LINSCOTT LAW & GREENSPAN engineers

REVISED TRAFFIC CIRCULATION ANALYSIS

RELATED BRISTOL

Santa Ana, California

June 28, 2023

Prepared for:

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1.0 INTRODUCTION

1.1 Senate Bill 743

Senate Bill (SB) 743 (2013), codified in Public Resources Code section 21099, changed the methodology for analyzing transportation impacts under the California Environmental Quality Act (CEQA). SB 743 directed the Office of Planning and Research (OPR) to prepare proposed revisions to the CEQA Guidelines establishing new criteria for determining the significance of transportation impacts. The Secretary of the Natural Resources Agency subsequently certified CEQA Guideline 15064.3, establishing vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. Upon certification of the new Guideline, automobile delay, as measured by "level of service" and other similar metrics, is no longer considered a significant impact on the environment under CEQA. (Public Resources Code 21099(b)(2).) However, the amendments to the Public Resources Code and the Guidelines did not relieve a public agency of the requirement to analyze a project's potentially significant transportation impacts related to air quality, noise, safety, or other secondary impacts associated with transportation. (Pub. Res. Code 21099(b)(3).) Consequently, the information in this study provides an evidentiary basis for analysis of potential secondary impacts of the project associated with transportation in the project environmental impact report and, as detailed more fully below, the project's consistency with the City's General Plan Circulation Element.

1.2 Compliance with City of Santa Ana General Plan and SCAG RTP/SCS

In addition to providing an evidentiary basis for evaluating a project's potentially significant impacts related to air quality, noise, safety, or other secondary impacts associated with transportation, a traffic study is necessary to evaluate a project's consistency with applicable goals and policies of the City's General Plan Circulation (Mobility) Element, including:

- *Policy 1.1: Coordinate transportation improvements in a manner which minimizes disruptions to the community.*
- *Policy 1.3: Utilize advance technology to improve traffic flow and minimize the need for land acquisition.*
- *Policy 1.4: Maintain at least a level of service "D" on arterial street intersections, except in major development areas.*
- *Policy 1.6: Improve intersection capacity on major arterials to accommodate increased traffic demands.*
- *Policy 2.7: Continue design practices which facilitate the safe use of circulation systems.*

- *Policy 3.1: Support the efforts of regional, state, and federal agencies to enhance local and express bus services.*

- *Policy 3.2: Support programs which complement bus and rail services for specialized transit needs.*

- *Policy 3.3: Support the expansion of commuter rail services.*

- *Policy 3.4: Encourage the development of multi-modal transit opportunities within major development areas.*

- *Policy 3.5: Enhance sidewalks and pedestrian systems to promote their use as a means of travel.*

Furthermore, the Southern California Association of Regional Governments (SCAG) adopted the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) in April 2016 which integrates strategies for land use and transportation centered around sustainability, protecting and preserving existing transportation infrastructure, increasing capacity through improved systems managements, and providing more transportation choices, in order to help reduce GHG emissions from transportation. The City's General Plan consistency, and thus the project's consistency, with the RTP/SCS can be evaluated based on the following applicable goals[1]:

- *RTP/SCS G1: Encourage regional economic prosperity and global competitiveness.*

- *RTP/SCS G2: Improve mobility, accessibility, reliability, and travel safety for people and goods.*

- *RTP/SCS G3: Enhance the preservation, security, and resilience of the regional transportation system.*

- *RTP/SCS G4: Increase person and good movement and travel choices within the transportation system.*

- *RTP/SCS G5: Reduce greenhouse gas emissions and improve air quality.*

- *RTP/SCS G6: Support healthy and equitable communities.*

- *RTP/SCS G7: Adapt to a changing climate and support an integrated regional development pattern and transportation network.*

- *RTP/SCS G8: Leverage new transportation technologies and data-driven solutions that result in more efficient travel.*

[1] Source: *City of Santa Ana General Plan Update, Table 5.10-1.*

1.3 Traffic Study

This Traffic Circulation Analysis report addresses the potential traffic circulation needs associated with Related Bristol Project (hereinafter referred to as Project) in the City of Santa Ana. The Project site, currently known as Metro Town Square, is a 41.3±-acre rectangular-shaped parcel of land generally located west of Bristol Street, east of S. Plaza Drive, north of Sunflower Avenue, and south of MacArthur Boulevard. The subject property's land use designation in the newly adopted Santa Ana General Plan is District Center-High (DC-5). The subject property is currently developed with 465,063 square-feet (SF) of retail/commercial uses. The proposed Project, which will be contained in a Specific Plan, will include the development of up to 3,750 apartment units, 200-unit senior continuum care, 250 hotel rooms, and 350,000 SF retail/commercial.

1.3.1 *Scope of Work*

This traffic report documents the findings and recommendations of a traffic analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the need for potential Project-related circulation improvements. The traffic analysis evaluates the existing operating conditions at forty-one (41) key study intersections and project driveways and forty-three (43) key roadway segments within the project vicinity, estimates the trip generation potential of the proposed Project, and forecasts future near-term (Year 2030, 2032 and 2036) and long-term (Year 2045) operating conditions without and with the proposed Project. Where warranted, intersection improvements are identified.

The scope of work for this traffic analysis was developed in collaboration with City of Santa Ana Public Works Agency – Traffic Engineering staff. This traffic report satisfies the traffic requirements of the City of Santa Ana. ***Appendix A*** presents the scope of work that was developed in conjunction with and reflects input City of Santa Ana Public Works Department staff.

The project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing weekday peak hour and daily traffic count information has been collected at forty-one (41) key study intersections and forty-three (43) key roadway segments, respectively, for use in the preparation of intersection and roadway segment level of service calculations. Information concerning cumulative projects (planned and/or approved) in the vicinity of the proposed Project has been researched at the City of Santa Ana, City of Costa Mesa, City of Irvine and City of Tustin. Based on our research, there are ten (10) related projects located in the City of Santa Ana, seven (7) related projects located in the City of Costa Mesa and three (3) related projects located in the City of Irvine. The twenty (20) related projects were considered in the cumulative traffic analysis for this project.

This traffic report analyzes existing and future weekday daily, AM peak hour and PM peak hour traffic conditions for a near-term (Year 2030, 2032 and 2036) and long-term (Year 2045) traffic setting upon completion of the proposed Project. Near-term (Year 2030, 2030 and 2036) cumulative daily and peak hour traffic forecasts were projected by incorporating a one percent (1.0%) annual growth rate and the trip generation potential of twenty (20) related projects. Long-term (Year 2045) daily and peak hour traffic forecasts were projected based on modeled traffic projections prepared by OCTA utilizing the OCTAM 5.0 Year 2045 Model.

1.4 Study Area

The forty-one (41) intersections and forty-three (43) roadway segments listed below provide regional and local access to the study area and define the extent of the boundaries for this traffic analysis.

Key Study Intersections

1. Fairview Street at Segerstrom Avenue (Santa Ana)
2. Bear Street at Segerstrom Avenue (Santa Ana)
3. Bristol Street at Segerstrom Avenue (Santa Ana)
4. Flower Street at Segerstrom Avenue/Dyer Road (Santa Ana)
5. Main Street at Dyer Road (Santa Ana)
6. Fairview Street at MacArthur Boulevard (Santa Ana)
7. Bear Street at MacArthur Boulevard (Santa Ana)
8. S. Plaza Drive at MacArthur Boulevard (Santa Ana)
9. Bristol Street at MacArthur Boulevard (Santa Ana)
10. Flower Street at MacArthur Boulevard (Santa Ana)
11. Main Street at MacArthur Boulevard (Santa Ana)
12. SR-55 SB Ramps at MacArthur Boulevard (Santa Ana/Caltrans)
13. SR-55 NB Ramps at MacArthur Boulevard (Irvine/Caltrans)
14. S. Plaza Drive at Callen's Common (Santa Ana)
15. Bristol Street at Callen's Common (Santa Ana)
16. Fairview Road at Sunflower Avenue (Santa Ana/Costa Mesa)
17. Bear Street at Sunflower Avenue (Santa Ana/Costa Mesa)
18 S. Plaza Drive at Sunflower Avenue (Santa Ana/Costa Mesa)
19. Project Driveway at Sunflower Avenue (Santa Ana/Costa Mesa)
20. Bristol Street at Sunflower Avenue (Santa Ana/Costa Mesa)
21. Flower Street/Sakioka Drive at Sunflower Avenue (Santa Ana/Costa Mesa)
22. Main Street at Sunflower Avenue (Santa Ana/Costa Mesa)
23. Red Hill Avenue at Main Street (Irvine)
24. Fairview Road at S. Coast Drive (Costa Mesa)
25. I-405 NB Off-Ramp at S. Coast Drive (Costa Mesa/Caltrans)
26. Bear Street at S. Coast Drive (Costa Mesa)
27. Bristol Street at Anton Boulevard (Costa Mesa)
28. Fairview Road at I-405 NB Ramps (Costa Mesa/Caltrans)
29. Fairview Road at I-405 SB Ramps (Costa Mesa/Caltrans)
30. Bristol Street at I-405 NB Ramps (Costa Mesa/Caltrans)
31. Bristol Street at I-405 SB Ramps (Costa Mesa/Caltrans)
32. Bear Street at Paularino Avenue (Costa Mesa)
33. Bristol Street at Paularino Avenue (Costa Mesa)
34. Fairview Road at Baker Street (Costa Mesa)
35. Bear Street at Baker Street (Costa Mesa)
36. Bristol Street at Baker Street (Costa Mesa)
37. Bear Street at SR-73 NB Ramps (Costa Mesa/Caltrans)
38. Bear Street at SR-73 SB Ramps (Costa Mesa/Caltrans)
39. Spruce Street at Segerstrom Avenue (Santa Ana)
40. Bristol Street at Newport Avenue (SB) (Costa Mesa)
41. Bristol Street at Newport Avenue (NB) (Costa Mesa)

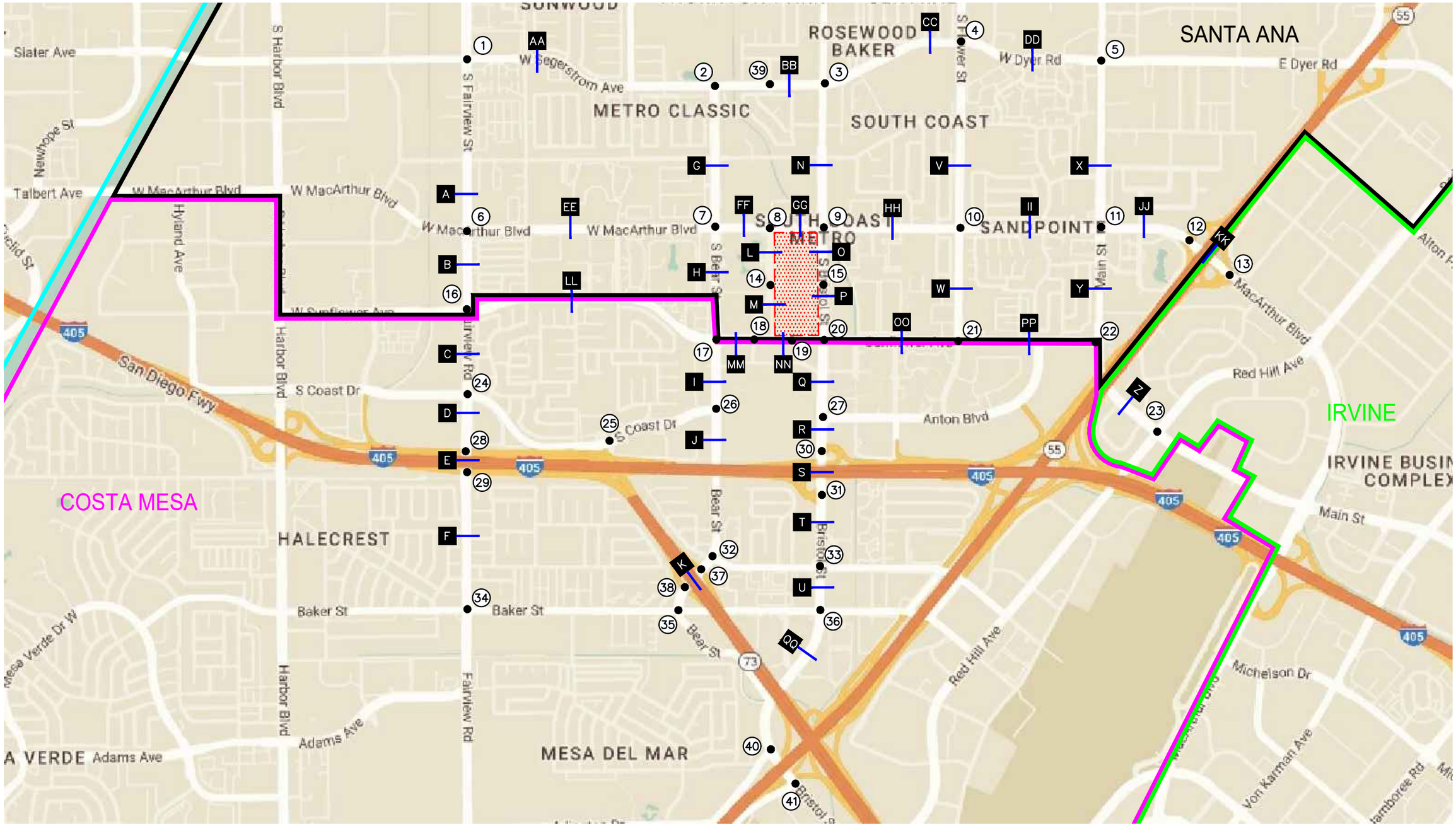
Key Roadway Segments

A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)
C. Fairview Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps (Costa Mesa)
E. Fairview Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)
F. Fairview Street, between I-405 SB Ramps and Baker Street (Costa Mesa)
G. Bear Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)
H. Bear Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana/Costa Mesa)
I. Bear Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)
J. Bear Street, between S. Coast Drive and Paularino Avenue (Costa Mesa)
K. Bear Street, between Paularino Avenue and Baker Street (Costa Mesa)
L. S. Plaza Drive, between MacArthur Boulevard and Callen's Common (Santa Ana)
M. S. Plaza Drive, between Callen's Common and Sunflower Avenue (Santa Ana)
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)
O. Bristol Street, between MacArthur Boulevard and Callen's Common (Santa Ana)
P. Bristol Street, between Callen's Common and Sunflower Avenue (Santa Ana)
Q. Bristol Street, between Sunflower Avenue and Anton Boulevard (Costa Mesa)
R. Bristol Street, between Anton Boulevard and I-405 NB Ramps (Costa Mesa)
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)
T. Bristol Street, between I-405 SB Ramps and Paularino Avenue (Costa Mesa)
U. Bristol Street, between Paularino Avenue and Baker Street (Costa Mesa)
V. Flower Street, between Dyer Road and MacArthur Boulevard (Santa Ana)
W. Flower Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)
X. Main Street, between Dyer Road and MacArthur Boulevard (Santa Ana)
Y. Main Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)
Z. Main Street, between Sunflower Avenue and Red Hill Avenue (Santa Ana/Irvine)
AA. Segerstrom Avenue, between Fairview Street and Bear Street (Santa Ana)
BB. Segerstrom Avenue, between Bear Street and Bristol Street (Santa Ana)
CC. Segerstrom Avenue, between Bristol Street and Flower Street (Santa Ana)
DD. Dyer Road, between Flower Street and Main Street (Santa Ana)
EE. MacArthur Boulevard, between Fairview Street and Bear Street (Santa Ana)
FF. MacArthur Boulevard, between Bear Street and S. Plaza Drive (Santa Ana)
GG. MacArthur Boulevard, between S. Plaza Drive and Bristol Street (Santa Ana)
HH. MacArthur Boulevard, between Bristol Street and Flower Street (Santa Ana)
II. MacArthur Boulevard, between Flower Street and Main Street (Santa Ana)
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Santa Ana)
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps (Santa Ana/Irvine/Caltrans)
LL. Sunflower Avenue, between Fairview Street and Bear Street (Santa Ana/Costa Mesa)
MM. Sunflower Avenue, between Bear Street and S. Plaza Drive (Santa Ana/Costa Mesa)
NN. Sunflower Avenue, between S. Plaza Drive and Bristol Street (Santa Ana/Costa Mesa)
OO. Sunflower Avenue, between Bristol Street and Flower Street (Santa Ana/Costa Mesa)
PP. Sunflower Avenue, between Bristol Street and Flower Street (Santa Ana/Costa Mesa)
QQ. Bristol Street, south of Baker Street (Costa Mesa)

Figure 1-1 presents a Vicinity Map, which illustrates the general location of the Project and depicts the study locations and surrounding street system. The Level of Service (LOS) investigations at these key locations were used to evaluate the potential traffic circulation effects associated with area growth, cumulative projects and the proposed Project. When necessary, this report recommends intersection and/or roadway improvements to accommodate future traffic volumes and restore/maintain an acceptable Level of Service and/or accommodate added Project-related traffic volumes.

Included in this Traffic Analysis are:

- Existing traffic counts,
- Estimated project traffic generation/distribution/assignment,
- Estimated cumulative project traffic generation/distribution/assignment,
- AM and PM peak hour capacity analyses for existing conditions,
- AM and PM peak hour capacity analyses for existing plus project conditions,
- AM and PM peak hour capacity analyses for future near-term (Year 2030, 2032 and 2036) traffic conditions without and with the proposed Project,
- AM and PM peak hour capacity analyses for future long-term (Year 2045) traffic conditions without and with the proposed Project,
- Caltrans Analysis, inclusive Ramp LOS and Queuing Calculations,
- Daily Roadway Segment Analysis,
- Site Access Evaluation,
- Internal Circulation and Sight Distance Evaluation, and
- Recommended Intersection Improvements.



LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

KEY

(#) = STUDY INTERSECTION

= STUDY ROADWAY SEGMENT

= PROJECT SITE

FIGURE 1–1

VICINITY MAP

RELATED BRISTOL, SANTA ANA

2.0 PROJECT DESCRIPTION

The Project site, currently known as Metro Town Square, is a 41.3±-acre rectangular-shaped parcel of land generally located west of Bristol Street, east of S. Plaza Drive, north of Sunflower Avenue, and south of MacArthur Boulevard in the City of Santa Ana, California. The subject property's land use designation in the newly adopted Santa Ana General Plan is District Center-High (DC-5) which is designed to serve as anchors to the City's commercial corridors and to accommodate major development activity.

The subject property is currently developed with 465,063 square-feet (SF) of retail/commercial uses. The northern half of the property is developed with approximately 45% of floor area whose tenants include Vons, LA Fitness, Bank of America, and a variety of retail, service retail/commercial, medical, restaurant, and fast-food uses. The southern half of the property contains approximately 55% of floor area with a tenant mix of retail, service retail/commercial, restaurant, and fast-food uses. Existing major tenants on the southern half of the center include TJ Maxx, Ross Dress for Less, Cost Plus World Market, and Red Robin. Vehicular access to the Project site is currently provided via unsignalized driveways located along MacArthur Boulevard, Bristol Street, Sunflower Avenue, S. Plaza Drive, and Callen's Common. Signalized access is provided along Bristol Street at Callen's Common. ***Figure 2-1*** is an existing aerial photograph of the Project site.

The proposed Project, which will be contained in a Specific Plan, will include the development of up to 3,750 apartment units, 200-unit senior continuum care, 250 hotel rooms, and 350,000 SF retail/commercial. ***Table 2-1*** provides a summary of the existing land uses and proposed Project components**,** whereas ***Table 2-2*** presents the anticipated development that would occur with each of the Project's phases. ***Figure 2-2A*** and ***Figure 2-2B*** present the conceptual site plan's ground floor and upper floor layout, respectively, provided by RCR Bristol LLC, dated May 7, 2022.

The Project is expected to be completed in three phases. Completion of Phase 1 is anticipated by Year 2030 which is the southern half of the site, with Phase 2 completion by Year 2032 which is the northern half of the site adjacent to Bristol Street and Phase 3 completion by Year 2036 which is the northern half of the site adjacent to Plaza Drive. *Figure 2-2A* and *Figure 2-2B* identify the anticipated phasing of the Project.

2.1 Site Access

Vehicular access to the Project site will be provided via four (4) unsignalized right-turn only driveways along S. Plaza Drive (Driveways I, J, K, and L), one (1) unsignalized full-access driveway along S. Plaza Drive (Driveway M), one (1) signalized driveway (Callen's Common) on S. Plaza Drive, two (2) unsignalized right-turn only driveways along MacArthur Boulevard (Driveways G and H), three (3) unsignalized right-turn only driveways along Bristol Street (Driveways D, E and F), two (2) signalized driveways (Callen's Common and Driveway C) on Bristol Street, two (2) unsignalized right-turn only driveways along Sunflower Avenue (Driveways A and B), and one signalized driveway along Sunflower Avenue. It should be noted that Driveway D is designated for service access only to service the truck deliveries for the grocery store. ***Figure 2-3*** illustrates the proposed lane configuration and control type.

2.2 Project Design Features

The following improvements within the public right-of-way along Bristol Street, MacArthur Boulevard, Sunflower Avenue, and South Plaza Drive are anticipated to be constructed as part of the proposed Project:

- **Bristol Street** planned improvements include a widened parkway, street trees, planted setback areas, new curb cuts for ingress/egress to/from Bristol Street, new sidewalks, median modifications, and construction of Class IV bikeway improvements per City design. The project driveways along the roadway are anticipated to include the following specific improvements along Bristol Street:

  - **Bristol Street at Driveway C:** Modify the northbound approach to provide a second left-turn lane and demolish the existing median. Demolish the existing median on the southbound approach. Install a five-phase traffic signal.

- **MacArthur Boulevard** planned improvements include installation of a Class IV bike lane per the City's Mobility Element, construction of new landscaped median, planted setback areas with new sidewalks, and street trees.

- **Sunflower Avenue** planned improvements include median modification, new sidewalks, and installation of Class IV bike lanes per the City Mobility Element. The project driveways along the roadway are anticipated to include the following specific improvements along Sunflower Avenue:

  - **No. 19 – Project Driveway at Sunflower Avenue:** As part of the proposed Project, the existing driveway will be realigned approximately 110-feet to the east of the existing driveway. Restriping along Sunflower Avenue and modification of the existing median will be required to accommodate the new driveway. Install a five-phase traffic signal, subject to the improvements/realignment of South Coast Plaza driveway and the coordination with the City of Costa Mesa.

- **South Plaza Drive** planned improvements include new curb cutouts for ingress/egress and planted setback areas with new sidewalks and street trees. The project driveways along the roadway are anticipated to include the following specific improvements along South Plaza Drive:

    - **No. 14 – South Plaza Drive at Callen's Common:** Install a three-phase traffic signal.

Figure 2-4 presents the anticipated cross-sections for Bristol Street, MacArthur Boulevard, Sunflower Avenue, South Plaza Drive, Callen's Commons, and the proposed Bristol Paseo, residential driveways, Green Link and Bristol Green Loop.

2.2.1 *Compliance with City of Santa Ana Requirements and Standards*

During the development plan review process, curb radii should be validated to ensure proper design to accommodate a small service/delivery truck (SU-30), fire truck and large moving vehicles. Additionally, landscaping around the perimeter of the project site should be designed to avoid obstructions to sight lines at the project driveways. The installation of any new signal and/or signal modifications, inclusive of all necessary signing and striping modifications, plus continental crosswalks and stop bars, plus the Project Design Features noted above, at the Project driveways will be required to conform to City of Santa Ana design standards.

2.3 Pedestrian and Bicycle Circulation

The proposed Project will encourage walking by integrating innovative connections internally as well as to nearby activities. The Project's internal pedestrian network includes the "Greenlink", which is a landscaped dedicated pedestrian paseo linking the north and south areas of the Specific Plan, as illustrated in *Figure 2-3*. It is a dedicated pedestrian path with shade and flowering trees meant for sitting and socializing and will connect to the Project's other internal walkways. The Village Core portion of the proposed Project will provide a slow speed/low volume ring road to encourage non-vehicular mobility for pedestrians and bicyclists.

Pedestrian circulation for the proposed Project would be provided externally via new/reconstructed and/or proposed relocation of public sidewalks along S. Plaza Drive, MacArthur Boulevard, Bristol Street, and Sunflower Avenue, which will connect to the Project's internal pedestrian network. Sidewalks are provided on both sides of the street throughout most of the City. Crosswalks, pedestrian push buttons, and pedestrian indication lights are provided at all signalized intersections adjacent to the project site. The proposed Project plans to retain this existing pedestrian infrastructure and implement the same pedestrian safety measures at all potential traffic signals on Bristol Street and S. Plaza Drive adjacent to the site.

The proposed Bristol Street improvements include upgrading the southbound bike lane to a Class IV bike lane, which includes a planted buffer separation between vehicular and bicycle circulation. Bicycle racks will be provided in conjunction with commercial, office, and residential projects. For improvements on MacArthur Boulevard and Sunflower Avenue along project frontage, Class IV bike lanes are planned, consistent with the City of Santa Ana Bikeway Master Plan.

TABLE 2-1

PROJECT DEVELOPMENT SUMMARY

Planning Area (PA) / Land Use / Building	Existing[2]	Proposed Project
❑ Shopping Center	465,063 SF	350,000 SF
❑ Multi-Family Housing	--	3,750 DU
❑ Senior Continuum Care	--	200 Units
❑ Hotel	--	250 Rooms
Total Building Floor Area	***465,063 SF Commercial***	***350,000 SF of Commercial*** ***3,750 DU Apartments*** ***200 DU Senior Continuum Care*** ***250 Room Hotel***

[2] The northern half of Metro Town Square is developed with approximately 45% of floor area whose tenants include Vons, LA Fitness, Bank of America, and a variety of retail, service retail/commercial, medical, restaurant, and fast food uses. The southern half contains approximately 55% of floor area with a tenant mix of retail, service retail/commercial, restaurant, and fast food uses. Existing major tenants on the southern half of the center include TJ Maxx Ross Dress for Less, Cost Plus World Market and Red Robin.

TABLE 2-2

PROJECT DEVELOPMENT SUMMARY BY PHASE

Planning Area (PA) / Land Use / Building	Existing[3]	Proposed Project
Phase 1 (Southern Half)		
❑ Shopping Center	244,120 SF	250,000 SF
❑ Multi-Family Housing	--	1,375 DU
❑ Senior Continuum Care	--	200 Units
❑ Hotel	--	250 Rooms
Phase 2 (Northern Half Adjacent to Bristol St)		
❑ Shopping Center	36,522 SF	65,000 SF
❑ Multi-Family Housing	--	856 DU
Phase 3 (Northern Half Adjacent to Plaza Dr)		
❑ Shopping Center	184,421 SF	35,000 SF
❑ Multi-Family Housing	--	1,519 DU
Total Building Floor Area	***465,063 SF Commercial***	***350,000 SF of Commercial***

[3] The northern half of Metro Town Square is developed with approximately 45% of floor area whose tenants include Vons, LA Fitness, Bank of America, and a variety of retail, service retail/commercial, medical, restaurant, and fast food uses. The southern half contains approximately 55% of floor area with a tenant mix of retail, service retail/commercial, restaurant, and fast food uses. Existing major tenants on the southern half of the center include TJ Maxx Ross Dress for Less, Cost Plus World Market and Red Robin.

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N NO SCALE

SOURCE: GOOGLE

KEY

= PROJECT SITE

FIGURE 2-1

EXISTING SITE AERIAL

RELATED BRISTOL, SANTA ANA

MACARTHUR BOULEVARD

DRIVEWAY H

DRIVEWAY G

DRIVEWAY L

DRIVEWAY I

DRIVEWAY F

DRIVEWAY M

BRISTOL CENTRAL PARK

BRISTOL PASEO

DRIVE

PLAZA

DRIVEWAY J

DRIVEWAY E

BRISTOL STREET

GREEN LINK

CALLEN'S COMMON

DRIVEWAY K

GROCERY

DRIVEWAY D

DRIVEWAY C

BRISTOL GREEN

BRISTOL PLAZA

DRIVEWAY A

DRIVEWAY B

SUNFLOWER AVENUE

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N NO SCALE

KEY

- RESIDENTIAL
- SENIOR CONTINUUM CARE
- HOTEL
- RETAIL

FIGURE 2-2A

CONCEPT SITE PLAN GROUND FLOOR PLAN

RELATED BRISTOL PROJECT, SANTA ANA

MACARTHUR BOULEVARD

DRIVEWAY H

DRIVEWAY G

DRIVEWAY L

DRIVEWAY I

DRIVEWAY F

DRIVEWAY M

BRISTOL CENTRAL PARK

BRISTOL PASEO

DRIVE

DRIVEWAY J

DRIVEWAY E

PLAZA

GREEN LINK

BRISTOL STREET

CALLEN'S COMMON

DRIVEWAY K

DRIVEWAY D

DRIVEWAY C

BRISTOL GREEN

BRISTOL PLAZA

DRIVEWAY A

DRIVEWAY B

SUNFLOWER AVENUE

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N NO SCALE

KEY

- RESIDENTIAL
- SENIOR CONTINUUM CARE
- HOTEL
- RETAIL

FIGURE 2-2B

CONCEPT SITE PLAN UPPER FLOOR PLAN

RELATED BRISTOL PROJECT, SANTA ANA

NOTE:
IT IS ASSUMED THAT THE ROAD INFRASTRUCTURE FOR THE PHASE 2 & 3 WILL BE CONSTRUCTED AT THE SAME TIME.

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N NO SCALE

SOURCE: RCR BRISTOL LLC

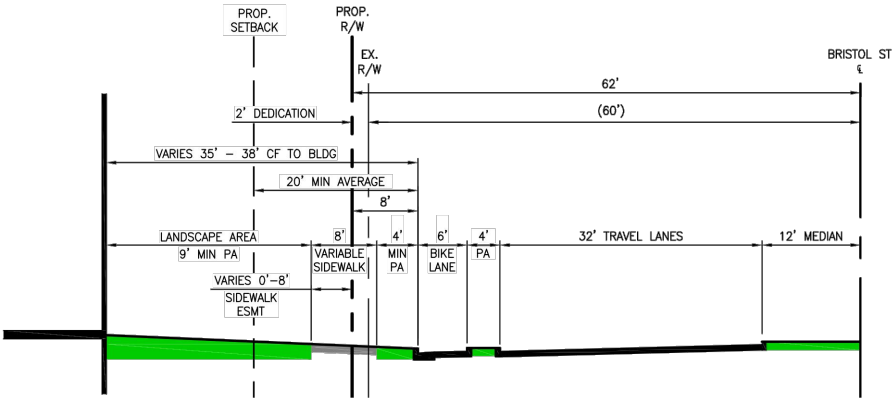
KEY

= PHASE 1
= PHASE 2
= PHASE 3
= PLANNED IMPROVEMENT
= PROJECT SPECIFIC IMPROVEMENT

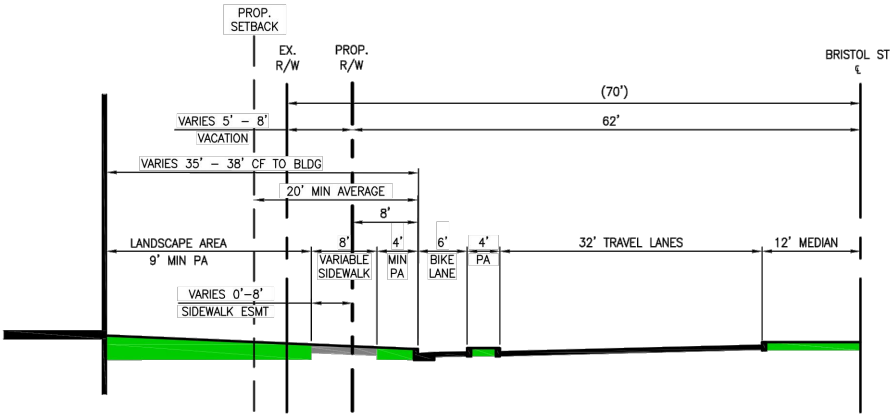
FIGURE 2-3

PROPOSED SITE CIRCULATION PLAN

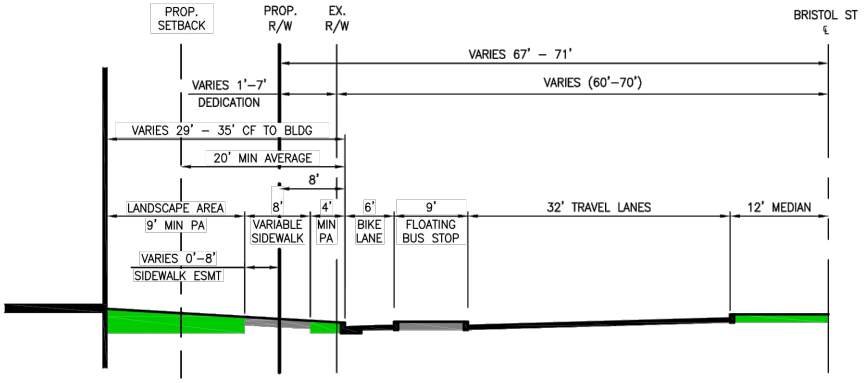
RELATED BRISTOL, SANTA ANA



BRISTOL STREET - RIGHT OF WAY DEDICATION (A)
SCALE: 1"=20'



BRISTOL STREET - RIGHT OF WAY VACATION (B)
SCALE: 1"=20'



BRISTOL STREET WITH FLOATING BUS STOP (C)
SCALE: 1"=20'

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LINSCOTT LAW & GREENSPAN engineers

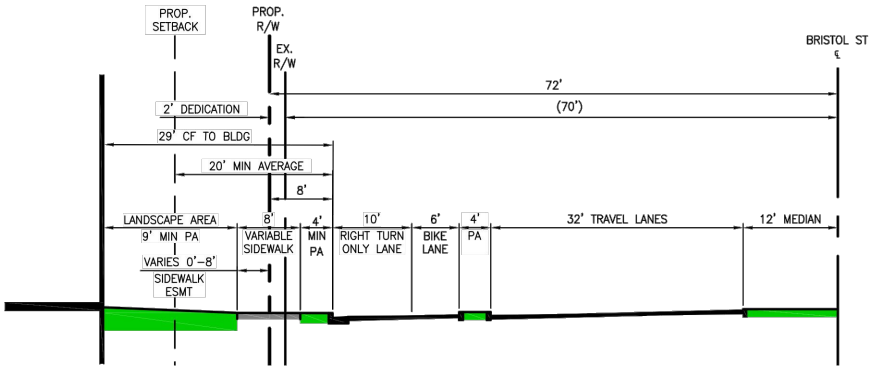
SOURCE: FUSCOE ENGINEERING, INC.

N NO SCALE

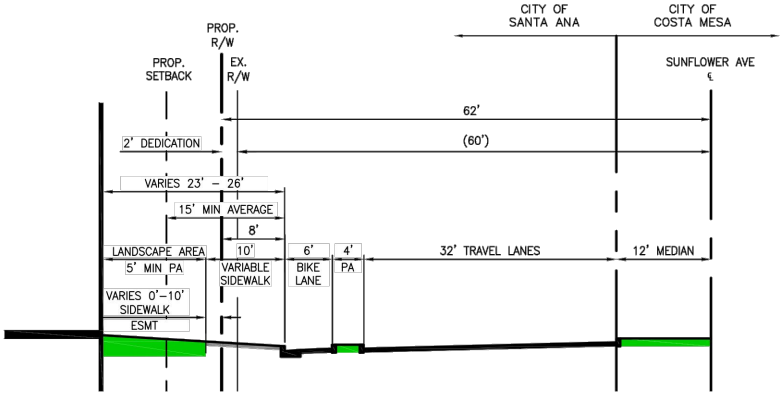
FIGURE 2–4A

BRISTOL STREET CROSS SECTIONS

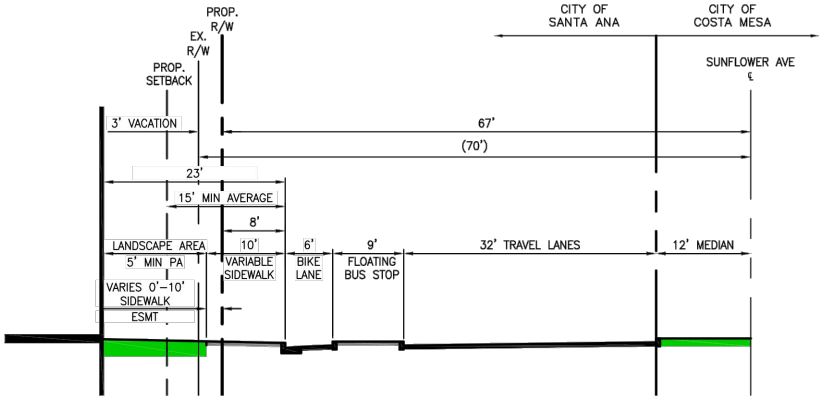
RELATED BRISTOL, SANTA ANA



BRISTOL ST WITH RIGHT TURN ONLY LANE (D)
SCALE: 1"=20'



SUNFLOWER AVE (E)
SCALE: 1"=20'



SUNFLOWER AVE WITH FLOATING BUS STOP (F)
SCALE: 1"=20'

LINSCOTT LAW & GREENSPAN engineers

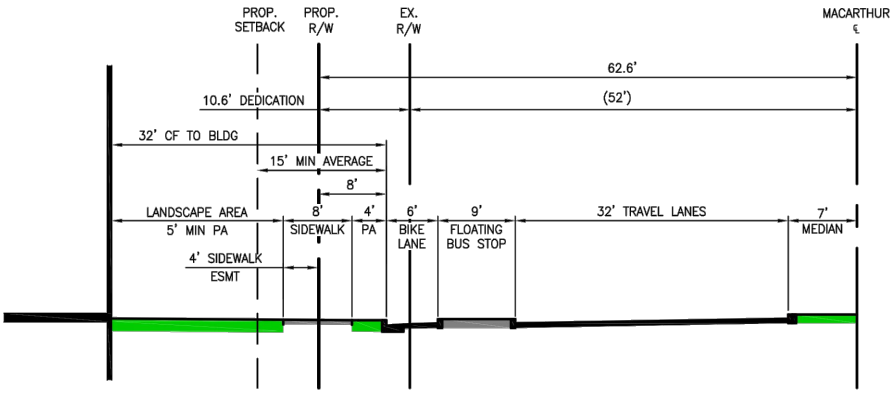
SOURCE: FUSCOE ENGINEERING, INC.

N NO SCALE

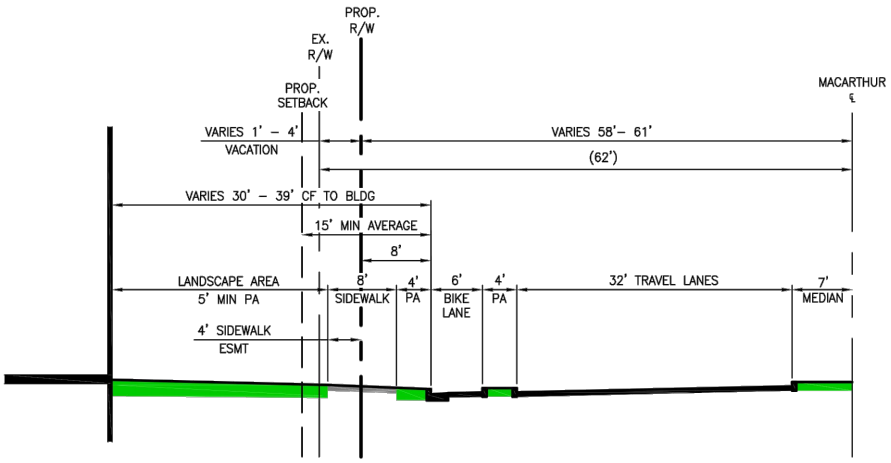
FIGURE 2-4B

BRISTOL STREET AND SUNFLOWER AVENUE CROSS SECTIONS

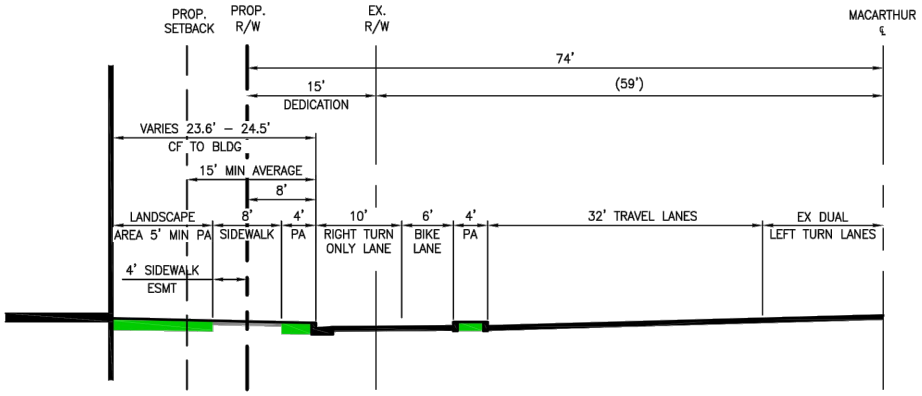
RELATED BRISTOL, SANTA ANA



MACARTHUR BLVD WITH FLOATING BUS STOP (G)
SCALE: 1"=20'



MACARTHUR BLVD - RIGHT OF WAY VACATION (H)
SCALE: 1"=20'



MACARTHUR BLVD - RIGHT OF WAY DEDICATION (I)
SCALE: 1"=20'

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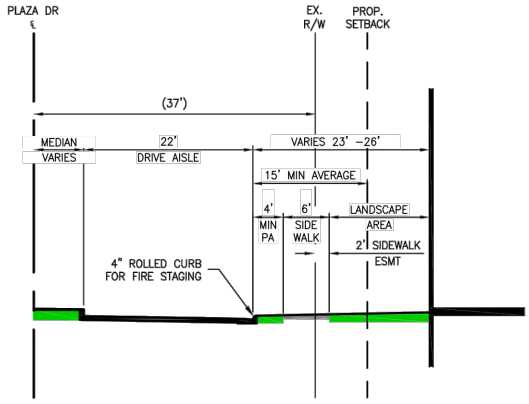
SOURCE: FUSCOE ENGINEERING, INC.

N NO SCALE

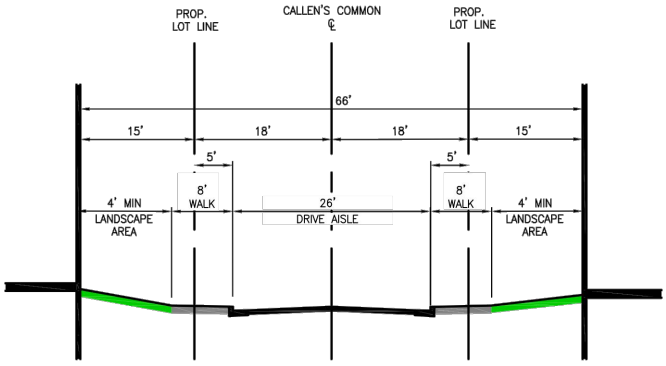
FIGURE 2–4C

MACARTHUR BOULEVARD CROSS SECTIONS

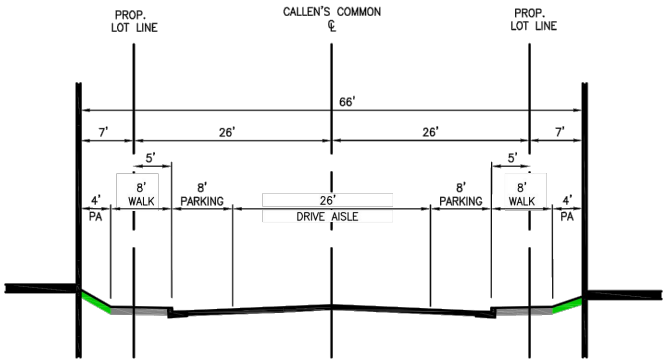
RELATED BRISTOL, SANTA ANA



PLAZA DR (J)
SCALE: 1"=20'



CALLEN'S COMMON (K)
SCALE: 1"=20'



CALLEN'S COMMON WITH STREET PARKING (L)
SCALE: 1"=20'

LINSCOTT LAW & GREENSPAN engineers

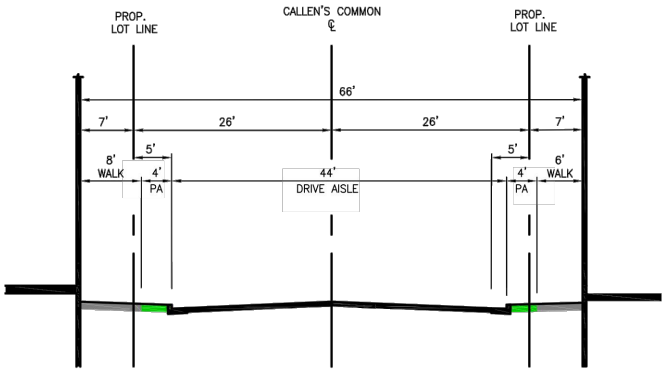
SOURCE: FUSCOE ENGINEERING, INC.

N NO SCALE

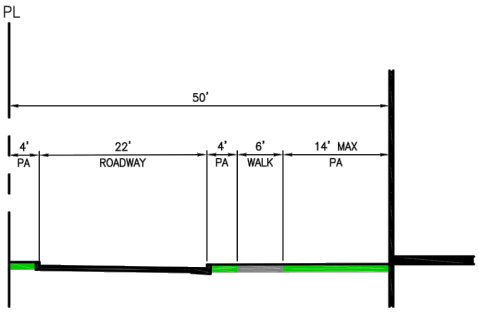
FIGURE 2-4D

PLAZA DRIVE AND CALLENS COMMONS CROSS SECTIONS

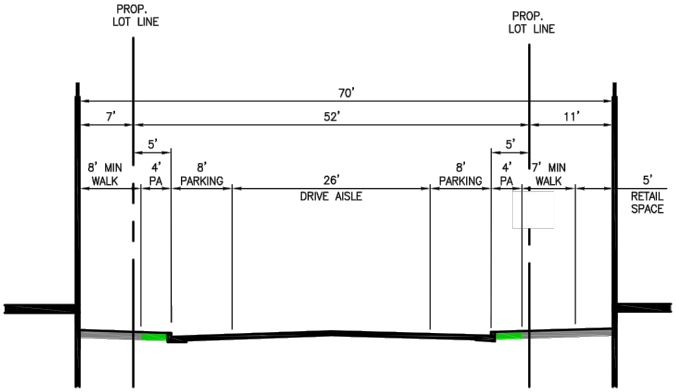
RELATED BRISTOL, SANTA ANA



CALLEN'S COMMON AT BRISTOL M
SCALE: 1"=20' -



PRIVATE ROADWAY N
SCALE: 1"=20' -



BRISTOL PASEO O
SCALE: 1"=20' -

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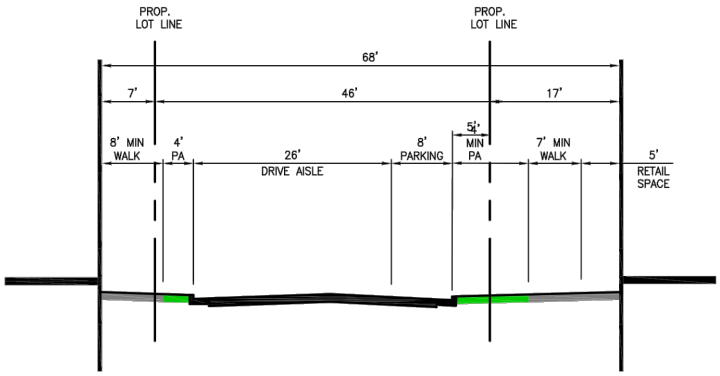
SOURCE: FUSCOE ENGINEERING, INC.

N NO SCALE

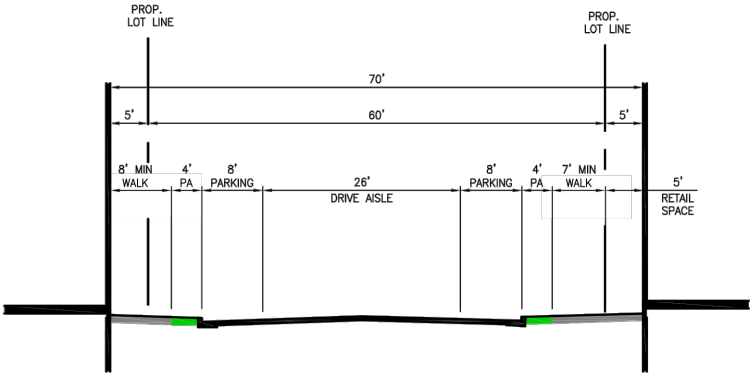
FIGURE 2-4E

CALLENS COMMONS, PRIVATE ROAD AND BRISTOL PASEO CROSS SECTIONS

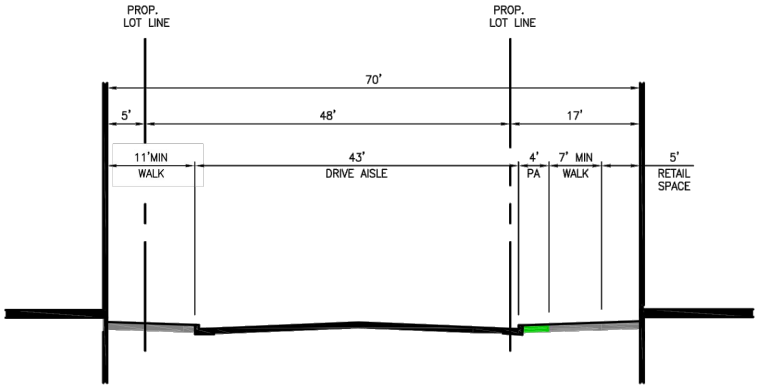
RELATED BRISTOL, SANTA ANA



BRISTOL PASEO P
SCALE: 1"=20'



BRISTOL PASEO Q
SCALE: 1"=20'



BRISTOL PASEO R
SCALE: 1"=20'

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LINSCOTT LAW & GREENSPAN engineers

SOURCE: FUSCOE ENGINEERING, INC.

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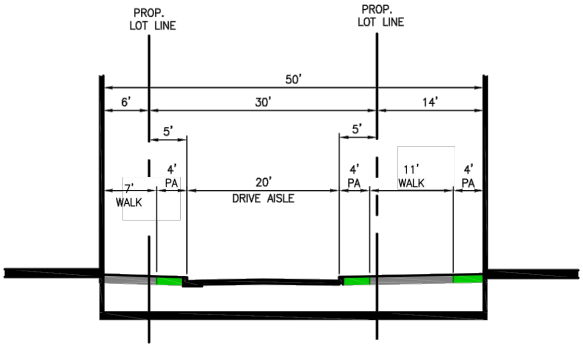
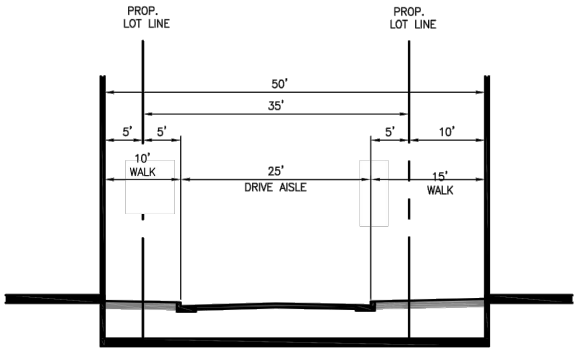
FIGURE 2-4F

BRISTOL PASEO CROSS SECTIONS

RELATED BRISTOL, SANTA ANA



EAST/WEST RESIDENTIAL ROADWAY (S)
SCALE: 1"=20'



RETAIL LOOP (T)
SCALE: 1"=20'

LINSCOTT LAW & GREENSPAN engineers

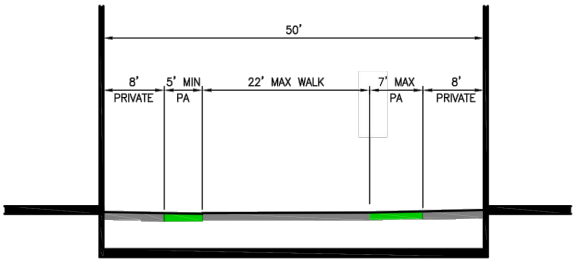
N NO SCALE

SOURCE: FUSCOE ENGINEERING, INC.

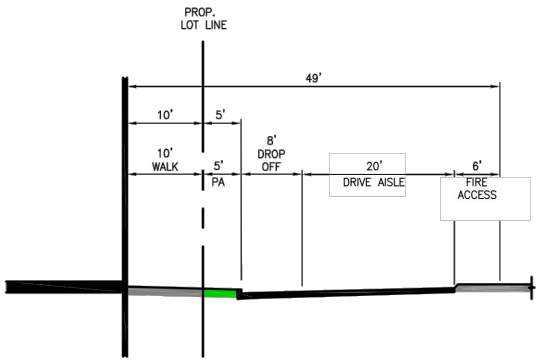
FIGURE 2-4G

EAST/WEST RESIDENTIAL DRIVEWAY AND RETAIL LOOP CROSS SECTIONS

RELATED BRISTOL, SANTA ANA



GREEN LINK
SCALE: 1"=20'
U
-



BRISTOL GREEN LOOP
SCALE: 1"=20'
V
-

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: FUSCOE ENGINEERING, INC.

FIGURE 2-4H

GREEN LINK AND BRISTOL GREEN LOOP CROSS SECTIONS

RELATED BRISTOL, SANTA ANA

3.0 EXISTING CONDITIONS

3.1 Existing Street System

The principal local network of streets serving the project site is Bristol Street, South Plaza Drive, Bear Street, MacArthur Boulevard, and Sunflower Avenue. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions.

Bristol Street is a six-lane divided roadway, oriented in the north-south direction, that borders the Project site to the east. The posted speed limit on Bristol Street is 40 miles per hour (mph). On-street parking is not permitted on either side of this roadway in the vicinity of the Project.

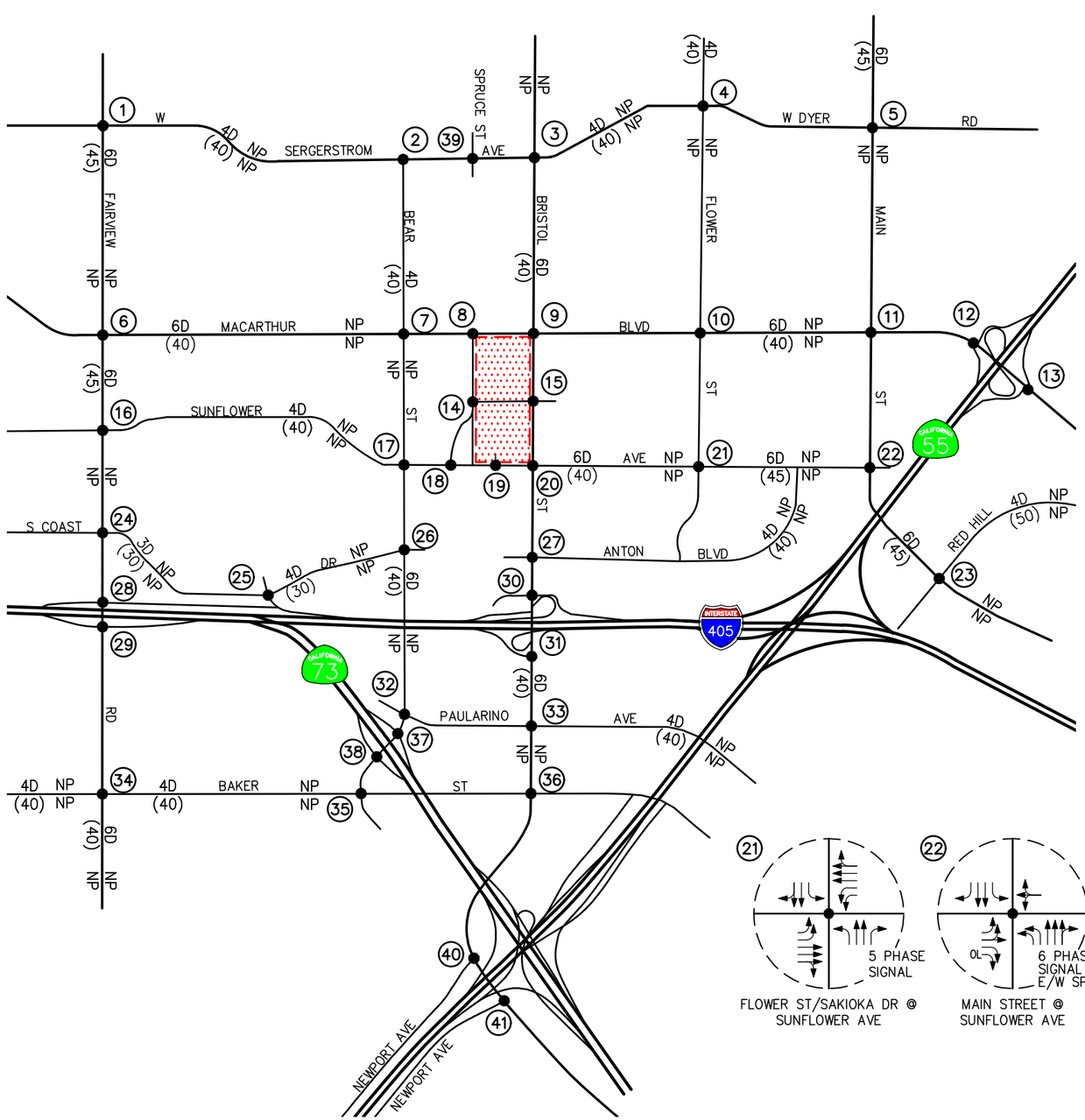
South Plaza Drive is a four-lane divided roadway, oriented in the north-south direction, that borders the Project site to the west. The posted speed limit on South Plaza Drive is 25 mph. On-street parking is not permitted along this roadway in the vicinity of the project.

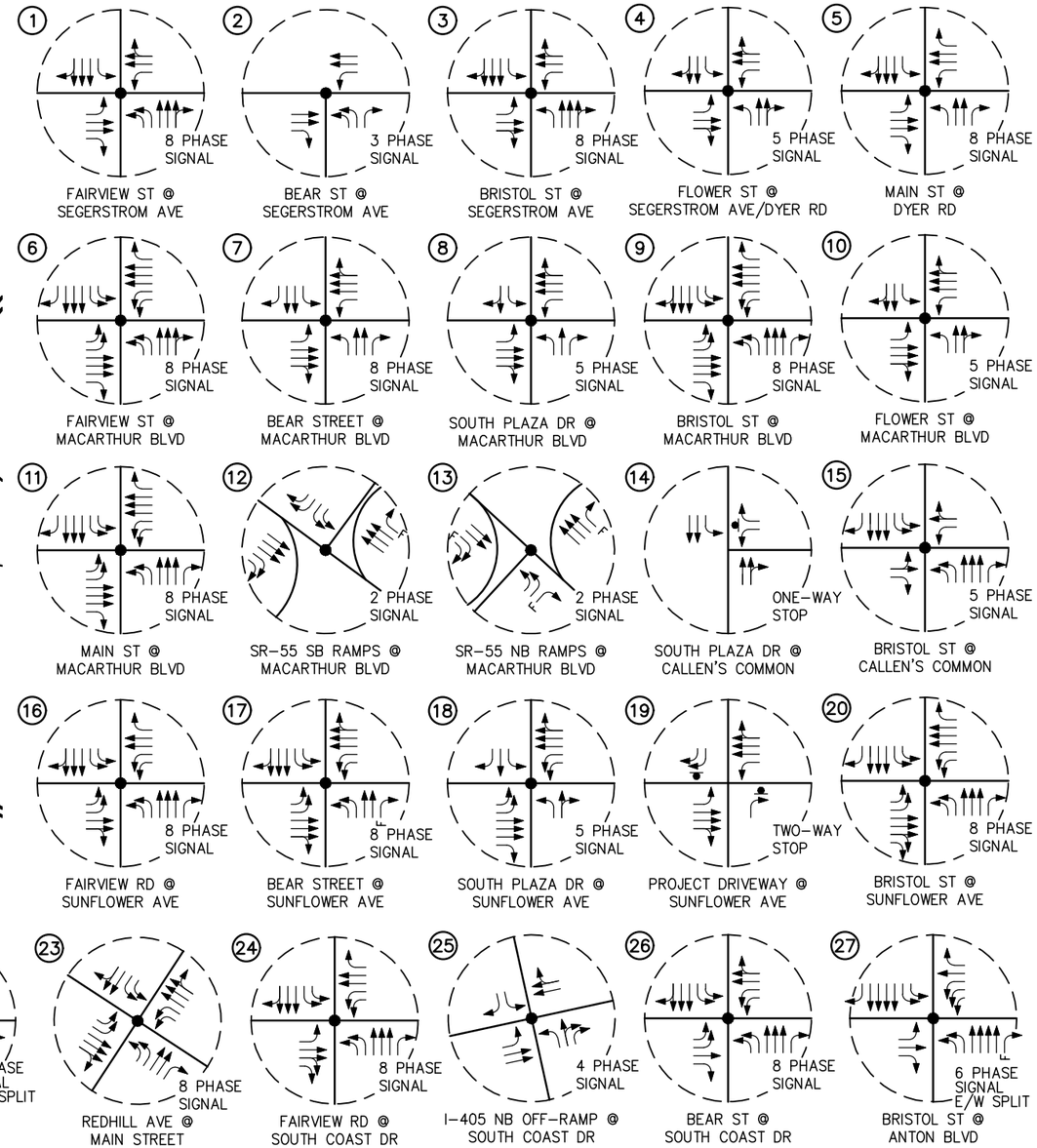
Bear Street is four-lane divided roadway north of MacArthur Boulevard, five-lane divided roadway between MacArthur Boulevard and Sunflower Avenue, and a six-lane divided roadway south of Sunflower Avenue, oriented in the north-south direction. The posted speed limit on Bear Street is 40 mph. On-street parking is not permitted along this roadway in the vicinity of the project.

MacArthur Boulevard a six-lane divided roadway, oriented in the east-west direction, that borders the Project site to the north. The posted speed limit on MacArthur Boulevard is 40 mph. On-street parking is not permitted along this roadway in the vicinity of the project.

Sunflower Avenue is a four-lane divided roadway west of Brea Street, and a six-lane divided roadway east of Bear Street, oriented in the east-west direction, that borders the Project site to the south. The posted speed limit on Sunflower Avenue is 40 mph. On-street parking is not permitted on either side of this roadway in the vicinity of the Project.

Figure 3-1 presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the key area study intersections.





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

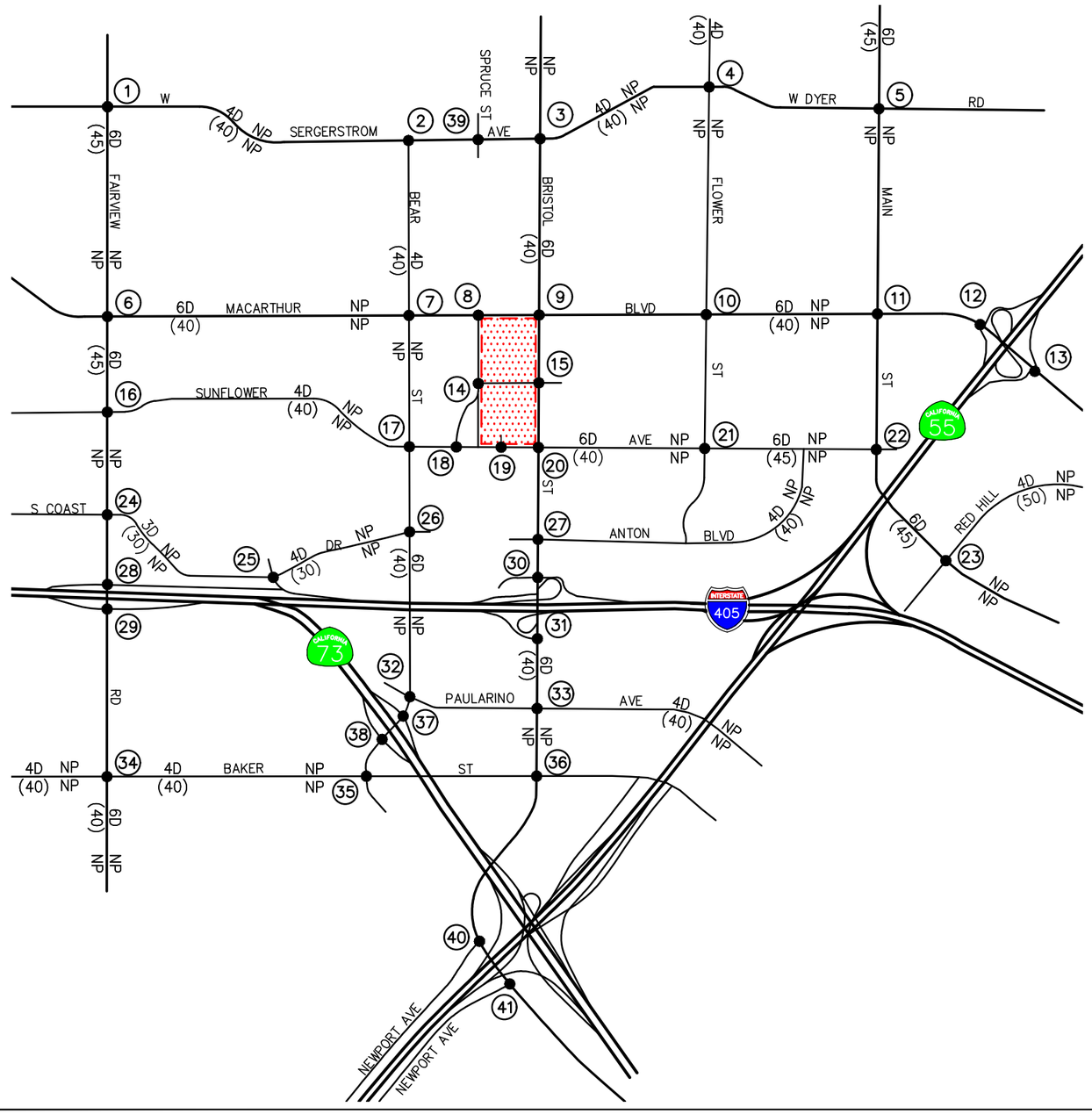
KEY

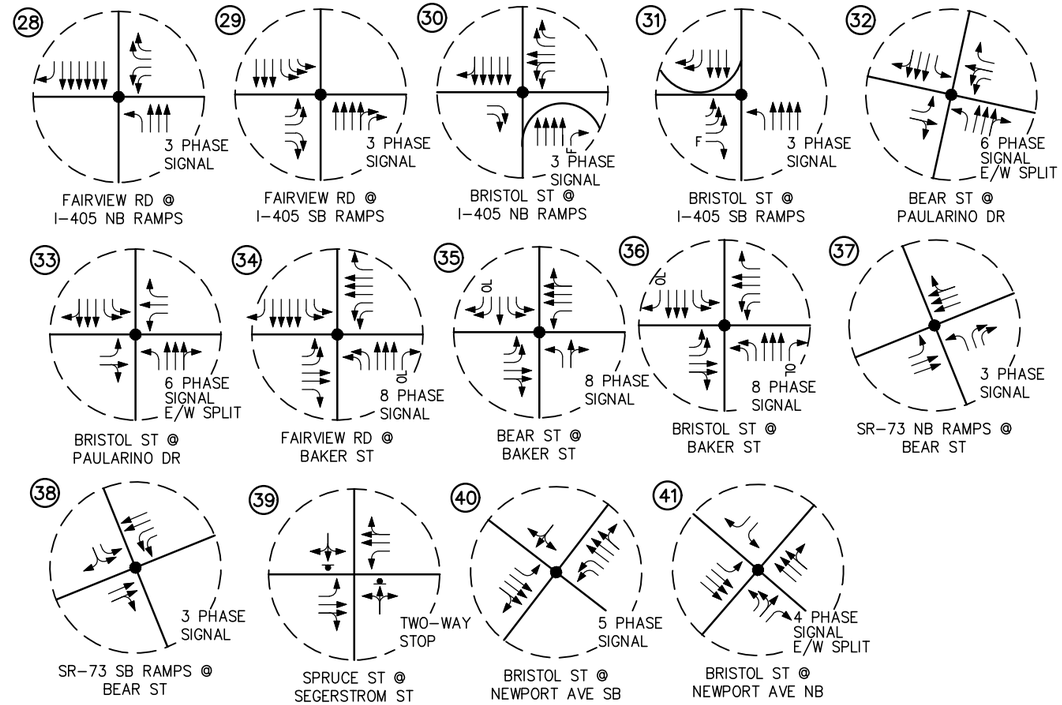
- ← = APPROACH LANE ASSIGNMENT
- ● = TRAFFIC SIGNAL, ▼ = STOP SIGN
- P = PARKING, NP = NO PARKING
- U = UNDIVIDED, D = DIVIDED
- 2 = NUMBER OF TRAVEL LANES
- (XX)= POSTED SPEED LIMIT (MPH)
- F = FREE-RIGHT, OL = OVERLAP
- ▭ = PROJECT SITE

FIGURE 3-1A

EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

- ← = APPROACH LANE ASSIGNMENT
- ● = TRAFFIC SIGNAL, ▼ = STOP SIGN
- P = PARKING, NP = NO PARKING
- U = UNDIVIDED, D = DIVIDED
- 2 = NUMBER OF TRAVEL LANES
- (XX)= POSTED SPEED LIMIT (MPH)
- F = FREE-RIGHT, OL = OVERLAP
- ▭ = PROJECT SITE

FIGURE 3-1B

EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS

RELATED BRISTOL, SANTA ANA

3.1.1 *Public Transit*

Public transit bus service for the Project site is adequate and is provided in the project area by the Orange County Transportation Authority (OCTA). OCTA is the leading transit provider in Orange County and offers a wide range of fixed-route bus services. OCTA has developed an extensive network of transit routes to connect residents and commuters of Santa Ana to key destinations. Five (5) OCTA bus routes operate within the vicinity of the project site on Macarthur Boulevard, Bristol Street, Sunflower Avenue, Plaza Drive, and Bear Street which consists of the following:

- OCTA Route 55: The major routes of travel include Macarthur Boulevard and Bristol Street. Nearest to the project site are bus stops on Bristol Street – northbound and southbound south of the intersection with Macarthur Boulevard. Route 55 operates on approximate 30-minute headways during weekdays and weekends. The nearest five bus stops are located directly east of the project site, along Bristol Street between MacArthur Boulevard and Sunflower Avenue.

- OCTA Route 57: The major route of travel includes Bristol Street. Nearest to the project site are bus stops on Bristol Street – northbound and southbound south of the intersection with Macarthur Boulevard. Route 57 operates on approximate 15-minute headways on the weekdays and weekends. The nearest five bus stops are located directly east of the project site, along Bristol Street between MacArthur Boulevard and Sunflower Avenue.

  OCTA Route 76: The major route of travel includes Macarthur Boulevard. Nearest to the project site are bus stops on Macarthur Boulevard– eastbound and westbound west of the intersection with Bristol Street. Route 76 operates on approximate 60-minute headways on the weekdays and does not operate on weekends. The nearest two bus stops are located directly north of the project site, along MacArthur Boulevard between South Plaza Drive and Bristol Street.

- OCTA Route 86: The major routes of travel include Bristol Street and Sunflower Avenue. Nearest to the project site is a bus stop on Bristol Street – northbound and southbound north of the intersection with Sunflower Avenue. Route 86 operates on approximate 60-minute headways on the weekdays and does not operate on weekends. The nearest four bus stops are located directly south, west, and east of the project site. The bus stop south of the site is located along Sunflower Avenue between South Plaza Drive and Bristol Street. The bus stop west of the project site is located along South Plaza Drive, between Callen's Common and Sunflower Avenue. The two bus stops east of the project site are located along Bristol Street between MacArthur Boulevard and Callen's Common.

- OCTA Route 150: The major route of travel is Sunflower Avenue. Nearest to the project site are bus stops on Sunflower Ave– eastbound and westbound east and west of the intersection with South Plaza Drive. Route 150 operates on approximate 40-minute headways on the weekdays and does not operate on weekends. The nearest two bus stops are located south of the project site along Sunflower Avenue. The first is between South Plaza Drive and Bristol Street and the second is between Bear Street and South Plaza Drive.

Furthermore, the Southern California Regional Rail Authority also provides commuter and passenger rail service to Santa Ana. The Metrolink Orange County Line and the Inland Empire-Orange County commuter lines travel through Santa Ana, with stops at the Santa Ana Regional Transportation Center. Amtrak's Pacific Surfliner also provides passenger rail service through Santa Ana, connecting residents and commuters of Santa Ana to neighboring communities throughout Southern California such as Los Angeles and San Diego counties.

Figure 3-2 graphically illustrates the transit routes of OCTA within the vicinity of the project. ***Figure 3-3*** identifies the locations of the existing bus stops in proximity to the Project site.

3.2 Bicycle Master Plan

The City of Santa Ana and Costa Mesa both promote bicycling as a means of mobility and a way in which to improve the quality of life within its community. The Bikeway Master Plan recognizes the needs of bicycle users and aims to create a complete and safe bicycle network throughout the City. The City of Santa Ana and Costa Mesa provided an extensive network of existing and future bicycle facilities in close proximity to the project site. A Class IV bike lane is proposed along Sunflower Avenue, between Bear Street and Bristol Street. In addition, there are Class II bike lanes along Bristol Street and MacArthur Boulevard, between Sunflower Avenue and Macarthur Boulevard and between Bear Street and Bristol Street that will be converted to Class IV bike lanes to further enhance user safety. A Class I bike lane can be found along Bear Street between Macarthur Boulevard and Sunflower Avenue. A Class IV Cycle Track is located between Bear Street and Bristol Street and connects to the Class II bike lane. ***Figures 3-4 and 3-5*** present the City of Santa Ana's and Costa Mesa's Bikeway Master Plans, respectively.

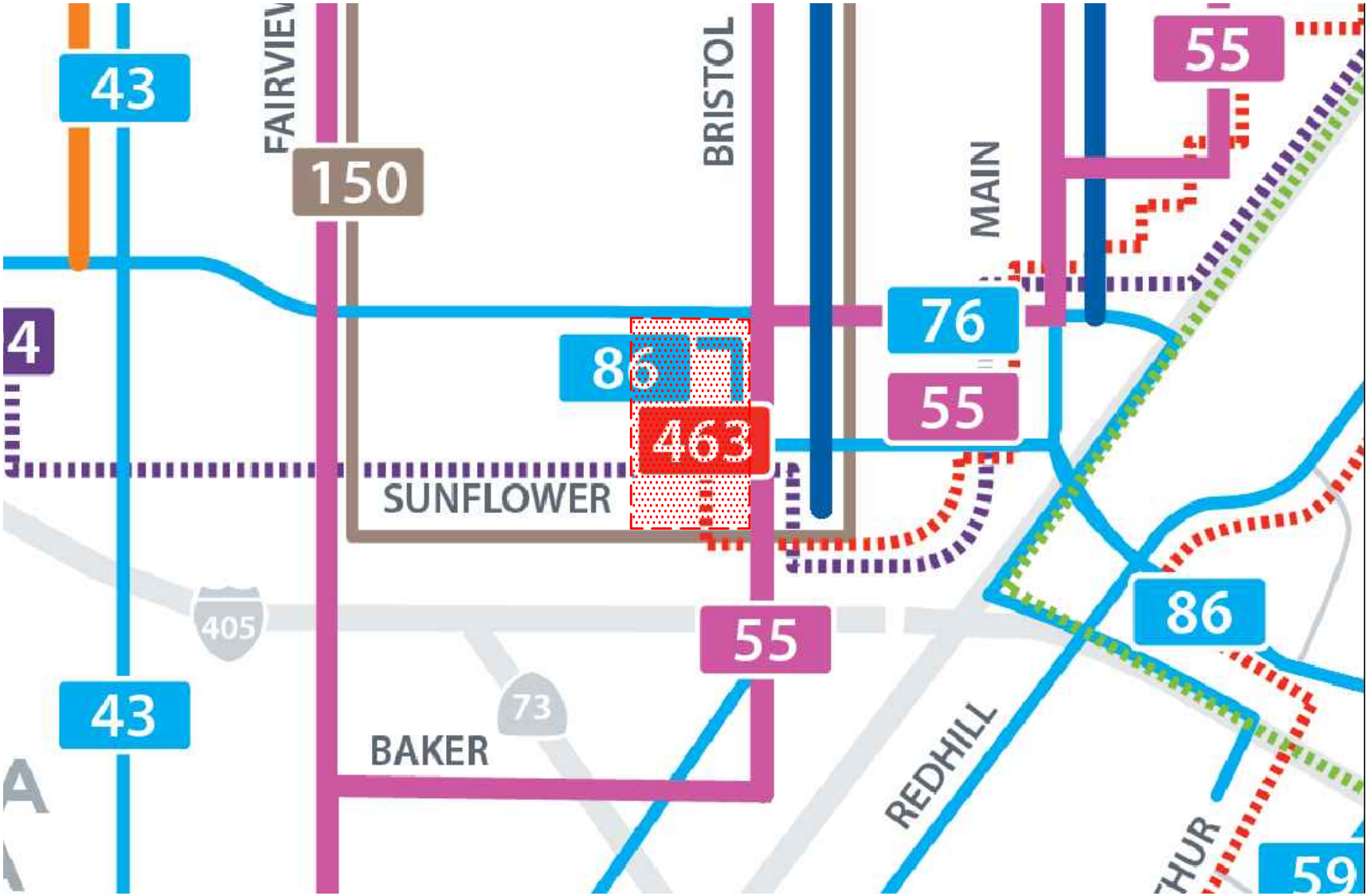
3.3 Existing Traffic Volumes

Forty-one (41) key study intersections and forty-three (43) roadway segments have been identified as the locations at which to evaluate existing and future traffic operating conditions. Some portion of potential project-related traffic will pass through each of these intersections, and their analysis will reveal the potential need for Project-related circulation improvements.

Due to the COVID-19 virus, traffic patterns have changed and are significantly lower than pre-COVID-19 conditions. As such, to establish "baseline" traffic conditions, pre-COVID-19, historic Year 2020 traffic counts were obtained from the City of Santa Ana General Plan at fourteen (14) study intersections and three (3) roadway segments. Given the availability of historic data, the following steps were used to establish Existing Year 2022 pre-COVID-19 baseline traffic conditions:

(1) Historic data is available at fourteen (14) study intersections and three (3) roadway segments for Year 2020.

(2) Given data is not available at the remaining twenty-seven (27) study intersections and forty (40) roadway segments, Year 2022 traffic counts were collected in May 2022, September 2022,



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: OCTA

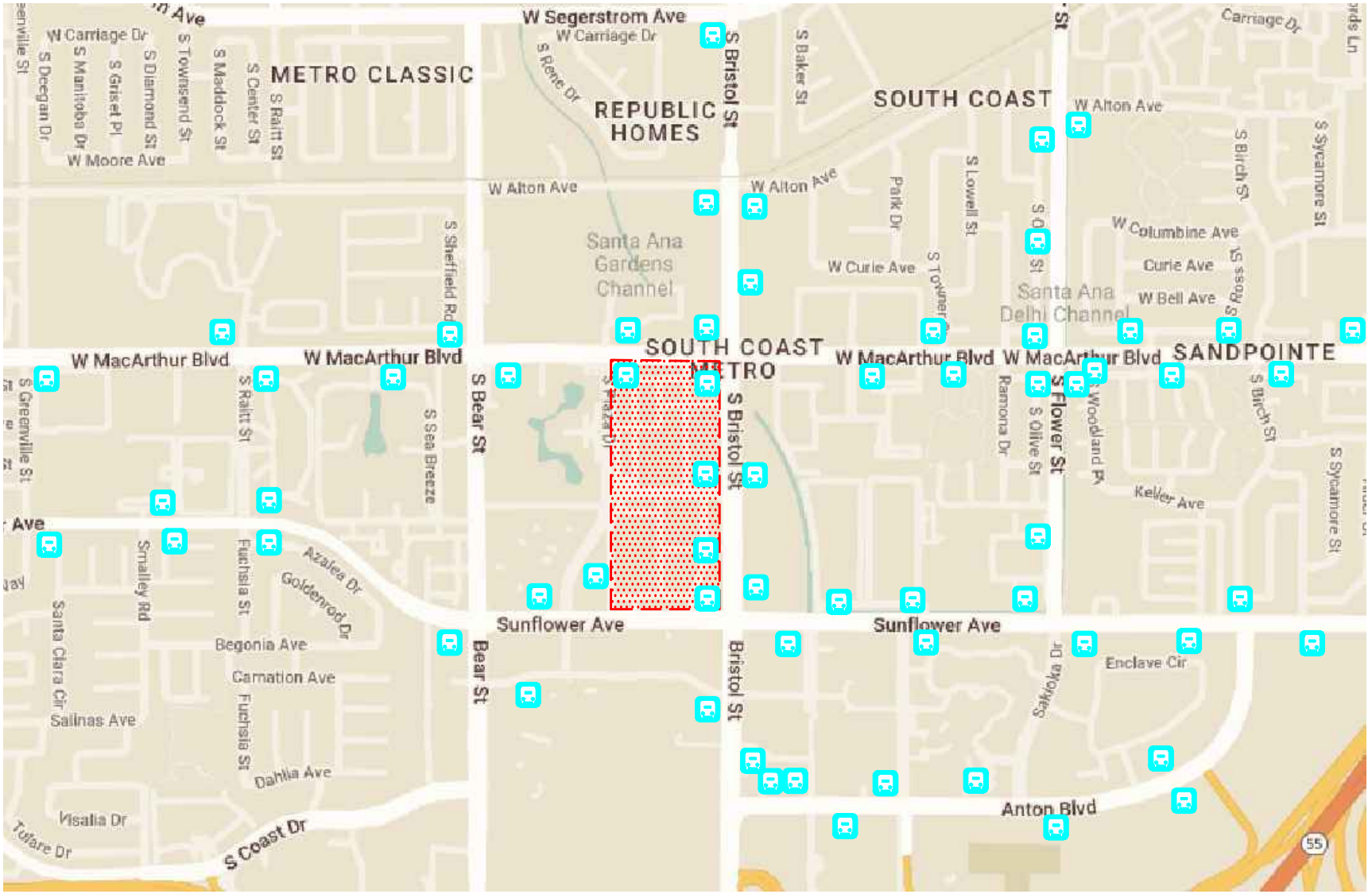
KEY

= PROJECT SITE

FIGURE 3-2

OCTA TRANSIT MAP

RELATED BRISTOL, SANTA ANA



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

KEY

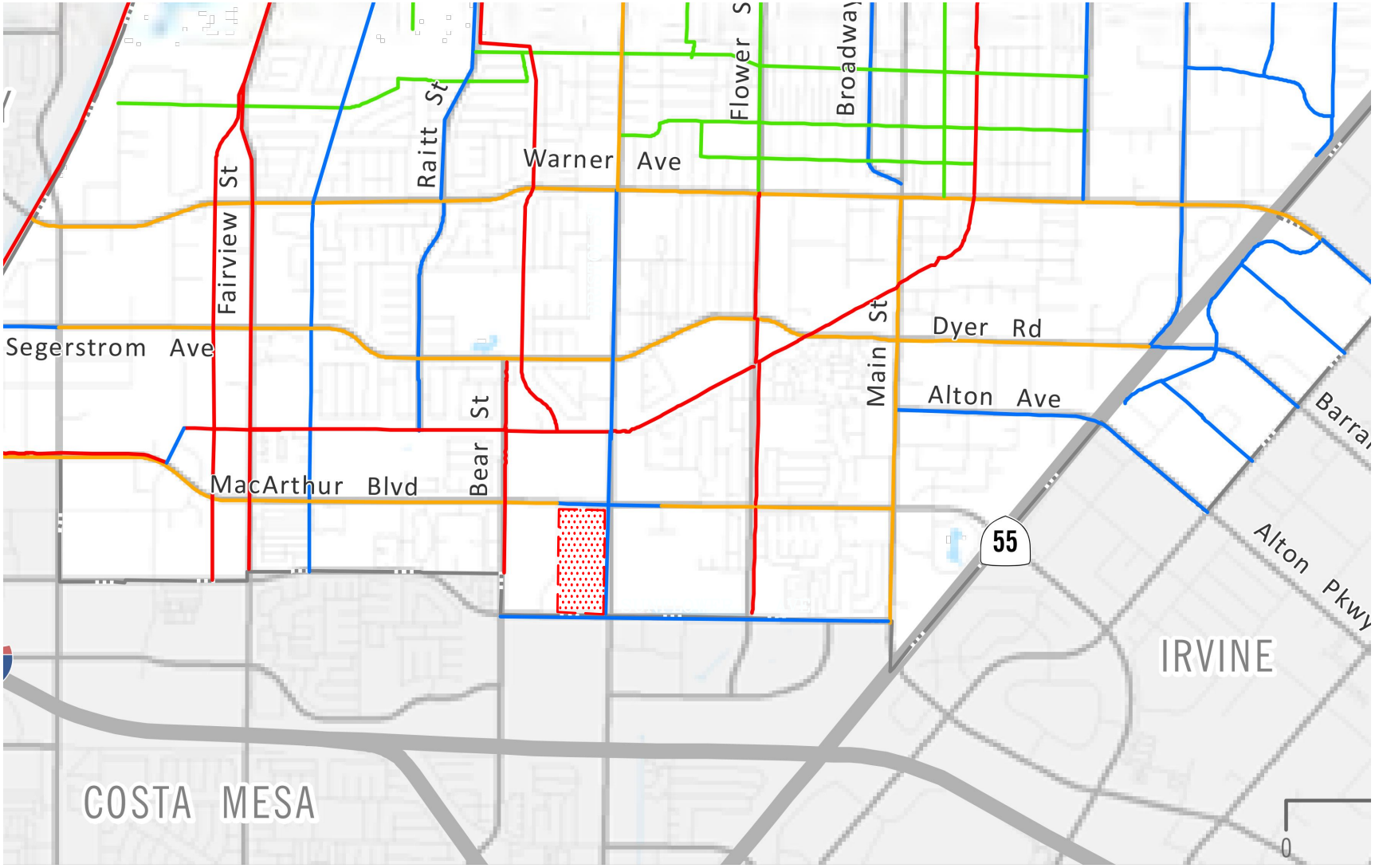
= PROJECT SITE

= TRANSIT STOP

FIGURE 3-3

TRANSIT STOP LOCATIONS

RELATED BRISTOL, SANTA ANA



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: CITY OF SANTA ANA GENERAL PLAN

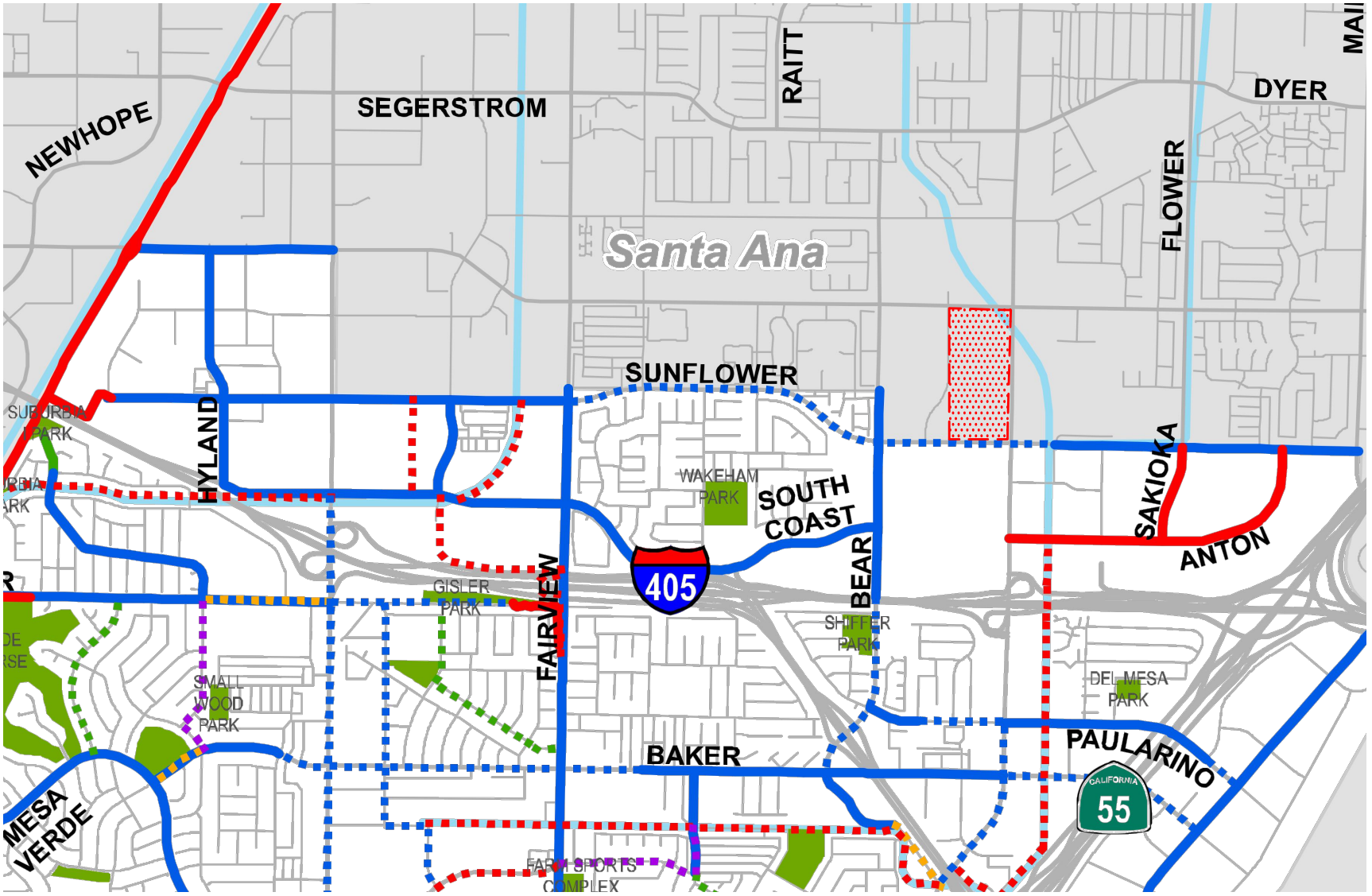
KEY

= PROJECT SITE
= CLASS I PATH
= CLASS II BIKE LANE
= CLASS III BIKE ROUTE/BOULEVARD
= CLASS IV CYCLE TRACK

FIGURE 3-4

CITY OF SANTA ANA MASTER PLAN OF BIKEWAYS

RELATED BRISTOL, SANTA ANA



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: CITY OF COSTA MESA GENERAL PLAN

KEY

= PROJECT SITE
= CLASS I PATH
= CLASS II BIKE LANE
= CLASS III BIKE ROUTE/BOULEVARD

FIGURE 3-5

CITY OF COSTA MESA BIKEWAY MASTER PLAN

RELATED BRISTOL, SANTA ANA

October 2022, November 2022 and January 2023 for use in establishing traffic counts/turning movement percentages.

(3) Using information from (1) and (2), compare Year 2020 to Year 2022 to establish change in traffic counts as a result of the current traffic patterns.

(4) Apply the rate calculated in (3) to Year 2022 traffic counts and forecast Year 2020 traffic conditions at the twenty-seven (27) study intersections and forty (40) roadway segments.

(5) Lastly, apply an annual growth factor of 0.5% per year to the Year 2020 traffic conditions to establish Year 2022 baseline traffic conditions.

Figures 3-6 and ***3-7*** illustrate the existing AM and PM peak hour traffic volumes at the forty-one (41) key study intersections evaluated in this report, respectively. ***Appendix B*** contains the detailed peak hour and daily traffic count sheets for the key intersections and roadway segments evaluated in this report.

3.4 Existing Intersection Conditions

In conformance with Cities of Santa Ana, Costa Mesa, and Irvine, existing AM and PM peak hour operating conditions for the forty-one (41) key study intersections were evaluated using the *Intersection Capacity Utilization* (ICU) methodology for signalized intersections and the methodology outlined in the *Highway Capacity Manual 6* (HCM 6) for unsignalized intersections.

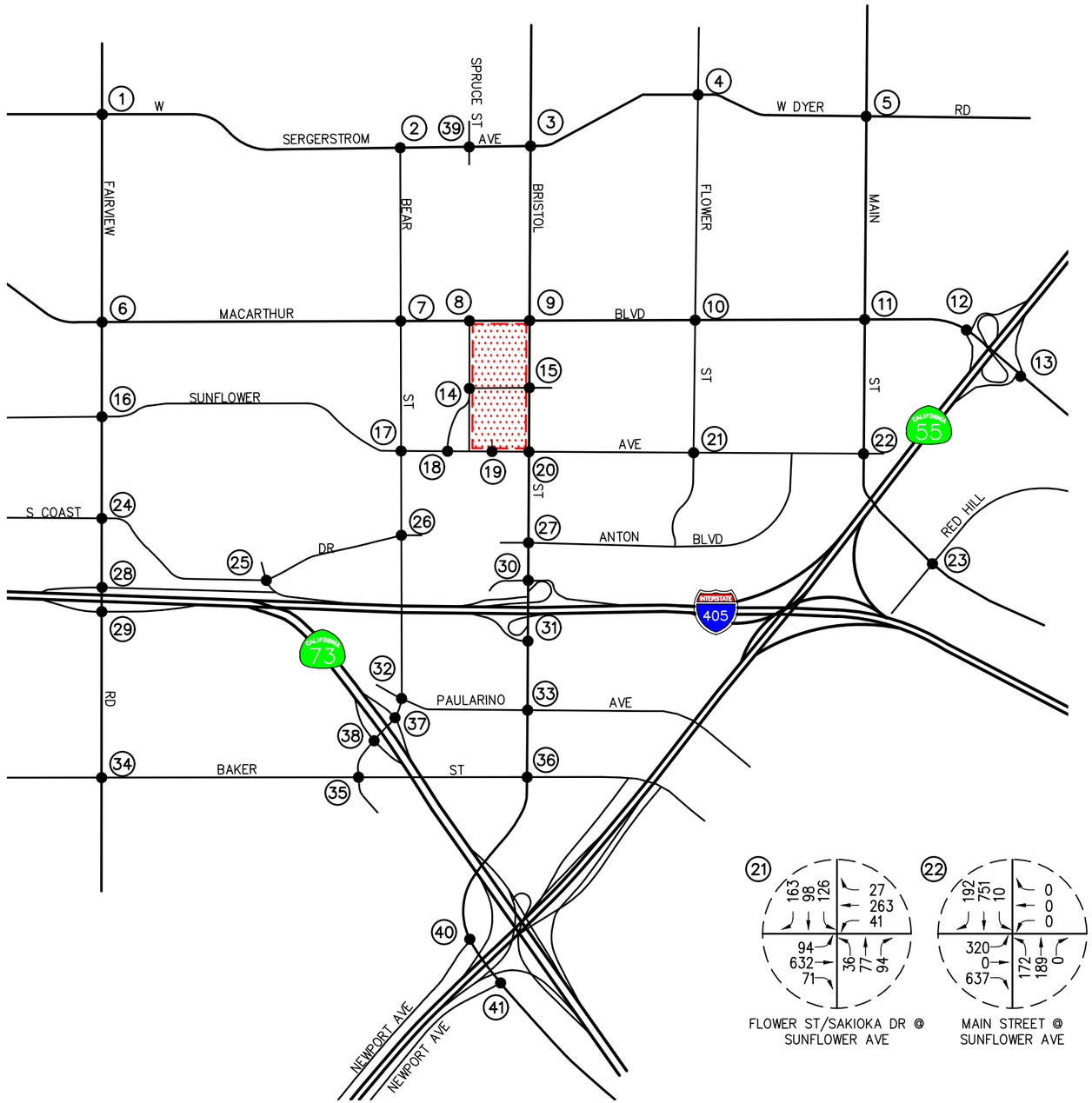
In conformance with Caltrans requirements, existing AM and PM peak hour operating conditions for the state-controlled study intersections were evaluated using the methodology outlined in the *Highway Capacity Manual 6* (HCM 6) for signalized intersections.

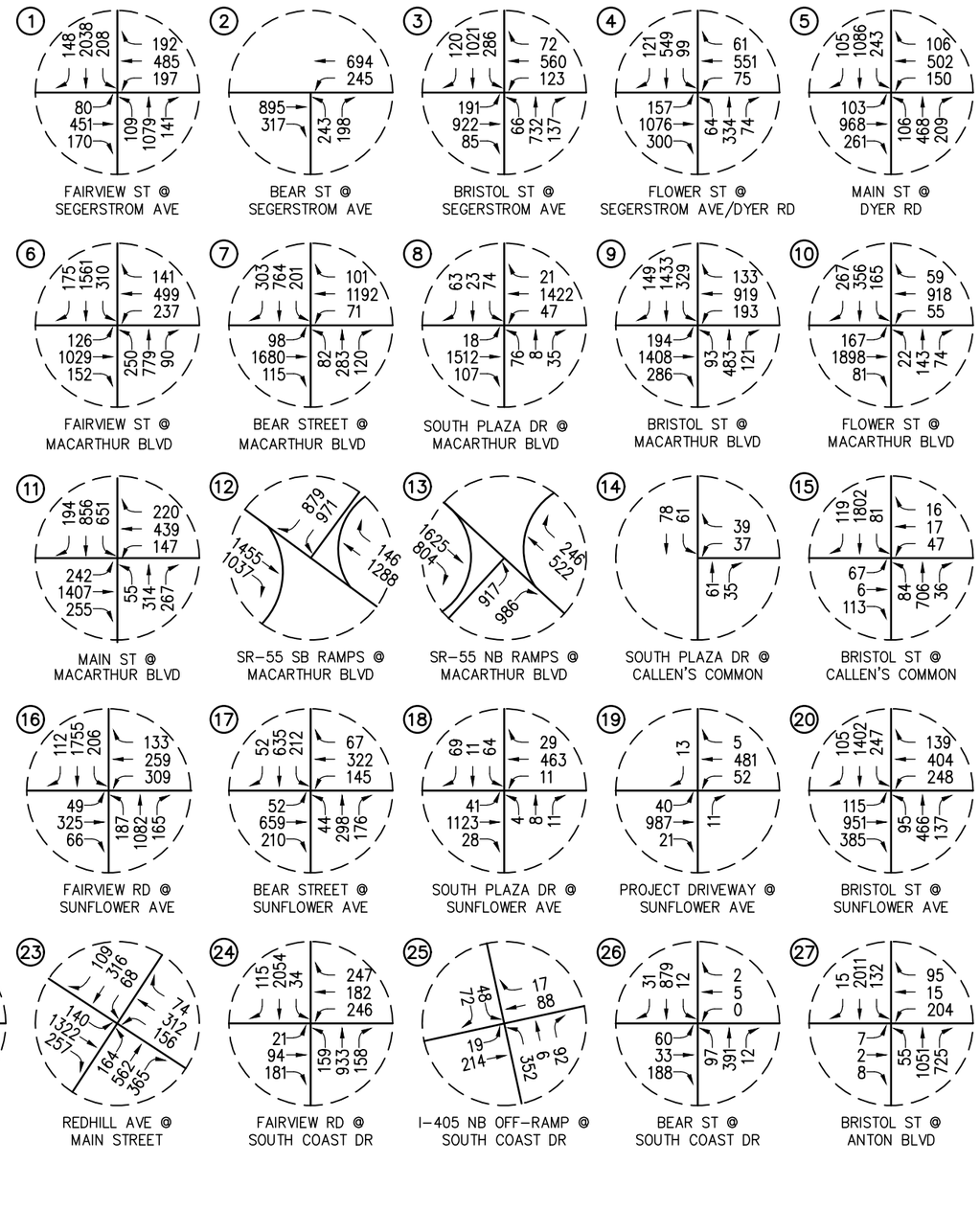
In conformance with the City of Santa Ana requirements, analysis of the forty-three (43) roadway segments were evaluated per the methodology presented in the County Master Plan of Arterial Highways (MPAH) and the City of Santa Ana Circulation Element.

3.4.1 *Intersection Capacity Utilization (ICU) Method of Analysis*

In conformance with the Cities of Santa Ana, Costa Mesa, and Irvine, peak hour operating conditions for the key signalized study intersections were evaluated using the Intersection Capacity Utilization (ICU) method. The ICU technique is intended for signalized intersection analysis and estimates the volume to capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements. The ICU numerical value represents the percent signal (green) time, and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing.

Per City of Santa Ana requirements, the ICU calculations use a lane capacity of 1,700 vehicles per hour (vph) for through lanes and 1,600 vph for left-turn lanes and right-turn lanes. A clearance adjustment factor of 0.05 was added to each Level of Service calculation.





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

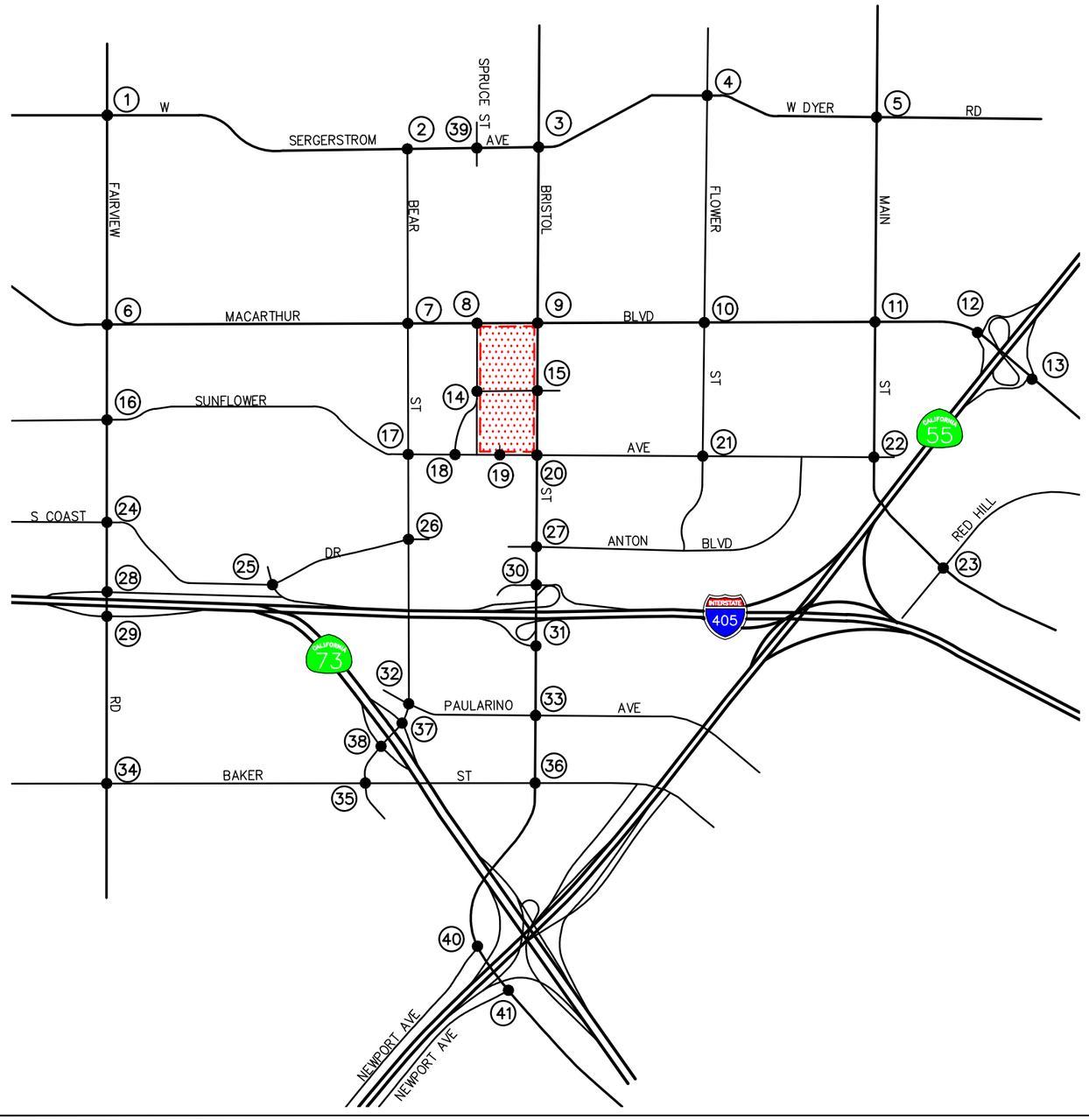
(#) = STUDY INTERSECTION

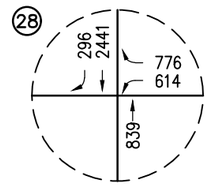
= PROJECT SITE

FIGURE 3-6A

EXISTING AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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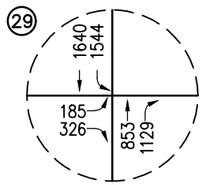
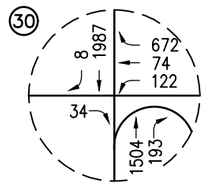
I-405 NB RAMPS



FAIRVIEW RD @
I-405 SB RAMPS



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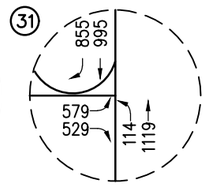
I-405 NB RAMPS



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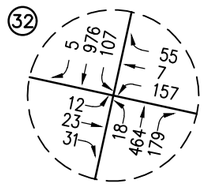
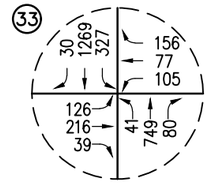
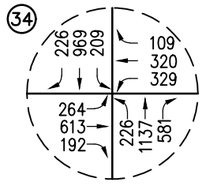
I-405 SB RAMPS



BEAR ST @
PAULARINO DR



BRISTOL ST @
PAULARINO DR



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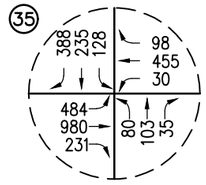
BAKER ST



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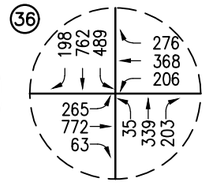
BAKER ST



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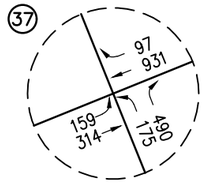
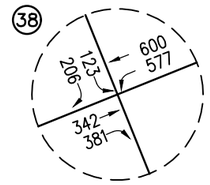
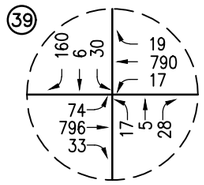
BAKER ST



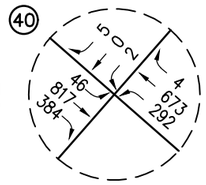
SR-73 NB RAMPS @
BEAR ST



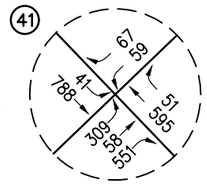
SR-73 SB RAMPS @
BEAR ST



SPRUCE ST @
SEGERSTROM AVE



BRISTOL ST @
NEWPORT AVE NB



BRISTOL ST @
NEWPORT AVE SB

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

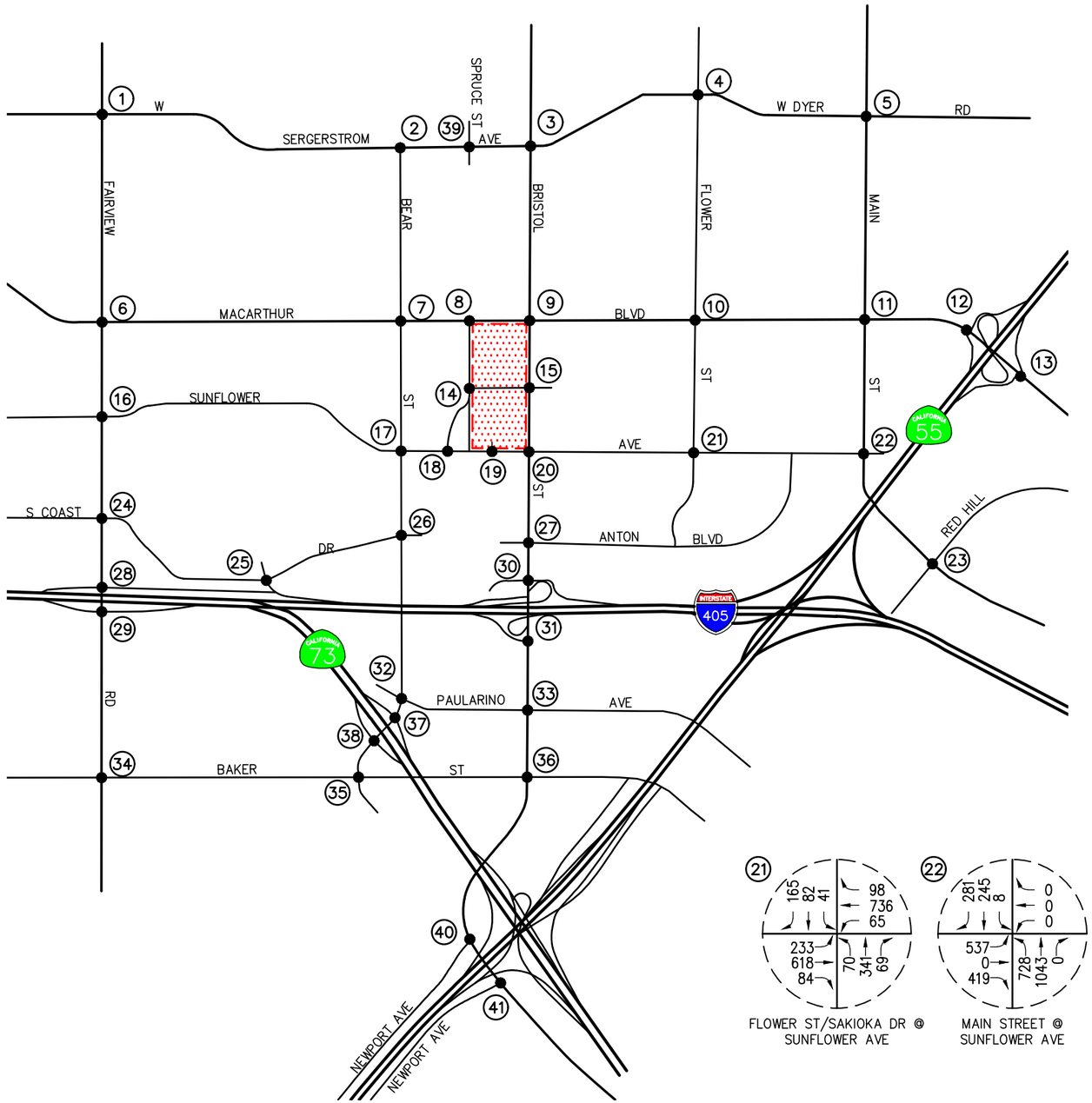
(#) = STUDY INTERSECTION

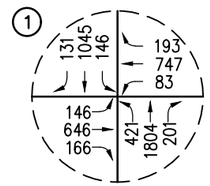
= PROJECT SITE

FIGURE 3-6B

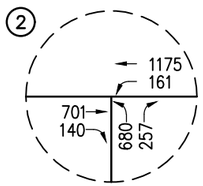
EXISTING AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA

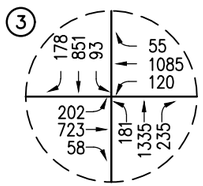




FAIRVIEW ST @
SEGERSTROM AVE



BEAR ST @
SEGERSTROM AVE



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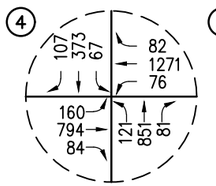
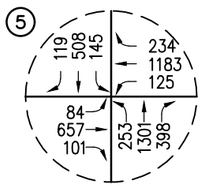
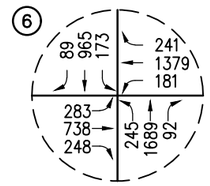
SEGERSTROM AVE



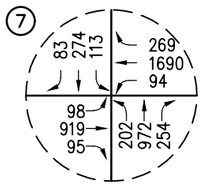
FLOWER ST @
SEGERSTROM AVE/DYER RD



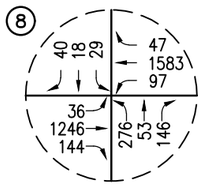
MAIN ST @
DYER RD



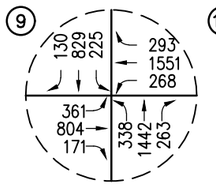
FAIRVIEW ST @
MACARTHUR BLVD



BEAR STREET @
MACARTHUR BLVD



SOUTH PLAZA DR @
MACARTHUR BLVD



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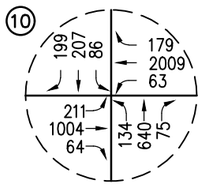
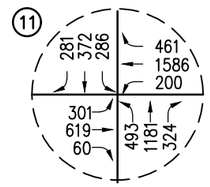


FLOWER ST @
MACARTHUR BLVD



MAIN ST @
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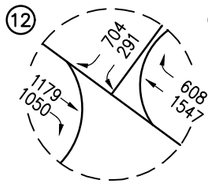
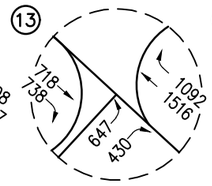


SR-55 SB RAMPS @
MACARTHUR BLVD



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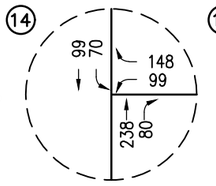

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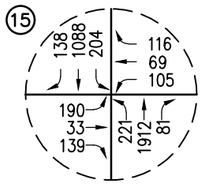
CALLEN'S COMMON



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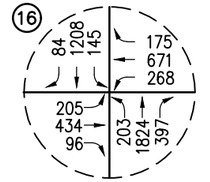
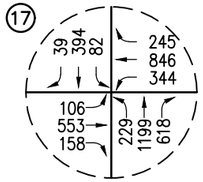
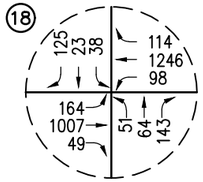
CALLEN'S COMMON



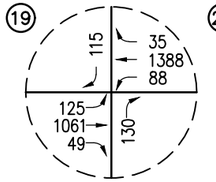
FAIRVIEW RD @
SUNFLOWER AVE



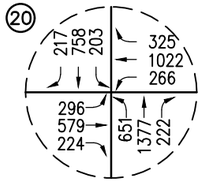
BEAR STREET @
SUNFLOWER AVE



SOUTH PLAZA DR @
SUNFLOWER AVE

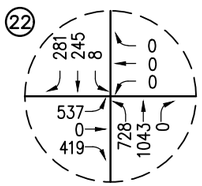


PROJECT DRIVEWAY @
SUNFLOWER AVE

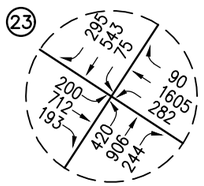


BRISTOL ST @
SUNFLOWER AVE

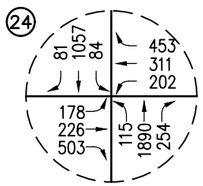
FLOWER ST/SAKIOKA DR @
SUNFLOWER AVE



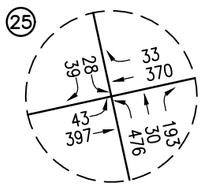
MAIN STREET @
SUNFLOWER AVE



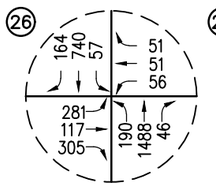
REDHILL AVE @
MAIN STREET



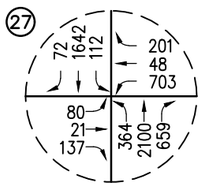
FAIRVIEW RD @
SOUTH COAST DR



I-405 NB OFF-RAMP @
SOUTH COAST DR



BEAR ST @
SOUTH COAST DR



BRISTOL ST @
ANTON BLVD

n:\4400\2214410 - bristol commons - confidential, santa ana\dwg\4410 f3-7a.dwg LDP 09:26:30 01-31-2023 howell

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

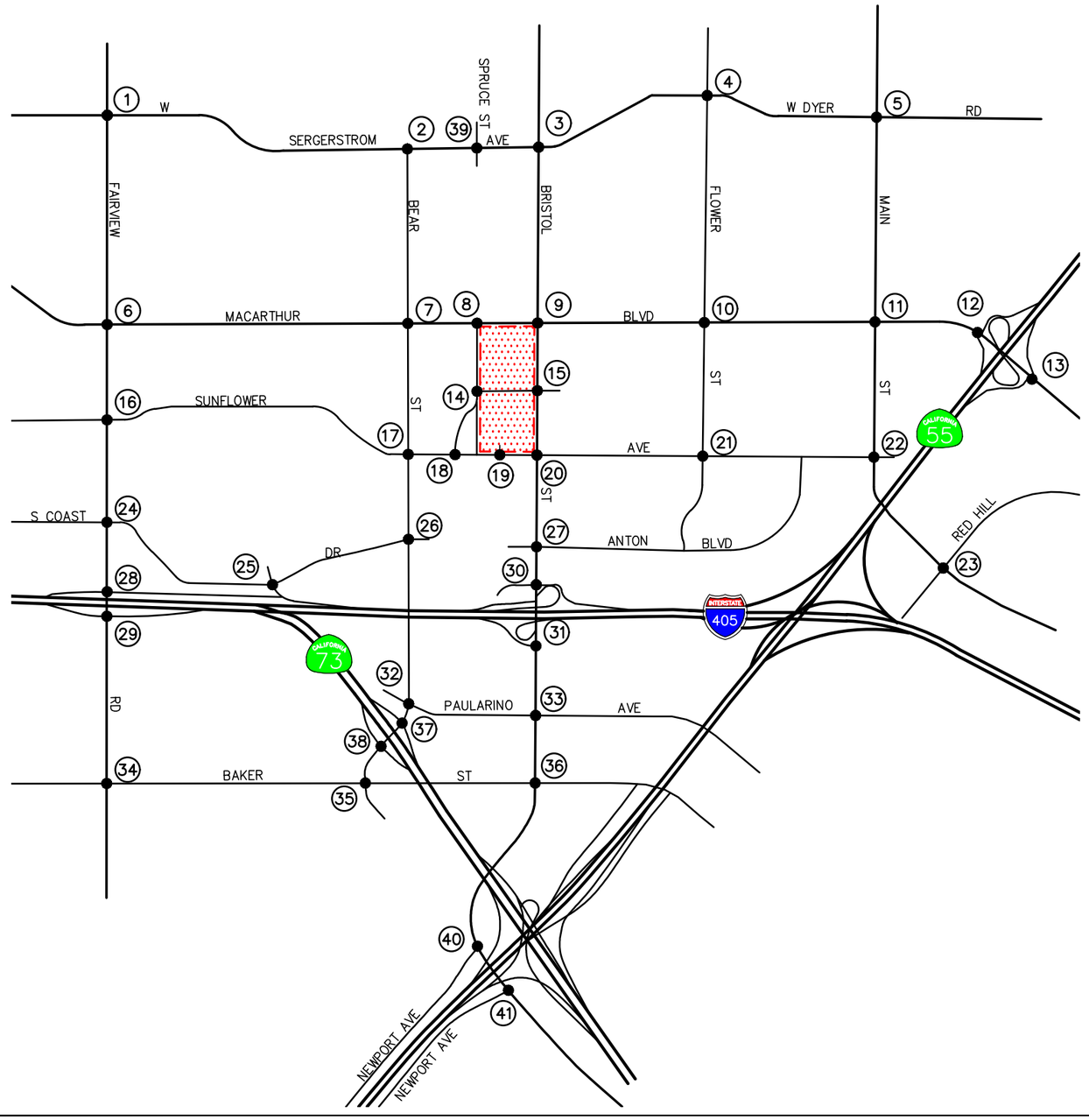
(#) = STUDY INTERSECTION

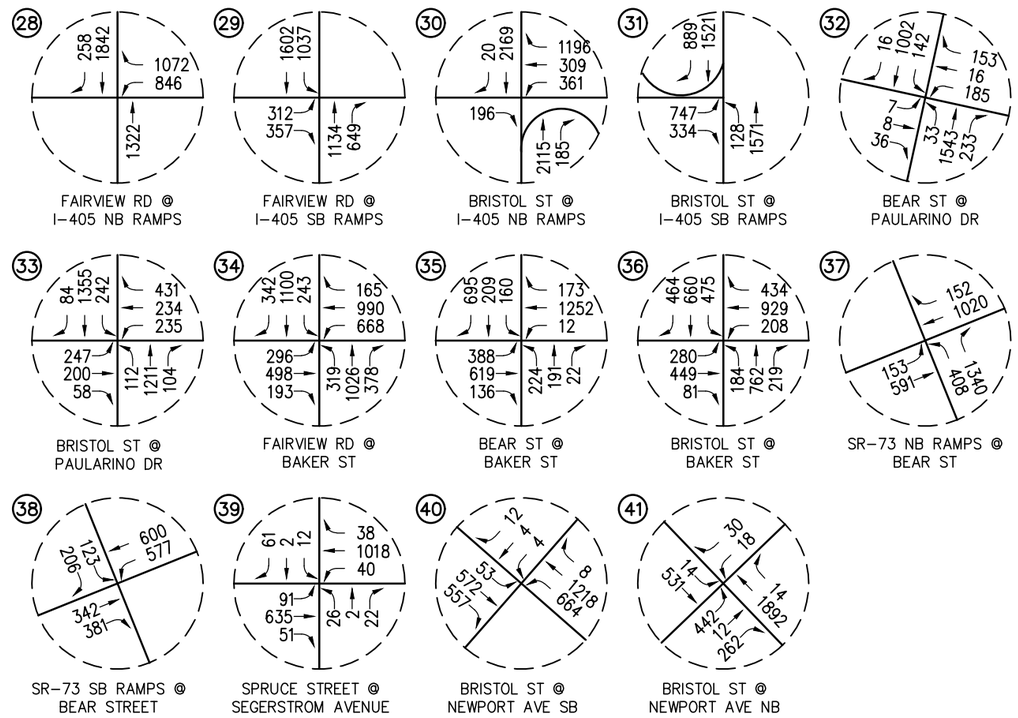
= PROJECT SITE

FIGURE 3-7A

EXISTING PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

FIGURE 3-7B

EXISTING PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA

Per City of Costa Mesa requirements, the ICU calculations use a lane capacity of 1,600 vph for left-turn lanes, through lanes and right-turn lanes. No adjustments for clearance intervals are made since the assumed lane capacity reflects the effect of lost time. Existing peak hour factors (PHF) were applied to level of service calculations for existing traffic conditions.

Per City of Irvine requirements, the ICU calculations use a lane capacity of 1,700 vph for left-turn lanes, through lanes and right-turn lanes. A clearance adjustment factor of 0.05 was added to each Level of Service calculation.

The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The ICU value is the sum of the critical volume to capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in ***Table 3-1***.

3.4.2 *Highway Capacity Manual 6 (HCM 6) Method of Analysis (Unsignalized Intersections)*

Two-way stop-controlled intersections are comprised of a major street, which is uncontrolled, and a minor street, which is controlled by stop signs. Level of service for a two-way stop-controlled intersection is determined by the computed or measured control delay. The control delay by movement, by approach, and for the intersection as a whole is estimated by the computed capacity for each movement. LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. The worst side street approach delay is reported. LOS is not defined for the intersection as a whole or for major-street approaches, as it is assumed that major-street through vehicles experience zero delay. The HCM control delay value range for two-way stop-controlled intersections is shown in ***Table 3-2***.

