

DRAFT
Initial Study/Mitigated Negative Declaration No. ND 08-01
Brea Plaza Building and Parking Expansion

Prepared for:



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SECTION 1: INTRODUCTION

PURPOSE

The purpose of this *Initial Study (IS)* is to identify and assess the significance of the environmental impacts that would result from implementation of a plan to demolish 10,300 square feet (sf) of existing building space, construct approximately 22,500 sf of new building space and construct parking lot, circulation, landscaping and drainage improvements in the east edge of Brea Plaza, in the City of Brea. A detailed description of this plan is provided later in this section.

This *IS* has been prepared in accordance with the California Environmental Quality Act (CEQA) Statutes and Guidelines, and the City of Brea's local rules and procedures to implement CEQA. The proposed project requires discretionary approvals from the City of Brea, who is the Lead Agency with respect to this *IS*, pursuant to §15367 of the CEQA Guidelines. Specifically, this project requires approval of a Conditional Use Permit and a Precise Development Permit, in accordance with the standards set forth for such permits in the Brea Municipal Code. No other governmental agencies have discretionary permitting authority with respect to approval of the proposed project, and there are no Responsible or Trustee Agencies, as defined in §21069 and §21070 of the CEQA Statutes. Pursuant to §15074 of the CEQA Guidelines, prior to taking any official action to approve this project, the City is obligated to consider the findings of this *IS* and to either adopt a Negative Declaration (ND), a Mitigated Negative Declaration (MND), or to initiate preparation of an environmental impact report. The findings of this *IS* support adoption of a MND, as discussed in Section 3 of this report.

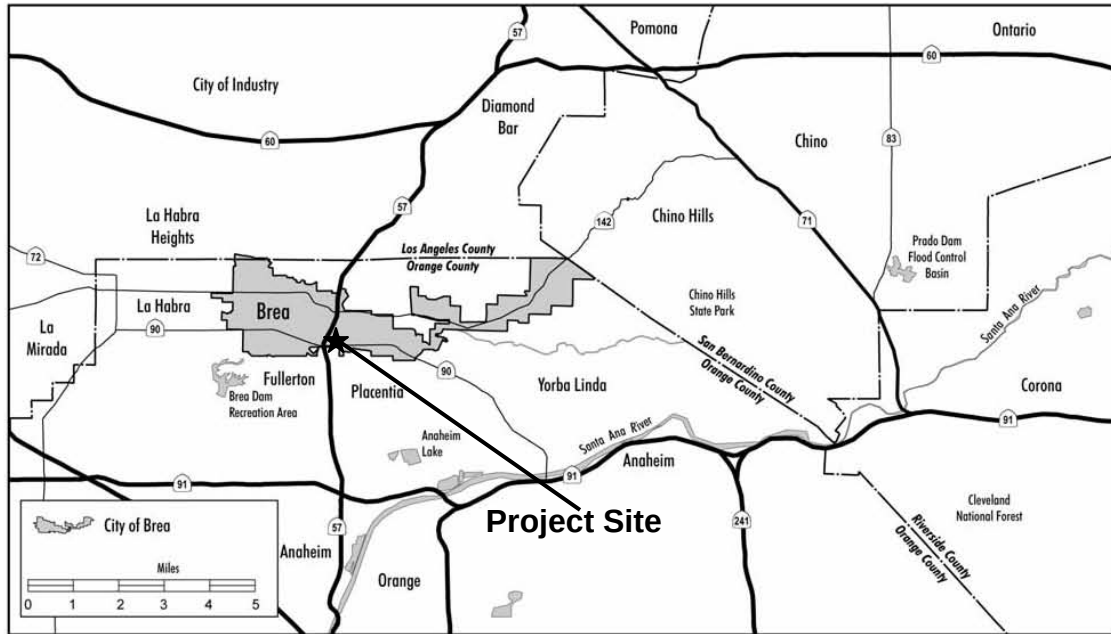
The remainder of this introductory section describes the project location, presents details of the characteristics of the proposed project, and describes the environmental setting that occurs on and surrounding the subject site. Section 2 contains an environmental checklist that summarizes potential environmental impacts that would or would not result from project implementation, and conclusions regarding the significance of those impacts, or lack thereof. Section 3 discusses project impacts with respect to 17 major topics and explains the findings summarized in the environmental checklist, including measures that have been incorporated in to the proposed project to eliminate, reduce, or offset adverse or potentially significant environmental effects.

PROJECT LOCATION

Brea is located at the northern edge of Orange County, at the border of Los Angeles and San Bernardino Counties, with regional access from the State Route 57 (SR 57) Freeway, as shown in Exhibit 1. As further shown in Exhibit 1, the proposed project is located in the eastern edge of the 13.16-acre Brea Plaza, a mixed-use commercial center located on the north side of Imperial Highway

(SR 91), between SR 57 and Associated Road. Proposed site improvements would occur in the eastern edge of the Plaza, above and adjacent to the Loftus Channel.

Regional Location Map



Source: Brea General Plan EIR, February 2003

Vicinity Map



Source: Google October 2007

Exhibit 1

Project Location

Brea Plaza Building and Parking Expansion IS/MND

PROJECT DESCRIPTION

The owners of the Brea Plaza (“Plaza”) are proposing to demolish existing buildings, expand and reconfigure surface parking and circulation, and build additional retail/commercial building space in the eastern side of the Plaza, along Associated Road. A site plan illustration of the proposed improvements is provided in Exhibit 2. Conceptual elevations of the proposed buildings are presented in Exhibit 3. Proposed landscaping, bio-swale and pedestrian improvements along the Associated Road frontage are shown in Exhibit 4.

This project is intended to accomplish the following objectives, as identified by the applicant:

- Provide enhanced pedestrian access from the neighborhood to Brea Plaza
- Eliminate an ‘unsightly’ view of the existing open flood control channel
- Enhance the general appearance of Brea Plaza as an important community element
- Create more green space within the extended Plaza area
- Provide a naturalistic “bio-swale” to capture and filter parking lot runoff before discharge to the channel
- Provide adjacent parking for the proposed larger retail building
- Expand overall parking available for customers at Brea Plaza

Three structures are to be removed:

- 1) a 3,000 square feet (sf) Al & Ed’s Autosound store (now vacant) near the corner of Imperial Highway and Associated Road,
- 2) a 7,200 sf U.S. Bank building, immediately north of the Al & Ed’s parcel; and
- 3) a 100 sf former Fotomax photo shop (now vacant), located in the parking lot near the Associated Road drive entrance.

Following construction of a new concrete box drainage structure within the Loftus Channel that abuts Associated Road (a separate project under County or Orange jurisdiction that will precede the proposed project), the Plaza parking lot will be expanded to occupy the surface of the channel structure. A 50-foot wide landscaping zone, including a bio-swale drainage element and a meandering sidewalk, will be developed along the Associated Road frontage. Approximately 133 new parking spaces would be created by this project. A portion of the existing parking lot is to be reconfigured to improve parking and circulation, and a new driveway connection to Associated Road is proposed in the northeastern corner of the Plaza. The new driveway would also serve the adjacent Mercury Insurance Company campus.

A building containing approximately 8,460 sf is proposed on the site of the vacated Al & Ed’s store (Building “T” shown on Exhibit 2). The new building will remain oriented toward Imperial

Highway, with the Imperial Highway setback increased from zero to 20 feet. It is to be occupied by a cellular telephone retailer and an international coffee shop, plus a food service business. The cell phone retailer (AT&T) and the coffee shop (Starbucks) will each relocate from an existing leased space elsewhere in the Plaza. A drive-thru lane is proposed within the adjacent parking area, to provide vehicular access to a drive up window at the Starbucks space. A second building, with approximately 13,050 sf of space on two floor levels, is to be built in the northeastern corner of the Plaza, where surface parking currently exists (Building "U" on Exhibit 2). No tenants have been identified to-date; a variety of retail, office, personal services and other general commercial businesses could occupy this space, in accordance with the land use restrictions for the City's General Commercial Zone. The two new buildings would increase the total building area within the Plaza by just over 11,200 sf, to a total of 158,742 sf.

Discretionary Approvals by City of Brea

This project has been assigned City of Brea Plan Review No. PR 08-01. This application will require approval by the City of Brea Planning Commission of the following discretionary actions:

- a) The entire reach of Loftus Channel is within the City's Flood Plain 1 ("FP-1") Overlay Zone. Construction of a parking lot and a drive-thru fast food use within this zone requires City approval of *Conditional Use Permit No. CUP 08-01*.
- b) City approval of *Precise Development No. PD 08-01* is required for the design of the proposed parking lot, landscaping, building and site improvements in the C-G/PD (Commercial General/Precise Development) Zone.

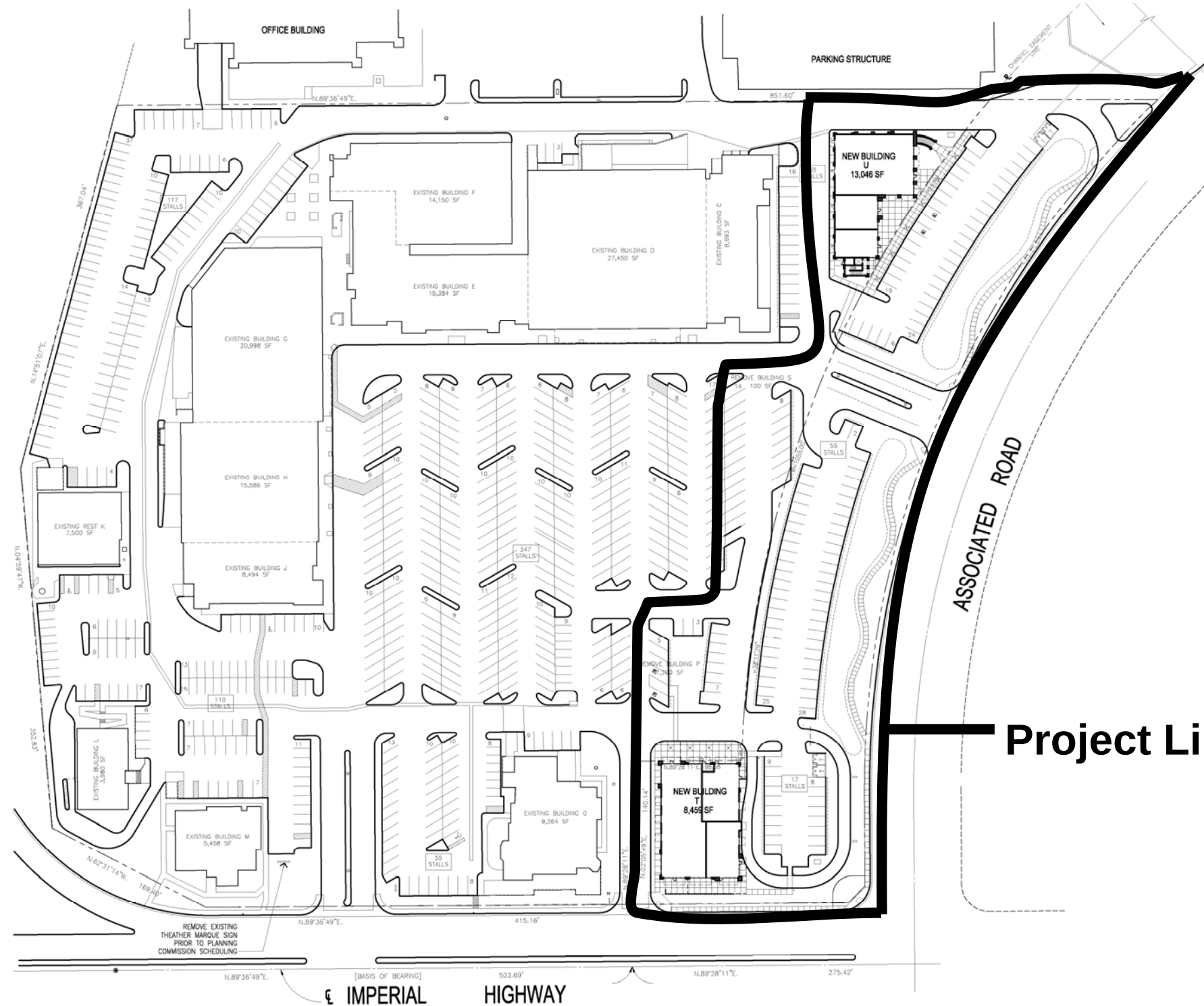
Construction Program

The entire construction program, including the channel box structure and the proposed plaza development area, would be completed within 9-12 months. Where possible, work elements will overlap to streamline the process to minimize the total time under construction. With full streamlining, work on the channel would commence in June 2008 and be completed by October 2008 and the parking lot, buildings, landscaping and bio-swale improvements would be completed by the end of February 2009. Total grading for the work outside of the channel is estimated at approximately 1,247 cubic yards of cut and 2,999 cy of fill, requiring import of approximately 1,752 of engineered fill material. The excavation includes removal of unsuitable artificial fill materials and preparation of the parking lot, building pads, driveways, drainage and landscape areas. Imported material will include conventional fill for building pads, road and parking lot base material, and fill for the landscaped slope and first flush bio-swales along Associated Road. Work would occur in four primary phases, as follows:

Table 1: Construction Phasing

Phase	Activities	Duration
1	Demolish bank, auto sound store and photo kiosk. Staging and storage to occupy single row of parking next to each structure	30 days
2	Build channel box structure, north of Associated Road bridge Keep Associated Rd. bridge and all other Plaza access open Construct new site entrance in northeast corner Staging and stockpile area at site of future Building “U”	60-80 days
3	Close and demolish Associated Rd. bridge Construct surface improvements in finished channel segment Construct building pads for both buildings. Close site driveway near Building “T” and drive aisle near Building “U” while pads are excavated. Maintain three entrances and full circulation for Plaza Staging and stockpiling to occur at Building “T” pad area	60-80 days
4	Construct surface improvements in southern channel segment Construct Buildings “T” and “U” Complete landscaping and other site work Staging to occur in parking areas adjacent to both buildings	140-150 days

ORANGE FREEWAY 57



SUMMARY:

BREA PLAZA BREA CA
EXHIBIT A1 PLAN
EXISTING COMMERCIAL/RETAIL CENTER

LAND AREA ±675,063 SF ±15.49 AC

BUILDINGS:(GBA – GROSS BUILDING AREA)

BLDG DESIGNATION	USE	BLDG AREA
EX. BLDG C	RETAIL	8,693 SF
EX. BLDG D	RETAIL	27,450 SF
EX. BLDG E	RETAIL	15,384 SF
EX. BLDG F	RETAIL	14,150 SF
EX. BLDG G	RETAIL	20,998 SF
EX. BLDG H	RETAIL	15,866 SF
EX. BLDG J	RETAIL	8,494 SF
EX. BLDG K	REST	7,500 SF
EX. BLDG L	OFFICE	3,980 SF
EX. BLDG M	REST	5,458 SF
EX. BLDG O	REST	9,264 SF
EX. BLDG P	TO BE REMOVED	0 SF
EX. BLDG S	TO BE REMOVED	0 SF
NEW BLDG T	REST./RETAIL	8,459 SF
NEW BLDG U	RETAIL	13,046 SF
TOTAL AREA		158,742 SF

PARKING REQUIRED

BLDG DESIGNATION	USE/RATIO	STALLS
EX. BLDG C	RETAIL 5.5/1000	48
EX. BLDG D	RETAIL 5.5/1000	151
EX. BLDG E	RETAIL 5.5/1000	85
EX. BLDG F	RETAIL 5.5/1000	78
EX. BLDG G	RETAIL 5.5/1000	115
EX. BLDG H	RETAIL 5.5/1000	87
EX. BLDG J	RETAIL 5.5/1000	47
EX. BLDG K	REST 5.5/1000	42
EX. BLDG L	OFFICE 5.5/1000	22
EX. BLDG M	REST 5.5/1000	30
EX. BLDG O	REST 5.5/1000	51
EX. BLDG P	---5.5/1000	---
EX. BLDG S	---5.5/1000	---
NEW BLDG T	RETAIL 5.5/1000	47
NEW BLDG U	RETAIL 5.5/1000	72

TOTAL 875 STALLS

PARKING PROVIDED

TOTAL 766 STALLS
PARKING RATIO:(Commercial/Retail Center) 4.8 STALLS/1000 SF

Project Limits

Source: Architects Orange, April 2008

Exhibit #2
Proposed Site Plan

Brea Plaza Building and Parking Expansion IS/MND



BUILDING T EAST ELEVATION



BUILDING T SOUTH ELEVATION



BUILDING U EAST ELEVATION



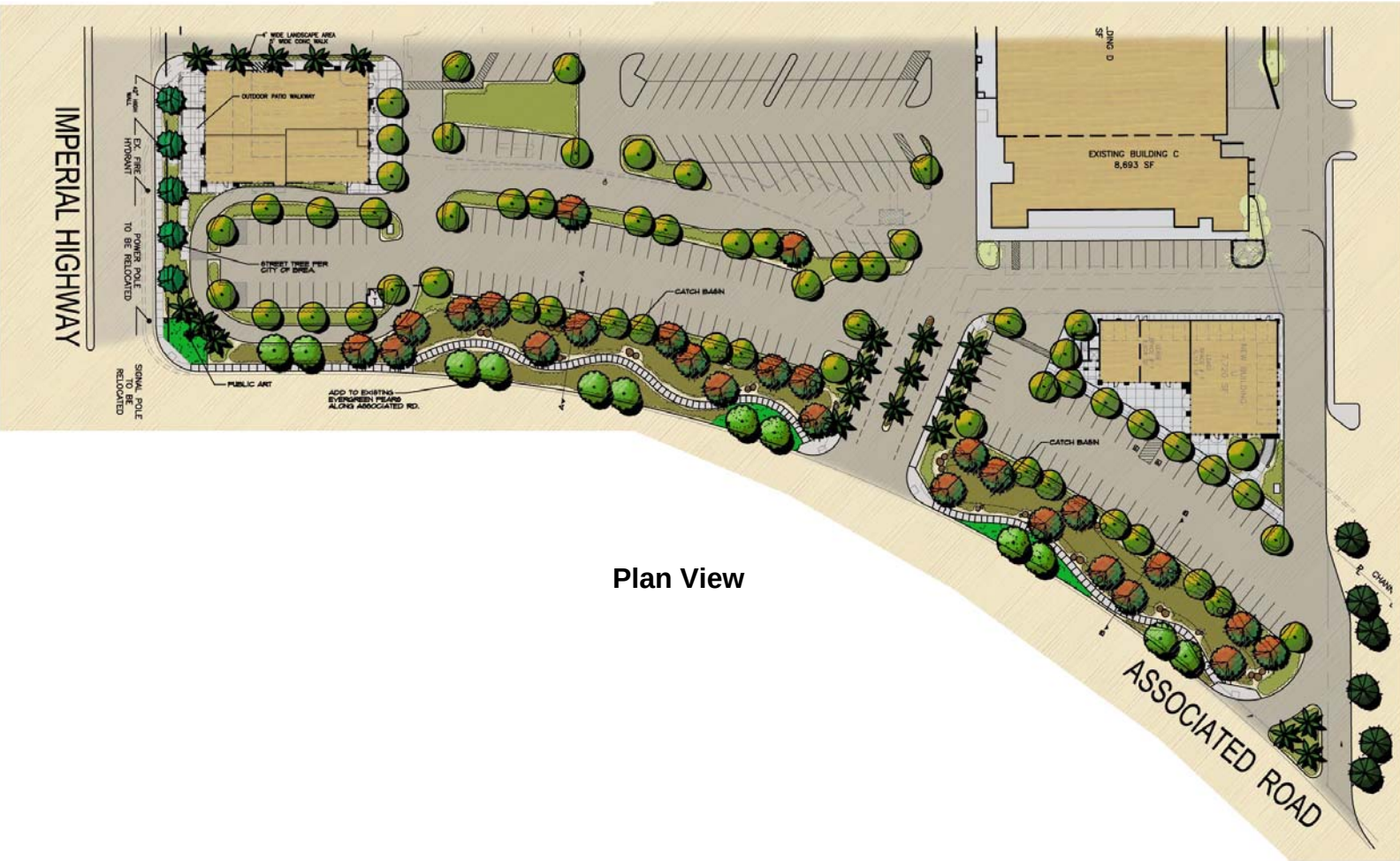
BUILDING U SOUTH ELEVATION

Source: Architects Orange, February 2008

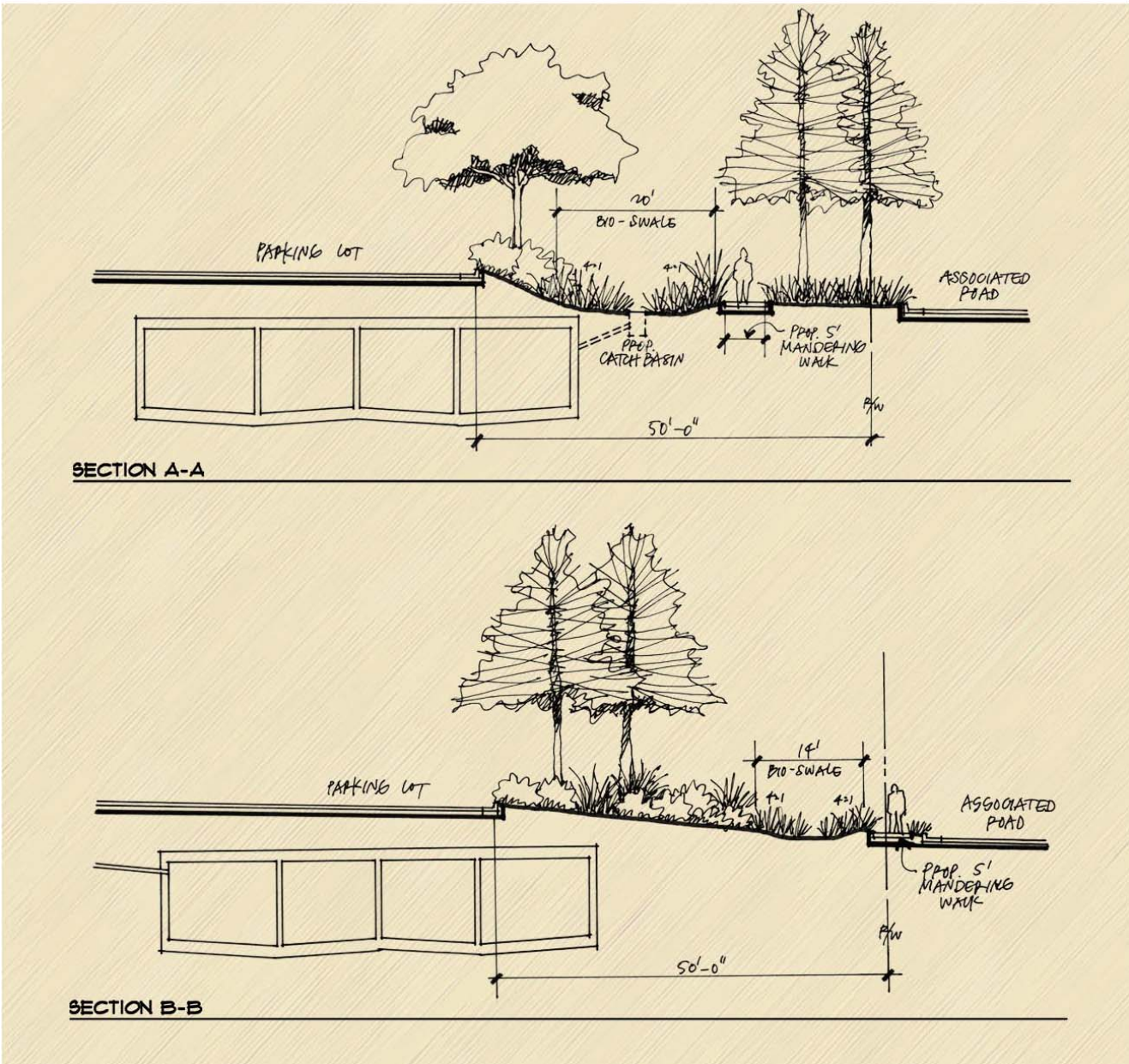
Exhibit #3

Proposed Building Elevations

Brea Plaza Building and Parking Expansion IS/MND



Plan View



Section View With Bio-Swale

Source: R. Dale Hadfield Landscape Architect and Architects Orange, February 2008

Exhibit #4

Proposed Landscape and Bio-Swale Plan

Brea Plaza Building and Parking Expansion IS/MND

ENVIRONMENTAL SETTING

State Route 57 borders the western side of the subject property. Mercury Plaza, an office campus housing Mercury Insurance Company operations, is located immediately north. The Glenbrook community of single family residential neighborhoods is located to the east of Associated Road. A mixture of commercial uses, a drainage detention basin and the continuation of Loftus Channel are to the south, on the opposite side of Imperial Highway. An aerial view of the local land use pattern is shown in Exhibit 1.

As noted earlier, the project site is along the eastern edge of the mixed retail/commercial center known as Brea Plaza (Plaza). This center currently consists of approximately 144,537 square feet of building area, 633 vehicle parking spaces and miscellaneous landscaping, lighting, signage and utility improvements. This property is fully developed and there is no natural open space anywhere on this site. Major tenants include: Borders Books and Café, Rite Aid Pharmacy, Lucille's Bar B Que restaurant, and Buca di Beppa Restaurant. Vehicular access occurs at two locations along the Imperial Highway frontage, including a fully signalized drive entrance that aligns with the SR 57 northbound off ramps, and a right-in/right out only driveway 210 feet west of the corner of Imperial Highway and Associated Road. An additional Plaza entrance permitting full turning movements occurs about midway along the Associated Road frontage, via a bridge crossing of the open Loftus Flood Control Channel.

Imperial Highway is a six-to-eight lane, divided roadway and is a major east-west circulation route that carries approximately 48,000 to 58,600 average daily trips (ADT) in this area. It is designated in the City's Circulation Element and in the countywide Master Plan of Arterial Highways as a Smart Street, and it is also part of the state highway network (State Route 90). This classification applies to arterial roads with enhance traffic carrying capacity. Smart Street improvements are underway between SR 57 and Rose Drive. Associated Road is a four-lane divided roadway that carries approximately 10,900 to 12,300 ADT north and south of Imperial Highway. It is classified in the City's Circulation Element as a Secondary Arterial.

Limits of the proposed development plan are outlined on Exhibit 1. As shown, the affected area comprises the eastern edge of the Plaza, and consists of an open flood control channel, surface parking and circulation areas, landscape planters, a 3,000 sf building that is vacant, a 7,200 sf building occupied by U.S. Bank, a retail bank services facility, and a small (100 sf), free-standing photo shop that is vacant.

Proposed parking lot and landscaping improvements would occupy approximately two acres of the surface of the adjacent Loftus Channel, which lies between the east edge of the Plaza and Associated Road. Loftus Channel is a regional flood control facility (referred to as Facility No. A06), built, owned and maintained by the County of Orange Flood Control District. It begins about 2/3 mile south of Lambert Road and runs east-to-west from Voyager to Associated Road, then southwest until it crosses beneath the SR 57 Freeway before outletting into a U.S. Army Corps of Engineers Fullerton

Creek Reservoir at Craig Regional Park. This is an engineered channel with revetted side slopes and an earthen invert, within a 120-foot right-of-way (see photos in Exhibit 6). From Imperial Highway north, the typical channel bottom width is 34 feet and from 9-13 feet deep, with 1:5:1 side slopes and access roads on both sides. A variety of drainage improvements have occurred within the channel since 1980, including drop structures, riprap and improved culvert crossings. There is a double, 12-foot wide by 10-feet high reinforced concrete box (RCB) at the Imperial Highway crossing, and a triple, 16-feet wide by 9-feet high RCB crossing at the drive entrance from Associated Road into Brea Plaza.

Construction of a four-barrel concrete box structure within the Loftus Channel right-of-way has been approved by the County of Orange, who owns and maintains this regional flood control channel. Construction within the Loftus Channel will also require issuance of a permit by the U.S. Army Corps of Engineers (“ACOE”), pursuant to Section 404 of the federal Clean Water Act, since a portion of the channel bottom meets the criteria of a non-wetland Water of the U.S. A Streambed Alteration Agreement with the California Department of Fish and Game (CDFG) is required, due to removal of disturbed riparian vegetation in the channel area. County, ACOE and CDFG approvals are being processed separately and are not subject to any action by the City of Brea; thus, the in-channel structure is not addressed by this Initial Study.



Vacated
Al & Ed's
building to be
removed – view
at entrance
drive on
Imperial
Highway



View of
northwest
corner
Imperial
Highway and
Associated
Road



View south
along
Associated
Road
frontage



View north
along
Associated
Road
frontage

Source: Planning Research Network, October 8, 2007 and March 27, 2008

Exhibit #5

Street Frontage Views

Brea Plaza Building and Parking Expansion IS/MND



Loftus Channel,
view north,
between Imperial
Highway
Associated Road
bridge



Loftus Channel, view north of
Associated Road bridge



Loftus Channel, view of “3-
Barrel” culvert at Associated
Road bridge

Source: Planning Research Network, October 8, 2007

Exhibit #6

Views of Loftus Channel

Brea Plaza Building and Parking Expansion IS/MND



U.S. Bank building to be removed



Proposed Building "U" site



Vacant photoshoot to be removed

Source: Planning Research Network, March 27, 2008

Exhibit #7

Site Interior Views

Brea Plaza Building and Parking Expansion IS/MND

SECTION 2: ENVIRONMENTAL CHECKLIST

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
I. Aesthetics <i>Would the project:</i>				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐
II. Agriculture Resources <i>Would the project:</i>				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒
III. Air Quality <i>Would the project:</i>				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
IV. Biological Resources <i>Would the project:</i>				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or MCCratory fish or wildlife species or with established native resident or MCCratory wildlife corridors, or impede the use of wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
V. Cultural Resources <i>Would the project:</i>				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒
VI. Geology and Soils <i>Would the project:</i>				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
VII. Hazards and Hazardous Materials <i>Would the project:</i>				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
VIII. Hydrology and Water Quality				
<i>Would the project:</i>				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
IX. Land Use and Planning <i>Would the project:</i>				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community's conservation plan?	☐	☐	☐	☒
X. Mineral Resources <i>Would the project:</i>				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
XI. Noise				
<i>Would the project result in:</i>				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XII. Population and Housing				
<i>Would the project:</i>				
a) Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XIII. Public Services				
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire Protection?	☐	☐	☐	☒
b) Police Protection?	☐	☐	☐	☒
c) Schools?	☐	☐	☐	☒
d) Parks?	☐	☐	☐	☒

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
e) Other public facilities?	☐	☐	☐	☒
XIV. Recreation				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which MCCht have an adverse physical effect on the environment?	☐	☐	☐	☒
XV. Transportation/Traffic				
<i>Would the project:</i>				
a) 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)?	☐	☐	☒	☐
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Result in inadequate parking capacity?	☐	☐	☒	☐
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒
XVI. Utilities and Service Systems				
<i>Would the project:</i>				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

Environmental Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
XVII. Mandatory Findings of Significance				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ('Cumulatively considerable' means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☒	☐
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Environmental Factors That Could Result in a Potentially Significant Impact

The environmental factors checked below would be potentially affected by the project, involving at least one impact that is a "potentially significant impact" as indicated by the preceding checklist and supported by evidence provided in Section 3.

- | | | |
|--|--|---|
| ☐ Aesthetics | ☐ Agriculture Resources | ☐ Air Quality |
| ☐ Biological Resources | ☐ Cultural Resources | ☐ Geology/Soils |
| ☐ Hazards & Hazardous Materials | ☐ Hydrology/Water Quality | ☐ Land Use/Planning |
| ☐ Mineral Resources | ☐ Noise | ☐ Population/Housing |
| ☐ Public Services | ☐ Recreation | ☐ Transportation/Traffic |

ENVIRONMENTAL DETERMINATION

On the basis of this initial evaluation:

- ☐ I find that the proposed project could not have a significant effect on the environment, and a Negative Declaration will be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A Mitigated Negative Declaration will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an Environmental Impact Report is required.
- ☐ I find that the proposed project MAY have a 'potentially significant impact' or 'potentially significant unless mitigated' impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measure based on the earlier analysis as described on attached sheets. An Environmental Impact Report is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or Negative Declaration pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or Negative Declaration, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signed 
David Crabtree, AICP, City Planner

Date 4/21/08

SECTION 3: DISCUSSION OF ENVIRONMENTAL EVALUATION

I. AESTHETICS

- a) *Have a substantial adverse effect on a scenic vista?*

No Impact. Momentary views of the distant Puente Hills to the north are available to motorists, pedestrians and bicyclists traveling along Associated Road and Imperial Highway, above the developed forms of Brea Plaza. These views are not recognized as comprising a scenic vista in the Brea General Plan. Views of the Plaza itself are not considered to represent a scenic vista. Construction of the proposed buildings, therefore, would not occur within or otherwise affect a scenic vista. Construction of a surface parking lot with landscape improvements along Associated Road would be at the same approximate ground level as the adjacent portion of Brea Plaza and Associated Road. These improvements would not affect views of the distant hills and would not affect any scenic vistas.

- b) *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?*

No Impact. There are no natural scenic resources within the fully developed Brea Plaza, and the open Loftus Channel is comprised of scraped earthen sides and disturbed bottom vegetation that is not considered to be a scenic resource. None of the ornamental landscaping within the Plaza or along the flood control channel is considered to be a scenic resource. Neither Imperial Highway nor Associated Road are scenic highways, and the existing buildings to be removed do not have any architectural or historical significance. This project would thus have no effect on scenic resources.

- c) *Substantially degrade the existing visual character or quality of the site and its surroundings?*

Less Than Significant Impact. The project site is within a fully urbanized area comprised of a variety of structural forms and features, ornamental landscape elements and streetscapes that are typical of a low-rise commercial center in a suburban environment. Located at a prominent corner in the eastern periphery of the Brea Plaza, proposed Building “T” would be highly visible because of its adjacency to heavily traveled Imperial Highway and Associated Road. This building would be more than twice as large as the existing building (8,500 sf vs. 3,000 sf) and would be taller, with a main roof line height of 26’ and corner elements extending to 43’ high,

similar to the adjacent Lucille's Bar B Que Smokehouse building. With a substantially increased building setback from Imperial Highway compared to the existing building (from zero to 20 feet), the new structure would not significantly change the visual impact of the building mass at the corner. Building U would represent a new two-story building mass in the northeastern corner of the plaza, taller than the single-story northeastern-most Plaza building. This structure would have a main roof line of 34' to 38' high, plus a projection up to 43' high, and would be similar to the height of the nearby parking structure on the adjacent Mercury Insurance Company property. This building would not be visually significant in the context of extensive existing building forms.

As shown on Exhibit 3, proposed materials include:

- Painted stucco walls and trims
- Tile roofs
- False stone veneer
- Canvas awnings
- Precast stone base
- Painted wood corbels and railings
- Aluminum store fronts and clear glazing
- Precast stone columns

Proposed architectural treatments will provide a modern motif that would blend well into the nearby Plaza elements and enhance the visual character of the site and surroundings.

A narrow landscape edge comprised of shrubs, an irregular spacing of mature canopy trees and a deteriorating masonry/metal fence currently lies between the edge of Associated Road and the Loftus Channel. With a substantial landscape zone (50 feet wide) comprised of trees, shrubs and ground cover along the Associated Road frontage, this project would expand the landscape character and thus soften the visual edge of this street frontage, compared to existing conditions. This is considered a beneficial impact. New landscaping is proposed in the perimeter of the proposed parking lot, along Imperial Highway. This is considered an improvement compared to the existing view of a chain link fence, asphalt drives, concrete abutments and a trapezoidal channel with earthen sides and a grassy bottom.

- d) *Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?*

Less Than Significant Impact. There is minimal outdoor lighting in the eastern edge of Brea Plaza at this time, consisting of a few light poles in the parking lot and

some negligible light that may be emitted from some store interiors after dark. No lighting sources occur within the Loftus Channel area. There are no light-sensitive land uses in the vicinity of the project site. Homes within the Glenbrook community on the opposite side of Associated Road are buffered from that road by a large block wall and are more affected by street lighting than any lighting within Brea Plaza.

A number of single and double-lamp, pole-mounted light fixtures are proposed within the new parking lot, to provide a safe level of night-time illumination for Plaza customers and employees, as they travel to/from and within the parking area. Each of the 20-foot high lamps are to be enclosed within a fixture that will focus the illumination onto the parking lot surface and prevent glare into the sky or outside of the parking lot. A preliminary lighting study submitted with the project plans indicates illumination levels will average approximately 3.1 footcandles throughout the new parking lot area, and less than 2 footcandles along the two street frontages. These low light levels would not result in glare effects and would not affect lighting levels beyond this site. Landscaping along the Associated Road frontage would mute the visual effect of lighting within the parking lot, to some extent. New street lights are not proposed and will not be required for this project. Changes in outdoor lighting associated with this project would result in a less than significant impact.

II. AGRICULTURAL RESOURCES

- a) *Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?*

No Impact. The subject site was developed with the Brea Plaza and Loftus Channel improvements a number of years ago. The surrounding area is also fully urbanized. This project would have no effect upon Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.

- b) *Conflict with existing zoning for agricultural use, or a Williamson Act contract?*

No Impact. There is no existing agricultural zoning on or near the subject site. The existing commercial property is zoned as “General Commercial,” with a “Precise Development” overlay and the Loftus Channel is within the “Flood Plain Overlay Zone.” There is no Williamson Act contract for this property.

- c) *Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?*

No Impact. There are no agricultural uses in this area, which has been urbanized with a mixture of residential, commercial, transportation and flood control uses for many years.

III. AIR QUALITY

- a) *Conflict with or obstruct implementation of the applicable air quality plan?*

No Impact. Attainment of tougher federal standards for ozone and small particulate matter (PM 2.5) are the main challenges being addressed in the updated (2007) regional Air Quality Management Plan (AQMP). This project would have no effect on most of the AQMP pollution reduction strategies, which are targeted at reducing direct emissions of NO_x, PM_{2.5}, SO_x and volatile organic compounds (VOCs) generated by mobile sources such as light and heavy-duty trucks, ships, aircraft and passenger vehicles, as well as off-road machinery such as construction equipment and consumer products such as aerosol sprays and paints. Key control strategies rely on more efficient combustion engine exhaust systems, lower emission propulsion systems, use of cleaner alternative fuels and limits on total emissions from various sources. Implementation of the regional air quality improvement strategies involving restrictions on mobile emission sources will rest primarily upon the regulatory authority of the federal and state governments, while transportation and growth management strategies are within the jurisdiction of the Southern California Association of Governments (SCAG) and stationary source control measures are regulated mainly by the South Coast Air Quality Management District (SCAQMD).

Since this project is a relatively minor expansion to an existing shopping center, in an urbanized area, it is consistent with air quality management strategies that encourage infill and compact development. By providing expanded commercial services at an existing commercial center, this project may reduce trip lengths (and thus vehicular emissions) for some shopping needs that are now found at more distant locations. This project would not require any unique construction materials or methods that would generate new types of air pollutants or excessive levels of pollutants that would require any unusual control measures. No air quality permits are required for any of the construction work or for the proposed buildings.

- b) *Violate any air quality standard or contribute substantially to an existing or projected air quality violation?*

No Impact. This project does not include any mechanical processes, building materials or outdoor activities that would generate direct emissions of air pollutants; therefore, the long-term building operations would not violate any air quality standards. As discussed later in this Initial Study, in the response to Checklist item XV.a, traffic associated with the expanded commercial space would have a less than significant impact on local traffic flow and would thus not produce high concentrations of vehicular exhausts resulting from slow-moving and stopped vehicles. Those vehicular exhaust emissions would occur somewhere within the region, with or without this project, since all of the project-related traffic would be local in nature, as opposed to inter-regional travel. This project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation.

- c) *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?*

Less Than Significant Impact. The South Coast Air Basin is currently designated as non-attainment with respect to federal and state ozone standards, as well as federal fine particulate matter (PM 2.5) standards. Ozone levels result from a complex set of photochemical reactions stemming from a combination of regional meteorological conditions and basin-wide emissions of a variety of pollutants, including oxides of nitrogen and carbon monoxide. Fine particulates are emitted in the form of fugitive dust and as a component of vehicle exhaust.

Construction phase emissions would be less than significant, given the minor grading requirements and small-scale of the proposed buildings. Nonetheless, a variety of dust control and construction equipment exhaust control measures will be implemented to minimize and contain emissions, as set forth in the mitigation measures, below. These control measures will reduce the levels of fine particulate matter, as well as oxides of nitrogen and carbon monoxide, and the construction emissions would not result in a cumulatively considerable net increase in the levels of these criteria pollutants.

Mitigation Measure #1: Construction Emissions Control Measures

Dust Control

- Pre water site prior to grading.

- Water during soil disturbance grading.
- Maintain soil moisture at 12% or more.
- Install wind fencing around perimeter.
- Maintain disturbance area as small as practical.
- Apply water periodically to form a stable crust on storage piles.
- Add non-toxic chemical dust suppressants to water applications.
- Load in/out material on the leeward (downwind) side of the pile.
- Construct a paved 50-foot access apron from any public street.
- Wash/sweep the public street within 30 minutes of visible track-out.
- Apply a four inch gravel surface to any equipment staging or construction employee parking area.
- Apply dust suppressants to the gravel surface in the staging area.
- Pave the construction employee parking area.

Exhaust Emissions

- Conduct 90-day low-NOx tune-ups for off-road equipment.
- Limit idling to 5 minutes for trucks and heavy equipment.
- Use Tier 3-rated diesel engines during demolition and grading for any off-road equipment exceeding 100 horsepower, if available.
- Utilize diesel oxidation catalysts, if available.
- Utilize CARB-certified diesel particulate filters on heavy off-road equipment if such filters are reasonably available.

As stated in the preceding response, the completed project would not generate any direct emissions and would thus not have a cumulatively considerable contribution to regional ozone levels or levels of fine particulate matter. Vehicular exhaust associated with the minor increase in traffic attributable to the increase in commercial space would not have a cumulatively considerable effect on ozone or particulate matter levels. Those vehicular exhaust emissions would occur somewhere within the region, with or without this project, since all of the project-related traffic would be local in nature, as opposed to inter-regional travel.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. The closest sensitive potentially sensitive receptors could be residents within the Glenbrook community. The nearest homes are located more than 100 feet from the east edge of the Loftus Channel, while a large majority of homes in that community are much farther away. All other surrounding land uses include a variety of commercial businesses, parking areas and major streets, none of which are considered sensitive receptor locations. A variety of routine dust controls

will be implemented during the minor excavation phase, as specified in Mitigation Measure #1, in the previous response. As a result, fugitive dust emissions would not travel outside of the immediate construction zone and would not significantly affect persons within the Glenbrook community. No permanent, direct air pollutant emissions would occur as a result of building operations. The traffic study prepared for this project (see Appendix B) determined that project-related traffic would have a negligible effect on levels of service at study area intersections; therefore, vehicle exhaust emissions would not result in significant concentrations of air pollutants due to heavily congested intersection conditions. In any event, there are no sensitive receptors that would be directly exposed to such exhaust emissions on a continuous basis.

- e) *Create objectionable odors affecting a substantial number of people?*

No Impact. No outdoor activities are proposed and the commercial buildings will not include any industrial or mechanical processes that would emit odor-containing gasses. Objectionable odors would not be generated by typical activities in the proposed surface parking lot, which would be used for vehicle access and parking. Trash enclosures will be located in the two new parking lots on both sides of the Associated Road entrance; each will be equipped with lockable lids, in accordance with standard City design specifications, which will prevent emissions of odors from the trash materials.

IV. BIOLOGICAL RESOURCES

- a) *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

No Impact. There is no natural habitat on the Brea Plaza site, which is located in a fully urbanized area. The proposed parking lots would be built on the surface of a new concrete box flood control structure within the Loftus Channel, and would thus have no effect on any candidate, sensitive or special status plants or animal species.

- b) *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?*

No Impact. There are no riparian resources within the fully developed Brea Plaza. The proposed parking lot would be built on the surface of a new concrete box flood control structure within the Loftus Channel, and would thus have no effect on any riparian resources.

- c) *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*

No Impact. There are no water resources within the fully developed Brea Plaza. The proposed parking lot would be built on the surface of a new concrete box flood control structure within the Loftus Channel, and would thus have no effect on any wetland resources.

- d) *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*

No Impact. This completely developed Brea Plaza site is located in a fully urbanized area and does not provide any resources to support movement of native resident or migratory fish or wildlife species. The proposed parking lot would be built on the surface of a new concrete box flood control structure within the Loftus Channel, and would thus have no effect on any resources that could support wildlife or fish movement.

- e) *Conflict with any local applicable policies protecting biological resources?*

No Impact. This project would not affect any natural biological resources; therefore, it would not result in any conflicts with policies to protect such resources.

- f) *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other applicable habitat conservation plan?*

No Impact. This project site is not within any habitat conservation planning area.

V. CULTURAL RESOURCES

Would the project:

- a) *Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?*

No Impact. Developed in the early 1970s, the Brea Plaza commercial center is over 30 years old. There are no recognized historic resources in this part of Brea, as shown on Figure CR-6 in the Bea General Plan. This property and the adjacent Loftus Channel satisfy none of the criteria for a historic resource defined in Section 15064.5 of the State CEQA Guidelines. This project would have no effect upon a historic resource.

- b) *Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?*

Less Than Significant, With Mitigation Incorporated. Archaeological resources are not expected to be found within the shallow fill materials that would be excavated by the proposed building construction. If excavation equipment reaches native materials, there is some possibility that archaeological materials could be found. No soil materials would be disturbed by construction of the proposed parking lot atop a concrete box drainage structure.

The Brea General Plan EIR does not identify any particular archaeological sensitivity for this area, but it does indicate that the archaeological community is of the opinion that the entire Brea area was at one time inhabited by native Gabrielino people. If potential archaeological materials are uncovered during grading, implementation of the following mitigation measure will ensure that such materials are properly identified and a determination of significance made, before grading proceeds in that immediate area.

Mitigation Measure #2: Protect Possible Archaeological Resources

If potential archaeological materials are uncovered during grading, the contractor shall be required to halt work in the immediate area of the find, and to retain a professional archaeologist to examine the material to determine whether it is a “unique archaeological resource” as defined in Section 21083.2(g) of the State CEQA Statutes. If this determination is positive, the scientifically consequential information shall be fully recovered by the archaeologist. Work may continue outside of the area of the find; however, no further work shall occur in the immediate location of the find until all information recovery has been completed and a report concerning same filed with the City Planning Department.

- c) *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*

No Impact. The Brea General Plan EIR (p. 90) indicates that vertebrate fossil materials are often found in deposits of the Puente Formation, typically located in bedrock in the Puente Hills. Given the minor excavation requirements that would disturb previously placed fill materials, penetration of bedrock materials would not occur. No impacts to paleontological resources are expected.

- d) *Disturb any human remains, including those interred outside of formal cemeteries?*

No Impact. Given the shallow excavation requirements into fill materials of this previously developed site, it is considered unlikely that human remains could be

uncovered during grading operations. Nonetheless, should suspected human remains be encountered, the contractor would be required to notify the County Coroner, in accordance with Section 7050.5 of the California Health and Safety Code, who must then determine whether the remains are of forensic interest. If the Coroner, with the aid of a supervising archaeologist, determines that the remains are or appear to be of a Native American, he/she would contact the Native American Heritage Commission for further investigations and proper recovery of such remains, if necessary.

VI. GEOLOGY AND SOILS

The following responses are based on the results of a review of past geotechnical investigations on and near this site, recent subsurface geotechnical investigations on-site, and laboratory analyses of on-site soil materials. Please refer to the complete geotechnical report¹ contained in Appendix A of this Initial Study, for further details.

Would the project:

a) *Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:*

i) *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.*

No Impact. The nearest known earthquake fault is the Puente Hills Fault, located about 1.7 kilometers north of the project site. This site is not within an Alquist-Priolo Earthquake Fault Zone. Past and recent geological investigations at the Brea Plaza and Loftus Channel found no evidence of any earthquake faulting on site.

ii) *Strong seismic ground shaking?*

Less Than Significant Impact. An earthquake along any of a number of local or regional faults could generate strong ground motions at the subject site that could threaten the structural integrity of the proposed commercial buildings and parking lot improvements. Grading, foundation and building structure elements must be designed to meet or exceed the California Building Code seismic safety standards, as adopted by the City of Brea, based on the localized soils characteristics, distances to faults, estimated energy levels associated with potential earthquake events, etc. Compliance with these regulatory standards will ensure that hazards associated with seismically induced ground shaking are reduced to less than significant.

¹ Pacific Soils Engineering, Inc., *Preliminary Geotechnical Investigation, Proposed Storm Drain Improvements for the Loftus Diversion Channel and the Brea Plaza Shopping Center, Northwest Corner of Imperial Highway and Associated Road, City of Brea, California*. March 26, 2008.

iii) Seismic-related ground failure, including liquefaction?

Less Than Significant Impact. Brea Plaza is not within a liquefaction-prone area, as shown on the Seismic Hazards Map of the La Habra Quadrangle, prepared by the State of California, Division of Mines and Geology (CDMG). Compliance with the City's routine building code standards will ensure that the proposed buildings lie on properly compacted soils and satisfy all structural requirements for building foundations. Parking lot improvements constructed above the new Loftus Channel concrete box structure would be built on engineered fill materials, and the box structure itself will be founded upon engineered fill, after removal of potentially liquifieable soil materials in the channel bottom. No significant impacts involving liquefaction hazards are anticipated.

iv) Landslides?

No Impact. This relatively flat Plaza site is not susceptible to landslide dynamics that occur in sloped conditions. Neither the flood channel or the Plaza site are within the boundaries of a mapped landslide and the project site is not identified as part of an "Earthquake-Induced Landslide Zone on the Seismic Hazards Map of the La Habra Quadrangle," prepared by the CDMG.

b) Result in substantial soil erosion or the loss of topsoil?

No Impact. The proposed building sites are underlain by fill material placed during the original development of the existing commercial center and the proposed parking lot would be built atop a concrete box drainage structure. This project would not, therefore, affect any native topsoil. Small areas of bare ground surface could be temporarily exposed during the excavation period, which could lead to some wind or rain-based erosion. Compliance with the routine erosion controls required under the City's grading regulations and the General Construction Permit to be obtained from the Santa Ana Regional Water Quality Control Board will ensure that no erosion of exposed soils occurs during this project's grading activities.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Less Than Significant Impact. Near surface soils consist of cohesive materials that are saturated, compressible and potentially expansive, and are considered unsuitable for support of the proposed site improvements. Sufficient soil stability will be achieved through implementation of the recommendations identified in the preliminary geotechnical investigation report prepared for this project and any further refinements that may be warranted, based on post-grading soils testing. This will be

a required condition of approval that will be verified through the City's routine grading permit process. The geotechnical report indicates that excavation/removal of unsuitable existing soil materials, to be replaced with engineered fill material, and construction with a conventional concrete foundation will be sufficient for the proposed buildings and additional development areas.

- d) *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?*

Less Than Significant Impact. Expansive soils are subject to shrinking and swelling, which can lead to cracking in foundations. Recent soils testing conducted as part of a preliminary geotechnical investigations report for this project determined that near surface materials have an expansion potential ranging from low to high. Replacement of these materials with properly engineered fill materials is identified in the geotechnical report as a measure that will eliminate this constraint and facilitate design and construction of conventional foundations. This will be a required condition of approval that will be verified through the City's routine grading permit process.

- e) *Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?*

No Impact. This project will not generate wastewater and will not require installation of or affect any existing septic tanks or other wastewater disposal systems.

VII. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

- a) *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*

Less Than Significant Impact. A coffee shop, a cellular communications retailer and a food service business have been identified as the initial occupants of the proposed commercial building near the corner of Imperial Highway and Associated Road. These kinds of businesses do not involve transport, use or disposal of significant volumes of hazardous materials that would warrant any special control measures. Tenants have not yet been identified to occupy the new building proposed near the northeast corner of the site; however, all future tenants would be limited to typical retail, personal and business services, restaurants and other eating establishments, and other businesses permitted in the City's CG General Commercial

Zone. Such uses normally do not involve regular transport, use or disposal of significant volumes of hazardous materials that would require special site controls or permitting by the Fire Department. Any future uses that involve handling of substantial volumes of hazardous materials would be subject to City Fire Department approval for materials storage and accident prevention/response measures that would ensure there are no significant impacts involving use of hazardous materials. The proposed surface parking lot would not involve transport, use or disposal of hazardous materials.

- b) *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*

No Impact. There is no storage, generation or disposal of hazardous materials within the project limits. Near-surface soils consist of fill materials placed during the original development of the Brea Plaza; therefore, hazardous substances do not likely occur beneath the proposed building sites. Accidental release of hazardous materials during grading, therefore, is not expected. If unknown materials of suspicious origin are encountered during excavation, the contractor is required as a standard performance specification to halt work and determine whether the material(s) is (are) hazardous and to take appropriate remedial measures to remove and dispose of such materials, if warranted. This will ensure that there is no significant hazard created due to an accidental release of hazardous materials into the environment. As noted in the preceding response, this project would not result in activities that could result in upset and accident conditions that could release hazardous materials to the environment.

- c) *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*

No Impact. The City's land use restrictions and development standards for the C-G Zone prohibit activities that would emit hazardous substances, or handle hazardous or acutely hazardous materials. There are no schools within a quarter mile of the project site.

- d) *Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?*

No Impact. According to records maintained by the California Environmental Protection Agency ("Cortese Lists") there are no reported hazardous substance

release sites within or near the project limits; therefore, this project would not result in a significant hazard involving such a site.

- e) *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?*

No Impact. There are no public airports within two miles of this site and there is no airport land use plan covering this area.

- f) *For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?*

No Impact. There are no private airstrips within the project vicinity.

- g) *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

No Impact. No public or private streets would be closed during or following project construction and this project would have no effect upon existing opportunities for emergency access/evacuation at Brea Plaza or to any surrounding land uses. The new Associated Road driveway connection in the northeastern corner of the proposed parking lot would provide an additional opportunity for emergency access and evacuation for Brea Plaza and the adjacent Mercury Insurance office complex.

- h) *Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildland are adjacent to urbanized areas or where residences are intermixed with wildlands?*

No Impact. There are no wildland conditions in this fully developed area.

VIII. HYDROLOGY AND WATER QUALITY

- a) *Violate any water quality standards or waste discharge requirements?*

No Impact. This project would not involve any activities that would be subject to waste discharge requirements administered by the Santa Ana Regional Water Quality Control Board (SARWQCB) and would not violate any water quality standards, as explained below.

Short-term surface water quality impacts could potentially occur during the grading and construction phases, for example, if runoff of loose soils and/or construction wastes and fuels occurs during a rainstorm that that is allowed to flow into local

storm drains and streets and/or the Loftus Channel. Such contaminated runoff could potentially threaten downstream water resources that receive runoff from the local drainage network. Significant water quality impacts during the construction phases will be avoided through compliance with the National Pollutant Discharge Elimination System (NPDES) regulations set forth under the federal Clean Water Act. Pursuant to the NPDES regulations, the contractor must obtain a General Construction Permit from the RWQCB. To obtain that permit, the contractor will submit a Stormwater Pollution Prevention Plan (SWPPP) that specifies best management practices (BMPs) to prevent storm water from contacting waste materials and other pollutants in the construction zones. BMPs will include erosion and sediment controls, runoff water quality monitoring, means of waste disposal, implementation of approved local plans, prevention and containment of accidental fuel spills or other waste releases, inspection requirements, etc. Compliance with the approved permit will ensure that this project does not violate any water quality standards or any waste discharge requirements during the construction phases.

Waste Discharge Requirements are issued by the Santa Ana Regional Water Quality Control Board under the provisions of Division 7, Article 4 of the California Water Code. These requirements regulate “point source” discharges of wastes to surface and ground waters, such as septic systems, sanitary landfills, dairies, etc. This project would have no point sources of wastewater discharge and thus would have no direct effect upon surface or ground waters.

Runoff from the proposed parking lot and the adjacent Plaza parking lot will be directed into a sloped “bio-swale” that will filter the runoff through vegetation and a subsurface sand filter as it flows into two outlet pipes that will discharge to the new flood channel box structure (see illustration of bio-swales in Exhibit 4). The bio-swale is being designed to treat runoff from a first flush storm, which typically contains higher concentrations of pollutants due to build up between storms. As a result, the water quality of runoff from the completed project site would be an improvement, compared to existing conditions where runoff from Brea Plaza is conveyed directly into structural drainage outlets that discharge to the open channel, without any interim filtration.

Please note that the bio-swale, and possibly other structural and non-structural water quality control measures will be incorporated into the site design and long-term maintenance program for this project. Such measures will be defined in a Water Quality Management Plan (WQMP), as part of the City’s routine plan check process. A WQMP is required as an element of the City’s Local Implementation Program

(LIP) under the countywide Drainage Area Management Plan (DAMP). City of Brea LIP requirements are set forth in Chapter 13.32 of the Brea Municipal Code. The DAMP was developed to implement the federal water pollution control requirements pertaining to municipal storm water drainage systems, pursuant to the National Pollutant Discharge Elimination System program mentioned earlier. It is possible that additional water quality filtration measures will be imposed by the Santa Ana Regional Water Quality Control Board, pursuant to its authority under Section 401 of the Clean Water Act, in conjunction with its review of plans for the new concrete box structure within the Loftus Channel. Implementation of the City-approved WQMP and any other water quality management measures imposed by the RWQCB will ensure that this project does not result in any significant sources of water pollution or violate any water quality standards.

