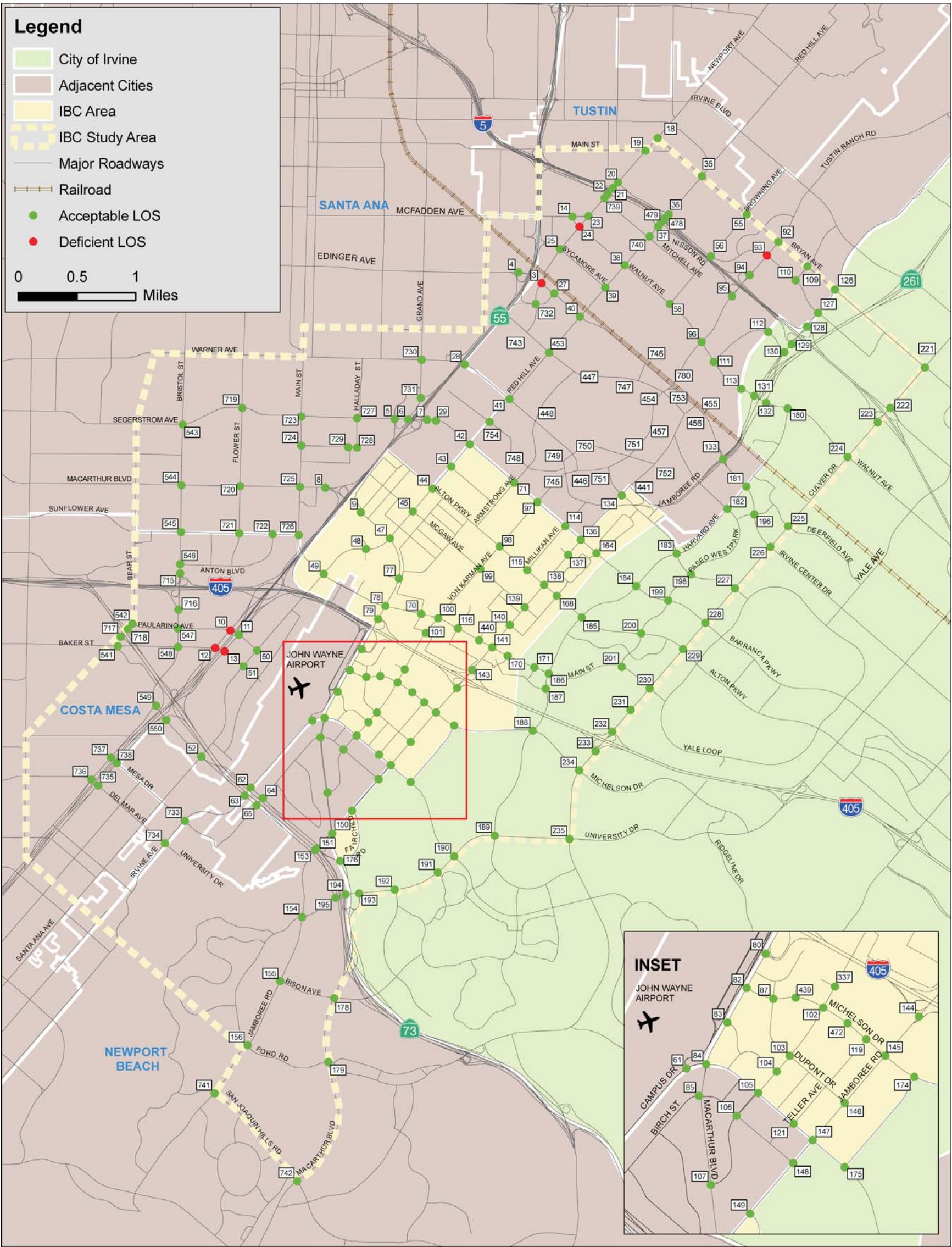
PM Peak Hour:

- #141: Jamboree Road at Main Street (Irvine)*
- #145: Jamboree Road at Michelson Drive (Irvine)*
- #188: Harvard Avenue at Michelson Drive (Irvine)
- #232: Culver Drive at I-405 Northbound Ramps (Irvine)*
- #134: Loop Road/Park Avenue at Warner Avenue (Irvine/Tustin)*
- #136: Jamboree Road at Barranca Avenue (Irvine/Tustin)*
- #62: Campus Drive at Bristol Street (Newport Beach)*
- #85: MacArthur Boulevard at Birch Street (Newport Beach)*
- #543: Bristol Street at Segerstrom Avenue (Santa Ana)*
- #723: Main Street at Dyer Road (Segerstrom Avenue) (Santa Ana)*
- #730: Grand Avenue at Warner Avenue (Santa Ana)*
- #24: Newport Avenue at Walnut Avenue (Tustin)*
- #111: Franklin Avenue at Walnut Avenue (Tustin)
- #754: Red Hill Avenue at Carnegie Avenue/A Street (Tustin/Santa Ana)*

*Denotes project related significant impact in Post-2030



Post-2030 Cumulative With Project AM Peak Hour Intersection Deficiencies



Source: Parsons Brinckerhoff 2009



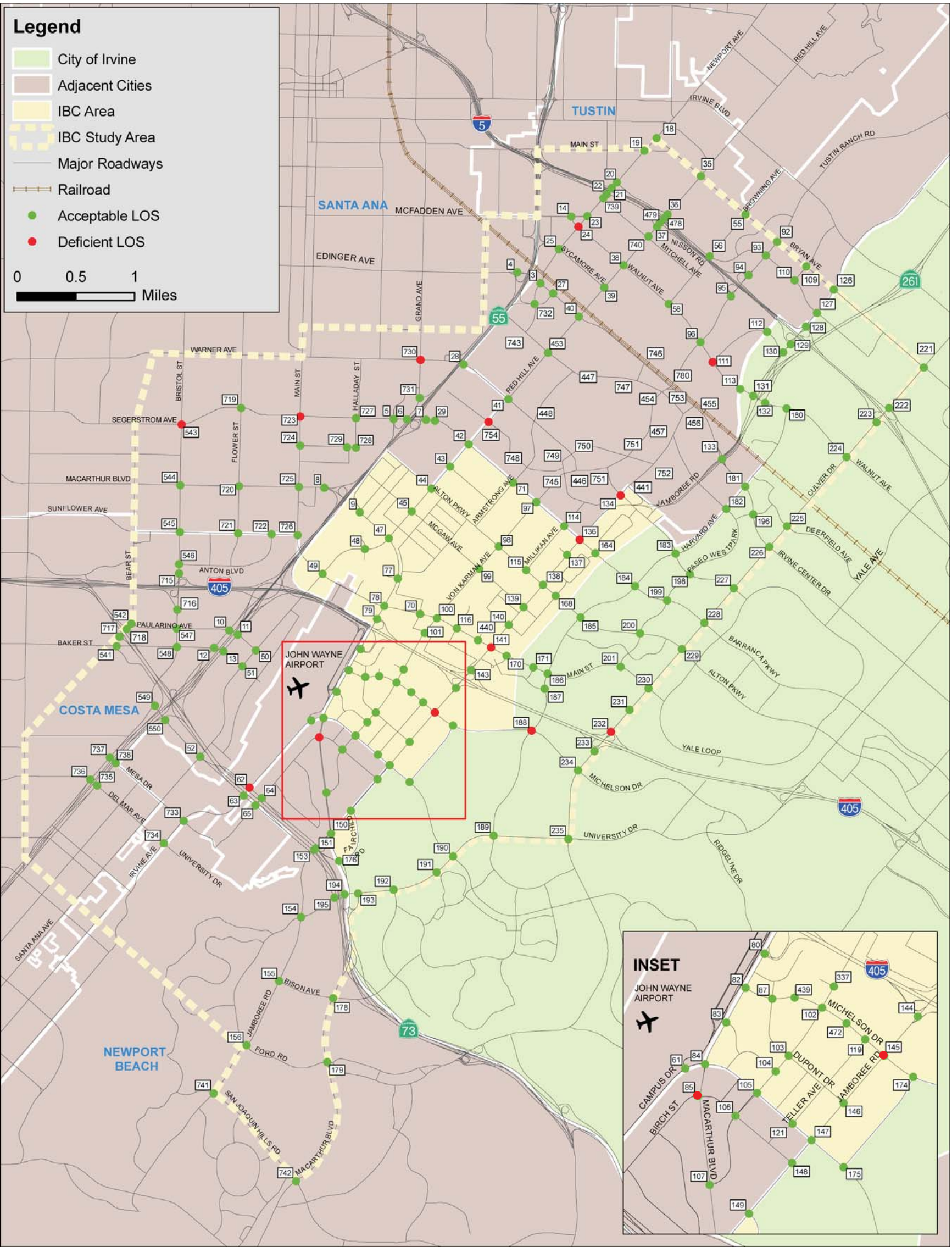
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Post-2030 Cumulative With Project PM Peak Hour Intersection Deficiencies



Source: Parsons Brinckerhoff 2009

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Post-2030 Cumulative With Project Freeway Mainline Analysis

The freeway mainline volumes (forecast using the ITAM 8.4 model), densities, and levels of service reflect the future potential deficiencies of each freeway segment. Figures 5.13-48 and 5.13-49 graphically depict the Post-2030 Cumulative With Project freeway and ramp deficiencies. According to the analysis, the following segments are forecast to operate at LOS E or F. When compared to the No Project scenario, there is one additional deficiency under AM peak hour conditions, and one additional deficiency under PM peak hour conditions. The deficient segments include the following:

AM Peak Hour:

- I-5 Northbound between Culver Drive and Jamboree Road
- I-5 Northbound between Jamboree Road and Tustin Ranch Road
- I-5 Southbound between Jamboree Road and Tustin Ranch Road
- I-5 Northbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Southbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Northbound between Red Hill Avenue and Newport Avenue
- I-5 Southbound between Red Hill Avenue and Newport Avenue
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Southbound between Newport Avenue and SR-55
- I-5 Northbound North of SR-55
- I-5 Southbound North of SR-55
- I-405 Northbound between Culver Drive and Jamboree Road
- I-405 Northbound between Jamboree Road and MacArthur Boulevard
- SR-55 Northbound between Fair Drive and SR-73
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between MacArthur Boulevard and Dyer Road
- SR-55 Southbound North of I-5
- SR-73 Northbound between MacArthur Boulevard and University Drive
- SR-73 Northbound between University Drive and Jamboree Road
- SR-73 Northbound between Jamboree Road and Birch Street
- SR-73 Northbound between Birch Street and Campus Drive
- SR-73 Northbound between Campus Drive and SR-55
- SR-73 Southbound between Campus Drive and SR-55

PM Peak Hour:

- I-5 Northbound between Culver Drive and Jamboree Road
- I-5 Southbound between Culver Drive and Jamboree Road
- I-5 Northbound between Jamboree Road and Tustin Ranch Road
- I-5 Southbound between Jamboree Road and Tustin Ranch Road
- I-5 Northbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Southbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Northbound between Red Hill Avenue and Newport Avenue
- I-5 Southbound between Red Hill Avenue and Newport Avenue
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Southbound between Newport Avenue and SR-55
- I-5 Northbound North of SR-55
- I-5 Southbound North of SR-55

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- I-405 Southbound between Culver Drive and Jamboree Road
- I-405 Northbound between Jamboree Road and MacArthur Boulevard
- I-405 Southbound between Jamboree Road and MacArthur Boulevard
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between I-405 and MacArthur Boulevard
- SR-55 Northbound between MacArthur Boulevard and Dyer Road
- SR-55 Northbound between Dyer Road and Edinger Avenue
- SR-73 Southbound between MacArthur Boulevard and University Drive
- SR-73 Southbound between Jamboree Road and Birch Street
- SR-73 Southbound between Birch Street and Campus Drive
- SR-73 Northbound between Campus Drive and SR-55
- SR-73 Southbound between Campus Drive and SR-55