3.4.3 *Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)*

In conformance with Caltrans criteria, peak hour operating conditions for the state-controlled signalized study intersections were evaluated using HCM methodology. Based on the HCM 6th Edition operations method of analysis, level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometries, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during ideal conditions: in the absence of traffic control, in the absence of geometric delay, in the absence of any incidents and when there are no other vehicles on the road.

In the HCM, only the portion of total delay attributed to the control facility is quantified. This delay is called *control delay.* Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle. The six qualitative categories of Level of Service that have been defined along with the corresponding HCM control delay value range for signalized intersections are shown in ***Table 3-3***.

3.4.4 *Roadway Segment Level of Service Analysis*

The City of Santa Ana utilizes the methodology presented in the County Master Plan of Arterial Highways (MPAH) and the City of Santa Ana Circulation Element to determine LOS midblock locations, as summarized in ***Table 3-4***.

Although VMT governs CEQA impacts, vehicle LOS is also assessed in order to address local operational performance and impacts. Additionally, roadway performance is assessed in order to monitor conformance with the City's Circulation and the County MPAH operational requirements.

3.5 Level of Service Criteria

According to the Cities of Santa Ana, Costa Mesa, and Irvine, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours, except for areas of major development within the City of Santa Ana (per City Mobility Policy 1.4).

TABLE 3-1

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (ICU METHODOLOGY)

Level of Service (LOS)	Intersection Capacity Utilization Value (V/C)	Level of Service Description
A	≤ 0.60	EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used.
B	0.61 – 0.70	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.71 – 0.80	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.81 – 0.90	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.91 – 1.00	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.00	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths.

TABLE 3-2

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 6 METHODOLOGY)[4]

Level of Service (LOS)	Highway Capacity Manual (HCM) Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

[4] Source: *Highway Capacity Manual 6*, Chapter 20: Two-Way Stop-Controlled Intersections. The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

TABLE 3-3

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM 6 METHODOLOGY)[5]

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	$\leq$ 10.0	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	> 10.0 and $\leq$ 20.0	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	> 20.0 and $\leq$ 35.0	Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	> 35.0 and $\leq$ 55.0	Long traffic delays. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	> 55.0 and $\leq$ 80.0	Very long traffic delays. This level is considered by many agencies (i.e. SANBAG) to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent occurrences.
F	$\geq$ 80.0	Severe congestion. This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

[5] Source: *Highway Capacity Manual* (Signalized Intersections).

TABLE 3-4

ROADWAY SEGMENT CAPACITIES AND LEVEL OF SERVICE CRITERIA[6]

Roadway Classification	Lanes	Roadway Capacities					
		LOS A	LOS B	LOS C	LOS D	LOS E	LOS F
Principal Arterial	10D[7]	56,250	65,625	75,000	84,375	93,750	> 93,750
Principal Arterial	9D[7]	50,625	59,063	67,500	75,938	84,375	> 84,375
Principal Arterial	8D	45,000	52,500	60,000	67,500	75,000	> 75,000
Principal/Major Arterial	7D[8]	39,450	45,950	52,500	59,050	65,650	> 65,650
Major Arterial	6D	33,900	39,400	45,000	50,600	56,300	> 56,300
Major/Primary Arterial	5D[8]	28,200	32,850	37,500	42,200	46,900	> 46,900
Primary Arterial	4D	22,500	26,300	30,000	33,800	37,500	> 37,500
Secondary Arterial	4U	15,000	17,500	20,000	22,500	25,000	> 25,000
Divided Collector	2D	9,000	12,000	15,000	20,000	22,000	> 22,000
Collector	2U	7,500	8,800	10,000	11,300	12,500	> 12,500

6 Source: *Guidance for Administration of the Orange County Master Plan of Arterials and Highways (2017).*

7 Roadway capacity values are estimated based on primary arterial with 8-lanes.

8 Roadway capacity values are estimated based on interpolation.

3.5.1 *Intersection Existing Level of Service Results*

Table 3-5 summarizes the existing peak hour service level calculations for the forty-one (41) key study intersections based on existing traffic volumes and current street geometrics. Review of *Table 3-5* indicates that six (6) of the forty-one (41) study intersections currently operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections currently operate at acceptable level of service during the AM and PM peak hours. The intersections which operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	0.944	E
3. Bristol Street at Segerstrom Avenue	--	--	0.918	E
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.906	E
5. Main Street at Dyer Road	--	--	0.924	E
10. Flower Street at MacArthur Boulevard	--	--	0.915	E
39. Spruce Street at Segerstrom Avenue	51.6 s/v	F	65.3 s/v	F

Appendix D presents the ICU/LOS and HCM/LOS calculation worksheets for the forty-one (41) key study intersections for the AM peak hour and PM peak hour.

TABLE 3-5
EXISTING PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Jurisdiction	Minimum Acceptable LOS	Control Type	Time Period	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	Santa Ana	D	8∅ Traffic Signal	AM	0.801	D
				PM	**0.944**	**E**
2. Bear Street at Segerstrom Avenue	Santa Ana	D	3∅ Traffic Signal	AM	0.588	A
				PM	0.606	B
3. Bristol Street at Segerstrom Avenue	Santa Ana	D	8∅ Traffic Signal	AM	0.801	D
				PM	**0.918**	**E**
4. Flower Street at Segerstrom Avenue/Dyer Road	Santa Ana	D	5∅ Traffic Signal	AM	0.776	C
				PM	**0.906**	**E**
5. Main Street at Dyer Road	Santa Ana	D	8∅ Traffic Signal	AM	0.743	C
				PM	**0.924**	**E**
6. Fairview Street at MacArthur Boulevard	Santa Ana	D	8∅ Traffic Signal	AM	0.710	C
				PM	0.834	D
7. Bear Street at MacArthur Boulevard	Santa Ana	D	8∅ Traffic Signal	AM	0.744	C
				PM	0.876	D
8. South Plaza Drive at MacArthur Boulevard	Santa Ana	D	5∅ Traffic Signal	AM	0.518	A
				PM	0.621	B
9. Bristol Street at MacArthur Boulevard	Santa Ana	D	8∅ Traffic Signal	AM	0.745	C
				PM	0.820	D
10. Flower Street at MacArthur Boulevard	Santa Ana	D	5∅ Traffic Signal	AM	0.705	C
				PM	**0.915**	**E**
11. Main Street at MacArthur Boulevard	Santa Ana	D	8∅ Traffic Signal	AM	0.742	C
				PM	0.785	C
12. SR-55 SB Ramps at MacArthur Boulevard	Santa Ana/ Caltrans	D	2∅ Traffic Signal	AM	Caltrans Intersection, **See Section 9.0**	
				PM		
13. SR-55 NB Ramps at MacArthur Boulevard	Irvine/ Caltrans	D	2∅ Traffic Signal	AM	Caltrans Intersection, **See Section 9.0**	
				PM		
14. South Plaza Drive at Callen's Common	Santa Ana	D	One-Way Stop	AM	9.6 s/v	A
				PM	11.7 s/v	B

TABLE 3-5 (CONTINUED)
EXISTING PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Jurisdiction	Minimum Acceptable LOS	Control Type	Time Period	ICU/HCM	LOS
15. Bristol Street at Callen's Common	Santa Ana	D	5∅ Traffic Signal	AM	0.530	A
				PM	0.723	C
16. Fairview Road at Sunflower Avenue	Santa Ana/ Costa Mesa	D	8∅ Traffic Signal	AM	0.716	C
				PM	0.714	C
Costa Mesa:				*AM*	*0.774*	*C*
				PM	*0.733*	*C*
17. Bear Street at Sunflower Avenue	Santa Ana/ Costa Mesa	D	8∅ Traffic Signal	AM	0.433	A
				PM	0.689	B
Costa Mesa:				*AM*	*0.474*	*A*
				PM	*0.683*	*B*
18. South Plaza Drive at Sunflower Avenue	Santa Ana/ Costa Mesa	D	5∅ Traffic Signal	AM	0.326	A
				PM	0.538	A
Costa Mesa:				*AM*	*0.314*	*A*
				PM	*0.535*	*A*
19. Project Driveway at Sunflower Avenue	Santa Ana/ Costa Mesa	D	Two-Way Stop	AM	13.4 s/v	B
				PM	18.6 s/v	C
Costa Mesa:				*AM*	*13.4 s/v*	*B*
				PM	*18.6 s/v*	*C*
20. Bristol Street at Sunflower Avenue	Santa Ana/ Costa Mesa	D	8∅ Traffic Signal	AM	0.641	B
				PM	0.698	B
Costa Mesa:				*AM*	*0.687*	*B*
				PM	*0.676*	*B*
21. Flower Street/Sakioka Drive at Sunflower Avenue	Santa Ana/ Costa Mesa	D	5∅ Traffic Signal	AM	0.347	A
				PM	0.422	A
Costa Mesa:				*AM*	*0.321*	*A*
				PM	*0.394*	*A*

TABLE 3-5 (CONTINUED)
EXISTING PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Jurisdiction	Minimum Acceptable LOS	Control Type	Time Period	ICU/HCM	LOS
22. Main Street at Sunflower Avenue	Santa Ana/ Costa Mesa	D	6∅ Traffic Signal	AM	0.470	A
				PM	0.621	B
Costa Mesa:				*AM*	*0.513*	*A*
				PM	*0.632*	*B*
23. Red Hill Avenue at Main Street	Irvine	D	8∅ Traffic Signal	AM	0.640	B
				PM	0.811	D
24. Fairview Road at South Coast Drive	Costa Mesa	D	8∅ Traffic Signal	AM	0.744	C
				PM	0.836	D
25. I-405 NB Off-Ramp at South Coast Drive	Costa Mesa/ Caltrans	D	4∅ Traffic Signal	AM	Caltrans Intersection, **See Section 9.0**	
				PM		
26. Bear Street at South Coast Drive	Costa Mesa	D	8∅ Traffic Signal	AM	0.371	A
				PM	0.555	A
27. Bristol Street at Anton Boulevard	Costa Mesa	D	6∅ Traffic Signal	AM	0.421	A
				PM	0.628	B
28. Fairview Road at I-405 NB Ramps	Costa Mesa/ Caltrans	D	3∅ Traffic Signal	AM	Caltrans Intersection, **See Section 9.0**	
				PM		
29. Fairview Road at I-405 SB Ramps	Costa Mesa/ Caltrans	D	3∅ Traffic Signal	AM	Caltrans Intersection, **See Section 9.0**	
				PM		
30. Bristol Street at I-405 NB Ramps	Costa Mesa/ Caltrans	D	3∅ Traffic Signal	AM	Caltrans Intersection, **See Section 9.0**	
				PM		
31. Bristol Street at I-405 SB Ramps	Costa Mesa/ Caltrans	D	3∅ Traffic Signal	AM	Caltrans Intersection, **See Section 9.0**	
				PM		
32. Bear Street at Paularino Avenue	Costa Mesa	D	6∅ Traffic Signal	AM	0.316	A
				PM	0.609	B
33. Bristol Street at Paularino Avenue	Costa Mesa	D	6∅ Traffic Signal	AM	0.604	B
				PM	0.833	D
34. Fairview Road at Baker Street	Costa Mesa	D	8∅ Traffic Signal	AM	0.761	C
				PM	0.702	C

TABLE 3-5 (CONTINUED)
EXISTING PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Jurisdiction	Minimum Acceptable LOS	Control Type	Time Period	ICU/HCM	LOS
35. Bear Street at Baker Street	Costa Mesa	D	8∅ Traffic Signal	AM PM	0.666 0.729	B C
36. Bristol Street at Baker Street	Costa Mesa	D	8∅ Traffic Signal	AM PM	0.616 0.741	B C
37. Bear Street at SR-73 NB Ramps	Costa Mesa/ Caltrans	D	3∅ Traffic Signal	AM PM	Caltrans Intersection, **See Section 9.0**	
38. Bear Street at SR-73 SB Ramps	Costa Mesa/ Caltrans	D	3∅ Traffic Signal	AM PM	Caltrans Intersection, **See Section 9.0**	
39. Spruce Street at Segerstrom Avenue	Santa Ana	D	Two-Way Stop	AM PM	**51.6 s/v** **65.3 s/v**	**F** **F**
40. Bristol Street at Newport Boulevard (SB)	Costa Mesa	D	5∅ Traffic Signal	AM PM	0.382 0.495	A A
41. Bristol Street at Newport Boulevard (NB)	Costa Mesa	D	4∅ Traffic Signal	AM PM	0.561 0.637	A B

Notes:

- ICU = Intersection Capacity Utilization
- s/v = seconds per vehicle (delay)
- LOS = Level of Service, please refer to *Tables 3-1 and 3-2* for the LOS definitions
- ∅ = Phase
- **BOLD ICU/LOS** indicates unacceptable service level

3.5.2 *Daily Roadway Segment Existing Level of Service Results*

Table 3-6 summarizes the existing daily roadway segments service level calculations for the forty-three (43) key study intersections based on existing traffic volumes and current street geometrics. Review of *Table 3-6* indicates that four (4) of the forty-three (43) roadway segments currently operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	56,973	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	54,025	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	58,231	F
K. Bear Street, between Paularino Avenue and Baker Street	38,267	F

TABLE 3-6

EXISTING DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions	
					Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	**56,973**	**F**
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	**54,025**	**E**
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	48,087	D
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	Costa Mesa	D	Major Arterial	6D	**58,231**	**F**
E. Fairview Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	9D	43,770	A
F. Fairview Street, between I-405 SB Ramps and Baker Street	Costa Mesa	D	Major Arterial	6D	48,390	D
G. Bear Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	17,008	A
H. Bear Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana/ Costa Mesa	D	Primary Arterial	5D	17,989	A
I. Bear Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	29,134	A
J. Bear Street, between S. Coast Drive and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	30,398	A
K. Bear Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Primary Arterial	4D	**38,267**	**F**
L. S. Plaza Drive, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Primary Arterial	4D	5,308	A
M. S. Plaza Drive, between Callen's Common and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	4,843	A
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	44,293	C

TABLE 3-6 (CONTINUED)
EXISTING DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions	
					Daily Volume	LOS
O. Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Major Arterial	6D	46,145	D
P. Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	44,768	C
Q. Bristol Street, between Sunflower Avenue and Anton Boulevard	Costa Mesa	D	Principal Arterial	8D	49,274	B
R. Bristol Street, between Anton Boulevard and I-405 NB Ramps	Costa Mesa	D	Principal Arterial	10D	56,559	B
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	8D	58,259	C
T. Bristol Street, between I-405 SB Ramps and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	39,269	B
U. Bristol Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Major Arterial	6D	40,662	C
V. Flower Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	15,150	A
W. Flower Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	9,338	A
X. Main Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	30,688	A
Y. Main Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	23,929	A
Z. Main Street, between Sunflower Avenue and Red Hill Avenue	Santa Ana/ Irvine	D	Major Arterial	6D	23,638	A
AA. Segerstrom Avenue, between Fairview Street and Bear Street	Santa Ana	D	Primary Arterial	4D	21,253	A
BB. Segerstrom Avenue, between Bear Street and Bristol Street	Santa Ana	D	Primary Arterial	4D	28,544	C

TABLE 3-6 (CONTINUED)
EXISTING DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key	Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions	
						Daily Volume	LOS
CC.	Segerstrom Avenue, between Bristol Street and Flower Street	Santa Ana	D	Primary Arterial	4D	23,189	B
DD.	Dyer Road, between Flower Street and Main Street	Santa Ana	D	Primary Arterial	4D	29,175	C
EE.	MacArthur Boulevard, between Fairview Street and Bear Street	Santa Ana	D	Major Arterial	6D	31,076	A
FF.	MacArthur Boulevard, between Bear Street and S. Plaza Drive	Santa Ana	D	Major Arterial	6D	37,959	B
GG.	MacArthur Boulevard, between S. Plaza Drive and Bristol Street	Santa Ana	D	Major Arterial	6D	34,622	B
HH.	MacArthur Boulevard, between Bristol Street and Flower Street	Santa Ana	D	Major Arterial	6D	37,835	B
II.	MacArthur Boulevard, between Flower Street and Main Street	Santa Ana	D	Major Arterial	6D	38,325	B
JJ.	MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	D	Major Arterial	6D	48,923	D
KK.	MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	Santa Ana/ Irvine/ Caltrans	D	Major Arterial	7D	50,476	C
LL.	Sunflower Avenue, between Fairview Street and Bear Street	Santa Ana/ Costa Mesa	D	Primary Arterial	4D	16,071	A
MM.	Sunflower Avenue, between Bear Street and S. Plaza Drive	Santa Ana/ Costa Mesa	D	Major Arterial	6D	28,528	A
NN.	Sunflower Avenue, between S. Plaza Drive and Bristol Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	27,615	A
OO.	Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	21,571	A
PP.	Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	17,778	A
QQ.	Bristol Street, south of Baker Street	Costa Mesa	D	Major Arterial	6D	27,756	A

4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic characteristics of the proposed Project, a multi-step process has been utilized. The first step is trip generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the Project development tabulation.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound Project traffic. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of Project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and Project traffic assignments developed, the effect of the proposed Project's added traffic is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast Project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated.

5.0 PROJECT TRAFFIC CHARACTERISTICS

5.1 Project Traffic Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 11th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2021].

As shown in ***Table 5-1,*** ITE Land Use 221: Multifamily Family Housing (Mid-Rise), ITE Land Use 255: Continuing Care Retirement Community, ITE Land Use 310: Hotel, and ITE Land Use 820: Shopping Center trip rates will be used to forecast the trip generation potential of the Existing Land Use and proposed Project.

Table 5-2 identifies the existing trips generated by the site and compares it to the proposed Project by phase as identified in *Table 2-2*. A review of the upper portion of *Table 5-2* indicates that the Phase 1 portion of the Project will generate 4,167 "net" daily trips, with 545 "net" trips (157 inbound, 388 outbound) produced in the AM peak hour and 359 "net" trips (233 inbound, 126 outbound) produced in the PM peak hour on a "typical" weekday.

The middle portion of *Table 5-2* indicates that the proposed Phase 2 portion of the Project is forecast to generate 3,241 "net" daily trips, with 293 "net" trips (69 inbound, 224 outbound) produced in the AM peak hour and 271 "net" trips (164 inbound, 107 outbound) produced in the PM peak hour on a "typical" weekday.

The lower portion of *Table 5-2* indicates that the proposed Phase 3 portion of the Project is forecast to generate 80 fewer "net" daily trips, with 381 "net" trips (41 inbound, 340 outbound) produced in the AM peak hour and 58 "net" trips (79 inbound, -21 outbound) produced in the PM peak hour on a "typical" weekday.

The bottom of *Table 5-2* indicates that the proposed Project for Phases 1, 2 and 3 are forecast to generate 7,328 "net" daily trips, with 1,219 "net" trips (267 inbound, 952 outbound) produced in the AM peak hour and 688 "net" trips (476 inbound, 212 outbound) produced in the PM peak hour on a "typical" weekday.

Please note that trip generation for the proposed Project and the existing retail center includes adjustments for pass-by as recommended by ITE. The pass-by reduction factors are based on a review of available information published in the 11th Edition of *Trip Generation,* published by the Institute of Transportation Engineers (ITE), [Washington, D.C., 2021]. The proposed Project trip generation also includes adjustments for internal capture, consistent with the *Trip Generation Handbook, 3rd Edition,* published by ITE (September 2017), to account for internal interaction between the hotel, residential, and retail components of the Project. Additionally, a 5% non-auto trip reduction and a 5% TDM reduction was applied to the proposed Project to account for other modes of transportation (i.e. public transit, ride share, walking, biking, etc.).

5.2 Project Traffic Distribution and Assignment

Figures 5-1 through 5-4 presents the Project Trip Distribution for residential, senior continuum care, hotel and retail for Phase 1 construction, respectively. ***Figures 5-5 and 5-6*** presents the Project Trip Distribution for residential and retail for Phase 2 construction, respectively. ***Figures 5-7 and 5-8*** presents the Project Trip Distribution for residential and retail for Phase 3 construction, respectively. Project traffic both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- location of site access points in relation to the surrounding street system,
- the site's proximity to major traffic carriers and regional access routes,
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- presence of traffic congestion in the surrounding vicinity,
- ingress/egress availability at the project site and turn restrictions at the Project driveways, if any, and
- input from City staff.

Figures 5-9 and ***5-10*** presents the Project only volumes for the Phase 1 component of the Project. The traffic volume assignments presented in *Figures 5-9* and *5-10* reflect the traffic distribution characteristics shown in *Figures 5-1 through 5-4* and the traffic generation forecast of the proposed Project presented in Row [B] of *Table 5-2.*

Figures 5-11 and ***5-12*** presents the Project only volumes for the Phase 1 and 2 components of the Project. The traffic volume assignments presented in *Figures 5-11* and *5-12* reflect the traffic distribution characteristics shown in *Figures 5-1 through 5-6* and the traffic generation forecast of the proposed Project presented in Rows [B] and [E] of *Table 5-2.*

Figures 5-13 and ***5-14*** presents the Project only volumes for the Phase 1, 2 and 3 components of the Project. The traffic volume assignments presented in *Figures 5-13* and *5-14* reflect the traffic distribution characteristics shown in *Figures 5-1 through 5-8* and the traffic generation forecast of the proposed Project presented in Rows [B], [E] and [H] of *Table 5-2.*

5.3 Existing Plus Project Traffic Conditions

The Existing Plus Project traffic conditions have been generated based upon existing conditions and the estimated project traffic. These forecast traffic conditions have been prepared to assess the potential effects of the Project upon the circulation system as it currently exists per the requirements of the City. This traffic volume scenario and the related intersection capacity analyses will identify the roadway improvements necessary to offset the Project, if any.

Figures 5-15 and ***5-16*** present projected AM and PM peak hour traffic volumes at the forty-one (41) key study intersections and Project driveways with the addition of the trips generated by Phase 1 of the proposed Project to existing traffic volumes, respectively.

Figures 5-17 and ***5-18*** present projected AM and PM peak hour traffic volumes at the forty-one (41) key study intersections and Project driveways with the addition of the trips generated by Phases 1 and 2 of the proposed Project to existing traffic volumes, respectively.

Figures 5-19 and ***5-20*** present projected AM and PM peak hour traffic volumes at the forty-one (41) key study intersections and Project driveways with the addition of the trips generated by Phases 1, 2 and 3 of the proposed Project to existing traffic volumes, respectively.

TABLE 5-1
PROJECT TRIP GENERATION RATES AND EQUATIONS[9]

Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Trip Generation Rates:							
▪ 221: Multifamily Housing Mid-Rise (TE/DU)	4.54	23%	77%	0.37	61%	39%	0.39
▪ 255: Continuing Care Retirement Community (TE/DU)	2.47	65%	35%	0.15	39%	61%	0.19
▪ 310: Hotel (TE/Rooms)	7.99	56%	44%	0.46	51%	49%	0.59
▪ 820: Shopping Center (TE/1000 SF)	37.01	62%	38%	0.84	48%	52%	3.40

Notes:
TE/1000 SF = Trip end per 1,000 SF
TE/DU = Trip end per Dwelling Unit
TE/Room = Trip end per Room

[9] Source: *Trip Generation, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021).*

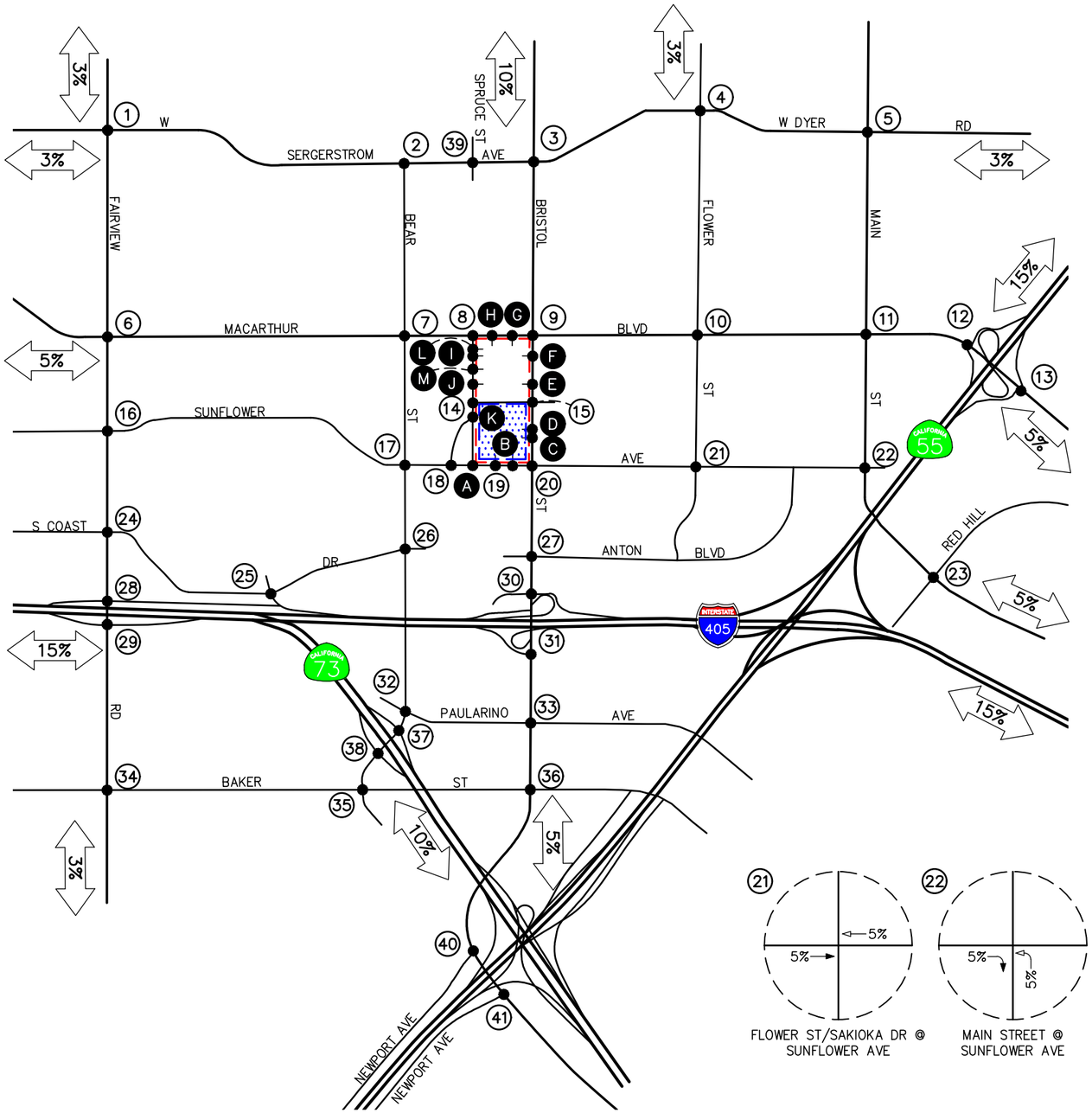
TABLE 5-2
PROJECT TRIP GENERATION FORECAST[10]

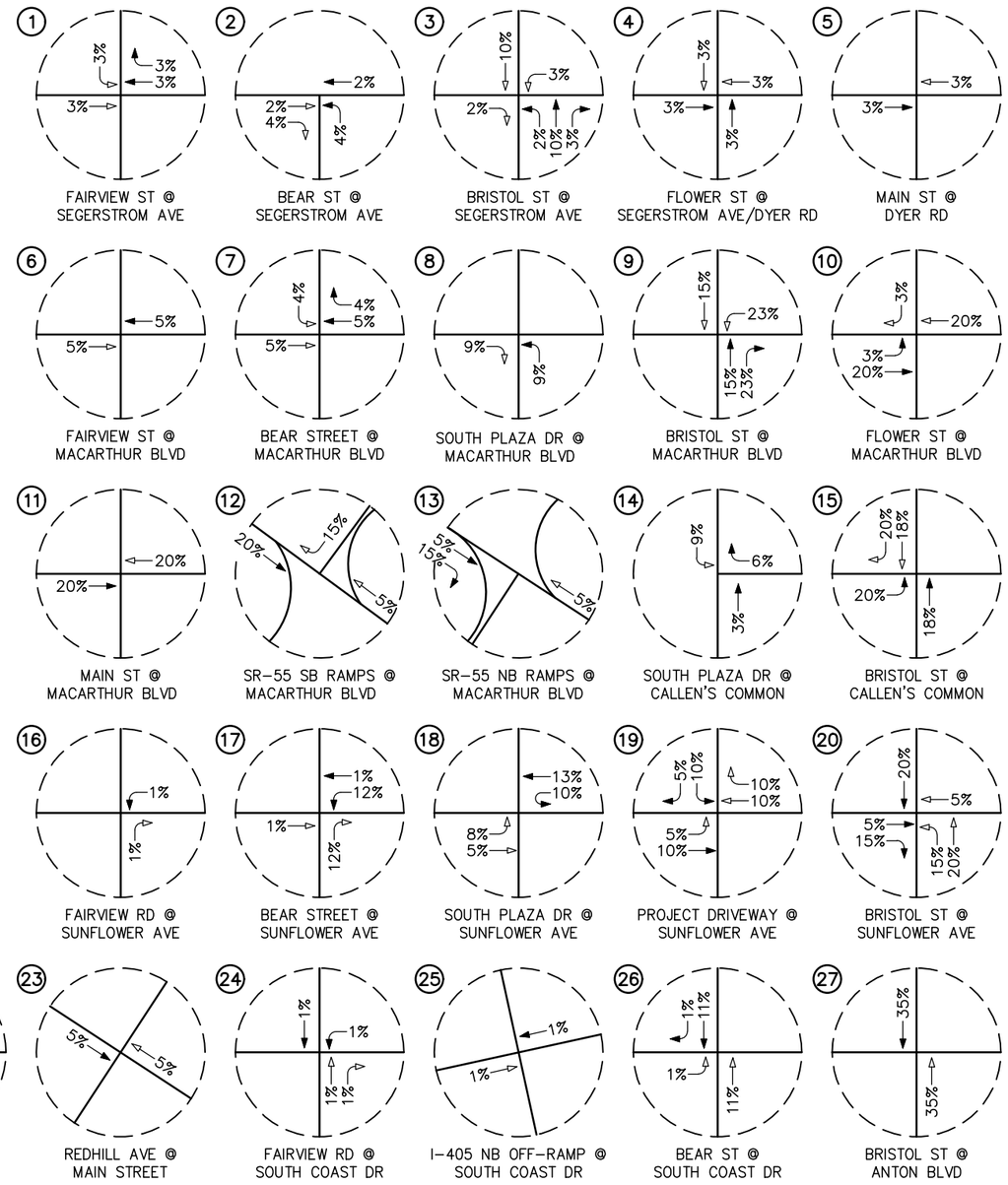
Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Phase 1 - Existing Land Use Trip Generation Forecast:							
▪ Shopping Center (244,120 SF)	9,035	127	78	205	398	432	830
Pass-by (10% Daily, 10% AM, 29% PM)[11]	*-904*	*-13*	*-8*	*-21*	*-115*	*-126*	*-241*
Total Existing Shopping Center Trips	8,131	114	70	184	283	306	589
Total Phase 1 Existing Land Use Trips [A]	***8,131***	***114***	***70***	***184***	***283***	***306***	***589***
Phase 1 – Entitlement Project Trip Generation Forecast:							
▪ Multifamily Housing Mid-Rise (1,375 DU)	6,243	117	392	509	327	209	536
▪ Hotel (250 Rooms)	1,998	64	51	115	75	73	148
▪ Shopping Center (250,000 SF)	9,253	130	80	210	408	442	850
▪ Senior Continuum Care (200 Units)	494	20	10	30	15	23	38
Subtotal	17,988	331	533	864	825	747	1,572
Internal Capture (17% Daily, 3% AM, 18% PM)[12]	-3,244	-16	-14	-30	-134	-160	-294
Non-Auto Trip Reduction (5% Daily, 5% AM, 5% PM)	-900	-17	-27	-44	-41	-38	-79
TDM Reduction (5% Daily, 5% AM, 5% PM)	-900	-17	-27	-44	-41	-38	-79
Pass-by (10% Daily, 10% AM, 29% PM)[11]	-646	-10	-7	-17	-93	-79	-172
Total Phase 1 Entitled Project Trips [B]	***12,298***	***271***	***458***	***729***	***516***	***432***	***948***
Phase 1 Net Project Trip Generation Total [C]	**4,167**	**157**	**388**	**545**	**233**	**126**	**359**
Phase 2 - Existing Land Use Trip Generation Forecast:							
▪ Shopping Center (36,522 SF)	1,352	19	12	31	60	64	124
Pass-by (10% Daily, 10% AM, 29% PM)[11]	*-135*	*-2*	*-1*	*-3*	*-17*	*-19*	*-36*
Total Existing Shopping Center Trips	1,217	17	11	28	43	45	88
Total Phase 2 Existing Land Use Trips [D]	***1,217***	***17***	***11***	***28***	***43***	***45***	***88***
Phase 2 – Entitlement Project Trip Generation Forecast:							
▪ Multifamily Housing Mid-Rise (856 DU)	3,886	73	244	317	204	130	334
▪ Shopping Center (65,000 SF)	2,406	34	21	55	106	115	221
Subtotal	6,292	107	265	372	310	245	555
Internal Capture (17% Daily, 3% AM, 18% PM)[12]	-1,039	-6	-3	-9	-49	-47	-96
Non-Auto Trip Reduction (5% Daily, 5% AM, 5% PM)	-314	-6	-13	-19	-15	-13	-28
TDM Reduction (5% Daily, 5% AM, 5% PM)	-314	-6	-13	-19	-15	-13	-28
Pass-by (10% Daily, 10% AM, 29% PM)[11]	-167	-3	-1	-4	-24	-20	-44
Total Phase 2 Entitled Project Trips [E]	***4,458***	***86***	***235***	***321***	***207***	***152***	***359***
Phase 2 Net Project Trip Generation Total [F]	**3,241**	**69**	**224**	**293**	**164**	**107**	**271**
Phase 3 – Existing Land Use Trip Generation Forecast:							
▪ Shopping Center (184,421 SF)	6,825	96	59	155	301	326	627
Pass-by (10% Daily, 10% AM, 29% PM)[11]	*-683*	*-10*	*-6*	*-16*	*-87*	*-95*	*-182*
Total Existing Shopping Center Trips	6,142	86	53	139	214	231	445
Total Phase 3 Existing Land Use Trips [G]	***6,142***	***86***	***53***	***139***	***214***	***231***	***445***
Phase 3 – Entitlement Project Trip Generation Forecast:							
▪ Multifamily Housing Mid-Rise (1,519 DU)	6,896	129	433	562	361	231	592
▪ Shopping Center (35,000 SF)	1,295	18	11	29	57	62	119
Subtotal	8,191	147	444	591	418	293	711
Internal Capture (17% Daily, 3% AM, 18% PM)[12]	-1,219	-5	-5	-10	-70	-42	-112
Non-Auto Trip Reduction (5% Daily, 5% AM, 5% PM)	-410	-7	-22	-29	-21	-15	-36
TDM Reduction (5% Daily, 5% AM, 5% PM)	-410	-7	-22	-29	-21	-15	-36
Pass-by (10% Daily, 10% AM, 29% PM)[11]	-90	-1	-2	-3	-13	-11	-24
Total Phase 3 Entitled Project Trips [H]	***6,062***	***127***	***393***	***520***	***293***	***210***	***503***
Phase 3 Net Project Trip Generation Total [I]	**-80**	**41**	**340**	**381**	**79**	**-21**	**58**
Phases 1, 2 and 3 Total Net Project Trip Generation ([C] + [F] + [I])	**7,328**	**267**	**952**	**1,219**	**476**	**212**	**688**

[10] Source: *Trip Generation, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021).*

[11] Pass-by trips are made as intermediate stop on the way from one origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on adjacent streets, which contain direct access to the generator. For this analysis, the following pass-by reduction factors were used *Trip Generation, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021)*:
Shopping Center: Daily – Estimated to be 10% / AM Peak Hour – Estimated to be 10% / PM Peak Hour – 29%

[12] Internal capture trip reduction is consistent with the *Trip Generation Handbook, 3rd Edition,* published by ITE (September 2017). Project trip generation was adjusted to account for internal capture between the hotel, residential, and retail components of the Project.





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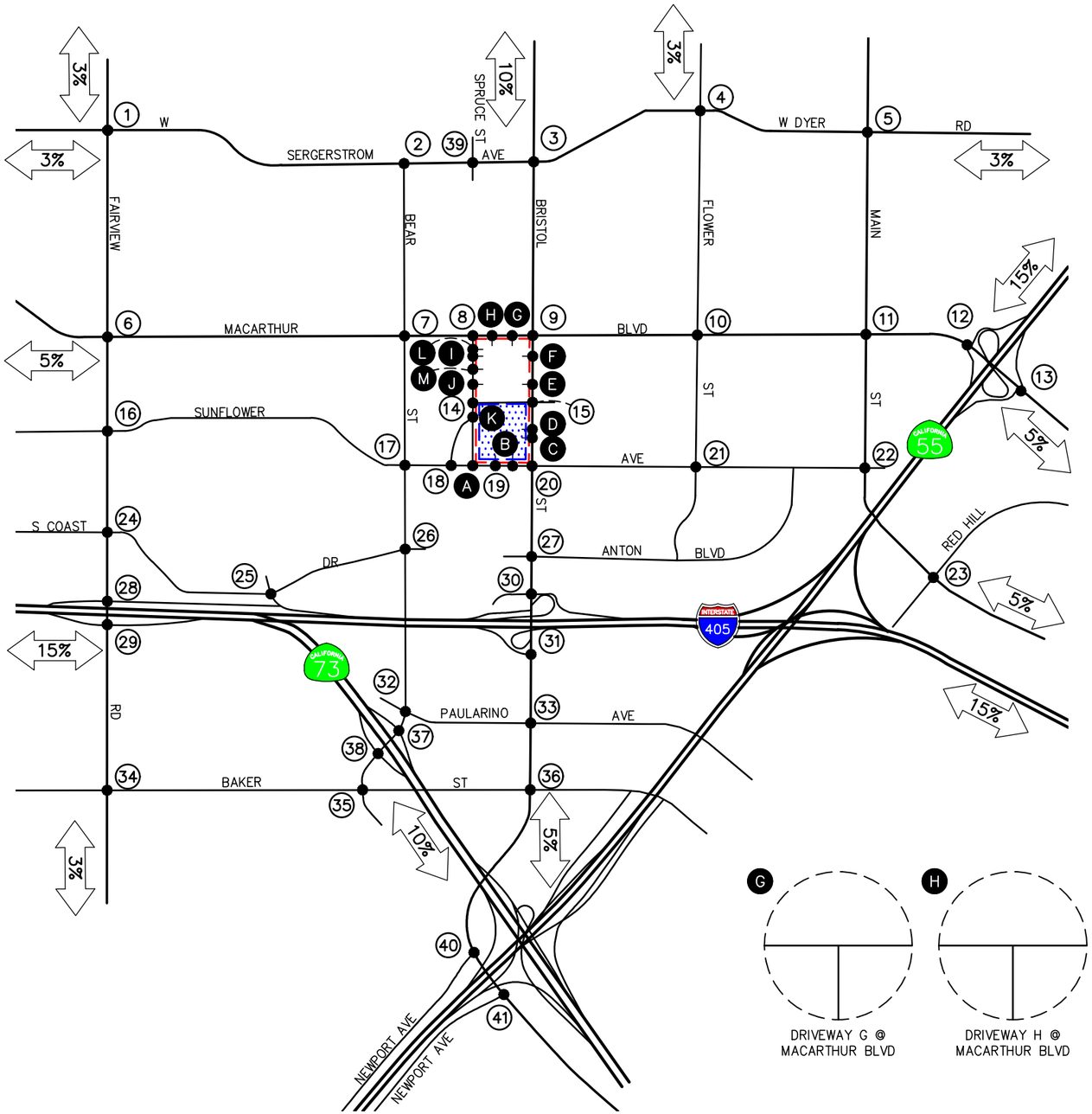
N NO SCALE

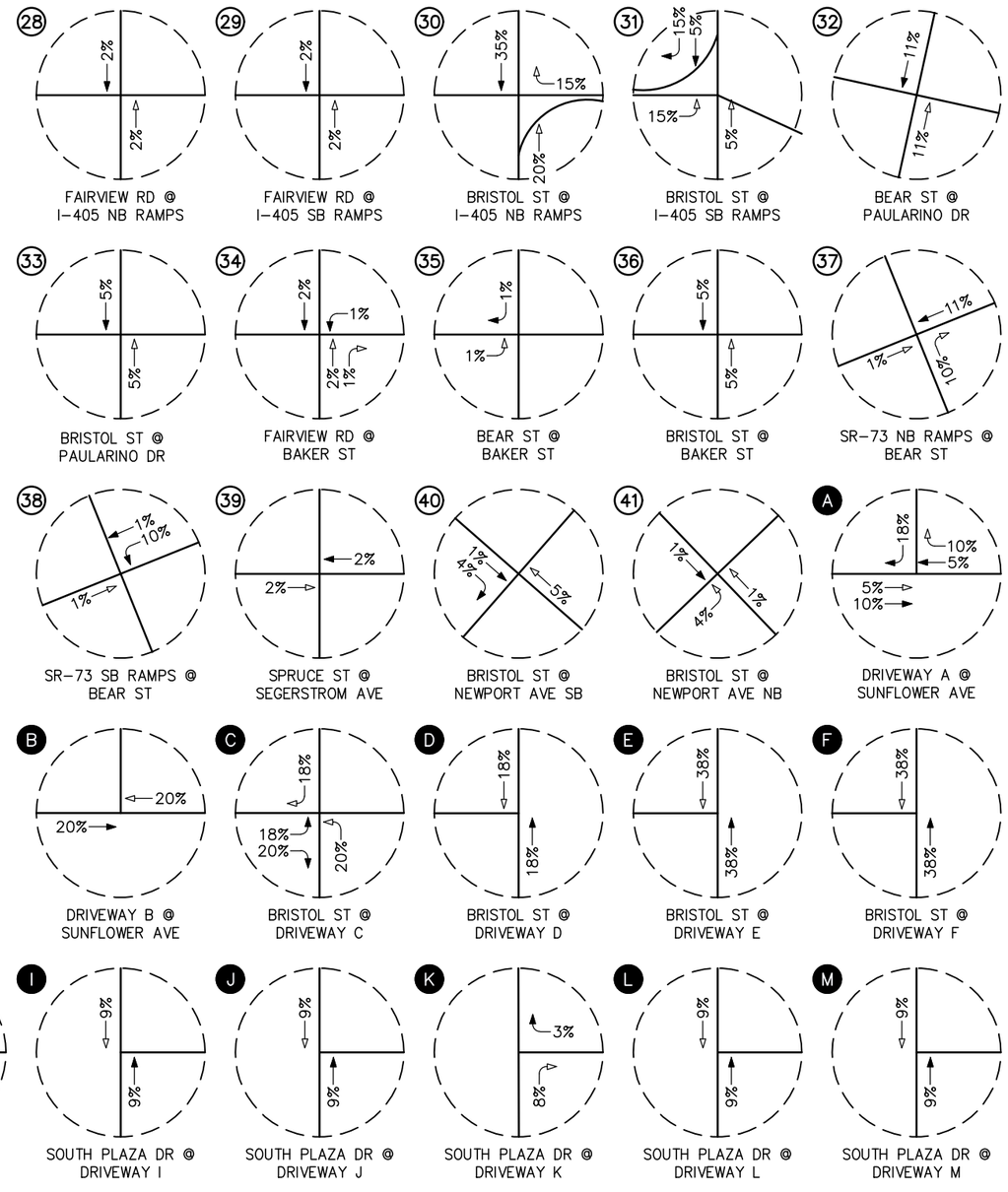
KEY
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= INBOUND PERCENTAGE
= OUTBOUND PERCENTAGE

FIGURE 5-1A

PROJECT TRAFFIC DISTRIBUTION PATTERN - RESIDENTIAL PHASE 1

RELATED BRISTOL, SANTA ANA





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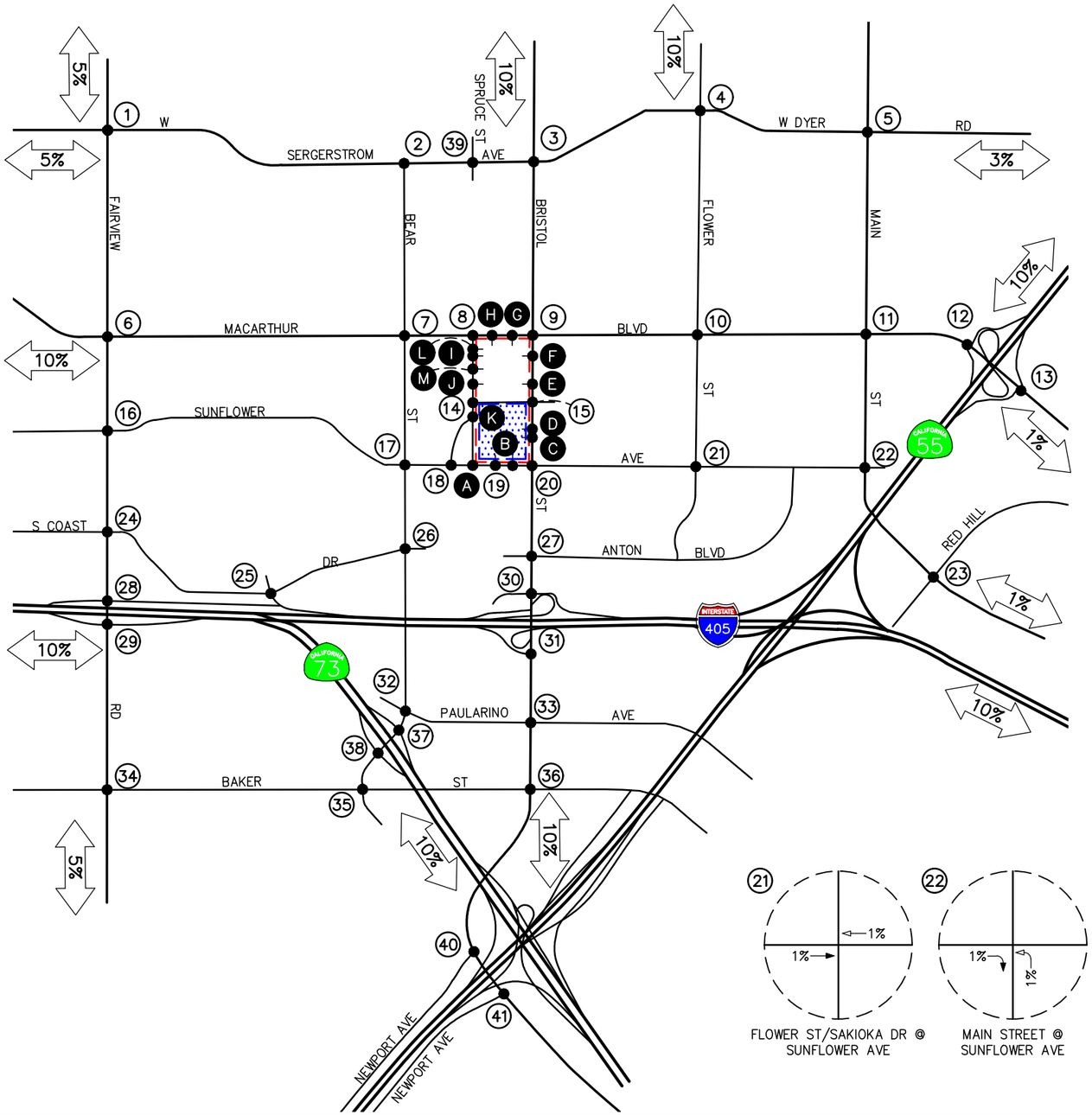
N NO SCALE

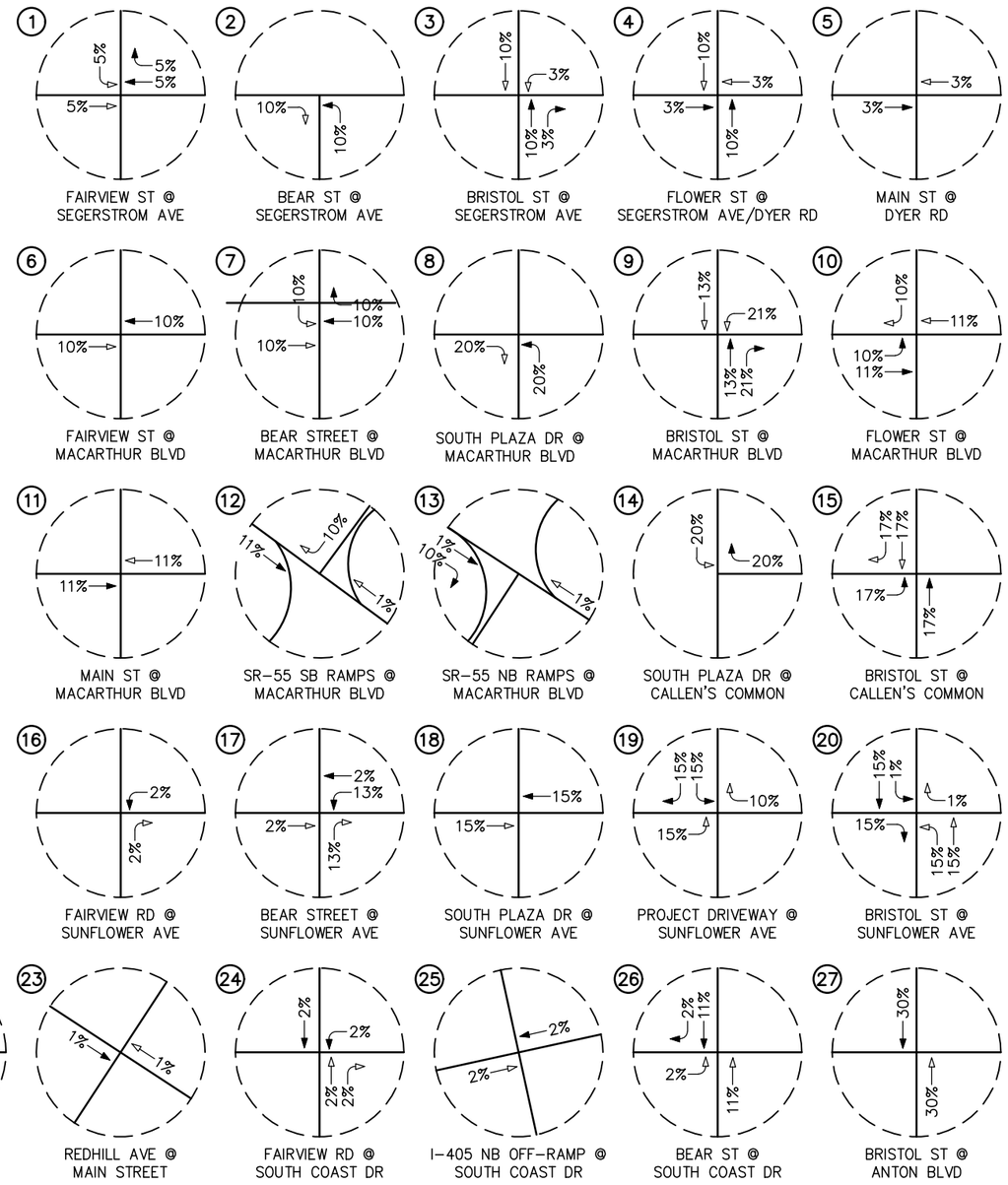
KEY
- (#) = STUDY INTERSECTION
- = PROJECT SITE
- = PHASE 1
- = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE

FIGURE 5-1B

PROJECT TRAFFIC DISTRIBUTION PATTERN – RESIDENTIAL PHASE 1

RELATED BRISTOL, SANTA ANA





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N NO SCALE

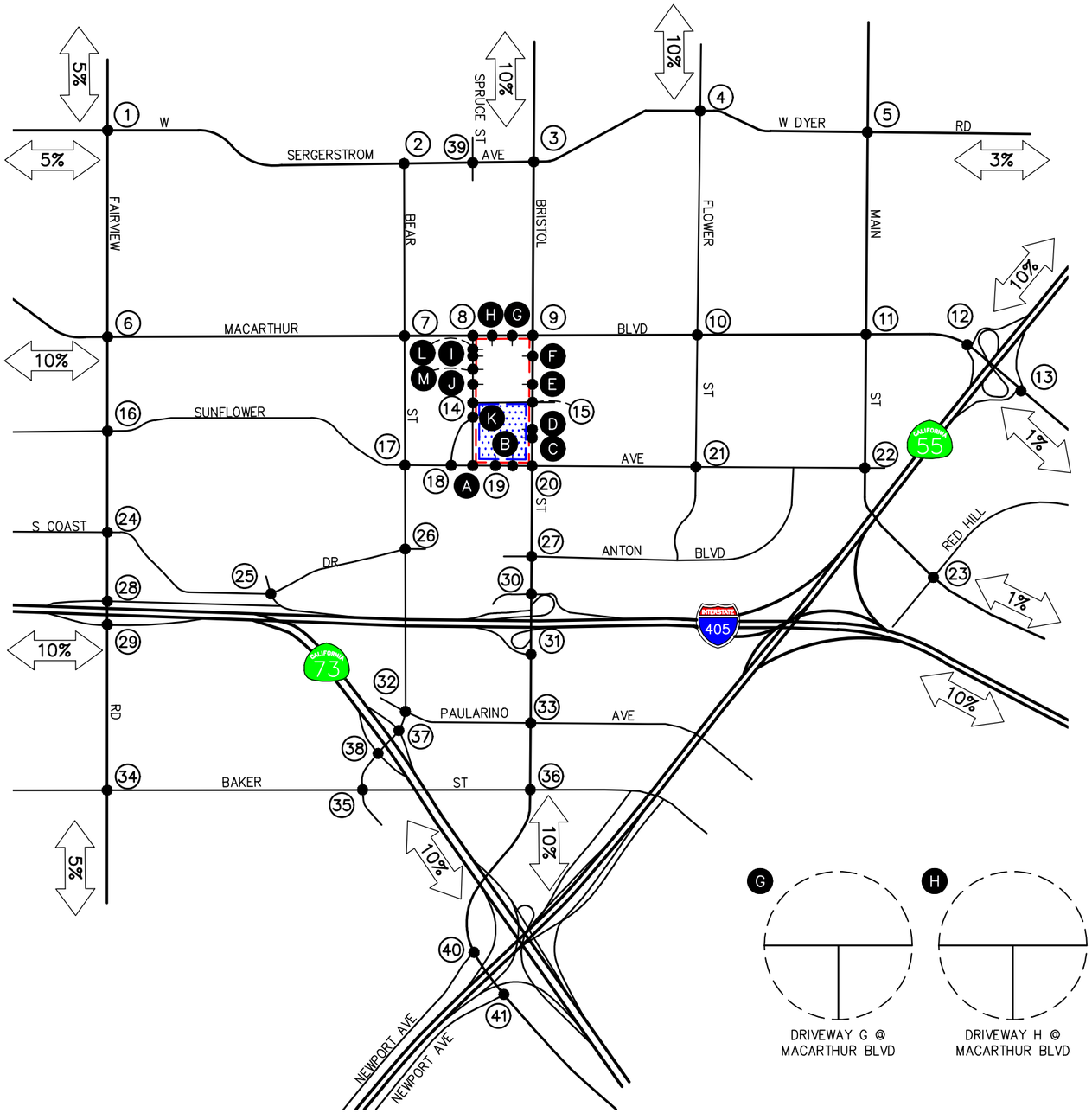
KEY

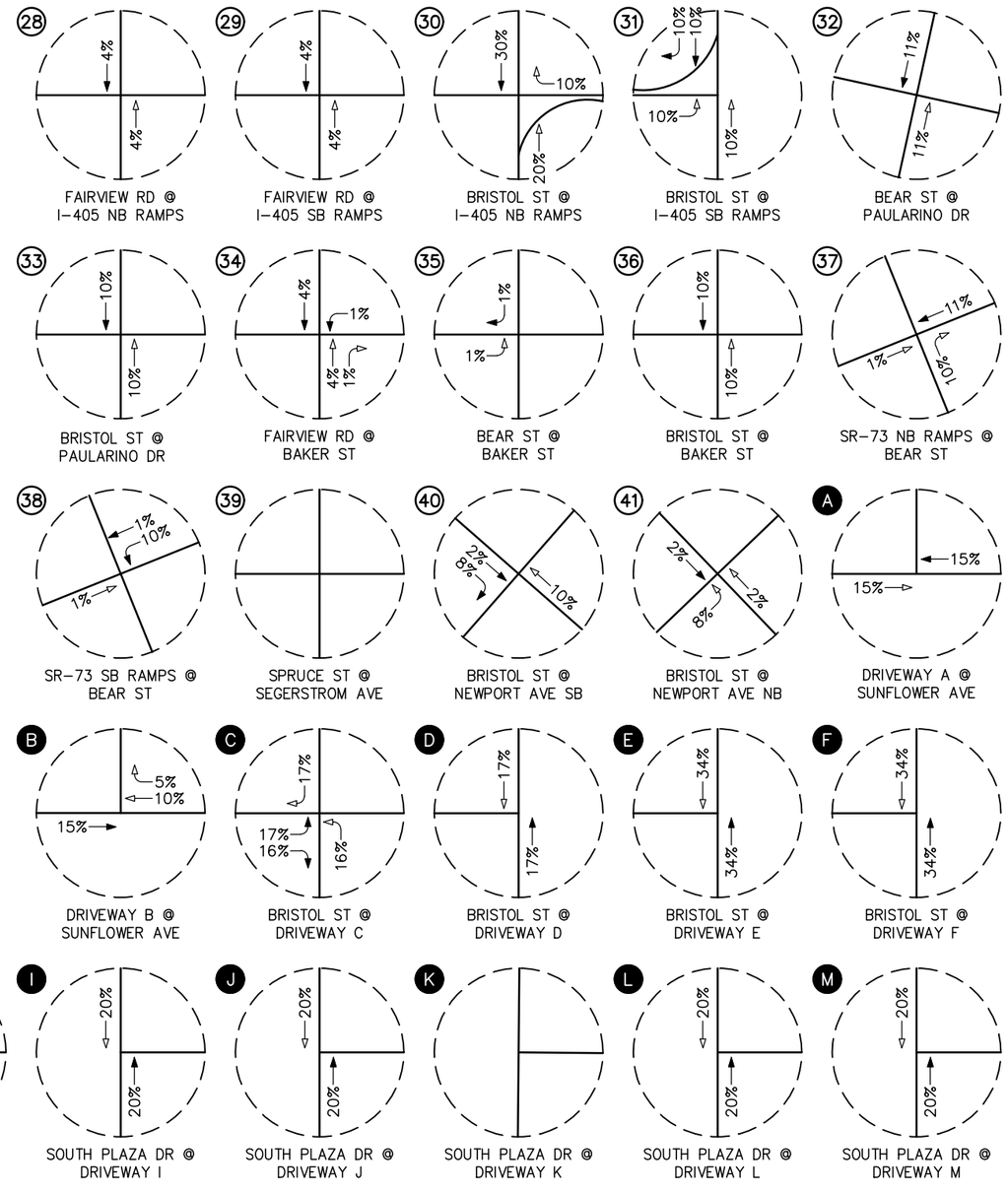
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= INBOUND PERCENTAGE
= OUTBOUND PERCENTAGE

FIGURE 5-2A

PROJECT TRAFFIC DISTRIBUTION PATTERN - SENIOR CONTINUUM CARE PHASE 1

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

= PHASE 1

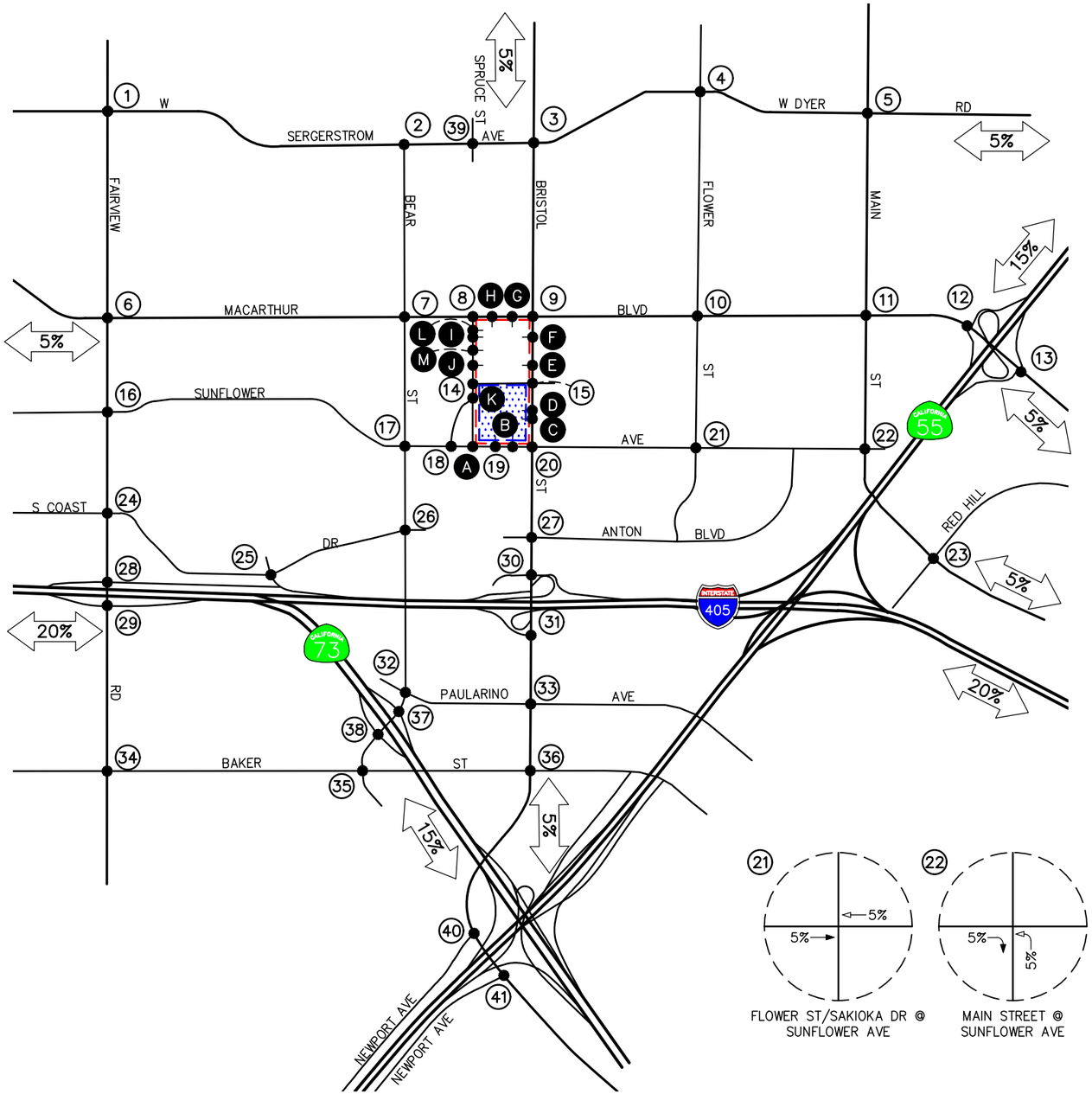
= INBOUND PERCENTAGE

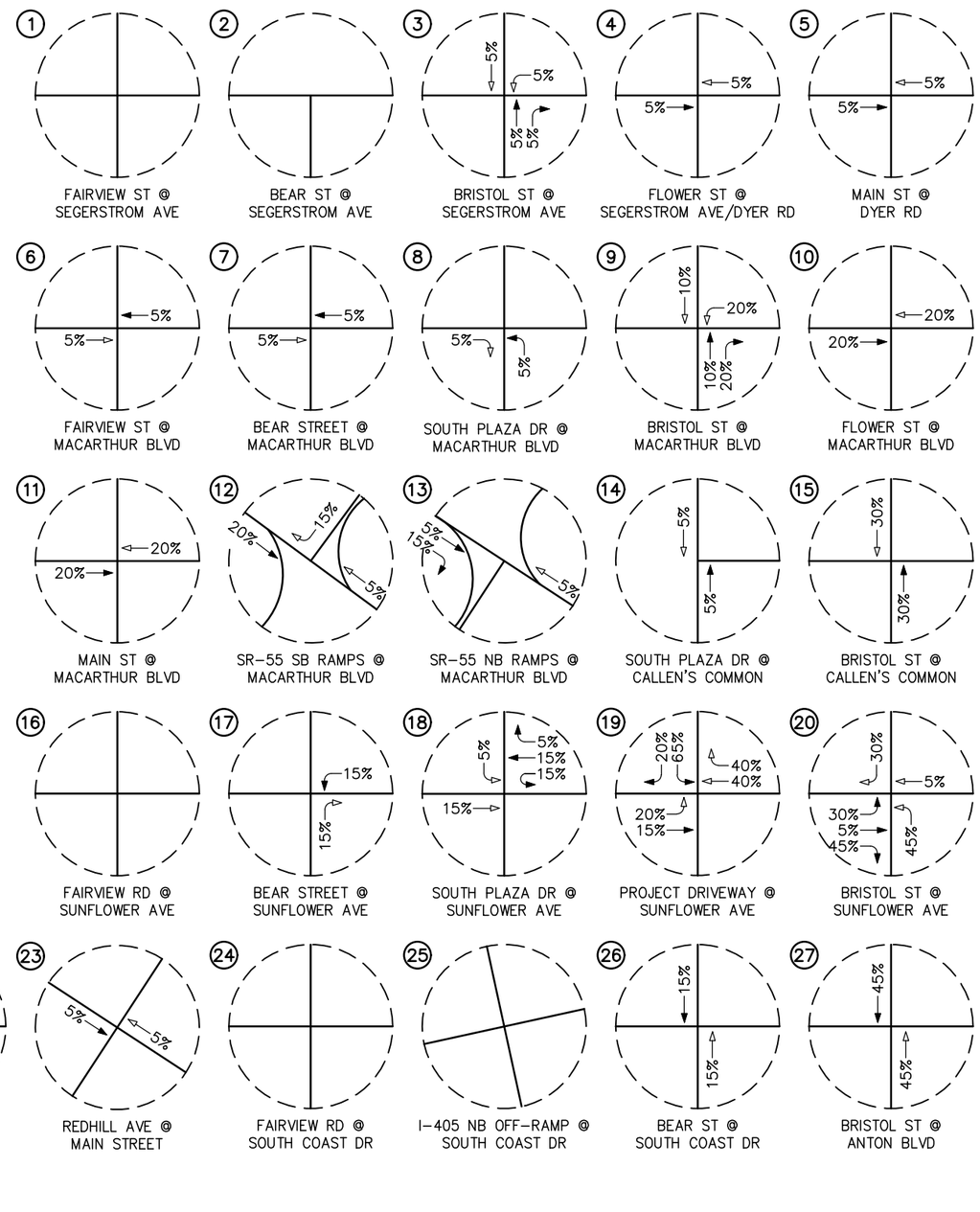
= OUTBOUND PERCENTAGE

FIGURE 5-2B

PROJECT TRAFFIC DISTRIBUTION PATTERN – SENIOR CONTINUUM CARE PHASE 1

RELATED BRISTOL, SANTA ANA





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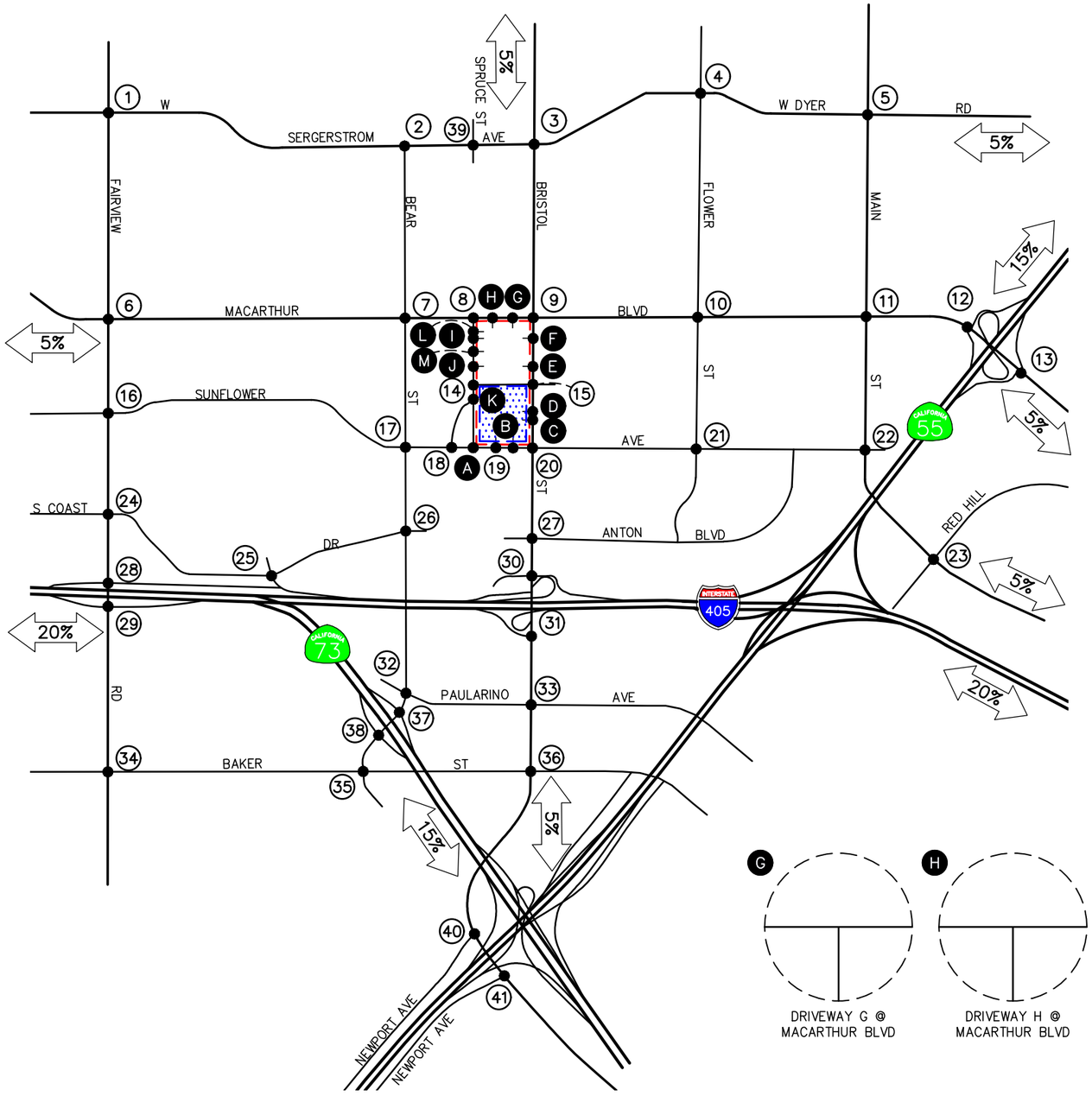
N NO SCALE

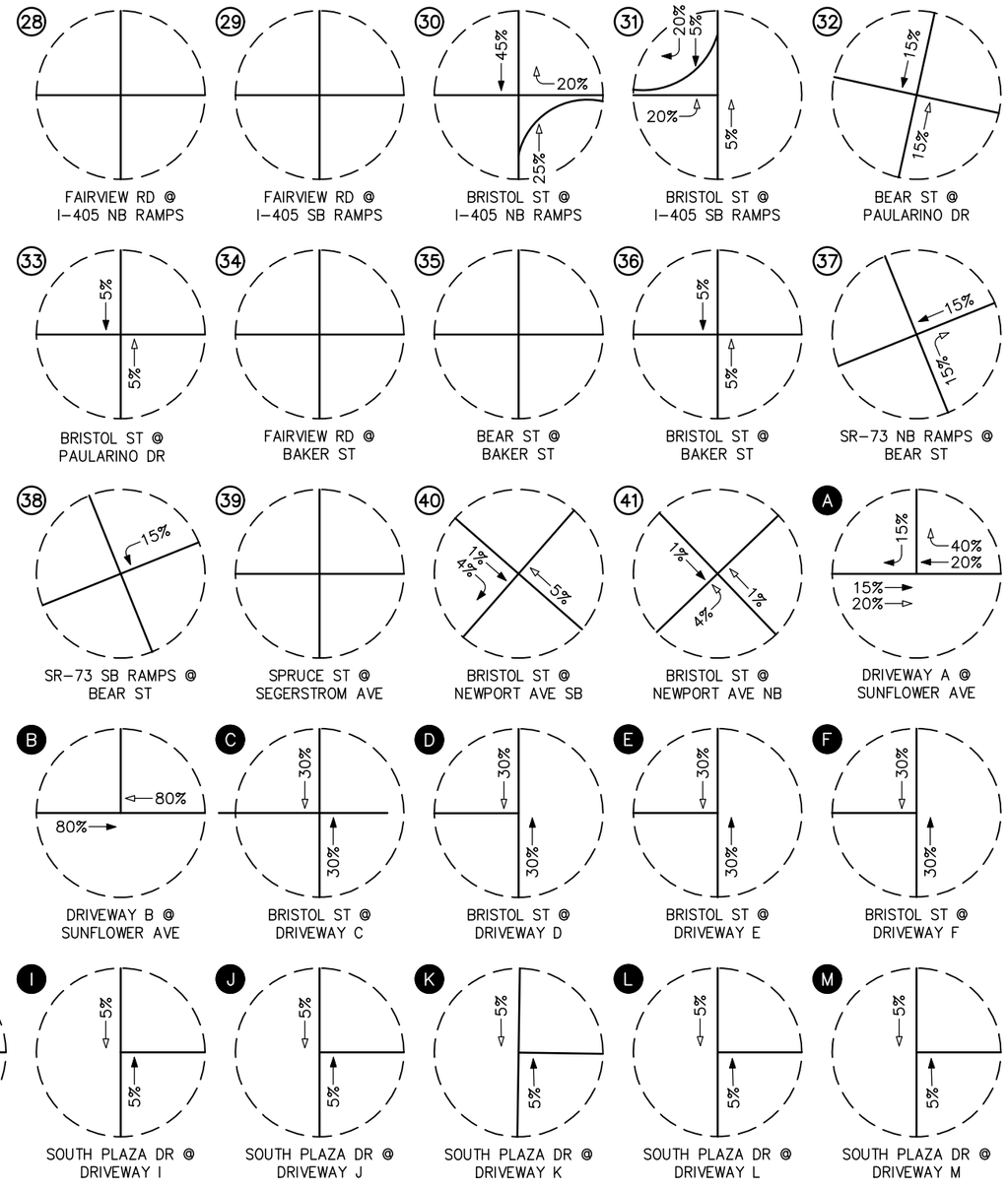
KEY
- (#) = STUDY INTERSECTION
- = PROJECT SITE
- = PHASE 1
- = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE

FIGURE 5-3A

PROJECT TRAFFIC DISTRIBUTION PATTERN - HOTEL PHASE 1

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

= PHASE 1

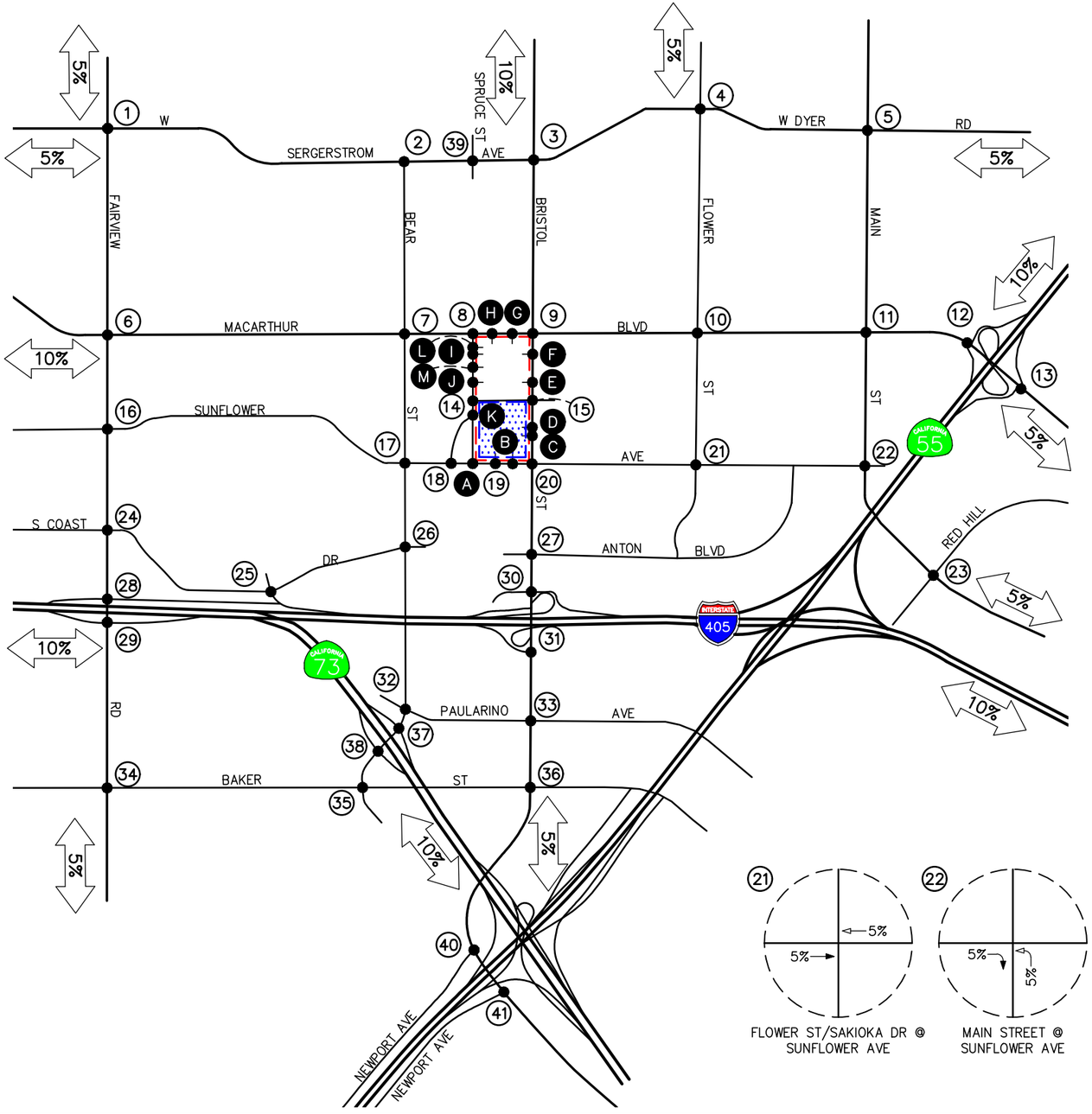
= INBOUND PERCENTAGE

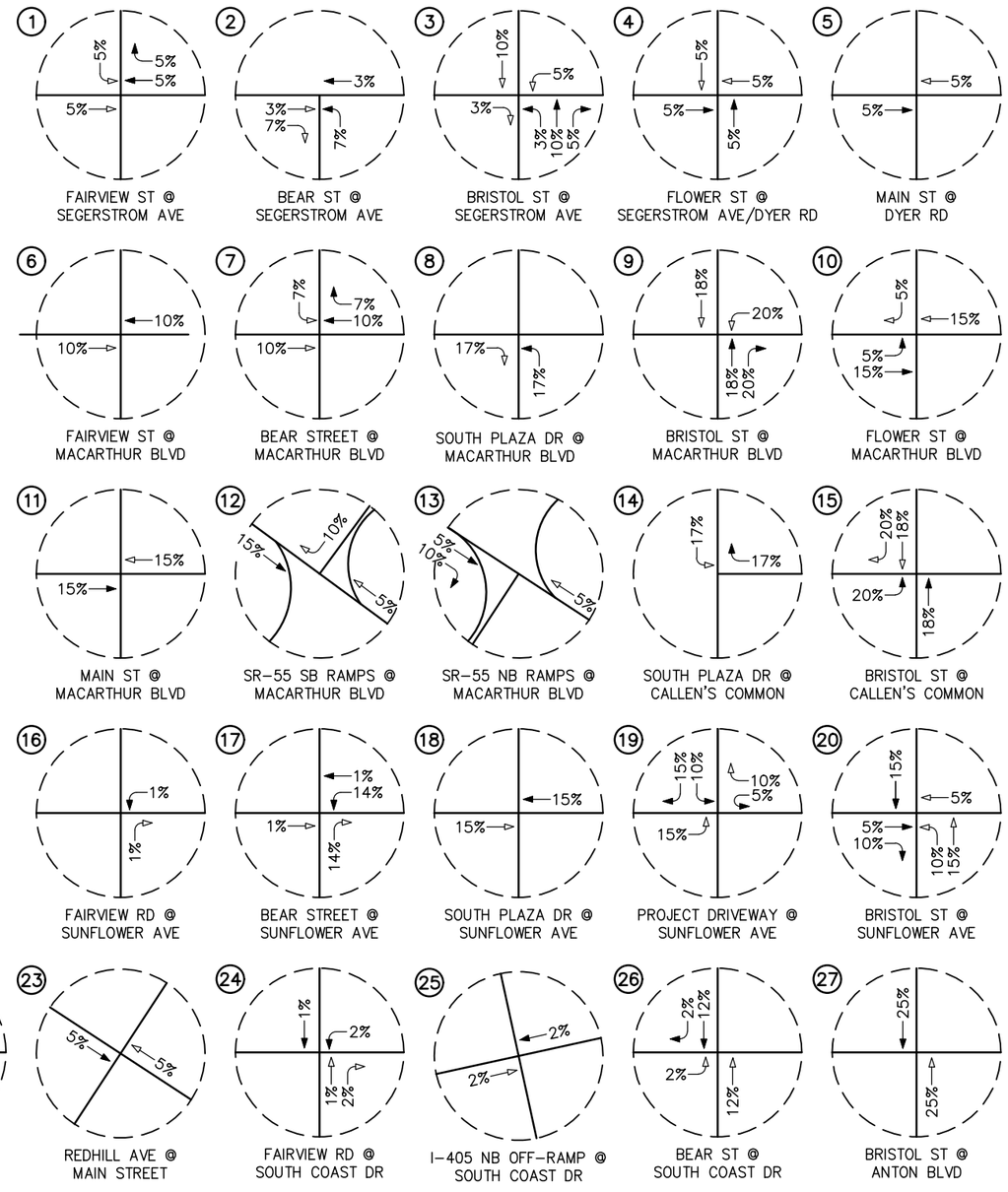
= OUTBOUND PERCENTAGE

FIGURE 5-3B

PROJECT TRAFFIC DISTRIBUTION PATTERN – HOTEL PHASE 1

RELATED BRISTOL, SANTA ANA





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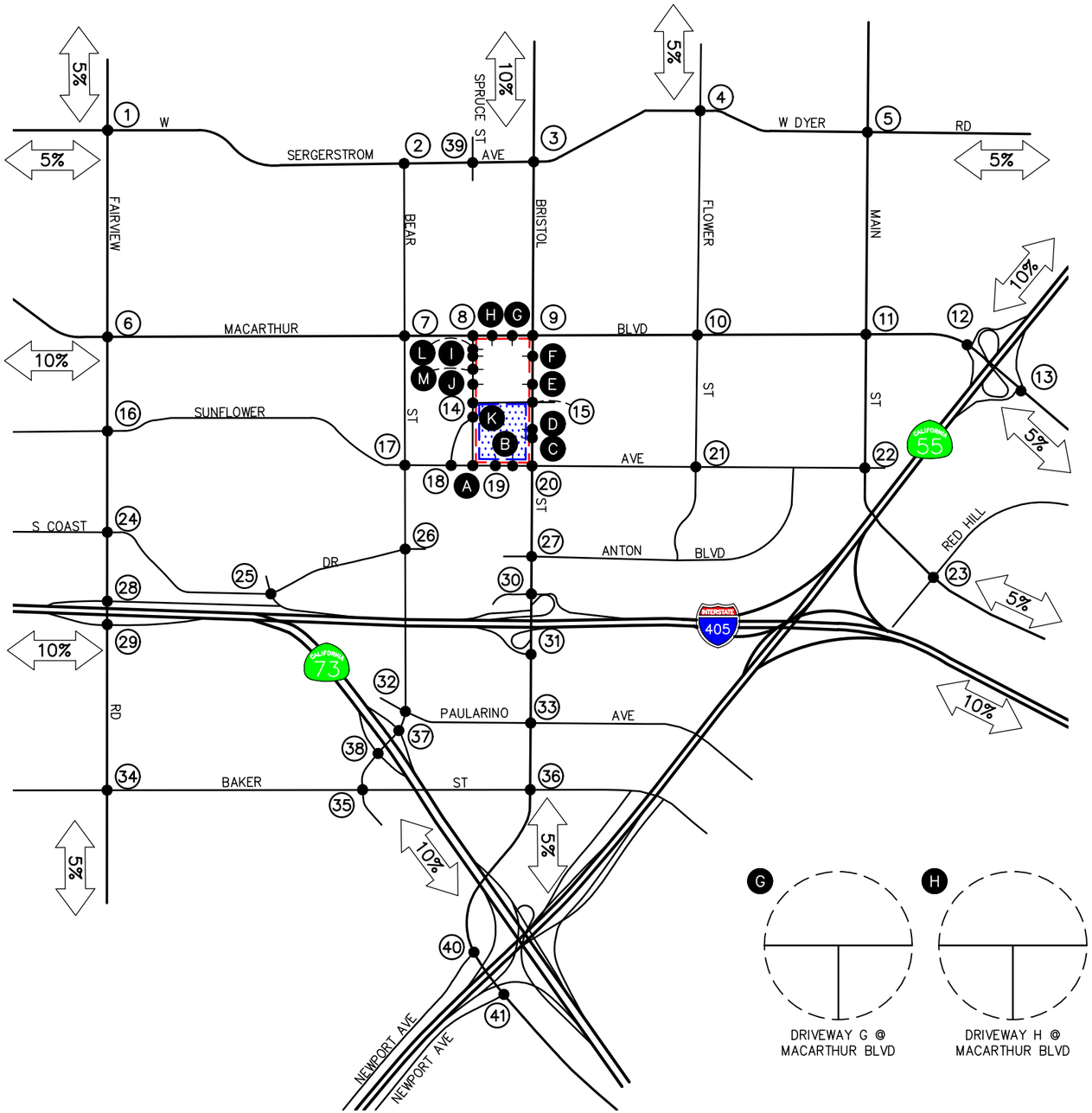
N NO SCALE

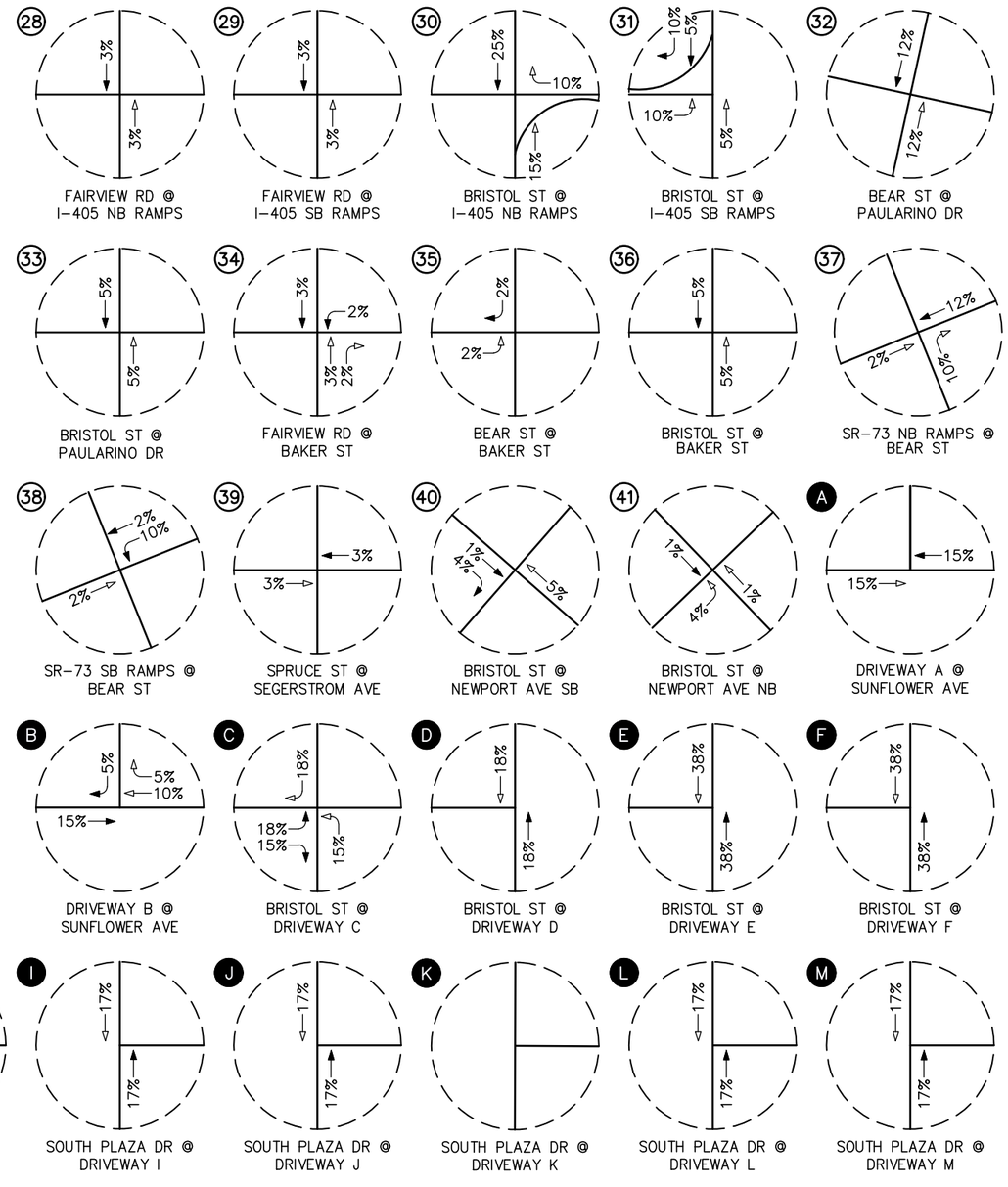
KEY
- (#) = STUDY INTERSECTION
- = PROJECT SITE
- = PHASE 1
- = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE

FIGURE 5-4A

PROJECT TRAFFIC DISTRIBUTION PATTERN – RETAIL PHASE 1

RELATED BRISTOL, SANTA ANA





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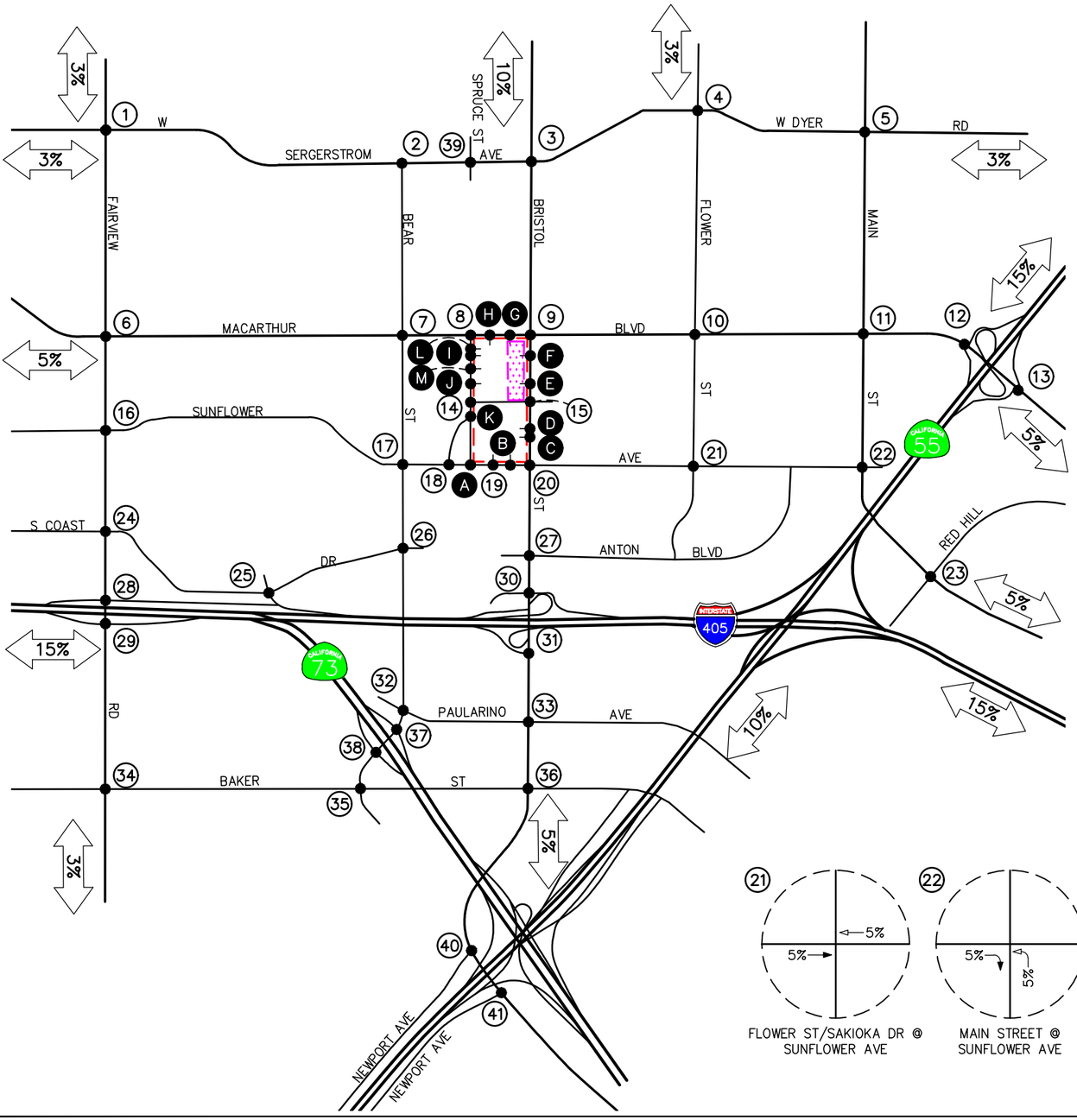
N NO SCALE

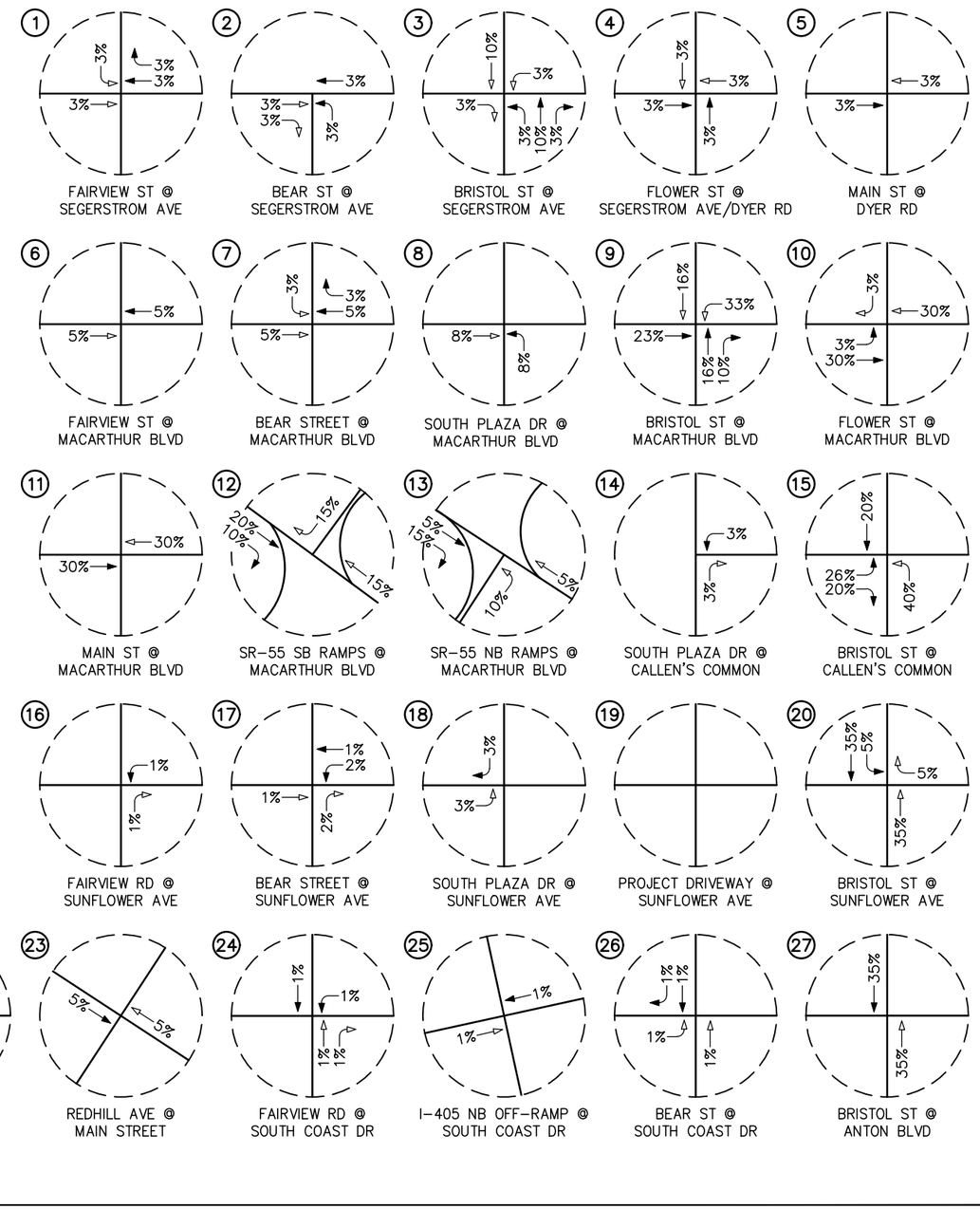
KEY
- (#) = STUDY INTERSECTION
- = PROJECT SITE
- = PHASE 1
- = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE

FIGURE 5-4B

PROJECT DISTRIBUTION PATTERN – RETAIL PHASE 1

RELATED BRISTOL, SANTA ANA





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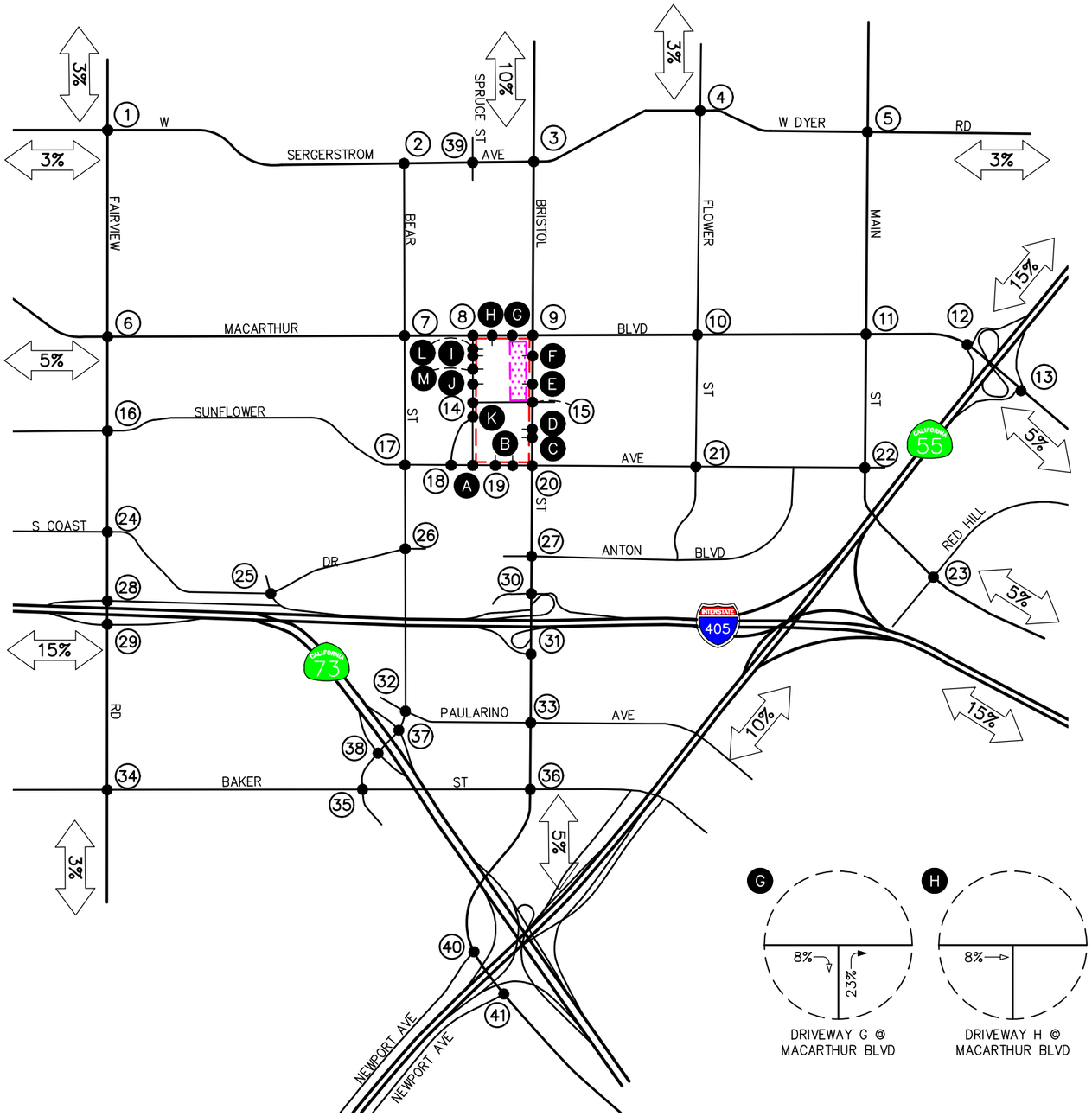
N NO SCALE

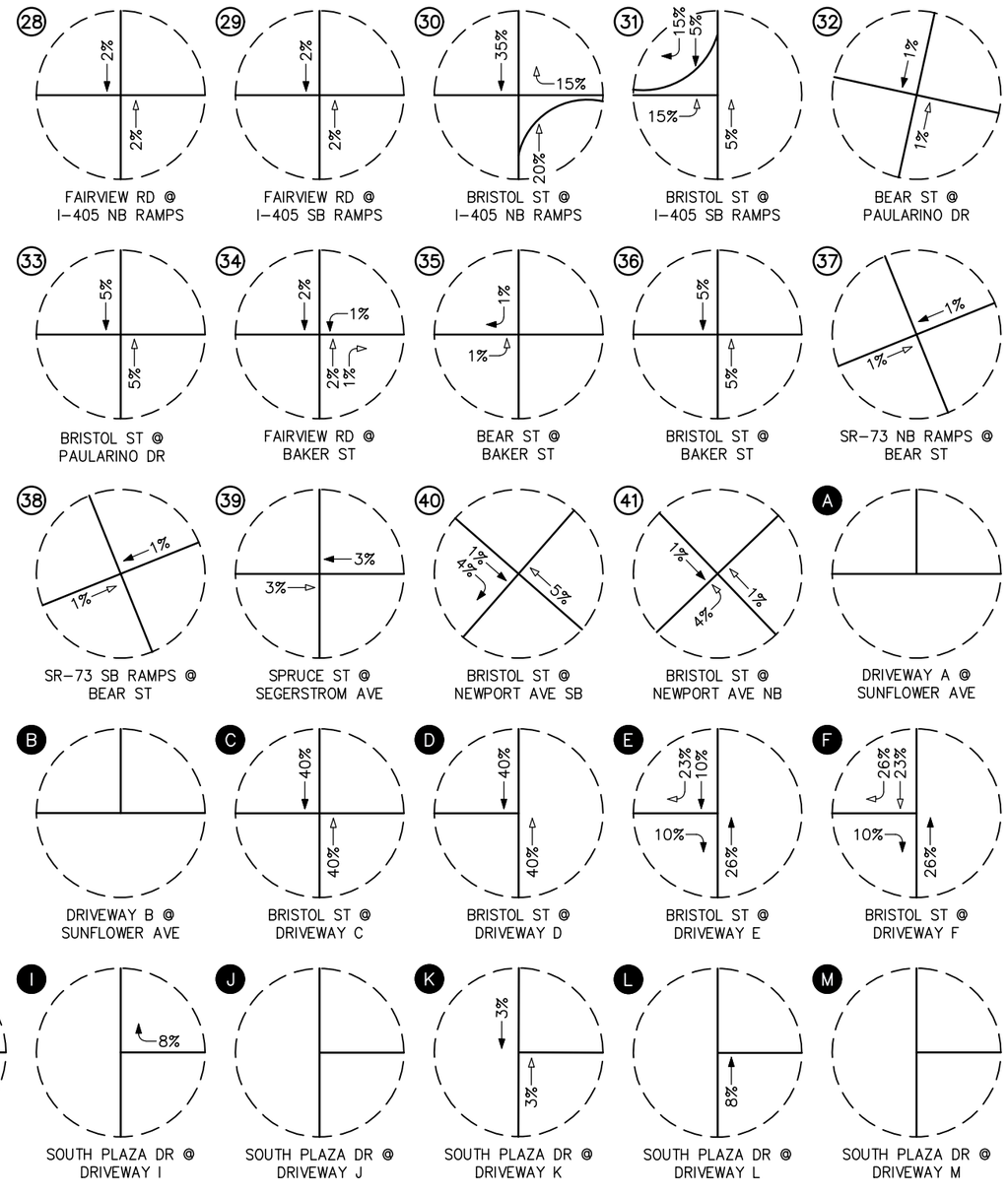
KEY
- (#) = STUDY INTERSECTION
- = PROJECT SITE
- = PHASE 2
- = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE

FIGURE 5-5A

PROJECT TRAFFIC DISTRIBUTION PATTERN – RESIDENTIAL PHASE 2

RELATED BRISTOL, SANTA ANA





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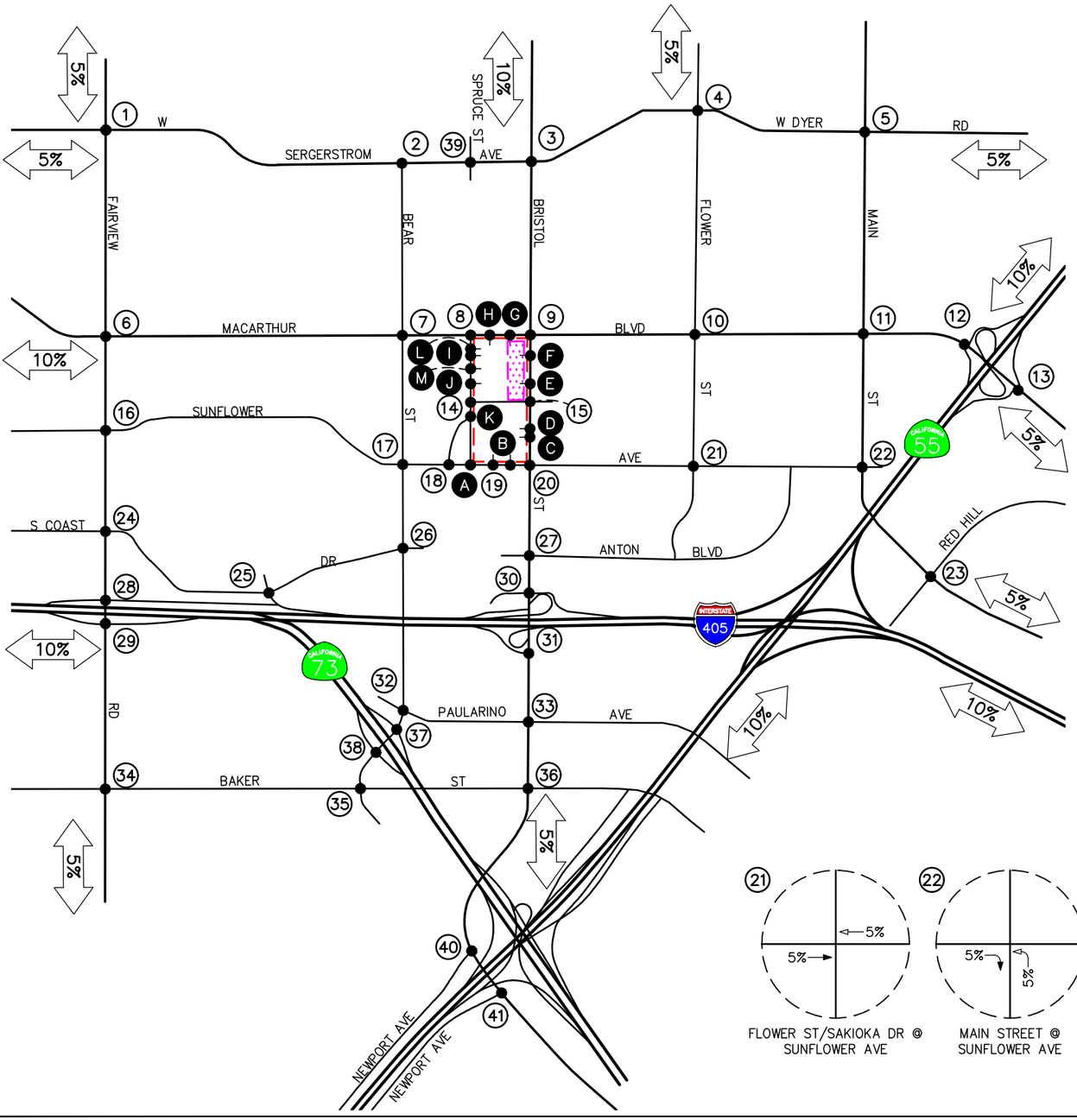
N NO SCALE

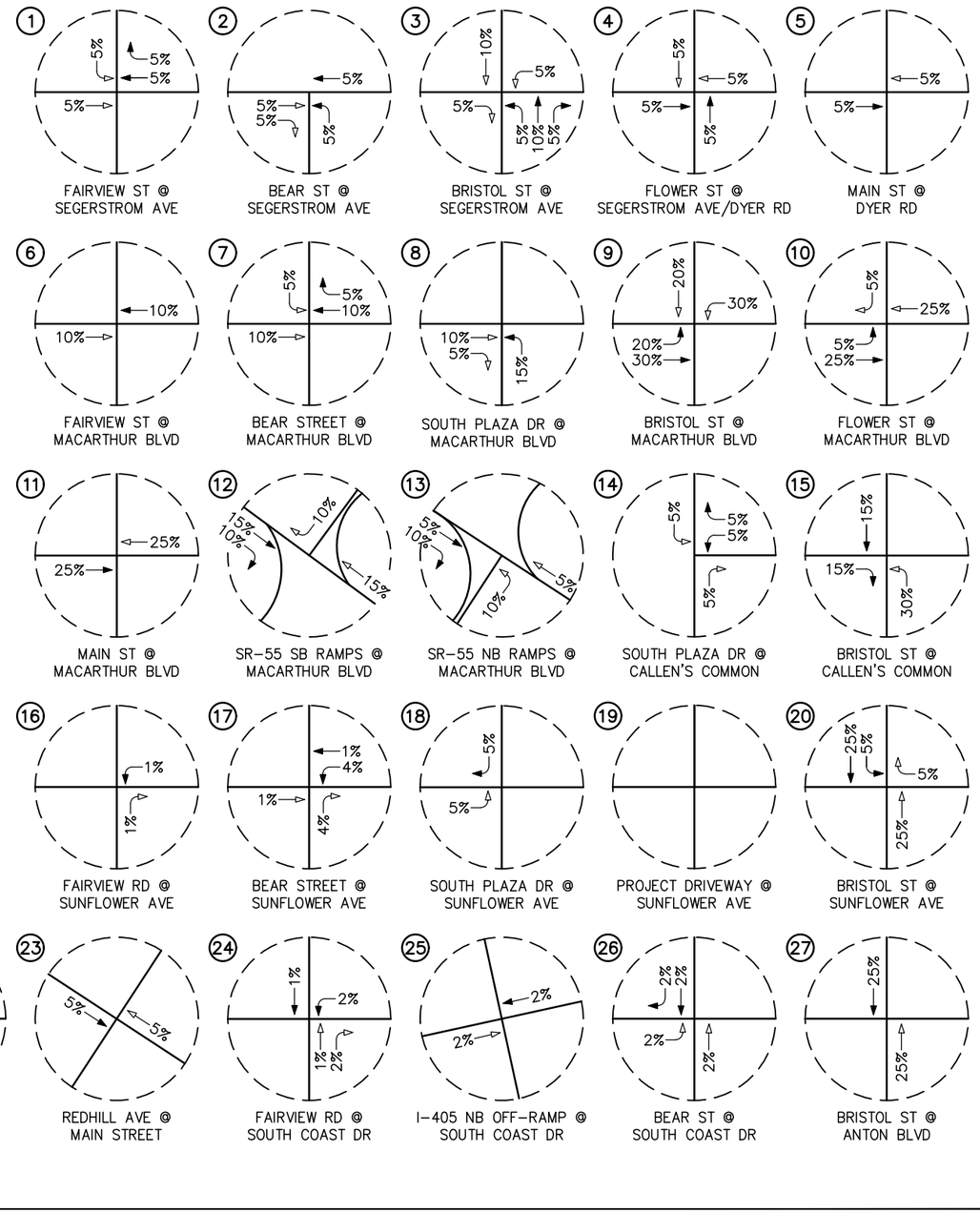
KEY
- (#) = STUDY INTERSECTION
- = PROJECT SITE
- = PHASE 2
- = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE

FIGURE 5-5B

PROJECT TRAFFIC DISTRIBUTION PATTERN – RESIDENTIAL PHASE 2

RELATED BRISTOL, SANTA ANA





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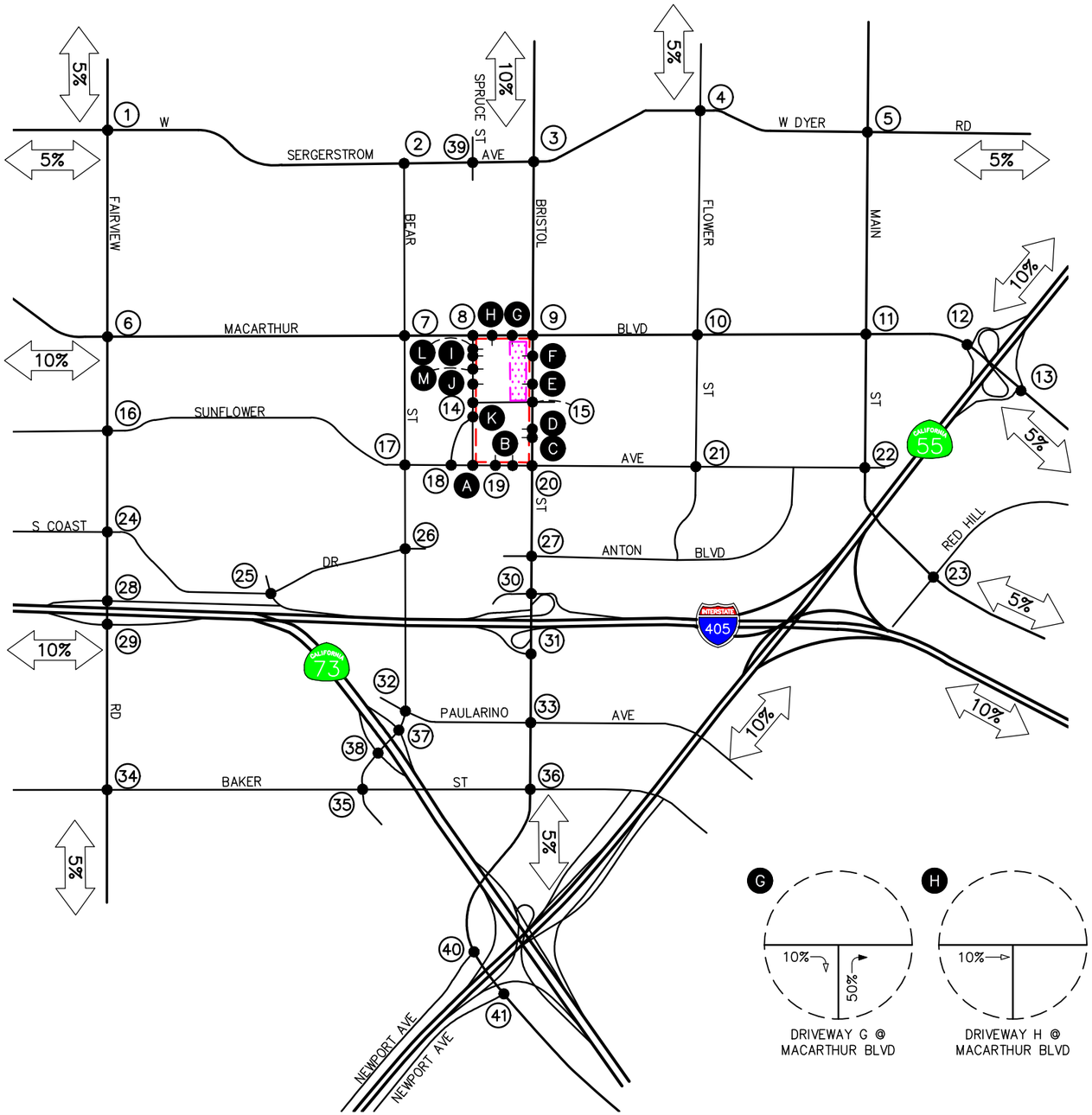
N NO SCALE

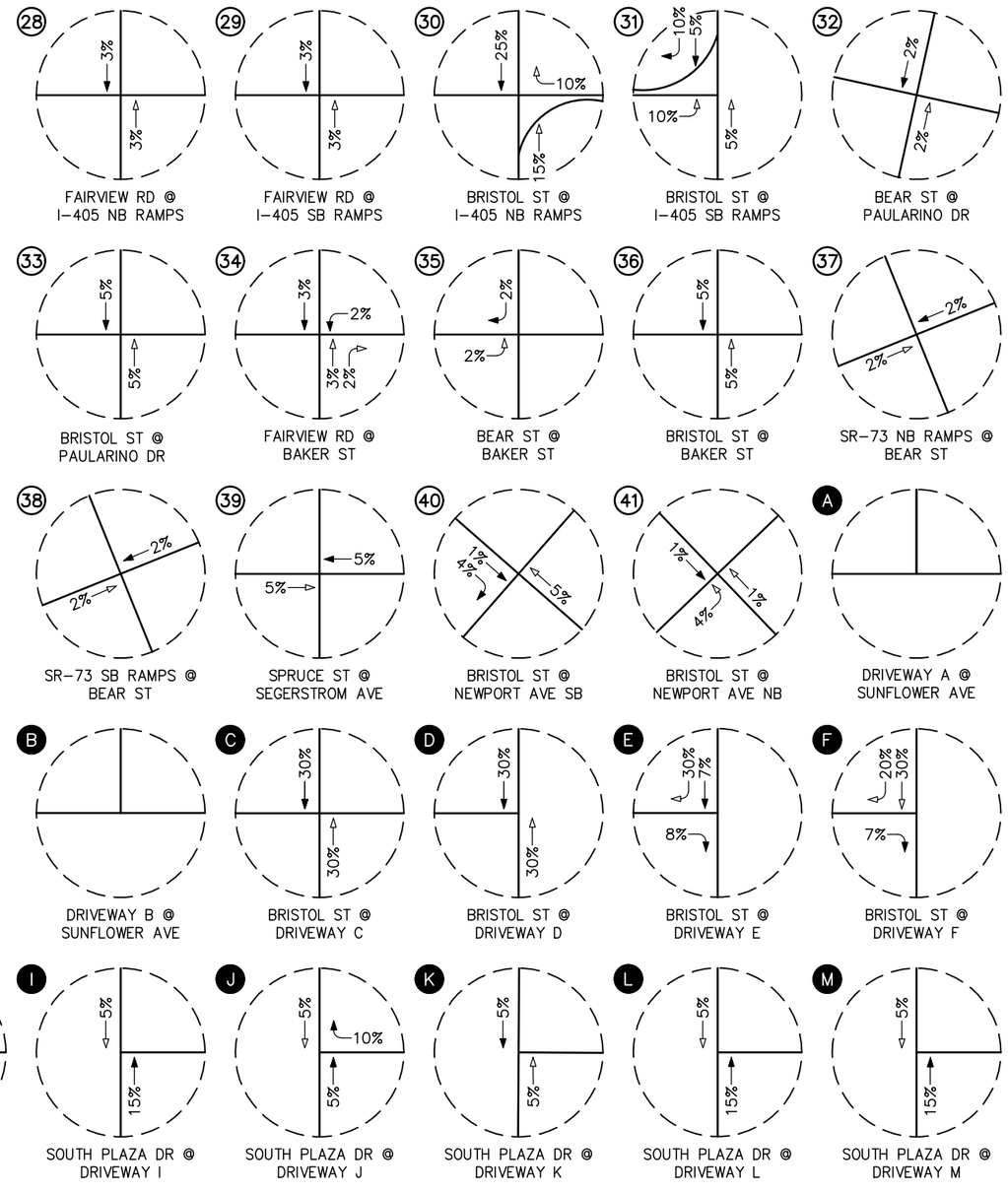
KEY
- (#) = STUDY INTERSECTION
- = PROJECT SITE
- = PHASE 2
- = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE

FIGURE 5-6A

PROJECT TRAFFIC DISTRIBUTION PATTERN – RETAIL PHASE 2

RELATED BRISTOL, SANTA ANA





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NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