- b) *Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?*

No Impact. There is currently little percolation of rainwater into the ground within the already developed eastern edge of the Brea Plaza, since most of this site is covered by impervious surfaces including parking lot surfaces, sidewalks and building rooftops. The project site is not within and does not support any groundwater production systems. This project would result in little change to this condition and would not affect ground water supplies or recharge. Since the proposed parking lot would be built atop a new concrete box drainage structure, it would have no effect upon ground water filtration or any ground water resources.

- c) *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?*

Less Than Significant Impact. This project is being designed to maintain the current west-to-east drainage flow and to direct all runoff from the project limits through a bio-swale system and then into the Loftus Channel box structure to be built prior to this project. Site runoff would be comprised almost entirely of materials found on impervious surfaces, with a negligible amount from landscape planters. As such, this project would not result in any erosion or siltation on or off-site.

- d) *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?*

Less Than Significant Impact. As noted in the previous response, this project would maintain the existing drainage pattern. The conceptual drainage plan includes handling runoff from the adjacent Brea Plaza, as well as the proposed parking lot, to safely collect and discharge runoff for a 100-year storm event, in accordance with the flood control design criteria established by the County of Orange. This project's drainage system is being designed to ensure that post-project runoff volumes discharged to the new Loftus Channel box structure do not exceed volumes under existing conditions. Site runoff would thus not increase the rate or amount of runoff downstream of the adjacent channel reach, and this project would not result in flooding on or off site.

- e) *Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?*

Less Than Significant Impact. As stated in the preceding response, this project would not increase the amount of runoff conveyed into the Loftus Channel; therefore, this project would not have a significant impact on the capacity of an existing or planned storm drainage system. Composition of runoff from the proposed building site would be identical to the composition of runoff from the existing building site. Runoff from the proposed parking lot would include the same water pollutants as runoff from the adjacent Brea Plaza parking lot, including dust, light trash, tire residues, and miscellaneous automotive waste materials such as dripping oil, air conditioner fluid, etc. from parked automobiles.

Runoff from the proposed parking lot and the adjacent Plaza parking lot will be directed into a sloped "bio-swale" that will filter the runoff through vegetation and a subsurface sand filter as it flows into two outlet pipes that will discharge to the new flood channel box structure (see illustration of bio-swales in Exhibit 4). The bio-swale is being designed to treat runoff from a first flush storm, which often contains higher concentrations of pollutants due to build up of pollutants on impervious surfaces between storms. As a result, the water quality of runoff from the completed project site would be an improvement, compared to existing conditions where runoff from Brea Plaza is conveyed directly into structural drainage outlets that discharge to the open channel, without any interim filtration.

- f) *Otherwise substantially degrade water quality?*

No Impact. Operation of the proposed commercial building and parking lot would not include any activities that would generate discharges to surface or ground water, except for storm water runoff addressed in prior responses.

- g) *Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?*

No Impact. This project does not affect any existing housing and does not propose any new housing.

- h) *Place structures within a 100-year flood hazard area that would impede or redirect flood flows?*

No Impact. The proposed commercial building sites are not within a flood hazard area. Currently, the Loftus Channel is within a FEMA-designated 100-year flood hazard area, and is within the City's Floodplain Overlay Zone. Once the new concrete box structure is built within Loftus Channel, the flood hazard in this reach of the channel will be eliminated.

- i) *Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?*

No Impact. The proposed building sites are outside of the potential inundation area of the Carbon Canyon dam and there are no levee structures in this area.

- j) *Inundation by seiche, tsunami, or mudflow?*

No Impact. Located miles inland from the Pacific Ocean, there is no part of Brea that could be exposed to a tsunami hazard. There are no water bodies or water storage facilities in this area that could overtop and flood this site in the event of seismically induced seiche conditions. There is no source of mudflows on or near the project site.

IX. LAND USE AND PLANNING

- a) *Physically divide an established community?*

No Impact. The proposed commercial buildings would be located entirely within the eastern edge of the developed Brea Plaza. The proposed parking lot would be built atop a new concrete box within the existing right-of-way of the Loftus Channel. This project would have no effect on the land use or circulation pattern in the surrounding community.

- b) *Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the LRDP, general plan,*

specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. The proposed commercial building redevelopment site is designated as “General Commercial” in the Brea General Plan Land Use Element and is zoned “General Commercial/Precise Development Permit.” This project is consistent with these land use regulations. Construction of a parking lot is permitted in the City’s Floodplain Overlay Zone, pursuant to a Conditional Use Permit. The proposed lot would be built atop a new concrete box structure that would eliminate the existing flood hazard in this reach of the channel. This project would not, therefore, conflict with any land use plans, policies or regulations established to avoid or mitigate an environmental effect.

- c) *Conflict with any applicable habitat conservation plan or natural community conservation plan?*

No Impact. The project site is in a fully urbanized part of Brea that is not covered by any kind of conservation plan.

X. MINERAL RESOURCES

- a) *Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?*

No Impact. This site was developed about 30 years ago with the existing commercial center and flood control channel. There are no mineral extraction or processing facilities on or near this site.

- b) *Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?*

No Impact. The Brea General Plan Land Use Element does not identify any portion of the project site or surroundings as an important mineral resource recovery site.

XI. NOISE

- a) *Exposure of persons to or generation of noise levels in excess of standards established in any applicable plan or noise ordinance, or applicable standards of other agencies?*

Less Than Significant Impact. Businesses that could occupy the proposed commercial buildings would be limited to those that operate entirely indoors; thus, no noise impacts due to outdoor activities would occur. There are no noise sources in this area that would be incompatible with retail and various commercial uses that

could occupy the proposed commercial buildings. A doubling of traffic volumes is required to raise street noise to a noticeable level. This project would result in a minor increase in local traffic volumes, estimated at less than two percent of daily volumes along Imperial Highway and less than nine percent of existing daily volumes on Associated Road. Project-related traffic, therefore, would not result in a significant noise impact at any of the homes in the Glenbrook community.

Typical parking lot noises would occur in the proposed parking lot on a regular basis, as customers and employees arrive and depart. Such noise would include car doors slamming, cars starting, cars accelerating away from the parking stalls, car alarms being activated, brake squeal, and suspension squeal when vehicles pass over speed bumps. These noises would occur during day and night hours, each day of the week, coinciding with the open hours of operation of the tenants within the two proposed buildings. Traffic noise along Associated Road is likely to be more noticeable to nearby residential uses than the noise in the new parking lot. There would be occasional and less than significant noises associated with the operation of large trash disposal trucks and the clamor of loading and unloading trash dumpsters to be located in the proposed new parking areas. Noise from activities within the proposed parking lot would have a minor and insignificant effect upon the local noise environment and would not increase noise levels above City standards for any surrounding land uses.

b) *Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels?*

No Impact. Some minor and localized ground vibration would occur in conjunction with jack hammering to demolish the existing pavement and building foundation within the proposed building site. This would not result in any significant ground borne vibration on or off-site. The noise from jack hammers could be discernible off-site, and would probably reach the nearest homes along the east side of Associated Road. This noise would occur only during the short period of time associated with the demolition of the existing commercial building and adjacent pavement areas and only during normal day time construction hours permitted by the City of Brea. Given the shallow excavation required for this project, there will be no need for any pile drivers or other heavy machinery that involves substantial ground vibration and noise to break up extremely hard materials. No significant ground borne noise impacts would occur during construction.

There are no elements of the completed proposed parking lot or commercial building improvements that would generate ground borne vibration or noise.

- c) *A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?*

Less Than Significant Impact. As explained in the previous response to item a, this project would not result in significant noise generating activities and would have a less than significant effect on ambient noise levels.

- d) *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?*

Less Than Significant Impact. During the demolition and construction phases, local noise levels would increase due to operation of a variety of construction machinery and vehicles. With shallow excavation requirements within existing fill materials, and a standard wood-frame building structure, the proposed commercial building improvements would not require the use of any unusually noisy construction equipment. Construction of the parking lot atop a new concrete box structure within Loftus Channel would involve typical machinery used to establish asphalt parking lots, install drainage and electrical connections, pouring and finishing concrete curbs and planters, and installing landscaping and irrigation systems.

Noise from temporary construction activities is exempt from the restrictions set forth in the City's Noise Ordinance, provided that the construction does not take place between the hours of 7 pm and 7 am on weekdays and Saturdays, or at any time on Sunday or a federal holiday. Compliance with these restrictions is required for all projects in the City of Brea, as a condition of issuance of grading and building permits. City inspectors will monitor construction to ensure, among other things, that the time restrictions are fully observed. Temporary noise impacts during the construction phases would be less than significant.

Indoor activities within the completed commercial building would not generate outdoor noise and would thus have no temporary or periodic impact. Daily activities within the proposed parking lot would be limited to vehicular arrivals and departures and people walking to/from their cars. This would not result in significant periodic noise increases.

- e) *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*

No Impact. There is no public airport within two miles of this property, and this site is not within an area governed by an airport land use plan.

- f) *For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?*

No Impact. There are no private airstrips within the vicinity of this property.

XII. POPULATION AND HOUSING

- a) *Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?*

No Impact. This project does not include any housing and would not require any new or expanded infrastructure that could support new growth.

- b) *Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?*

No Impact. There is no housing within Brea Plaza or the Loftus Channel.

- c) *Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?*

No Impact. There are no people living on the project site.

XIII. PUBLIC SERVICES

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services?

- a) *Fire Protection?*

No Impact. There will be a need for fire department plan checking service and there may be a need for response to a fire at some time, but this will not require addition of any personnel or construction of any new fire department facilities. Since this project is an expansion to an existing commercial center at the intersection of two major thoroughfares in the urbanized part of the city, it would not affect fire department response times.

b) *Police Protection?*

No Impact. The police department will also be involved in reviewing project plans and may need to respond to criminal activities or other public safety needs at some time. These services would not require the addition of any personnel or the construction of any new police department facilities. Since this project is an expansion to an existing commercial center at the intersection of two major thoroughfares in the urbanized part of the city, it would not affect police department response times.

c) *Schools?*

d) *Parks?*

No Impact (c-d). The proposed commercial building and the proposed parking lot would not provide any housing; this project would not, therefore, generate a demand for public schools or parks. No existing or planned parks or school sites would be affected by this project.

.e) *Other public facilities?*

No Impact. Review of project plans by City planning, engineering and building and safety staff would not require the addition of any personnel or construction of any new administrative facilities. No other public services or facilities are required to support the proposed commercial space or the proposed parking lot.

XIV. RECREATION

a) *Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?*

No Impact. The proposed commercial buildings and the proposed parking lot would not provide any housing; this project would not, therefore, generate a demand for parks or other recreation facilities. No existing or planned parks or school sites would be affected by this project.

- b) *Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?*

No Impact. There are no recreational elements in this project and as noted in the previous response, this project would have no effect on any parks or recreation facilities.

XV. TRANSPORTATION/TRAFFIC

Responses concerning traffic congestion and parking impacts are based on the results of a detailed traffic and parking impact study prepared by Kimley-Horn and Associates, Inc., in accordance with the City's impact significance criteria and traffic forecasts developed with the City of Brea Traffic Model. That report is contained in Appendix B of this Initial Study.

Would the project:

- a) *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)?*

Less Than Significant Impact. Based on the project's estimated trip generation and distribution and in consideration of existing traffic patterns associated with Brea Plaza, it was determined that six intersections along Imperial Highway, between State College Boulevard and Kraemer Boulevard, and two along Associated Road, north of Imperial Highway, could be significantly impacted by this project's traffic. As shown on Figure 4 in the traffic study, this includes five signalized intersections, two unsignalized entrances to the Plaza, and one new unsignalized Plaza entrance. These signalized intersections, along with the existing and proposed unsignalized Plaza entrances, were analyzed in the traffic impact study. Peak hour traffic counts conducted in June and December 2007 determined that the signalized Imperial Highway intersections currently operate at Level of Service (LOS) A or B in the AM peak period and C or D during the PM peak period. The two unsignalized Plaza entrances currently operate at LOS A or B in the morning and B or C in the afternoon peak period. These levels of service indicate sufficient flow with minor delay at each location.

Traffic capacity improvements at the intersection of Imperial Highway/Associated Road are scheduled for construction in 2008. These improvements will include restriping the southbound leg of the intersection to provide two left turn lanes, one through lane and one right-turn lane, plus adding a fourth westbound through lane. No right-of-way is required along the project site frontage to implement these

improvements. This project, funded through the City's traffic Nexus Fee program, will improve traffic flow and the level of service through this intersection.

The traffic study determined that this project would generate a net increase of approximately 1,000 trips/day, including 85 trips in the AM peak hour and 93 trips in the PM peak hour. These volumes account for the unique traffic-generating characteristics of the proposed drive-thru Starbucks, based on actual counts taken at a similar Starbucks in a commercial center location at the corner of Imperial Highway and Valencia Avenue, in Brea.

Results of the traffic study indicate that the project-related traffic would not significantly affect the levels of service at any of the study area intersections, in the short term (at opening year) or in the long-term (approximately 2030). In both scenarios, the project traffic would not worsen the LOS, and would not increase the intersection capacity utilization (ICU) by more than one percent. It is noted that in the long range scenario, project traffic would result in an increase in vehicle delay at the intersection of Imperial Highway and Associated Road by about nine seconds, adding further delay to a projected LOS F condition, which indicates substantial congestion. This is a cumulatively considerable impact that will be mitigated to less than significant through payment of the project's required traffic nexus program fee, in accordance with City Ordinance No. 966. Monies from this impact fee program are allocated to improvements throughout the City's transportation network, on an as-needed basis that is prioritized by the City Council through its budgeting process.

- b) *Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?*

Less Than Significant Impact. Three of the study area intersections are within the Orange County Congestion Management Program (CMP) network, where the CMP establishes level of service E as the performance standard. These intersections are:

- Imperial Highway/SR 57 northbound ramps/Brea Plaza
- Imperial Highway/SR 57 southbound ramps
- Imperial Highway/State College Boulevard

The traffic impact study determined that this project's peak hour traffic, in the near term and in the long term, would not worsen the projected level of service at any of these intersections, and would increase the ICU by one percent or less at each

location. Project impacts on the CMP network, therefore, would be less than significant.

- c) *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?*

No Impact. The proposed commercial buildings would range from 26 to 43 feet high and the pole-mounted lights within the proposed parking lot would be approximately 20 feet high. These low-scale improvements would not encroach into any air traffic space and this relative small-scale project would have no effect on air traffic volumes or patterns.

- d) *Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*

No Impact. This project does not propose or require any changes to the configuration of existing roadway or driveway entrance geometrics on Imperial Highway or Associated Road. The proposed driveway connection to Associated Road at the northeast corner of the site will provide adequate sight distance to allow for safe entry and exit movements. This was determined as part of the traffic study, through an analysis in accordance with the intersection sight distance standards established by the American Association of State Highway and Transportation Officials (AASHTO)². This project would generate a minor increase in passenger vehicles and light truck traffic, typical of the mix of traffic that already occurs in this area. Road traffic hazards would not increase due to any design features or incompatible uses.

- e) *Result in inadequate emergency access?*

Less Than Significant Impact. Temporary closures of the Imperial Highway entrance near Associated Road, and the Associated Road entrance, would occur during the construction phases. Only one of the two driveways would be closed at any point in time; thus there will be at least two driveways available for emergency access to Brea Plaza, throughout the construction program. The construction plan includes completion of the new drive entrance in the northeast corner of the site within the first four months after construction begins. This will provide an alternate for the existing Associated Road access while it is being reconstructed over the new channel box structure. Work in the Loftus Channel and the adjacent portion of Brea Plaza would not affect emergency access to any other properties. Temporary lane closures along the Imperial Highway or Associated Road frontages are not anticipated at this time. If such a temporary lane closure is deemed necessary for

² AASHTO, *Geometric Design of Highways and Streets, Chapter 9 – Intersections (Intersection Sight Distance)*, 2001.

some limited construction activity, the contractor must coordinate with Caltrans District 12 and the City, to ensure provision of appropriate signage and temporary traffic control measures to maintain adequate emergency access and avoid disruption of through traffic.

This project would have no permanent effect on emergency vehicle access to Brea Plaza or any surrounding properties. A new driveway connection to Associated Road, in the northeastern corner of the proposed parking lot, would provide an additional opportunity for emergency access for both the Brea Plaza and the adjacent Mercury Insurance office campus. The proposed commercial buildings would be readily accessible by fire trucks, emergency medical crews and police department patrol units.

f) Result in inadequate parking capacity?

Less Than Significant Impact. Construction crews and staging areas will be located on site, i.e. within the eastern edge of Brea Plaza, in all construction phases; therefore, there would be no impact on parking located on other properties or along any public streets. Since the Al & Ed's store, photo shop and other tenant spaces in the northeastern Plaza area are vacant, the parking spaces within the proposed construction limits are not fully utilized at this time. Access to parking spaces along the store fronts immediately west of proposed two-story building "U" would be maintained throughout this project's construction phases. As portions of the new parking lot atop the channel box structure are completed, more area for parking will be available for construction crews and staging areas, reducing the need for parking spaces within the nearby Plaza area. The impact of construction crew parking and materials staging/storage areas, therefore, is not expected to be significant.

There are presently 633 total surface parking spaces within the Brea Plaza, serving of a mixture of 147,537 sf of retail, movie theater, restaurant, bank and office businesses. This is a ratio of 4.38 spaces/1,000 sf of building space, compared to the City's Development Code standard of 5.5 spaces/1,000 sf for shopping centers. Existing parking capacity is thus 162 short of the 795 required by the City's Development Code. This shortfall is currently offset through a reciprocal parking/access agreement with Mercury Insurance, that allows use of up to 116 parking spaces on the adjacent Mercury office campus site by customers and employees at Brea Plaza, if not occupied by Mercury employees.

This project would increase the total building area in the Plaza to 158,742 sf. This mixture of retail, food services, office and miscellaneous commercial uses would require a total of 875 parking spaces, under the City's Development Code. With the additional parking to be provided atop the new concrete box structure in the Loftus Diversion Channel, this project would increase total parking within the Plaza to 766 stalls, improving the ratio to 4.83 spaces/1,000 sf building area.

It has long been recognized that in mixed-use centers such as Brea Plaza, there are shared parking synergies that exist between different businesses whose peak operating times are at different times of the day. A good example of such synergy involves offices and theater uses. When the office parking demand is at 100 percent (between 10 and 11 AM on a weekday), the theater parking demand is at zero percent. Conversely, when the theater demand is at 100% (8 pm to 11 pm on a weekend night), there is virtually no office demand. At Brea Plaza, retail parking demand peaks between noon and 8 pm on weekdays and between 1 PM and 6 PM on weekends, while restaurant demand peaks between 11 AM and 3 PM and between 6 PM and 11 PM on weekdays, and between Noon and 3 PM and between 6 PM and midnight on weekends.

Applying shared parking needs for various commercial uses at the Plaza results in a total peak demand of 589 spaces, for the months of January through November (see "ULI Shared Parking Analysis" in the Traffic and Parking Impact Study, Appendix B). For this large majority of the year, therefore, there will be more than sufficient parking spaces available within the Plaza (766 provided less 589 demand = surplus of 177). Parking demand increases sharply during the busy shopping periods in December, with a peak demand forecast of 768 spaces on a weekday, and up to 797 spaces between 2 PM and 3 PM on a weekend. With 766 proposed spaces, the proposed plan is two short of the projected demand for a December weekday, and 31 short of the peak demand on a weekend afternoon. As noted earlier, there are an additional 116 spaces available in the adjacent Mercury Plaza parking area that could be used by employees and patrons at Brea Plaza. Since the proposed parking supply will be more than sufficient for a vast majority of the year and there are overflow spaces available on the adjacent Mercury property, this project would not result in significant parking impacts. In fact, the increased number of spaces and the higher ratio of spaces to building area will be an improvement over existing conditions.

- g) *Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?*

No Impact. There are no existing or planned bicycle, bus, train, or other alternative transit facilities within or adjacent to the proposed project site. A meandering sidewalk is proposed within the parkway along the entire Associated Road frontage. This will improve pedestrian access to Brea Plaza.

XVI. UTILITIES AND SERVICE SYSTEMS

- a) *Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?*

No Impact. Wastewater generated by tenants within the proposed commercial buildings would consist of the same substances generated by other retail and food service businesses in the Plaza and would not require any new methods of wastewater treatment. This project would thus have no effect, relative to compliance with wastewater treatment requirements.

- b) *Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?*

No Impact. This project would result in a minor increase in water demand and wastewater generation, due to additional interior plumbing fixtures in the two buildings and additional irrigation for the new landscape areas. Connections to existing water supply and wastewater collection facilities within Brea Plaza will satisfy this demand. No new or expanded water or wastewater treatment facilities would be required for this project. Nonetheless, this project, like other new development projects, must pay connection fees to Orange County Sanitation District (OCSD) and to the City of Brea, prior to issuance of building permits, to help fund continuing improvements to the wastewater collection and treatment systems. This project is also subject compliance with City of Brea Ordinance 967, which requires payment of fees to help fund upgrades to the City's water supply and distribution infrastructure that are necessary to meet the expanding water demands attributable to new development.

- c) *Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?*

Less Than Significant Impact. The proposed storm drainage system is being designed to handle existing runoff from the Plaza, plus the additional runoff from the new parking lot surfaces, in accordance with City and County flood control criteria for a 100-year/24 hour design storm. Site runoff will be conveyed via sheet flow and

underground pipes through 12 to 14-foot wide bio-swales to filter pollutants prior to discharge into the new Loftus Channel concrete box structure. Rates and volumes of runoff into the channel will not exceed existing drainage conditions and would not, therefore, have any effect on the capacity of downstream drainage facilities. As previously discussed in the responses to items VIII. a, c, d and e, the proposed storm drainage system would not result in significant water quality impacts.

- d) *Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?*

No Impact. This project would result in a minor increase in the volume of water demand generated at Brea Plaza. This includes the new commercial space demand for interior water and wastewater needs, and irrigation of the parking lot and Associated Road parkway landscaping elements. Meeting this water demand would not require acquisition of additional water supply entitlements or other water supply resources.

- e) *Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?*

No Impact. The increased volume of wastewater generated within the proposed commercial building space would not exceed the Orange County Sanitation District's regional wastewater treatment capacity.

- f) *Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?*

Less Than Significant Impact. A majority of the non-hazardous solid wastes generated in the Brea area that require landfill disposal are taken to the County of Orange-operated Olinda-Alpha landfill, located near the eastern limits of the City of Brea. This facility currently receives an average of about 7,000 tons of municipal, non-hazardous solid wastes each day. It does not accept a variety of common waste materials, including:

- o Asbestos, batteries, brake lining, chemicals and fuel tanks
- o Mufflers, paints, poisons, hazardous wastes and animal parts
- o Body parts, medical wastes, radioactive material
- o Auto body shredder wastes, fuels, heavy metals
- o Explosives, pesticides, contaminated soils
- o Liquid waste (moisture content 50% or greater)
- o Nuisance dust

- o Chemically treated wood waste (railroad ties, telephone poles, lumber for fencing, decking, playground equipment, etc.)
- o Tires

The County is evaluating the costs and benefits of expanding Olinda Alpha Landfill and extending its permitted operating life to approximately the year 2021 (current permit expires in 2013). As currently proposed, horizontal expansions would begin in 2014-2015, and vertical expansion would begin in 2016.

Demolition of the existing commercial buildings and construction of two new buildings, parking lot and landscaping improvements will generate a variety of solid waste materials that could be disposed of at a landfill. This would include miscellaneous building materials, plastic and metallic piping, asphalt, concrete, green waste. Contractors must divert as much of this waste as they can through recycling and re-use, pursuant to City Ordinance No. 1097. The completed commercial buildings would generate relatively small volumes of solid wastes typical of retail, food services and possibly office businesses that would also require landfill disposal. Businesses that generate significant volumes of wastes that cannot be disposed of at a landfill would not be permitted on site, given the City's zoning regulations that restrict such uses and the incompatibility of such uses within the context of Brea Plaza and nearby residential neighborhoods. The relatively minor volumes of construction and long-term solid wastes that would be generated by this project would not result in early closure of the Olinda-Alpha or any other landfill that may receive the wastes.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

No Impact. Construction contractors are obligated by law to observe and comply with all applicable statutes governing collection and disposal of waste materials, and City inspectors will be observing construction activities to help ensure that proper waste disposal is implemented. Solid wastes generated by tenants of the proposed commercial building would be disposed of in the same manner as solid wastes currently generated throughout Brea Plaza, involving regular trash disposal service by Brea Disposal Company. The completed, operational parking lot would not generate any waste materials beyond whatever minor amounts of trash may be discarded by people using the parking lot. This project would have no effect upon the County's operation of its landfill system, would not conflict with the City's solid waste disposal program, and would not result in any violations of federal, state or local statutes pertaining to solid waste disposal.

XVII. MANDATORY FINDINGS OF SIGNIFICANCE

- a) *Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?*

Less Than Significant Impact. Based on the findings of the entire Initial Study, this project does not have the potential to degrade the quality of the environment. It would result in no impact to any important biological, cultural or paleontological resources, and the change in visual character and quality of the site would not result in a significant aesthetic impact.

- b) *Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)*

Less Than Significant Impact. As discussed throughout this Initial Study, this project would not result in any significant short-term or long-term environmental effects. All of the permanent impacts will be limited to the area of the project site itself, except for minor additional vehicular traffic that would primarily affect the adjacent segments of Imperial Highway and Associated Road. The traffic impact study prepared for this Initial Study determined that the project’s traffic increase would not result in any significant congestion or safety impacts. The traffic study considered the cumulative effects of existing traffic volumes, plus the project’s net increase, plus increases due to continuing growth in the area.

This project will be built concurrently with construction of a concrete box structure within the Loftus Channel. The box structure will maintain the channel’s flood control capacity and function, while providing a surface upon which the proposed parking lot and a portion of the Associated Road landscape frontage is to be built. As previously noted in the discussion of traffic impacts in the response to Checklist item XV.a, traffic flow improvements are scheduled for completion before the end of 2008 at the intersection of Imperial Highway/Associated Road. Construction of the early phases of the proposed project, involving parking lot improvements and demolition of existing structures, will likely overlap with some of the intersection improvement work. Construction crew parking and staging/storage areas for the proposed project will be located entirely within the Plaza and flood channel area, and would not

conflict with the traffic improvement work at the intersection of Imperial Highway and Associated Road. No other private or public development projects are planned, have been approved or are underway in this vicinity; therefore, this project would not contribute to any significant cumulative impacts involving other new development or public facilities projects. The nearest proposed project of significance is a pending expansion of the Brea Mall to add 200,000 of store and restaurant space plus a new parking structure. That project, located on the west side of SR 57, has not been approved by the City. Construction of the mall expansion is expected to occur sometime after the proposed project is completed. An environmental impact report is being prepared to assess the impacts of the mall expansion, including cumulative impacts involving the effects of past, present and reasonably foreseeable future projects.

- c) *Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?*

Less Than Significant Impact. This Initial Study has not identified any significant, adverse effects on human beings, during any of the construction phases, or over the operating life of the project. No further investigations or analyses are warranted to confirm this conclusion.

XVIII. SUMMARY OF MITIGATION MEASURES IDENTIFIED IN INITIAL STUDY

1. Construction Emissions Control Measures

Dust Control

- Pre water site prior to grading.
- Water during soil disturbance grading.
- Maintain soil moisture at 12% or more.
- Install wind fencing around perimeter.
- Maintain disturbance area as small as practical.
- Apply water periodically to form a stable crust on storage piles.
- Add non-toxic chemical dust suppressants to water applications.
- Load in/out material on the leeward (downwind) side of the pile.
- Construct a paved 50-foot access apron from any public street.
- Wash/sweep the public street within 30 minutes of visible track-out.
- Apply a four inch gravel surface to any equipment staging or construction employee parking area.
- Apply dust suppressants to the gravel surface in the staging area.
- Pave the construction employee parking area.

Exhaust Emissions Controls

- Conduct 90-day low-NOx tune-ups for off-road equipment.
- Limit idling to 5 minutes for trucks and heavy equipment.
- Use Tier 3-rated diesel engines during demolition and grading for any off-road equipment exceeding 100 horsepower, if available.
- Utilize diesel oxidation catalysts, if available.
- Utilize CARB-certified diesel particulate filters on heavy off-road equipment if such filters are reasonably available.

2. Protect Possible Archaeological Resources

If potential archaeological materials are uncovered during grading, the contractor shall be required to halt work in the immediate area of the find, and to retain a professional archaeologist to examine the material to determine whether it is a “unique archaeological resource” as defined in Section 21083.2(g) of the State CEQA Statutes. If this determination is positive, the scientifically consequential information shall be fully recovered by the archaeologist. Work may continue outside of the area of the find; however, no further work shall occur in the immediate location of the find until all information recovery has been completed and a report concerning same is filed with the City Planning Department.

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State of California, Water Resources Control Board, *List of Active Cease and Desist Orders and Cleanup/Abatement Orders*, April 2008.

Appendix A: Geotechnical Report

Prepared by Pacific Soils Engineering, Inc., dated January 25, 2008.



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CALIFORNIA BREA PARTNERS, LP
C/O BOSC Equities
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March 26, 2008
Work Order 500690

Attention: Mr. Marc Harris

Subject: **PRELIMINARY GEOTECHNICAL INVESTIGATION**
Proposed Storm Drain Improvements for the
Loftus Diversion Channel and the Brea Plaza Shopping Center
Northwest Corner of Imperial Highway and Associated Road
City of Brea, California

References: Appendix A

Gentlemen:

Pursuant to your request, attached here with is Pacific Soils Engineering, Inc. (PSE) preliminary geotechnical investigation for the storm drain improvements on the Loftus Diversion Channel and the associated improvements of the Brea Plaza shopping center. The channel is located on the northwestern corner of Associated Road and Imperial Highway in the City of Brea. It is a southerly draining feature that runs westerly adjacent to Associated Road and extends underneath Imperial Highway via a reinforced concrete box structure. Currently, the Loftus Diversion Channel is an open earthen trapezoid with 2:1 (horizontal: vertical) banks that extend roughly 15 to 20 feet below adjacent grades. PSE understands that this portion of the existing channel was constructed approximately 35 years ago in conjunction with the grading for the Brea Plaza shopping center. A four-lane bridge currently provides access over Loftus Channel from Associated Road to the Brea Plaza.

Based on plans provided by Hunsaker and Associates, the channel improvements will entail construction of a 55-foot wide, four (4) cell reinforced concrete box culvert in the area of the existing open channel. The improvements will extend northerly from Imperial Highway for roughly 900± lineal feet. Based on preliminary site plans prepared by Hunsaker and Associates, once the box culvert construction is complete, additional improvements will be constructed for

the Brea Plaza shopping center. These improvements will consist of landscape, new parking, driveways, and the grading of a new commercial building pad (approximately 8,500 square feet).

In preparing this investigation, PSE has drilled a total of thirteen (13) borings and advanced ten (10) cone penetration test (CPT) soundings in the channel area and the adjacent shopping center.

Seven (7) of the borings and seven (7) of the CPT's are located within or near the channel.

These borings extend to a maximum depth of up to 51.5± feet. Based upon PSE's field and laboratory testing, the proposed improvements are feasible from a geotechnical viewpoint.

Several key issues should be considered with regard to site grading and development:

- The near-surface soils will range from "Low" to "High" in expansive potential. Improvements founded on these soils may be subject to movements caused by the volume changes within these soils. Several measures to mitigate these detrimental effects are provided herein.
- The near surface soils consist of cohesive soils that are saturated, compressible, and potentially expansive, and are not considered suitable for support of the proposed development in their present state. Measures to improve the soil support characteristics are provided herein.
- Left-in-place saturated alluvium will undergo time dependent settlement as a result of the proposed embankment loads. The amount of settlement and the associated time for the completion of primary settlement may impact the timing of surface improvement construction. Various options have been provided in this document to address this issue.
- Surface water is present in the channel bottom. Saturated soils will likely be encountered during remedial grading of the box culvert. Dewatering and top loading will be likely be necessary during grading for excavations within the channel. The existing native soils may be saturated and require processing, (drying and/or mixing) prior to reuse as engineered fill.
- Testing of the chemical properties of the on site soils indicate that they are "corrosive" to ferrous metals.

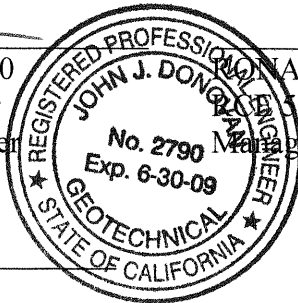
Future development plans should be reviewed and the recommendations provided herein may need to be modified. Additional subsurface exploration may be necessary to provided additional foundation design recommendations. Actual site conditions will vary and modifications to the recommendations presented herein may be required based upon conditions exposed during grading. Addressing environmental issues is outside the scope of work performed by PSE.

We at Pacific Soils Engineering, Inc., appreciate the opportunity to be of service to you and your organization. Should you have any questions or require additional information, please do not hesitate to contact the undersigned at (951) 582-0170.

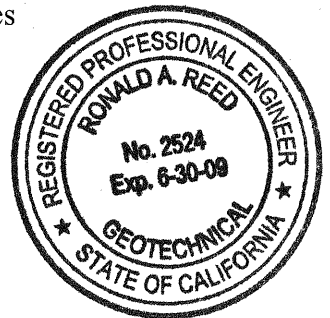
Respectfully submitted,
PACIFIC SOILS ENGINEERING, INC.

Reviewed by:

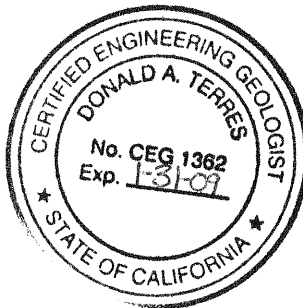

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Appendix A - References

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Appendix C - Laboratory Testing

Appendix D - Borings Logs and Laboratory Testing by Others

Appendix E - Probabilistic Seismicity Analysis

Appendix F - Summary of Cone Penetration Test Data, Kehoe Testing and Engineering

Appendix G - Earthwork Specifications and Grading Details

ATTACHMENTS:

Plate 1- Geotechnical Map

Plate 2- Geologic Cross Sections

1.0 INTRODUCTION

1.1 Purpose

The purpose of this report is to provide preliminary geotechnical recommendations for the initial design and construction of the reinforced concrete box culvert and the associated improvements to the Brea Plaza shopping center in the vicinity of the channel.

1.2 Scope of Study

The scope of our study included the following tasks:

- Reviewing available geologic and geotechnical data pertinent to the site, including readily available geotechnical reports.
- Geotechnical logging and sampling thirteen (13) hollow-stem auger borings.
- Conducting laboratory testing to evaluate general engineering properties of the on-site subsurface materials.
- Advancing ten (10) Cone Penetration Test (CPT) soundings at or near the site to depths of up to 51.5± feet below the ground surface.
- Preparation of cross-sections A-A' through F-F' (Plate 2) depicting the assumed geologic contacts.
- Presenting site-grading recommendations, including remedial grading and retaining wall and utility trench backfill criteria.
- Providing preliminary recommendations relative to the design of the proposed box culvert, retaining walls, foundations for commercial structures, flatwork, and asphalt concrete pavement.
- Evaluating groundwater conditions and the potential effects on the proposed construction.
- Settlement analysis of the proposed box culvert and associated surface improvements.
- Compiling a limited seismicity study.
- Preparing this report, which presents this firm's findings, conclusions, and recommendations to be used in the preliminary design of the proposed development.

1.3 Report Organization

This report has been organized to summarize geologic and geotechnical data and to present preliminary remedial grading and design recommendations. Subsurface exploration logs, laboratory test procedures and results, and data developed during this study have been utilized in our analyses and selected data is presented in this document.

The main text of this report is divided into the following sections: Introduction, Project Description, Field Investigation and Laboratory Testing, Geologic Conditions, Material Properties, Geotechnical Conclusions and Recommendations Design Recommendations, and Closure. Included in this report are the following appendices:

Appendix A - References

Appendix B - Subsurface Exploration

Appendix C - Laboratory Testing

Appendix D - Boring Logs and Laboratory Testing by Others

Appendix E - Probabilistic Seismicity Analysis

Appendix F - Summary of Core Penetration Test Data – Kehoe Testing and Engineering

Appendix G - Earthwork Specifications and Grading Details

1.4 Report Limitations

The conclusions and recommendations in this report are based on the data developed during this study and on the proposed development plan as reflected on the preliminary channel construction plans and the enclosed Preliminary Grading Plan. Changes to the plans or development scheme will necessitate further review and analyses.

It should be noted that this study focused on the evaluation and analysis of the geotechnical conditions of the subject site. Investigation or assessment of the

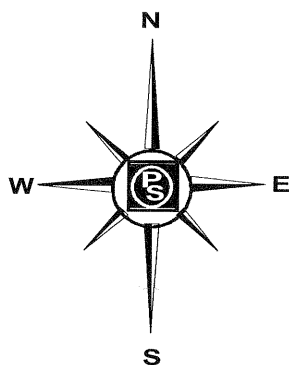
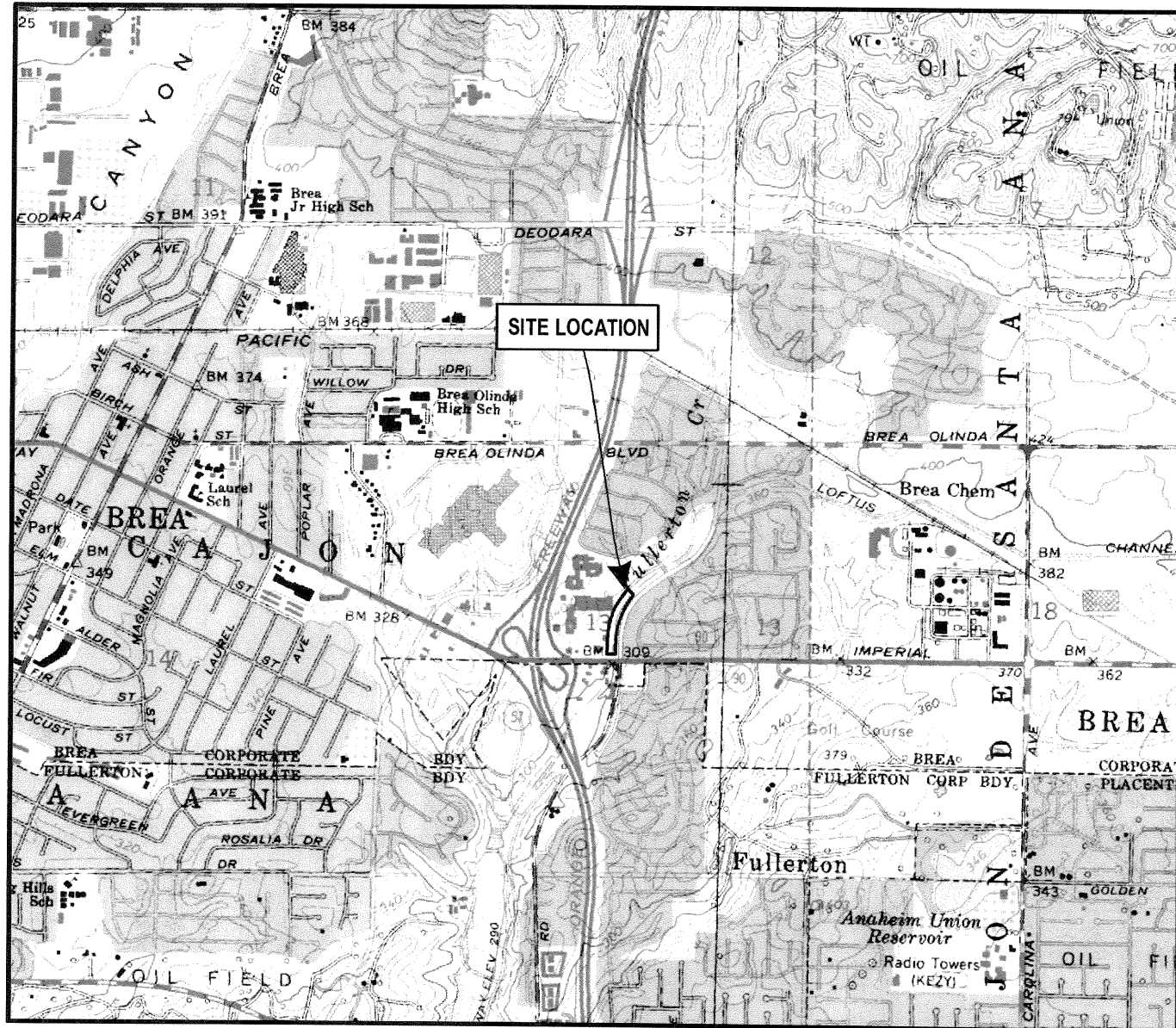
potential presence of toxic or hazardous substances is beyond the scope of our services.

2.0 PROJECT DESCRIPTION

2.1 Location and Existing Conditions

The subject channel improvements and associated Brea Plaza improvements are to be located northwesterly of Imperial Highway and Associated Road in the City of Brea (Figure 1, Site Map). The Loftus Diversion Channel is a southerly draining man-made feature that runs westerly adjacent to Associated Road and extends underneath Imperial Highway via a reinforced concrete box structure. Currently, the Loftus Diversion Channel is an open trapezoid with earthen 2:1 (horizontal:vertical) banks that extend roughly 15 to 20 feet below adjacent grades. Access roads exist on both sides of the channel. The bottom of the channel is unlined whereas some revetment exists along portions of the earthen channel walls. An existing reinforced concrete box structure provides for four-lane access road connecting Brea Plaza to Associated Road.

The Loftus Diversion Channel (County of Orange Facility Number A06) was first constructed in 1955, and starts at Voyager Avenue, crossing beneath Imperial Highway and draining into the reservoir constructed behind the U.S. Corps of Engineers' Fullerton Dam located in Craig Regional Park. The Brea Plaza was constructed between 1975 and 1976. Prior to construction of the Brea Plaza, the Loftus Diversion Channel was confined on the westerly side by a berm, and access roads may have been located along this berm. Associated Road and a descending slope confined the channel on the easterly side. It is our understanding that this portion of the channel was constructed to its current configuration as part of the construction of Brea Plaza. Additional improvement were completed to the channel in 1980, including the construction of concrete drop structures located upstream of the site, improvements to the culvert crossings, and placement of additional revetment along the channel sides.



SITE LOCATION MAP LOFTUS DIVERSION CHANNEL IMPROVEMENT

FIGURE 1

SOURCE MAP -
LA HABRA & YORBA LINDA QUADRANGLES
SCALE 1"= 2000'



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2.2 Proposed Development

Based upon the 40-scale Preliminary Grading Plan prepared by Hunsaker and Associates, it is proposed to construct a new ten (10) foot high by fifty-five (55) foot wide, four-cell, reinforced concrete box culvert in the existing Loftus Diversion Channel. The flow line of the box structure would be placed near the current flow line of the existing channel. The box culvert will have a few feet to as much as seven (7) feet of cover.

Improvements to the Brea Plaza will be constructed atop and adjacent to the box culvert, including a new (roughly 8,540 square foot) commercial building, parking lots, driveways, landscaped areas, and related storm-water management improvements.

3.0 FIELD INVESTIGATION AND LABORATORY TESTING

3.1 Current Field Investigation

Thirteen (13) hollowstem auger borings were drilled at the site to depths between 21± and 51.5± feet below the existing ground surface as part of the current investigation. The borings were logged by a representative of this firm and selected soil samples were collected. Upon reaching the groundwater, drilling was suspended so measurements of the groundwater levels could be taken. Logs of these borings are presented on Plates B-1 through B-13 in Appendix B. Ten (10) CPT soundings were advanced to depths of up to 50± feet below the ground surface. Data from the CPT soundings are included in Appendix F. The locations of these borings and CPT soundings are shown on Plate 1.

3.2 Laboratory Testing

To assist in evaluating the geotechnical properties of the onsite materials, laboratory testing was performed on relatively “undisturbed” ring and bulk samples obtained during the field investigations. A complete discussion of the laboratory testing procedures and results of our testing are presented in Appendix C.

3.3 Previous Investigations

Several geotechnical reports on or adjacent to the site have been reviewed by PSE and are listed in Appendix A.

- Converse Davis Dixon Associates (Converse 1975) conducted a geotechnical investigation for the Brea Plaza Shopping Center in 1975. Their investigation included drilling twelve (12) rotary auger borings.
- In 1976, Converse (Converse 1976a, b&c) performed geotechnical observation and testing during construction of the Brea Plaza. According to their report and information collected during the recent subsurface investigation, the grading associated with the construction of the Brea Plaza likely included the following: stripping the existing ground surface and removing the upper couple feet of the alluvial materials; placing compacted fill until final grades were reached; design cuts were made in the northwesterly half of the Brea Plaza, with design fills placed in the southeasterly half of the plaza, including the areas adjacent to the Loftus Diversion Channel.
- In 1988, G.A. Nicoll (G.A. Nicoll 1988 & 1991) conducted a geotechnical investigation for the structure located in the southeast corner of the Brea Plaza. The investigation included drilling two (2) hollow stem auger borings to depths of up to 52 feet.
- In 2004, Geotechnologies Inc. (Geotechnologies 2004) conducted a geotechnical investigation for the parking structure located northerly of the Brea Plaza, adjacent to the Loftus Diversion Channel. Their investigation included drilling five (5) hollow stem auger borings to depths of up to 32± feet. The parking structure was constructed between 2006 and 2007.

Selected boring logs and related laboratory testing from these investigations have been included in Appendix D of this report. The locations of these borings are shown on Plate 1.

4.0 GEOLOGIC CONDITIONS

4.1 Geologic and Geomorphic Setting

The site is located within a geomorphic province in California known as the Peninsular Ranges. This province is characterized by northwest trending valleys and mountains that, in part, owe their existence to regional northwest trending

geologic structures. The site is at the southeastern end of the Los Angeles basin, which is bounded on the east by the Puente Hills and on the south and by the San Joaquin Hills.

The subject site is located in the middle of the southwestern flank of the Puente Hills and northeast of the Coyote Hills. The Puente Hills are bracketed by the Whittier and Chino Fault Zones and underlain by the Puente Hills Thrust Fault and have been created by uplift along those faults. Approximately 13,000 feet of Miocene, marine clastic sedimentary rocks underlie the Puente Hills. These sediments overlie approximately 16,000 feet of Cenozoic-aged rock that is underlain by Mesozoic plutonic basement rocks at depth (Yerkes 1972). Uplift of the Puente Hills and Coyote Hills in the late Pleistocene and Holocene has created the current geomorphic features.

The site is located in a broad alluvial plain that is underlain by recent alluvium from Carbon Canyon that has been deposited on Quaternary Terrace deposits. The majority of the site was graded in 1976 under the geotechnical observation and testing of Converse Davis Dixon Associates (1976). In approximately 1991, a portion of the southwest corner of the site, adjacent to the channel, was regraded (G.A. Nicoll, 1991).

4.2 Stratigraphy

4.2.1 Artificial Fill, Engineered (afe):

The borings drilled as part of the current investigation were located in paved parking areas or the Loftus Diversion Channel. The observed pavement structural sections in the parking lot consisted of between 3 to 6 inches of asphalt concrete underlain by 2 to 8 inches of base material. Engineered artificial fill was encountered in a majority of the borings, with maximum engineered artificial fill depths of up to 20 feet encountered. However, based on a comparison of topographic maps prior to original grading and the current topography, the maximum depth of fill is

estimated to be up to 25 feet in the southeasterly portion of the site as depicted on cross section A-A' (Plate 2). In general, the fill consists of a variety of earth materials ranging from silty clay to silty sand. In general these materials were moist and stiff/dense. A more detailed description is provided on the boring logs.

4.2.2 Alluvium (Qal):

Holocene-aged alluvial soils were encountered underlying the fill at several locations. The approximate, subsurface distributions of these deposits are shown on Plates 1 and 2. The alluvium consists of sandy silts, sandy clays, silts with some clayey sand, and minor sand and gravel lenses. In general, these soils were observed to be moist to wet and soft/loose to stiff/moderately dense. Detailed descriptions are provided on the boring logs.

4.2.3 Quaternary Terrace Deposits (Qt)

Quaternary Terrace deposits were encountered in the borings beneath the fill and recent alluvial deposits. These Holocene to Pleistocene-age deposits underlie most of the broad plain between the Puente Hills and the Coyote Hills. In the borings these deposits were observed to consist of a variety of silty clay to silty sand with occasional zones of sand and gravel. These deposits were generally moist to wet, and stiff/dense to hard/very dense.

4.3 Groundwater

Groundwater was encountered during the current investigation at depths ranging from 10 to 30 feet below the existing ground surface. In general, the groundwater was at an elevation of approximately 303 feet, although locally different perched zones of ground water were encountered. The State of California Seismic Hazard Zone Report of the La Habra Quadrangle indicates that historic high groundwater levels are at least 10 feet below the existing ground surface. Previous

investigations encountered groundwater at depths of 10 to 25 feet below the ground surface, generally at an elevation lower than 300 feet. It can be assumed that the groundwater table will be at an approximate elevation between 300 and 305 feet, which roughly correlates to the elevation of the Loftus Diversion Channel and the surface of the younger alluvial deposits. Groundwater encountered in the Terrace Deposits was not observed to be at a consistent level and may be locally perched.

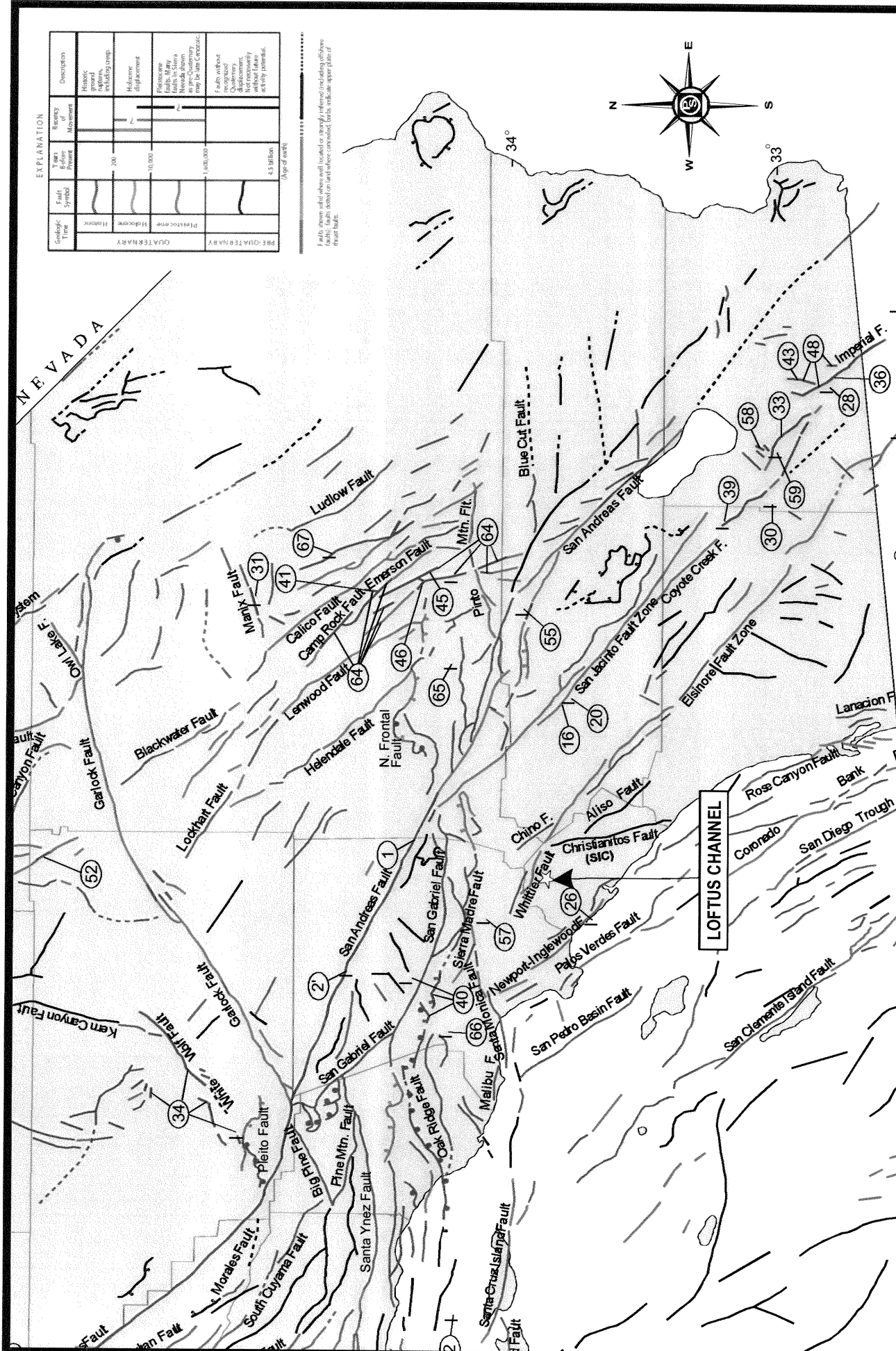
4.4 Geologic Structure

Complex faulting and folding dominate the geologic structure of the Los Angeles Basin and surrounding mountain ranges. There are several large active fault systems in the region surrounding the subject site (Figure 2, Fault Map). These fault systems have been studied extensively and in a large part control the geologic structure of Southern California. The prominent active regional fault systems affecting the site are the Puente Hills Fault, Newport-Inglewood, Whittier/Elsinore and San Andreas Faults.

4.4.1 Regional Mapped Faults

Puente Hills Fault

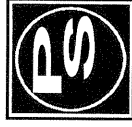
The Puente Hills Fault (PHF) is a blind thrust fault that underlies a good part of the northeastern and eastern Los Angeles Basin, including the Puente Hills. This fault is a blind, subsurface, southwest vergent, low angle thrust (Shaw and others, 2002; Griffith and Cooke, 2005). A segment of that thrust was responsible for the 1987 5.9 Mw “Whittier Narrows Earthquake”. For seismic hazards assessments, PSE has incorporated the State of California (Cao and others, 2002) PHF fault parameters of a slip rate of 0.7mm/yr and maximum magnitude of 7.0 Mw. The PHF is located approximately 1.7 kilometers northerly of the subject site.



EXPLANATION			
Geologic Time	Fault Symbol	Year Before Present	Description
Quaternary	---	0	Historic ground including creep
Pleistocene	---	10,000	Historic displacement
Pliocene	---	1,000,000	Historic displacement
Paleocene	---	4.5 Billion	Historic displacement
Pre-Cambrian	---	4.5 Billion	Historic displacement

FIGURE 2

PACIFIC SOILS ENGINEERING, INC.
 710 E. PARKRIDGE AVE. SUITE 105, CORONA CALIFORNIA 92879
 TELEPHONE: (951) 582-0170, FAX: (951) 582-0176
W.O. 500690 **DATE: 3/26/08**



SIMPLIFIED FAULT ACTIVITY MAP OF CALIFORNIA

Compiled by Charles W. Jennings and George J. Saucedo
 1999 (Revised 2002, Toussion Toppezzada and David Brannum)

Whittier-Elsinore Fault Zone

The active Whittier fault system lies approximately 2.7 kilometers northerly of the site. The Whittier-Elsinore fault runs north from Baja, California for approximately 180 kilometers where it splays near the Santa Ana River into two segments, the Whittier fault and the Chino fault. This fault system is a right-lateral strike-slip fault with some reverse-oblique slip on the Whittier fault, which may be partially responsible for the uplift of the Puente Hills. The slip rate for this fault ranges from 2.5 to 4 mm per year, with a maximum magnitude (Mw) of 6.8.

Newport-Inglewood Fault Zone

The onshore branch of the Newport-Inglewood Fault system is located approximately 26.5 kilometers southwesterly of the subject site. This fault system, approximately 75 kilometers long, extends northwesterly from a point approximately 3.5 kilometers offshore of Laguna Beach to the Santa Monica Mountains. The Newport-Inglewood is a right-lateral fault system characterized by a series of en echelon (sub-parallel) faults which exhibit considerable offset at a depth with little on no surface displacement. The slip rate for this fault is about 1.0 mm per year, with a maximum magnitude (Mw) of 6.7.

San Andreas Fault Zone

The San Andreas Fault zone lies approximately 54 kilometers northeasterly of the subject site. In California, the San Andreas extends northwesterly from the Mexican border to Point Arena where it continues offshore before turning to the west in the vicinity of Cape Mendocino. The San Andreas Fault is the major structural feature in California and defines a transform boundary between the Pacific and North American tectonic plates. Due to the length and complexity of this fault system, it has been divided into sections on the basis of general trend. The southern portion of the San Andreas, which extends from the Gulf of California to

the Transverse Ranges, is closest to the subject site. Displacement along the San Andreas is right lateral strike-slip with a slip rate of about 25 to 35 mm per year and a maximum magnitude (Mw) of 7.2.

4.5 Earthquake Hazards

The subject site is located in southern California, which is a tectonically active area. The type and magnitude of seismic hazards affecting a site are dependent on the distance to the causative fault and the intensity and magnitude of the seismic event. The seismic hazard may be primary, such as surface rupture and/or ground shaking, or secondary such as liquefaction and/or ground lurching.