Post-2030 Cumulative With Project Freeway Ramp Analysis

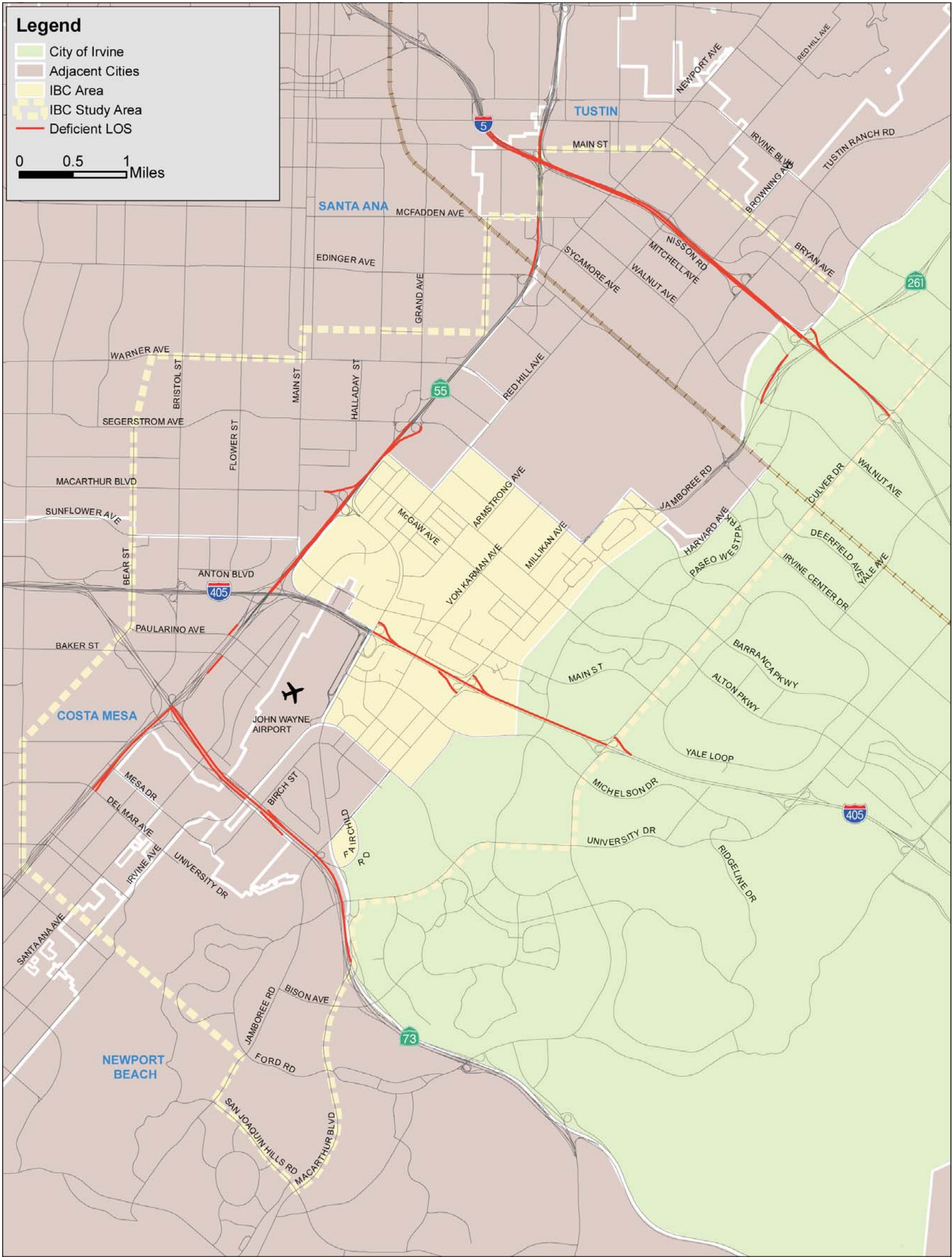
The methodology for determining the deficiencies on freeway ramps is consistent with that used for previously studied scenarios. When compared to the Post-2030 No Project scenario, there are two additional deficiencies under the With Project conditions: I-405 Northbound Off-Ramp to Culver Drive and the SR-55 Southbound Loop On-Ramp from MacArthur Boulevard. Impacted locations and mitigation strategies are discussed in Chapter 6. The deficient ramps include:

AM Peak Hour:

- Northbound I-5 Off-Ramp to Jamboree Road
- Northbound I-405 Off-Ramp to Culver Drive
- Southbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 Off-Ramp to MacArthur Boulevard
- Northbound SR-55 Direct On-Ramp from Fair Drive
- Northbound SR-55 Off-Ramp to Baker Street
- Southbound SR-55 Off-Ramp to Paularino Avenue
- Southbound SR-55 Off-Ramp to MacArthur Boulevard
- Northbound SR-55 Off-Ramp to Dyer Road
- Southbound SR-73 Off-Ramp to Jamboree Road
- Northbound SR-73 Off-Ramp to Birch Street
- Southbound SR-261 On-Ramp from Jamboree Road



Post-2030 Cumulative With Project Freeway AM Peak Hour Deficiencies



Source: Parsons Brinckerhoff 2009



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Post-2030 Cumulative With Project Freeway PM Peak Hour Deficiencies



Source: Parsons Brinckerhoff 2009



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PM Peak Hour:

- Northbound I-5 Off-Ramp to Jamboree Road
- Southbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 On-Ramp from MacArthur Boulevard
- Southbound I-405 Loop On-Ramp from Bristol Street
- Northbound I-405 Off-Ramp to Bristol Street
- Northbound SR-55 Direct On-Ramp from Fair Drive
- Southbound SR-55 On-Ramp from Baker Street
- Northbound SR-55 Off-Ramp to Baker Street
- Northbound SR-55 On-Ramp from Paularino Avenue
- Southbound SR-55 Loop On-Ramp from MacArthur Boulevard
- Southbound SR-55 Direct On-Ramp from MacArthur Boulevard
- Northbound SR-55 Loop On-Ramp from Dyer Road
- Northbound SR-55 Direct On-Ramp from Dyer Road
- Northbound SR-73 On-Ramp from MacArthur Boulevard
- Southbound SR-73 Off-Ramp to Jamboree Road
- Northbound SR-73 On-Ramp from Campus Drive
- Southbound SR-73 On-Ramp from Bear Street
- Northbound SR-73 Off-Ramp to Bear Street
- Northbound SR-261 Off-Ramp to Jamboree Road

5.13.3.7 MPAH and General Plan Amendment

Post-2030 With Project (MPAH Network)

The Post-2030 With Project (MPAH Network) impact analysis evaluates the proposed IBC Vision With Project scenario with the specific unfunded circulation system improvements identified in the 1992 IBC Rezone EIR assumed in the network. This buildout alternative was prepared to identify whether there were differences in resulting impacts when compared to the IBC Vision Plan network (constrained network) that removed specific unfunded improvements identified in the 1992 IBC Rezone EIR and to help determine if these improvements are necessary under buildout conditions or should be removed from the City's General Plan. The intent of the MPAH alternative buildout scenario analysis is two-fold: 1) to provide a reasonable sensitivity analysis that provides Irvine and adjacent jurisdictions with the information necessary to downgrade or upgrade facilities under General Plan buildout conditions using reasonable and accepted methodologies for impact identification and mitigation (such as Irvine's Traffic Impact Analysis Guidelines and adjacent jurisdictions' adopted methodologies); and 2) to begin the County MPAH Amendment process for downgrading MPAH arterials, which may require preparation of a Cooperative Study with OCTA, Irvine, and affected jurisdictions. The following improvements are included in the MPAH Network:

The following improvements are included in the MPAH Network:

- Barranca Parkway between Red Hill Avenue and Jamboree Road (widen to a 8-lane divided roadway from a 7-lane divided roadway)
- Jamboree Road between Barranca Parkway and McGaw Avenue (widen to a 10-lane divided roadway from an 8-lane divided roadway)
- Main Street between Red Hill and Harvard (widen to a 6-lane divided arterial with 2 auxiliary lanes from a 6-lane divided roadway)

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- MacArthur Boulevard between Fitch and Main Street (widen to a 8-lane divided roadway from a 7-lane divided roadway)
- Red Hill Avenue between Barranca Parkway and Main Street (widen to an 8-lane divided roadway from a 6-lane roadway)
- Alton Avenue between Red Hill Avenue and Jamboree Road (widen from a 6-lane divided roadway from a 4-lane divided roadway)
- Von Karman Avenue between Barranca Parkway and Michelson (widen to 6-lane divided roadway from a 4-lane divided roadway)
- Alton Avenue Overcrossing at the SR-55 freeway with High Occupancy Vehicle (HOV) drop ramps
- Von Karman Avenue at the I-405 freeway HOV drop ramps
- Red Hill Avenue between Edinger Avenue and Barranca Parkway (widen to an 8-lane divided roadway from a 6-lane divided roadway between Edinger and Warner and a 7-lane divided roadway between Warner and Barranca Parkway/Dyer Road)*
- Barranca Parkway/Dyer Road between Pullman and Red Hill Avenue (widen to an 8-lane divided roadway from a 6-lane divided roadway)**

*Located within the City of Tustin

**Located within the City of Santa Ana



Post-2030 With Project (MPAH Network) Land Use and Trip Generation

The land use setting for Post-2030 With Project (MPAH Network) is identical to that for the Post-2030 With Vision Plan Project. The network circulation assumptions have been adjusted to include the unfunded improvements identified in the 1992 IBC Rezone EIR. The following discussion describes the performance of the circulation system with these MPAH improvements in place.

Post-2030 With Project (MPAH Network) Daily Arterial Segment Analysis

Post-2030 arterial traffic conditions were analyzed based on the projected volumes and future lane configurations with all unfunded improvements identified in the 1992 IBC Rezone EIR applied. Deficient segments were further analyzed for peak hour performance within the City of Irvine. Alternative methodologies by other cities within the study area called for a different analysis approach. There are some differences in the daily V/C LOS between the Post-2030 constrained network and MPAH Network scenarios.

There are 20 deficient segments under the Post-2030 With Project (MPAH Network) daily conditions, two segments located within Costa Mesa, 16 of the segments in Irvine, one segment in Newport Beach, and ~~one~~ no segments in Tustin. As noted above, LOS E indicates a deficient segment for arterial segments outside Planning Area (PA) 36 within the City of Irvine. PA 36 segments are deficient at LOS F. Deficient segments under the Post-2030 With Project (MPAH Network) conditions include the following:

- 2728—Bristol Street from Anton Boulevard to I-405 Northbound Ramps (Costa Mesa)
- 2751—Bristol Street from I-405 Northbound Ramps to I-405 Southbound Ramps (Costa Mesa)
- 770—Alton Parkway from Daimler Street to Red Hill Avenue (Irvine)
- 879—Campus Drive from Carlson Avenue to University Drive (Irvine)

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- 726—Culver Drive from I-5 NB Ramps to I-5 SB Ramps (Irvine)
- 213—Culver Drive from I-5 SB Off-Ramp to Scottsdale Drive (Irvine)
- 214—Culver Drive from Scottsdale Drive to Walnut Avenue (Irvine)
- 219—Culver Drive from Barranca Parkway to Alton Parkway (Irvine)
- 220—Culver Drive from Alton Parkway to Main Street (Irvine)
- 221—Culver Drive from Main Street to San Leandro (Irvine)
- 222—Culver Drive from San Leandro to I-405 NB On-Ramp (Irvine)
- 224—Culver Drive from I-405 SB On-Ramp to Michelson Drive (Irvine)
- 130—Jamboree Road from El Camino Real to I-5 NB On-Ramp (Irvine)
- 958—Jamboree Road from I-5 NB Ramps to I-5 SB Off-Ramp (Irvine)
- 133—Jamboree Road from Michelle Drive to Walnut Avenue (Irvine)
- 148—Jamboree Road from I-405 On-Ramp to Michelson Drive (Irvine)
- 149—Jamboree Road from Michelson Drive to Dupont Drive (Irvine)
- 151—Jamboree Road from Campus Drive to Birch Street (Irvine)
- 1301—MacArthur Boulevard from Bison Avenue to Ford Road (Newport Beach)
- ~~1585—Newport Avenue from Valencia Avenue to Edinger Avenue (Tustin)~~

Two locations become acceptable under daily conditions when the MPAH improvements are applied, #1884, MacArthur between Main Street and SR-55 in the City of Santa Ana, and #44 Edinger Avenue West of Newport Boulevard. The location in Santa Ana has a project related significant impact under the Post-2030 With Project (constrained network) scenario. Arterial improvements within the vicinity of these segments, including the Alton Avenue crossing of SR-55 south of this area, contribute to traffic being diverted in the MPAH network and resulting in an improved LOS. Additionally, segment #770, Alton Parkway between Daimler Street and Red Hill Avenue becomes deficient with the MPAH improvements applied. This segment would likely need to be improved to accommodate additional traffic diversion to the Alton Avenue crossing of SR-55.

Post-2030 With Project (MPAH Network) Peak Hour Link Analysis

Peak hour directional traffic volumes were obtained from forecast peak hour turning movement volumes for intersections upstream and downstream for each deficient arterial segment. The peak hour link analysis indicates that all arterial segments in Irvine that are deficient under daily conditions operate at an acceptable LOS in both peak hours, performing at LOS D or better, and hence no mitigation measures are recommended.

Post-2030 With Project (MPAH Network) Peak Hour Intersection Analysis

The ICU analysis was performed for every intersection within the study area for the Post-2030 With Project (MPAH Network) scenario. When comparing the results of this analysis to that of the IBC Vision Plan buildout, there are six additional intersection deficiencies and four locations where the intersections become acceptable. This indicates that the buildout of the unfunded 1992 IBC EIR improvements does not provide relief to the overall circulation system within the study area. Instead, traffic shifts from one facility to another. Von Karman Avenue is attracting a greater share of overall traffic as evidenced by the two additional deficient intersections. Additionally, two locations along Red Hill Avenue deteriorate with this network assumption. It should be noted that most of the deficient locations in Irvine and Santa Ana appear to be the result of increased traffic in the vicinity of Alton Parkway at SR-55. This scenario assumes a network that includes an overcrossing of SR-55 on Alton Parkway with High Occupancy Vehicle (HOV) drop-ramps (an unfunded 1992 IBC Rezone improvements). Based on the Post-2030 With Project (MPAH Network) intersection ICU analysis, the following intersections are forecast to operate at a deficient LOS:

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AM Peak Hour:

- #10: SR-55 Frontage Road Southbound Ramps at Paularino Avenue (Costa Mesa)
- #12: SR-55 Southbound Frontage Road at Baker Street (Costa Mesa)
- #13: SR-55 Northbound Frontage Road at Baker Street (Costa Mesa)
- #24: Newport Avenue at Walnut Avenue (Tustin)
- #93: Tustin Ranch Road at El Camino Real (Tustin)

PM Peak Hour:

- #50: Red Hill Avenue at Paularino Avenue (Costa Mesa)*
- #51: Red Hill Avenue at Baker Street (Costa Mesa)*
- #98: Von Karman Avenue at Alton Parkway (Irvine)*
- #102: Von Karman Avenue at Michelson Drive (Irvine)*
- #145: Jamboree Road at Michelson Drive (Irvine)
- #188: Harvard Avenue at Michelson Drive (Irvine)
- #232: Culver Drive at I-405 Northbound Ramps (Irvine)
- #134: Loop Road/Park Avenue at Warner Avenue (Irvine/Tustin)
- #136: Jamboree Road at Barranca Avenue (Irvine/Tustin)
- #85: MacArthur Boulevard at Birch Street (Newport Beach)
- #44: Red Hill Avenue at Alton Parkway (Irvine/Santa Ana)*
- #543: Bristol Street at Segerstrom Avenue (Santa Ana)
- #723: Main Street at Dyer Road (Segerstrom Avenue) (Santa Ana)
- #728: Halladay Street East at Alton Parkway (Santa Ana)*
- #24: Newport Avenue at Walnut Avenue (Tustin)
- #111: Franklin Avenue at Walnut Avenue (Tustin)