= PHASE 2

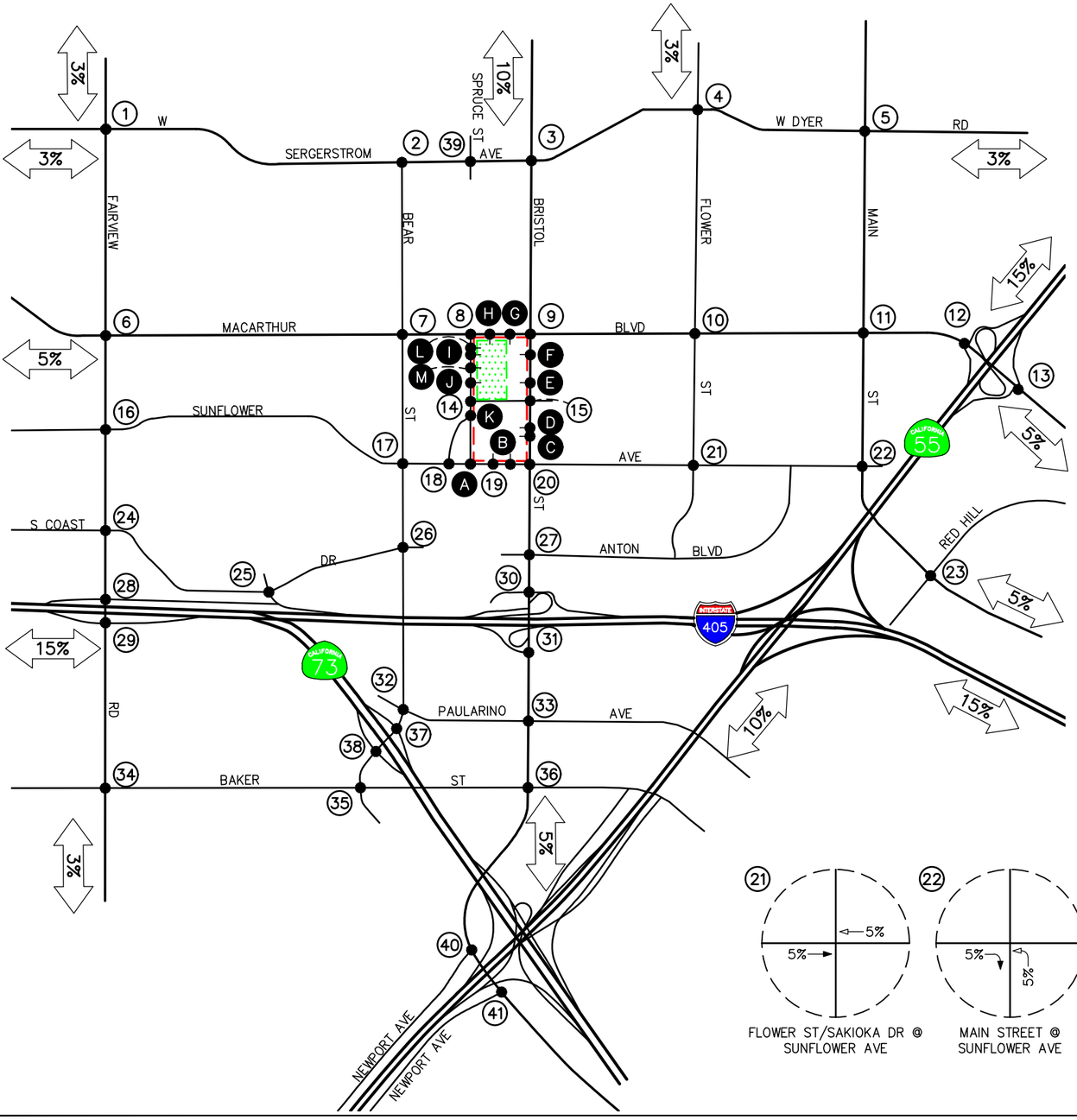
= INBOUND PERCENTAGE

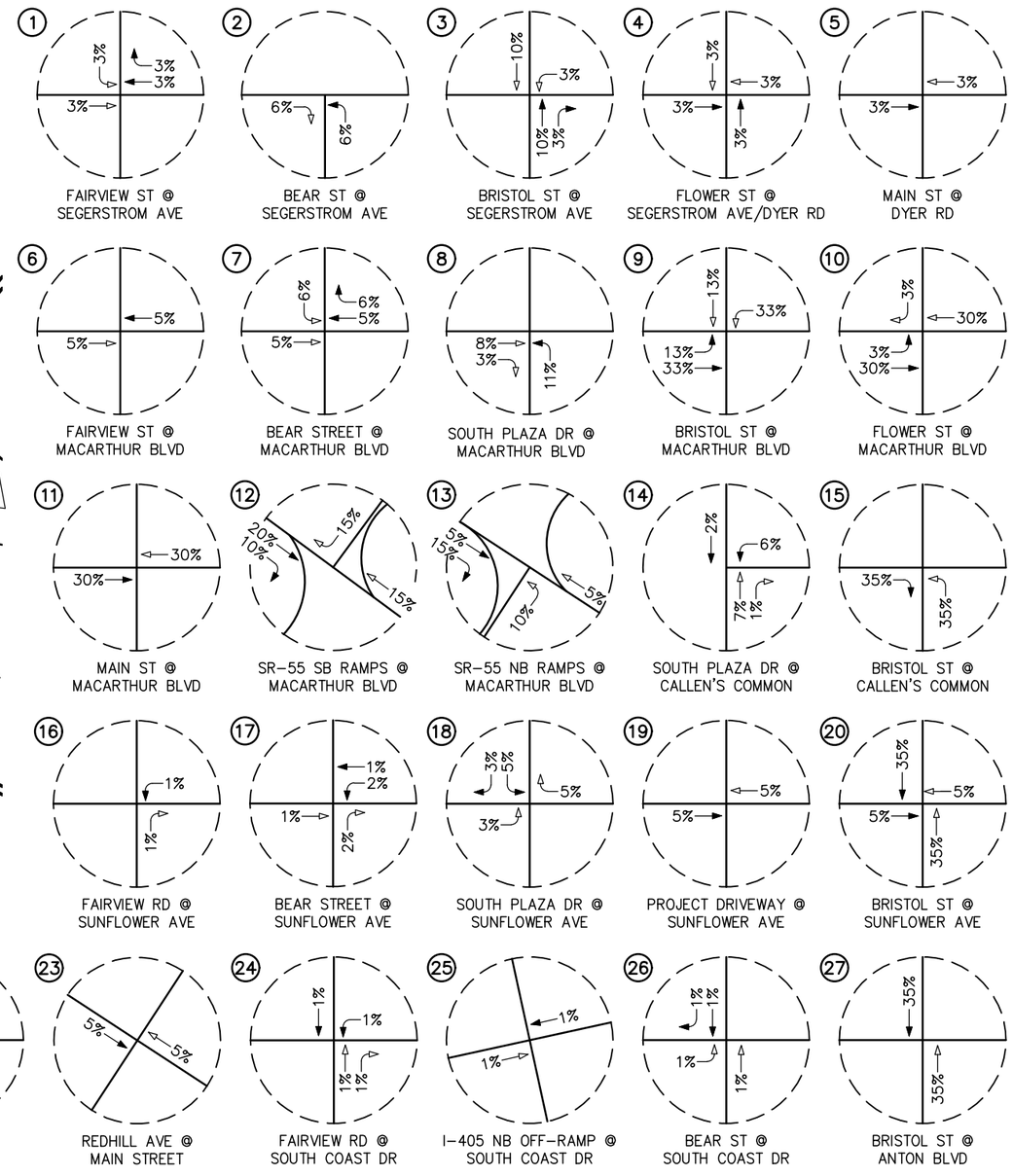
= OUTBOUND PERCENTAGE

FIGURE 5-6B

PROJECT TRAFFIC DISTRIBUTION PATTERN – RETAIL PHASE 2

RELATED BRISTOL, SANTA ANA





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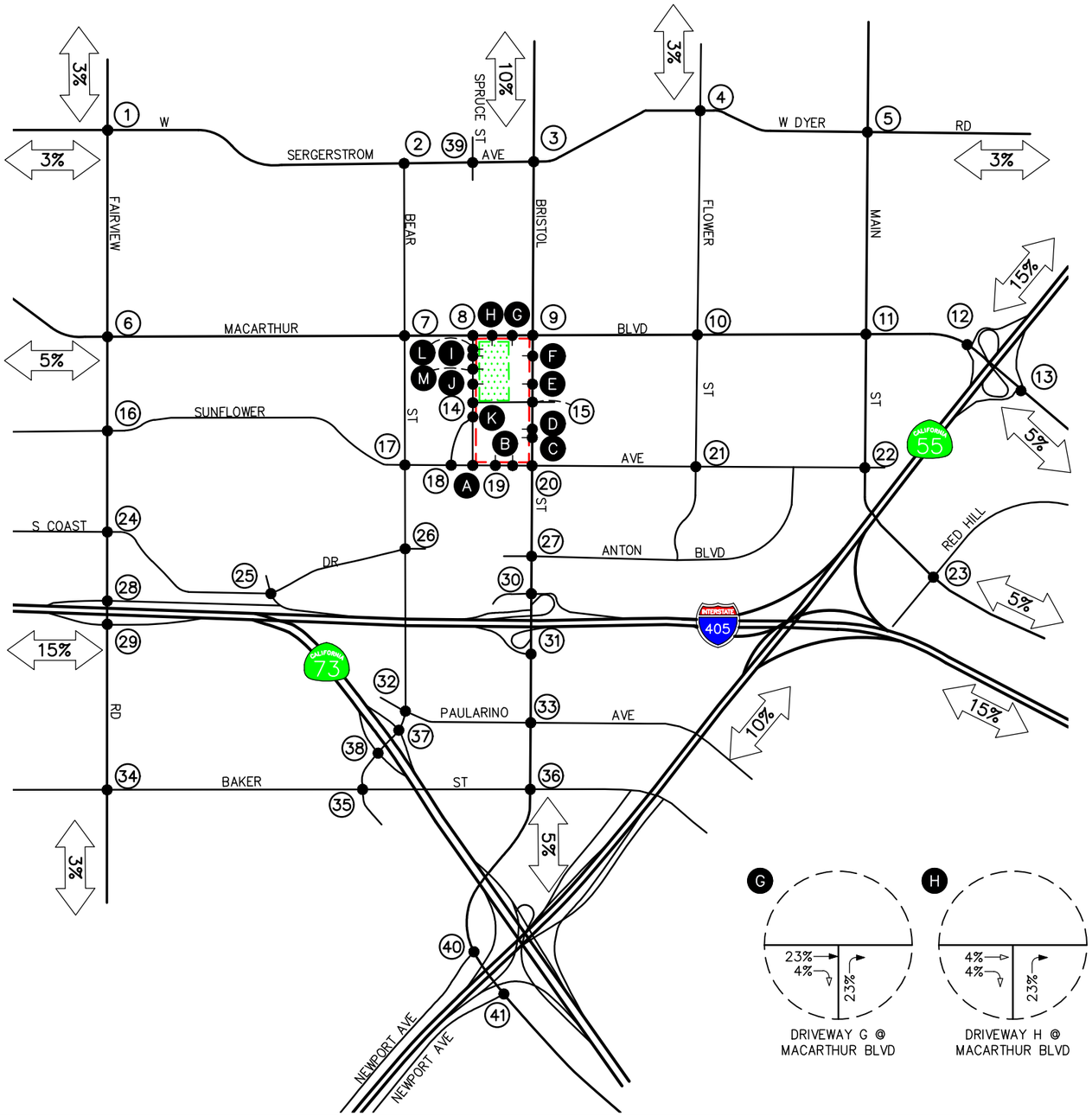
N NO SCALE

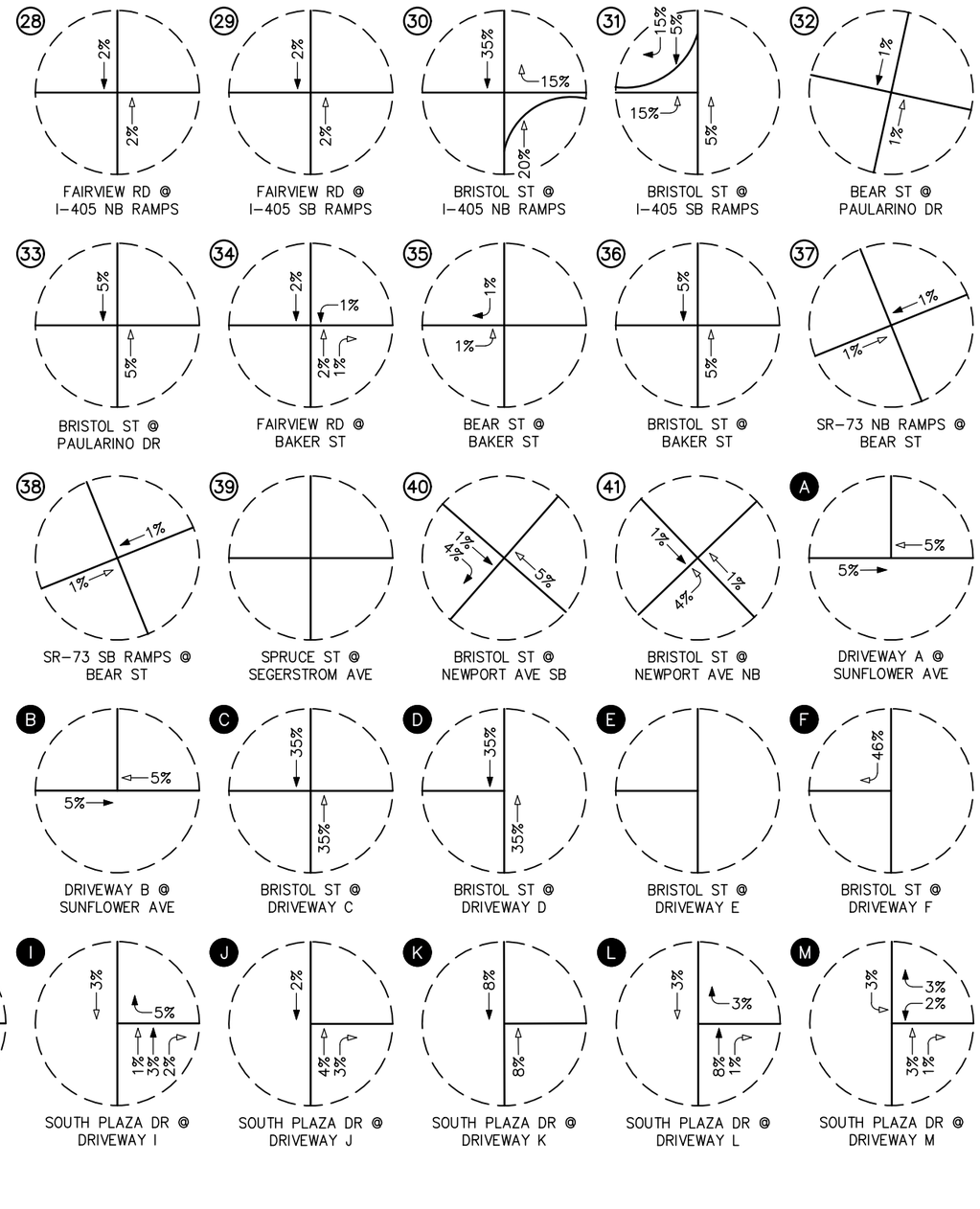
KEY
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 3
= INBOUND PERCENTAGE
= OUTBOUND PERCENTAGE

FIGURE 5-7A

PROJECT TRAFFIC DISTRIBUTION PATTERN - RESIDENTIAL PHASE 3

RELATED BRISTOL, SANTA ANA





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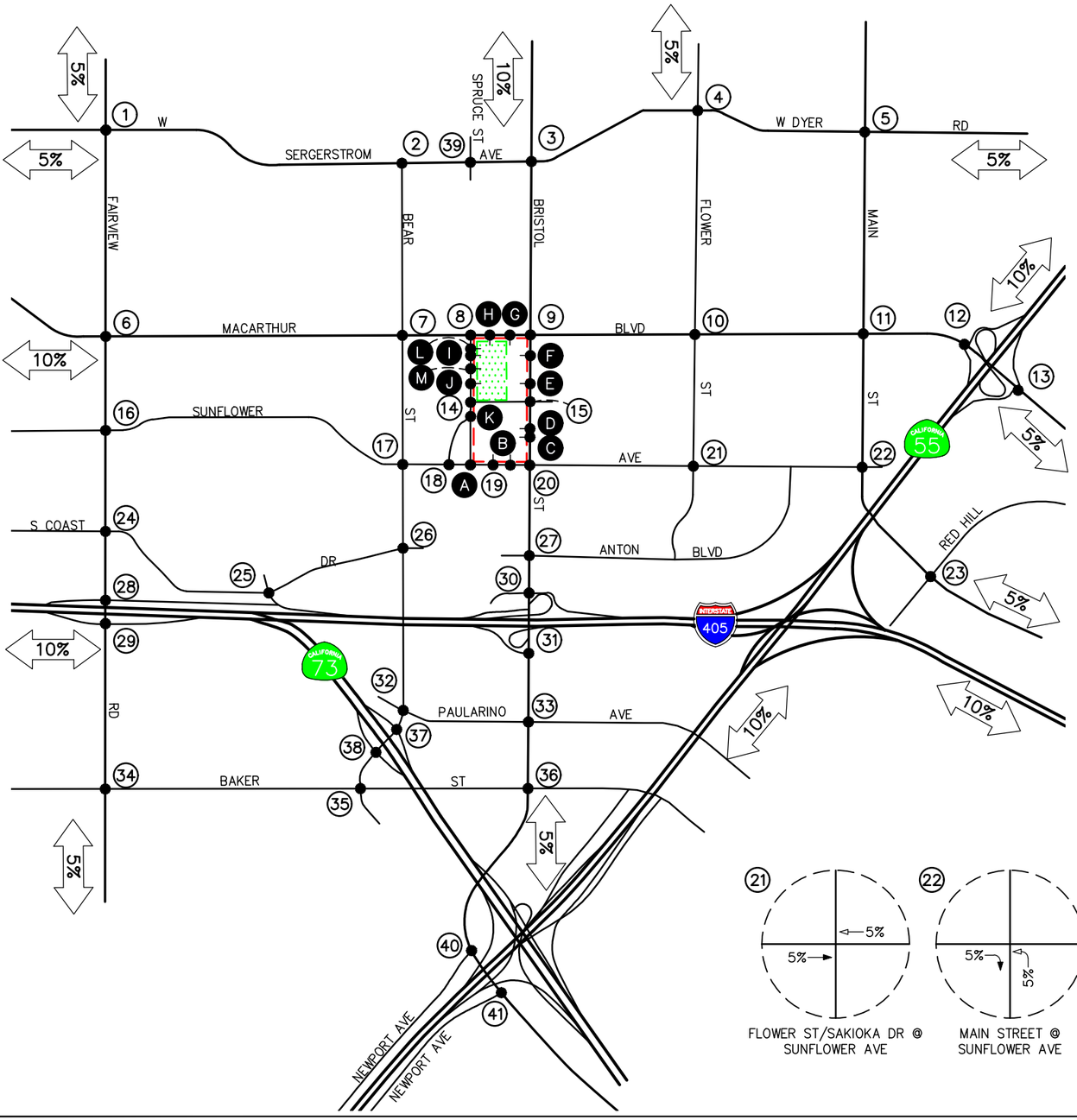
N NO SCALE

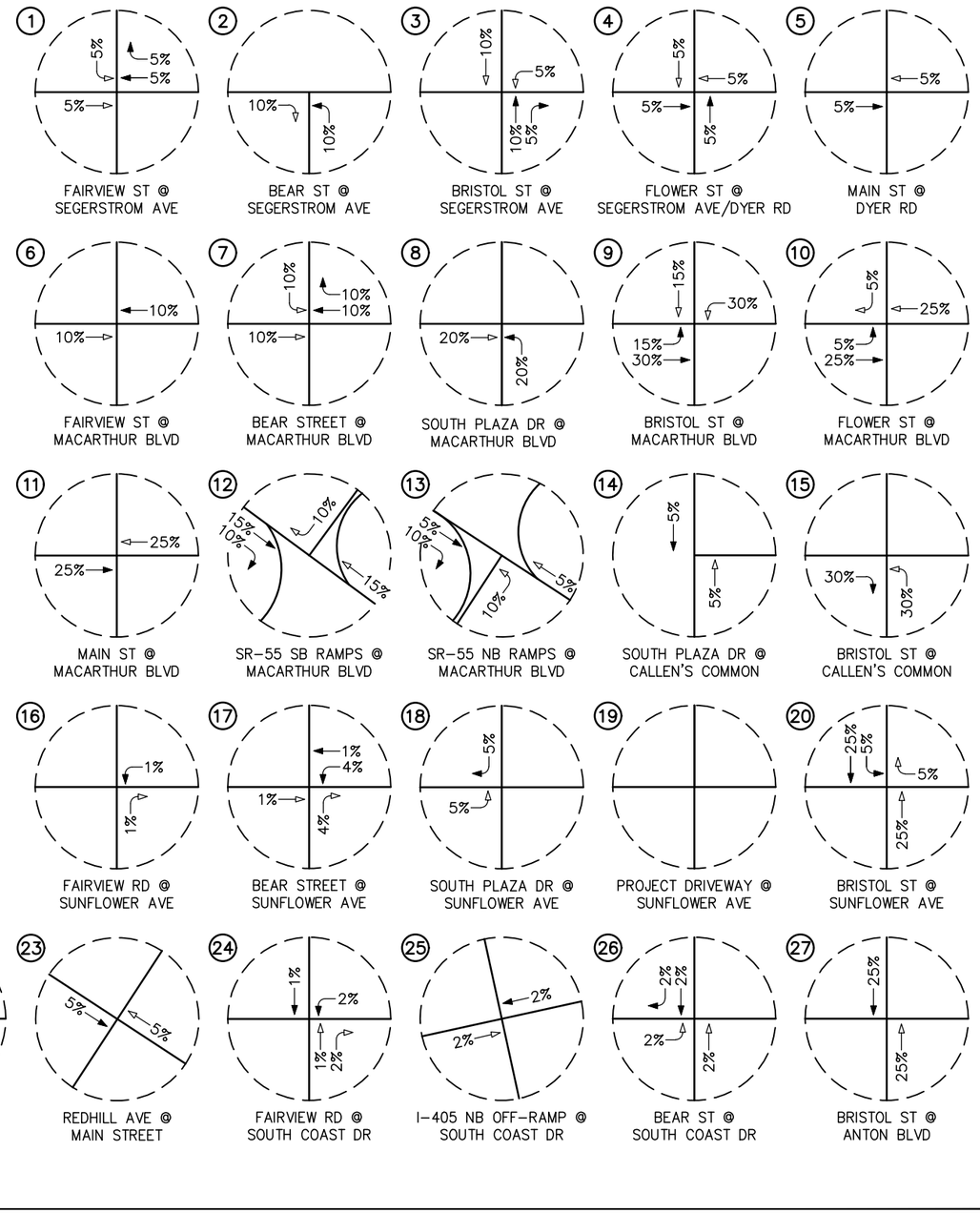
KEY
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 3
= INBOUND PERCENTAGE
= OUTBOUND PERCENTAGE

FIGURE 5-7B

PROJECT TRAFFIC DISTRIBUTION PATTERN – RESIDENTIAL PHASE 3

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY
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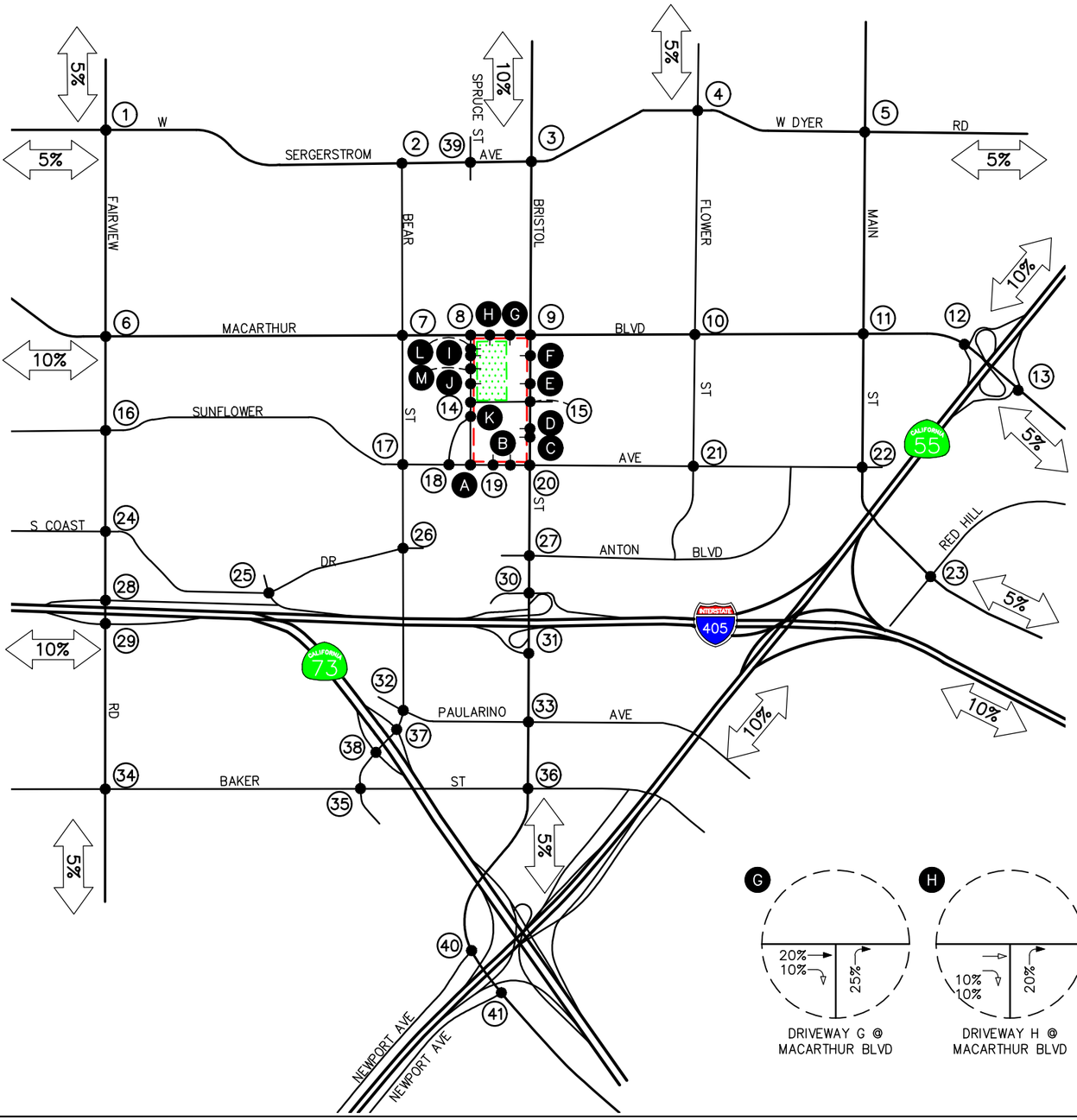
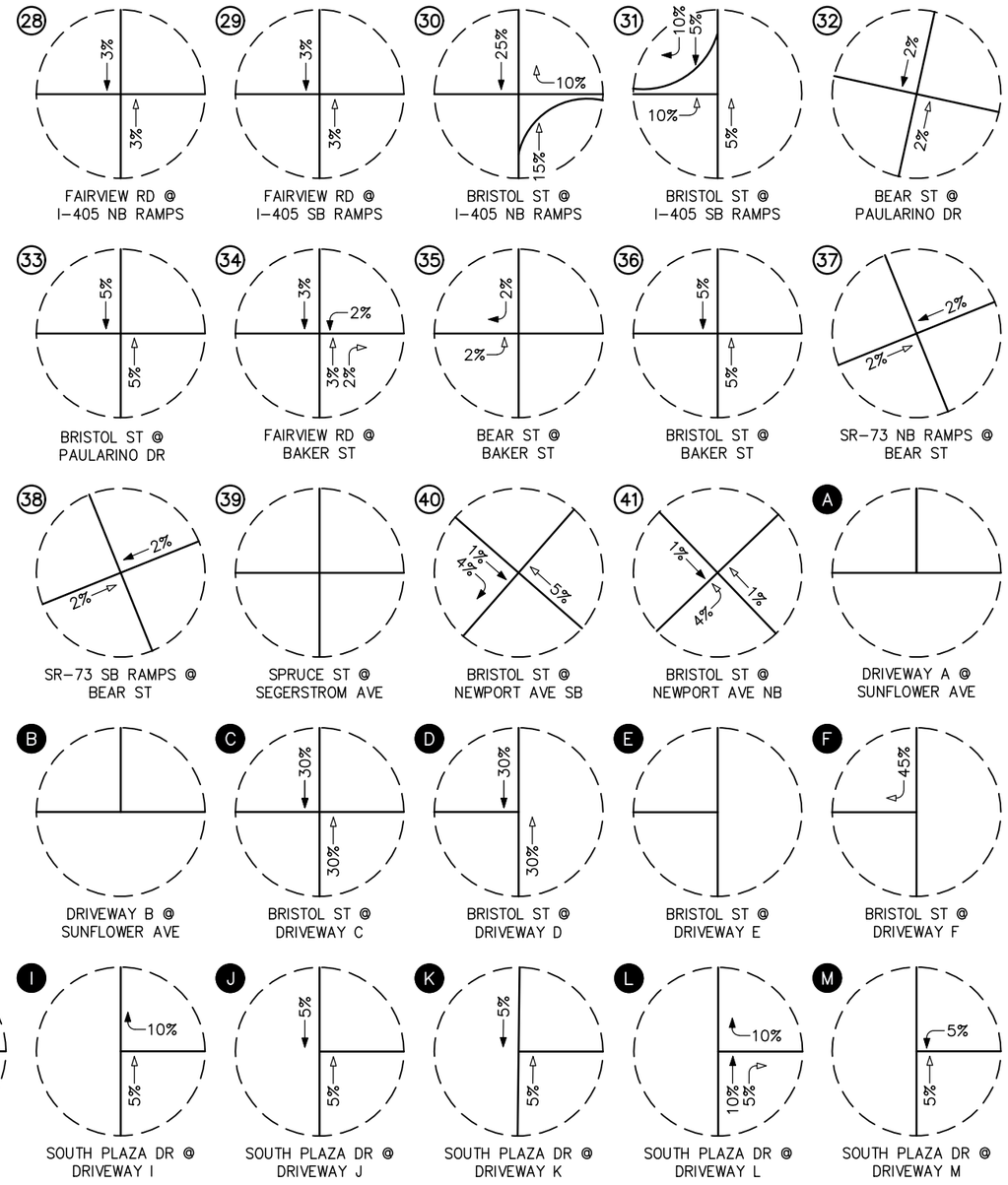
- = PHASE 3
- = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE

FIGURE 5-8A

PROJECT TRAFFIC DISTRIBUTION PATTERN – RETAIL PHASE 3

RELATED BRISTOL, SANTA ANA





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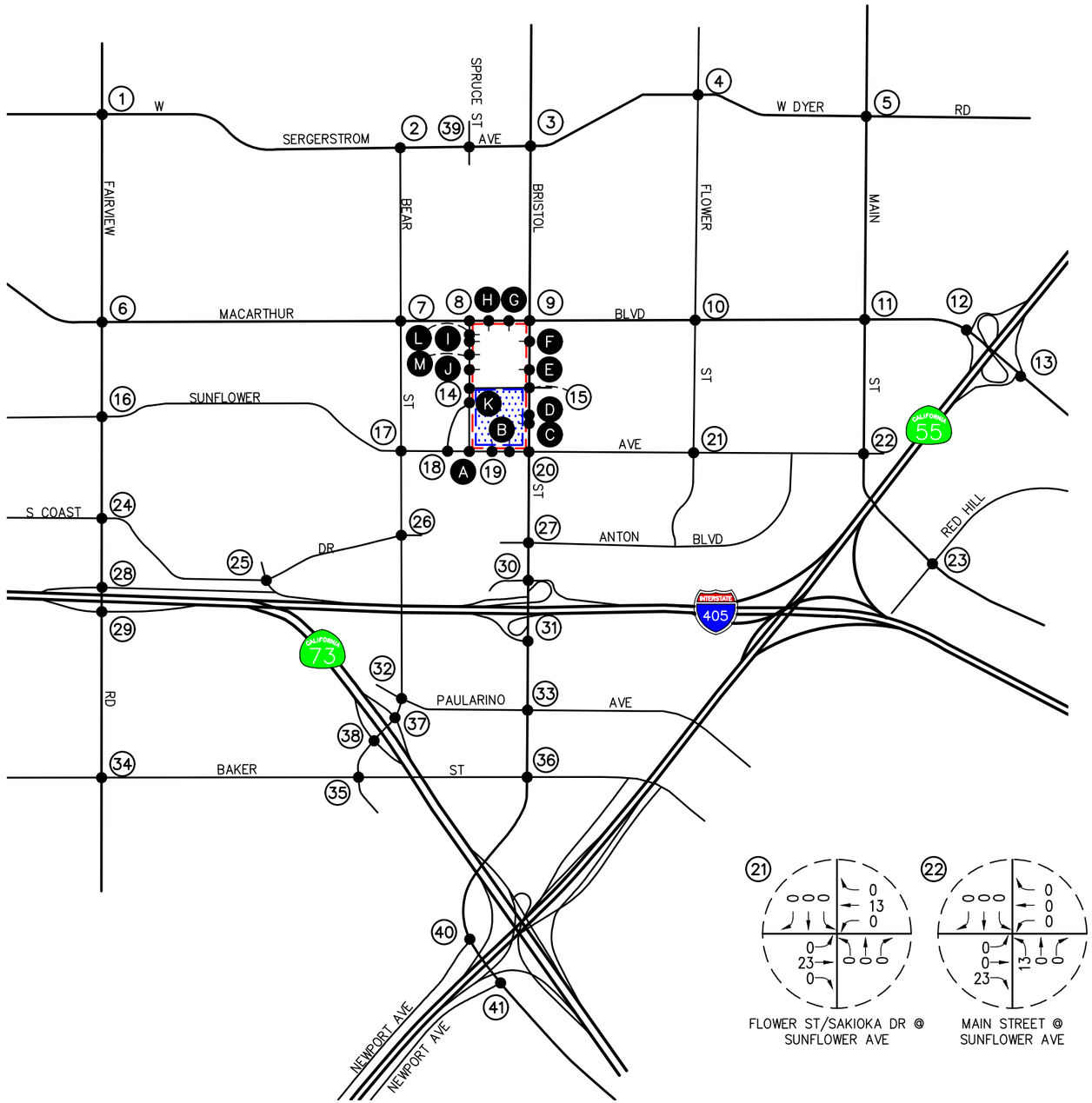
N NO SCALE

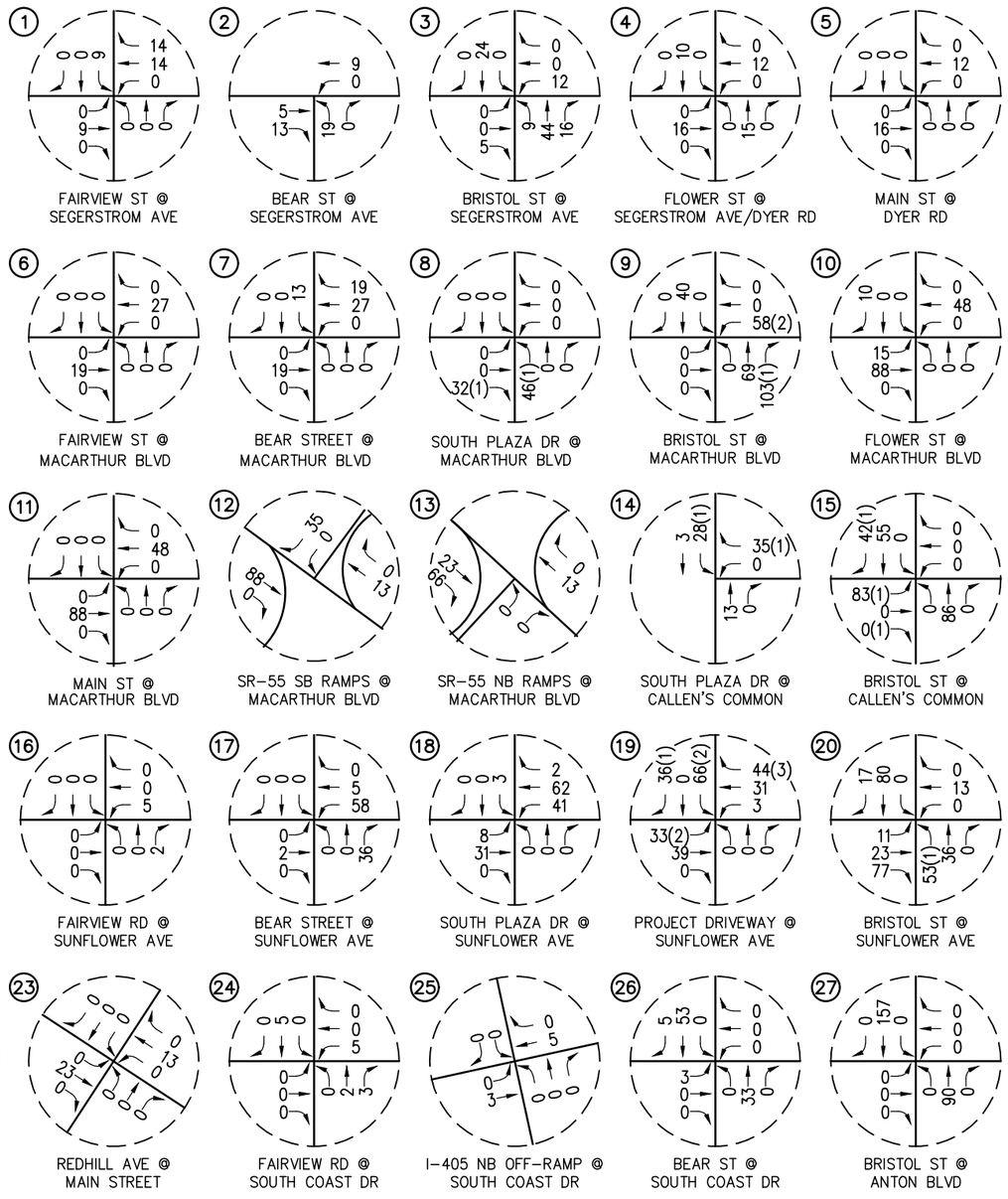
KEY
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 3
= INBOUND PERCENTAGE
= OUTBOUND PERCENTAGE

FIGURE 5-8B

PROJECT TRAFFIC DISTRIBUTION PATTERN – RETAIL PHASE 3

RELATED BRISTOL, SANTA ANA





n:\4400\2214410 - bristol commons - confidential, santa ana\dwg\4410 f5-9a.dwg LDP 13:37:55 01-17-2023 howell

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

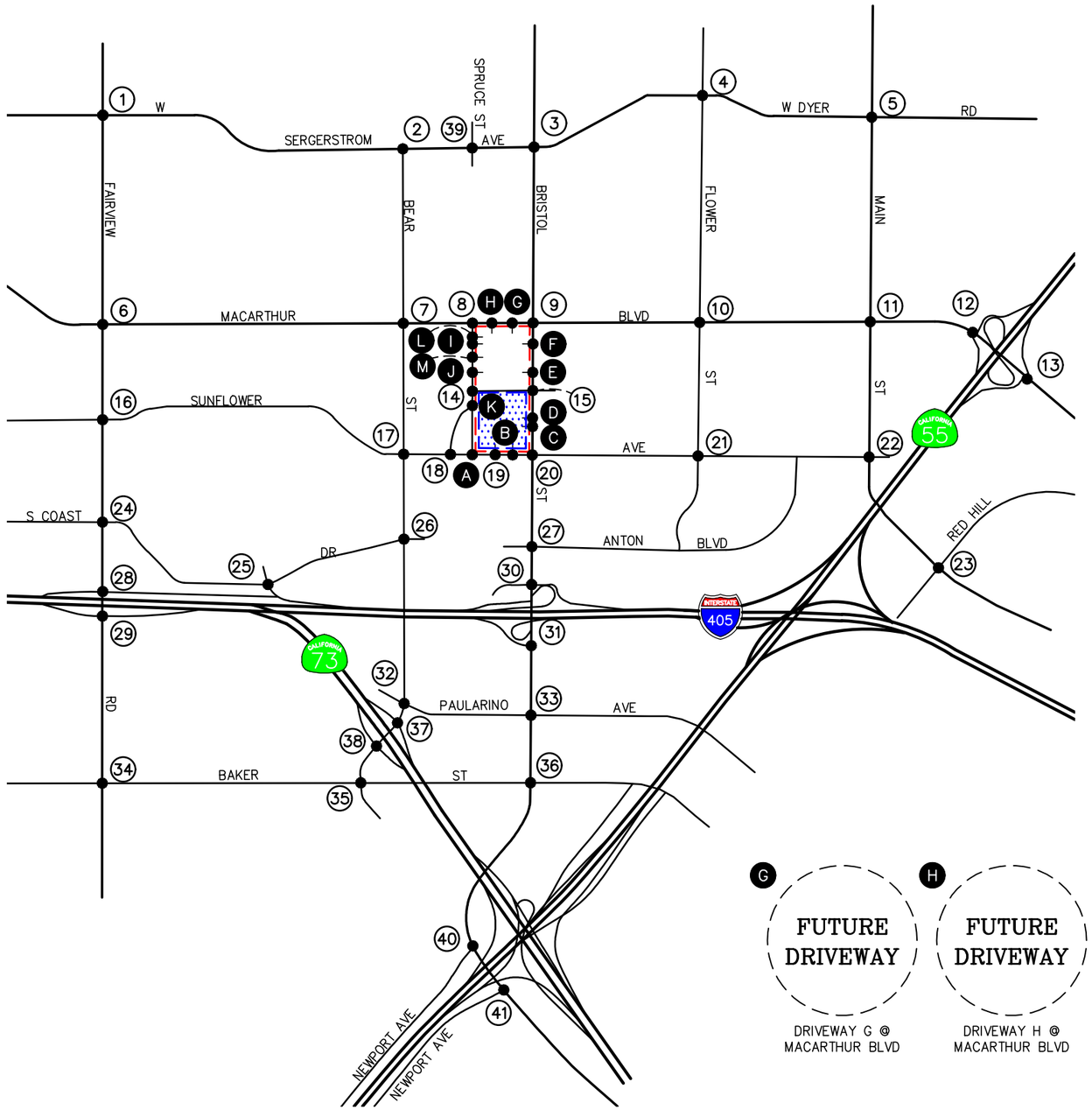
KEY

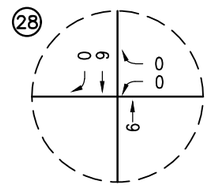
(#) = STUDY INTERSECTION
(XX) = PASSBY TRIPS
= PROJECT SITE
= PHASE 1

FIGURE 5-9A

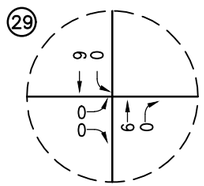
AM PEAK HOUR PHASE 1 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA

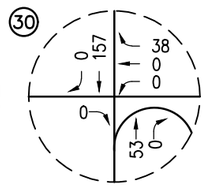




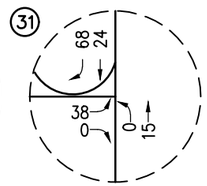
FAIRVIEW RD @
I-405 NB RAMPS



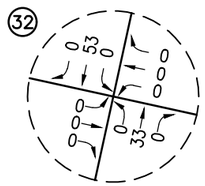
FAIRVIEW RD @
I-405 SB RAMPS



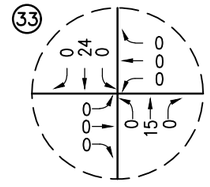
BRISTOL ST @
I-405 NB RAMPS



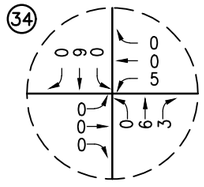
BRISTOL ST @
I-405 SB RAMPS



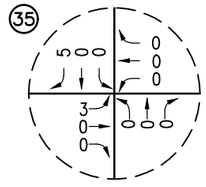
BEAR ST @
PAULARINO DR



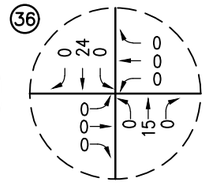
BRISTOL ST @
PAULARINO DR



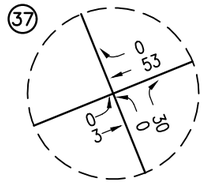
FAIRVIEW RD @
BAKER ST



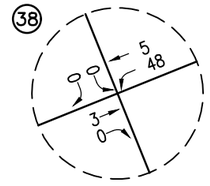
BEAR ST @
BAKER ST



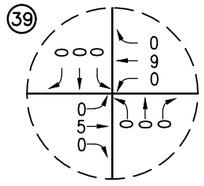
BRISTOL ST @
BAKER ST



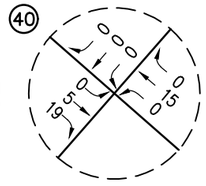
SR-73 NB RAMPS @
BEAR ST



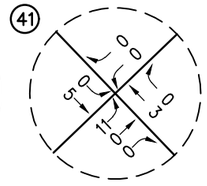
SR-73 SB RAMPS @
BEAR ST



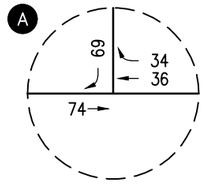
SPRUCE ST @
SEGERSTROM AVE



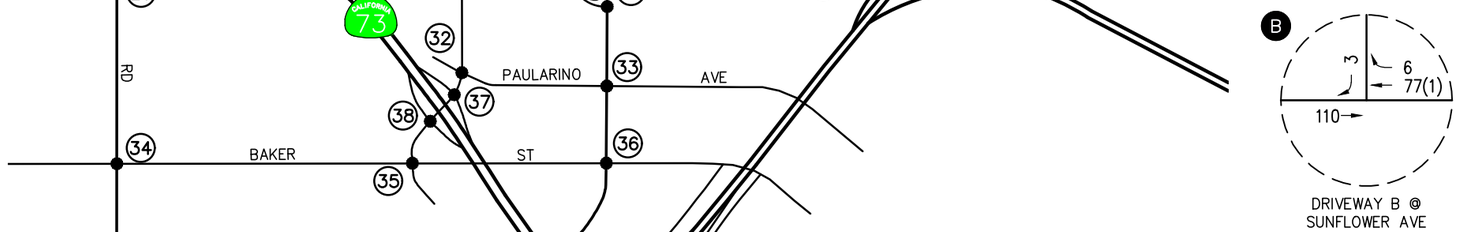
BRISTOL ST @
NEWPORT AVE NB



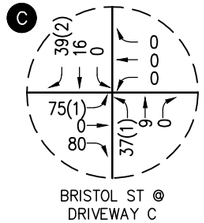
BRISTOL ST @
NEWPORT AVE SB



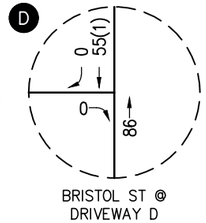
DRIVEWAY A @
SUNFLOWER AVE



DRIVEWAY B @
SUNFLOWER AVE



BRISTOL ST @
DRIVEWAY C



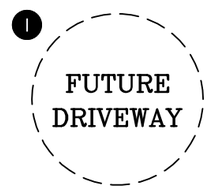
BRISTOL ST @
DRIVEWAY D

BRISTOL ST @
DRIVEWAY E

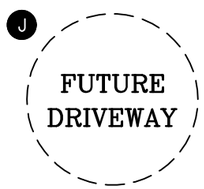
BRISTOL ST @
DRIVEWAY F

DRIVEWAY G @
MACARTHUR BLVD

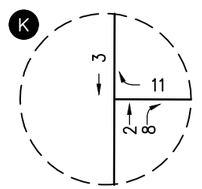
DRIVEWAY H @
MACARTHUR BLVD



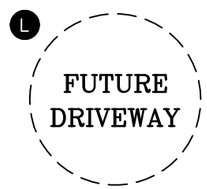
SOUTH PLAZA DR @
DRIVEWAY I



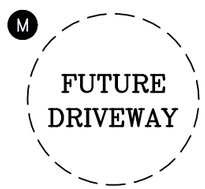
SOUTH PLAZA DR @
DRIVEWAY J



SOUTH PLAZA DR @
DRIVEWAY K



SOUTH PLAZA DR @
DRIVEWAY L



SOUTH PLAZA DR @
DRIVEWAY M

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

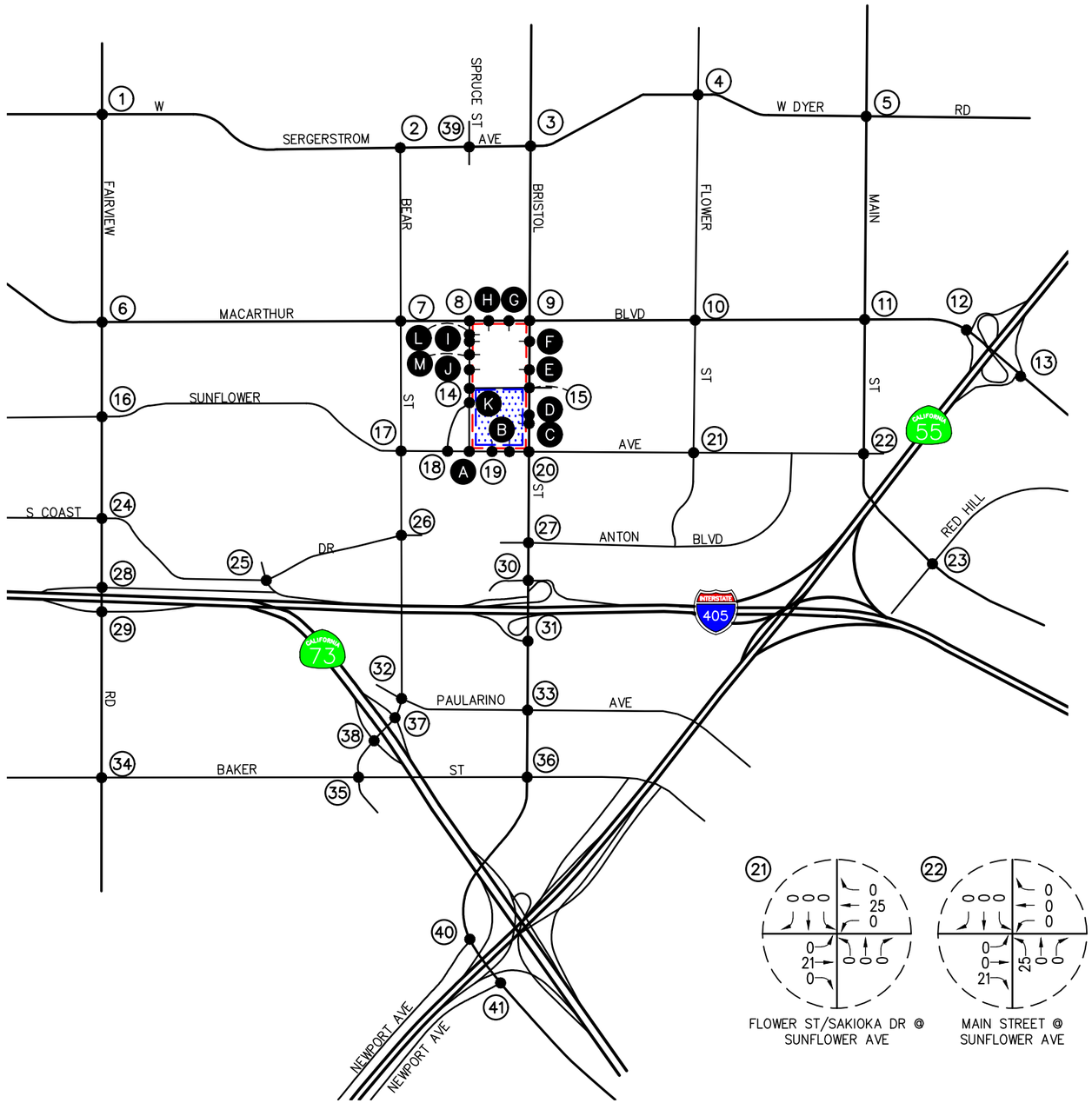
KEY

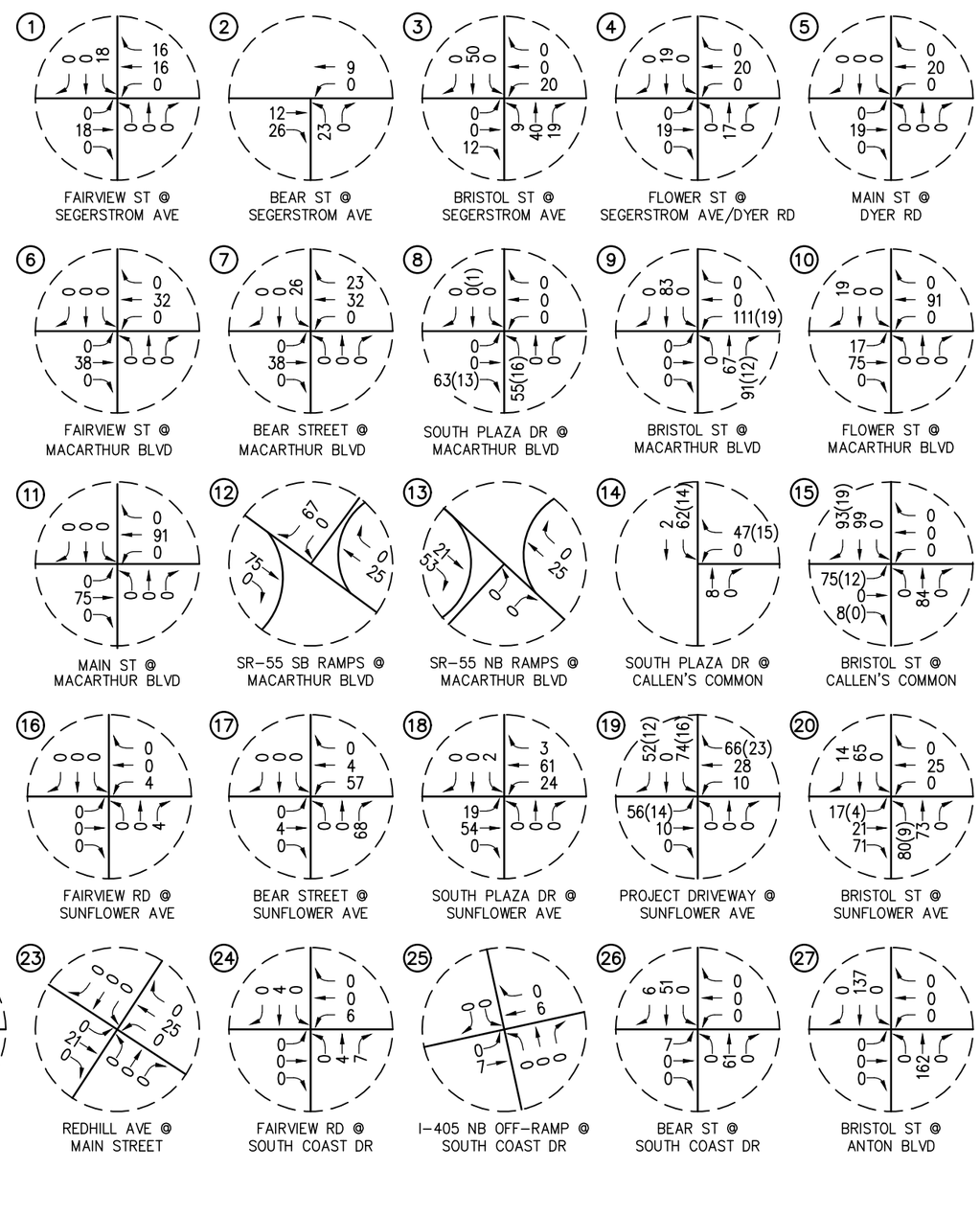
(#) = STUDY INTERSECTION
(XX) = PASSBY TRIPS
= PROJECT SITE
= PHASE 1

FIGURE 5-9B

AM PEAK HOUR PHASE 1 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

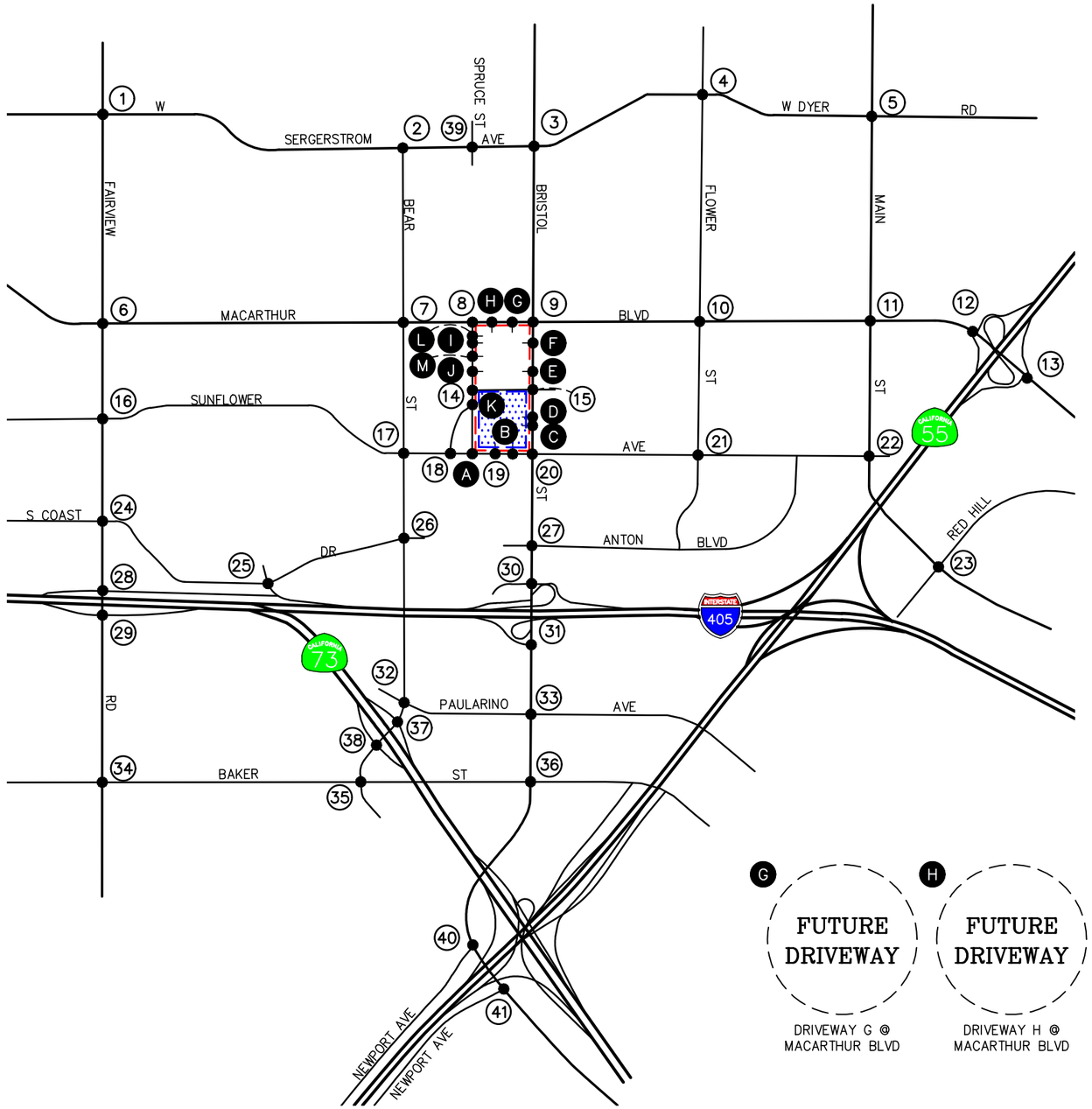
KEY

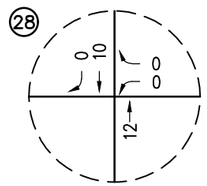
(#) = STUDY INTERSECTION
(XX) = PASSBY TRIPS
= PROJECT SITE
= PHASE 1

FIGURE 5-10A

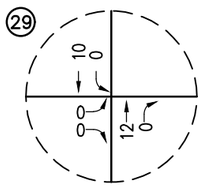
PM PEAK HOUR PHASE 1 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA

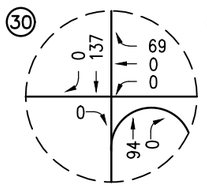




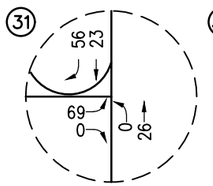
FAIRVIEW RD @
I-405 NB RAMPS



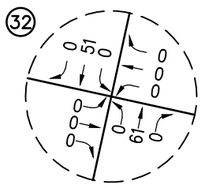
FAIRVIEW RD @
I-405 SB RAMPS



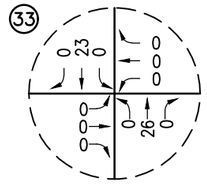
BRISTOL ST @
I-405 NB RAMPS



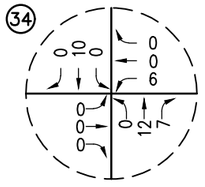
BRISTOL ST @
I-405 SB RAMPS



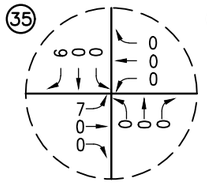
BEAR ST @
PAULARINO DR



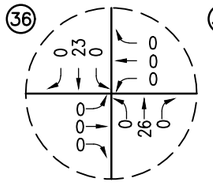
BRISTOL ST @
PAULARINO DR



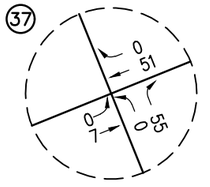
FAIRVIEW RD @
BAKER ST



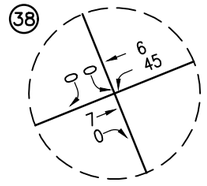
BEAR ST @
BAKER ST



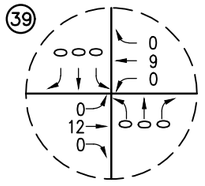
BRISTOL ST @
BAKER ST



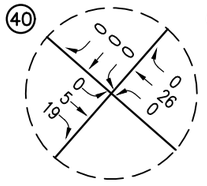
SR-73 NB RAMPS @
BEAR ST



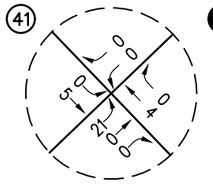
SR-73 SB RAMPS @
BEAR ST



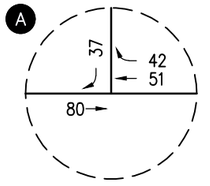
SPRUCE ST @
SEGERSTROM AVE



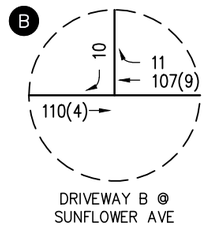
BRISTOL ST @
NEWPORT AVE SB



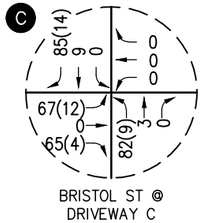
BRISTOL ST @
NEWPORT AVE NB



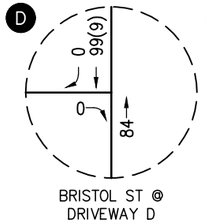
DRIVEWAY A @
SUNFLOWER AVE



DRIVEWAY B @
SUNFLOWER AVE



BRISTOL ST @
DRIVEWAY C



BRISTOL ST @
DRIVEWAY D

BRISTOL ST @
DRIVEWAY E

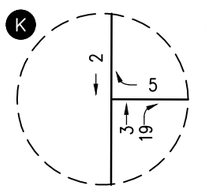
BRISTOL ST @
DRIVEWAY F

DRIVEWAY G @
MACARTHUR BLVD

DRIVEWAY H @
MACARTHUR BLVD

SOUTH PLAZA DR @
DRIVEWAY I

SOUTH PLAZA DR @
DRIVEWAY J



SOUTH PLAZA DR @
DRIVEWAY K

SOUTH PLAZA DR @
DRIVEWAY L

SOUTH PLAZA DR @
DRIVEWAY M

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

(XX) = PASSBY TRIPS

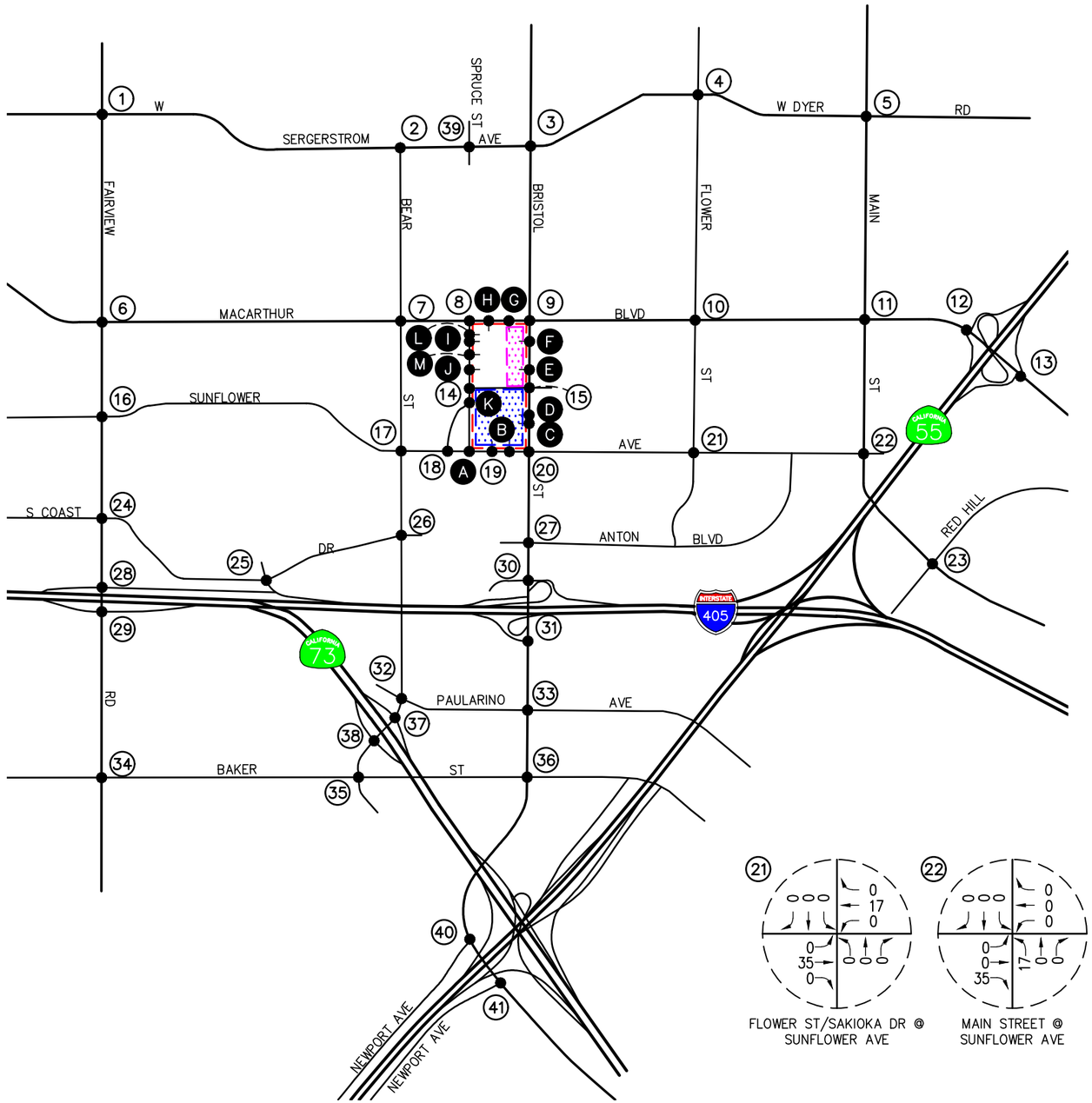
= PROJECT SITE

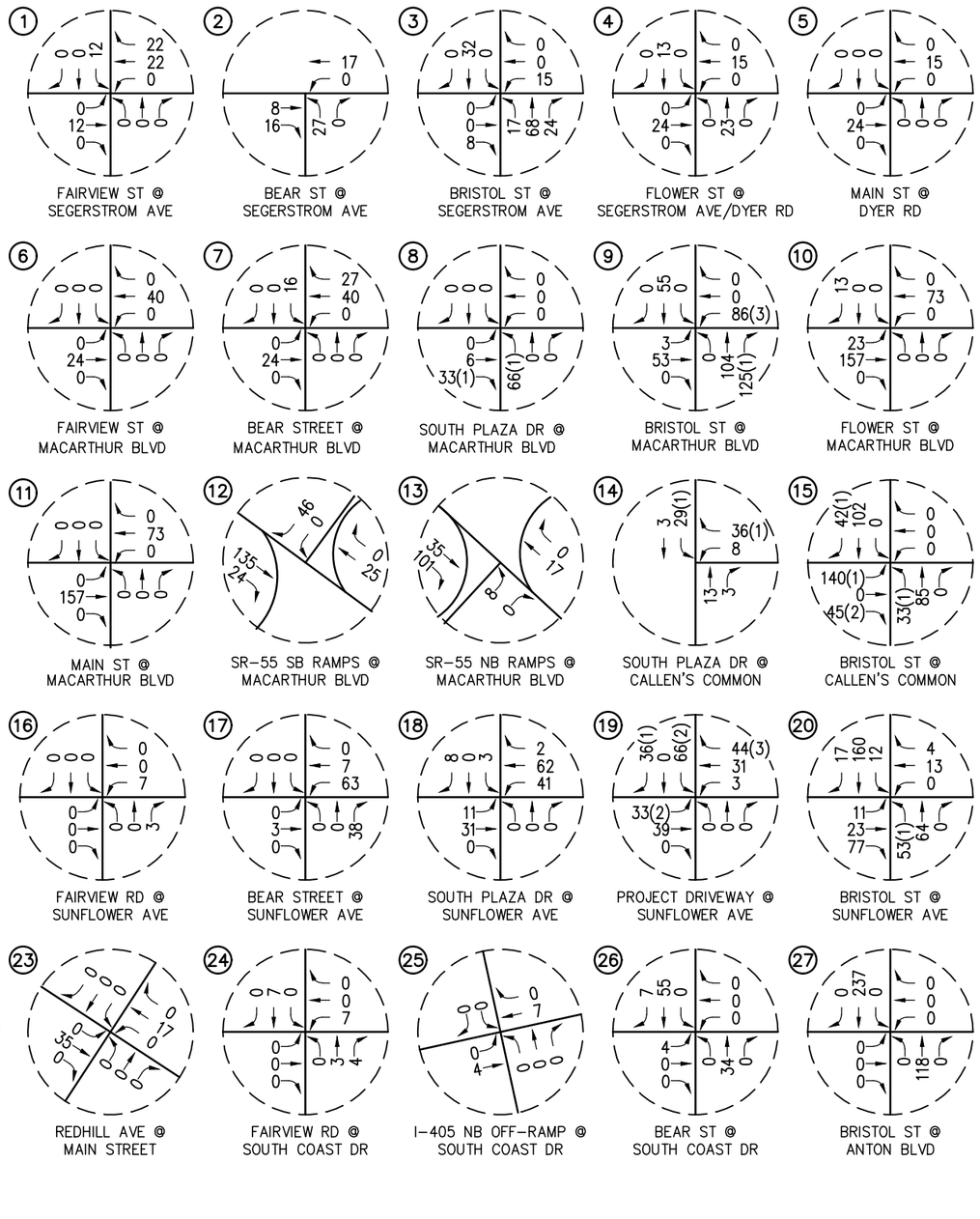
= PHASE 1

FIGURE 5-10B

PM PEAK HOUR PHASE 1 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

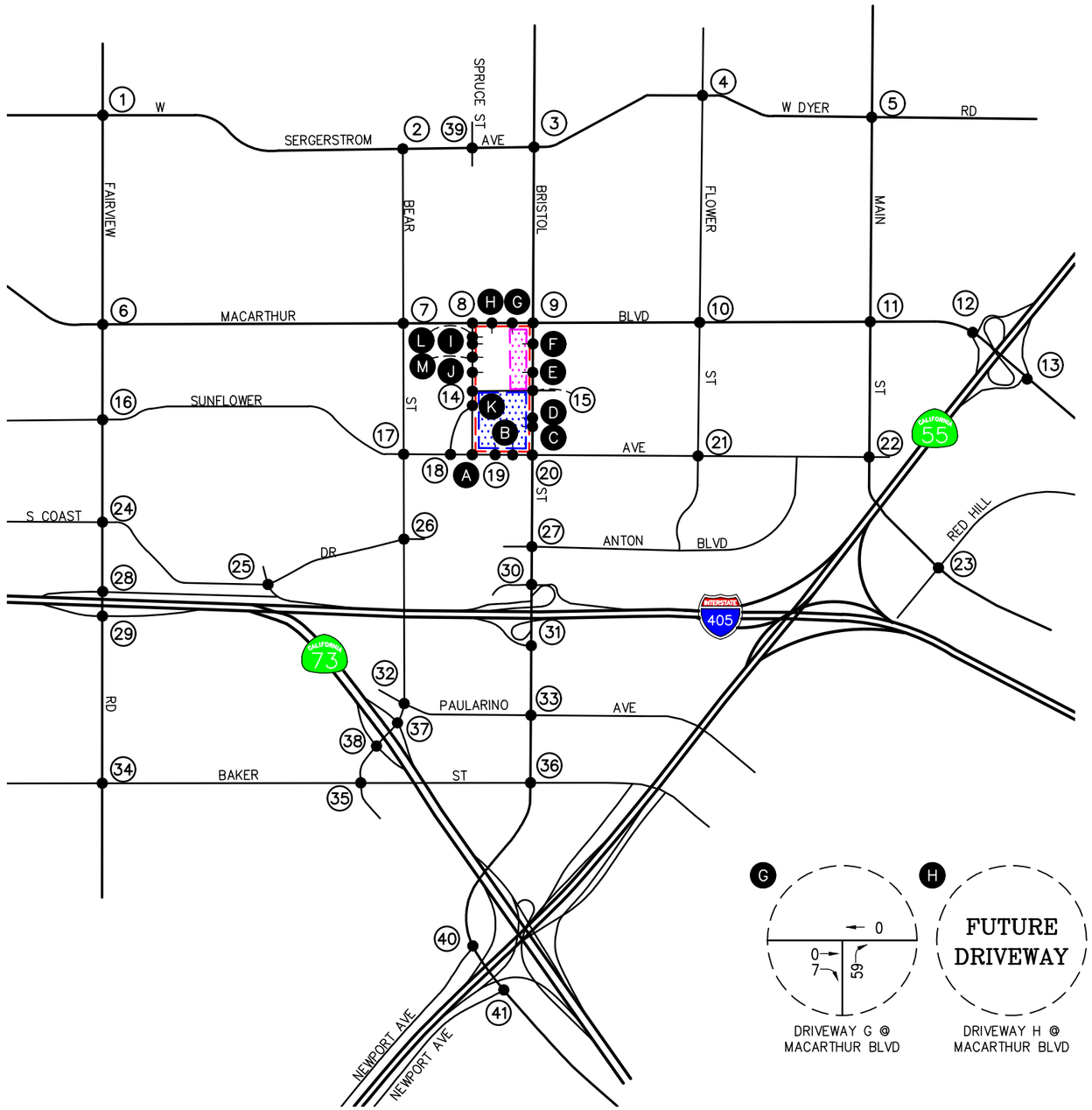
KEY

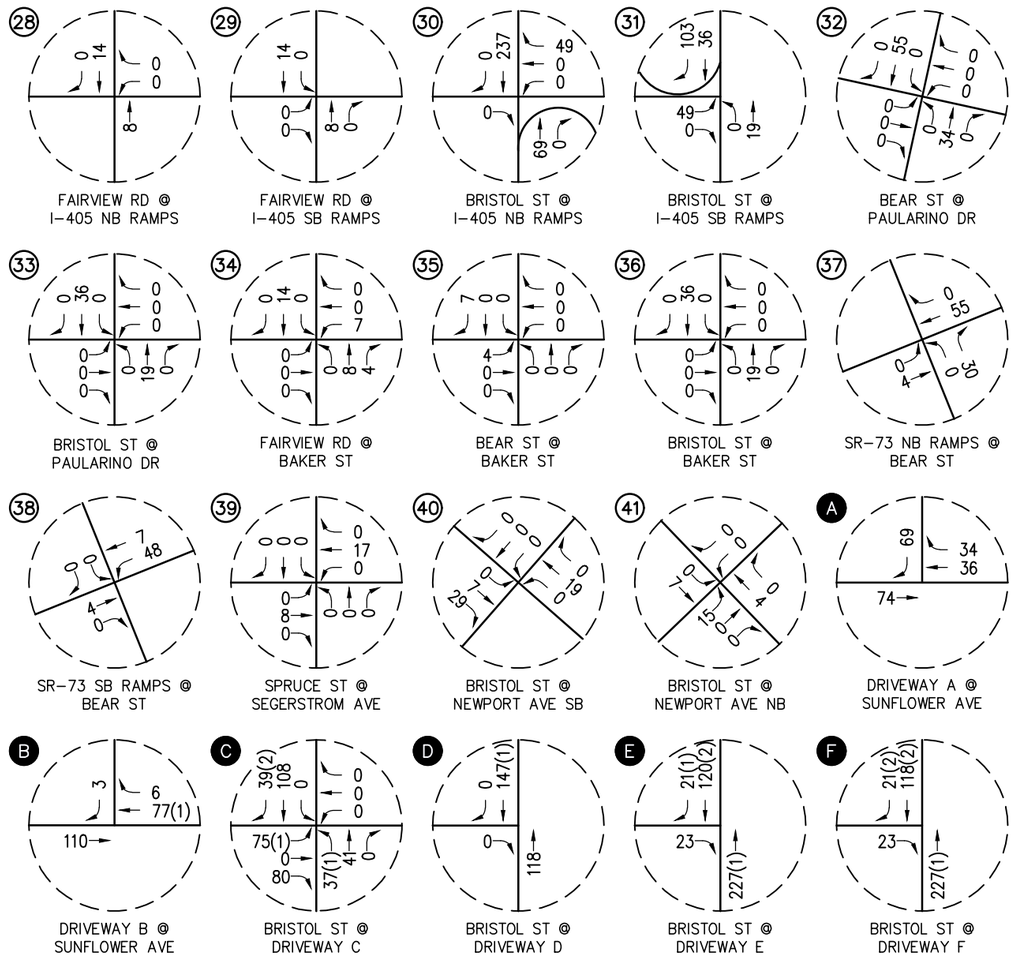
(#) = STUDY INTERSECTION
(XX) = PASSBY TRIPS
= PROJECT SITE
= PHASE 1
= PHASE 2

FIGURE 5-11A

AM PEAK HOUR PHASES 1 AND 2 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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(#) = STUDY INTERSECTION
(XX) = PASSBY TRIPS
= PROJECT SITE
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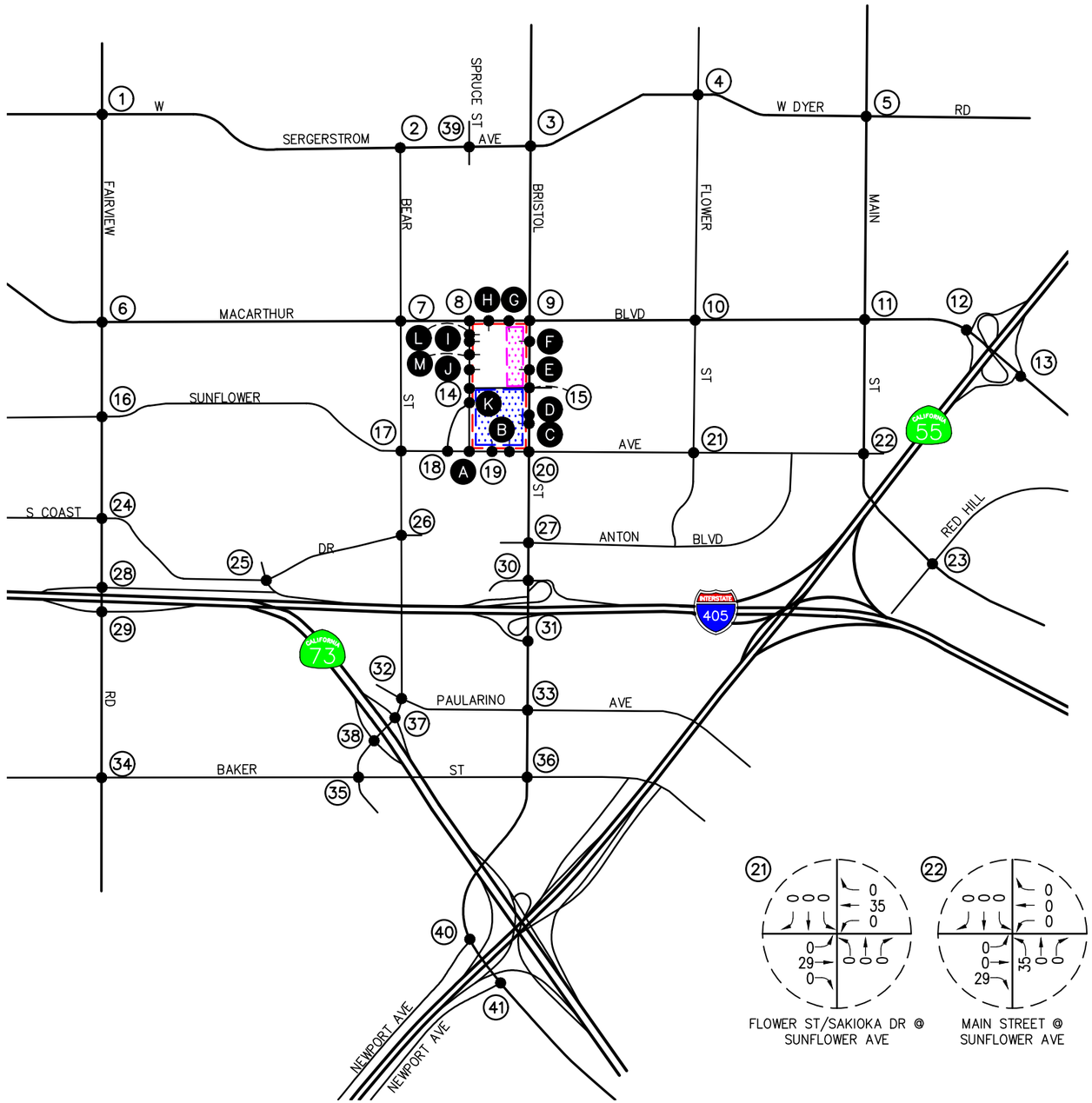
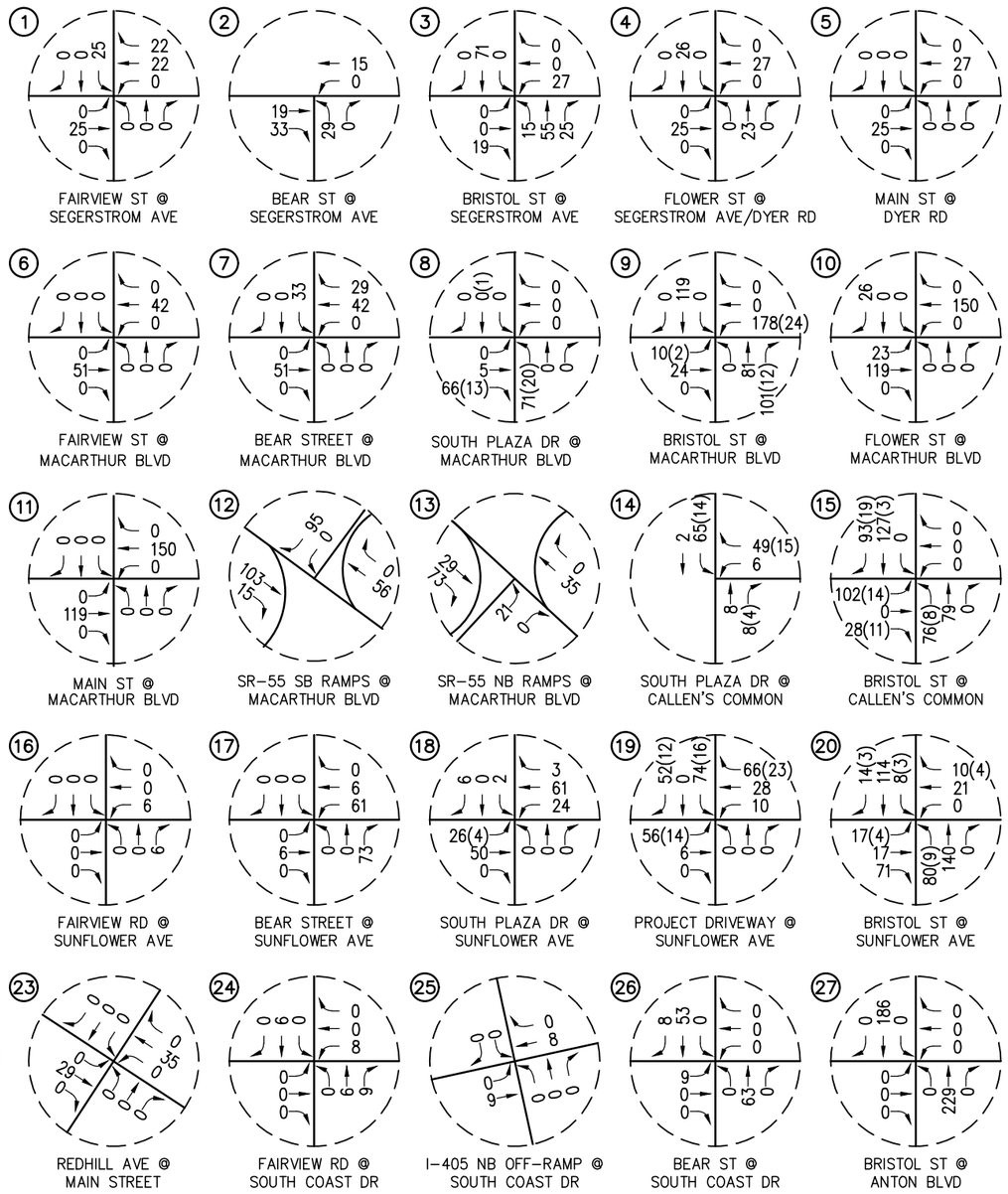
= PHASE 2

FIGURE 5-11B

AM PEAK HOUR PHASES 1 AND 2 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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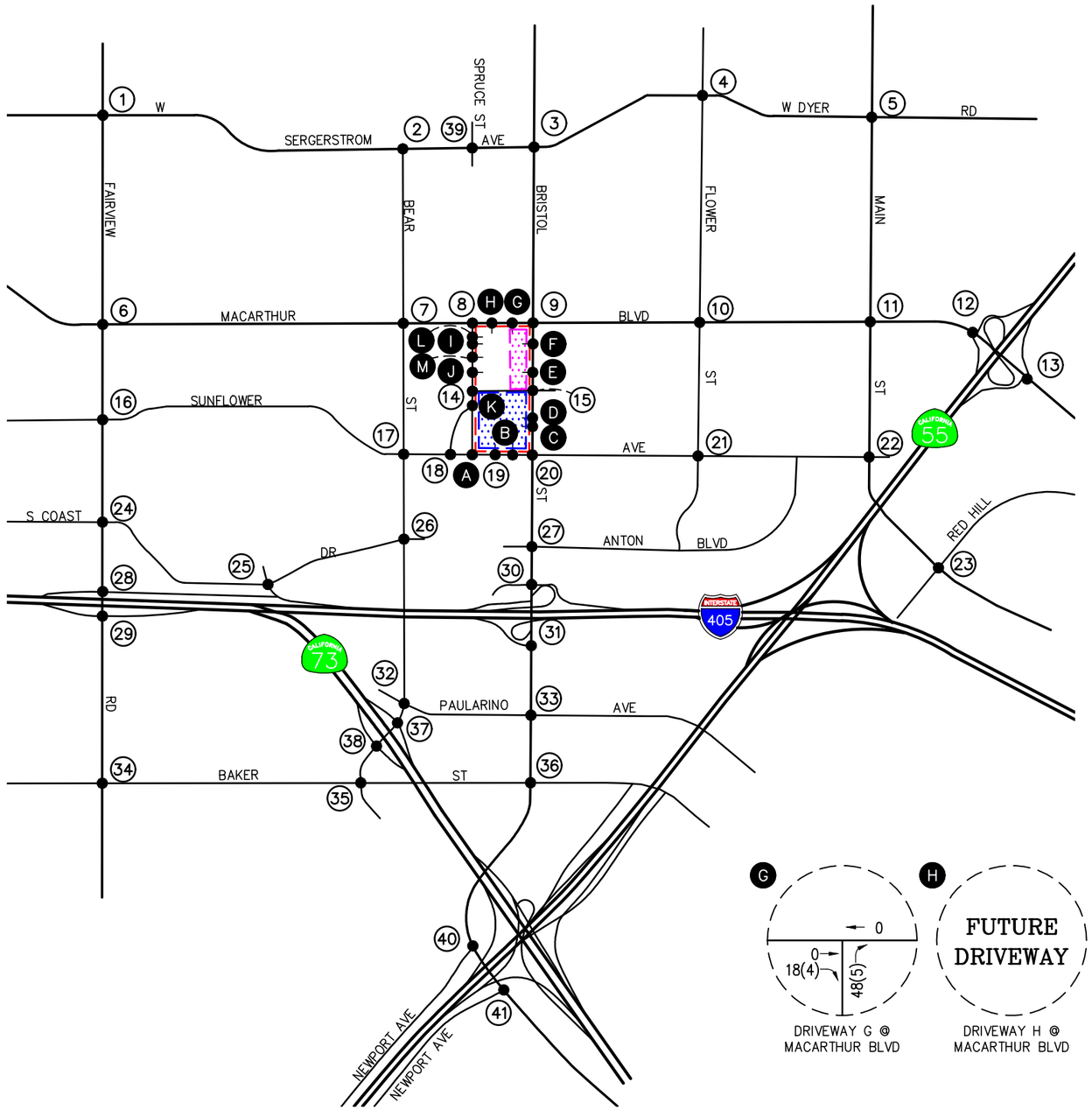
KEY

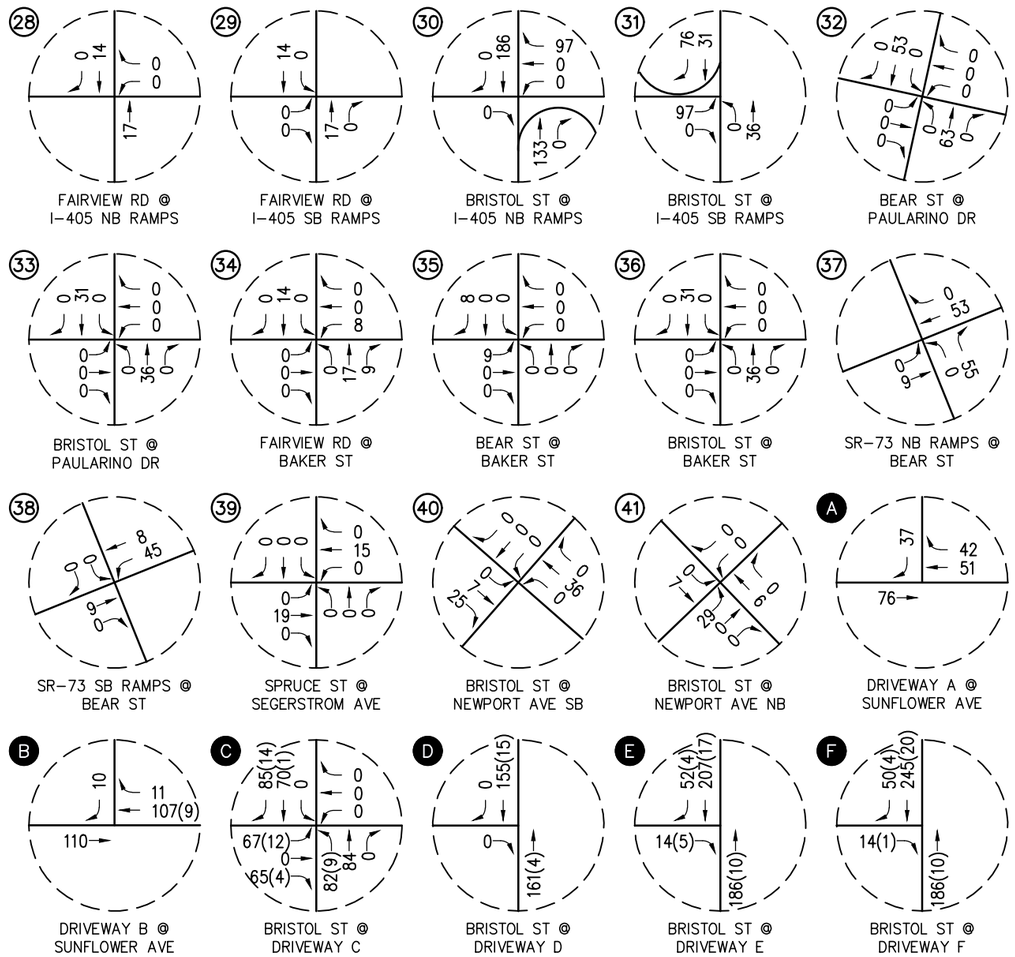
(#) = STUDY INTERSECTION
(XX) = PASSBY TRIPS
= PROJECT SITE
= PHASE 1
= PHASE 2

FIGURE 5-12A

PM PEAK HOUR PHASES 1 AND 2 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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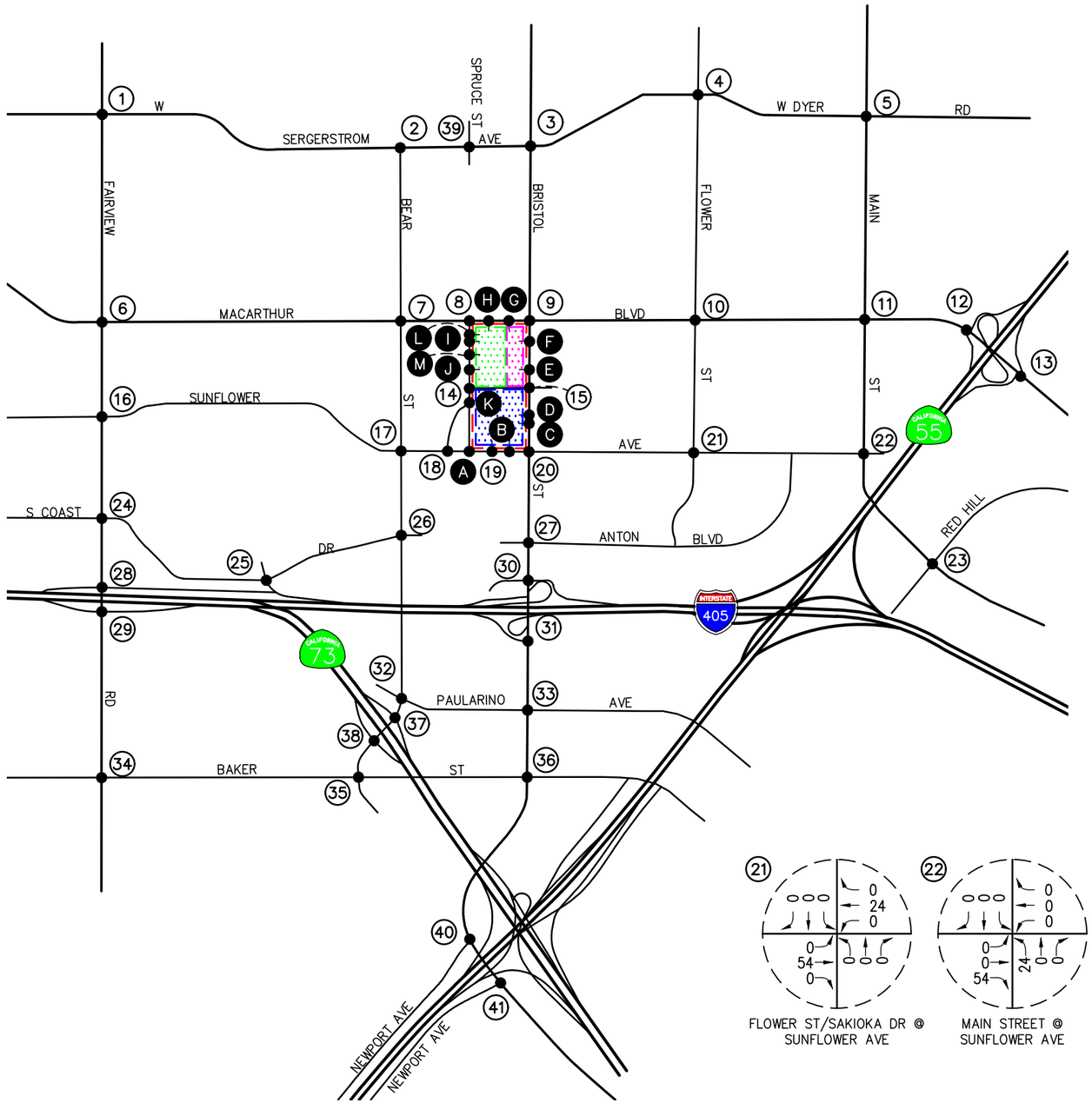
KEY

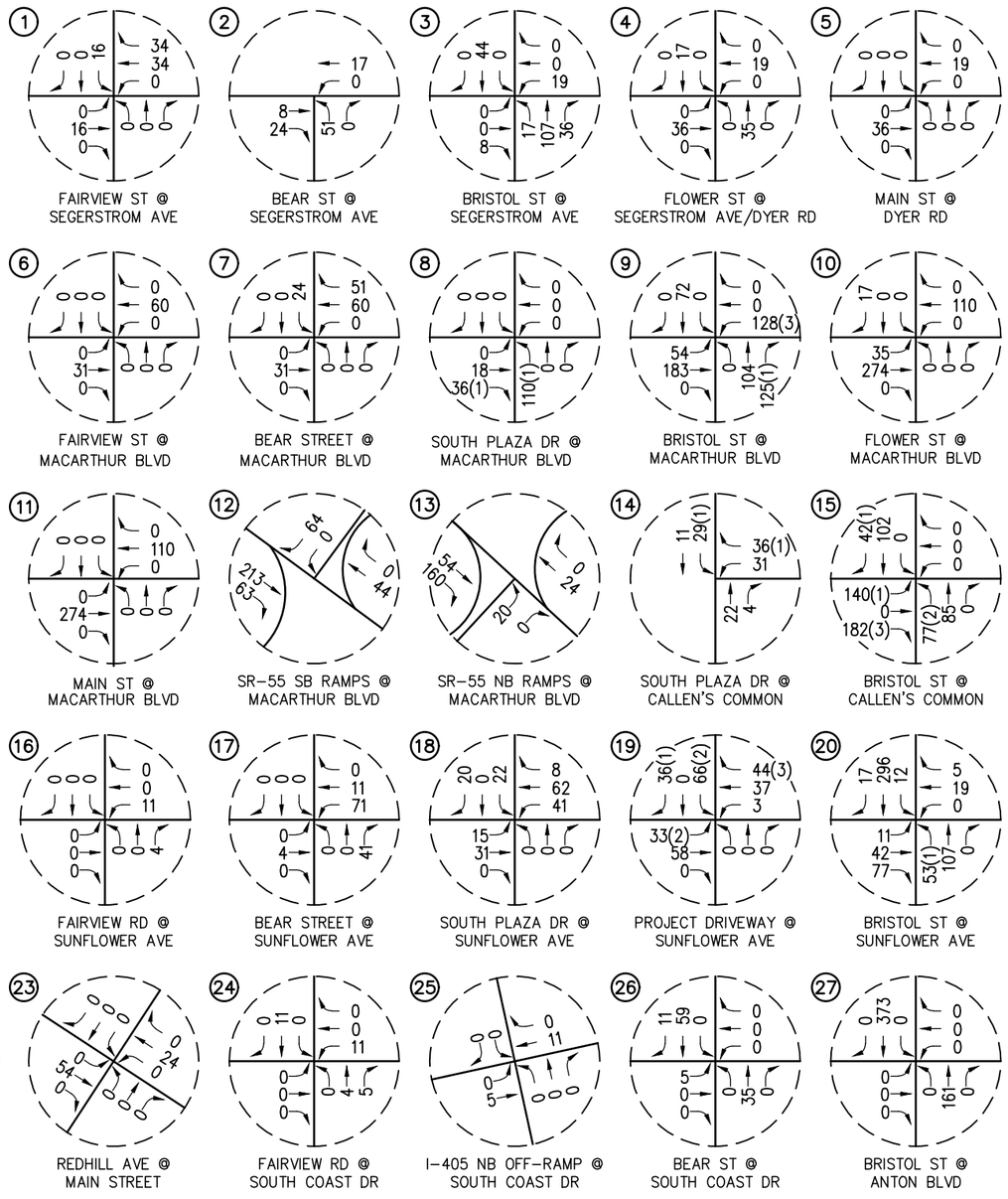
(#) = STUDY INTERSECTION
(XX) = PASSBY TRIPS
= PROJECT SITE
= PHASE 1
= PHASE 2

FIGURE 5-12B

PM PEAK HOUR PHASES 1 AND 2 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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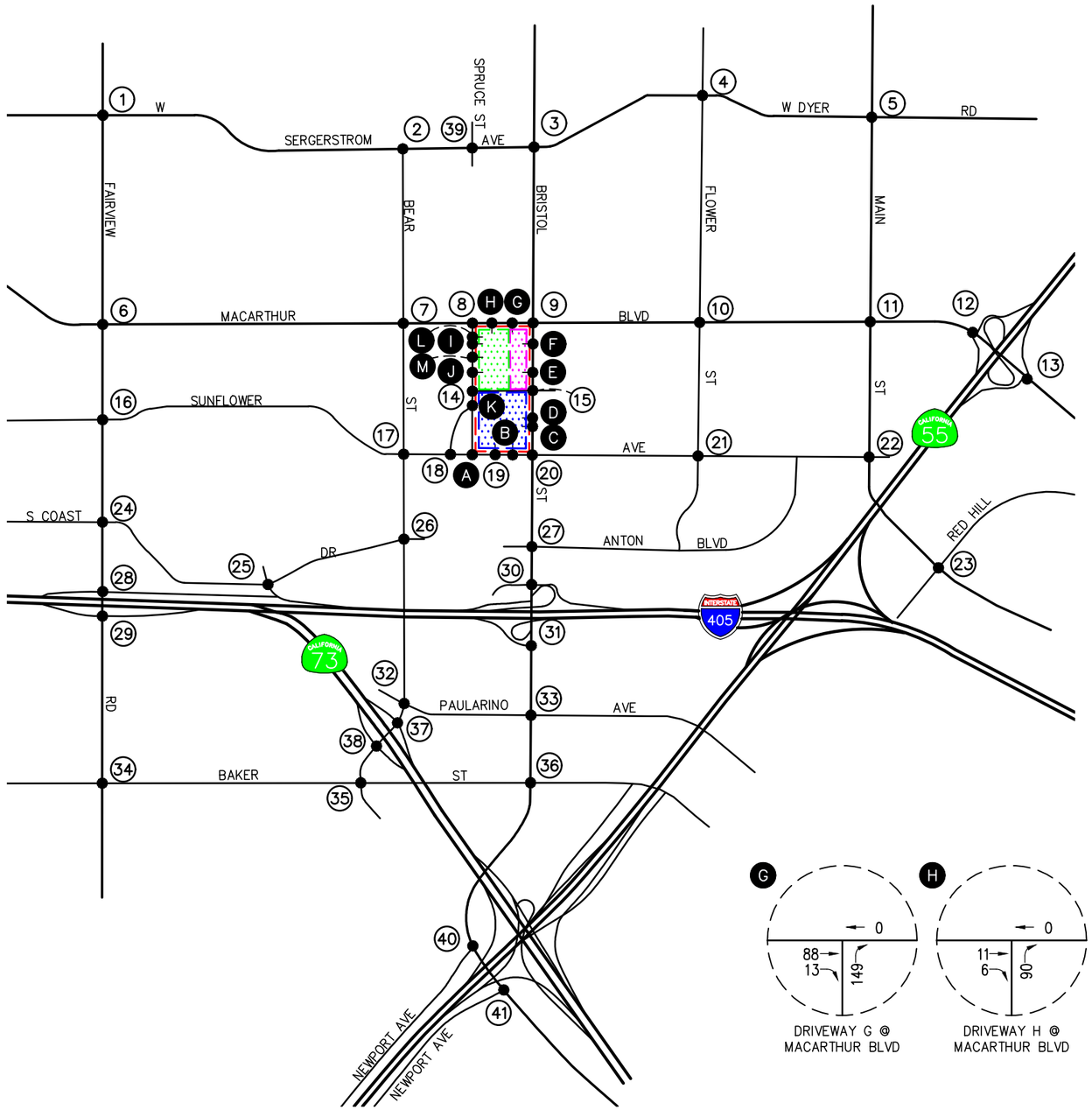
KEY

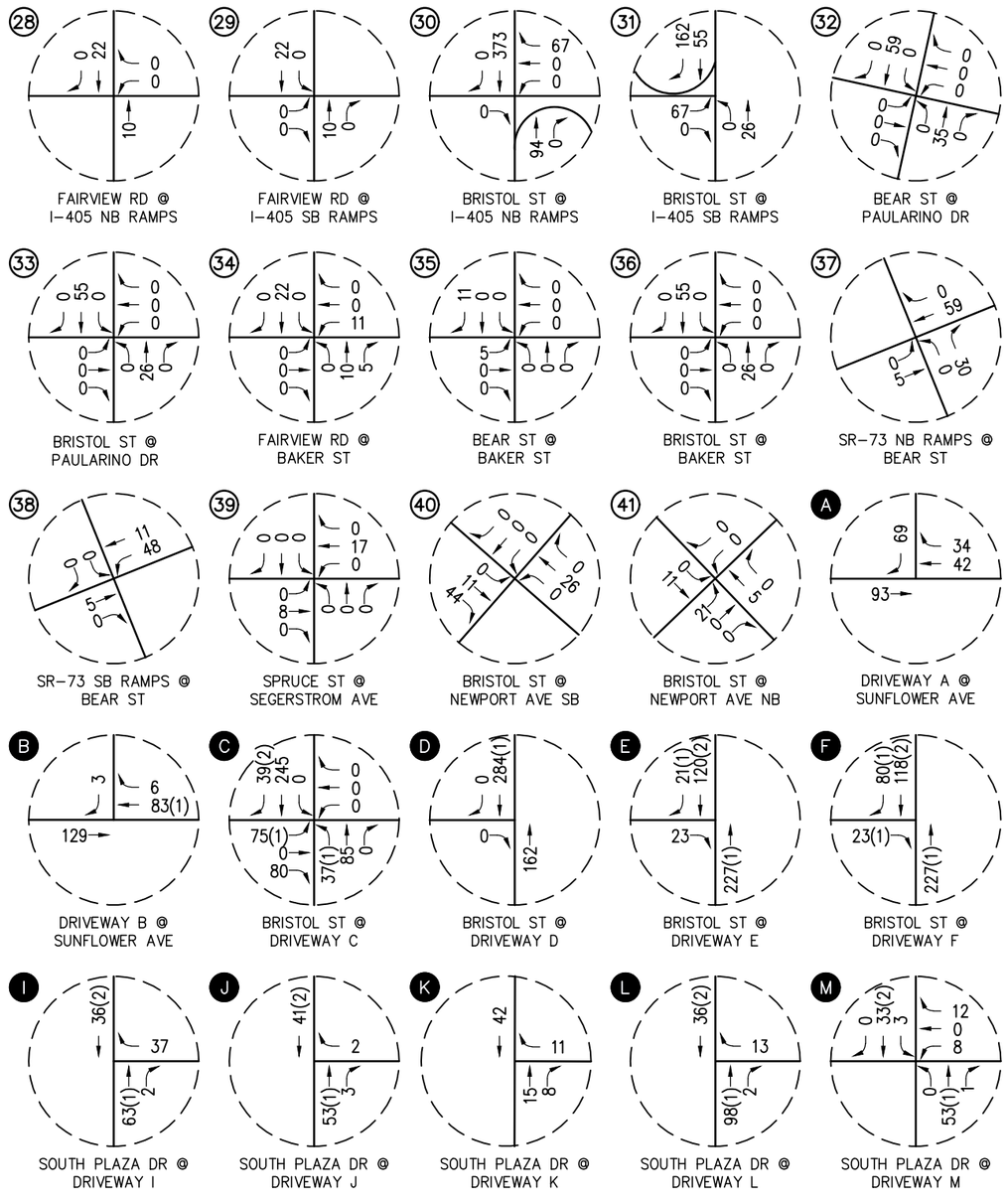
(#) = STUDY INTERSECTION
(XX) = PASSBY TRIPS
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 5-13A

AM PEAK HOUR PHASES 1, 2 AND 3 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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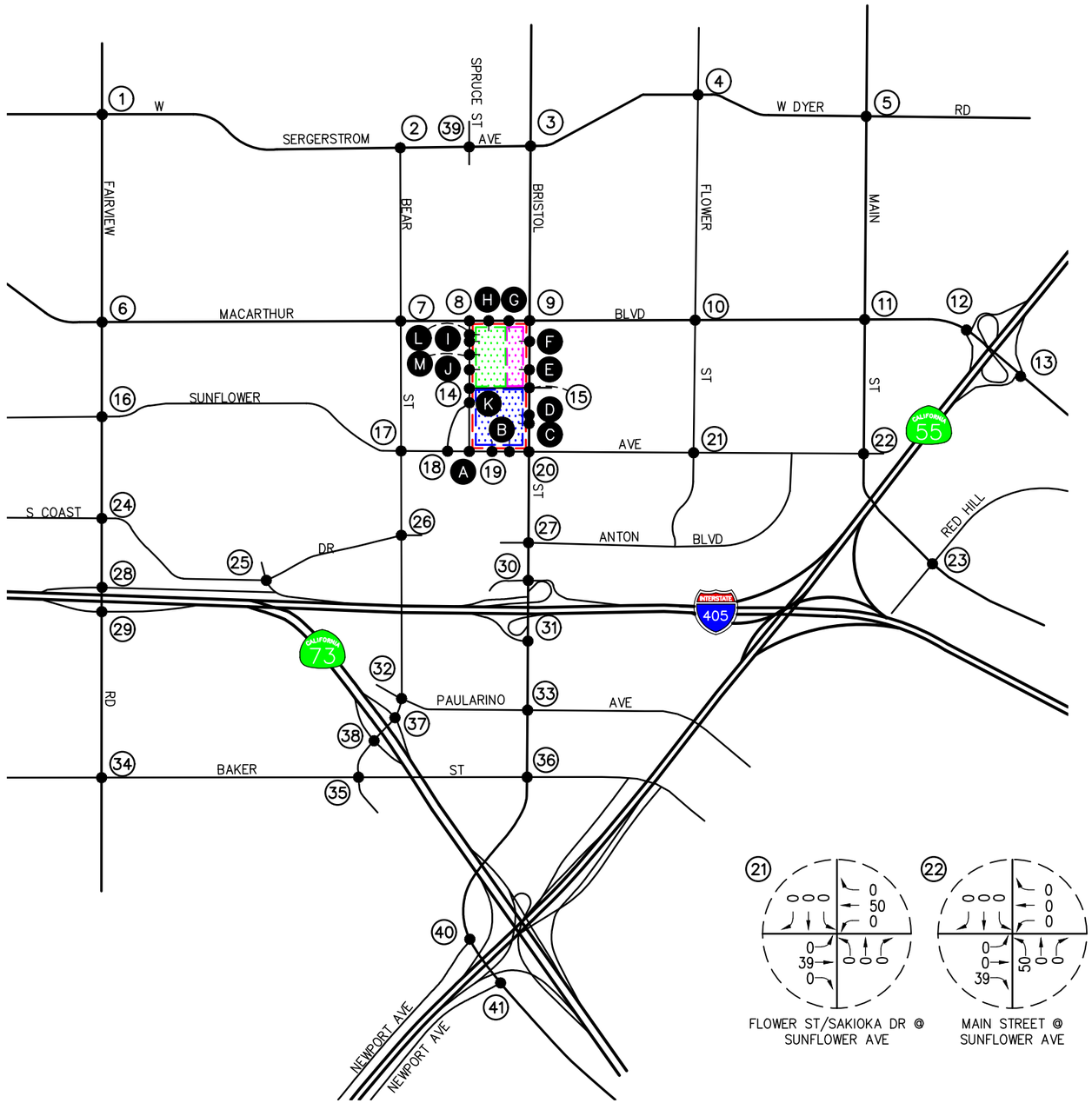
KEY

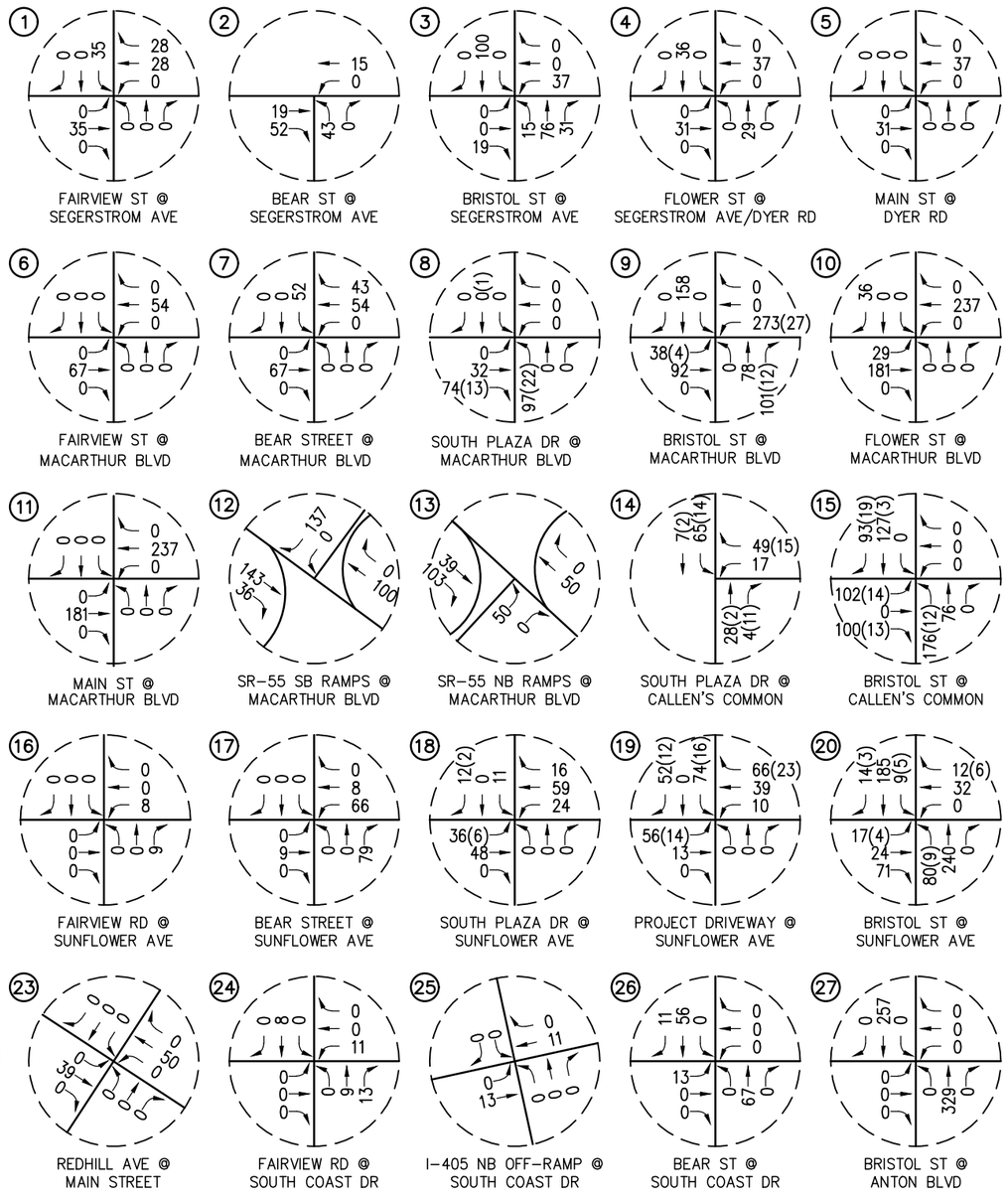
(#) = STUDY INTERSECTION
(XX) = PASSBY TRIPS
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 5-13B

AM PEAK HOUR PHASES 1, 2 AND 3 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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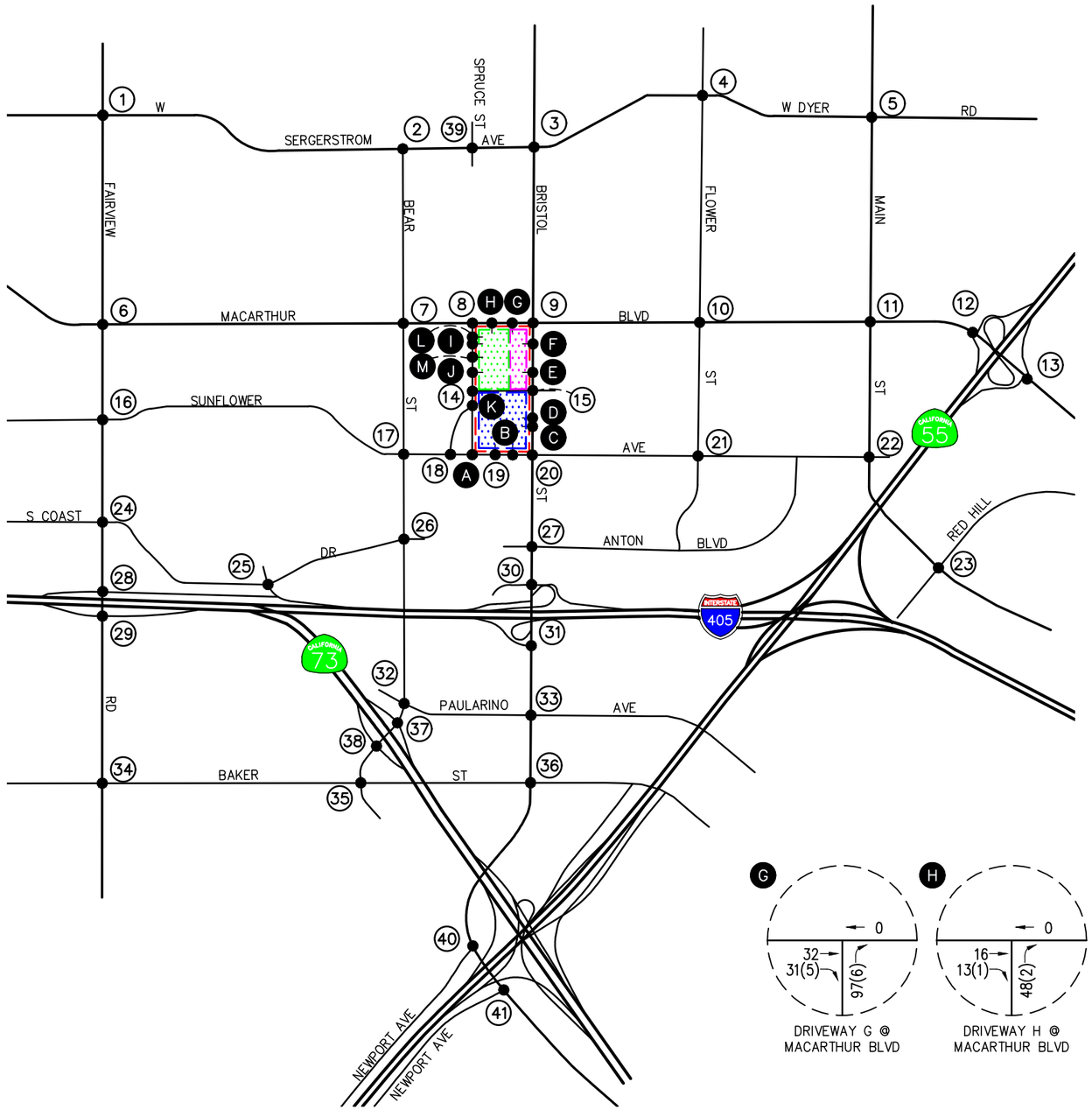
KEY

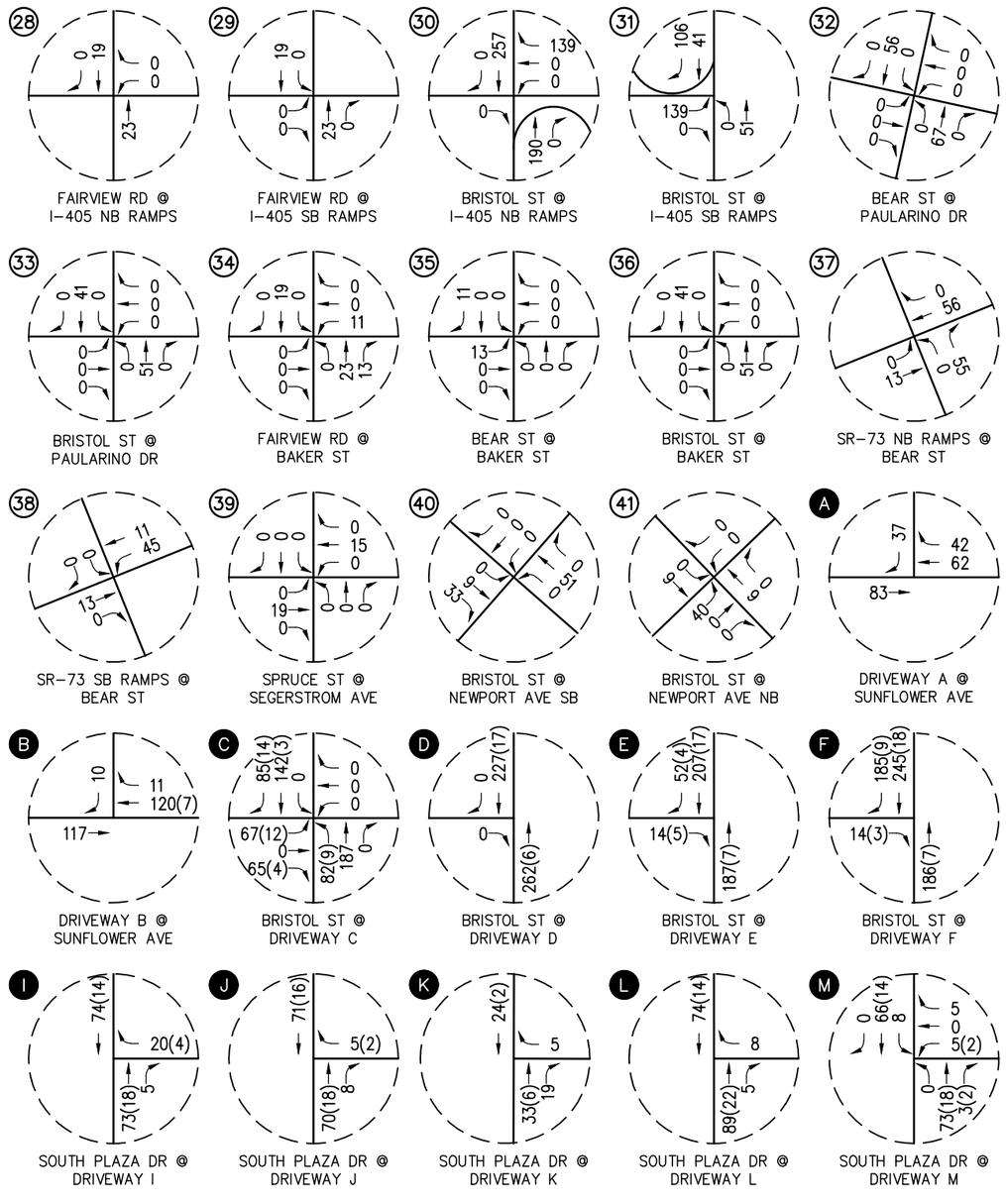
(#) = STUDY INTERSECTION
(XX) = PASSBY TRIPS
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 5-14A

PM PEAK HOUR PHASES 1, 2 AND 3 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