The State of California prohibits the location of most structures for human occupancy across the traces of active faults through the Alquist-Priolo Earthquake Fault Zoning Act (A-P). The State Geologist assists local agencies by delineating Earthquake Fault Zones in California. In order to protect public safety from the effects of strong ground shaking, liquefaction, landslides or other ground failure, and other hazards caused by earthquakes, the State of California passed the Seismic Hazards Mapping Act in 1991. Seismic hazards relating to these two acts are discussed below.

4.5.1 Surface Rupture

Surface rupture is a break in the ground surface during or as a consequence of seismic activity. The site is not located within an Alquist Priolo (A-P) Fault Zone, nor are there any A-P Fault Zones near the site. No active faults have been identified in the reviewed literature or observed onsite during the referenced studies. The potential for surface rupture on this site is therefore considered low; however, as is the case with most of California, this potential cannot be completely eliminated as a possibility.

4.5.2 Seismically Induced Landsliding

The subject site is not located within a State of California Zone of required investigation for landsliding. Due to the lack of significant slopes on or

near the site at the completion of the proposed improvements, seismically induced landsliding is not expected to adversely affect the site.

4.5.3 Dynamic Settlement

Dynamic settlement is the process of non-uniform settlement of the ground surface during a seismic event. Dynamic settlement includes liquefaction and dry-sand settlement.

4.5.3.1 Liquefaction

Liquefaction is the phenomenon where seismic agitation of loose, saturated sands and silty sands can result in a buildup of pore pressures and, if sufficient to overcome overburden stresses, can produce a temporary quick condition known as liquefaction. Once the excess pore water pressure dissipates, the liquefied zones/lenses consolidate causing settlement.

The site is not located in a "Zone of Required Investigation" for liquefaction potential according to the *State of California Seismic Hazard Zone Map* for the La Habra Quadrangle. However, a seismic hazard zone is located immediately south of the site within the Loftus Diversion Channel.

Thin (less than 2 feet) interbedded layers of silty sand, sandy silt, and sand with silt were encountered within the alluvium with the majority of the alluvium consisting of fine-grained (clays, silts, sandy clays) soils. Additionally, the proposed improvements will be founded upon engineered fill (a minimum of 3 feet for the box culvert and up to 20 feet for the associated surface improvements). Considering the proposed thickness of engineered fill and the relatively fine-grained consistency of the left-in-place alluvium, the potential for liquefaction is considered to be very low.

Accordingly, the potential for surface manifestation (sand boils and fissuring) and dynamic settlement is also considered low.

4.5.3.2 Dry Sand Settlement

The materials that underlie the site consist of cohesive soils and saturated silty sands and sands that are generally considered resistant to dry sand settlement. Therefore, dry sand settlement is not anticipated to affect the subject development.

4.5.4 Seiches

A seiche is a free or standing-wave oscillation on the surface of water in an enclosed or semi-enclosed basin. The wave can be initiated by an earthquake and can vary in height from several centimeters to a few meters. The potential for a seiche impacting the property is considered to be non-existent due to its distance from any large bodies of water.

4.5.5 Tsunami

A tsunami is a great sea wave produced by a submarine earthquake or volcanic eruption. It is characterized by great speed of propagation and low observable amplitude on the open sea but can attain heights of up to 100 feet upon encountering shallow water. Significant damage can occur along coastal areas subjected to such a wave. Due to the site's distance from the coastline, a tsunami is not considered to pose a hazard.

4.5.6 Seismic Ground Motions

Ground shaking hazards caused by earthquakes along active regional faults exist. Based on a Probabilistic Seismicity Analysis, a mean random horizontal acceleration of 0.64g has been determined for the site. This acceleration hypothetically has a CBC-consistent 10 percent chance of being exceeded in 50 years (the equivalent of a 475-year average return period). Details are presented in Appendix E. Seismic design parameters

using soil profile types identified in the 2007 California Building Code are presented in Section 7.4.

5.0 MATERIAL PROPERTIES

Presented herein is a general discussion of the analytic methods utilized in this report and the geotechnical properties of the various soil types and earth materials encountered.

5.1 Hydro-Consolidation

The hydro-consolidation process is a singular response to the introduction of water into collapse-prone alluvial soils. Upon initial wetting, the soil structure and apparent strength are altered and a virtually immediate settlement response occurs. The soils at the site are saturated, generally cohesive, and are not considered susceptible to hydro-consolidation.

5.2 Excavation Characteristics

Based on our previous experience with similar projects near the subject site, and the information gathered during our investigation for this report, it is PSE's opinion that the majority of the engineered artificial fill can be excavated with conventional earth moving equipment. Depending on the depth of removal within the existing channel, specialized grading techniques (top loading, swamp cats, etc.) may be required to efficiently grade the saturated alluvium. Furthermore, control of surface water and/or seepage will likely be required during construction. Saturated soils generated during remedial grading may not be suitable for re-use as compacted fill without drying and/or mixing.

5.3 Compressibility

The topsoil and the upper portions of the alluvium are considered highly compressible and unsuitable for support of structures or proposed fills as they presently exist. The upper portions of the existing fills, especially within the existing channel, are also unsuitable for support of proposed fills and structures as they presently exist. These materials will require removal from fill areas prior to

placement of fill, as well as where exposed in cut areas. Recommended removal depths are presented in Section 6.1, and earthwork adjustment estimates are presented in Section 5.9.

5.4 Time Dependent Settlement

Laboratory testing shows that the alluvium within the existing Loftus Diversion Channel consists of saturated silts, sandy clays, and clayey soils that will undergo primary consolidation as a result of the proposed embankment loads. The estimated amounts of settlement on the outside edges and at the centerline of the reinforced concrete box culvert at various locations along the proposed alignment are summarized in Table 5-1. PSE has analyzed four separate cases with varying depths of removal. The estimated primary settlement is anticipated to take 2 to 3 months to achieve.

5.5 Bearing Capacity and Lateral Earth Pressures

Ultimate bearing capacity values were obtained using the graphs and formula presented in NAVFAC DM-7.1. Allowable bearing was determined by applying a Factor of Safety of at least 3 to the ultimate bearing capacity. Static lateral earth pressures were calculated using Rankine methods for active and passive cases. If it is desired to use Coulomb forces, a separate analysis specific to the application can be conducted.

5.6 Pavement Support Characteristics

It is anticipated that the onsite soils will possess "poor" to "moderate" support characteristics. Depending upon the final distribution of site soils, pavement support characteristics could vary. For preliminary design and estimating purposes, an "R"-value of 20 was used.

5.7 Shear Strengths

Direct shear strength tests were conducted on undisturbed samples. The shear strengths for the various geologic units are summarized in Table 5-2 below.

TABLE 5-1 SUMMARY OF ANTICIPATED SETTLEMENT BENEATH REINFORCED CONCRETE BOX CULVERT					
Cross-Section	Location Settlement Analysis ¹	Engineered Fill Thickness ²	Alluvium Thickness ³	Total Settlement	Estimated Differential Settlement ⁴
		(feet)	(feet)	(inches)	(inches)
1-Foot Overexcavation Beneath RCB Culvert					
A-A'	West	1	19	3.0	1.5
A-A'	Center	1	19	3.9	
A-A'	East	1	19	3.1	
C-C'	West	1	14	3.7	1.6
C-C'	Center	1	14	3.6	
C-C'	East	1	14	2.7	
F-F'	West	1	9	2.0	0.8
F-F'	Center	1	9	2.4	
F-F'	East	1	9	2.2	
3-Foot Overexcavation Beneath RCB Culvert					
A-A'	West	3	17	2.7	1.2
A-A'	Center	3	17	3.4	
A-A'	East	3	17	2.6	
C-C'	West	3	12	3.0	1.2
C-C'	Center	3	12	3.0	
C-C'	East	3	12	2.2	
F-F'	West	3	7	1.5	0.5
F-F'	Center	3	7	1.8	
F-F'	East	3	7	1.7	
5-Foot Overexcavation Beneath RCB Culvert					
A-A'	West	5	15	2.2	1.0
A-A'	Center	5	15	2.8	
A-A'	East	5	15	2.1	
C-C'	West	5	10	2.3	1.0
C-C'	Center	5	10	2.3	
C-C'	East	5	10	1.6	
F-F'	West	5	5	0.9	0.5
F-F'	Center	5	5	1.2	
F-F'	East	5	5	1.0	
8-Foot Overexcavation Beneath RCB Culvert					
A-A'	West	8	12	1.5	0.9
A-A'	Center	8	12	2.0	
A-A'	East	8	12	1.3	
C-C'	West	8	7	1.4	0.7
C-C'	Center	8	7	1.5	
C-C'	East	8	7	1.0	
F-F'	West	8	2	0.3	0.3
F-F'	Center	8	2	0.5	
F-F'	East	8	2	0.6	
Notes: ¹ West= West Side of RCB, Center=Centerline of RCB, East=East Side of RCB ² Thickness of engineered fill beneath RCB ³ Estimated thickness of alluvial soils left in-place below RCB ⁴ Beneath RCB Across a Distance of 40 feet					

TABLE 5-2 SHEAR STRENGTH PARAMETERS		
Material	Strength	
	Cohesion, C (psf)	Friction Angle, ϕ (degrees)
Artificial Fill, Engineered: Sandy Clay	650	27
Alluvium: Clayey Sand	200	32

5.8 Expansion Potential

The expansion potential of the near surface on-site materials is expected to range from “Low” to “High” when tested in accordance with ASTM D 4829.

Expansion indices from the current investigation and previous investigations at or near the site ranged from 35 to 129.

Foundation design recommendations presented in this report assume that the as-graded soils affecting the foundation will also be classified as “High” in expansion potential. Further testing should be conducted during and upon completion of the grading operations to confirm the assumptions stated above or to modify the design recommendations accordingly.

5.9 Earthwork Adjustments

The following average earthwork adjustment factors are presented in the following table:

TABLE 5-3 EARTHWORK ADJUSTMENTS	
Geologic Unit	Recommended Adjustment
Artificial Fill, Engineered	0 to 5% shrinkage
Alluvium (Qal)- Upper 10 feet	10% to 15% shrinkage

The values may be used in an effort to balance the earthwork quantities. As is the case with every project, contingencies should be made to adjust the earthwork balance when grading is in-progress and actual conditions are better defined.

5.10 Chemical Analyses

The on-site soils are classified as having a “negligible” soluble sulfate exposure level when classified in accordance with Table 4.3.1 of ACI (American Concrete Institute) 318-05.

The resistivity of onsite soils indicates that these soils are “corrosive” in nature with respect to ferrous metals. It is the opinion of PSE that plastic pipes or non-ferrous conduits should be utilized for underground utilities at the subject site. Consideration should be given to consulting with a Corrosion Engineer for a more comprehensive evaluation.

Upon completion of grading, samples should be collected and tested. Final recommendations should be based on the results of those tests.

6.0 GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

Development of the subject property as proposed is considered feasible, from a geotechnical standpoint, provided that the conclusions and recommendations presented herein are incorporated into the design and construction of the project. Presented below are specific issues identified by this study or previous studies as possibly affecting site development. Recommendations to mitigate these issues are presented in the text of this report, with graphic presentation of the recommendations on the enclosed plan, where appropriate.

6.1 Site Preparation and Removals

All grading shall be accomplished under the observation and testing of the project Soils Engineer and Engineering Geologist or their authorized representative in accordance with the recommendations contained herein, the current grading ordinance of the City of Brea and/or the County of Orange and PSE’s Earthwork Specifications (Appendix G). All topsoil, portions of the artificial fill, alluvium, and bedrock should be removed in fill areas or where exposed at design cut grade.

Guidelines to determine the depth of removals are presented below; however, the exact extent of the removals must be determined in the field during grading, when observation and evaluation of the greater detail afforded by those exposures can be performed by the Geotechnical Engineer and/or Engineering Geologist. In general, removed soils will be suitable for reuse as compacted fill when free of deleterious materials and after moisture conditioning.

Removal of unsuitable soils typically should be established at a 1:1 projection to suitable materials outside the proposed structures. Front cuts should be made no steeper than 1:1, thus, except where constrained by other factors, removals should be initiated at approximately twice the distance of the anticipated removal depth, outside the structures. The bottoms of all removal areas should be observed, mapped, and approved by the Engineering Geologist prior to fill placement. It is recommended the bottoms of removals be surveyed and documented by the project Civil Engineer.

6.1.1 Stripping and Deleterious Material Removal

Existing vegetation, trash, debris, and other deleterious materials should be removed and wasted from the site prior to commencing removal of unsuitable soils and placement of compacted fill materials.

All buried structures; such as waterlines, foundations, septic systems, cess pools, leach fields, etc.; associated with past land use and abandoned structures should be removed and wasted offsite.

6.1.2 Removals

The following removal recommendations are presented for the proposed improvements.

6.1.2.1 Reinforced Concrete Box Culvert and Appurtenant Structures

Minimally the upper one (1) foot of alluvium measured from the bottom of the RCB culvert and appurtenant structures (wing-wall,

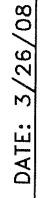
retaining wall, etc.) should be removed. The removal should extend a minimum of five (5) feet, horizontally, from the outside edges of the structures. Figure 3 depicts the proposed removals beneath the culvert. The removal should be sufficient in depth such that the top of the proposed rock layer below the box provides a firm and unyielding surface in which to construct the concrete box. This may require removals in excess of the minimum.

Below the box culvert extending a minimum of five (5) feet horizontally outside the box culvert a geotextile with similar properties to Mirafi 500X or 600X should be placed on the approved removal bottom. A crushed rock fill (3/4 inch to 1 inch) should be placed above this stabilization fabric to the design subgrade elevation of the culvert. Figure 3 depicts this rock blanket fill.

These removal recommendations assume that the structure can tolerate the total and differential settlements as outlined in Table 5-1 for a minimum removal of one (1) foot. PSE has provided alternative removal depths and associated settlement potentials in Table 5-1 for varying removal depths. Ultimately it is up to the reviewing agency determine their settlement tolerances and performance expectations for the box culvert. If desired, PSE can provide other methods to minimize both the settlement potential and the time of detrimental primary settlement.

Outside the limits of the proposed box culvert in the existing Loftus Diversion Channel, it is anticipated that the outer five (5) feet to ten (10) feet (measured horizontally from the slope face) will require removal and recompaction. Final determination of these removal limits will be determined in the field.

PROPOSED LOFTUS DIVERSION CHANNEL



6.1.2.2 Proposed Retail Structure

Minimally the upper five (5) feet of the existing engineered artificial fill should be removed and recompact. The removals should extend a minimum of seven (7) feet horizontally outside the building foot print.

6.1.2.3 Proposed Parking and Driveway Areas

Minimally the upper two (2) feet of the existing fill should be removed and recompact to support the proposed driveways and parking areas.

6.1.2.4 Additional Future Structures

It is PSE's understanding that additional structures may be constructed westerly adjacent to the RCB right-of-way. Depending on the siting of the structures, additional unsuitable material removals may be required to reduce both settlement magnitudes and times. Consideration should be given to performing these removals during construction of the proposed box culvert. The plans for future buildings should be evaluated from a geotechnical perspective when they become available.

6.2 Temporary Backcut Stability

During grading operations, temporary backcuts will be required to accomplish unsuitable soil removals, as discussed in Section 6.1, and, if necessary, to construct stabilization fills and associated keys. Backcuts for removals should be made no steeper than 1:1.

Stabilization fill backcuts should be made no steeper than 1:1 (horizontal to vertical). Flatter backcuts may be necessary where geologic conditions dictate, and where minimum width dimensions are to be maintained.

Care should be taken during remedial grading operations in order to minimize risk of failure. Should failure occur, complete removal of the disturbed material will be required.

In consideration of the inherent instability created by temporary construction backcuts for stabilization fills and removals, it is imperative that grading schedules are coordinated to minimize the unsupported exposure time of these excavations. Once started these excavations and subsequent fill operations should be maintained to completion without intervening delays imposed by avoidable circumstances. In cases where five-day workweeks comprise a normal schedule, grading should be planned to avoid exposing at-grade or near-grade excavations through a non-work weekend. Where improvements may be affected by temporary instability, either on or offsite, further restrictions such as slot cutting, extending work days, implementing weekend schedules, and/or other requirements considered critical to serving specific circumstances may be imposed.

6.3 Excavatability

The overexcavation of unsuitable soils below the proposed RCB culvert will likely require specialized grading techniques (top loading, swamp cats, etc.) to efficiently remove these saturated soils. Depending on field conditions, temporarily diverting the channel, damming, dewatering, and/or pumping maybe required to maintain the excavations during construction. The materials generated during the removals for the RCB culvert may be unsuitable for reuse as fill unless dried and/or mixed with drier soils. Further, due to the clayey nature of these soils, they may not be suitable for backfill immediately adjacent to the RCB culvert. Accordingly, import and export maybe required.

6.4 Subsurface Drainage

Due to the relatively flat topography of the site and lack of well-developed drainages, no subdrains are proposed for the site.

6.5 Construction Staking and Survey

Removal bottoms, fill keys, stabilization fill keys, backdrains and subdrains (if required), should be surveyed by the project Civil Engineer prior to final observation and approval by the Geotechnical Engineer/Engineering Geologist in order to verify locations and gradients.

6.6 Earthwork Considerations

6.6.1 Compaction Standards

Fill and processed natural ground shall be compacted to a minimum relative compaction of 90 percent, as determined by ASTM Test Method D 1557-02 or to agency standards. Compaction shall be achieved at or slightly above the optimum moisture content, and as generally discussed in the attached Earthwork Specifications. Compaction shall be achieved with the use of sheepsfoot rollers or similar kneading type equipment. Mixing and moisture conditioning will be required in order to achieve the required moisture conditions.

6.6.2 Documentation of Removals and Drains

Removal bottoms, stabilization keys, fill keys, slope laybacks, backdrains and their outlets should be observed and approved by the Engineering Geologist and/or Geotechnical Engineer and documented by the Civil Engineer prior to fill placement. Toe stakes should be provided by the civil engineer in order to verify required key dimensions and locations.

6.6.3 Treatment of Removal Bottoms

At the completion of unsuitable soil removals and excavation of stabilization keys, the exposed bottom should be scarified to a minimum depth of eight (8) inches, moisture conditioned to above optimum conditions, and compacted in-place to the standards set forth in this report.

6.6.4 Fill Placement

After removals, scarification, and compaction of in-place materials are completed, additional fill may be placed. Fill should be placed in thin lifts (eight inch bulk), moisture conditioned to slightly above the optimum moisture content, mixed, compacted, and tested as grading progresses until final grades are attained.

6.6.5 Benching

Where the natural slope is steeper than 5-horizontal to 1-vertical and where determined by the project Geotechnical Engineer or Engineering Geologist, compacted fill material shall be keyed and benched into competent materials.

6.6.6 Mixing

In order to prevent layering of different soil types and/or different moisture contents, mixing of materials may be necessary. The mixing should be accomplished prior to and as part of the compaction of each fill lift. Discing may be required when either excessively dry or wet materials are encountered.

6.7 Haul Roads

All haul roads, ramp fills, and tailing areas should be removed before placement of fill.

6.8 Onsite Asphalt/Concrete and Slope Revetment

Existing asphalt and concrete rubble can be reused onsite. It is suggested that existing asphalt concrete rubble from flatwork, curb and gutter, existing structures should be crushed to a maximum size of four (4) inches. All deleterious material (wood, plastic, steel) should be removed and wasted offsite. This material will then be suitable for use as fill material onsite. Existing slope revetment can be buried in proposed fill areas provided it is a minimum of 10 feet below all

improvements. In lieu of burial the revetment may be reused at the upstream inlet or can be crushed and used as selected fill.

6.9 Import Soils

Import soils, if required, should consist of clean, structural quality, compactable materials similar to the on-site soils and should be free of trash, debris or other objectionable materials.

Plans and Specifications should indicate that the grading contractor shall notify the project Geotechnical Engineer not less than 72 hours in advance of the location for any soils proposed for import. Proposed import source shall be sampled, tested and approved prior to delivery of soils for use on the site.

6.10 Settlement Monitoring

Due to the potential for detrimental time dependent settlement, it is suggested that settlement monuments be installed and monitored by the project surveyor. These settlement monuments will consist of buried settlement plates (see Detail G-12) and surface settlement monuments (see Detail G-12A). These monuments should be surveyed by the project surveyor to within a vertical tolerance of 0.02 feet.

The approximate location of these proposed settlement monuments are depicted on Plate 1. Dependent upon the settlement data, it may be necessary to delay the construction of settlement sensitive surface improvements until the detrimental time dependent settlement is complete.

7.0 DESIGN RECOMMENDATIONS

7.1 Proposed Commercial Structure

In addition to the box culvert and associated appurtenances it is anticipated that one- or two-story, wood-frame commercial structure with shallow foundations will be constructed at the site. Precise building plans and loading conditions are not currently available. However, it can be expected that for typical commercial product and loading conditions, conventionally reinforced slab/foundations can be used. The design of those systems should be based upon as-graded soil conditions and specific locations. For preliminary design and cost estimating purposes, the

following recommendations and procedures can be anticipated, subject to confirmation of assumptions and as-graded conditions. The following recommendations are for the proposed commercial structure only.

Upon the completion of rough grading, finish grade samples should be collected and tested to provide specific recommendations as they relate proposed building pad. These test results and corresponding design recommendations will be presented in a Final Rough Grading Report. Final slab and foundation design recommendations should be made based upon specific structure-locations, loading conditions, and as-graded soil conditions.

It is anticipated that the majority of onsite soils will possess "Low" to "High" expansion potential when tested in accordance ASTM D 4829. For preliminary budgeting purposes, the following foundation design requirements are presented.

7.1.1 Foundation Design-Commercial Structures

Commercial structures can be supported on conventional shallow foundations. The design of foundation systems should be based on the as-graded conditions as determined after the completion of grading. The following values may be used in preliminary foundation design.

Allowable Bearing:	2000 lbs./sq.ft. (assuming a minimum embedment depth of 24 inches and a minimum width of 12- or 15-inches for one- or two-story structure, respectively).
Lateral Bearing:	250 lbs./sq.ft. per foot of depth to a maximum of 2000 lbs./sq.ft.
Sliding Coefficient:	0.25

The above values may be increased as allowed by Code to resist transient loads such as wind or seismic. Building Code and structural design considerations may govern. Depth and reinforcement requirements should be evaluated by the Structural Engineer.

For budgeting purposes, it can be anticipated that conventional foundations can be designed based upon the values presented in Section 7.1.1 and Table 7-1. Final design recommendations should be made based upon post-grading testing of the near surface soils.

7.1.2 Moisture and Vapor Retarding System

A moisture and vapor retarding system should be placed below all slabs-on-grade in living areas and other portions of the structures considered moisture sensitive. The retarder should be of suitable composition, thickness, strength and low permeability to effectively prevent the migration of water and reduce the transmission of water vapor to acceptable levels. Historically, a 10-mil plastic membrane, such as Visqueen placed between 2 to 4 inches of clean sand, has been used for this purpose. The use of this system or other systems, materials, or techniques can be considered, at the discretion of the designer, provided the system reduces the vapor transmission rates to acceptable levels.

7.1.3 Isolated Footings

Isolated exterior post/column footings should be tied back to the main foundation system in at least two (2) orthogonal directions.

7.1.4 Additional Foundation Construction Considerations

- To reduce moisture penetration beneath the slab-on-grade areas, utility trenches should be backfilled with lean concrete or concrete slurry where they intercept the foundation perimeter. As an alternative, such excavations can be backfilled with native soils moisture-conditioned to over optimum and compacted to a minimum of 90 percent relative compaction.
- Soil materials from foundation excavations should not be spread on slab on grade areas unless it is compacted and tested.
- Foundation excavations should be observed by a representative of this firm prior to the placement of forms, reinforcement or concrete. The excavations should be free of all loose and sloughed materials, be neatly trimmed and moisture conditioned at the time of concrete placement.

TABLE 7-1 CONVENTIONAL FOUNDATION DESIGN PARAMETERS	
Design Expansion Potential	<i>“High”</i>
Footing Depth Below Lowest Adjacent Finish Grade	
One- and Two-Story Interior and Exterior	24 inches
Footing Width	
One-Story	12 inches
Two-Story	15 inches
Footing Reinforcement	No. 4 rebar - two (2) on top; two (2) on bottom.
Minimum Slab Thickness	4 inches (actual)
Minimum Slab Reinforcement	No. 3 rebar spaced 18 inches (maximum) on center, each way; Dowel interior slab to perimeter footing with No. 3 rebar spaced 24 inches (maximum) on center with a minimum embedment length of 24 inches into the slab
Under-Slab Requirement	An approved moisture/vapor retarder should be placed below all slabs-on-grade within living and moisture sensitive areas as discussed in Section 7.3
Slab Subgrade Moisture	Minimum of 140 percent of optimum moisture prior to placing concrete.
<u>Footing Embedment Next to Swales and Slopes</u> If exterior footings adjacent to drainage swales are to exist within five (5) feet horizontally of the swale, the footing should be embedded sufficiently to assure embedment below the swale bottom is maintained. Footings adjacent to slopes should be embedded such that a least five (5) feet is provided horizontally from edge of the footing to the face of the slope.	

7.2 Proposed Box Culvert and Appurtenances

7.2.1 Box Culvert and Appurtenant Structures Foundation Design

The proposed RCB and appurtenant structures (wing walls, retaining walls, etc.) can be supported on conventional shallow foundations. The design of foundation systems should be based on the as-graded conditions as determined after the completion of grading. The following values may be used in preliminary foundation design.

Allowable Bearing:	2000 lbs./sq.ft. (assuming a minimum embedment depth of 24 inches and a minimum width of 15 inches).
Lateral Bearing:	250 lbs./sq.ft. per foot of depth to a maximum of 2000 lbs./sq.ft.
Sliding Coefficient:	0.30

The above values may be increased as allowed by Code to resist transient loads such as wind or seismic. Building Code and structural design considerations may govern. Depth and reinforcement requirements should be evaluated by the Structural Engineer.

7.2.2 Box Culvert and Retaining Wall Design Parameters

The following design parameters are presented based on the assumption that native soils will be placed over the culvert and used as backfill surrounding the culvert. Based on the materials observed in the exploratory borings and CPT soundings, the native materials are expected to generally consist of sandy clays, clayey sands, silty sands and clays.

Restrained retaining walls may be designed to resist lateral pressures (at rest) imposed by a fluid with a unit weight determined in accordance with Table 7-2. Unrestrained retaining walls, free to rotate at least 0.001 radians, may be designed to resist lateral pressures imposed by a fluid with a unit weight determined in accordance with Table 7-2. Overcompaction of the backfill materials should be avoided.

TABLE 7-2 RETAINING WALL DESIGN PARAMETERS				
Slope of Retained Material (Horizontal:Vertical)	Unrestrained, $K_a \bullet \gamma$ (pcf)		Restrained, $K_o \bullet \gamma$ (pcf)	
	Native Backfill	Select Backfill	Native Backfill	Select Backfill
Level	61	36	82	52

- The design loads presented in the above table are to be applied on the retaining wall in a horizontal fashion and as such friction between wall and retained soils should not be allowed in the retaining wall analyses.

- Additional allowances should be made in the retaining wall design to account for the influence of construction loads, temporary loads, and possible nearby structural loads.
- A unit weight of 125 pcf may be used for on-site engineered fill materials.
- Select backfill should be granular, structural quality backfill with a Sand Equivalent of 30 or better and an ASCE Expansion Index of 20 or less. The select backfill must extend at least one-half the wall height behind the wall; otherwise, the values presented in the **Native Backfill** columns must be used for the design. Native backfill should have an expansion index of 50 or less. **Much of the onsite material doesn't meet this criteria.** The upper one foot of backfill should be comprised of native on-site soils or paving. The recommended retaining wall backfill and drain system profile is shown on Plate A.
- As a minimum, a 1-foot wide zone of select backfill should be placed behind the wall to provide drainage. Otherwise, the wall design should include the potential for hydrostatic forces to develop behind the wall.
- Retaining wall designs should include waterproofing (where appropriate) and backdrains or weep holes for relieving possible hydrostatic pressures. The backdrain should be comprised of a 4-inch perforated PVC pipe in a 1 ft. by 1 ft., ¾-inch gravel matrix, wrapped with a geofabric. The backdrain should be installed with a minimum gradient of 2 percent and should outlet to an appropriate location.
- An upstream concrete cut-off wall should be constructed for the box culvert that should extend a minimum of one (1) to two (2) feet below the proposed rock blanket fill below the culvert. Ultimately it is the responsibility of the box culvert design Engineer to determine the thickness and depth.

7.3 Settlement

7.3.1 Reinforced Concrete Box Structure

Anticipated settlement values for the proposed box culvert are dependent on the alluvial removal depths and are discussed in Section 5.4 and presented in Table 5-1.

7.3.2 Commercial Structure and Associate Surface Improvements

In addition to the potential effects of expansive soils, the commercial structure should be designed in anticipation of differential settlements on the order of 1/2-inch in 40 feet under typical design loads for one or two-story structures. This assumes construction of the proposed commercial structure after the primary settlement of the underlying alluvial soils within the influence of the structure. If surface improvements (concrete flatwork, curb and gutter, driveways and AC parking) are constructed prior to completion of primary time dependent settlement then deflection and cracking of these improvements may occur. As a result additional repair and replacement of these improvements should be anticipated. Accordingly, it is suggested that these improvements be constructed in an "interim" condition if they need to be put in to service immediately. Some interim measures could entail the use of temporary AC rolled curbs and allowing for an additional cap (finish) course of asphalt after settlement is complete.

7.4 Seismic Design Parameters

Presented below are seismic design parameters for the subject site. The subject parameters are presented to be compliant with the 2007 California Building Code (CBC).

The site is located at Latitude 33.9120° and Longitude -117.8803°. The proposed retail building pad area has been identified to be a "D" site class in accordance with Table 1613.5.2 of the 2007 CBC. Utilizing this information, the computer program *Seismic Hazard Curves and Uniform Hazard Response Spectra, Java Ground Motion Parameter Calculator – Version 5.0.8*, provided by the United States Geological Survey (<http://earthquake.usgs.gov/research/hazmaps/design/>) and ASCE 7 criterion, the seismic design category for 0.20 second (S_s) and 1.0 second (S_1) period response accelerations can be determined (2007 CBC, Section 1613.5.1) along with the design spectral response accelerations (2007 CBC, Sections 1613.5.3 and 1613.5.4).

7.5 Exterior Flatwork

The onsite soils have been classified as being expansive in nature. The minimum thickness of all exterior concrete (outside the proposed structures) should be 4 inches (actual). Subgrade soils should moisture-conditioned to at least 140 percent of the optimum moisture content to a depth of 12-inches immediately prior to placing concrete. The structural engineer should evaluate the need for reinforcement and doweling of exterior flatwork areas, raised porches and stairways. Control joints should be provided at a minimum spacing of 10± feet.

7.6 Utility Trench Excavation and Backfill

All utility trenches should be shored or laid back in accordance with applicable OSHA standards. Mainline and lateral utility trench backfill should be compacted to at least 90 percent of maximum laboratory dry density as determined in accordance with ASTM Test Method: D 1557-02. On-site soils may not be suitable for use as bedding materials but will be suitable for use in backfill.

Compaction should be accomplished by mechanical means. Jetting of native soils will not be acceptable. Under-slab trenches should also be compacted to project specifications. If native soils are used, mechanical compaction is recommended. The Geotechnical Engineer should be notified for observation and testing prior to placement of the membrane and slab reinforcement.

It is suggested that the utility trenches be backfilled with concrete slurry where they intercept the perimeter footings (under the footing) to reduce the potential for moisture migration below the slab area.

7.7 Concrete Mix Design

Preliminary testing of onsite soils indicated a “negligible” sulfate exposure when classified in accordance with Table 19-A-4 of the 2007 CBC. As such, sulfate resistant concrete is not required by the CBC. However, it is PSE’s opinion that it would be prudent to utilize sulfate resistant concrete to construct the RCB structure.

7.8 Pavement Design

Testing of subgrade soils should be performed once subgrade elevations are achieved to determine the actual R-Value of the subgrade soils. For preliminary budgeting purposes, using an R-Value of 20 and a range of traffic indices, estimated pavement structural sections are presented in Table 7-3.

TABLE 7-3 RECOMMENDED PAVEMENT SECTIONS		
Traffic Index	Pavement Section	Alternate Section
4.0	3 in. AC over 5 in. AB	---
4.5	3 in. AC over 6 in. AB	4 in. AC over 4 in. AB
5.0	3 in. AC over 8 in. AB	4 in. AC over 5 in. AB
5.5	3 in. AC over 9 in. AB	4 in. AC over 7 in. AB
6.0	4 in. AC over 9 in. AB	5 in. AC over 7 in. AB
AC = Asphalt Concrete AB = Caltrans Class 2 Aggregate Base		

Subgrade soils should be compacted to at least 90 percent of the laboratory maximum dry density as determined by ASTM Test Method: D 1557-02. Base materials should be compacted to at least 95 percent of the laboratory maximum dry density as determined by ASTM Test Method: D 1557-02.

7.9 Site Drainage

Final site grading should assure positive drainage away from structures. Planter areas should be provided with area drains to transmit irrigation and rainwater away from structures. The use of gutters and down spouts to carry roof drainage well away from structures is recommended. Raised planters should be provided with a positive means to remove water through the face of the containment wall.

8.0 CLOSURE

8.1 Geotechnical Review

As is the case in any grading project, multiple working hypotheses are established utilizing the available data and the most probable model is used for the analysis. Information collected during the grading operations is intended to evaluate the hypothesis and some of the assumptions summarized herein may need to be

changed as more information becomes available. Some modification of the grading recommendations may become necessary, should the conditions encountered in the field differ significantly than those hypothesized to exist.

Pacific Soils Engineering, Inc. should review the pertinent plans and sections of the project specifications, to evaluate conformance with the intent of the recommendations contained in this report.

If the project description or final design varies from that described in this report, Pacific Soils Engineering, Inc., must be consulted regarding the applicability of, and the necessity for, any revisions to the recommendations presented herein.

Pacific Soils Engineering, Inc., accepts no liability for any use of its recommendations if the project description or final design varies and Pacific Soils Engineering, Inc., is not consulted regarding the changes.

8.2 Limitations

This report is based on the project as indicated on the Preliminary Grading Plan and described in this report and on the information obtained from the borings and CPT soundings at the approximate locations indicated on the plans. The findings are based on the results of the field, laboratory, and office investigations combined with an interpolation and extrapolation of conditions between and beyond the boring locations. The results reflect an interpretation of the direct evidence obtained. Services performed by Pacific Soils Engineering, Inc., have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, either expressed or implied, and no warranty or guarantee is included or intended.

The recommendations presented in this report are based on the assumption that an appropriate level of field review will be provided by Geotechnical Engineers and Engineering Geologists who are familiar with the design and site geologic conditions. That field review shall be sufficient to confirm that geotechnical and

geologic conditions exposed during grading are consistent with the geologic representations and corresponding recommendations presented in this report. Pacific Soils Engineering, Inc., should be notified of any pertinent changes in the project plans or if subsurface conditions are found to vary from those described herein. Such changes or variations may require a re-evaluation of the recommendations contained in this report.

The data, opinions, and recommendations of this report are applicable to the specific design of this project as discussed in this report. They have no applicability to any other project or to any other location and any and all subsequent users accept any and all liability resulting from any use or reuse of the data, opinions, and recommendations without the prior written consent of Pacific Soils Engineering, Inc.

Pacific Soils Engineering, Inc., has no responsibility for construction means, methods, techniques, sequences, or procedures, or for safety precautions or programs in connection with the construction, for the acts or omissions of the CONTRACTOR, or any other person performing any of the construction, or for the failure of any of them to carry out the construction in accordance with the final design drawings and specifications.

Appendix materials for the geotechnical report may be reviewed at the City of Brea, Development Services Department, 1 Civic Center Circle, Brea, CA 92821. Contact Shaveta Sharma, Assistant Planner, at 714.990.7674.

Appendix B: Traffic and Parking Impact Study

Prepared by Kimley-Horn and Associates, Inc., dated March 28, 2008.

Traffic Impact and Parking Analysis

for

BREA PLAZA REDEVELOPMENT

Prepared for:
CALIFORNIA BREA PARTNERS, LP
and BREA IMPERIAL, LLC

**TRAFFIC IMPACT AND PARKING ANALYSIS
FOR BREA PLAZA REDEVELOPMENT
IN THE CITY OF BREA, CALIFORNIA**

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TRAFFIC IMPACT AND PARKING ANALYSIS
FOR BREA PLAZA REDEVELOPMENT
IN THE CITY OF BREA, CALIFORNIA

EXECUTIVE SUMMARY

- California Brea Partners, LP and Brea Imperial, LLC are proposing to redevelop a small portion of the shopping center, resulting in 158,742 square feet of retail uses. The scope of the redevelopment consists of demolishing the existing 2,943-square-foot Al and Ed's building and replacing it with an 8,459-square-foot building that will include a Starbucks with a drive-through lane, an AT&T store, and food uses; demolishing the US Bank and photo shop buildings and constructing a 13,046-square-foot retail building in the northeast corner of the site. The net gain in square footage at Brea Plaza would be 11,205 square feet.
- The proposed project is estimated to generate 2,457 trips on a daily basis, with 302 trips during the morning peak hour and 232 trips during the evening peak hour before application of a passby reduction to the Starbucks trips. With the passby reduction, the proposed project is estimated to generate 999 trips on a daily basis, with 85 trips during the morning peak hour and 93 trips during the evening peak hour.
- The study area intersections and project driveways currently operate at LOS D or better during both peak hours.
- Under Opening Year (2008) traffic conditions, the study area intersections and project driveways would continue to operate at LOS D or better during both peak hours. Project traffic would not result in any significant traffic impacts at any of the study area intersections.
- Under Year 2030 traffic conditions, following study intersections are projected to operate at an unacceptable LOS under Year 2030 Traffic Conditions without the proposed project. Project traffic would not result in any significant traffic impacts at any of the study area intersections, thus, no mitigation measures have been recommended.
 - Imperial Highway at State College Boulevard (CMP/Caltrans)
 - Imperial Highway at SR-57 NB Off-Ramp/Brea Plaza Entrance (Caltrans)
 - Imperial Highway at Associated Road (City of Brea/Caltrans)
 - Imperial Highway at Kraemer Boulevard (City of Brea/Caltrans)
- Under Year 2030 traffic conditions, the project driveways would operate at LOS D or better during both peak hours with the exception of the driveway that aligns with the SR-57 Northbound Off-Ramp. This intersection would operate at LOS E during the PM peak hour.

- The applicant proposes to provide 766 parking spaces on the site, including paving the adjacent Loftus Channel in order to provide 125 parking spaces.
- A shared parking analysis, based on the ULI shared parking methodology, indicates that on a weekday, Brea Plaza with the proposed project would need a parking supply of 768 parking spaces at its peak time. Considering the proposed parking supply of 766 parking spaces, there would be a weekday deficit of 2 parking spaces between 1 PM and 2 PM during the month of December.
- On a typical weekend day, the peak parking demand for Brea Plaza with the proposed project would be 797 parking spaces at its peak time, which would result in a weekend parking deficit of 31 parking spaces between 2 PM and 3 PM during the month of December and a deficit of 22 parking spaces between 3 PM and 4 PM during the month of December.
- For all other hours of the day, Brea Plaza would have a surplus of parking of 16 spaces or more during the month of December. For the months of January through November, the maximum parking demand per the ULI shared parking methodology would be 589 parking spaces.
- The parking analysis does not assume the use of the 116 parking spaces located on the Mercury property. While Brea Plaza has a parking agreement with Mercury, the availability of all 116 parking cannot be guaranteed during the working hours of the Mercury offices. However, taking into the hours and days during which the Brea Plaza parking deficits are projected to occur compared to typical office hours, the number of spaces within the Mercury surface lot that would be needed by Brea Plaza are likely to be available. Thus, no parking mitigation measures are recommended for the project.

TRAFFIC IMPACT AND PARKING ANALYSIS FOR BREA PLAZA REDEVELOPMENT IN THE CITY OF BREA, CALIFORNIA

INTRODUCTION

The Brea Plaza shopping center is an existing shopping center located on the northwest corner of Imperial Highway and Associated Road in the City of Brea, California. The boundaries of the center are the Mercury Insurance property on the north, Imperial Highway on the south, State Route 57 Freeway (SR-57) on the west and the Loftus Channel on the east. The existing shopping center consists of 147,537 square feet of retail land uses including a movie theatre. The movie theatre and a couple of the retail shops are currently vacant. California Brea Partners, LP and Brea Imperial, LLC are proposing to redevelop a small portion of the shopping center, resulting in 158,742 square feet of retail uses. A vicinity map is presented on Figure 1.

The traffic impact analysis will focus on traffic impacts at seven existing intersections and one future intersection. The analysis will be conducted for Existing traffic conditions, Opening Year (2008) traffic conditions, and Year 2030 traffic conditions without and with the proposed project. Traffic improvements planned by the City of Brea and Caltrans for the intersection of Imperial Highway and Associated Road will be taken into consideration. The parking analysis will evaluate the adequacy of the amount of parking to be provided as part of the project.

PROJECT DESCRIPTION

Brea Plaza is located on the northwest corner of Imperial Highway and Associated Road in the City of Brea. California Brea Partners, LP and Brea Imperial, LP (the Applicants) propose to redevelop the southeast corner of the existing Brea Plaza. The scope of the redevelopment consists of demolishing the existing 2,943-square-foot Al and Ed's building and replacing it with an 8,459-square-foot building that will include a Starbucks with a drive-through lane, an AT&T store, and food uses; demolishing the US Bank and photo shop buildings and constructing a 13,046-square-foot retail building in the northeast corner of the site. The net gain in square footage at Brea Plaza would be 11,205 square feet. The project site plan is presented in Figure 2.

As shown on the site plan, as part of the proposed project, the applicant proposes to construct a second driveway on Associated Road approximately 240 feet north of the existing Associated Road driveway. This driveway would also serve the Mercury Insurance property. The applicant also proposes to pave the Loftus Channel between Imperial Highway and the proposed Associated Driveway in order to provide 125 additional parking spaces on the site.

The Starbucks and AT&T store are currently located elsewhere within Brea Plaza and are proposed to be relocated to the new building. The analysis assumes that general retail uses will remain in the current Starbucks and AT&T locations. The analysis also assumes that the vacant theatre building will contain retail uses.



NOT TO SCALE

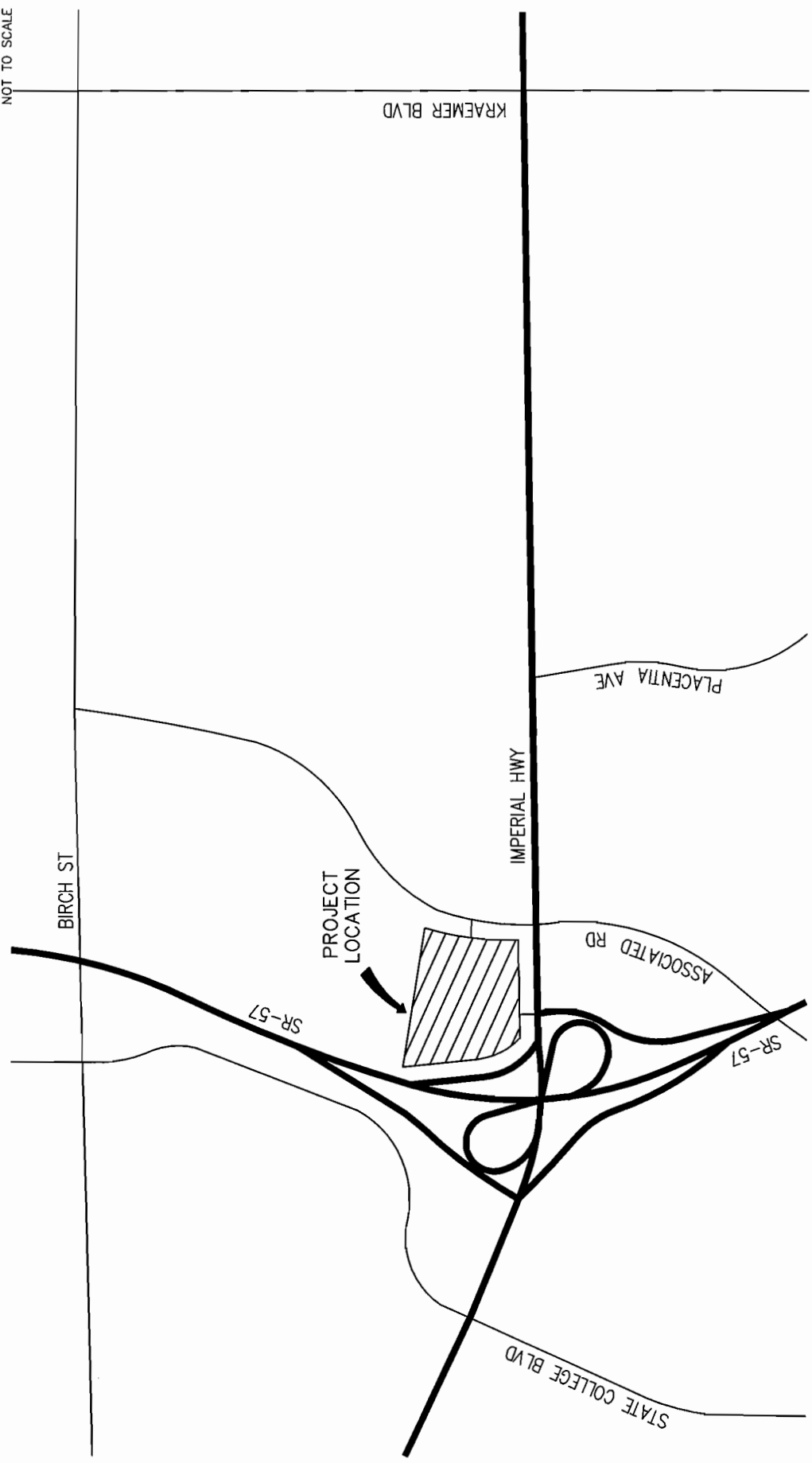


**FIGURE 1
VICINITY MAP**

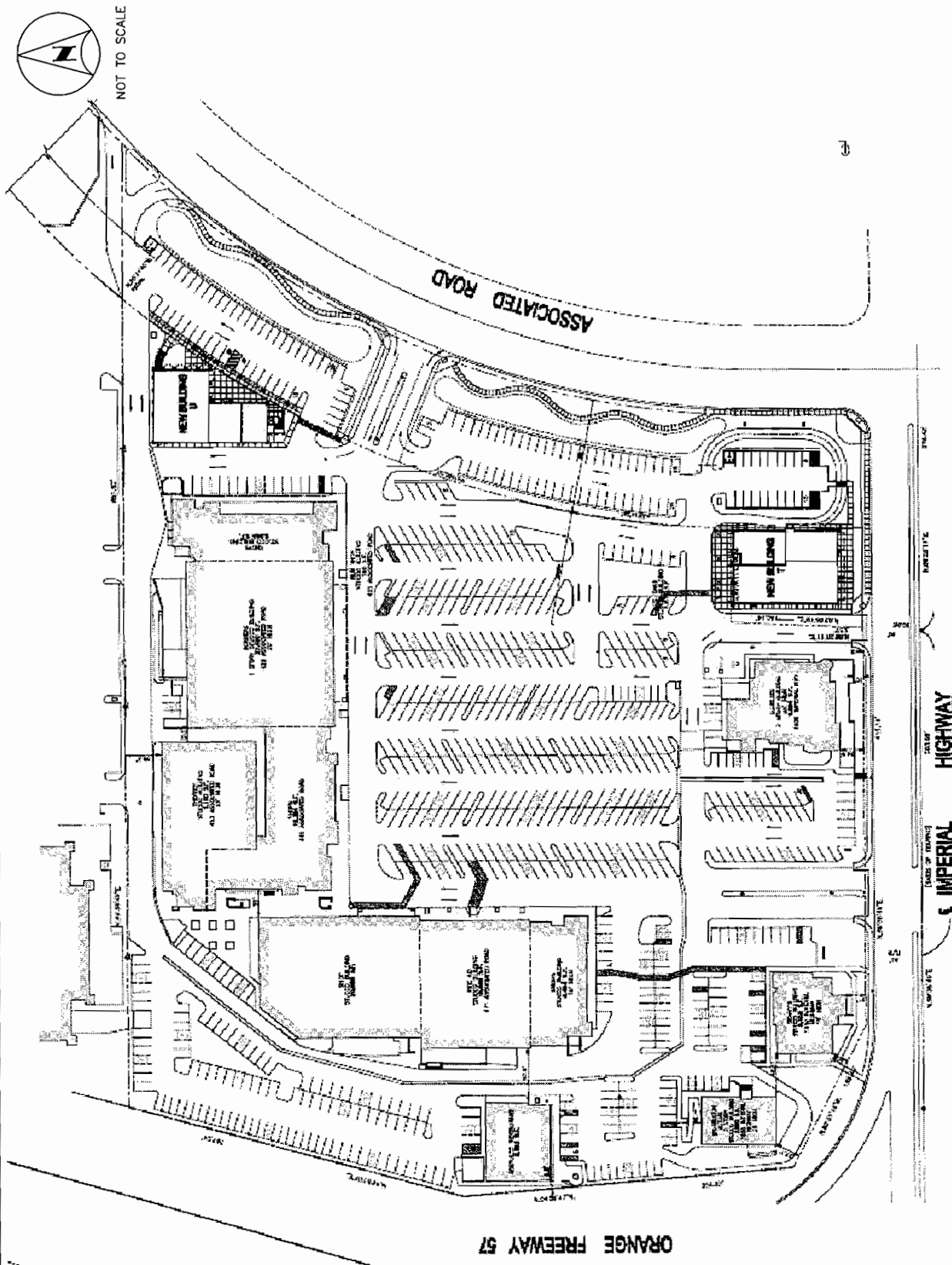


FIGURE 2
PROJECT SITE PLAN

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Currently, access to the site is provided via two driveways on Imperial Highway and one driveway on Associated Road. The primary driveway on Imperial Highway is signalized and aligns with the northbound off-ramp from SR-57. A secondary driveway on Imperial Highway is located approximately 210 feet west of Associated Road and is restricted to right turns in and out only. An unsignalized driveway is located on Associated Road approximately 470 feet north of Imperial Highway and allows full turning movements. A previously mentioned, the applicants propose to construct a second driveway on Associated Road approximately 240 feet north of the existing Associated Road driveway. This driveway would also serve the Mercury Insurance property.

ANALYSIS METHODOLOGY

The traffic impact analysis will focus on traffic impacts at seven existing intersections and one future intersection. The analysis will be conducted for Existing traffic conditions, Opening Year (2008) traffic conditions, and Year 2030 traffic conditions without and with the proposed project. Traffic improvements planned by the City of Brea and Caltrans for the intersection of Imperial Highway and Associated Road will be taken into consideration. The parking analysis will evaluate the adequacy of the amount of parking to be provided as part of the project.

The traffic analysis will analyze and report the project impact on the following intersections in the vicinity of the project.

Intersections

Imperial Highway at State College Boulevard
Imperial Highway at SR-57 Southbound Off and On Ramps
Imperial Highway at SR-57 Northbound Off-ramp/Brea Plaza Entrance
Imperial Highway at Brea Plaza Secondary Driveway
Imperial Highway at Associated Road
Imperial Highway at Kraemer Boulevard
Associated Road at Existing Brea Plaza South Driveway
Associated Road at Brea Plaza Future North Driveway

For each of the study intersections, the following traffic scenarios will be analyzed:

- Existing Traffic Conditions (Year 2007)
- Opening Year (2008) without Project
- Opening Year (2008) with Project Traffic Conditions
- Year 2030 Traffic Conditions
- Year 2030 Traffic Conditions with Project

Intersection operation at the signalized study area intersections has been evaluated using the Intersection Capacity Utilization (ICU) methodology in accordance with City of Brea traffic

guidelines. The signalized intersections along Imperial Highway were also analyzed using the Highway Capacity Methodology (HCM) in accordance with Caltrans guidelines as Imperial Highway is a state route. Intersection operation at the unsignalized study intersections has been evaluated using the HCM methodology. Brief descriptions of the ICU and HCM methodologies are provided below. The intersection analysis was conducted using the City of Brea Traffic Model, which is maintained and executed by Austin Foust Associates, Inc. (AFA).

Intersection Capacity Utilization (ICU) Methodology

The ICU methodology provides a comparison of the number of vehicles actually passing through that intersection during a given hour to the theoretical hourly vehicular capacity of an intersection.

The ICU calculation assumes a per-lane capacity of 1,700 vehicles per hour (vph) for each travel lane (through or turning lane) through the intersection. A clearance factor of 0.05 (5%) of the total intersection capacity is included in the ICU calculation.

The ICU calculation returns a volume-to-capacity (V/C) ratio that translates into a corresponding Level of Service (LOS) measure, ranging from LOS 'A', representing uncongested, free-flowing conditions, to LOS 'F', representing congested, over-capacity conditions. A summary description of each Level of Service and the corresponding V/C ratio is provided in Table 1.

Highway Capacity Manual (HCM) Delay Methodology

Intersections along Imperial Highway and unsignalized intersections will be analyzed using the HCM methodology. The Level of Service at signalized intersections is measured utilizing average delay per vehicle based upon peak hour traffic volumes, peak hour factors, number of lanes, and the operational characteristics of the traffic signal system. For unsignalized intersections, the HCM methodology analysis determines the average total delay for each vehicle making any movement from the stop-controlled minor street, as well as left turns from the major street. Delay values are calculated based on the relationship between traffic on the major street and the availability of acceptable "gaps" in the traffic stream through which conflicting traffic movements can be made.

The HCM delay values translate to a Level of Service (LOS) designation, ranging from LOS "A" to LOS "F" using the delay ranges shown on Table 1.

Table 1
Intersection Capacity Utilization (ICU)
and Highway Capacity Manual (HCM)
Level of Service (LOS) Descriptions

LOS	Volume-to-Capacity Ratios	Delay in Seconds per Vehicle	
	Roadway Segments and Signalized Intersections	Signalized Intersections	Unsignalized Intersections
A	0.00 to 0.60	0 to 10 seconds	0 to 10 seconds
B	0.61 to 0.70	> 10 to 20 seconds	> 10 to 15 seconds
C	0.71 to 0.80	> 20 to 35 seconds	> 15 to 25 seconds
D	0.81 to 0.90	> 35 to 55 seconds	> 25 to 35 seconds
E	0.91 to 1.00	> 55 to 80 seconds	> 35 to 50 seconds
F	> 1.00	> 80 seconds	> 50 seconds

Source: City of Brea Circulation Element and Highway Capacity Manual 2000 Update

LEVEL OF SERVICE STANDARDS

Per the County of Orange Congestion Management Program (CMP), the target LOS standard for intersections on the CMP roadway system is LOS E. The intersections of Imperial Highway/SR-57 Northbound Ramps/Brea Plaza, Imperial Highway/SR-57 Southbound Ramps, and Imperial Highway/State College Boulevard are CMP intersections and thus, have an LOS standard of E.

The City of Brea considers LOS D acceptable for intersection operation. This standard would apply to the non-CMP intersections.

The Guide for the Preparation of Traffic Impact Studies (December 2002) published by Caltrans indicates that Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities. However, Caltrans acknowledges that this may not always be feasible. If the existing State highway facility is operating at less than the target LOS (between LOS C and LOS D), then the existing LOS should be maintained.

SIGNIFICANT TRAFFIC IMPACT CRITERIA

A significant project traffic impact would occur:

- If a project causes a change in LOS from acceptable to unacceptable (LOS E to F for CMP facilities, or LOS D to E/F for non-CMP facilities or
- If a project causes an increase in ICU of more than 0.010, causing or worsening an unacceptable LOS

If a proposed project's traffic causes the conditions above, then the impacts are deemed significant and the project shall identify feasible mitigations to bring the facility back to the level previously held by the facility prior to the project's significant impacts.

EXISTING TRAFFIC CONDITIONS

Roadway Characteristics

The proposed project is located on the north side of Imperial Highway west of Associated Road in the City of Brea, California. The following provides a brief description of the roadways directly serving the project site.

Imperial Highway is a six to eight-lane divided roadway in the vicinity of the project. Imperial Highway currently carries about 48,000 to 58,600 average daily trips (ADT) in the vicinity of the project site at LOS D to F. Imperial Highway provides direct access to Brea Plaza at two driveways. Imperial Highway is designated in the City's Circulation Element as a Smart Street.

It should be noted that Imperial Highway is designated as a Smart Street on the County of Orange Master Plan of Arterial Highways (MPAH). The MPAH recognizes Smart Streets as arterials with enhanced traffic-carrying capacity. According to the Orange County Transit Authority (OCTA) website, Smart Street improvements are currently underway along the section of Imperial Highway from SR-57 to Rose Drive.

Associated Road is a four-lane divided roadway with a posted speed limit of 45 miles per hour in the vicinity of the project. Associated Road currently carries approximately 10,900 to 12,300 ADT at LOS A north and south of Imperial Highway. Associated Road provides direct access to Brea Plaza at one driveway. Associated Road is designated in the City's Circulation Element as a Secondary Arterial.