* Note: Only deficient under MPAH Buildout scenario

Post-2030 With Project (MPAH Network) Peak Hour Freeway Mainline Analysis

The freeway mainline volumes were forecast using the ITAM 8.4 model. The volumes, densities, and levels of service reflect the Post-2030 freeway segment performance. When compared to the IBC Vision Plan With Project (Constrained Network) scenario, there is one freeway segment that improves when utilizing the MPAH network, and one segment that deteriorates. Overall, the freeway system seems to operate at a slightly better V/C ratio and LOS with the MPAH network. This is likely due to traffic distribution to improved arterial facilities that were not improved in the constrained network. The deficient segments for this scenario include the following:



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AM Peak Hour:

- I-5 Northbound between Culver Drive and Jamboree Road
- I-5 Northbound between Jamboree Road and Tustin Ranch Road
- I-5 Northbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Southbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Northbound between Red Hill Avenue and Newport Avenue
- I-5 Southbound between Red Hill Avenue and Newport Avenue
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Southbound between Newport Avenue and SR-55
- I-5 Northbound North of SR-55
- I-5 Southbound North of SR-55
- I-405 Northbound between Culver Drive and Jamboree Road
- I-405 Southbound between Culver Drive and Jamboree Road
- I-405 Northbound between Jamboree Road and MacArthur Boulevard
- SR-55 Northbound between Fair Drive and SR-73
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between MacArthur Boulevard and Dyer Road
- SR-55 Southbound between Dyer Road and Edinger Avenue
- SR-55 Southbound between Edinger Avenue and McFadden Street/Sycamore Avenue
- SR-55 Southbound North of I-5
- SR-73 Northbound between MacArthur Boulevard and University Drive
- SR-73 Northbound between University Drive and Jamboree Road
- SR-73 Northbound between Jamboree Road and Birch Street
- SR-73 Northbound between Birch Street and Campus Drive
- SR-73 Northbound between Campus Drive and SR-55
- SR-73 Southbound between Campus Drive and SR-55

PM Peak Hour:

- I-5 Northbound between Culver Drive and Jamboree Road
- I-5 Southbound between Culver Drive and Jamboree Road
- I-5 Northbound between Jamboree Road and Tustin Ranch Road
- I-5 Northbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Southbound between Tustin Ranch Road and Red Hill Avenue
- I-5 Northbound between Red Hill Avenue and Newport Avenue
- I-5 Southbound between Red Hill Avenue and Newport Avenue
- I-5 Northbound between Newport Avenue and SR-55
- I-5 Southbound between Newport Avenue and SR-55
- I-5 Northbound North of SR-55
- I-5 Southbound North of SR-55
- I-405 Southbound between Culver Drive and Jamboree Road
- I-405 Northbound between Jamboree Road and MacArthur Boulevard
- I-405 Southbound between Jamboree Road and MacArthur Boulevard
- SR-55 Northbound between I-405 and MacArthur Boulevard
- SR-55 Southbound between I-405 and MacArthur Boulevard
- SR-55 Northbound between MacArthur Boulevard and Dyer Road
- SR-55 Northbound between Dyer Road and Edinger Avenue
- SR-73 Southbound between MacArthur Boulevard and University Drive

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- SR-73 Southbound between Jamboree Road and Birch Street
- SR-73 Southbound between Birch Street and Campus Drive
- SR-73 Southbound between Campus Drive and SR-55

Post-2030 With Project (MPAH Network) Peak Hour Freeway Ramp Analysis

The methodology for determining the deficiencies on freeway ramps is consistent with that used for previous alternatives. When this scenario is compared to the Post-2030 With Project (Constrained Network) scenario, there are two ramps that improve as a result of the assumption of the MPAH Network: I-405 Northbound Off-Ramp to Culver Drive and SR-55 Northbound Direct On-Ramp from Dyer Road. These locations are not deficient under the Post-2030 With Project (MPAH Network) scenario. Additionally, one ramp deteriorates as a result of the assumption of the MPAH Network, Northbound SR-55 Direct On-Ramp from Victoria Street. The freeway ramp facilities generally operate at a similar LOS as with the constrained network, although there are some minor improvements. The deficient ramps include:

AM Peak Hour:

- Northbound I-5 Off-Ramp to Jamboree Road
- Southbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 Off-Ramp to MacArthur Boulevard
- Northbound SR-55 On-Ramp from Victoria Street
- Northbound SR-55 Direct On-Ramp from Fair Drive
- Northbound SR-55 Off-Ramp to Baker Street
- Southbound SR-55 Off-Ramp to Paularino Avenue
- Southbound SR-55 Off-Ramp to MacArthur Boulevard
- Northbound SR-55 Off-Ramp to Dyer Road
- Southbound SR-73 Off-Ramp to Jamboree Road
- Northbound SR-73 Off-Ramp to Birch Street
- Southbound SR-261 On-Ramp from Jamboree Road

PM Peak Hour:

- Northbound I-5 Off-Ramp to Jamboree Road
- Southbound I-405 Off-Ramp to Jamboree Road
- Northbound I-405 On-Ramp from MacArthur Boulevard
- Southbound I-405 Loop On-Ramp from Bristol Street
- Northbound I-405 Off-Ramp to Bristol Street
- Northbound SR-55 Direct On-Ramp from Fair Drive
- Southbound SR-55 On-Ramp from Baker Street
- Northbound SR-55 On-Ramp from Paularino Avenue
- Southbound SR-55 Loop On-Ramp from MacArthur Boulevard
- Southbound SR-55 Direct On-Ramp from MacArthur Boulevard
- Northbound SR-55 Loop On-Ramp from Dyer Road
- Northbound SR-73 On-Ramp from MacArthur Boulevard
- Southbound SR-73 Off-Ramp to Jamboree Road
- Northbound SR-73 On-Ramp from Campus Drive
- Southbound SR-73 On-Ramp from Bear Street
- Northbound SR-73 Off-Ramp to Bear Street
- Northbound SR-261 Northbound Off-Ramp to Jamboree Road



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Conclusion

The City of Irvine General Plan Circulation Element identifies certain roadway configurations that are no longer needed as determined in the IBC Vision Plan; therefore a General Plan Amendment subsequent to the approval of the IBC Vision EIR will downgrade arterial roadways as needed. The City of Irvine intends to downgrade the following arterial segments as a General Plan Amendment to the Circulation Element:

- Barranca Parkway between Red Hill Avenue and Jamboree Road (downgrade from 8-lane divided roadway to 7-lane divided roadway)
- Jamboree Road between Barranca Parkway and McGaw Avenue (downgrade from a 10-lane divided roadway to a 8-lane divided roadway)
- Main Street between Red Hill and Harvard (downgrade from 6-lane divided arterial with 2 auxiliary lanes to 6-lane divided roadway)
- MacArthur Boulevard between Fitch and Main Street (downgrade from 8-lane divided roadway to 7-lane divided roadway)
- Red Hill Avenue between Barranca Parkway and Main Street (downgrade from an 8-lane divided roadway to a 6-lane roadway)
- Alton Avenue between Red Hill Avenue and Jamboree Road (downgrade from a 6-lane divided roadway to 4-lane divided roadway)*
- Von Karman Avenue between Barranca Parkway and Michelson (downgrade from 6-lane roadway to 4-lane roadway)*

The arterial segment of Alton Parkway between Red Hill Avenue and Jamboree Road as well as the segment of Von Karman Avenue between Barranca Parkway and Michelson Drive as identified with an asterisk in the list above, are programmed into both the City of Irvine's General Plan and the Orange County Master Plan of Arterial Highways (MPAH). Both roadways are currently 4-lane roadways and expected to remain as 4-lane roadways in the future. Both the City's General Plan and the Orange County MPAH currently have these two segments programmed as 6-lane divided arterials in the buildout condition. The IBC Vision Plan traffic study has determined that 6 lanes are unnecessary for both of these roadway segments under buildout conditions. Thus, the City of Irvine will initiate an MPAH Amendment by entering into a cooperative study with the Orange County Transportation Authority (OCTA) to determine the feasibility of downgrading both Alton Parkway and Von Karman Avenue. ~~Once this study is complete, both agencies can move forward with amendments to the General Plan and MPAH to downgrade both Alton Parkway between Red Hill Avenue and Jamboree Road as well as Von Karman Avenue between Barranca Parkway and Michelson Drive. Once the Study is complete, in order for the City of Irvine to maintain eligibility for Measure M funding, prior to amending the City's General Plan to downgrade both Alton Parkway between Red Hill Avenue and Jamboree Road and Von Karman Avenue between Barranca Parkway and Michelson Drive, the City and OCTA will work to prepare amendments to the County MPAH to be approved by the OCTA Board of Directors. If the MPAH is approved by the OCTA Board, the City can move forward with downgrading the arterial segments.~~

Additionally, the City of Irvine intends to remove the following interchange improvements:

- Alton Avenue Overcrossing at the SR-55 freeway with High Occupancy Vehicle (HOV) drop ramps
- Von Karman Avenue at the I-405 freeway HOV drop ramps

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These interchange improvements are programmed in the Orange County MPAH as buildout improvements. However, the IBC Vision Plan traffic study has determined that these interchanges are unnecessary under build-out conditions. The City of Irvine will initiate an MPAH Amendment by entering into a cooperative study with OCTA and the affected local agencies to determine the feasibility of removing these interchange improvements from the MPAH.

IMPACT 5.13-2 *THE PROPOSED PROJECT WOULD NOT INCREASE HAZARDS DUE TO A DESIGN FEATURE OR INCOMPATIBLE USES. [THRESHOLD T-5]*

Impact Analysis: The City of Irvine Transportation Design Procedures (TDP) establish uniform policies and procedures for reviewing traffic plans in the City. These procedures are used to evaluate the roadway design features that may be impacted by future projects pursuant to the proposed IBC Vision Plan and Mixed-Use Overlay Zoning Code. For those criteria that are traffic-volume dependent, (i.e., evaluation of the project driveway) evaluation is based in the existing plus project condition. Since the City has adopted roadway design standards that would preclude the construction of any unsafe features, no increased hazards are anticipated. Additionally, there would be adequate levels of service at all City and adjacent jurisdiction intersections with implementation of recommended traffic improvements. Therefore, there would be no impacts to the circulation system or to emergency access as a result of the proposed project.

IMPACT 5.13-3: *ADEQUATE PARKING WOULD BE PROVIDED FOR THE PROPOSED PROJECT. [THRESHOLD T-6]*

Impact Analysis: Future development pursuant to the IBC Vision Plan and Mixed-Use Overlay Zoning Code will be required to provide adequate parking, on-site, in accordance with the City of Irvine Zoning Ordinance standards. Therefore, no parking inadequacies are anticipated.

IMPACT 5.13-4: *THE PROPOSED PROJECT COMPLIES WITH ADOPTED POLICIES, PLANS, AND PROGRAMS FOR ALTERNATIVE TRANSPORTATION. [THRESHOLD T-7]*

Impact Analysis: As more fully described in Section 5.15, *Global Climate Change*, the proposed project includes a number of programs to promote alternative transportation. As discussed in PDF 15-7, the project would develop high-density housing within an area being served by at least two modes of transit. On June 9, 2008, **The i Shuttle**, which is operated by the City of Irvine and designed for the IBC community, began operating. The shuttle allows residents and employees to have an alternative way to commute to jobs and locations throughout the IBC. The shuttle offers two routes to accommodate residents and employees traveling within the area and to and from the IBC (see Figure 4-2, **The i Shuttle** Route). Route A connects the Tustin Metrolink Station to the John Wayne Airport via Von Karman Avenue. Route B connects the Tustin Metrolink Station to the heart of the IBC via Jamboree Road and Michelson Drive. Therefore, the project would facilitate walking and non-vehicular travel to a greater extent than would be the case for similar development in outlying areas without extensive transit availability. In addition, the high-density development would include a greater number of potential residents that could potentially utilize or engage in alternative modes of travel than in a lower density development on the project site.

As discussed in PDF 15-9, the IBC Vision Plan creates funding mechanisms to provide for the implementation of community-orientated pedestrian infrastructure improvements to increase walkability in the IBC. New streets incorporated into the IBC would reduce the size of the City blocks to a pedestrian scale and pedestrian paseos would connect to the arterials at key locations. In addition, many of the streets in the IBC currently do not have sidewalks. The sidewalk improvement program will be expanded to provide connectivity, incorporate several new pedestrian bridges, and many existing sidewalks would be moved away from the curb into the setback area. Creekwalk system is also envisioned adjacent to the San Diego Creek to provide a trail to connect the Great Park from the IBC and the Civic Center.



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As discussed in PDF 15-10, The IBC Vision Plan would provide linkages to the City regional bicycle trail system. Currently continuous on-street bicycle lanes exist only along Main Street. Bicycle lanes are proposed along parts of Jamboree Road, Red Hill Avenue, Von Karman Avenue, Michelson Avenue, Carlson Avenue, Barranca Parkway, and Alton Parkway. Furthermore, the sidewalk system would be shared with pedestrians and bicycles. As part of the Vision Plan, bicycle connections to the San Marco Park, adjacent to the San Diego Creek, would be improved with a new pedestrian bridge.

As a result, the proposed project is consistent with adopted policies, plans, and programs for alternative transportation and no significant impacts are anticipated.