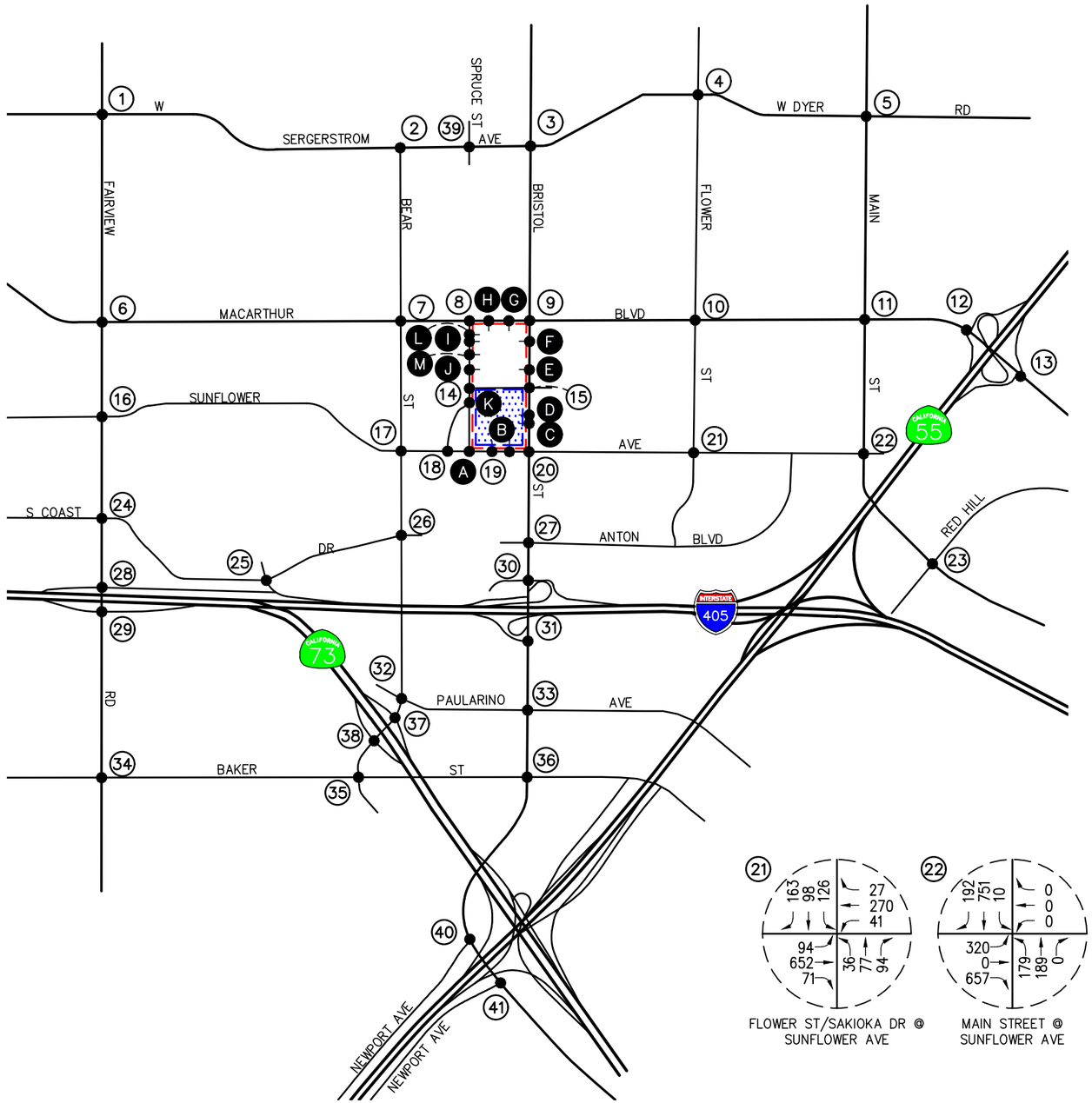
KEY

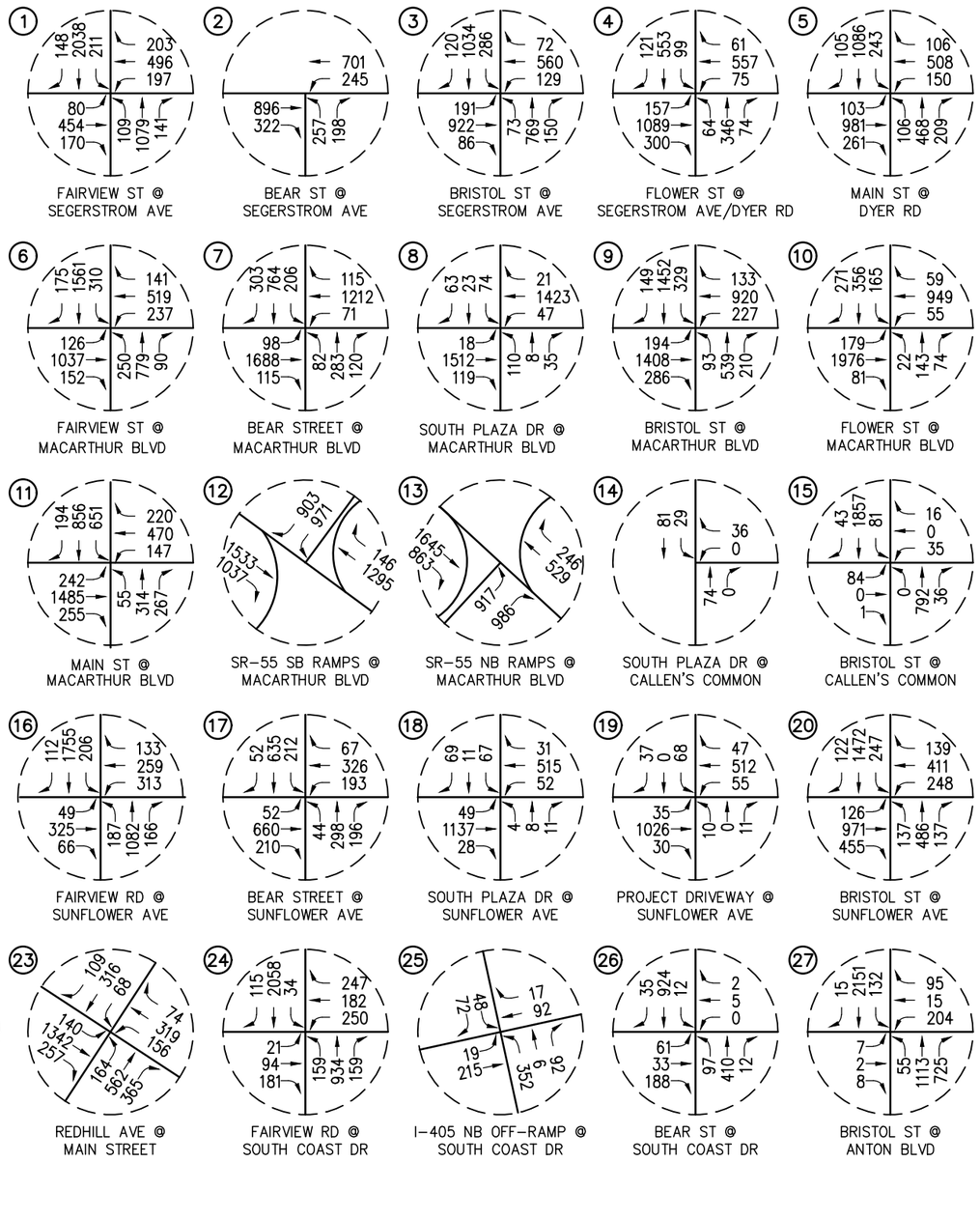
(#) = STUDY INTERSECTION
(XX) = PASSBY TRIPS
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 5-14B

PM PEAK HOUR PHASES 1, 2 AND 3 PROJECT TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

(#) = STUDY INTERSECTION

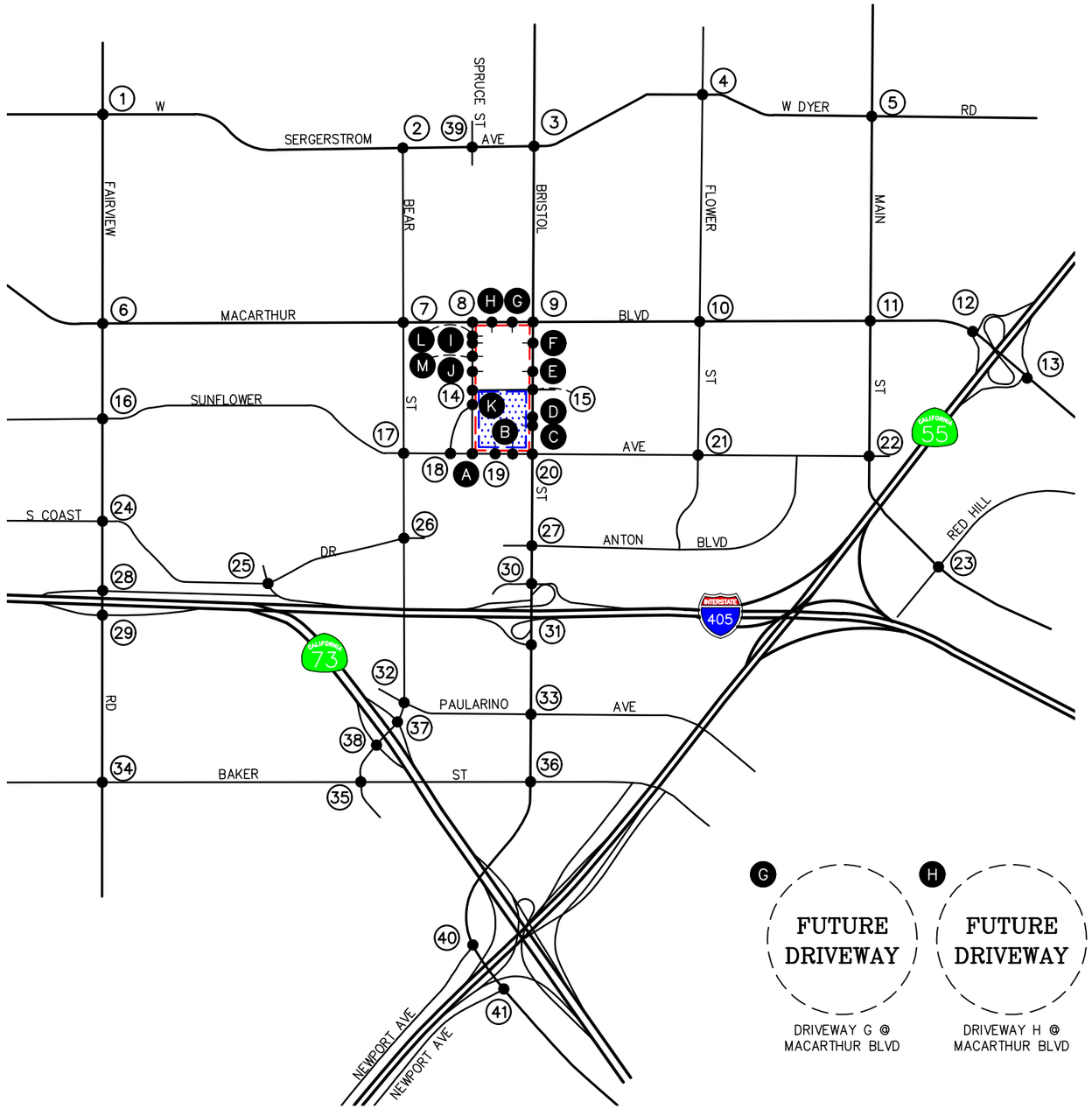
= PROJECT SITE

= PHASE 1

FIGURE 5-15A

EXISTING PLUS PROJECT PHASE 1 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA



28 FAIRVIEW RD @ I-405 NB RAMPS
296 2448 776 614 841

29 FAIRVIEW RD @ I-405 SB RAMPS
1647 1544 185 326 855 1129

30 BRISTOL ST @ I-405 NB RAMPS
8 2127 699 74 122 34 1540 193

31 BRISTOL ST @ I-405 SB RAMPS
916 1016 606 529 114 1128

32 BEAR ST @ PAULARINO DR
5 1021 107 55 7 157 12 23 31 18 483 179

33 BRISTOL ST @ PAULARINO DR
30 1290 327 156 77 105 126 216 39 41 758 80

34 FAIRVIEW RD @ BAKER ST
226 976 209 109 320 333 264 613 192 226 1139 582

35 BEAR ST @ BAKER ST
392 235 128 98 455 30 485 980 231 80 103 35

36 BRISTOL ST @ BAKER ST
198 783 489 276 368 206 265 772 63 35 348 203

37 SR-73 NB RAMPS @ BEAR ST
97 976 159 315 509 175

38 SR-73 SB RAMPS @ BEAR ST
123 206 604 618 343 381

39 SPRUCE ST @ SEGERSTROM AVE
160 6 30 19 797 17 74 797 33 17 5 28

40 BRISTOL ST @ NEWPORT AVE NB
502 46 821 399 4 618 292

41 BRISTOL ST @ NEWPORT AVE SB
67 59 41 792 51 596 312 58 551

A DRIVEWAY A @ SUNFLOWER AVE
69 34 540 1272

B DRIVEWAY B @ SUNFLOWER AVE
3 6 1229 1561

C BRISTOL ST @ DRIVEWAY C
41 1897 24 23 0 17 76 0 80 38 1086 23

D BRISTOL ST @ DRIVEWAY D
0 1949 0 1163

E BRISTOL ST @ DRIVEWAY E
FUTURE DRIVEWAY

F BRISTOL ST @ DRIVEWAY F
FUTURE DRIVEWAY

G DRIVEWAY G @ MACARTHUR BLVD
FUTURE DRIVEWAY

H DRIVEWAY H @ MACARTHUR BLVD
FUTURE DRIVEWAY

I SOUTH PLAZA DR @ DRIVEWAY I
FUTURE DRIVEWAY

J SOUTH PLAZA DR @ DRIVEWAY J
FUTURE DRIVEWAY

K SOUTH PLAZA DR @ DRIVEWAY K
118 11 98 8

L SOUTH PLAZA DR @ DRIVEWAY L
FUTURE DRIVEWAY

M SOUTH PLAZA DR @ DRIVEWAY M
FUTURE DRIVEWAY

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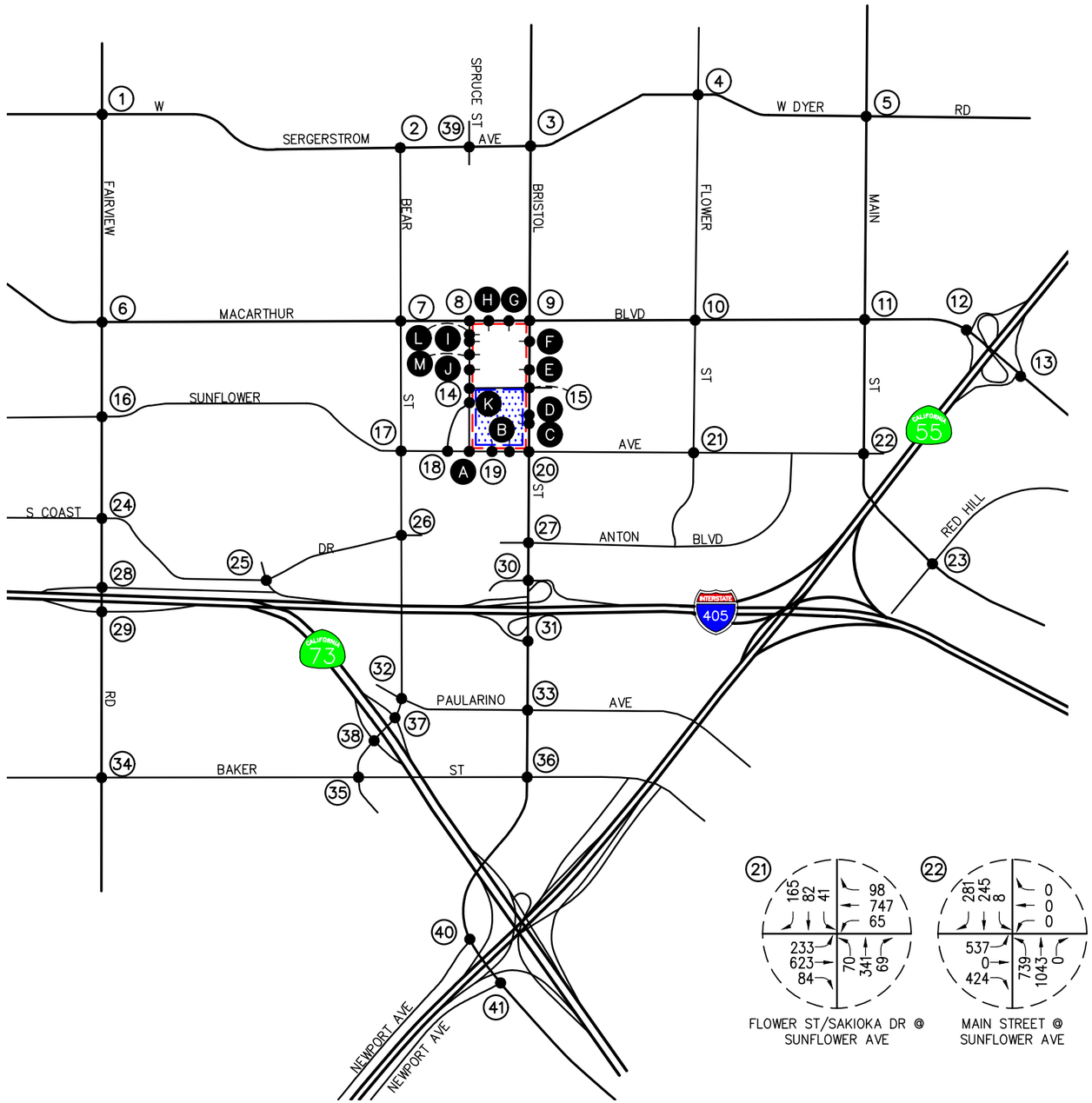
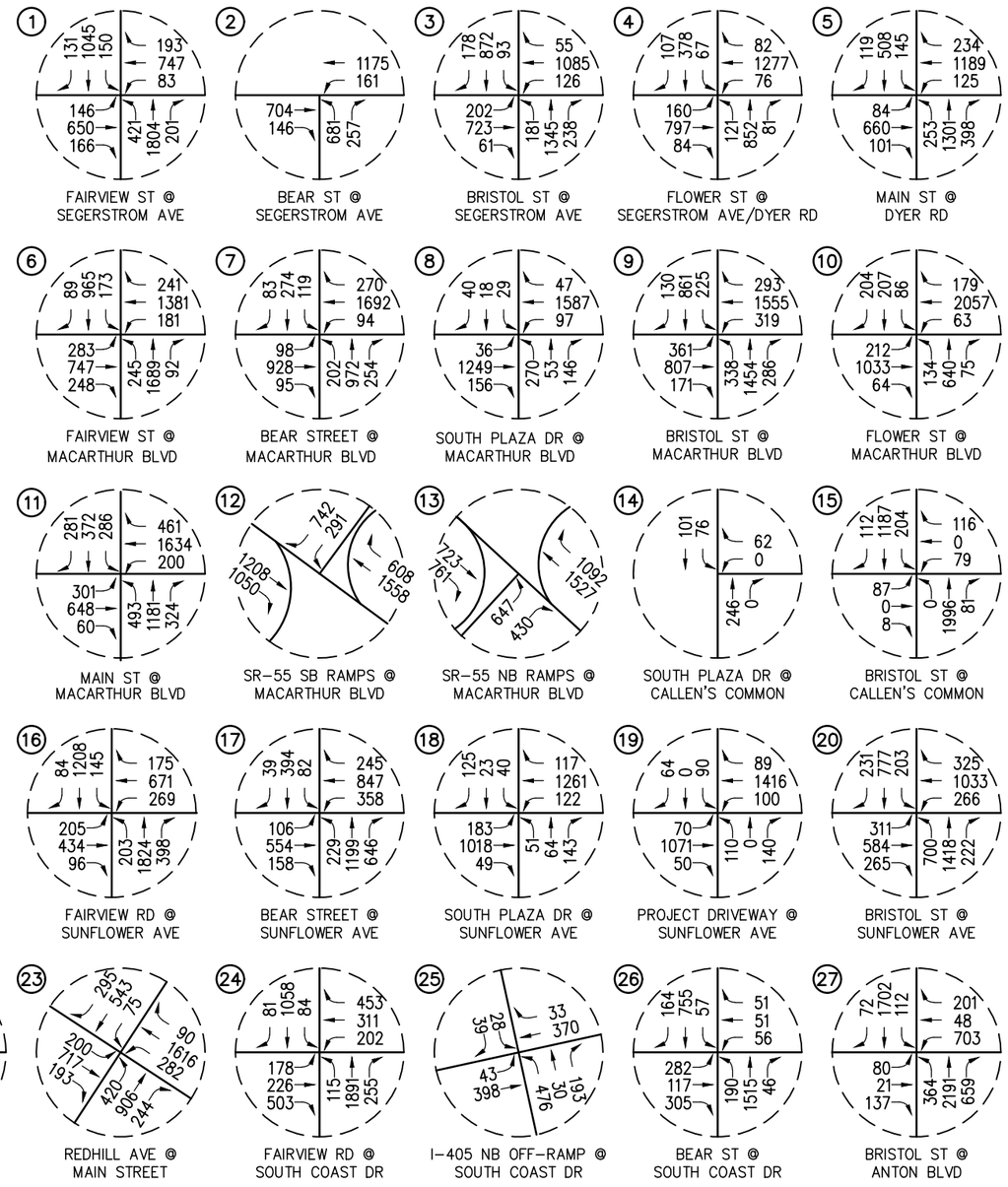
KEY
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1

FIGURE 5-15B

EXISTING PLUS PROJECT PHASE 1 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

(#) = STUDY INTERSECTION

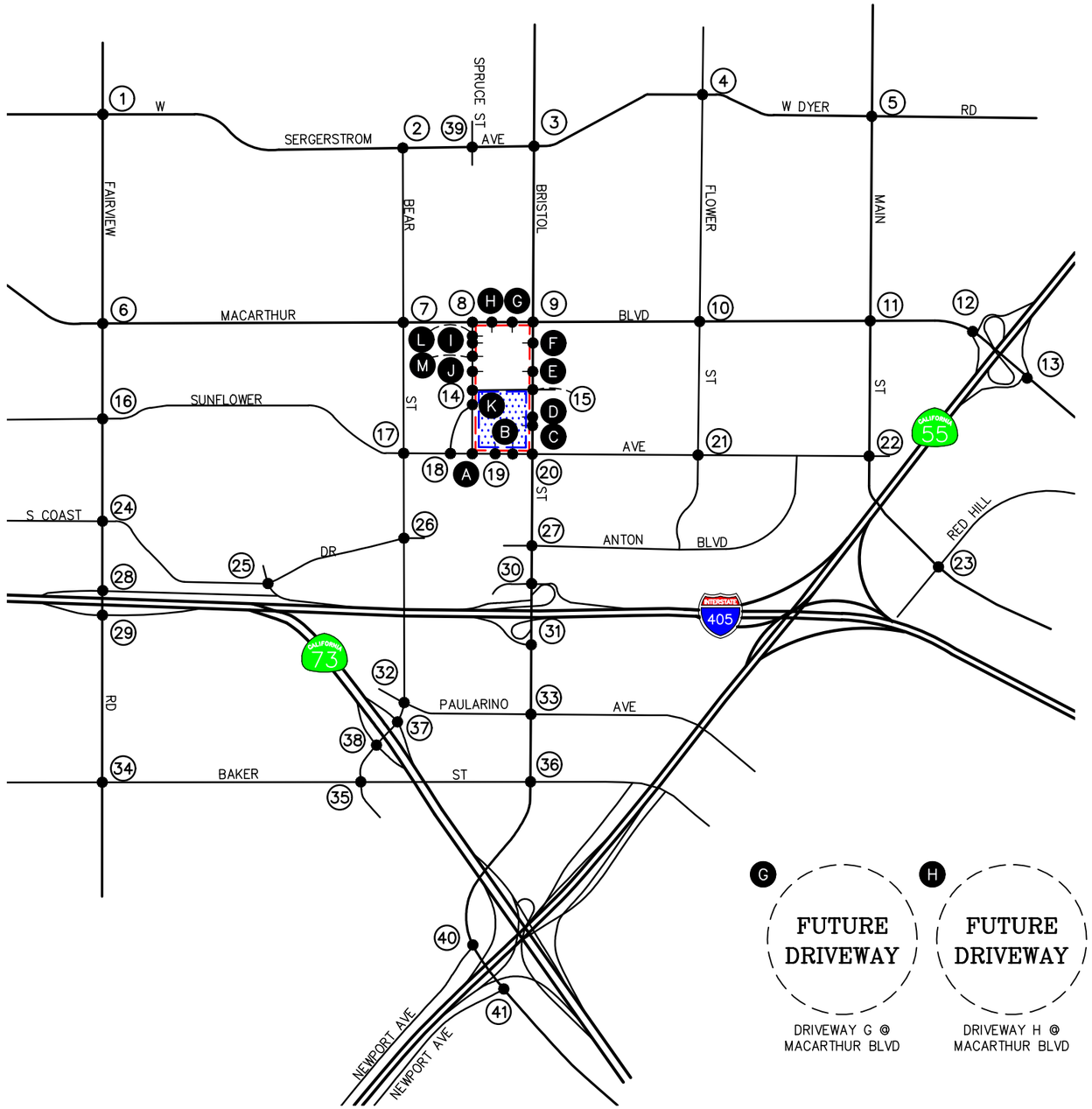
= PROJECT SITE

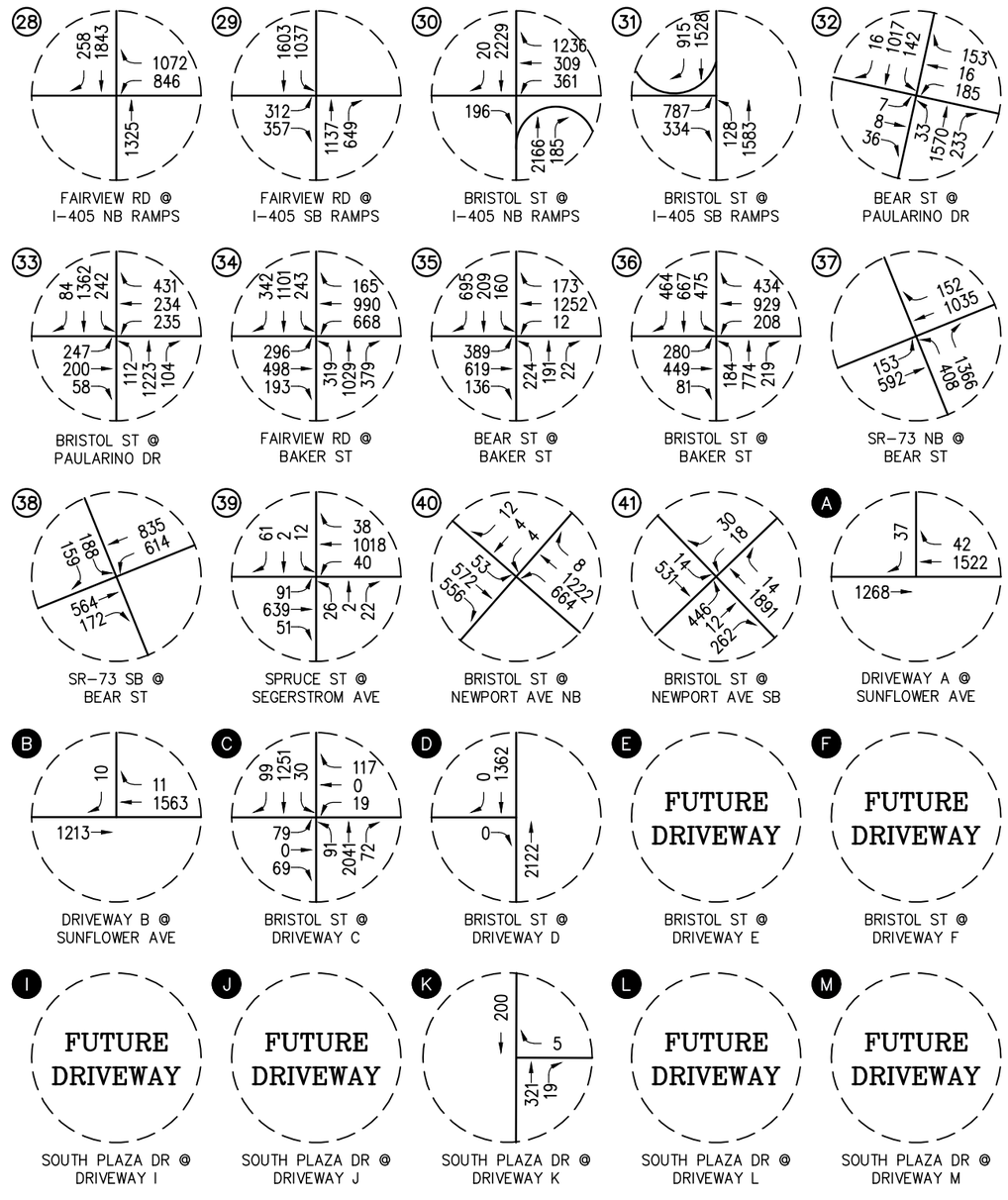
= PHASE 1

FIGURE 5-16A

EXISTING PLUS PROJECT PHASE 1 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

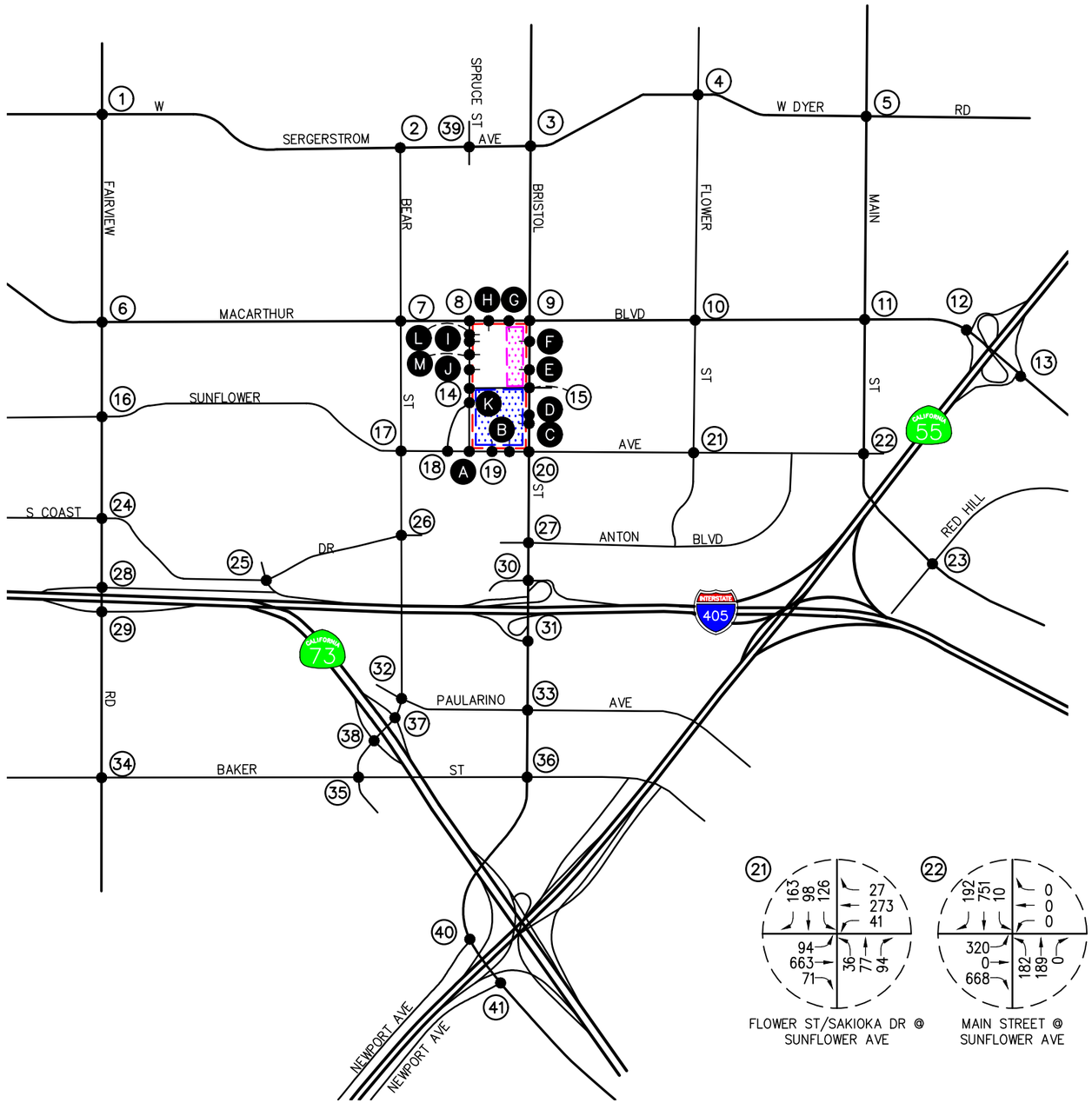
= PROJECT SITE

= PHASE 1

FIGURE 5-16B

EXISTING PLUS PROJECT PHASE 1 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA



1 FAIRVIEW ST @ SEGERSTROM AVE
148 2038 213 | 210 503 197 | 80 456 170 | 109 1079 141

2 BEAR ST @ SEGERSTROM AVE
708 245 | 898 324 | 264 198

3 BRISTOL ST @ SEGERSTROM AVE
120 1041 286 | 72 560 131 | 191 922 88 | 80 792 157

4 FLOWER ST @ SEGERSTROM AVE/DYER RD
121 555 99 | 61 559 75 | 157 1096 300 | 64 353 74

5 MAIN ST @ DYER RD
105 1086 243 | 106 510 150 | 103 988 261 | 106 468 209

6 FAIRVIEW ST @ MACARTHUR BLVD
175 1561 310 | 141 531 237 | 126 1041 152 | 250 779 90

7 BEAR STREET @ MACARTHUR BLVD
303 764 208 | 122 1224 71 | 98 1692 115 | 82 283 120

8 SOUTH PLAZA DR @ MACARTHUR BLVD
63 23 74 | 21 1423 47 | 18 1518 119 | 128 8 35

9 BRISTOL ST @ MACARTHUR BLVD
149 1463 329 | 133 920 250 | 195 1460 286 | 93 574 232

10 FLOWER ST @ MACARTHUR BLVD
273 356 165 | 59 970 55 | 186 2043 81 | 22 143 74

11 MAIN ST @ MACARTHUR BLVD
194 856 651 | 220 491 147 | 242 1552 255 | 55 314 267

12 SR-55 SB RAMPS @ MACARTHUR BLVD
913 971 | 1578 1060 | 146 1305

13 SR-55 NB RAMPS @ MACARTHUR BLVD
1656 897 | 246 532 | 924 986

14 SOUTH PLAZA DR @ CALLEN'S COMMON
81 30 | 37 8 | 74 3

15 BRISTOL ST @ CALLEN'S COMMON
43 1904 81 | 16 0 35 | 141 0 47 | 34 791 36

16 FAIRVIEW RD @ SUNFLOWER AVE
112 1755 206 | 133 259 315 | 49 325 66 | 187 1082 167

17 BEAR STREET @ SUNFLOWER AVE
52 635 212 | 67 328 197 | 52 661 210 | 44 298 197

18 SOUTH PLAZA DR @ SUNFLOWER AVE
76 11 67 | 31 515 52 | 51 1137 28 | 4 8 11

19 PROJECT DRIVEWAY @ SUNFLOWER AVE
37 0 68 | 47 512 55 | 35 1026 30 | 10 0 11

20 BRISTOL ST @ SUNFLOWER AVE
122 1550 258 | 142 411 248 | 126 971 455 | 137 510 137

21 FLOWER ST/SAKIOKA DR @ SUNFLOWER AVE
163 98 126 | 27 273 41 | 94 663 71 | 36 77 94

22 MAIN STREET @ SUNFLOWER AVE
192 751 10 | 0 0 0 | 320 0 668 | 182 189 0

23 REDHILL AVE @ MAIN STREET
109 516 68 | 74 352 136 | 140 1353 257 | 164 562 365

24 FAIRVIEW RD @ SOUTH COAST DR
115 2060 34 | 247 182 252 | 21 94 181 | 159 935 160

25 I-405 NB OFF-RAMP @ SOUTH COAST DR
48 72 | 17 94 | 19 216 | 9 352 92

26 BEAR ST @ SOUTH COAST DR
37 926 12 | 2 5 0 | 62 33 188 | 97 411 12

27 BRISTOL ST @ ANTON BLVD
15 2229 132 | 95 15 204 | 7 2 8 | 55 1137 725

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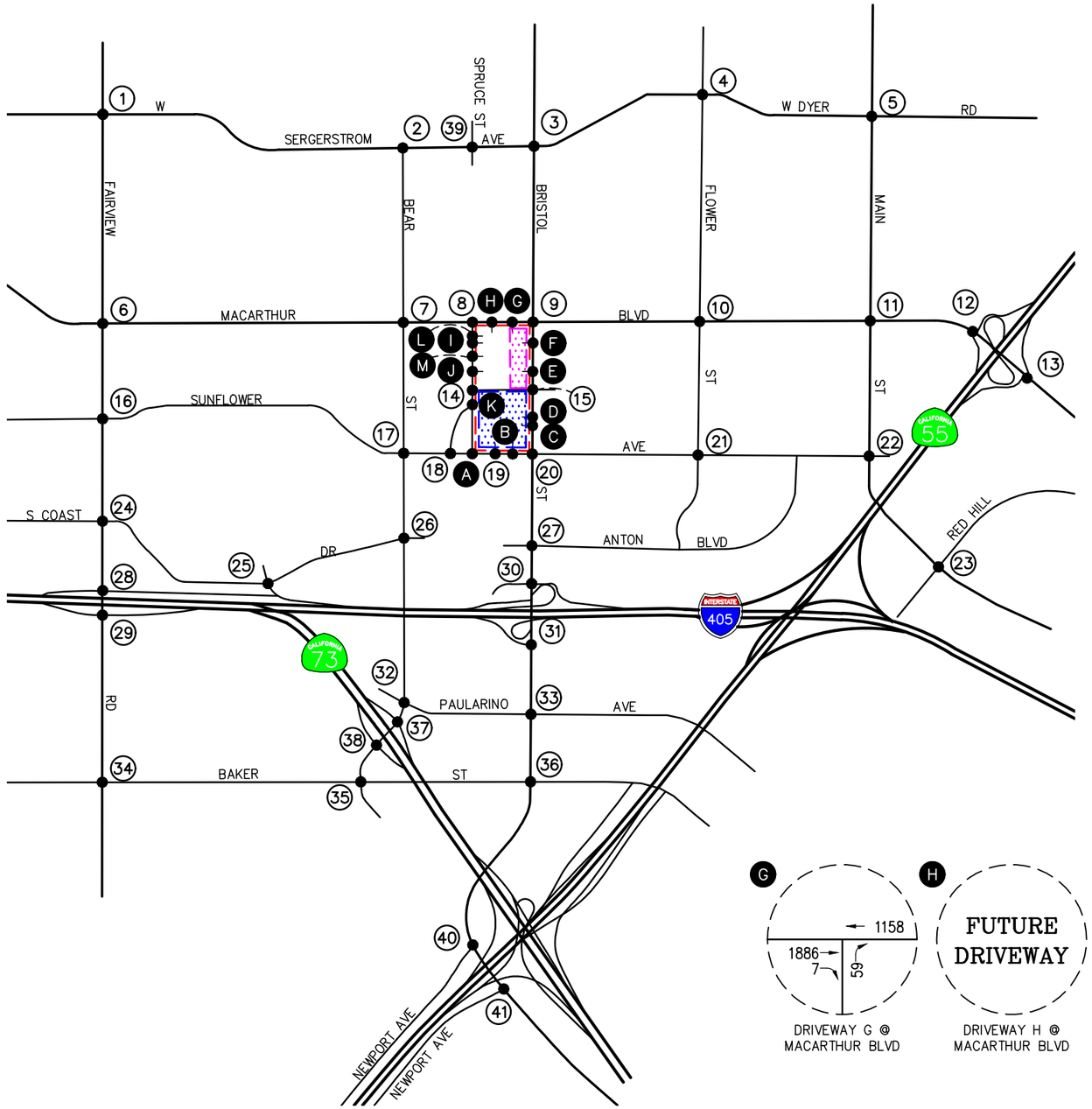
KEY
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2

FIGURE 5-17A

EXISTING PLUS PROJECT PHASES 1 AND 2 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA



28 FAIRVIEW RD @ I-405 NB RAMPS
296 2452 776 614 842

29 FAIRVIEW RD @ I-405 SB RAMPS
1651 1544 185 326 856 1129

30 BRISTOL ST @ I-405 NB RAMPS
8 2205 709 74 122 34 1554 193

31 BRISTOL ST @ I-405 SB RAMPS
950 1027 616 529 114 1131

32 BEAR ST @ PAULARINO DR
5 1023 107 55 7 157 12 23 31 18 484 179

33 BRISTOL ST @ PAULARINO DR
30 1301 327 156 77 105 126 216 39 41 761 80

34 FAIRVIEW RD @ BAKER ST
226 980 209 109 320 335 264 613 192 226 1140 583

35 BEAR ST @ BAKER ST
394 235 128 98 455 30 486 980 231 80 103 35

36 BRISTOL ST @ BAKER ST
198 794 489 276 368 206 265 772 63 35 351 203

37 SR-73 NB @ BEAR ST
97 978 159 316 509 175

38 SR-73 SB @ BEAR ST
123 206 606 618 344 381

39 SPRUCE ST @ SEGERSTROM AVE
160 6 30 19 804 17 74 799 33 17 5 28

40 BRISTOL ST @ NEWPORT AVE NB
502 46 823 408 4 581 292

41 BRISTOL ST @ NEWPORT AVE SB
67 59 41 794 51 597 315 58 551

A DRIVEWAY A @ SUNFLOWER AVE
69 34 540 1272

B DRIVEWAY B @ SUNFLOWER AVE
3 6 1229 1561

C BRISTOL ST @ DRIVEWAY C
41 1989 24 23 0 17 76 0 80 38 1118 23

D BRISTOL ST @ DRIVEWAY D
0 2041 0 1195

E BRISTOL ST @ DRIVEWAY E
22 2034 23 925

F BRISTOL ST @ DRIVEWAY F
22 2032 23 925

G DRIVEWAY G @ MACARTHUR BLVD
1158 1886 7 59

H DRIVEWAY H @ MACARTHUR BLVD
FUTURE DRIVEWAY

I SOUTH PLAZA DR @ DRIVEWAY I
212 17 169 0

J SOUTH PLAZA DR @ DRIVEWAY J
166 2 138 0

K SOUTH PLAZA DR @ DRIVEWAY K
126 11 101 8

L SOUTH PLAZA DR @ DRIVEWAY L
FUTURE DRIVEWAY

M SOUTH PLAZA DR @ DRIVEWAY M
FUTURE DRIVEWAY

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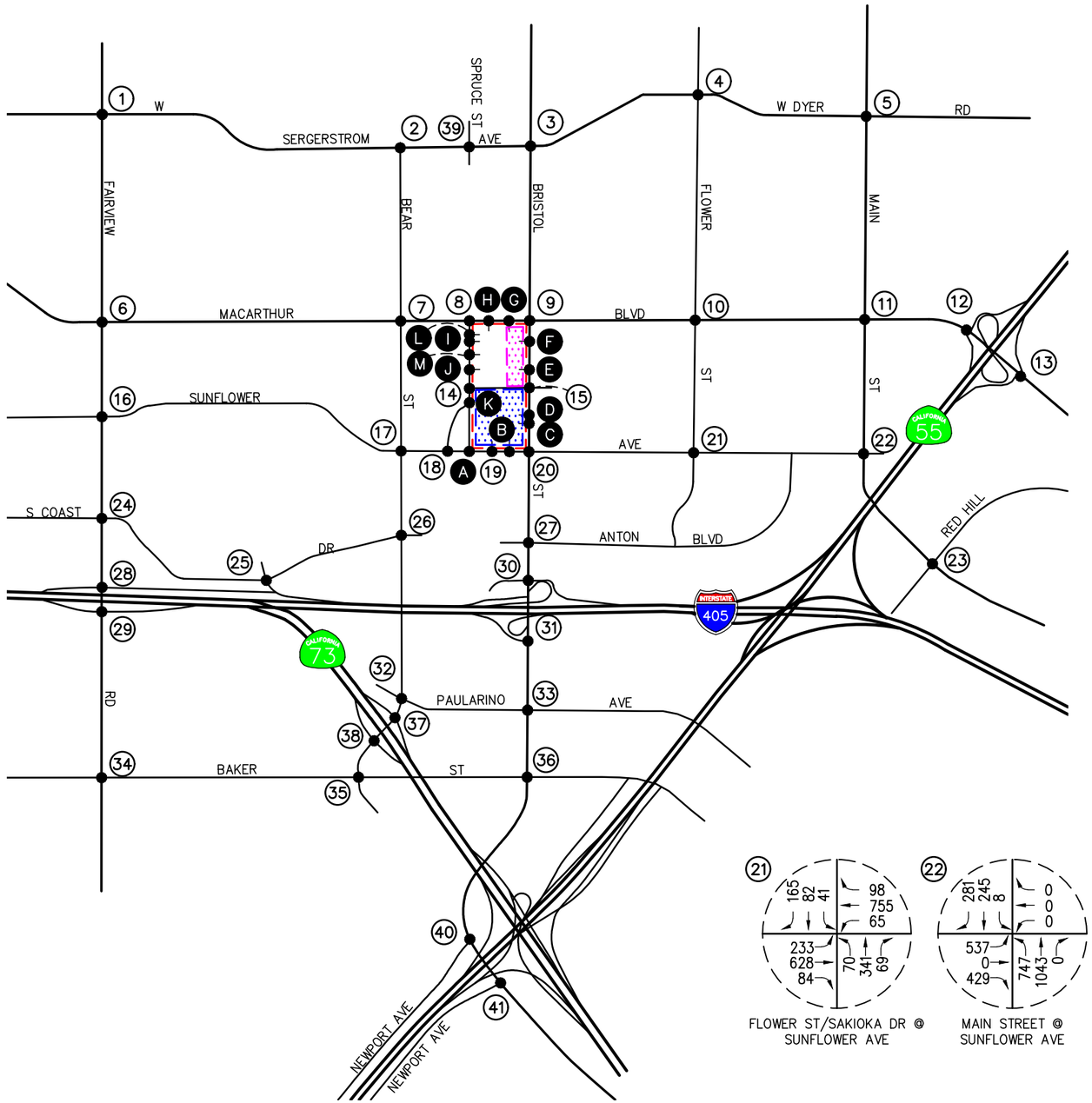
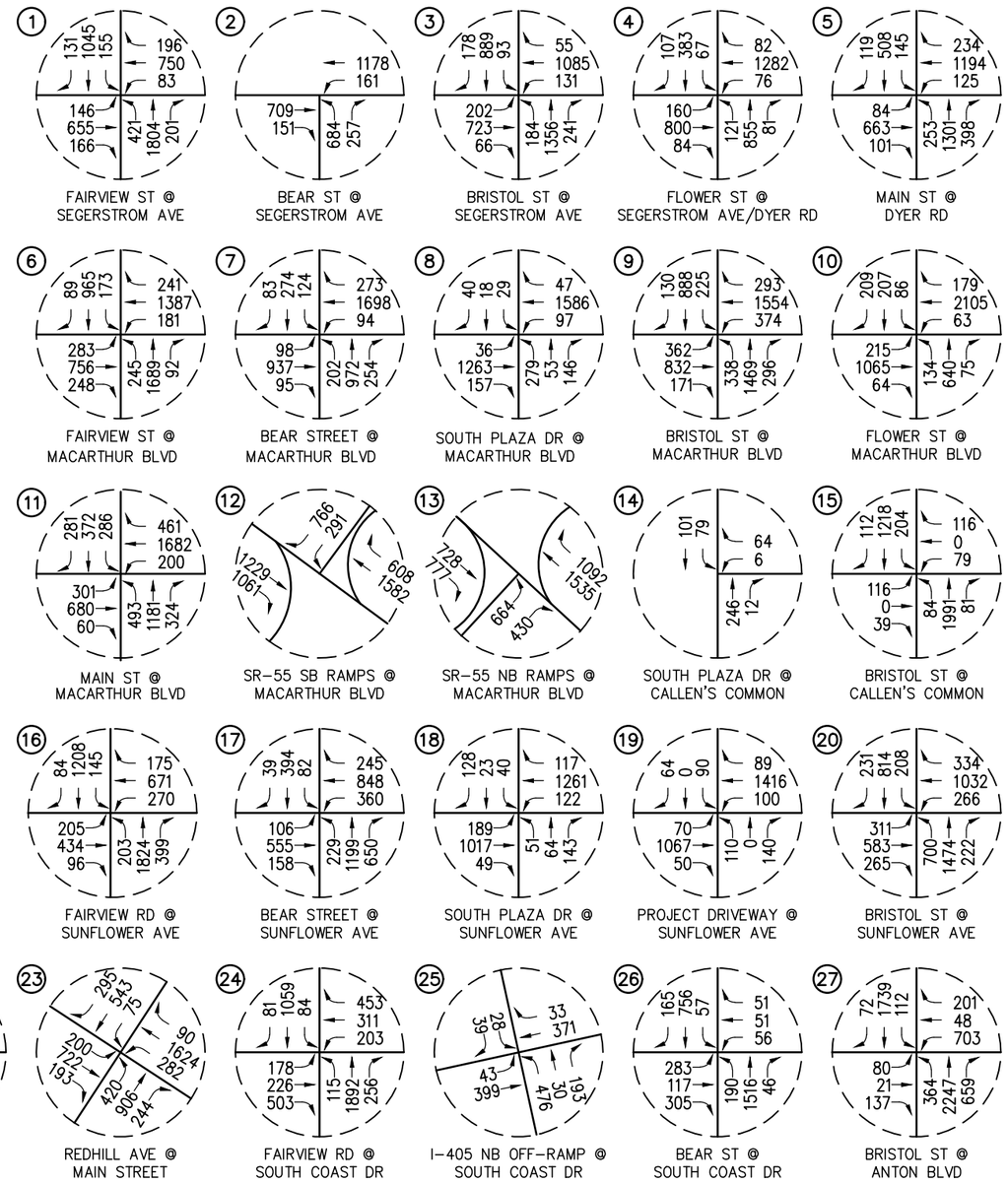
KEY
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2

FIGURE 5-17B

EXISTING PLUS PROJECT PHASES 1 AND 2
AM PEAK HOUR TRAFFIC VOLUMES
RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

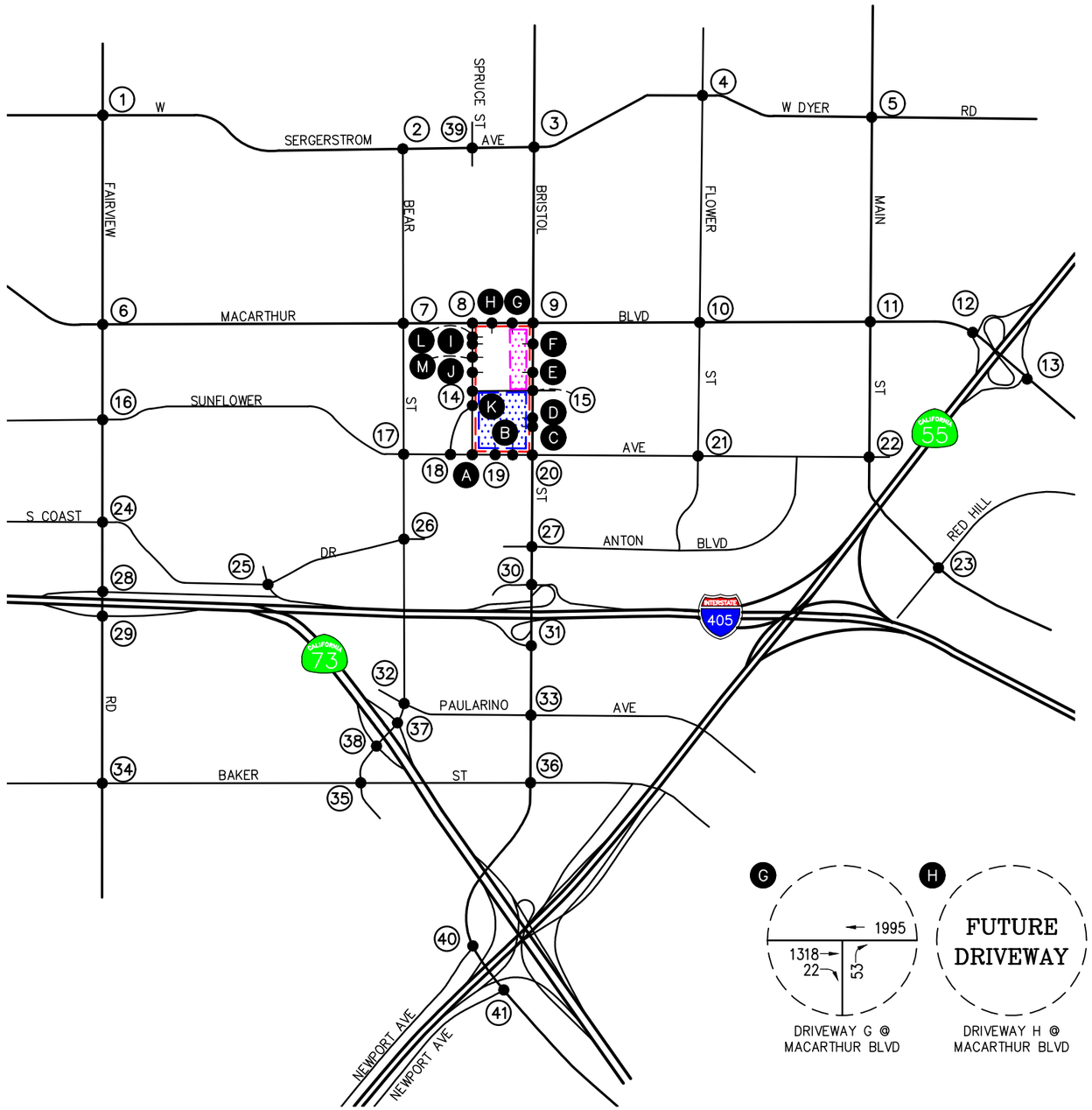
= PHASE 1

= PHASE 2

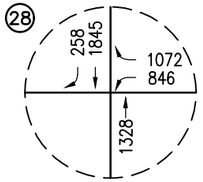
FIGURE 5-18A

EXISTING PLUS PROJECT PHASES 1 AND 2 PM PEAK HOUR TRAFFIC VOLUMES

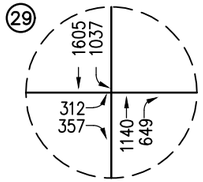
RELATED BRISTOL, SANTA ANA



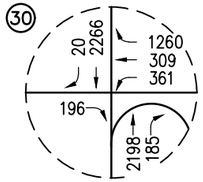
28 FAIRVIEW RD @ I-405 NB RAMPS



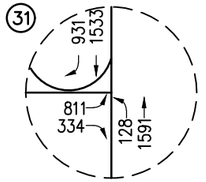
29 FAIRVIEW RD @ I-405 SB RAMPS



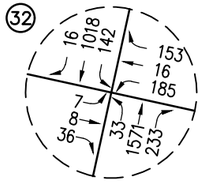
30 BRISTOL ST @ I-405 NB RAMPS



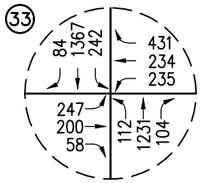
31 BRISTOL ST @ I-405 SB RAMPS



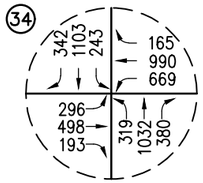
32 BEAR ST @ PAULARINO DR



33 BRISTOL ST @ PAULARINO DR



34 FAIRVIEW RD @ BAKER ST



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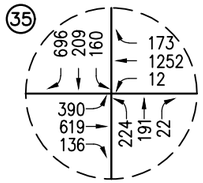

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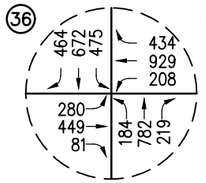
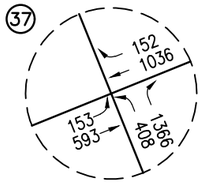


37 SR-73 NB @ BEAR ST



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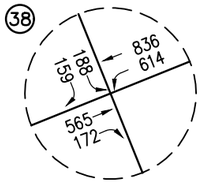

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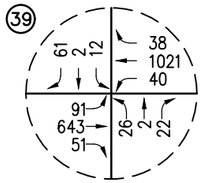

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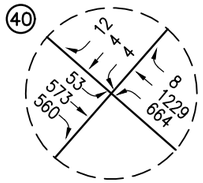

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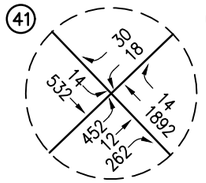
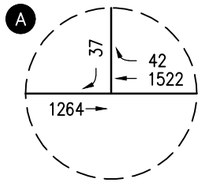


A DRIVEWAY A @ SUNFLOWER AVE



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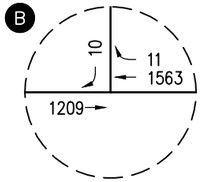

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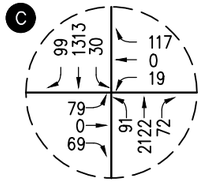

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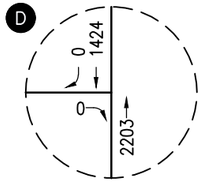

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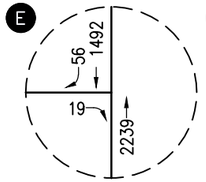

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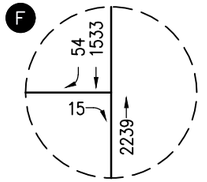
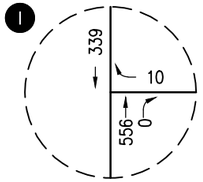


G DRIVEWAY G @ MACARTHUR BLVD

H DRIVEWAY H @ MACARTHUR BLVD

FUTURE DRIVEWAY

I SOUTH PLAZA DR @ DRIVEWAY I



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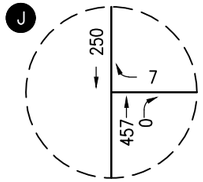

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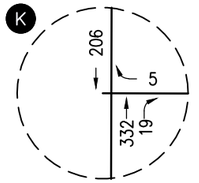

L SOUTH PLAZA DR @ DRIVEWAY L

FUTURE DRIVEWAY

M SOUTH PLAZA DR @ DRIVEWAY M

FUTURE DRIVEWAY

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N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

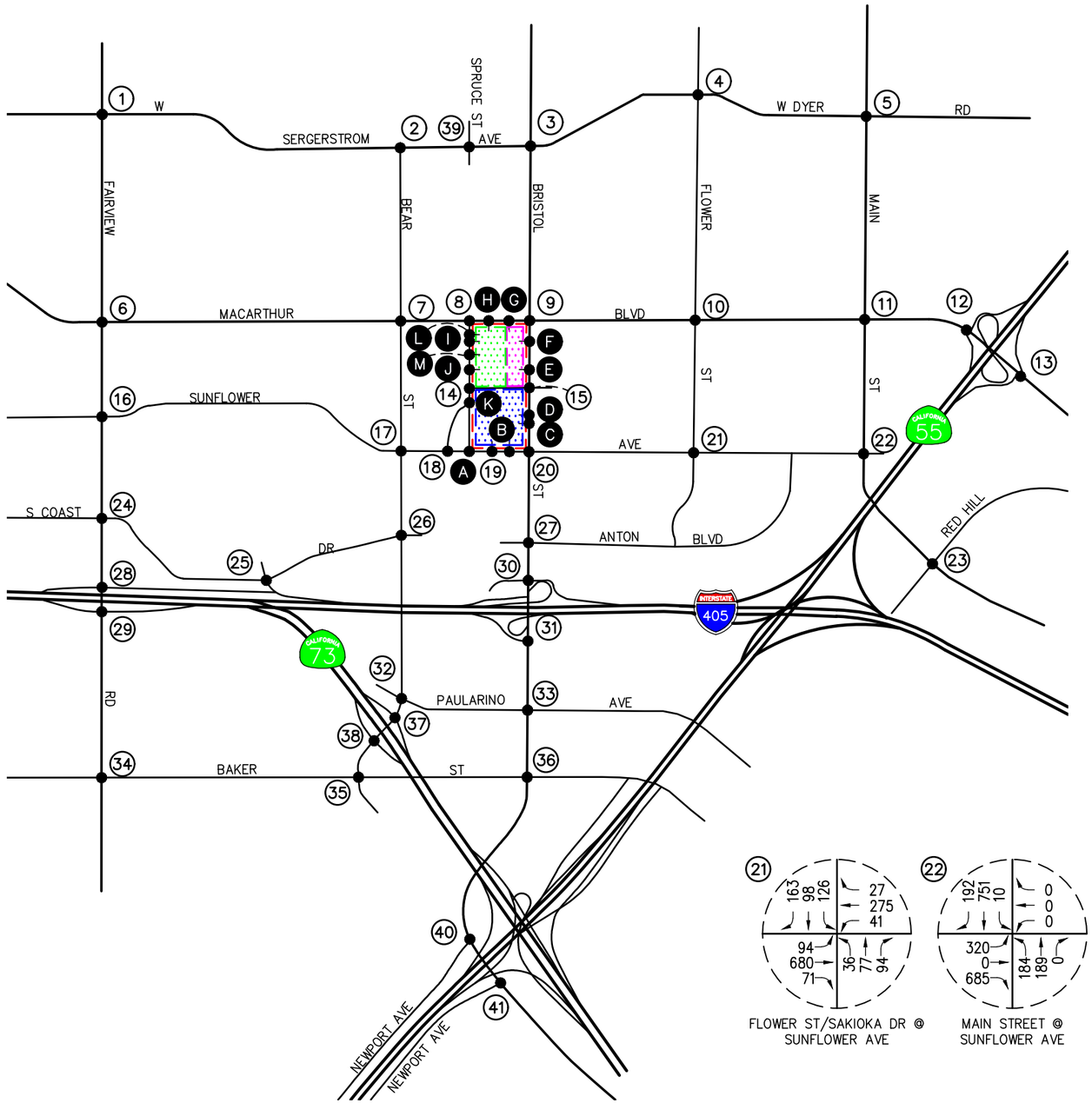
= PHASE 1

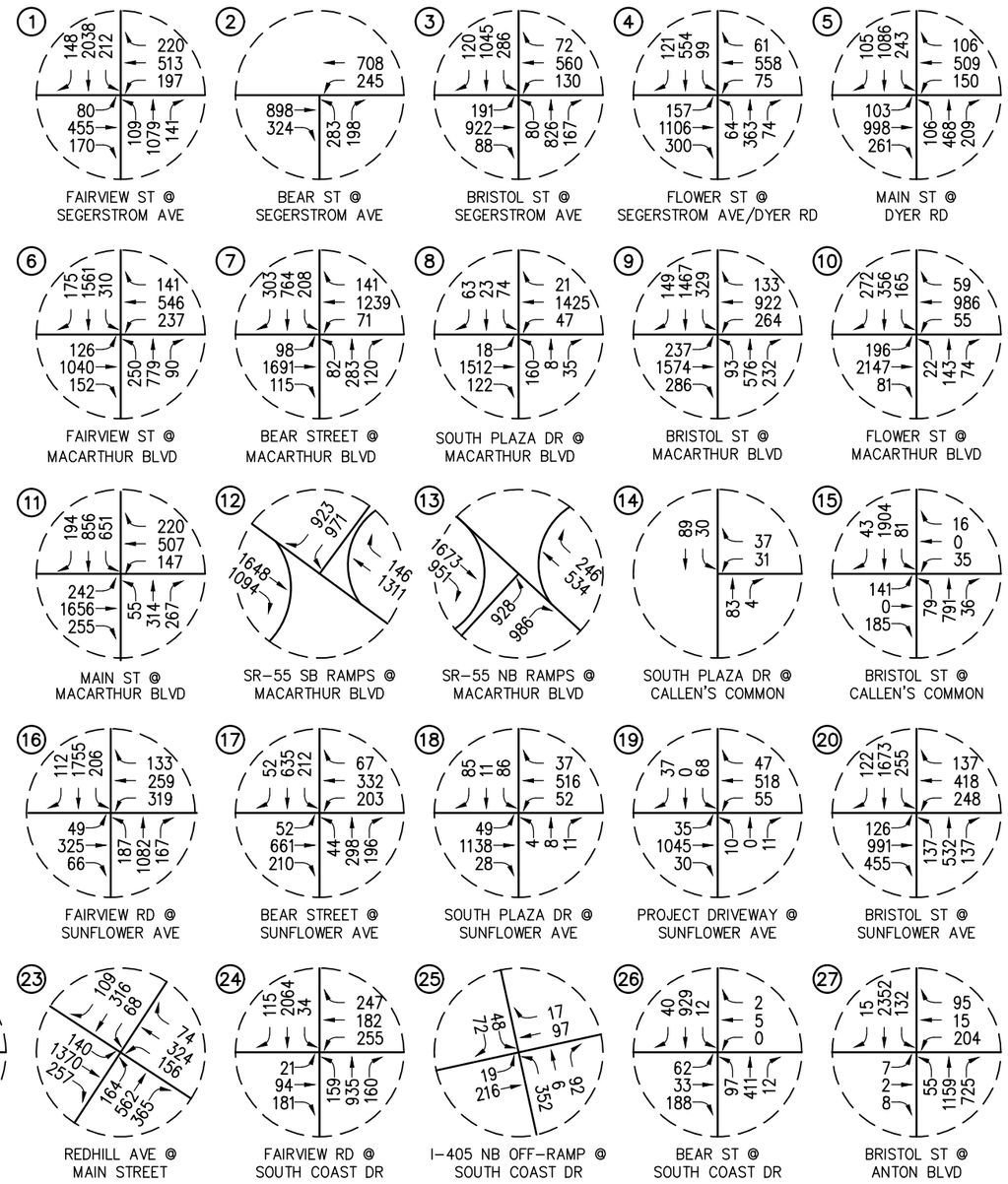
= PHASE 2

FIGURE 5-18B

EXISTING PLUS PROJECT PHASES 1 AND 2 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

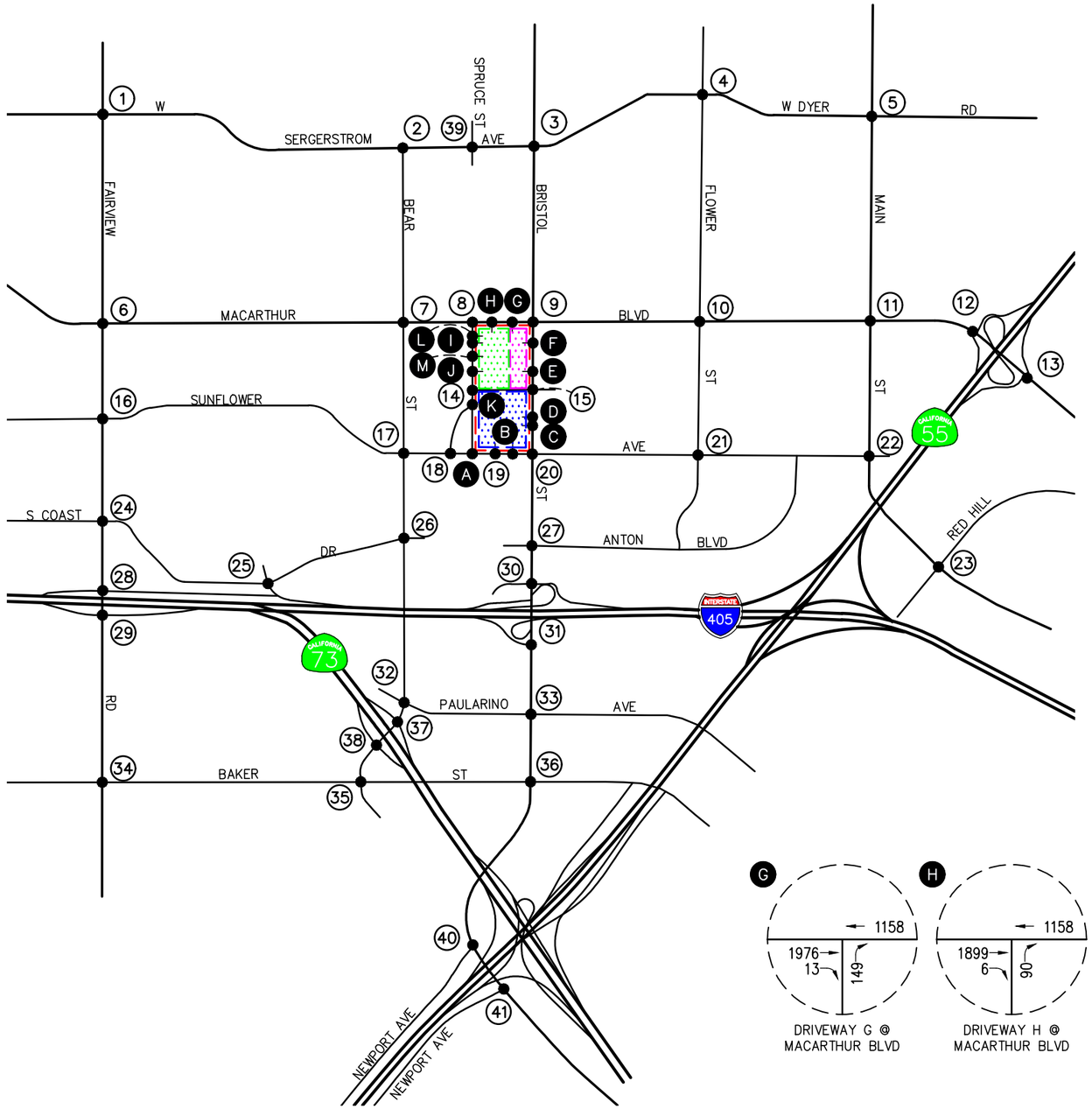
KEY

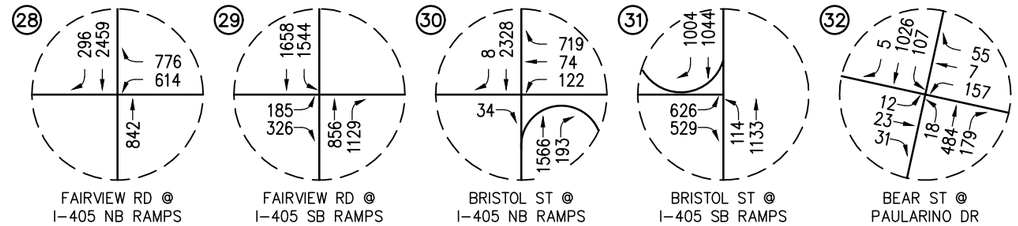
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 5-19A

EXISTING PLUS PROJECT PHASES 1, 2 AND 3 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

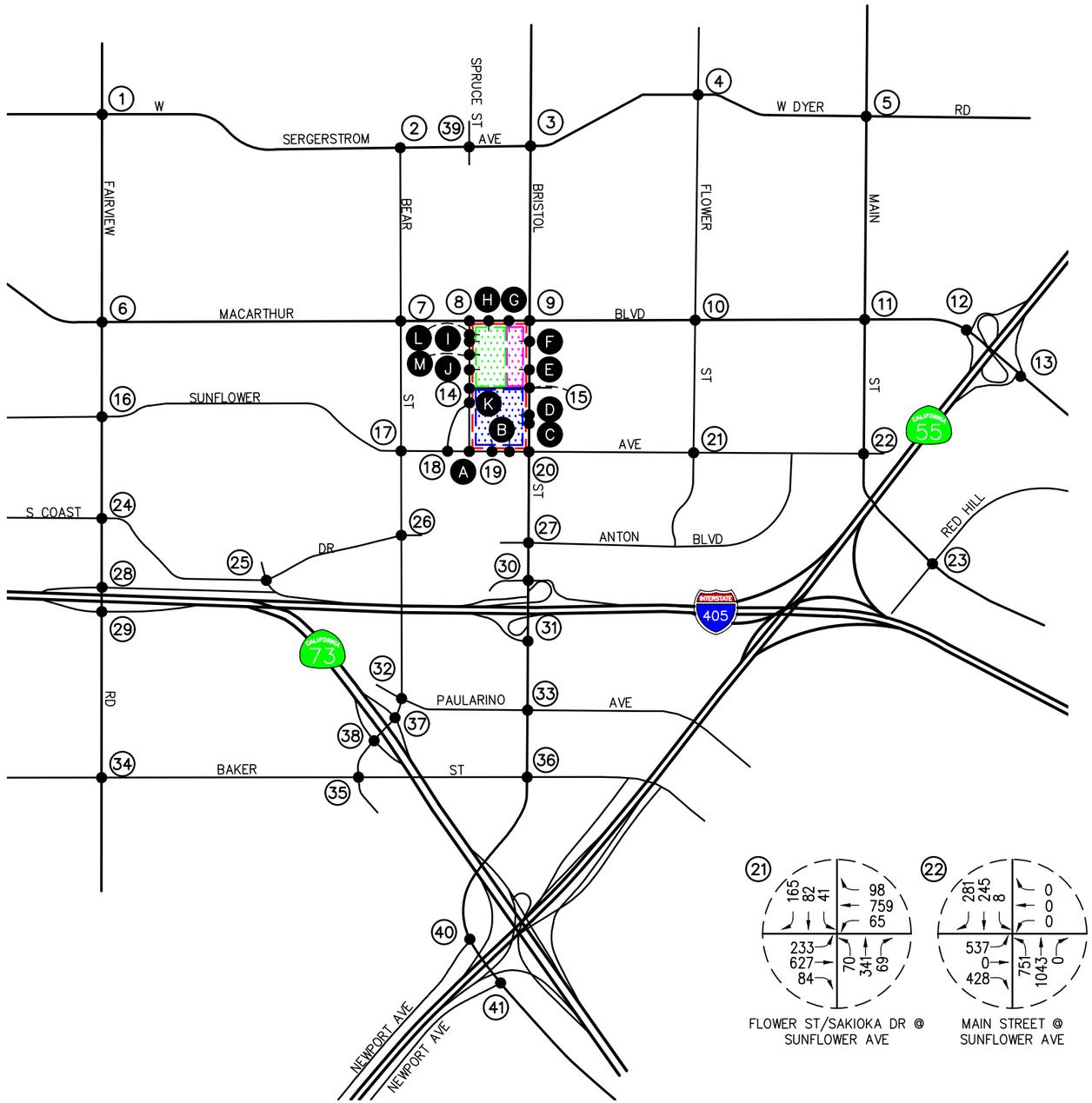
KEY

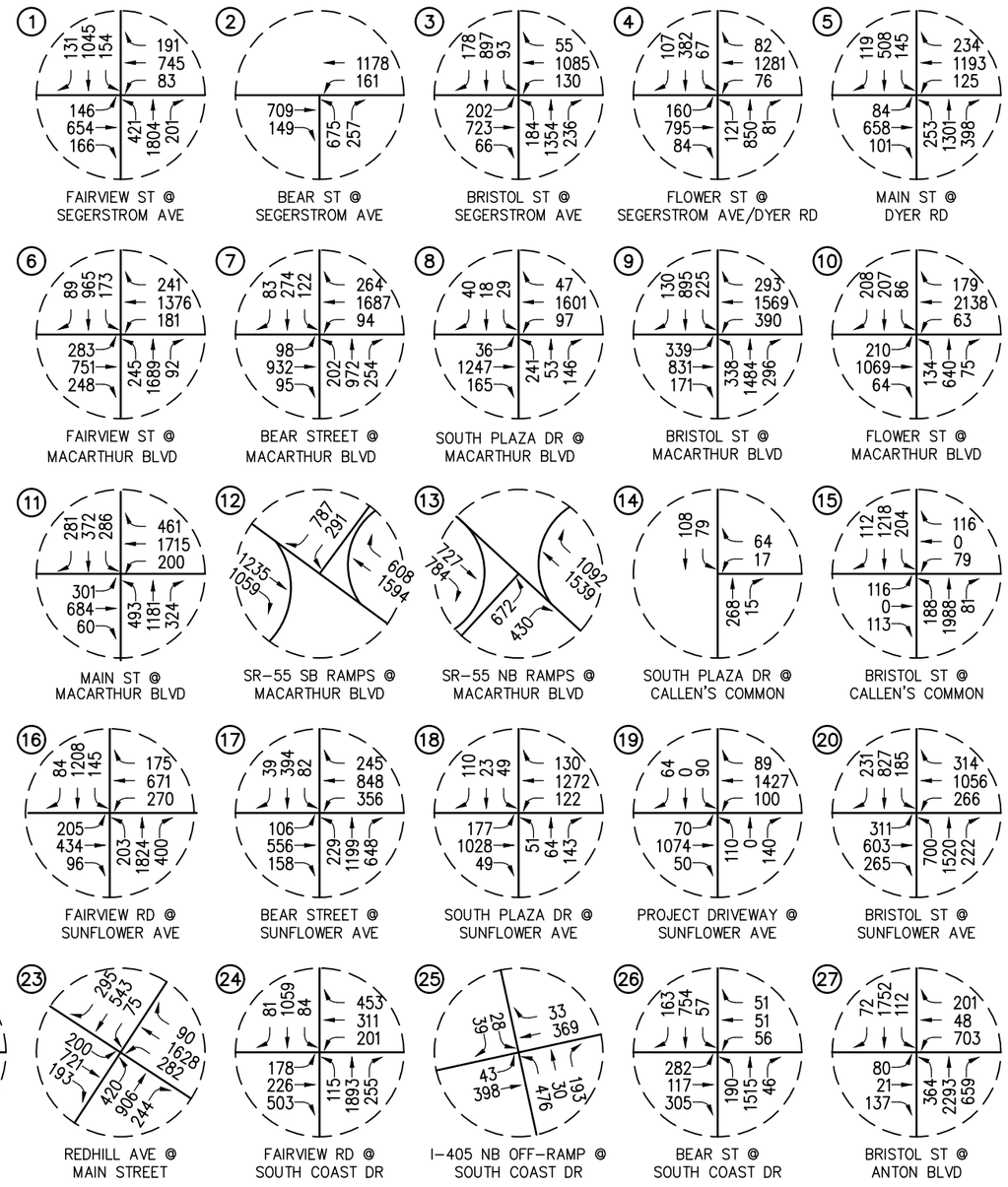
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 5-19B

EXISTING PLUS PROJECT PHASES 1, 2 AND 3 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

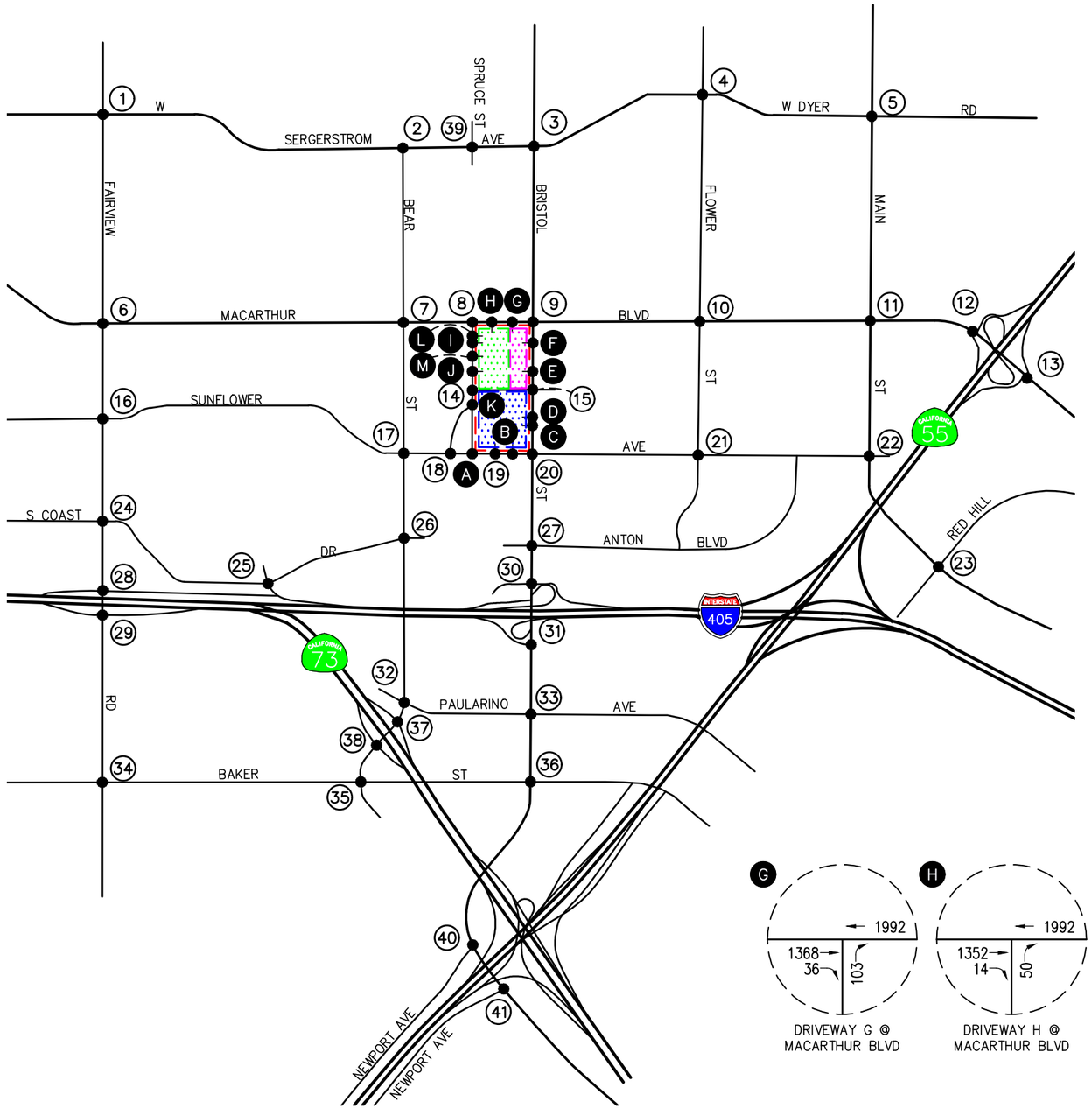
KEY

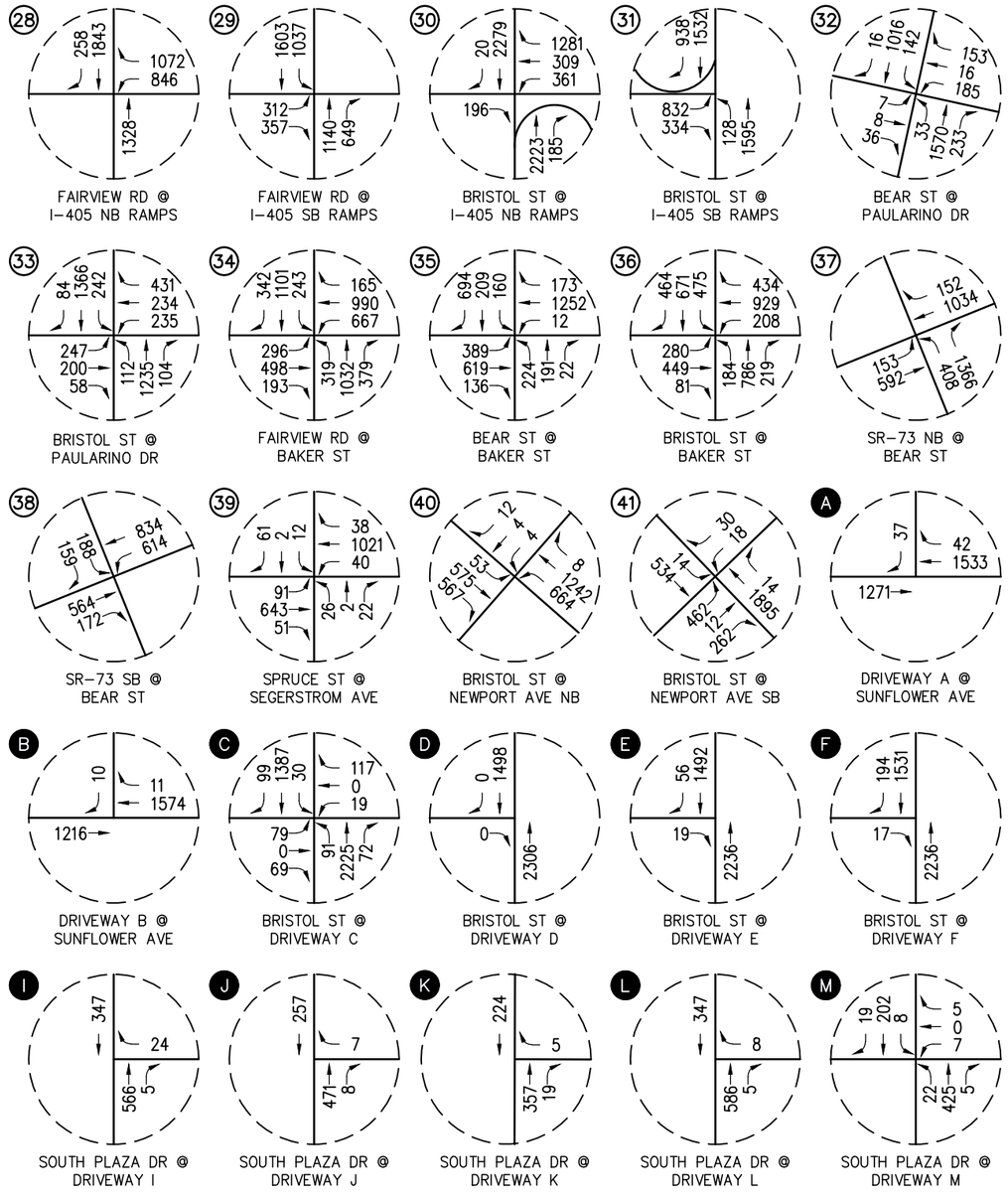
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 5-20A

EXISTING PLUS PROJECT PHASES 1, 2 AND 3 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL SANTA ANA





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KEY

(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 5-20B

EXISTING PLUS PROJECT PHASES 1, 2 AND 3 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA

6.0 FUTURE TRAFFIC CONDITIONS

6.1 Ambient Traffic Growth

Horizon year, background traffic growth estimates have been calculated using an ambient traffic growth factor. The ambient traffic growth factor is intended to include unknown and future related projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. The future growth in traffic volumes has been calculated at one percent (1.0%) per year. Applied to the Year 2022 existing baseline conditions, this factor results in an 8.0% growth in existing volumes to the near-term horizon year 2030 for Phase 1, a 10.0% growth in existing volumes to the near-term horizon year 2032 for Phase 2, and a 14.0% growth in existing volumes to the near-term horizon year 2036 for Phase 3.

6.2 Related Projects Traffic Characteristics

In order to make a realistic estimate of future on-street conditions prior to implementation of the proposed Project, the status of other known development projects (related projects) within a two-mile radius of the proposed project has been researched at the Cities of Santa Ana, Costa Mesa, Irvine and Tustin. With this information, the potential circulation effects of the proposed Project can be evaluated within the context of the cumulative impact of all ongoing development.

Based on our research during the scoping process, there are ten (10) related projects located in the City of Santa Ana, seven (7) related projects located in the City of Costa Mesa and three (3) related projects located in the City of Irvine. These twenty (20) related projects have been included as part of the cumulative background setting.

Table 6-1 provides a brief description for each of the twenty (20) related projects. ***Figure 6-1*** graphically illustrates the location of the twenty (20) related projects. These related projects are expected to generate vehicular traffic, which may affect the operating conditions of the key study intersections.

Table 6-2 summarizes the trip generation potential for all twenty (20) related projects on a daily and peak hour basis for a typical weekday. As shown, the related projects are expected to generate 28,993 daily trips, with 2,517 trips (1,477 inbound, 1,040 outbound) anticipated during the AM peak hour and 2,899 trips (1,194 inbound, 1,705 outbound) produced during the PM peak hour.

The AM and PM peak hour traffic volumes associated with the twenty (20) related projects are presented in ***Figures 6-2*** and ***6-3***, respectively.

TABLE 6-1
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[13]

No.	Cumulative Project	Location/Address	Description
Santa Ana			
1.	Legado at the Met	200 E. First American Way	278 DU residential apartments
2.	Our Lady of Guadalupe Office/Residence	542 E. Central Avenue	2,395 SF rectory office/residential apartment
3.	Pollo Campero	2320 S. Bristol Street	2,756 SF fast-food restaurant with drive-thru window
4.	Garry Avenue Business Park	1700 E. Garry Avenue	91,500 SF distribution and warehousing
5.	Shell Service Station Retail Building	3820 S. Fairview Street	12 VFP and 1,600 SF Gas station and convenience store
6.	3130 Fairview Industrial Building	3130 S. Fairview Street	82,241 SF industrial building
7.	Bristol Office Plaza	1400 W. Saint Gertrude Place	7,500 SF commercial
8.	Chick-Fil-A Expansion	3601 S. Bristol Street	630 SF expansion of fast-food restaurant with drive-thru window
9.	Legacy Sunflower Apartments	651 W. Sunflower Avenue	226 DU apartments
10.	South Coast Village Mixed-Use[14]	NEC and NWC of Sunflower Avenue and S. Plaza Drive	*Phase 1:* Demolition of existing 46,843 SF retail, 47,301 SF furniture store, 38,290 SF quality restaurant, 4,560 SF high-turnover restaurant, and 24,000 SF office. Construction of 629 DU high-rise residential apartments, 18,000 SF supermarket, and 55,175 SF retail *Phase 2:* Construction of 690 DU high-rise residential apartments *Phase 3:* Demolition of existing 18,362 SF movie theater. Construction of 300,000 SF office, 264 DU high-rise residential apartments, and 6,825 SF retail
City of Costa Mesa			
11.	The Press	1375 Sunflower Street	453,950 SF office and 50,909 SF commercial
12.	DeNova Homes	929 Baker Street	56 DU single-family residential
13.	Audi Fletcher Jones Auto Dealership	1275 Bristol Street	50,971 SF automotive dealership and service center
14.	Halcyon House (Symphony Apartments)	585-595 Anton Boulevard	393 DU apartments and 4,104 SF retail

Notes:

- SF = Square-feet
- DU = Dwelling units
- VFP = Vehicle Fueling Positions

[13] Source: City of Santa Ana, City of Costa Mesa, and City of Irvine Planning Departments.

[14] Phases 1 and 2 have been included within Year 2036 background conditions. Phases 1, 2 and 3 have been included within Year 2045 background conditions.

TABLE 6-1 (CONTINUED)
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[15]

No.	Cumulative Project	Location/Address	Description
City of Costa Mesa (Cont.)			
15.	Orange County Museum of Art	3333 Avenue of the Arts	66,750 SF art museum
16.	Avenue of the Arts Hotel	3350 Avenue of the Arts	150 room hotel[16]
17.	The Plant	2972 Century Place	62 DU apartments and 19,479 SF commercial spaces to include 5,230 SF retail, 3,000 SF restaurant, 2,315 SF food stalls, 6,364 SF live/work office use, and 2,570 SF office
City of Irvine			
18.	0086961-PPA	18011 Mitchell South	48,045 SF warehouse
19.	00860930-PPA	17731 Cowan	56,500 SF warehouse
20.	0855935-PCPU	1340 Reynolds Avenue	3,636 SF escape room

Notes:

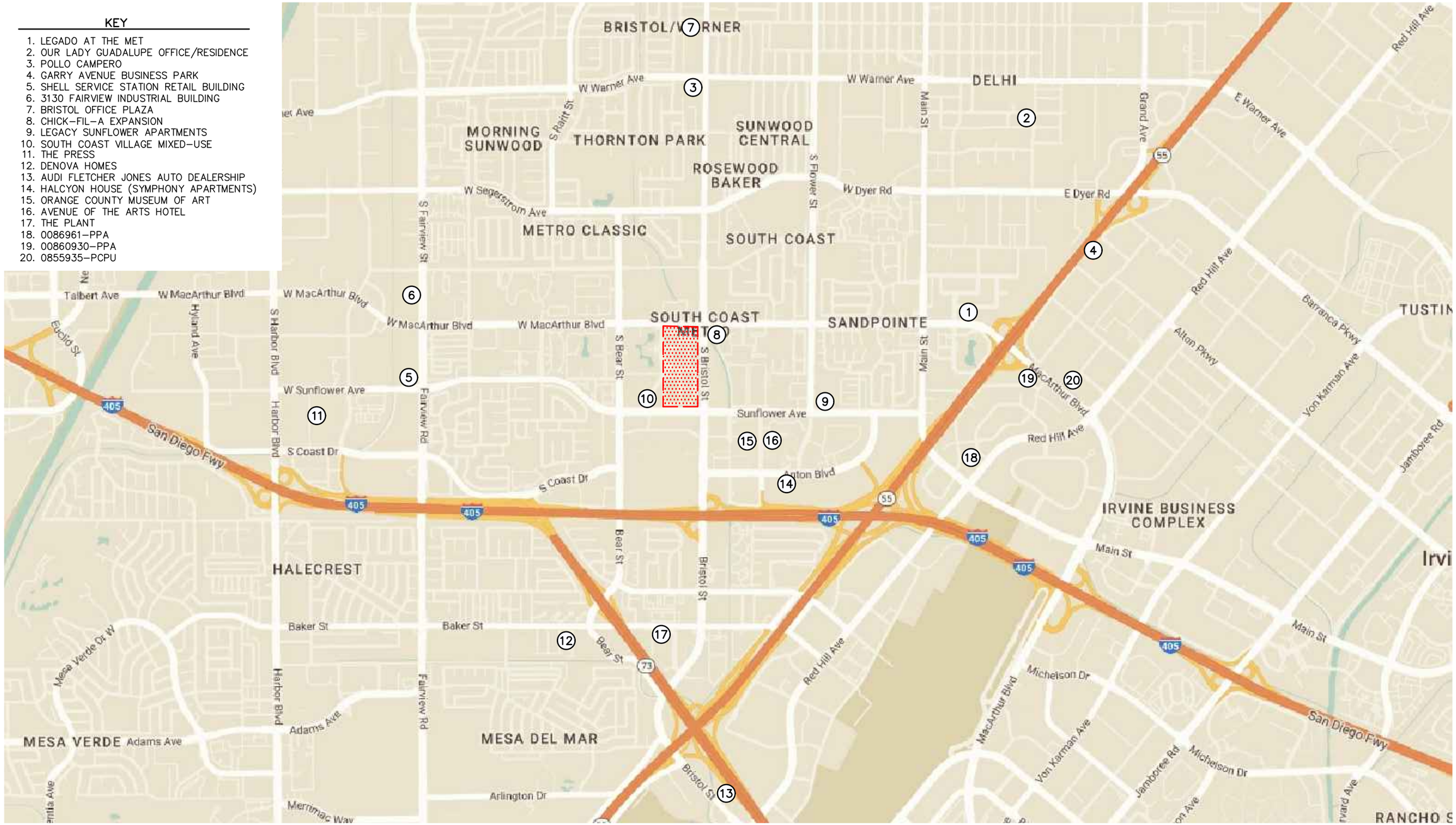
- SF = Square-feet
- DU = Dwelling units
- VFP = Vehicle Fueling Positions

[15] Source: City of Santa Ana, City of Costa Mesa, and City of Irvine Planning Departments.

[16] According to the *Addendum to the Wyndham Boutique Hotel/High-Rise Residential Project Final Environmental Impact Report No. 1054 (SCH No. 2007011125)*, the previously approved project included the construction of a 238-room hotel, and the proposed project includes the expansion of the hotel to include an additional 150-rooms. Therefore, the net additional 150-room hotel was analyzed under the cumulative background traffic setting in this report.

KEY

1. LEGADO AT THE MET
2. OUR LADY GUADALUPE OFFICE/RESIDENCE
3. POLLO CAMPERO
4. GARRY AVENUE BUSINESS PARK
5. SHELL SERVICE STATION RETAIL BUILDING
6. 3130 FAIRVIEW INDUSTRIAL BUILDING
7. BRISTOL OFFICE PLAZA
8. CHICK–FIL–A EXPANSION
9. LEGACY SUNFLOWER APARTMENTS
10. SOUTH COAST VILLAGE MIXED–USE
11. THE PRESS
12. DENOVA HOMES
13. AUDI FLETCHER JONES AUTO DEALERSHIP
14. HALCYON HOUSE (SYMPHONY APARTMENTS)
15. ORANGE COUNTY MUSEUM OF ART
16. AVENUE OF THE ARTS HOTEL
17. THE PLANT
18. 0086961–PPA
19. 00860930–PPA
20. 0855935–PCPU



SOURCE: GOOGLE

KEY

(#) = CUMULATIVE PROJECTS LOCATION

= PROJECT SITE

NO SCALE

FIGURE 6–1

LOCATION OF CUMULATIVE PROJECTS

RELATED BRISTOL, SANTA ANA

TABLE 6-2
CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST[17]

Cumulative Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
1. Legado at the Met[18]	2,015	30	124	154	121	67	188
2. Our Lady of Guadalupe Office/Residence	26	4	0	4	1	2	3
3. Pollo Campero	966	31	30	61	21	20	41
4. Garry Avenue Business Park	156	12	4	16	4	12	16
5. Shell Service Station Retail Building	841	11	11	22	11	11	22
6. 3130 Fairview Industrial Building	401	54	7	61	7	46	53
7. Bristol Office Plaza	367	10	6	16	15	14	29
8. Chick-Fil-A Expansion	221	7	7	14	5	4	9
9. Legacy Sunflower Apartments[19]	1,229	21	60	81	60	39	99
10. South Coast Village Mixed-Use	2,861	410	252	662	27	380	407
11. The Press[20]	9,293	648	229	877	353	598	951
12. DeNova Homes[21]	533	11	31	42	35	21	56
13. Audi Fletcher Jones Auto Dealership	1,419	69	26	95	49	74	123
14. Halcyon House (Symphony Apartments)[22]	2,770	41	163	204	163	94	257
15. Orange County Museum of Art[23]	3,754	49	20	69	234	254	488
16. Avenue of the Arts Hotel	1,199	39	30	69	45	44	89
17. The Plant[24]	565	11	32	43	25	0	25
18. 0086961-PPA	82	6	2	8	3	6	9
19. 00860930-PPA	97	8	2	10	3	7	10
20. 0855935-PCPU	198	5	4	9	12	12	24
Cumulative Projects Total Trip Generation Potential	**28,993**	**1,477**	**1,040**	**2,517**	**1,194**	**1,705**	**2,899**

17 Unless otherwise noted, Source: *Trip Generation*, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021).

18 Source: *Traffic Impact Analysis Report for The Met at South Coast* prepared by LLG Engineers, dated November 9, 2011.

19 Source: *Traffic Impact Analysis Report for Legacy Sunflower Apartments* prepared by LLG Engineers, dated January 2019.

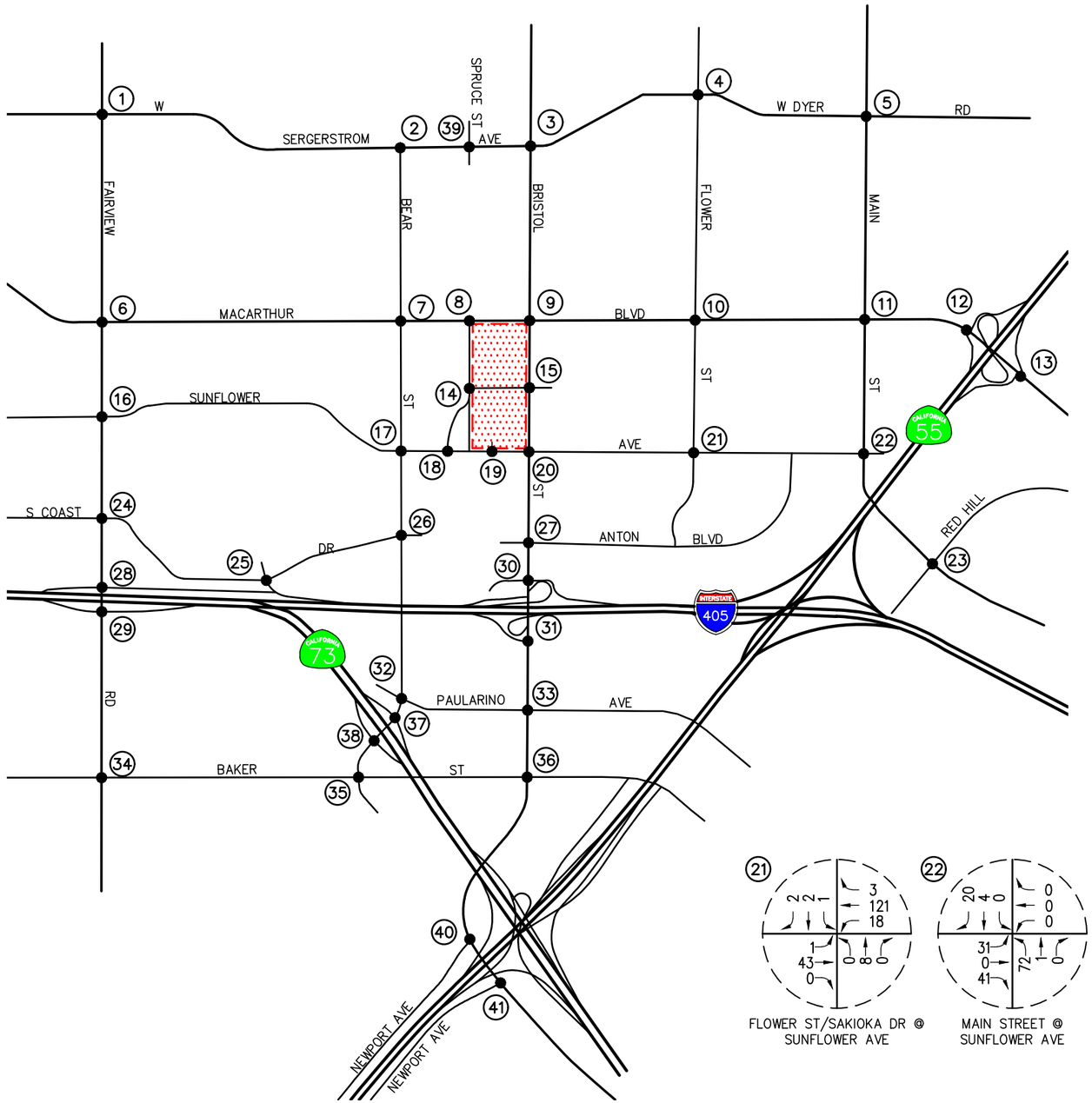
20 Source: *Traffic Impact Analysis Report for The Press Site Phases 1, 2 and 3* prepared by LLG Engineers, dated January 2020.

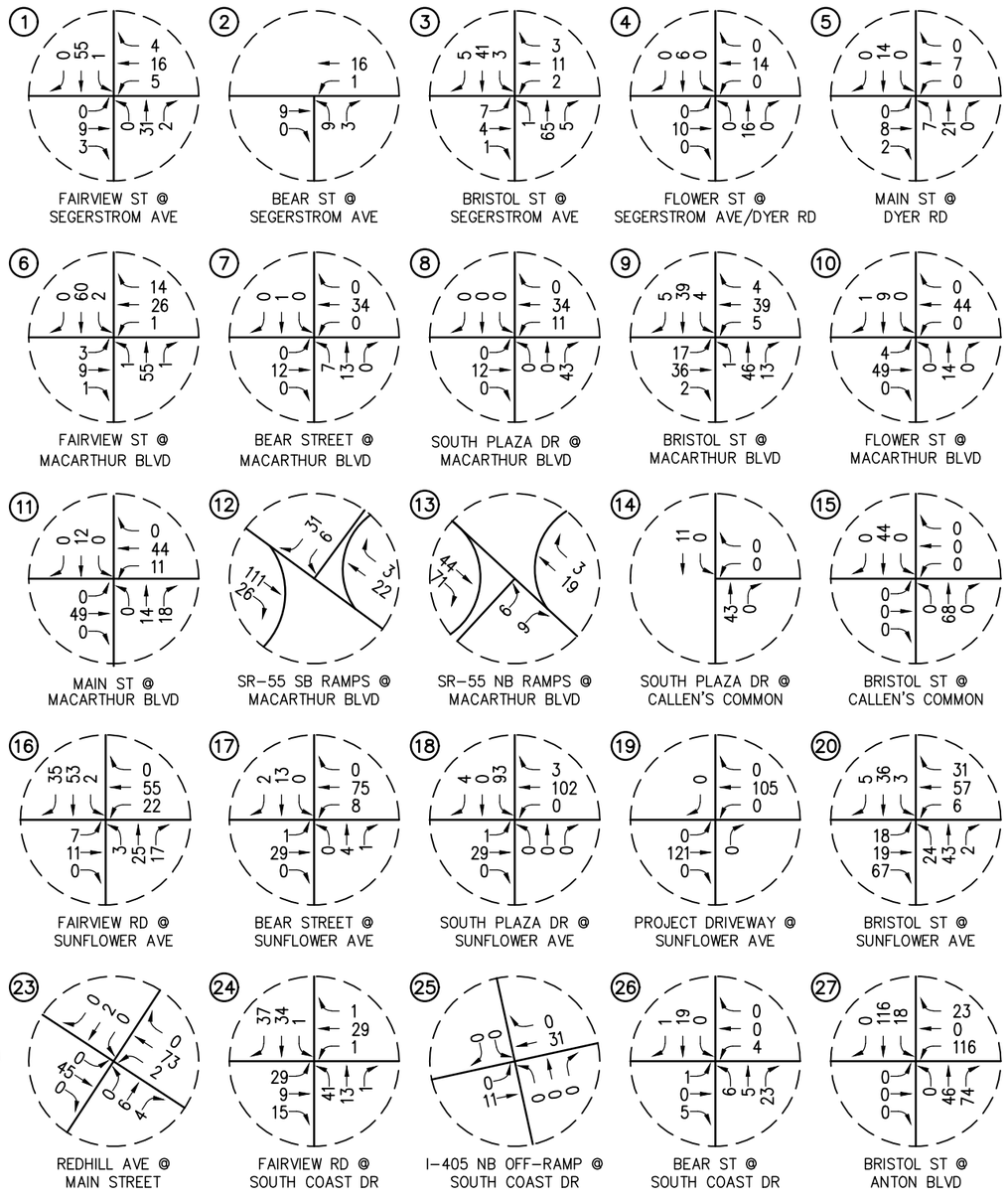
21 Source: *Del Nova Homes Traffic Impact Analysis*, prepared by Transpo Group, dated January 2016.

22 Source: *Traffic Impact Analysis Report for Symphony Apartments*, prepared by LLG Engineers, dated July 24, 2014.

23 Source: *Addendum to the Final Program Environmental Impact Report for the South Coast Plaza Town Center Project SCH No. 2000041100* prepared by LSA, dated December 2018.

24 Source: *Traffic Impact Analysis Report for The Plant* prepared by LLG Engineers, dated June 2018.





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N NO SCALE

KEY

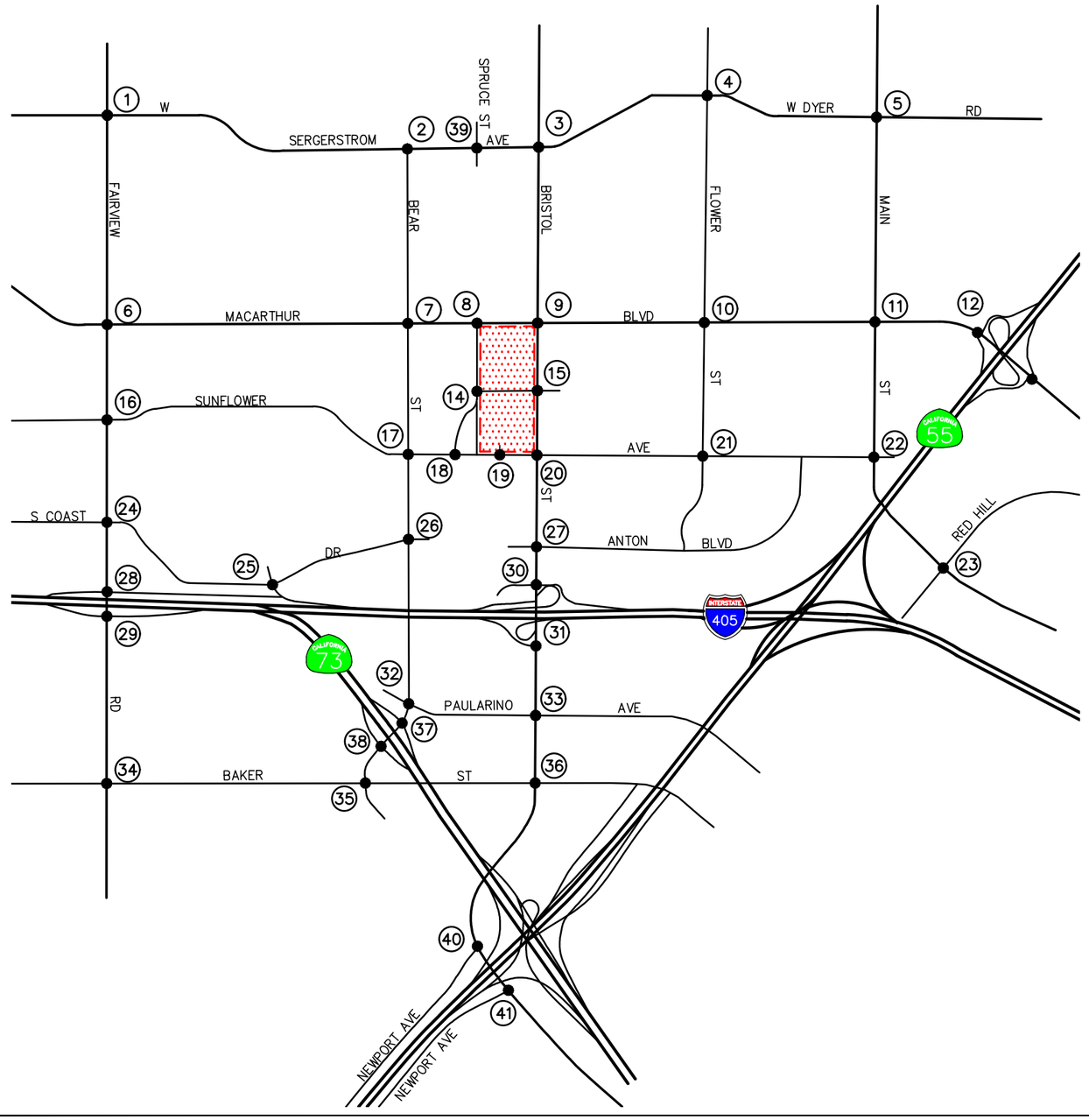
(#) = STUDY INTERSECTION

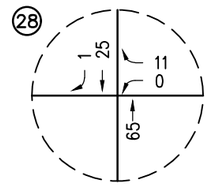
= PROJECT SITE

FIGURE 6-2A

AM PEAK HOUR CUMULATIVE PROJECTS TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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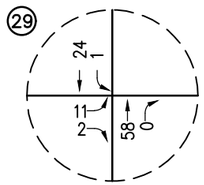

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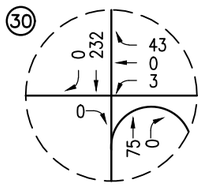
I-405 SB RAMPS



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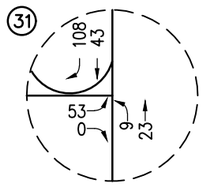
I-405 NB RAMPS



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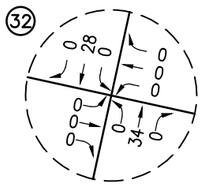
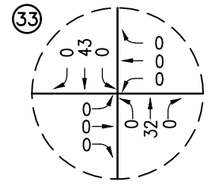
I-405 SB RAMPS



BEAR ST @
PAULARINO DR



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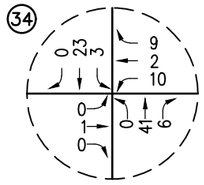
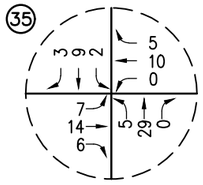


FAIRVIEW RD @
BAKER ST



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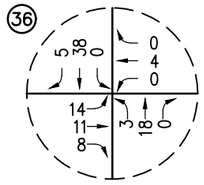
BAKER ST



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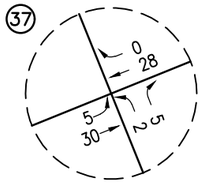
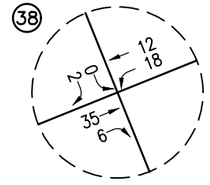
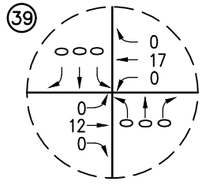
BAKER ST



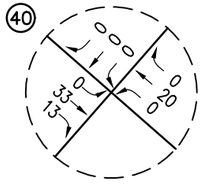
SR-73 NB RAMPS @
BEAR ST



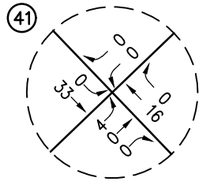
SR-73 SB RAMPS @
BEAR ST



SPRUCE ST @
SEGERSTROM AVE



BRISTOL ST @
NEWPORT AVE NB



BRISTOL ST @
NEWPORT AVE SB

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N NO SCALE

KEY

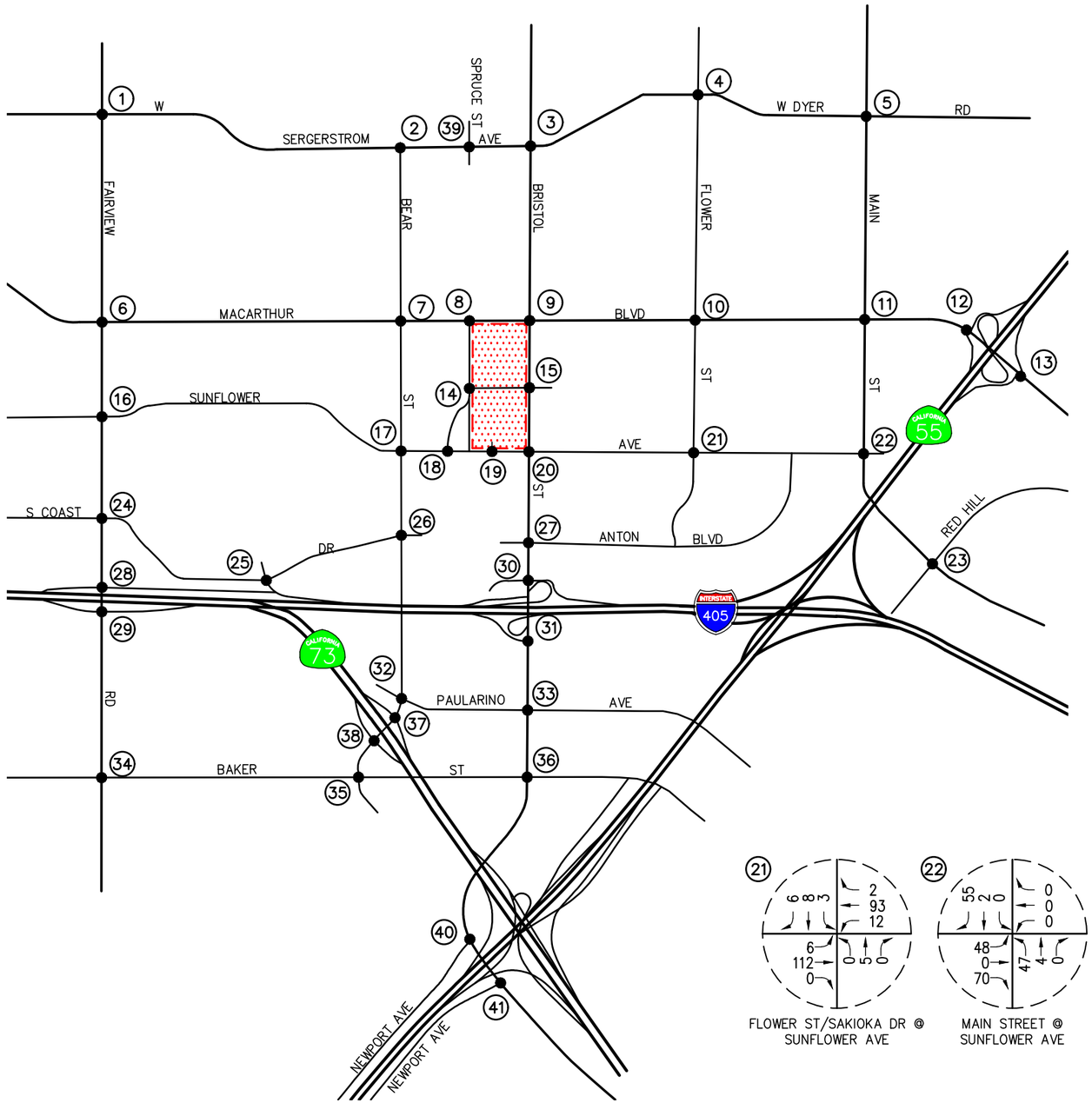
(#) = STUDY INTERSECTION

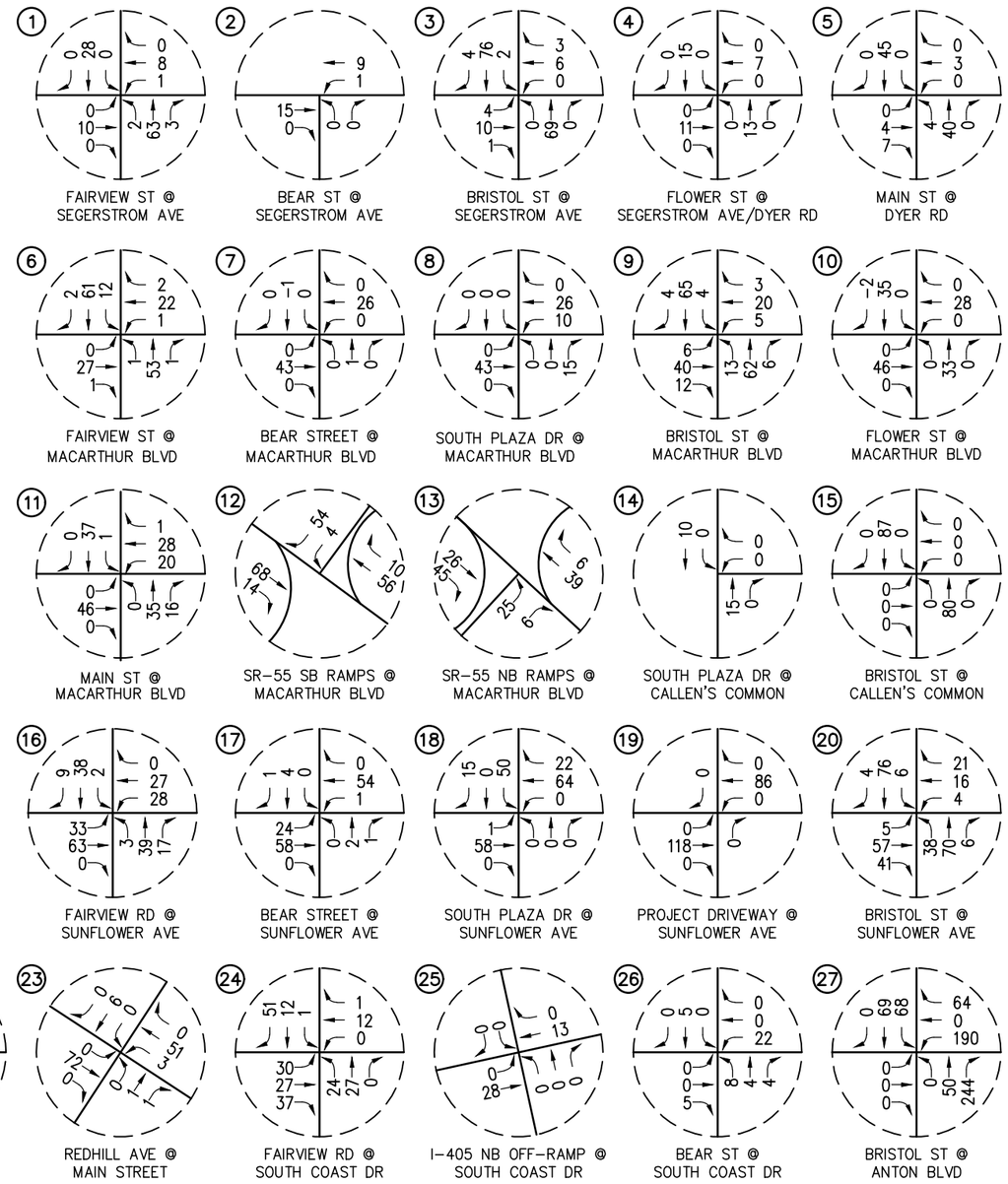
= PROJECT SITE

FIGURE 6-2B

AM PEAK HOUR CUMULATIVE PROJECTS TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

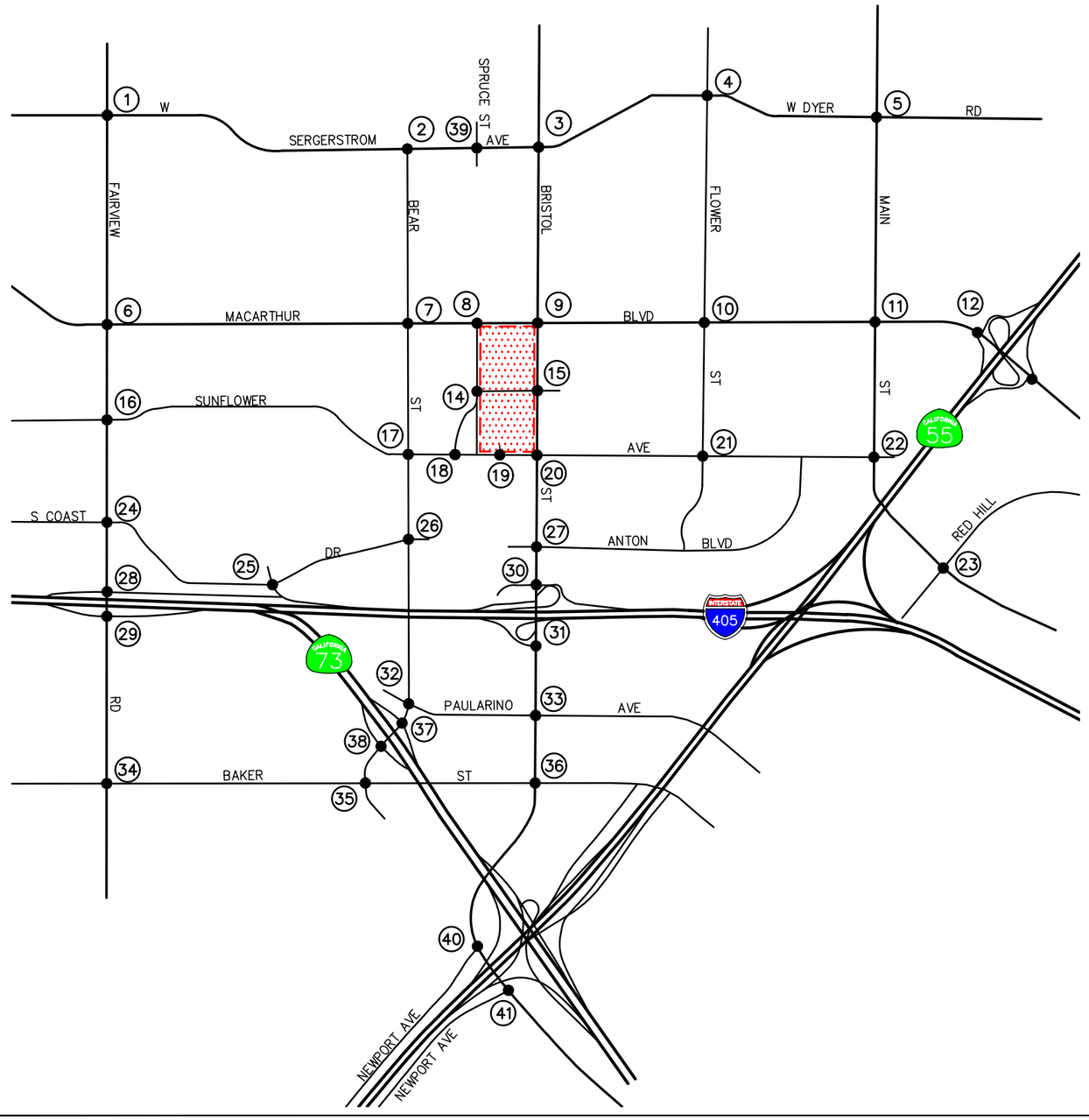
(#) = STUDY INTERSECTION

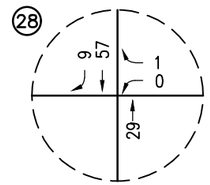
= PROJECT SITE

FIGURE 6-3A

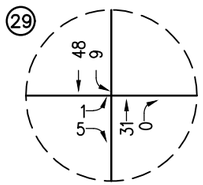
PM PEAK HOUR CUMULATIVE PROJECTS TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA

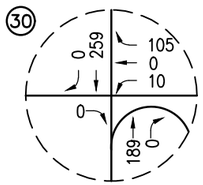




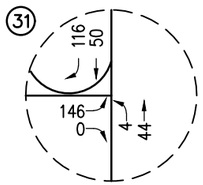
FAIRVIEW RD @
I-405 NB RAMPS



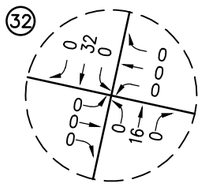
FAIRVIEW RD @
I-405 SB RAMPS



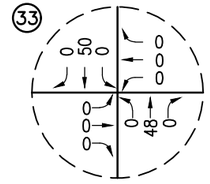
BRISTOL ST @
I-405 NB RAMPS



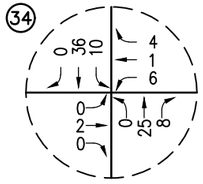
BRISTOL ST @
I-405 SB RAMPS



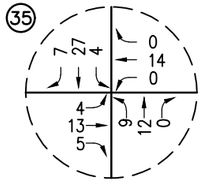
BEAR ST @
PAULARINO DR



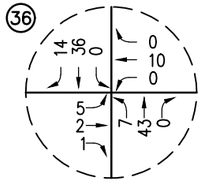
BRISTOL ST @
PAULARINO DR



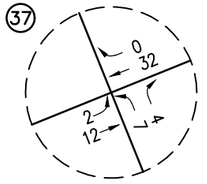
FAIRVIEW RD @
BAKER ST



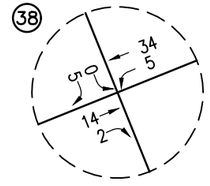
BEAR ST @
BAKER ST



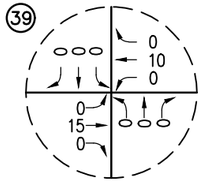
BRISTOL ST @
BAKER ST



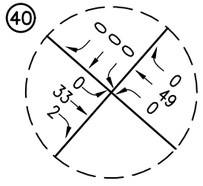
SR-73 NB RAMPS @
BEAR ST



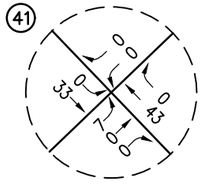
SR-73 SB RAMPS @
BEAR ST



SPRUCE ST @
SEGERSTROM AVE



BRISTOL ST @
NEWPORT AVE NB



BRISTOL ST @
NEWPORT AVE SB

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N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

FIGURE 6-3B

PM PEAK HOUR CUMULATIVE PROJECTS TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA

6.3 Year 2045 Traffic Conditions

The Year 2045 traffic volume forecasts for this traffic study were development via the utilization of the OCTAM 5.0 Year 2045 traffic model provided by OCTA. Specifically, daily, AM peak period and PM peak period intersection traffic volumes were provided by OCTA for the existing base year (i.e. Year 2016) and for the Year 2045 year. The AM peak period corresponds to a three-hour morning commute period while the PM peak period corresponds to a four-hour afternoon commute period. Using the peak period model runs and the OCTA approved peak hour factors (i.e. AM = 0.3566 and PM = 0.2662), the one-hour peak hour intersection traffic volumes were determined. The model worksheets are contained in ***Appendix C***.