Existing Peak Hour Traffic Volumes

Existing peak hour traffic counts were conducted at the study intersections in June and December 2007. Peak hour traffic count worksheets are provided in Appendix A of this report.

The study intersections are shown on Figure 3. Existing lane configurations and traffic control at the study intersections are shown on Figure 4. Figure 5 illustrates the existing peak hour traffic volumes.

Intersection Operation

Existing peak hour intersection operations were evaluated using the methodologies described previously, and the results are summarized on Table 2. The study area intersections are currently operating at LOS D or better during both peak hours using both analysis methodologies. Intersection analysis worksheets are provided in Appendix B of this report.

BREA PLAZA TRAFFIC

The trip generation for the proposed project was accomplished through the use of the City of Brea Traffic Model, maintained and executed by Austin Foust Associates, Inc. (AFA). Brea Plaza is located in Traffic Analysis Zone (TAZ) 159 of the Brea Traffic Model. Other uses included in this zone are residential uses, a park, and open space. The general commercial portion of the land use in the model also includes the Mercury Insurance Company located to the north of Brea Plaza. The TAZ map provided by AFA is included in Appendix C.

The Brea traffic model indicates that TAZ 159 currently generates 17,138 trips on a daily basis, with 464 morning peak hour trips and 1,614 evening peak hour trips. The land use and trip summary provided by AFA is included in Appendix C.



NOT TO SCALE

LEGEND:

 = STUDY INTERSECTION

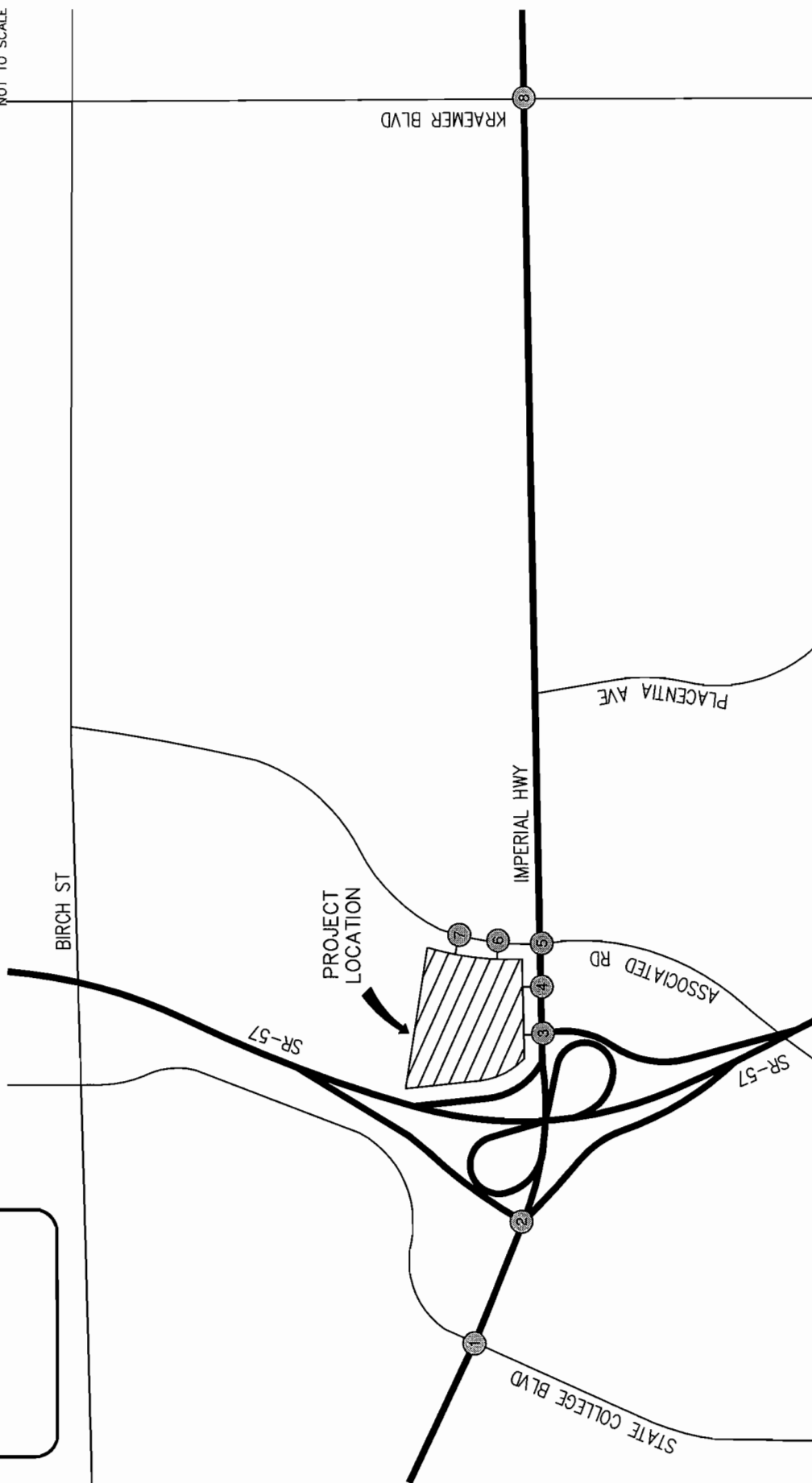


FIGURE 3
STUDY INTERSECTIONS



Kimley-Horn and Associates, Inc.

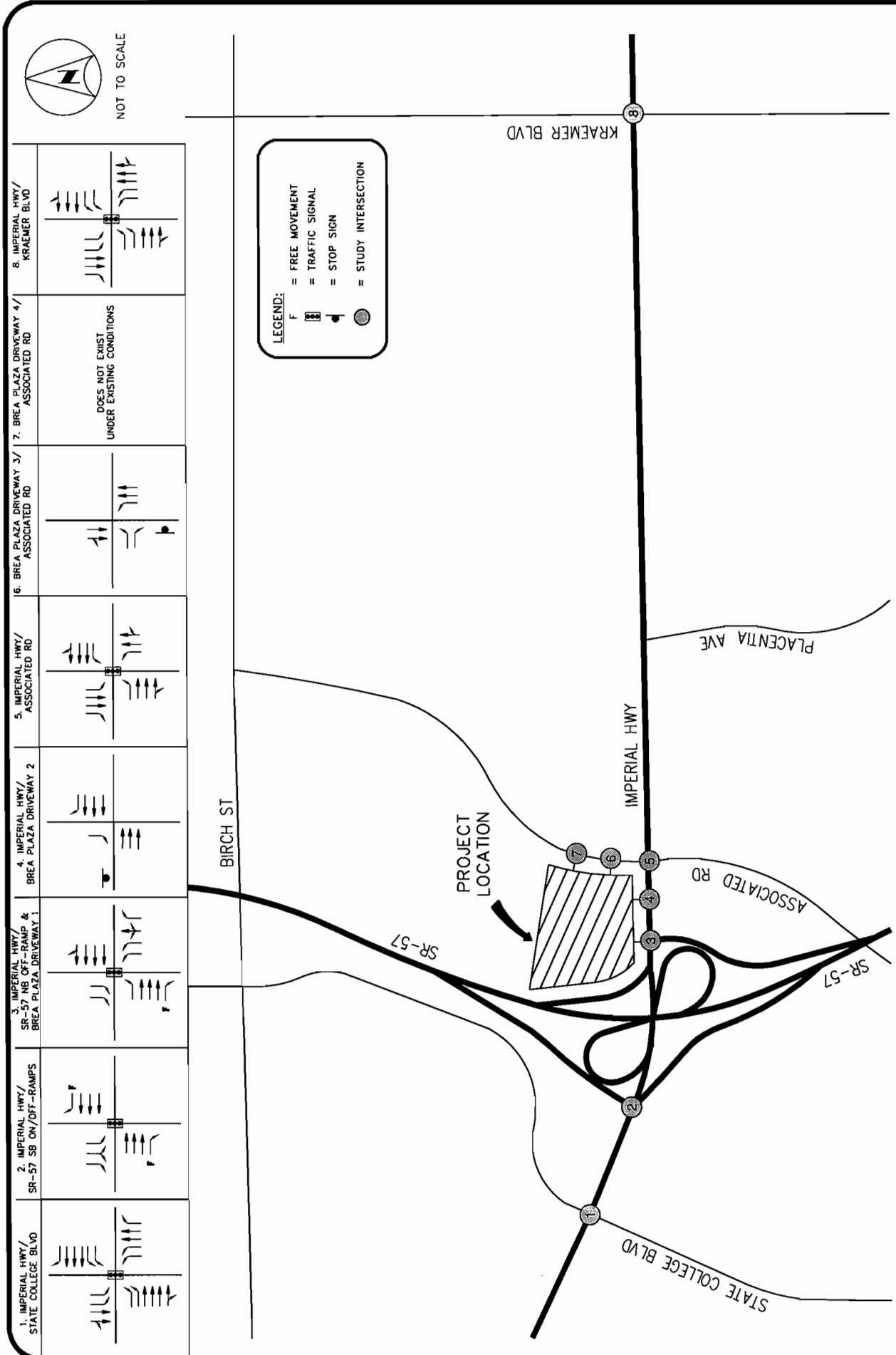


**FIGURE 4
EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL**

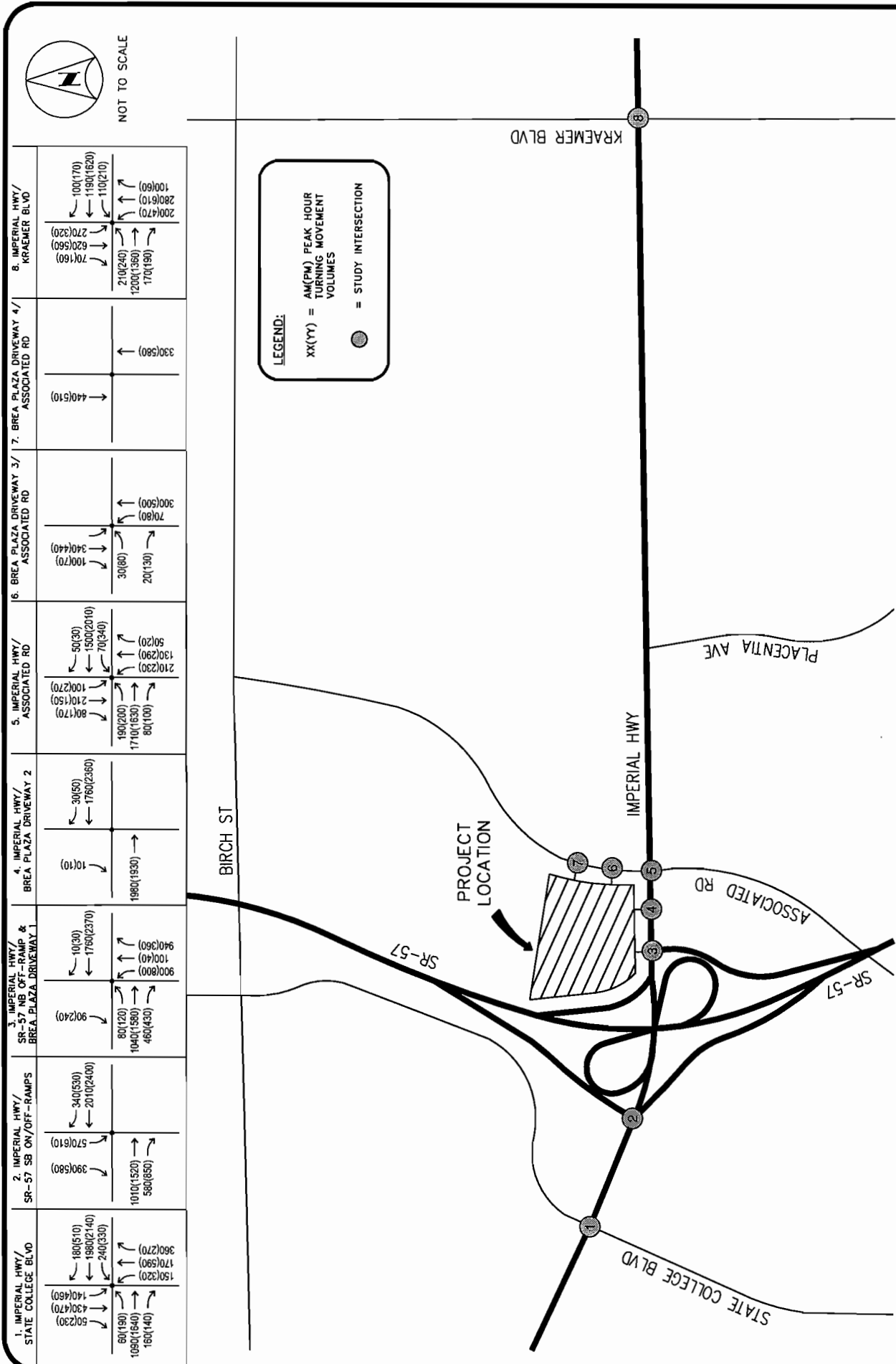


**FIGURE 5
EXISTING PEAK HOUR TRAFFIC VOLUMES**

Table 2
Summary of Intersection Operation
Existing Traffic Conditions

Intersection Capacity Utilization Analysis					
Signalized Intersections	Control	AM Peak Hour		PM Peak Hour	
		ICU	LOS	ICU	LOS
Imperial Highway at:					
State College Boulevard	S	0.64	B	0.84	D
SR-57 Southbound Ramps	S	0.63	B	0.75	C
SR-57 NB Off-Ramp Brea Plaza Entrance	S	0.62	B	0.73	C
Associated Road	S	0.64	B	0.84	D
Kraemer Boulevard	S	0.60	A	0.77	C
Highway Capacity Manual Analysis					
Signalized Intersections	Control	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
Imperial Highway at:					
State College Boulevard	S	25.1	C	46.4	D
SR-57 Southbound Ramps	S	9.5	A	14.2	B
SR-57 NB Off-Ramp Brea Plaza Entrance	S	20.4	C	19.6	B
Associated Road	S	28.8	C	54.1	D
Kraemer Boulevard	S	26.2	C	41.7	D
Unsignalized Intersections	Control	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
Imperial Highway at Brea Plaza Secondary Driveway	U	9.8	A	10.6	B
Associated Road at Brea Plaza South Driveway	U	13.9	B	16.7	C
Associated Road at Brea Plaza North Driveway	U	na	na	na	na
S = Signalized, U = Unsignalized					
Intersection delay is expressed in average seconds of delay per vehicle during the peak hour					

Proposed Project Trip Generation Estimates

The estimates of the amount of traffic to be generated by the proposed project at Brea Plaza have been developed by AFA through the use of the city's traffic model, with one exception. Based on the city's concern regarding the level of traffic that would be generated by the Starbucks drive-through, traffic counts were made at the Starbucks drive-through store at the intersection of Imperial Highway and Valencia Avenue in the City of Brea. The location of the Starbucks to be surveyed was at the direction of the City's traffic engineer.

The trip generation rates and resulting trips for the proposed project at Brea Plaza are summarized on Table 3. Table 3 indicates that the proposed project is estimated to generate 2,457 trips on a daily basis, with 302 trips during the morning peak hour and 232 trips during the evening peak hour before application of a passby reduction to the Starbucks trips.

It is recognized that not all trips associated with select land uses are "new" trips. In fact, many trips typically consist of "passby" trips, or stops by motorists who would be traveling on the roadway in any event. AFA applied a passby reduction of 75% to the Starbucks counts based on estimates from previous traffic studies related to Starbucks. The passby reduction was approved by the City of Brea traffic engineer.

Table 3 indicates that with the passby reduction, the proposed project is estimated to generate 999 trips on a daily basis, with 85 trips during the morning peak hour and 93 trips during the evening peak hour.

Trip Distribution and Assignment

The distribution of project traffic to the surrounding street system was accomplished by AFA through the City of Brea Traffic Model. Figure 6 shows the total project-related trips for the proposed project distributed to the study area.

PROJECT TRAFFIC IMPACT

The City of Brea requires analysis of the following traffic scenarios:

- Existing Traffic Conditions (Year 2007)
- Opening Year (2008) Traffic Conditions without Project
- Opening Year (2008) Traffic Conditions with Project
- Year 2030 Traffic Conditions
- Year 2030 Traffic Conditions with Project

For purposes of this study, Opening Year (2008) traffic conditions represent 2008 because the applicant expects that the proposed project will be open this year.

Table 3
Summary of Trip Generation
Brea Plaza Redevelopment

Land Use Description	Trips per:	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
General Plan Land Use								
4. Medium Density Residential	177.000 DU	1,434	23	89	112	94	50	144
7. General Commercial	288.040 KSF	15,698	242	109	351	735	735	1,470
13. Parks/Recreation/O.S.	3.510 AC	6	1	0	1	0	0	0
14. Natural Open Space	1.910 AC	0	0	0	0	0	0	0
SUB-TOTAL		17,138	266	198	464	829	785	1,614
Land Use with Brea Plaza Redevelopment								
4. Medium Density Residential	177.000 DU	1,434	23	89	112	94	50	144
7. General Commercial	297.445 KSF	16,211	250	113	363	758	758	1,516
13. Parks/Recreation/O.S.	3.510 AC	6	1	0	1	0	0	0
14. Natural Open Space	1.910 AC	0	0	0	0	0	0	0
36. Starbucks (Survey)	1.800 KSF	1,944	151	139	290	101	85	186
SUB-TOTAL		19,595	425	341	766	953	893	1,846
75% Passby Reduction for Starbucks		1,458	113	104	218	76	64	140
TOTAL		18,137	312	237	549	877	829	1,707
Increase in KSF/Trips								
7. General Commercial	9.405 KSF	513	8	4	12	23	23	46
36. Starbucks (Survey)	1.800 KSF	1,944	151	139	290	101	85	186
75% Passby Reduction for Starbucks		1,458	113	104	218	76	64	140
Total New Trips		11.205 KSF	999	46	39	85	48	93
Note: Trip generation is based on data from the City of Brea Traffic Model, provided by Austin-Foust Associates and represents the trip generation for the entire traffic analysis zone (TAZ 159).								
DU - dwelling unit								
KSF - thousand square feet								
AC - Acre								

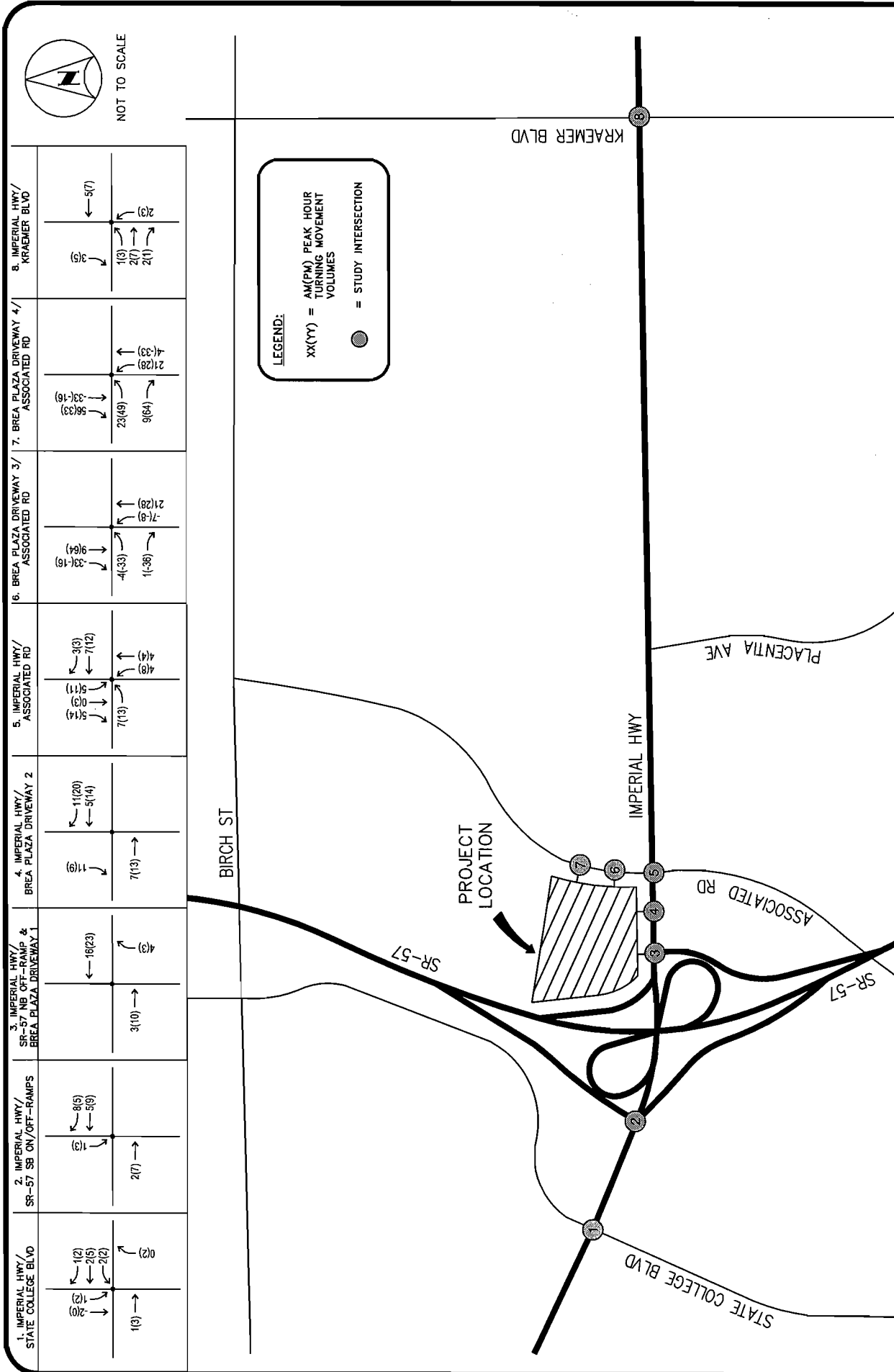


**FIGURE 6
PROJECT PEAK HOUR TRAFFIC VOLUMES**

Opening Year (2008) and Year 2030 traffic volumes without and with the proposed project were developed by AFA through the use of the city's traffic model. The description of the modeling process provided by AFA is included in Appendix C.

Opening Year (2008) without Project morning and evening peak hour turning movement volumes are shown on Figure 7. Opening Year (2008) with Project morning and evening peak hour turning movement volumes are shown on Figure 8. Year 2030 without Project morning and evening peak hour turning movement volumes are shown on Figure 9. Year 2030 with Project morning and evening peak hour turning movement volumes are shown on Figure 10.

Intersection Operation - Opening Year (2008) without Project Traffic Conditions

The study intersections were re-analyzed and the results are summarized on Table 4. Intersection analysis worksheets are provided in Appendix B. The analysis assumes that traffic improvements planned by the City of Brea and Caltrans for the intersection of Imperial Highway and Associated Road are in place as these improvements are projected to be completed in by the end of 2008. The improvements include restriping the southbound leg of the intersection to result in two left turn lanes, one through lane, and one right turn lane and adding a fourth westbound lane.

The analysis indicates that the study intersections are projected to operate at LOS D or better under Opening Year (2008) without Project Traffic Conditions using both analysis methodologies.

Intersection Operation - Opening Year (2008) with Project Traffic Conditions

The study intersections were re-analyzed and the results are summarized on Table 5. The magnitude of the project impact is also shown Table 5. Intersection analysis worksheets are provided in Appendix B. The analysis assumes that traffic improvements planned by the City of Brea and Caltrans for the intersection of Imperial Highway and Associated Road are in place as these improvements are projected to be completed in by the end of 2008. The improvements include restriping the southbound leg of the intersection to result in two left turn lanes, one through lane, and one right turn lane and adding a fourth westbound lane.

The analysis indicates that the study intersections are projected to operate at LOS D or better under Opening Year (2008) with Project Traffic Conditions using both analysis methodologies.

The project would not cause a change in LOS from acceptable to unacceptable, nor would the project cause an increase in ICU of more than 0.01, causing or worsening unacceptable LOS conditions. Project traffic will not result in a significant impact on operation at the study intersections under Opening Year (2008) traffic conditions.

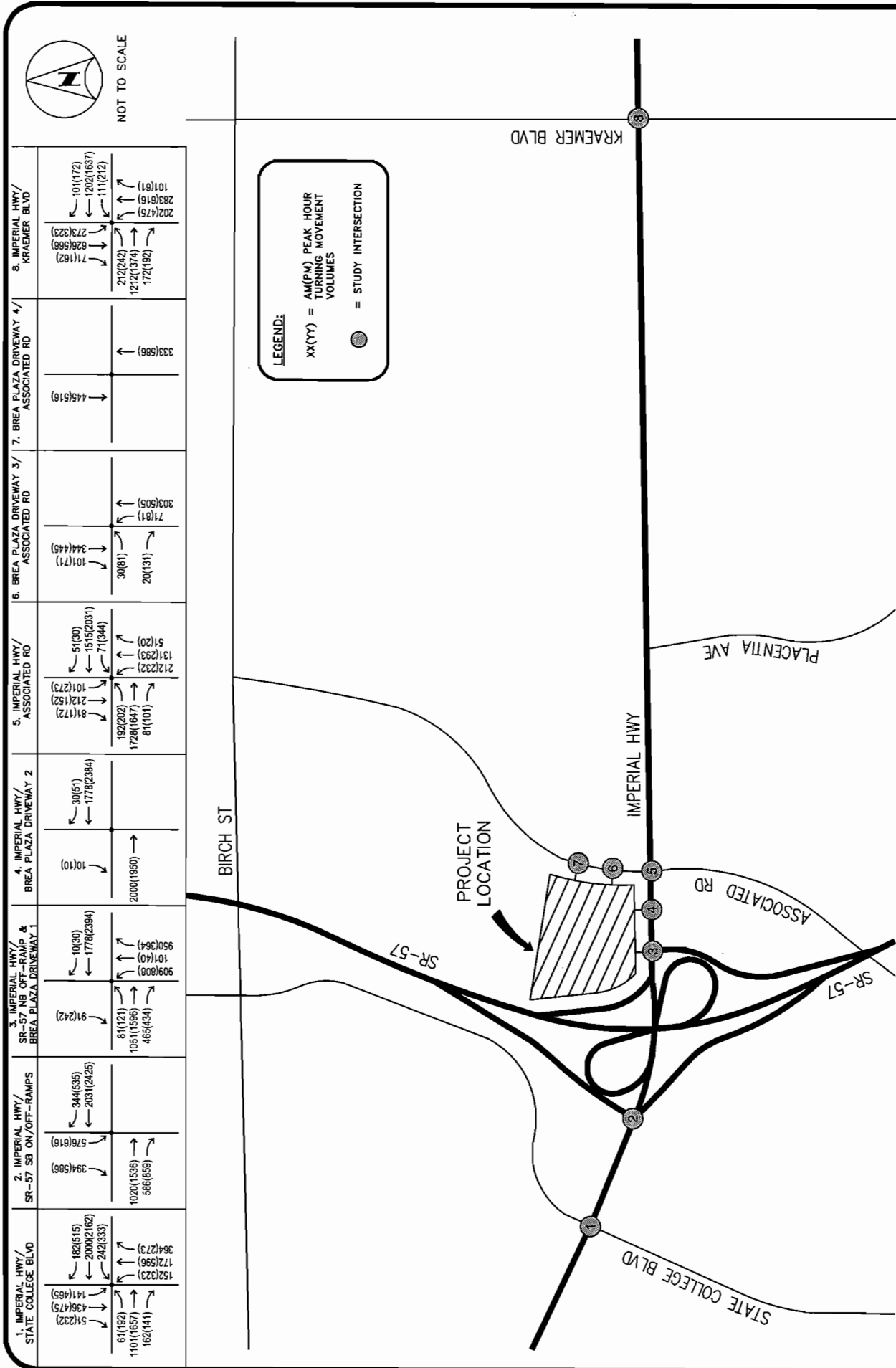


**FIGURE 7
 OPENING YEAR (2008) WITHOUT PROJECT PEAK HOUR TRAFFIC VOLUMES**

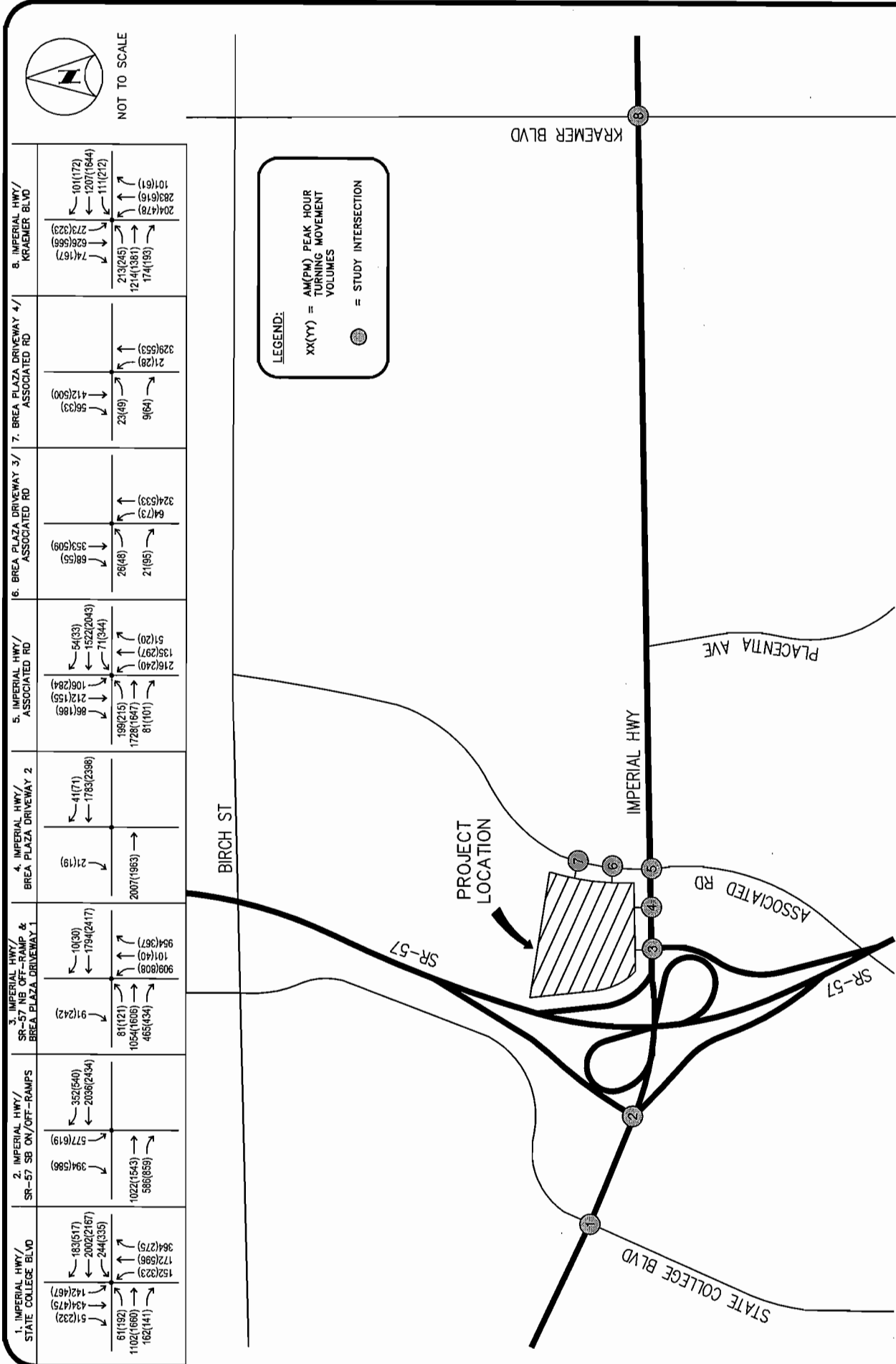


**FIGURE 8
 OPENING YEAR (2008) WITH PROJECT PEAK HOUR TRAFFIC VOLUMES**

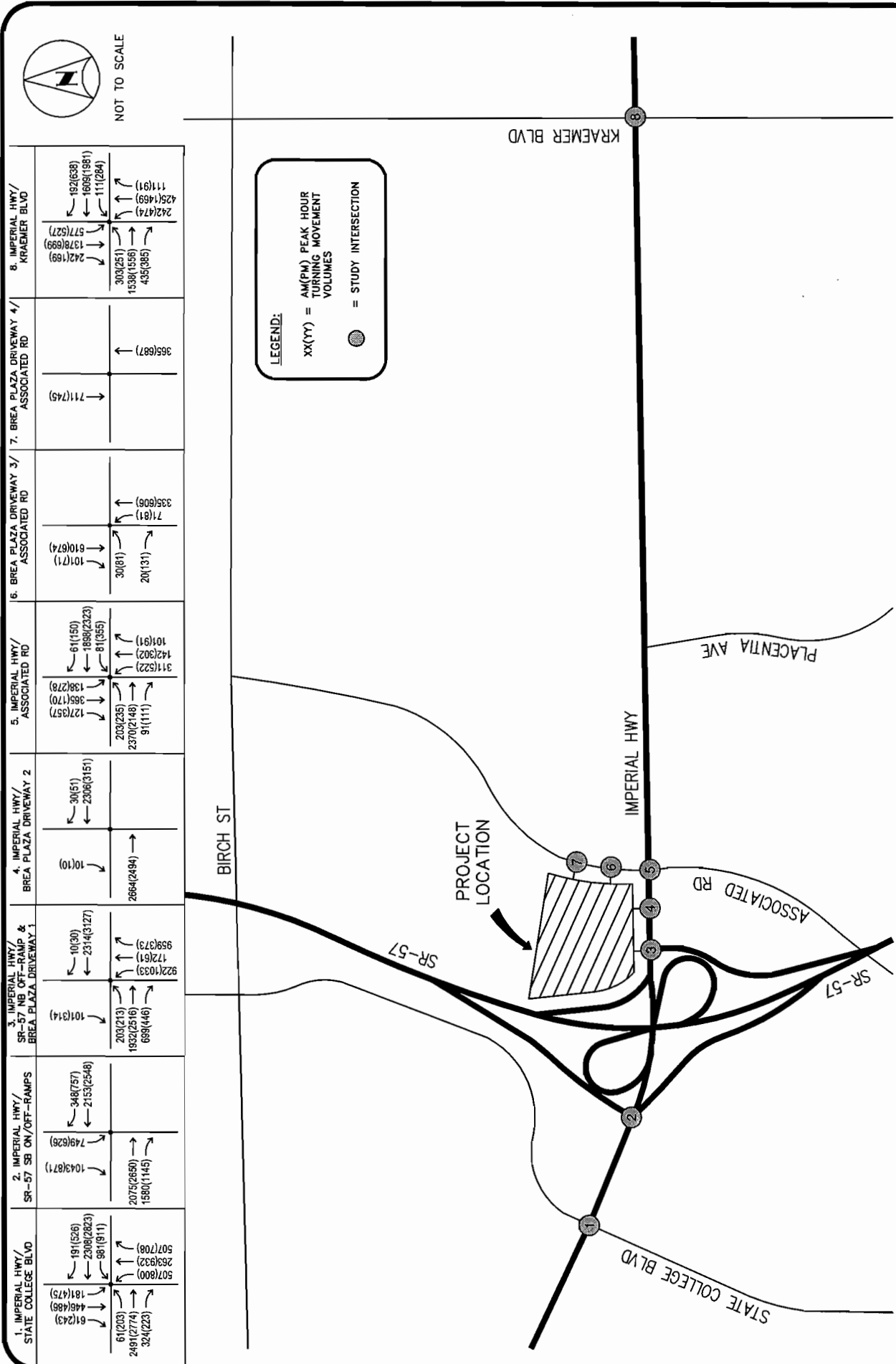


FIGURE 9
YEAR 2030 WITHOUT PROJECT PEAK HOUR TRAFFIC VOLUMES

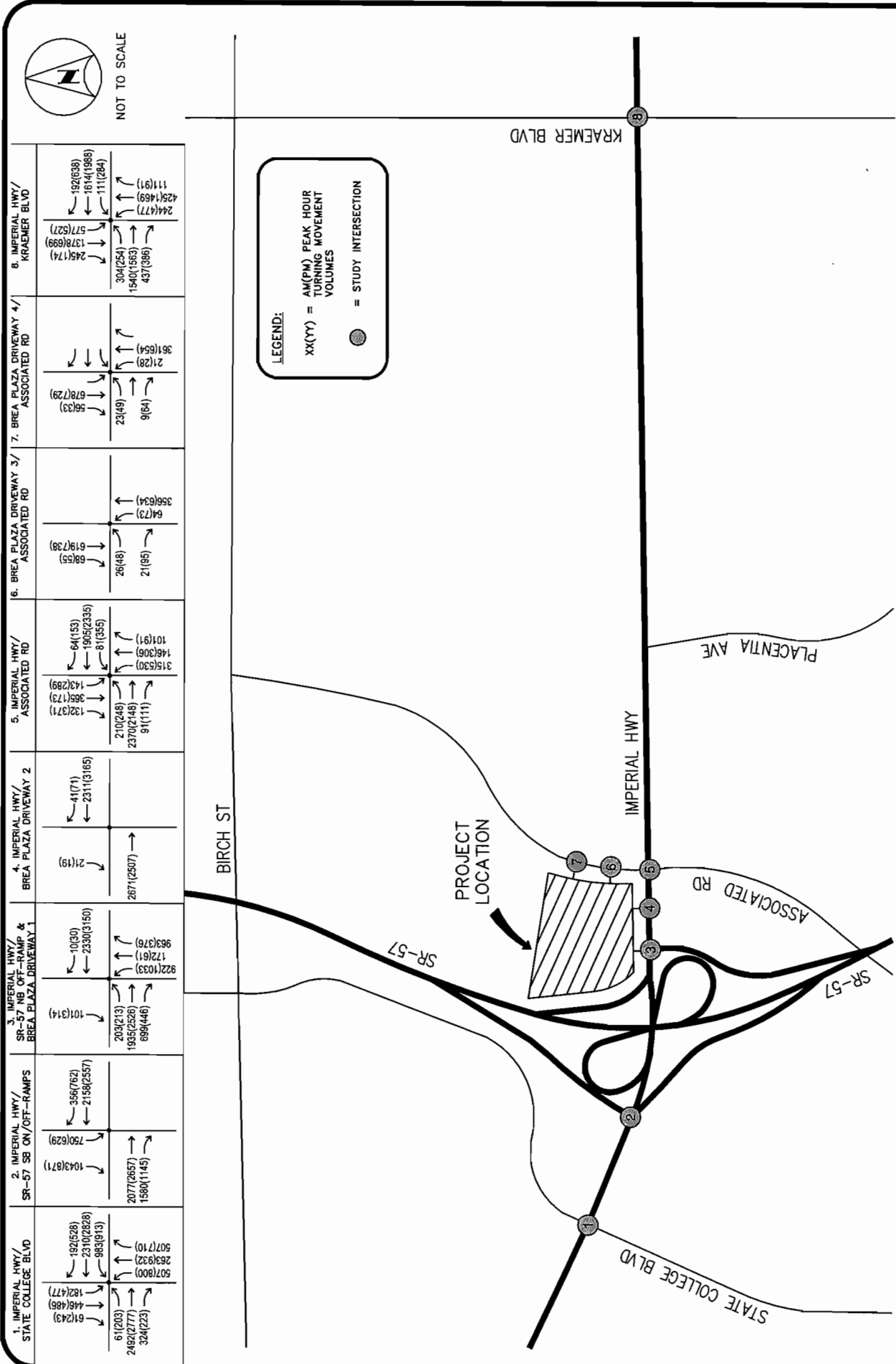


FIGURE 10
YEAR 2030 WITH PROJECT PEAK HOUR TRAFFIC VOLUMES

Table 4
Summary of Intersection Operation
Opening Year (2008) Traffic Conditions without the Project

Intersection Capacity Utilization Analysis					
Signalized Intersections	Control	AM Peak Hour		PM Peak Hour	
		ICU	LOS	ICU	LOS
Imperial Highway at:					
State College Boulevard	S	0.64	B	0.85	D
SR-57 Southbound Ramps	S	0.64	B	0.77	C
SR-57 NB Off-Ramp Brea Plaza Entrance	S	0.63	B	0.74	C
Associated Road	S	0.68	B	0.82	D
Kraemer Boulevard	S	0.61	B	0.78	C
Highway Capacity Manual Analysis					
Signalized Intersections	Control	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
Imperial Highway at:					
State College Boulevard	S	25.2	C	48.1	D
SR-57 Southbound Ramps	S	9.6	A	14.7	B
SR-57 NB Off-Ramp Brea Plaza Entrance	S	21.4	C	20.2	C
Associated Road	S	31.8	C	44.8	D
Kraemer Boulevard	S	27.2	C	43.0	D
Unsignalized Intersections	Control	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
Imperial Highway at Brea Plaza Secondary Driveway	U	9.8	A	10.8	B
Associated Road at Brea Plaza South Driveway	U	14.0	B	17.1	C
Associated Road at Brea Plaza North Driveway	U	na	na	na	na
S = Signalized, U = Unsignalized					
Intersection delay is expressed in average seconds of delay per vehicle during the peak hour					

Table 5
Summary of Intersection Operation
Opening Year (2008) Traffic Conditions with Project

Intersection Capacity Utilization Analysis							
Signalized Intersections	Control	AM Peak Hour			PM Peak Hour		
		ICU	Increase in ICU	LOS	ICU	Increase in ICU	LOS
Imperial Highway at:							
State College Boulevard	S	0.64	0.00	B	0.85	0.00	D
SR-57 Southbound Ramps	S	0.64	0.00	B	0.77	0.00	C
SR-57 NB Off-Ramp Brea Plaza Entrance	S	0.64	0.01	B	0.74	0.00	C
Associated Road	S	0.69	0.01	B	0.82	0.00	D
Kraemer Boulevard	S	0.61	0.00	B	0.79	0.01	C
Highway Capacity Manual Analysis							
Signalized Intersections	Control	AM Peak Hour			PM Peak Hour		
		Delay	Increase in Delay	LOS	Delay	Increase in Delay	LOS
Imperial Highway at:							
State College Boulevard	S	25.9	0.70	C	48.5	0.4	D
SR-57 Southbound Ramps	S	9.7	0.10	A	14.9	0.2	B
SR-57 NB Off-Ramp Brea Plaza Entrance	S	21.7	0.30	C	19.6	-0.6	B
Associated Road	S	32.5	0.70	C	46.2	1.4	D
Kraemer Boulevard	S	27.4	0.20	C	43.4	0.4	D
Unsignalized Intersections	Control	AM Peak Hour			PM Peak Hour		
		Delay	Increase in Delay	LOS	Delay	Increase in Delay	LOS
Imperial Highway at Brea Plaza Secondary Driveway	U	10.0	0.2	A	10.9	0.1	B
Associated Road at Brea Plaza South Driveway	U	13.4	-0.6	B	15.7	-1.4	C
Associated Road at Brea Plaza North Driveway	U	13.7	na	B	14.9	na	B
S - Signalized, U - Unsignalized							
NA - Not Applicable							
Intersection delay is expressed in average seconds of delay per vehicle during the peak hour							

Intersection Operation - Year 2030 without Project Traffic Conditions

The study intersections were re-analyzed and the results are summarized on Table 6. Intersection analysis worksheets are provided in Appendix B. The analysis indicates that the following study intersections are projected to operate at an unacceptable LOS under Year 2030 Traffic Conditions without the proposed project:

City of Brea Intersections

- Imperial Highway at Associated Road – PM LOS = E
- Imperial Highway at Kraemer Boulevard – PM LOS = E

CMP Intersections

- Imperial Highway at State College Boulevard – AM/PM LOS = F

The following study intersections are projected to operate at an unacceptable LOS under Year 2030 Traffic Conditions without the proposed project using the Caltrans HCS methodology and LOS criteria:

- Imperial Highway at State College Boulevard – AM/PM LOS = F
- Imperial Highway at SR-57 NB Off-Ramp/Brea Plaza Entrance – PM LOS = E
- Imperial Highway at Associated Road – PM LOS = F
- Imperial Highway at Kraemer Boulevard – AM LOS = E, PM LOS = F

Intersection Operation - Year 2030 with Project Traffic Conditions

The study intersections were re-analyzed and the results are summarized on Table 7. The magnitude of the project impact is also shown on Table 7. Intersection analysis worksheets are provided in Appendix B.

The project would not cause a change in LOS from acceptable to unacceptable, nor would the project cause an increase in ICU of more than 0.01, causing or worsening unacceptable LOS conditions at any of the other study intersections.

Caltrans HCS Methodology

The study intersections were re-analyzed using Caltrans HCS methodology and the results are also summarized on Table 7. The magnitude of the project impact is also shown on Table 7. Intersection analysis worksheets are provided in Appendix B. The analysis indicates that the proposed project would not have significant traffic impacts on the study intersections using the Caltrans HCS methodology under Year 2030 plus Project Traffic Conditions.

Table 6
Summary of Intersection Operation
Year 2030 Traffic Conditions without Project

Intersection Capacity Utilization Analysis					
Signalized Intersections	Control	AM Peak Hour		PM Peak Hour	
		ICU	LOS	ICU	LOS
Imperial Highway at:					
State College Boulevard	S	1.05	F	1.21	F
SR-57 Southbound Ramps	S	0.82	D	0.86	D
SR-57 NB Off-Ramp Brea Plaza Entrance	S	0.81	D	0.94	E
Associated Road	S	0.88	D	0.95	E
Kraemer Boulevard	S	0.86	D	0.98	E
Highway Capacity Manual Analysis					
Signalized Intersections	Control	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
Imperial Highway at:					
State College Boulevard	S	107.1	F	191.2	F
SR-57 Southbound Ramps	S	42.0	D	30.2	C
SR-57 NB Off-Ramp Brea Plaza Entrance	S	41.1	D	55.1	E
Associated Road	S	74.6	D	121.6	F
Kraemer Boulevard	S	58.2	E	94.2	F
Unsignalized Intersections	Control	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
Imperial Highway at Brea Plaza Secondary Driveway	U	9.7	A	10.5	B
Associated Road at Brea Plaza South Driveway	U	19.3	C	28.7	D
Associated Road at Brea Plaza North Driveway	U	na	na	na	na
S - Signalized, U - Unsignalized					
Intersection delay is expressed in average seconds of delay per vehicle during the peak hour					

Table 7
Summary of Intersection Operation
Year 2030 Traffic Conditions with Project

Intersection Capacity Utilization Analysis							
Signalized Intersections	Control	AM Peak Hour			PM Peak Hour		
		ICU	Increase in ICU	LOS	ICU	Increase in ICU	LOS
Imperial Highway at:							
State College Boulevard	S	1.05	0.00	F	1.21	0.00	F
SR-57 Southbound Ramps	S	0.82	0.00	D	0.86	0.00	D
SR-57 NB Off-Ramp Brea Plaza Entrance	S	0.81	0.00	D	0.95	0.01	E
Associated Road	S	0.88	0.00	D	0.96	0.01	E
Kraemer Boulevard	S	0.86	0.00	D	0.98	0.00	E
Highway Capacity Manual Analysis							
Signalized Intersections	Control	AM Peak Hour			PM Peak Hour		
		Delay	Increase in Delay	LOS	Delay	Increase in Delay	LOS
Imperial Highway at:							
State College Boulevard	S	107.3	0.2	F	191.9	0.7	F
SR-57 Southbound Ramps	S	42.2	0.2	D	30.7	0.5	C
SR-57 NB Off-Ramp Brea Plaza Entrance	S	42.1	1.0	D	56.3	1.2	E
Associated Road	S	75.2	0.6	D	130.9	9.3	F
Kraemer Boulevard	S	58.7	0.5	E	95.1	0.9	F
Unsignalized Intersections	Control	AM Peak Hour			PM Peak Hour		
		Delay	Increase in Delay	LOS	Delay	Increase in Delay	LOS
Imperial Highway at Brea Plaza Secondary Driveway	U	9.9	0.2	A	10.6	0.1	A
Associated Road at Brea Plaza South Driveway	U	18.1	-1.2	C	23.1	-5.6	C
Associated Road at Brea Plaza North Driveway	U	18.6	na	C	21.2	na	C
S = Signalized, U = Unsignalized							
NA - Not Applicable							
Intersection delay is expressed in average seconds of delay per vehicle during the peak hour							

The Caltrans criteria stipulates that if the State highway facility is operating at less than the target LOS (between LOS C and LOS D), then the pre-project LOS should be maintained. The proposed project does not cause a change in LOS at any of the study intersections on Imperial Highway.

RECOMMENDED IMPROVEMENTS

The proposed project does not cause a change in LOS from acceptable to unacceptable, nor would the project cause an increase in ICU of more than 0.01, causing or worsening unacceptable LOS conditions at any of the study intersections. Thus, no mitigation measures are necessary or recommended on the part of the proposed project.

City Of Brea Nexus Program

The City of Brea maintains a Nexus Program, which funds transportation improvements throughout the city. The Nexus Program requires that development projects contribute to planned transportation improvements on a fair share basis through a fee program, which manages the collection of fees and the implementation of transportation improvements.

City planning staff has indicated that the Nexus Program is being updated and is still in process. Staff anticipates that the program will be updated during the fiscal year 08/09.

The applicant will be required to participate in the current Nexus Program through the payment of fees. Brea Plaza is located in Fee District 2. The traffic impact fees for this district are \$5.86 per gross square foot of commercial, office, and/or industrial uses. Based on the increase in square footage for the proposed project (11,205 square feet), the applicant would be responsible for traffic impact fees of \$65,661.30.

PROJECT ACCESS LOCATIONS

Level of Service Analysis

As shown on Table 2, the two existing unsignalized driveways are currently operating at LOS C or better during both peak hours. The existing signalized driveway that aligns with the SR-57 Northbound Off-Ramp currently operate at LOS C or better during both peak hours.

Under Opening Year (2008) with Project conditions (Table 5), the two existing unsignalized driveways are projected to continue to operate at LOS C or better during both peak hours. The future unsignalized driveway on Associated Road is projected to operate at LOS B during both peak hours. The existing signalized driveway is projected to continue to operate at LOS C or better during both peak hours.

Under Year 2030 with Project conditions (Table 7), the two existing unsignalized driveways are projected to continue to operate at LOS C or better during both peak hours. The future

unsignalized driveway on Associated Road is projected to operate at LOS C during both peak hours. The existing signalized driveway is projected to operate at LOS D during the morning peak hour and at LOS E during the evening peak hour. Since the signalized driveway is a CMP intersection, LOS E is acceptable according to the Congestion Management Program.

Sight Distance Analysis

A sight distance field review was performed at the proposed driveway location along the west side of Associated Road. There is an existing full access driveway that currently provides access to Brea Plaza. The proposed driveway is located approximately 275 feet north of the existing driveway.

Associated Road is a north-south arterial with two lanes in each direction separated by a raised median with landscaping. The posted speed limit on Associated Road is 35 miles per hour north of Imperial Highway. Vehicles turning left into and out of the driveway would need to cross two lanes of travel and a raised median.

The sight distance standards used, Cases B1, B2, and F, in this analysis are from the 2001 American Association of State Highway and Transportation Officials (AASHTO) – Geometric Design of Highways and Streets, Chapter 9 – Intersections (Intersection Sight Distance). Case B1 will be used for left turners at a stopped position from a minor street. Case B2 will be used for right turners at a stopped position from a minor street. Case F will be used left turners from a major street. Since the area predominantly experiences passenger car traffic, the sight distance calculations used will have the passenger car as the design vehicle. In addition, the raised median along Associated Road will be considered as a lane and taken into account in the Case B1 sight distance calculations.

The sight distance measurement is taken 7.5' from the stop bar on the driveway approach, to simulate the location of the driver in the car. The line of sight of the driver is from 3.5' from the ground to represent the driver's eye line while sitting in the vehicle. The sight distance available is the distance the driver can see an object 2' above the ground, which represents the height of typical passenger car headlights. Using these parameters helped determine the sight distances from the driveway. The intersection sight distance standard for passenger cars for a 35 mile per hour design speed is 415' for Case B1, 335' for Case B2, and 310' for Case F.

Looking southbound from the proposed driveway, the driver has adequate sight distance greater than 500', which exceeds the 415' intersection sight distance requirement for passenger cars on a roadway with a 35 mile per hour design speed. Looking northbound from the proposed driveway, the driver has sight distance greater than 600' which exceeds the sight distance requirement (335'). A driver turning northbound left into the proposed driveway from Associated Road can see beyond the required 310' to the north and would have adequate sight distance for this movement.

PARKING ANALYSIS

The following section presents the parking analysis prepared for the proposed project. As part of the project, the applicant proposes to pave the Loftus Channel in order to provide 125 additional parking spaces on-site.

Parking Required Per City Code

The parking requirements for the proposed project per the City of Brea Municipal Code are presented on Table 8. The Municipal Code sets forth the off-street parking space requirements for developments in the City. The Off-Street Parking and Loading section of the Municipal Code is provided in Appendix D.

The City's code for shopping centers requires 5.5 parking spaces for each 1,000 square feet (KSF) of Gross Floor Area (GFA).

As shown on Table 8, by application of the City's code, the existing uses at Brea Plaza would be required to have a parking supply of 811 parking spaces. According to the site plan (Figure 1), Brea Plaza currently has 644 parking spaces.

The additional 11,205 square feet of retail uses would have a requirement of 62 additional parking spaces, bringing the total city-required parking for Brea Plaza to 873 parking spaces.

Parking Spaces Provided By Applicant

The applicant proposes to pave the Loftus Channel between Imperial Highway and the proposed Associated Driveway in order to provide 125 additional parking spaces on the site. With the additional parking spaces over the channel, the applicant proposes to provide a total of 766 parking spaces.

Adequacy of Proposed Parking

Compared to the number of parking spaces required by application of the City of Brea parking code, the applicant would provide 107 fewer parking spaces than would be required.

ULI Shared Parking Analysis

The ULI Shared Parking methodology is a multi-step process that first establishes the stand-alone peak parking requirements for various land uses. The methodology then applies a percentage to the peak requirement for each use, for each hour of the day between the hours of 6:00 AM and midnight, reflecting the fact that the parking demand for each use varies throughout the course of the day.

Table 8
Comparison of Existing and Projected Parking Spaces
Brea Plaza Redevelopment

Land Uses	Quantity	City of Brea Parking Code	Parking Required per City Code
REQUIRED PARKING			
Existing Shopping Center	147.537 ksf	5.5 spaces/ksf	811
Proposed Shopping Center	158.742 ksf	5.5 spaces/ksf	873
Land Uses	Quantity		Parking Provided
PARKING PROVIDED			
Existing Shopping Center	147.537 ksf		644
Proposed Shopping Center	158.742 ksf		766
sf = square feet			

Shared parking synergies exist between different uses whose peak operating times are at different times of the day. The most dramatic example of complementary uses for shared parking purposes are office and theater uses in the same development. When the office parking demand is at 100% (at 10:00 and 11:00 in the morning on a weekday), the theater parking demand is at 0%, according to the ULI document. Conversely, when the theater parking demand is at 100% (from 8:00 to 10:00 on a weekend night), the office has virtually no parking demand. These two uses, then, can share all or a portion of the same parking supply without detriment to the other, rather than each providing their own distinct and complete parking supply. In theory, the total parking demand for that mix of uses will not exceed that projected peak, due to the interrelationships and benefits of shared parking synergies.

In the case of the Brea Plaza shopping center, the bank parking demand would have peaks between 9 AM and 5 PM on weekdays and between 10 AM and 1 PM on weekends, the retail uses would have peaks between Noon and 8 PM on weekdays and between 1 PM and 6 PM on weekends, while the restaurant parking demand peak would be between 11 AM and 3 PM and again between 6 PM and 11 PM on weekdays and between Noon and 3 PM and again between 6 PM and midnight on weekdays. The ULI shared parking analysis, including percentages and needed parking spaces are provided in Appendix E.

The shared parking analyses are summarized on Tables 9 and 10 for weekdays and weekends, respectively. The shared parking analysis indicates that the peak parking demand on a typical weekday for Brea Plaza with the proposed project would be 768 parking spaces between 1 PM and 2 PM. Considering the proposed parking supply of 766 parking spaces, there would be a weekday deficit of 2 parking spaces between 1 PM and 2 PM.

On a typical weekend day, the peak parking demand for Brea Plaza with the proposed project would be 797 parking spaces between 2 PM and 3 PM. Considering the proposed parking supply of 766 parking spaces, there would be a weekend deficit of 31 parking spaces between 2 PM and 3 PM. There would also be a deficit of 22 parking spaces between the hours of 3 PM and 4 PM, when the center would have a demand of 788 parking spaces.

For all other hours of the day, Brea Plaza would have a surplus of parking of 16 spaces or more.

It should be noted that the ULI parking methodology takes into consideration variations in parking depending on the month of the year. For the month of December the seasonal factor for most land uses is 1.0. For other months of the year, the seasonal factor ranges from 0.56 to 0.72 for retail uses and from 0.68 to 0.99 for restaurant uses. Banking uses (characterized by the office category) would have a seasonal factor of 1.0 for all months of the year. The parking analysis is based on the December seasonal factor and thus, provides the worst case parking demand of a year.

For the months of January through November, the maximum parking demand per the ULI shared parking methodology would be 589 parking spaces.