5.13.4 Cumulative Impacts

The geographic scope for traffic includes cumulative growth projections for Orange County that are reflected in Orange County Projections (OCP)-2004, as modified by more recent data as described in Section 4.5, *Cumulative Impact Assumptions*. Past projects in surrounding Orange County cities and unincorporated areas have converted undeveloped and agricultural land to urban uses resulting in area residential and employment population increases and associated demand for expansions of roadway systems. The contribution of these past projects to area growth is also reflected in OCP-2004. As described in Section 5.10, *Population and Housing*, the Orange County Projections are prepared, and periodically updated, by the Center for Demographic Research at California State University, Fullerton, based on a Memorandum of Understanding with the Orange County Council of Governments (OCCOG). General Plan information from each jurisdiction within Orange County is used in the development of growth projections for the County. The OCP growth projections, as adopted by the OCCOG, are then incorporated into traffic models approved for use by the Orange County Transportation Authority (i.e., the Orange County Transportation Analysis Model - OCTAM), which provides the countywide traffic model basis for more localized traffic models, such as that used by the City of Irvine (i.e., the Irvine Transportation Analysis Model - ITAM). As such, the traffic modeling for future conditions includes areawide growth as anticipated in adopted growth projections (e.g., OCP-2004).

The 2015 Cumulative With Project and Post-2030 Cumulative With Project analyses contained in Section 5.13, *Transportation and Traffic*, assess the traffic impacts of all cumulative development anticipated by the Year 2015 and Post-2030. As shown in these analyses, most intersections and roadway/freeway/tollway/ramp segments will operate at acceptable levels of service with the existing or planned improvements, although some may require additional improvements, as described in Section 5.13.6, *Mitigation Measures*. It should be noted, however, that it has been anticipated in the traffic analysis that the cumulative impact of Project traffic along with other regional growth at the identified ramp and freeway locations will be largely mitigated through a combination of regional programs that are the responsibility of other agencies. If these programs are not implemented by the agencies with the responsibility to do so, the cumulative freeway/tollway ramp impacts would remain significant and unavoidable. As a result, the proposed Project will result in a cumulatively significant traffic impact that may remain significant and unavoidable.

5.13.5 Level of Significance Before Mitigation

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant: 5.13-2, 5.13-3, and 5.13-4.

Impact 5.13-2

Since the City has adopted roadway design standards that would preclude the construction of any unsafe features, no increased hazards are anticipated. There would be adequate levels of service at all City and adjacent jurisdiction intersections with implementation of recommended traffic improvements. Therefore, there would be no impacts to the circulation system or to emergency access as a result of the proposed project.

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Impact 5.13-3

Future development pursuant to the IBC Vision Plan and Mixed-Use Overlay Zoning Code will be required to provide adequate parking, on-site, in accordance with the City of Irvine Zoning Ordinance standards. Therefore, no parking inadequacies are anticipated.

Impact 5.13-4

As discussed in PDF 15-7, the project would develop high-density housing within an area being served by at least two modes of transit. As discussed in PDF 15-9, the IBC Vision Plan creates funding mechanisms to provide for the implementation of community-orientated pedestrian infrastructure improvements to increase walkability in the IBC. As discussed in PDF 15-10, The IBC Vision Plan would provide linkages to the City regional bicycle trail system. As a result, the proposed project is consistent with adopted policies, plans, and programs for alternative transportation and no significant impacts are anticipated.

Without mitigation, the following impacts would be **potentially significant**:

- Impact 5.13-1 Project generated traffic would result in significant impacts at a number of intersections in the 2015 and Post-2030 conditions.

Roadway System Deficiencies

Individual arterial segments that operate at a deficient LOS under daily conditions within the City of Irvine are candidates for peak hour analysis to determine performance during the AM and PM peak hour. The peak hour analysis conducted for each of the forecast future scenarios revealed no arterial segments operating at a deficient level in either peak hour within the City of Irvine. Hence, no further analysis or mitigation is required. For arterial segments within the Cities of Newport Beach, Costa Mesa, and Tustin, daily arterial segment LOS analysis is valuable for long-range planning purposes but the Cities do not assess segment deficiencies under daily conditions. Deficiencies are assessed at intersections at either end of the arterial segment. Intersection deficiencies for the IBC Vision have been assessed and conclusions discussed in the next section. Hence, there are no deficiencies or project related impacts expected in future forecast scenarios for arterial segments within Newport Beach, Costa Mesa, and Tustin. For the City of Santa Ana, daily arterial volume-to-capacity ratio (V/C) analysis is used to assess deficiencies in the arterial network. An increase of 0.01 or more of the daily V/C ratio constitutes a project impact when compared with the no project conditions. For arterial segments within the City of Santa Ana, daily arterial LOS analysis showed that the segment of MacArthur Boulevard, from Main Street to SR-55 has a significant project related impact under the Post-2030 future forecast scenario and will require mitigation.

MacArthur Boulevard between Main Street and SR-55 cannot be mitigated to below a level of significance without changing the MPAH road classification upgrading the segment from a Major Arterial (six lanes) to a Principal Arterial (eight lanes). The classification would not need to be upgraded in the MPAH, as the MPAH designations represent a minimum standard which jurisdictions, such as Irvine or Santa Ana, may build upon. Reclassification would provide one additional lane in each direction and potentially would require an amendment to the City of Santa Ana General Plan. This forecast deficiency constitutes a project related significant impact according to the City of Santa Ana's performance criteria. The City of Irvine is responsible for a fair-share for this improvement for the Post-2030 future scenario.

Table 5.13-21 identifies future project impacts and cumulative deficiencies by jurisdiction and those intersections that will require mitigation. Project impacts under existing scenarios are not included as impacts under these scenarios are theoretical and will not be mitigated. Recommended improvements for existing scenarios are presented for future planning purposes only. Figure 5.13-50 displays the locations of the intersections requiring mitigation within the IBC study area.



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Table 5.13-21
Intersection/Arterial Segment Project Impacts/Cumulative Deficiencies

ID	Intersection	Jurisdiction	IBC Vision With Project (2015)		IBC Vision With Project (P-2030)		Fair-share		
			Cumulative Deficiency	Project Impact	Cumulative Deficiency	Project Impact	2015 With Project	Post-2030 With Project	Expected Share (Vision Plan)
10	SR-55 Frontage Road SB Ramps at Paularino	CM			X				No Share
12	SR-55 SB Frontage Road at Baker Street	CM				X		8.0%	8.0%
13	SR-55 NB Frontage Road at Baker Street	CM				X		8.7%	8.7%
62	Campus Drive at Bristol Street NB	NB		X		X	29.8%	30.2%	30.2%
85	MacArthur Boulevard at Birch Street	NB				X		19.6%	19.6%
543	Bristol Street at Segerstrom Avenue	SA				X		12.7%	12.7%
723	Main Street at Dyer Road (Segerstrom Avenue)	SA				X		21.0%	21.0%
730	Grand Avenue at Warner Avenue	SA				X		15.8%	15.8%
3	Newport Avenue at Edinger Avenue	Tus			X				No Share
24	Newport Avenue at Walnut Avenue	Tus				X		6.3%	6.3%
36	Red Hill Avenue at El Camino Real	Tus	X						No Share
93	Tustin Ranch Road at El Camino Real	Tus		X		X	2.1%	0.1%	2.1%
111	Franklin Avenue at Walnut Avenue	Tus	X		X				No Share
134	Loop Road/Park Avenue at Warner Avenue	Tus		X		X	2.5%	11.6%	11.6%
732	SR-55 NB Ramps/Del Amo Avenue at Newport Avenue	Tus	X						No Share

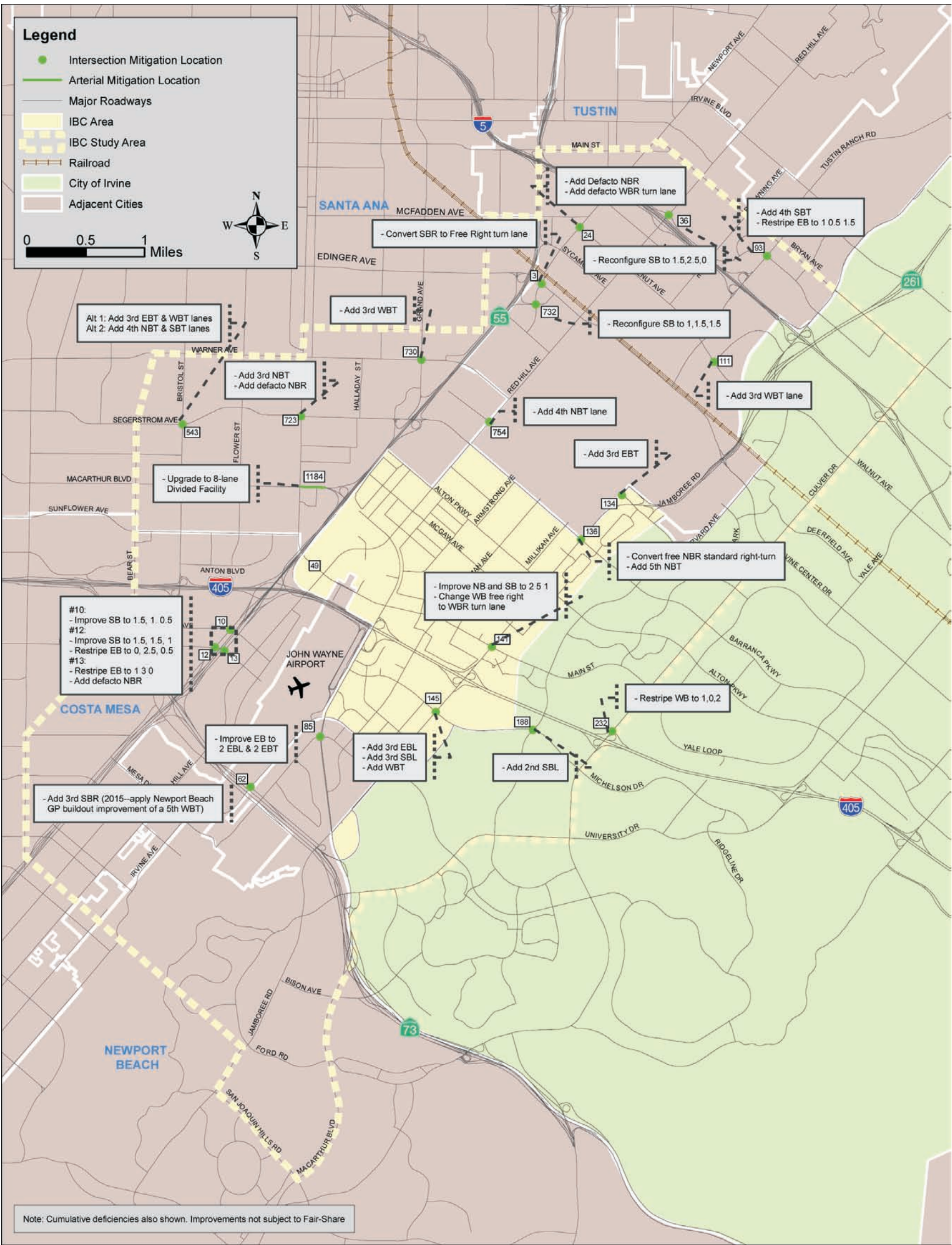
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Table 5.13-21
Intersection/Arterial Segment Project Impacts/Cumulative Deficiencies

ID	Intersection	Jurisdiction	IBC Vision With Project (2015)		IBC Vision With Project (P-2030)		Fair-share		
			Cumulative Deficiency	Project Impact	Cumulative Deficiency	Project Impact	2015 With Project	Post-2030 With Project	Expected Share (Vision Plan)
754	Red Hill Avenue at Carnegie Avenue/A Street	Tus				X		7.3%	7.3%
136	Jamboree Road at Barranca Avenue	Irv				X		100.0%	100.0%
141	Jamboree Road at Main Street	Irv				X		100.0%	100.0%
145	Jamboree Road at Michelson Drive	Irv		X		X	100.0%	100.0%	100.0%
188	Harvard Avenue at Michelson Drive	Irv			X			100.0%	100.0%
232	Culver Drive at I-405 NB Ramps	Irv				X		100.0%	100.0%
1884	MacArthur between Main Street and SR-55 SB	SA				X		31.1%	31.1%

IBC Vision Study Area Improvement Locations



Source: Parsons Brinckerhoff 2009



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Intersection Deficiencies

Analysis of the intersections was conducted for all intersections within the defined IBC Vision study area, with additional intersections added to the previously analyzed 1992 IBC Vision Plan study area at the request of adjacent jurisdictions. For each jurisdiction, the established and published criteria for evaluating significant impacts have been employed in this study. Project impacts are identified for the study area using the methodology for each respective jurisdiction.

For intersections with a project related significant impact, the Project would be responsible for its fair-share to improve the intersection back to an acceptable LOS (or existing conditions if the intersection is currently deficient). Cumulative deficiencies (where the intersection is deficient under future conditions with no project related impact) are also evaluated but the project is not responsible for a fair-share of the cost of the improvement.

Freeway/Tollway Mainline and Ramp Improvements

The significant impact threshold methodology used to identify significant impacts on Caltrans facilities has demonstrated a number of freeway mainline and ramp project related significant impacts. Since the City has no jurisdiction to implement the improvements on the Caltrans facilities and the required improvements are largely the result of background regional traffic, coordination between the City of Irvine and Caltrans is necessary to reach consensus on potential operational improvement measures. Any improvements identified would require a statement of overriding considerations. Irvine is committed to coordinating with Caltrans in the development of alternative feasible improvements such as Intelligent Transportation Strategies (ITS) that reduce congestion and improve operations on freeway mainlines and ramps.