6.4 Future Traffic Volumes

6.4.1 *Year 2030 Traffic Volumes*

Figures 6-4 and ***6-5*** present the AM and PM peak hour cumulative traffic volumes (existing traffic + ambient growth + related projects) at forty-one (41) key study intersections for the Year 2030, respectively.

Figures 6-6 and ***6-7*** present the Year 2030 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project Phase 1, respectively.

6.4.2 *Year 2032 Traffic Volumes*

Figures 6-8 and ***6-9*** present the AM and PM peak hour cumulative traffic volumes (existing traffic + ambient growth + related projects) at forty-one (41) key study intersections for the Year 2032, respectively.

Figures 6-10 and ***6-11*** present the Year 2032 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project Phases 1 and 2, respectively.

6.4.3 *Year 2036 Traffic Volumes*

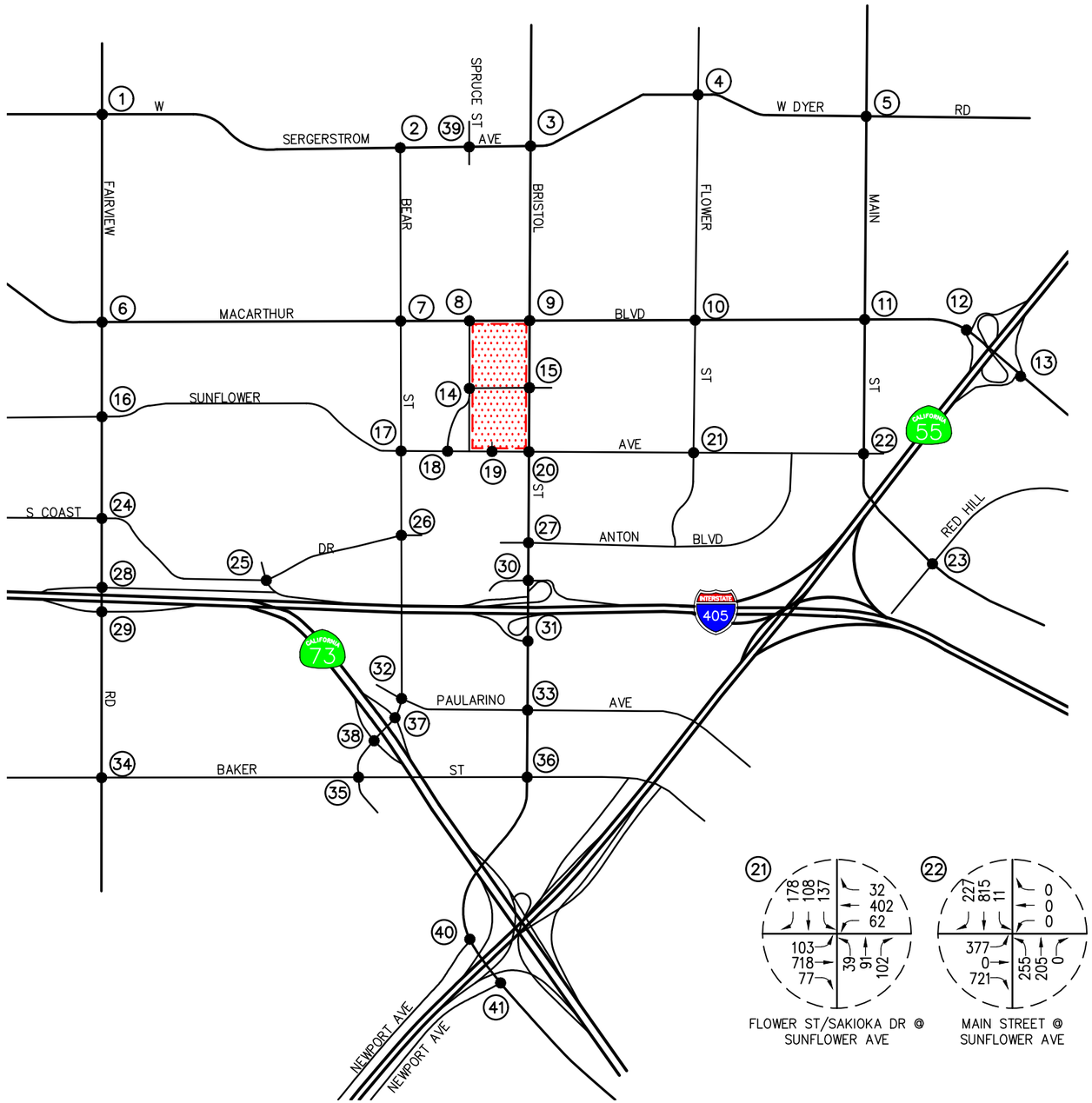
Figures 6-12 and ***6-13*** present the AM and PM peak hour cumulative traffic volumes (existing traffic + ambient growth + related projects) at forty-one (41) key study intersections for the Year 2036, respectively.

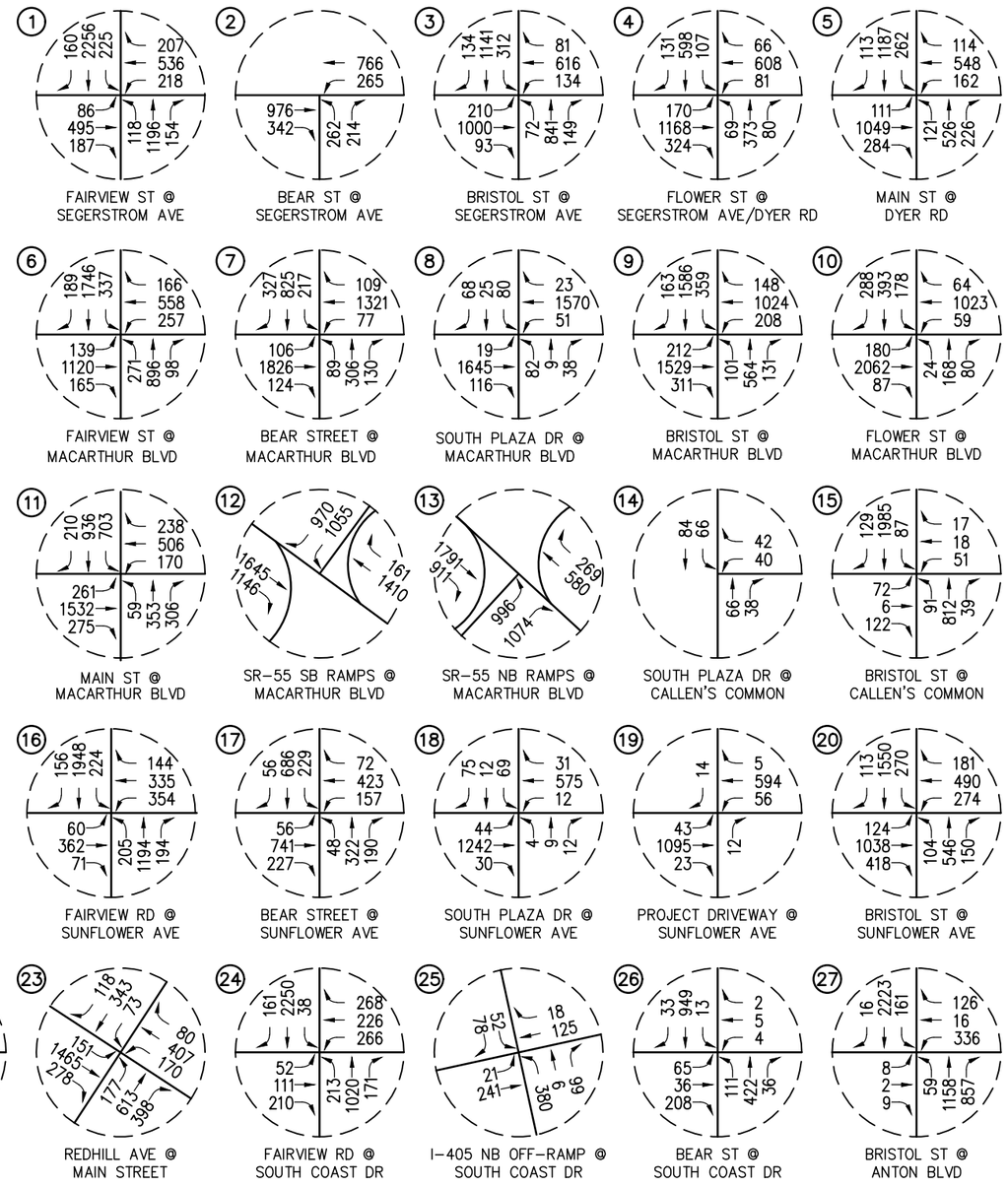
Figures 6-14 and ***6-15*** present the Year 2036 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project Phases 1, 2 and 3, respectively.

6.4.4 *Year 2045 Traffic Volumes*

Figures 6-16 and ***6-17*** present the Year 2045 AM and PM peak hour cumulative traffic volumes at the forty-one (41) key study intersections, respectively.

Figures 6-18 and ***6-19*** illustrate the Year 2045 forecast AM and PM peak hour traffic volumes, with the inclusion of the trips generated by the proposed Project Phases 1, 2 and 3, respectively.





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LINSCOTT LAW & GREENSPAN engineers

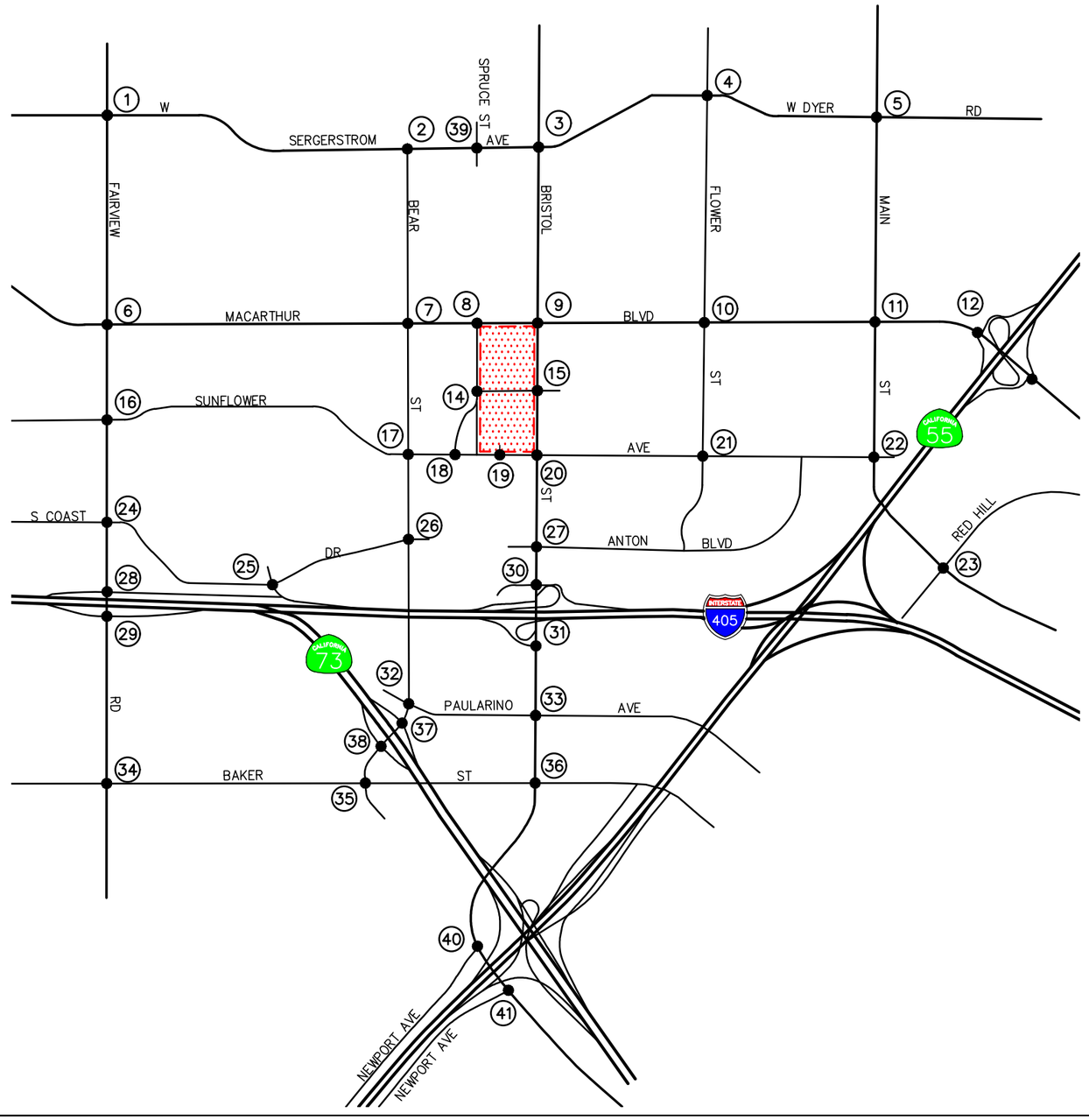
N NO SCALE

KEY
(#) = STUDY INTERSECTION
= PROJECT SITE

FIGURE 6-4A

YEAR 2030 CUMULATIVE AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA



28 FAIRVIEW RD @ I-405 NB RAMPS: 321, 2658, 849, 663, 971

29 FAIRVIEW RD @ I-405 SB RAMPS: 1792, 1669, 211, 354, 979, 1219

30 BRISTOL ST @ I-405 NB RAMPS: 9, 2313, 759, 80, 135, 37, 1687, 208

31 BRISTOL ST @ I-405 SB RAMPS: 1003, 1110, 668, 571, 132, 1229

32 BEAR ST @ PAULARINO DR: 5, 1063, 116, 59, 8, 170, 13, 25, 33, 19, 530, 193

33 BRISTOL ST @ PAULARINO DR: 32, 1406, 353, 168, 83, 113, 136, 233, 42, 44, 838, 86

34 FAIRVIEW RD @ BAKER ST: 244, 1067, 229, 127, 348, 364, 285, 663, 207, 244, 1269, 632

35 BEAR ST @ BAKER ST: 421, 263, 140, 111, 501, 32, 529, 1072, 255, 91, 140, 38

36 BRISTOL ST @ BAKER ST: 219, 853, 528, 298, 401, 222, 300, 845, 76, 41, 381, 219

37 SR-73 NB RAMPS @ BEAR ST: 105, 1014, 177, 368, 529, 191

38 SR-73 SB RAMPS @ BEAR ST: 133, 224, 659, 623, 403, 417

39 SPRUCE ST @ SEGERSTROM AVE: 173, 6, 32, 21, 869, 18, 80, 869, 36, 18, 5, 30

40 BRISTOL ST @ NEWPORT AVE NB: 502, 50, 973, 421, 4, 144, 315

41 BRISTOL ST @ NEWPORT AVE SB: 72, 64, 44, 882, 55, 658, 336, 63, 595

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N NO SCALE

KEY

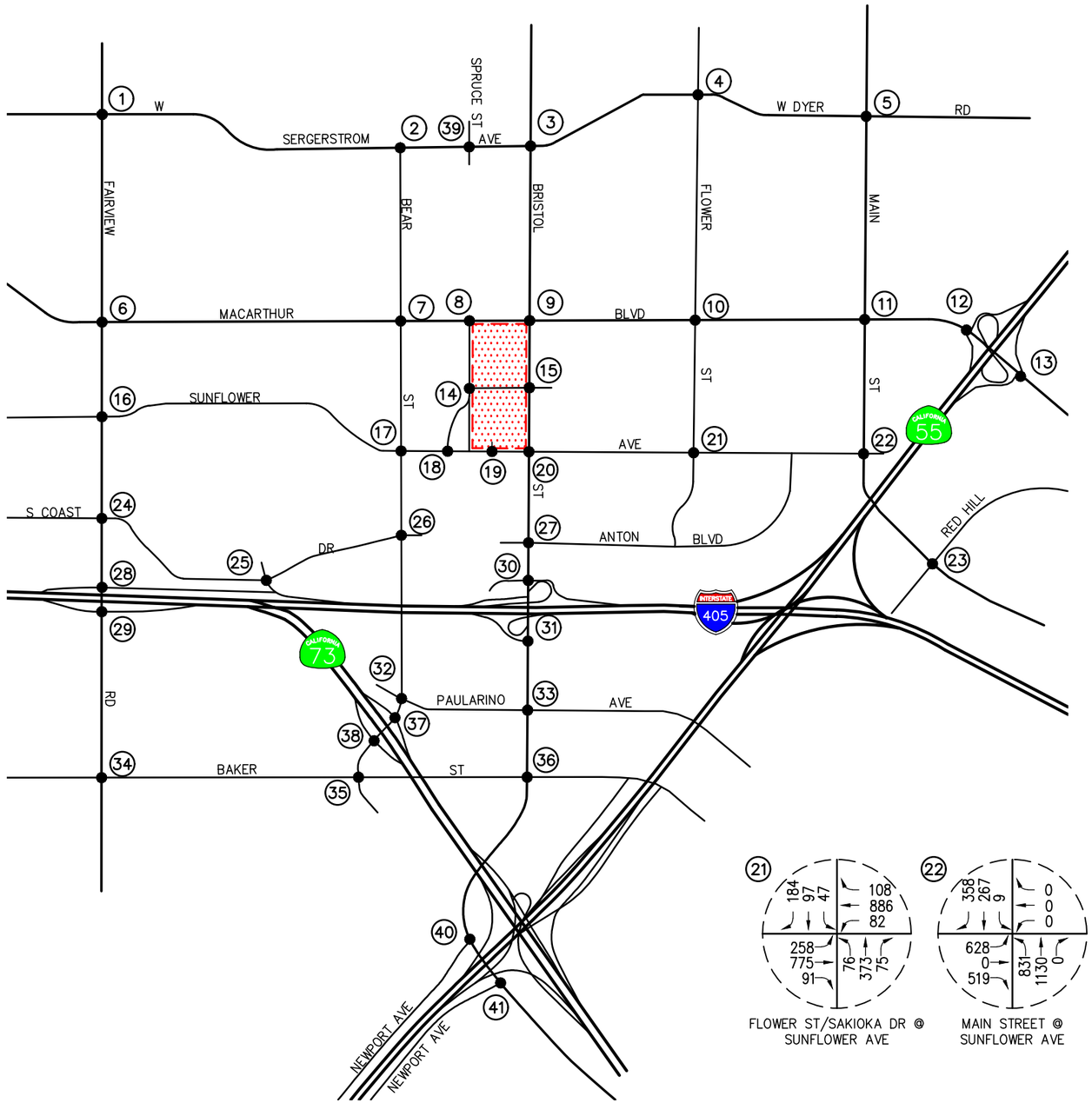
(#) = STUDY INTERSECTION

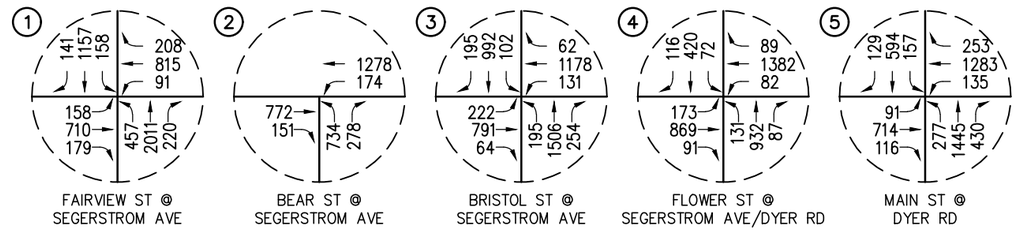
= PROJECT SITE

FIGURE 6-4B

YEAR 2030 AM CUMULATIVE PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

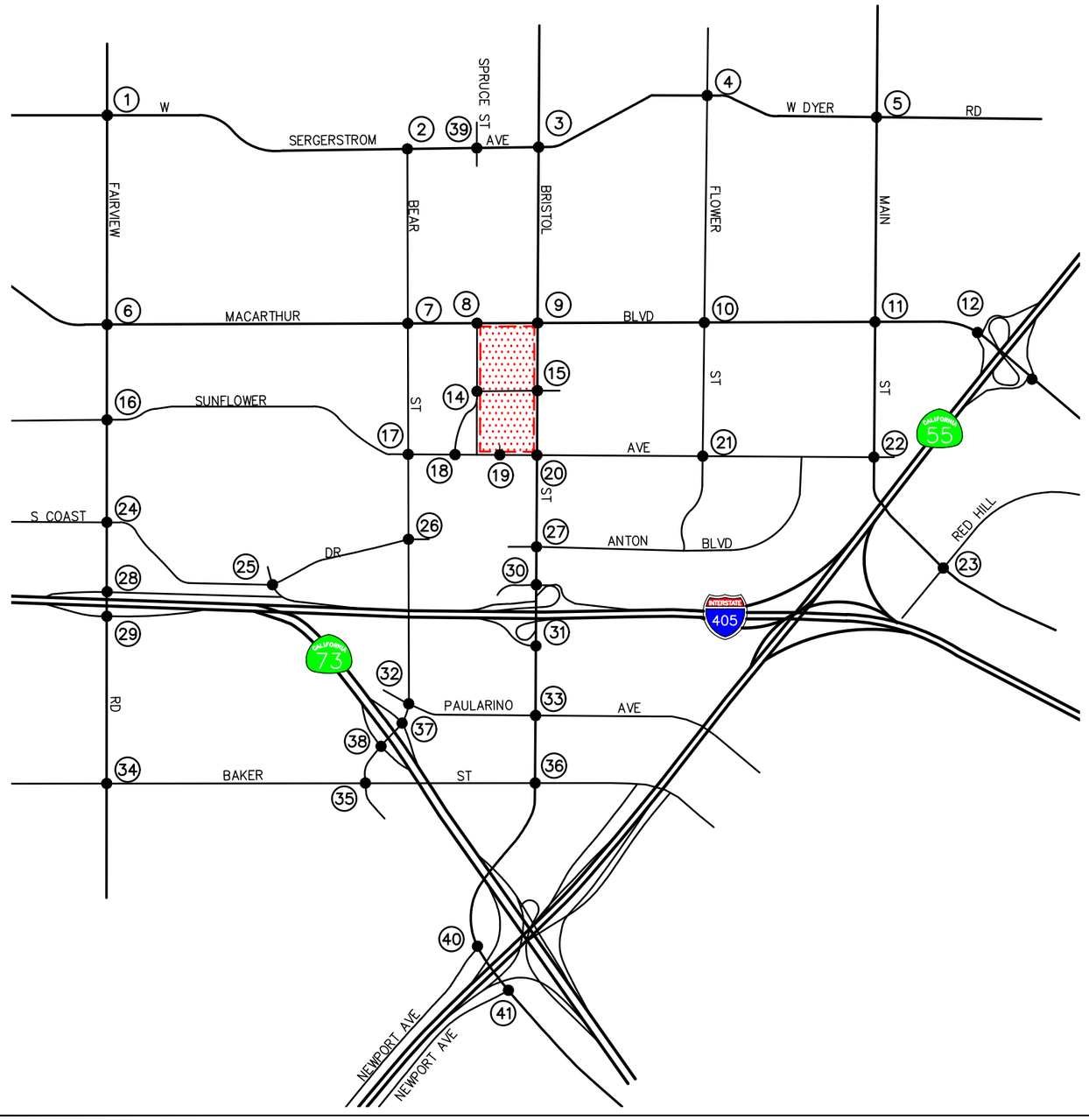
(#) = STUDY INTERSECTION

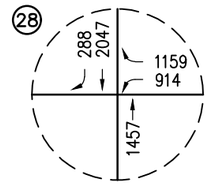
= PROJECT SITE

FIGURE 6-5A

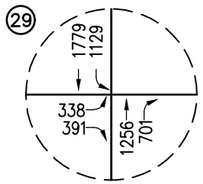
YEAR 2030 CUMULATIVE PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





FAIRVIEW RD @
I-405 NB RAMPS



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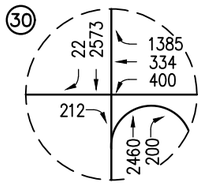
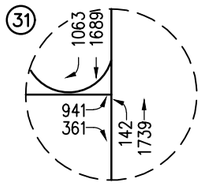
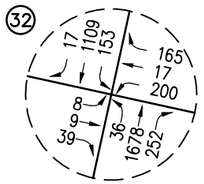
I-405 SB RAMPS



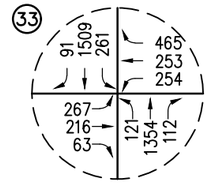
BRISTOL ST @
I-405 NB RAMPS



BRISTOL ST @
I-405 SB RAMPS



BEAR ST @
PAULARINO DR



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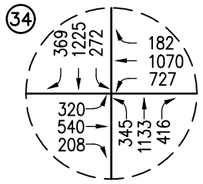

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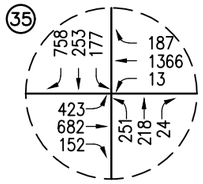
BAKER ST



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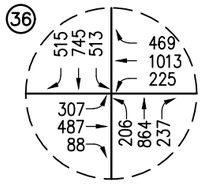
BAKER ST



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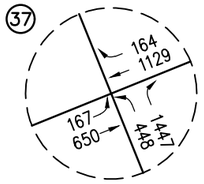
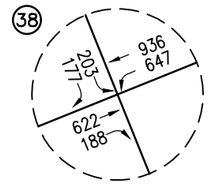
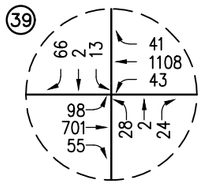


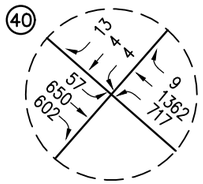
SR-73 NB RAMPS @
BEAR ST



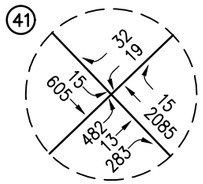
SR-73 SB RAMPS @
BEAR ST



SPRUCE ST @
SEGERSTROM AVE



BRISTOL ST @
NEWPORT AVE NB



BRISTOL ST @
NEWPORT AVE SB

LINSCOTT LAW & GREENSPAN engineers

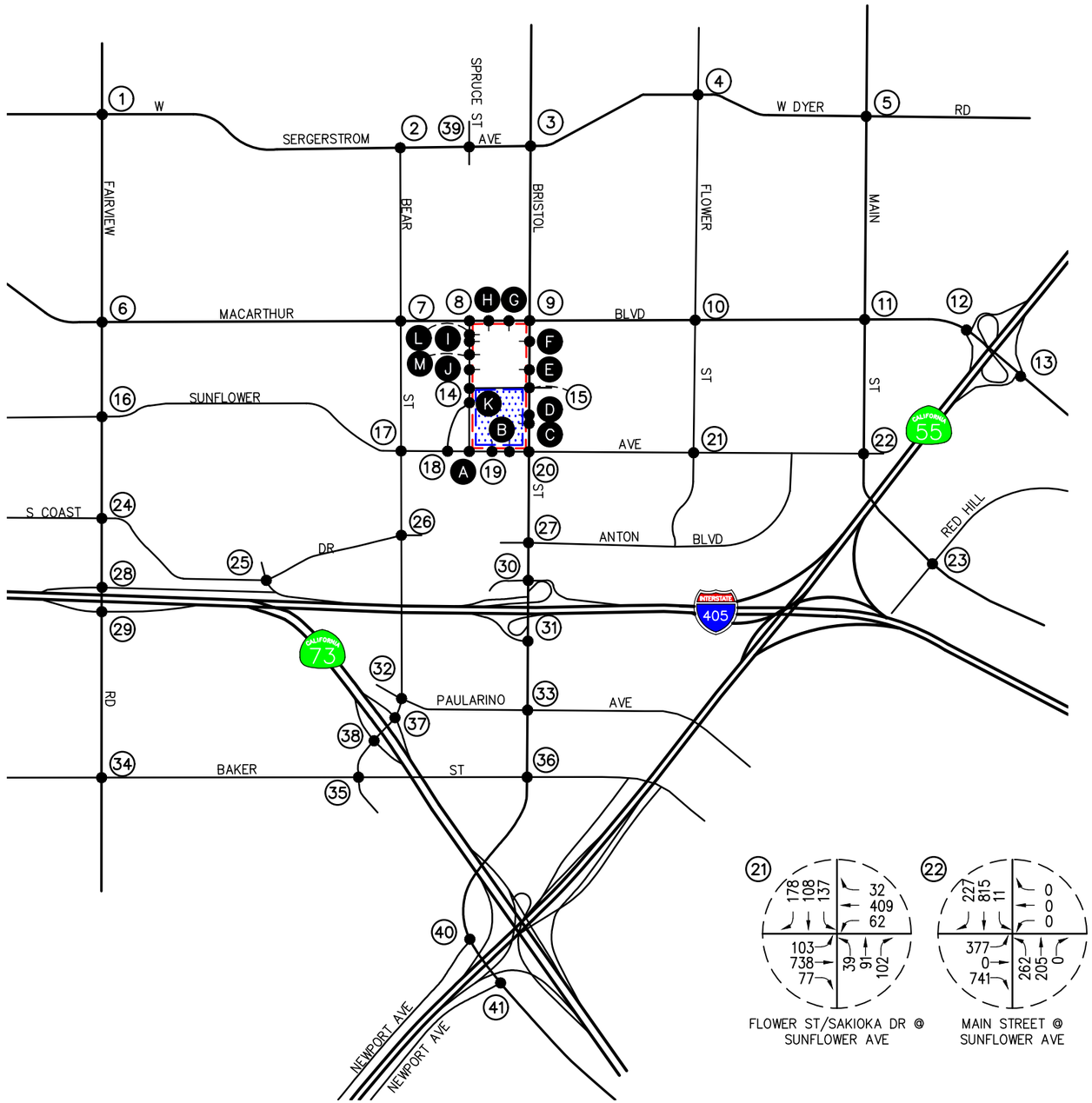
N NO SCALE

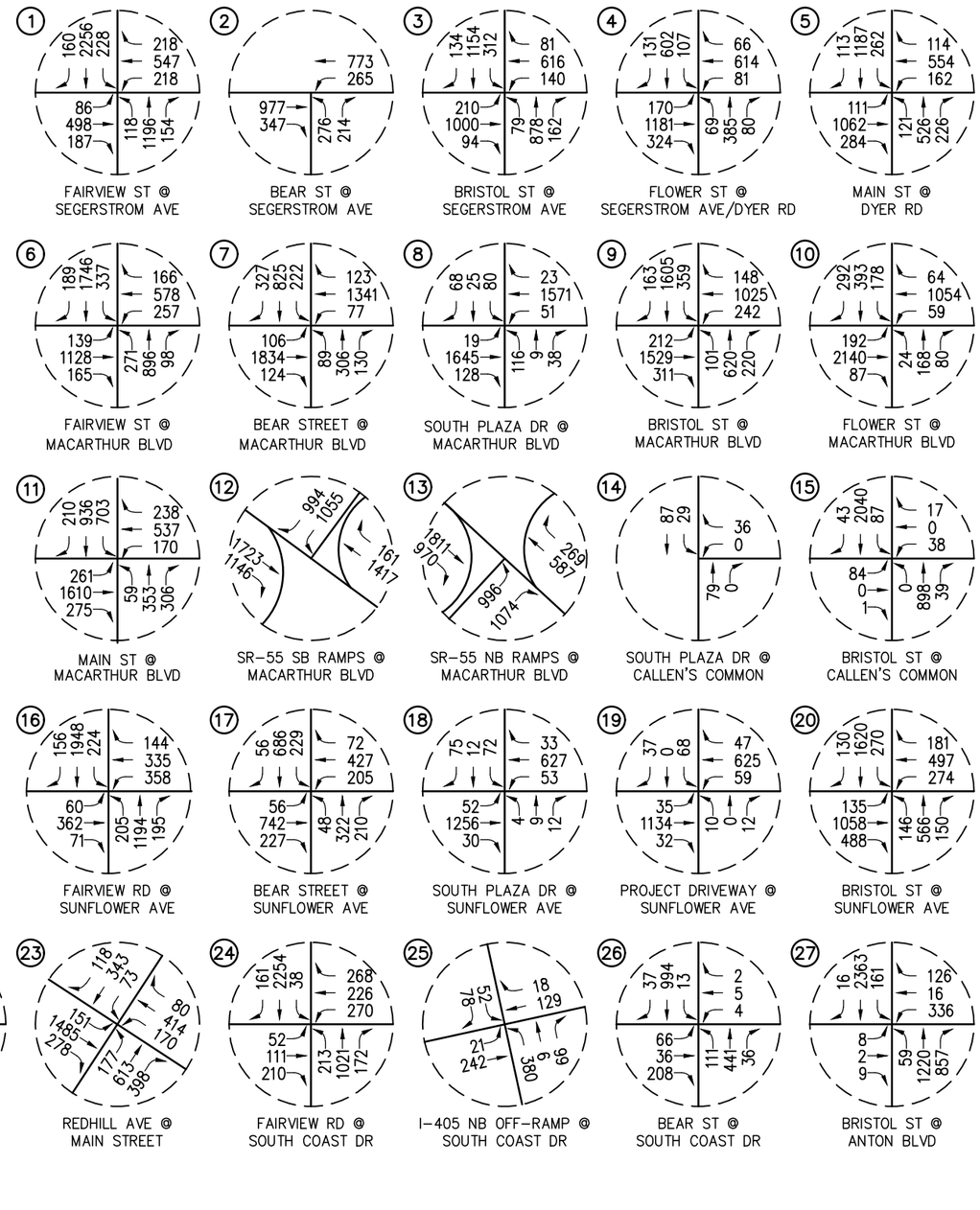
KEY
(#) = STUDY INTERSECTION
= PROJECT SITE

FIGURE 6-5B

YEAR 2030 CUMULATIVE PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

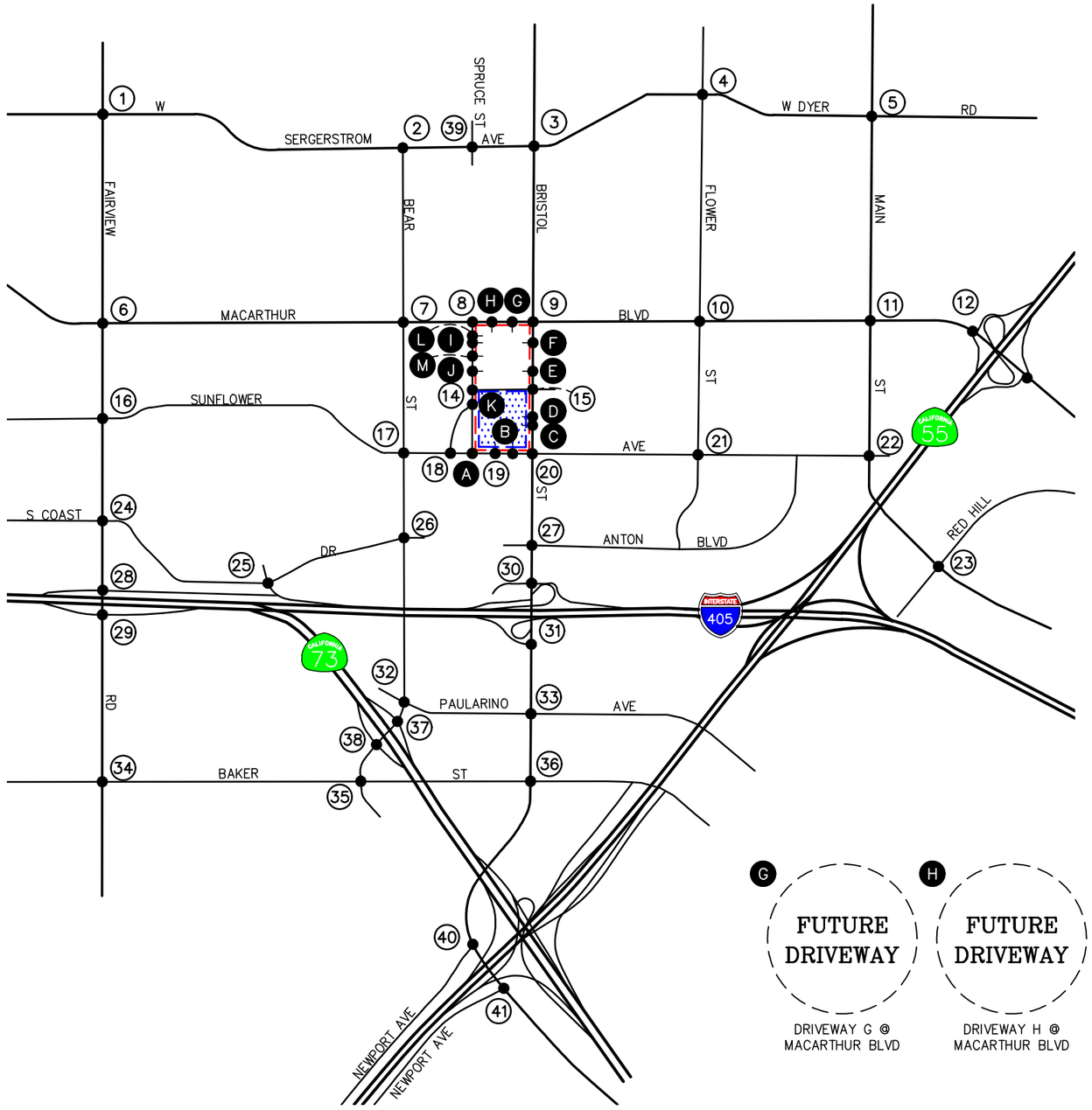
= PROJECT SITE

= PHASE 1

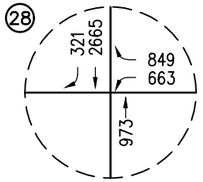
FIGURE 6-6A

YEAR 2030 CUMULATIVE PLUS PROJECT PHASE 1 AM PEAK HOUR TRAFFIC VOLUMES

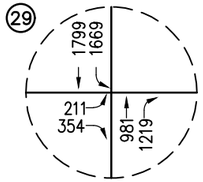
RELATED BRISTOL, SANTA ANA



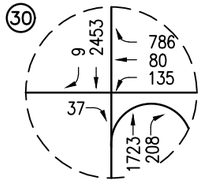
28 FAIRVIEW RD @ I-405 NB RAMPS



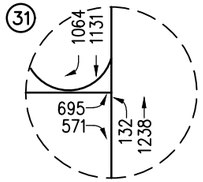
29 FAIRVIEW RD @ I-405 SB RAMPS



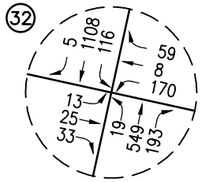
30 BRISTOL ST @ I-405 NB RAMPS



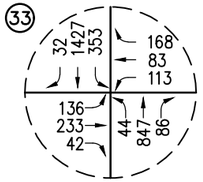
31 BRISTOL ST @ I-405 SB RAMPS



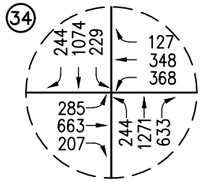
32 BEAR ST @ PAULARINO DR



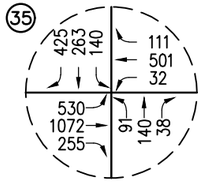
33 BRISTOL ST @ PAULARINO DR



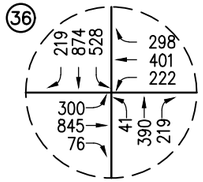
34 FAIRVIEW RD @ BAKER ST



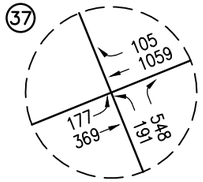
35 BEAR ST @ BAKER ST



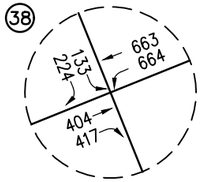
36 BRISTOL ST @ BAKER ST



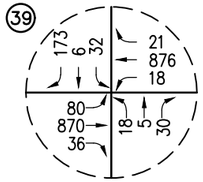
37 SR-73 NB RAMPS @ BEAR ST



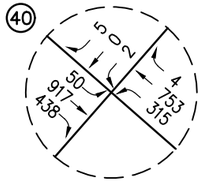
38 SR-73 SB RAMPS @ BEAR ST



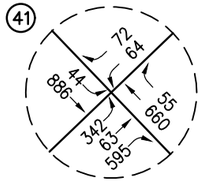
39 SPRUCE ST @ SEGERSTROM AVE



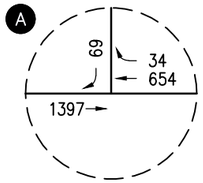
40 BRISTOL ST @ NEWPORT AVE NB



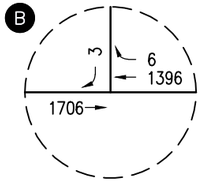
41 BRISTOL ST @ NEWPORT AVE SB



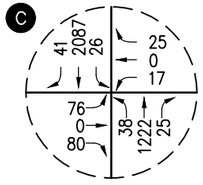
A DRIVEWAY A @ SUNFLOWER AVE



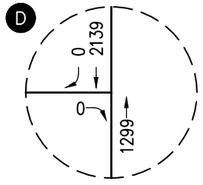
B DRIVEWAY B @ SUNFLOWER AVE



C BRISTOL ST @ DRIVEWAY C



D BRISTOL ST @ DRIVEWAY D



E BRISTOL ST @ DRIVEWAY E

FUTURE DRIVEWAY

F BRISTOL ST @ DRIVEWAY F

FUTURE DRIVEWAY

G DRIVEWAY G @ MACARTHUR BLVD

FUTURE DRIVEWAY

H DRIVEWAY H @ MACARTHUR BLVD

FUTURE DRIVEWAY

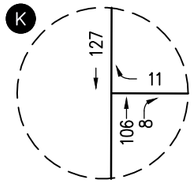
I SOUTH PLAZA DR @ DRIVEWAY I

FUTURE DRIVEWAY

J SOUTH PLAZA DR @ DRIVEWAY J

FUTURE DRIVEWAY

K SOUTH PLAZA DR @ DRIVEWAY K



L SOUTH PLAZA DR @ DRIVEWAY L

FUTURE DRIVEWAY

M SOUTH PLAZA DR @ DRIVEWAY M

FUTURE DRIVEWAY

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

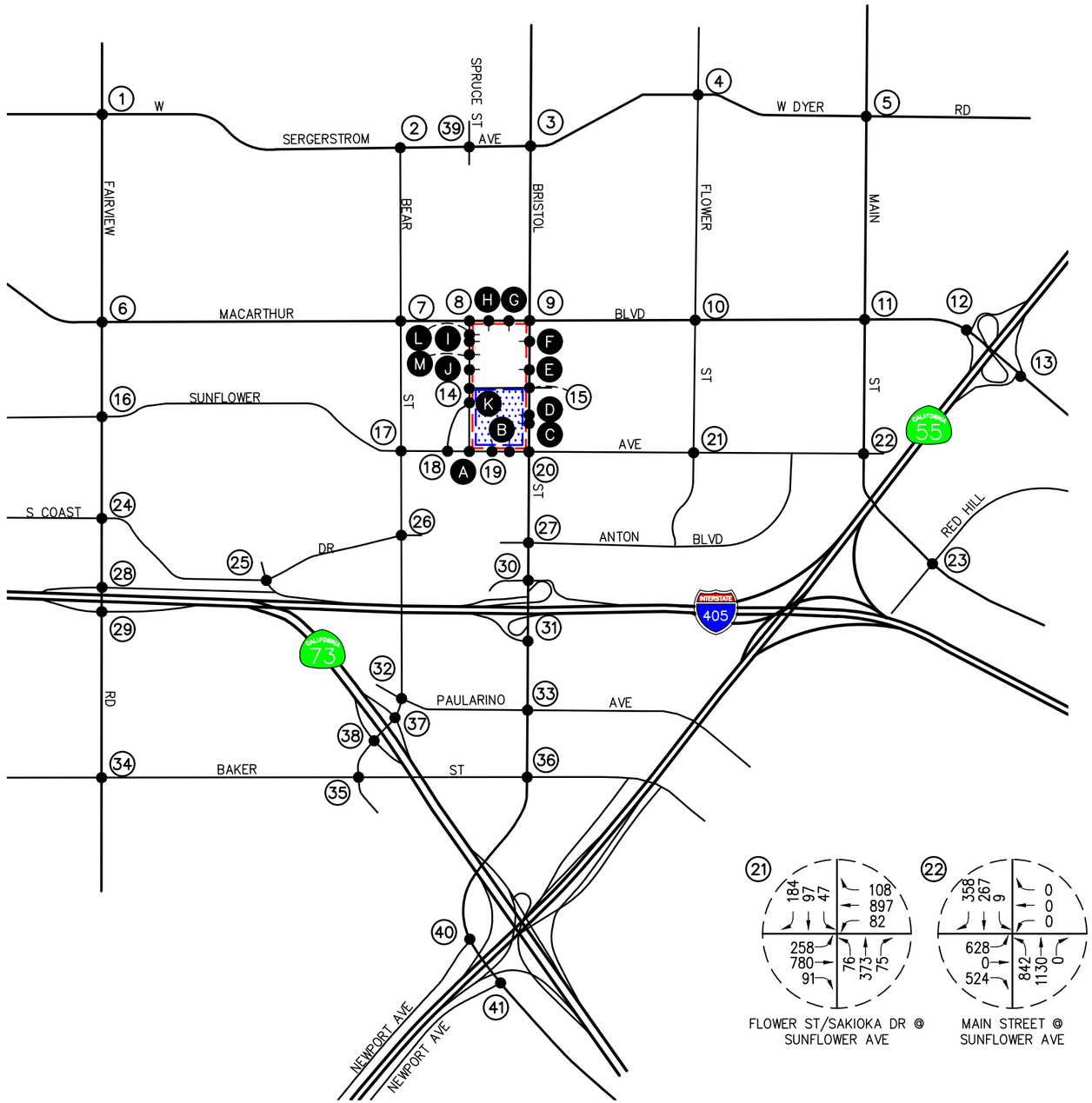
= PROJECT SITE

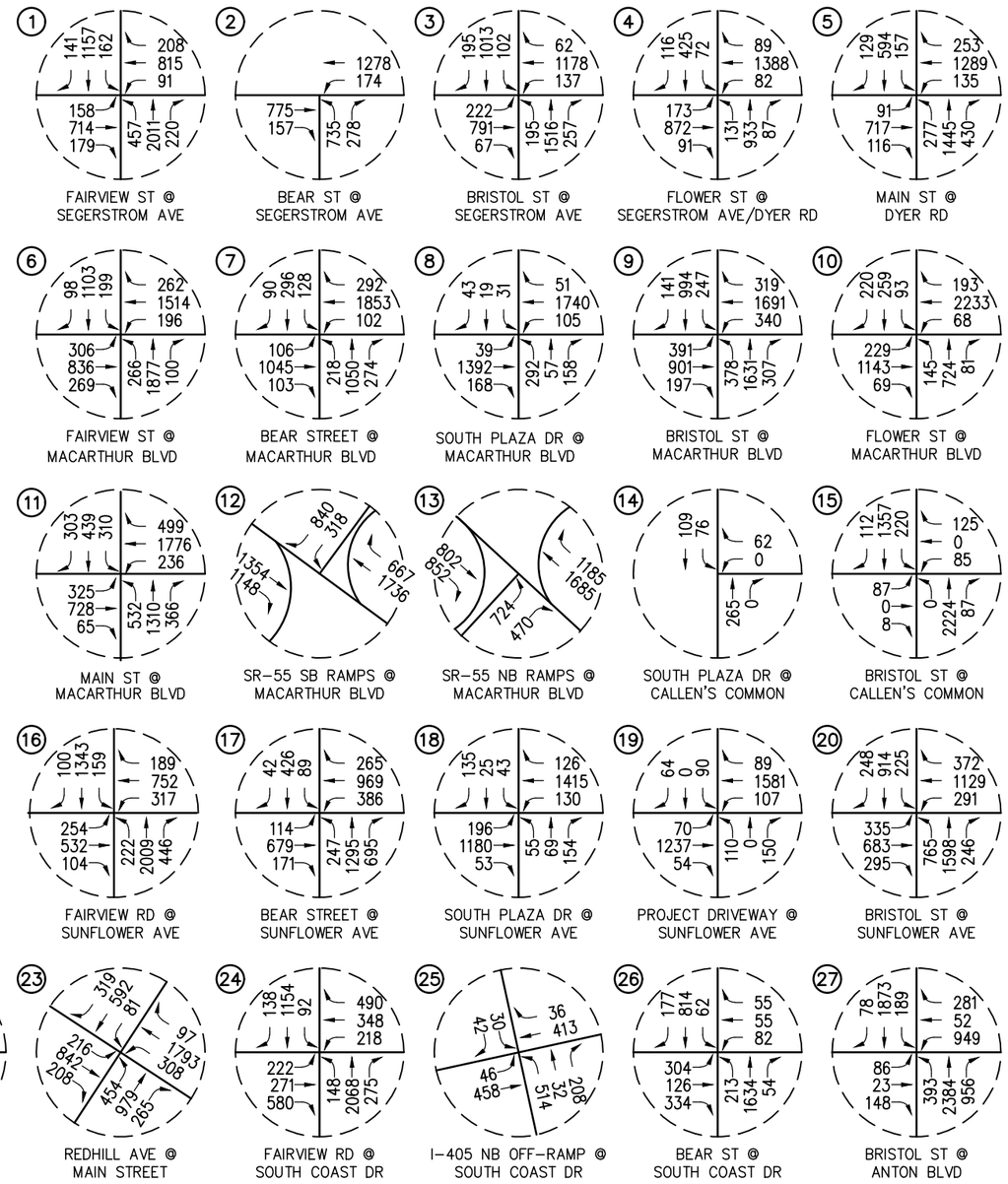
= PHASE 1

FIGURE 6-6B

YEAR 2030 CUMULATIVE PLUS PROJECT PHASE 1 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

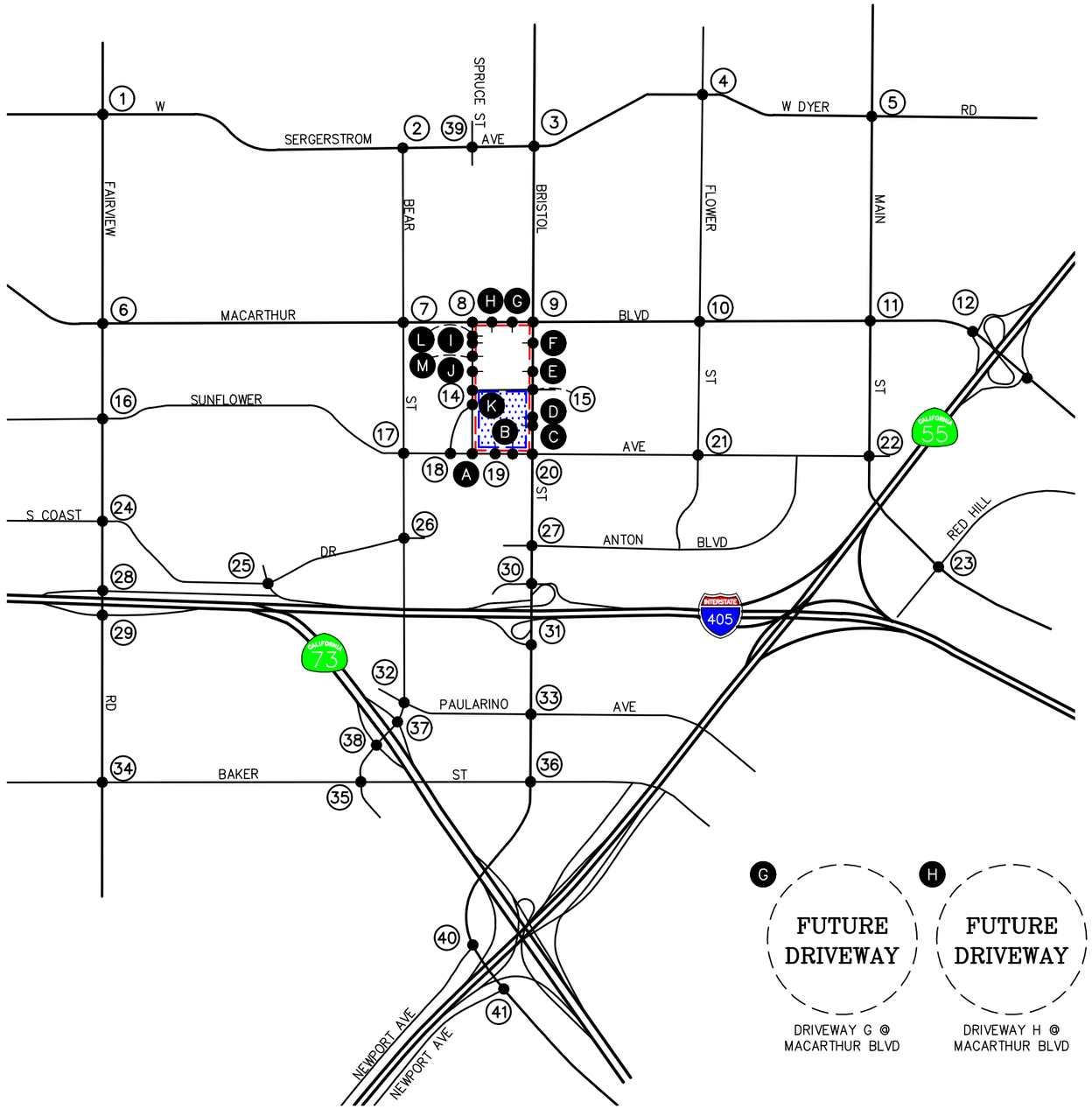
= PROJECT SITE

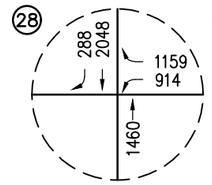
= PHASE 1

FIGURE 6-7A

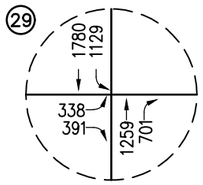
YEAR 2030 CUMULATIVE PLUS PROJECT PHASE 1 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA

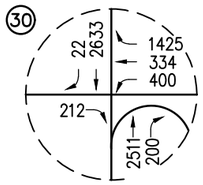




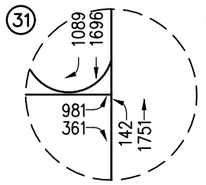
FAIRVIEW RD @
I-405 NB RAMPS



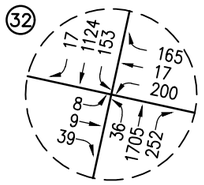
FAIRVIEW RD @
I-405 SB RAMPS



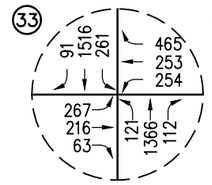
BRISTOL ST @
I-405 NB RAMPS



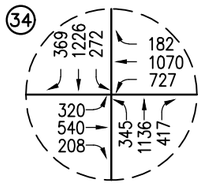
BRISTOL ST @
I-405 SB RAMPS



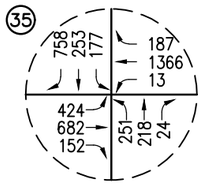
BEAR ST @
PAULARINO DR



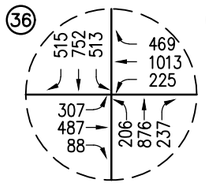
BRISTOL ST @
PAULARINO DR



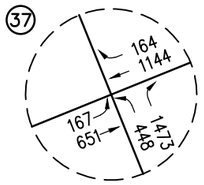
FAIRVIEW RD @
BAKER ST



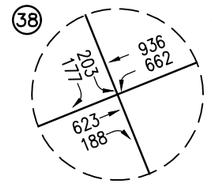
BEAR ST @
BAKER ST



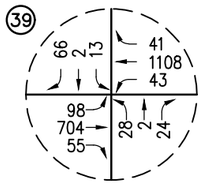
BRISTOL ST @
BAKER ST



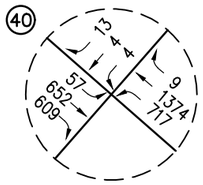
SR-73 NB RAMPS @
BEAR ST



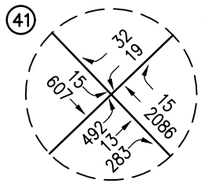
SR-73 SB RAMPS @
BEAR ST



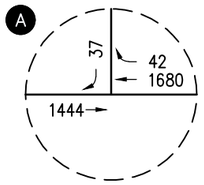
SPRUCE ST @
SEGERSTROM AVE



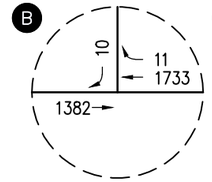
BRISTOL ST @
NEWPORT AVE NB



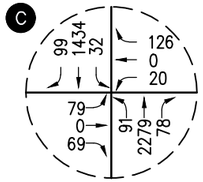
BRISTOL ST @
NEWPORT AVE SB



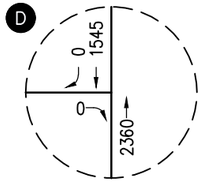
DRIVEWAY A @
SUNFLOWER AVE



DRIVEWAY B @
SUNFLOWER AVE



BRISTOL ST @
DRIVEWAY C



BRISTOL ST @
DRIVEWAY D

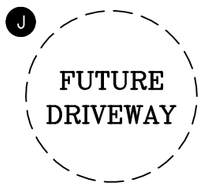
BRISTOL ST @
DRIVEWAY E

BRISTOL ST @
DRIVEWAY F

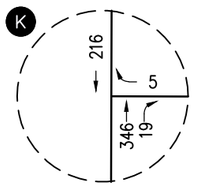
DRIVEWAY G @
MACARTHUR BLVD

DRIVEWAY H @
MACARTHUR BLVD

SOUTH PLAZA DR @
DRIVEWAY I

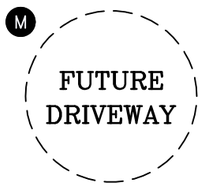


SOUTH PLAZA DR @
DRIVEWAY J



SOUTH PLAZA DR @
DRIVEWAY K

SOUTH PLAZA DR @
DRIVEWAY L



SOUTH PLAZA DR @
DRIVEWAY M

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

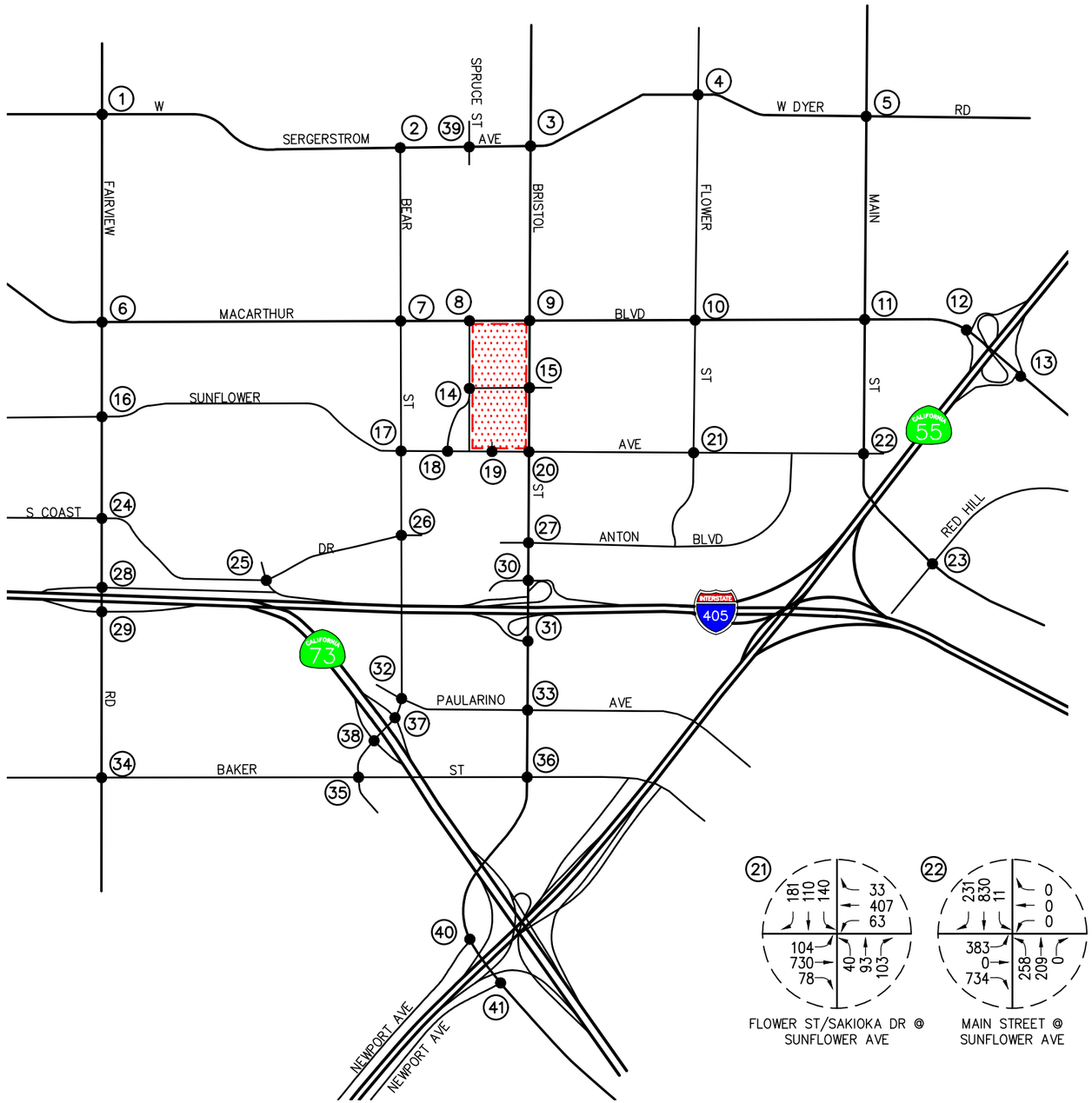
= PROJECT SITE

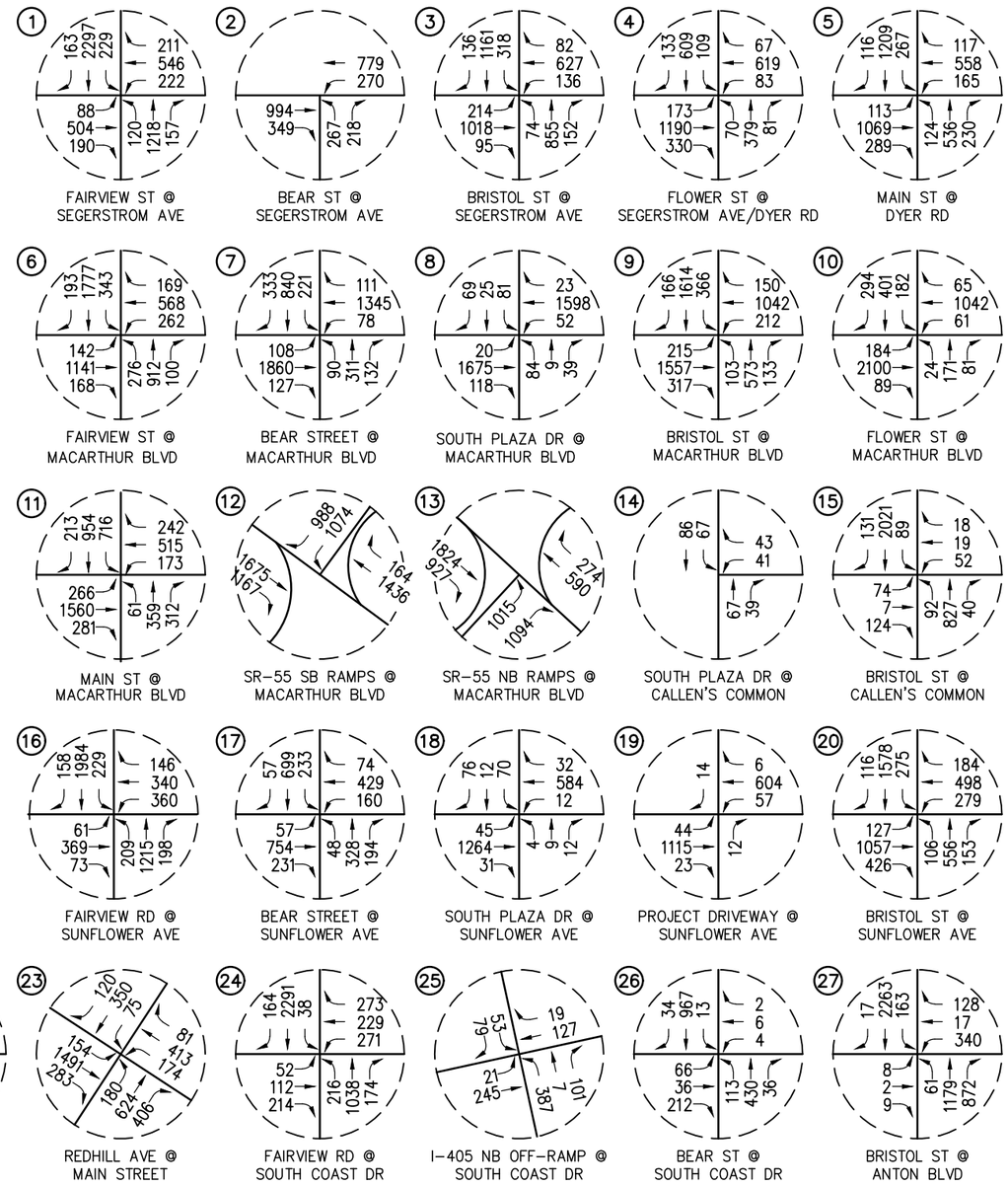
= PHASE 1

FIGURE 6-7B

YEAR 2030 CUMULATIVE PLUS PROJECT PHASE 1 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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KEY

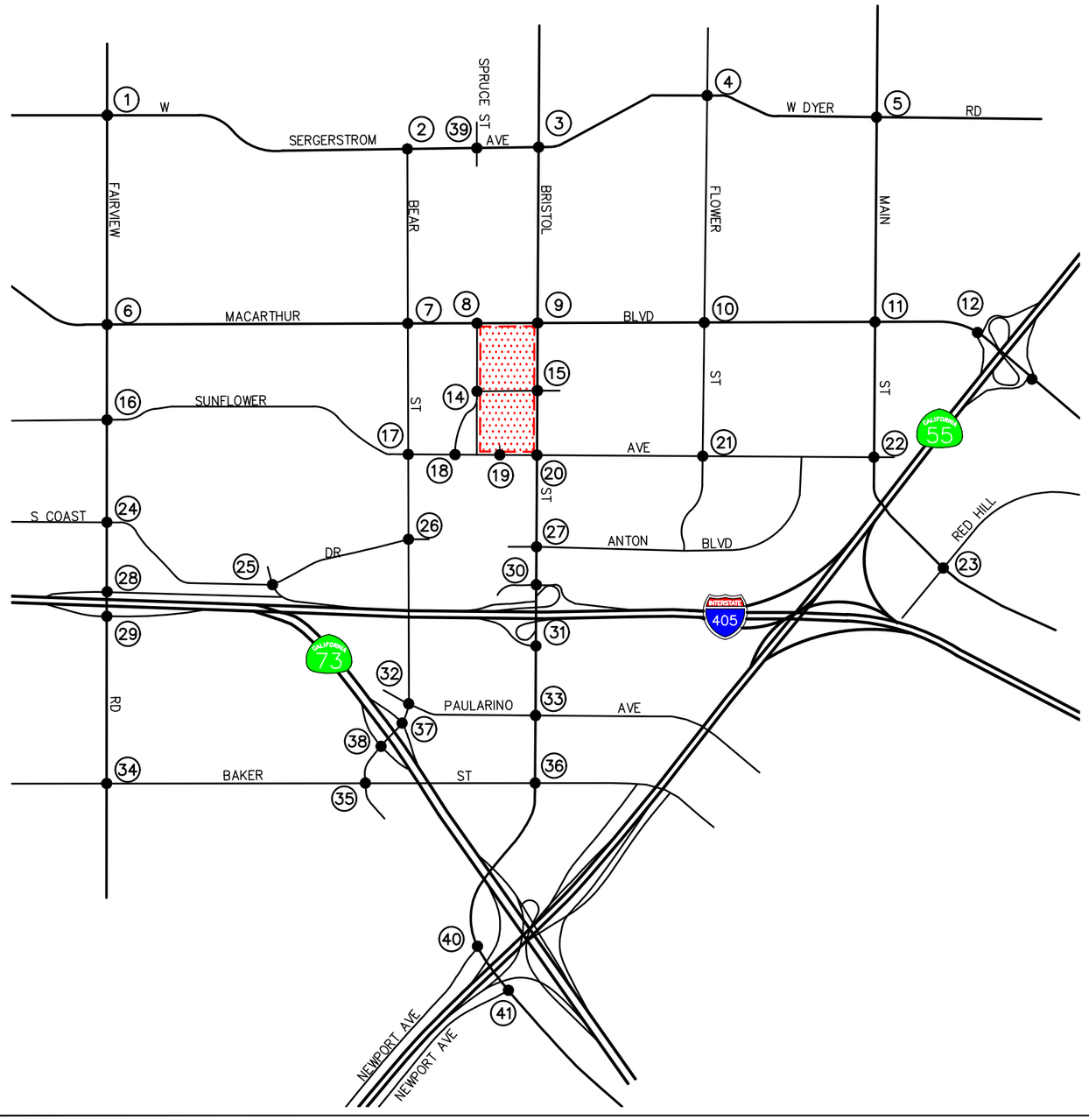
(#) = STUDY INTERSECTION

= PROJECT SITE

FIGURE 6-8A

YEAR 2032 CUMULATIVE AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA



28 FAIRVIEW RD @ I-405 NB RAMPS: 327, 2707, 865, 675, 988

29 FAIRVIEW RD @ I-405 SB RAMPS: 1825, 1699, 215, 361, 996, 1242

30 BRISTOL ST @ I-405 NB RAMPS: 9, 2353, 772, 81, 137, 37, 1717, 212

31 BRISTOL ST @ I-405 SB RAMPS: 1021, 1130, 680, 582, 134, 1251

32 BEAR ST @ PAULARINO DR: 6, 1083, 118, 61, 8, 173, 13, 25, 34, 20, 539, 197

33 BRISTOL ST @ PAULARINO DR: 33, 1431, 360, 172, 85, 116, 139, 238, 43, 45, 853, 88

34 FAIRVIEW RD @ BAKER ST: 249, 1086, 233, 129, 354, 371, 290, 675, 211, 249, 1292, 644

35 BEAR ST @ BAKER ST: 429, 268, 143, 113, 511, 33, 538, 1092, 260, 93, 142, 39

36 BRISTOL ST @ BAKER ST: 223, 868, 538, 304, 409, 227, 306, 860, 77, 42, 388, 223

37 SR-73 NB RAMPS @ BEAR ST: 107, 1033, 180, 374, 595, 195

38 SR-73 SB RAMPS @ BEAR ST: 135, 229, 671, 635, 410, 425

39 SPRUCE ST @ SEGERSTROM AVE: 176, 7, 33, 21, 885, 19, 81, 885, 36, 19, 6, 31

40 BRISTOL ST @ NEWPORT AVE NB: 602, 51, 930, 428, 4, 157, 321

41 BRISTOL ST @ NEWPORT AVE SB: 74, 65, 45, 898, 56, 670, 342, 64, 606

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

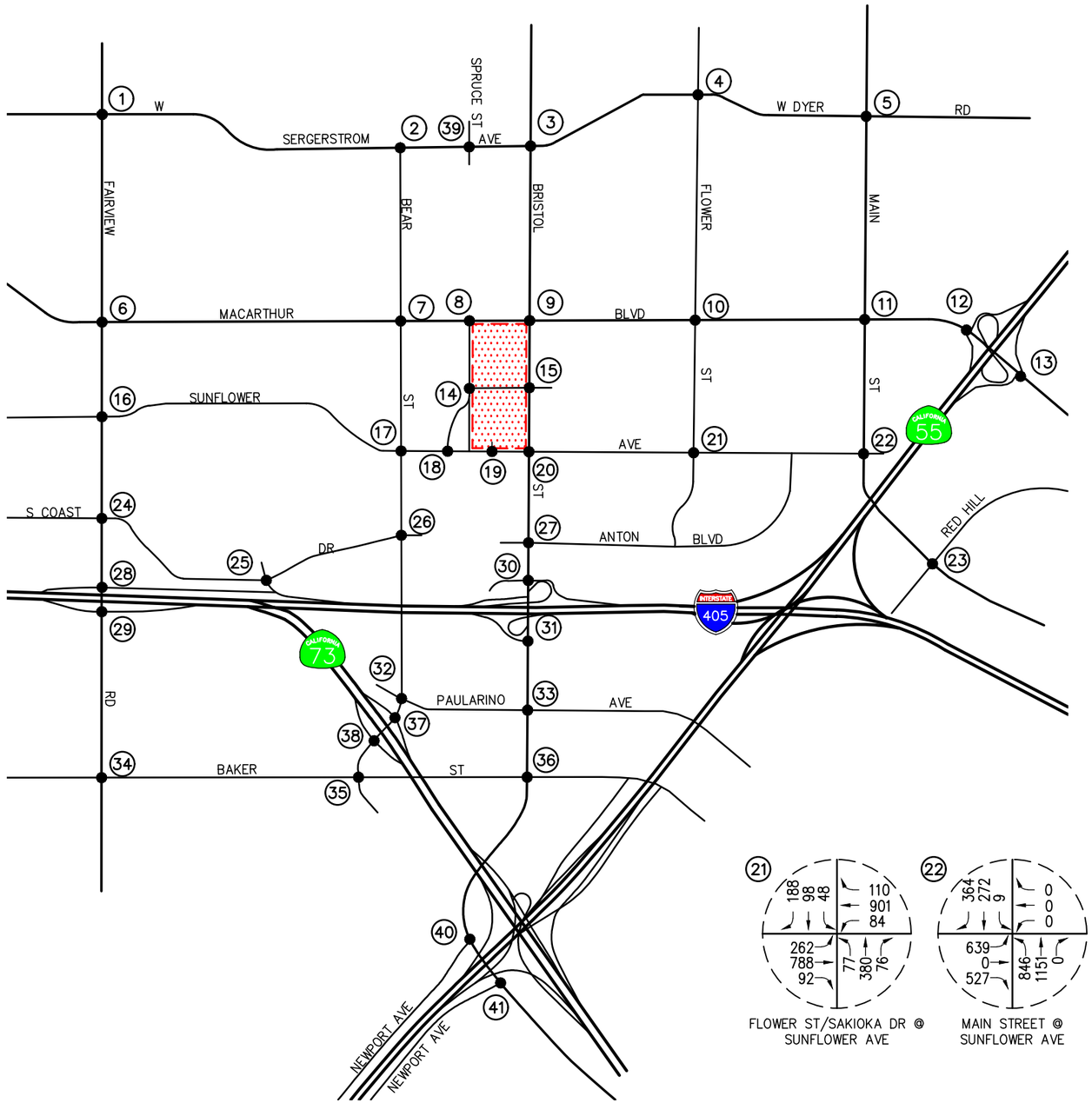
(#) = STUDY INTERSECTION

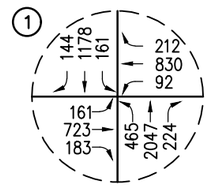
= PROJECT SITE

FIGURE 6-8B

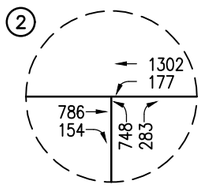
YEAR 2032 CUMULATIVE AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA

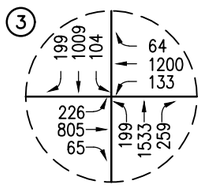




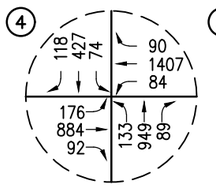
FAIRVIEW ST @
SEGERSTROM AVE



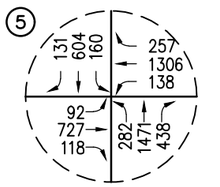
BEAR ST @
SEGERSTROM AVE



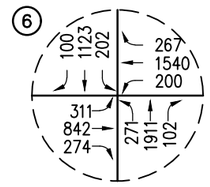
BRISTOL ST @
SEGERSTROM AVE



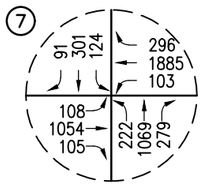
FLOWER ST @
SEGERSTROM AVE/DYER RD



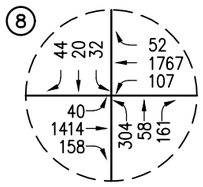
MAIN ST @
DYER RD



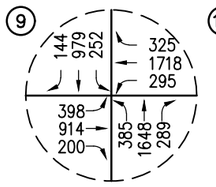
FAIRVIEW ST @
MACARTHUR BLVD



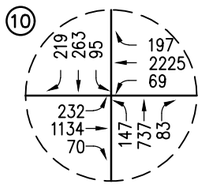
BEAR STREET @
MACARTHUR BLVD



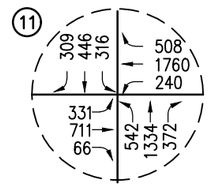
SOUTH PLAZA DR @
MACARTHUR BLVD



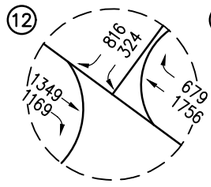
BRISTOL ST @
MACARTHUR BLVD



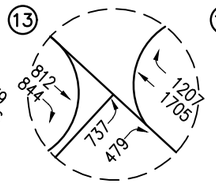
FLOWER ST @
MACARTHUR BLVD



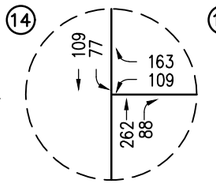
MAIN ST @
MACARTHUR BLVD



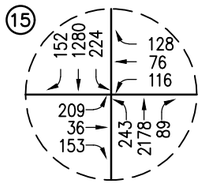
SR-55 SB RAMPS @
MACARTHUR BLVD



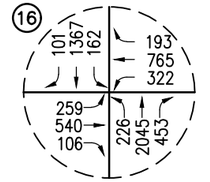
SR-55 NB RAMPS @
MACARTHUR BLVD



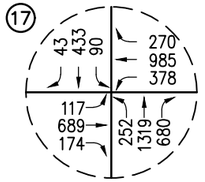
SOUTH PLAZA DR @
CALLEN'S COMMON



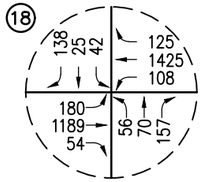
BRISTOL ST @
CALLEN'S COMMON



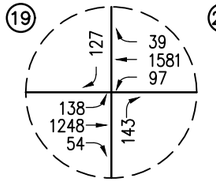
FAIRVIEW RD @
SUNFLOWER AVE



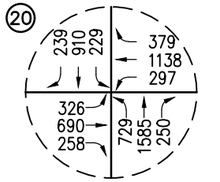
BEAR STREET @
SUNFLOWER AVE



SOUTH PLAZA DR @
SUNFLOWER AVE

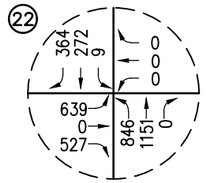


PROJECT DRIVEWAY @
SUNFLOWER AVE

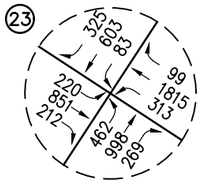


BRISTOL ST @
SUNFLOWER AVE

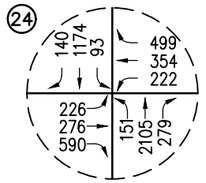
FLOWER ST/SAKIOKA DR @
SUNFLOWER AVE



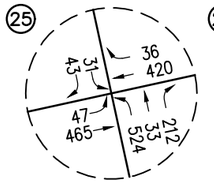
MAIN STREET @
SUNFLOWER AVE



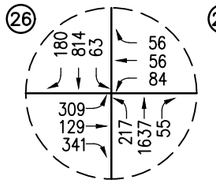
REDHILL AVE @
MAIN STREET



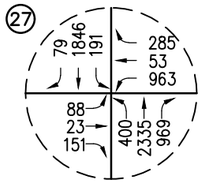
FAIRVIEW RD @
SOUTH COAST DR



I-405 NB OFF-RAMP @
SOUTH COAST DR



BEAR ST @
SOUTH COAST DR



BRISTOL ST @
ANTON BLVD

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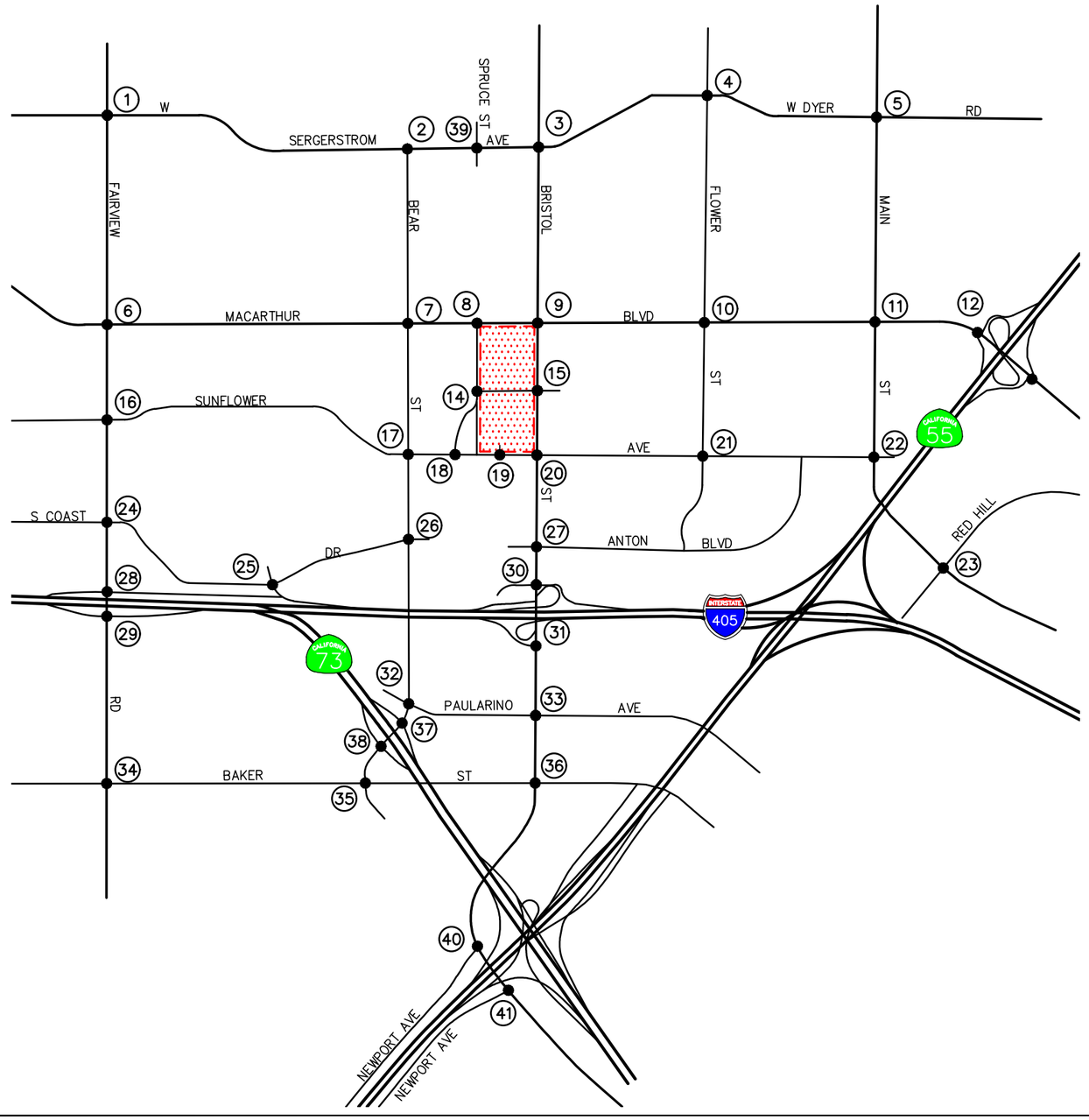
(#) = STUDY INTERSECTION

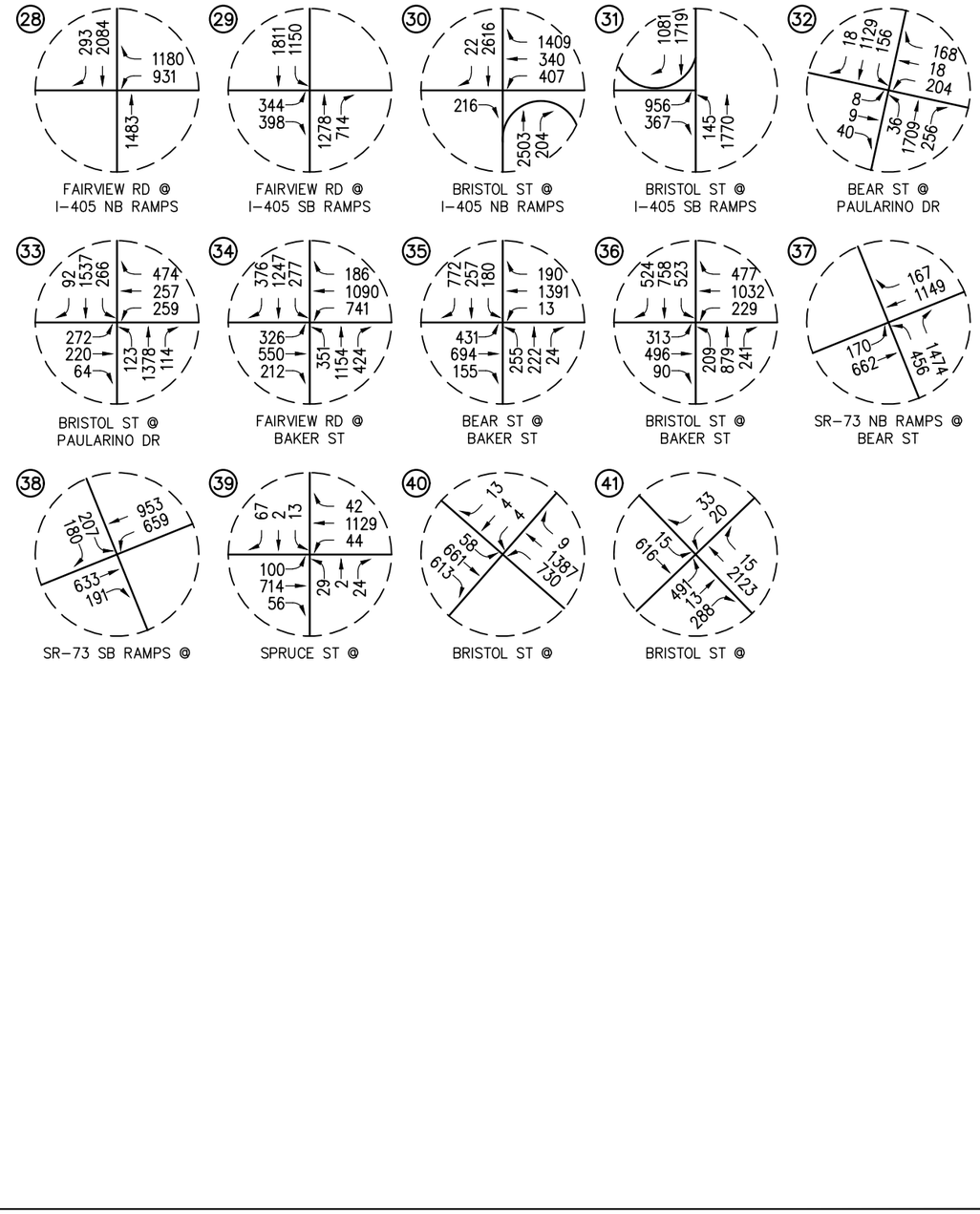
= PROJECT SITE

FIGURE 6-9A

YEAR 2032 CUMULATIVE PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

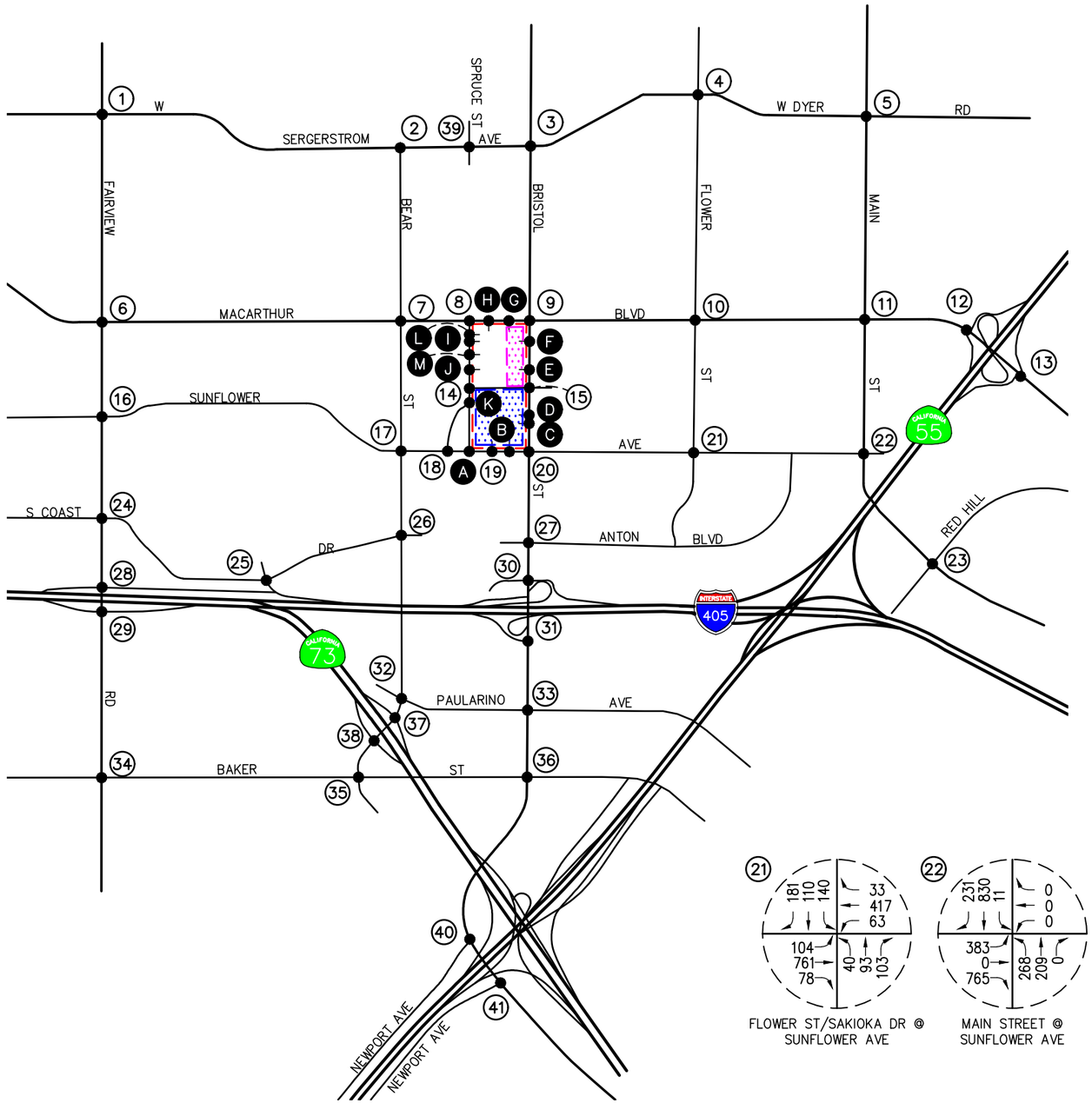
(#) = STUDY INTERSECTION

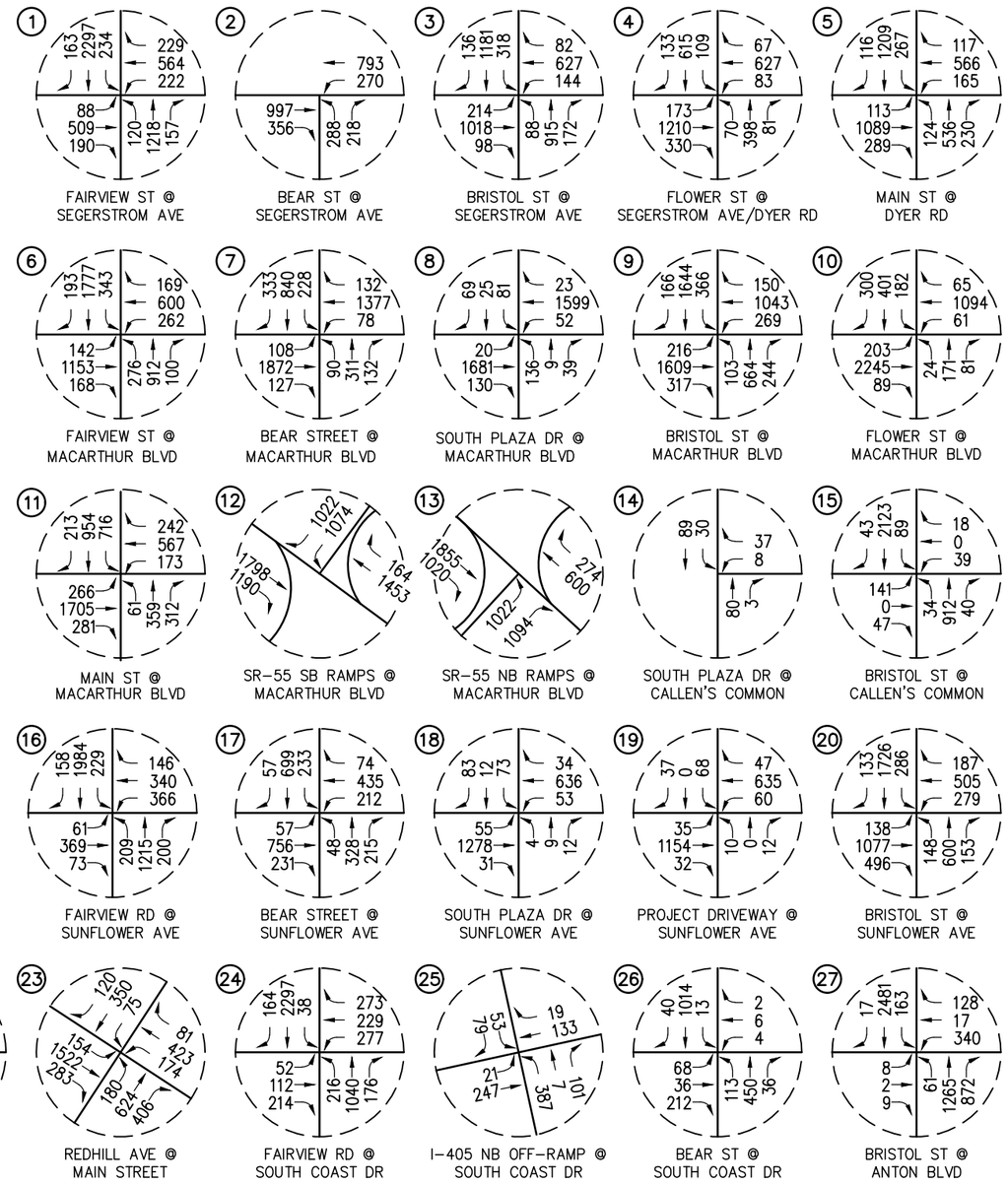
= PROJECT SITE

FIGURE 6-9B

YEAR 2032 CUMULATIVE PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PHASE 2

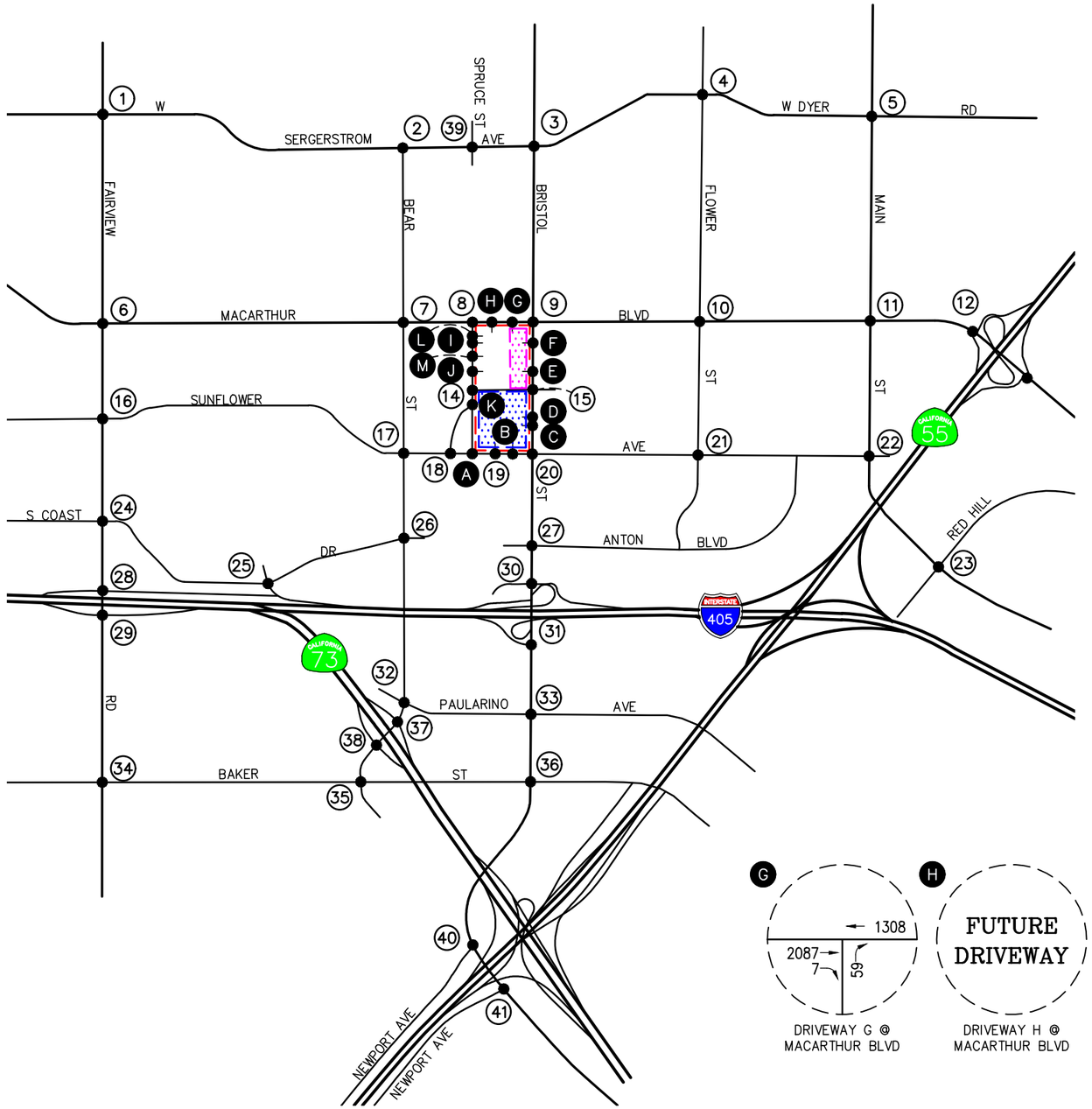
= PROJECT SITE

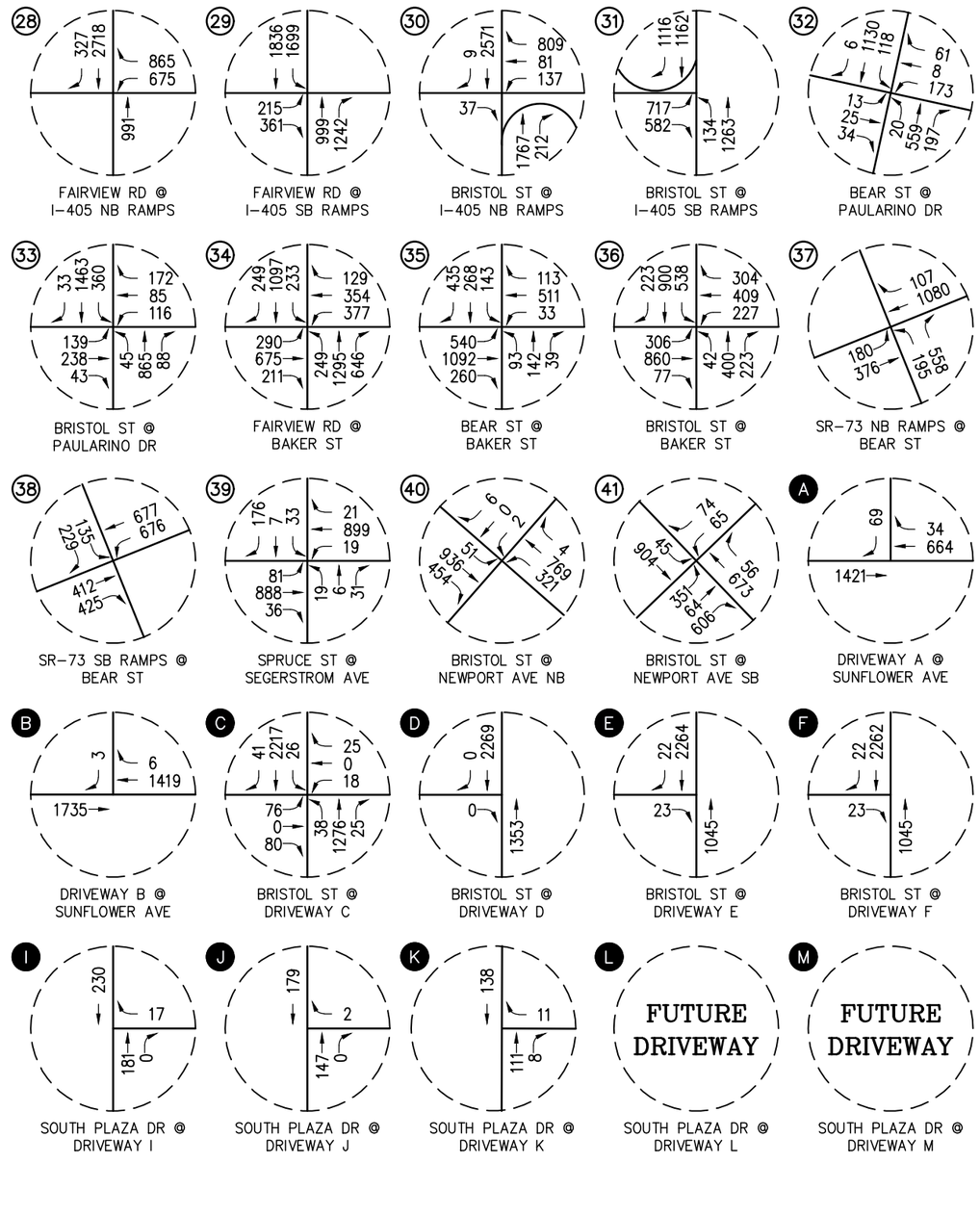
= PHASE 1

FIGURE 6-10A

YEAR 2032 CUMULATIVE PLUS PROJECT PHASES 1 AND 2 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

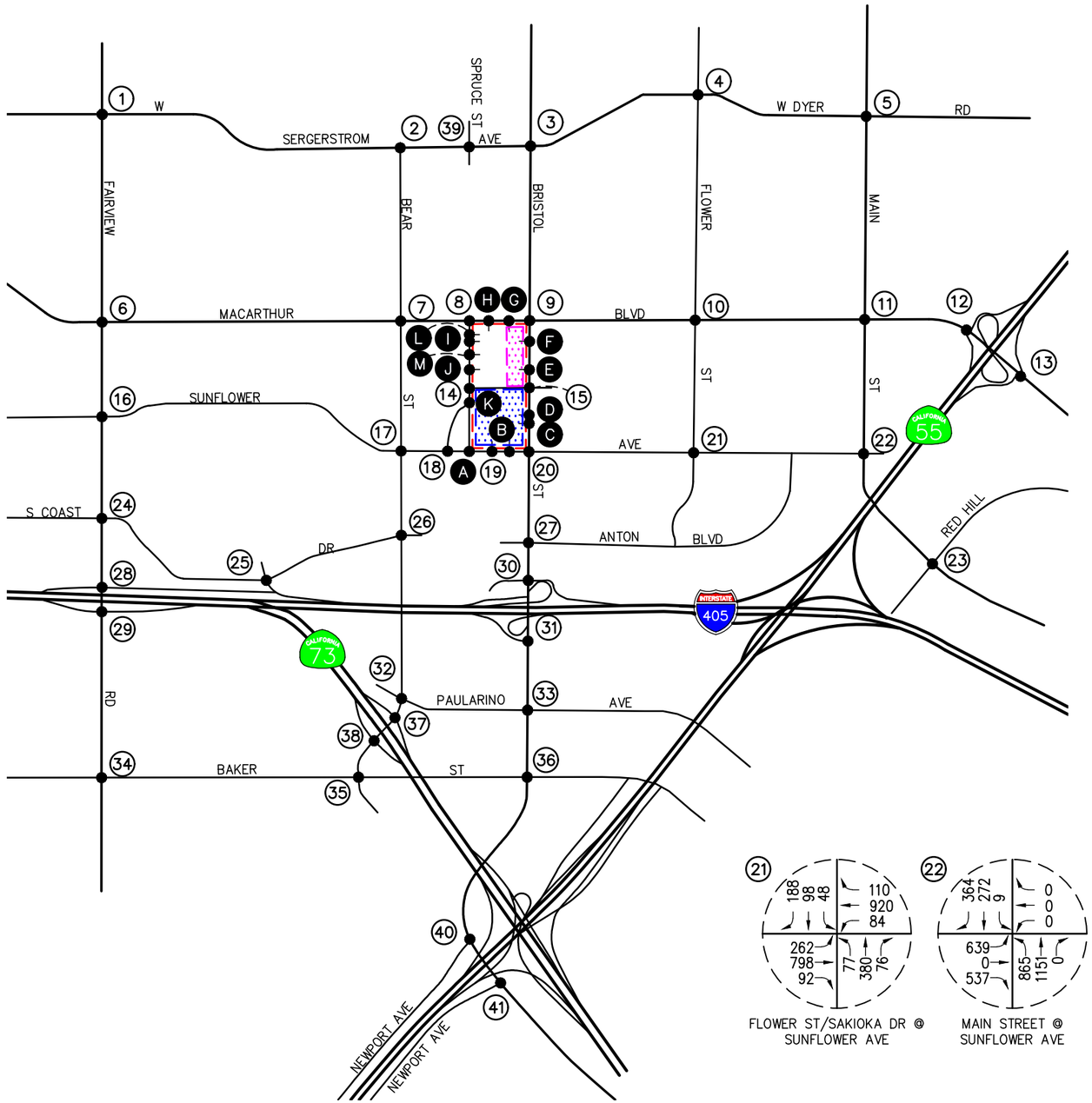
= PHASE 1

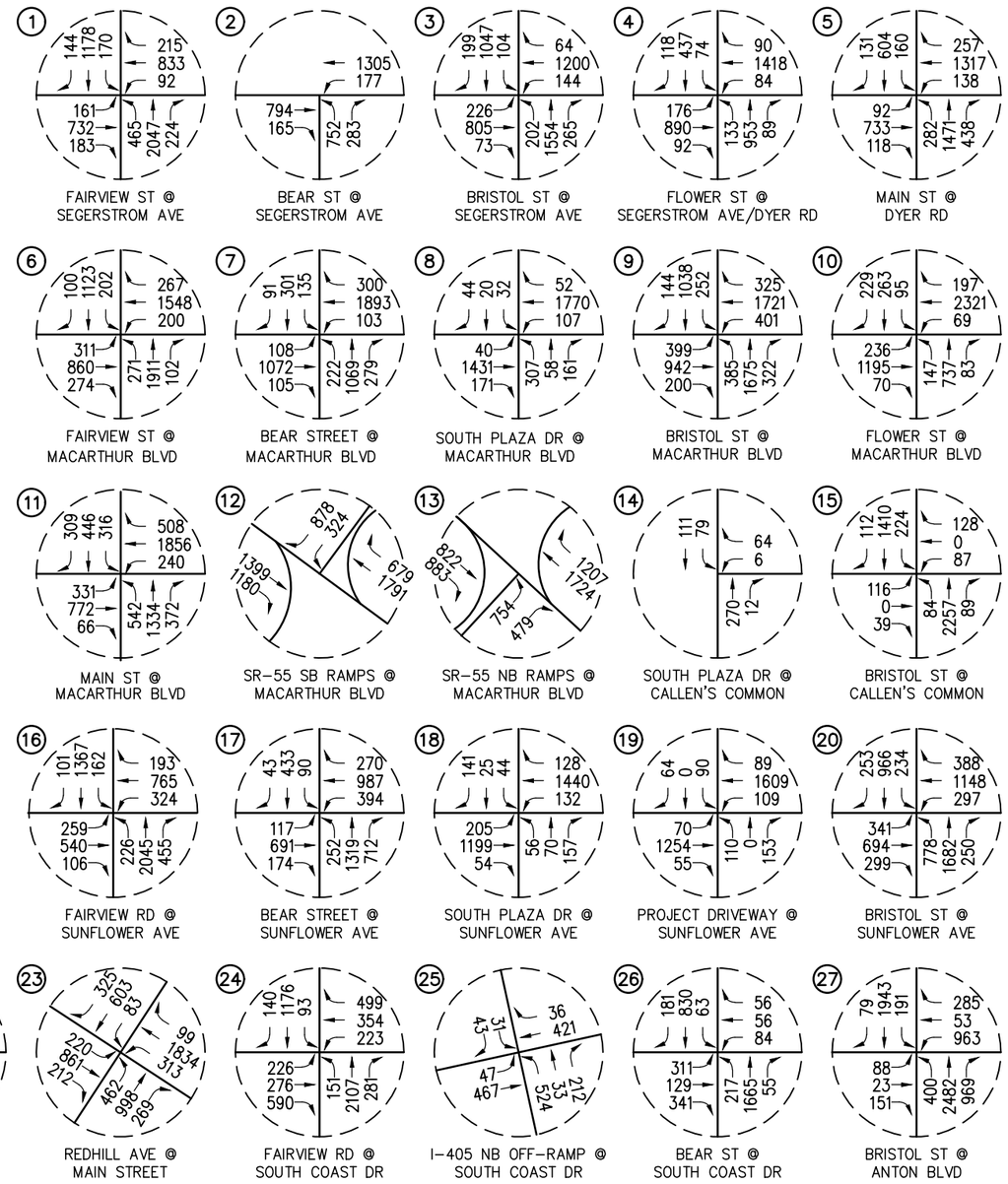
= PHASE 2

FIGURE 6-10B

YEAR 2032 CUMULATIVE PLUS PROJECT PHASES 1 AND 2 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PHASE 2

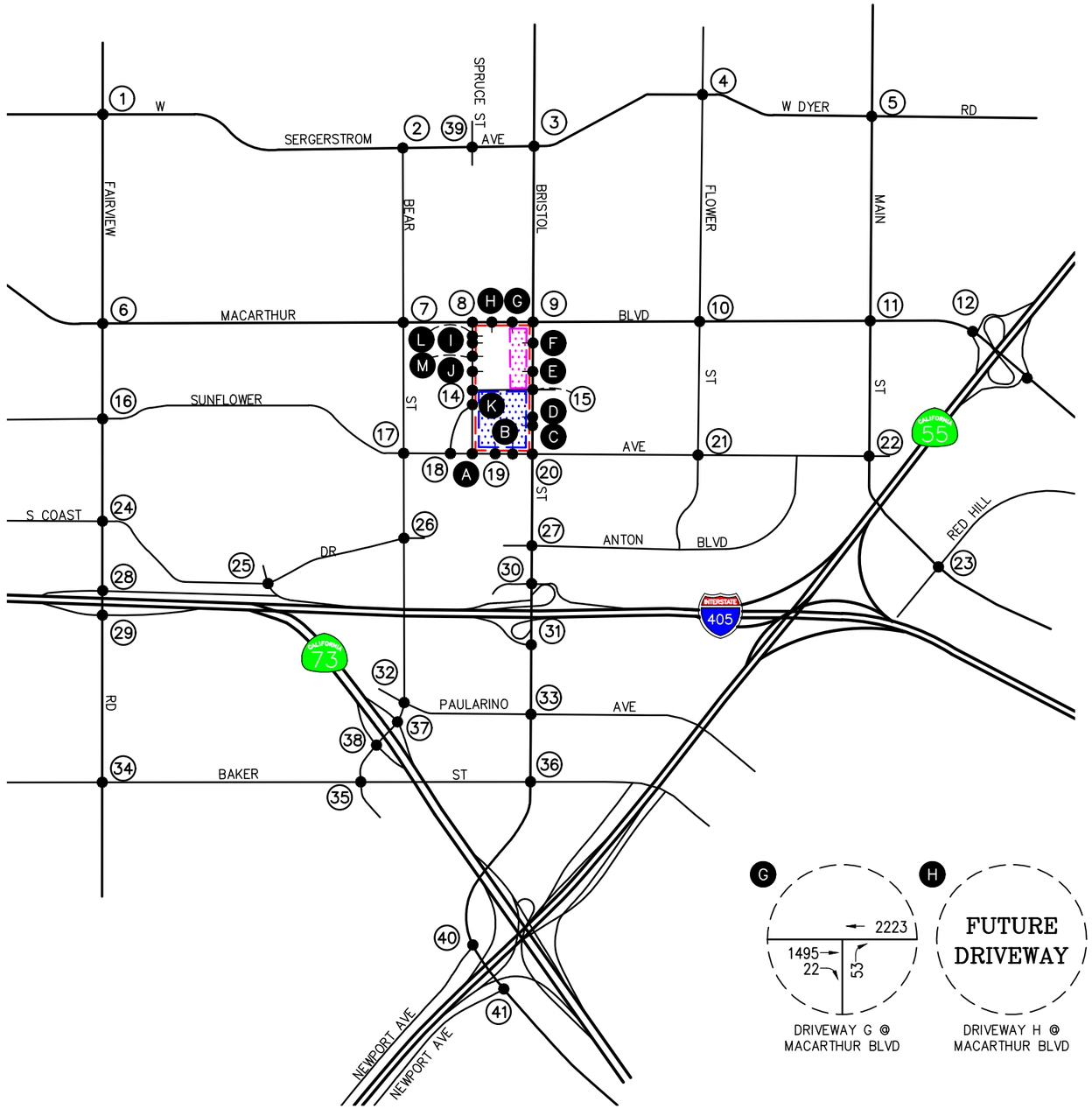
= PROJECT SITE

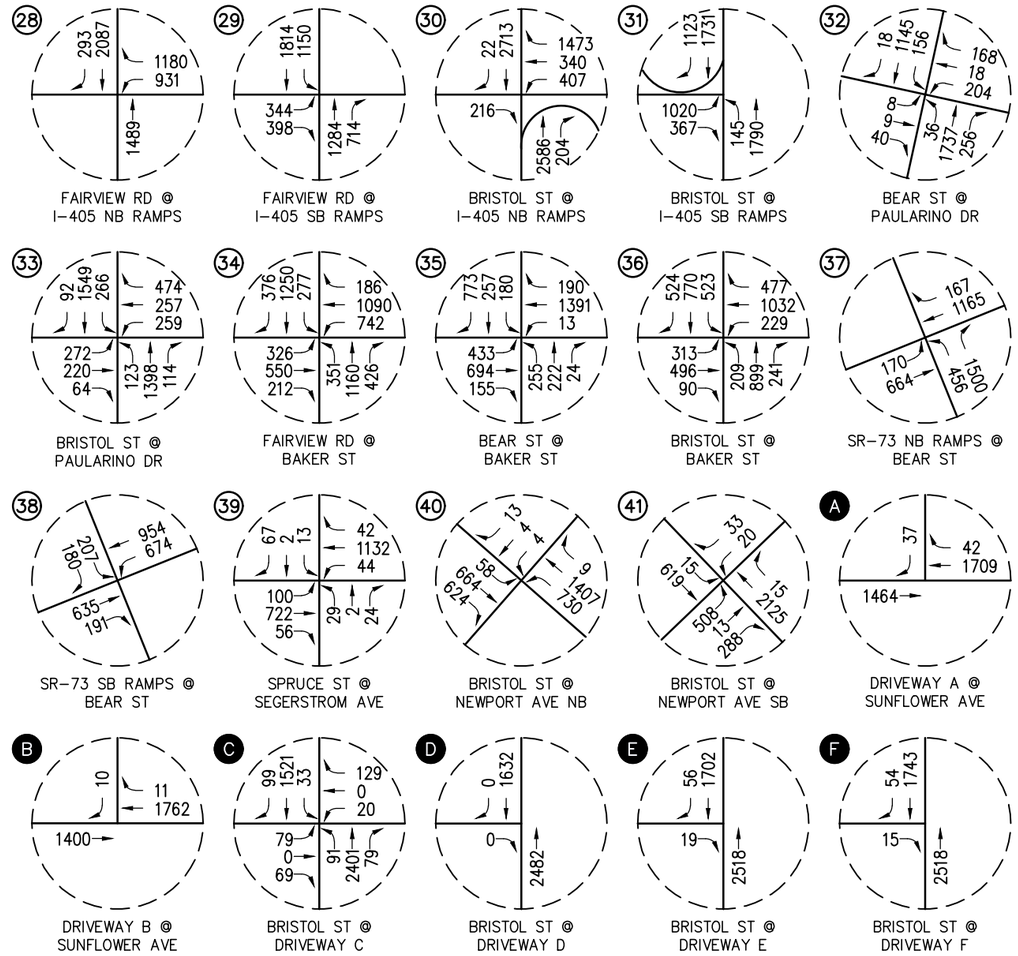
= PHASE 1

FIGURE 6-11A

YEAR 2032 CUMULATIVE PLUS PROJECT PHASES 1 AND 2 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