Table 9
Summary of Hourly Parking Demand for Brea Plaza Redevelopment
For Weekdays

Time of Day	Hourly Parking Demand				Proposed Parking Supply	Surplus/ (Deficit)
	Retail	Restaurant	Office	Total		
6:00 AM	7	2	1	10	766	756
7:00 AM	33	3	7	43	766	723
8:00 AM	98	6	16	120	766	646
9:00 AM	230	9	21	260	766	506
10:00 AM	426	29	22	477	766	289
11:00 AM	558	59	22	639	766	127
12:00 AM	623	92	20	735	766	31
1:00 PM	656	92	20	768	766	(2)
2:00 PM	623	81	22	726	766	40
3:00 PM	590	51	22	663	766	103
4:00 PM	590	58	20	668	766	98
5:00 PM	623	80	11	714	766	52
6:00 PM	623	105	5	733	766	33
7:00 PM	623	107	2	732	766	34
8:00 PM	525	98	1	624	766	142
9:00 PM	328	92	0	420	766	346
10:00 PM	197	85	0	282	766	484
11:00 PM	66	65	0	131	766	635
12:00 PM	0	23	0	23	766	743
Bold indicates weekday peak parking demand						

Table 10
Summary of Hourly Parking Demand for Brea Plaza Redevelopment
For Weekends

Time of Day	Hourly Parking Demand				Proposed Parking Supply	Surplus/ (Deficit)
	Retail	Restaurant	Office	Total		
6:00 AM	7	1	0	8	766	758
7:00 AM	36	3	1	40	766	726
8:00 AM	73	6	2	81	766	685
9:00 AM	219	8	3	230	766	536
10:00 AM	364	15	3	382	766	384
11:00 AM	474	38	4	516	766	250
12:00 AM	583	74	3	660	766	106
1:00 PM	656	79	3	738	766	28
2:00 PM	729	66	2	797	766	(31)
3:00 PM	729	58	1	788	766	(22)
4:00 PM	693	56	1	750	766	16
5:00 PM	656	72	0	728	766	38
6:00 PM	583	107	0	690	766	76
7:00 PM	547	120	0	667	766	99
8:00 PM	474	106	0	580	766	186
9:00 PM	364	91	0	455	766	311
10:00 PM	255	89	0	344	766	422
11:00 PM	109	86	0	195	766	571
12:00 PM	0	47	0	47	766	719
Bold indicates weekend peak parking demand						

Mercury Parking

This parking analysis does not take into consideration the provision of 116 surface parking spaces on the property of the Mercury Casualty Company located adjacent to the north side of Brea Plaza. The applicant and Mercury Casualty Company entered into a parking agreement in 1976. The agreement was modified in 2006 at the time that Mercury constructed an on-site parking structure. The modified agreement restricts Brea Plaza from using the parking structure but allows Brea Plaza to continue to use the surface parking on the Mercury site. As part of the agreement, Mercury relinquishes all rights to park on any portion of Brea Plaza. A copy of the agreement is provided in Appendix F of this report.

The proposed parking supply of 766 parking spaces does not include the 116 parking spaces located on the Mercury property. While Brea Plaza has a parking agreement with Mercury, the availability of all 116 parking cannot be guaranteed during the working hours of the Mercury offices. However, taking into account the hours and days during which the Brea Plaza parking deficits are projected to occur compared to typical office hours, the number of spaces within the Mercury surface lot that would be needed by Brea Plaza are likely to be available.

Brea Plaza is projected to have a weekday parking deficit of 2 parking spaces between 1 PM and 2 PM during the month of December when the office parking demand is at 90%. Brea Plaza is projected to have a weekend parking deficit of 31 parking spaces between 2 PM and 3 PM during the month of December when the office parking demand is at 60% and a weekend parking deficit of 22 parking spaces between the hours of 3 PM and 4 PM during the month of December when the office parking demand is at 40%.

FINDINGS AND CONCLUSIONS

Based on the significance criteria used by the City of Brea, the Congestion Management Program, and Caltrans, the proposed project would not have significant traffic impacts at any of the study area intersections. The project access locations would operate at acceptable levels of service for all analysis conditions. Thus, no roadway mitigation measures are recommended for the project.

The proposed number of parking spaces to be provided at Brea Plaza would result in a shortfall of 107 parking spaces compared to city code. Compared to the ULI shared parking methodology, there would be a shortfall of 2 parking spaces at Brea Plaza on a weekday during the month of December during the hours of 1 PM and 2 PM. On a weekend day during the month of December, there would be a shortfall of 31 parking spaces between 2 PM and 3 PM and a shortfall of 22 parking spaces between 3 PM and 4 PM. Since the shortfall in parking spaces would be accommodated through the use of the 116-space Mercury parking lot and because these parking space shortfalls would only occur during limited hours during the month of December, no parking mitigation measures are recommended for the project.

Appendices

Appendix A

- Existing Traffic Counts

Intersection Turning Movement

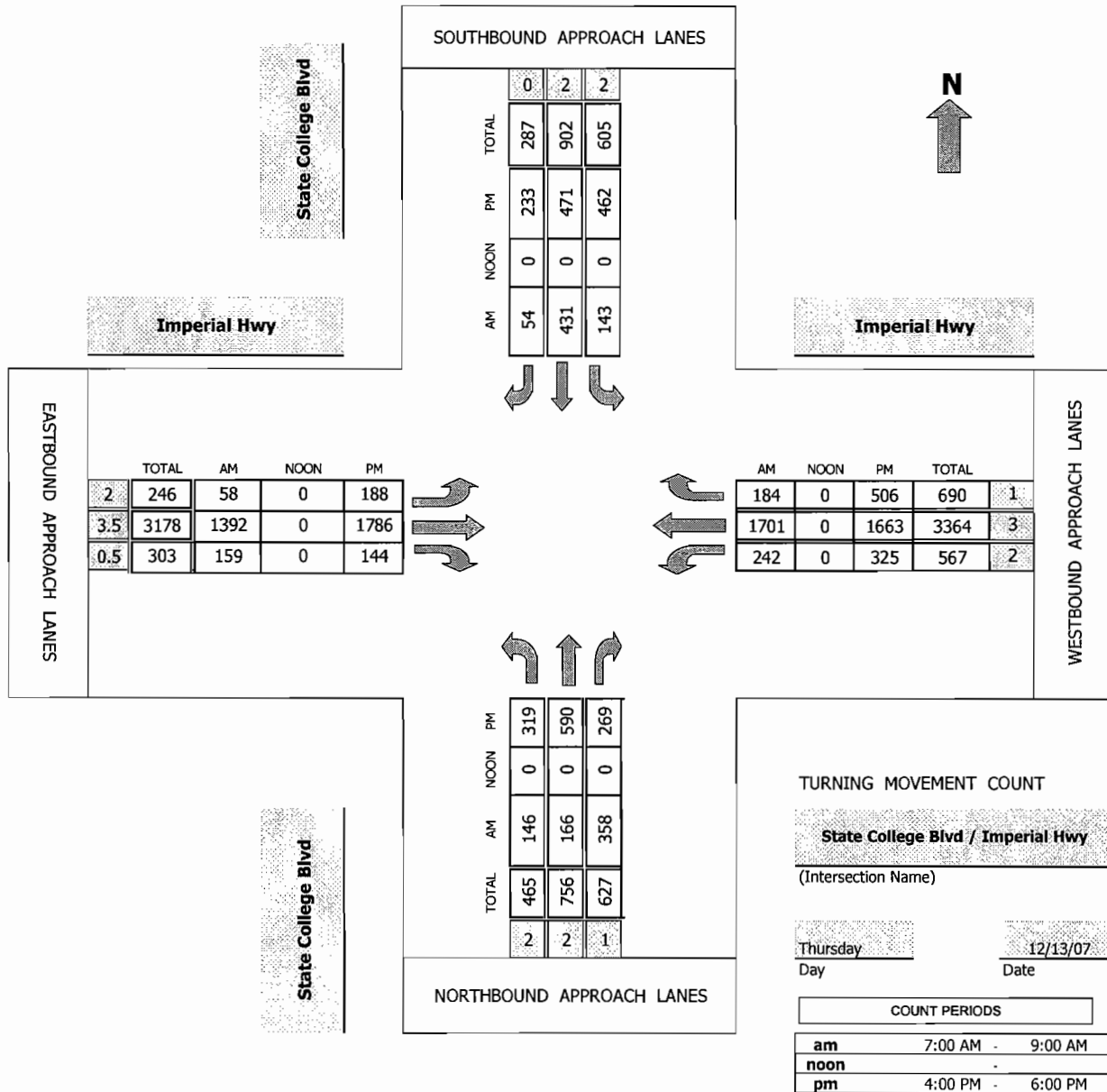
Prepared by:



National Data & Surveying Services

TMC Summary of State College Blvd/Imperial Hwy

Project #: 07-1363-001



AM PEAK HOUR 730 AM

NOON PEAK HOUR 0 AM

PM PEAK HOUR 445 PM

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: State College Blvd

DATE: 12/13/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: THURSDAY

PROJECT# 07-1363-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 2	NR 1	SL 2	ST 2	SR 0	EL 2	ET 3.5	ER 0.5	WL 2	WT 3	WR 1	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	25	25	80	30	98	8	12	282	40	42	310	20	972
7:15 AM	39	26	91	30	118	10	5	286	42	43	408	29	1127
7:30 AM	28	33	90	21	117	8	9	390	47	58	416	40	1257
7:45 AM	47	54	96	41	128	16	16	313	32	66	432	44	1285
8:00 AM	41	36	81	39	91	13	15	374	46	56	456	47	1295
8:15 AM	30	43	91	42	95	17	18	315	34	62	397	53	1197
8:30 AM	23	41	76	41	76	15	11	344	32	56	434	72	1221
8:45 AM	43	67	70	29	74	14	19	312	25	75	441	87	1256
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL VOLUMES =	NL 276	NT 325	NR 675	SL 273	ST 797	SR 101	EL 105	ET 2616	ER 298	WL 458	WT 3294	WR 392	TOTAL 9610
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AM Peak Hr Begins at: 730 AM

PEAK VOLUMES =	146	166	358	143	431	54	58	1392	159	242	1701	184	5034
PEAK HR. FACTOR:	0.850			0.849			0.902			0.951			0.972

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: State College Blvd

DATE: 12/13/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: THURSDAY

PROJECT# 07-1363-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	2	2	1	2	2	0	2	3.5	0.5	2	3	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	84	105	63	117	101	62	45	408	47	77	412	128	1649
4:15 PM	57	137	45	118	115	55	67	348	47	88	434	125	1636
4:30 PM	67	124	52	120	101	74	44	431	54	90	403	133	1693
4:45 PM	87	160	73	115	144	49	49	410	37	74	435	130	1763
5:00 PM	66	130	56	122	110	62	49	472	41	85	393	134	1720
5:15 PM	83	158	70	108	113	59	37	422	35	90	399	122	1696
5:30 PM	83	142	70	117	104	63	53	482	31	76	436	120	1777
5:45 PM	66	146	64	115	142	52	37	385	28	102	405	112	1654
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	593	1102	493	932	930	476	381	3358	320	682	3317	1004	13588

PM Peak Hr Begins at: 445 PM

PEAK													
VOLUMES =	319	590	269	462	471	233	188	1786	144	325	1663	506	6956
PEAK HR. FACTOR:		0.920			0.946			0.936			0.976		0.979

CONTROL: Signalized

Intersection Turning Movement

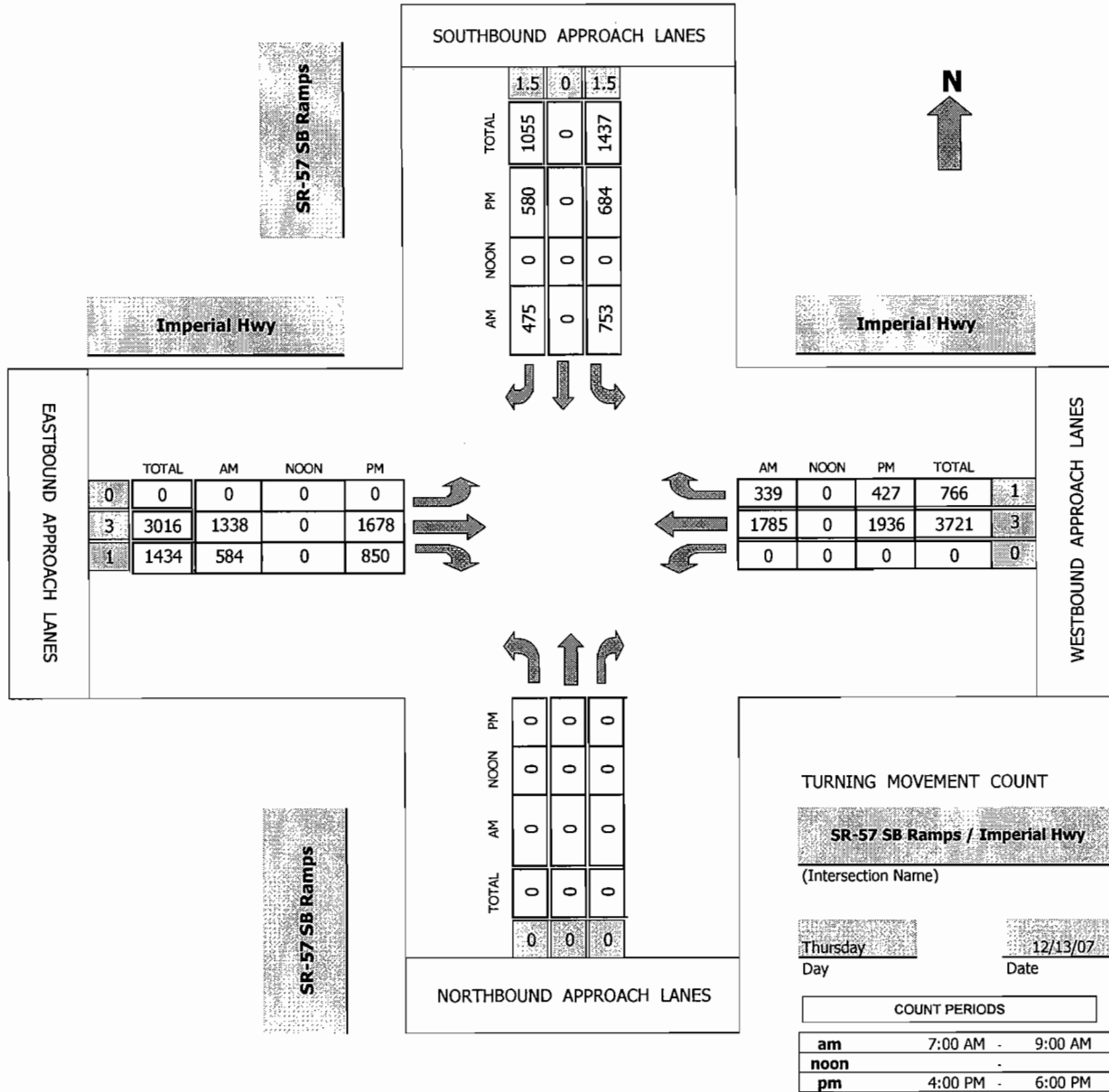
Prepared by:



National Data & Surveying Services

TMC Summary of SR-57 SB Ramps/Imperial Hwy

Project #: 07-1363-002



AM PEAK HOUR 730 AM

NOON PEAK HOUR 0 AM

PM PEAK HOUR 445 PM

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: SR-57 SB Ramps

DATE: 12/13/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: THURSDAY

PROJECT# 07-1363-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 0	NR 0	SL 1.5	ST 0	SR 1.5	EL 0	ET 3	ER 1	WL 0	WT 3	WR 1	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM				150		78		264	104		286	60	942
7:15 AM				147		92		342	135		331	67	1114
7:30 AM				151		99		352	150		390	70	1212
7:45 AM				211		117		408	145		539	88	1508
8:00 AM				211		132		342	150		441	90	1366
8:15 AM				180		127		236	139		415	91	1188
8:30 AM				161		112		275	132		352	86	1118
8:45 AM				151		148		249	123		397	71	1139
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL VOLUMES =	NL 0	NT 0	NR 0	SL 1362	ST 0	SR 905	EL 0	ET 2468	ER 1078	WL 0	WT 3151	WR 623	TOTAL 9587
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AM Peak Hr Begins at: 730 AM

PEAK VOLUMES =	0	0	0	753	0	475	0	1338	584	0	1785	339	5274
PEAK HR. FACTOR:		0.000			0.895			0.869			0.847		0.874

CONTROL: Signalized

A5

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: SR-57 SB Ramps

DATE: 12/13/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: THURSDAY

PROJECT# 07-1363-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	0	0	1.5	0	1.5	0	3	1	0	3	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM				170		163		297	175		432	50	1287
4:15 PM				162		159		418	168		480	57	1444
4:30 PM				150		132		381	176		445	100	1384
4:45 PM				155		158		396	168		475	192	1544
5:00 PM				178		132		426	214		486	77	1513
5:15 PM				180		143		429	233		493	78	1556
5:30 PM				171		147		427	235		482	80	1542
5:45 PM				162		148		441	190		505	81	1527
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	0	0	0	1328	0	1182	0	3215	1559	0	3798	715	11797

PM Peak Hr Begins at: 445 PM

PEAK													
VOLUMES =	0	0	0	684	0	580	0	1678	850	0	1936	427	6155
PEAK HR.													
FACTOR:		0.000			0.978			0.955			0.886		0.989

CONTROL: Signalized

Intersection Turning Movement

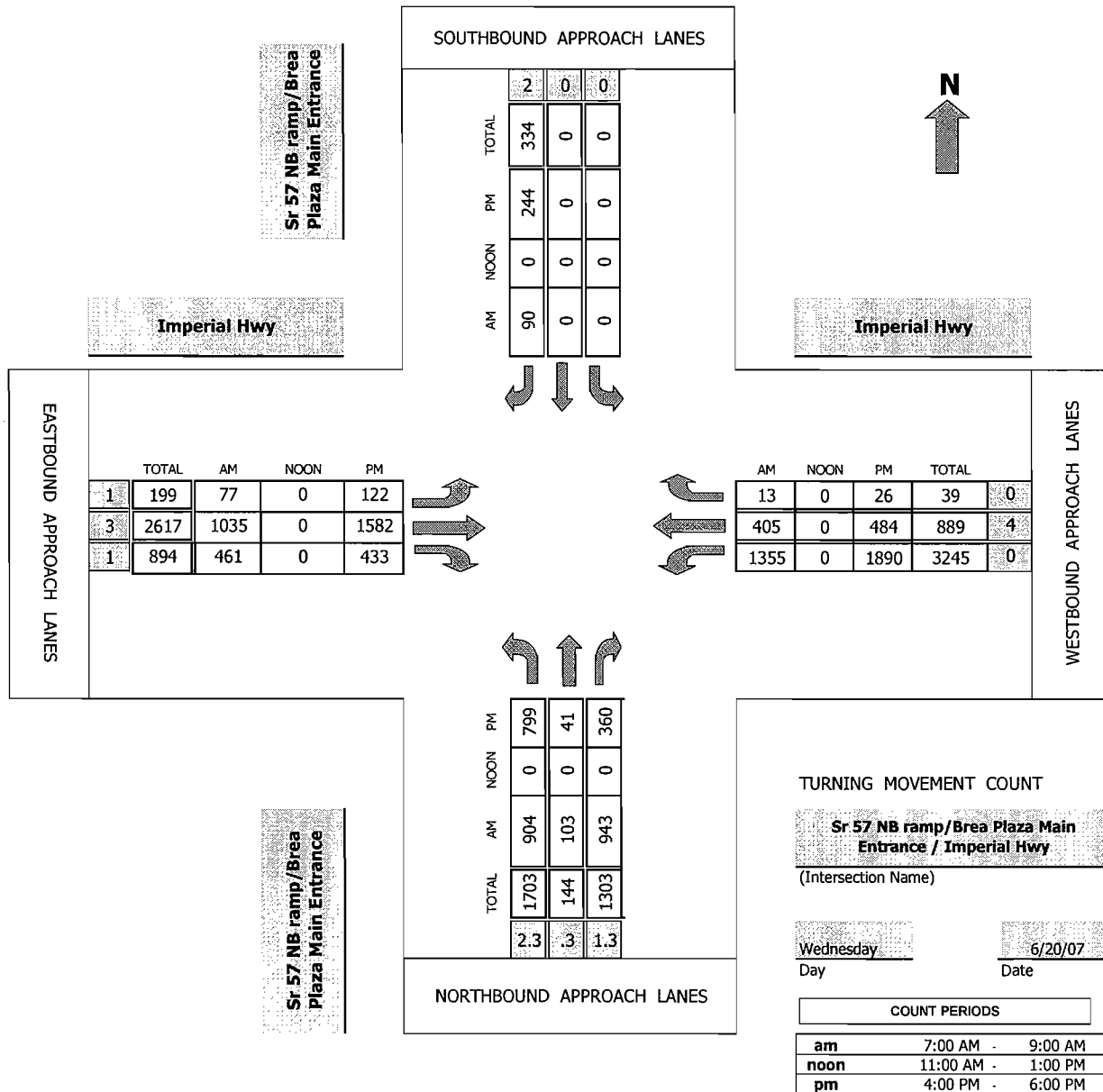
Prepared by:



National Data & Surveying Services

TMC Summary of Sr 57 NB ramp/Brea Plaza Main Entrance/Imperial Hwy

Project #: 07-1187-001



AM PEAK HOUR 715 AM

NOON PEAK HOUR 0 AM

PM PEAK HOUR 430 PM

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Sr 57 NB ramp/Brea Plaza

DATE: 6/20/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: WEDNESDAY

PROJECT# 07-1187-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2.3	NT .3	NR 1.3	SL 0	ST 0	SR 2	EL 1	ET 3	ER 1	WT 0	WR 4	WRR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	179	25	159			19	21	206	98	283	99	6	1095
7:15 AM	231	23	201			24	22	236	126	296	107	2	1268
7:30 AM	237	29	257			22	19	263	132	354	120	1	1434
7:45 AM	245	36	300			28	20	269	114	349	78	5	1444
8:00 AM	191	15	185			16	16	267	89	356	100	5	1240
8:15 AM	213	16	230			25	16	261	102	240	72	6	1181
8:30 AM	186	9	180			18	17	272	75	295	90	1	1143
8:45 AM	263	10	224			20	13	296	67	240	90	5	1228
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WT	WR	WRR	TOTAL
VOLUMES =	1745	163	1736	0	0	172	144	2070	803	2413	756	31	10033

AM Peak Hr Begins at: 715 AM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WT	WR	WRR	TOTAL
VOLUMES =	904	103	943	0	0	90	77	1035	461	1355	405	13	5386
PEAK HR.													
FACTOR:	0.839			0.804			0.950			0.933			0.932

CONTROL: Signalized
 WR= Enter to Fwy
 WRR= Enter to Plaza Center

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Sr 57 NB ramp/Brea Plaza

DATE: 6/20/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: WEDNESDAY

PROJECT# 07-1187-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2.3	NT .3	NR 1.3	SL 0	ST 0	SR 2	EL 1	ET 3	ER 1	WT 0	WR 4	WRR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	189	8	70			41	40	344	96	449	114	7	1358
4:15 PM	182	8	84			66	26	377	98	403	91	10	1345
4:30 PM	198	13	97			33	14	381	106	489	112	5	1448
4:45 PM	214	8	82			97	46	387	90	424	86	5	1439
5:00 PM	205	8	105			58	25	378	103	506	136	7	1531
5:15 PM	182	12	76			56	37	436	134	471	150	9	1563
5:30 PM	140	13	62			42	41	431	110	468	116	14	1437
5:45 PM	126	20	71			51	43	422	107	415	108	8	1371
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL VOLUMES =	NL 1436	NT 90	NR 647	SL 0	ST 0	SR 444	EL 272	ET 3156	ER 844	WT 3625	WR 913	WRR 65	TOTAL 11492
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PM Peak Hr Begins at: 430 PM

PEAK VOLUMES =	799	41	360	0	0	244	122	1582	433	1890	484	26	5981
PEAK HR. FACTOR:		0.943			0.629			0.880			0.924		0.957

CONTROL: Signalized
WR= Enter to Fwy
WRR= Enter to Plaza Center

Intersection Turning Movement

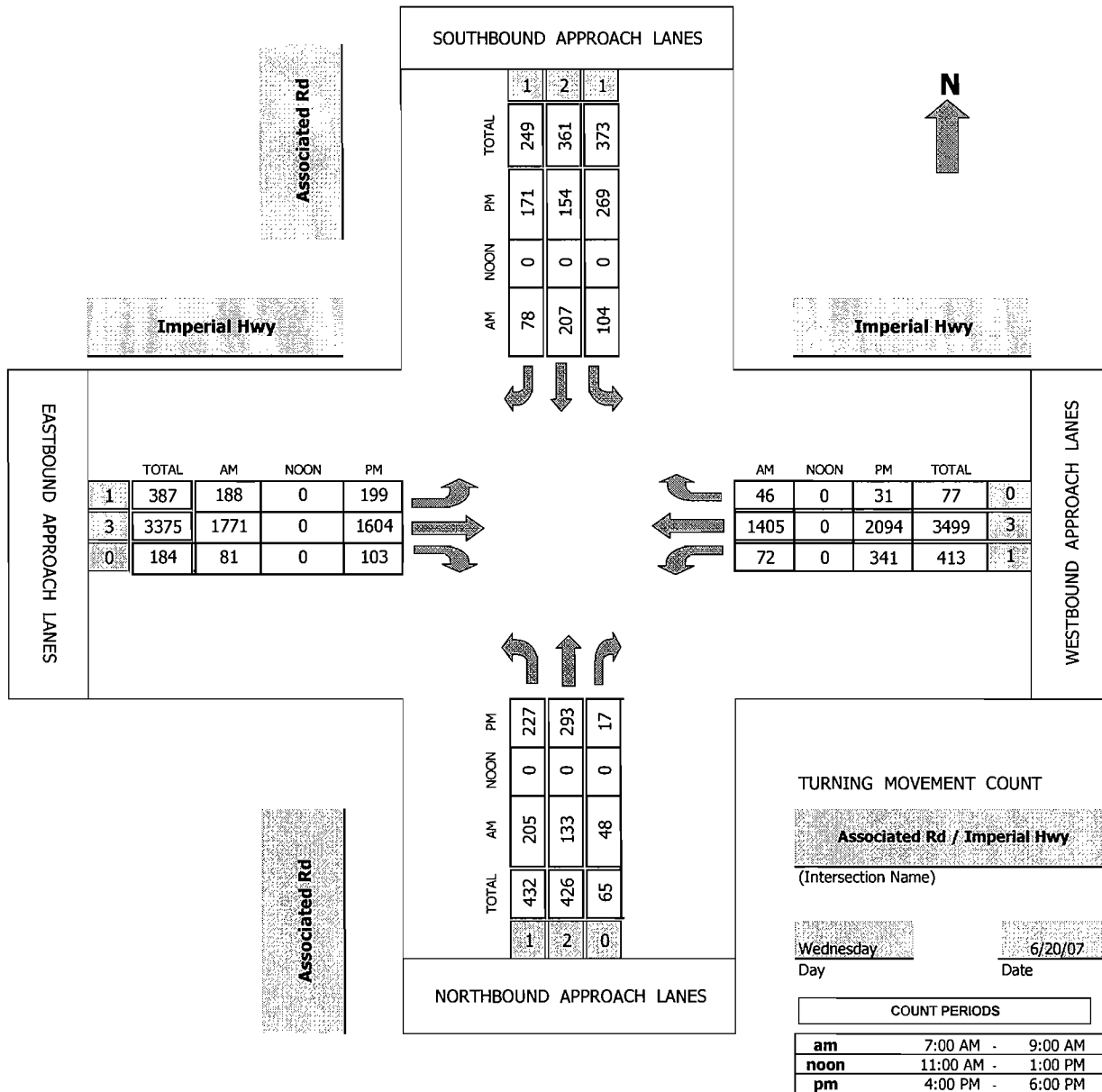
Prepared by:



National Data & Surveying Services

TMC Summary of Associated Rd/Imperial Hwy

Project #: 07-1187-003



AM PEAK HOUR 730 AM
NOON PEAK HOUR 0 AM
PM PEAK HOUR 500 PM

A10

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Associated Rd

DATE: 6/20/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: WEDNESDAY

PROJECT# 07-1187-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	37	18	7	11	47	16	17	308	10	7	335	7	820
7:15 AM	52	28	10	13	52	21	23	358	17	11	363	9	957
7:30 AM	44	22	15	31	50	16	49	440	28	15	414	14	1138
7:45 AM	64	41	10	29	60	17	54	415	12	27	339	17	1085
8:00 AM	38	38	12	19	58	21	41	500	18	14	365	7	1131
8:15 AM	59	32	11	25	39	24	44	416	23	16	287	8	984
8:30 AM	37	11	7	13	40	14	33	451	24	9	291	14	944
8:45 AM	34	19	10	20	44	7	34	454	20	17	333	10	1002
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL VOLUMES =	NL 365	NT 209	NR 82	SL 161	ST 390	SR 136	EL 295	ET 3342	ER 152	WL 116	WT 2727	WR 86	TOTAL 8061
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AM Peak Hr Begins at: 730 AM

PEAK VOLUMES =	205	133	48	104	207	78	188	1771	81	72	1405	46	4338
PEAK HR. FACTOR:	0.839			0.917			0.912			0.859			0.953

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Associated Rd

DATE: 6/20/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: WEDNESDAY

PROJECT# 07-1187-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	28	64	9	20	67	32	42	380	18	48	462	7	1177
4:15 PM	48	68	7	43	39	30	56	365	20	68	480	9	1233
4:30 PM	41	73	6	46	56	50	61	469	35	98	446	3	1384
4:45 PM	26	86	15	51	24	56	42	398	13	79	523	7	1320
5:00 PM	41	91	3	66	29	39	54	381	23	84	536	9	1356
5:15 PM	56	85	6	77	41	54	46	372	29	61	543	10	1380
5:30 PM	60	67	5	51	44	54	32	391	25	99	487	5	1320
5:45 PM	70	50	3	75	40	24	67	460	26	97	528	7	1447
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL VOLUMES =	NL 370	NT 584	NR 54	SL 429	ST 340	SR 339	EL 400	ET 3216	ER 189	WL 634	WT 4005	WR 57	TOTAL 10617
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PM Peak Hr Begins at: 500 PM

PEAK VOLUMES =	227	293	17	269	154	171	199	1604	103	341	2094	31	5503
PEAK HR. FACTOR:		0.913			0.863			0.862			0.975		0.951

CONTROL: Signalized

A12

Intersection Turning Movement

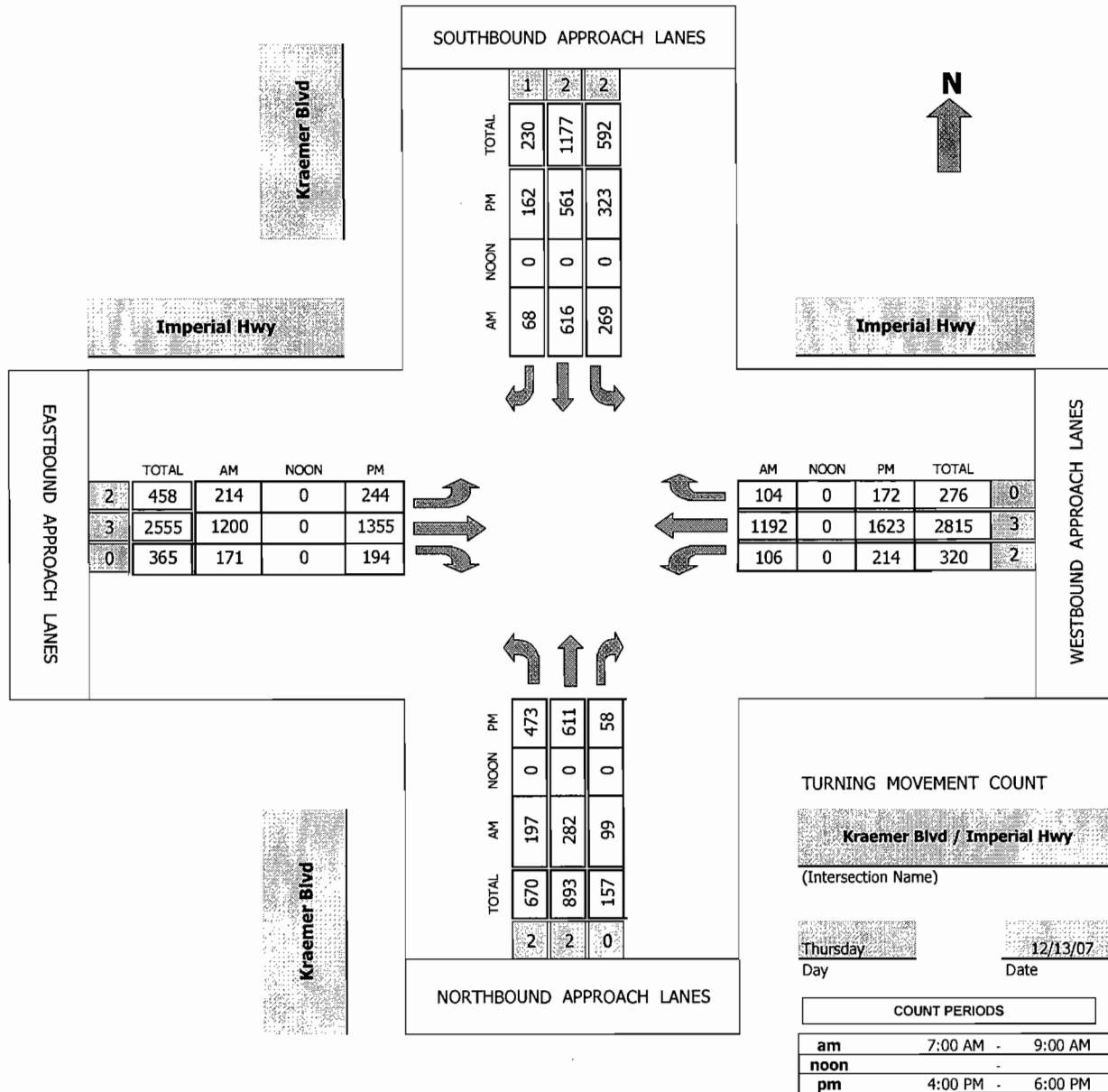
Prepared by:



National Data & Surveying Services

TMC Summary of Kraemer Blvd/Imperial Hwy

Project #: 07-1363-003



AM PEAK HOUR 730 AM
NOON PEAK HOUR 0 AM
PM PEAK HOUR 445 PM

A13

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Kraemer Blvd

DATE: 12/13/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: THURSDAY

PROJECT# 07-1363-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 2	NR 0	SL 2	ST 2	SR 1	EL 2	ET 3	ER 0	WL 2	WT 3	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	28	38	14	52	113	15	24	179	26	8	259	14	770
7:15 AM	32	43	17	64	120	17	28	192	23	13	277	17	843
7:30 AM	46	61	19	71	130	19	62	292	34	24	265	30	1053
7:45 AM	59	93	35	79	187	14	73	305	44	21	332	21	1263
8:00 AM	61	70	29	60	112	21	52	330	52	35	309	30	1161
8:15 AM	31	58	16	59	187	14	27	273	41	26	286	23	1041
8:30 AM	39	44	22	61	148	10	32	307	40	23	300	15	1041
8:45 AM	81	62	42	53	130	13	32	226	14	18	306	25	1002
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL VOLUMES =	NL 377	NT 469	NR 194	SL 499	ST 1127	SR 123	EL 330	ET 2104	ER 274	WL 168	WT 2334	WR 175	TOTAL 8174
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AM Peak Hr Begins at: 730 AM

PEAK VOLUMES =	197	282	99	269	616	68	214	1200	171	106	1192	104	4518
PEAK HR. FACTOR:	0.773			0.851			0.913			0.937			0.894

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Kraemer Blvd

DATE: 12/13/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: THURSDAY

PROJECT# 07-1363-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 2	NR 0	SL 2	ST 2	SR 1	EL 2	ET 3	ER 0	WL 2	WT 3	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	74	118	7	74	103	18	28	248	31	26	302	24	1053
4:15 PM	98	136	16	56	128	24	36	253	42	33	321	31	1174
4:30 PM	124	133	12	89	119	51	53	374	68	21	403	36	1483
4:45 PM	103	142	18	92	136	46	49	328	53	48	426	28	1469
5:00 PM	108	128	11	88	132	32	67	336	32	62	418	47	1461
5:15 PM	114	160	10	75	153	29	58	311	49	51	393	48	1451
5:30 PM	148	181	19	68	140	55	70	380	60	53	386	49	1609
5:45 PM	128	219	12	95	144	63	76	268	51	51	300	58	1465
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													
TOTAL VOLUMES =	NL 897	NT 1217	NR 105	SL 637	ST 1055	SR 318	EL 437	ET 2498	ER 386	WL 345	WT 2949	WR 321	TOTAL 11165

PM Peak Hr Begins at: 445 PM

PEAK VOLUMES =	473	611	58	323	561	162	244	1355	194	214	1623	172	5990
PEAK HR. FACTOR:		0.820			0.954			0.879			0.953		0.931

CONTROL: Signalized

A15

Intersection Turning Movement

Prepared by:



National Data & Surveying Services

TMC Summary of Brea Plaza Secondary Entrance(North Side Only)/Imperial Hwy

Project #: 07-1187-002

Brea Plaza Secondary Entrance(North Side Only)

Imperial Hwy

SOUTHBOUND APPROACH LANES

	1	0	0
TOTAL	18	0	0
PM	13	0	0
NOON	0	0	0
AM	5	0	0

↓ ↓ ↓

Imperial Hwy

N
↑

EASTBOUND APPROACH LANES

	TOTAL	AM	NOON	PM
0	0	0	0	0
4	4075	2064	0	2011
0	1	0	0	1

→ → →

← ← ←

AM	NOON	PM	TOTAL	
29	0	52	81	0
1732	0	2461	4193	3
0	0	0	0	0

WESTBOUND APPROACH LANES

Brea Plaza Secondary Entrance(North Side Only)

NORTHBOUND APPROACH LANES

	PM	NOON	AM
0	0	0	0
0	0	0	0
0	0	0	0
TOTAL	0	0	0

TURNING MOVEMENT COUNT

Brea Plaza Secondary Entrance(North Side Only) / Imperial Hwy

(Intersection Name)

Wednesday

Day

6/20/07

Date

COUNT PERIODS	
am	7:00 AM - 9:00 AM
noon	11:00 AM - 1:00 PM
pm	4:00 PM - 6:00 PM

AM PEAK HOUR	715 AM
NOON PEAK HOUR	0 AM
PM PEAK HOUR	500 PM

AIV

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Brea Plaza Secondary

DATE: 6/20/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: WEDNESDAY

PROJECT# 07-1187-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 0	NR 0	SL 0	ST 0	SR 1	EL 0	ET 4	ER 0	WL 0	WT 3	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM						1		366			373	5	745
7:15 AM						3		468			410	4	885
7:30 AM						1		517			480	9	1007
7:45 AM						1		524			415	9	949
8:00 AM						0		555			427	7	989
8:15 AM						2		464			346	3	815
8:30 AM						0		461			370	5	836
8:45 AM						0		439			365	7	811
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL VOLUMES =	NL 0	NT 0	NR 0	SL 0	ST 0	SR 8	EL 0	ET 3794	ER 0	WL 0	WT 3186	WR 49	TOTAL 7037
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AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	0	0	0	0	0	5	0	2064	0	0	1732	29	3830
PEAK HR. FACTOR:	0.000			0.417			0.930			0.900			0.951

CONTROL: No Control

A17

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Brea Plaza Secondary

DATE: 6/20/2007

LOCATION: City of Brea

E-W STREET: Imperial Hwy

DAY: WEDNESDAY

PROJECT# 07-1187-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	0	0	0	0	1	0	4	0	0	3	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM						5		429	0		510	6	950
4:15 PM						6		430	0		488	7	931
4:30 PM						3		455	0		561	7	1026
4:45 PM						5		474	0		587	4	1070
5:00 PM						2		521	1		662	14	1200
5:15 PM						3		471	0		661	9	1144
5:30 PM						4		499	0		591	14	1108
5:45 PM						4		520	0		547	15	1086
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	0	0	0	0	0	32	0	3799	1	0	4607	76	8515

PM Peak Hr Begins at: 500 PM

PEAK													
VOLUMES =	0	0	0	0	0	13	0	2011	1	0	2461	52	4538
PEAK HR.													
FACTOR:		0.000			0.813			0.964			0.929		0.945

CONTROL: No Control

A18

Intersection Turning Movement

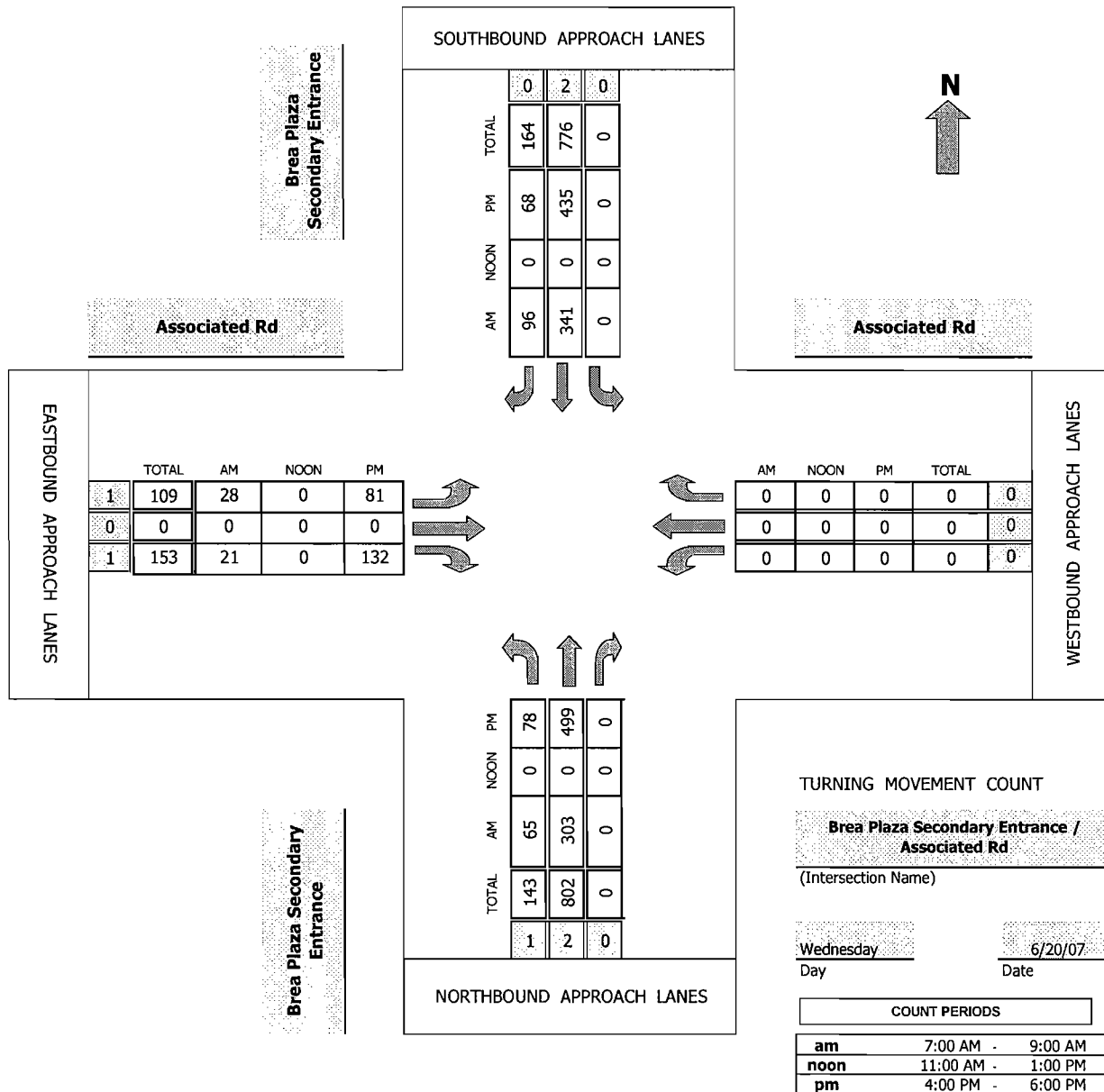
Prepared by:



National Data & Surveying Services

TMC Summary of Brea Plaza Secondary Entrance/Associated Rd

Project #: 07-1187-004



AM PEAK HOUR 730 AM

NOON PEAK HOUR 0 AM

PM PEAK HOUR 445 PM

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Brea Plaza Secondary

DATE: 6/20/2007

LOCATION: City of Brea

E-W STREET: Associated Rd

DAY: WEDNESDAY

PROJECT# 07-1187-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 2	SR 0	EL 1	ET 0	ER 1	WL 0	WT 0	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	18	25			72	12	4		3				134
7:15 AM	32	27			77	20	8		6				170
7:30 AM	11	76			93	23	6		7				216
7:45 AM	40	73			83	37	4		4				241
8:00 AM	10	76			78	27	8		3				202
8:15 AM	4	78			87	9	10		7				195
8:30 AM	5	51			70	7	3		10				146
8:45 AM	5	59			72	9	5		8				158
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL VOLUMES =	NL 125	NT 465	NR 0	SL 0	ST 632	SR 144	EL 48	ET 0	ER 48	WL 0	WT 0	WR 0	TOTAL 1462
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AM Peak Hr Begins at: 730 AM

PEAK VOLUMES =	65	303	0	0	341	96	28	0	21	0	0	0	854
PEAK HR. FACTOR:	0.814			0.910			0.721			0.000			0.886

CONTROL: 1-Way Stop E

A-20

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Brea Plaza Secondary

DATE: 6/20/2007

LOCATION: City of Brea

E-W STREET: Associated Rd

DAY: WEDNESDAY

PROJECT# 07-1187-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 2	SR 0	EL 1	ET 0	ER 1	WL 0	WT 0	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	19	87			88	22	10		33				259
4:15 PM	11	101			94	17	24		43				290
4:30 PM	18	92			112	30	16		22				290
4:45 PM	15	97			83	16	27		58				296
5:00 PM	20	110			97	18	19		21				285
5:15 PM	19	140			125	19	23		28				354
5:30 PM	24	152			130	15	12		25				358
5:45 PM	21	103			103	19	8		25				279
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL VOLUMES =	NL 147	NT 882	NR 0	SL 0	ST 832	SR 156	EL 139	ET 0	ER 255	WL 0	WT 0	WR 0	TOTAL 2411
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PM Peak Hr Begins at: 445 PM

PEAK VOLUMES =	78	499	0	0	435	68	81	0	132	0	0	0	1293
PEAK HR. FACTOR:		0.820			0.867			0.626			0.000		0.903

CONTROL: 1-Way Stop E

A21

Appendix B

- Intersection Analysis
Worksheets

25. State College & Imperial Hwy

Existing (2007) Count						
	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	150	.04*	320	.09
NBT	2	3400	170	.05	590	.17*
NBR	1	1700	360	.21	270	.16
SBL	2	3400	140	.04	460	.14*
SBT	2	3400	430	.14*	470	.21
SBR	0	0	50		230	
EBL	2	3400	60	.02*	190	.06*
EBT	4	6800	1090	.18	1640	.26
EBR	0	0	160		140	
WBL	2	3400	240	.07	330	.10
WBT	3	5100	1980	.39*	2140	.42*
WBR	1	1700	180	.11	510	.30
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .64 .84

Opening Day (2008) No Project						
	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	152	.04*	323	.10
NBT	2	3400	172	.05	596	.18*
NBR	1	1700	364	.21	273	.16
SBL	2	3400	141	.04	465	.14*
SBT	2	3400	434	.14*	475	.21
SBR	0	0	51		232	
EBL	2	3400	61	.02*	192	.06*
EBT	4	6800	1101	.19	1657	.26
EBR	0	0	162		141	
WBL	2	3400	242	.07	333	.10
WBT	3	5100	2000	.39*	2162	.42*
WBR	1	1700	182	.11	515	.30
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .64 .85

Opening Day (2008) With Project						
	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	152	.04*	323	.10
NBT	2	3400	172	.05	596	.18*
NBR	1	1700	364	.21	275	.16
SBL	2	3400	142	.04	467	.14*
SBT	2	3400	434	.14*	475	.21
SBR	0	0	51		232	
EBL	2	3400	61	.02*	192	.06*
EBT	4	6800	1102	.19	1660	.26
EBR	0	0	162		141	
WBL	2	3400	244	.07	335	.10
WBT	3	5100	2002	.39*	2167	.42*
WBR	1	1700	183	.11	517	.30
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .64 .85

2030 No Project with Committed Lanes						
	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	507	.15*	800	.24*
NBT	2	3400	263	.08	932	.27
NBR	1	1700	507	.30	708	.42
SBL	2	3400	181	.05	475	.14
SBT	2	3400	446	.15*	486	.21*
SBR	0	0	61		243	
EBL	2	3400	61	.02	203	.06
EBT	4	6800	2491	.41*	2774	.44*
EBR	0	0	324		223	
WBL	2	3400	981	.29*	911	.27*
WBT	3	5100	2308	.45	2823	.55
WBR	1	1700	191	.11	526	.31
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION 1.05 1.21

25. State College & Imperial Hwy

2030 With Project with Committed Lanes						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	2	3400	507	.15*	800	.24*
NBT	2	3400	263	.08	932	.27
NBR	1	1700	507	.30	710	.42
SBL	2	3400	182	.05	477	.14
SBT	2	3400	446	.15*	486	.21*
SBR	0	0	61		243	
EBL	2	3400	61	.02	203	.06
EBT	4	6800	2492	.41*	2777	.44*
EBR	0	0	324		223	
WBL	2	3400	983	.29*	913	.27*
WBT	3	5100	2310	.45	2828	.55
WBR	1	1700	192	.11	528	.31
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION			1.05		1.21	

26. SR-57 SB & Imperial Hwy

Existing (2007) Count						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	1.5		570		610	
SBT	0	5100	0	.19*	0	.23*
SBR	1.5		390		580	
EBL	0	0	0		0	
EBT	3	5100	1010	.20	1520	.30
EBR	f		580		850	
WBL	0	0	0		0	
WBT	3	5100	2010	.39*	2400	.47*
WBR	f		340		530	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.63		.75

Opening Day (2008) No Project						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	1.5		576		616	
SBT	0	5100	0	.19*	0	.24*
SBR	1.5		394		586	
EBL	0	0	0		0	
EBT	3	5100	1020	.20	1536	.30
EBR	f		586		859	
WBL	0	0	0		0	
WBT	3	5100	2031	.40*	2425	.48*
WBR	f		344		535	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.64		.77

Opening Day (2008) With Project						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	1.5		577		619	
SBT	0	5100	0	.19*	0	.24*
SBR	1.5		394		586	
EBL	0	0	0		0	
EBT	3	5100	1022	.20	1543	.30
EBR	f		586		859	
WBL	0	0	0		0	
WBT	3	5100	2036	.40*	2434	.48*
WBR	f		352		540	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.64		.77

2030 No Project with Committed Lanes						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	1.5		749		626	
SBT	0	5100	0	.35*	0	.29*
SBR	1.5		1043		871	
EBL	0	0	0		0	
EBT	3	5100	2075	.41	2650	.52*
EBR	f		1580		1145	
WBL	0	0	0		0	
WBT	3	5100	2153	.42*	2548	.50
WBR	f		348		757	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.82		.86

26. SR-57 SB & Imperial Hwy

2030 With Project with Committed Lanes						
	LANES	CAPACITY	AM PK HOUR		PM PK HOUR	
			VOL	V/C	VOL	V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	1.5		750		629	
SBT	0	5100	0	.35*	0	.29*
SBR	1.5		1043		871	
EBL	0	0	0		0	
EBT	3	5100	2077	.41	2657	.52*
EBR	f		1580		1145	
WBL	0	0	0		0	
WBT	3	5100	2158	.42*	2557	.50
WBR	f		356		762	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.82		.86

27. SR-57 NB & Imperial Hwy

Existing (2007) Count						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	2	3400	900	.26*	800	.24*
NBT	0.5	3400	100	{.26}	40	{.08}
NBR	1.5		940		360	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	2	3400	90	.03	240	.07
EBL	1	1700	80	.05*	120	.07*
EBT	3	5100	1040	.20	1580	.31
EBR	f		460		430	
WBL	0	0	0		0	
WBT	4	6800	1760	.26*	2370	.35*
WBR	0	0	10		30	
Right Turn Adjustment					SBR	.02*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .62 .73

Opening Day (2008) No Project						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	2	3400	909	.27*	808	.24*
NBT	0.5	3400	101	{.27}	40	{.07}
NBR	1.5		950		364	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	2	3400	91	.03	242	.07
EBL	1	1700	81	.05*	121	.07*
EBT	3	5100	1051	.21	1596	.31
EBR	f		465		434	
WBL	0	0	0		0	
WBT	4	6800	1778	.26*	2394	.36*
WBR	0	0	10		30	
Right Turn Adjustment					SBR	.02*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .63 .74

Opening Day (2008) With Project						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	2	3400	909	.27*	808	.24*
NBT	0.5	3400	101	{.27}	40	{.07}
NBR	1.5		954		367	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	2	3400	91	.03	242	.07
EBL	1	1700	81	.05*	121	.07*
EBT	3	5100	1054	.21	1606	.31
EBR	f		465		434	
WBL	0	0	0		0	
WBT	4	6800	1794	.27*	2417	.36*
WBR	0	0	10		30	
Right Turn Adjustment					SBR	.02*
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .64 .74

2030 No Project with Committed Lanes						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	2	3400	922	.27	1033	.30*
NBT	0.5	3400	172	{.30}*	61	{.09}
NBR	1.5		959		373	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	2	3400	101	.03	314	.09
EBL	1	1700	203	.12*	213	.13*
EBT	3	5100	1932	.38	2516	.49
EBR	f		699		446	
WBL	0	0	0		0	
WBT	4	6800	2314	.34*	3127	.46*
WBR	0	0	10		30	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .81 .94

27. SR-57 NB & Imperial Hwy

2030 With Project with Committed Lanes						
	LANES	CAPACITY	AM PK HOUR		PM PK HOUR	
			VOL	V/C	VOL	V/C
NBL	2	3400	922	.27	1033	.30*
NBT	0.5	3400	172	{.30}*	61	{.09}
NBR	1.5		963		376	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	2	3400	101	.03	314	.09
EBL	1	1700	203	.12*	213	.13*
EBT	3	5100	1935	.38	2526	.50
EBR	f		699		446	
WBL	0	0	0		0	
WBT	4	6800	2330	.34*	3150	.47*
WBR	0	0	10		30	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.81		.95

28. Associated Rd & Imperial Hwy

Existing (2007) Count						
	LANES	CAPACITY	AM PK HOUR		PM PK HOUR	
			VOL	V/C	VOL	V/C
NBL	1	1700	210	.12*	230	.14
NBT	2	3400	130	.05	290	.09*
NBR	0	0	50		20	
SBL	1	1700	100	.06	270	.16*
SBT	2	3400	210	.06*	150	.04
SBR	1	1700	80	.05	170	.10
EBL	1	1700	190	.11*	200	.12
EBT	3	5100	1710	.35	1630	.34*
EBR	0	0	80		100	
WBL	1	1700	70	.04	340	.20*
WBT	3	5100	1500	.30*	2010	.40
WBR	0	0	50		30	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .64 .84

Opening Day (2008) No Project						
	LANES	CAPACITY	AM PK HOUR		PM PK HOUR	
			VOL	V/C	VOL	V/C
NBL	1	1700	212	.12*	232	.14*
NBT	2	3400	131	.05	293	.09
NBR	0	0	51		20	
SBL	2	3400	101	.03	273	.08
SBT	1	1700	212	.12*	152	.09*
SBR	1	1700	81	.05	172	.10
EBL	1	1700	192	.11	202	.12
EBT	3	5100	1728	.35*	1647	.34*
EBR	0	0	81		101	
WBL	1	1700	71	.04*	344	.20*
WBT	4	6800	1515	.23	2031	.30
WBR	0	0	51		30	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .68 .82

Opening Day (2008) With Project						
	LANES	CAPACITY	AM PK HOUR		PM PK HOUR	
			VOL	V/C	VOL	V/C
NBL	1	1700	216	.13*	240	.14*
NBT	2	3400	135	.05	297	.09
NBR	0	0	51		20	
SBL	2	3400	106	.03	284	.08
SBT	1	1700	212	.12*	155	.09*
SBR	1	1700	86	.05	186	.11
EBL	1	1700	199	.12	215	.13
EBT	3	5100	1728	.35*	1647	.34*
EBR	0	0	81		101	
WBL	1	1700	71	.04*	344	.20*
WBT	4	6800	1522	.23	2043	.31
WBR	0	0	54		33	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .69 .82

2030 No Project with Committed Lanes						
	LANES	CAPACITY	AM PK HOUR		PM PK HOUR	
			VOL	V/C	VOL	V/C
NBL	2	3400	311	.09*	522	.15*
NBT	2	3400	142	.07	302	.12
NBR	0	0	101		91	
SBL	2	3400	138	.04	278	.08
SBT	1	1700	365	.21*	170	.10*
SBR	1	1700	127	.07	357	.21
EBL	1	1700	203	.12	235	.14
EBT	3	5100	2370	.48*	2148	.44*
EBR	0	0	91		111	
WBL	1	1700	81	.05*	355	.21*
WBT	4	6800	1898	.29	2323	.36
WBR	0	0	61		150	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .88 .95