5.13.6 Mitigation Measures

5.13.6.1 Summary of Mitigation Program

In summary, one arterial segment and 21 intersections are forecast to operate at a deficient LOS under 2015 and Post-2030 conditions. Mitigation measures are proposed for all project-related impacts identified in the interim year 2015 analysis regardless of whether the location is impacted in the build-out condition. Of the 21 deficient intersections, a project impact is forecast for 15 of the deficient intersections. The arterial segment deficiency is a project related impact. Additionally, a number of freeway mainline segments and ramps are forecast to operate at a deficient LOS. As a general rule, mitigation measures for arterials or intersections begin with identification of any measures that might have been recommended as part of other traffic studies in the area. These mitigation measures are then applied to determine whether they result in roadway segment or intersection operation within acceptable thresholds.

If mitigation measures were not previously identified either as part of a traffic study or planned future improvements, mitigation is achieved by providing adequate capacity for the critical movement for an intersection or for arterial segments. Critical movements are conflicting intersection turning movements that are found to have the highest ICU for opposing movements; i.e. each of the approaches at a four-legged intersection will contain a critical movement that conflicts with an opposing movement. Since the combination of the ICU values for each critical movement defines the ICU, providing additional through lanes or turning lanes is dependent upon whether the critical movement is a through or turn (left or right) movement. The decision of whether additional lanes should be auxiliary lanes that just add capacity to the intersection without widening the street segment or extended to intersections is dependent upon the performance, proximity and improvement needs of adjacent intersections.

Mitigation measures are further analyzed for feasibility. A preliminary feasibility assessment is reliant upon potential cost-effectiveness and right-of-way acquisition. Right-of-way acquisitions are least preferred, as they require relocation of businesses and residents. Compensation for this relocation is an added financial burden to the community. Wherever feasible, additional capacity for through movements or turning movements should be



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provided through re-striping or widening. Some factors involved in widening an intersection to provide an additional left or right turning lane or to add a through lane are:

- whether there are a sufficient number of receiving lanes through the intersection to accommodate the added lane (triple lefts need at least 3 lanes to turn into)
- whether the opposing left turns would collide, (triple lefts opposite a dual left may not be able to occur simultaneously) so the signal phasing would need to be modified to provide split phasing
- how far to extend a through lane past the intersection so that it has sufficient benefit in increasing the capacity of the intersection. If the through lane ends too soon after the intersection, motorists may not want to bother using it due to the hassle of merging back in to the narrower section.

Fee Assessment/Fair-share for Improvements

The City of Irvine has applied a fair-share methodology to evaluate the financial responsibility of mitigating IBC Vision project impacts. For intersection improvements within the City of Irvine, the IBC Vision project is fully responsible. For project impacts outside the City of Irvine, the project will pay a fair-share.

Cumulative deficiencies operate deficiently in both the No Project and With Project conditions but do not have a project impact as identified by the criteria and therefore do not require mitigations.

For Caltrans facilities the equitable share responsibility for project related freeway mainline and ramp deficiencies has been developed through consultation with Caltrans. For Caltrans facilities, the fair-share is developed by calculating the future forecast With Project AM and PM peak hour volume minus the future forecast No Project AM and PM peak hour volume, divided by the future forecast With Project volume. Thus, the share represents the total growth that the IBC Vision Plan contributes to the freeway system under Post-2030 conditions. The highest share, between the AM and PM peak hour is utilized for significantly impacted locations.

Policy Framework

The project is committed to identifying improvements for project related impacts as well as cumulative deficiencies. For project impacts within the City of Irvine, the project is responsible for 100% of the cost of the improvement. For all project related impacts outside the City of Irvine, i.e. in Tustin, Costa Mesa, Newport Beach, and Santa Ana, the project is responsible for its fair-share of the improvements. Coordination with adjacent jurisdictions as well as a thorough analysis of each jurisdictions' performance and mitigation criteria have contributed to the development of these mitigation measures and continued coordination is critical to their implementation. The City of Irvine will work with all the neighboring Cities as well as Caltrans to identify the most appropriate improvement strategies to mitigate the impacts that result from the implementation of the IBC Vision Plan. For Caltrans freeway mainline and ramp facilities, every effort was made to identify the significantly impacted ramps and potential improvement measures. For Caltrans mainline and ramp facilities, the City will coordinate with Caltrans to identify the most feasible strategies to improve the operation of the freeway facilities.

Intersection Improvements

Deficient intersections within the IBC study area fall under two categories of impact, project related impact and cumulative deficiency. Project impacts are determined using the definition of significant impacts from each city's traffic impact analysis protocol, discussed in Section 5.13.1. For Costa Mesa, Santa Ana, and Tustin, significant impacts are identified as an increase in intersection ICU of 0.01 or greater under With Project conditions of a deficient intersection when compared to No Project conditions. For those intersections, a fair-share is computed for the project to contribute to the overall cost of the improvement through IBC fees. For the City of Newport Beach, a project impact is identified as an increase of 0.01 or more of the critical movement of a deficient intersection.

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Cumulative deficiencies are identified as those intersections that fail under both the No Project and With Project conditions but do not have a project impact as identified by the above noted criteria and therefore do not require project related improvements. The City of Irvine threshold for defining project impact is an increase of 0.02 or greater of an intersection ICU. For intersections with shared jurisdictional boundaries, the more conservative methodology was employed.

Where applicable and appropriate feasible improvements identified in the 1992 IBC Rezone EIR that have yet to be implemented were recommended as mitigation. Additionally, traffic studies and other planning documents were sourced in adjacent jurisdictions to develop mitigation measures for intersection deficiencies.

Previous Table 5.13-21 identifies future project impacts and cumulative deficiencies by jurisdiction. Project impacts identified under the existing scenarios are not included as impacts because they are considered theoretical impacts and will not be mitigated. Note that intersection #62 – Campus Drive at Bristol Street NB and intersection #93 – Tustin Ranch Road at El Camino Real were identified to have a project related impact under 2015 conditions. These intersections also have a project impact under Post-2030 conditions. Some of the intersections noted in Table 5.13-21 were also deficient under 2015 conditions but did not have a project related impact in 2015. Recommended improvements for existing scenarios are presented for future planning purposes only.

For the IBC Vision Plan Traffic Study, the improvements recommended include physical improvements rather than operational improvements. Although application of Advanced Traffic Management System (ATMS) strategies have previously been recommended for all intersections within the IBC, these strategies have not been recommended as mitigation strategies for this study. Physical improvements such as restriping, intersection geometrics, or addition of intersection capacity to more efficiently serve forecast future traffic volumes have been identified. Recommended improvements have been developed and evaluated through site analysis to determine feasibility. Previous Figure 5.13-50 identifies the locations of the intersections requiring mitigation within the IBC study area.



The following sections discuss the intersection deficiencies and recommended mitigations for each jurisdiction within the study area. The accompanying tables identify whether the improvements are required for 2015 conditions or should be implemented for all future conditions. If an intersection impact occurs only in 2015 and subsequent improvements result in acceptable LOS under buildout conditions, the improvement is considered temporary and may be overridden. Recommendations for mitigation at locations where future improvements result in the elimination of the intersection deficiency involve expediting the future improvement.

Costa Mesa

Two intersections within the City of Costa Mesa have project impacts and one location has a cumulative deficiency under Post-2030 Conditions. The City of Irvine will contribute a fair-share for project related impacts. Table 5.13-22 identifies the project related impacts and cumulative deficiencies, required mitigation, and resulting LOS for intersections within the City of Costa Mesa. Appendix N includes detailed mitigation ICU worksheets. The following intersections are deficient under future scenarios:

- Intersection #10: SR-55 Frontage Road Southbound Ramps at Paularino Avenue

The intersection of SR-55 Frontage Road Southbound Ramps and Paularino Avenue is forecast to be cumulatively deficient under both Post-2030 future scenarios. There is no project related significant impact at this location. The proposed improvement at this intersection, to improve the southbound approach to one left turn lane, one shared left-through lane, and one shared through-right turn lane to return the ICU to an acceptable LOS and appears to be physically feasible. Because this is a cumulative deficiency, the project is not responsible for mitigation. Improvements have been recommended to return the intersection back to an acceptable LOS for future planning purposes.

- Intersection #12: SR-55 Southbound Frontage Road at Baker Street

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ICU analysis indicates that the intersection of SR-55 southbound Frontage Road at Baker Street is forecast to be deficient under Post-2030 AM peak hour conditions and has a project related significant impact. Since the southbound left-turn movement is a critical movement, intersection mitigation would improve the southbound approach to one left turn lane, one shared through left, one through lane, and one right turn lane. Additionally, mitigation to restripe the eastbound approach to two through lanes and a shared through right turn lane would return the intersection to an acceptable LOS under both scenarios.

- Intersection #13: SR-55 Northbound Frontage Road at Baker Street

ICU analysis indicates that the intersection of SR-55 Northbound Frontage Road at Baker Street is forecast to be deficient under Post-2030 AM peak hour conditions under the buildout scenario and has a project related significant impact. Since the eastbound through movement is a critical movement, restriping the eastbound approach to include a single left turn lane, three through lanes, and no right turn lane, plus the addition of a northbound defacto right turn lane would return the intersection to an acceptable LOS.

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Table 5.13-22
City of Costa Mesa Proposed Intersection Mitigation

ID	Intersection	Jurisdiction	2015 Cumulative With Project				2015 Cumulative With Project After Mitigation				Post-2030 Cumulative With Project				Post-2030 Cumulative With Project After Mitigation				Mitigation Strategy	Fair-share
			AM		PM		AM		PM		AM		PM		AM		PM			
			ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS		
10	SR-55 Frontage Road SB Ramps at Paularino	CM	No Impact								1.02	F	0.67	B	0.88	D	0.64	B	Improve SB to 1.5, 1.0, 0.5	No Share
12	SR-55 SB Frontage Road at Baker Street	CM									1.19	F	0.76	C	0.78	C	0.85	D	Improve SB to 1.5, 1.5, 1, Restripe EB to 0, 2.5, 0.5	8.0%
13	SR-55 NB Frontage Road at Baker Street	CM									1.02	F	0.86	D	0.87	D	0.84	D	Restripe EB to 1, 3, 0, Add defacto NBR	8.7%

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Irvine

Five intersections within the City of Irvine are forecast to operate deficiently under future conditions and will require mitigation to achieve an acceptable LOS. Table 5.13-23 presents the mitigation strategy for deficient City of Irvine intersections before and after the mitigation measures are applied. For the five City of Irvine intersections, including one shared location between Irvine and Tustin, four have project related significant impacts and one has a cumulative deficiency. The following intersections are significantly impacted by the proposed project:

- Intersection #141: Jamboree Road and Main Street

The intersection at Jamboree Road and Main Street is forecast to be deficient under PM peak hour conditions under the Post-2030 scenario. Because of the high volume on the north and southbound through movements, recommended improvements are the same for both scenarios, to improve the northbound and southbound approaches to 2 left turn lanes, 5 through lanes, and 1 right turn lane. Additionally, as part of this improvement the conversion of the westbound free right turn lane to a single right turn lane would improve traffic flow with the five through lanes on the northbound approach. With this improvement, the intersection returns to an acceptable LOS and the mitigation appears to be physically feasible

- Intersection #145: Jamboree Road and Michelson Drive

This intersection has a project related significant impact under the 2015 and Post-2030 Proposed Project scenarios. The forecast ICU in the worst case scenario is 1.26 in the PM peak hour. Since the eastbound and southbound left turn lanes and the northbound through lane are some of the critical movements, intersection mitigation would require adding substantial capacity to these movements. Recommended improvements are the same in both 2015 and Post-2030 and include the addition of a westbound through lane, third eastbound left turn lane, and restriping of the southbound approach to get a third southbound left from the southbound through movement. However, triple eastbound and southbound left turn improvements are contrary to City standards due to safety and operational concerns associated with the vehicles turning within appropriate receiving lanes. In addition, the City believes that the addition of a triple left turn lane would not operationally improve the intersection capacity because the three lanes would likely not load traffic evenly. Many motorists making the eastbound left turn are destined for the I-405 on ramps, and they have one block in which to merge over into the right lanes, while weaving with the westbound free right traffic that does not stop. Similarly the proximity of the destination for the southbound triple left would inhibit the full operational benefits of this movement as motorists would primarily load in the left and middle lanes of a southbound triple left because many are destined to the Maguire Properties (Park Place).

In addition, there are physical constraints associated with the proposed improvements, including Southern California Edison (SCE) 220kV transmission lines along the west side of Jamboree Road and an SCE substation located at the southeast corner of this intersection. These physical constraints limit the improvements to mitigate the project impacts at this location. Additionally, a future pedestrian overcrossing is planned at this intersection which may inhibit the implementation of the additional westbound through lane, which would fall in the footprint of the future bridge support. This pedestrian crossing may also improve signal operations and ICU levels at this intersection. This intersection improvement will be subject to an override due to its infeasibility.

- Intersection #188: Harvard Avenue and Michelson Drive

ICU analysis for all future scenarios indicates that the intersection at Harvard Avenue and Michelson Drive is forecast to be deficient under both Post-2030 Cumulative Baseline No Project and With Project scenarios. The recommended improvement involves the addition of a second southbound left turn lane to reduce the ICU in the PM peak hour. This improvement would return the intersection to an acceptable LOS and appears to be physically feasible.



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- Intersection #232: Culver Drive and I-405 Northbound Ramps

This intersection is deficient under Post-2030 conditions with a project related significant impact. The extremely high volume and high right turn adjustment on the westbound right turn movement has contributed to the ICU deficiency in the PM peak hour and necessitated the recommendation of restriping the westbound approach of this intersection to one left turn lane, ~~one~~ one and two right turn lanes, ~~and a shared left-right turn lane~~. Implementation of this improvement results in acceptable operations in both the AM and PM peak hours under the Post-2030 scenario and appears to be physically feasible.