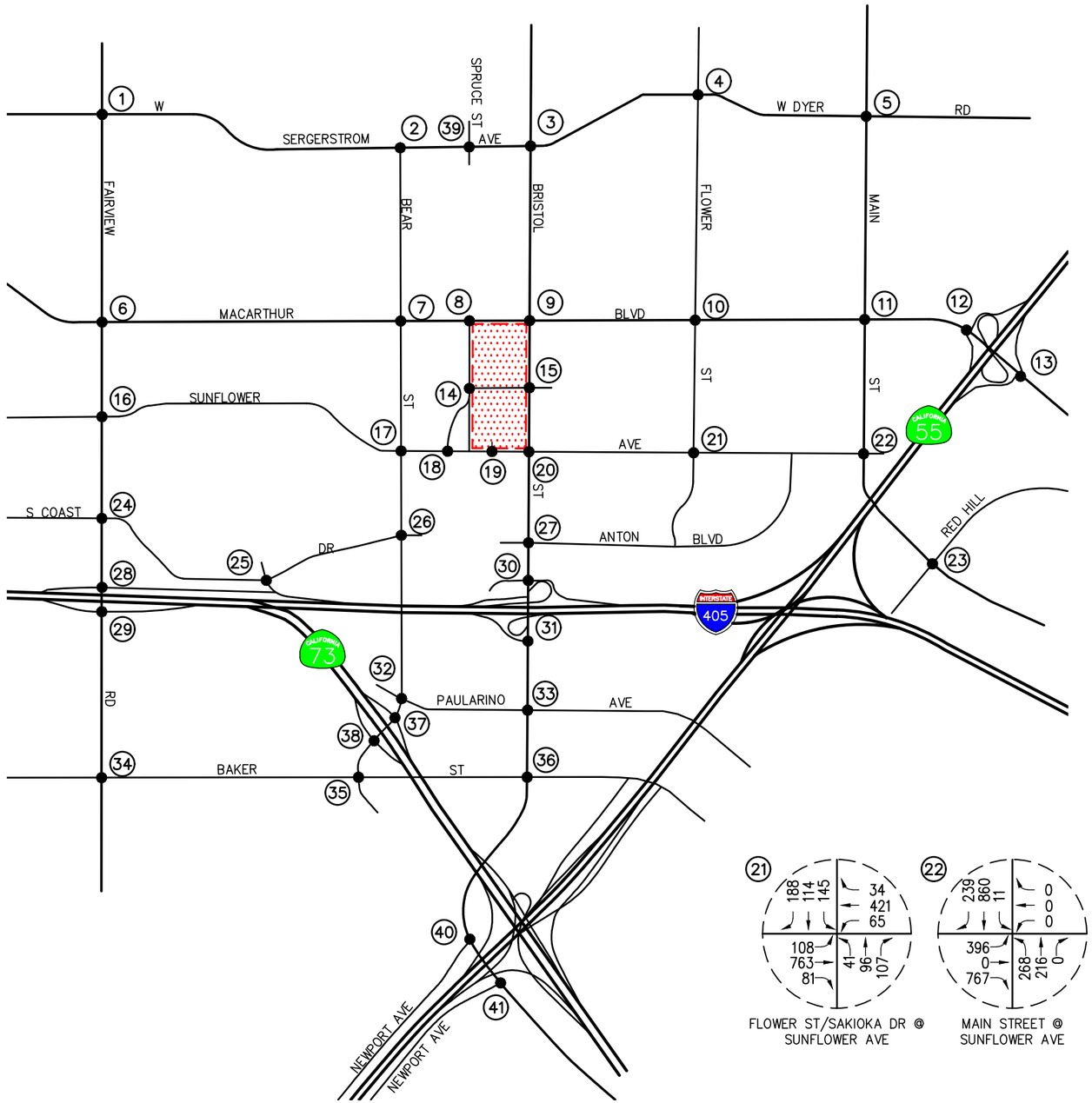
= PHASE 1

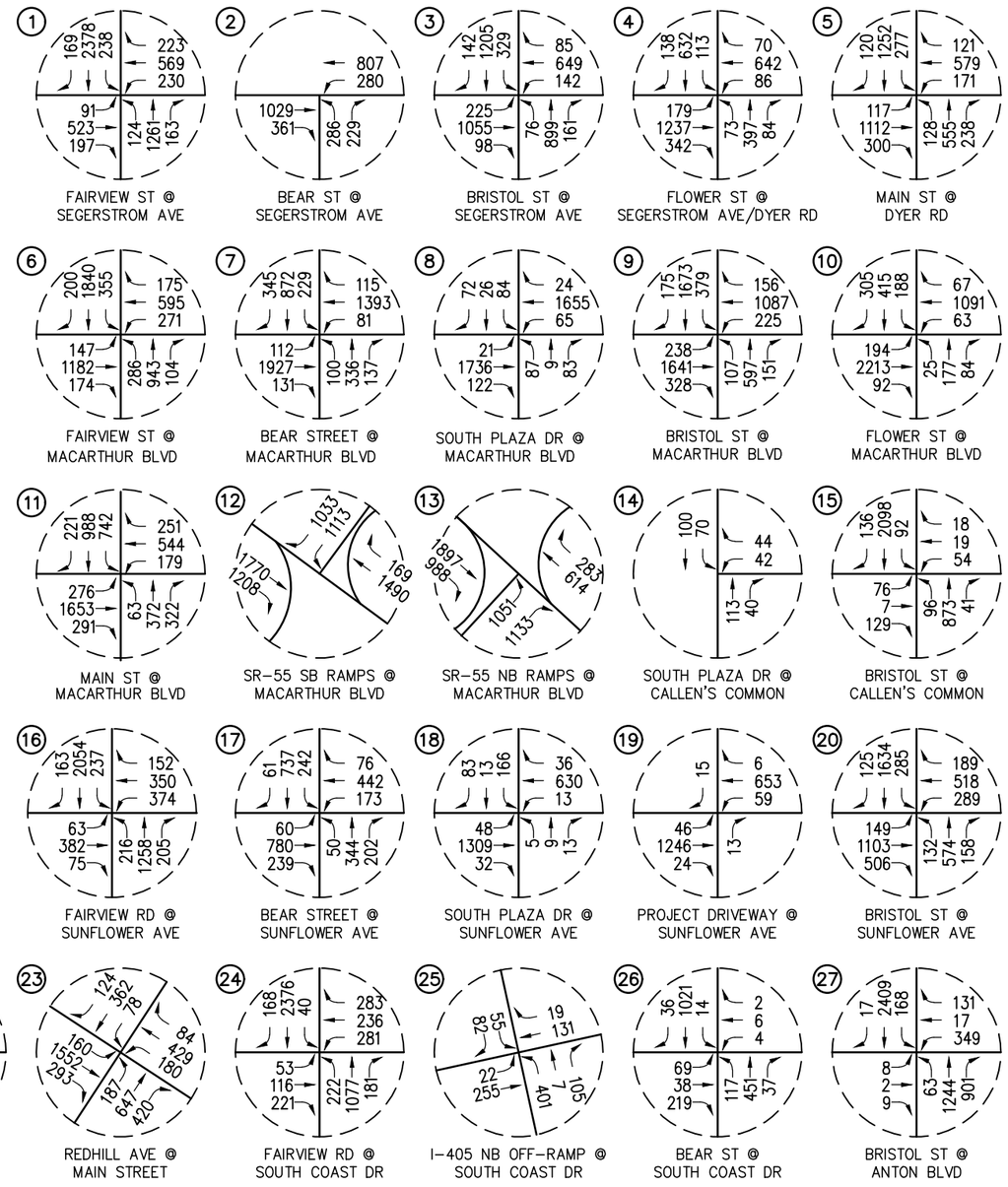
= PHASE 2

FIGURE 6-11B

YEAR 2032 CUMULATIVE PLUS PROJECT PHASES 1 AND 2 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

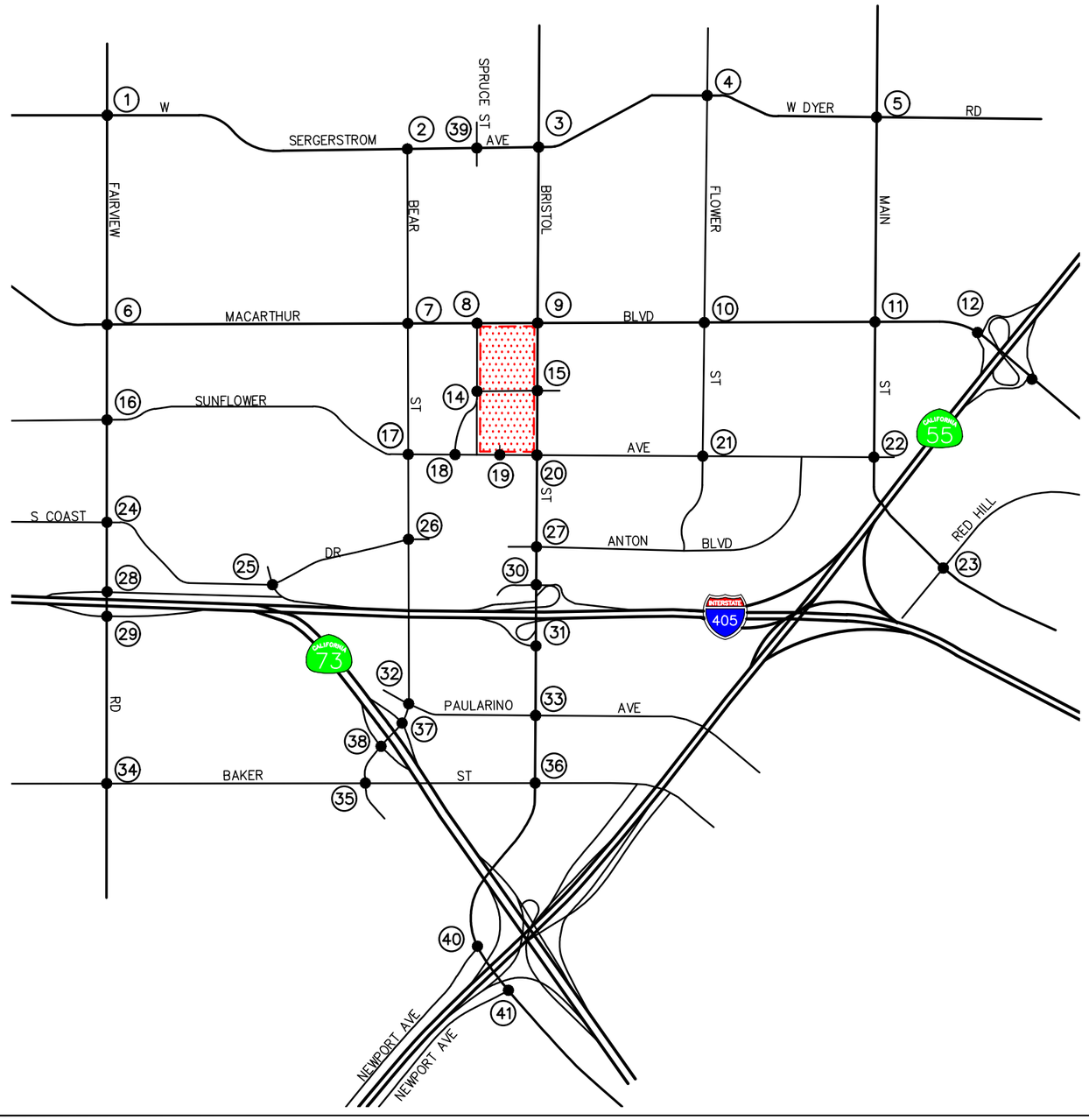
(#) = STUDY INTERSECTION

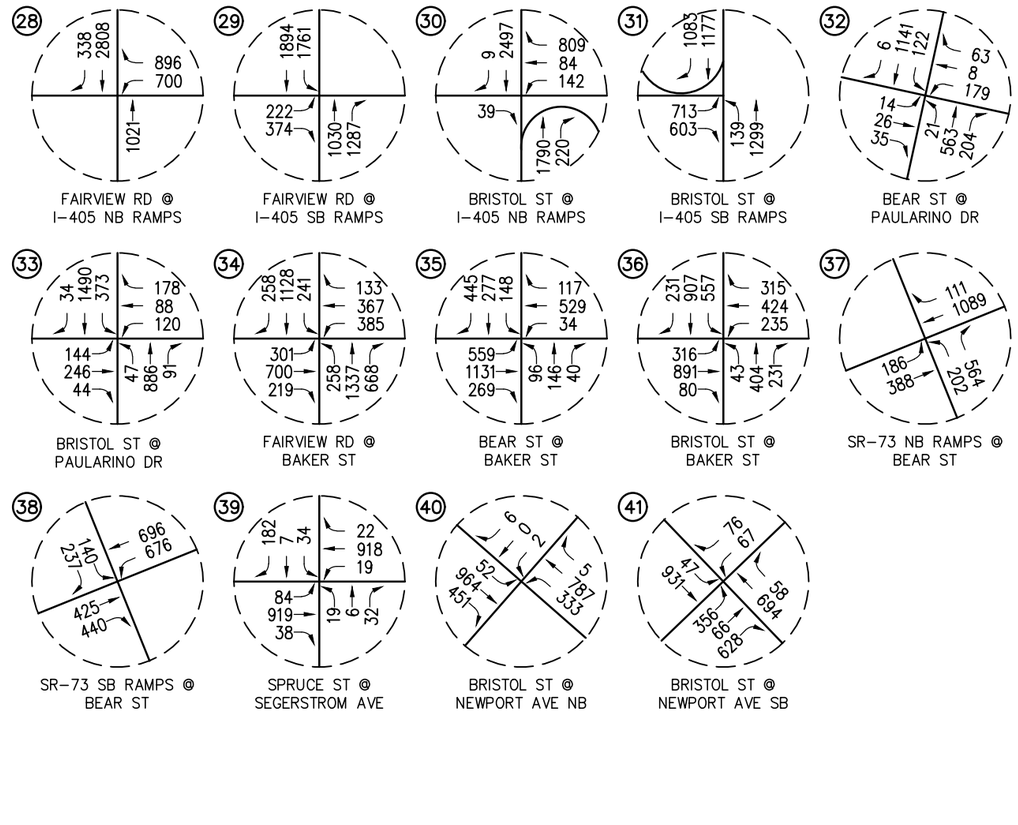
= PROJECT SITE

FIGURE 6-12A

YEAR 2036 CUMULATIVE AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

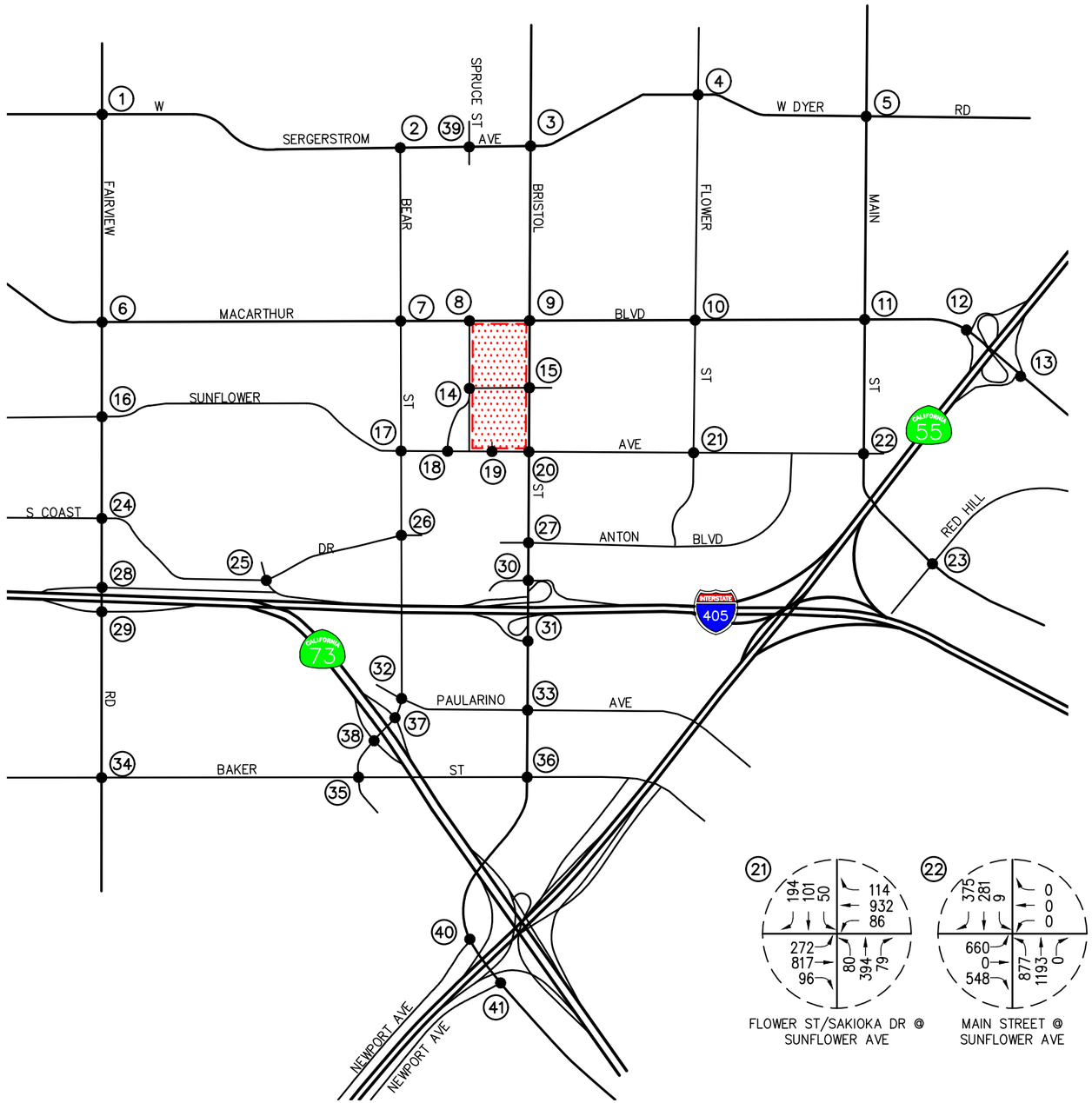
(#) = STUDY INTERSECTION

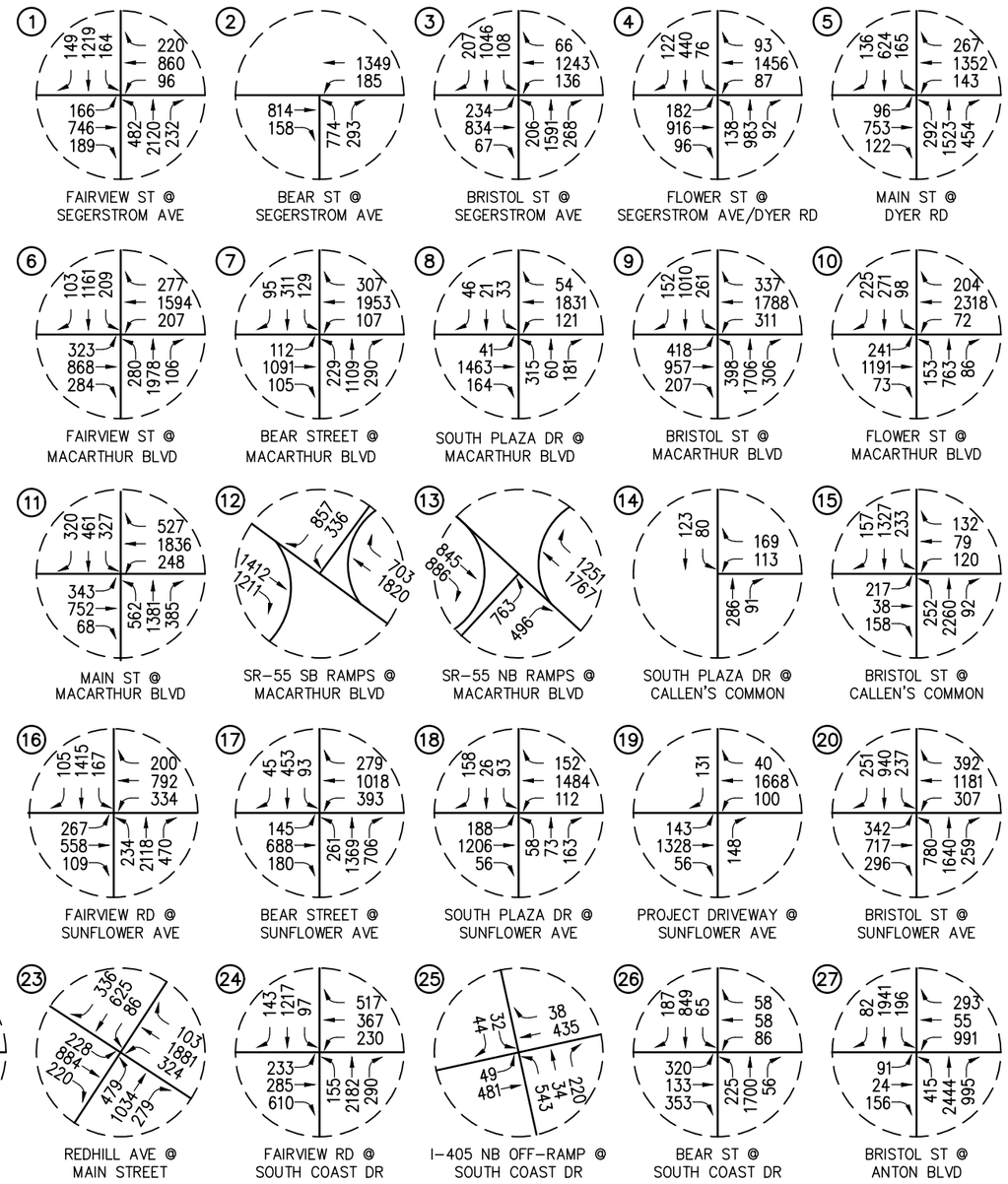
= PROJECT SITE

FIGURE 6-12B

YEAR 2036 CUMULATIVE AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

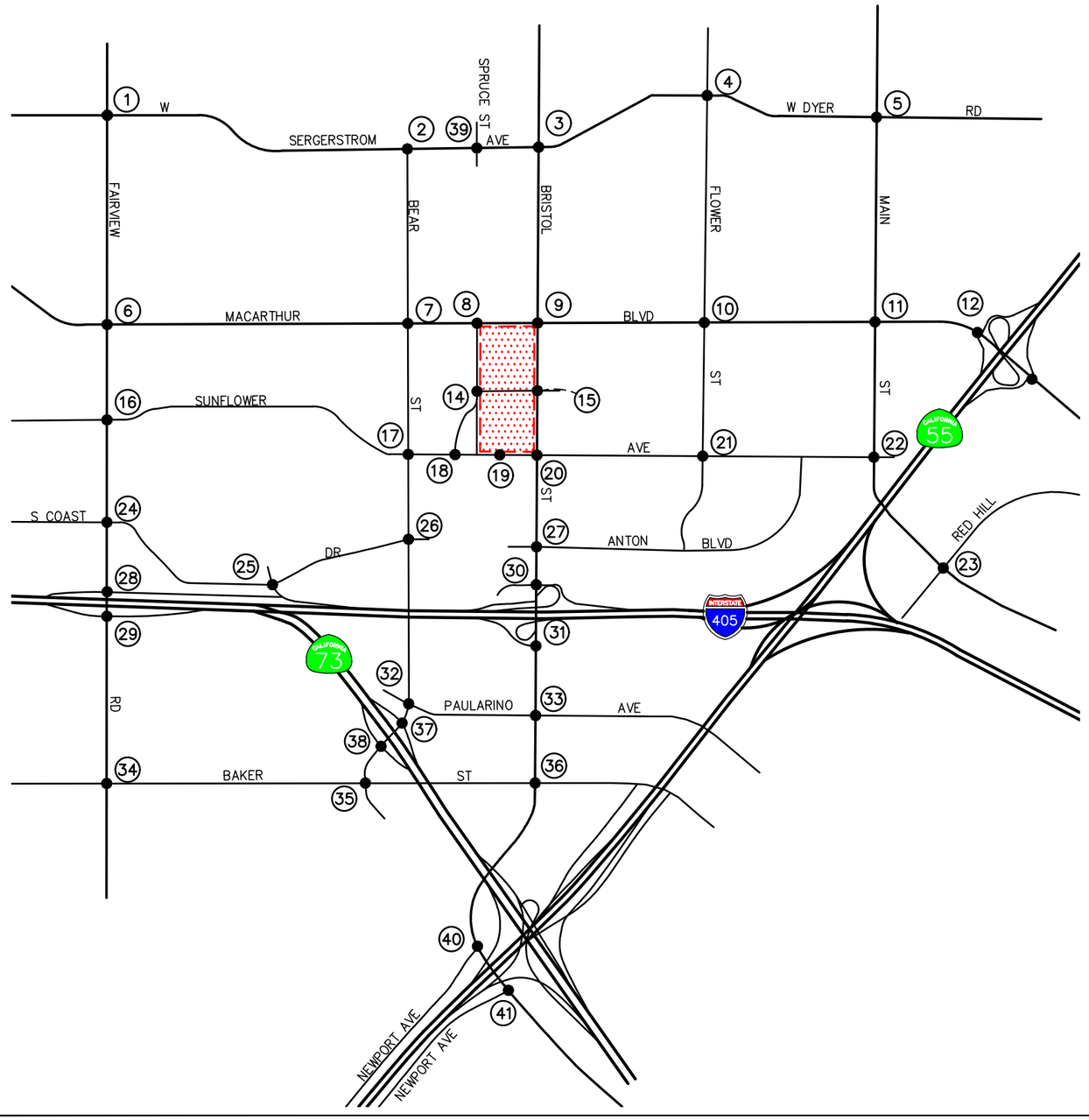
(#) = STUDY INTERSECTION

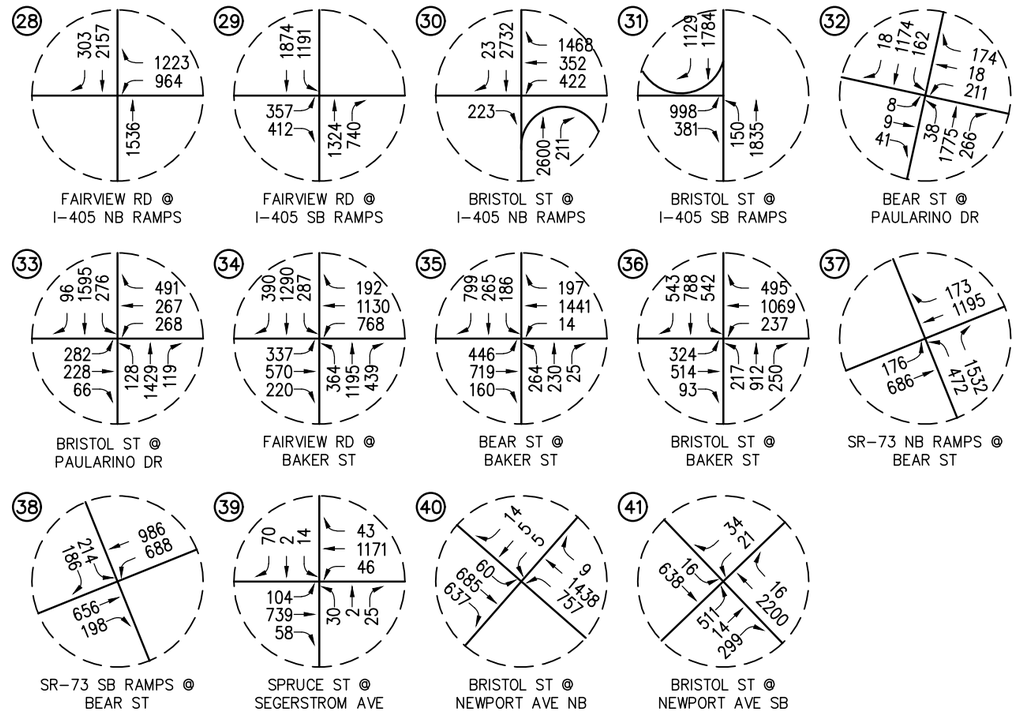
= PROJECT SITE

FIGURE 6-13A

YEAR 2036 CUMULATIVE PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

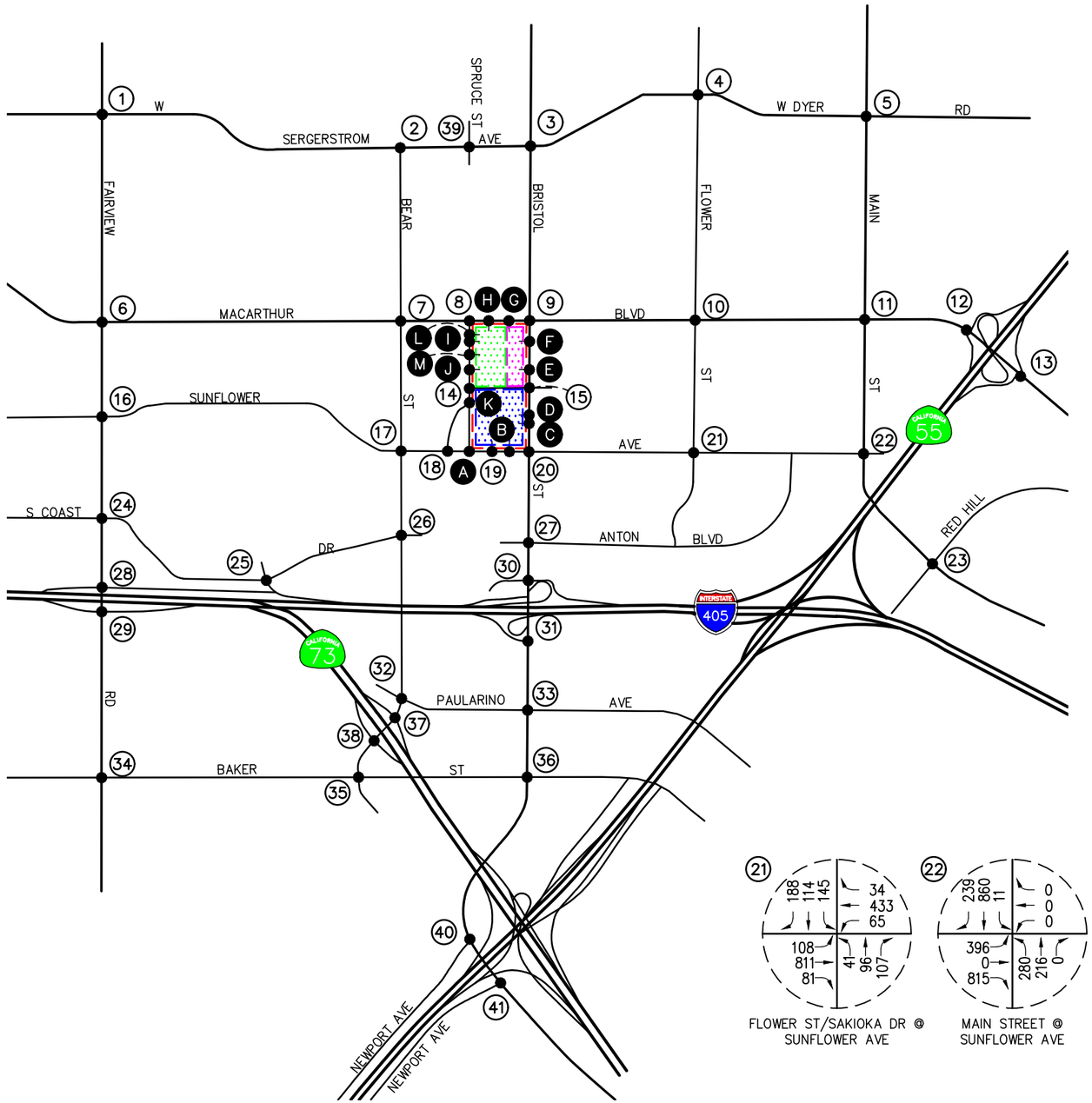
(#) = STUDY INTERSECTION

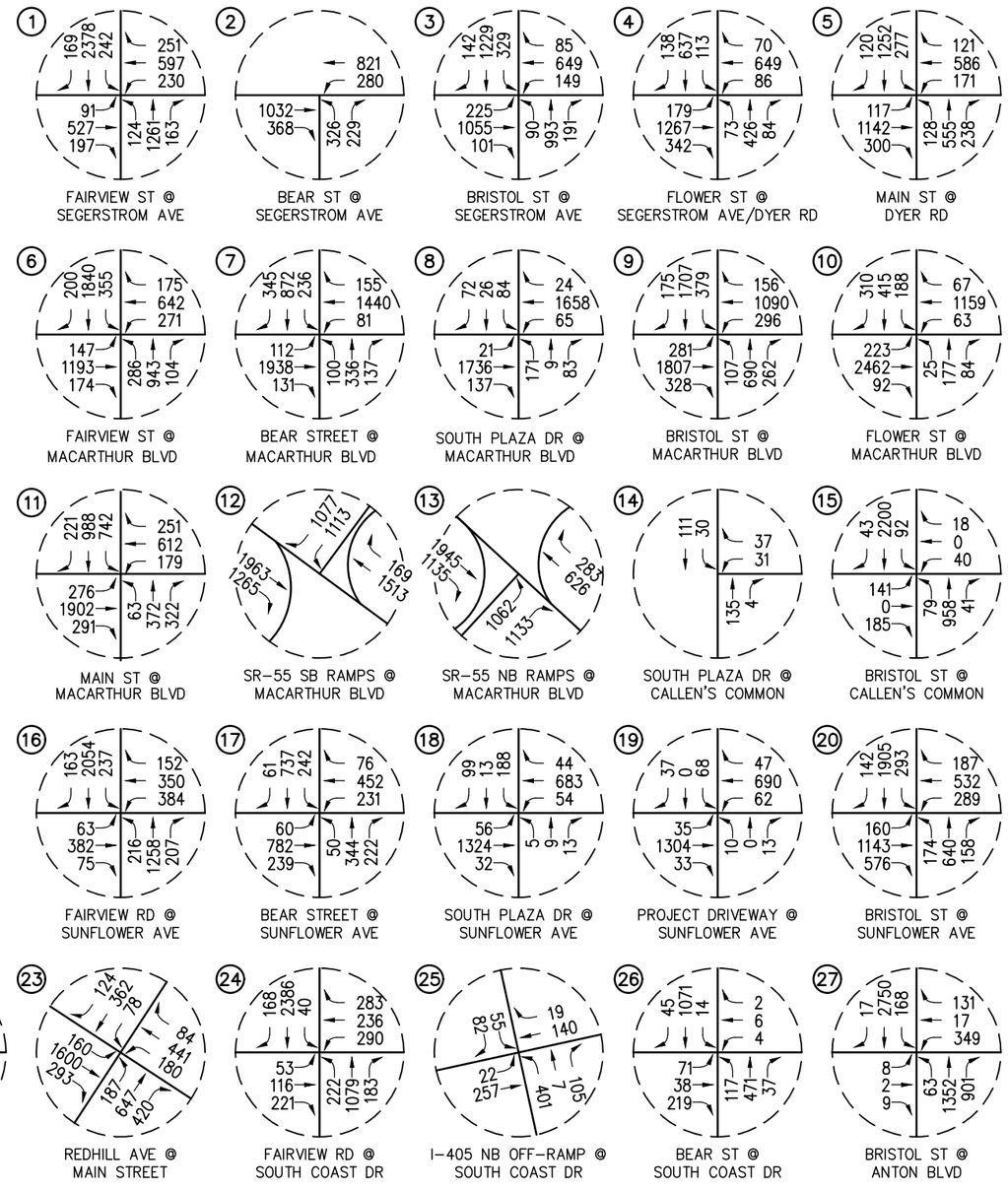
= PROJECT SITE

FIGURE 6-13B

YEAR 2036 CUMULATIVE PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

= PHASE 1

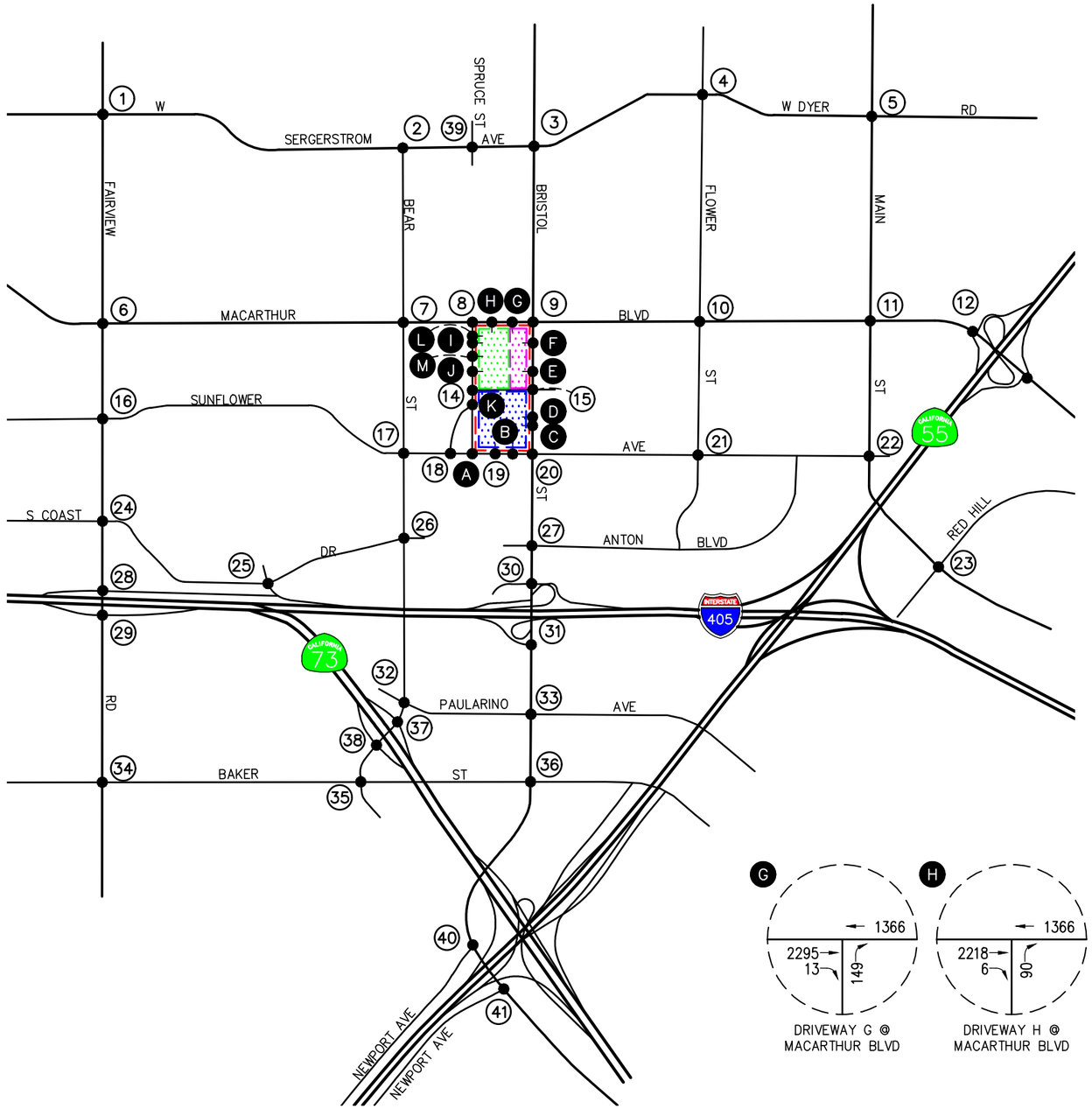
= PHASE 2

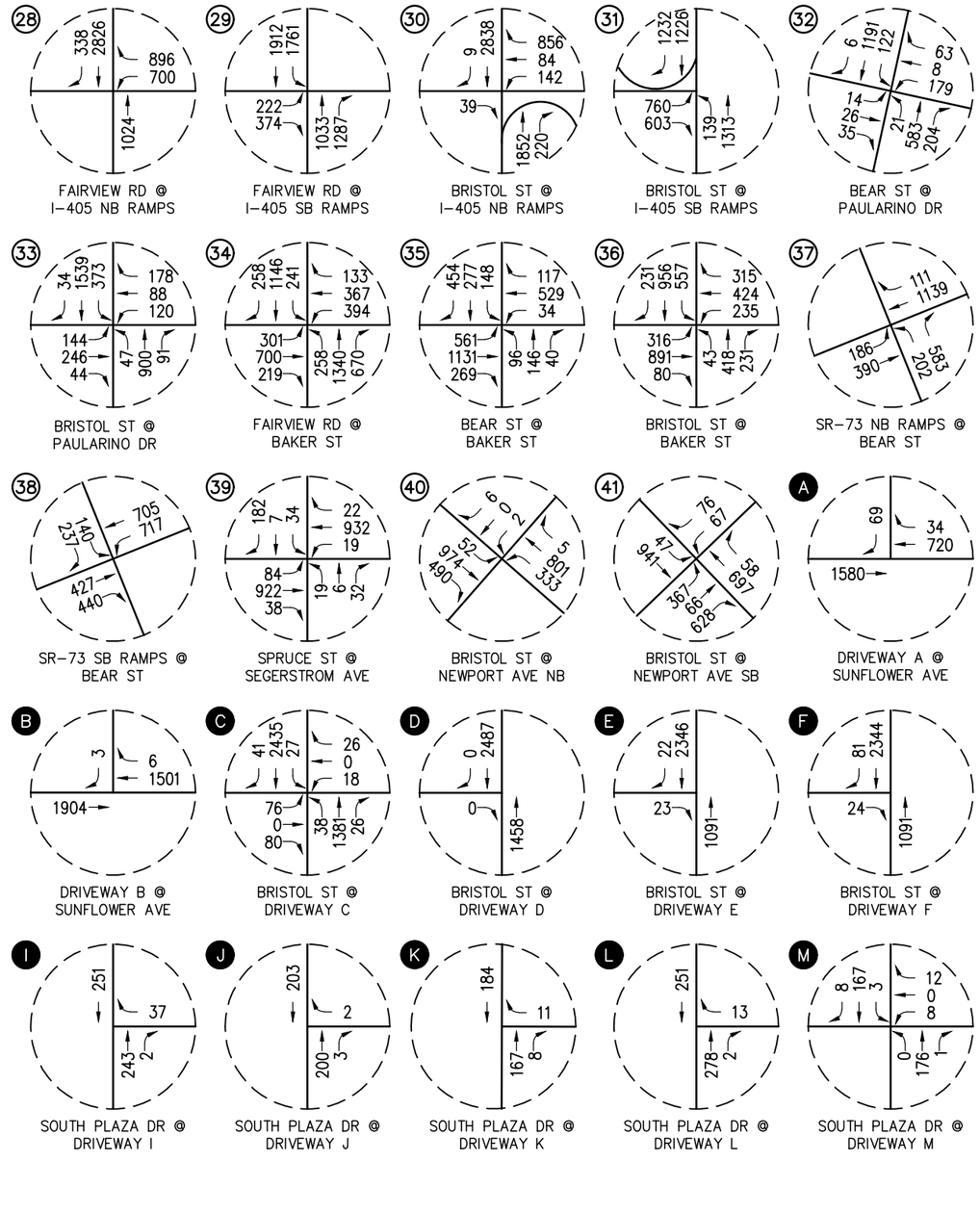
= PHASE 3

FIGURE 6-14A

YEAR 2036 CUMULATIVE PLUS PROJECT PHASES 1, 2 AND 3 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

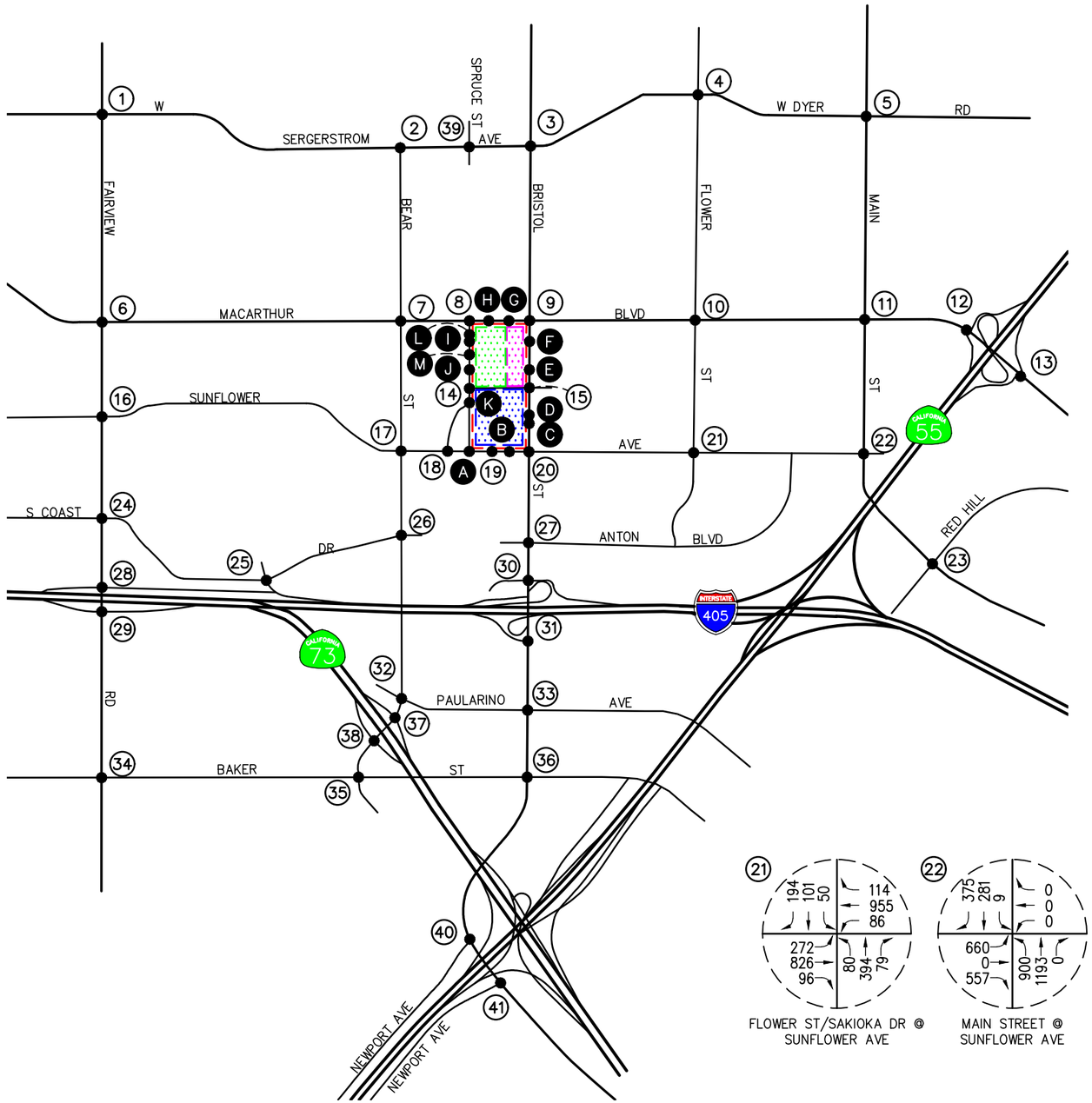
KEY

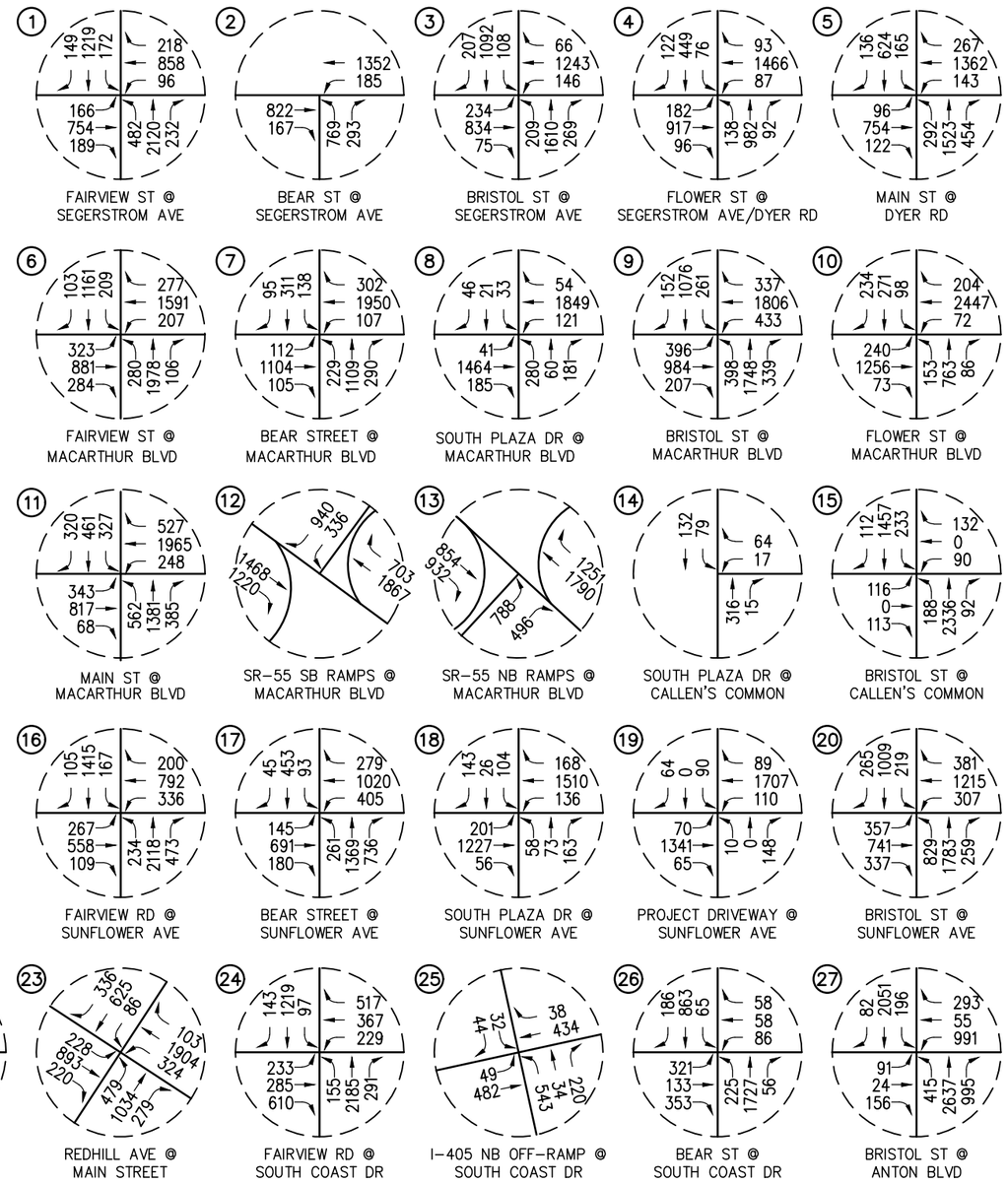
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 6-14B

YEAR 2036 CUMULATIVE PLUS PROJECT PHASES 1, 2 AND 3 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

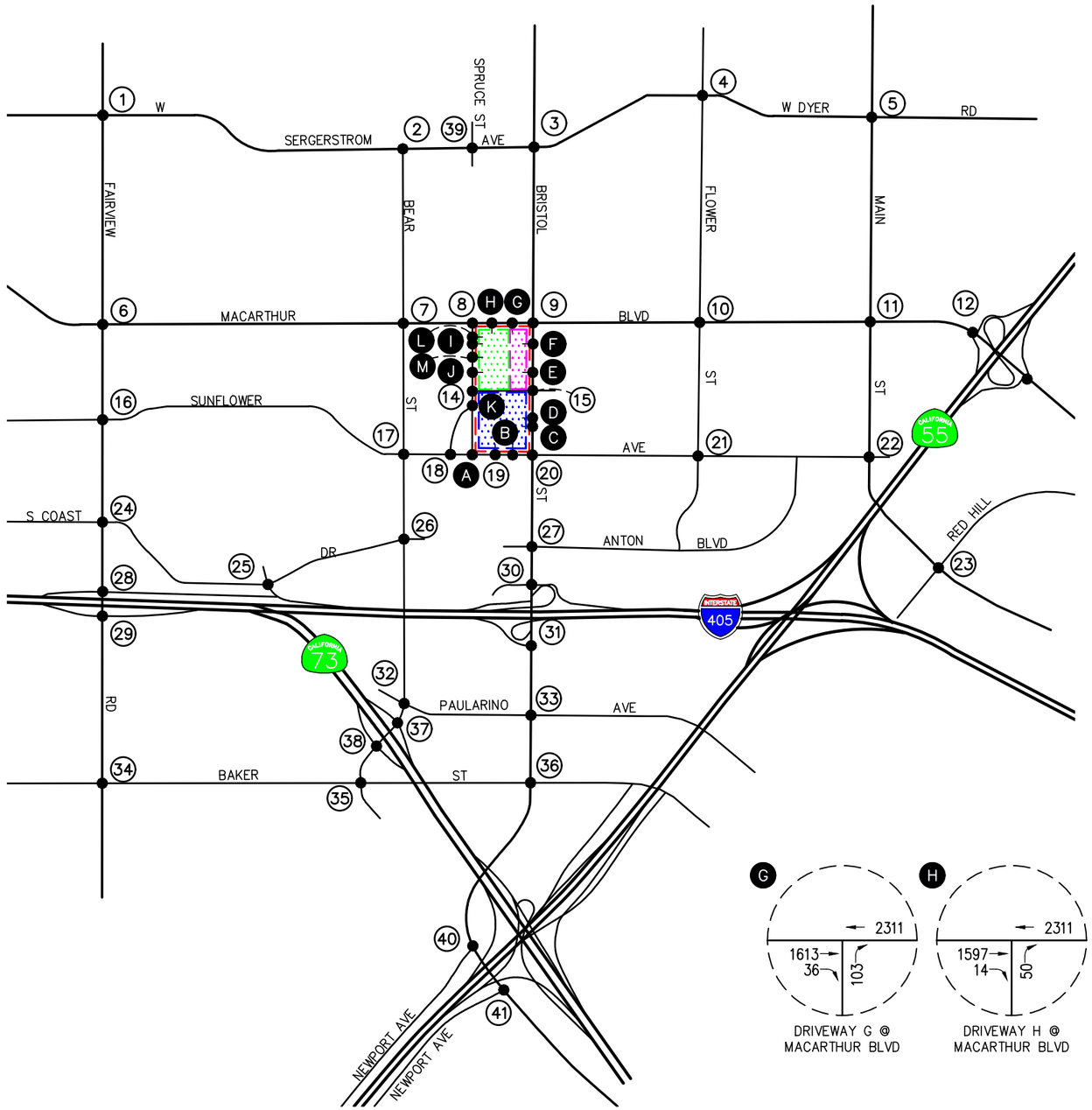
KEY

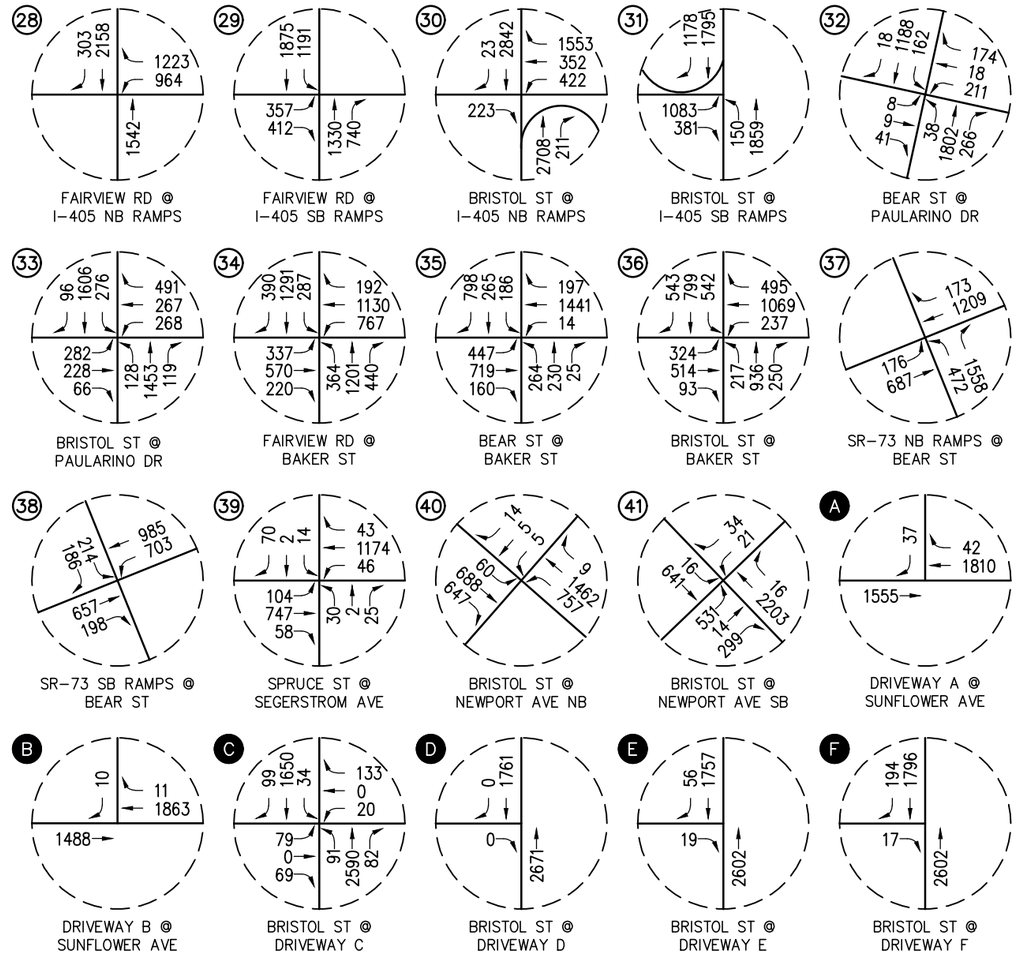
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 6-15A

YEAR 2036 CUMULATIVE PLUS PROJECT PHASES 1, 2 AND 3 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

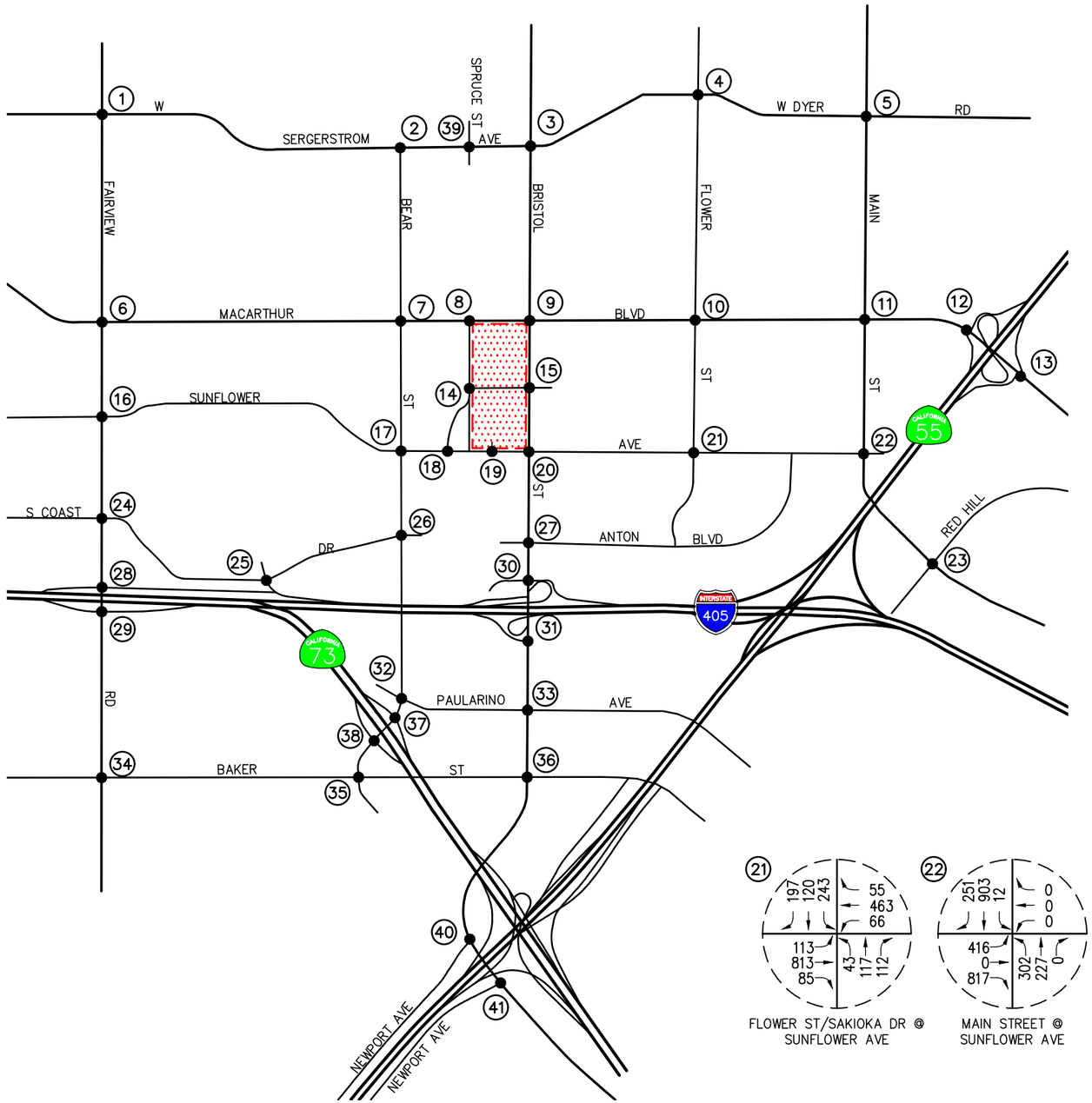
KEY

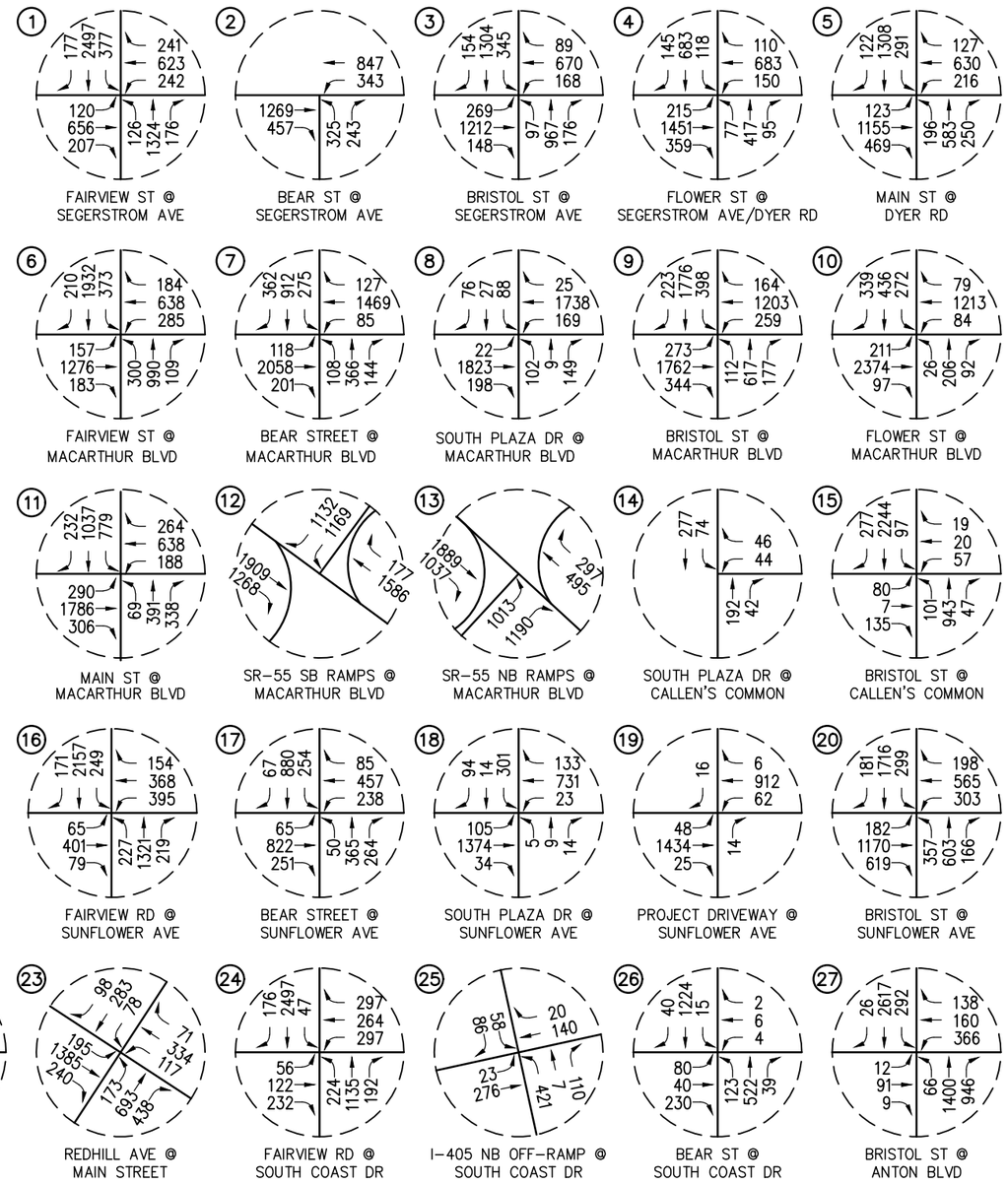
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 6-15B

YEAR 2036 CUMULATIVE PLUS PROJECT PHASES 1, 2 AND 3 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

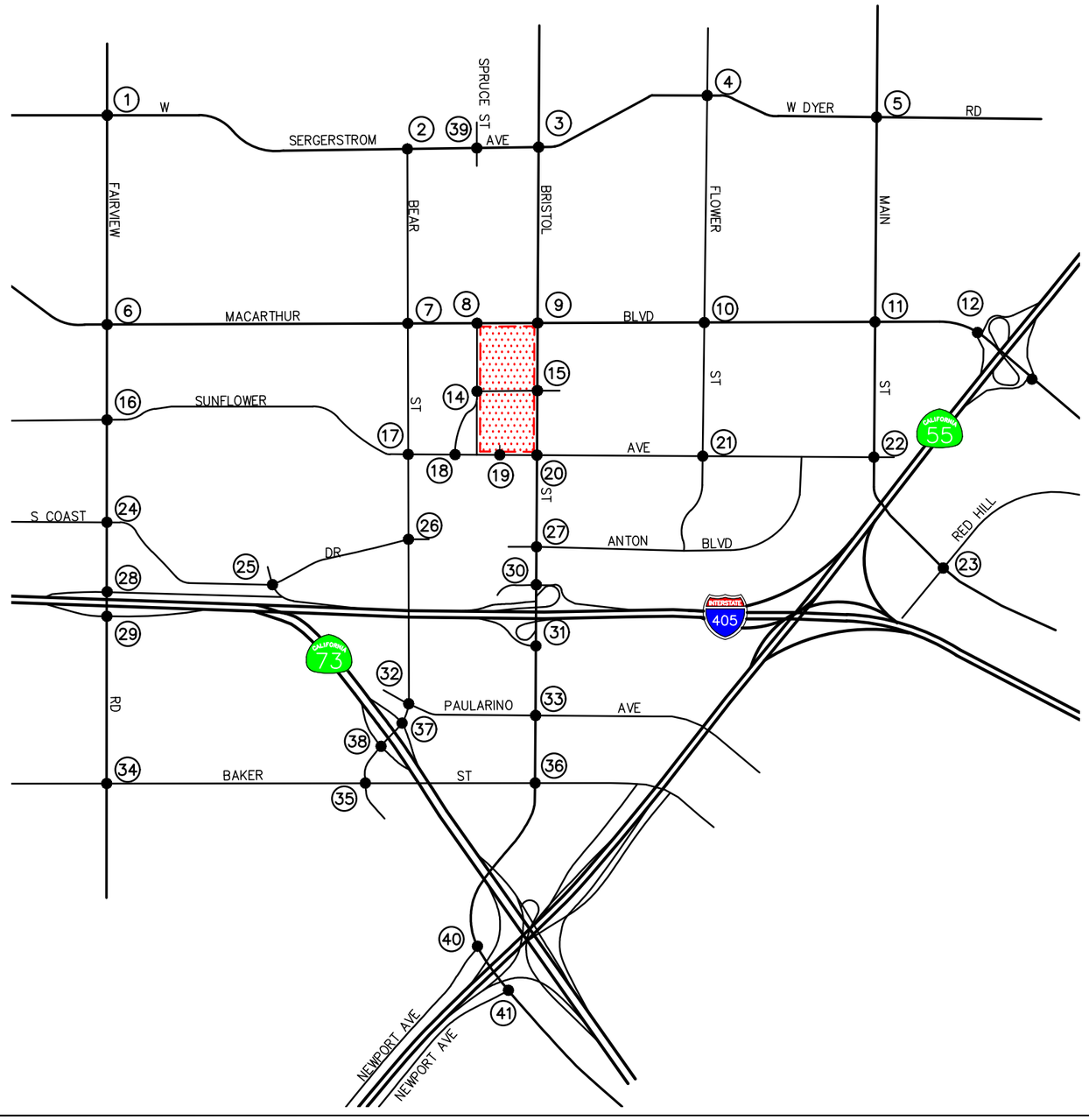
(#) = STUDY INTERSECTION

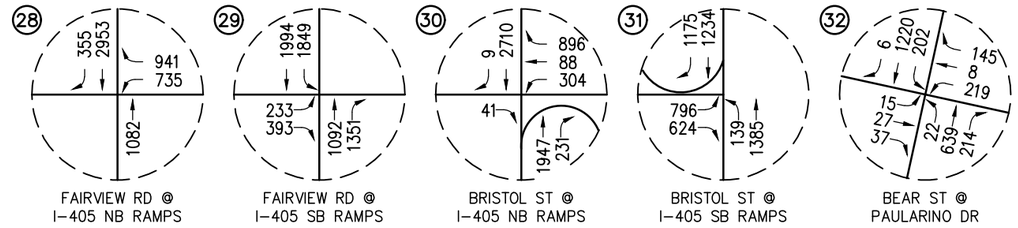
= PROJECT SITE

FIGURE 6-16A

YEAR 2045 BUILDOUT AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

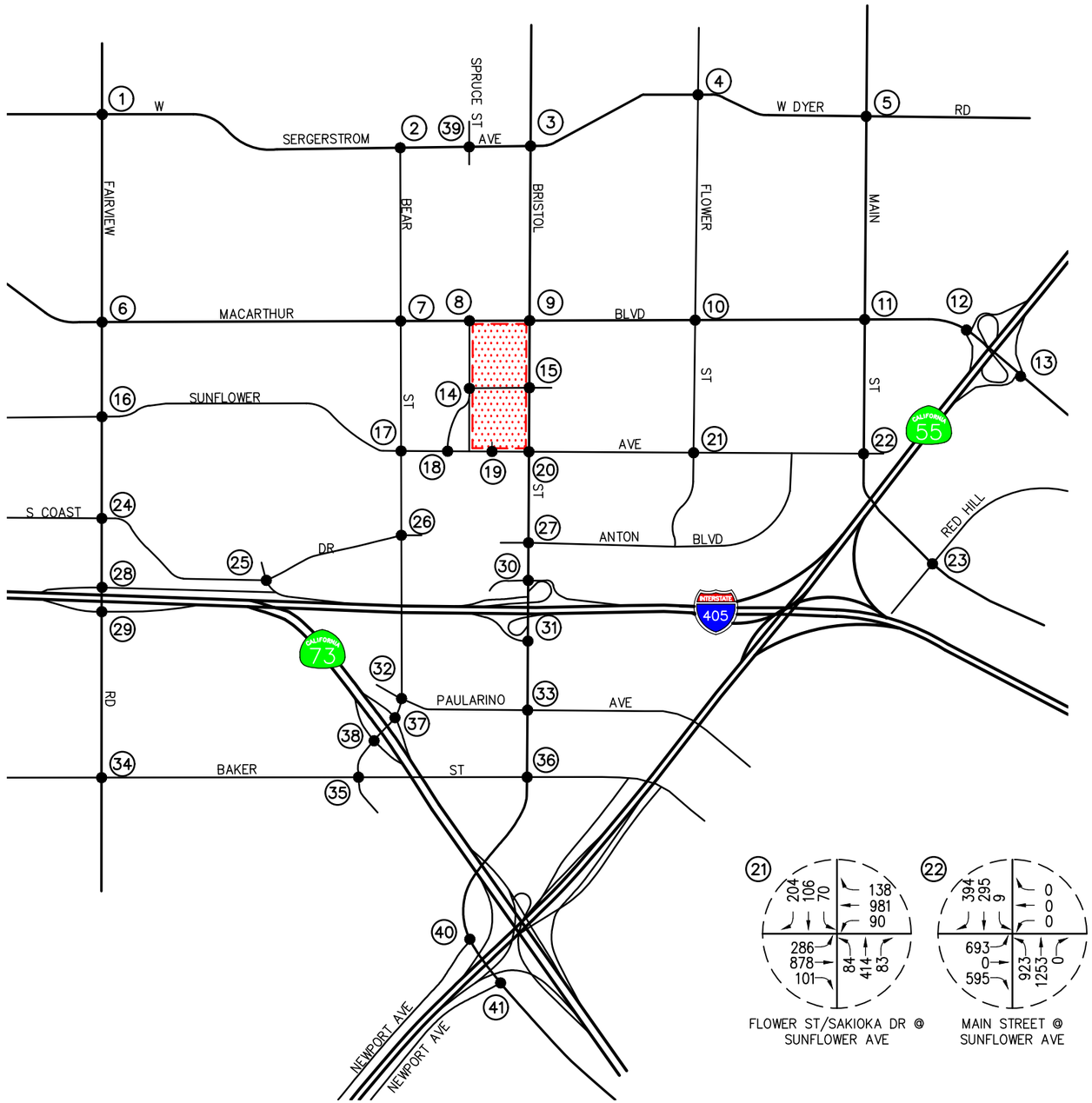
(#) = STUDY INTERSECTION

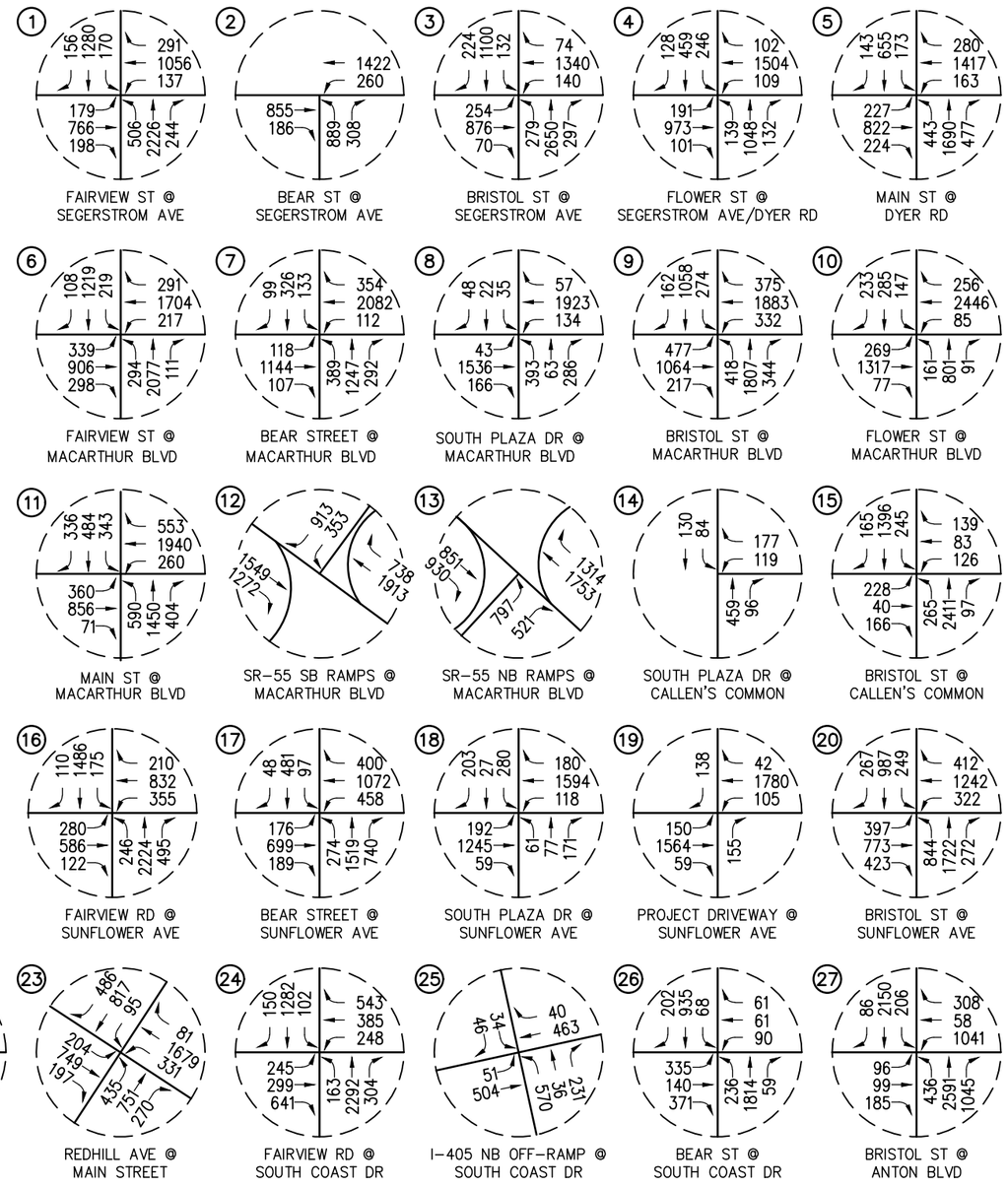
= PROJECT SITE

FIGURE 6-16B

YEAR 2045 BUILDOUT AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

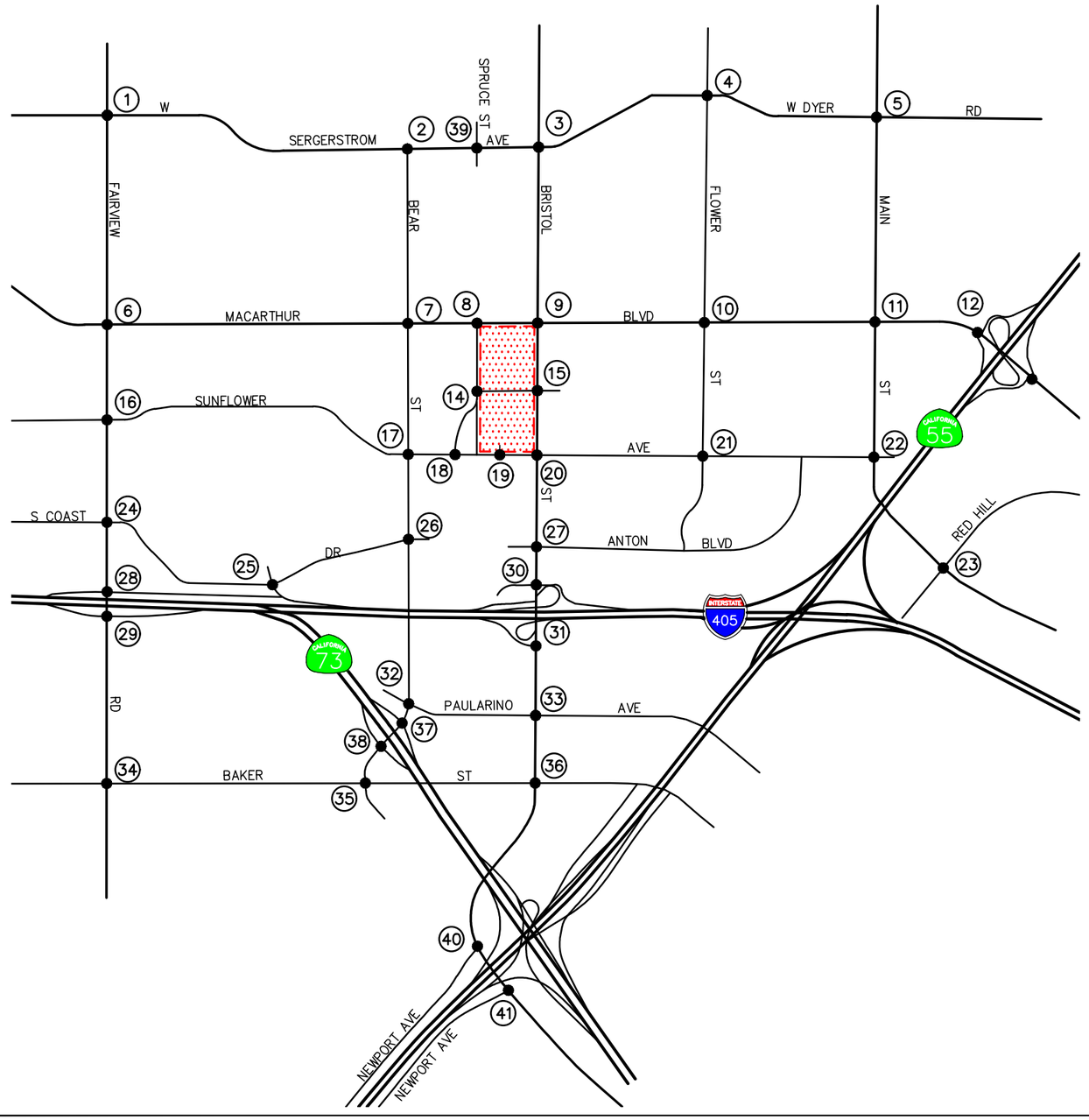
(#) = STUDY INTERSECTION

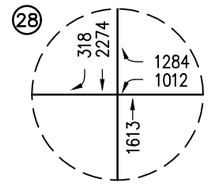
= PROJECT SITE

FIGURE 6-17A

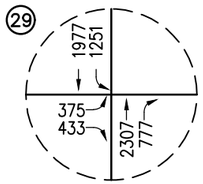
YEAR 2045 BUILDOUT PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





FAIRVIEW RD @
I-405 NB RAMPS



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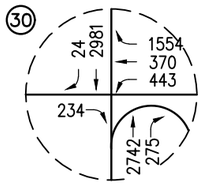

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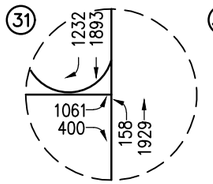

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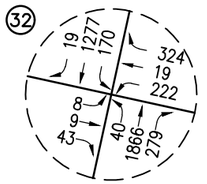
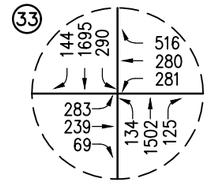


BEAR ST @
PAULARINO DR



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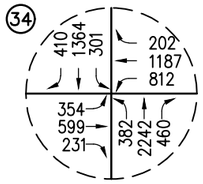

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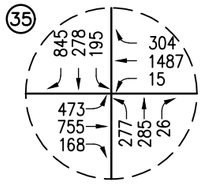

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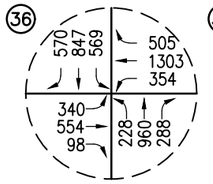
BAKER ST



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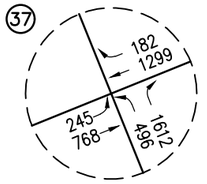
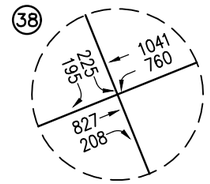


SR-73 NB RAMPS @
BEAR ST



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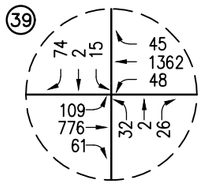
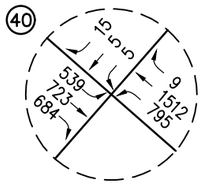
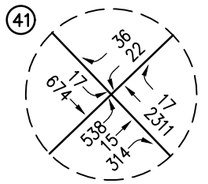


SPRUCE ST @
SEGERSTROM AVE



BRISTOL ST @
NEWPORT AVE NB



BRISTOL ST @
NEWPORT AVE SB

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N NO SCALE

KEY

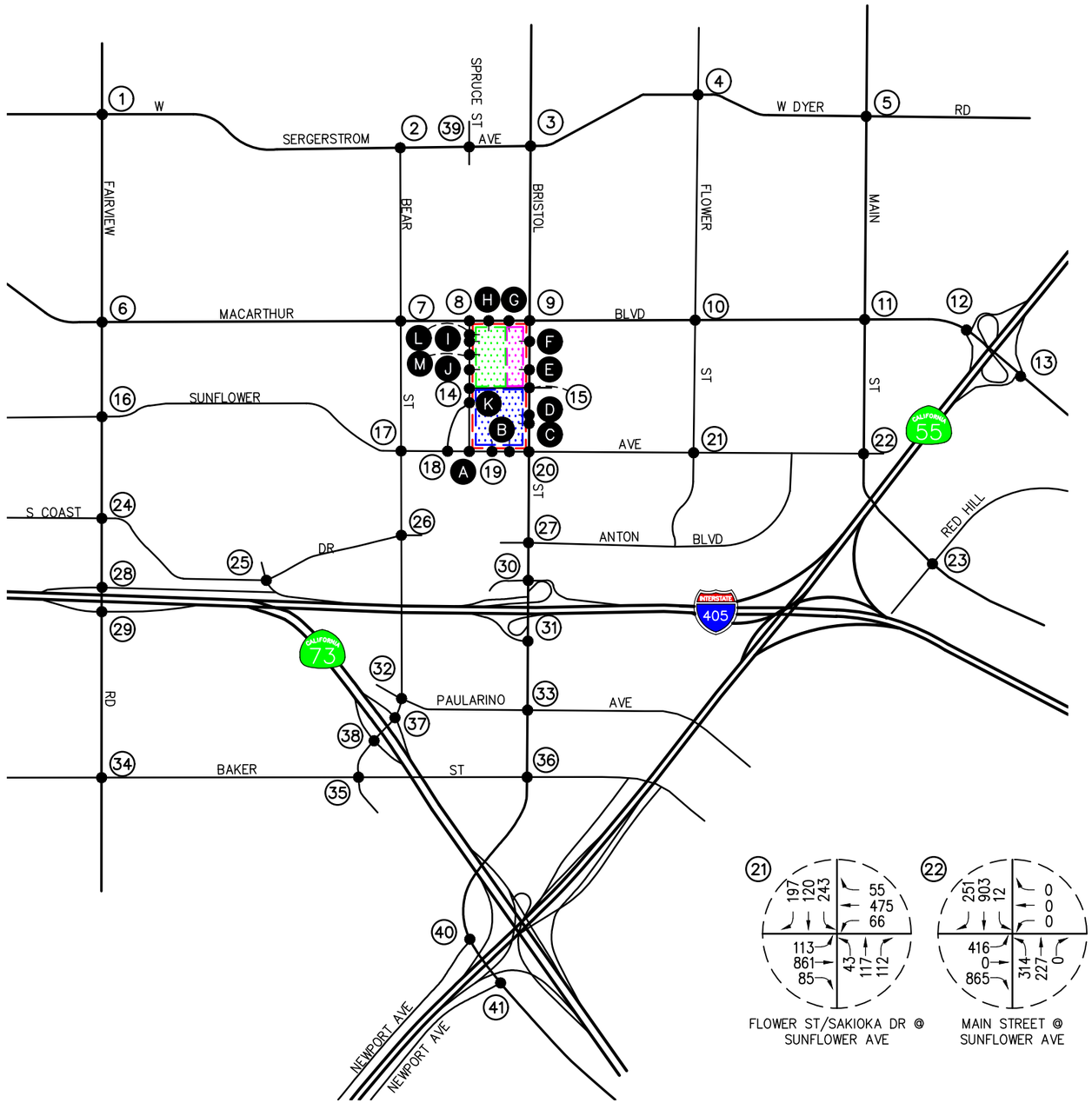
(#) = STUDY INTERSECTION

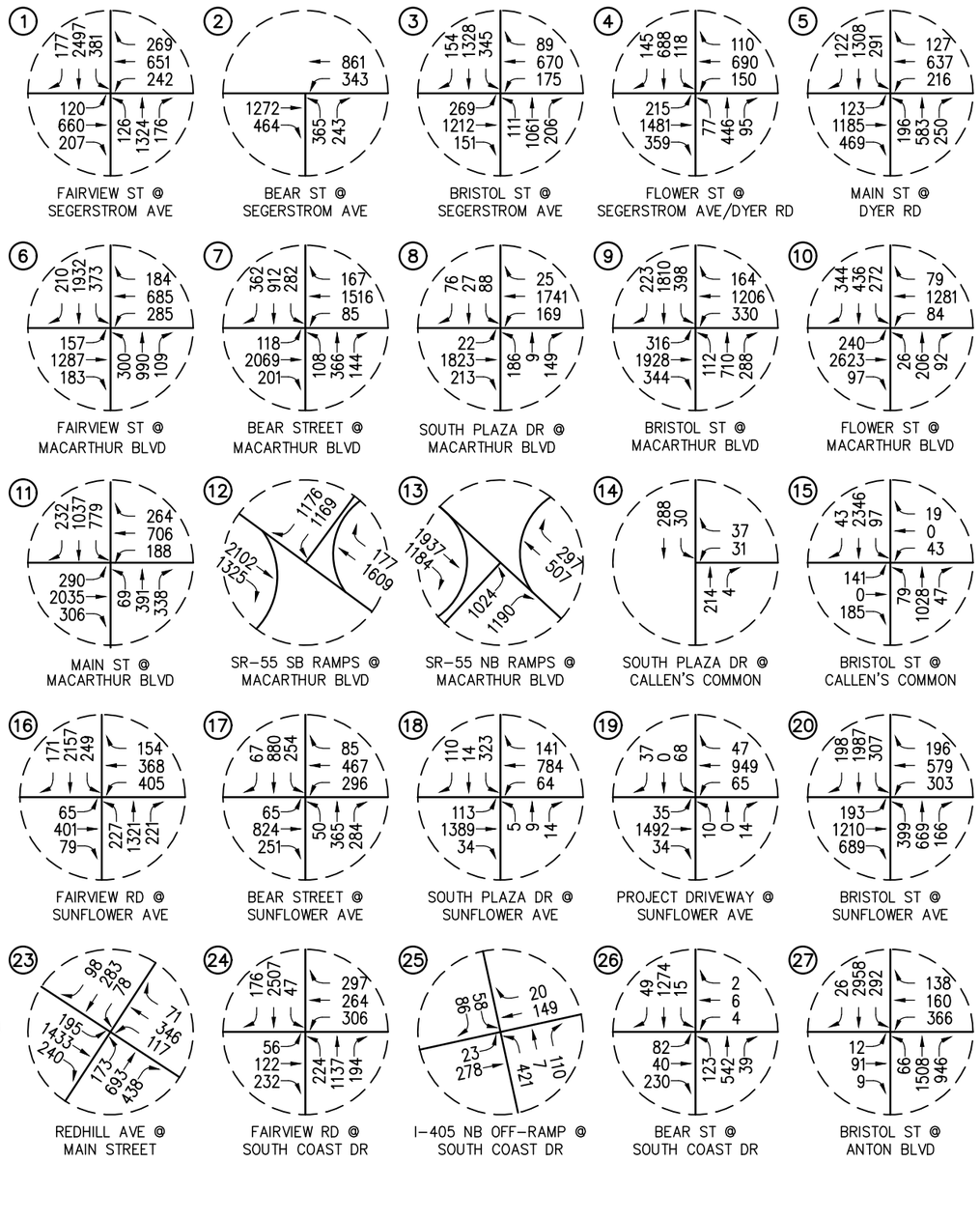
= PROJECT SITE

FIGURE 6-17B

YEAR 2045 BUILDOUT PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

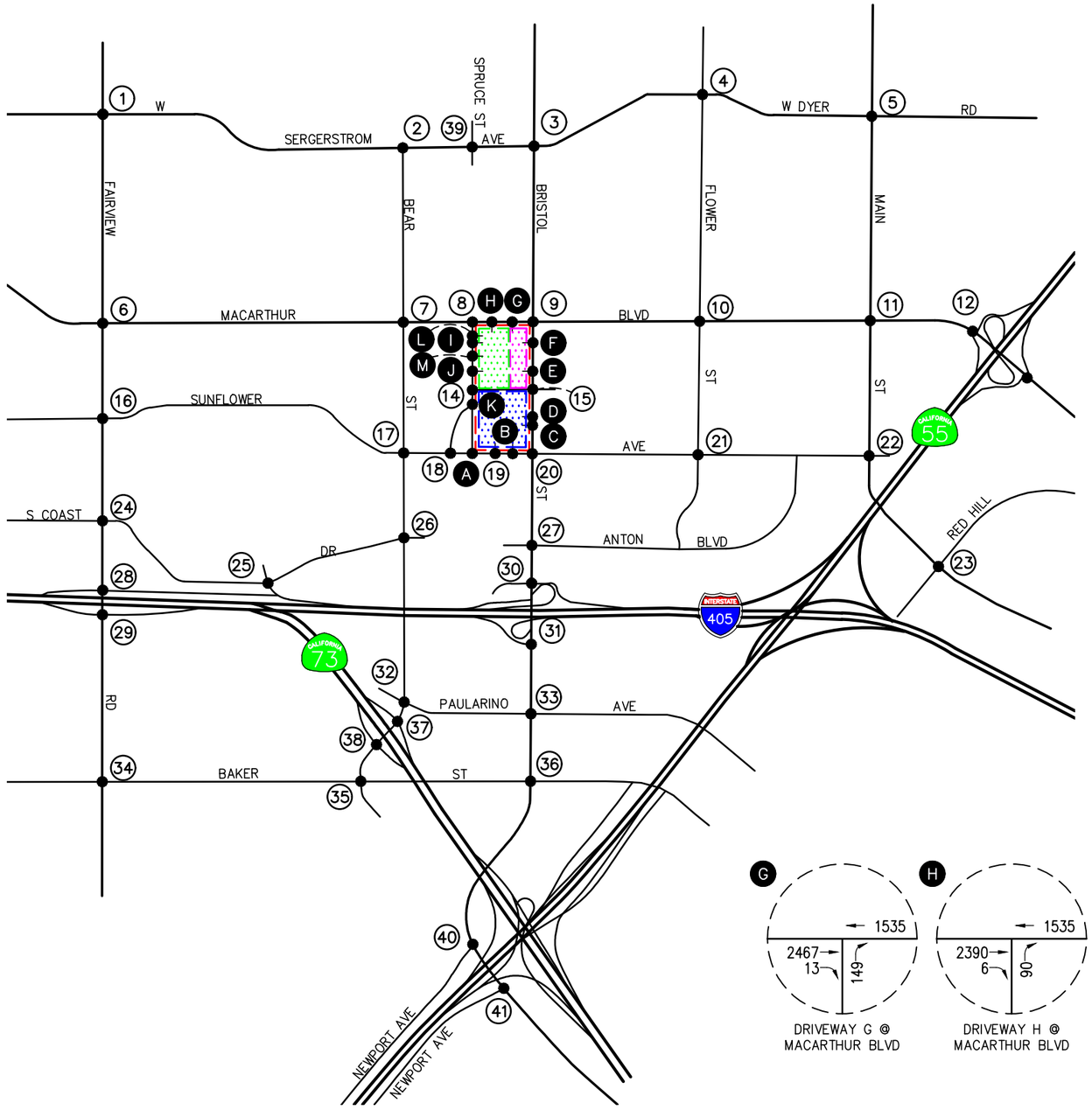
KEY

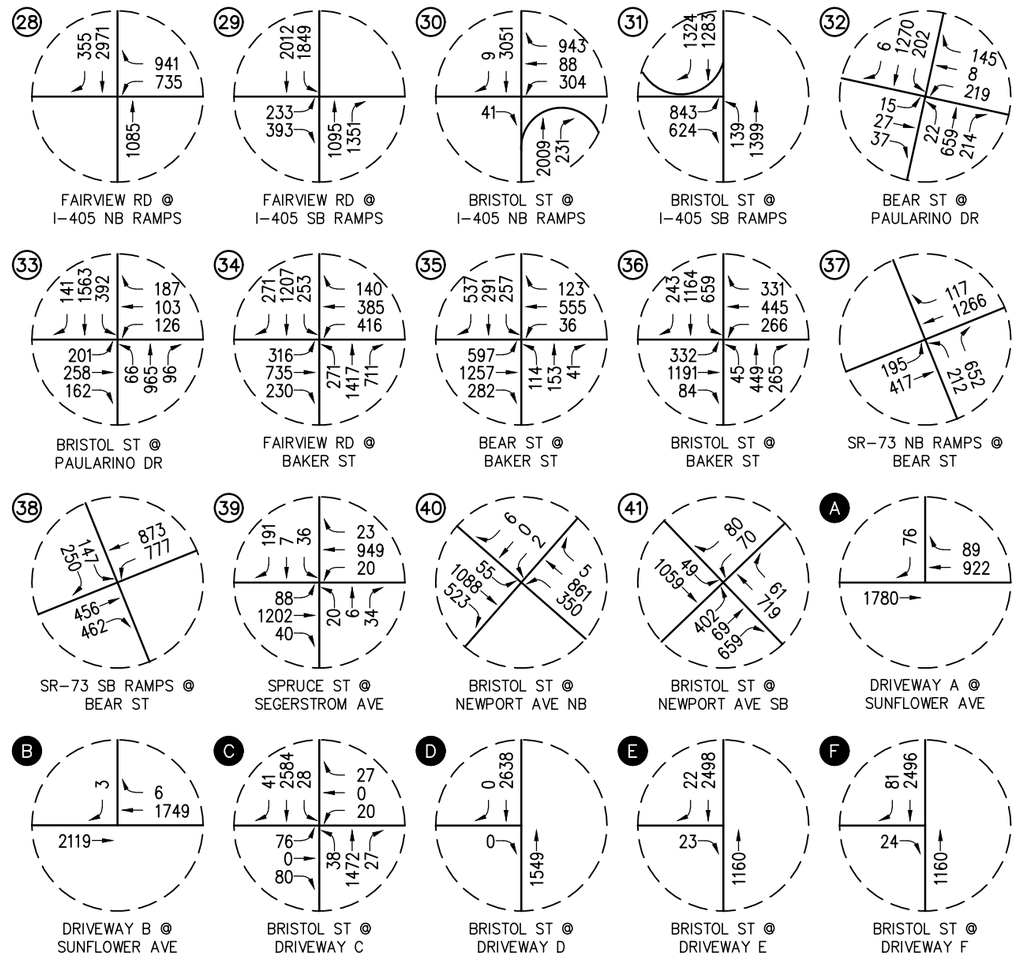
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 6-18A

YEAR 2045 BUILDOUT PLUS PROJECT PHASES 1, 2 AND 3 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

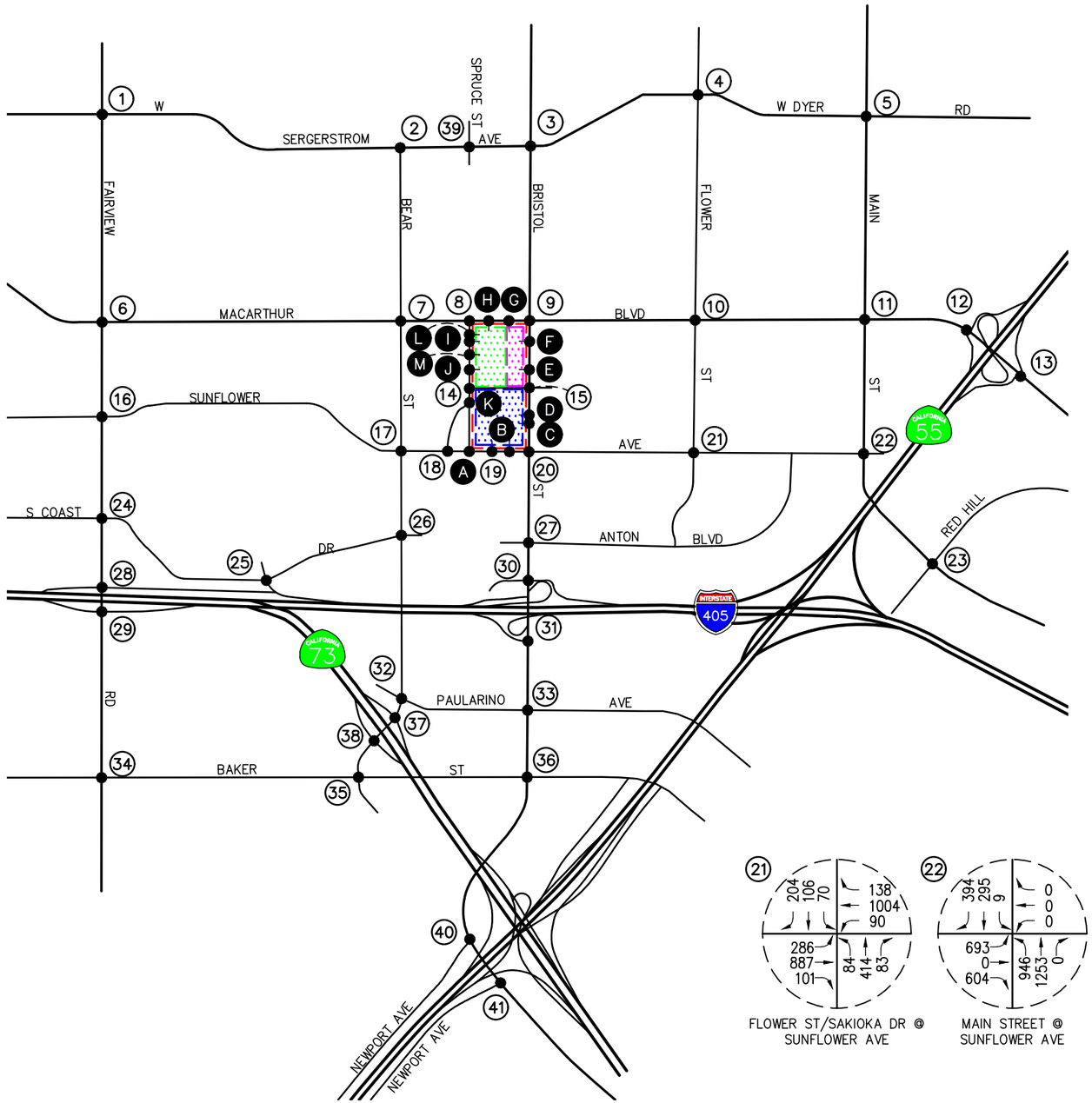
KEY

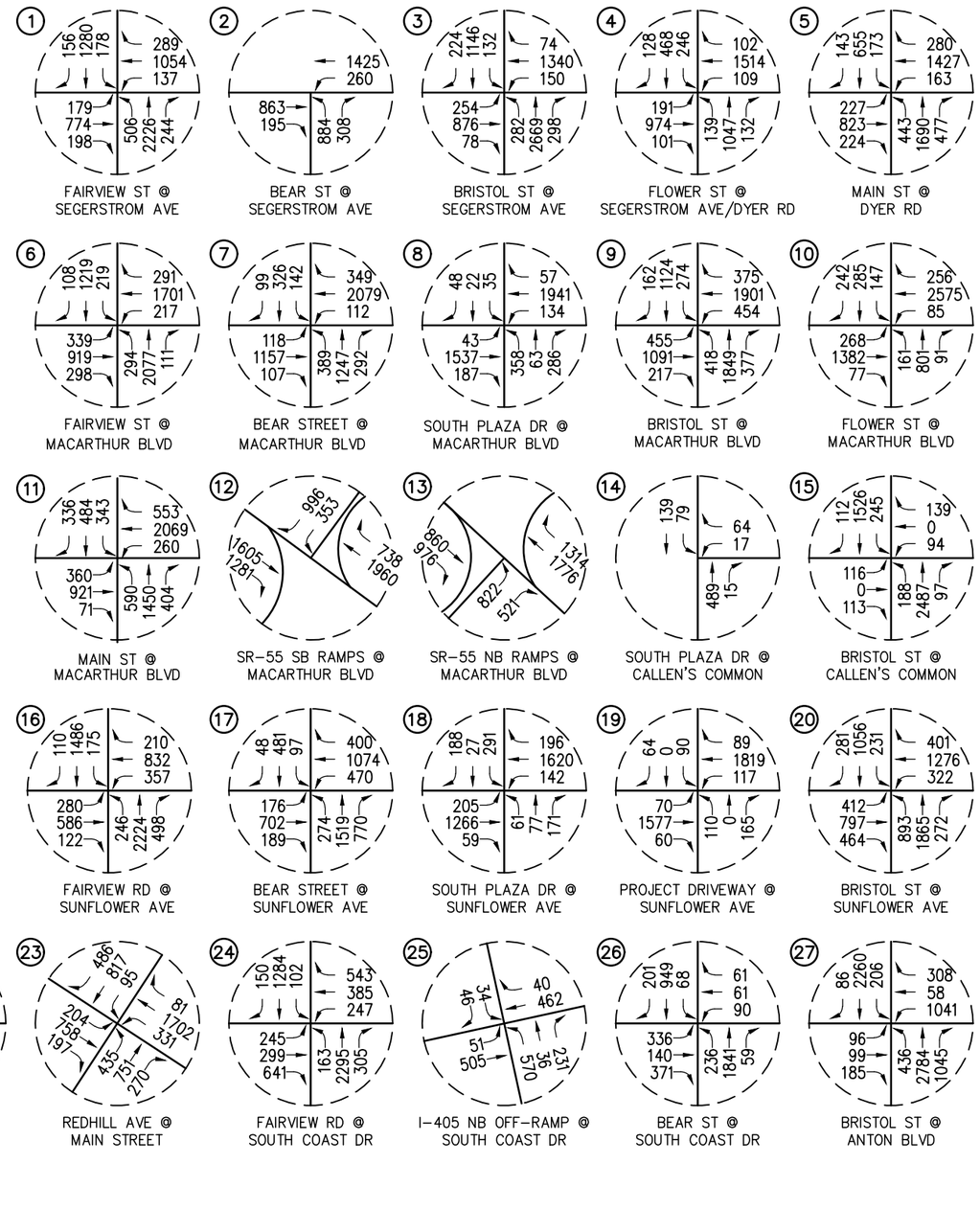
(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 6-18B

YEAR 2045 BUILDOUT PLUS PROJECT PHASES 1, 2 AND 3 AM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

= PHASE 1

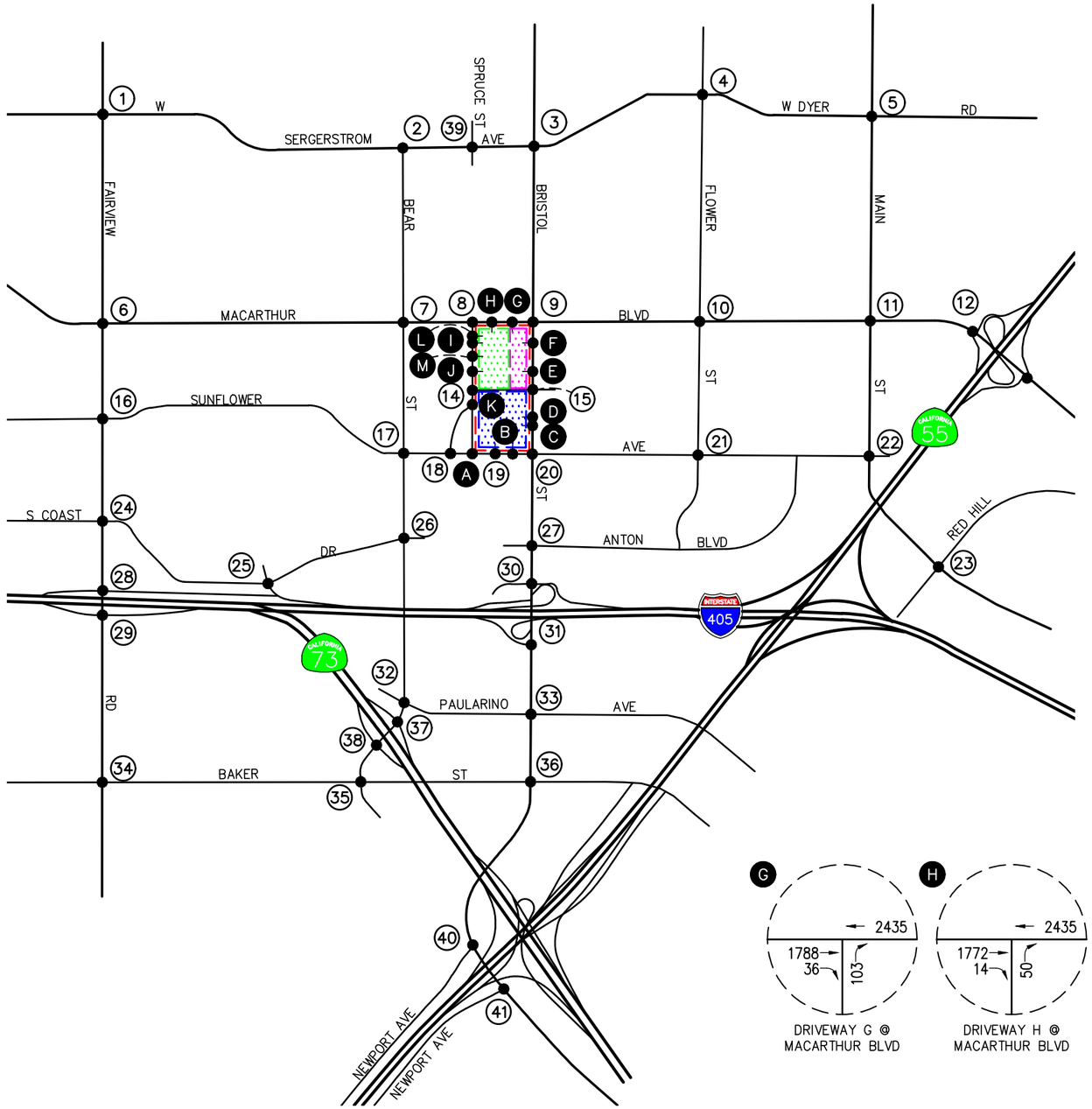
= PHASE 2

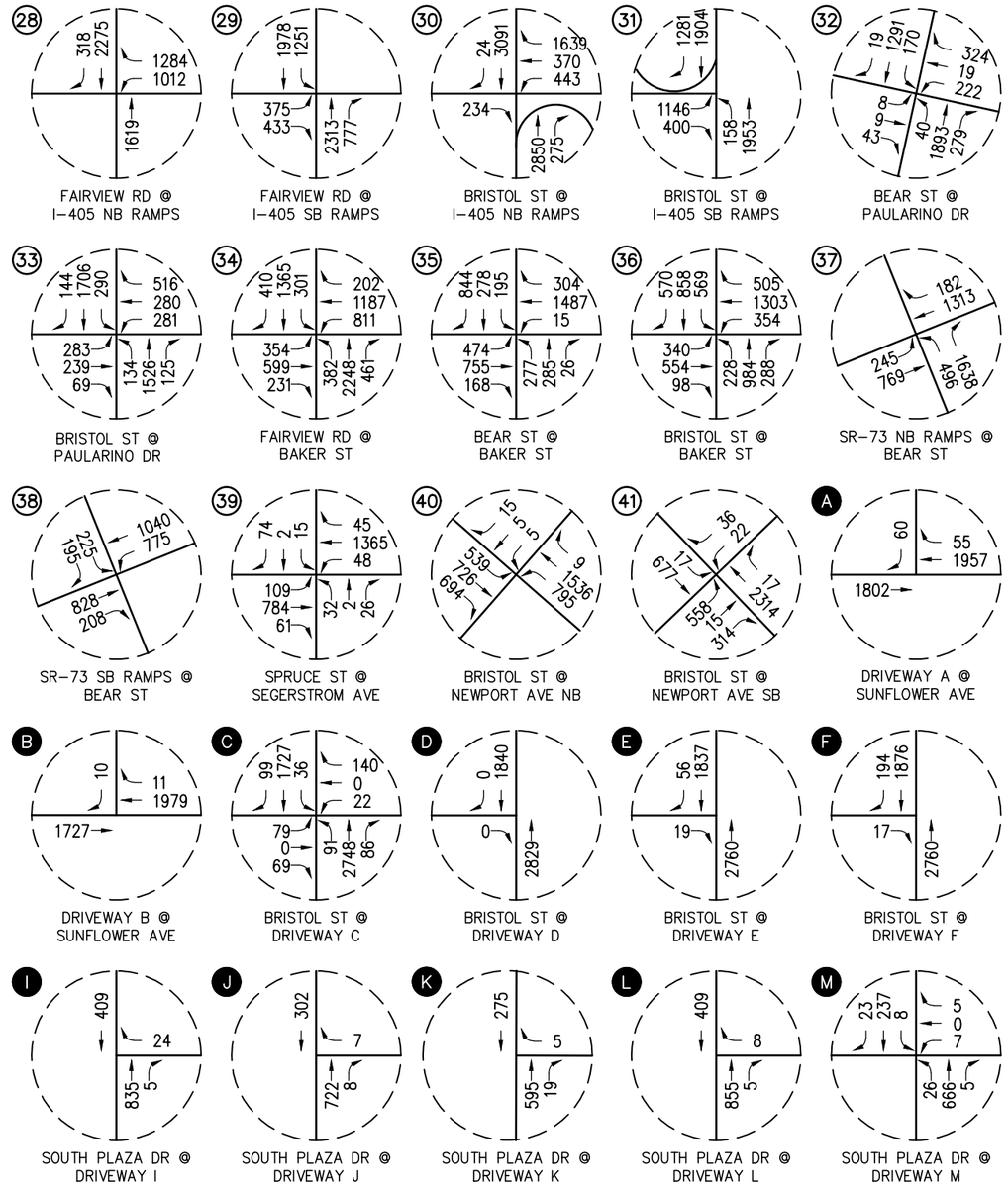
= PHASE 3

FIGURE 6-19A

YEAR 2045 BUILDOUT PLUS PROJECT PHASES 1, 2 AND 3 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

(#) = STUDY INTERSECTION
= PROJECT SITE
= PHASE 1
= PHASE 2
= PHASE 3

FIGURE 6-19B

YEAR 2045 BUILDOUT PLUS PROJECT PHASES 1, 2 AND 3 PM PEAK HOUR TRAFFIC VOLUMES

RELATED BRISTOL, SANTA ANA

7.0 TRAFFIC ANALYSIS METHODOLOGY

The relative effect of the added peak hour Project traffic volumes generated by the Project have been evaluated based on the analysis of future operating conditions at forty-one (41) study intersections. Operating conditions at the key study intersections were evaluated during the AM and PM peak hours for existing traffic conditions, future near-term (2030, 2032 and 2036) and future long-term (2045) traffic conditions without, then with the proposed Project. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships and LOS characteristics at each study intersection. The potential effect of the Project at each key intersection was then evaluated using LOS standards and thresholds summarized below.

7.1 LOS Standards and Thresholds

7.1.1 *City of Santa Ana*

Based on the City of Santa Ana, the need for potential improvements will be assessed based on the following criteria:

- Project traffic would cause an intersection currently operating at an acceptable peak hour Level of Service (LOS) to operate at an unacceptable peak hour LOS. The City of Santa Ana considers LOS D to be the minimum acceptable LOS for all intersections, or
- The project increases traffic demand by 1% of capacity (ICU increase ≥ 0.01) if the intersection already operates at an unacceptable LOS.
- At unsignalized intersections, the project causes an intersection at LOS D or better to degrade to LOS E or F.

7.1.2 *City of Costa Mesa*

Per the City of Costa Mesa, the need for potential improvements will be assessed based on the following criteria:

- The project increases traffic demand by 1% of capacity (ICU increase ≥ 0.01) at a signalized study intersection forecast to operate at an unacceptable LOS. The City of Costa Mesa considers LOS D to be the minimum acceptable LOS for all intersections.
- At unsignalized intersections, the project causes an intersection at LOS D or better to degrade to LOS E or F, and the traffic signal warrant analysis determines that a signal is justified.

7.1.3 *City of Irvine*

Per the City of Irvine, the need for potential improvements will be assessed based on the following criteria:

- Project traffic would cause an intersection currently operating at an acceptable peak hour Level of Service (LOS) to operate at an unacceptable peak hour LOS. The City of Irvine considers LOS D to be the minimum acceptable LOS for all intersections, or
- The project increases traffic demand by 2% of capacity (ICU increase ≥ 0.02) if the intersection already operates at an unacceptable LOS.

7.2 Traffic Analysis Scenarios

The following scenarios are those for which LOS calculations have been performed at the forty-one (41) study intersections and forty-three (43) roadway segments to determine the potential circulation effects of the proposed Project:

1. Existing Traffic Conditions;
2. Existing Plus Project (Phase 1) Traffic Conditions;
3. Scenario (2) with recommended improvements, if necessary;
4. Existing Plus Project (Phase 1 and 2) Traffic Conditions;
5. Scenario (4) with recommended improvements, if necessary;
6. Existing Plus Project (Phase 1, 2 and 3) Traffic Conditions;
7. Scenario (6) with recommended improvements, if necessary;
8. Near-Term (Year 2030) Background Traffic Conditions (Existing plus Ambient Growth plus Related Projects);
9. Near-Term (Year 2030) Background Plus Project (Phase 1) Traffic Conditions;
10. Scenario (9) with recommended improvements, if necessary;
11. Near-Term (Year 2032) Background Traffic Conditions (Existing plus Ambient Growth plus Related Projects);
12. Near-Term (Year 2032) Background Plus Project (Phase 1 and 2) Traffic Conditions;
13. Scenario (12) with recommended improvements, if necessary;
14. Near-Term (Year 2036) Background Traffic Conditions (Existing plus Ambient Growth plus Related Projects);
15. Near-Term (Year 2036) Background Plus Project (Phase 1, 2 and 3) Traffic Conditions;
16. Scenario (15) with recommended improvements, if necessary;
17. Long-Term (Year 2045) Buildout Traffic Conditions;
18. Long-Term (Year 2045) Buildout Plus Project (Phase 1, 2 and 3) Traffic Conditions; and
19. Scenario (18) with recommended improvements, if necessary.

8.0 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

8.1 Existing Plus Project Phase 1 Analysis

Table 8-1 summarizes the peak hour Level of Service results at the forty-one (41) key study intersections for Existing Plus Project Phase 1 traffic conditions. The first column (1) of ICU/LOS values and HCM/LOS values in *Table 8-1* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists existing traffic conditions with the addition of traffic generated by the proposed Project Phase 1. The third column (3) shows the increase in ICU value and/or HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.1.1 *Existing Traffic Conditions*

As previously summarized in *Section 3.5.2*, six (6) of the forty-one (41) study intersections currently operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections currently operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	0.944	E
3. Bristol Street at Segerstrom Avenue	--	--	0.918	E
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.906	E
5. Main Street at Dyer Road	--	--	0.924	E
10. Flower Street at MacArthur Boulevard	--	--	0.915	E
39. Spruce Street at Segerstrom Avenue	51.6 s/v	F	65.3 s/v	F

8.1.2 *Existing Plus Project Phase 1 Traffic Conditions*

Review of column (2) of *Table 8-1* indicates that six (6) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	0.946	E
3. Bristol Street at Segerstrom Avenue	--	--	0.920	E
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.908	E
5. Main Street at Dyer Road	--	--	0.925	E
10. Flower Street at MacArthur Boulevard	--	--	0.926	E
39. Spruce Street at Segerstrom Avenue	52.3 s/v	F	65.8 s/v	F

Review of column (3) of *Table 8-1* indicates that of the six (6) study intersections operating adversely, the intersection of Flower Street at MacArthur Boulevard (Intersection No. 10) exceeds the level of service thresholds. For that intersection, improvements are recommended, if feasible. The proposed Project adds less than the required increment thresholds to the remaining five (5) study intersections. No improvements are recommended.

Review of column (4) of *Table 8-1* indicates that improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) to pre-project LOS conditions are considered infeasible. These recommended improvements are discussed in Section 12.0. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

It should be noted that although the intersection of Flower Street at Segerstrom Avenue (Intersection No. 4) operates adversely, the level of service thresholds is not exceeded. It is our understanding that the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

Lastly, it should be noted that although the intersection of Spruce Street at Segerstrom Avenue (Intersection No. 39) operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

Appendix D also presents the Existing Plus Project Phase 1 ICU/LOS and HCM/LOS calculations for the forty-one (41) key study intersections.