28. Associated Rd & Imperial Hwy

2030 With Project with Committed Lanes						
	LANES	CAPACITY	AM PK HOUR VOL	V/C	PM PK HOUR VOL	V/C
NBL	2	3400	315	.09*	530	.16*
NBT	2	3400	146	.07	306	.12
NBR	0	0	101		91	
SBL	2	3400	143	.04	289	.09
SBT	1	1700	365	.21*	173	.10*
SBR	1	1700	132	.08	371	.22
EBL	1	1700	210	.12	248	.15
EBT	3	5100	2370	.48*	2148	.44*
EBR	0	0	91		111	
WBL	1	1700	81	.05*	355	.21*
WBT	4	6800	1905	.29	2335	.37
WBR	0	0	64		153	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.88		.96

30. Kraemer Blvd & Imperial hwy

Existing (2007) Count						
	LANES	CAPACITY	AM PK HOUR		PM PK HOUR	
			VOL	V/C	VOL	V/C
NBL	2	3400	200	.06*	470	.14*
NBT	2	3400	280	.11	610	.20
NBR	0	0	100		60	
SBL	2	3400	270	.08	320	.09
SBT	2	3400	620	.18*	560	.16*
SBR	1	1700	70	.04	160	.09
EBL	2	3400	210	.06*	240	.07*
EBT	3	5100	1200	.27	1360	.30
EBR	0	0	170		190	
WBL	2	3400	110	.03	210	.06
WBT	3	5100	1190	.25*	1620	.35*
WBR	0	0	100		170	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .60 .77

Opening Day (2008) No Project						
	LANES	CAPACITY	AM PK HOUR		PM PK HOUR	
			VOL	V/C	VOL	V/C
NBL	2	3400	202	.06*	475	.14*
NBT	2	3400	283	.11	616	.20
NBR	0	0	101		61	
SBL	2	3400	273	.08	323	.10
SBT	2	3400	626	.18*	566	.17*
SBR	1	1700	71	.04	162	.10
EBL	2	3400	212	.06*	242	.07*
EBT	3	5100	1212	.27	1374	.31
EBR	0	0	172		192	
WBL	2	3400	111	.03	212	.06
WBT	3	5100	1202	.26*	1637	.35*
WBR	0	0	101		172	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .61 .78

Opening Day (2008) With Project						
	LANES	CAPACITY	AM PK HOUR		PM PK HOUR	
			VOL	V/C	VOL	V/C
NBL	2	3400	204	.06*	478	.14*
NBT	2	3400	283	.11	616	.20
NBR	0	0	101		61	
SBL	2	3400	273	.08	323	.10
SBT	2	3400	626	.18*	566	.17*
SBR	1	1700	74	.04	167	.10
EBL	2	3400	213	.06*	245	.07*
EBT	3	5100	1214	.27	1381	.31
EBR	0	0	174		193	
WBL	2	3400	111	.03	212	.06
WBT	3	5100	1207	.26*	1644	.36*
WBR	0	0	101		172	
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .61 .79

2030 No Project with Committed Lanes						
	LANES	CAPACITY	AM PK HOUR		PM PK HOUR	
			VOL	V/C	VOL	V/C
NBL	2	3400	242	.07*	474	.14
NBT	3	5100	425	.11	1469	.31*
NBR	0	0	111		91	
SBL	2	3400	577	.17	527	.16*
SBT	3	5100	1378	.32*	699	.17
SBR	0	0	242		169	
EBL	2	3400	303	.09	251	.07
EBT	3	5100	1538	.39*	1556	.38*
EBR	0	0	435		385	
WBL	2	3400	111	.03*	284	.08*
WBT	3	5100	1609	.32	1981	.39
WBR	1	1700	192	.11	638	.38
Clearance Interval				.05*		.05*

TOTAL CAPACITY UTILIZATION .86 .98

30. Kraemer Blvd & Imperial hwy

2030 With Project with Committed Lanes						
	LANES	CAPACITY	AM PK HOUR		PM PK HOUR	
			VOL	V/C	VOL	V/C
NBL	2	3400	244	.07*	477	.14
NBT	3	5100	425	.11	1469	.31*
NBR	0	0	111		91	
SBL	2	3400	577	.17	527	.16*
SBT	3	5100	1378	.32*	699	.17
SBR	0	0	245		174	
EBL	2	3400	304	.09	254	.07
EBT	3	5100	1540	.39*	1563	.38*
EBR	0	0	437		386	
WBL	2	3400	111	.03*	284	.08*
WBT	3	5100	1614	.32	1988	.39
WBR	1	1700	192	.11	638	.38
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				.86		.98

Existing (2007) Count - AM Peak Hour
25: Imperial Hwy & State College

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	6285		3433	5085	1583	3433	3539	1583	3433	3484	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	6285		3433	5085	1583	3433	3539	1583	3433	3484	
Volume (vph)	60	1090	160	240	1980	180	150	170	360	140	430	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	1147	168	253	2084	189	158	179	379	147	453	53
RTOR Reduction (vph)	0	37	0	0	0	105	0	0	135	0	13	0
Lane Group Flow (vph)	63	1278	0	253	2084	84	158	179	244	147	493	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	2.2	23.3		8.5	29.6	29.6	4.0	15.8	15.8	3.1	14.9	
Effective Green, g (s)	2.2	23.3		8.5	29.6	29.6	4.0	15.8	15.8	3.1	14.9	
Actuated g/C Ratio	0.03	0.35		0.13	0.44	0.44	0.06	0.24	0.24	0.05	0.22	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	113	2196		437	2257	703	206	838	375	160	778	
v/s Ratio Prot	0.02	0.20		c0.07	c0.41		c0.05	0.05		0.04	0.14	
v/s Ratio Perm						0.05			c0.15			
v/c Ratio	0.56	0.58		0.58	0.92	0.12	0.77	0.21	0.65	0.92	0.63	
Uniform Delay, d1	31.8	17.7		27.4	17.5	10.9	30.9	20.5	23.0	31.7	23.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.8	0.4		1.9	7.0	0.1	15.6	0.1	4.0	47.4	1.7	
Delay (s)	37.6	18.1		29.3	24.5	11.0	46.5	20.6	27.0	79.1	25.1	
Level of Service	D	B		C	C	B	D	C	C	E	C	
Approach Delay (s)		19.0			23.9			29.7			37.3	
Approach LOS		B			C			C			D	

Intersection Summary

HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	66.7	Sum of lost time (s)	12.0
Analysis Period (min)	15		
c Critical Lane Group			

Existing (2007) Count - AM Peak Hour
26: Imperial Hwy & SR-57 SB

Synchro 6 Report [B614]

											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑	↑	↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.95		
Fr't		1.00	0.85		1.00	0.85	1.00	0.96	0.85		
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.97	1.00		
Satd. Flow (prot)		5085	1583		5085	1583	1681	1637	1504		
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.97	1.00		
Satd. Flow (perm)		5085	1583		5085	1583	1681	1637	1504		
Volume (vph)	0	1010	580	0	2010	340	570	0	390	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1063	611	0	2116	358	600	0	411	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	2	0	0
Lane Group Flow (vph)	0	1063	611	0	2116	358	340	358	309	0	0
Turn Type		Free			Free		Perm		Perm		
Protected Phases		4			8			6			
Permitted Phases		Free			Free		6		6		
Actuated Green, G (s)		23.9	46.2		23.9	46.2	14.3	14.3	14.3		
Effective Green, g (s)		23.9	46.2		23.9	46.2	14.3	14.3	14.3		
Actuated g/C Ratio		0.52	1.00		0.52	1.00	0.31	0.31	0.31		
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0		
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)		2631	1583		2631	1583	520	507	466		
v/s Ratio Prot		0.21			0.42						
v/s Ratio Perm			0.39			0.23	0.20	0.22	0.21		
v/c Ratio		0.40	0.39		0.80	0.23	0.65	0.71	0.66		
Uniform Delay, d1		6.8	0.0		9.2	0.0	13.8	14.1	13.9		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		0.1	0.7		1.9	0.3	3.0	4.5	3.5		
Delay (s)		6.9	0.7		11.1	0.3	16.8	18.5	17.4		
Level of Service		A	A		B	A	B	B	B		
Approach Delay (s)		4.6			9.5			17.6		0.0	
Approach LOS		A			A			B		A	
Intersection Summary											
HCM Average Control Delay			9.5			HCM Level of Service			A		
HCM Volume to Capacity ratio			0.77								
Actuated Cycle Length (s)			46.2			Sum of lost time (s)			8.0		
Analysis Period (min)			15								
c Critical Lane Group											

Existing (2007) Count - AM Peak Hour
27: Imperial Hwy & SR-57 NB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	0.91	1.00		0.86		0.91	0.86	0.95			0.88
Fr _t	1.00	1.00	0.85		1.00		1.00	0.88	0.85			0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (prot)	1770	5085	1583		6402		3221	1406	1504			2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (perm)	1770	5085	1583		6402		3221	1406	1504			2787
Volume (vph)	80	1040	460	0	1760	10	900	100	940	0	0	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	1095	484	0	1853	11	947	105	989	0	0	95
RTOR Reduction (vph)	0	0	0	0	1	0	0	24	24	0	0	49
Lane Group Flow (vph)	84	1095	484	0	1863	0	947	539	507	0	0	46
Turn Type	Prot		Free				Prot		Perm			Over
Protected Phases	7	4			8		5	2				7
Permitted Phases			Free						2			
Actuated Green, G (s)	3.1	26.2	59.3		19.1		25.1	25.1	25.1			3.1
Effective Green, g (s)	3.1	26.2	59.3		19.1		25.1	25.1	25.1			3.1
Actuated g/C Ratio	0.05	0.44	1.00		0.32		0.42	0.42	0.42			0.05
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	93	2247	1583		2062		1363	595	637			146
v/s Ratio Prot	0.05	0.22			0.29		0.29	0.38				0.02
v/s Ratio Perm			0.31						0.34			
v/c Ratio	0.90	0.49	0.31		0.90		0.69	0.91	0.80			0.31
Uniform Delay, d1	28.0	11.8	0.0		19.2		14.0	16.0	14.9			27.1
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	62.4	0.2	0.5		6.0		1.6	17.4	6.9			1.2
Delay (s)	90.3	11.9	0.5		25.2		15.5	33.4	21.7			28.3
Level of Service	F	B	A		C		B	C	C			C
Approach Delay (s)		12.6			25.2			22.1			28.3	
Approach LOS		B			C			C			C	

Intersection Summary

HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	59.3	Sum of lost time (s)	12.0
Analysis Period (min)	15		
c Critical Lane Group			

Existing (2007) Count - AM Peak Hour
28: Imperial Hwy & Associated

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	1.00
Fr _t	1.00	0.99		1.00	1.00		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5051		1770	5061		1770	3391		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5051		1770	5061		1770	3391		1770	3539	1583
Volume (vph)	190	1710	80	70	1500	50	210	130	50	100	210	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	1800	84	74	1579	53	221	137	53	105	221	84
RTOR Reduction (vph)	0	5	0	0	4	0	0	42	0	0	0	73
Lane Group Flow (vph)	200	1879	0	74	1628	0	221	148	0	105	221	11
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	11.5	37.7		4.6	30.8		13.0	16.5		7.8	11.3	11.3
Effective Green, g (s)	11.5	37.7		4.6	30.8		13.0	16.5		7.8	11.3	11.3
Actuated g/C Ratio	0.14	0.46		0.06	0.37		0.16	0.20		0.09	0.14	0.14
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	246	2305		99	1887		279	677		167	484	217
v/s Ratio Prot	c0.11	c0.37		0.04	0.32		c0.12	0.04		0.06	c0.06	
v/s Ratio Perm												0.01
v/c Ratio	0.81	0.82		0.75	0.86		0.79	0.22		0.63	0.46	0.05
Uniform Delay, d1	34.5	19.4		38.4	23.9		33.5	27.7		36.0	32.8	31.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.2	2.3		26.1	4.4		14.2	0.2		7.2	0.7	0.1
Delay (s)	52.7	21.8		64.5	28.3		47.7	27.8		43.2	33.5	31.1
Level of Service	D	C		E	C		D	C		D	C	C
Approach Delay (s)		24.7			29.9			38.5			35.5	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM Average Control Delay	28.8			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.74											
Actuated Cycle Length (s)	82.6			Sum of lost time (s)			12.0					
Analysis Period (min)	15											
c Critical Lane Group												

Existing (2007) Count - AM Peak Hour
30: Imperial Hwy & Kraemer

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4991		3433	5026		3433	3400		3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4991		3433	5026		3433	3400		3433	3539	1583
Volume (vph)	210	1200	170	110	1190	100	200	280	100	270	620	70
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	221	1263	179	116	1253	105	211	295	105	284	653	74
RTOR Reduction (vph)	0	29	0	0	16	0	0	62	0	0	0	55
Lane Group Flow (vph)	221	1413	0	116	1342	0	211	338	0	284	653	19
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	4.0	19.6		3.1	18.7		5.0	14.0		6.0	15.0	15.0
Effective Green, g (s)	4.0	19.6		3.1	18.7		5.0	14.0		6.0	15.0	15.0
Actuated g/C Ratio	0.07	0.33		0.05	0.32		0.09	0.24		0.10	0.26	0.26
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	234	1667		181	1601		292	811		351	904	405
v/s Ratio Prot	c0.06	c0.28		0.03	0.27		0.06	0.10		c0.08	c0.18	
v/s Ratio Perm												0.01
v/c Ratio	0.94	0.85		0.64	0.84		0.72	0.42		0.81	0.72	0.05
Uniform Delay, d1	27.2	18.2		27.3	18.6		26.2	18.9		25.8	19.9	16.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	43.3	4.2		7.5	4.0		8.5	0.3		12.9	2.9	0.0
Delay (s)	70.5	22.4		34.8	22.6		34.7	19.2		38.6	22.8	16.5
Level of Service	E	C		C	C		C	B		D	C	B
Approach Delay (s)		28.8			23.6			24.6			26.8	
Approach LOS		C			C			C			C	

Intersection Summary

HCM Average Control Delay	26.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	58.7	Sum of lost time (s)	8.0
Analysis Period (min)	15		
c Critical Lane Group			

Existing (2007) Count - PM Peak Hour
25: Imperial Hwy & State College

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	6332		3433	5085	1583	3433	3539	1583	3433	3365	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	6332		3433	5085	1583	3433	3539	1583	3433	3365	
Volume (vph)	190	1640	140	330	2140	510	320	590	270	460	470	230
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	1726	147	347	2253	537	337	621	284	484	495	242
RTOR Reduction (vph)	0	14	0	0	0	184	0	0	146	0	66	0
Lane Group Flow (vph)	200	1859	0	347	2253	353	337	621	138	484	671	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	6.0	33.3		11.7	39.0	39.0	9.0	16.0	16.0	13.0	20.0	
Effective Green, g (s)	6.0	33.3		11.7	39.0	39.0	9.0	16.0	16.0	13.0	20.0	
Actuated g/C Ratio	0.07	0.37		0.13	0.43	0.43	0.10	0.18	0.18	0.14	0.22	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	229	2343		446	2204	686	343	629	281	496	748	
v/s Ratio Prot	0.06	0.29		c0.10	c0.44		0.10	0.18		c0.14	c0.20	
v/s Ratio Perm						0.22			0.09			
v/c Ratio	0.87	0.79		0.78	1.02	0.51	0.98	0.99	0.49	0.98	0.90	
Uniform Delay, d1	41.6	25.3		37.9	25.5	18.6	40.4	36.9	33.3	38.3	34.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	28.6	1.9		8.3	25.0	0.7	43.6	32.3	1.4	33.9	13.4	
Delay (s)	70.2	27.2		46.2	50.5	19.2	84.0	69.2	34.7	72.2	47.4	
Level of Service	E	C		D	D	B	F	E	C	E	D	
Approach Delay (s)		31.4			44.7			65.4			57.2	
Approach LOS		C			D			E			E	

Intersection Summary

HCM Average Control Delay	46.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		
c Critical Lane Group			

Existing (2007) Count - PM Peak Hour
26: Imperial Hwy & SR-57 SB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR	
Lane Configurations		↑↑↑↑	↑		↑↑↑↑	↑	↑	↑	↑			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.95			
Frt		1.00	0.85		1.00	0.85	1.00	0.92	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.98	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1596	1504			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.98	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1596	1504			
Volume (vph)	0	1520	850	0	2400	530	610	0	580	0	0	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	1600	895	0	2526	558	642	0	611	0	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	0	
Lane Group Flow (vph)	0	1600	895	0	2526	558	419	450	382	0	0	
Turn Type		Free				Free	Perm		Perm			
Protected Phases		4			8			6				
Permitted Phases		Free				Free	6		6			
Actuated Green, G (s)		32.0	59.1		32.0	59.1	19.1	19.1	19.1			
Effective Green, g (s)		32.0	59.1		32.0	59.1	19.1	19.1	19.1			
Actuated g/C Ratio		0.54	1.00		0.54	1.00	0.32	0.32	0.32			
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0			
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)		2753	1583		2753	1583	543	516	486			
v/s Ratio Prot		0.31			0.50							
v/s Ratio Perm			0.57			0.35	0.25	0.28	0.25			
v/c Ratio		0.58	0.57		0.92	0.35	0.77	0.87	0.79			
Uniform Delay, d1		9.1	0.0		12.3	0.0	18.0	18.9	18.2			
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		0.3	1.5		5.4	0.6	6.7	15.0	8.2			
Delay (s)		9.4	1.5		17.8	0.6	24.7	33.9	26.4			
Level of Service		A	A		B	A	C	C	C			
Approach Delay (s)		6.5			14.7			28.5		0.0		
Approach LOS		A			B			C		A		
Intersection Summary												
HCM Average Control Delay		14.2			HCM Level of Service		B					
HCM Volume to Capacity ratio		0.90										
Actuated Cycle Length (s)		59.1			Sum of lost time (s)		8.0					
Analysis Period (min)		15										
c Critical Lane Group												

Existing (2007) Count - PM Peak Hour
27: Imperial Hwy & SR-57 NB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	0.91	1.00		0.86		0.91	0.86	0.95			0.88
Frt	1.00	1.00	0.85		1.00		1.00	0.97	0.85			0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	0.97	1.00			1.00
Satd. Flow (prot)	1770	5085	1583		6396		3221	1503	1504			2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	0.97	1.00			1.00
Satd. Flow (perm)	1770	5085	1583		6396		3221	1503	1504			2787
Volume (vph)	120	1580	430	0	2370	30	800	40	360	0	0	240
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	1663	453	0	2495	32	842	42	379	0	0	253
RTOR Reduction (vph)	0	0	0	0	3	0	0	16	16	0	0	13
Lane Group Flow (vph)	126	1663	453	0	2524	0	627	307	297	0	0	240
Turn Type	Prot		Free				Prot		Perm			Over
Protected Phases	7	4			8		5	2				7
Permitted Phases			Free						2			
Actuated Green, G (s)	6.0	35.0	60.0		25.0		17.0	17.0	17.0			6.0
Effective Green, g (s)	6.0	35.0	60.0		25.0		17.0	17.0	17.0			6.0
Actuated g/C Ratio	0.10	0.58	1.00		0.42		0.28	0.28	0.28			0.10
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	177	2966	1583		2665		913	426	426			279
v/s Ratio Prot	0.07	0.33			0.39		0.19	0.20				0.09
v/s Ratio Perm			0.29						0.20			
v/c Ratio	0.71	0.56	0.29		0.95		0.69	0.72	0.70			0.86
Uniform Delay, d1	26.2	7.7	0.0		16.9		19.1	19.4	19.2			26.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	12.7	0.2	0.5		8.1		2.2	5.9	4.9			22.8
Delay (s)	38.8	8.0	0.5		25.0		21.3	25.3	24.1			49.4
Level of Service	D	A	A		C		C	C	C			D
Approach Delay (s)		8.2			25.0			23.0			49.4	
Approach LOS		A			C			C			D	

Intersection Summary

HCM Average Control Delay	19.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		
c Critical Lane Group			

Existing (2007) Count - PM Peak Hour
28: Imperial Hwy & Associated

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	1.00
Flt Protected	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	0.85
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5041		1770	5074		1770	3505		1770	3539	1583
Satd. Flow (perm)	1770	5041		1770	5074		1770	3505		1770	3539	1583
Volume (vph)	200	1630	100	340	2010	30	230	290	20	270	150	170
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	1716	105	358	2116	32	242	305	21	284	158	179
RTOR Reduction (vph)	0	6	0	0	1	0	0	4	0	0	0	155
Lane Group Flow (vph)	211	1815	0	358	2147	0	242	322	0	284	158	24
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	15.0	46.0		26.0	57.0		19.6	14.9		21.0	16.3	16.3
Effective Green, g (s)	15.0	46.0		26.0	57.0		19.6	14.9		21.0	16.3	16.3
Actuated g/C Ratio	0.12	0.37		0.21	0.46		0.16	0.12		0.17	0.13	0.13
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	214	1872		371	2334		280	422		300	466	208
v/s Ratio Prot	0.12	c0.36		c0.20	0.42		0.14	c0.09		c0.16	0.04	
v/s Ratio Perm												0.01
v/c Ratio	0.99	0.97		0.96	0.92		0.86	0.76		0.95	0.34	0.11
Uniform Delay, d1	54.3	38.3		48.5	31.3		50.9	52.8		50.9	48.9	47.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	57.0	14.1		37.2	6.4		23.1	7.9		37.5	0.4	0.2
Delay (s)	111.4	52.4		85.7	37.7		73.9	60.7		88.4	49.3	47.7
Level of Service	F	D		F	D		E	E		F	D	D
Approach Delay (s)		58.5			44.6			66.3			66.7	
Approach LOS		E			D			E			E	

Intersection Summary

HCM Average Control Delay	54.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	123.9	Sum of lost time (s)	16.0
Analysis Period (min)	15		
c Critical Lane Group			

Existing (2007) Count - PM Peak Hour
30: Imperial Hwy & Kraemer

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4992		3433	5013		3433	3492		3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4992		3433	5013		3433	3492		3433	3539	1583
Volume (vph)	240	1360	190	210	1620	170	470	610	60	320	560	160
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	253	1432	200	221	1705	179	495	642	63	337	589	168
RTOR Reduction (vph)	0	20	0	0	14	0	0	8	0	0	0	124
Lane Group Flow (vph)	253	1612	0	221	1870	0	495	697	0	337	589	44
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	7.0	34.0		8.0	35.0		14.0	22.4		9.0	17.4	17.4
Effective Green, g (s)	7.0	34.0		8.0	35.0		14.0	22.4		9.0	17.4	17.4
Actuated g/C Ratio	0.08	0.38		0.09	0.39		0.16	0.25		0.10	0.19	0.19
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	269	1899		307	1963		538	875		346	689	308
v/s Ratio Prot	c0.07	0.32		0.06	c0.37		c0.14	c0.20		0.10	0.17	
v/s Ratio Perm												0.03
v/c Ratio	0.94	0.85		0.72	0.95		0.92	0.80		0.97	0.85	0.14
Uniform Delay, d1	41.0	25.4		39.6	26.4		37.1	31.4		40.1	34.8	29.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.0	3.8		7.9	11.1		21.1	5.1		41.1	10.1	0.2
Delay (s)	79.9	29.1		47.5	37.5		58.3	36.4		81.2	44.9	30.0
Level of Service	E	C		D	D		E	D		F	D	C
Approach Delay (s)		35.9			38.6			45.5			53.8	
Approach LOS		D			D			D			D	

Intersection Summary

HCM Average Control Delay	41.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	89.4	Sum of lost time (s)	8.0
Analysis Period (min)	15		
c Critical Lane Group			

2008 No Project (Opening Day) - AM Peak Hour
25: Imperial Hwy & State College

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	6284		3433	5085	1583	3433	3539	1583	3433	3483	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	6284		3433	5085	1583	3433	3539	1583	3433	3483	
Volume (vph)	61	1101	162	242	2000	182	152	172	364	141	434	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	64	1159	171	255	2105	192	160	181	383	148	457	54
RTOR Reduction (vph)	0	38	0	0	0	106	0	0	133	0	13	0
Lane Group Flow (vph)	64	1292	0	255	2105	86	160	181	250	148	498	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	2.2	23.8		8.5	30.1	30.1	4.1	15.6	15.6	3.1	14.6	
Effective Green, g (s)	2.2	23.8		8.5	30.1	30.1	4.1	15.6	15.6	3.1	14.6	
Actuated g/C Ratio	0.03	0.36		0.13	0.45	0.45	0.06	0.23	0.23	0.05	0.22	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	113	2232		436	2284	711	210	824	369	159	759	
v/s Ratio Prot	0.02	0.21		c0.07	c0.41		c0.05	0.05		0.04	0.14	
v/s Ratio Perm						0.05			c0.16			
y/c Ratio	0.57	0.58		0.58	0.92	0.12	0.76	0.22	0.68	0.93	0.66	
Uniform Delay, d1	31.9	17.5		27.6	17.3	10.7	31.0	20.8	23.4	31.8	23.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.4	0.4		2.0	6.8	0.1	15.0	0.1	4.9	51.2	2.1	
Delay (s)	38.3	17.9		29.6	24.1	10.8	46.0	20.9	28.3	83.0	26.0	
Level of Service	D	B		C	C	B	D	C	C	F	C	
Approach Delay (s)		18.8			23.7			30.3			38.8	
Approach LOS		B			C			C			D	

Intersection Summary

HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	67.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		
c Critical Lane Group			

2008 No Project (Opening Day) - AM Peak Hour
26: Imperial Hwy & SR-57 SB

Synchro 6 Report [B614]

											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑	↑	↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.95		
Frt		1.00	0.85		1.00	0.85	1.00	0.96	0.85		
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.97	1.00		
Satd. Flow (prot)		5085	1583		5085	1583	1681	1637	1504		
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.97	1.00		
Satd. Flow (perm)		5085	1583		5085	1583	1681	1637	1504		
Volume (vph)	0	1020	586	0	2031	344	576	0	394	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1074	617	0	2138	362	606	0	415	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	2	0	0
Lane Group Flow (vph)	0	1074	617	0	2138	362	343	361	313	0	0
Turn Type			Free			Free	Perm		Perm		
Protected Phases		4			8			6			
Permitted Phases			Free			Free	6		6		
Actuated Green, G (s)		24.2	46.5		24.2	46.5	14.3	14.3	14.3		
Effective Green, g (s)		24.2	46.5		24.2	46.5	14.3	14.3	14.3		
Actuated g/C Ratio		0.52	1.00		0.52	1.00	0.31	0.31	0.31		
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0		
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)		2646	1583		2646	1583	517	503	463		
v/s Ratio Prot		0.21			0.42						
v/s Ratio Perm			0.39			0.23	0.20	0.22	0.21		
v/c Ratio		0.41	0.39		0.81	0.23	0.66	0.72	0.68		
Uniform Delay, d1		6.8	0.0		9.2	0.0	14.0	14.3	14.1		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		0.1	0.7		1.9	0.3	3.2	4.9	3.9		
Delay (s)		6.9	0.7		11.1	0.3	17.2	19.2	18.0		
Level of Service		A	A		B	A	B	B	B		
Approach Delay (s)		4.6			9.6			18.1		0.0	
Approach LOS		A			A			B		A	
Intersection Summary											
HCM Average Control Delay			9.6			HCM Level of Service			A		
HCM Volume to Capacity ratio			0.77								
Actuated Cycle Length (s)			46.5			Sum of lost time (s)			8.0		
Analysis Period (min)			15								
c Critical Lane Group											

2008 No Project (Opening Day) - AM Peak Hour
27: Imperial Hwy & SR-57 NB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	0.91	1.00		0.86		0.91	0.86	0.95			0.88
Fr't	1.00	1.00	0.85		1.00		1.00	0.88	0.85			0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (prot)	1770	5085	1583		6402		3221	1406	1504			2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (perm)	1770	5085	1583		6402		3221	1406	1504			2787
Volume (vph)	81	1051	465	0	1778	10	909	101	950	0	0	91
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	1106	489	0	1872	11	957	106	1000	0	0	96
RTOR Reduction (vph)	0	0	0	0	1	0	0	22	22	0	0	53
Lane Group Flow (vph)	85	1106	489	0	1882	0	957	548	514	0	0	43
Turn Type	Prot		Free				Prot		Perm			Over
Protected Phases	7	4			8		5	2				7
Permitted Phases			Free						2			
Actuated Green, G (s)	3.1	28.2	64.3		21.1		28.1	28.1	28.1			3.1
Effective Green, g (s)	3.1	28.2	64.3		21.1		28.1	28.1	28.1			3.1
Actuated g/C Ratio	0.05	0.44	1.00		0.33		0.44	0.44	0.44			0.05
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	85	2230	1583		2101		1408	614	657			134
v/s Ratio Prot	c0.05	0.22			c0.29		0.30	c0.39				0.02
v/s Ratio Perm			0.31						0.34			
v/c Ratio	1.00	0.50	0.31		0.90		0.68	0.89	0.78			0.32
Uniform Delay, d1	30.6	13.0	0.0		20.6		14.5	16.7	15.5			29.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	97.6	0.2	0.5		5.4		1.3	15.3	6.0			1.4
Delay (s)	128.2	13.1	0.5		26.0		15.8	32.0	21.5			31.0
Level of Service	F	B	A		C		B	C	C			C
Approach Delay (s)		15.3			26.0			21.8			31.0	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM Average Control Delay			21.4				HCM Level of Service		C			
HCM Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			64.3				Sum of lost time (s)		12.0			
Analysis Period (min)			15									
c Critical Lane Group												

2008 No Project (Opening Day) - AM Peak Hour
28: Imperial Hwy & Associated

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.86		1.00	0.95		0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5051		1770	6376		1770	3390		3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5051		1770	6376		1770	3390		3433	1863	1583
Volume (vph)	192	1728	81	71	1515	51	212	131	51	101	212	81
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	202	1819	85	75	1595	54	223	138	54	106	223	85
RTOR Reduction (vph)	0	6	0	0	6	0	0	39	0	0	0	69
Lane Group Flow (vph)	202	1898	0	75	1643	0	223	153	0	106	223	16
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	9.0	29.9		3.1	24.0		10.0	20.0		3.9	13.9	13.9
Effective Green, g (s)	9.0	29.9		3.1	24.0		10.0	20.0		3.9	13.9	13.9
Actuated g/C Ratio	0.12	0.41		0.04	0.33		0.14	0.27		0.05	0.19	0.19
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	219	2072		75	2099		243	930		184	355	302
v/s Ratio Prot	c0.11	c0.38		0.04	0.26		c0.13	0.05		0.03	c0.12	
v/s Ratio Perm												0.01
v/c Ratio	0.92	0.92		1.00	0.78		0.92	0.16		0.58	0.63	0.05
Uniform Delay, d1	31.6	20.3		34.9	22.1		31.0	20.1		33.7	27.1	24.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.8	6.8		103.9	2.0		35.9	0.1		4.3	3.5	0.1
Delay (s)	71.4	27.2		138.8	24.1		66.9	20.2		38.0	30.6	24.2
Level of Service	E	C		F	C		E	C		D	C	C
Approach Delay (s)		31.4			29.1			45.3			31.2	
Approach LOS		C			C			D			C	

Intersection Summary

HCM Average Control Delay	31.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	72.9	Sum of lost time (s)	12.0
Analysis Period (min)	15		
c Critical Lane Group			

2008 No Project (Opening Day) - AM Peak Hour
30: Imperial Hwy & Kraemer

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		0.97	0.95	1.00
Flt	1.00	0.98		1.00	0.99		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4991		3433	5026		3433	3400		3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4991		3433	5026		3433	3400		3433	3539	1583
Volume (vph)	212	1212	172	111	1202	101	202	283	101	273	626	71
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	223	1276	181	117	1265	106	213	298	106	287	659	75
RTOR Reduction (vph)	0	29	0	0	16	0	0	61	0	0	0	57
Lane Group Flow (vph)	223	1428	0	117	1355	0	213	343	0	287	659	18
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	4.0	19.7		3.2	18.9		6.0	14.6		6.0	14.6	14.6
Effective Green, g (s)	4.0	19.7		3.2	18.9		6.0	14.6		6.0	14.6	14.6
Actuated g/C Ratio	0.07	0.33		0.05	0.32		0.10	0.25		0.10	0.25	0.25
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	231	1652		185	1596		346	834		346	868	388
v/s Ratio Prot	c0.06	c0.29		0.03	0.27		0.06	0.10		c0.08	c0.19	
v/s Ratio Perm												0.01
v/c Ratio	0.97	0.86		0.63	0.85		0.62	0.41		0.83	0.76	0.05
Uniform Delay, d1	27.7	18.6		27.6	19.0		25.6	18.8		26.2	20.8	17.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	49.0	5.0		6.9	4.4		3.2	0.3		15.1	3.9	0.1
Delay (s)	76.7	23.6		34.5	23.4		28.9	19.2		41.3	24.7	17.2
Level of Service	E	C		C	C		C	B		D	C	B
Approach Delay (s)		30.7			24.3			22.5			28.8	
Approach LOS		C			C			C			C	

Intersection Summary

HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	59.5	Sum of lost time (s)	12.0
Analysis Period (min)	15		
c Critical Lane Group			

2008 No Project (Opening Day) - PM Peak Hour
25: Imperial Hwy & State College

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	6333		3433	5085	1583	3433	3539	1583	3433	3365	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	6333		3433	5085	1583	3433	3539	1583	3433	3365	
Volume (vph)	192	1657	141	333	2162	515	323	596	273	465	475	232
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	202	1744	148	351	2276	542	340	627	287	489	500	244
RTOR Reduction (vph)	0	14	0	0	0	184	0	0	146	0	66	0
Lane Group Flow (vph)	202	1878	0	351	2276	358	340	627	141	489	678	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	6.0	33.3		11.7	39.0	39.0	9.0	16.0	16.0	13.0	20.0	
Effective Green, g (s)	6.0	33.3		11.7	39.0	39.0	9.0	16.0	16.0	13.0	20.0	
Actuated g/C Ratio	0.07	0.37		0.13	0.43	0.43	0.10	0.18	0.18	0.14	0.22	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	229	2343		446	2204	686	343	629	281	496	748	
v/s Ratio Prot	0.06	0.30		c0.10	c0.45		0.10	0.18		c0.14	c0.20	
v/s Ratio Perm						0.23			0.09			
v/c Ratio	0.88	0.80		0.79	1.03	0.52	0.99	1.00	0.50	0.99	0.91	
Uniform Delay, d1	41.6	25.4		37.9	25.5	18.7	40.5	37.0	33.4	38.4	34.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	30.3	2.1		8.9	28.2	0.7	46.1	34.8	1.4	36.4	14.5	
Delay (s)	71.9	27.4		46.8	53.7	19.4	86.5	71.8	34.8	74.8	48.6	
Level of Service	E	C		D	D	B	F	E	C	E	D	
Approach Delay (s)		31.7			47.1			67.3			59.0	
Approach LOS		C			D			E			E	

Intersection Summary

HCM Average Control Delay	48.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		
c Critical Lane Group			

2008 No Project (Opening Day) - PM Peak Hour
26: Imperial Hwy & SR-57 SB

Synchro 6 Report [B614]

											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑↑	↗		↑↑↑↑	↗	↘	↘↗	↗		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.95		
Fr _t		1.00	0.85		1.00	0.85	1.00	0.92	0.85		
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.98	1.00		
Satd. Flow (prot)		5085	1583		5085	1583	1681	1596	1504		
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.98	1.00		
Satd. Flow (perm)		5085	1583		5085	1583	1681	1596	1504		
Volume (vph)	0	1536	859	0	2425	535	616	0	586	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1617	904	0	2553	563	648	0	617	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	0
Lane Group Flow (vph)	0	1617	904	0	2553	563	423	454	386	0	0
Turn Type		Free				Free	Perm		Perm		
Protected Phases		4			8			6			
Permitted Phases		Free				Free	6		6		
Actuated Green, G (s)		32.0	59.1		32.0	59.1	19.1	19.1	19.1		
Effective Green, g (s)		32.0	59.1		32.0	59.1	19.1	19.1	19.1		
Actuated g/C Ratio		0.54	1.00		0.54	1.00	0.32	0.32	0.32		
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0		
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)		2753	1583		2753	1583	543	516	486		
v/s Ratio Prot		0.32			0.50						
v/s Ratio Perm			0.57			0.36	0.25	0.28	0.26		
v/c Ratio		0.59	0.57		0.93	0.36	0.78	0.88	0.79		
Uniform Delay, d1		9.1	0.0		12.5	0.0	18.1	18.9	18.2		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		0.3	1.5		6.1	0.6	7.0	16.0	8.7		
Delay (s)		9.4	1.5		18.6	0.6	25.1	34.9	26.9		
Level of Service		A	A		B	A	C	C	C		
Approach Delay (s)		6.6			15.4			29.2		0.0	
Approach LOS		A			B			C		A	
Intersection Summary											
HCM Average Control Delay		14.7			HCM Level of Service		B				
HCM Volume to Capacity ratio		0.91									
Actuated Cycle Length (s)		59.1			Sum of lost time (s)		8.0				
Analysis Period (min)		15									
c Critical Lane Group											

2008 No Project (Opening Day) - PM Peak Hour
27: Imperial Hwy & SR-57 NB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 	 				 
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	0.91	1.00		0.86		0.91	0.86	0.95			0.88
Fr't	1.00	1.00	0.85		1.00		1.00	0.97	0.85			0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	0.97	1.00			1.00
Satd. Flow (prot)	1770	5085	1583		6396		3221	1503	1504			2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	0.97	1.00			1.00
Satd. Flow (perm)	1770	5085	1583		6396		3221	1503	1504			2787
Volume (vph)	121	1596	434	0	2394	30	808	40	364	0	0	242
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	1680	457	0	2520	32	851	42	383	0	0	255
RTOR Reduction (vph)	0	0	0	0	3	0	0	16	16	0	0	12
Lane Group Flow (vph)	127	1680	457	0	2549	0	634	310	300	0	0	243
Turn Type	Prot		Free				Prot		Perm			Over
Protected Phases	7	4			8		5	2				7
Permitted Phases			Free						2			
Actuated Green, G (s)	6.0	35.0	60.0		25.0		17.0	17.0	17.0			6.0
Effective Green, g (s)	6.0	35.0	60.0		25.0		17.0	17.0	17.0			6.0
Actuated g/C Ratio	0.10	0.58	1.00		0.42		0.28	0.28	0.28			0.10
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	177	2966	1583		2665		913	426	426			279
v/s Ratio Prot	0.07	0.33			c0.40		0.20	c0.21				c0.09
v/s Ratio Perm			0.29						0.20			
v/c Ratio	0.72	0.57	0.29		0.96		0.69	0.73	0.70			0.87
Uniform Delay, d1	26.2	7.8	0.0		17.0		19.2	19.4	19.3			26.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	13.0	0.3	0.5		9.3		2.3	6.1	5.2			24.4
Delay (s)	39.2	8.0	0.5		26.2		21.5	25.5	24.5			51.1
Level of Service	D	A	A		C		C	C	C			D
Approach Delay (s)		8.2			26.2			23.3			51.1	
Approach LOS		A			C			C			D	
Intersection Summary												
HCM Average Control Delay			20.2				HCM Level of Service		C			
HCM Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)		12.0			
Analysis Period (min)			15									
c Critical Lane Group												

2008 No Project (Opening Day) - PM Peak Hour
28: Imperial Hwy & Associated

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.86		1.00	0.95		0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5041		1770	6394		1770	3505		3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5041		1770	6394		1770	3505		3433	1863	1583
Volume (vph)	202	1647	101	344	2031	30	232	293	20	273	152	172
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	213	1734	106	362	2138	32	244	308	21	287	160	181
RTOR Reduction (vph)	0	6	0	0	2	0	0	4	0	0	0	158
Lane Group Flow (vph)	213	1834	0	362	2168	0	244	325	0	287	160	23
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	15.7	40.1		22.0	46.4		15.0	15.5		13.3	13.8	13.8
Effective Green, g (s)	15.7	40.1		22.0	46.4		15.0	15.5		13.3	13.8	13.8
Actuated g/C Ratio	0.15	0.38		0.21	0.43		0.14	0.14		0.12	0.13	0.13
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	260	1891		364	2775		248	508		427	240	204
v/s Ratio Prot	0.12	c0.36		c0.20	0.34		c0.14	c0.09		0.08	0.09	
v/s Ratio Perm												0.01
v/c Ratio	0.82	0.97		0.99	0.78		0.98	0.64		0.67	0.67	0.11
Uniform Delay, d1	44.2	32.8		42.4	25.9		45.8	43.1		44.7	44.4	41.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.9	14.0		45.4	1.5		52.3	2.6		4.1	6.8	0.3
Delay (s)	62.1	46.9		87.8	27.4		98.1	45.7		48.9	51.2	41.4
Level of Service	E	D		F	C		F	D		D	D	D
Approach Delay (s)		48.4			36.0			68.0			47.3	
Approach LOS		D			D			E			D	
Intersection Summary												
HCM Average Control Delay	44.8			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	106.9			Sum of lost time (s)			12.0					
Analysis Period (min)	15											
c Critical Lane Group												

2008 No Project (Opening Day) - PM Peak Hour
30: Imperial Hwy & Kraemer

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		0.97	0.95	1.00
Fr _t	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4992		3433	5013		3433	3491		3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4992		3433	5013		3433	3491		3433	3539	1583
Volume (vph)	242	1374	192	212	1637	172	475	616	61	323	566	162
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	255	1446	202	223	1723	181	500	648	64	340	596	171
RTOR Reduction (vph)	0	20	0	0	14	0	0	8	0	0	0	124
Lane Group Flow (vph)	255	1628	0	223	1890	0	500	704	0	340	596	47
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	7.0	34.0		8.0	35.0		14.0	22.5		9.0	17.5	17.5
Effective Green, g (s)	7.0	34.0		8.0	35.0		14.0	22.5		9.0	17.5	17.5
Actuated g/C Ratio	0.08	0.38		0.09	0.39		0.16	0.25		0.10	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	269	1896		307	1960		537	878		345	692	310
v/s Ratio Prot	c0.07	0.33		0.06	c0.38		c0.15	c0.20		0.10	0.17	
v/s Ratio Perm												0.03
v/c Ratio	0.95	0.86		0.73	0.96		0.93	0.80		0.99	0.86	0.15
Uniform Delay, d1	41.1	25.5		39.7	26.6		37.3	31.4		40.2	34.8	29.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	40.4	4.1		8.3	12.9		23.1	5.3		44.2	10.7	0.2
Delay (s)	81.5	29.7		48.0	39.5		60.3	36.7		84.4	45.5	30.1
Level of Service	F	C		D	D		E	D		F	D	C
Approach Delay (s)		36.6			40.4			46.5			55.1	
Approach LOS		D			D			D			E	
Intersection Summary												
HCM Average Control Delay			43.0			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			89.5			Sum of lost time (s)				8.0		
Analysis Period (min)			15									
c Critical Lane Group												

2008 With Project (Opening Day) - AM Peak Hour
25: Imperial Hwy & State College

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Fr't	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	6284		3433	5085	1583	3433	3539	1583	3433	3483	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	6284		3433	5085	1583	3433	3539	1583	3433	3483	
Volume (vph)	61	1102	162	244	2002	183	152	172	364	142	434	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	64	1160	171	257	2107	193	160	181	383	149	457	54
RTOR Reduction (vph)	0	38	0	0	0	105	0	0	111	0	13	0
Lane Group Flow (vph)	64	1293	0	257	2107	88	160	181	272	149	498	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7			3		8	5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	2.2	27.3		5.1	30.2	30.2	4.0	14.0	14.0	4.0	14.0	
Effective Green, g (s)	2.2	27.3		5.1	30.2	30.2	4.0	14.0	14.0	4.0	14.0	
Actuated g/C Ratio	0.03	0.41		0.08	0.45	0.45	0.06	0.21	0.21	0.06	0.21	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	114	2584		264	2313	720	207	746	334	207	734	
v/s Ratio Prot	0.02	0.21		c0.07	c0.41		c0.05	0.05		0.04	0.14	
v/s Ratio Perm						0.06			c0.17			
v/c Ratio	0.56	0.50		0.97	0.91	0.12	0.77	0.24	0.81	0.72	0.68	
Uniform Delay, d1	31.6	14.5		30.6	16.8	10.4	30.8	21.8	25.0	30.6	24.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.2	0.2		47.7	5.9	0.1	16.3	0.2	14.0	11.4	2.5	
Delay (s)	37.8	14.6		78.3	22.8	10.5	47.0	22.0	39.0	42.0	26.6	
Level of Service	D	B		E	C	B	D	C	D	D	C	
Approach Delay (s)	15.7			27.4			36.5			30.1		
Approach LOS	B			C			D			C		
Intersection Summary												
HCM Average Control Delay			25.9		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			66.4		Sum of lost time (s)				16.0			
Analysis Period (min)			15									
c Critical Lane Group												

2008 With Project (Opening Day) - AM Peak Hour
26: Imperial Hwy & SR-57 SB

Synchro 6 Report [B614]

											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑	↑	↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.95		
Fr _t		1.00	0.85		1.00	0.85	1.00	0.96	0.85		
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.97	1.00		
Satd. Flow (prot)		5085	1583		5085	1583	1681	1637	1504		
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.97	1.00		
Satd. Flow (perm)		5085	1583		5085	1583	1681	1637	1504		
Volume (vph)	0	1022	586	0	2036	352	577	0	394	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1076	617	0	2143	371	607	0	415	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	2	0	0
Lane Group Flow (vph)	0	1076	617	0	2143	371	344	361	313	0	0
Turn Type			Free			Free	Perm		Perm		
Protected Phases		4			8			6			
Permitted Phases			Free			Free	6		6		
Actuated Green, G (s)		24.2	46.5		24.2	46.5	14.3	14.3	14.3		
Effective Green, g (s)		24.2	46.5		24.2	46.5	14.3	14.3	14.3		
Actuated g/C Ratio		0.52	1.00		0.52	1.00	0.31	0.31	0.31		
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0		
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)		2646	1583		2646	1583	517	503	463		
v/s Ratio Prot		0.21			0.42						
v/s Ratio Perm			0.39			0.23	0.20	0.22	0.21		
v/c Ratio		0.41	0.39		0.81	0.23	0.67	0.72	0.68		
Uniform Delay, d1		6.8	0.0		9.2	0.0	14.0	14.3	14.1		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		0.1	0.7		1.9	0.3	3.2	4.9	3.9		
Delay (s)		6.9	0.7		11.2	0.3	17.2	19.2	18.0		
Level of Service		A	A		B	A	B	B	B		
Approach Delay (s)		4.6			9.6			18.1		0.0	
Approach LOS		A			A			B		A	
Intersection Summary											
HCM Average Control Delay			9.7			HCM Level of Service			A		
HCM Volume to Capacity ratio			0.78								
Actuated Cycle Length (s)			46.5			Sum of lost time (s)			8.0		
Analysis Period (min)			15								
c Critical Lane Group											

2008 With Project (Opening Day) - AM Peak Hour

27: Imperial Hwy & SR-57 NB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	0.91	1.00		0.86		0.91	0.86	0.95			0.88
Fr't	1.00	1.00	0.85		1.00		1.00	0.88	0.85			0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (prot)	1770	5085	1583		6402		3221	1406	1504			2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (perm)	1770	5085	1583		6402		3221	1406	1504			2787
Volume (vph)	81	1054	465	0	1794	10	909	101	954	0	0	91
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	1109	489	0	1888	11	957	106	1004	0	0	96
RTOR Reduction (vph)	0	0	0	0	1	0	0	21	21	0	0	53
Lane Group Flow (vph)	85	1109	489	0	1898	0	957	551	517	0	0	43
Turn Type	Prot		Free				Prot		Perm			Over
Protected Phases	7	4			8		5	2				7
Permitted Phases			Free						2			
Actuated Green, G (s)	3.1	28.2	64.3		21.1		28.1	28.1	28.1			3.1
Effective Green, g (s)	3.1	28.2	64.3		21.1		28.1	28.1	28.1			3.1
Actuated g/C Ratio	0.05	0.44	1.00		0.33		0.44	0.44	0.44			0.05
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	85	2230	1583		2101		1408	614	657			134
v/s Ratio Prot	c0.05	0.22			c0.30		0.30	c0.39				0.02
v/s Ratio Perm			0.31						0.34			
v/c Ratio	1.00	0.50	0.31		0.90		0.68	0.90	0.79			0.32
Uniform Delay, d1	30.6	13.0	0.0		20.6		14.5	16.8	15.5			29.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	97.6	0.2	0.5		5.9		1.3	15.7	6.2			1.4
Delay (s)	128.2	13.1	0.5		26.5		15.8	32.4	21.7			31.0
Level of Service	F	B	A		C		B	C	C			C
Approach Delay (s)		15.3			26.5			21.9			31.0	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM Average Control Delay			21.7									
HCM Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			64.3									
Analysis Period (min)			15									
c Critical Lane Group												

2008 With Project (Opening Day) - AM Peak Hour
28: Imperial Hwy & Associated

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.86		1.00	0.95		0.97	1.00	1.00
Frst	1.00	0.99		1.00	0.99		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5051		1770	6375		1770	3393		3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5051		1770	6375		1770	3393		3433	1863	1583
Volume (vph)	199	1728	81	71	1522	54	216	135	51	106	212	86
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	209	1819	85	75	1602	57	227	142	54	112	223	91
RTOR Reduction (vph)	0	6	0	0	6	0	0	39	0	0	0	74
Lane Group Flow (vph)	209	1898	0	75	1653	0	227	157	0	112	223	17
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	9.0	30.0		3.1	24.1		10.0	20.0		3.9	13.9	13.9
Effective Green, g (s)	9.0	30.0		3.1	24.1		10.0	20.0		3.9	13.9	13.9
Actuated g/C Ratio	0.12	0.41		0.04	0.33		0.14	0.27		0.05	0.19	0.19
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	218	2076		75	2105		242	930		183	355	301
v/s Ratio Prot	c0.12	c0.38		0.04	0.26		c0.13	0.05		0.03	c0.12	
v/s Ratio Perm												0.01
v/c Ratio	0.96	0.91		1.00	0.79		0.94	0.17		0.61	0.63	0.06
Uniform Delay, d1	31.8	20.3		35.0	22.1		31.2	20.2		33.8	27.2	24.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	48.7	6.7		103.9	2.0		40.7	0.1		5.9	3.5	0.1
Delay (s)	80.5	27.0		138.9	24.1		71.9	20.3		39.8	30.6	24.3
Level of Service	F	C		F	C		E	C		D	C	C
Approach Delay (s)		32.3			29.1			47.9			31.7	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM Average Control Delay			32.5			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			73.0			Sum of lost time (s)				12.0		
Analysis Period (min)			15									
c Critical Lane Group												

2008 With Project (Opening Day) - AM Peak Hour
30: Imperial Hwy & Kraemer

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4990		3433	5027		3433	3400		3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4990		3433	5027		3433	3400		3433	3539	1583
Volume (vph)	213	1214	174	111	1207	101	204	283	101	273	626	74
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	224	1278	183	117	1271	106	215	298	106	287	659	78
RTOR Reduction (vph)	0	30	0	0	16	0	0	61	0	0	0	59
Lane Group Flow (vph)	224	1431	0	117	1361	0	215	343	0	287	659	19
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	4.0	19.7		3.2	18.9		6.0	14.6		6.0	14.6	14.6
Effective Green, g (s)	4.0	19.7		3.2	18.9		6.0	14.6		6.0	14.6	14.6
Actuated g/C Ratio	0.07	0.33		0.05	0.32		0.10	0.25		0.10	0.25	0.25
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	231	1652		185	1597		346	834		346	868	388
v/s Ratio Prot	c0.07	c0.29		0.03	0.27		0.06	0.10		c0.08	c0.19	
v/s Ratio Perm												0.01
v/c Ratio	0.97	0.87		0.63	0.85		0.62	0.41		0.83	0.76	0.05
Uniform Delay, d1	27.7	18.7		27.6	19.0		25.7	18.8		26.2	20.8	17.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	50.0	5.0		6.9	4.6		3.4	0.3		15.1	3.9	0.1
Delay (s)	77.7	23.7		34.5	23.6		29.1	19.2		41.3	24.7	17.2
Level of Service	E	C		C	C		C	B		D	C	B
Approach Delay (s)		30.9			24.5			22.6			28.8	
Approach LOS		C			C			C			C	

Intersection Summary

HCM Average Control Delay	27.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	59.5	Sum of lost time (s)	12.0
Analysis Period (min)	15		
c Critical Lane Group			

2008 With Project (Opening Day) - PM Peak Hour

25: Imperial Hwy & State College

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Frst	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	6333		3433	5085	1583	3433	3539	1583	3433	3365	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	6333		3433	5085	1583	3433	3539	1583	3433	3365	
Volume (vph)	192	1660	141	335	2167	517	323	596	275	467	475	232
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	202	1747	148	353	2281	544	340	627	289	492	500	244
RTOR Reduction (vph)	0	15	0	0	0	184	0	0	146	0	66	0
Lane Group Flow (vph)	202	1880	0	353	2281	360	340	627	143	492	678	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	6.0	33.2		11.8	39.0	39.0	9.0	16.0	16.0	13.0	20.0	
Effective Green, g (s)	6.0	33.2		11.8	39.0	39.0	9.0	16.0	16.0	13.0	20.0	
Actuated g/C Ratio	0.07	0.37		0.13	0.43	0.43	0.10	0.18	0.18	0.14	0.22	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	229	2336		450	2204	686	343	629	281	496	748	
v/s Ratio Prot	0.06	0.30		c0.10	c0.45		0.10	0.18		c0.14	c0.20	
v/s Ratio Perm						0.23			0.09			
v/c Ratio	0.88	0.81		0.78	1.03	0.53	0.99	1.00	0.51	0.99	0.91	
Uniform Delay, d1	41.6	25.5		37.9	25.5	18.7	40.5	37.0	33.5	38.4	34.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	30.3	2.1		8.7	28.9	0.7	46.1	34.8	1.6	38.2	14.5	
Delay (s)	71.9	27.6		46.6	54.4	19.4	86.5	71.8	35.0	76.6	48.6	
Level of Service	E	C		D	D	B	F	E	D	E	D	
Approach Delay (s)		31.9			47.5			67.3			59.8	
Approach LOS		C			D			E			E	

Intersection Summary

HCM Average Control Delay	48.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Analysis Period (min)	15		
c Critical Lane Group			

2008 With Project (Opening Day) - PM Peak Hour
26: Imperial Hwy & SR-57 SB

Synchro 6 Report [B614]

											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑	↑	↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.95		
Frt		1.00	0.85		1.00	0.85	1.00	0.92	0.85		
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.98	1.00		
Satd. Flow (prot)		5085	1583		5085	1583	1681	1597	1504		
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.98	1.00		
Satd. Flow (perm)		5085	1583		5085	1583	1681	1597	1504		
Volume (vph)	0	1543	859	0	2434	540	619	0	586	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1624	904	0	2562	568	652	0	617	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	0
Lane Group Flow (vph)	0	1624	904	0	2562	568	425	455	387	0	0
Turn Type		Free			Free		Perm		Perm		
Protected Phases		4			8			6			
Permitted Phases		Free			Free		6		6		
Actuated Green, G (s)		32.0	59.2		32.0	59.2	19.2	19.2	19.2		
Effective Green, g (s)		32.0	59.2		32.0	59.2	19.2	19.2	19.2		
Actuated g/C Ratio		0.54	1.00		0.54	1.00	0.32	0.32	0.32		
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0		
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)		2749	1583		2749	1583	545	518	488		
v/s Ratio Prot		0.32			0.50						
v/s Ratio Perm			0.57			0.36	0.25	0.29	0.26		
v/c Ratio		0.59	0.57		0.93	0.36	0.78	0.88	0.79		
Uniform Delay, d1		9.2	0.0		12.6	0.0	18.1	18.9	18.2		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		0.3	1.5		6.6	0.6	7.0	15.6	8.6		
Delay (s)		9.5	1.5		19.2	0.6	25.1	34.5	26.8		
Level of Service		A	A		B	A	C	C	C		
Approach Delay (s)		6.7			15.8			29.0		0.0	
Approach LOS		A			B			C		A	
Intersection Summary											
HCM Average Control Delay			14.9			HCM Level of Service			B		
HCM Volume to Capacity ratio			0.91								
Actuated Cycle Length (s)			59.2			Sum of lost time (s)			8.0		
Analysis Period (min)			15								
c Critical Lane Group											