- Intersection #136: Jamboree Road and Barranca Parkway

This location is a shared location between the Cities of Irvine and Tustin. ICU analysis indicates that the intersection of Jamboree Road at Barranca Parkway is deficient in the PM peak hour under the Post-2030 scenario. There is an extremely high volume on the northbound through movement and relatively small volume on the northbound right-turn movement. Recommended improvements include the conversion of the existing free northbound right-turn lane to a standard right turn lane and addition of a fifth northbound through lane. Implementation of this improvement results in acceptable operations under both scenarios and the mitigation appears to be physically feasible.

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Table 5.13-23
City of Irvine Proposed Intersection Mitigation

ID	Intersection	Jurisdiction	2015 Cumulative with Project				2015 Cumulative With Project After Mitigation				Post-2030 Cumulative With Project				Post-2030 Cumulative With Project After Mitigation				Mitigation Strategy	Fair-share
			AM		PM		AM		PM		AM		PM		AM		PM			
			ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS		
141	Jamboree Road at Main Street	Irv	0.87	D	0.94	E					0.92	E	1.02	F	0.84	D	0.94	E	Improve NB and SB to 2, 5, 1, Change WB free right to WBR turn lane	100.0%
145	Jamboree Road at Michelson Drive	Irv	0.75	C	1.12	F	0.73	C	0.91	E	0.81	D	1.26	F	0.79	C	0.98	E	Add 3rd EBL, 3rd SBL, and WBT	100.0%
188	Harvard Avenue at Michelson Drive	Irv	0.67	B	0.89	D					0.71	C	0.91	E	0.71	C	0.82	D	Add 2nd SBL	100.0%
232	Culver Drive at I-405 NB Ramps	Irv	0.48	A	0.87	D					0.56	A	0.95	E	0.56 0.81	A D	0.73 0.76	C	Restripe WB to 4-5, 0-1-5, 1, 0, 2	100.0%
136	Jamboree Road at Barranca Avenue	Irv/Tus	0.81	D	0.96	E					0.87	D	1.04	F	0.87	D	0.95	E	Convert free NBR standard right-turn, Add 5th NBT	100.0%

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Newport Beach

There are two intersections within the City of Newport Beach that are deficient in the forecast future scenarios. Both intersections have a project related significant impact as outlined by the City of Newport Beach's performance and significant impact criteria. These significant impacts are outlined in Table 5.13-24.

The following intersections within the City of Newport Beach have project related significant impacts in the future 2015 and Post-2030 Cumulative scenarios and will need to be improved to achieve acceptable operations.

- Intersection #62: Campus Drive at Bristol Street NB

This intersection is deficient in the PM peak hour and has a project related impact under both the interim year and buildout future scenarios. In 2015, the recommended improvement is the implementation of the already planned addition of a fifth westbound through lane, consistent with the City of Newport Beach's General Plan buildout. This improvement will return the intersection to an acceptable LOS in 2015. For the buildout scenario, an additional improvement of a third southbound right turn lane is proposed. Implementation of the identified improvements results in acceptable operations under both scenarios and the mitigation appears to be physically feasible although potentially cost prohibitive due to potential impacts to a structure adjacent to the intersection. The addition of a 5th westbound through lane was identified by the City of Newport Beach as part of the Newport Beach General Plan Update Traffic Study (Urban Crossroads, 2006). The addition of a 3rd southbound right turn lane was identified in the John Wayne Airport (JWA) Improvement Program as an ancillary improvement to support the growth of the Airport. The City should coordinate with Newport Beach and JWA to determine the timing and funding availability for this improvement.

- Intersection #85: MacArthur Boulevard and Birch Street

This intersection is deficient under future scenarios with a project impact under the Post-2030 scenario. The recommended improvement would improve the eastbound approach to two eastbound left-turn lanes and two eastbound through lanes. Implementation of this improvement would result in acceptable operations under all scenarios and appears to be physically feasible.



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Table 5.13-24
City of Newport Beach Proposed Intersection Mitigation

ID	Intersection	Jurisdiction	2015 Cumulative With Project				2015 Cumulative With Project After Mitigation				Post-2030 Cumulative With Project				Post-2030 Cumulative With Project After Mitigation				Mitigation Strategy	Fair-share
			AM		PM		AM		PM		AM		PM		AM		PM			
			ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS		
62	Campus Drive at Bristol Street NB	NB	0.62	B	0.92	E	0.57	A	0.85	D	0.76	C	0.95	E	0.76	C	0.83	D	Add 3rd SBR (2015: apply Newport Beach General Plan buildout improvement of a 5th WBT)	30.2%
85	MacArthur Boulevard at Birch Street	NB	No Impact								0.73	C	0.97	E	0.70	B	0.89	D	Improve EB to 2 EBL and 2 EBT	19.6%

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Santa Ana

There are three intersections within Santa Ana that will require mitigation in the future to achieve an acceptable LOS. The project is responsible for a fair-share of the cost of the improvements identified as a project impact. Table 5.13-25 identifies required mitigation for intersections within the City of Santa Ana.

For the three intersections within the City of Santa Ana that are deficient in the future scenarios, all have project related significant impacts. The following intersections have project related impacts and will need to be improved to achieve an acceptable LOS.

- Intersection #543 Bristol Street and Segerstrom Avenue

This intersection is deficient and has a project impact under the Post-2030 scenario. The critical movements include both the eastbound and westbound through movements and the northbound through and southbound through movements. Two alternative recommended improvements are proposed and outlined below. With implementation of either of these improvements, the intersection operates at an acceptable LOS and the mitigation appears to be physically feasible. The City of Irvine should coordinate with the City of Santa Ana to determine the most appropriate future improvement at this location.

- Alternative 1: Add 3rd eastbound through and westbound through lanes on Segerstrom Avenue
- Alternative 2: Add 4th northbound through and southbound through lanes on Bristol Street

- Intersection #723 Main Street and Dyer Road (Segerstrom)

This intersection is deficient and has a project impact under the Post-2030 scenario. The critical movement is the northbound through movement. Recommended improvements include the addition of a third northbound through lane and a defacto northbound right-turn lane. Implementation of these improvements results in acceptable operations under all scenarios and the mitigation appears to be physically feasible.

- Intersection #730 Grand Avenue and Warner Avenue

This intersection is deficient and has a project impact under the Post-2030 scenario. The critical movement at this intersection is the westbound through movement and adding additional capacity to this movement would remove the deficiency. Recommended mitigation involves the addition of a third westbound through lane. The mitigation appears to be physically feasible.



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Table 5.13-25
City of Santa Ana Proposed Intersection Mitigation

ID	Intersection	Jurisdiction	2015 Cumulative With Project				2015 Cumulative With Project After Mitigation				Post-2030 Cumulative With Project				Post-2030 Cumulative With Project After Mitigation				Mitigation Strategy	Fair-share
			AM		PM		AM		PM		AM		PM		AM		PM			
			ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS		
543	Bristol Street at Segerstrom Avenue (Alternative 1)	SA	No Impact								0.90	D	0.97	E	0.77	C	0.85	D	Add 3rd EBT and WBT lanes	12.7%
543	Bristol Street at Segerstrom Avenue (Alternative 2)	SA									0.90	D	0.97	E	0.84	D	0.90	D	Add 4th NBT and SBT lanes	12.7%
723	Main Street at Dyer Road (Segerstrom Avenue)	SA									0.86	D	0.91	E	0.86	D	0.79	C	Add 3rd NBT, defacto NBR	21.0%
730	Grand Avenue at Warner Avenue	SA									0.83	D	0.96	E	0.81	D	0.82	D	Add 3rd WBT	15.8%

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Tustin

There are a total of eight intersections within the City of Tustin that are deficient under 2015 and Post-2030 future scenarios. The project is responsible for a fair-share of impacts identified as project related. The project has no responsibility for cumulative deficiencies but recommends improvements to bring the deficient intersection back to an acceptable LOS for future planning purposes. Table 5.13-26 identifies mitigation for intersections within the City of Tustin.

Of these eight deficient intersections within the City of Tustin, four have a project impact and four are cumulatively deficient. Mitigation for Intersection #3 (Newport Avenue at Edinger Avenue), Intersection #36 (Red Hill Avenue at El Camino Real), Intersection #111 (Franklin Avenue at Walnut Avenue), and #732 (SR-55 Northbound Ramps/Del Amo Avenue at Newport Avenue) are not the responsibility of the project as the deficiency is not project related, however improvements have been proposed to return the intersections to an acceptable LOS. The following intersections will require improvements to achieve an acceptable LOS for planning purposes:

- Intersection #3: Newport Avenue and Edinger Avenue

This intersection has a cumulative deficiency under the Post-2030 Cumulative scenario. Since there is heavy traffic on the eastbound and southbound right turn movements, recommended mitigation includes conversion of the southbound right-turn lane into a free right-turn lane in Post-2030. Implementation of this improvement would result in acceptable operations and is physically feasible. Because Newport Avenue and Edinger Avenue has been recently reconfigured this intersection should be monitored in the future for potential changes in traffic patterns.

- Intersection #24: Newport Avenue and Walnut Avenue

This intersection has a project impact under the Post-2030 condition. The critical movement at this location is the westbound right-turn movement and northbound right turn movement. Hence, it is recommended to add a defacto westbound right turn lane and defacto northbound right turn lane which would mitigate this intersection back to an acceptable operations in the future scenario.

- Intersection #36: Red Hill Avenue at El Camino Real

This intersection has a temporary cumulative deficiency under the 2015 scenario. The southbound left turn movement is the critical movement and the proposed improvement reconfigures the approach to one left turn lane, one shared through left, two through lanes, and no right turn lane would return this intersection to an acceptable LOS. Because this location was recently reconfigured, the traffic should be monitored to evaluate if future improvements are indeed warranted.

- Intersection #93: Tustin Ranch Road and El Camino Real

This intersection has a project impact under both the 2015 and Post-2030 Cumulative scenarios. Because of heavy traffic on the southbound through movement, the addition of a fourth southbound through lane and the restripe of the eastbound approach to one left turn lane, a shared through right and a right turn lane would return this intersection to an acceptable LOS under all future scenarios. The recommended mitigation appears to be physically feasible and the project would be responsible for a fair-share.

- Intersection #111: Franklin Avenue and Walnut Avenue

This intersection has a cumulative deficiency under both the 2015 and Post-2030 scenarios. The critical movement at this intersection is the westbound through movement, with heavy volume and limited capacity. Improving capacity on this approach to add a third westbound through lane would bring the intersection back to an acceptable LOS under all forecast scenarios. These improvements are provided for future planning purposes.



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- Intersection #134: Loop Road/Park Avenue at Warner Avenue

This intersection has a project impact under both the 2015 and Post-2030 scenarios. The critical movement at this intersection is the eastbound through movement. Improving capacity on this approach to add a third eastbound through lane would bring the intersection back to an acceptable LOS under all forecast scenarios. This improvement appears to be physically feasible.

- Intersection #732: SR-55 NB Ramps/Del Amo Avenue at Newport Avenue

This intersection has a temporary cumulative deficiency under the 2015 scenario. The southbound right turn movement is the critical movement and improving the southbound approach to one left turn lane, one through lane, one right turn lane, and one shared through right would return this intersection to an acceptable LOS. Because this intersection operates at an acceptable LOS under the buildout scenarios, expediting the already planned improvements would be recommended. The project is not responsible for a fair-share at this location.

- Intersection #754: Red Hill Avenue at Carnegie Avenue/A Street

This intersection has a project impact under the Post-2030 scenario. The project impact is largely due to heavy traffic on the northbound through movement. Widening this approach, by adding a fourth northbound through lane would return the intersection to an acceptable LOS under all future scenarios. This intersection is expected to be substantially expanded as a result of development of the Tustin Legacy project and should be monitored to observe if any additional improvements are warranted when that project nears buildout. The project is responsible for a fair-share at this location.

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Table 5.13-26
City of Tustin Proposed Intersection Mitigation

ID	Intersection	Jurisdiction	2015 Cumulative With Project				2015 Cumulative With Project After Mitigation				Post-2030 Cumulative With Project				Post-2030 Cumulative With Project After Mitigation				Mitigation Strategy	Fair-share
			AM		PM		AM		PM		AM		PM		AM		PM			
			ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS		
3	Newport Avenue at Edinger Avenue	Tus	No Impact								0.92	E	0.80	C	0.75	C	0.80	C	Convert SBR to Free Right turn lane	No Share
24	Newport Avenue at Walnut Avenue	Tus									0.91	E	0.95	E	0.89	D	0.84	D	Add Defacto NBR and defacto WBR turn lane	6.3%
36	Red Hill Avenue at El Camino Real	Tus	0.62	B	0.91	E	0.62	B	0.87	D	No Impact								Reconfigure SB to 1.5, 2.5, 0	No Share
93	Tustin Ranch Road at El Camino Real	Tus	1.08	F	0.87	D	0.84	D	0.90	D	1.03	F	0.84	D	0.81	D	0.88	D	Add 4th SBT, Restripe EB to 1, 0.5, 1.5	2.1%
111	Franklin Avenue at Walnut Avenue	Tus	0.52	A	0.99	E	0.47	A	0.85	D	0.57	A	0.97	E	0.50	A	0.81	D	Add 3rd WBT lane	No Share
134	Loop Road/Park Avenue at Warner Avenue	Irv/Tus	0.83	D	1.00	E	0.83	D	0.82	D	0.48	A	1.07	F	0.42	A	0.86	D	Add 3rd EBT	11.6%
732	SR-55 NB Ramps/Del Amo Avenue at Newport Avenue	Tus	0.51	A	0.91	E	0.51	A	0.59	A	No Impact								Reconfigure SB to 1, 1.5, 1.5	No Share
754	Red Hill Avenue at Carnegie Avenue/A Street	Tus	No Impact								0.62	B	0.95	E	0.62	B	0.83	D	Add 4th NBT lane	7.3%

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Existing Conditions With Project Impacts

The California Environmental Quality Act (CEQA) requires an evaluation of the impacts relating to the addition of the buildout of the project on the existing highway network. The Existing Conditions with Project impacts are developed as a theoretical exercise to assess where project trips are likely to concentrate and impact the circulation system. The project is not responsible for mitigation of impacts from the Existing Conditions with Project scenario but improvements are proposed for future planning purposes. Table 5.13-27 identifies mitigation for all deficient intersections under the 2008 Existing Conditions with Project scenario. Detailed ICU worksheets demonstrating the improvement and ICU with mitigation are included in Appendix N.