TABLE 8-1

EXISTING PLUS PROJECT PHASE 1 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1.	Fairview Street at	AM	0.801	D	0.808	D	0.007	No	--	--
	Segerstrom Avenue	PM	**0.944**	**E**	**0.946**	**E**	0.002	No	--	--
2.	Bear Street at	AM	0.588	A	0.588	A	0.000	No	--	--
	Segerstrom Avenue	PM	0.606	B	0.606	B	0.000	No	--	--
3.	Bristol Street at	AM	0.801	D	0.816	D	0.015	No	--	--
	Segerstrom Avenue	PM	**0.918**	**E**	**0.920**	**E**	0.002	No	--	--
4.	Flower Street at	AM	0.776	C	0.782	C	0.006	No	0.782[25]	C
	Segerstrom Avenue/Dyer Road	PM	**0.906**	**E**	**0.908**	**E**	0.002	No	**0.908**[25]	**E**
5.	Main Street at	AM	0.743	C	0.747	C	0.004	No	--	--
	Dyer Road	PM	**0.924**	**E**	**0.925**	**E**	0.001	No	--	--
6.	Fairview Street at	AM	0.710	C	0.712	C	0.002	No	--	--
	MacArthur Boulevard	PM	0.834	D	0.834	D	0.000	No	--	--
7.	Bear Street at	AM	0.744	C	0.746	C	0.002	No	--	--
	MacArthur Boulevard	PM	0.876	D	0.880	D	0.004	No	--	--

[25] Level of Service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. The City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

TABLE 8-1 (CONTINUED)
EXISTING PLUS PROJECT PHASE 1 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
8.	South Plaza Drive at	AM	0.518	A	0.542	A	0.024	No	--	--
	MacArthur Boulevard	PM	0.621	B	0.618	B	0.000[26]	No	--	--
9.	Bristol Street at	AM	0.745	C	0.760	C	0.015	No	--	--
	MacArthur Boulevard	PM	0.820	D	0.823	D	0.003	No	--	--
10.	Flower Street at	AM	0.705	C	0.723	C	0.018	No	0.723[27]	C
	MacArthur Boulevard	PM	**0.915**	**E**	**0.926**	**E**	**0.011**	**Yes**	**0.926**[27]	**E**
11.	Main Street at	AM	0.742	C	0.757	C	0.015	No	--	--
	MacArthur Boulevard	PM	0.785	C	0.794	C	0.009	No	--	--
12.	SR-55 SB Ramps at	AM	Caltrans Intersection, **See Section 9.0**							
	MacArthur Boulevard	PM								
13.	SR-55 NB Ramps at	AM	Caltrans Intersection, **See Section 9.0**							
	MacArthur Boulevard	PM								
14.	South Plaza Drive at	AM	9.6 s/v	A	0.085	A	--	No	--	--
	Callen's Common	PM	11.7 s/v	B	0.184	A	--	No	--	--

[26] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

[27] Improvements which are required to bring Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

TABLE 8-1 (CONTINUED)
EXISTING PLUS PROJECT PHASE 1 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
15. Bristol Street at Callen's Commons	AM	0.530	A	0.508	A	0.000[28]	No	--	--
	PM	0.723	C	0.632	B	0.000[28]	No	--	--
16. Fairview Road at Sunflower Avenue	AM	0.716	C	0.717	C	0.001	No	--	--
	PM	0.714	C	0.714	C	0.000	No	--	--
Costa Mesa:	*AM*	*0.774*	*C*	*0.776*	*C*	0.002	*No*	--	--
	PM	*0.733*	*C*	*0.733*	*C*	0.000	*No*	--	--
17. Bear Street at Sunflower Avenue	AM	0.433	A	0.448	A	0.015	No	--	--
	PM	0.689	B	0.689	B	0.000	No	--	--
Costa Mesa:	*AM*	*0.474*	*A*	*0.492*	*A*	0.018	*No*	--	--
	PM	*0.683*	*B*	*0.684*	*B*	0.001	*No*	--	--
18. South Plaza Drive at Sunflower Avenue	AM	0.326	A	0.343	A	0.017	No	--	--
	PM	0.538	A	0.549	A	0.011	No	--	--
Costa Mesa:	*AM*	*0.314*	*A*	*0.333*	*A*	0.019	*No*	--	--
	PM	*0.535*	*A*	*0.546*	*A*	0.011	*No*	--	--

[28] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

TABLE 8-1 (CONTINUED)
EXISTING PLUS PROJECT PHASE 1 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
19. Project Driveway at Sunflower Avenue	AM	13.4 s/v	B	0.354[29]	A	--	No	--	--
	PM	18.6 s/v	C	0.551[29]	A	--	No	--	--
Costa Mesa:	*AM*	*13.4 s/v*	*B*	*0.304*[29]	*A*	--	*No*	--	--
	PM	*18.6 s/v*	*C*	*0.501*[29]	*A*	--	*No*	--	--
20. Bristol Street at Sunflower Avenue	AM	0.641	B	0.682	B	0.041	No	--	--
	PM	0.698	B	0.721	C	0.023	No	--	--
Costa Mesa:	*AM*	*0.687*	*B*	*0.734*	*C*	0.047	*No*	--	--
	PM	*0.676*	*B*	*0.703*	*C*	0.027	*No*	--	--
21. Flower Street/Sakioka Drive at Sunflower Avenue	AM	0.347	A	0.351	A	0.004	No	--	--
	PM	0.422	A	0.425	A	0.003	No	--	--
Costa Mesa:	*AM*	*0.321*	*A*	*0.325*	*A*	0.004	*No*	--	--
	PM	*0.394*	*A*	*0.397*	*A*	0.003	*No*	--	--
22. Main Street at Sunflower Avenue	AM	0.470	A	0.476	A	0.006	No	--	--
	PM	0.621	B	0.624	B	0.003	No	--	--
Costa Mesa:	*AM*	*0.513*	*A*	*0.521*	*A*	0.008	*No*	--	--
	PM	*0.632*	*B*	*0.636*	*B*	0.004	*No*	--	--

[29] There are multiple factors that come into play to allow for the installation of the proposed signal along Sunflower. Two main factors are that South Coast Plaza would have to agree to construct the south leg of the signal and that City of Costa Mesa would also have to provide construction permits since half of the street falls within the jurisdiction of the City of Costa Mesa. Since both of these factors cannot be fully guaranteed two alternatives have been considered. In the event that the south leg is not built by South Coast Plaza the intersection would operate as a 3-legged intersection with a three-phase traffic signal (Alternative 1). If Costa Mesa does not allow the proposed signal the intersection would operate as a 3-leg unsignalized right-turn only intersection (Alternative 2). Resulting service levels for the two alternatives at Project Driveway at Sunflower Avenue (Intersection No. 19) are summarized below:

- *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.310, LOS A; PM Peak Hour – 0.482, LOS A / (Alt. 2) AM Peak Hour – 11.3 s/v, LOS B, PM Peak Hour – 20.2 s/v, LOS C*
- *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.274, LOS A; PM Peak Hour – 0.455, LOS A / (Alt. 2) AM Peak Hour – 11.3 s/v, LOS B; PM Peak Hour – 20.2 s/v, LOS C*
- *It should be noted that intersections 14, 15, 18, 20 and Project driveways A, B, C, D and K are also affected by the change of intersection operations as part of Alternative 2. However, the level of service results are consistent with the findings identified in Sections 8.0 and 11.1.1 of this report. Appendix F includes the intersection calculation worksheets for Alternatives 1 and 2.*

TABLE 8-1 (CONTINUED)
EXISTING PLUS PROJECT PHASE 1 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
23. Red Hill Avenue at Main Street	AM	0.640	B	0.644	B	0.004	No	--	--
	PM	0.811	D	0.813	D	0.002	No	--	--
24. Fairview Road at South Coast Drive	AM	0.744	C	0.745	C	0.001	No	--	--
	PM	0.836	D	0.836	D	0.000	No	--	--
25. I-405 NB Off-Ramp at South Coast Drive	AM	Caltrans Intersection, **See Section 9.0**							
	PM								
26. Bear Street at South Coast Drive	AM	0.371	A	0.382	A	0.011	No	--	--
	PM	0.555	A	0.561	A	0.006	No	--	--
27. Bristol Street at Anton Boulevard	AM	0.421	A	0.444	A	0.023	No	--	--
	PM	0.628	B	0.637	B	0.009	No	--	--
28. Fairview Road at I-405 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**							
	PM								
29. Fairview Road at I-405 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**							
	PM								

TABLE 8-1 (CONTINUED)
EXISTING PLUS PROJECT PHASE 1 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
30. Bristol Street at I-405 NB Ramps	AM PM	Caltrans Intersection, **See Section 9.0**							
31. Bristol Street at I-405 SB Ramps	AM PM	Caltrans Intersection, **See Section 9.0**							
32. Bear Street at	AM	0.316	A	0.326	A	0.010	No	--	--
Paularino Avenue	PM	0.609	B	0.615	B	0.006	No	--	--
33. Bristol Street at	AM	0.604	B	0.609	B	0.005	No	--	--
Paularino Avenue	PM	0.833	D	0.834	D	0.001	No	--	--
34. Fairview Road at	AM	0.761	C	0.761	C	0.000	No	--	--
Baker Street	PM	0.702	C	0.702	C	0.000	No	--	--
35. Bear Street at	AM	0.666	B	0.666	B	0.000	No	--	--
Baker Street	PM	0.729	C	0.729	C	0.000	No	--	--
36. Bristol Street at	AM	0.616	B	0.618	B	0.002	No	--	--
Baker Street	PM	0.741	C	0.744	C	0.003	No	--	--

TABLE 8-1 (CONTINUED)
EXISTING PLUS PROJECT PHASE 1 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
37. Bear Street at SR-73 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**							
	PM								
38. Bear Street at SR-73 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**							
	PM								
39. Spruce Street at Segerstrom Avenue	AM	**51.6 s/v**	**F**	**52.3 s/v**	**F**	0.7 s/v	No	0.457[30]	A
	PM	**65.3 s/v**	**F**	**65.8 s/v**	**F**	0.5 s/v	No	0.470[30]	A
40. Bristol Street at Newport Boulevard (SB)	AM	0.382	A	0.387	A	0.005	No	--	--
	PM	0.495	A	0.623	B	0.128	No	--	--
41. Bristol Street at Newport Boulevard (NB)	AM	0.561	A	0.562	A	0.001	No	--	--
	PM	0.637	B	0.637	B	0.000	No	--	--

Notes:

- **BOLD ICU/HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)
- N.F. = Improvements not feasible

[30] Level of service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

8.2 Existing Plus Project Phases 1 and 2 Analysis

Table 8-2 summarizes the peak hour Level of Service results at the forty-one (41) key study intersections for Existing Plus Project Phases 1 and 2 traffic conditions. The first column (1) of ICU/LOS values and HCM/LOS values in *Table 8-2* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists existing traffic conditions with the addition of traffic generated by the proposed Project Phases 1 and 2. The third column (3) shows the increase in ICU value and/or HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.2.1 *Existing Traffic Conditions*

As previously summarized in *Section 3.5.2*, six (6) of the forty-one (41) study intersections currently operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections currently operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	0.944	E
3. Bristol Street at Segerstrom Avenue	--	--	0.918	E
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.906	E
5. Main Street at Dyer Road	--	--	0.924	E
10. Flower Street at MacArthur Boulevard	--	--	0.915	E
39. Spruce Street at Segerstrom Avenue	51.6 s/v	F	65.3 s/v	F

8.2.2 *Existing Plus Project Phases 1 and 2 Traffic Conditions*

Review of column (2) of *Table 8-2* indicates that six (6) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	0.951	E
3. Bristol Street at Segerstrom Avenue	--	--	0.923	E
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.911	E
5. Main Street at Dyer Road	--	--	0.927	E
10. Flower Street at MacArthur Boulevard	--	--	0.937	E
39. Spruce Street at Segerstrom Avenue	53.2 s/v	F	67.0 s/v	F

Review of column (3) of *Table 8-2* indicates that of the six (6) study intersections operating adversely, the intersection of Flower Street at MacArthur Boulevard (Intersection No. 10) exceeds the level of service thresholds. For that intersection, improvements are recommended, if feasible. The proposed Project adds less than the required increment thresholds to the remaining five (5) study intersections. No improvements are recommended.

Review of column (4) of *Table 8-2* indicates that improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) to pre-project LOS conditions are considered infeasible. These recommended improvements are discussed in Section 12.0. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

It should be noted that although the intersection of Flower Street at Segerstrom Avenue (Intersection No. 4) operates adversely, the level of service thresholds is not exceeded. It is our understanding that the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

Lastly, it should be noted that although the intersection of Spruce Street at Segerstrom Avenue (Intersection No. 39) operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

Appendix D also presents the Existing Plus Project Phases 1 and 2 ICU/LOS and HCM/LOS calculations for the forty-one (41) key study intersections.

TABLE 8-2

EXISTING PLUS PROJECT PHASES 1 AND 2 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Fairview Street at	AM	0.801	D	0.812	D	0.011	No	--	--
Segerstrom Avenue	PM	**0.944**	**E**	**0.951**	**E**	0.007	No	--	--
2. Bear Street at	AM	0.588	A	0.589	A	0.001	No	--	--
Segerstrom Avenue	PM	0.606	B	0.608	B	0.002	No	--	--
3. Bristol Street at	AM	0.801	D	0.824	D	0.023	No	--	--
Segerstrom Avenue	PM	**0.918**	**E**	**0.923**	**E**	0.005	No	--	--
4. Flower Street at	AM	0.776	C	0.784	C	0.008	No	0.784[31]	C
Segerstrom Avenue/Dyer Road	PM	**0.906**	**E**	**0.911**	**E**	0.005	No	**0.911**[31]	**E**
5. Main Street at	AM	0.743	C	0.749	C	0.006	No	--	--
Dyer Road	PM	**0.924**	**E**	**0.927**	**E**	0.003	No	--	--
6. Fairview Street at	AM	0.710	C	0.712	C	0.002	No	--	--
MacArthur Boulevard	PM	0.834	D	0.836	D	0.002	No	--	--
7. Bear Street at	AM	0.744	C	0.747	C	0.003	No	--	--
MacArthur Boulevard	PM	0.876	D	0.885	D	0.009	No	--	--

[31] Level of Service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. The City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

TABLE 8-2 (CONTINUED)

EXISTING PLUS PROJECT PHASES 1 AND 2 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
8.	South Plaza Drive at	AM	0.518	A	0.554	A	0.036	No	--	--
	MacArthur Boulevard	PM	0.621	B	0.623	B	0.002	No	--	--
9.	Bristol Street at	AM	0.745	C	0.779	C	0.034	No	--	--
	MacArthur Boulevard	PM	0.820	D	0.826	D	0.006	No	--	--
10.	Flower Street at	AM	0.705	C	0.737	C	0.032	No	0.737[32]	C
	MacArthur Boulevard	PM	**0.915**	**E**	**0.937**	**E**	**0.022**	**Yes**	**0.937**[32]	**E**
11.	Main Street at	AM	0.742	C	0.771	C	0.029	No	--	--
	MacArthur Boulevard	PM	0.785	C	0.804	D	0.019	No	--	--
12.	SR-55 SB Ramps at	AM	Caltrans Intersection, **See Section 9.0**							
	MacArthur Boulevard	PM								
13.	SR-55 NB Ramps at	AM	Caltrans Intersection, **See Section 9.0**							
	MacArthur Boulevard	PM								
14.	South Plaza Drive at	AM	9.6 s/v	A	0.087	A	--	No	--	--
	Callen's Common	PM	11.7 s/v	B	0.191	A	--	No	--	--

[32] Improvements which are required to bring Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

TABLE 8-2 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1 AND 2 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
15. Bristol Street at Callen's Commons	AM	0.530	A	0.564	A	0.034	No	--	--
	PM	0.723	C	0.649	B	0.000[33]	No	--	--
16. Fairview Road at Sunflower Avenue	AM	0.716	C	0.718	C	0.002	No	--	--
	PM	0.714	C	0.714	C	0.000	No	--	--
Costa Mesa:	*AM*	*0.774*	*C*	*0.777*	*C*	*0.003*	*No*	--	--
	PM	*0.733*	*C*	*0.733*	*C*	*0.000*	*No*	--	--
17. Bear Street at Sunflower Avenue	AM	0.433	A	0.450	A	0.017	No	--	--
	PM	0.689	B	0.689	B	0.000	No	--	--
Costa Mesa:	*AM*	*0.474*	*A*	*0.494*	*A*	*0.020*	*No*	--	--
	PM	*0.683*	*B*	*0.684*	*B*	*0.001*	*No*	--	--
18. South Plaza Drive at Sunflower Avenue	AM	0.326	A	0.343	A	0.017	No	--	--
	PM	0.538	A	0.551	A	0.013	No	--	--
Costa Mesa:	*AM*	*0.314*	*A*	*0.333*	*A*	*0.019*	*No*	--	--
	PM	*0.535*	*A*	*0.548*	*A*	*0.013*	*No*	--	--

[33] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

TABLE 8-2 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1 AND 2 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
19. Project Driveway at Sunflower Avenue	AM	13.4 s/v	B	0.354[34]	A	--	No	--	--
	PM	18.6 s/v	C	0.551[34]	A	--	No	--	--
Costa Mesa:	*AM*	*13.4 s/v*	*B*	*0.304*[34]	*A*	--	*No*	--	--
	PM	*18.6 s/v*	*C*	*0.501*[34]	*A*	--	*No*	--	--
20. Bristol Street at Sunflower Avenue	AM	0.641	B	0.697	B	0.056	No	--	--
	PM	0.698	B	0.734	C	0.036	No	--	--
Costa Mesa:	*AM*	*0.687*	*B*	*0.752*	*C*	*0.065*	*No*	--	--
	PM	*0.676*	*B*	*0.711*	*C*	*0.035*	*No*	--	--
21. Flower Street/Sakioka Drive at Sunflower Avenue	AM	0.347	A	0.353	A	0.006	No	--	--
	PM	0.422	A	0.426	A	0.004	No	--	--
Costa Mesa:	*AM*	*0.321*	*A*	*0.328*	*A*	*0.007*	*No*	--	--
	PM	*0.394*	*A*	*0.398*	*A*	*0.004*	*No*	--	--
22. Main Street at Sunflower Avenue	AM	0.470	A	0.480	A	0.010	No	--	--
	PM	0.621	B	0.627	B	0.006	No	--	--
Costa Mesa:	*AM*	*0.513*	*A*	*0.525*	*A*	*0.012*	*No*	--	--
	PM	*0.632*	*B*	*0.639*	*B*	*0.007*	*No*	--	--

[34] There are multiple factors that come into play to allow for the installation of the proposed signal along Sunflower. Two main factors are that South Coast Plaza would have to agree to construct the south leg of the signal and that City of Costa Mesa would also have to provide construction permits since half of the street falls within the jurisdiction of the City of Costa Mesa. Since both of these factors cannot be fully guaranteed two alternatives have been considered. In the event that the south leg is not built by South Coast Plaza the intersection would operate as a 3-legged intersection with a three-phase traffic signal (Alternative 1). If Costa Mesa does not allow the proposed signal the intersection would operate as a 3-leg unsignalized right-turn only intersection (Alternative 2). Resulting service levels for the two alternatives at Project Driveway at Sunflower Avenue (Intersection No. 19) are summarized below:

- *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.310, LOS A; PM Peak Hour – 0.482, LOS A / (Alt. 2) AM Peak Hour – 11.3 s/v, LOS B, PM Peak Hour – 20.2 s/v, LOS C*
- *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.274, LOS A; PM Peak Hour – 0.455, LOS A / (Alt. 2) AM Peak Hour – 11.3 s/v, LOS B; PM Peak Hour – 20.2 s/v, LOS C*
- *It should be noted that intersections 14, 15, 18, 20 and Project driveways A, B, C, D and K are also affected by the change of intersection operations as part of Alternative 2. However, the level of service results are consistent with the findings identified in Sections 8.0 and 11.1.1 of this report. Appendix F includes the intersection calculation worksheets for Alternatives 1 and 2.*

TABLE 8-2 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1 AND 2 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
23.	Red Hill Avenue at	AM	0.640	B	0.646	B	0.006	No	--	--
	Main Street	PM	0.811	D	0.815	D	0.004	No	--	--
24.	Fairview Road at	AM	0.744	C	0.746	C	0.002	No	--	--
	South Coast Drive	PM	0.836	D	0.837	D	0.001	No	--	--
25.	I-405 NB Off-Ramp at	AM	Caltrans Intersection, **See Section 9.0**							
	South Coast Drive	PM								
26.	Bear Street at	AM	0.371	A	0.383	A	0.012	No	--	--
	South Coast Drive	PM	0.555	A	0.561	A	0.006	No	--	--
27.	Bristol Street at	AM	0.421	A	0.457	A	0.036	No	--	--
	Anton Boulevard	PM	0.628	B	0.644	B	0.016	No	--	--
28.	Fairview Road at	AM	Caltrans Intersection, **See Section 9.0**							
	I-405 NB Ramps	PM								
29.	Fairview Road at	AM	Caltrans Intersection, **See Section 9.0**							
	I-405 SB Ramps	PM								

TABLE 8-2 (CONTINUED)

EXISTING PLUS PROJECT PHASES 1 AND 2 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
30.	Bristol Street at I-405 NB Ramps	AM PM	Caltrans Intersection, **See Section 9.0**							
31.	Bristol Street at I-405 SB Ramps	AM PM	Caltrans Intersection, **See Section 9.0**							
32.	Bear Street at Paularino Avenue	AM	0.316	A	0.327	A	0.011	No	--	--
		PM	0.609	B	0.615	B	0.006	No	--	--
33.	Bristol Street at Paularino Avenue	AM	0.604	B	0.611	B	0.007	No	--	--
		PM	0.833	D	0.835	D	0.002	No	--	--
34.	Fairview Road at Baker Street	AM	0.761	C	0.762	C	0.001	No	--	--
		PM	0.702	C	0.703	C	0.001	No	--	--
35.	Bear Street at Baker Street	AM	0.666	B	0.666	B	0.000	No	--	--
		PM	0.729	C	0.729	C	0.000	No	--	--
36.	Bristol Street at Baker Street	AM	0.616	B	0.619	B	0.003	No	--	--
		PM	0.741	C	0.746	C	0.005	No	--	--

TABLE 8-2 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1 AND 2 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
37.	Bear Street at SR-73 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**							
		PM								
38.	Bear Street at SR-73 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**							
		PM								
39.	Spruce Street at Segerstrom Avenue	AM	**51.6 s/v**	**F**	**53.2 s/v**	**F**	1.6 s/v	No	0.458[35]	A
		PM	**65.3 s/v**	**F**	**67.0 s/v**	**F**	1.7 s/v	No	0.471[35]	A
40.	Bristol Street at Newport Boulevard (SB)	AM	0.382	A	0.389	A	0.007	No	--	--
		PM	0.495	A	0.626	B	0.131	No	--	--
41.	Bristol Street at Newport Boulevard (NB)	AM	0.561	A	0.563	A	0.002	No	--	--
		PM	0.637	B	0.637	B	0.000	No	--	--

Notes:

- **BOLD ICU/HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)
- N.F. = Improvements not feasible

[35] Level of service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

8.3 Existing Plus Project Phases 1, 2 and 3 Analysis

Table 8-3 summarizes the peak hour Level of Service results at the forty-one (41) key study intersections for Existing Plus Project Phases 1, 2 and 3 traffic conditions. The first column (1) of ICU/LOS values and HCM/LOS values in *Table 8-3* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists existing traffic conditions with the addition of traffic generated by the proposed Project Phases 1, 2 and 3. The third column (3) shows the increase in ICU value and/or HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.3.1 *Existing Traffic Conditions*

As previously summarized in *Section 3.5.2*, six (6) of the forty-one (41) study intersections currently operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections currently operate at acceptable level of service during the AM and PM peak hours. The intersections which operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	0.944	E
3. Bristol Street at Segerstrom Avenue	--	--	0.918	E
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.906	E
5. Main Street at Dyer Road	--	--	0.924	E
10. Flower Street at MacArthur Boulevard	--	--	0.915	E
39. Spruce Street at Segerstrom Avenue	51.6 s/v	F	65.3 s/v	F

8.3.2 *Existing Plus Project Phases 1, 2 and 3 Traffic Conditions*

Review of column (2) of *Table 8-3* indicates that six (6) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	0.948	E
3. Bristol Street at Segerstrom Avenue	--	--	0.922	E
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.909	E
5. Main Street at Dyer Road	--	--	0.927	E
10. Flower Street at MacArthur Boulevard	--	--	0.941	E
39. Spruce Street at Segerstrom Avenue	53.2 s/v	F	67.0 s/v	F

Review of column (3) of *Table 8-3* indicates that of the six (6) study intersections operating adversely, the intersection of Flower Street at MacArthur Boulevard (Intersection No. 10) exceeds the level of service thresholds. For that intersection, improvements are recommended, if feasible. The proposed Project adds less than the required increment thresholds to the remaining five (5) study intersections. No improvements are recommended.

Review of column (4) of *Table 8-3* indicates that improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) to pre-project LOS conditions are considered infeasible. These recommended improvements are discussed in Section 12.0. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

It should be noted that although the intersection of Flower Street at Segerstrom Avenue (Intersection No. 4) operates adversely, the level of service thresholds is not exceeded. It is our understanding that the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

Lastly, it should be noted that although the intersection of Spruce Street at Segerstrom Avenue (Intersection No. 39) operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

Appendix D also presents the Existing Plus Project Phases 1, 2 and 3 ICU/LOS and HCM/LOS calculations for the forty-one (41) key study intersections.

TABLE 8-3

EXISTING PLUS PROJECT PHASES 1, 2, AND 3 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Fairview Street at	AM	0.801	D	0.819	D	0.018	No	--	--
Segerstrom Avenue	PM	**0.944**	**E**	**0.948**	**E**	0.004	No	--	--
2. Bear Street at	AM	0.588	A	0.589	A	0.001	No	--	--
Segerstrom Avenue	PM	0.606	B	0.605	B	0.000[36]	No	--	--
3. Bristol Street at	AM	0.801	D	0.833	D	0.032	No	--	--
Segerstrom Avenue	PM	**0.918**	**E**	**0.922**	**E**	0.004	No	--	--
4. Flower Street at	AM	0.776	C	0.787	C	0.011	No	0.787[37]	C
Segerstrom Avenue/Dyer Road	PM	**0.906**	**E**	**0.909**	**E**	0.003	No	**0.909**[37]	**E**
5. Main Street at	AM	0.743	C	0.752	C	0.009	No	--	--
Dyer Road	PM	**0.924**	**E**	**0.927**	**E**	0.003	No	--	--
6. Fairview Street at	AM	0.710	C	0.712	C	0.002	No	--	--
MacArthur Boulevard	PM	0.834	D	0.833	D	0.000[36]	No	--	--
7. Bear Street at	AM	0.744	C	0.747	C	0.003	No	--	--
MacArthur Boulevard	PM	0.876	D	0.880	D	0.004	No	--	--

[36] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

[37] Level of Service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. The City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

TABLE 8-3 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1, 2, AND 3 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
8.	South Plaza Drive at	AM	0.518	A	0.574	A	0.056	No	--	--
	MacArthur Boulevard	PM	0.621	B	0.603	B	0.000[38]	No	--	--
9.	Bristol Street at	AM	0.745	C	0.807	D	0.062	No	--	--
	MacArthur Boulevard	PM	0.820	D	0.825	D	0.005	No	--	--
10.	Flower Street at	AM	0.705	C	0.759	C	0.054	No	0.759[39]	C
	MacArthur Boulevard	PM	**0.915**	**E**	**0.941**	**E**	**0.026**	**Yes**	**0.941**[39]	**E**
11.	Main Street at	AM	0.742	C	0.791	C	0.049	No	--	--
	MacArthur Boulevard	PM	0.785	C	0.810	D	0.025	No	--	--
12.	SR-55 SB Ramps at	AM	Caltrans Intersection, **See Section 9.0**							
	MacArthur Boulevard	PM								
13.	SR-55 NB Ramps at	AM	Caltrans Intersection, **See Section 9.0**							
	MacArthur Boulevard	PM								
14.	South Plaza Drive at	AM	9.6 s/v	A	0.090	A	--	No	--	--
	Callen's Common	PM	11.7 s/v	B	0.199	A	--	No	--	--

[38] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

[39] Improvements which are required to bring Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

TABLE 8-3 (CONTINUED)

EXISTING PLUS PROJECT PHASES 1, 2, AND 3 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
15. Bristol Street at Callen's Commons	AM	0.530	A	0.578	A	0.048	No	--	--
	PM	0.723	C	0.649	B	0.000[40]	No	--	--
16. Fairview Road at Sunflower Avenue	AM	0.716	C	0.719	C	0.003	No	--	--
	PM	0.714	C	0.714	C	0.000	No	--	--
Costa Mesa:	*AM*	*0.774*	*C*	*0.778*	*C*	0.004	*No*	--	--
	PM	*0.733*	*C*	*0.733*	*C*	0.000	*No*	--	--
17. Bear Street at Sunflower Avenue	AM	0.433	A	0.452	A	0.019	No	--	--
	PM	0.689	B	0.689	B	0.000	No	--	--
Costa Mesa:	*AM*	*0.474*	*A*	*0.496*	*A*	0.022	*No*	--	--
	PM	*0.683*	*B*	*0.684*	*B*	0.001	*No*	--	--
18. South Plaza Drive at Sunflower Avenue	AM	0.326	A	0.355	A	0.029	No	--	--
	PM	0.538	A	0.557	A	0.019	No	--	--
Costa Mesa:	*AM*	*0.314*	*A*	*0.346*	*A*	0.032	*No*	--	--
	PM	*0.535*	*A*	*0.556*	*A*	0.021	*No*	--	--

[40] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

TABLE 8-3 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1, 2, AND 3 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
19. Project Driveway at Sunflower Avenue	AM	13.4 s/v	B	0.358[41]	A	--	No	--	--
	PM	18.6 s/v	C	0.553[41]	A	--	No	--	--
Costa Mesa:	*AM*	*13.4 s/v*	*B*	*0.325*[41]	*A*	--	*No*	--	--
	PM	*18.6 s/v*	*C*	*0.530*[41]	*A*	--	*No*	--	--
20. Bristol Street at Sunflower Avenue	AM	0.641	B	0.724	C	0.083	No	--	--
	PM	0.698	B	0.735	C	0.037	No	--	--
Costa Mesa:	*AM*	*0.687*	*B*	*0.785*	*C*	0.098	*No*	--	--
	PM	*0.676*	*B*	*0.718*	*C*	0.042	*No*	--	--
21. Flower Street/Sakioka Drive at Sunflower Avenue	AM	0.347	A	0.357	A	0.010	No	--	--
	PM	0.422	A	0.427	A	0.005	No	--	--
Costa Mesa:	*AM*	*0.321*	*A*	*0.332*	*A*	0.011	*No*	--	--
	PM	*0.394*	*A*	*0.399*	*A*	0.005	*No*	--	--
22. Main Street at Sunflower Avenue	AM	0.470	A	0.485	A	0.015	No	--	--
	PM	0.621	B	0.628	B	0.007	No	--	--
Costa Mesa:	*AM*	*0.513*	*A*	*0.531*	*A*	0.018	*No*	--	--
	PM	*0.632*	*B*	*0.640*	*B*	0.008	*No*	--	--

[41] There are multiple factors that come into play to allow for the installation of the proposed signal along Sunflower. Two main factors are that South Coast Plaza would have to agree to construct the south leg of the signal and that City of Costa Mesa would also have to provide construction permits since half of the street falls within the jurisdiction of the City of Costa Mesa. Since both of these factors cannot be fully guaranteed two alternatives have been considered. In the event that the south leg is not built by South Coast Plaza the intersection would operate as a 3-legged intersection with a three-phase traffic signal (Alternative 1). If Costa Mesa does not allow the proposed signal the intersection would operate as a 3-leg unsignalized right-turn only intersection (Alternative 2). Resulting service levels for the two alternatives at Project Driveway at Sunflower Avenue (Intersection No. 19) are summarized below:

- *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.314, LOS A; PM Peak Hour – 0.484, LOS A / (Alt. 2) AM Peak Hour – 11.3 s/v, LOS B, PM Peak Hour – 20.4 s/v, LOS C*
- *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.279, LOS A; PM Peak Hour – 0.458, LOS A / (Alt. 2) AM Peak Hour – 11.5 s/v LOS B; PM Peak Hour – 21.9 s/v, LOS C*
- *It should be noted that intersections 14, 15, 18, 20 and Project driveways A, B, C, D and K are also affected by the change of intersection operations as part of Alternative 2. However, the level of service results are consistent with the findings identified in Sections 8.0 and 11.1.1 of this report. Appendix F includes the intersection calculation worksheets for Alternatives 1 and 2.*

TABLE 8-3 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1, 2, AND 3 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
23.	Red Hill Avenue at	AM	0.640	B	0.650	B	0.010	No	--	--
	Main Street	PM	0.811	D	0.816	D	0.005	No	--	--
24.	Fairview Road at	AM	0.744	C	0.747	C	0.003	No	--	--
	South Coast Drive	PM	0.836	D	0.837	D	0.001	No	--	--
25.	I-405 NB Off-Ramp at	AM	Caltrans Intersection, **See Section 9.0**							
	South Coast Drive	PM								
26.	Bear Street at	AM	0.371	A	0.385	A	0.014	No	--	--
	South Coast Drive	PM	0.555	A	0.561	A	0.006	No	--	--
27.	Bristol Street at	AM	0.421	A	0.477	A	0.056	No	--	--
	Anton Boulevard	PM	0.628	B	0.652	B	0.024	No	--	--
28.	Fairview Road at	AM	Caltrans Intersection, **See Section 9.0**							
	I-405 NB Ramps	PM								
29.	Fairview Road at	AM	Caltrans Intersection, **See Section 9.0**							
	I-405 SB Ramps	PM								

TABLE 8-3 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1, 2, AND 3 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
30. Bristol Street at I-405 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**							
	PM								
31. Bristol Street at I-405 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**							
	PM								
32. Bear Street at Paularino Avenue	AM	0.316	A	0.328	A	0.012	No	--	--
	PM	0.609	B	0.615	B	0.006	No	--	--
33. Bristol Street at Paularino Avenue	AM	0.604	B	0.615	B	0.011	No	--	--
	PM	0.833	D	0.835	D	0.002	No	--	--
34. Fairview Road at Baker Street	AM	0.761	C	0.762	C	0.001	No	--	--
	PM	0.702	C	0.702	C	0.000	No	--	--
35. Bear Street at Baker Street	AM	0.666	B	0.666	B	0.000	No	--	--
	PM	0.729	C	0.729	C	0.000	No	--	--
36. Bristol Street at Baker Street	AM	0.616	B	0.619	B	0.003	No	--	--
	PM	0.741	C	0.747	C	0.006	No	--	--

TABLE 8-3 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1, 2, AND 3 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
37.	Bear Street at SR-73 NB Ramps	AM PM	Caltrans Intersection, **See Section 9.0**							
38.	Bear Street at SR-73 SB Ramps	AM PM	Caltrans Intersection, **See Section 9.0**							
39.	Spruce Street at Segerstrom Avenue	AM	**51.6 s/v**	**F**	**53.2 s/v**	**F**	1.6 s/v	No	0.458[42]	A
		PM	**65.3 s/v**	**F**	**67.0 s/v**	**F**	1.7 s/v	No	0.471[42]	A
40.	Bristol Street at Newport Boulevard (SB)	AM	0.382	A	0.393	A	0.011	No	--	--
		PM	0.495	A	0.498	A	0.003	No	--	--
41.	Bristol Street at Newport Boulevard (NB)	AM	0.561	A	0.563	A	0.002	No	--	--
		PM	0.637	B	0.637	B	0.000	No	--	--

Notes:

- **BOLD ICU/HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)
- N.F. = Improvements not feasible

[42] Level of service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

8.4 Year 2030 Analysis

Table 8-4 summarizes the peak hour Level of Service results at the forty-one (41) key study intersections for the Year 2030 horizon year. The first column (1) of ICU/LOS and HCM/LOS values in *Table 8-4* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists future Year 2030 cumulative traffic conditions (existing plus ambient plus related projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents future Year 2030 near-term traffic conditions with the addition of traffic generated by the proposed Project Phase 1. The fourth column (4) shows the increase in ICU value and/or HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.4.1 *Year 2030 Cumulative Traffic Conditions*

Review of column (2) of *Table 8-4* indicates that nine (9) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections which operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	1.032	F
3. Bristol Street at Segerstrom Avenue	--	--	1.007	F
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.981	E
5. Main Street at Dyer Road	--	--	1.007	F
6. Fairview Street at MacArthur Boulevard	--	--	0.916	E
7. Bear Street at MacArthur Boulevard	--	--	0.948	E
10. Flower Street at MacArthur Boulevard	--	--	0.998	E
24. Fairview Road at South Coast Drive	--	--	0.904	E
39. Spruce Street at Segerstrom Avenue	89.2 s/v	F	111.0 s/v	F

8.4.2 *Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions*

Review of column (3) of *Table 8-4* indicates that ten (10) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

Key Intersection	AM Peak Hour ICU/HCM	AM Peak Hour LOS	PM Peak Hour ICU/HCM	PM Peak Hour LOS
1. Fairview Street at Segerstrom Avenue	--	--	1.034	F
3. Bristol Street at Segerstrom Avenue	--	--	1.009	F
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.983	E
5. Main Street at Dyer Road	--	--	1.009	F
6. Fairview Street at MacArthur Boulevard	--	--	0.917	E
7. Bear Street at MacArthur Boulevard	--	--	0.952	E
9. Bristol Street at MacArthur Boulevard	--	--	0.901	E
10. Flower Street at MacArthur Boulevard	--	--	1.008	F
24. Fairview Road at South Coast Drive	--	--	0.905	E
39. Spruce Street at Segerstrom Avenue	92.3 s/v	F	112.1 s/v	F

Review of column (4) of *Table 8-4* indicates that of the ten (10) study intersections operating adversely, the intersections of Bristol Street at MacArthur Boulevard (Intersection No. 9) and Flower Street at MacArthur Boulevard (Intersection No. 10) exceed the level of service thresholds. For those intersections, improvements are recommended, if feasible. The proposed Project adds less than the required increment thresholds to the remaining eight (8) study intersections. No improvements are recommended.

Review of column (5) of *Table 8-4* indicates that improvements for both Bristol Street at MacArthur Boulevard (Intersection No. 9) are considered infeasible. Additionally, improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) to pre-project LOS conditions are considered infeasible. These recommended improvements are discussed in Section 12.0. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

It should be noted that although the intersection of Flower Street at Segerstrom Avenue (Intersection No. 4) operates adversely, the level of service thresholds is not exceeded. It is our understanding that the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

Lastly, it should be noted that although the intersection of Spruce Street at Segerstrom Avenue (Intersection No. 39) operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

Appendix D also presents the Year 2030 Cumulative ICU/LOS and HCM/LOS calculations for the forty-one (41) key study intersections.

TABLE 8-4

YEAR 2030 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2030 Cumulative Traffic Conditions		(3) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Fairview Street at	AM	0.801	D	0.876	D	0.883	D	0.007	No	--	--
Segerstrom Avenue	PM	**0.944**	**E**	**1.032**	**F**	**1.034**	**F**	0.002	No	--	--
2. Bear Street at	AM	0.588	A	0.635	B	0.635	B	0.000	No	--	--
Segerstrom Avenue	PM	0.606	B	0.653	B	0.654	B	0.001	No	--	--
3. Bristol Street at	AM	0.801	D	0.877	D	0.891	D	0.014	No	--	--
Segerstrom Avenue	PM	**0.918**	**E**	**1.007**	**F**	**1.009**	**F**	0.002	No	--	--
4. Flower Street at	AM	0.776	C	0.838	D	0.843	D	0.005	No	0.843[43]	D
Segerstrom Avenue/Dyer Road	PM	**0.906**	**E**	**0.981**	**E**	**0.983**	**E**	0.002	No	**0.983**[43]	**E**
5. Main Street at	AM	0.743	C	0.806	D	0.810	D	0.004	No	--	--
Dyer Road	PM	**0.924**	**E**	**1.007**	**F**	**1.009**	**F**	0.002	No	--	--
6. Fairview Street at	AM	0.710	C	0.777	C	0.779	C	0.002	No	--	--
MacArthur Boulevard	PM	0.834	D	**0.916**	**E**	**0.917**	**E**	0.001	No	--	--
7. Bear Street at	AM	0.744	C	0.803	D	0.804	D	0.001	No	--	--
MacArthur Boulevard	PM	0.876	D	**0.948**	**E**	**0.952**	**E**	0.004	No	--	--

[43] Level of Service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. The City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

TABLE 8-4 (CONTINUED)
YEAR 2030 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2030 Cumulative Traffic Conditions		(3) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
8. South Plaza Drive at MacArthur Boulevard	AM	0.518	A	0.558	A	0.582	A	0.024	No	--	--
	PM	0.621	B	0.672	B	0.669	B	0.000[44]	No	--	--
9. Bristol Street at MacArthur Boulevard	AM	0.745	C	0.811	D	0.825	D	0.014	No	N.F.	N.F.
	PM	0.820	D	0.898	D	**0.901**	**E**	**0.003**	**Yes**	N.F.	N.F.
10. Flower Street at MacArthur Boulevard	AM	0.705	C	0.762	C	0.780	C	0.018	No	0.780[45]	C
	PM	**0.915**	**E**	**0.998**	**E**	**1.008**	**F**	**0.010**	**Yes**	**1.008**[45]	**F**
11. Main Street at MacArthur Boulevard	AM	0.742	C	0.814	D	0.830	D	0.016	No	--	--
	PM	0.785	C	0.846	D	0.855	D	0.009	No	--	--
12. SR-55 SB Ramps at MacArthur Boulevard	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
13. SR-55 NB Ramps at MacArthur Boulevard	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
14. South Plaza Drive at Callen's Common	AM	9.6 s/v	A	9.68 s/v	A	0.086	A	--	No	--	--
	PM	11.7 s/v	B	12.2 s/v	B	0.190	A	--	No	--	--

[44] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

[45] Improvements which are required to bring Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

TABLE 8-4 (CONTINUED)
YEAR 2030 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2030 Cumulative Traffic Conditions		(3) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
15. Bristol Street at Callen's Commons	AM	0.530	A	0.576	A	0.547	A	0.000[46]	No	--	--
	PM	0.723	C	0.791	C	0.687	B	0.000[46]	No	--	--
16. Fairview Road at Sunflower Avenue	AM	0.716	C	0.798	C	0.800	C	0.002	No	--	--
	PM	0.714	C	0.794	C	0.794	C	0.000	No	--	--
Costa Mesa:	*AM*	*0.774*	*C*	*0.748*	*C*	*0.750*	*C*	*0.002*	*No*	--	--
	PM	*0.733*	*C*	*0.783*	*C*	*0.783*	*C*	*0.000*	*No*	--	--
17. Bear Street at Sunflower Avenue	AM	0.433	A	0.470	A	0.486	A	0.016	No	--	--
	PM	0.689	B	0.752	C	0.756	C	0.004	No	--	--
Costa Mesa:	*AM*	*0.474*	*A*	*0.423*	*A*	*0.438*	*A*	*0.015*	*No*	--	--
	PM	*0.683*	*B*	*0.726*	*C*	*0.730*	*C*	*0.004*	*No*	--	--
18. South Plaza Drive at Sunflower Avenue	AM	0.326	A	0.354	A	0.371	A	0.017	No	--	--
	PM	0.538	A	0.588	A	0.599	A	0.011	No	--	--
Costa Mesa:	*AM*	*0.314*	*A*	*0.319*	*A*	*0.336*	*A*	*0.017*	*No*	--	--
	PM	*0.535*	*A*	*0.538*	*A*	*0.549*	*A*	*0.011*	*No*	--	--

[46] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

TABLE 8-4 (CONTINUED)
YEAR 2030 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2030 Cumulative Traffic Conditions		(3) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
19. Project Driveway at Sunflower Avenue	AM	13.4 s/v	B	14.2 s/v	B	0.380[47]	A	--	No	--	--
	PM	18.6 s/v	C	21.3 s/v	C	0.592[47]	A	--	No	--	--
Costa Mesa:	*AM*	*13.4 s/v*	*B*	*14.2 s/v*	*B*	*0.330*[47]	*A*	--	*No*	--	--
	PM	*18.6 s/v*	*C*	*21.3 s/v*	*C*	*0.542*[47]	*A*	--	*No*	--	--
20. Bristol Street at Sunflower Avenue	AM	0.641	B	0.700	B	0.740	C	0.040	No	--	--
	PM	0.698	B	0.782	C	0.805	D	0.023	No	--	--
Costa Mesa:	*AM*	*0.687*	*B*	*0.669*	*B*	*0.710*	*C*	*0.041*	*No*	--	--
	PM	*0.676*	*B*	*0.743*	*C*	*0.769*	*C*	*0.026*	*No*	--	--
21. Flower Street/Sakioka Drive at Sunflower Avenue	AM	0.347	A	0.384	A	0.389	A	0.005	No	--	--
	PM	0.422	A	0.477	A	0.479	A	0.002	No	--	--
Costa Mesa:	*AM*	*0.321*	*A*	*0.334*	*A*	*0.339*	*A*	*0.005*	*No*	--	--
	PM	*0.394*	*A*	*0.434*	*A*	*0.436*	*A*	*0.002*	*No*	--	--
22. Main Street at Sunflower Avenue	AM	0.470	A	0.515	A	0.521	A	0.006	No	--	--
	PM	0.621	B	0.730	C	0.733	C	0.003	No	--	--
Costa Mesa:	*AM*	*0.513*	*A*	*0.480*	*A*	*0.486*	*A*	*0.006*	*No*	--	--
	PM	*0.632*	*B*	*0.680*	*B*	*0.683*	*B*	*0.003*	*No*	--	--

[47] There are multiple factors that come into play to allow for the installation of the proposed signal along Sunflower. Two main factors are that South Coast Plaza would have to agree to construct the south leg of the signal and that City of Costa Mesa would also have to provide construction permits since half of the street falls within the jurisdiction of the City of Costa Mesa. Since both of these factors cannot be fully guaranteed two alternatives have been considered. In the event that the south leg is not built by South Coast Plaza the intersection would operate as a 3-legged intersection with a three-phase traffic signal (Alternative 1). If Costa Mesa does not allow the proposed signal the intersection would operate as a 3-leg unsignalized right-turn only intersection (Alternative 2). Resulting service levels for the two alternatives at Project Driveway at Sunflower Avenue (Intersection No. 19) are summarized below:

- *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.333, LOS A; PM Peak Hour – 0.518, LOS A / (Alt. 2) AM Peak Hour – 12.0 s/v, LOS B, PM Peak Hour – 23.5 s/v, LOS C*
- *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.283, LOS A; PM Peak Hour – 0.468, LOS A / (Alt. 2) AM Peak Hour – 12.0 s/v, LOS B; PM Peak Hour – 23.5 s/v, LOS C*
- *It should be noted that intersections 14, 15, 18, 20 and Project driveways A, B, C, D and K are also affected by the change of intersection operations as part of Alternative 2. However, the level of service results are consistent with the findings identified in Sections 8.0 and 11.1.1 of this report. Appendix F includes the intersection calculation worksheets for Alternatives 1 and 2.*

TABLE 8-4 (CONTINUED)
YEAR 2030 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2030 Cumulative Traffic Conditions		(3) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
23. Red Hill Avenue at Main Street	AM	0.640	B	0.697	B	0.701	C	0.004	No	--	--
	PM	0.811	D	0.883	D	0.886	D	0.003	No	--	--
24. Fairview Road at South Coast Drive	AM	0.744	C	0.769	C	0.770	C	0.001	No	--	--
	PM	0.836	D	**0.904**	**E**	**0.905**	**E**	0.001	No	--	--
25. I-405 NB Off-Ramp at South Coast Drive	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
26. Bear Street at South Coast Drive	AM	0.371	A	0.371	A	0.381	A	0.010	No	--	--
	PM	0.555	A	0.589	A	0.594	A	0.005	No	--	--
27. Bristol Street at Anton Boulevard	AM	0.421	A	0.450	A	0.472	A	0.022	No	--	--
	PM	0.628	B	0.708	C	0.722	C	0.014	No	--	--
28. Fairview Road at I-405 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
29. Fairview Road at I-405 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										

TABLE 8-4 (CONTINUED)
YEAR 2030 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2030 Cumulative Traffic Conditions		(3) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
30. Bristol Street at I-405 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
31. Bristol Street at I-405 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
32. Bear Street at Paularino Avenue	AM	0.316	A	0.326	A	0.336	A	0.010	No	--	--
	PM	0.609	B	0.631	B	0.636	B	0.005	No	--	--
33. Bristol Street at Paularino Avenue	AM	0.604	B	0.604	B	0.608	B	0.004	No	--	--
	PM	0.833	D	0.874	D	0.875	D	0.001	No	--	--
34. Fairview Road at Baker Street	AM	0.761	C	0.674	B	0.674	B	0.000	No	--	--
	PM	0.702	C	0.734	C	0.734	C	0.000	No	--	--
35. Bear Street at Baker Street	AM	0.666	B	0.656	B	0.656	B	0.000	No	--	--
	PM	0.729	C	0.771	C	0.771	C	0.000	No	--	--
36. Bristol Street at Baker Street	AM	0.616	B	0.602	B	0.603	B	0.001	No	--	--
	PM	0.741	C	0.753	C	0.755	C	0.002	No	--	--

TABLE 8-4 (CONTINUED)
YEAR 2030 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2030 Cumulative Traffic Conditions		(3) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
37. Bear Street at SR-73 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
38. Bear Street at SR-73 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
39. Spruce Street at Segerstrom Avenue	AM	**51.6 s/v**	**F**	**89.2 s/v**	**F**	**92.3 s/v**	**F**	3.1 s/v	No	0.494[48]	A
	PM	**65.3 s/v**	**F**	**111.0 s/v**	**F**	**112.1 s/v**	**F**	1.1 s/v	No	0.509[48]	A
40. Bristol Street at Newport Boulevard (SB)	AM	0.382	A	0.381	A	0.385	A	0.004	No	--	--
	PM	0.495	A	0.613	B	0.500	A	0.000[49]	No	--	--
41. Bristol Street at Newport Boulevard (NB)	AM	0.561	A	0.601	B	0.601	B	0.000	No	--	--
	PM	0.637	B	0.644	B	0.644	B	0.000	No	--	--

Notes:

- **BOLD ICU/HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)
- N.F. = Improvements not feasible

[48] Level of service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

[49] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

8.5 Year 2032 Analysis

Table 8-5 summarizes the peak hour Level of Service results at the forty-one (41) key study intersections for the Year 2032 horizon year. The first column (1) of ICU/LOS and HCM/LOS values in *Table 8-5* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists future Year 2032 cumulative traffic conditions (existing plus ambient plus related projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents future Year 2032 near-term traffic conditions with the addition of traffic generated by the proposed Project Phases 1 and 2. The fourth column (4) shows the increase in ICU value and/or HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.5.1 *Year 2032 Cumulative Traffic Conditions*

Review of column (2) of *Table 8-5* indicates that ten (10) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections which operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	1.050	F
3. Bristol Street at Segerstrom Avenue	--	--	1.025	F
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.998	E
5. Main Street at Dyer Road	--	--	1.024	F
6. Fairview Street at MacArthur Boulevard	--	--	0.932	E
7. Bear Street at MacArthur Boulevard	--	--	0.964	E
9. Bristol Street at MacArthur Boulevard	--	--	0.913	E
10. Flower Street at MacArthur Boulevard	--	--	1.015	F
24. Fairview Road at South Coast Drive	--	--	0.921	E
39. Spruce Street at Segerstrom Avenue	118.3 s/v	F	131.4 s/v	F

8.5.2 *Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions*

Review of column (3) of *Table 8-5* indicates that eleven (11) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	0.903	E	1.058	F
3. Bristol Street at Segerstrom Avenue	0.914	E	1.030	F
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	1.003	F
5. Main Street at Dyer Road	--	--	1.028	F
6. Fairview Street at MacArthur Boulevard	--	--	0.933	E
7. Bear Street at MacArthur Boulevard	--	--	0.973	E
9. Bristol Street at MacArthur Boulevard	--	--	0.919	E
10. Flower Street at MacArthur Boulevard	--	--	1.038	F
23. Red Hill Avenue at Main Street	--	--	0.903	E
24. Fairview Road at South Coast Drive	--	--	0.921	E
39. Spruce Street at Segerstrom Avenue	127.2 s/v	F	136.0 s/v	F

Review of column (4) of *Table 8-5* indicates that of the eleven (11) study intersections operating adversely, the following four (4) study intersections exceed the level of service thresholds:

Key Intersection	
1. Fairview Street at Segerstrom Avenue	10. Flower Street at MacArthur Boulevard
3. Bristol Street at Segerstrom Avenue	23. Red Hill Avenue at Main Street

For those intersections, improvements are recommended, if feasible. The proposed Project adds less than the required increment thresholds to the remaining seven (7) study intersections. No improvements are recommended.

Review of column (5) of *Table 8-5* indicates that the implementation of feasible improvements for Fairview Street at Segerstrom Avenue (Intersection No. 1) and Bristol Street at Segerstrom Avenue (Intersection No. 3) would ensure the intersection operates efficiently. Improvements for Red Hill Avenue at Main Street (Intersection No. 23) are considered infeasible. Recommended improvements are discussed in Section 12.0.

Additionally, improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) to pre-project LOS conditions are considered infeasible. These recommended improvements are discussed in Section 12.0. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

It should be noted that although the intersection of Flower Street at Segerstrom Avenue (Intersection No. 4) operates adversely, the level of service thresholds is not exceeded. It is our understanding that the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

Lastly, it should be noted that although the intersection of Spruce Street at Segerstrom Avenue (Intersection No. 39) operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

Appendix D also presents the Year 2032 Cumulative ICU/LOS and HCM/LOS calculations for the forty-one (41) key study intersections.

TABLE 8-5

YEAR 2032 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2032 Cumulative Traffic Conditions		(3) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Fairview Street at	AM	0.801	D	0.892	D	**0.903**	**E**	**0.011**	**Yes**	0.888	D
Segerstrom Avenue	PM	**0.944**	**E**	**1.050**	**F**	**1.058**	**F**	0.008	No	**0.975**	**E**
2. Bear Street at	AM	0.588	A	0.645	B	0.646	B	0.001	No	--	--
Segerstrom Avenue	PM	0.606	B	0.665	B	0.667	B	0.002	No	--	--
3. Bristol Street at	AM	0.801	D	0.891	D	**0.914**	**E**	**0.023**	**Yes**	0.867	D
Segerstrom Avenue	PM	**0.918**	**E**	**1.025**	**F**	**1.030**	**F**	0.005	No	**0.972**	**E**
4. Flower Street at	AM	0.776	C	0.853	D	0.861	D	0.008	No	0.861[50]	D
Segerstrom Avenue/Dyer Road	PM	**0.906**	**E**	**0.998**	**E**	**1.003**	**F**	0.005	No	**1.003**[50]	**F**
5. Main Street at	AM	0.743	C	0.821	D	0.827	D	0.006	No	--	--
Dyer Road	PM	**0.924**	**E**	**1.024**	**F**	**1.028**	**F**	0.004	No	--	--
6. Fairview Street at	AM	0.710	C	0.790	C	0.793	C	0.003	No	--	--
MacArthur Boulevard	PM	0.834	D	**0.932**	**E**	**0.933**	**E**	0.001	No	--	--
7. Bear Street at	AM	0.744	C	0.816	D	0.819	D	0.003	No	--	--
MacArthur Boulevard	PM	0.876	D	**0.964**	**E**	**0.973**	**E**	0.009	No	--	--

[50] Level of Service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. The City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

TABLE 8-5 (CONTINUED)
YEAR 2032 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Year 2032 Cumulative Traffic Conditions		(3) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
8.	South Plaza Drive at	AM	0.518	A	0.567	A	0.604	B	0.037	No	--	--
	MacArthur Boulevard	PM	0.621	B	0.684	B	0.686	B	0.002	No	--	--
9.	Bristol Street at	AM	0.745	C	0.825	D	0.859	D	0.034	No	--	--
	MacArthur Boulevard	PM	0.820	D	**0.913**	**E**	**0.919**	**E**	0.006	No	--	--
10.	Flower Street at	AM	0.705	C	0.776	C	0.808	D	0.032	No	0.808[51]	D
	MacArthur Boulevard	PM	**0.915**	**E**	**1.015**	**F**	**1.038**	**F**	**0.023**	**Yes**	**1.038**[51]	**F**
11.	Main Street at	AM	0.742	C	0.829	D	0.857	D	0.028	No	--	--
	MacArthur Boulevard	PM	0.785	C	0.861	D	0.880	D	0.019	No	--	--
12.	SR-55 SB Ramps at	AM	Caltrans Intersection, **See Section 9.0**									
	MacArthur Boulevard	PM										
13.	SR-55 NB Ramps at	AM	Caltrans Intersection, **See Section 9.0**									
	MacArthur Boulevard	PM										
14.	South Plaza Drive at	AM	9.6 s/v	A	9.7 s/v	A	0.089	A	--	No	--	--
	Callen's Common	PM	11.7 s/v	B	12.3 s/v	B	0.198	A	--	No	--	--

[51] Improvements which are required to bring Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

TABLE 8-5 (CONTINUED)
YEAR 2032 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2032 Cumulative Traffic Conditions		(3) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
15. Bristol Street at Callen's Commons	AM	0.530	A	0.585	A	0.611	B	0.045	No	--	--
	PM	0.723	C	0.805	D	0.715	C	0.000[52]	No	--	--
16. Fairview Road at Sunflower Avenue	AM	0.716	C	0.812	D	0.814	D	0.002	No	--	--
	PM	0.714	C	0.808	D	0.808	D	0.000	No	--	--
Costa Mesa:	*AM*	*0.774*	*C*	*0.762*	*C*	*0.764*	*C*	*0.002*	*No*	--	--
	PM	*0.733*	*C*	*0.797*	*C*	*0.797*	*C*	*0.000*	*No*	--	--
17. Bear Street at Sunflower Avenue	AM	0.433	A	0.478	A	0.494	A	0.016	No	--	--
	PM	0.689	B	0.764	C	0.769	C	0.005	No	--	--
Costa Mesa:	*AM*	*0.474*	*A*	*0.431*	*A*	*0.447*	*A*	*0.016*	*No*	--	--
	PM	*0.683*	*B*	*0.738*	*C*	*0.744*	*C*	*0.006*	*No*	--	--
18. South Plaza Drive at Sunflower Avenue	AM	0.326	A	0.358	A	0.376	A	0.018	No	--	--
	PM	0.538	A	0.597	A	0.610	B	0.013	No	--	--
Costa Mesa:	*AM*	*0.314*	*A*	*0.324*	*A*	*0.342*	*A*	*0.018*	*No*	--	--
	PM	*0.535*	*A*	*0.547*	*A*	*0.560*	*A*	*0.013*	*No*	--	--

[52] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

TABLE 8-5 (CONTINUED)

YEAR 2032 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2032 Cumulative Traffic Conditions		(3) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
19. Project Driveway at Sunflower Avenue	AM	13.4 s/v	B	14.3 s/v	B	0.385[53]	A	--	No	--	--
	PM	18.6 s/v	C	22.0 s/v	C	0.599[53]	A	--	No	--	--
Costa Mesa:	*AM*	*13.4 s/v*	*B*	*14.3 s/v*	*B*	*0.335*[53]	*A*	--	*No*	--	--
	PM	*18.6 s/v*	*C*	*22.0 s/v*	*C*	*0.549*[53]	*A*	--	*No*	--	--
20. Bristol Street at Sunflower Avenue	AM	0.641	B	0.711	C	0.768	C	0.057	No	--	--
	PM	0.698	B	0.795	C	0.832	D	0.037	No	--	--
Costa Mesa:	*AM*	*0.687*	*B*	*0.681*	*B*	*0.739*	*C*	*0.058*	*No*	--	--
	PM	*0.676*	*B*	*0.756*	*C*	*0.793*	*C*	*0.037*	*No*	--	--
21. Flower Street/Sakioka Drive at Sunflower Avenue	AM	0.347	A	0.390	A	0.396	A	0.006	No	--	--
	PM	0.422	A	0.484	A	0.488	A	0.004	No	--	--
Costa Mesa:	*AM*	*0.321*	*A*	*0.340*	*A*	*0.346*	*A*	*0.006*	*No*	--	--
	PM	*0.394*	*A*	*0.441*	*A*	*0.445*	*A*	*0.004*	*No*	--	--
22. Main Street at Sunflower Avenue	AM	0.470	A	0.523	A	0.533	A	0.010	No	--	--
	PM	0.621	B	0.742	C	0.748	C	0.006	No	--	--
Costa Mesa:	*AM*	*0.513*	*A*	*0.489*	*A*	*0.498*	*A*	*0.009*	*No*	--	--
	PM	*0.632*	*B*	*0.692*	*B*	*0.698*	*B*	*0.006*	*No*	--	--

[53] There are multiple factors that come into play to allow for the installation of the proposed signal along Sunflower. Two main factors are that South Coast Plaza would have to agree to construct the south leg of the signal and that City of Costa Mesa would also have to provide construction permits since half of the street falls within the jurisdiction of the City of Costa Mesa. Since both of these factors cannot be fully guaranteed two alternatives have been considered. In the event that the south leg is not built by South Coast Plaza the intersection would operate as a 3-legged intersection with a three-phase traffic signal (Alternative 1). If Costa Mesa does not allow the proposed signal the intersection would operate as a 3-leg unsignalized right-turn only intersection (Alternative 2). Resulting service levels for the two alternatives at Project Driveway at Sunflower Avenue (Intersection No. 19) are summarized below:

- *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.337, LOS A; PM Peak Hour – 0.524, LOS A / (Alt. 2) AM Peak Hour – 12.1 s/v, LOS B, PM Peak Hour – 24.0 s/v, LOS C*
- *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.287, LOS A; PM Peak Hour – 0.474, LOS A / (Alt. 2) AM Peak Hour –12.1 s/v, LOS B; PM Peak Hour – 24.0 s/v, LOS C*
- *It should be noted that intersections 14, 15, 18, 20 and Project driveways A, B, C, D and K are also affected by the change of intersection operations as part of Alternative 2. However, the level of service results are consistent with the findings identified in Sections 8.0 and 11.1.1 of this report. Appendix F includes the intersection calculation worksheets for Alternatives 1 and 2.*

TABLE 8-5 (CONTINUED)
YEAR 2032 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2032 Cumulative Traffic Conditions		(3) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
23. Red Hill Avenue at Main Street	AM	0.640	B	0.710	C	0.716	C	0.006	No	N.F.	N.F.
	PM	0.811	D	0.899	D	**0.903**	**E**	**0.004**	**Yes**	N.F.	N.F.
24. Fairview Road at South Coast Drive	AM	0.744	C	0.782	C	0.783	C	0.001	No	--	--
	PM	0.836	D	**0.921**	**E**	**0.921**	**E**	0.000	No	--	--
25. I-405 NB Off-Ramp at South Coast Drive	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
26. Bear Street at South Coast Drive	AM	0.371	A	0.378	A	0.389	A	0.011	No	--	--
	PM	0.555	A	0.600	B	0.606	B	0.006	No	--	--
27. Bristol Street at Anton Boulevard	AM	0.421	A	0.458	A	0.492	A	0.034	No	--	--
	PM	0.628	B	0.720	C	0.743	C	0.023	No	--	--
28. Fairview Road at I-405 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
29. Fairview Road at I-405 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										

TABLE 8-5 (CONTINUED)

YEAR 2032 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2032 Cumulative Traffic Conditions		(3) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
30. Bristol Street at I-405 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
31. Bristol Street at I-405 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
32. Bear Street at Paularino Avenue	AM	0.316	A	0.333	A	0.343	A	0.010	No	--	--
	PM	0.609	B	0.643	B	0.648	B	0.005	No	--	--
33. Bristol Street at Paularino Avenue	AM	0.604	B	0.616	B	0.623	B	0.007	No	--	--
	PM	0.833	D	0.890	D	0.893	D	0.003	No	--	--
34. Fairview Road at Baker Street	AM	0.761	C	0.686	B	0.688	B	0.002	No	--	--
	PM	0.702	C	0.748	C	0.748	C	0.000	No	--	--
35. Bear Street at Baker Street	AM	0.666	B	0.669	B	0.669	B	0.000	No	--	--
	PM	0.729	C	0.784	C	0.785	D	0.001	No	--	--
36. Bristol Street at Baker Street	AM	0.616	B	0.613	B	0.615	B	0.002	No	--	--
	PM	0.741	C	0.767	C	0.771	D	0.004	No	--	--

TABLE 8-5 (CONTINUED)
YEAR 2032 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Year 2032 Cumulative Traffic Conditions		(3) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
37.	Bear Street at SR-73 NB Ramps	AM PM	Caltrans Intersection, **See Section 9.0**									
38.	Bear Street at SR-73 SB Ramps	AM PM	Caltrans Intersection, **See Section 9.0**									
39.	Spruce Street at Segerstrom Avenue	AM	**51.6 s/v**	**F**	**118.3 s/v**	**F**	**127.2 s/v**	**F**	8.9 s/v	No	0.505[54]	A
		PM	**65.3 s/v**	**F**	**131.4 s/v**	**F**	**136.0 s/v**	**F**	4.6 s/v	No	0.519[54]	A
40.	Bristol Street at Newport Boulevard (SB)	AM	0.382	A	0.388	A	0.395	A	0.007	No	--	--
		PM	0.495	A	0.507	A	0.510	A	0.003	No	--	--
41.	Bristol Street at Newport Boulevard (NB)	AM	0.561	A	0.612	B	0.613	B	0.001	No	--	--
		PM	0.637	B	0.655	B	0.656	B	0.001	No	--	--

Notes:

- **BOLD ICU/HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)
- N.F. = Improvements not feasible

[54] Level of service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

8.6 Year 2036 Analysis

Table 8-6 summarizes the peak hour Level of Service results at the forty-one (41) key study intersections for the Year 2036 horizon year. The first column (1) of ICU/LOS and HCM/LOS values in *Table 8-6* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists future Year 2036 cumulative traffic conditions (existing plus ambient plus related projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents future Year 2036 near-term traffic conditions with the addition of traffic generated by the proposed Project Phases 1, 2 and 3. The fourth column (4) shows the increase in ICU value and/or HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.6.1 *Year 2036 Cumulative Traffic Conditions*

Review of column (2) of *Table 8-6* indicates that twelve (12) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	0.924	E	1.084	F
3. Bristol Street at Segerstrom Avenue	0.926	E	1.060	F
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	1.031	F
5. Main Street at Dyer Road	--	--	1.059	F
6. Fairview Street at MacArthur Boulevard	--	--	0.963	E
7. Bear Street at MacArthur Boulevard	--	--	0.998	E
9. Bristol Street at MacArthur Boulevard	--	--	0.947	E
10. Flower Street at MacArthur Boulevard	--	--	1.053	F
23. Red Hill Avenue at Main Street	--	--	0.930	E
24. Fairview Road at South Coast Drive	--	--	0.954	E
33. Bristol Street at Paularino Avenue	--	--	0.923	E
39. Spruce Street at Segerstrom Avenue	165.9 s/v	F	177.7 s/v	F

8.6.2 *Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions*

Review of column (3) of *Table 8-6* indicates that thirteen (13) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	0.941	E	1.088	F
3. Bristol Street at Segerstrom Avenue	0.957	E	1.064	F
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	1.034	F
5. Main Street at Dyer Road	--	--	1.062	F
6. Fairview Street at MacArthur Boulevard	--	--	0.962	E
7. Bear Street at MacArthur Boulevard	--	--	1.002	F
9. Bristol Street at MacArthur Boulevard	0.922	E	0.952	E
10. Flower Street at MacArthur Boulevard	--	--	1.079	F
11. Main Street at MacArthur Boulevard	0.912	E	0.918	E
23. Red Hill Avenue at Main Street	--	--	0.934	E
24. Fairview Road at South Coast Drive	--	--	0.954	E
33. Bristol Street at Paularino Avenue	--	--	0.925	E
39. Spruce Street at Segerstrom Avenue	177.8 s/v	F	184.2 s/v	F

Review of column (4) of *Table 8-6* indicates that of the thirteen (13) study intersections operating adversely, the following five (5) study intersections exceed the level of service thresholds:

Key Intersection

1. Fairview Street at Segerstrom Avenue
3. Bristol Street at Segerstrom Avenue
9. Bristol Street at MacArthur Boulevard
10. Flower Street at MacArthur Boulevard
11. Main Street at MacArthur Boulevard

For those intersections, improvements are recommended, if feasible. The proposed Project adds less than the required increment threshold to the remaining eight (8) study intersections. No Improvements are recommended.

Review of column (5) of *Table 8-6* indicates that the implementation of feasible improvements for Fairview Street at Segerstrom Avenue (Intersection No. 1) and Bristol Street at Segerstrom Avenue (Intersection No. 3) would ensure the intersection operates efficiently. The implementation of feasible improvements for Main Street at MacArthur Boulevard (Intersection No. 11) will improve service levels but not enough to offset the Project's increment. Improvements for Bristol Street at MacArthur Boulevard (Intersection No. 9) are considered infeasible. Recommended improvements are discussed in Section 12.0.

Additionally, improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) to pre-project LOS conditions are considered infeasible. These recommended improvements are discussed in Section 12.0. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added

to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

It should be noted that although the intersection of Flower Street at Segerstrom Avenue (Intersection No. 4) operates adversely, the level of service thresholds is not exceeded. It is our understanding that the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

Lastly, it should be noted that although the intersection of Spruce Street at Segerstrom Avenue (Intersection No. 39) operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

Appendix D also presents the Year 2036 Cumulative ICU/LOS and HCM/LOS calculations for the forty-one (41) key study intersections.

TABLE 8-6

YEAR 2036 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2036 Cumulative Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Fairview Street at	AM	0.801	D	**0.924**	**E**	**0.941**	**E**	**0.017**	**Yes**	**0.918**	**E**
Segerstrom Avenue	PM	**0.944**	**E**	**1.084**	**F**	**1.088**	**F**	0.004	No	**1.004**	**F**
2. Bear Street at	AM	0.588	A	0.669	B	0.670	B	0.001	No	--	--
Segerstrom Avenue	PM	0.606	B	0.687	B	0.686	B	0.000[55]	No	--	--
3. Bristol Street at	AM	0.801	D	**0.926**	**E**	**0.957**	**E**	**0.031**	**Yes**	**0.905**	**E**
Segerstrom Avenue	PM	**0.918**	**E**	**1.060**	**F**	**1.064**	**F**	0.004	No	**1.007**	**F**
4. Flower Street at	AM	0.776	C	0.883	D	0.894	D	0.011	No	0.894[56]	D
Segerstrom Avenue/Dyer Road	PM	**0.906**	**E**	**1.031**	**F**	**1.034**	**F**	0.003	No	**1.034**[56]	**F**
5. Main Street at	AM	0.743	C	0.850	D	0.859	D	0.009	No	--	--
Dyer Road	PM	**0.924**	**E**	**1.059**	**F**	**1.062**	**F**	0.003	No	--	--
6. Fairview Street at	AM	0.710	C	0.817	D	0.819	D	0.002	No	--	--
MacArthur Boulevard	PM	0.834	D	**0.963**	**E**	**0.962**	**E**	0.000[55]	No	--	--
7. Bear Street at	AM	0.744	C	0.848	D	0.851	D	0.003	No	--	--
MacArthur Boulevard	PM	0.876	D	**0.998**	**E**	**1.002**	**F**	0.004	No	--	--

[55] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

[56] Level of Service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. The City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

TABLE 8-6 (CONTINUED)

YEAR 2036 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Year 2036 Cumulative Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
8.	South Plaza Drive at	AM	0.518	A	0.593	A	0.649	B	0.056	No	--	--
	MacArthur Boulevard	PM	0.621	B	0.707	C	0.689	B	0.000[57]	No	--	--
9.	Bristol Street at	AM	0.745	C	0.861	D	**0.922**	**E**	**0.061**	**Yes**	N.F.	N.F.
	MacArthur Boulevard	PM	0.820	D	**0.947**	**E**	**0.952**	**E**	0.005	No	N.F.	N.F.
10.	Flower Street at	AM	0.705	C	0.810	D	0.864	D	0.054	No	0.864[58]	D
	MacArthur Boulevard	PM	**0.915**	**E**	**1.053**	**F**	**1.079**	**F**	**0.026**	**Yes**	**1.079**[58]	**F**
11.	Main Street at	AM	0.742	C	0.863	D	**0.912**	**E**	**0.049**	**Yes**	0.856	D
	MacArthur Boulevard	PM	0.785	C	0.893	D	**0.918**	**E**	**0.025**	**Yes**	**0.915**	**E**
12.	SR-55 SB Ramps at	AM	Caltrans Intersection, **See Section 9.0**									
	MacArthur Boulevard	PM										
13.	SR-55 NB Ramps at	AM	Caltrans Intersection, **See Section 9.0**									
	MacArthur Boulevard	PM										
14.	South Plaza Drive at	AM	9.6 s/v	A	10.1 s/v	B	0.106	A	--	No	--	--
	Callen's Common	PM	11.7 s/v	B	12.8 s/v	B	0.214	A	--	No	--	--

[57] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

[58] Improvements which are required to bring Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

TABLE 8-6 (CONTINUED)

YEAR 2036 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2036 Cumulative Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
15. Bristol Street at Callen's Commons	AM	0.530	A	0.606	B	0.641	B	0.035	No	--	--
	PM	0.723	C	0.833	D	0.736	C	0.000[59]	No	--	--
16. Fairview Road at Sunflower Avenue	AM	0.716	C	0.839	D	0.842	D	0.003	No	--	--
	PM	0.714	C	0.834	D	0.834	D	0.000	No	--	--
Costa Mesa:	*AM*	*0.774*	*C*	*0.789*	*C*	*0.792*	*C*	*0.003*	*No*	--	--
	PM	*0.733*	*C*	*0.824*	*D*	*0.824*	*D*	*0.000*	No	--	--
17. Bear Street at Sunflower Avenue	AM	0.433	A	0.498	A	0.517	A	0.019	No	--	--
	PM	0.689	B	0.797	C	0.798	C	0.001	No	--	--
Costa Mesa:	*AM*	*0.474*	*A*	*0.449*	*A*	*0.468*	*A*	*0.019*	No	--	--
	PM	*0.683*	*B*	*0.772*	*C*	*0.773*	*C*	*0.001*	No	--	--
18. South Plaza Drive at Sunflower Avenue	AM	0.326	A	0.428	A	0.458	A	0.030	No	--	--
	PM	0.538	A	0.655	B	0.675	B	0.020	No	--	--
Costa Mesa:	*AM*	*0.314*	*A*	*0.394*	*A*	*0.424*	*A*	*0.030*	No	--	--
	PM	*0.535*	*A*	*0.605*	*B*	*0.625*	*B*	*0.020*	No	--	--

[59] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

TABLE 8-6 (CONTINUED)

YEAR 2036 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2036 Cumulative Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
19. Project Driveway at Sunflower Avenue	AM	13.4 s/v	B	15.3 s/v	C	0.418[60]	A	--	No	--	--
	PM	18.6 s/v	C	24.3 s/v	C	0.617[60]	B	--	No	--	--
Costa Mesa:	*AM*	*13.4 s/v*	*B*	*15.3 s/v*	*C*	*0.368*[60]	*A*	--	No	--	--
	PM	*18.6 s/v*	*C*	*24.3 s/v*	*C*	*0.567*[60]	*A*	--	No	--	--
20. Bristol Street at Sunflower Avenue	AM	0.641	B	0.753	C	0.837	D	0.084	No	--	--
	PM	0.698	B	0.830	D	0.857	D	0.027	No	--	--
Costa Mesa:	*AM*	*0.687*	*B*	*0.723*	*C*	*0.810*	*D*	*0.087*	*No*	--	--
	PM	*0.676*	*B*	*0.793*	*C*	*0.834*	*D*	*0.041*	No	--	--
21. Flower Street/Sakioka Drive at Sunflower Avenue	AM	0.347	A	0.404	A	0.414	A	0.01	No	--	--
	PM	0.422	A	0.500	A	0.505	A	0.005	No	--	--
Costa Mesa:	*AM*	*0.321*	*A*	*0.354*	*A*	*0.364*	*A*	0.011	No	--	--
	PM	*0.394*	*A*	*0.457*	*A*	*0.462*	*A*	0.005	No	--	--
22. Main Street at Sunflower Avenue	AM	0.470	A	0.543	A	0.558	A	0.015	No	--	--
	PM	0.621	B	0.765	C	0.772	C	0.007	No	--	--
Costa Mesa:	*AM*	*0.513*	*A*	*0.508*	*A*	*0.523*	*A*	*0.015*	No	--	--
	PM	*0.632*	*B*	*0.715*	*C*	*0.722*	*C*	*0.007*	No	--	--

[60] There are multiple factors that come into play to allow for the installation of the proposed signal along Sunflower. Two main factors are that South Coast Plaza would have to agree to construct the south leg of the signal and that City of Costa Mesa would also have to provide construction permits since half of the street falls within the jurisdiction of the City of Costa Mesa. Since both of these factors cannot be fully guaranteed two alternatives have been considered. In the event that the south leg is not built by South Coast Plaza the intersection would operate as a 3-legged intersection with a three-phase traffic signal (Alternative 1). If Costa Mesa does not allow the proposed signal the intersection would operate as a 3-leg unsignalized right-turn only intersection (Alternative 2). Resulting service levels for the two alternatives at Project Driveway at Sunflower Avenue (Intersection No. 19) are summarized below:

- *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.369, LOS A; PM Peak Hour – 0.545, LOS A / (Alt. 2) AM Peak Hour – 12.2 s/v, LOS B, PM Peak Hour – 25.3 s/v, LOS D*
- *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.319, LOS A; PM Peak Hour – 0.495, LOS A / (Alt. 2) AM Peak Hour – 12.2 s/v, LOS B, PM Peak Hour – 25.3 s/v, LOS D*
- *It should be noted that intersections 14, 15, 18, 20 and Project driveways A, B, C, D and K are also affected by the change of intersection operations as part of Alternative 2. However, the level of service results are consistent with the findings identified in Sections 8.0 and 11.1.1 of this report. Appendix F includes the intersection calculation worksheets for Alternatives 1 and 2.*

TABLE 8-6 (CONTINUED)

YEAR 2036 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Year 2036 Cumulative Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
23.	Red Hill Avenue at	AM	0.640	B	0.735	C	0.744	C	0.009	No	--	--
	Main Street	PM	0.811	D	**0.930**	**E**	**0.934**	**E**	0.004	No	--	--
24.	Fairview Road at	AM	0.744	C	0.809	D	0.811	D	0.002	No	--	--
	South Coast Drive	PM	0.836	D	**0.954**	**E**	**0.954**	**E**	0.000	No	--	--
25.	I-405 NB Off-Ramp at	AM	Caltrans Intersection, **See Section 9.0**									
	South Coast Drive	PM										
26.	Bear Street at	AM	0.371	A	0.395	A	0.407	A	0.012	No	--	--
	South Coast Drive	PM	0.555	A	0.622	B	0.628	B	0.006	No	--	--
27.	Bristol Street at	AM	0.421	A	0.484	A	0.537	A	0.053	No	--	--
	Anton Boulevard	PM	0.628	B	0.747	C	0.777	C	0.030	No	--	--
28.	Fairview Road at	AM	Caltrans Intersection, **See Section 9.0**									
	I-405 NB Ramps	PM										
29.	Fairview Road at	AM	Caltrans Intersection, **See Section 9.0**									
	I-405 SB Ramps	PM										

TABLE 8-6 (CONTINUED)

YEAR 2036 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2036 Cumulative Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
30. Bristol Street at I-405 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
31. Bristol Street at I-405 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
32. Bear Street at Paularino Avenue	AM	0.316	A	0.349	A	0.359	A	0.010	No	--	--
	PM	0.609	B	0.666	B	0.672	B	0.006	No	--	--
33. Bristol Street at Paularino Avenue	AM	0.604	B	0.639	B	0.650	B	0.011	No	--	--
	PM	0.833	D	**0.923**	**E**	**0.925**	**E**	0.002	No	--	--
34. Fairview Road at Baker Street	AM	0.761	C	0.712	C	0.713	C	0.001	No	--	--
	PM	0.702	C	0.776	C	0.775	C	0.000[61]	No	--	--
35. Bear Street at Baker Street	AM	0.666	B	0.692	B	0.692	B	0.000	No	--	--
	PM	0.729	C	0.811	D	0.812	D	0.001	No	--	--
36. Bristol Street at Baker Street	AM	0.616	B	0.635	B	0.638	B	0.003	No	--	--
	PM	0.741	C	0.795	C	0.800	C	0.005	No	--	--

[61] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

TABLE 8-6 (CONTINUED)

YEAR 2036 CUMULATIVE PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Year 2036 Cumulative Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
37.	Bear Street at SR-73 NB Ramps	AM PM	Caltrans Intersection, **See Section 9.0**									
38.	Bear Street at SR-73 SB Ramps	AM PM	Caltrans Intersection, **See Section 9.0**									
39.	Spruce Street at Segerstrom Avenue	AM	**51.6 s/v**	**F**	**165.9 s/v**	**F**	**177.8 s/v**	**F**	11.9 s/v	No	0.522[62]	A
		PM	**65.3 s/v**	**F**	**177.7 s/v**	**F**	**184.2 s/v**	**F**	6.5 s/v	No	0.538[62]	A
40.	Bristol Street at Newport Boulevard (SB)	AM	0.382	A	0.404	A	0.414	A	0.010	No	--	--
		PM	0.495	A	0.527	A	0.530	A	0.003	No	--	--
41.	Bristol Street at Newport Boulevard (NB)	AM	0.561	A	0.634	B	0.636	B	0.002	No	--	--
		PM	0.637	B	0.680	B	0.680	B	0.000	No	--	--

Notes:

- **BOLD ICU/HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)
- N.F. = Improvements not feasible

[62] Level of service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

8.7 Year 2045 Analysis

Table 8-7 summarizes the peak hour Level of Service results at the forty-one (41) key study intersections for the Year 2045 buildout year. The first column (1) of ICU/LOS and HCM/LOS values in *Table 8-7* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists future Year 2045 buildout traffic conditions based on existing intersection geometry, but without any traffic generated from the proposed Project Phases 1, 2 and 3. The third column (3) presents future Year 2045 buildout traffic conditions with the addition of traffic generated by the proposed Project. The fourth column (4) shows the increase in ICU value and/or HCM value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

8.7.1 *Year 2045 Buildout Traffic Conditions*

Review of column (2) of *Table 8-7* indicates that fourteen (14) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	0.991	E	1.204	F
3. Bristol Street at Segerstrom Avenue	1.034	F	1.347	F
4. Flower Street at Segerstrom Avenue/Dyer Road	1.016	F	1.194	F
5. Main Street at Dyer Road	0.945	E	1.214	F
6. Fairview Street at MacArthur Boulevard	--	--	1.014	F
7. Bear Street at MacArthur Boulevard	0.909	E	1.081	F
9. Bristol Street at MacArthur Boulevard	0.928	E	1.008	F
10. Flower Street at MacArthur Boulevard	--	--	1.152	F
11. Main Street at MacArthur Boulevard	0.914	E	0.937	E
23. Red Hill Avenue at Main Street	--	--	0.966	E
24. Fairview Road at South Coast Drive	--	--	1.002	F
33. Bristol Street at Paularino Avenue	--	--	0.982	E
34. Fairview Road at Baker Street	--	--	1.002	F
39. Spruce Street at Segerstrom Avenue	441.7 s/v	F	391.2 s/v	F

8.7.2 *Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions*

Review of column (3) of *Table 8-3* indicates that fifteen (15) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	1.009	E	1.207	F
3. Bristol Street at Segerstrom Avenue	1.065	F	1.351	F
4. Flower Street at Segerstrom Avenue/Dyer Road	1.027	F	1.197	F
5. Main Street at Dyer Road	0.954	E	1.217	F
6. Fairview Street at MacArthur Boulevard	--	--	1.014	F
7. Bear Street at MacArthur Boulevard	0.912	E	1.085	F
9. Bristol Street at MacArthur Boulevard	0.990	E	1.013	F
10. Flower Street at MacArthur Boulevard	0.932	E	1.178	F
11. Main Street at MacArthur Boulevard	0.962	E	0.963	E
20. Bristol Street at Sunflower Avenue	0.956	E	0.915	E
Cost Mesa:	*0.930*	*E*	--	--
23. Red Hill Avenue at Main Street	--	--	0.971	E
24. Fairview Road at South Coast Drive	--	--	1.003	F
33. Bristol Street at Paularino Avenue	--	--	0.984	E
34. Fairview Road at Baker Street	--	--	1.003	F
39. Spruce Street at Segerstrom Avenue	464.9 s/v	F	404.5 s/v	F

Review of column (4) of *Table 8-7* indicates that of the fifteen (15) study intersections operating adversely, the following seven (7) study intersections exceed the level of service thresholds:

Key Intersection

1. Fairview Street at Segerstrom Avenue
3. Bristol Street at Segerstrom Avenue
4. Flower Street at Segerstrom Avenue/Dyer Road
9. Bristol Street at MacArthur Boulevard
10. Flower Street at MacArthur Boulevard
11. Main Street at MacArthur Boulevard
20. Bristol Street at Sunflower Avenue

For those intersections, improvements are recommended, if feasible. The proposed Project adds less than the required increment thresholds to the remaining eight (8) study intersections. No improvements are recommended.

Review of column (5) of *Table 8-7* indicates that the implementation of feasible improvements for Bristol Street at Segerstrom Avenue (Intersection No. 3) would ensure the intersection operates efficiently. The implementation of feasible improvements for Fairview Street at Segerstrom Avenue (Intersection No. 1) and Main Street at MacArthur Boulevard (Intersection No. 11) will improve service levels but not enough to offset the Project's increment. Improvements for Bristol Street at MacArthur Boulevard (Intersection No. 9) and Bristol Street at Sunflower Avenue (Intersection No. 20) are considered infeasible. Recommended improvements are discussed in Section 12.0.

Additionally, that improvements which are required to return both intersections of Flower Street at Segerstrom Avenue (Intersection No. 4) and Flower Street at MacArthur Boulevard (Intersection No. 10) to pre-project LOS conditions are considered infeasible. These recommended improvements are discussed in Section 12.0. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signals at both locations to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersections have been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signals to add the left-turn arrows for the northbound and southbound directions.

Lastly, it should be noted that although the intersection of Spruce Street at Segerstrom Avenue (Intersection No. 39) operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

Appendix D also presents the Year 2045 Buildout ICU/LOS and HCM/LOS calculations for the forty-one (41) key study intersections.

TABLE 8-7
YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
1. Fairview Street at	AM	0.801	D	**0.991**	**E**	**1.009**	**E**	**0.018**	**Yes**	**0.992**	**E**
Segerstrom Avenue	PM	**0.944**	**E**	**1.204**	**F**	**1.207**	**F**	0.003	No	**1.098**	**F**
2. Bear Street at	AM	0.588	A	0.788	C	0.788	C	0.000	No	--	--
Segerstrom Avenue	PM	0.606	B	0.744	C	0.743	C	0.000[63]	No	--	--
3. Bristol Street at	AM	0.801	D	**1.034**	**F**	**1.065**	**F**	**0.031**	**Yes**	**1.009**	**F**
Segerstrom Avenue	PM	**0.918**	**E**	**1.347**	**F**	**1.351**	**F**	0.004	No	**1.256**	**F**
4. Flower Street at	AM	0.776	C	**1.016**	**F**	**1.027**	**F**	**0.011**	**Yes**	**1.027**[64]	**F**
Segerstrom Avenue/Dyer Road	PM	**0.906**	**E**	**1.194**	**F**	**1.197**	**F**	0.003	No	**1.197**[64]	**F**
5. Main Street at	AM	0.743	C	**0.945**	**E**	**0.954**	**E**	0.009	No	--	--
Dyer Road	PM	**0.924**	**E**	**1.214**	**F**	**1.217**	**F**	0.003	No	--	--
6. Fairview Street at	AM	0.710	C	0.862	D	0.864	D	0.002	No	--	--
MacArthur Boulevard	PM	0.834	D	**1.014**	**F**	**1.014**	**F**	0.000	No	--	--
7. Bear Street at	AM	0.744	C	**0.909**	**E**	**0.912**	**E**	0.003	No	--	--
MacArthur Boulevard	PM	0.876	D	**1.081**	**F**	**1.085**	**F**	0.004	No	--	--

[63] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

[64] Although the intersection operates adversely, the level of service thresholds is not exceeded. The City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

TABLE 8-7 (CONTINUED)
YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
8. South Plaza Drive at MacArthur Boulevard	AM	0.518	A	0.725	C	0.760	C	0.035	No	--	--
	PM	0.621	B	0.779	C	0.761	C	0.000[65]	No	--	--
9. Bristol Street at MacArthur Boulevard	AM	0.745	C	**0.928**	**E**	**0.990**	**E**	**0.062**	**Yes**	N.F.	N.F.
	PM	0.820	D	**1.008**	**F**	**1.013**	**F**	0.005	No	N.F.	N.F.
10. Flower Street at MacArthur Boulevard	AM	0.705	C	0.880	D	**0.932**	**E**	**0.052**	**Yes**	**0.932**[66]	**E**
	PM	**0.915**	**E**	**1.152**	**F**	**1.178**	**F**	**0.026**	**Yes**	**1.178**[66]	**F**
11. Main Street at MacArthur Boulevard	AM	0.742	C	**0.914**	**E**	**0.962**	**E**	**0.048**	**Yes**	**0.904**	**E**
	PM	0.785	C	**0.937**	**E**	**0.963**	**E**	**0.026**	**Yes**	**0.960**	**E**
12. SR-55 SB Ramps at MacArthur Boulevard	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
13. SR-55 NB Ramps at MacArthur Boulevard	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
14. South Plaza Drive at Callen's Common	AM	9.6 s/v	A	11.2 s/v	B	0.131	A	--	No	--	--
	PM	11.7 s/v	B	16.0 s/v	C	0.268	A	--	No	--	--

[65] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

[66] Improvements which are required to bring Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

TABLE 8-7 (CONTINUED)
YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
15. Bristol Street at Callen's Commons	AM	0.530	A	0.642	B	0.672	B	0.030	No	--	--
	PM	0.723	C	0.881	D	0.774	C	0.000[67]	No	--	--
16. Fairview Road at Sunflower Avenue	AM	0.716	C	0.879	D	0.883	D	0.004	No	--	--
	PM	0.714	C	0.873	D	0.874	D	0.001	No	--	--
Costa Mesa:	*AM*	*0.774*	*C*	*0.829*	*D*	*0.833*	*D*	*0.004*	*No*	--	--
	PM	*0.733*	*C*	*0.866*	*D*	*0.866*	*D*	*0.000*	*No*	--	--
17. Bear Street at Sunflower Avenue	AM	0.433	A	0.561	A	0.579	A	0.018	No	--	--
	PM	0.689	B	0.889	D	0.889	D	0.000	No	--	--
Costa Mesa:	*AM*	*0.474*	*A*	*0.511*	*A*	*0.529*	*A*	*0.018*	*No*	--	--
	PM	*0.683*	*B*	*0.867*	*D*	*0.867*	*D*	*0.000*	*No*	--	--
18. South Plaza Drive at Sunflower Avenue	AM	0.326	A	0.529	A	0.559	A	0.030	No	--	--
	PM	0.538	A	0.810	D	0.829	D	0.019	No	--	--
Costa Mesa:	*AM*	*0.314*	*A*	*0.496*	*A*	*0.526*	*A*	*0.030*	*No*	--	--
	PM	*0.535*	*A*	*0.760*	*C*	*0.779*	*C*	*0.019*	*No*	--	--

[67] A theoretical negative increase, denoted as an increase of 0.000 for ICU and 0.0 s/v for HCM, is due to the reduced traffic volumes for certain movements at the intersection, however, it should be noted that the overall traffic volumes at the intersection increases with the addition of the Project.

TABLE 8-7 (CONTINUED)
YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
19. Project Driveway at Sunflower Avenue	AM	13.4 s/v	B	17.0 s/v	C	0.460[68]	A	--	No	--	--
	PM	18.6 s/v	C	33.4 s/v	D	0.651[68]	B	--	No	--	--
Costa Mesa:	*AM*	*13.4 s/v*	*B*	*17.0 s/v*	*C*	*0.410*[68]	*A*	--	No	--	--
	PM	*18.6 s/v*	*C*	*33.4 s/v*	*D*	*0.601*[68]	*B*	--	No	--	--
20. Bristol Street at Sunflower Avenue	AM	0.641	B	0.872	D	**0.956**	**E**	**0.084**	**Yes**	N.F.	N.F.
	PM	0.698	B	0.889	D	**0.915**	**E**	**0.026**	**Yes**	N.F.	N.F.
Costa Mesa:	*AM*	*0.687*	*B*	*0.843*	*D*	***0.930***	***E***	***0.087***	***Yes***	N.F.	N.F.
	PM	*0.676*	*B*	*0.852*	*D*	*0.894*	*D*	*0.042*	*No*	N.F.	N.F.
21. Flower Street/Sakioka Drive at Sunflower Avenue	AM	0.347	A	0.480	A	0.490	A	0.010	No	--	--
	PM	0.422	A	0.538	A	0.543	A	0.005	No	--	--
Costa Mesa:	*AM*	*0.321*	*A*	*0.430*	*A*	*0.440*	*A*	*0.010*	*No*	--	--
	PM	*0.394*	*A*	*0.496*	*A*	*0.500*	*A*	*0.004*	*No*	--	--
22. Main Street at Sunflower Avenue	AM	0.470	A	0.571	A	0.586	A	0.015	No	--	--
	PM	0.621	B	0.801	D	0.808	D	0.007	No	--	--
Costa Mesa:	*AM*	*0.513*	*A*	*0.538*	*A*	*0.553*	*A*	*0.015*	*No*	--	--
	PM	*0.632*	*B*	*0.751*	*C*	*0.758*	*C*	*0.007*	*No*	--	--

[68] There are multiple factors that come into play to allow for the installation of the proposed signal along Sunflower. Two main factors are that South Coast Plaza would have to agree to construct the south leg of the signal and that City of Costa Mesa would also have to provide construction permits since half of the street falls within the jurisdiction of the City of Costa Mesa. Since both of these factors cannot be fully guaranteed two alternatives have been considered. In the event that the south leg is not built by South Coast Plaza the intersection would operate as a 3-legged intersection with a three-phase traffic signal (Alternative 1). If Costa Mesa does not allow the proposed signal the intersection would operate as a 3-leg unsignalized right-turn only intersection (Alternative 2). Resulting service levels for the two alternatives at Project Driveway at Sunflower Avenue (Intersection No. 19) are summarized below:

- *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.408, LOS A; PM Peak Hour – 0.569, LOS A / (Alt. 2) AM Peak Hour 12.5 s/v, LOS B, PM Peak Hour – 28.1 s/v, LOS D*
- *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.358, LOS A; PM Peak Hour – 0.519, LOS A / (Alt. 2) AM Peak Hour 12.5 s/v, LOS B, PM Peak Hour – 28.1 s/v, LOS D*
- *It should be noted that intersections 14, 15, 18, 20 and Project driveways A, B, C, D and K are also affected by the change of intersection operations as part of Alternative 2. However, the level of service results are consistent with the findings identified in Sections 8.0 and 11.1.1 of this report. Appendix F includes the intersection calculation worksheets for Alternatives 1 and 2.*

TABLE 8-7 (CONTINUED)
YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
23. Red Hill Avenue at Main Street	AM	0.640	B	0.684	B	0.693	B	0.009	No	--	--
	PM	0.811	D	**0.966**	**E**	**0.971**	**E**	0.005	No	--	--
24. Fairview Road at South Coast Drive	AM	0.744	C	0.848	D	0.850	D	0.002	No	--	--
	PM	0.836	D	**1.002**	**F**	**1.003**	**F**	0.001	No	--	--
25. I-405 NB Off-Ramp at South Coast Drive	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
26. Bear Street at South Coast Drive	AM	0.371	A	0.447	A	0.459	A	0.012	No	--	--
	PM	0.555	A	0.659	B	0.665	B	0.006	No	--	--
27. Bristol Street at Anton Boulevard	AM	0.421	A	0.586	A	0.640	B	0.054	No	--	--
	PM	0.628	B	0.805	D	0.832	D	0.027	No	--	--
28. Fairview Road at I-405 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
29. Fairview Road at I-405 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										

TABLE 8-7 (CONTINUED)
YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
30. Bristol Street at I-405 NB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
31. Bristol Street at I-405 SB Ramps	AM	Caltrans Intersection, **See Section 9.0**									
	PM										
32. Bear Street at Paularino Avenue	AM	0.316	A	0.435	A	0.439	A	0.004	No	--	--
	PM	0.609	B	0.788	C	0.794	C	0.006	No	--	--
33. Bristol Street at Paularino Avenue	AM	0.604	B	0.765	C	0.776	C	0.011	No	--	--
	PM	0.833	D	**0.982**	**E**	**0.984**	**E**	0.002	No	--	--
34. Fairview Road at Baker Street	AM	0.761	C	0.752	C	0.753	C	0.001	No	--	--
	PM	0.702	C	**1.002**	**F**	**1.003**	**F**	0.001	No	--	--
35. Bear Street at Baker Street	AM	0.666	B	0.757	C	0.757	C	0.000	No	--	--
	PM	0.729	C	0.868	D	0.868	D	0.000	No	--	--
36. Bristol Street at Baker Street	AM	0.616	B	0.778	C	0.781	C	0.003	No	--	--
	PM	0.741	C	0.891	D	0.896	D	0.005	No	--	--

TABLE 8-7 (CONTINUED)
YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/No	ICU/HCM	LOS
37. Bear Street at SR-73 NB Ramps	AM PM	Caltrans Intersection, **See Section 9.0**									
38. Bear Street at SR-73 SB Ramps	AM	0.668	B	0.673	B	0.686	B	0.013	No	--	--
	PM	0.565	A	0.692	B	0.697	B	0.005	No	--	--
39. Spruce Street at Segerstrom Avenue	AM	**51.6 s/v**	**F**	**441.7 s/v**	**F**	**464.9 s/v**	**F**	23.2 s/v	No	0.581[69]	A
	PM	**65.3 s/v**	**F**	**391.2 s/v**	**F**	**404.5 s/v**	**F**	13.3 s/v	No	0.606[69]	B
40. Bristol Street at Newport Boulevard (SB)	AM	0.382	A	0.440	A	0.450	A	0.010	No	--	--
	PM	0.495	A	0.669	B	0.674	B	0.005	No	--	--
41. Bristol Street at Newport Boulevard (NB)	AM	0.561	A	0.680	B	0.683	B	0.003	No	--	--
	PM	0.637	B	0.714	C	0.715	C	0.001	No	--	--

Notes:

- **BOLD ICU/HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)
- N.F. = Improvements not feasible

[69] Level of service results with improvements provided for informational purposes. Although the intersection operates adversely, the level of service thresholds is not exceeded. Congestion at the intersection is an existing issue that is not related to the proposed Project. It is our understanding that the City of Santa Ana has identified the necessity for a traffic signal at this location and has included it on the City's signal priority list. As a result, funding has been identified in the City's Capital Improvement Program for fiscal year 2023-2024 budget cycle. Construction of the new traffic signal is expected to be completed by the end of 2024.

9.0 STATE OF CALIFORNIA (CALTRANS) ANALYSIS

The Department of Transportation (Caltrans) has also formally adopted VMT as the metric for reviewing the transportation impacts of a land use development project. Caltrans has released the Vehicle Miles Traveled-Focused *Transportation Impact Study Guide (TISG)*, dated May 20, 2020 in order to provide guidance on Caltrans' review of land use projects.

Caltrans' TISG references the *Technical Advisory on Evaluating Transportation Impacts In California Environmental Quality Act* (CEQA), dated December 2018, prepared by the State of California Governor's Office of Planning and Research (OPR) as the basis for its guidance on VMT assessment. The City of Santa Ana adopted new traffic impact criteria to be consistent with the CEQA revisions and OPR recommendations. These new guidelines are contained within the *City of Santa Ana Traffic Impact Study Guidelines (dated September 2019)* and provide screening criteria and methodology for VMT analysis. Since the City's guidelines are generally consistent with OPR guidelines, no separate VMT analysis has been prepared for Caltrans' review of the proposed project. The VMT analysis for this project is contained within a separate document (i.e. refer to the *Vehicle Miles Traveled (VMT) Screening Assessment for the Proposed Relative Bristol Project, dated June 2023*.

9.1 Level of Service (LOS) Analysis

Level of Service (LOS) calculations for state-controlled study intersections have been prepared in conformance with the Caltrans *Guide for the Preparation of Traffic Impact Studies, dated December 2002* and in support of off-ramp vehicle queuing analysis as required by Caltrans. The existing and projected peak hour operating conditions at the nine (9) state-controlled study intersections within the study area have been evaluated using the *Highway Capacity Manual* operations method of analysis. These state-controlled locations include the following study intersections:

Key Study Intersection

12. SR-55 SB Ramps at MacArthur Boulevard (Santa Ana/Caltrans)
13. SR-55 NB Ramps at MacArthur Boulevard (Irvine/Caltrans)
25. I-405 NB Off-Ramp at S. Coast Drive (Costa Mesa/Caltrans)
28. Fairview Road at I-405 NB Ramps (Costa Mesa/Caltrans)
29. Fairview Road at I-405 SB Ramps (Costa Mesa/Caltrans)
30. Bristol Street at I-405 NB Ramps (Costa Mesa/Caltrans)
31. Bristol Street at I-405 SB Ramps (Costa Mesa/Caltrans)
37. Bear Street at SR-73 NB Ramps (Costa Mesa/Caltrans)
38. Bear Street at SR-73 SB Ramps (Costa Mesa/Caltrans)

Caltrans "endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities"; it does not require that LOS "D" (shall) be maintained. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with

Caltrans to determine the appropriate target LOS. For this analysis, LOS D is the target level of service standard and will be utilized to assess the need for project-related improvements at the state-controlled study intersections.

It is noted that the Caltrans *Guide for the Preparation of Traffic Impact Studies, dated December 2002* states that if an existing State-owned facility operates at less than the target LOS (i.e. LOS D); the existing service level should be maintained. Based on Caltrans Criteria, project-related improvements are required if the Project causes the LOS to change from an acceptable LOS (i.e., LOS D or better) to a deficient LOS (i.e. LOS E or F).

9.2 Existing Plus Project Traffic Conditions

9.2.1 *Existing Plus Project Phase 1 Traffic Conditions*

Table 9-1 summarizes the peak hour Level of Service results at the nine (9) state-controlled study intersections for Existing Plus Project Phase 1 traffic conditions. The first column (1) of HCM/LOS values in *Table 9-1* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists existing traffic conditions with the addition of traffic generated by the proposed Project Phase 1. The third column (3) shows the increase in delay due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

Review of column (1) of *Table 9-1* indicates that the nine (9) state-controlled study intersections currently operate at acceptable level of service during the AM and PM peak hours.

Review of columns (2) and (3) of *Table 9-1* indicates that the nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic.

Appendix E presents the Existing Plus Project Phase 1 HCM/LOS and queueing calculations for the nine (9) state-controlled study intersections.

TABLE 9-1

EXISTING PLUS PROJECT PHASE 1 PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
			HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
12.	SR-55 SB Ramps at	AM	13.2	B	14.0	B	0.8	No	--	--
	MacArthur Boulevard	PM	11.3	B	11.9	B	0.6	No	--	--
13.	SR-55 NB Ramps at	AM	18.0	B	19.2	B	1.2	No	--	--
	MacArthur Boulevard	PM	8.5	A	8.5	A	0.0	No	--	--
25.	I-405 NB Off-Ramp at	AM	21.8	C	22.9	C	1.1	No	--	--
	South Coast Drive	PM	21.2	C	21.2	C	0.0	No	--	--
28.	Fairview Road at	AM	25.5	C	25.5	C	0.0	No	--	--
	I-405 NB Ramps	PM	30.2	C	30.2	C	0.0	No	--	--
29.	Fairview Road at	AM	35.1	D	35.1	D	0.0	No	--	--
	I-405 SB Ramps	PM	19.8	B	20.5	C	0.7	No	--	--
30.	Bristol Street at	AM	6.3	A	6.3	A	0.0	No	--	--
	I-405 NB Ramps	PM	13.9	B	14.1	B	0.2	No	--	--
31.	Bristol Street at	AM	14.2	B	14.4	B	0.2	No	--	--
	I-405 SB Ramps	PM	15.1	B	15.5	B	0.4	No	--	--

TABLE 9-1 (CONTINUED)

EXISTING PLUS PROJECT PHASE 1 PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
		HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
37. Bear Street at SR-73 NB Ramps	AM	22.7	C	23.0	C	0.3	No	--	--
	PM	41.9	D	43.4	D	1.5	No	--	--
38. Bear Street at SR-73 SB Ramps	AM	24.7	C	25.2	C	0.5	No	--	--
	PM	20.5	C	21.3	C	0.8	No	--	--

Notes:

- **BOLD HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)

9.2.2 *Existing Plus Project Phase 1 and 2 Traffic Conditions*

Table 9-2 summarizes the peak hour Level of Service results at the nine (9) state-controlled study intersections for Existing Plus Project Phases 1 and 2 traffic conditions. The first column (1) of HCM/LOS values in *Table 9-2* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists existing traffic conditions with the addition of traffic generated by the proposed Project Phases 1 and 2. The third column (3) shows the increase in delay due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

Review of columns (2) and (3) of *Table 9-2* indicates that the nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic.

Appendix E presents the Existing Plus Project Phases 1 and 2 HCM/LOS and queueing calculations for the nine (9) state-controlled study intersections.

TABLE 9-2

EXISTING PLUS PROJECT PHASES 1 AND 2 PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
			HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
12.	SR-55 SB Ramps at	AM	13.2	B	14.3	B	1.1	No	--	--
	MacArthur Boulevard	PM	11.3	B	12.4	B	1.1	No	--	--
13.	SR-55 NB Ramps at	AM	18.0	B	20.5	C	2.5	No	--	--
	MacArthur Boulevard	PM	8.5	A	8.7	A	0.2	No	--	--
25.	I-405 NB Off-Ramp at	AM	21.8	C	22.9	C	1.1	No	--	--
	South Coast Drive	PM	21.2	C	21.2	C	0.0	No	--	--
28.	Fairview Road at	AM	25.5	C	25.5	C	0.0	No	--	--
	I-405 NB Ramps	PM	30.2	C	30.2	C	0.0	No	--	--
29.	Fairview Road at	AM	35.1	D	35.1	D	0.0	No	--	--
	I-405 SB Ramps	PM	19.8	B	19.8	B	0.0	No	--	--
30.	Bristol Street at	AM	6.3	A	6.3	A	0.0	No	--	--
	I-405 NB Ramps	PM	13.9	B	14.4	A	0.5	No	--	--
31.	Bristol Street at	AM	14.2	B	15.1	B	0.9	No	--	--
	I-405 SB Ramps	PM	15.1	B	15.8	B	0.7	No	--	--

TABLE 9-2 (CONTINUED)

EXISTING PLUS PROJECT PHASES 1 AND 2 PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
			HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
37.	Bear Street at	AM	22.7	C	23.0	C	0.3	No	--	--
	SR-73 NB Ramps	PM	41.9	D	43.5	D	1.6	No	--	--
38.	Bear Street at	AM	24.7	C	25.2	C	0.5	No	--	--
	SR-73 SB Ramps	PM	20.5	C	21.3	C	0.8	No	--	--

Notes:

- **BOLD HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)

9.2.3 *Existing Plus Project Phase 1, 2 and 3 Traffic Conditions*

Table 9-3 summarizes the peak hour Level of Service results at the nine (9) state-controlled study intersections for Existing Plus Project Phases 1, 2 and 3 traffic conditions. The first column (1) of HCM/LOS values in *Table 9-3* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists existing traffic conditions with the addition of traffic generated by the proposed Project Phases 1, 2 and 3. The third column (3) shows the increase in delay due to the added peak hour Project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

Review of columns (2) and (3) of *Table 9-3* indicates that the nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic.

Appendix E presents the Existing Plus Project Phases 1, 2 and 3 HCM/LOS and queueing calculations for the nine (9) state-controlled study intersections.

TABLE 9-3

EXISTING PLUS PROJECT PHASES 1, 2, AND 3 PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
			HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
12.	SR-55 SB Ramps at	AM	13.2	B	14.8	B	1.6	No	--	--
	MacArthur Boulevard	PM	11.3	B	12.7	B	1.4	No	--	--
13.	SR-55 NB Ramps at	AM	18.0	B	22.4	C	4.4	No	--	--
	MacArthur Boulevard	PM	8.5	A	8.8	A	0.3	No	--	--
25.	I-405 NB Off-Ramp at	AM	21.8	C	22.8	C	1.0	No	--	--
	South Coast Drive	PM	21.2	C	21.2	C	0.0	No	--	--
28.	Fairview Road at	AM	25.5	C	25.5	C	0.0	No	--	--
	I-405 NB Ramps	PM	30.2	C	30.2	C	0.0	No	--	--
29.	Fairview Road at	AM	35.1	D	35.2	D	0.1	No	--	--
	I-405 SB Ramps	PM	19.8	B	19.8	B	0.0	No	--	--
30.	Bristol Street at	AM	6.3	A	6.3	A	0.0	No	--	--
	I-405 NB Ramps	PM	13.9	B	14.1	B	0.2	No	--	--
31.	Bristol Street at	AM	14.2	B	14.6	B	0.4	No	--	--
	I-405 SB Ramps	PM	15.1	B	16.0	B	0.9	No	--	--

TABLE 9-3 (CONTINUED)

EXISTING PLUS PROJECT PHASES 1, 2, AND 3 PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceed LOS Criteria		(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
37. Bear Street at SR-73 NB Ramps	AM	22.7	C	23.0	C	0.3	No	--	--
	PM	41.9	D	43.4	D	1.5	No	--	--
38. Bear Street at SR-73 SB Ramps	AM	24.7	C	25.2	C	0.5	No	--	--
	PM	20.5	C	21.3	C	0.8	No	--	--

Notes:

- **BOLD HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)

9.3 Year 2030 Analysis

Table 9-4 summarizes the peak hour Level of Service results at the at the nine (9) state-controlled study intersections for the Year 2030 horizon year. The first column (1) of HCM/LOS values in *Table 9-4* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists future Year 2030 cumulative traffic conditions (existing plus ambient growth traffic plus cumulative projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents future Year 2030 cumulative traffic conditions with the addition of traffic generated by the proposed Project. The fourth column (4) shows the increase in delay value due to the added peak hour project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

9.3.1 *Year 2030 Cumulative Traffic Conditions*

Review of column (2) of *Table 9-4* indicates that the nine (9) state-controlled study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours.

9.3.2 *Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions*

Review of columns (3) and (4) of *Table 9-4* indicates that the nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic.

Appendix E presents the Year 2030 HCM/LOS and queueing calculations for the nine (9) state-controlled study intersections.

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TABLE 9-4

YEAR 2030 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2030 Cumulative Traffic Conditions		(3) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
		HCM (s/v)	LOS	HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
12. SR-55 SB Ramps at	AM	13.2	B	14.4	B	15.0	B	0.6	No	--	--
MacArthur Boulevard	PM	11.3	B	11.5	B	12.0	B	0.5	No	--	--
13. SR-55 NB Ramps at	AM	18.0	B	17.4	B	18.4	B	1.0	No	--	--
MacArthur Boulevard	PM	8.5	A	8.8	A	8.8	A	0.0	No	--	--
25. I-405 NB Off-Ramp at	AM	21.8	C	21.7	C	22.8	C	1.1	No	--	--
South Coast Drive	PM	21.2	C	21.4	C	21.4	C	0.0	No	--	--
28. Fairview Road at	AM	25.5	C	25.2	C	25.2	C	0.0	No	--	--
I-405 NB Ramps	PM	30.2	C	31.6	C	31.6	C	0.0	No	--	--
29. Fairview Road at	AM	35.1	D	31.1	C	31.1	C	0.0	No	--	--
I-405 SB Ramps	PM	19.8	B	20.4	C	20.4	C	0.0	No	--	--
30. Bristol Street at	AM	6.3	A	6.4	A	6.4	A	0.0	No	--	--
I-405 NB Ramps	PM	13.9	B	15.0	B	15.0	B	0.0	No	--	--
31. Bristol Street at	AM	14.2	B	15.3	B	15.5	B	0.2	No	--	--
I-405 SB Ramps	PM	15.1	B	16.8	B	17.2	B	0.4	No	--	--

TABLE 9-4 (CONTINUED)

YEAR 2030 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2030 Cumulative Traffic Conditions		(3) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
		HCM (s/v)	LOS	HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
37. Bear Street at SR-73 NB Ramps	AM	22.7	C	21.3	C	21.5	C	0.2	No	--	--
	PM	41.9	D	41.9	D	43.3	D	1.4	No	--	--
38. Bear Street at SR-73 SB Ramps	AM	24.7	C	22.1	C	22.4	C	0.3	No	--	--
	PM	20.5	C	20.2	C	20.5	C	0.3	No	--	--

Notes:

- **BOLD HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)

9.4 Year 2032 Analysis

Table 9-5 summarizes the peak hour Level of Service results at the at the nine (9) state-controlled study intersections for the Year 2032 horizon year. The first column (1) of HCM/LOS values in *Table 9-5* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists future Year 2032 cumulative traffic conditions (existing plus ambient growth traffic plus cumulative projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents future Year 2032 cumulative traffic conditions with the addition of traffic generated by the proposed Project. The fourth column (4) shows the increase in delay value due to the added peak hour project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

9.4.1 *Year 2032 Cumulative Traffic Conditions*

Review of column (2) of *Table 9-5* indicates that the nine (9) state-controlled study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours.

9.4.2 *Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions*

Review of columns (3) and (4) of *Table 9-5* indicates that the nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic.

Appendix E presents the Year 2032 HCM/LOS and queueing calculations for the nine (9) state-controlled study intersections.

TABLE 9-5

YEAR 2032 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2032 Cumulative Traffic Conditions		(3) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
		HCM (s/v)	LOS	HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
12. SR-55 SB Ramps at MacArthur Boulevard	AM	13.2	B	14.7	B	15.7	B	1.0	No	--	--
	PM	11.3	B	11.8	B	12.8	B	1.0	No	--	--
13. SR-55 NB Ramps at MacArthur Boulevard	AM	18.0	B	20.3	C	23.5	C	3.2	No	--	--
	PM	8.5	A	9.0	A	9.2	A	0.2	No	--	--
25. I-405 NB Off-Ramp at South Coast Drive	AM	21.8	C	21.6	C	22.6	C	1.0	No	--	--
	PM	21.2	C	21.5	C	21.5	C	0.0	No	--	--
28. Fairview Road at I-405 NB Ramps	AM	25.5	C	25.7	C	25.8	C	0.1	No	--	--
	PM	30.2	C	29.3	C	29.3	C	0.0	No	--	--
29. Fairview Road at I-405 SB Ramps	AM	35.1	D	32.9	C	32.9	C	0.0	No	--	--
	PM	19.8	B	20.7	C	20.7	C	0.0	No	--	--
30. Bristol Street at I-405 NB Ramps	AM	6.3	A	6.4	A	6.4	A	0.0	No	--	--
	PM	13.9	B	15.2	B	15.3	B	0.1	No	--	--
31. Bristol Street at I-405 SB Ramps	AM	14.2	B	14.8	B	15.1	B	0.3	No	--	--
	PM	15.1	B	17.0	B	17.7	B	0.7	No	--	--

TABLE 9-5 (CONTINUED)

YEAR 2032 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2032 Cumulative Traffic Conditions		(3) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
		HCM (s/v)	LOS	HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
37. Bear Street at SR-73 NB Ramps	AM	22.7	C	21.5	C	21.7	C	0.2	No	--	--
	PM	41.9	D	43.1	D	46.4	D	3.3	No	--	--
38. Bear Street at SR-73 SB Ramps	AM	24.7	C	22.3	C	22.6	C	0.3	No	--	--
	PM	20.5	C	20.4	C	20.5	C	0.1	No	--	--

Notes:

- **BOLD HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)

9.5 Year 2036 Analysis

Table 9-6 summarizes the peak hour Level of Service results at the at the nine (9) state-controlled study intersections for the Year 2036 horizon year. The first column (1) of HCM/LOS values in *Table 9-6* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists future Year 2036 cumulative traffic conditions (existing plus ambient growth traffic plus cumulative projects traffic) based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents future Year 2036 cumulative traffic conditions with the addition of traffic generated by the proposed Project. The fourth column (4) shows the increase in delay value due to the added peak hour project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

9.5.1 *Year 2036 Cumulative Traffic Conditions*

Review of column (2) of *Table 9-6* indicates that the nine (9) state-controlled study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours.

9.5.2 *Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions*

Review of columns (3) and (4) of *Table 9-6* indicates that the nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic.

Appendix E presents the Year 2036 HCM/LOS and queueing calculations for the nine (9) state-controlled study intersections.

TABLE 9-6

YEAR 2036 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2036 Cumulative Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		HCM (s/v)	LOS	HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
12. SR-55 SB Ramps at MacArthur Boulevard	AM	13.2	B	15.8	B	17.1	B	1.3	No	--	--
	PM	11.3	B	12.7	B	14.1	B	1.4	No	--	--
13. SR-55 NB Ramps at MacArthur Boulevard	AM	18.0	B	30.9	C	38.2	D	7.3	No	--	--
	PM	8.5	A	9.5	A	9.8	A	0.3	No	--	--
25. I-405 NB Off-Ramp at South Coast Drive	AM	21.8	C	21.4	C	22.5	C	0.9	No	--	--
	PM	21.2	C	22.0	C	22.0	C	0.0	No	--	--
28. Fairview Road at I-405 NB Ramps	AM	25.5	C	25.3	C	25.4	C	0.1	No	--	--
	PM	30.2	C	31.8	C	31.8	C	0.0	No	--	--
29. Fairview Road at I-405 SB Ramps	AM	35.1	D	34.4	C	34.8	C	0.4	No	--	--
	PM	19.8	B	22.0	C	23.5	C	1.5	No	--	--
30. Bristol Street at I-405 NB Ramps	AM	6.3	A	6.5	A	6.7	A	0.2	No	--	--
	PM	13.9	B	16.0	B	16.6	B	0.6	No	--	--
31. Bristol Street at I-405 SB Ramps	AM	14.2	B	15.0	B	15.5	B	0.5	No	--	--
	PM	15.1	B	17.6	B	19.0	B	1.4	No	--	--

TABLE 9-6 (CONTINUED)

YEAR 2036 CUMULATIVE PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2036 Cumulative Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		HCM (s/v)	LOS	HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
37. Bear Street at SR-73 NB Ramps	AM	22.7	C	21.8	C	22.1	C	0.3	No	--	--
	PM	41.9	D	51.2	D	53.8	D	2.6	No	--	--
38. Bear Street at SR-73 SB Ramps	AM	24.7	C	23.8	C	24.1	C	0.3	No	--	--
	PM	20.5	C	20.8	C	20.9	C	0.1	No	--	--

Notes:

- **BOLD HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)

9.6 Year 2045 Analysis

Table 9-7 summarizes the peak hour Level of Service results at the at the nine (9) state-controlled study intersections for the Year 2045 buildout year. The first column (1) of HCM/LOS values in *Table 9-7*presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists future Year 2045 buildout traffic conditions based on existing intersection geometry, but without any traffic generated from the proposed Project. The third column (3) presents future Year 2045 buildout traffic conditions with the addition of traffic generated by the proposed Project. The fourth column (4) shows the increase in delay value due to the added peak hour project trips and indicates whether the traffic associated with the Project will exceed the LOS thresholds defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

9.6.1 *Year 2045 Buildout Traffic Conditions*

Review of column (2) of *Table 9-7* indicates that the intersection Bear Street at SR-73 NB Ramps (Intersection No. 37) is forecast to operate at unacceptable LOS E in the PM peak hour. The remaining state-controlled study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours.

9.6.2 *Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions*

Review of columns (3) and (4) of *Table 9-7* indicates that the intersection Bear Street at SR-73 NB Ramps (Intersection No. 37) is forecast to operate at unacceptable LOS E in the PM peak hour. The remaining state-controlled study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours.

Review of column (4) of *Table 9-7* indicates that feasible improvements for Bear Street at SR-73 NB Ramps (Intersection No. 37) will help the intersection operate at acceptable level of service. Recommended improvements are discussed in Section 12.0.

Appendix E presents the Year 2045 HCM/LOS and queueing calculations for the nine (9) state-controlled study intersections.

TABLE 9-7

YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections		Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
			HCM (s/v)	LOS	HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
12.	SR-55 SB Ramps at	AM	13.2	B	17.6	B	19.0	B	1.4	No	--	--
	MacArthur Boulevard	PM	11.3	B	14.0	B	15.4	B	1.4	No	--	--
13.	SR-55 NB Ramps at	AM	18.0	B	26.9	C	34.2	C	7.3	No	--	--
	MacArthur Boulevard	PM	8.5	A	9.8	A	10.1	B	0.3	No	--	--
25.	I-405 NB Off-Ramp at	AM	21.8	C	21.3	C	21.3	C	0.0	No	--	--
	South Coast Drive	PM	21.2	C	22.6	C	22.6	C	0.0	No	--	--
28.	Fairview Road at	AM	25.5	C	28.0	C	29.6	C	1.6	No	--	--
	I-405 NB Ramps	PM	30.2	C	37.9	D	37.9	D	0.0	No	--	--
29.	Fairview Road at	AM	35.1	D	41.7	D	42.7	D	1.0	No	--	--
	I-405 SB Ramps	PM	19.8	B	30.9	C	31.0	C	0.1	No	--	--
30.	Bristol Street at	AM	6.3	A	8.8	A	9.1	A	0.3	No	--	--
	I-405 NB Ramps	PM	13.9	B	16.8	B	17.1	B	0.3	No	--	--
31.	Bristol Street at	AM	14.2	B	15.6	B	16.1	B	0.5	No	--	--
	I-405 SB Ramps	PM	15.1	B	19.8	B	20.3	C	0.5	No	--	--

TABLE 9-7 (CONTINUED)

YEAR 2045 BUILDOUT PEAK HOUR INTERSECTION CAPACITY ANALYSIS – CALTRANS

Key Intersections	Time Period	(1) Existing Traffic Conditions		(2) Year 2045 Buildout Traffic Conditions		(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(4) Exceed LOS Criteria		(5) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
		HCM (s/v)	LOS	HCM (s/v)	LOS	HCM (s/v)	LOS	Increase	Yes/No	HCM (s/v)	LOS
37. Bear Street at SR-73 NB Ramps	AM	22.7	C	22.9	C	25.0	C	2.1	No	22.7	C
	PM	41.9	D	**73.9**	**E**	**78.6**	**E**	**4.7**	**Yes**	54.7	D
38. Bear Street at SR-73 SB Ramps	AM	24.7	C	26.6	C	30.7	C	4.1	No	--	--
	PM	20.5	C	22.0	C	23.0	C	1.0	No	--	--

Notes:

- **BOLD HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)

9.7 Off-Ramp Vehicle Queuing Analysis

Pursuant to requirements of Caltrans, off-ramp queueing was analyzed using the Highway Capacity Manual (HCM) method for signalized intersections. The off-ramp queuing calculations were prepared utilizing the HCM 7 operational methodology for signalized intersections. A *Vistro* network was created based on existing conditions field reviews at the nine (9) ramp intersections. In addition, specifics such as traffic volume data, lane configurations, available vehicle storage lengths, crosswalk locations, posted speed limits, traffic signal timing and phasing, etc., were coded to complete the existing network. The corresponding weekday AM peak hour and PM peak hour HCM 7 worksheets for purposes of determining the 95th percentile vehicle queues are contained in ***Appendix E.***

The queuing analysis was prepared for following scenarios General Plan Buildout Plus Project traffic conditions, consistent with the LOS calculations at the nine (9) ramp study intersections presented in the previous sections.

1. Existing Traffic Conditions;
2. Existing Plus Project (Phase 1) Traffic Conditions;
3. Existing Plus Project (Phase 1 and 2) Traffic Conditions;
4. Existing Plus Project (Phase 1, 2 and 3) Traffic Conditions;
5. Year 2030 Cumulative Traffic Conditions;
6. Year 2030 Cumulative Traffic Conditions Project (Phase 1) Traffic Conditions;
7. Year 2032 Cumulative Traffic Conditions;
8. Year 2032 Cumulative Traffic Conditions Project (Phase 1 and 2) Traffic Conditions;
9. Year 2036 Cumulative Traffic Conditions;
10. Year 2036 Cumulative Traffic Conditions Project (Phase 1, 2 and 3) Traffic Conditions;
11. Year 2045) Buildout Traffic Conditions; and
12. Year 2045 Buildout Plus Project (Phase 1, 2 and 3) Traffic Conditions.

All of the freeway off-ramp intersection approaches were reviewed in terms of expected maximum vehicle queues (i.e. 95th percentile queues) which represent the maximum back of vehicle queues with 95th percentile traffic volumes. The corresponding maximum vehicle queue lengths were then compared to the total ramp storage lengths (i.e. the available storage length as measured from the applicable off-ramp/frontage road lane striping to the respective off-ramp approach limit lines/merge points).

9.7.1 *Existing Plus Project Traffic Conditions*

As shown in ***Table 9-8, Table 9-9 and Table 9-10*** adequate storage is provided to accommodate the forecast 95th percentile queues at the nine (9) off-ramp locations, for Existing Plus Project (Phase 1) Traffic Conditions, Existing Plus Project (Phase 1 and 2) Traffic Conditions and Existing Plus Project (Phase 1, 2 and 3) Traffic Conditions, respectively.

The proposed Project is expected to neither cause nor contribute towards vehicle queuing which extends back into the SR-55 Freeway or I-405 Freeway mainline travel lanes for Existing and Existing Plus Project traffic conditions. Therefore, the proposed Project is not anticipated to negatively affect traffic flow on the State Highway System as the existing vehicular storage capacity on the off-ramps are considered adequate.

9.7.2 *Year 2030 Cumulative Plus Project (Phase 1) Traffic Conditions*

As shown in ***Table 9-11***, adequate storage is provided to accommodate the forecast 95th percentile queues under Year 2030 Cumulative and Year 2030 Cumulative Plus Project Phase 1 traffic conditions at the nine (9) off-ramp locations. The proposed Project is expected to neither cause nor contribute towards vehicle queuing which extends back into the SR-55 Freeway or I-405 Freeway mainline travel lanes for Year 2030 Cumulative Plus Project Phase 1 traffic conditions. Therefore, the proposed Project is not anticipated to negatively affect traffic flow on the State Highway System as the existing vehicular storage capacity on the off-ramps are considered adequate.