2008 With Project (Opening Day) - PM Peak Hour
 27: Imperial Hwy & SR-57 NB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	0.91	1.00		0.86		0.91	0.86	0.95			0.88
Frt	1.00	1.00	0.85		1.00		1.00	0.97	0.85			0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	0.97	1.00			1.00
Satd. Flow (prot)	1770	5085	1583		6396		3221	1503	1504			2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	0.97	1.00			1.00
Satd. Flow (perm)	1770	5085	1583		6396		3221	1503	1504			2787
Volume (vph)	121	1606	434	0	2417	30	808	40	367	0	0	242
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	127	1691	457	0	2544	32	851	42	386	0	0	255
RTOR Reduction (vph)	0	0	0	0	2	0	0	14	17	0	0	11
Lane Group Flow (vph)	127	1691	457	0	2574	0	634	312	302	0	0	244
Turn Type	Prot		Free				Prot		Perm			Over
Protected Phases	7	4			8		5	2				7
Permitted Phases			Free						2			
Actuated Green, G (s)	7.0	39.0	65.0		28.0		18.0	18.0	18.0			7.0
Effective Green, g (s)	7.0	39.0	65.0		28.0		18.0	18.0	18.0			7.0
Actuated g/C Ratio	0.11	0.60	1.00		0.43		0.28	0.28	0.28			0.11
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	191	3051	1583		2755		892	416	416			300
v/s Ratio Prot	0.07	0.33			0.40		0.20	0.21				0.09
v/s Ratio Perm			0.29						0.20			
v/c Ratio	0.66	0.55	0.29		0.93		0.71	0.75	0.73			0.81
Uniform Delay, d1	27.9	7.8	0.0		17.6		21.2	21.4	21.3			28.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	8.4	0.2	0.5		6.7		2.7	7.2	6.2			15.5
Delay (s)	36.3	8.0	0.5		24.3		23.8	28.7	27.4			43.8
Level of Service	D	A	A		C		C	C	C			D
Approach Delay (s)		8.1			24.3			26.0			43.8	
Approach LOS		A			C			C			D	
Intersection Summary												
HCM Average Control Delay			19.6			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			65.0			Sum of lost time (s)			12.0			
Analysis Period (min)			15									
c Critical Lane Group												

2008 With Project (Opening Day) - PM Peak Hour
28: Imperial Hwy & Associated

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.86		1.00	0.95		0.97	1.00	1.00
Friction	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5041		1770	6392		1770	3506		3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5041		1770	6392		1770	3506		3433	1863	1583
Volume (vph)	215	1647	101	344	2043	33	240	297	20	284	155	186
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	226	1734	106	362	2151	35	253	313	21	299	163	196
RTOR Reduction (vph)	0	6	0	0	2	0	0	4	0	0	0	170
Lane Group Flow (vph)	226	1834	0	362	2184	0	253	330	0	299	163	26
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	16.5	40.0		22.0	45.5		15.0	15.5		13.5	14.0	14.0
Effective Green, g (s)	16.5	40.0		22.0	45.5		15.0	15.5		13.5	14.0	14.0
Actuated g/C Ratio	0.15	0.37		0.21	0.43		0.14	0.14		0.13	0.13	0.13
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	273	1884		364	2718		248	508		433	244	207
v/s Ratio Prot	0.13	c0.36		c0.20	0.34		c0.14	c0.09		0.09	0.09	
v/s Ratio Perm												0.02
v/c Ratio	0.83	0.97		0.99	0.80		1.02	0.65		0.69	0.67	0.12
Uniform Delay, d1	43.9	33.0		42.4	26.8		46.0	43.2		44.8	44.3	41.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.3	14.8		45.4	1.8		62.4	2.9		4.7	6.8	0.3
Delay (s)	62.1	47.8		87.9	28.7		108.4	46.0		49.5	51.0	41.4
Level of Service	E	D		F	C		F	D		D	D	D
Approach Delay (s)		49.4			37.1			72.9			47.4	
Approach LOS		D			D			E			D	

Intersection Summary

HCM Average Control Delay	46.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	107.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

2008 With Project (Opening Day) - PM Peak Hour
30: Imperial Hwy & Kraemer

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4992		3433	5013		3433	3491		3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4992		3433	5013		3433	3491		3433	3539	1583
Volume (vph)	245	1381	193	212	1644	172	478	616	61	323	566	167
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	258	1454	203	223	1731	181	503	648	64	340	596	176
RTOR Reduction (vph)	0	20	0	0	14	0	0	8	0	0	0	124
Lane Group Flow (vph)	258	1637	0	223	1898	0	503	704	0	340	596	52
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	7.0	34.0		8.0	35.0		14.0	22.5		9.0	17.5	17.5
Effective Green, g (s)	7.0	34.0		8.0	35.0		14.0	22.5		9.0	17.5	17.5
Actuated g/C Ratio	0.08	0.38		0.09	0.39		0.16	0.25		0.10	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	269	1896		307	1960		537	878		345	692	310
v/s Ratio Prot	c0.08	0.33		0.06	c0.38		c0.15	c0.20		0.10	0.17	
v/s Ratio Perm												0.03
v/c Ratio	0.96	0.86		0.73	0.97		0.94	0.80		0.99	0.86	0.17
Uniform Delay, d1	41.1	25.6		39.7	26.7		37.3	31.4		40.2	34.8	29.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	43.2	4.4		8.3	13.5		23.9	5.3		44.2	10.7	0.3
Delay (s)	84.3	30.0		48.0	40.2		61.2	36.7		84.4	45.5	30.2
Level of Service	F	C		D	D		E	D		F	D	C
Approach Delay (s)		37.3			41.0			46.9			55.0	
Approach LOS		D			D			D			D	

Intersection Summary

HCM Average Control Delay	43.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	89.5	Sum of lost time (s)	8.0
Analysis Period (min)	15		
c Critical Lane Group			

2030 No Project/Committed Lanes - AM Peak Hour
25: Imperial Hwy & State College

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Fr't	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	6297		3433	5085	1583	3433	3539	1583	3433	3475	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	6297		3433	5085	1583	3433	3539	1583	3433	3475	
Volume (vph)	61	2491	324	981	2308	191	507	263	507	181	446	61
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	64	2622	341	1033	2429	201	534	277	534	191	469	64
RTOR Reduction (vph)	0	15	0	0	0	58	0	0	282	0	7	0
Lane Group Flow (vph)	64	2948	0	1033	2429	143	534	277	252	191	526	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	4.8	57.8		36.0	89.0	89.0	19.0	32.0	32.0	9.0	22.0	
Effective Green, g (s)	4.8	57.8		36.0	89.0	89.0	19.0	32.0	32.0	9.0	22.0	
Actuated g/C Ratio	0.03	0.38		0.24	0.59	0.59	0.13	0.21	0.21	0.06	0.15	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	109	2414		820	3001	934	433	751	336	205	507	
v/s Ratio Prot	0.02	c0.47		c0.30	0.48		c0.16	0.08		0.06	c0.15	
v/s Ratio Perm						0.09			0.16			
v/c Ratio	0.59	1.22		1.26	0.81	0.15	1.23	0.37	0.75	0.93	1.04	
Uniform Delay, d1	72.0	46.5		57.4	24.2	13.9	65.9	50.8	55.7	70.6	64.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.8	103.4		126.7	1.7	0.1	123.6	0.3	8.9	43.8	50.1	
Delay (s)	79.9	149.9		184.1	25.9	14.0	189.5	51.1	64.5	114.4	114.5	
Level of Service	E	F		F	C	B	F	D	E	F	F	
Approach Delay (s)		148.4			69.9			111.4			114.5	
Approach LOS		F			E			F			F	
Intersection Summary												
HCM Average Control Delay			107.1			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			150.8			Sum of lost time (s)			16.0			
Analysis Period (min)			15									
c Critical Lane Group												

2030 No Project/Committed Lanes - AM Peak Hour

26: Imperial Hwy & SR-57 SB

Synchro 6 Report [B614]

											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑	↑	↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.95		
Fr _t		1.00	0.85		1.00	0.85	1.00	0.89	0.85		
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.99	1.00		
Satd. Flow (prot)		5085	1583		5085	1583	1681	1549	1504		
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.99	1.00		
Satd. Flow (perm)		5085	1583		5085	1583	1681	1549	1504		
Volume (vph)	0	2075	1580	0	2153	348	749	0	1043	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2184	1663	0	2266	366	788	0	1098	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	0
Lane Group Flow (vph)	0	2184	1663	0	2266	366	627	680	577	0	0
Turn Type			Free			Free	Perm		Perm		
Protected Phases		4			8			6			
Permitted Phases			Free			Free	6		6		
Actuated Green, G (s)		36.0	80.0		36.0	80.0	36.0	36.0	36.0		
Effective Green, g (s)		36.0	80.0		36.0	80.0	36.0	36.0	36.0		
Actuated g/C Ratio		0.45	1.00		0.45	1.00	0.45	0.45	0.45		
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0		
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)		2288	1583		2288	1583	756	697	677		
v/s Ratio Prot		0.43			0.45						
v/s Ratio Perm			c1.05			0.23	0.37	0.44	0.38		
v/c Ratio		0.95	1.05		0.99	0.23	0.83	0.98	0.85		
Uniform Delay, d1		21.2	40.0		21.8	0.0	19.3	21.6	19.6		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		10.2	37.2		16.5	0.3	7.5	28.0	10.2		
Delay (s)		31.4	77.2		38.4	0.3	26.8	49.5	29.8		
Level of Service		C	E		D	A	C	D	C		
Approach Delay (s)		51.2			33.1			35.9		0.0	
Approach LOS		D			C			D		A	
Intersection Summary											
HCM Average Control Delay			42.0			HCM Level of Service			D		
HCM Volume to Capacity ratio			1.05								
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			0.0		
Analysis Period (min)			15								
c Critical Lane Group											

2030 No Project/Committed Lanes - AM Peak Hour
 27: Imperial Hwy & SR-57 NB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 					 
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	0.91	1.00		0.86		0.97	0.95	0.95			0.88
Fr't	1.00	1.00	0.85		1.00		1.00	0.89	0.85			0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (prot)	1770	5085	1583		6404		3433	1579	1504			2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (perm)	1770	5085	1583		6404		3433	1579	1504			2787
Volume (vph)	203	1932	699	0	2314	10	922	172	959	0	0	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	214	2034	736	0	2436	11	971	181	1009	0	0	106
RTOR Reduction (vph)	0	0	0	0	1	0	0	3	3	0	0	30
Lane Group Flow (vph)	214	2034	736	0	2446	0	971	640	544	0	0	76
Turn Type	Prot		Free				Prot		Perm			Over
Protected Phases	7	4			8		5	2				7
Permitted Phases			Free						2			
Actuated Green, G (s)	12.0	53.0	100.0		37.0		39.0	39.0	39.0			12.0
Effective Green, g (s)	12.0	53.0	100.0		37.0		39.0	39.0	39.0			12.0
Actuated g/C Ratio	0.12	0.53	1.00		0.37		0.39	0.39	0.39			0.12
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	212	2695	1583		2369		1339	616	587			334
v/s Ratio Prot	0.12	0.40			0.38		0.28	0.41				0.03
v/s Ratio Perm			0.46						0.36			
v/c Ratio	1.01	0.75	0.46		1.03		0.73	1.04	0.93			0.23
Uniform Delay, d1	44.0	18.4	0.0		31.5		25.9	30.5	29.1			39.8
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	64.3	1.2	1.0		27.5		2.0	46.7	20.7			0.3
Delay (s)	108.3	19.6	1.0		59.0		27.9	77.2	49.9			40.2
Level of Service	F	B	A		E		C	E	D			D
Approach Delay (s)		21.4			59.0			48.2			40.2	
Approach LOS		C			E			D			D	

Intersection Summary

HCM Average Control Delay	41.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		
c Critical Lane Group			

2030 No Project/Committed Lanes - AM Peak Hour
28: Imperial Hwy & Associated

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.86		1.00	0.95		0.97	1.00	1.00
Fr _t	1.00	0.99		1.00	1.00		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5057		1770	6378		1770	3319		3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5057		1770	6378		1770	3319		3433	1863	1583
Volume (vph)	203	2370	91	81	1898	61	311	142	101	138	365	127
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	214	2495	96	85	1998	64	327	149	106	145	384	134
RTOR Reduction (vph)	0	3	0	0	3	0	0	73	0	0	0	106
Lane Group Flow (vph)	214	2588	0	85	2059	0	327	182	0	145	384	28
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	18.5	60.0		6.0	47.5		22.0	38.5		9.5	26.0	26.0
Effective Green, g (s)	18.5	60.0		6.0	47.5		22.0	38.5		9.5	26.0	26.0
Actuated g/C Ratio	0.14	0.46		0.05	0.37		0.17	0.30		0.07	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	252	2334		82	2330		300	983		251	373	317
v/s Ratio Prot	c0.12	c0.51		0.05	0.32		c0.18	0.05		0.04	c0.21	
v/s Ratio Perm												0.02
v/c Ratio	0.85	1.11		1.04	0.88		1.09	0.18		0.58	1.03	0.09
Uniform Delay, d1	54.4	35.0		62.0	38.7		54.0	34.1		58.3	52.0	42.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	22.5	55.8		109.8	4.4		78.2	0.1		3.2	54.4	0.1
Delay (s)	76.9	90.8		171.8	43.0		132.2	34.2		61.5	106.4	42.5
Level of Service	E	F		F	D		F	C		E	F	D
Approach Delay (s)		89.8			48.1			89.2			83.6	
Approach LOS		F			D			F			F	
Intersection Summary												
HCM Average Control Delay	74.6			HCM Level of Service			E					
HCM Volume to Capacity ratio	1.09											
Actuated Cycle Length (s)	130.0			Sum of lost time (s)			16.0					
Analysis Period (min)	15											
c Critical Lane Group												

2030 No Project/Committed Lanes - AM Peak Hour

30: Imperial Hwy & Kraemer

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4917		3433	5085	1583	3433	4927		3433	4971	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4917		3433	5085	1583	3433	4927		3433	4971	
Volume (vph)	303	1538	435	111	1609	192	242	425	111	577	1378	242
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	319	1619	458	117	1694	202	255	447	117	607	1451	255
RTOR Reduction (vph)	0	46	0	0	0	117	0	40	0	0	22	0
Lane Group Flow (vph)	319	2031	0	117	1694	85	255	524	0	607	1684	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	11.0	44.0		4.0	37.0	37.0	8.0	22.7		23.3	38.0	
Effective Green, g (s)	11.0	44.0		4.0	37.0	37.0	8.0	22.7		23.3	38.0	
Actuated g/C Ratio	0.10	0.40		0.04	0.34	0.34	0.07	0.21		0.21	0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	343	1967		125	1710	532	250	1017		727	1717	
v/s Ratio Prot	c0.09	c0.41		0.03	0.33		c0.07	0.11		0.18	c0.34	
v/s Ratio Perm						0.05						
v/c Ratio	0.93	1.03		0.94	0.99	0.16	1.02	0.51		0.83	0.98	
Uniform Delay, d1	49.1	33.0		52.9	36.3	25.6	51.0	38.8		41.5	35.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	31.1	29.2		60.4	19.5	0.1	62.2	0.4		8.2	17.2	
Delay (s)	80.3	62.2		113.3	55.8	25.7	113.2	39.2		49.7	52.9	
Level of Service	F	E		F	E	C	F	D		D	D	
Approach Delay (s)		64.6			56.1			62.2			52.1	
Approach LOS		E			E			E			D	
Intersection Summary												
HCM Average Control Delay			58.2			HCM Level of Service			E			
HCM Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			12.0			
Analysis Period (min)			15									
c Critical Lane Group												

2030 No Project/Committed Lanes - PM Peak Hour
 25: Imperial Hwy & State College

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Fr _t	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	6336		3433	5085	1583	3433	3539	1583	3433	3362	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	6336		3433	5085	1583	3433	3539	1583	3433	3362	
Volume (vph)	203	2774	223	911	2823	526	800	932	708	475	486	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	214	2920	235	959	2972	554	842	981	745	500	512	256
RTOR Reduction (vph)	0	8	0	0	0	134	0	0	213	0	41	0
Lane Group Flow (vph)	214	3147	0	959	2972	420	842	981	532	500	727	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	7.0	53.0		28.0	74.0	74.0	25.0	38.0	38.0	15.0	28.0	
Effective Green, g (s)	7.0	53.0		28.0	74.0	74.0	25.0	38.0	38.0	15.0	28.0	
Actuated g/C Ratio	0.05	0.35		0.19	0.49	0.49	0.17	0.25	0.25	0.10	0.19	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	160	2239		641	2509	781	572	897	401	343	628	
v/s Ratio Prot	0.06	c0.50		c0.28	0.58		c0.25	0.28		0.15	0.22	
v/s Ratio Perm						0.27			c0.34			
v/c Ratio	1.34	1.41		1.50	1.18	0.54	1.47	1.09	1.33	1.46	1.16	
Uniform Delay, d1	71.5	48.5		61.0	38.0	26.2	62.5	56.0	56.0	67.5	61.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	187.9	185.2		231.4	87.4	0.7	221.8	58.9	163.6	221.5	87.6	
Delay (s)	259.4	233.7		292.4	125.4	26.9	284.3	114.9	219.6	289.0	148.6	
Level of Service	F	F		F	F	C	F	F	F	F	F	
Approach Delay (s)		235.3			149.0			200.8			204.0	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			191.2			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.40									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			12.0			
Analysis Period (min)			15									
c Critical Lane Group												

2030 No Project/Committed Lanes - PM Peak Hour
26: Imperial Hwy & SR-57 SB

Synchro 6 Report [B614]

											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑	↑	↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.95		
Fr't		1.00	0.85		1.00	0.85	1.00	0.89	0.85		
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.99	1.00		
Satd. Flow (prot)		5085	1583		5085	1583	1681	1549	1504		
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.99	1.00		
Satd. Flow (perm)		5085	1583		5085	1583	1681	1549	1504		
Volume (vph)	0	2650	1145	0	2548	757	626	0	871	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2789	1205	0	2682	797	659	0	917	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	0
Lane Group Flow (vph)	0	2789	1205	0	2682	797	524	568	482	0	0
Turn Type			Free			Free	Perm		Perm		
Protected Phases		4			8			6			
Permitted Phases			Free			Free	6		6		
Actuated Green, G (s)		49.0	90.0		49.0	90.0	33.0	33.0	33.0		
Effective Green, g (s)		49.0	90.0		49.0	90.0	33.0	33.0	33.0		
Actuated g/C Ratio		0.54	1.00		0.54	1.00	0.37	0.37	0.37		
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0		
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)		2769	1583		2769	1583	616	568	551		
v/s Ratio Prot		0.55			0.53						
v/s Ratio Perm			0.76			0.50	0.31	0.37	0.32		
v/c Ratio		1.01	0.76		0.97	0.50	0.85	1.00	0.88		
Uniform Delay, d1		20.5	0.0		19.8	0.0	26.2	28.5	26.6		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		18.9	3.5		10.7	1.1	10.9	37.9	14.5		
Delay (s)		39.4	3.5		30.4	1.1	37.1	66.4	41.0		
Level of Service		D	A		C	A	D	E	D		
Approach Delay (s)		28.5			23.7			48.9		0.0	
Approach LOS		C			C			D		A	
Intersection Summary											
HCM Average Control Delay			30.2								HCM Level of Service C
HCM Volume to Capacity ratio			1.00								
Actuated Cycle Length (s)			90.0								Sum of lost time (s) 8.0
Analysis Period (min)			15								
c Critical Lane Group											

2030 No Project/Committed Lanes - PM Peak Hour

27: Imperial Hwy & SR-57 NB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 					 
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	0.91	1.00		0.86		0.97	0.95	0.95			0.88
Fr _t	1.00	1.00	0.85		1.00		1.00	0.89	0.85			0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (prot)	1770	5085	1583		6399		3433	1573	1504			2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (perm)	1770	5085	1583		6399		3433	1573	1504			2787
Volume (vph)	213	2516	446	0	3127	30	1033	61	373	0	0	314
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	224	2648	469	0	3292	32	1087	64	393	0	0	331
RTOR Reduction (vph)	0	0	0	0	1	0	0	2	2	0	0	5
Lane Group Flow (vph)	224	2648	469	0	3323	0	1087	245	208	0	0	326
Turn Type	Prot	Free					Prot	Perm				Over
Protected Phases	7	4			8		5	2				7
Permitted Phases		Free						2				
Actuated Green, G (s)	15.0	82.0	130.0		63.0		40.0	40.0	40.0			15.0
Effective Green, g (s)	15.0	82.0	130.0		63.0		40.0	40.0	40.0			15.0
Actuated g/C Ratio	0.12	0.63	1.00		0.48		0.31	0.31	0.31			0.12
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	204	3207	1583		3101		1056	484	463			322
v/s Ratio Prot	c0.13	0.52			c0.52		c0.32	0.16				0.12
v/s Ratio Perm			0.30						0.14			
v/c Ratio	1.10	0.83	0.30		1.07		1.03	0.51	0.45			1.01
Uniform Delay, d1	57.5	18.5	0.0		33.5		45.0	36.9	36.1			57.5
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	91.7	1.8	0.5		39.3		35.5	0.8	0.7			53.1
Delay (s)	149.2	20.3	0.5		72.8		80.5	37.7	36.8			110.6
Level of Service	F	C	A		E		F	D	D			F
Approach Delay (s)		26.2			72.8			67.7			110.6	
Approach LOS		C			E			E			F	
Intersection Summary												
HCM Average Control Delay			55.1			HCM Level of Service			E			
HCM Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			12.0			
Analysis Period (min)			15									
c Critical Lane Group												

2030 No Project/Committed Lanes - PM Peak Hour

28: Imperial Hwy & Associated

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.86		1.00	0.95		0.97	1.00	1.00
Fr _t	1.00	0.99		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5048		1770	6350		1770	3416		3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5048		1770	6350		1770	3416		3433	1863	1583
Volume (vph)	235	2148	111	355	2323	150	522	302	91	278	170	357
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	2261	117	374	2445	158	549	318	96	293	179	376
RTOR Reduction (vph)	0	4	0	0	7	0	0	18	0	0	0	191
Lane Group Flow (vph)	247	2374	0	374	2596	0	549	396	0	293	179	185
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	20.0	56.0		25.0	61.0		36.0	36.0		17.0	17.0	17.0
Effective Green, g (s)	20.0	56.0		25.0	61.0		36.0	36.0		17.0	17.0	17.0
Actuated g/C Ratio	0.13	0.37		0.17	0.41		0.24	0.24		0.11	0.11	0.11
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	236	1885		295	2582		425	820		389	211	179
v/s Ratio Prot	0.14	c0.47		c0.21	0.41		c0.31	0.12		0.09	0.10	
v/s Ratio Perm												c0.12
v/c Ratio	1.05	1.26		1.27	1.01		1.29	0.48		0.75	0.85	1.04
Uniform Delay, d1	65.0	47.0		62.5	44.5		57.0	49.0		64.5	65.2	66.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	71.3	121.3		144.6	19.1		147.9	0.4		8.0	25.8	76.9
Delay (s)	136.3	168.3		207.1	63.6		204.9	49.4		72.5	91.0	143.4
Level of Service	F	F		F	E		F	D		E	F	F
Approach Delay (s)		165.3			81.6			138.1			107.9	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			121.6			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.24									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				16.0		
Analysis Period (min)			15									
c Critical Lane Group												

2030 No Project/Committed Lanes - PM Peak Hour

30: Imperial Hwy & Kraemer

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	0.97	0.91		0.97	0.91	
Fr _t	1.00	0.97		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4934		3433	5085	1583	3433	5041		3433	4937	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4934		3433	5085	1583	3433	5041		3433	4937	
Volume (vph)	251	1556	385	284	1981	638	474	1469	91	527	699	169
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	264	1638	405	299	2085	672	499	1546	96	555	736	178
RTOR Reduction (vph)	0	28	0	0	0	205	0	4	0	0	26	0
Lane Group Flow (vph)	264	2015	0	299	2085	467	499	1638	0	555	888	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	11.0	56.0		12.0	57.0	57.0	25.8	44.0		22.0	40.2	
Effective Green, g (s)	11.0	56.0		12.0	57.0	57.0	25.8	44.0		22.0	40.2	
Actuated g/C Ratio	0.07	0.37		0.08	0.38	0.38	0.17	0.29		0.15	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	252	1842		275	1932	602	590	1479		504	1323	
v/s Ratio Prot	0.08	0.41		0.09	0.41		0.15	0.32		0.16	0.18	
v/s Ratio Perm						0.30						
v/c Ratio	1.05	1.09		1.09	1.08	0.78	0.85	1.11		1.10	0.67	
Uniform Delay, d ₁	69.5	47.0		69.0	46.5	40.9	60.2	53.0		64.0	49.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d ₂	69.7	51.5		79.5	45.6	6.2	10.8	58.6		70.6	1.4	
Delay (s)	139.2	98.5		148.5	92.1	47.1	70.9	111.6		134.6	50.3	
Level of Service	F	F		F	F	D	E	F		F	D	
Approach Delay (s)		103.2			87.7			102.2			82.2	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			94.2			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				12.0		
Analysis Period (min)			15									
c Critical Lane Group												

2030 With Project/Committed Lanes - AM Peak Hour
25: Imperial Hwy & State College

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Flt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	6297		3433	5085	1583	3433	3539	1583	3433	3475	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	6297		3433	5085	1583	3433	3539	1583	3433	3475	
Volume (vph)	61	2492	324	983	2310	192	507	263	507	182	446	61
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	64	2623	341	1035	2432	202	534	277	534	192	469	64
RTOR Reduction (vph)	0	15	0	0	0	59	0	0	281	0	7	0
Lane Group Flow (vph)	64	2949	0	1035	2432	143	534	277	253	192	526	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	4.8	57.8		36.0	89.0	89.0	19.0	32.0	32.0	9.0	22.0	
Effective Green, g (s)	4.8	57.8		36.0	89.0	89.0	19.0	32.0	32.0	9.0	22.0	
Actuated g/C Ratio	0.03	0.38		0.24	0.59	0.59	0.13	0.21	0.21	0.06	0.15	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	109	2414		820	3001	934	433	751	336	205	507	
v/s Ratio Prot	0.02	0.47		0.30	0.48		0.16	0.08		0.06	0.15	
v/s Ratio Perm						0.09			0.16			
v/c Ratio	0.59	1.22		1.26	0.81	0.15	1.23	0.37	0.75	0.94	1.04	
Uniform Delay, d1	72.0	46.5		57.4	24.3	13.9	65.9	50.8	55.7	70.6	64.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.8	103.6		127.7	1.7	0.1	123.6	0.3	9.2	44.8	50.1	
Delay (s)	79.9	150.1		185.1	26.0	14.0	189.5	51.1	64.9	115.4	114.5	
Level of Service	E	F		F	C	B	F	D	E	F	F	
Approach Delay (s)		148.6			70.2			111.5			114.7	
Approach LOS		F			E			F			F	
Intersection Summary												
HCM Average Control Delay			107.3			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			150.8			Sum of lost time (s)				16.0		
Analysis Period (min)			15									
c Critical Lane Group												

											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑	↑	↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.95		
Fr _t		1.00	0.85		1.00	0.85	1.00	0.89	0.85		
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.99	1.00		
Satd. Flow (prot)		5085	1583		5085	1583	1681	1549	1504		
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.99	1.00		
Satd. Flow (perm)		5085	1583		5085	1583	1681	1549	1504		
Volume (vph)	0	2077	1580	0	2158	356	750	0	1043	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2186	1663	0	2272	375	789	0	1098	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	0
Lane Group Flow (vph)	0	2186	1663	0	2272	375	627	680	578	0	0
Turn Type		Free				Free	Perm		Perm		
Protected Phases		4			8			6			
Permitted Phases		Free				Free	6		6		
Actuated Green, G (s)		36.0	80.0		36.0	80.0	36.0	36.0	36.0		
Effective Green, g (s)		36.0	80.0		36.0	80.0	36.0	36.0	36.0		
Actuated g/C Ratio		0.45	1.00		0.45	1.00	0.45	0.45	0.45		
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0		
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)		2288	1583		2288	1583	756	697	677		
v/s Ratio Prot		0.43			0.45						
v/s Ratio Perm		c1.05				0.24	0.37	0.44	0.38		
v/c Ratio		0.96	1.05		0.99	0.24	0.83	0.98	0.85		
Uniform Delay, d1		21.2	40.0		21.9	0.0	19.3	21.6	19.7		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2		10.3	37.2		17.1	0.4	7.5	28.0	10.3		
Delay (s)		31.5	77.2		39.0	0.4	26.8	49.5	29.9		
Level of Service		C	E		D	A	C	D	C		
Approach Delay (s)		51.2			33.5			36.0		0.0	
Approach LOS		D			C			D		A	
Intersection Summary											
HCM Average Control Delay		42.2			HCM Level of Service		D				
HCM Volume to Capacity ratio		1.05									
Actuated Cycle Length (s)		80.0			Sum of lost time (s)		0.0				
Analysis Period (min)		15									
c Critical Lane Group											

2030 With Project/Committed Lanes - AM Peak Hour
27: Imperial Hwy & SR-57 NB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	0.91	1.00		0.86		0.97	0.95	0.95			0.88
Frt	1.00	1.00	0.85		1.00		1.00	0.89	0.85			0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (prot)	1770	5085	1583		6404		3433	1579	1504			2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (perm)	1770	5085	1583		6404		3433	1579	1504			2787
Volume (vph)	203	1935	699	0	2330	10	922	172	963	0	0	101
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	214	2037	736	0	2453	11	971	181	1014	0	0	106
RTOR Reduction (vph)	0	0	0	0	1	0	0	3	3	0	0	30
Lane Group Flow (vph)	214	2037	736	0	2463	0	971	642	547	0	0	76
Turn Type	Prot	Free					Prot	Perm				Over
Protected Phases	7	4			8		5	2				7
Permitted Phases		Free						2				
Actuated Green, G (s)	12.0	53.0	100.0		37.0		39.0	39.0	39.0			12.0
Effective Green, g (s)	12.0	53.0	100.0		37.0		39.0	39.0	39.0			12.0
Actuated g/C Ratio	0.12	0.53	1.00		0.37		0.39	0.39	0.39			0.12
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	212	2695	1583		2369		1339	616	587			334
v/s Ratio Prot	c0.12	0.40			c0.38		0.28	c0.41				0.03
v/s Ratio Perm			0.46						0.36			
v/c Ratio	1.01	0.76	0.46		1.04		0.73	1.04	0.93			0.23
Uniform Delay, d1	44.0	18.4	0.0		31.5		25.9	30.5	29.2			39.8
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	64.3	1.2	1.0		29.8		2.0	47.7	21.8			0.3
Delay (s)	108.3	19.7	1.0		61.3		27.9	78.2	51.0			40.2
Level of Service	F	B	A		E		C	E	D			D
Approach Delay (s)		21.4			61.3			48.7			40.2	
Approach LOS		C			E			D			D	
Intersection Summary												
HCM Average Control Delay			42.1				HCM Level of Service		D			
HCM Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)		12.0			
Analysis Period (min)			15									
c Critical Lane Group												

2030 With Project/Committed Lanes - AM Peak Hour

28: Imperial Hwy & Associated

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.86		1.00	0.95		0.97	1.00	1.00
Flt Protected	1.00	0.99		1.00	1.00		1.00	0.94		1.00	1.00	0.85
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5057		1770	6377		1770	3323		3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5057		1770	6377		1770	3323		3433	1863	1583
Volume (vph)	210	2370	91	81	1905	64	315	146	101	143	365	132
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	221	2495	96	85	2005	67	332	154	106	151	384	139
RTOR Reduction (vph)	0	3	0	0	3	0	0	72	0	0	0	110
Lane Group Flow (vph)	221	2588	0	85	2069	0	332	188	0	151	384	29
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	18.8	60.0		6.0	47.2		22.0	38.5		9.5	26.0	26.0
Effective Green, g (s)	18.8	60.0		6.0	47.2		22.0	38.5		9.5	26.0	26.0
Actuated g/C Ratio	0.14	0.46		0.05	0.36		0.17	0.30		0.07	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	256	2334		82	2315		300	984		251	373	317
v/s Ratio Prot	c0.12	c0.51		0.05	0.32		c0.19	0.06		0.04	c0.21	
v/s Ratio Perm												0.02
v/c Ratio	0.86	1.11		1.04	0.89		1.11	0.19		0.60	1.03	0.09
Uniform Delay, d1	54.3	35.0		62.0	39.0		54.0	34.1		58.4	52.0	42.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	24.6	55.8		109.8	4.9		83.7	0.1		4.0	54.4	0.1
Delay (s)	79.0	90.8		171.8	43.9		137.7	34.2		62.4	106.4	42.5
Level of Service	E	F		F	D		F	C		E	F	D
Approach Delay (s)		89.9			49.0			92.3			83.4	
Approach LOS		F			D			F			F	
Intersection Summary												
HCM Average Control Delay	75.2			HCM Level of Service			E					
HCM Volume to Capacity ratio	1.09											
Actuated Cycle Length (s)	130.0			Sum of lost time (s)			16.0					
Analysis Period (min)	15											
c Critical Lane Group												

2030 With Project/Committed Lanes - AM Peak Hour

30: Imperial Hwy & Kraemer

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	0.97	0.91		0.97	0.91	
Fr't	1.00	0.97		1.00	1.00	0.85	1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4917		3433	5085	1583	3433	4927		3433	4970	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4917		3433	5085	1583	3433	4927		3433	4970	
Volume (vph)	304	1540	437	111	1614	192	244	425	111	577	1378	245
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	320	1621	460	117	1699	202	257	447	117	607	1451	258
RTOR Reduction (vph)	0	46	0	0	0	117	0	40	0	0	23	0
Lane Group Flow (vph)	320	2035	0	117	1699	85	257	524	0	607	1686	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	11.0	44.0		4.0	37.0	37.0	8.0	22.7		23.3	38.0	
Effective Green, g (s)	11.0	44.0		4.0	37.0	37.0	8.0	22.7		23.3	38.0	
Actuated g/C Ratio	0.10	0.40		0.04	0.34	0.34	0.07	0.21		0.21	0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	343	1967		125	1710	532	250	1017		727	1717	
v/s Ratio Prot	c0.09	c0.41		0.03	0.33		c0.07	0.11		0.18	c0.34	
v/s Ratio Perm						0.05						
v/c Ratio	0.93	1.03		0.94	0.99	0.16	1.03	0.51		0.83	0.98	
Uniform Delay, d1	49.1	33.0		52.9	36.4	25.6	51.0	38.8		41.5	35.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	31.6	29.8		60.4	20.1	0.1	64.4	0.4		8.2	17.5	
Delay (s)	80.8	62.8		113.3	56.5	25.7	115.4	39.2		49.7	53.2	
Level of Service	F	E		F	E	C	F	D		D	D	
Approach Delay (s)		65.2			56.7			63.0			52.3	
Approach LOS		E			E			E			D	

Intersection Summary

HCM Average Control Delay	58.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		
c Critical Lane Group			

2030 With Project/Committed Lanes - PM Peak Hour

25: Imperial Hwy & State College

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.86		0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	6336		3433	5085	1583	3433	3539	1583	3433	3362	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	6336		3433	5085	1583	3433	3539	1583	3433	3362	
Volume (vph)	203	2777	223	913	2828	528	800	932	710	477	486	243
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	214	2923	235	961	2977	556	842	981	747	502	512	256
RTOR Reduction (vph)	0	8	0	0	0	135	0	0	213	0	41	0
Lane Group Flow (vph)	214	3150	0	961	2977	421	842	981	534	502	727	0
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	7.0	53.0		28.0	74.0	74.0	25.0	38.0	38.0	15.0	28.0	
Effective Green, g (s)	7.0	53.0		28.0	74.0	74.0	25.0	38.0	38.0	15.0	28.0	
Actuated g/C Ratio	0.05	0.35		0.19	0.49	0.49	0.17	0.25	0.25	0.10	0.19	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	160	2239		641	2509	781	572	897	401	343	628	
v/s Ratio Prot	0.06	c0.50		c0.28	0.59		c0.25	0.28		0.15	0.22	
v/s Ratio Perm						0.27			c0.34			
v/c Ratio	1.34	1.41		1.50	1.19	0.54	1.47	1.09	1.33	1.46	1.16	
Uniform Delay, d1	71.5	48.5		61.0	38.0	26.2	62.5	56.0	56.0	67.5	61.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	187.9	185.8		232.8	88.3	0.7	221.8	58.9	165.7	224.0	87.6	
Delay (s)	259.4	234.3		293.8	126.3	27.0	284.3	114.9	221.7	291.5	148.6	
Level of Service	F	F		F	F	C	F	F	F	F	F	
Approach Delay (s)		235.8			149.8			201.5			205.1	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay	191.9			HCM Level of Service			F					
HCM Volume to Capacity ratio	1.41											
Actuated Cycle Length (s)	150.0			Sum of lost time (s)			12.0					
Analysis Period (min)	15											
c Critical Lane Group												

2030 With Project/Committed Lanes - PM Peak Hour
 26: Imperial Hwy & SR-57 SB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR	
Lane Configurations		↑↑↑↑	↑		↑↑↑↑	↑	↑	↑	↑			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor		0.91	1.00		0.91	1.00	0.95	0.95	0.95			
Frt		1.00	0.85		1.00	0.85	1.00	0.89	0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)		5085	1583		5085	1583	1681	1549	1504			
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)		5085	1583		5085	1583	1681	1549	1504			
Volume (vph)	0	2657	1145	0	2557	762	629	0	871	0	0	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	2797	1205	0	2692	802	662	0	917	0	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	1	1	0	0	
Lane Group Flow (vph)	0	2797	1205	0	2692	802	525	569	483	0	0	
Turn Type		Free				Free	Perm		Perm			
Protected Phases		4			8			6				
Permitted Phases		Free				Free	6		6			
Actuated Green, G (s)		49.0	90.0		49.0	90.0	33.0	33.0	33.0			
Effective Green, g (s)		49.0	90.0		49.0	90.0	33.0	33.0	33.0			
Actuated g/C Ratio		0.54	1.00		0.54	1.00	0.37	0.37	0.37			
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0			
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)		2769	1583		2769	1583	616	568	551			
v/s Ratio Prot		0.55			0.53							
v/s Ratio Perm			0.76			0.51	0.31	0.37	0.32			
v/c Ratio		1.01	0.76		0.97	0.51	0.85	1.00	0.88			
Uniform Delay, d1		20.5	0.0		19.8	0.0	26.3	28.5	26.6			
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		19.6	3.5		11.3	1.2	11.0	38.4	14.6			
Delay (s)		40.1	3.5		31.2	1.2	37.2	66.9	41.2			
Level of Service		D	A		C	A	D	E	D			
Approach Delay (s)		29.1			24.3			49.2		0.0		
Approach LOS		C			C			D		A		
Intersection Summary												
HCM Average Control Delay			30.7		HCM Level of Service					C		
HCM Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)					8.0		
Analysis Period (min)			15									
c Critical Lane Group												

2030 With Project/Committed Lanes - PM Peak Hour

27: Imperial Hwy & SR-57 NB

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	0.91	1.00		0.86		0.97	0.95	0.95			0.88
Fr _t	1.00	1.00	0.85		1.00		1.00	0.89	0.85			0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (prot)	1770	5085	1583		6399		3433	1572	1504			2787
Flt Permitted	0.95	1.00	1.00		1.00		0.95	1.00	1.00			1.00
Satd. Flow (perm)	1770	5085	1583		6399		3433	1572	1504			2787
Volume (vph)	213	2526	446	0	3150	30	1033	61	376	0	0	314
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	224	2659	469	0	3316	32	1087	64	396	0	0	331
RTOR Reduction (vph)	0	0	0	0	1	0	0	2	2	0	0	5
Lane Group Flow (vph)	224	2659	469	0	3347	0	1087	247	209	0	0	326
Turn Type	Prot		Free				Prot		Perm			Over
Protected Phases	7	4			8		5	2				7
Permitted Phases			Free						2			
Actuated Green, G (s)	15.0	82.0	130.0		63.0		40.0	40.0	40.0			15.0
Effective Green, g (s)	15.0	82.0	130.0		63.0		40.0	40.0	40.0			15.0
Actuated g/C Ratio	0.12	0.63	1.00		0.48		0.31	0.31	0.31			0.12
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	204	3207	1583		3101		1056	484	463			322
v/s Ratio Prot	c0.13	0.52			c0.52		c0.32	0.16				0.12
v/s Ratio Perm			0.30						0.14			
v/c Ratio	1.10	0.83	0.30		1.08		1.03	0.51	0.45			1.01
Uniform Delay, d1	57.5	18.6	0.0		33.5		45.0	37.0	36.2			57.5
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00			1.00
Incremental Delay, d2	91.7	1.9	0.5		42.4		35.5	0.9	0.7			53.1
Delay (s)	149.2	20.5	0.5		75.9		80.5	37.9	36.9			110.6
Level of Service	F	C	A		E		F	D	D			F
Approach Delay (s)		26.3			75.9			67.7			110.6	
Approach LOS		C			E			E			F	

Intersection Summary

HCM Average Control Delay	56.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Analysis Period (min)	15		

c Critical Lane Group

2030 With Project/Committed Lanes - PM Peak Hour
28: Imperial Hwy & Associated

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.86		1.00	0.95		0.97	1.00	1.00
Fr _t	1.00	0.99		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5048		1770	6349		1770	3417		3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5048		1770	6349		1770	3417		3433	1863	1583
Volume (vph)	248	2148	111	355	2335	153	530	306	91	289	173	371
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	261	2261	117	374	2458	161	558	322	96	304	182	391
RTOR Reduction (vph)	0	4	0	0	7	0	0	18	0	0	0	190
Lane Group Flow (vph)	261	2374	0	374	2612	0	558	400	0	304	182	201
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	20.0	55.0		24.0	59.0		36.0	37.4		17.6	19.0	19.0
Effective Green, g (s)	20.0	55.0		24.0	59.0		36.0	37.4		17.6	19.0	19.0
Actuated g/C Ratio	0.13	0.37		0.16	0.39		0.24	0.25		0.12	0.13	0.13
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	236	1851		283	2497		425	852		403	236	201
v/s Ratio Prot	0.15	c0.47		c0.21	c0.41		c0.32	0.12		0.09	0.10	
v/s Ratio Perm												c0.13
v/c Ratio	1.11	1.28		1.32	1.05		1.31	0.47		0.75	0.77	1.00
Uniform Delay, d1	65.0	47.5		63.0	45.5		57.0	47.9		64.1	63.4	65.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	89.9	131.5		167.3	31.5		156.8	0.4		7.8	14.4	62.5
Delay (s)	154.9	179.0		230.3	77.0		213.8	48.3		71.9	77.8	128.0
Level of Service	F	F		F	E		F	D		E	E	F
Approach Delay (s)		176.6			96.2			142.9			98.1	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay	130.9			HCM Level of Service			F					
HCM Volume to Capacity ratio	1.28											
Actuated Cycle Length (s)	150.0			Sum of lost time (s)			20.0					
Analysis Period (min)	15											
c Critical Lane Group												

2030 With Project/Committed Lanes - PM Peak Hour
30: Imperial Hwy & Kraemer

Synchro 6 Report [B614]

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	0.97	0.91		0.97	0.91	
Fr _t	1.00	0.97		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4934		3433	5085	1583	3433	5041		3433	4933	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4934		3433	5085	1583	3433	5041		3433	4933	
Volume (vph)	254	1563	386	284	1988	638	477	1469	91	527	699	174
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	267	1645	406	299	2093	672	502	1546	96	555	736	183
RTOR Reduction (vph)	0	28	0	0	0	205	0	4	0	0	28	0
Lane Group Flow (vph)	267	2023	0	299	2093	467	502	1638	0	555	891	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	11.0	56.0		12.0	57.0	57.0	25.8	44.0		22.0	40.2	
Effective Green, g (s)	11.0	56.0		12.0	57.0	57.0	25.8	44.0		22.0	40.2	
Actuated g/C Ratio	0.07	0.37		0.08	0.38	0.38	0.17	0.29		0.15	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	252	1842		275	1932	602	590	1479		504	1322	
v/s Ratio Prot	0.08	0.41		c0.09	c0.41		0.15	c0.32		c0.16	0.18	
v/s Ratio Perm						0.30						
v/c Ratio	1.06	1.10		1.09	1.08	0.78	0.85	1.11		1.10	0.67	
Uniform Delay, d1	69.5	47.0		69.0	46.5	40.9	60.2	53.0		64.0	49.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	73.3	53.2		79.5	47.1	6.2	11.3	58.6		70.6	1.4	
Delay (s)	142.8	100.2		148.5	93.6	47.1	71.6	111.6		134.6	50.4	
Level of Service	F	F		F	F	D	E	F		F	D	
Approach Delay (s)		105.1			88.8			102.3			82.1	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			95.1			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				12.0		
Analysis Period (min)			15									
c Critical Lane Group												

Table 1
DELAY SUMMARY - STOP-CONTROLLED LOCATIONS

INTERSECTION	EXISTING		2008 NO-PROJECT		2008 W/PROJECT		2030 NO-PROJECT		2030 W/PROJECT	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
192. Plaza Dwy & Imperial Hwy	9.8 sec/A	10.6 sec/B	9.8 sec/A	10.8 sec/B	10.0 sec/A	10.9 sec/B	9.7 sec/A	10.5 sec/B	9.9 sec/A	10.6 sec/B
193. Plaza Dwy & Associated	13.9 sec/B	16.7 sec/C	14.0 sec/B	17.1 sec/C	13.4 sec/B	15.7 sec/C	19.3 sec/C	28.7 sec/D	18.1 sec/C	23.1 sec/C
194. New Entrance & Associated	--	--	--	--	13.7 sec/B	14.9 sec/B	--	--	18.6 sec/C	21.2 sec/C

Note: Delays reported for stop-controlled leg.

Level of service ranges: 0.0 - 10.0 sec/veh A
 10.1 - 15.0 sec/veh B
 15.1 - 25.0 sec/veh C
 25.1 - 35.0 sec/veh D
 35.1 - 50.0 sec/veh E
 Above 50.0 sec/veh F

Existing (2007) Count - AM Peak Hour
192: Imperial Hwy & Plaza Dwy

Synchro 6 Report [B614]

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑↑	↑↑↑↑			↗		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Volume (veh/h)	0	1980	1760	30	0	10		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	0	2084	1853	32	0	11		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					None			
Median storage (veh)								
Upstream signal (ft)		309	264					
pX, platoon unblocked	0.70				0.76	0.70		
vC, conflicting volume	1884				2389	633		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	1414				1393	0		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)								
tF (s)	2.2				3.5	3.3		
p0 queue free %	100				100	99		
cM capacity (veh/h)	336				101	763		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	521	521	521	521	741	741	402	11
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	32	11
cSH	1700	1700	1700	1700	1700	1700	1700	763
Volume to Capacity	0.31	0.31	0.31	0.31	0.44	0.44	0.24	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.8
Lane LOS								A
Approach Delay (s)	0.0				0.0			9.8
Approach LOS								A
Intersection Summary								
Average Delay				0.0				
Analysis Period (min)				15				

Existing (2007) Count - AM Peak Hour
193: Plaza Dwy & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	30	20	70	300	340	100	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	32	21	74	316	358	105	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh							
Upstream signal (ft)				510			
pX, platoon unblocked							
vC, conflicting volume	716	232	463				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	716	232	463				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	91	97	93				
cM capacity (veh/h)	340	771	1094				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	32	21	74	158	158	239	225
Volume Left	32	0	74	0	0	0	0
Volume Right	0	21	0	0	0	0	105
cSH	340	771	1094	1700	1700	1700	1700
Volume to Capacity	0.09	0.03	0.07	0.09	0.09	0.14	0.13
Queue Length 95th (ft)	8	2	5	0	0	0	0
Control Delay (s)	16.7	9.8	8.5	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	13.9		1.6			0.0	
Approach LOS	B						
Intersection Summary							
Average Delay			1.5				
Analysis Period (min)			15				

Existing (2007) Count - PM Peak Hour
192: Imperial Hwy & Plaza Dwy

Synchro 6 Report [B614]

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑↑	↑↑↑↑			↗		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Volume (veh/h)	0	1930	2360	50	0	10		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	0	2032	2484	53	0	11		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					None			
Median storage veh								
Upstream signal (ft)		309	264					
pX, platoon unblocked	0.60				0.68	0.60		
vC, conflicting volume	2537				3018	854		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	2228				1717	0		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)								
tF (s)	2.2				3.5	3.3		
p0 queue free %	100				100	98		
cM capacity (veh/h)	138				55	651		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	508	508	508	508	994	994	549	11
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	53	11
cSH	1700	1700	1700	1700	1700	1700	1700	651
Volume to Capacity	0.30	0.30	0.30	0.30	0.58	0.58	0.32	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6
Lane LOS								B
Approach Delay (s)	0.0				0.0			10.6
Approach LOS								B
Intersection Summary								
Average Delay				0.0				
Analysis Period (min)				15				

Existing (2007) Count - PM Peak Hour
193: Plaza Dwy & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	80	130	80	500	440	70	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	84	137	84	526	463	74	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)				510			
pX, platoon unblocked	0.93						
vC, conflicting volume	932	268	537				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	852	268	537				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	67	81	92				
cM capacity (veh/h)	255	730	1027				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	84	137	84	263	263	309	228
Volume Left	84	0	84	0	0	0	0
Volume Right	0	137	0	0	0	0	74
cSH	255	730	1027	1700	1700	1700	1700
Volume to Capacity	0.33	0.19	0.08	0.15	0.15	0.18	0.13
Queue Length 95th (ft)	35	17	7	0	0	0	0
Control Delay (s)	25.9	11.1	8.8	0.0	0.0	0.0	0.0
Lane LOS	D	B	A				
Approach Delay (s)	16.7		1.2			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay			3.2				
Analysis Period (min)			15				

2008 No Project (Opening Day) - AM Peak Hour
192: Imperial Hwy & Plaza Dwy

Synchro 6 Report [B614]

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑	↑↑↑			↗		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Volume (veh/h)	0	2000	1778	30	0	10		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	0	2105	1872	32	0	11		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					None			
Median storage (veh)								
Upstream signal (ft)		309	264					
pX, platoon unblocked	0.70				0.76	0.70		
vC, conflicting volume	1903				2414	640		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	1426				1372	0		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)								
tF (s)	2.2				3.5	3.3		
p0 queue free %	100				100	99		
cM capacity (veh/h)	330				104	756		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	526	526	526	526	749	749	406	11
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	32	11
cSH	1700	1700	1700	1700	1700	1700	1700	756
Volume to Capacity	0.31	0.31	0.31	0.31	0.44	0.44	0.24	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.8
Lane LOS								A
Approach Delay (s)	0.0				0.0			9.8
Approach LOS								A
Intersection Summary								
Average Delay			0.0					
Analysis Period (min)			15					

2008 No Project (Opening Day) - AM Peak Hour
193: Plaza Dwy & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	30	20	71	303	344	101	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	32	21	75	319	362	106	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)	510						
pX, platoon unblocked							
vC, conflicting volume	724	234	468				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	724	234	468				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	91	97	93				
cM capacity (veh/h)	336	768	1089				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	32	21	75	159	159	241	227
Volume Left	32	0	75	0	0	0	0
Volume Right	0	21	0	0	0	0	106
cSH	336	768	1089	1700	1700	1700	1700
Volume to Capacity	0.09	0.03	0.07	0.09	0.09	0.14	0.13
Queue Length 95th (ft)	8	2	6	0	0	0	0
Control Delay (s)	16.8	9.8	8.5	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	14.0		1.6			0.0	
Approach LOS	B						
Intersection Summary							
Average Delay	1.5						
Analysis Period (min)	15						

2008 No Project (Opening Day) - PM Peak Hour
192: Imperial Hwy & Plaza Dwy

Synchro 6 Report [B614]

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑	↑↑↑			↑		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Volume (veh/h)	0	1950	2384	51	0	10		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	0	2053	2509	54	0	11		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					None			
Median storage (veh)								
Upstream signal (ft)		309	264					
pX, platoon unblocked	0.58				0.66	0.58		
vC, conflicting volume	2563				3049	863		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	2246				1701	0		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)								
tF (s)	2.2				3.5	3.3		
p0 queue free %	100				100	98		
cM capacity (veh/h)	131				55	628		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	513	513	513	513	1004	1004	556	11
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	54	11
cSH	1700	1700	1700	1700	1700	1700	1700	628
Volume to Capacity	0.30	0.30	0.30	0.30	0.59	0.59	0.33	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8
Lane LOS								B
Approach Delay (s)	0.0				0.0			10.8
Approach LOS								B
Intersection Summary								
Average Delay				0.0				
Analysis Period (min)				15				

2008 No Project (Opening Day) - PM Peak Hour
193: Plaza Dwy & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	81	131	81	505	445	71	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	85	138	85	532	468	75	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)	510						
pX, platoon unblocked	0.93						
vC, conflicting volume	942	272	543				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	868	272	543				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	66	81	92				
cM capacity (veh/h)	250	726	1022				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	85	138	85	266	266	312	231
Volume Left	85	0	85	0	0	0	0
Volume Right	0	138	0	0	0	0	75
cSH	250	726	1022	1700	1700	1700	1700
Volume to Capacity	0.34	0.19	0.08	0.16	0.16	0.18	0.14
Queue Length 95th (ft)	36	17	7	0	0	0	0
Control Delay (s)	26.7	11.1	8.8	0.0	0.0	0.0	0.0
Lane LOS	D	B	A				
Approach Delay (s)	17.1		1.2			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay	3.3						
Analysis Period (min)	15						

2008 With Project (Opening Day) - AM Peak Hour
192: Imperial Hwy & Plaza Dwy

Synchro 6 Report [B614]

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑	↑↑↑			↗		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Volume (veh/h)	0	2007	1783	41	0	21		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	0	2113	1877	43	0	22		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					None			
Median storage veh								
Upstream signal (ft)		309	264					
pX, platoon unblocked	0.69				0.75	0.69		
vC, conflicting volume	1920				2427	647		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	1429				1364	0		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)								
tF (s)	2.2				3.5	3.3		
p0 queue free %	100				100	97		
cM capacity (veh/h)	324				103	745		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	528	528	528	528	751	751	419	22
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	43	22
cSH	1700	1700	1700	1700	1700	1700	1700	745
Volume to Capacity	0.31	0.31	0.31	0.31	0.44	0.44	0.25	0.03
Queue Length 95th (ft)	0	0	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Lane LOS								A
Approach Delay (s)	0.0				0.0			10.0
Approach LOS								A
Intersection Summary								
Average Delay			0.1					
Analysis Period (min)			15					

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	26	21	64	324	353	68	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	27	22	67	341	372	72	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)				504			
pX, platoon unblocked							
vC, conflicting volume	713	222	443				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	713	222	443				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	92	97	94				
cM capacity (veh/h)	344	782	1113				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	27	22	67	171	171	248	195
Volume Left	27	0	67	0	0	0	0
Volume Right	0	22	0	0	0	0	72
cSH	344	782	1113	1700	1700	1700	1700
Volume to Capacity	0.08	0.03	0.06	0.10	0.10	0.15	0.11
Queue Length 95th (ft)	6	2	5	0	0	0	0
Control Delay (s)	16.4	9.7	8.4	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	13.4		1.4			0.0	
Approach LOS	B						
Intersection Summary							
Average Delay			1.4				
Analysis Period (min)			15				

2008 With Project (Opening Day) - AM Peak Hour
194: New Entrance & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	23	9	21	329	412	56	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	24	9	22	346	434	59	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)				659			
pX, platoon unblocked							
vC, conflicting volume	681	246	493				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	681	246	493				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	94	99	98				
cM capacity (veh/h)	376	754	1067				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	24	9	22	173	173	289	204
Volume Left	24	0	22	0	0	0	0
Volume Right	0	9	0	0	0	0	59
cSH	376	754	1067	1700	1700	1700	1700
Volume to Capacity	0.06	0.01	0.02	0.10	0.10	0.17	0.12
Queue Length 95th (ft)	5	1	2	0	0	0	0
Control Delay (s)	15.2	9.8	8.4	0.0	0.0	0.0	0.0
Lane LOS	C	A	A				
Approach Delay (s)	13.7		0.5			0.0	
Approach LOS	B						
Intersection Summary							
Average Delay			0.7				
Analysis Period (min)			15				

2008 With Project (Opening Day) - PM Peak Hour
192: Imperial Hwy & Plaza Dwy

Synchro 6 Report [B614]

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑	↑↑↑			↗		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Volume (veh/h)	0	1963	2398	71	0	19		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	0	2066	2524	75	0	20		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					None			
Median storage (veh)								
Upstream signal (ft)		309	264					
pX, platoon unblocked	0.58				0.66	0.58		
vC, conflicting volume	2599				3078	879		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	2309				1773	0		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)								
tF (s)	2.2				3.5	3.3		
p0 queue free %	100				100	97		
cM capacity (veh/h)	124				49	630		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	517	517	517	517	1010	1010	580	20
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	75	20
cSH	1700	1700	1700	1700	1700	1700	1700	630
Volume to Capacity	0.30	0.30	0.30	0.30	0.59	0.59	0.34	0.03
Queue Length 95th (ft)	0	0	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9
Lane LOS								B
Approach Delay (s)	0.0				0.0			10.9
Approach LOS								B
Intersection Summary								
Average Delay				0.0				
Analysis Period (min)				15				

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	48	95	73	533	509	55	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	51	100	77	561	536	58	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh							
Upstream signal (ft)	504						
pX, platoon unblocked	0.93						
vC, conflicting volume	999	297	594				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	928	297	594				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	78	86	92				
cM capacity (veh/h)	230	699	978				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	51	100	77	281	281	357	236
Volume Left	51	0	77	0	0	0	0
Volume Right	0	100	0	0	0	0	58
cSH	230	699	978	1700	1700	1700	1700
Volume to Capacity	0.22	0.14	0.08	0.17	0.17	0.21	0.14
Queue Length 95th (ft)	20	12	6	0	0	0	0
Control Delay (s)	25.0	11.0	9.0	0.0	0.0	0.0	0.0
Lane LOS	D	B	A				
Approach Delay (s)	15.7		1.1			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay	2.2						
Analysis Period (min)	15						