Table 5.13-27
2008 Existing Conditions with Project Intersection Mitigation

ID	Intersection	Jurisdiction	Existing Conditions With Project				Existing Conditions Plus Project After Mitigation				Mitigation Strategy (Existing Conditions with Project)
			AM		PM		AM		PM		
			ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS	
145	Jamboree Road at Michelson Drive	Irv	0.77	C	1.21	F	0.74	C	0.97	E	Add 3rd EBL, 3rd SBL
42	Red Hill Avenue at Barranca Parkway/Dyer Road	Irv	0.91	E	1.01	F	0.63	B	0.79	C	Implement 2015 improvements
36	Red Hill Avenue at El Camino Real	Tus	0.70	B	1.12	F	0.57	A	0.84	D	Implement 2015 Improvements
111	Franklin Avenue at Walnut Avenue	Tus	0.44	A	0.91	E	0.42	A	0.77	C	Add 3rd WBT lane



Although the development of impacts under this scenario is a theoretical exercise, for the purposes of analysis, recommended improvements have been highlighted for the sake of future planning efforts. There are no fair-shares associated with these improvements nor are there any obligations to implement them. The Existing With Project scenario is a theoretical exercise to determine what would happen if all project trips are applied to the existing circulation system. Two of the four intersections that have a project impact identified under the 2008 Existing Conditions with Project scenario are also deficient in 2015 or Post-2030, and the mitigation recommended or elements of the mitigation below, applies to future deficiencies.

- Intersection #145: Jamboree Road and Michelson Drive

This intersection is deficient under the 2008 with Project scenario. Recommended improvements are the same for all future forecast alternatives as with Existing Conditions With Project with the exception of the additional westbound through lane. However, as noted above, physical constraints limit the improvements possible to mitigate the project impacts at this location.

- Intersection #42: Red Hill Avenue at Barranca Parkway/Dyer Road

This shared intersection between the Cities of Tustin and Irvine is deficient only under the Existing With Project scenario, with a PM peak hour ICU of 1.01. This intersection is programmed for substantial capacity improvements in 2015 as part of the City of Irvine's areawide Capital Improvement Program, including four lanes on each of the through movements. The application of those improvements will improve the intersection to an acceptable LOS in 2015.

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- Intersection #36: Red Hill Avenue and El Camino Real

The ICU analysis indicates that this Tustin intersection is deficient under the 2008 Existing Conditions with Project scenario. This intersection is also deficient under Existing Conditions. Implementation of the 2015 improvements (westbound left, westbound through, eastbound left, and eastbound through movements from 1 to 1.5 lanes each) would mitigate the project impact under the Existing Conditions with Project scenario to an acceptable LOS.

- Intersection #111: Franklin Avenue and Walnut Avenue

This Tustin intersection is deficient under all future scenarios, as well as the 2008 Existing Conditions with Project scenario, with a PM peak hour ICU of 0.91. As noted above, the westbound through movement at this intersection is the critical movement and the addition of a third westbound through to the existing conditions with project lane configuration eliminates the deficiency at this location.

Arterial Improvements

For all segments that operate deficiently under daily conditions within the City of Irvine, a peak hour analysis was conducted per the City's Traffic Analysis Guidelines. It was determined from the results of the peak hour link analysis that no arterial segments were deficient in the AM or PM peak hours. Hence, no arterial segment improvements are recommended within the City of Irvine.

For arterial segments in Newport Beach, Costa Mesa, and Tustin, deficiencies are addressed at the intersection level. If an arterial segment is deficient in the daily conditions, the intersections at either end of the segment are analyzed for peak hour deficiency. It is assumed that improvements at deficient intersections would alleviate the deficiency on the arterial segment. For the City of Santa Ana, arterial segment impacts are identified as an increase of 0.01 to the deficient V/C ratio between the No Project and With Project conditions. The segment of MacArthur Boulevard, from Main Street to SR-55 has a significant project related impact and will require mitigation.

It is recommended to widen MacArthur Boulevard between Main Street and SR-55 to an 8-lane divided facility. The improvement would provide one additional lane in each direction and may require an amendment to the City of Santa Ana General Plan. This forecast deficiency constitutes a project related significant impact according to the City of Santa Ana's performance criteria. The City of Irvine is responsible for a fair-share for this improvement. Table 5.13-28 presents the segment V/C ratio before and after potential improvements. Coordination with Santa Ana is necessary to determine the feasibility of additional capacity on MacArthur Boulevard.

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Table 5.13-28
Arterial Segment Daily LOS After Mitigation

ID	Arterial Segment	Jurisdiction	Post-2030				Improvement	Fair-share
			Cumulative With Project		Cumulative With Project after Mitigation			
			Daily		Daily			
			V/C	LOS	V/C	LOS		
1884	MacArthur Boulevard from Main to SR-55	Santa Ana	0.94	E	0.70	B	Increase arterial capacity from 6-lanes to 8-lanes	31.1%

Freeway Mainline and Ramp Improvements

Freeway Mainlines

There are several freeway mainline deficiencies under the 2015 and Post-2030 future scenarios. For the IBC Post-2030 Cumulative With Project scenario, which includes all regional growth, the volume on all freeway segments within the study area increases when compared with Existing Conditions. The volumes are consistent with the No Project scenario forecast volumes, with some segments and ramps experiencing an increase in the peak hour volume of over 200 vehicles per hour, triggering a significant impact under the City of Irvine and Caltrans agreed upon project impact criteria. Table 5.13-29 identifies the freeway mainline segments with a project impact under Post-2030 conditions.



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Table 5.13-29
Freeway Mainline Project Impacts and Fair-share

Location		Direction	Post-2030 Lanes		Post-2030 Cumulative Baseline No Project						Post-2030 Cumulative with Project						Required Mitigation			
			Lanes	Peak Hour Capacity	AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour			Trips Difference AM (+200 cars=impact)	Trips Difference PM (+200 cars=impact)	Project Impact V/C-- 200 TRIPS	Project Fair-share (V/C)
					Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS				
I-5	Jamboree Road to Tustin Ranch Road	NB	5	10,000	11,649	1.16	F	9,753	0.98	E	11,857	1.19	F	9,660	0.97	E	208	-92	*	1.8%
		SB	5	10,000	8,865	0.89	D	8,879	0.89	D	9,075	0.91	E	9,085	0.91	E	210	207	*	2.3%
	Tustin Ranch Road to Red Hill Avenue	NB	5	10,000	11,459	1.15	F	10,273	1.03	F	11,677	1.17	F	10,190	1.02	F	218	-82	*	1.9%
		SB	5	10,000	9,675	0.97	E	9,409	0.94	E	9,905	0.99	E	9,615	0.96	E	230	207	*	2.3%
	Red Hill Avenue to Newport Avenue	NB	5	10,000	11,629	1.16	F	10,113	1.01	F	11,847	1.18	F	10,010	1.00	E	218	-102	*	1.8%
	Newport Avenue to SR-55	NB	5	10,000	12,389	1.24	F	10,883	1.09	F	12,597	1.26	F	10,820	1.08	F	208	-62	*	1.7%
	North of SR-55	SB	5	10,000	10,300	1.03	F	9,774	0.98	E	10,559	1.06	F	9,919	0.99	E	259	145	*	2.5%
I-405	Jamboree Road to MacArthur Boulevard	NB	6	12,000	11,306	1.13	F	9,650	0.96	E	11,561	1.16	F	9,790	0.98	E	255	140	*	2.2%
		SB	5	10,000	8,366	0.84	D	9,017	0.90	E	8,560	0.86	D	9,288	0.93	E	194	271	*	2.9%
SR-55	I-405 to MacArthur Boulevard	NB	4	8,000	8,401	1.05	F	8,327	1.04	F	8,688	1.09	F	8,586	1.07	F	287	260	*	3.3%
		SB	4	8,000	8,697	1.09	F	8,528	1.07	F	9,134	1.14	F	8,732	1.09	F	437	204	*	4.8%
	MacArthur Boulevard to Dyer Road	NB	5	10,000	7,551	0.76	D	9,377	0.94	E	7,858	0.79	D	9,666	0.97	E	307	290	*	3.9% 3.0%
		SB	5	10,000	9,867	0.99	E	7,748	0.77	D	10,284	1.03	F	7,912	0.79	D	417	164	*	4.1%
	Dyer Road to Edinger Avenue	NB	6	12,000	6,771	0.56	C	11,387	0.95	E	7,128	0.59	C	11,696	0.97	E	357	310	*	5.0% 2.7%

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Improvements beyond the planned system improvements would be required to maintain an acceptable LOS for the State Highway System. Potential improvement measures would include the addition of one, two, or three lanes to freeway mainline segments. However, capacity improvements to the freeway mainline are not feasible improvement options. Caltrans has not identified any further improvements beyond those already assumed in the buildout analysis for I-5, I-405, SR-55, SR-73, and SR-261 and the City has no control over State facilities. Additional capacity improvements are infeasible due to physical, right-of-way and other environmental constraints

For example, the expansion of the identified freeway segments would involve significant right-of-way acquisition which would involve either the acquisition of residences and/or businesses, or this would involve bringing the freeway facilities close to such residences and businesses. It is not a legal prerogative or policy of the City to support further freeway widening when such widening would have negative impacts on adjacent businesses and residences. Bringing State facilities closer to residences and businesses is also not a social or legal prerogative of the City however, the regional transportation agency, OCTA has identified certain improvements to the freeway mainline to be funded by the Renewed Measure M, approved in 2007-08 by the County and participating Cities including the City of Irvine. This analysis does take into consideration improvements identified through this funding source. Finally, the Proposed Project supports recent State legislation to reduce the average vehicle miles travelled as the Project is designed to co-locate urban-style housing and employment opportunities. As a result of these policy prerogatives and identified constraints, the project is not expected to mitigate the freeway mainline segments to an acceptable LOS. As part of the Proposed Project approval and certification of the EIR, the City will develop a Statement of Overriding Considerations for the capacity improvements of freeway mainlines and freeway ramp facilities. Consultation between the City of Irvine and Caltrans is necessary to reach consensus on any potential alternative improvement measures including but not limited to the following strategies:

- Intelligent Transportation System (ITS) strategies
- Improved signage to alleviate weaving issues
- Enhanced on and off-ramp merge and diverge areas utilizing auxiliary lanes
- Operational improvements to ramp meters and signal timing



Although the implementation of these improvements does not necessarily mitigate the project impact as identified by the volume to capacity ratio analysis, the City will work with Caltrans to identify the most appropriate feasible improvements on the freeway mainlines and is prepared to contribute the identified share to such improvements.

Freeway Ramps

As identified in above, there are several freeway ramp deficiencies under the 2015 and Post-2030 future scenarios. For the IBC Post-2030 Cumulative With Project scenario, which includes all regional growth, the volume on many freeway ramps increases when compared with Existing Conditions. The volumes are generally consistent with the No Project scenario forecast volumes, with some segments and ramps experiencing an increase in the peak hour volume of over 30 vehicles per hour, triggering a significant impact under the City of Irvine and Caltrans agreed upon project impact criteria. Table 5.13-30 identifies the freeway ramps with a project impact under the Post-2030 Cumulative With Project conditions. The ramps with a project impact under the 2015 Cumulative With Project scenario are also identified. In addition, the table presents the IBC Vision fair-shares for the deficient ramps. The City of Irvine will work with Caltrans to identify the appropriate improvements on the freeway ramps and determine the strategy for implementation of those improvements.

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Table 5.13-30
Freeway Ramp Project Impacts and Fair Share

Interchange	Ramp Type	Ramp Capacity		Post-2030 Cumulative Baseline No Project						Post-2030 Cumulative With Project						Mitigation Post-2030 Cumulative			
				AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour						
		Number of Lanes	Ramp Length	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Trips Difference AM	Trips Difference PM	Project Impact V/C	Project Fair-share (V/C)
I-405	Culver Drive	NB Off	1	1,500	1,270	0.85	D	1,250	0.83	D	1,360	0.91	E	1,270	0.85	D	90	20	* 6.6% 1.8%
	Jamboree Road	SB Off	2	500	2,340	1.04	F	2,110	0.94	E	2,730	1.21	F	2,690	1.20	F	390	580	* 21.6%
	MacArthur Boulevard	NB On	1	1,000	440	0.29	A	1,530	1.02	F	490	0.33	B	1,590	1.06	F	50	60	* 40.2% 3.8%
		NB Off	1	500	1,640	1.09	F	890	0.59	C	1,770	1.18	F	920	0.61	C	130	30	* 7.3%
	Bristol Street	SB Loop On	1	1,000	1,090	0.73	D	1,490	0.99	E	1,110	0.74	D	1,610	1.07	F	20	120	* 7.5%
SR-55	Baker Street	SB On	1	1,000	510	0.57	C	1,250	1.39	F	510	0.57	C	1,290	1.43	F	0	40	* 3.1%
	Baker Street	NB Off	1	1,500	1,420	0.95	E	1,300	0.87	D	1,450	0.97	E	1,350	0.90	E	30	50	* 3.7% 1.1%
	MacArthur Boulevard	SB On Loop	1	1,000	170	0.19	A	800	0.89	D	200	0.22	A	870	0.97	E	30	70	* 45.0% 8.0%
	Dyer Road	NB On Direct	1	1,000	330	0.22	A	1,350	0.90	D	390	0.26	A	1,400	0.93	E	60	50	* 45.4% 3.6%
SR-73	Jamboree Road	SB Off	2	500	2,619	1.16	F	2,867	1.27	F	2,727	1.21	F	2,938	1.31	F	109	71	* 4.0%
	Campus Drive	NB On	1	1,000	629	0.42	B	1,983	1.32	F	818	0.55	C	2,111	1.41	F	189	128	* 23.1% 6.1%

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There are three locations that have a project impact under the 2015 conditions that improve under the Post-2030 Cumulative With Project conditions. In 2015, the model has distributed greater amounts of traffic to these ramp facilities than in the buildout scenario due to different land use assumptions and buildout improvements throughout the circulation system. The following ramps have a temporary project impact under 2015 conditions:

- I-405 Northbound Off-Ramp to Jamboree Road
- SR-55 Northbound Direct On-Ramp from Victoria Street
- SR-55 Northbound ON-Ramp from MacArthur Boulevard

The regional transportation agency, OCTA has identified improvements to be funded by the Renewed Measure M, approved in 2007-08 by the County and participating Cities including the City of Irvine. It is conceivable that ramp improvements will be incorporated into the freeway facility enhancements planned for the buildout condition. As part of the Proposed Project approval and certification of the EIR, the City will develop a Statement of Overriding Considerations for the capacity improvements of freeway ramp facilities. Pursuant to Caltrans' Guide for the Preparation of Traffic Impact Studies (2002), consultation between the City of Irvine and Caltrans is necessary to reach consensus on feasible operational improvement measures.