2008 With Project (Opening Day) - PM Peak Hour
194: New Entrance & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBR	SWL	SWR	
Lane Configurations							
Sign Control	Stop		Free		Free		
Grade	0%		0%		0%		
Volume (veh/h)	49	64	28	553	500	33	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	52	67	29	582	526	35	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh							
Upstream signal (ft)			691				
pX, platoon unblocked	0.95						
vC, conflicting volume	894	281	561				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	835	281	561				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	82	91	97				
cM capacity (veh/h)	282	717	1006				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SW 1	SW 2
Volume Total	52	67	29	291	291	351	210
Volume Left	52	0	29	0	0	0	0
Volume Right	0	67	0	0	0	0	35
cSH	282	717	1006	1700	1700	1700	1700
Volume to Capacity	0.18	0.09	0.03	0.17	0.17	0.21	0.12
Queue Length 95th (ft)	16	8	2	0	0	0	0
Control Delay (s)	20.6	10.5	8.7	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	14.9		0.4			0.0	
Approach LOS	B						
Intersection Summary							
Average Delay			1.6				
Analysis Period (min)			15				

2030 No Project/Committed Lanes - AM Peak Hour
192: Imperial Hwy & Plaza Dwy

Synchro 6 Report [B614]

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑↑	↑↑↑↱			↱		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Volume (veh/h)	0	2664	2306	30	0	10		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	0	2804	2427	32	0	11		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					None			
Median storage (veh)								
Upstream signal (ft)		309	264					
pX, platoon unblocked	0.71				0.85	0.71		
vC, conflicting volume	2459				3144	825		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	2237				1356	0		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)								
tF (s)	2.2				3.5	3.3		
p0 queue free %	100				100	99		
cM capacity (veh/h)	162				119	769		
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	SB 1
Volume Total	701	701	701	701	971	971	517	11
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	32	11
cSH	1700	1700	1700	1700	1700	1700	1700	769
Volume to Capacity	0.41	0.41	0.41	0.41	0.57	0.57	0.30	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7
Lane LOS								A
Approach Delay (s)	0.0				0.0			9.7
Approach LOS								A
Intersection Summary								
Average Delay				0.0				
Analysis Period (min)				15				

2030 No Project/Committed Lanes - AM Peak Hour
193: Plaza Dwy & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	30	20	71	335	610	101	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	32	21	75	353	642	106	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh							
Upstream signal (ft)	510						
pX, platoon unblocked							
vC, conflicting volume	1021	374	748				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1021	374	748				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	85	97	91				
cM capacity (veh/h)	212	623	856				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	32	21	75	176	176	428	320
Volume Left	32	0	75	0	0	0	0
Volume Right	0	21	0	0	0	0	106
cSH	212	623	856	1700	1700	1700	1700
Volume to Capacity	0.15	0.03	0.09	0.10	0.10	0.25	0.19
Queue Length 95th (ft)	13	3	7	0	0	0	0
Control Delay (s)	24.9	11.0	9.6	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	19.3		1.7			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay			1.4				
Analysis Period (min)			15				

2030 No Project/Committed Lanes - PM Peak Hour
192: Imperial Hwy & Plaza Dwy

Synchro 6 Report [B614]

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑↑	↑↑↑↑			↗		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Volume (veh/h)	0	2494	3151	51	0	10		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	0	2625	3317	54	0	11		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					None			
Median storage (veh)								
Upstream signal (ft)		309	264					
pX, platoon unblocked	0.61				0.79	0.61		
vC, conflicting volume	3371				4219	856		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	2972				1849	0		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)								
tF (s)	2.2				3.5	3.3		
p0 queue free %	100				100	98		
cM capacity (veh/h)	71				52	664		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	875	875	875	948	948	948	528	11
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	54	11
cSH	1700	1700	1700	1700	1700	1700	1700	664
Volume to Capacity	0.51	0.51	0.51	0.56	0.56	0.56	0.31	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5
Lane LOS								B
Approach Delay (s)	0.0			0.0				10.5
Approach LOS								B
Intersection Summary								
Average Delay			0.0					
Analysis Period (min)			15					

2030 No Project/Committed Lanes - PM Peak Hour
193: Plaza Dwy & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	81	131	81	606	674	71	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	85	138	85	638	709	75	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage veh							
Upstream signal (ft)	510						
pX, platoon unblocked	0.92						
vC, conflicting volume	1236	392	784				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1174	392	784				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	44	77	90				
cM capacity (veh/h)	153	607	830				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	85	138	85	319	319	473	311
Volume Left	85	0	85	0	0	0	0
Volume Right	0	138	0	0	0	0	75
cSH	153	607	830	1700	1700	1700	1700
Volume to Capacity	0.56	0.23	0.10	0.19	0.19	0.28	0.18
Queue Length 95th (ft)	71	22	9	0	0	0	0
Control Delay (s)	54.5	12.7	9.8	0.0	0.0	0.0	0.0
Lane LOS	F	B	A				
Approach Delay (s)	28.7		1.2			0.0	
Approach LOS	D						
Intersection Summary							
Average Delay			4.2				
Analysis Period (min)			15				

2030 With Project/Committed Lanes - AM Peak Hour
192: Imperial Hwy & Plaza Dwy

Synchro 6 Report [B614]

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑	↑↑↑			↗		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Volume (veh/h)	0	2671	2311	41	0	21		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	0	2812	2433	43	0	22		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					None			
Median storage (veh)								
Upstream signal (ft)		309	264					
pX, platoon unblocked	0.70				0.84	0.70		
vC, conflicting volume	2476				3391	630		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	1821				1495	0		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)								
tF (s)	2.2				3.5	3.3		
p0 queue free %	100				100	97		
cM capacity (veh/h)	233				95	759		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	937	937	937	695	695	695	391	22
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	43	22
cSH	1700	1700	1700	1700	1700	1700	1700	759
Volume to Capacity	0.55	0.55	0.55	0.41	0.41	0.41	0.23	0.03
Queue Length 95th (ft)	0	0	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9
Lane LOS								A
Approach Delay (s)	0.0			0.0				9.9
Approach LOS								A
Intersection Summary								
Average Delay				0.0				
Analysis Period (min)				15				

2030 With Project/Committed Lanes - AM Peak Hour
193: Plaza Dwy & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	26	21	64	356	619	68	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	27	22	67	375	652	72	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)				504			
pX, platoon unblocked							
vC, conflicting volume	1009	362	723				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1009	362	723				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	87	97	92				
cM capacity (veh/h)	218	635	875				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	27	22	67	187	187	434	289
Volume Left	27	0	67	0	0	0	0
Volume Right	0	22	0	0	0	0	72
cSH	218	635	875	1700	1700	1700	1700
Volume to Capacity	0.13	0.03	0.08	0.11	0.11	0.26	0.17
Queue Length 95th (ft)	11	3	6	0	0	0	0
Control Delay (s)	23.9	10.9	9.5	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	18.1		1.4			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay			1.3				
Analysis Period (min)			15				

2030 With Project/Committed Lanes - AM Peak Hour
194: New Entrance & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	23	9	21	361	678	56	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	24	9	22	380	714	59	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)				722			
pX, platoon unblocked							
vC, conflicting volume	977	386	773				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	977	386	773				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	90	98	97				
cM capacity (veh/h)	241	612	838				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	24	9	22	190	190	476	297
Volume Left	24	0	22	0	0	0	0
Volume Right	0	9	0	0	0	0	59
cSH	241	612	838	1700	1700	1700	1700
Volume to Capacity	0.10	0.02	0.03	0.11	0.11	0.28	0.17
Queue Length 95th (ft)	8	1	2	0	0	0	0
Control Delay (s)	21.6	11.0	9.4	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	18.6		0.5			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay			0.7				
Analysis Period (min)			15				

2030 With Project/Committed Lanes - PM Peak Hour
192: Imperial Hwy & Plaza Dwy

Synchro 6 Report [B614]

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations		↑↑↑	↑↑↑			↑		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Volume (veh/h)	0	2507	3165	71	0	19		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	0	2639	3332	75	0	20		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type	None							
Median storage veh								
Upstream signal (ft)		309	264					
pX, platoon unblocked	0.61				0.79	0.61		
vC, conflicting volume	3406				4249	870		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	3032				1889	0		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)								
tF (s)	2.2				3.5	3.3		
p0 queue free %	100				100	97		
cM capacity (veh/h)	67				49	665		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	880	880	880	952	952	952	551	20
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	75	20
cSH	1700	1700	1700	1700	1700	1700	1700	665
Volume to Capacity	0.52	0.52	0.52	0.56	0.56	0.56	0.32	0.03
Queue Length 95th (ft)	0	0	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6
Lane LOS	B							
Approach Delay (s)	0.0			0.0				10.6
Approach LOS	B							
Intersection Summary								
Average Delay	0.0							
Analysis Period (min)	15							

2030 With Project/Committed Lanes - PM Peak Hour
193: Plaza Dwy & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Volume (veh/h)	48	95	73	634	738	55	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	51	100	77	667	777	58	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)	504						
pX, platoon unblocked	0.93						
vC, conflicting volume	1293	417	835				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1240	417	835				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	64	83	90				
cM capacity (veh/h)	141	584	794				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	51	100	77	334	334	518	317
Volume Left	51	0	77	0	0	0	0
Volume Right	0	100	0	0	0	0	58
cSH	141	584	794	1700	1700	1700	1700
Volume to Capacity	0.36	0.17	0.10	0.20	0.20	0.30	0.19
Queue Length 95th (ft)	37	15	8	0	0	0	0
Control Delay (s)	44.3	12.4	10.0	0.0	0.0	0.0	0.0
Lane LOS	E	B	B				
Approach Delay (s)	23.1		1.0			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay			2.5				
Analysis Period (min)			15				

2030 With Project/Committed Lanes - PM Peak Hour
194: New Entrance & Associated

Synchro 6 Report [B614]

							
Movement	EBL	EBR	NBL	NBR	SWL	SWR	
Lane Configurations							
Sign Control	Stop		Free		Free		
Grade	0%		0%		0%		
Volume (veh/h)	49	64	28	654	729	33	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	52	67	29	688	767	35	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None						
Median storage (veh)							
Upstream signal (ft)			699				
pX, platoon unblocked	0.95						
vC, conflicting volume	1188	401	802				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1146	401	802				
tC, single (s)	6.8	6.9	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	71	89	96				
cM capacity (veh/h)	177	599	817				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SW 1	SW 2
Volume Total	52	67	29	344	344	512	291
Volume Left	52	0	29	0	0	0	0
Volume Right	0	67	0	0	0	0	35
cSH	177	599	817	1700	1700	1700	1700
Volume to Capacity	0.29	0.11	0.04	0.20	0.20	0.30	0.17
Queue Length 95th (ft)	29	9	3	0	0	0	0
Control Delay (s)	33.6	11.8	9.6	0.0	0.0	0.0	0.0
Lane LOS	D	B	A				
Approach Delay (s)	21.2		0.4			0.0	
Approach LOS	C						
Intersection Summary							
Average Delay			1.7				
Analysis Period (min)			15				

Appendix C

- AFA Model Documentation



MEMORANDUM

TO: Susan Rosner, Kimley-Horn & Associates

FROM: Cassandra Carlin

DATE: January 24, 2008

SUBJECT: BREA PLAZA TRAFFIC FORECAST DATA

Austin-Foust Associates, Inc. (AFA) has performed the model runs related to the Brea Plaza Expansion and packaged the requested data here in a Technical Notebook, for your use and information.

As we had previously discussed with you, the City's traffic model has a forecast year of 2025. To produce opening day (year 2008) and year 2030 volumes, we derived a growth factor using OCP-2004 data. The following table summarizes the OCP-2004 data for the City of Brea.

OCP-2004 DEMOGRAPHIC DATA - City of Brea					
Category	Year 2000	Year 2025	Percentage of Growth (2000 to 2025)	Year 2030	Percentage of Growth (2025 to 2030)
Population	35,566	46,532	30.8%	46,947	0.9%
Dwelling Units	13,330	16,931	27.0%	17,086	0.9%
Employment	38,125	46,090	20.9%	46,991	2.0%
Average		--	26.2%	--	1.26%

To derive the opening year data (year 2008), the average growth is first calculated at 26.2 percent for a 25 year time period. This results in a growth factor of 1.04 percent per year. This factor is then applied to the existing count data (2007) to derive year 2008 No-Project data. The project only volumes are then added to derive the year 2008 With-Project data.

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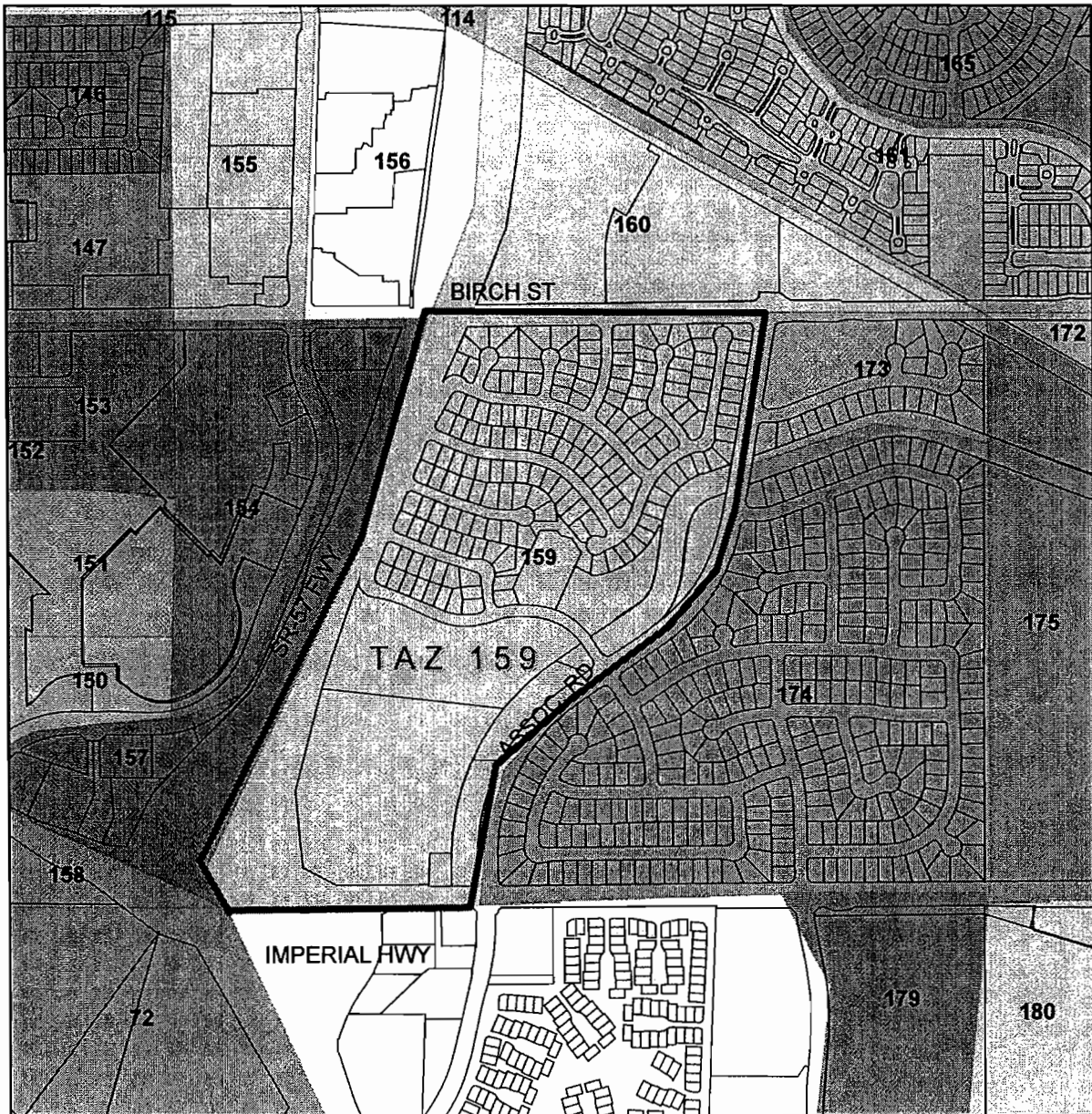
Susan Rosner, Kimley-Horn & Associates
January 24, 2008
Page 2

The growth over a five-year time period (2025 to 2030) is 1.26 percent. This factor is then applied to the year 2025 data to derive the year 2030 forecast data.

I hope that this information is sufficient for your needs. As a reminder, I will be going on maternity leave as of February 1, 2008. If you have any questions about the enclosed data, please feel free to contact my colleague, Cathy Lawrence (P.E.) here at (714) 667-0496. Ms. Lawrence is responsible for the HCM analysis performed here and is familiar with the project background.

Attachments

BREA AREA TRAFFIC MODEL - PROJECT TAZ 159 (BREA PLAZA AREA)



LAND USE SUMMARY
- CITY OF BREA

	Land Use Description	Amount	Unit	----- AM Peak Hour -----		----- PM Peak Hour -----		ADT
				In	Out	In	Out	Total
General Plan								
159	4. Medium Density Residential	177,000	DU	23	89	94	50	144
	7. General Commercial	288,040	TSF	242	109	735	735	1470
	13. Parks/Recreation/O.S.	3,510	ACRE	1	0	0	0	0
	14. Natural Open Space	1,910	ACRE	0	0	0	0	0
	SUB-TOTAL			266	198	829	785	1614
Brea Plaza Expansion								
159	4. Medium Density Residential	177,000	DU	23	89	94	50	144
	7. General Commercial	297,445	TSF	250	113	758	758	1516
	13. Parks/Recreation/O.S.	3,510	ACRE	1	0	0	0	0
	14. Natural Open Space	1,910	ACRE	0	0	0	0	0
	36. Starbucks (Survey)	1,800	TSF	151	139	101	85	186
	75% Pass-by reduction			-113	-104	-76	-64	-140
	SUB-TOTAL			312	237	877	829	1706
Net Change								
	7. General Commercial	9,405	TSF	8	4	23	23	46
	36. Starbucks (Survey)	1,800	TSF	151	139	101	85	186
	75% Pass-by reduction			-113	-104	-76	-64	-140
	SUB-TOTAL			46	39	48	44	92

Abbreviations:

DU - dwelling unit

TSF - thousand square feet

04

Appendix D

- City of Brea Parking Requirements

include patios, gazebos, arbors, trellis work and other similar structures. The minimum standards for open accessory structures are as follows:

1. All open accessory structures shall maintain a minimum setback of three (3) feet from all property lines. No projections shall extend into this three foot setback.

2. All accessory structures detached from the main building shall not exceed fifteen (15) feet in height.

3. Setbacks for covered structures shall follow the building setback requirements. For the purpose of this Section, a covered structure shall be defined as "being less than fifty (50) percent open free and clear to the sky."

G. *Lot coverage.* Each lot shall have a maximum building coverage of sixty (60) percent.

1. The dwelling unit, garage, plus any additions and expansions, covered patios, and balconies shall be calculated as lot coverage.

2. Open patios, ground level decks, terraces, trellis work and other similar structures intended for outdoor living shall not be included in the lot coverage requirement.

H. *Property maintenance.* The property shall be maintained as required in § 20.208.040E.1.b., 2.c., and 3.b. of this title.

(Ord. 998, passed 9-2-97)

§ 20.08.040 OFF-STREET PARKING AND LOADING.

A. *Intent and purpose.* These regulations are established to provide for on-site maneuvering and parking of motor vehicles that are attached to and generated by land uses within the city. The parking requirements contained herein are assumed to be minimums only. It is the responsibility of the developer, owner or operator of any specific use to provide adequate off-street parking and maneuvering facilities. The following requirements are designed to lessen traffic congestion and contribute to public safety by providing sufficient on-site parking facilities.

B. *General requirements.*

1. *Application.*

- a. These standards shall apply when:

- (1) A main building is constructed.
- (2) An existing building is enlarged for any purpose.
- (3) The occupancy or use of any premises is changed to a different use or occupancy.

b. Parking (or additional parking) to meet the requirements of this section shall be provided for:

- (1) An existing building that is enlarged.
- (2) When the category of use listed in paragraph D. of this section is changed to a different category of use.

c. Where insufficient parking is serving a building or use existing at the time this zoning code became effective, said building may be enlarged only if adequate parking is provided for the total building in accordance with the requirements of this section. If the category of use is listed in paragraph D. of this section, changes to a category of use which requires more parking stalls, additional parking stalls must be provided meeting all requirements of this section.

2. Location.

a. All required parking spaces and garages shall be located on the same lot, or the same building site in the case of a shopping center. Where a parking lot owned by the city is located within four hundred (400) feet of the front door or main entry of the building, parking requirements listed in paragraph D. of this section may be reduced as determined by the Development Services Director.

b. All required parking spaces shall be located not more than two hundred (200) feet from the building or use to be served. Buildings with floor area in excess of ten thousand (10,000) square feet shall be exempt from this requirement except that all required parking shall be located on the same or contiguous lots.

c. All required parking spaces for individual tenants of shopping centers, shall have his or her required parking within a two hundred (200) foot radius of the main entrance. Parking immediately in front of a tenant space, if not required for fire access, may be reserved for customers of that tenant.

3. *Computation of required parking.* Whenever the computation of the number of off-street parking spaces required by this section results in a fractional parking space, one (1) additional parking space shall be required for one-half ($\frac{1}{2}$) or more fractional parking space, and any fractional space less than one-half ($\frac{1}{2}$) of a parking space shall not be counted.

a. All access to a parking area from a public street, alley or highway shall be designed so that motor vehicles leaving the driveway or parking area will enter the highway traveling in a forward direction. This shall not apply to single family subdivisions, or multiple family residential properties serving four (4) units or less.

b. The parking area shall be designed so that a vehicle within the parking area will not have to enter a public street to move from one location to any other location within the parking area.

c. Vehicular access to arterial streets and highways will be permitted only in accordance with driveway locations and access design to be approved by the Traffic Engineer of the city.

4. *Surfacing.* All parking spaces, driveways, and maneuvering areas shall be paved and permanently maintained with asphaltic concrete or cement concrete, with a structural section to be approved by the City Engineer.

5. *Striping.* All parking stalls and directional arrows and instructions shall be delineated with paint, as required by the Traffic Engineer.

C. *Design.*

1. *Maximum grades permitted.*

a. Entrance - four (4) or less dwelling units. The driveway or accessway shall have a maximum grade of plus fifteen percent (+15%) or minus six percent (-6%) measured along the driveway centerline, for a distance of not less than twenty (20) feet from the ultimate right-of-way line of the street or alley.

b. Entrance - five (5) or more dwelling units, industrial, commercial, office and parking areas serving buildings or recreation areas owned or operated by any governmental agency. The driveway or accessway shall have a maximum grade of plus fifteen percent (+15%) or minus two percent (-2%), measured along the driveway centerline, for a distance not less than twenty (20) feet from the ultimate right-of-way line of the street or alley.

c. *Parking spaces.* All parking spaces and abutting access aisle shall have a maximum grade of five percent (5%), measured in any direction.

d. *Interior driveways.* Ramps or driveways within the interior of a parking area (beyond twenty (20) feet from ultimate right-of-way line) shall have a maximum grade of twenty percent (20%). If such a ramp or driveway exceeds ten percent (10%), the ramp or driveway design shall include transitions (at each end of the

ramp) not less than eight (8) feet in length, having a slope equal to one-half ($\frac{1}{2}$) the ramp or driveway slope.

2. *Parking spaces.*

a. All parking stalls shall be double or “hairpin” striped.
(Please see Diagram “A” in the Appendix following this chapter.)

b. *Sizes.*

(1) Perpendicular or angular stalls.

(a) *Residential.*

(i) Covered - ten (10) feet wide by twenty (20) feet long (interior clear dimension to be nine (9) feet wide by nineteen (19) feet long), minimum seven (7) feet height clearance.

(ii) Uncovered - nine (9) feet wide by nineteen (19) feet long.

(b) *Commercial and office uses and community facilities.* Nine and one-half ($9\frac{1}{2}$) feet wide by nineteen (19) feet long, minimum eight (8) feet height clearance.

(c) *Industrial uses.* Nine (9) feet wide by nineteen (19) feet long.

(2) *Parallel stalls.* Eight (8) feet wide by twenty-three (23) feet long.

(3) *Handicapped stalls.* Nine (9) feet wide by nineteen (19) feet long with a minimum five (5) foot ramp at the side and front of the stall.

(4) Compact stalls shall be a minimum of eight (8) feet wide by sixteen (16) feet long.

(a) Compact stalls may be permitted in multiple family residential projects of five (5) or more units in accordance with the provisions of this paragraph C.

(b) Compact stalls may be permitted in commercial and industrial projects requiring a minimum of forty (40) parking spaces in accordance with the following conditions:

(i) A maximum of fifteen percent (15%) of the required number of parking spaces may be compact stalls.

(ii) The maximum number of compact parking stalls may be increased upon approval of a conditional use permit, but in no event shall the number of compact stalls exceed thirty percent (30%).

(iii) Each compact stall approved hereunder shall be individually designated as a compact stall per the City of Brea Public Works Standards.

(c) All parking areas containing compact stalls shall be approved by the Development Services Director and the City Traffic Engineer.

(5) *Overhang.* Parking stall lengths, except parallel spaces, may be reduced by two (2) feet [seventeen (17) feet for standard size stalls; fourteen (14) feet for compact stalls] where the front of the parking stall abuts a landscaped area or sidewalk which is a minimum of four (4) feet clear. Said landscape area shall be enclosed with a minimum of six (6) inch high curb and no trees or shrubs shall be planted in the two (2) foot reduced area.

c. *Locations.*

(1) The point of exit or entry from any off-street parking space shall not be closer than fifteen (15) feet from the ultimate right-of-way line of a street and five (5) feet in the case of an alley.

(2) Industrially zoned facilities on arterial streets and commercially zoned facilities providing parking for fifty (50) or more vehicles shall be designed with access driveways which shall not be intersected by a parking aisle, parking space, or another access driveway for a minimum distance of fifty (50) feet from the street right-of-way line. *(Please see Diagram "C" in the Appendix following this chapter.)*

(3) Required off-street parking in residential zones shall not be provided in areas required for ingress and egress to other parking spaces; no tandem parking is permitted.

(4) Off-street parking spaces when located below living quarters shall be provided in garages.

3. *Driveways and parking aisles.*

a. *Driveway approaches (curb cuts).*

(1) *Residential.*

(a) One way - sixteen (16) feet minimum, twenty-

four (24) feet maximum.

(b) Two way - twenty-four (24) feet minimum, forty (40) feet maximum.

(2) *Commercial/Office/Industrial.* Refer to City of Brea Public Works Standards 210-A.

b. *Access driveways.* Access driveways shall have a minimum width of twenty-eight (28) feet. Access driveways are defined as those that provide access into and through a parking area from a street access point providing access to the parking aisles, and those driveways providing interior circulation between parking areas. *(Please see Diagram "C" in the Appendix following this chapter.)*

c. *Parking aisles.* Parking aisles are defined as driveways which have parking spaces taking access from either or both sides and which are intended primarily to provide direct access to parking spaces. Parking aisles shall be designed in accordance with Diagrams "A" and "B" in the Appendix following this chapter.

4. *Screening.* Open parking spaces and parking structures shall be screened with a solid wall, mounded landscaping or evergreen shrubs of not less than three (3) feet nor more than three and one-half (3½) feet in height whenever such parking is adjacent to a street right-of-way. Walls shall be located adjacent to the inside edge of any required boundary landscaping and to the outside edge of the paved parking area when there is no landscaping. When evergreen shrubs are used as a screen they shall be planted in quantity and location so as to form a screen which is a minimum of seventy-five percent (75%) opaque within eighteen (18) months after installation. It shall be the responsibility of the owner to maintain such shrubbery so that it does not exceed three and one-half (3½) feet in height, nor encroach into limited use areas outlined in § 20.08.060 of this chapter.

5. *Lighting.*

a. All off-street parking areas within commercially zoned projects shall be provided with exterior lighting meeting the following minimums:

(1) The equivalent of one (1) foot candle of illumination shall be maintained on the average throughout the parking area.

(2) All lighting shall be on a time-clock or photo-sensor system.

(3) All lighting shall be designed to confine direct rays to the premises. No spillover beyond the property line shall be

permitted.

(4) Parking lot luminaries shall be high pressure sodium vapor with ninety degree (90°) horizontal cut-off flat lenses.

b. All off-street parking areas within industrially zoned areas shall meet all standards in paragraph C.5.a. of this section, except that the equivalent of three fourths (0.75) foot candle of illumination shall be maintained on the average throughout the parking area.

D. *Parking space requirements.* All land uses shall provide off-street parking in conformity with the following requirements, unless otherwise modified by the provisions contained herein.

***Use
Required***

Minimum Parking Stalls

Commercial

Automobile service stations A minimum of five (5) parking spaces per use plus an additional space for each service bay.

Automobile washing and Minimum twenty (20) cleaning establishments queuing spaces; minimum (not self-service) ten (10) parking stalls; plus two (2) stalls per detail bay; minimum seventeen (17) drying stalls (drying stalls shall be a minimum ten (10) foot by twenty (20) foot clear area).

Banks, savings and loans, One (1) per two hundred(200) square feet

other financial institutions may include stacking credit for drive-through

and related offices window on the basis of one (1) car for every
twenty-three (23) lineal feet of striped stacking lanes). A maximum credit not to exceed thirty percent (30%) of the total required parking for the site or no more than twenty (20) spaces for stacked credit, whichever is less. Drive through lanes shall provide a minimum of one hundred fifteen (115) feet per lane for required stacking space.

Barbershops and beauty One (1) per two hundred fifty (250) square
parlors feet.

Churches and religious One (1) per three (3) fixed

institutions seats or thirty-five (35) square feet where there are no fixed seats; eighteen (18) inches of bench shall be considered a fixed seat. For worship seating areas with three hundred (300) seats or above shall require a parking study.

Coin-operated laundromats One (1) per two hundred (200) square feet
Coin-operated dry cleaning

Contractor's storage yards One (1) per three thousand (3,000) square

and other storage and feet of lot area
salvage yards

General retail, except as One (1) per two hundred (200) square feet.
otherwise specified herein

Lumberyards and building One (1) per five hundred (500) square feet of materials retail area and one (1) per one-thousand (1,000) square feet of storage area.

Mortuaries, crematories, One (1) per three (3) fixed seats or one (1)

and funeral homes per twenty-five (25) square feet of assembly area, where there are no fixed seats.

Motels and hotels One (1) per guest unit.

Motor vehicle sales One (1) per four hundred (400) square feet.

Motor vehicle repair One (1) per two hundred fifty (250) square feet.

Offices, except as otherwise One (1) per two hundred (250) square specified herein fifty feet.

Self-service car wash Two (2) per wash bay.

Stores, solely for the sale One (1) per five hundred (500) square feet.

of furniture and appliances

Shopping centers Five and one-half (5½) for each one thousand (1,000) square feet.

Trade schools, business One (1) per thirty-five (35) square feet in colleges and commercial instruction areas, one (1) per two hundred fifty schools (250) square feet in office areas.

Commercial Recreation

Bowling alleys Four (4) per alley plus spaces for uses in building.

Billiard and pool halls Two (2) per table.

Commercial stables Not less than one (1) space for every five (5)

and riding clubs horses kept on the premises or facilities therefore, plus required spaces for additional uses.

Golf driving ranges One (1) per tee, plus spaces required for additional uses on-site.

Golf courses Eight (8) per hole, plus spaces required for additional uses on-site.

Handball/racquetball One and one-half (1½) for each court, plus

facility spaces required for additional uses on-site.

Pitch and putt and Three (3) per hole, plus spaces required for

miniature golf courses additional uses on-site.

Skating rinks/ice rinks One (1) per one-hundred (100) square feet

or roller rinks of gross floor area, plus spaces required for additional uses on-site.

Swimming pool One (1) per five hundred (500) square feet

(Commercial) of enclosed area, plus spaces required for additional uses on-site.

Tennis facility Three (3) per court, plus spaces required for additional uses on-site.

Health

Medical, dental, Five and one-half (5½) spaces per one
veterinary clinics thousand (1,000) square feet.
or offices.

Hospitals (general One and three-quarter (1¾) per bed.
medical)

Sanitariums, asylums, Five and one-half (5½) spaces per one
convalescent and and thousand facilities, (1,000) square feet.
nursing homes, homes
for the aged, rest homes

Health studios and spas One (1) per one hundred fifty (150)
square feet of gross floor area (including swimming pools and spas).

Manufacturing

Industrial uses of all One (1) per five hundred (500) square
feet.

types, except a building
used exclusively for ware-
house or storage purposes

Warehouse/storage One (1) per one thousand (1,000) square
feet.

buildings or structures
exclusively for storage

Wholesale establishments One (1) per one thousand (1,000)
square feet,

and warehouses not used plus one (1) per each two hundred fifty
(250)

exclusively for storage square feet of office or sales area.

Public Assembly

Cafes, "sit down" restaurants, Minimum of ten (10) or one (1)
for each
"drive-in" restaurants, "drive- seventy-five (75) square feet of
gross
through" restaurants, nightclubs, floor area, up to six thousand
(6,000) square feet, plus one (1) for each fifty-five
taverns, lounges or other (55)
establishments for the sale and square feet over six thousand
(6,000) square feet or one (1) for every three
consumption on the premises of (3) seats,
food and beverages whichever is greater. "Drive through" or
"Drive in" restaurants shall also provide a
minimum of one hundred sixty (160) feet of
stacking space, as measured from the pick up
window, for each drive through lane.

Auditoriums, theaters, One (1) per three (3) fixed seats or one
(1)

sports arenas, stadiums per thirty-five (35) square feet where
there are no fixed seats.

Dance floors, discotheques One (1) per seven (7) square feet of
dance floor area plus one (1) per thirty-five (35) square feet of
assembly area.

Libraries One (1) per three hundred (300) square feet.

Private clubs, lodge One (1) per seventy-five (75) square feet.

halls, union headquarters

Churches and other places One (1) per three (3) fixed seats or
thirty-five

of assembly (35) square feet where there are no fixed
seats; eighteen (18) inches of bench shall be considered a fixed seat.

Day nurseries One (1) per two hundred (200) square feet of
office and classroom area.

Residential

Single family dwellings Two (2) covered parking spaces for
each unit.

Attached single family dwellings	Two (2) covered parking spaces for each unit, plus one-half ($\frac{1}{2}$) uncovered parking spaces for each dwelling unit.
Two (2) or more dwelling units on one building site or lot:	
Bachelor unit	One and one-half ($1\frac{1}{2}$) spaces per unit, of which one (1) space shall be located within a garage or three (3) sided carport.
One (1) bedroom units	One and three-quarter ($1\frac{3}{4}$) spaces per unit, of which one (1) space shall be located within a garage or three (3) sided carport.
Two (2) bedroom units	Two (2) spaces per unit, of which one (1) space shall be located within a garage or three (3) sided carport.
Three (3) bedroom or more dwelling units	Two and one-half ($2\frac{1}{2}$) off-street spaces per dwelling unit, of which two (2) spaces must be covered for each dwelling unit, plus one-half ($\frac{1}{2}$) off-street parking spaces must be provided for each bedroom in excess of three (3).
All building sites or shall be	Two-tenths (0.2) guest parking space
lots containing five addition to	provided for each dwelling unit, in
(5) or more	the required number of parking spaces stated above. A maximum of twenty-five percent (25%) of the required uncovered parking spaces may be of compact car size, provided such spaces are clearly and individually marked.
Combination of uses	Sum of the requirements for the various uses, except shopping centers.

E. *Truck loading and maneuvering area.*

1. All industrial and commercially zoned developments shall be designed so as to prevent truck back-up maneuvering within public right-of-way.

2. a. All industrial and commercially zoned developments designed with dock high approaches and/or truck wells shall be provided with at least one (1) back-up area to said dock or well in accordance with the below schedule. The driveway aisle between parking stalls may be used for said approach provided the forty-eight (48) foot wheel track turning radius is maintained, as outlined in Diagrams "E" and "F" in the Appendix following this chapter.

<i>Berth or Aisle Width (feet)</i>	<i>Dock Approach (feet)</i>
10	120
12	117
14	113

b. The dock approach may not be encumbered by parking stalls or physical obstructions and shall be measured perpendicular to the dock or door as shown in accompanying Diagram "E" in the Appendix following this chapter. The minimum dock or door overhead clearance (excluding pipes, lights, etc.) is twelve (12) feet.

3. Unless otherwise provided for in paragraph E.2. above, all commercial and industrially zoned buildings must provide at least one (1) identified loading area (twelve (12) feet by twenty (20) feet with ramp). Access to said loading area must be designed as a minimum to provide a forty-eight (48) foot wheel track turning radius for a fifty-five (55) foot long semitrailer truck maneuvering, in accordance with Diagram "F" in the Appendix following this chapter. Parking aisles and access driveways adjacent to loading doors without dock high approaches or truck wells shall have a minimum width of eight (8) feet plus the aisle width required in Diagram "B" in the Appendix following this chapter, except for ninety degree (90°) parking in which the parking aisle shall be thirty-two (32) feet minimum. Designated fire lanes shall provide fire ladder truck maneuvering in accordance with Diagram "G" in the Appendix following this chapter.

4. All developments zoned commercial and industrial shall be designed with the following:

a. At least one (1) driveway approach capable of accommodating a forty-eight (48) foot wheel track turning radius. *(Please see accompanying Diagram "D" in the Appendix following this chapter.)*

b. At least one (1) on-site maneuvering area which provides a forty-eight (48) foot turning radius wheel track through the parking area. *(Please see accompanying Diagram "E" in the Appendix following this chapter.)*

c. All loading doors shall not be visible from a public street.

F. *Exceptions or modifications to off-street parking requirements.* The provisions of this section are intended to meet the minimum design needs for off-street parking under most conditions. Where, because of the use involved or other relevant circumstances, the requirements of this section are considered to be excessive, exceptions and modifications to these provisions may be approved in accordance with the following procedure provided such exceptions and modifications are consistent with the purpose and intent of this section:

1. Any property owner, his or her authorized agent or the city may apply for exceptions to, or modifications of, the off-street parking regulations.

2. a. Exceptions to, or modifications of the off-street parking requirements as they relate to shared parking and/or the location of off-street parking may be permitted subject to the approval of a conditional use permit application in accordance with the provisions of § 20.408.030 of this title.

b. If parking space requirements for any specific use are not contained herein, the Planning Commission, upon recommendation of the city staff, shall determine the parking requirements for said use. There shall be no application fee for this procedure.

(Ord. 425, passed 10-14-68; Am. Ord. 707, passed 12-23-80; Am. Ord. 708, passed 1-20-81; Am. Ord. 720, passed 10-6-81; Am. Ord. 741, passed 6-21-83; Am. Ord. 782, passed 10-15-85; Am. Ord. 916, passed 2-18-92; Am. Ord. 965, passed 4-4-95; Am. Ord. 1092, passed 5-16-06)

§ 20.08.050 TRANSPORTATION DEMAND MANAGEMENT REQUIREMENTS.

A. The provisions of this section are intended to meet the requirements of Cal. Gov't Code § 65089(b)(3) which requires development of a trip-reduction and travel-demand element to the Congestion Management Plan, and Cal. Gov't Code § 65089.3(b) which requires adoption and implementation of Trip-Reduction and Travel-Demand Ordinance. New commercial, retail, office, manufacturing, industrial, mixed-use development including employment centers of fifty (50) persons or more may adversely impact existing transportation and parking facilities, resulting in increased motor vehicles emissions, deteriorating levels of service, and possibly significant additional capital expenditures to augment and improve the existing transportation system. In order to more

Appendix E

- ULI Shared Parking
Spreadsheets

SHARED PARKING ANALYSIS

PER THE ULJ SHARED PARKING MANUAL (Second Edition - 2005) FOR WEEKDAY PARKING DEMAND

PROJECT:	Breca Plaza Redevelopment										SCENARIO: Existing plus Project									
LAND USE:	OFFICE KSF	RES non-CBD DU	RETAIL KSF	RESTAURANT		THEATER SEAT	HOTEL			TOTAL	OFFICE	RES non-CBD	RETAIL	RESTAURANT		THEATER	HOTEL		TOTAL	
				QUAL KSF	F FOOD KSF		ROOM	REST. KSF	CONF. KSF					QUAL	F FOOD		ROOM	REST.		CONF.
UNIT:	3,980	0	132,540	16,764	5,458	0	0	0.00	0.00	0.00										
QUANTITY:	5.5	0	5.5	5.5	5.5	0	0	0.00	0.00	0.00										
RATE:	22	0	729	92	30	0	0	0	0	0										
REQ'D PRKG	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00										
Transit Center Factor	1.00	1.00	0.90	0.90	1.00	0.83	0.97	1.00	1.00	1.00										
W-day/W-end Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.67	1.00	1.00	0.00										
Seasonal Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.67	1.00	1.00	0.00										
PERCENTAGE OF PEAK DEMAND																				
BY HOUR OF DAY																				
TIME OF DAY	OFFICE	RES non-CBD	RETAIL	RESTAURANT QUAL	RESTAURANT F FOOD	THEATER	ROOM	REST.	CONF.	CONV.	OFFICE	RES non-CBD	RETAIL	RESTAURANT QUAL	RESTAURANT F FOOD	THEATER	ROOM	REST.	CONF.	TOTAL
6:00 AM	3%	100%	1%	0%	5%	0%	95%	0%	0%	0%	1	0	7	0	2	0	0	0	0	9
7:00 AM	30%	90%	5%	0%	10%	0%	95%	10%	0%	0%	7	0	33	0	3	0	0	0	0	42
8:00 AM	75%	85%	15%	0%	20%	0%	90%	30%	30%	50%	16	0	98	0	6	0	0	0	0	121
9:00 AM	95%	80%	35%	0%	30%	0%	80%	10%	60%	100%	21	0	230	0	9	0	0	0	0	259
10:00 AM	100%	75%	65%	15%	55%	0%	70%	10%	60%	100%	22	0	426	12	17	0	0	0	0	477
11:00 AM	100%	70%	85%	40%	85%	0%	70%	5%	60%	100%	22	0	558	33	26	0	0	0	0	638
12:00 PM	90%	65%	95%	75%	100%	20%	65%	100%	65%	100%	20	0	623	62	30	0	0	0	0	735
1:00 PM	90%	70%	100%	75%	100%	45%	65%	100%	65%	100%	20	0	656	62	30	0	0	0	0	768
2:00 PM	100%	70%	95%	65%	90%	55%	70%	33%	65%	100%	22	0	623	54	27	0	0	0	0	726
3:00 PM	100%	70%	90%	40%	60%	55%	70%	10%	65%	100%	22	0	590	33	18	0	0	0	0	664
4:00 PM	90%	75%	90%	50%	55%	55%	75%	10%	65%	100%	20	0	590	41	17	0	0	0	0	668
5:00 PM	50%	85%	95%	75%	60%	60%	80%	30%	100%	100%	11	0	623	62	18	0	0	0	0	714
6:00 PM	25%	90%	95%	95%	85%	60%	85%	55%	100%	50%	5	0	623	79	26	0	0	0	0	733
7:00 PM	10%	97%	95%	100%	80%	80%	85%	60%	100%	30%	2	0	623	83	24	0	0	0	0	732
8:00 PM	7%	98%	80%	100%	50%	100%	90%	70%	100%	30%	2	0	525	83	15	0	0	0	0	624
9:00 PM	3%	99%	50%	100%	30%	100%	95%	67%	100%	10%	1	0	328	83	9	0	0	0	0	421
10:00 PM	1%	100%	30%	95%	20%	80%	95%	60%	50%	0%	0	0	197	79	6	0	0	0	0	282
11:00 PM	0%	100%	10%	75%	10%	65%	100%	40%	0%	0%	0	0	66	62	3	0	0	0	0	131
12:00 AM	0%	100%	0%	25%	5%	40%	100%	30%	0%	0%	0	0	0	21	2	0	0	0	0	22

PROJECTED PEAK PARKING DEMAND = 768 AT 1:00 PM
 UNADJUSTED PEAK PARKING DEMAND = 873
 PARKING ADJUSTMENT DUE TO SHARED PARKING = 105 12%

SHARED PARKING ANALYSIS

PER THE ULI SHARED PARKING MANUAL (Second Edition - 2005) FOR WEEKEND PARKING DEMAND

PROJECT:		Brea Plaza Redevelopment										SCENARIO: Existing plus Project													
		RES non-CBD			RESTAURANT			HOTEL				OFFICE			RES non-CBD			RESTAURANT			HOTEL				
		OFFICE	DU	KSF	RETAIL	KSF	F FOOD	THEATER	ROOM	REST.	CONF.	CONV.	OFFICE	DU	KSF	RETAIL	KSF	F FOOD	THEATER	ROOM	REST.	CONF.	CONV.	TOTAL	
LAND USE:		KSF																							
UNIT:																									
QUANTITY:		3,980	0	132,540	16,764	5,458	0	0	0	0.00	0.00	0.00													
RATE:		5.5	0	5.5	5.5	5.5	0	0	0	0	0	0	TOTAL												
REQ'D PRKG		22	0	729	92	30	0	0	0	0	0	0	873												
Transit Center Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00													
W-day/W-end Factor		0.17	0.17	1.00	1.00	0.93	1.00	1.00	1.00	1.00	1.00	0.50													
Seasonal Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.23	0.50	0.50	1.00	0.00	DEC												
PERCENTAGE OF PEAK DEMAND																									
BY HOUR OF DAY																									
TIME OF DAY		OFFICE	RES non-CBD	RETAIL	QUAL	F FOOD	THEATER	ROOM	REST.	CONF.	CONV.	OFFICE	RES non-CBD	RETAIL	QUAL	F FOOD	THEATER	ROOM	REST.	CONF.	CONV.	TOTAL			
6:00 AM		0%	100%	1%	0%	5%	0%	95%	0%	0%	0%	0	0	7	0	1	0	0	0	0	0	9			
7:00 AM		20%	90%	5%	0%	10%	0%	95%	10%	0%	0%	1	0	36	0	3	0	0	0	0	0	40			
8:00 AM		60%	85%	10%	0%	20%	0%	90%	30%	30%	50%	2	0	73	0	6	0	0	0	0	0	81			
9:00 AM		80%	80%	30%	0%	30%	0%	80%	10%	60%	100%	3	0	219	0	8	0	0	0	0	0	230			
10:00 AM		90%	75%	50%	0%	55%	0%	70%	10%	60%	100%	3	0	364	0	15	0	0	0	0	0	383			
11:00 AM		100%	70%	65%	15%	85%	0%	70%	5%	60%	100%	4	0	474	14	24	0	0	0	0	0	515			
12:00 PM		90%	65%	80%	50%	100%	20%	65%	100%	65%	100%	3	0	583	46	28	0	0	0	0	0	661			
1:00 PM		80%	70%	90%	55%	100%	45%	65%	100%	65%	100%	3	0	656	51	28	0	0	0	0	0	738			
2:00 PM		60%	70%	100%	45%	90%	55%	70%	33%	65%	100%	2	0	729	41	25	0	0	0	0	0	798			
3:00 PM		40%	70%	100%	45%	60%	55%	70%	10%	65%	100%	1	0	729	41	17	0	0	0	0	0	789			
4:00 PM		20%	75%	95%	45%	55%	55%	75%	10%	65%	100%	1	0	693	41	15	0	0	0	0	0	750			
5:00 PM		10%	85%	90%	60%	60%	60%	80%	30%	100%	100%	0	0	656	55	17	0	0	0	0	0	729			
6:00 PM		5%	90%	80%	90%	85%	60%	85%	55%	100%	50%	0	0	583	83	24	0	0	0	0	0	690			
7:00 PM		0%	97%	75%	95%	80%	80%	85%	60%	100%	30%	0	0	547	88	22	0	0	0	0	0	657			
8:00 PM		0%	98%	65%	100%	50%	100%	90%	70%	100%	30%	0	0	474	92	14	0	0	0	0	0	580			
9:00 PM		0%	99%	50%	90%	30%	100%	95%	67%	100%	10%	0	0	364	83	8	0	0	0	0	0	456			
10:00 PM		0%	100%	35%	90%	20%	100%	95%	60%	50%	0%	0	0	255	83	6	0	0	0	0	0	344			
11:00 PM		0%	100%	15%	90%	10%	80%	100%	10%	0%	0%	0	0	109	83	3	0	0	0	0	0	195			
12:00 AM		0%	100%	0%	50%	5%	50%	100%	30%	0%	0%	0	0	0	46	1	0	0	0	0	0	47			

PROJECTED PEAK PARKING DEMAND = 798 AT 2:00 PM
 UNADJUSTED PEAK PARKING DEMAND = 873
 PARKING ADJUSTMENT DUE TO SHARED PARKING = 75 9%

Appendix F

- Parking Agreement

**RECORDING REQUESTED BY
AND
WHEN RECORDED RETURN TO:**

**WILLIAM W. HOLCOMB
Tyre Kamins Katz Granof & Menes
1880 Century Park East, Suite 300
Los Angeles, CA 990067**

**AMENDMENT No. 2 TO
DECLARATION OF RESTRICTIONS
AND GRANT OF EASEMENTS**

This Amendment to Declaration of Restrictions and Grant of Easements (the "Second Amendment") is made and entered into as of this 22nd day of June, 2006, by and between MERCURY CASUALTY COMPANY, a California Corporation ("Mercury") and CALIFORNIA BREA PARTNERS, L.P ("Brea").

RECITALS

- A. Mercury owns that certain parcel of real property in the City of Brea, County of Orange, State of California, described in Exhibit "A" attached hereto ("Mercury Parcel").
- B. Brea owns that certain parcel of real property, situated in the City of Brea, County of Orange, State of California, described in Exhibit "B" attached hereto ("Brea Parcel").
- C. The "Brea Parcel" and the "Mercury Parcel" are collectively referred to herein as the "Parcels", and the terms "Brea" and "Mercury" or "owners of the Brea Parcel" and "owners of the Mercury Parcel" shall be construed to mean any successors in interest in and to such entities, as well as any affiliated corporations, partnerships or other related entities which are controlled by or through such entities.
- D. The Parcels are subject to that certain Declaration of Restrictions and Grant of Easements, dated April 15, 1976 recorded June 17, 1976 in Book 1776, Page 1757, *et seq.*, as amended, by that certain Amendment No. 1 to the Declaration of Restrictions and Grant of Easements, recorded September 7, 1977 in Book 12368, Pages 1865, *et seq.*, (collectively, the "Declaration"), and the Declaration sets forth reciprocal access and parking easements for the passage and parking of motor vehicles into, out of, on, over and across all parking areas, driveways and service areas from time to time established upon the Mercury Parcel and the Brea Parcel.
- E. The Parcels may also be subject to other restrictions, easements and other documents of record and not of record that affect the Parcels (the "Other Documents").

F. Mercury and Brea desire to: (i) amend the Declaration; (ii) modify the Other Documents as set forth below to the extent that Mercury and Brea have the authority to do so, and (iii) if the parties lack the authority to modify the Other Documents, whether because the Other Documents affect property other than the Parcels or grant rights to third parties, then to the extent that such Other Documents affect the Parcels, Mercury and Brea desire to amend such Other Documents to the fullest extent of their authority as provided below; however, Mercury and Brea represent they have the authority to execute this Amendment on behalf of their respective organization (clauses (i), (ii) and (iii) being referred to herein as the "Disclaimers").

AMENDMENT TO DECLARATION AND ANY OTHER DOCUMENTS

Subject to the Disclaimers, Mercury and Brea hereby supplement and amend all Title Documents as of the date and year first set forth above as follows:

1. From this time forward, that portion of the Mercury Parcel upon which a parking structure is to be constructed, as depicted on Exhibit "C", and the parking structure upon completion thereof (together referred to herein as the "Mercury Parking Structure Site"), shall be, and the same hereby is, restricted for the sole and exclusive use by Mercury for access, ingress and egress and parking of motor vehicles into, out of, on, over and across the Mercury Parking Structure Site. All rights to access, ingress and egress and parking of motor vehicles in, out, on, over and across said Mercury Parking Structure Site by the Brea Parcel are hereby waived and released. However, the owner of the Brea Parcel, its tenants and occupants, shall retain the right to access, ingress and egress and parking of motor vehicles into, out of, on, over and across all parking areas, driveways, and service areas of the Mercury Parcel that are not included within the Mercury Parking Structure Site, as the same may be permitted under the Declaration.

2. Mercury, on behalf of the Mercury Parcel, relinquishes all rights to park motor vehicles on any portion of the Brea Parcel.

3. Except as otherwise provided in this Second Amendment, Mercury, on behalf of the Mercury Parcel, releases the Brea Parcel and its owner from any restrictions imposed by the Declaration or Other Documents, over the design, location, color or any other matters concerning the existing improvements, modifications to the existing improvements or the construction of new improvements on the Brea Parcel, including but not limited to height restrictions for any buildings on the Brea Parcel and any rights of approval that the owner of the Mercury Parcel may have or claim to have with respect to the Brea Parcel.

4. Except as otherwise provided in this Second Amendment, Brea, on behalf of the Brea Parcel, releases the Mercury Parcel and its owner from any restrictions imposed by the Declaration or Other Documents, over the design, location, color or any other matters concerning the existing improvements, modifications to the existing improvements or the construction of new improvements on the Mercury Parcel, including

but not limited to height restrictions for any buildings on the Mercury Parcel and any rights of approval that the owner of the Brea Parcel may have or claim to have with respect to the Mercury Parcel.

5. Mercury, on behalf of the Mercury Parcel, waives and releases all use restrictions regarding or affecting the Brea Parcel, such that the Brea Parcel may be used for any use permitted by applicable law or variance thereof, including without limitation, retail, restaurant, residential, office or any other lawful use.

6. Brea, on behalf of the Brea Parcel, waives and releases all use restrictions regarding or affecting the Mercury Parcel, such that the Mercury Parcel may be used for any use permitted by applicable law or variance thereof, including without limitation, retail, restaurant, residential, office or any other lawful use.

7. In exercising their rights under Section 3 and 4 above to locate or relocate new or existing buildings and other improvements on their respective Parcels, Mercury and Brea may modify existing motor vehicle drive isles and pedestrian walkways, provide however, neither Brea nor Mercury may effect a change in the existing motor vehicle drive isles and pedestrian walkways that would have the effect of materially reducing or interfering with the rights of ingress and egress under the easements created by the Declaration.

8. To the extent that the parties have the authority to do so, the Other Documents are hereby amended to the fullest extent possible to conform to the terms of this Second Amendment, Except as herein modified, the Declaration and Other Documents, as heretofore modified by previous amendments, shall remain in full force and effect.

9. The provisions of this Amendment and all other documents of records shall bind and inure to the benefit of the representatives, successors and assigns of Mercury and Brea.

10. This Amendment shall only be deemed to modify the Other Documents as the same may affect the Parcels, subject to the Disclaimers. Mercury and Brea expressly reserve their rights to enforce the Other Documents against any other real property, owner or party subject to the Other Documents. Further, this Amendment shall only be effective to modify the rights of Mercury and Brea under the Other Documents, if any, subject to the Disclaimers, and shall not be deemed to modify the rights of any third parties under the Other Documents. Mercury and Brea make no representation or warranty as to whether or not any third parties are necessary to modify the Other Documents.

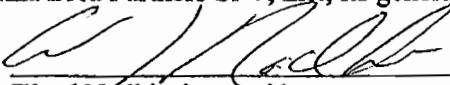
11. Both Mercury and Brea agree to cooperate with one another at the request of the other party to execute such other documents as may be reasonably requested in order to carry out the intentions of this Amendment; however, the requesting party shall bear any reasonable expense associated with such request.

Kristin Butner
Notary Public

Brea:

CALIFORNIA BREA PARTNERS, L.P., a Delaware limited partnership

By: California Brea Partners SPV, Inc., its general partner

By: 
Waad Nadhir, its president

Notary:

STATE OF CALIFORNIA)
) ss
COUNTY OF LOS ANGELES)



On June 22, 2006, before me, Kristin Poertner, a Notary Public, personally appeared Waad Nadhir, personally known to me or proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument, and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

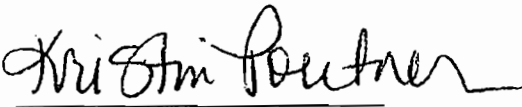

Notary Public

Exhibit "A"

**All that certain real property situated in the County of Orange, State of California,
described as follows:**

**Parcel 2, in the City of Brea, County of Orange, State of California, as per map recorded
June 3, 1976, in Book 80, Page(s) 42 and 43 of Parcel Maps, in the Office of the County
Recorder of said County, California.**

Exhibit "B"

**All that certain real property situated in the County of Orange, State of California,
described as follows:**

**Parcel 1, in the City of Brea, County of Orange, State of California, as per map recorded
June 3, 1976, in Book 80, Page(s) 42 and 43 of Parcel Maps, in the Office of the County
Recorder of said County, California.**

Exhibit "C"
[Mercury Parking Site]