5.13.6.2 Mitigation

Impact 5.13-1

- 5.13-1 Prior to the issuance of the first building permit pursuant to the proposed project, the City of Irvine shall prepare a "nexus" study that will serve as the basis for requiring development impact fees under AB 1600 legislation, as codified by California Code Government Section 66000 et seq, for the Irvine Business Complex to support General Plan and Zoning changes under consideration for the Irvine Business Complex Vision Plan. The established procedures under AB 1600 require that a "reasonable relationship" or nexus exist between the traffic improvements and facilities required to mitigate the traffic impacts of new development pursuant to the proposed project. The following traffic improvements and facilities are necessary to mitigate project impacts and shall be included, among other improvements, in the AB 1600 nexus study:



Costa Mesa

Intersection #12: SR-55 Southbound Frontage Road at Baker Street: Improve the southbound approach to one left turn lane, one shared through left, one through lane, and one right turn lane. Restripe the eastbound approach to two through lanes and a shared through right turn lane.

Intersection #13: SR-55 Northbound Frontage Road at Baker Street: Restripe the eastbound approach to include a single left turn lane, three through lanes, and no right turn lane, plus the addition of a northbound defacto right turn lane.

Irvine

Intersection #141: Jamboree Road and Main Street: Improve the northbound and southbound approaches to 2 left turn lanes, 5 through lanes, and 1 right turn lane. Additionally, as part of this improvement, convert the westbound free right turn lane to a single right turn lane.

Intersection #188: Harvard Avenue and Michelson Drive: Add a second southbound left turn lane.

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Intersection #232: Culver Drive and I-405 Northbound Ramps: Restripe the westbound approach of this intersection to one left turn lane, and two one right turn lanes, ~~and a shared left-right turn lane.~~

Intersection #136: Jamboree Road and Barranca Parkway: Convert the existing free northbound right-turn lane to a standard right turn lane and add a fifth northbound through lane.

Newport Beach

Intersection #62: Campus Drive at Bristol Street NB: In 2015, the required improvement is the implementation of the already planned addition of a fifth westbound through lane, consistent with the City of Newport Beach's General Plan buildout. For the buildout scenario, an additional improvement of a third southbound right turn lane is required. Implementation of the identified improvements results in acceptable operations under both scenarios and the mitigation appears to be physically feasible although potentially cost prohibitive due to potential impacts to a structure adjacent to the intersection. The addition of a 5th westbound through lane was identified by the City of Newport Beach as part of the Newport Beach General Plan Update Traffic Study (Urban Crossroads, 2006). The addition of a 3rd southbound right turn lane was identified in the John Wayne Airport (JWA) Improvement Program as an ancillary improvement to support the growth of the Airport. The City shall coordinate with Newport Beach and JWA to determine the timing and funding availability for this improvement.

Intersection #85: MacArthur Boulevard and Birch Street: Improve the eastbound approach to two eastbound left-turn lanes and two ~~southbound~~ eastbound through lanes.

Santa Ana

Intersection #543 Bristol Street and Segerstrom Avenue: Two alternative improvements are proposed and outlined below. The City of Irvine shall coordinate with the City of Santa Ana to determine the most appropriate future improvement at this location.

- Alternative 1: Add 3rd eastbound through and westbound through lanes on Segerstrom Avenue
- Alternative 2: Add 4th northbound through and southbound through lanes on Bristol Street

Intersection #723 Main Street and Dyer Road (Segerstrom): Add a third northbound through lane and a defacto northbound right-turn lane.

Intersection #730 Grand Avenue and Warner Avenue: Add a third westbound through lane.

Tustin

Intersection #24: Newport Avenue and Walnut Avenue: Add a defacto westbound right turn lane and defacto northbound right turn lane.

Intersection #93: Tustin Ranch Road and El Camino Real: Add a fourth southbound through lane and restripe the eastbound approach to one left turn lane, a shared through right turn lane and a right turn lane.

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Intersection #134: Loop Road/Park Avenue at Warner Avenue: Add a third eastbound through lane.

Intersection #754: Red Hill Avenue at Carnegie Avenue/A Street: This intersection has a project impact under the Post-2030 scenario. The project impact is largely due to heavy traffic on the northbound through movement. Widening the northbound approach to provide a fourth northbound through lane on Red Hill. This intersection is expected to be substantially expanded as a result of development of the Tustin Legacy project and shall be monitored to observe if any additional improvements are warranted when that project nears buildout.

- 5.13-2 Prior to the issuance of the first building permit pursuant to the proposed project, the City of Irvine shall update the IBC Development Fee program pursuant to the AB 1600 Nexus Study identified in Mitigation Measure 5.13-1. The IBC Development Fee program was established to fund area-wide circulation improvements within the IBC and adjoining areas. The improvements are required due to potential circulation impacts associated with buildout of the IBC. Fees are assessed when there is new construction or when there is an increase in square footage within an existing building or the conversion of existing square footage to a more intensive use. The development fees collected are applied toward circulation improvements and right-of-way acquisition in the IBC and adjoining areas. Fees are calculated by multiplying the proposed square footage, dwelling unit or hotel room by the appropriate rate. The IBC Fees are included with any other applicable fees payable at the time the building permit is issued. The City will use the IBC development fees to, among other things, fund construction (or to recoup fees advanced to fund construction) of the transportation improvements identified in Mitigation Measure 5.13-1.
- 5.13-3 Prior to issuance of the first building permit pursuant to the proposed project, the City shall update the Irvine Business Complex Land Use and Trip Monitoring Data base (IBC Database) to reflect the land use changes associated with the proposed project. The City maintains this database for tracking development intensity within the IBC. This data base is an important tool to help ensure the circulation system serving the IBC area is adequate and to ensure roadway improvements are provided at the appropriate time. The data base tracks the amount of square footage built (Existing), the available square footage (Additional Zoning Potential and/or Remaining Approval) and the maximum amount of square footage allocated (Total Development Potential and/or Buildout + Existing) to each parcel within the IBC.
- 5.13-4 Prior to adoption of the AB 1600 nexus study identified in MM 13-1, issuance of a building permit for the 12,000th unit within the IBC, the City and Caltrans shall jointly identify feasible operational and physical improvements and the associated fair-share funding contribution necessary to mitigate project-related impacts to state transportation facilities. The City shall fund said improvements on pro-rata "fair-share" basis in accordance with the terms and conditions of an Agreement to be prepared and agreed to by both agencies. These fair-share contributions for feasible improvements shall be included in the AB 1600 nexus study enter into a mitigation agreement with Caltrans which identifies transportation or operational improvements necessary to mitigate project-related impacts to state transportation facilities.

5.13.7 Level of Significance After Mitigation

Impact 5.13-1

With implementation of the programs, plans, and policies (PPPs), project design features (PDFs), and mitigation measures described above, impacts related to traffic and circulation will be reduced to a less than significant level except where noted below.



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Although every effort was made, through site analyses and aerial imagery evaluation to ensure that all recommended improvements are physically feasible, there are intersections where improvements may not be feasible due to cost, right-of-way concerns, or community opposition. For these intersections a Statement of Overriding Considerations is proposed.

City of Irvine

- *Intersection #145: Jamboree Road and Michelson Drive*

This intersection has a project related significant impact under the 2015 and Post-2030 Approved Project scenarios, and a cumulative deficiency under the Post-2030 Pending scenarios. Recommended improvements are the same in both 2015 and Post-2030 and include the addition of a third eastbound left and restriping of the southbound approach to get a third southbound left from the southbound through movement. With this improvement, the intersection returns to an acceptable LOS under all scenarios. The recommended triple eastbound and southbound left turn improvements are contrary to City standards due to safety and operational concerns associated with the vehicles turning within appropriate receiving lanes. In addition, as noted previously, the City believes that the triple turn movements would not provide the operational improvements intended due to the proximity of downstream destinations and likely distribution of traffic in the triple left turn lanes. In addition, there are physical constraints associated with the proposed improvements, including Southern California Edison (SCE) 220kV transmission lines along the west side of Jamboree Road and SCE substation located at the southeast corner of this intersection. These physical constraints limit the improvements necessary to mitigate the project impacts at this location.

With completion of the improvements described in Mitigation Measure 13-1, the significant impacts to local roadways associated with the proposed project would be fully mitigated with the exception the Jamboree Road/Michelson Drive intersection.

Cities of Costa Mesa, Newport Beach, Santa Ana, and Tustin Intersections and Arterial Segments

Inasmuch as the primary responsibility for approving and/or completing certain improvements located outside of Irvine lies with agencies other than the City of Irvine (i.e., City of Newport Beach, City of Tustin, City of Santa Ana, City of Costa Mesa, and Caltrans), there is the potential that significant impacts may not be fully mitigated if such improvements are not completed for reasons beyond the City of Irvine's control (i.e., the City of Irvine cannot undertake or require improvements outside of Irvine's jurisdiction). Should that occur, impacts relating to traffic generated by the project would remain significant. The impacted facilities that fall within this category include the improvements identified in Tables 5.13-24 through 5.13-26.

To provide as much assurance as possible that the necessary resources will be available to allow the adjacent Cities to implement necessary traffic improvements, The City of Irvine has committed to the creation of a development fee program associated with development in the IBC study area. This program will contribute to the improvement of facilities within Irvine and a fair-share to improvements outside the City of Irvine. The City is committed to working with the adjacent Cities to identify the most appropriate improvement strategies for their facilities and acknowledges the fair-share cost of improvements to those facilities. Consistent with that objective, the City recently committed to provide the City of Newport Beach with \$3.65 million toward traffic improvements that will improve circulation within and adjacent to the IBC. However, the adjacent Cities have full jurisdiction toward implementing the identified improvements under their jurisdiction.

Caltrans Mainline Segments and Ramps

State highway facilities within the study area are not within the jurisdiction of the City of Irvine. Rather, those improvements are planned, funded, and constructed by the State of California through a legislative and political process involving the State Legislature; the California Transportation Commission (CTC); the California Business,

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TRANSPORTATION AND TRAFFIC

Transportation, and Housing Agency; the California Department of Transportation (Caltrans); and OCTA. Recent funding opportunities designated by OCTA's Renewed Measure M provides the vehicle for designated improvements on the freeway facilities within the study area and were analyzed at their recommended build-out in the IBC Vision.

To provide as much assurance as possible that the necessary resources will be available to allow CalTrans to implement necessary traffic improvements, the City of Irvine has committed to the creation of a development fee program associated with development in the IBC study area. This program is specifically in place to contribute to the improvement of facilities within Irvine and a fair-share to improvements outside the City of Irvine. The City is committed to working with Caltrans to identify the most appropriate improvement strategies for their facilities and acknowledges the fair-share cost of improvements to those facilities. However, Caltrans has full jurisdiction toward implementing the identified improvements under their jurisdiction.

While potential impacts to the freeway mainline segments and ramps have been evaluated, implementation of the transportation improvements to Caltrans facilities listed above is the primary responsibility of Caltrans. While Caltrans has recognized that private development has a role to play in funding fair share improvements to impacts on the I-405 and SR-55, neither Caltrans nor the State has adopted a program that can ensure that locally-contributed impact fees will be tied to improvements to freeway mainlines and only Caltrans has jurisdiction over mainline improvements. Because Caltrans has exclusive control over state highway improvements, ensuring that developer fair share contributions to mainline improvements are actually part of a program tied to implementation of mitigation is within the jurisdiction of Caltrans. However, a number of programs are in place in Orange County to improve and upgrade the regional transportation system. These include the Transportation Corridor Agencies (TCA) Corridor program, the State Transportation Improvement Program (STIP), Caltrans Traffic Operations Strategies (TOPS), State Highway Operation and Protection Program (SHOPP), and the Orange County Transportation Authority (OCTA) Measure M program. State and federal fuel taxes generate most of the funds used to pay for these improvements. Funds expected to be available for transportation improvements are identified through a Fund Estimate prepared by Caltrans and adopted by the California Transportation Commission (CTC). These funds, along with other fund sources, are deposited in the State Highway Account to be programmed and allocated to specific project improvements in both the STIP and SHOPP by the CTC. However, if these programs are not implemented by the agencies with the responsibility to do so, the project's freeway/tollway ramp and mainline impacts would remain significant and unmitigated.