9.7.3 *Year 2032 Cumulative Plus Project (Phase 1 and 2) Traffic Conditions*

As shown in ***Table 9-12***, adequate storage is provided to accommodate the forecast 95th percentile queues under Year 2032 Cumulative and Year 2036 Cumulative Plus Project Phase 1 and 2 traffic conditions at the nine (9) off-ramp locations. The proposed Project is expected to neither cause nor contribute towards vehicle queuing which extends back into the SR-55 Freeway or I-405 Freeway mainline travel lanes for Year 2032 Cumulative Plus Project Phase 1 and 2 traffic conditions. Therefore, the proposed Project is not anticipated to negatively affect traffic flow on the State Highway System as the existing vehicular storage capacity on the off-ramps are considered adequate.

9.7.4 *Year 2036 Cumulative Plus Project (Phase 1, 2 and 3) Traffic Conditions*

As shown in ***Table 9-13***, adequate storage is provided to accommodate the forecast 95th percentile queues under Year 2036 Cumulative and Year 2036 Cumulative Plus Project Phase 1, 2 and 3 traffic conditions at the nine (9) off-ramp locations. The proposed Project is expected to neither cause nor contribute towards vehicle queuing which extends back into the SR-55 Freeway or I-405 Freeway mainline travel lanes for Year 2036 Cumulative Plus Project Phase 1, 2 and 3 traffic conditions. Therefore, the proposed Project is not anticipated to negatively affect traffic flow on the State Highway System as the existing vehicular storage capacity on the off-ramps are considered adequate.

9.7.5 *Year 2045 Buildout Plus Project (Phase 1, 2 and 3) Traffic Conditions*

As shown in ***Table 9-14***, adequate storage is provided to accommodate the forecast 95th percentile queues under General Plan Buildout and General Plan Buildout Plus Project traffic conditions at the nine (9) off-ramp locations, except for one (1) off-ramp intersection. As shown in *Table 9-14* **,** the existing vehicular storage capacity is forecast to be inadequate for the westbound right-turn at Bear Street at SR-73 NB Ramps (Intersection No. 37) during the PM peak hour. However, the implementation of feasible improvements at the intersection will increase storage capacity and help improve the queues as discussed in Section 12.0.

At the eight (8) other ramp locations, the proposed Project is expected to neither cause nor contribute towards vehicle queuing which extends back into the SR-55 Freeway or I-405 Freeway mainline travel lanes for General Plan Buildout and General Plan Buildout Plus Project traffic conditions. Therefore, the proposed Project is not anticipated to negatively affect traffic flow on the State Highway System as the existing vehicular storage capacity on the eight (8) other off-ramps are considered adequate.

TABLE 9-8
EXISTING PLUS PROJECT PHASE 1 CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[70]

Key Intersections	Storage Provided (feet)	(1) Existing Traffic Conditions				(2) Existing Plus Project Phase 1 Traffic Conditions				(3) Existing Plus Project Phase 1 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
12. SR-55 SB Ramps at MacArthur Boulevard													
Southbound Left-Turn[71]	1,415	187	Yes	50	Yes	202	Yes	52	Yes	--	--	--	--
Southbound Right-Turn[71]	265	180	Yes	159	Yes	203	Yes	176	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[71]	1,190	241	Yes	105	Yes	241	Yes	107	Yes	--	--	--	--
25. I-405 NB Off-Ramp at South Coast Drive													
Northbound Left-Turn	175	328	Yes[72]	393	Yes[72]	347	Yes[72]	393	Yes[72]	--	--	--	--
Northbound Through/Right-Turn	645	36	Yes	69	Yes	38	Yes	69	Yes	--	--	--	--
Northbound Right-Turn	175	35	Yes	67	Yes	37	Yes	67	Yes	--	--	--	--
28. Fairview Road at I-405 NB Ramps													
Westbound Left-Turn[71]	1,480	262	Yes	314	Yes	262	Yes	314	Yes	--	--	--	--
Westbound Right-Turn[73]	880	364	Yes	467	Yes	364	Yes	467	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[74]	625	133	Yes	147	Yes	133	Yes	157	Yes	--	--	--	--
Eastbound Right-Turn[75]	625	270	Yes	182	Yes	270	Yes	192	Yes	--	--	--	--

70 Queues are based on HCM 95th Percentile methodology.

71 This movement consists of dual turn lanes.

72 The spillover queue can be accommodated upstream of the turn pocket.

73 The westbound right-turn consists of dual lanes. The first lane consists of approximately 1,480 feet of storage and the second lane consists of approximately 280 feet of storage. The storage reported is the average of both lanes.

74 The eastbound left-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

75 The eastbound right-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

TABLE 9-8 (CONTINUED)

EXISTING PLUS PROJECT PHASE 1 CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[76]

Key Intersections	Storage Provided (feet)	(1) Existing Cumulative Traffic Conditions				(2) Existing Plus Project Phase 1 Traffic Conditions				(3) Existing Plus Project Phase 1 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
30. Bristol Street at I-405 NB Ramps													
Westbound Left-Turn	1,550	64	Yes	215	Yes	64	Yes	214	Yes	--	--	--	--
Westbound Left-Through	1,550	65	Yes	214	Yes	65	Yes	213	Yes	--	--	--	--
Westbound Through	1,195	68	Yes	218	Yes	68	Yes	217	Yes	--	--	--	--
Westbound Right-Turn[77]	385	25	Yes	105	Yes	25	Yes	112	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[78]	1,012	197	Yes	234	Yes	204	Yes	243	Yes	--	--	--	--
37. Bear Street at SR-73 NB Ramps													
Westbound Left-Turn	470	179	Yes	295	Yes	176	Yes	295	Yes	--	--	--	--
Westbound Right-Turn[79]	723	262	Yes	671	Yes	269	Yes	702	Yes	--	--	--	--
38. Bear Street at SR-73 SB Ramps													
Eastbound Left-Turn	350	145	Yes	205	Yes	145	Yes	210	Yes	--	--	--	--
Eastbound Left/Right-Turn	895	260	Yes	191	Yes	261	Yes	196	Yes	--	--	--	--

[76] Queues are based on HCM 95th Percentile methodology.

[77] The westbound right-turn consists of dual lanes. The first lane consists of approximately 340 feet of storage and the second lane consists of approximately 430 feet of storage. The storage reported is the average of both lanes.

[78] The eastbound left-turn consists of triple lanes. The first lane consists of approximately 465 feet of storage, the second and third lanes consists of approximately 1,285 feet of storage. The storage reported is the average of the three lanes.

[79] The westbound right-turn consists of dual lanes. The first lane consists of approximately 470 feet of storage and the second lane consists of approximately 975 feet of storage. The storage reported is the average of both lanes.

TABLE 9-9

EXISTING PLUS PROJECT PHASES 1 AND 2 CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[80]

Key Intersections	Storage Provided (feet)	(1) Existing Traffic Conditions				(2) Existing Plus Project Phases 1 and 2 Traffic Conditions				(3) Existing Plus Project Phases 1 and 2 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
12. SR-55 SB Ramps at MacArthur Boulevard													
Southbound Left-Turn[81]	1,415	187	Yes	50	Yes	209	Yes	53	Yes	--	--	--	--
Southbound Right-Turn[81]	265	180	Yes	159	Yes	213	Yes	190	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[81]	1,190	241	Yes	105	Yes	244	Yes	112	Yes	--	--	--	--
25. I-405 NB Off-Ramp at South Coast Drive													
Northbound Left-Turn	175	328	Yes[82]	393	Yes[82]	347	Yes[82]	393	Yes[82]	--	--	--	--
Northbound Through/Right-Turn	645	36	Yes	69	Yes	38	Yes	69	Yes	--	--	--	--
Northbound Right-Turn	175	35	Yes	67	Yes	38	Yes	67	Yes	--	--	--	--
28. Fairview Road at I-405 NB Ramps													
Westbound Left-Turn[81]	1,480	262	Yes	314	Yes	262	Yes	314	Yes	--	--	--	--
Westbound Right-Turn[83]	880	364	Yes	467	Yes	364	Yes	467	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[84]	625	133	Yes	147	Yes	133	Yes	147	Yes	--	--	--	--
Eastbound Right-Turn[85]	625	270	Yes	182	Yes	270	Yes	182	Yes	--	--	--	--

80 Queues are based on HCM 95th Percentile methodology.

81 This movement consists of dual turn lanes.

82 The spillover queue can be accommodated upstream of the turn pocket.

83 The westbound right-turn consists of dual lanes. The first lane consists of approximately 1,480 feet of storage and the second lane consists of approximately 280 feet of storage. The storage reported is the average of both lanes.

84 The eastbound left-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

85 The eastbound right-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

TABLE 9-9 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1 AND 2 CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[86]

Key Intersections	Storage Provided (feet)	(1) Existing Traffic Conditions				(2) Existing Plus Project Phases 1 and 2 Traffic Conditions				(3) Existing Plus Project Phases 1 and 2 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
30. Bristol Street at I-405 NB Ramps													
Westbound Left-Turn	1,550	64	Yes	215	Yes	64	Yes	225	Yes	--	--	--	--
Westbound Left-Through	1,550	65	Yes	214	Yes	65	Yes	224	Yes	--	--	--	--
Westbound Through	1,195	68	Yes	218	Yes	68	Yes	227	Yes	--	--	--	--
Westbound Right-Turn[87]	385	25	Yes	105	Yes	25	Yes	122	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[88]	1,012	197	Yes	234	Yes	217	Yes	248	Yes	--	--	--	--
37. Bear Street at SR-73 NB Ramps													
Westbound Left-Turn	470	179	Yes	295	Yes	177	Yes	295	Yes	--	--	--	--
Westbound Right-Turn[89]	723	262	Yes	671	Yes	270	Yes	702	Yes	--	--	--	--
38. Bear Street at SR-73 SB Ramps													
Eastbound Left-Turn	350	145	Yes	205	Yes	145	Yes	210	Yes	--	--	--	--
Eastbound Left/Right-Turn	895	260	Yes	191	Yes	261	Yes	196	Yes	--	--	--	--

[86] Queues are based on HCM 95th Percentile methodology.

[87] The westbound right-turn consists of dual lanes. The first lane consists of approximately 340 feet of storage and the second lane consists of approximately 430 feet of storage. The storage reported is the average of both lanes.

[88] The eastbound left-turn consists of triple lanes. The first lane consists of approximately 465 feet of storage, the second and third lanes consists of approximately 1,285 feet of storage. The storage reported is the average of the three lanes.

[89] The westbound right-turn consists of dual lanes. The first lane consists of approximately 470 feet of storage and the second lane consists of approximately 975 feet of storage. The storage reported is the average of both lanes.

TABLE 9-10
EXISTING PLUS PROJECT PHASES 1, 2 AND 3 CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[90]

Key Intersections	Storage Provided (feet)	(1) Existing Traffic Conditions				(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions				(3) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
12. SR-55 SB Ramps at MacArthur Boulevard													
Southbound Left-Turn[91]	1,415	187	Yes	50	Yes	219	Yes	54	Yes	--	--	--	--
Southbound Right-Turn[91]	265	180	Yes	159	Yes	227	Yes	199	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[91]	1,190	241	Yes	105	Yes	245	Yes	115	Yes	--	--	--	--
25. I-405 NB Off-Ramp at South Coast Drive													
Northbound Left-Turn	175	328	Yes[92]	393	Yes[92]	347	Yes[92]	393	Yes[92]	--	--	--	--
Northbound Through/Right-Turn	645	36	Yes	69	Yes	38	Yes	69	Yes	--	--	--	--
Northbound Right-Turn	175	35	Yes	67	Yes	37	Yes	67	Yes	--	--	--	--
28. Fairview Road at I-405 NB Ramps													
Westbound Left-Turn[91]	1,480	262	Yes	314	Yes	262	Yes	314	Yes	--	--	--	--
Westbound Right-Turn[93]	880	364	Yes	467	Yes	364	Yes	467	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[94]	625	133	Yes	147	Yes	133	Yes	147	Yes	--	--	--	--
Eastbound Right-Turn[95]	625	270	Yes	182	Yes	270	Yes	182	Yes	--	--	--	--

90 Queues are based on HCM 95th Percentile methodology.

91 This movement consists of dual turn lanes.

92 The spillover queue can be accommodated upstream of the turn pocket.

93 The westbound right-turn consists of dual lanes. The first lane consists of approximately 1,480 feet of storage and the second lane consists of approximately 280 feet of storage. The storage reported is the average of both lanes.

94 The eastbound left-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

95 The eastbound right-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

TABLE 9-10 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1, 2 AND 3 CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[96]

Key Intersections	Storage Provided (feet)	(1) Existing Traffic Conditions				(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions				(3) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
30. Bristol Street at I-405 NB Ramps													
Westbound Left-Turn	1,550	64	Yes	215	Yes	69	Yes	214	Yes	--	--	--	--
Westbound Left-Through	1,550	65	Yes	214	Yes	69	Yes	213	Yes	--	--	--	--
Westbound Through	1,195	68	Yes	218	Yes	73	Yes	217	Yes	--	--	--	--
Westbound Right-Turn[97]	385	25	Yes	105	Yes	25	Yes	120	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[98]	1,012	197	Yes	234	Yes	208	Yes	252	Yes	--	--	--	--
37. Bear Street at SR-73 NB Ramps													
Westbound Left-Turn	470	179	Yes	295	Yes	177	Yes	295	Yes	--	--	--	--
Westbound Right-Turn[99]	723	262	Yes	671	Yes	270	Yes	702	Yes	--	--	--	--
38. Bear Street at SR-73 SB Ramps													
Eastbound Left-Turn	350	145	Yes	205	Yes	145	Yes	210	Yes	--	--	--	--
Eastbound Left/Right-Turn	895	260	Yes	191	Yes	261	Yes	196	Yes	--	--	--	--

96 Queues are based on HCM 95th Percentile methodology.
97 The westbound right-turn consists of dual lanes. The first lane consists of approximately 340 feet of storage and the second lane consists of approximately 430 feet of storage. The storage reported is the average of both lanes.
98 The eastbound left-turn consists of triple lanes. The first lane consists of approximately 465 feet of storage, the second and third lanes consists of approximately 1,285 feet of storage. The storage reported is the average of the three lanes.
99 The westbound right-turn consists of dual lanes. The first lane consists of approximately 470 feet of storage and the second lane consists of approximately 975 feet of storage. The storage reported is the average of both lanes.

TABLE 9-11

YEAR 2030 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[100]

Key Intersections	Storage Provided (feet)	(1) Year 2030 Cumulative Traffic Conditions				(2) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions				(3) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
12. SR-55 SB Ramps at MacArthur Boulevard													
Southbound Left-Turn[101]	1,415	213	Yes	49	Yes	225	Yes	51	Yes	--	--	--	--
Southbound Right-Turn[101]	265	212	Yes	164	Yes	231	Yes	180	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[101]	1,190	238	Yes	115	Yes	238	Yes	117	Yes	--	--	--	--
25. I-405 NB Off-Ramp at South Coast Drive													
Northbound Left-Turn	175	315	Yes[102]	401	Yes[102]	332	Yes[102]	401	Yes[102]	--	--	--	--
Northbound Through/Right-Turn	645	34	Yes	69	Yes	37	Yes	69	Yes	--	--	--	--
Northbound Right-Turn	175	34	Yes	67	Yes	36	Yes	67	Yes	--	--	--	--
28. Fairview Road at I-405 NB Ramps													
Westbound Left-Turn[101]	1,480	258	Yes	329	Yes	258	Yes	329	Yes	--	--	--	--
Westbound Right-Turn[103]	880	362	Yes	491	Yes	362	Yes	491	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[104]	625	126	Yes	153	Yes	126	Yes	153	Yes	--	--	--	--
Eastbound Right-Turn[105]	625	231	Yes	191	Yes	231	Yes	191	Yes	--	--	--	--

100 Queues are based on HCM 95th Percentile methodology.

101 This movement consists of dual turn lanes.

102 The spillover queue can be accommodated upstream of the turn pocket.

103 The westbound right-turn consists of dual lanes. The first lane consists of approximately 1,480 feet of storage and the second lane consists of approximately 280 feet of storage. The storage reported is the average of both lanes.

104 The eastbound left-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

105 The eastbound right-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

TABLE 9-11 (CONTINUED)
YEAR 2030 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[106]

Key Intersections	Storage Provided (feet)	(1) Year 2030 Cumulative Traffic Conditions				(2) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions				(3) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
30. Bristol Street at I-405 NB Ramps													
Westbound Left-Turn	1,550	66	Yes	220	Yes	66	Yes	220	Yes	--	--	--	--
Westbound Left-Through	1,550	67	Yes	219	Yes	67	Yes	219	Yes	--	--	--	--
Westbound Through	1,195	70	Yes	222	Yes	70	Yes	222	Yes	--	--	--	--
Westbound Right-Turn[107]	385	25	Yes	132	Yes	25	Yes	140	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[108]	1,012	218	Yes	265	Yes	224	Yes	273	Yes	--	--	--	--
37. Bear Street at SR-73 NB Ramps													
Westbound Left-Turn	470	163	Yes	300	Yes	161	Yes	299	Yes	--	--	--	--
Westbound Right-Turn[109]	723	238	Yes	663	Yes	245	Yes	689	Yes	--	--	--	--
38. Bear Street at SR-73 SB Ramps													
Eastbound Left-Turn	350	120	Yes	203	Yes	120	Yes	207	Yes	--	--	--	--
Eastbound Left/Right-Turn	895	224	Yes	188	Yes	224	Yes	192	Yes	--	--	--	--

106 Queues are based on HCM 95th Percentile methodology.

107 The westbound right-turn consists of dual lanes. The first lane consists of approximately 340 feet of storage and the second lane consists of approximately 430 feet of storage. The storage reported is the average of both lanes.

108 The eastbound left-turn consists of triple lanes. The first lane consists of approximately 465 feet of storage, the second and third lanes consists of approximately 1,285 feet of storage. The storage reported is the average of the three lanes.

109 The westbound right-turn consists of dual lanes. The first lane consists of approximately 470 feet of storage and the second lane consists of approximately 975 feet of storage. The storage reported is the average of both lanes.

TABLE 9-12
YEAR 2032 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[110]

Key Intersections	Storage Provided (feet)	(1) Year 2032 Cumulative Traffic Conditions				(2) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions				(3) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
12. SR-55 SB Ramps at MacArthur Boulevard													
Southbound Left-Turn[111]	1,415	223	Yes	52	Yes	240	Yes	55	Yes	--	--	--	--
Southbound Right-Turn[111]	265	222	Yes	174	Yes	250	Yes	200	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[111]	1,190	243	Yes	123	Yes	245	Yes	130	Yes	--	--	--	--
25. I-405 NB Off-Ramp at South Coast Drive													
Northbound Left-Turn	175	319	Yes[112]	408	Yes[112]	337	Yes[112]	408	Yes[112]	--	--	--	--
Northbound Through/Right-Turn	645	35	Yes	70	Yes	38	Yes	70	Yes	--	--	--	--
Northbound Right-Turn	175	34	Yes	68	Yes	37	Yes	68	Yes	--	--	--	--
28. Fairview Road at I-405 NB Ramps													
Westbound Left-Turn[111]	1,480	260	Yes	271	Yes	260	Yes	271	Yes	--	--	--	--
Westbound Right-Turn[113]	880	367	Yes	406	Yes	367	Yes	406	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[114]	625	135	Yes	156	Yes	135	Yes	156	Yes	--	--	--	--
Eastbound Right-Turn[115]	625	242	Yes	194	Yes	242	Yes	194	Yes	--	--	--	--

110 Queues are based on HCM 95th Percentile methodology.

111 This movement consists of dual turn lanes.

112 The spillover queue can be accommodated upstream of the turn pocket.

113 The westbound right-turn consists of dual lanes. The first lane consists of approximately 1,480 feet of storage and the second lane consists of approximately 280 feet of storage. The storage reported is the average of both lanes.

114 The eastbound left-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

115 The eastbound right-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

TABLE 9-12 (CONTINUED)

YEAR 2032 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[116]

Key Intersections	Storage Provided (feet)	(1) Year 2032 Cumulative Traffic Conditions				(2) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions				(3) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
30. Bristol Street at I-405 NB Ramps													
Westbound Left-Turn	1,550	67	Yes	223	Yes	72	Yes	223	Yes	--	--	--	--
Westbound Left-Through	1,550	68	Yes	223	Yes	73	Yes	223	Yes	--	--	--	--
Westbound Through	1,195	71	Yes	226	Yes	77	Yes	226	Yes	--	--	--	--
Westbound Right-Turn[117]	385	25	Yes	139	Yes	25	Yes	153	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[118]	1,012	210	Yes	268	Yes	218	Yes	280	Yes	--	--	--	--
37. Bear Street at SR-73 NB Ramps													
Westbound Left-Turn	470	166	Yes	308	Yes	164	Yes	303	Yes	--	--	--	--
Westbound Right-Turn[119]	723	242	Yes	704	Yes	248	Yes	713	Yes	--	--	--	--
38. Bear Street at SR-73 SB Ramps													
Eastbound Left-Turn	350	121	Yes	206	Yes	121	Yes	206	Yes	--	--	--	--
Eastbound Left/Right-Turn	895	227	Yes	191	Yes	228	Yes	191	Yes	--	--	--	--

116 Queues are based on HCM 95th Percentile methodology.

117 The westbound right-turn consists of dual lanes. The first lane consists of approximately 340 feet of storage and the second lane consists of approximately 430 feet of storage. The storage reported is the average of both lanes.

118 The eastbound left-turn consists of triple lanes. The first lane consists of approximately 465 feet of storage, the second and third lanes consists of approximately 1,285 feet of storage. The storage reported is the average of the three lanes.

119 The westbound right-turn consists of dual lanes. The first lane consists of approximately 470 feet of storage and the second lane consists of approximately 975 feet of storage. The storage reported is the average of both lanes.

TABLE 9-13
YEAR 2036 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[120]

Key Intersections	Storage Provided (feet)	(1) Year 2036 Cumulative Traffic Conditions				(2) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions				(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
12. SR-55 SB Ramps at MacArthur Boulevard													
Southbound Left-Turn[121]	1,415	247	Yes	58	Yes	263	Yes	61	Yes	--	--	--	--
Southbound Right-Turn[121]	265	251	Yes	197	Yes	283	Yes[122]	228	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[121]	1,190	253	Yes	139	Yes	256	Yes	149	Yes	--	--	--	--
25. I-405 NB Off-Ramp at South Coast Drive													
Northbound Left-Turn	175	327	Yes[122]	422	Yes[122]	345	Yes[122]	422	Yes[122]	--	--	--	--
Northbound Through/Right-Turn	645	36	Yes	70	Yes	38	Yes	70	Yes	--	--	--	--
Northbound Right-Turn	175	35	Yes	69	Yes	38	Yes	69	Yes	--	--	--	--
28. Fairview Road at I-405 NB Ramps													
Westbound Left-Turn[121]	1,480	238	Yes	312	Yes	238	Yes	312	Yes	--	--	--	--
Westbound Right-Turn[123]	880	336	Yes	478	Yes	336	Yes	478	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[124]	625	128	Yes	172	Yes	128	Yes	192	Yes	--	--	--	--
Eastbound Right-Turn[125]	625	247	Yes	209	Yes	247	Yes	229	Yes	--	--	--	--

120 Queues are based on HCM 95th Percentile methodology.

121 This movement consists of dual turn lanes.

122 The spillover queue can be accommodated upstream of the turn pocket.

123 The westbound right-turn consists of dual lanes. The first lane consists of approximately 1,480 feet of storage and the second lane consists of approximately 280 feet of storage. The storage reported is the average of both lanes.

124 The eastbound left-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

125 The eastbound right-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

TABLE 9-13 (CONTINUED)

YEAR 2036 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[126]

Key Intersections	Storage Provided (feet)	(1) Year 2036 Cumulative Traffic Conditions				(2) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions				(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
30. Bristol Street at I-405 NB Ramps													
Westbound Left-Turn	1,550	70	Yes	243	Yes	89	Yes	254	Yes	--	--	--	--
Westbound Left-Through	1,550	70	Yes	242	Yes	89	Yes	253	Yes	--	--	--	--
Westbound Through	1,195	74	Yes	246	Yes	94	Yes	257	Yes	--	--	--	--
Westbound Right-Turn[127]	385	25	Yes	164	Yes	25	Yes	193	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[128]	1,012	218	Yes	276	Yes	227	Yes	311	Yes	--	--	--	--
37. Bear Street at SR-73 NB Ramps													
Westbound Left-Turn	470	170	Yes	300	Yes	168	Yes	298	Yes	--	--	--	--
Westbound Right-Turn[129]	723	250	Yes	698	Yes	256	Yes	720	Yes	--	--	--	--
38. Bear Street at SR-73 SB Ramps													
Eastbound Left-Turn	350	133	Yes	216	Yes	133	Yes	216	Yes	--	--	--	--
Eastbound Left/Right-Turn	895	245	Yes	200	Yes	246	Yes	200	Yes	--	--	--	--

126 Queues are based on HCM 95th Percentile methodology.

127 The westbound right-turn consists of dual lanes. The first lane consists of approximately 340 feet of storage and the second lane consists of approximately 430 feet of storage. The storage reported is the average of both lanes.

128 The eastbound left-turn consists of triple lanes. The first lane consists of approximately 465 feet of storage, the second and third lanes consists of approximately 1,285 feet of storage. The storage reported is the average of the three lanes.

129 The westbound right-turn consists of dual lanes. The first lane consists of approximately 470 feet of storage and the second lane consists of approximately 975 feet of storage. The storage reported is the average of both lanes.

TABLE 9-14
YEAR 2045 BUILDOUT CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[130]

Key Intersections	Storage Provided (feet)	(1) Year 2045 Buildout Traffic Conditions				(2) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions				(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
12. SR-55 SB Ramps at MacArthur Boulevard													
Southbound Left-Turn[131]	1,415	277	Yes	65	Yes	282	Yes	67	Yes	--	--	--	--
Southbound Right-Turn[131]	265	304	Yes[132]	223	Yes	334	Yes[132]	254	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[131]	1,190	242	Yes	146	Yes	245	Yes	157	Yes	--	--	--	--
25. I-405 NB Off-Ramp at South Coast Drive													
Northbound Left-Turn	175	341	Yes[132]	439	Yes[132]	342	Yes[132]	439	Yes[132]	--	--	--	--
Northbound Through/Right-Turn	645	36	Yes	70	Yes	36	Yes	70	Yes	--	--	--	--
Northbound Right-Turn	175	36	Yes	69	Yes	36	Yes	69	Yes	--	--	--	--
28. Fairview Road at I-405 NB Ramps													
Westbound Left-Turn[131]	1,480	258	Yes	367	Yes	305	Yes	367	Yes	--	--	--	--
Westbound Right-Turn[133]	880	368	Yes	574	Yes	440	Yes	574	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[134]	625	147	Yes	225	Yes	147	Yes	225	Yes	--	--	--	--
Eastbound Right-Turn[135]	625	278	Yes	271	Yes	278	Yes	271	Yes	--	--	--	--

130 Queues are based on HCM 95th Percentile methodology.

131 This movement consists of dual turn lanes.

132 The spillover queue can be accommodated upstream of the turn pocket.

133 The westbound right-turn consists of dual lanes. The first lane consists of approximately 1,480 feet of storage and the second lane consists of approximately 280 feet of storage. The storage reported is the average of both lanes.

134 The eastbound left-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

135 The eastbound right-turn consists of dual lanes. The first lane consists of approximately 265 feet of storage and the second lane consists of approximately 985 feet of storage. The storage reported is the average of both lanes.

TABLE 9-14 (CONTINUED)

YEAR 2045 BUILDOUT CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[136]

Key Intersections	Storage Provided (feet)	(1) Year 2045 Buildout Traffic Conditions				(2) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions				(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
30. Bristol Street at I-405 NB Ramps													
Westbound Left-Turn	1,550	143	Yes	239	Yes	142	Yes	239	Yes	--	--	--	--
Westbound Left-Through	1,550	143	Yes	238	Yes	142	Yes	238	Yes	--	--	--	--
Westbound Through	1,195	79	Yes	242	Yes	78	Yes	242	Yes	--	--	--	--
Westbound Right-Turn[137]	385	25	Yes	181	Yes	25	Yes	200	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[138]	1,012	235	Yes	321	Yes	245	Yes	322	Yes	--	--	--	--
37. Bear Street at SR-73 NB Ramps													
Westbound Left-Turn	470	172	Yes	356	Yes	192	Yes	338	Yes	--	--	--	--
Westbound Left/Right-Turn[139]	470	--	--	--	--	--	--	--	--	276	Yes	630	Yes[140]
Westbound Right-Turn[141]	723	272	Yes	**1,072**	**No**	308	Yes	**1,075**	**No**	242	Yes	558	Yes
38. Bear Street at SR-73 SB Ramps													
Eastbound Left-Turn	350	151	Yes	220	Yes	177	Yes	236	Yes	--	--	--	--
Eastbound Left/Right-Turn	895	307	Yes	204	Yes	375	Yes	218	Yes	--	--	--	--

136 Queues are based on HCM 95th Percentile methodology.

137 The westbound right-turn consists of dual lanes. The first lane consists of approximately 340 feet of storage and the second lane consists of approximately 430 feet of storage. The storage reported is the average of both lanes.

138 The eastbound left-turn consists of triple lanes. The first lane consists of approximately 465 feet of storage, the second and third lanes consists of approximately 1,285 feet of storage. The storage reported is the average of the three lanes.

139 Proposed improvements include restriping the left-turn pocket to a shared left/right-turn pocket.

140 The spillover queue can be accommodated upstream of the turn pocket.

141 The westbound right-turn consists of dual lanes. The first lane consists of approximately 470 feet of storage and the second lane consists of approximately 975 feet of storage. The storage reported is the average of both lanes.

10.0 DAILY ROADWAY SEGMENT ANALYSIS

10.1 Existing Plus Project Phase 1 Analysis

Table 10-1 summarizes the daily Level of Service results at the forty-three (43) study roadway segments for Existing Plus Project Phase 1 traffic conditions. The first column (1) in *Table 10-1* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists existing traffic conditions with the addition of traffic generated by the proposed Project Phase 1. The third column (3) indicates whether the traffic associated with the Project will exceed the level of service thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service. It should be noted that the City of Santa Ana and Costa Mesa guidelines do not have a daily threshold for significance, whereas the City of Irvine guidelines identifies an increase of 2.0% or more at an adverse location as their daily threshold of significance. However, to provide a conservative assessment and consistent with the peak hour criteria, the daily threshold of significance for this analysis will be based on an increase of 1.0% or more at an adverse location. For those locations where the thresholds are exceeded, recommended improvements are identified and the roadway segments are then analyzed with those improvements.

10.1.1 *Existing Traffic Conditions*

Review of column (1) of *Table 10-1* indicates that four (4) of the forty-three (43) roadway segments currently operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	56,973	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	54,025	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	58,231	F
K. Bear Street, between Paularino Avenue and Baker Street	38,267	F

10.1.2 *Existing Plus Project Phase 1 Traffic Conditions*

Review of column (2) of *Table 10-1* indicates that four (4) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	56,998	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	54,050	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	58,271	F
K. Bear Street, between Paularino Avenue and Baker Street	38,514	F

Review of column (3) of *Table 10-1* indicates that the proposed Project adds less than the required increment threshold to the four (4) roadway segments operating adversely and therefore recommended improvements are not identified.

TABLE 10-1

EXISTING PLUS PROJECT PHASE 1 DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	**56,973**	**F**	**56,998**	**F**	No	--	--
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	**54,025**	**E**	**54,050**	**E**	No	--	--
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	48,087	D	48,118	D	No	--	--
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	Costa Mesa	D	Major Arterial	6D	**58,231**	**F**	**58,271**	**F**	No	--	--
E. Fairview Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	9D	43,770	A	43,810	A	No	--	--
F. Fairview Street, between I-405 SB Ramps and Baker Street	Costa Mesa	D	Major Arterial	6D	48,390	D	48,430	D	No	--	--
G. Bear Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	17,008	A	17,072	A	No	--	--
H. Bear Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana/ Costa Mesa	D	Primary Arterial	5D	17,989	A	18,014	A	No	--	--
I. Bear Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	29,134	A	29,632	A	No	--	--
J. Bear Street, between S. Coast Drive and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	30,398	A	30,889	A	No	--	--
K. Bear Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Primary Arterial	4D	**38,267**	**F**	**38,514**	**F**	No	--	--
L. S. Plaza Drive, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Primary Arterial	4D	5,308	A	5,887	A	No	--	--
M. S. Plaza Drive, between Callen's Common and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	4,843	A	5,172	A	No	--	--
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	44,293	C	44,772	C	No	--	--

TABLE 10-1 (CONTINUED)

EXISTING PLUS PROJECT PHASE 1 DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
O. Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Major Arterial	6D	46,145	D	47,604	D	No	--	--
P. Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	44,768	C	45,830	D	No	--	--
Q. Bristol Street, between Sunflower Avenue and Anton Boulevard	Costa Mesa	D	Principal Arterial	8D	49,274	B	51,084	B	No	--	--
R. Bristol Street, between Anton Boulevard and I-405 NB Ramps	Costa Mesa	D	Principal Arterial	10D	56,559	B	58,369	B	No	--	--
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	8D	58,259	C	59,673	C	No	--	--
T. Bristol Street, between I-405 SB Ramps and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	39,269	B	39,496	C	No	--	--
U. Bristol Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Major Arterial	6D	40,662	C	40,889	C	No	--	--
V. Flower Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	15,150	A	15,213	A	No	--	--
W. Flower Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	9,338	A	9,363	A	No	--	--
X. Main Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	30,688	A	30,713	A	No	--	--
Y. Main Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	23,929	A	23,954	A	No	--	--
Z. Main Street, between Sunflower Avenue and Red Hill Avenue	Santa Ana/ Irvine	D	Major Arterial	6D	23,638	A	23,832	A	No	--	--
AA. Segerstrom Avenue, between Fairview Street and Bear Street	Santa Ana	D	Primary Arterial	4D	21,253	A	21,342	A	No	--	--
BB. Segerstrom Avenue, between Bear Street and Bristol Street	Santa Ana	D	Primary Arterial	4D	28,544	C	28,569	C	No	--	--

TABLE 10-1 (CONTINUED)
EXISTING PLUS PROJECT PHASE 1 DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment		Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Existing Plus Project Phase 1 Traffic Conditions with Improvements	
						Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
CC.	Segerstrom Avenue, between Bristol Street and Flower Street	Santa Ana	D	Primary Arterial	4D	23,189	B	23,295	B	No	--	--
DD.	Dyer Road, between Flower Street and Main Street	Santa Ana	D	Primary Arterial	4D	29,175	C	29,281	C	No	--	--
EE.	MacArthur Boulevard, between Fairview Street and Bear Street	Santa Ana	D	Major Arterial	6D	31,076	A	31,187	A	No	--	--
FF.	MacArthur Boulevard, between Bear Street and S. Plaza Drive	Santa Ana	D	Major Arterial	6D	37,959	B	38,081	B	No	--	--
GG.	MacArthur Boulevard, between S. Plaza Drive and Bristol Street	Santa Ana	D	Major Arterial	6D	34,622	B	34,647	B	No	--	--
HH.	MacArthur Boulevard, between Bristol Street and Flower Street	Santa Ana	D	Major Arterial	6D	37,835	B	38,814	B	No	--	--
II.	MacArthur Boulevard, between Flower Street and Main Street	Santa Ana	D	Major Arterial	6D	38,325	B	39,241	B	No	--	--
JJ.	MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	D	Major Arterial	6D	48,923	D	49,839	D	No	--	--
KK.	MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	Santa Ana/ Irvine/ Caltrans	D	Major Arterial	7D	50,476	C	51,030	C	No	--	--
LL.	Sunflower Avenue, between Fairview Street and Bear Street	Santa Ana/ Costa Mesa	D	Primary Arterial	4D	16,071	A	16,330	A	No	--	--
MM.	Sunflower Avenue, between Bear Street and S. Plaza Drive	Santa Ana/ Costa Mesa	D	Major Arterial	6D	28,528	A	29,059	A	No	--	--
NN.	Sunflower Avenue, between S. Plaza Drive and Bristol Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	27,615	A	28,844	A	No	--	--
OO.	Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	21,571	A	21,765	A	No	--	--
PP.	Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	17,778	A	17,972	A	No	--	--
QQ.	Bristol Street, south of Baker Street	Costa Mesa	D	Major Arterial	6D	27,756	A	27,983	A	No	--	--

10.2 Existing Plus Project Phases 1 and 2 Analysis

Table 10-2 summarizes the daily Level of Service results at the forty-three (43) study roadway segments for Existing Plus Project Phases 1 and 2 traffic conditions. The first column (1) in *Table 10-2* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists existing traffic conditions with the addition of traffic generated by the proposed Project Phases 1 and 2. The third column (3) indicates whether the traffic associated with the Project will exceed the level of service thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service. It should be noted that the City of Santa Ana and Costa Mesa guidelines do not have a daily threshold for significance, whereas the City of Irvine guidelines identifies an increase of 2.0% or more at an adverse location as their daily threshold of significance. However, to provide a conservative assessment and consistent with the peak hour criteria, the daily threshold of significance for this analysis will be based on an increase of 1.0% or more at an adverse location. For those locations where the thresholds are exceeded, recommended improvements are identified and the roadway segments are then analyzed with those improvements.

10.2.1 *Existing Traffic Conditions*

As previously summarized in *Section 10.1.1*, four (4) of the forty-three (43) roadway segments currently operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	56,973	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	54,025	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	58,231	F
K. Bear Street, between Paularino Avenue and Baker Street	38,267	F

10.2.2 *Existing Plus Project Phases 1 and 2 Traffic Conditions*

Review of column (2) of *Table 10-2* indicates that five (5) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	56,998	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	54,050	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	58,338	F
K. Bear Street, between Paularino Avenue and Baker Street	38,550	F
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	50,798	E

Review of column (3) of *Table 10-2* indicates that of the five (5) roadway segments operating adversely, the segment of MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Segment JJ) exceeds the level of service thresholds. The proposed Project adds less than the required increment threshold to the remaining four (4) roadway segments and therefore recommended improvements are not identified.

A peak hour link assessment was completed for the one (1) roadway segments that exceeds the level of service thresholds, as summarized in ***Table 10-3***. As shown, the one (1) roadway segment is forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended.

TABLE 10-2

EXISTING PLUS PROJECT PHASES 1 AND 2 DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 and 2 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Existing Plus Project Phase 1 and 2 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	**56,973**	**F**	**56,998**	**F**	No	--	--
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	**54,025**	**E**	**54,050**	**E**	No	--	--
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	48,087	D	48,151	D	No	--	--
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	Costa Mesa	D	Major Arterial	6D	**58,231**	**F**	**58,338**	**F**	No	--	--
E. Fairview Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	9D	43,770	A	43,877	A	No	--	--
F. Fairview Street, between I-405 SB Ramps and Baker Street	Costa Mesa	D	Major Arterial	6D	48,390	D	48,497	D	No	--	--
G. Bear Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	17,008	A	17,175	A	No	--	--
H. Bear Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana/ Costa Mesa	D	Primary Arterial	5D	17,989	A	18,014	A	No	--	--
I. Bear Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	29,134	A	29,702	A	No	--	--
J. Bear Street, between S. Coast Drive and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	30,398	A	30,925	A	No	--	--
K. Bear Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Primary Arterial	4D	**38,267**	**F**	**38,550**	**F**	No	--	--
L. S. Plaza Drive, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Primary Arterial	4D	5,308	A	5,991	A	No	--	--
M. S. Plaza Drive, between Callen's Common and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	4,843	A	5,277	A	No	--	--
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	44,293	C	45,301	D	No	--	--

TABLE 10-2 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1 AND 2 DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 and 2 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Existing Plus Project Phase 1 and 2 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
O. Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Major Arterial	6D	46,145	D	48,762	D	No	--	--
P. Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	44,768	C	47,074	D	No	--	--
Q. Bristol Street, between Sunflower Avenue and Anton Boulevard	Costa Mesa	D	Principal Arterial	8D	49,274	B	52,191	B	No	--	--
R. Bristol Street, between Anton Boulevard and I-405 NB Ramps	Costa Mesa	D	Principal Arterial	10D	56,559	B	59,476	B	No	--	--
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	8D	58,259	C	60,543	D	No	--	--
T. Bristol Street, between I-405 SB Ramps and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	39,269	B	39,658	C	No	--	--
U. Bristol Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Major Arterial	6D	40,662	C	41,051	C	No	--	--
V. Flower Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	15,150	A	15,316	A	No	--	--
W. Flower Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	9,338	A	9,363	A	No	--	--
X. Main Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	30,688	A	30,713	A	No	--	--
Y. Main Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	23,929	A	23,954	A	No	--	--
Z. Main Street, between Sunflower Avenue and Red Hill Avenue	Santa Ana/ Irvine	D	Major Arterial	6D	23,638	A	23,994	A	No	--	--
AA. Segerstrom Avenue, between Fairview Street and Bear Street	Santa Ana	D	Primary Arterial	4D	21,253	A	21,548	A	No	--	--
BB. Segerstrom Avenue, between Bear Street and Bristol Street	Santa Ana	D	Primary Arterial	4D	28,544	C	28,672	C	No	--	--

TABLE 10-2 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1 AND 2 DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment		Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions		(2) Existing Plus Project Phase 1 and 2 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Existing Plus Project Phase 1 and 2 Traffic Conditions with Improvements	
						Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
CC.	Segerstrom Avenue, between Bristol Street and Flower Street	Santa Ana	D	Primary Arterial	4D	23,189	B	23,398	B	No	--	--
DD.	Dyer Road, between Flower Street and Main Street	Santa Ana	D	Primary Arterial	4D	29,175	C	29,384	C	No	--	--
EE.	MacArthur Boulevard, between Fairview Street and Bear Street	Santa Ana	D	Major Arterial	6D	31,076	A	31,363	A	No	--	--
FF.	MacArthur Boulevard, between Bear Street and S. Plaza Drive	Santa Ana	D	Major Arterial	6D	37,959	B	38,360	B	No	--	--
GG.	MacArthur Boulevard, between S. Plaza Drive and Bristol Street	Santa Ana	D	Major Arterial	6D	34,622	B	35,208	B	No	--	--
HH.	MacArthur Boulevard, between Bristol Street and Flower Street	Santa Ana	D	Major Arterial	6D	37,835	B	39,875	C	No	--	--
II.	MacArthur Boulevard, between Flower Street and Main Street	Santa Ana	D	Major Arterial	6D	38,325	B	40,200	C	No	--	--
JJ.	MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	D	Major Arterial	6D	48,923	D	**50,798**	**E**	**Yes**	--	--
KK.	MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	Santa Ana/ Irvine/ Caltrans	D	Major Arterial	7D	50,476	C	51,590	C	No	--	--
LL.	Sunflower Avenue, between Fairview Street and Bear Street	Santa Ana/ Costa Mesa	D	Primary Arterial	4D	16,071	A	16,363	A	No	--	--
MM.	Sunflower Avenue, between Bear Street and S. Plaza Drive	Santa Ana/ Costa Mesa	D	Major Arterial	6D	28,528	A	29,162	A	No	--	--
NN.	Sunflower Avenue, between S. Plaza Drive and Bristol Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	27,615	A	28,842	A	No	--	--
OO.	Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	21,571	A	21,927	A	No	--	--
PP.	Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	17,778	A	18,134	A	No	--	--
QQ.	Bristol Street, south of Baker Street	Costa Mesa	D	Major Arterial	6D	27,756	A	28,145	A	No	--	--

TABLE 10-3

EXISTING PLUS PROJECT PHASES 1 AND 2 DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY – PEAK HOUR ANALYSIS

Key Roadway Segment	Jurisdiction	Time Period	Direction	No. of Lanes	Capacity[142]	(1) Existing Traffic Conditions			(2) Existing Plus Project Phase 1 and 2 Traffic Conditions			(3) Exceeds LOS Threshold
						Segment Volume	V/C	LOS	Segment Volume	V/C	LOS	Yes/No
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	AM	EB	3	5,100	2,492	0.489	A	2,638	0.517	A	No
			WB	3	5,100	2,167	0.425	A	2,218	0.435	A	No
		PM	EB	3	5,100	2,229	0.437	A	2,290	0.449	A	No
			WB	3	5,100	2,251	0.441	A	2,348	0.460	A	No

142 Capacities are consistent with the through lane capacities identified for the peak hour intersection capacity analyses (i.e. 1700 vph for the Cities of Santa Ana and Irvine and 1600 vph for the City of Costa Mesa).

10.3 Existing Plus Project Phases 1, 2 and 3 Analysis

Table 10-4 summarizes the daily Level of Service results at the forty-three (43) study roadway segments for Existing Plus Project Phases 1, 2 and 3 traffic conditions. The first column (1) in *Table 10-4* presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists existing traffic conditions with the addition of traffic generated by the proposed Project Phases 1, 2 and 3. The third column (3) indicates whether the traffic associated with the Project will exceed the level of service thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service. It should be noted that the City of Santa Ana and Costa Mesa guidelines do not have a daily threshold for significance, whereas the City of Irvine guidelines identifies an increase of 2.0% or more at an adverse location as their daily threshold of significance. However, to provide a conservative assessment and consistent with the peak hour criteria, the daily threshold of significance for this analysis will be based on an increase of 1.0% or more at an adverse location. For those locations where the thresholds are exceeded, recommended improvements are identified and the roadway segments are then analyzed with those improvements.

10.3.1 *Existing Traffic Conditions*

As previously summarized in *Section 10.1.1*, four (4) of the forty-three (43) roadway segments currently operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	56,973	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	54,025	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	58,231	F
K. Bear Street, between Paularino Avenue and Baker Street	38,267	F

10.3.2 *Existing Plus Project Phases 1, 2 and 3 Traffic Conditions*

Review of column (2) of *Table 10-4* indicates that five (5) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	56,998	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	54,050	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	58,283	F
K. Bear Street, between Paularino Avenue and Baker Street	38,496	F
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	51,040	E

Review of column (3) of *Table 10-4* indicates that of the five (5) roadway segments operating adversely, the segment of MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Segment JJ) exceeds the level of service thresholds. The proposed Project adds less than the required increment threshold to the remaining four (4) roadway segments and therefore recommended improvements are not identified.

A peak hour link assessment was completed for the one (1) roadway segments that exceeds the level of service thresholds, as summarized in ***Table 10-5***. As shown, the one (1) roadway segment is forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended.

TABLE 10-4
EXISTING PLUS PROJECT PHASES 1, 2, AND 3 DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions With Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	**56,973**	**F**	**56,998**	**F**	No	--	--
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	**54,025**	**E**	**54,050**	**E**	No	--	--
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	48,087	D	48,151	D	No	--	--
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	Costa Mesa	D	Major Arterial	6D	**58,231**	**F**	**58,283**	**F**	No	--	--
E. Fairview Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	9D	43,770	A	43,822	A	No	--	--
F. Fairview Street, between I-405 SB Ramps and Baker Street	Costa Mesa	D	Major Arterial	6D	48,390	D	48,442	D	No	--	--
G. Bear Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	17,008	A	17,033	A	No	--	--
H. Bear Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana/ Costa Mesa	D	Primary Arterial	5D	17,989	A	18,014	A	No	--	--
I. Bear Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	29,134	A	29,594	A	No	--	--
J. Bear Street, between S. Coast Drive and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	30,398	A	30,871	A	No	--	--
K. Bear Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Primary Arterial	4D	**38,267**	**F**	**38,496**	**F**	No	--	--
L. S. Plaza Drive, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Primary Arterial	4D	5,308	A	5,736	A	No	--	--
M. S. Plaza Drive, between Callen's Common and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	4,843	A	5,341	A	No	--	--
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	44,293	C	45,184	D	No	--	--

TABLE 10-4 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1, 2, AND 3 DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions With Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
O. Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Major Arterial	6D	46,145	D	48,890	D	No	--	--
P. Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	44,768	C	47,224	D	No	--	--
Q. Bristol Street, between Sunflower Avenue and Anton Boulevard	Costa Mesa	D	Principal Arterial	8D	49,274	B	52,696	C	No	--	--
R. Bristol Street, between Anton Boulevard and I-405 NB Ramps	Costa Mesa	D	Principal Arterial	10D	56,559	B	59,981	B	No	--	--
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	8D	58,259	C	60,921	D	No	--	--
T. Bristol Street, between I-405 SB Ramps and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	39,269	B	39,654	C	No	--	--
U. Bristol Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Major Arterial	6D	40,662	C	41,047	C	No	--	--
V. Flower Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	15,150	A	15,207	A	No	--	--
W. Flower Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	9,338	A	9,363	A	No	--	--
X. Main Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	30,688	A	30,713	A	No	--	--
Y. Main Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	23,929	A	23,954	A	No	--	--
Z. Main Street, between Sunflower Avenue and Red Hill Avenue	Santa Ana/ Irvine	D	Major Arterial	6D	23,638	A	23,990	A	No	--	--
AA. Segerstrom Avenue, between Fairview Street and Bear Street	Santa Ana	D	Primary Arterial	4D	21,253	A	21,330	A	No	--	--
BB. Segerstrom Avenue, between Bear Street and Bristol Street	Santa Ana	D	Primary Arterial	4D	28,544	C	28,672	C	No	--	--

TABLE 10-4 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1, 2, AND 3 DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment		Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Existing Traffic Conditions		(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions With Improvements	
						Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
CC.	Segerstrom Avenue, between Bristol Street and Flower Street	Santa Ana	D	Primary Arterial	4D	23,189	B	23,289	B	No	--	--
DD.	Dyer Road, between Flower Street and Main Street	Santa Ana	D	Primary Arterial	4D	29,175	C	29,275	C	No	--	--
EE.	MacArthur Boulevard, between Fairview Street and Bear Street	Santa Ana	D	Major Arterial	6D	31,076	A	31,101	A	No	--	--
FF.	MacArthur Boulevard, between Bear Street and S. Plaza Drive	Santa Ana	D	Major Arterial	6D	37,959	B	37,984	B	No	--	--
GG.	MacArthur Boulevard, between S. Plaza Drive and Bristol Street	Santa Ana	D	Major Arterial	6D	34,622	B	34,852	B	No	--	--
HH.	MacArthur Boulevard, between Bristol Street and Flower Street	Santa Ana	D	Major Arterial	6D	37,835	B	40,009	C	No	--	--
II.	MacArthur Boulevard, between Flower Street and Main Street	Santa Ana	D	Major Arterial	6D	38,325	B	40,442	C	No	--	--
JJ.	MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	D	Major Arterial	6D	48,923	D	**51,040**	**E**	**Yes**	--	--
KK.	MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	Santa Ana/ Irvine/ Caltrans	D	Major Arterial	7D	50,476	C	51,709	C	No	--	--
LL.	Sunflower Avenue, between Fairview Street and Bear Street	Santa Ana/ Costa Mesa	D	Primary Arterial	4D	16,071	A	16,363	A	No	--	--
MM.	Sunflower Avenue, between Bear Street and S. Plaza Drive	Santa Ana/ Costa Mesa	D	Major Arterial	6D	28,528	A	29,053	A	No	--	--
NN.	Sunflower Avenue, between S. Plaza Drive and Bristol Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	27,615	A	29,107	A	No	--	--
OO.	Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	21,571	A	21,923	A	No	--	--
PP.	Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	17,778	A	18,130	A	No	--	--
QQ.	Bristol Street, south of Baker Street	Costa Mesa	D	Major Arterial	6D	27,756	A	28,141	A	No	--	--

TABLE 10-5

EXISTING PLUS PROJECT PHASES 1, 2, AND 3 DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY – PEAK HOUR ANALYSIS

Key Roadway Segment	Jurisdiction	Time Period	Direction	No. of Lanes	Capacity[143]	(1) Existing Traffic Conditions			(2) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions			(3) Exceeds LOS Threshold
						Segment Volume	V/C	LOS	Segment Volume	V/C	LOS	Yes/No
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	AM	EB	3	5,100	2,492	0.489	A	2,742	0.538	A	No
			WB	3	5,100	2,167	0.425	A	2,234	0.438	A	No
		PM	EB	3	5,100	2,229	0.437	A	2,294	0.450	A	No
			WB	3	5,100	2,251	0.441	A	2,381	0.467	A	No

[143] Capacities are consistent with the through lane capacities identified for the peak hour intersection capacity analyses (i.e. 1700 vph for the Cities of Santa Ana and Irvine and 1600 vph for the City of Costa Mesa).

10.4 Year 2030 Analysis

Table 10-6 summarizes the daily Level of Service results at the forty-three (43) study roadway segments for the Year 2030 horizon year. The first column (1) in *Table 10-6* lists future Year 2030 cumulative traffic conditions (existing plus ambient plus related projects traffic) based on existing roadway geometry, but without any traffic generated from the proposed Project. The second column (2) presents future Year 2030 near-term traffic conditions with the addition of traffic generated by the proposed Project. The third column (3) indicates whether the traffic associated with the Project will exceed the level of service thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service. It should be noted that the City of Santa Ana and Costa Mesa guidelines do not have a daily threshold for significance, whereas the City of Irvine guidelines identifies an increase of 2.0% or more at an adverse location as their daily threshold of significance. However, to provide a conservative assessment and consistent with the peak hour criteria, the daily threshold of significance for this analysis will be based on an increase of 1.0% or more at an adverse location. For those locations where the thresholds are exceeded, recommended improvements are identified and the roadway segments are then analyzed with those improvements.

10.4.1 *Year 2030 Cumulative Traffic Conditions*

Review of column (1) of *Table 10-6* indicates that eight (8) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	62,900	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	59,954	F
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	53,444	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	63,912	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	53,203	E
K. Bear Street, between Paularino Avenue and Baker Street	41,750	F
O. Bristol Street, between MacArthur Boulevard and Callen's Common	51,586	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	54,572	E

10.4.2 *Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions*

Review of column (2) of *Table 10-6* indicates that ten (10) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	62,925	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	59,979	F

C. Fairview Street, between Sunflower Avenue and S. Coast Drive	53,475	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	63,952	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	53,243	E
K. Bear Street, between Paularino Avenue and Baker Street	41,997	F
O. Bristol Street, between MacArthur Boulevard and Callen's Common	53,000	E
P. Bristol Street, between Callen's Common and Sunflower Avenue	51,128	E
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	67,767	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	55,488	E

Review of column (3) of *Table 10-6* indicates that of the ten (10) roadway segments operating adversely, the following four (4) locations exceed the level of service thresholds:

Roadway Segment

O. Bristol Street, between MacArthur Boulevard and Callen's Common

P. Bristol Street, between Callen's Common and Sunflower Avenue

S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps

JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps

The proposed Project adds less than the required increment threshold to the remaining six (6) roadway segments and therefore recommended improvements are not identified.

A peak hour link assessment was completed for the four (4) roadway segments that exceed the level of service thresholds, as summarized in ***Table 10-7***. As shown, the four (4) roadway segments are forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended.

TABLE 10-6
YEAR 2030 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2030 Cumulative Traffic Conditions		(2) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	**62,900**	**F**	**62,925**	**F**	No	--	--
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	**59,954**	**F**	**59,979**	**F**	No	--	--
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	**53,444**	**E**	**53,475**	**E**	No	--	--
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	Costa Mesa	D	Major Arterial	6D	**63,912**	**F**	**63,952**	**F**	No	--	--
E. Fairview Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	9D	48,214	A	48,254	A	No	--	--
F. Fairview Street, between I-405 SB Ramps and Baker Street	Costa Mesa	D	Major Arterial	6D	**53,203**	**E**	**53,243**	**E**	No	--	--
G. Bear Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	18,369	A	18,433	A	No	--	--
H. Bear Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana/ Costa Mesa	D	Primary Arterial	5D	19,428	A	19,453	A	No	--	--
I. Bear Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	31,465	A	31,963	A	No	--	--
J. Bear Street, between S. Coast Drive and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	33,197	A	33,688	A	No	--	--
K. Bear Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Primary Arterial	4D	**41,750**	**F**	**41,997**	**F**	No	--	--
L. S. Plaza Drive, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Primary Arterial	4D	5,733	A	6,267	A	No	--	--
M. S. Plaza Drive, between Callen's Common and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	5,230	A	5,559	A	No	--	--
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	49,501	D	49,980	D	No	--	--

TABLE 10-6 (CONTINUED)

YEAR 2030 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2030 Cumulative Traffic Conditions		(2) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
O. Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Major Arterial	6D	**51,586**	**E**	**53,000**	**E**	**Yes**	--	--
P. Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	50,098	D	**51,128**	**E**	**Yes**	--	--
Q. Bristol Street, between Sunflower Avenue and Anton Boulevard	Costa Mesa	D	Principal Arterial	8D	55,366	C	57,176	C	No	--	--
R. Bristol Street, between Anton Boulevard and I-405 NB Ramps	Costa Mesa	D	Principal Arterial	10D	66,204	C	68,014	C	No	--	--
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	8D	66,353	D	**67,767**	**E**	**Yes**	--	--
T. Bristol Street, between I-405 SB Ramps and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	43,442	C	43,669	C	No	--	--
U. Bristol Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Major Arterial	6D	44,946	C	45,173	D	No	--	--
V. Flower Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	16,661	A	16,724	A	No	--	--
W. Flower Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	10,384	A	10,409	A	No	--	--
X. Main Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	34,075	B	34,100	B	No	--	--
Y. Main Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	26,921	A	26,946	A	No	--	--
Z. Main Street, between Sunflower Avenue and Red Hill Avenue	Santa Ana/ Irvine	D	Major Arterial	6D	26,725	A	26,919	A	No	--	--
AA. Segerstrom Avenue, between Fairview Street and Bear Street	Santa Ana	D	Primary Arterial	4D	23,274	B	23,363	B	No	--	--
BB. Segerstrom Avenue, between Bear Street and Bristol Street	Santa Ana	D	Primary Arterial	4D	31,149	D	31,174	D	No	--	--

TABLE 10-6 (CONTINUED)
YEAR 2030 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2030 Cumulative Traffic Conditions		(2) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
CC. Segerstrom Avenue, between Bristol Street and Flower Street	Santa Ana	D	Primary Arterial	4D	25,316	B	25,422	B	No	--	--
DD. Dyer Road, between Flower Street and Main Street	Santa Ana	D	Primary Arterial	4D	31,781	D	31,887	D	No	--	--
EE. MacArthur Boulevard, between Fairview Street and Bear Street	Santa Ana	D	Major Arterial	6D	34,265	B	34,376	B	No	--	--
FF. MacArthur Boulevard, between Bear Street and S. Plaza Drive	Santa Ana	D	Major Arterial	6D	41,699	C	41,821	C	No	--	--
GG. MacArthur Boulevard, between S. Plaza Drive and Bristol Street	Santa Ana	D	Major Arterial	6D	38,095	B	38,140	B	No	--	--
HH. MacArthur Boulevard, between Bristol Street and Flower Street	Santa Ana	D	Major Arterial	6D	41,462	C	42,441	C	No	--	--
II. MacArthur Boulevard, between Flower Street and Main Street	Santa Ana	D	Major Arterial	6D	41,852	C	42,768	C	No	--	--
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	D	Major Arterial	6D	**54,572**	**E**	**55,488**	**E**	**Yes**	--	--
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	Santa Ana/ Irvine/ Caltrans	D	Major Arterial	7D	55,605	D	56,159	D	No	--	--
LL. Sunflower Avenue, between Fairview Street and Bear Street	Santa Ana/ Costa Mesa	D	Primary Arterial	4D	18,732	A	18,991	A	No	--	--
MM. Sunflower Avenue, between Bear Street and S. Plaza Drive	Santa Ana/ Costa Mesa	D	Major Arterial	6D	32,185	A	32,716	A	No	--	--
NN. Sunflower Avenue, between S. Plaza Drive and Bristol Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	31,199	A	32,428	A	No	--	--
OO. Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	25,581	A	25,775	A	No	--	--
PP. Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	22,212	A	22,406	A	No	--	--
QQ. Bristol Street, south of Baker Street	Costa Mesa	D	Major Arterial	6D	30,901	A	31,128	A	No	--	--

TABLE 10-7

YEAR 2030 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY – PEAK HOUR ANALYSIS

Key Roadway Segment		Jurisdiction	Time Period	Direction	No. of Lanes	Capacity[144]	(1) Year 2030 Cumulative Traffic Conditions			(2) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions			(3) Exceeds LOS Threshold
							Segment Volume	V/C	LOS	Segment Volume	V/C	LOS	Yes/No
O.	Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	AM	NB	3	5,100	901	0.177	A	999	0.196	A	No
				SB	3	5,100	2,201	0.432	A	2,170	0.425	A	No
			PM	NB	3	5,100	2,470	0.484	A	2,436	0.478	A	No
				SB	3	5,100	1,627	0.319	A	1,689	0.331	A	No
P.	Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	AM	NB	3	5,100	942	0.185	A	937	0.184	A	No
				SB	3	5,100	2,158	0.423	A	2,079	0.408	A	No
			PM	NB	3	5,100	2,466	0.484	A	2,311	0.453	A	No
				SB	3	5,100	1,521	0.298	A	1,450	0.284	A	No
S.	Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	AM	NB	4	6,400	1,895	0.296	A	1,931	0.302	A	No
				SB	4	6,400	2,485	0.388	A	2,625	0.410	A	No
			PM	NB	4	6,400	2,660	0.416	A	2,711	0.424	A	No
				SB	4	6,400	3,185	0.498	A	3,245	0.507	A	No
JJ.	MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	AM	EB	3	5,100	2,791	0.547	A	2,869	0.563	A	No
				WB	3	5,100	2,380	0.467	A	2,411	0.473	A	No
			PM	EB	3	5,100	2,473	0.485	A	2,502	0.491	A	No
				WB	3	5,100	2,527	0.495	A	2,576	0.505	A	No

[144] Capacities are consistent with the through lane capacities identified for the peak hour intersection capacity analyses (i.e. 1700 vph for the Cities of Santa Ana and Irvine and 1600 vph for the City of Costa Mesa).

10.5 Year 2032 Analysis

Table 10-8 summarizes the daily Level of Service results at the forty-three (43) study roadway segments for the Year 2032 horizon year. The first column (1) in *Table 10-8* lists future Year 2032 cumulative traffic conditions (existing plus ambient plus related projects traffic) based on existing roadway geometry, but without any traffic generated from the proposed Project. The second column (2) presents future Year 2032 near-term traffic conditions with the addition of traffic generated by the proposed Project. The third column (3) indicates whether the traffic associated with the Project will exceed the level of service thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service. It should be noted that the City of Santa Ana and Costa Mesa guidelines do not have a daily threshold for significance, whereas the City of Irvine guidelines identifies an increase of 2.0% or more at an adverse location as their daily threshold of significance. However, to provide a conservative assessment and consistent with the peak hour criteria, the daily threshold of significance for this analysis will be based on an increase of 1.0% or more at an adverse location. For those locations where the thresholds are exceeded, recommended improvements are identified and the roadway segments are then analyzed with those improvements.

10.5.1 *Year 2032 Cumulative Traffic Conditions*

Review of column (1) of *Table 10-8* indicates that ten (10) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	64,039	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	61,035	F
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	54,406	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	65,077	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	54,171	E
K. Bear Street, between Paularino Avenue and Baker Street	42,516	F
O. Bristol Street, between MacArthur Boulevard and Callen's Common	52,509	E
P. Bristol Street, between Callen's Common and Sunflower Avenue	50,994	E
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	67,518	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	55,550	E

10.5.2 *Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions*

Review of column (2) of *Table 10-8* indicates that eleven (11) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	64,064	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	61,060	F
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	54,470	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	65,184	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	54,278	E
K. Bear Street, between Paularino Avenue and Baker Street	42,799	F
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	51,395	E
O. Bristol Street, between MacArthur Boulevard and Callen's Common	55,126	E
P. Bristol Street, between Callen's Common and Sunflower Avenue	53,300	E
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	69,802	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	57,425	F

Review of column (3) of *Table 10-8* indicates that of the eleven (11) roadway segments operating adversely, the following five (5) locations exceed the level of service thresholds:

Roadway Segment
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard
O. Bristol Street, between MacArthur Boulevard and Callen's Common
P. Bristol Street, between Callen's Common and Sunflower Avenue
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps

The proposed Project adds less than the required increment threshold to the remaining six (6) roadway segments and therefore recommended improvements are not identified.

A peak hour link assessment was completed for the five (5) roadway segments that exceed the level of service thresholds, as summarized in ***Table 10-9***. As shown, the five (5) roadway segments are forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended.

TABLE 10-8

YEAR 2032 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2032 Cumulative Traffic Conditions		(2) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	**64,039**	**F**	**64,064**	**F**	No	--	--
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	**61,035**	**F**	**61,060**	**F**	No	--	--
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	**54,406**	**E**	**54,470**	**E**	No	--	--
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	Costa Mesa	D	Major Arterial	6D	**65,077**	**F**	**65,184**	**F**	No	--	--
E. Fairview Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	9D	49,089	A	49,196	A	No	--	--
F. Fairview Street, between I-405 SB Ramps and Baker Street	Costa Mesa	D	Major Arterial	6D	**54,171**	**E**	**54,278**	**E**	No	--	--
G. Bear Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	18,709	A	18,876	A	No	--	--
H. Bear Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana/ Costa Mesa	D	Primary Arterial	5D	19,788	A	19,813	A	No	--	--
I. Bear Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	32,047	A	32,615	A	No	--	--
J. Bear Street, between S. Coast Drive and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	33,805	A	34,332	B	No	--	--
K. Bear Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Primary Arterial	4D	**42,516**	**F**	**42,799**	**F**	No	--	--
L. S. Plaza Drive, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Primary Arterial	4D	5,839	A	6,522	A	No	--	--
M. S. Plaza Drive, between Callen's Common and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	5,327	A	5,761	A	No	--	--
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	50,387	D	**51,395**	**E**	**Yes**	--	--

TABLE 10-8 (CONTINUED)

YEAR 2032 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2032 Cumulative Traffic Conditions		(2) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
O. Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Major Arterial	6D	**52,509**	**E**	**55,126**	**E**	**Yes**	--	--
P. Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	**50,994**	**E**	**53,300**	**E**	**Yes**	--	--
Q. Bristol Street, between Sunflower Avenue and Anton Boulevard	Costa Mesa	D	Principal Arterial	8D	56,351	C	59,268	C	No	--	--
R. Bristol Street, between Anton Boulevard and I-405 NB Ramps	Costa Mesa	D	Principal Arterial	10D	67,335	C	70,252	C	No	--	--
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	8D	**67,518**	**E**	**69,802**	**E**	**Yes**	--	--
T. Bristol Street, between I-405 SB Ramps and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	44,227	C	44,616	C	No	--	--
U. Bristol Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Major Arterial	6D	45,759	D	46,148	D	No	--	--
V. Flower Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	16,964	A	17,130	A	No	--	--
W. Flower Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	10,571	A	10,596	A	No	--	--
X. Main Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	34,689	B	34,714	B	No	--	--
Y. Main Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	27,400	A	27,425	A	No	--	--
Z. Main Street, between Sunflower Avenue and Red Hill Avenue	Santa Ana/ Irvine	D	Major Arterial	6D	27,198	A	27,554	A	No	--	--
AA. Segerstrom Avenue, between Fairview Street and Bear Street	Santa Ana	D	Primary Arterial	4D	23,699	B	23,994	B	No	--	--
BB. Segerstrom Avenue, between Bear Street and Bristol Street	Santa Ana	D	Primary Arterial	4D	31,719	D	31,847	D	No	--	--

TABLE 10-8 (CONTINUED)
YEAR 2032 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2032 Cumulative Traffic Conditions		(2) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
CC. Segerstrom Avenue, between Bristol Street and Flower Street	Santa Ana	D	Primary Arterial	4D	25,780	B	25,989	B	No	--	--
DD. Dyer Road, between Flower Street and Main Street	Santa Ana	D	Primary Arterial	4D	32,365	D	32,574	D	No	--	--
EE. MacArthur Boulevard, between Fairview Street and Bear Street	Santa Ana	D	Major Arterial	6D	34,887	B	35,174	B	No	--	--
FF. MacArthur Boulevard, between Bear Street and S. Plaza Drive	Santa Ana	D	Major Arterial	6D	42,458	C	42,859	C	No	--	--
GG. MacArthur Boulevard, between S. Plaza Drive and Bristol Street	Santa Ana	D	Major Arterial	6D	38,787	B	39,373	B	No	--	--
HH. MacArthur Boulevard, between Bristol Street and Flower Street	Santa Ana	D	Major Arterial	6D	42,219	C	44,259	C	No	--	--
II. MacArthur Boulevard, between Flower Street and Main Street	Santa Ana	D	Major Arterial	6D	42,619	C	44,494	C	No	--	--
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	D	Major Arterial	6D	**55,550**	**E**	**57,425**	**F**	**Yes**	--	--
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	Santa Ana/ Irvine/ Caltrans	D	Major Arterial	7D	56,615	D	57,729	D	No	--	--
LL. Sunflower Avenue, between Fairview Street and Bear Street	Santa Ana/ Costa Mesa	D	Primary Arterial	4D	19,053	A	19,345	A	No	--	--
MM. Sunflower Avenue, between Bear Street and S. Plaza Drive	Santa Ana/ Costa Mesa	D	Major Arterial	6D	32,756	A	33,390	A	No	--	--
NN. Sunflower Avenue, between S. Plaza Drive and Bristol Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	31,752	A	32,979	A	No	--	--
OO. Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	26,012	A	26,368	A	No	--	--
PP. Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	22,568	A	22,924	A	No	--	--
QQ. Bristol Street, south of Baker Street	Costa Mesa	D	Major Arterial	6D	31,457	A	31,846	A	No	--	--

TABLE 10-9

YEAR 2032 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY – PEAK HOUR ANALYSIS

Key Roadway Segment		Jurisdiction	Time Period	Direction	No. of Lanes	Capacity[145]	(1) Year 2032 Cumulative Traffic Conditions			(2) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions			(3) Exceeds LOS Threshold
							Segment Volume	V/C	LOS	Segment Volume	V/C	LOS	Yes/No
N.	Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	AM	NB	3	5,100	1,081	0.212	A	1,175	0.230	A	No
				SB	3	5,100	1,392	0.273	A	1,423	0.279	A	No
			PM	NB	3	5,100	1,991	0.390	A	2,021	0.396	A	No
				SB	3	5,100	1,207	0.237	A	1,264	0.248	A	No
O.	Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	AM	NB	3	5,100	919	0.180	A	1,071	0.210	A	No
				SB	3	5,100	2,241	0.439	A	2,255	0.442	A	No
			PM	NB	3	5,100	2,515	0.493	A	2,501	0.490	A	No
				SB	3	5,100	1,656	0.325	A	1,746	0.342	A	No
P.	Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	AM	NB	3	5,100	959	0.188	A	986	0.193	A	No
				SB	3	5,100	2,197	0.431	A	2,209	0.433	A	No
			PM	NB	3	5,100	2,510	0.492	A	2,430	0.476	A	No
				SB	3	5,100	1,549	0.304	A	1,536	0.301	A	No
S.	Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	AM	NB	4	6,400	1,929	0.301	A	1,979	0.309	A	No
				SB	4	6,400	2,527	0.395	A	2,745	0.429	A	No
			PM	NB	4	6,400	2,707	0.423	A	2,790	0.436	A	No
				SB	4	6,400	3,239	0.506	A	3,336	0.521	A	No
JJ.	MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	AM	EB	3	5,100	2,842	0.557	A	2,988	0.586	A	No
				WB	3	5,100	2,424	0.475	A	2,475	0.485	A	No
			PM	EB	3	5,100	2,518	0.494	A	2,579	0.506	A	No
				WB	3	5,100	2,572	0.504	A	2,669	0.523	A	No

[145] Capacities are consistent with the through lane capacities identified for the peak hour intersection capacity analyses (i.e. 1700 vph for the Cities of Santa Ana and Irvine and 1600 vph for the City of Costa Mesa).

10.6 Year 2036 Analysis

Table 10-10 summarizes the daily Level of Service results at the forty-three (43) study roadway segments for the Year 2036 horizon year. The first column (1) in *Table 10-10* lists future Year 2036 cumulative traffic conditions (existing plus ambient plus related projects traffic) based on existing roadway geometry, but without any traffic generated from the proposed Project. The second column (2) presents future Year 2036 near-term traffic conditions with the addition of traffic generated by the proposed Project. The third column (3) indicates whether the traffic associated with the Project will exceed the level of service thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service. It should be noted that the City of Santa Ana and Costa Mesa guidelines do not have a daily threshold for significance, whereas the City of Irvine guidelines identifies an increase of 2.0% or more at an adverse location as their daily threshold of significance. However, to provide a conservative assessment and consistent with the peak hour criteria, the daily threshold of significance for this analysis will be based on an increase of 1.0% or more at an adverse location. For those locations where the thresholds are exceeded, recommended improvements are identified and the roadway segments are then analyzed with those improvements.

10.6.1 *Year 2036 Cumulative Traffic Conditions*

Review of column (1) of *Table 10-10* indicates that eleven (11) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	66,318	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	63,196	F
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	56,339	F
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	67,391	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	56,092	E
K. Bear Street, between Paularino Avenue and Baker Street	44,069	F
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	52,195	E
O. Bristol Street, between MacArthur Boulevard and Callen's Common	54,449	E
P. Bristol Street, between Callen's Common and Sunflower Avenue	52,880	E
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	70,211	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	57,870	F

10.6.2 *Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions*

Review of column (2) of *Table 10-10* indicates that twelve (12) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	66,343	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	63,221	F
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	56,403	F
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	67,443	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	56,144	E
K. Bear Street, between Paularino Avenue and Baker Street	44,298	F
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	53,086	E
O. Bristol Street, between MacArthur Boulevard and Callen's Common	57,194	F
P. Bristol Street, between Callen's Common and Sunflower Avenue	55,336	E
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	72,873	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	59,987	F
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	60,072	E

Review of column (3) of *Table 10-10* indicates that of the twelve (12) roadway segments operating adversely, the following six (6) locations exceed the level of service thresholds:

Roadway Segment
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard
O. Bristol Street, between MacArthur Boulevard and Callen's Common
P. Bristol Street, between Callen's Common and Sunflower Avenue
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps

The proposed Project adds less than the required increment threshold to the remaining six (6) roadway segments and therefore recommended improvements are not identified.

A peak hour link assessment was completed for the six (6) roadway segments that exceed the level of service thresholds, as summarized in ***Table 10-11***. As shown, the six (6) roadway segments are forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended.

TABLE 10-10
YEAR 2036 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2036 Cumulative Traffic Conditions		(2) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	**66,318**	**F**	**66,343**	**F**	No	--	--
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	**63,196**	**F**	**63,221**	**F**	No	--	--
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	**56,339**	**F**	**56,403**	**F**	No	--	--
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	Costa Mesa	D	Major Arterial	6D	**67,391**	**F**	**67,443**	**F**	No	--	--
E. Fairview Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	9D	50,825	B	50,877	B	No	--	--
F. Fairview Street, between I-405 SB Ramps and Baker Street	Costa Mesa	D	Major Arterial	6D	**56,092**	**E**	**56,144**	**E**	No	--	--
G. Bear Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	19,327	A	19,352	A	No	--	--
H. Bear Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana/ Costa Mesa	D	Primary Arterial	5D	20,320	A	20,345	A	No	--	--
I. Bear Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	33,258	A	33,718	A	No	--	--
J. Bear Street, between S. Coast Drive and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	35,091	B	35,564	B	No	--	--
K. Bear Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Primary Arterial	4D	**44,069**	**F**	**44,298**	**F**	No	--	--
L. S. Plaza Drive, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Primary Arterial	4D	6,314	A	6,742	A	No	--	--
M. S. Plaza Drive, between Callen's Common and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	5,744	A	6,242	A	No	--	--
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	**52,195**	**E**	**53,086**	**E**	**Yes**	--	--

TABLE 10-10 (CONTINUED)
YEAR 2036 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2036 Cumulative Traffic Conditions		(2) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
O. Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Major Arterial	6D	**54,449**	**E**	**57,194**	**F**	**Yes**	--	--
P. Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	**52,880**	**E**	**55,336**	**E**	**Yes**	--	--
Q. Bristol Street, between Sunflower Avenue and Anton Boulevard	Costa Mesa	D	Principal Arterial	8D	59,000	C	62,422	D	No	--	--
R. Bristol Street, between Anton Boulevard and I-405 NB Ramps	Costa Mesa	D	Principal Arterial	10D	70,275	C	73,697	C	No	--	--
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	8D	**70,211**	**E**	**72,873**	**E**	**Yes**	--	--
T. Bristol Street, between I-405 SB Ramps and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	45,846	D	46,231	D	No	--	--
U. Bristol Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Major Arterial	6D	47,434	D	47,819	D	No	--	--
V. Flower Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	17,530	A	17,587	A	No	--	--
W. Flower Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	10,944	A	10,969	A	No	--	--
X. Main Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	35,916	B	35,941	B	No	--	--
Y. Main Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	28,357	A	28,382	A	No	--	--
Z. Main Street, between Sunflower Avenue and Red Hill Avenue	Santa Ana/ Irvine	D	Major Arterial	6D	28,191	A	28,543	A	No	--	--
AA. Segerstrom Avenue, between Fairview Street and Bear Street	Santa Ana	D	Primary Arterial	4D	24,468	B	24,545	B	No	--	--
BB. Segerstrom Avenue, between Bear Street and Bristol Street	Santa Ana	D	Primary Arterial	4D	32,880	D	33,008	D	No	--	--

TABLE 10-10 (CONTINUED)
YEAR 2036 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2036 Cumulative Traffic Conditions		(2) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
CC. Segerstrom Avenue, between Bristol Street and Flower Street	Santa Ana	D	Primary Arterial	4D	26,667	C	26,767	C	No	--	--
DD. Dyer Road, between Flower Street and Main Street	Santa Ana	D	Primary Arterial	4D	33,492	D	33,592	D	No	--	--
EE. MacArthur Boulevard, between Fairview Street and Bear Street	Santa Ana	D	Major Arterial	6D	36,005	B	36,030	B	No	--	--
FF. MacArthur Boulevard, between Bear Street and S. Plaza Drive	Santa Ana	D	Major Arterial	6D	43,976	C	44,001	C	No	--	--
GG. MacArthur Boulevard, between S. Plaza Drive and Bristol Street	Santa Ana	D	Major Arterial	6D	40,435	C	40,737	C	No	--	--
HH. MacArthur Boulevard, between Bristol Street and Flower Street	Santa Ana	D	Major Arterial	6D	44,014	C	46,188	D	No	--	--
II. MacArthur Boulevard, between Flower Street and Main Street	Santa Ana	D	Major Arterial	6D	44,515	C	46,632	D	No	--	--
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	D	Major Arterial	6D	**57,870**	**F**	**59,987**	**F**	**Yes**	--	--
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	Santa Ana/ Irvine/ Caltrans	D	Major Arterial	7D	58,839	D	**60,072**	**E**	**Yes**	--	--
LL. Sunflower Avenue, between Fairview Street and Bear Street	Santa Ana/ Costa Mesa	D	Primary Arterial	4D	19,706	A	19,998	A	No	--	--
MM. Sunflower Avenue, between Bear Street and S. Plaza Drive	Santa Ana/ Costa Mesa	D	Major Arterial	6D	34,478	B	35,003	B	No	--	--
NN. Sunflower Avenue, between S. Plaza Drive and Bristol Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	33,676	A	35,255	B	No	--	--
OO. Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	26,923	A	27,275	A	No	--	--
PP. Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	23,327	A	23,679	A	No	--	--
QQ. Bristol Street, south of Baker Street	Costa Mesa	D	Major Arterial	6D	32,615	A	33,000	A	No	--	--

TABLE 10-11

YEAR 2036 CUMULATIVE DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY – PEAK HOUR ANALYSIS

Key Roadway Segment		Jurisdiction	Time Period	Direction	No. of Lanes	Capacity[146]	(1) Year 2036 Cumulative Traffic Conditions			(2) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions			(3) Exceeds LOS Threshold
							Segment Volume	V/C	LOS	Segment Volume	V/C	LOS	Yes/No
N.	Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	AM	NB	3	5,100	1,136	0.223	A	1,274	0.250	A	No
				SB	3	5,100	1,445	0.283	A	1,479	0.290	A	No
			PM	NB	3	5,100	2,065	0.405	A	2,088	0.409	A	No
				SB	3	5,100	1,249	0.245	A	1,313	0.257	A	No
O.	Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	AM	NB	3	5,100	967	0.190	A	1,117	0.219	A	No
				SB	3	5,100	2,326	0.456	A	2,335	0.458	A	No
			PM	NB	3	5,100	2,609	0.512	A	2,584	0.507	A	No
				SB	3	5,100	1,717	0.337	A	1,802	0.353	A	No
P.	Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	AM	NB	3	5,100	1,010	0.198	A	1,078	0.211	A	No
				SB	3	5,100	2,281	0.447	A	2,425	0.475	A	No
			PM	NB	3	5,100	2,604	0.511	A	2,616	0.513	A	No
				SB	3	5,100	1,605	0.315	A	1,660	0.325	A	No
S.	Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	AM	NB	4	6,400	2,010	0.314	A	2,072	0.324	A	No
				SB	4	6,400	2,678	0.418	A	3,019	0.472	A	No
			PM	NB	4	6,400	2,811	0.439	A	2,919	0.456	A	No
				SB	4	6,400	3,377	0.528	A	3,487	0.545	A	No
JJ.	MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	AM	EB	3	5,100	2,978	0.584	A	3,228	0.633	B	No
				WB	3	5,100	2,523	0.495	A	2,590	0.508	A	No
			PM	EB	3	5,100	2,623	0.514	A	2,688	0.527	A	No
				WB	3	5,100	2,677	0.525	A	2,807	0.550	A	No
KK.	MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	Santa Ana/ Irvine/ Caltrans	AM	EB	4	6,800	2,883	0.424	A	3,076	0.452	A	No
				WB	3	5,100	1,659	0.325	A	1,682	0.330	A	No
			PM	EB	4	6,800	1,748	0.257	A	1,804	0.265	A	No
				WB	3	5,100	2,523	0.495	A	2,570	0.504	A	No

[146] Capacities are consistent with the through lane capacities identified for the peak hour intersection capacity analyses (i.e. 1700 vph for the Cities of Santa Ana and Irvine and 1600 vph for the City of Costa Mesa).

10.7 Year 2045 Analysis

Table 10-12 summarizes the daily Level of Service results at the forty-three (43) study roadway segments for the Year 2045 buildout year. The first column (1) in *Table 10-12* lists future Year 2045 buildout traffic conditions based on existing roadway geometry, but without any traffic generated from the proposed Project. The second column (2) presents future Year 2045 buildout traffic conditions with the addition of traffic generated by the proposed Project. The third column (3) indicates whether the traffic associated with the Project will exceed the level of service thresholds defined in this report. The fourth column (4) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service. It should be noted that the City of Santa Ana and Costa Mesa guidelines do not have a daily threshold for significance, whereas the City of Irvine guidelines identifies an increase of 2.0% or more at an adverse location as their daily threshold of significance. However, to provide a conservative assessment and consistent with the peak hour criteria, the daily threshold of significance for this analysis will be based on an increase of 1.0% or more at an adverse location. For those locations where the thresholds are exceeded, recommended improvements are identified and the roadway segments are then analyzed with those improvements.

10.7.1 *Year 2045 Buildout Traffic Conditions*

Review of column (1) of *Table 10-12* indicates that fourteen (14) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	69,634	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	66,356	F
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	59,156	F
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	70,761	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	58,897	F
K. Bear Street, between Paularino Avenue and Baker Street	46,272	F
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	54,805	E
O. Bristol Street, between MacArthur Boulevard and Callen's Common	57,171	F
P. Bristol Street, between Callen's Common and Sunflower Avenue	55,524	E
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	73,722	E
BB. Segerstrom Avenue, between Bear Street and Bristol Street	34,524	E
DD. Dyer Road, between Flower Street and Main Street	34,666	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	60,764	F
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	71,625	F

10.7.2 *Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions*

Review of column (2) of *Table 10-12* indicates that fourteen (14) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to

operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	69,659	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	66,381	F
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	59,220	F
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	70,813	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	58,949	F
K. Bear Street, between Paularino Avenue and Baker Street	46,501	F
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	55,696	E
O. Bristol Street, between MacArthur Boulevard and Callen's Common	59,916	F
P. Bristol Street, between Callen's Common and Sunflower Avenue	57,980	F
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	76,384	F
BB. Segerstrom Avenue, between Bear Street and Bristol Street	34,652	E
DD. Dyer Road, between Flower Street and Main Street	34,766	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	62,881	F
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	72,858	F

Review of column (3) of *Table 10-12* indicates that of the fourteen (14) roadway segments operating adversely, the following six (6) locations exceed the level of service thresholds:

Roadway Segment
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard
O. Bristol Street, between MacArthur Boulevard and Callen's Common
P. Bristol Street, between Callen's Common and Sunflower Avenue
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps

The proposed Project adds less than the required increment threshold to the remaining eight (8) roadway segments and therefore does not require recommended improvements based on the LOS standards and criteria specified in this report.

A peak hour link assessment was completed for the six (6) roadway segments that exceed the level of service thresholds, as summarized in ***Table 10-13***. As shown, the six (6) roadway segments are forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended.

TABLE 10-12

YEAR 2045 BUILDOUT DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2045 Buildout Traffic Conditions		(2) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	**69,634**	**F**	**69,659**	**F**	No	--	--
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	**66,356**	**F**	**66,381**	**F**	No	--	--
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	**59,156**	**F**	**59,220**	**F**	No	--	--
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	Costa Mesa	D	Major Arterial	6D	**70,761**	**F**	**70,813**	**F**	No	--	--
E. Fairview Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	9D	53,366	B	53,418	B	No	--	--
F. Fairview Street, between I-405 SB Ramps and Baker Street	Costa Mesa	D	Major Arterial	6D	**58,897**	**F**	**58,949**	**F**	No	--	--
G. Bear Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	20,293	A	20,318	A	No	--	--
H. Bear Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana/ Costa Mesa	D	Primary Arterial	5D	21,336	A	21,361	A	No	--	--
I. Bear Street, between Sunflower Avenue and S. Coast Drive	Costa Mesa	D	Major Arterial	6D	34,921	B	35,381	B	No	--	--
J. Bear Street, between S. Coast Drive and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	36,846	B	37,319	B	No	--	--
K. Bear Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Primary Arterial	4D	**46,272**	**F**	**46,501**	**F**	No	--	--
L. S. Plaza Drive, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Primary Arterial	4D	6,630	A	7,058	A	No	--	--
M. S. Plaza Drive, between Callen's Common and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	5,780	A	6,278	A	No	--	--
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	**54,805**	**E**	**55,696**	**E**	**Yes**	--	--

TABLE 10-12 (CONTINUED)

YEAR 2045 BUILDOUT DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2045 Buildout Traffic Conditions		(2) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
O. Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	D	Major Arterial	6D	**57,171**	**F**	**59,916**	**F**	**Yes**	--	--
P. Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	**55,524**	**E**	**57,980**	**F**	**Yes**	--	--
Q. Bristol Street, between Sunflower Avenue and Anton Boulevard	Costa Mesa	D	Principal Arterial	8D	61,950	D	65,372	D	No	--	--
R. Bristol Street, between Anton Boulevard and I-405 NB Ramps	Costa Mesa	D	Principal Arterial	10D	73,789	C	77,211	D	No	--	--
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	D	Principal Arterial	8D	**73,722**	**E**	**76,384**	**F**	**Yes**	--	--
T. Bristol Street, between I-405 SB Ramps and Paularino Avenue	Costa Mesa	D	Major Arterial	6D	48,138	D	48,523	D	No	--	--
U. Bristol Street, between Paularino Avenue and Baker Street	Costa Mesa	D	Major Arterial	6D	49,806	D	50,191	D	No	--	--
V. Flower Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Primary Arterial	4D	18,407	A	18,464	A	No	--	--
W. Flower Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Primary Arterial	4D	11,491	A	11,516	A	No	--	--
X. Main Street, between Dyer Road and MacArthur Boulevard	Santa Ana	D	Major Arterial	6D	37,712	B	37,737	B	No	--	--
Y. Main Street, between MacArthur Boulevard and Sunflower Avenue	Santa Ana	D	Major Arterial	6D	29,775	A	29,800	A	No	--	--
Z. Main Street, between Sunflower Avenue and Red Hill Avenue	Santa Ana/ Irvine	D	Major Arterial	6D	29,601	A	29,953	A	No	--	--
AA. Segerstrom Avenue, between Fairview Street and Bear Street	Santa Ana	D	Primary Arterial	4D	24,629	B	24,706	B	No	--	--
BB. Segerstrom Avenue, between Bear Street and Bristol Street	Santa Ana	D	Primary Arterial	4D	**34,524**	**E**	**34,652**	**E**	No	--	--

TABLE 10-12 (CONTINUED)
YEAR 2045 BUILDOUT DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY

Key Roadway Segment	Jurisdiction	Min. Acceptable LOS	Roadway Classification	No. of Lanes	(1) Year 2045 Buildout Traffic Conditions		(2) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions		(3) Exceeds LOS Threshold	(4) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions with Improvements	
					Daily Volume	LOS	Daily Volume	LOS	Yes/No	Daily Volume	LOS
CC. Segerstrom Avenue, between Bristol Street and Flower Street	Santa Ana	D	Primary Arterial	4D	27,540	C	27,640	C	No	--	--
DD. Dyer Road, between Flower Street and Main Street	Santa Ana	D	Primary Arterial	4D	**34,666**	**E**	**34,766**	**E**	No	--	--
EE. MacArthur Boulevard, between Fairview Street and Bear Street	Santa Ana	D	Major Arterial	6D	37,805	B	37,830	B	No	--	--
FF. MacArthur Boulevard, between Bear Street and S. Plaza Drive	Santa Ana	D	Major Arterial	6D	46,175	D	46,200	D	No	--	--
GG. MacArthur Boulevard, between S. Plaza Drive and Bristol Street	Santa Ana	D	Major Arterial	6D	42,457	C	42,759	C	No	--	--
HH. MacArthur Boulevard, between Bristol Street and Flower Street	Santa Ana	D	Major Arterial	6D	46,215	D	48,389	D	No	--	--
II. MacArthur Boulevard, between Flower Street and Main Street	Santa Ana	D	Major Arterial	6D	46,741	D	48,858	D	No	--	--
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	D	Major Arterial	6D	**60,764**	**F**	**62,881**	**F**	**Yes**	--	--
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	Santa Ana/ Irvine/ Caltrans	D	Major Arterial	7D	**71,625**	**F**	**72,858**	**F**	**Yes**	--	--
LL. Sunflower Avenue, between Fairview Street and Bear Street	Santa Ana/ Costa Mesa	D	Primary Arterial	4D	20,691	A	20,983	A	No	--	--
MM. Sunflower Avenue, between Bear Street and S. Plaza Drive	Santa Ana/ Costa Mesa	D	Major Arterial	6D	36,202	B	36,727	B	No	--	--
NN. Sunflower Avenue, between S. Plaza Drive and Bristol Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	35,360	B	36,939	B	No	--	--
OO. Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	28,269	A	28,621	A	No	--	--
PP. Sunflower Avenue, between Bristol Street and Flower Street	Santa Ana/ Costa Mesa	D	Major Arterial	6D	24,493	A	24,845	A	No	--	--
QQ. Bristol Street, south of Baker Street	Costa Mesa	D	Major Arterial	6D	34,246	B	34,631	B	No	--	--

TABLE 10-13

YEAR 2045 BUILDOUT DAILY ROADWAY SEGMENTS LEVEL OF SERVICE ANALYSIS SUMMARY – PEAK HOUR ANALYSIS

Key Roadway Segment		Jurisdiction	Time Period	Direction	No. of Lanes	Capacity[147]	(1) Year 2045 Buildout Traffic Conditions			(2) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions			(3) Exceeds LOS Threshold
							Segment Volume	V/C	LOS	Segment Volume	V/C	LOS	Yes/No
N.	Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	Santa Ana	AM	NB	3	5,100	1,240	0.243	A	1,378	0.270	A	No
				SB	3	5,100	1,620	0.318	A	1,654	0.324	A	No
			PM	NB	3	5,100	3,226	0.633	B	3,249	0.637	B	No
				SB	3	5,100	1,310	0.257	A	1,374	0.269	A	No
O.	Bristol Street, between MacArthur Boulevard and Callen's Common	Santa Ana	AM	NB	3	5,100	1,042	0.204	A	1,188	0.233	A	No
				SB	3	5,100	2,618	0.513	A	2,486	0.487	A	No
			PM	NB	3	5,100	2,778	0.545	A	2,742	0.538	A	No
				SB	3	5,100	1,806	0.354	A	1,883	0.369	A	No
P.	Bristol Street, between Callen's Common and Sunflower Avenue	Santa Ana	AM	NB	3	5,100	1,091	0.214	A	1,154	0.226	A	No
				SB	3	5,100	2,436	0.478	A	2,574	0.505	A	No
			PM	NB	3	5,100	2,773	0.544	A	2,772	0.544	A	No
				SB	3	5,100	1,688	0.331	A	1,733	0.340	A	No
S.	Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	Costa Mesa/ Caltrans	AM	NB	4	6,400	2,178	0.340	A	2,240	0.350	A	No
				SB	4	6,400	3,055	0.477	A	3,396	0.531	A	No
			PM	NB	4	6,400	3,017	0.471	A	3,125	0.488	A	No
				SB	4	6,400	3,658	0.572	A	3,768	0.589	A	No
JJ.	MacArthur Boulevard, between Main Street and SR-55 SB Ramps	Santa Ana	AM	EB	3	5,100	3,177	0.623	B	3,427	0.672	B	No
				WB	3	5,100	2,718	0.533	A	2,785	0.546	A	No
			PM	EB	3	5,100	2,821	0.553	A	2,886	0.566	A	No
				WB	3	5,100	2,826	0.554	A	2,956	0.580	A	No
KK.	MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	Santa Ana/ Irvine/ Caltrans	AM	EB	4	6,800	3,078	0.453	A	3,271	0.481	A	No
				WB	3	5,100	1,763	0.346	A	1,786	0.350	A	No
			PM	EB	4	6,800	1,902	0.280	A	1,958	0.288	A	No
				WB	3	5,100	2,651	0.520	A	2,698	0.529	A	No

[147] Capacities are consistent with the through lane capacities identified for the peak hour intersection capacity analyses (i.e. 1700 vph for the Cities of Santa Ana and Irvine and 1600 vph for the City of Costa Mesa).

11.0 SITE ACCESS AND INTERNAL CIRCULATION EVALUATION

11.1 Site Access

Vehicular access to the Project site will be provided via four (4) unsignalized right-turn only driveways along South Plaza Drive (Driveways I, J, K, and L), one (1) unsignalized full-access driveway along South Plaza Drive (Driveway M), one (1) signalized driveway (Callen's Common) on South Plaza Drive, two (2) unsignalized right-turn only driveways along MacArthur Boulevard (Driveways G and H), three (3) unsignalized right-turn only driveways along Bristol Street (Driveways D, E and F), two (2) signalized driveways (Callen's Common and Driveway C) on Bristol Street, two (2) unsignalized right-turn only driveways along Sunflower Avenue (Driveways A and B), and one signalized driveway along Sunflower Avenue. It should be noted that Driveway D is designated for service access only to service the truck deliveries for the grocery store. *Figure 2-3* illustrates the proposed lane configuration and control type.

11.1.1 *Level of Service Analysis*

Tables 11-1, 11-2 and ***11-3*** summarize the intersection level of service results at the Project driveways for Existing, Opening Year (Years 2030, 2032 and 2036), and Year 2045 Buildout traffic conditions, respectively.

As shown in *Table 11-1*, the Project driveways are forecast to operate at acceptable service levels with the exception of Driveway G, which is forecast to operate at LOS F during the AM peak hour under Existing Plus Project Phases 1, 2 and 3.

As shown in *Table 11-2*, the Project driveways are forecast to operate at acceptable service levels with the exception of Driveways G and H, which are forecast to operate at LOS F and E, respectively, during the AM peak hour under Year 2036 Cumulative Plus Project Phases 1, 2 and 3.

As shown in *Table 11-3*, the Project driveways are forecast to operate at acceptable service levels with the exception of Driveways E, F, G, and H, which are forecast to operate at LOS E or F during the AM peak hour under Year 2045 Buildout Plus Project Phases 1, 2 and 3.

Although Driveways E, F, G, and H are forecast to operate adversely during the AM peak hour with Project Phases 1, 2 and 3, it is not uncommon for private unsignalized driveways to experience a longer delay due to the heavy volumes on the major streets, such as MacArthur Boulevard and Bristol Street. Furthermore, due to the driveway being in close proximity to other signalized intersections, it is expected that gaps in traffic would occur and actual vehicular delay experienced would be lower than what is being reported within the HCM methodology. Additionally, the project site provides multiple entry/exit points of which some are signalized. Therefore, motorists that do not wish to wait can find alternative routes in/out of the site.

Appendix D presents the ICU/LOS and HCM/LOS calculations for the Project driveways.

11.1.2 *Queuing Analysis*

A queueing analysis was completed at all the Project driveways to validate that the existing and/or proposed storage is adequate to accommodate the anticipated queues with the proposed Project. The queuing evaluation was conducted based on the HCM 95th percentile queue methodology.

Table 11-4 summarizes the queueing results at the project driveways for Existing Plus Project Phases 1, 2 and 3, Year 2036 Cumulative Plus Project Phases 1, 2 and 3, and Year 2045 Buildout Plus Project Phases 1, 2 and 3. Review of *Table 11-4* indicates that the existing and/or proposed storage is adequate to accommodate the anticipated queues. It should be noted that Project Driveways C, D, K, L and M may queue past a parking garage ramp. As such, during the development plan review further consideration should be taken to ensure adequate ingress and egress.

11.2 Sight Distance and Internal Circulation Evaluation

During the development plan review process, curb radii should be validated to ensure proper design to accommodate a small service/delivery truck (SU-30), fire truck and large moving vehicles. More specifically, Driveway D, which is intended for service access only, should be assessed to ensure that large trucks can properly access the proposed grocery store. Additionally, landscaping around the perimeter of the project site should be designed to avoid obstructions to sight lines at the project driveways.

TABLE 11-1
EXISTING PLUS PROJECT DRIVEWAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key	Intersection	Intersection Control	Time Period	(1) Existing Plus Project Phase 1 Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions	
				ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS
14.	South Plaza Drive at Callen's Common	3∅ Traffic Signal	AM	0.085	A	0.087	A	0.090	A
			PM	0.184	A	0.191	A	0.199	A
15.	Bristol Street at Callen's Commons	5∅ Traffic Signal	AM	0.508	A	0.564	A	0.578	A
			PM	0.632	B	0.649	B	0.649	B
19.	Project Driveway at Sunflower Avenue	5∅ Traffic Signal	AM	0.354[148]	A	0.354[148]	A	0.358[148]	A
			PM	0.551[148]	A	0.551[148]	A	0.553[148]	A
		Costa Mesa:	*AM*	*0.304*[148]	*A*	*0.304*[148]	*A*	*0.325*[148]	*A*
			PM	*0.501*[148]	*A*	*0.501*[148]	*A*	*0.530*[148]	*A*
A.	Driveway A at Sunflower Avenue	One-Way Stop	AM	11.7 s/v	B	11.7 s/v	B	11.7 s/v	B
			PM	19.1 s/v	C	19.1 s/v	C	19.2 s/v	C

[148] There are multiple factors that come into play to allow for the installation of the proposed signal along Sunflower. Two main factors are that South Coast Plaza would have to agree to construct the south leg of the signal and that City of Costa Mesa would also have to provide construction permits since half of the street falls within the jurisdiction of the City of Costa Mesa. Since both of these factors cannot be fully guaranteed two alternatives have been considered. In the event that the south leg is not built by South Coast Plaza the intersection would operate as a 3-legged intersection with a three-phase traffic signal (Alternative 1). If Costa Mesa does not allow the proposed signal the intersection would operate as a 3-leg unsignalized right-turn only intersection (Alternative 2). Resulting service levels for the two alternatives at Project Driveway at Sunflower Avenue (Intersection No. 19) are summarized below:

- *Existing Plus Project Phase 1 and Existing Plus Project Phases 1 and 2:*
  - *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.310, LOS A; PM Peak Hour – 0.482, LOS A / (Alt. 2) AM Peak Hour –11.3 s/v, LOS B, PM Peak Hour – 20.2 s/v, LOS C*
  - *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.274, LOS A; PM Peak Hour – 0.455, LOS A / (Alt. 2) AM Peak Hour – 11.3 s/v, LOS B, PM Peak Hour – 20.2 s/v, LOS C*
- *Existing Plus Project Phases 1, 2 and 3:*
  - *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.314, LOS A; PM Peak Hour – 0.484, LOS A / (Alt. 2) AM Peak Hour –11.3 s/v, LOS B, PM Peak Hour – 20.4 s/v, LOS C*
  - *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.279, LOS A; PM Peak Hour – 0.458, LOS A / (Alt. 2) AM Peak Hour –11.5 s/v, LOS B, PM Peak Hour – 21.9 s/v, LOS C*

It should be noted that intersections 14, 15, 18, 20 and Project driveways A, B, C, D and K are also affected by the change of intersection operations as part of Alternative 2. However, the level of service results are consistent with the findings identified in Sections 8.0 and 11.1.1 of this report. Appendix F includes the intersection calculation worksheets for Alternatives 1 and 2.

TABLE 11-1 (CONTINUED)
EXISTING PLUS PROJECT DRIVEWAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection		Intersection Control	Time Period	(1) Existing Plus Project Phase 1 Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions	
				ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS
B.	Driveway B at Sunflower Avenue	One-Way Stop	AM	14.8 s/v	B	14.8 s/v	B	14.8 s/v	B
			PM	18.0 s/v	C	18.0 s/v	C	18.1 s/v	C
C.	Bristol Street at Driveway C	5∅ Traffic Signal	AM	0.584	A	0.593	A	0.621	B
			PM	0.591	A	0.619	B	0.639	B
D.	Bristol Street at Driveway D	One-Way Stop	AM	0.0 s/v	A	0.0 s/v	A	0.00 s/v	A
			PM	0.0 s/v	A	0.0 s/v	A	0.00 s/v	A
E.	Bristol Street at Driveway E	One-Way Stop	AM	--	--	25.5 s/v	D	25.5 s/v	D
			PM	--	--	18.2 s/v	C	18.2 s/v	C
F.	Bristol Street at Driveway F	One-Way Stop	AM	--	--	25.4 s/v	D	26.7 s/v	D
			PM	--	--	18.4 s/v	C	20.1 s/v	C
G.	Driveway G at MacArthur Boulevard	One-Way Stop	AM	--	--	26.6 s/v	D	**56.0 s/v**	**F**
			PM	--	--	17.4 s/v	C	21.0 s/v	C
H.	Driveway H at MacArthur Boulevard	One-Way Stop	AM	--	--	--	--	31.6 s/v	D
			PM	--	--	--	--	17.6 s/v	C

TABLE 11-1 (CONTINUED)
EXISTING PLUS PROJECT DRIVEWAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key	Intersection	Intersection Control	Time Period	(1) Existing Plus Project Phase 1 Traffic Conditions		(2) Existing Plus Project Phases 1 and 2 Traffic Conditions		(3) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions	
				ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS
I.	South Plaza Drive at Driveway I	One-Way Stop	AM	--	--	8.8 s/v	A	9.0 s/v	A
			PM	--	--	10.1 s/v	B	10.2 s/v	B
J.	South Plaza Drive at Driveway J	One-Way Stop	AM	--	--	8.7 s/v	A	8.7 s/v	A
			PM	--	--	9.7 s/v	A	9.8 s/v	A
K.	South Plaza Drive at Driveway K	One-Way Stop	AM	8.6 s/v	A	8.6 s/v	A	8.7 s/v	A
			PM	9.3 s/v	A	9.3 s/v	A	9.4 s/v	A
L.	South Plaza Drive at Driveway L	One-Way Stop	AM	--	--	--	--	9.0 s/v	A
			PM	--	--	--	--	10.2 s/v	B
M.	South Plaza Drive at Driveway M	One-Way Stop	AM	--	--	--	--	9.2 s/v	A
			PM	--	--	--	--	12.5 s/v	B

Notes:

- **BOLD ICU/HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)

TABLE 11-2
OPENING YEAR DRIVEWAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key	Intersection	Intersection Control	Time Period	(1) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(2) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions	
				ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS
14.	South Plaza Drive at Callen's Common	3∅ Traffic Signal	AM	0.086	A	0.089	A	0.106	A
			PM	0.190	A	0.198	A	0.214	A
15.	Bristol Street at Callen's Commons	5∅ Traffic Signal	AM	0.547	A	0.611	B	0.641	B
			PM	0.687	B	0.715	C	0.736	C
19.	Project Driveway at Sunflower Avenue	5∅ Traffic Signal	AM	0.380[149]	A	0.385[149]	A	0.418[149]	A
			PM	0.592[149]	A	0.599[149]	A	0.617[149]	B
		Costa Mesa:	*AM*	*0.330*[149]	*A*	*0.335*[149]	*A*	*0.368*[149]	*A*
			PM	*0.542*[149]	*A*	*0.549*[149]	*A*	*0.548*[149]	*A*
A.	Driveway A at Sunflower Avenue	One-Way Stop	AM	12.4 s/v	B	12.4 s/v	B	12.8 s/v	B
			PM	21.4 s/v	C	21.8 s/v	C	23.4 s/v	C

[149] There are multiple factors that come into play to allow for the installation of the proposed signal along Sunflower. Two main factors are that South Coast Plaza would have to agree to construct the south leg of the signal and that City of Costa Mesa would also have to provide construction permits since half of the street falls within the jurisdiction of the City of Costa Mesa. Since both of these factors cannot be fully guaranteed two alternatives have been considered. In the event that the south leg is not built by South Coast Plaza the intersection would operate as a 3-legged intersection with a three-phase traffic signal (Alternative 1). If Costa Mesa does not allow the proposed signal the intersection would operate as a 3-leg unsignalized right-turn only intersection (Alternative 2). Resulting service levels for the two alternatives at Project Driveway at Sunflower Avenue (Intersection No. 19) are summarized below:

- *Year 2030 Cumulative Plus Project Phase 1:*
  - *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.333, LOS A; PM Peak Hour – 0.518, LOS A / (Alt. 2) AM Peak Hour – 12.0 s/v, LOS B, PM Peak Hour – 23.5 s/v, LOS C*
  - *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.283, LOS A; PM Peak Hour – 0.468, LOS A / (Alt. 2) AM Peak Hour – 12.0 s/v, LOS B, PM Peak Hour – 23.5 s/v, LOS C*
- *Year 2032 Cumulative Plus Project Phases 1 and 2:*
  - *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.369, LOS A; PM Peak Hour – 0.545, LOS A / (Alt. 2) AM Peak Hour – 12.1 s/v, LOS B, PM Peak Hour – 24.0 s/v, LOS C*
  - *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.287, LOS A; PM Peak Hour – 0.474, LOS A / (Alt. 2) AM Peak Hour – 12.1 s/v, LOS B, PM Peak Hour – 24.0 s/v, LOS C*
- *Year 2036 Cumulative Plus Project Phases 1, 2 and 3:*
  - *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.369, LOS A; PM Peak Hour – 0.545, LOS A / (Alt. 2) AM Peak Hour – 12.2 s/v, LOS B, PM Peak Hour – 25.3 s/v, LOS D*
  - *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.319, LOS A; PM Peak Hour – 0.495, LOS A / (Alt. 2) AM Peak Hour – 12.2 s/v, LOS B, PM Peak Hour – 25.3 s/v, LOS D*

It should be noted that intersections 14, 15, 18, 20 and Project driveways A, B, C, D and K are also affected by the change of intersection operations as part of Alternative 2. However, the level of service results are consistent with the findings identified in Sections 8.0 and 11.1.1 of this report. Appendix F includes the intersection calculation worksheets for Alternatives 1 and 2.

TABLE 11-2 (CONTINUED)
OPENING YEAR DRIVEWAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection	Intersection Control	Time Period	(1) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(2) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions	
			ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS
B. Driveway B at Sunflower Avenue	One-Way Stop	AM	16.1 s/v	C	16.3 s/v	C	17.0 s/v	C
		PM	19.9 s/v	C	20.2 s/v	C	21.5 s/v	C
C. Bristol Street at Driveway C	5∅ Traffic Signal	AM	0.584	A	0.641	B	0.686	B
		PM	0.645	B	0.684	B	0.724	C
D. Bristol Street at Driveway D	One-Way Stop	AM	0.0 s/v	A	0.0 s/v	A	0.0 s/v	A
		PM	0.0 s/v	A	0.0 s/v	A	0.0 s/v	A
E. Bristol Street at Driveway E	One-Way Stop	AM	--	--	30.1 s/v	D	32.0 s/v	D
		PM	--	--	20.6 s/v	C	21.3 s/v	C
F. Bristol Street at Driveway F	One-Way Stop	AM	--	--	30.0 s/v	D	33.7 s/v	D
		PM	--	--	20.8 s/v	C	23.7 s/v	C
G. Driveway G at MacArthur Boulevard	One-Way Stop	AM	--	--	31.7 s/v	D	**104.1 s/v**	**F**
		PM	--	--	19.6 s/v	C	26.2 s/v	D
H. Driveway H at MacArthur Boulevard	One-Way Stop	AM	--	--	--	--	**45.7 s/v**	**E**
		PM	--	--	--	--	20.7 s/v	C

TABLE 11-2 (CONTINUED)
OPENING YEAR DRIVEWAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key	Intersection	Intersection Control	Time Period	(1) Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions		(2) Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions		(3) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions	
				ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS
I.	South Plaza Drive at Driveway I	One-Way Stop	AM	--	--	8.9 s/v	A	9.1 s/v	A
			PM	--	--	10.3 s/v	B	10.6 s/v	B
J.	South Plaza Drive at Driveway J	One-Way Stop	AM	--	--	8.7 s/v	A	8.9 s/v	A
			PM	--	--	9.8 s/v	A	10.0 s/v	B
K.	South Plaza Drive at Driveway K	One-Way Stop	AM	8.7 s/v	A	8.7 s/v	A	8.8 s/v	A
			PM	9.4 s/v	A	9.4 s/v	A	9.6 s/v	A
L.	South Plaza Drive at Driveway L	One-Way Stop	AM	--	--	--	--	9.1 s/v	A
			PM	--	--	--	--	10.5 s/v	B
M.	South Plaza Drive at Driveway M	One-Way Stop	AM	--	--	--	--	9.5 s/v	A
			PM	--	--	--	--	13.4 s/v	B

Notes:

- **BOLD ICU/HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)

TABLE 11-3
YEAR 2045 BUILDOUT DRIVEWAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection		Intersection Control	Time Period	(1) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions	
				ICU/HCM	LOS
14.	South Plaza Drive at Callen's Common	3∅ Traffic Signal	AM	0.131	A
			PM	0.268	A
15.	Bristol Street at Callen's Commons	5∅ Traffic Signal	AM	0.672	B
			PM	0.774	C
19.	Project Driveway at Sunflower Avenue	5∅ Traffic Signal	AM	0.460[150]	A
			PM	0.651[150]	B
		Costa Mesa:	*AM*	*0.410*[150]	*A*
			PM	*0.582*[150]	*B*
A.	Driveway A at Sunflower Avenue	One-Way Stop	AM	14.9 s/v	B
			PM	29.6 s/v	D
B.	Driveway B at Sunflower Avenue	One-Way Stop	AM	19.6 s/v	C
			PM	23.1 s/v	C
C.	Bristol Street at Driveway C	5∅ Traffic Signal	AM	0.719	B
			PM	0.762	C
D.	Bristol Street at Driveway D	One-Way Stop	AM	0.0 s/v	A
			PM	0.0 s/v	A
E.	Bristol Street at Driveway E	One-Way Stop	AM	**36.0 s/v**	**E**
			PM	22.5 s/v	C
F.	Bristol Street at Driveway F	One-Way Stop	AM	**38.0 s/v**	**E**
			PM	25.0 s/v	C
G.	Driveway G at MacArthur Boulevard	One-Way Stop	AM	**148.4 s/v**	**F**
			PM	31.3 s/v	D

[150] There are multiple factors that come into play to allow for the installation of the proposed signal along Sunflower. Two main factors are that South Coast Plaza would have to agree to construct the south leg of the signal and that City of Costa Mesa would also have to provide construction permits since half of the street falls within the jurisdiction of the City of Costa Mesa. Since both of these factors cannot be fully guaranteed two alternatives have been considered. In the event that the south leg is not built by South Coast Plaza the intersection would operate as a 3-legged intersection with a three-phase traffic signal (Alternative 1). If Costa Mesa does not allow the proposed signal the intersection would operate as a 3-leg unsignalized right-turn only intersection (Alternative 2). Resulting service levels for the two alternatives at Project Driveway at Sunflower Avenue (Intersection No. 19) are summarized below:

- *City of Santa Ana: (Alt. 1) AM Peak Hour – 0.408, LOS A; PM Peak Hour – 0.569, LOS A / (Alt. 2) AM Peak Hour – 12.5 s/v, LOS B, PM Peak Hour – 28.1 s/v, LOS D*
- *City of Costa Mesa: (Alt. 1) AM Peak Hour – 0.358, LOS A; PM Peak Hour – 0.519, LOS A / (Alt. 2) AM Peak Hour – 12.5 s/v, LOS B, PM Peak Hour – 28.1 s/v, LOS D*

It should be noted that intersections 14, 15, 18, 20 and Project driveways A, B, C, D and K are also affected by the change of intersection operations as part of Alternative 2. However, the level of service results are consistent with the findings identified in Sections 8.0 and 11.1.1 of this report. Appendix F includes the intersection calculation worksheets for Alternatives 1 and 2.

TABLE 11-3 (CONTINUED)
YEAR 2045 BUILDOUT DRIVEWAY PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersection		Intersection Control	Time Period	(1) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions	
				ICU/HCM	LOS
H.	Driveway H at MacArthur Boulevard	One-Way Stop	AM	**57.8 s/v**	**F**
			PM	23.5 s/v	C
I.	South Plaza Drive at Driveway I	One-Way Stop	AM	9.4 s/v	A
			PM	11.5 s/v	B
J.	South Plaza Drive at Driveway J	One-Way Stop	AM	9.1 s/v	A
			PM	10.8 s/v	B
K.	South Plaza Drive at Driveway K	One-Way Stop	AM	9.1 s/v	A
			PM	10.3 s/v	B
L.	South Plaza Drive at Driveway L	One-Way Stop	AM	9.4 s/v	A
			PM	11.4 s/v	B
M.	South Plaza Drive at Driveway M	One-Way Stop	AM	10.3 s/v	B
			PM	16.1 s/v	C

Notes:

- **BOLD ICU/HCM/LOS** indicates unacceptable service level
- s/v = seconds per vehicle (delay)

TABLE 11-4

PROJECT DRIVEWAY QUEUING ANALYSIS[151]

Key Intersections	Storage Provided (feet)	(1) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions				(2) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions				(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
14. South Plaza Drive at Callen's Common													
Southbound Left-Turn	105	33	Yes	88	Yes	33	Yes	89	Yes	33	Yes	89	Yes
Westbound Left-Turn	50	32	Yes	25	Yes	32	Yes	25	Yes	32	Yes	25	Yes
Westbound Right-Turn	545	39	Yes	73	Yes	39	Yes	73	Yes	39	Yes	73	Yes
15. Bristol Street at Callen's Common													
Northbound Left-Turn[152]	125	39	Yes	121	Yes	44	Yes	136	Yes[153]	50	Yes	136	Yes[153]
Eastbound Left/Through-Turn	270	139	Yes	131	Yes	157	Yes	143	Yes	175	Yes	143	Yes
Eastbound Right-Turn	170	182	Yes[154]	112	Yes	202	Yes[154]	120	Yes	220	Yes[154]	119	Yes
19. Project Driveway at Sunflower Avenue													
Southbound Left-Turn	65	68	Yes[153]	92	Yes[153]	68	Yes[153]	92	Yes[153]	68	Yes[153]	92	Yes[153]
Southbound Through/Right-Turn	190	35	Yes	53	Yes	35	Yes	53	Yes	35	Yes	52	Yes
Eastbound Left -Turn	200	38	Yes	78	Yes	38	Yes	78	Yes	38	Yes	78	Yes
A. Driveway A at Sunflower Ave													
Southbound Right-Turn	225	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes	28	Yes
B. Driveway B at Sunflower Avenue													
Southbound Right-Turn	50	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes
C. Bristol Street at Driveway C													
Northbound Left-Turn[152]	125	25	Yes	60	Yes	26	Yes	63	Yes	26	Yes	63	Yes
Eastbound Left/Through/Right-Turn	--[155]	158	--[155]	197	--[155]	212	--[155]	204	--[155]	212	--[155]	204	--[155]

[151] Queues are based on HCM 95th Percentile methodology.

[152] The movement consists of dual turn lanes.

[153] The spillover queue can be accommodated within the transition area of the turn pocket.

[154] The spillover queue can be accommodated upstream of the turn pocket.

[155] The estimated queues should be considered upon the development plan review of the proposed Project.

TABLE 11-4 (CONTINUED)
PROJECT DRIVEWAY QUEUING ANALYSIS[156]

Key Intersections	Storage Provided (feet)	(1) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions				(2) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions				(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
D. Bristol Street at Driveway D *Eastbound Right -Turn*	--[157]	25	--[157]	25	--[157]	25	--[157]	25	--[157]	25	--[157]	25	--[157]
E. Bristol Street at Driveway E *Eastbound Right -Turn*	270	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes
F. Bristol Street at Driveway F *Eastbound Right -Turn*	270	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes
G. Driveway G at MacArthur Boulevard *Northbound Right-Turn*	270	115	Yes[158]	33	Yes	166	Yes[158]	42	Yes	196	Yes[158]	49	Yes
H. Driveway H at MacArthur Boulevard *Northbound Right-Turn*	270	46	Yes	25	Yes	64	Yes	25	Yes	77	Yes	25	Yes
I. South Plaza Drive at Driveway I *Westbound Right-Turn*	260	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes
J. South Plaza Drive at Driveway J *Westbound Right-Turn*	565	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes
K. South Plaza Drive at Driveway K *Westbound Right-Turn*	--[157]	25	--[157]	25	--[157]	25	--[157]	25	--[157]	25	--[157]	25	--[157]

156 Queues are based on HCM 95th Percentile methodology.

157 The estimated queues should be considered upon the development plan review of the proposed Project.

158 It should be noted that the anticipated queues may extend past the internal parking garage driveways, in which case "Keep Clear" striping should be considered to allow for proper ingress and egress at the internal driveways.

TABLE 11-4 (CONTINUED)
PROJECT DRIVEWAY QUEUING ANALYSIS[159]

Key Intersections	Storage Provided (feet)	(1) Existing Plus Project Phases 1, 2 and 3 Traffic Conditions				(2) Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions				(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required (feet)	Adequate Storage (Yes/No)
L. South Plaza Drive at Driveway L													
Westbound Right-turn	--[160]	25	--[160]	25	--[160]	25	--[160]	25	--[160]	25	--[160]	25	--[160]
M. South Plaza Drive at Driveway M													
Southbound Left-Turn	105	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes	25	Yes
Westbound Left-turn	--[160]	25	--[160]	25	--[160]	25	--[160]	25	--[160]	25	--[160]	25	--[160]
Westbound Right-Turn	--[160]	25	--[160]	25	--[160]	25	--[160]	25	--[160]	25	--[160]	25	--[160]

[159] Queues are based on HCM 95th Percentile methodology.

[160] The estimated queues should be considered upon the development plan review of the proposed Project.

12.0 RECOMMENDED INTERSECTION IMPROVEMENTS

For those intersections where projected traffic volumes are expected to result in unacceptable operating conditions, this report recommends (identifies) improvement measures that change the intersection geometry to increase capacity. These capacity improvements involve roadway widening and/or re-striping to reconfigure (add lanes) to specific approaches of a key intersection. The identified improvements are expected to:

- improve existing traffic, Project traffic and future non-project (ambient traffic growth and cumulative project) traffic and
- improve Levels of Service to an acceptable range and/or to pre-project conditions.

This report identifies both feasible and infeasible improvements that would be required to improve levels of service as noted above. Improvements are considered infeasible if additional right-of-way is required to construct/implement the improvement.

12.1 Project-Specific Improvements

As previously noted in *Section 2.2*, the following improvements within the public right-of-way along Bristol Street, MacArthur Boulevard, Sunflower Avenue, and South Plaza Drive are anticipated to be constructed as part of the proposed Project:

- **Bristol Street** planned improvements include a widened parkway, street trees, planted setback areas, new curb cuts for ingress/egress to/from Bristol Street, new sidewalks, potential median modifications, and construction of Class IV bikeway improvements per City design. The project driveways along the roadway are anticipated to include the following specific improvements along Bristol Street:

  - **Bristol Street at Driveway C:** Modify the northbound approach to provide a second left-turn lane and demolish the existing median. Demolish the existing median on the southbound approach. Install a five-phase traffic signal.

- **MacArthur Boulevard** planned improvements include installation of a Class IV bike lane per the City's Mobility Element, construction of new landscaped median, planted setback areas with new sidewalks and street trees.

- **Sunflower Avenue** planned improvements include potential median modification, new sidewalks, and installation of Class IV bike lanes per the City Mobility Element. The project driveways along the roadway are anticipated to include the following specific improvements along Sunflower Avenue:

  - **No. 19 – Project Driveway at Sunflower Avenue:** As part of the proposed Project, the existing driveway will be realigned approximately 110-feet to the east of the existing driveway. Restriping along Sunflower Avenue and modification of the existing median

will be required to accommodate the new driveway. Install a five-phase traffic signal, subject to the improvements/realignment of South Coast Plaza driveway and the coordination with the City of Costa Mesa.

An alternate analysis was completed to assess the operations of this intersection in the event that the south leg access is not constructed. Results of this analysis indicate that the intersection will still operate at acceptable service levels.

A second alternate analysis was completed to assess the operations of this intersection in the event that a traffic signal is not installed and operates as an unsignalized "right-turn only" intersection. Results of this analysis indicate that the intersection will still operate at acceptable service levels.

- **South Plaza Drive** planned improvements include new curb cutouts for ingress/egress and planted setback areas with new sidewalks and street trees. The project driveways along the roadway are anticipated to include the following specific improvements along South Plaza Drive:

  - **No. 14 – South Plaza Drive at Callen's Common:** Install a three-phase traffic signal.

Figure 2-4 presents the anticipated cross-sections for Bristol Street, MacArthur Boulevard, Sunflower Avenue, and South Plaza Drive.

12.2 Recommended Improvements

12.2.1 *Existing Plus Project Phase 1 Traffic Conditions*

The results of the intersection capacity analyses summarized in *Table 8-1 and 9-1* identifies improvements at one (1) study intersection under Existing Plus Project Phase 1 traffic conditions. The recommended improvements consist of the following:

- **No. 10 – Flower Street at MacArthur Boulevard:** Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

12.2.2 *Existing Plus Project Phases 1 and 2 Traffic Conditions*

The results of the intersection capacity analyses summarized in *Table 8-2 and 9-3* identifies improvements at one (1) study intersections under Existing Plus Project Phases 1 and 2 traffic conditions. The recommended improvements consist of the following:

- **No. 10 – Flower Street at MacArthur Boulevard:** *(Same as those identified in Section 12.2.1)* Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

12.2.3 *Existing Plus Project Phases 1, 2 and 3 Traffic Conditions*

The results of the intersection capacity analyses summarized in *Table 8-3 and 9-5* identifies improvements at one (1) study intersections under Existing Plus Project Phases 1, 2 and 3 traffic conditions. The recommended improvements consist of the following:

- **No. 10 – Flower Street at MacArthur Boulevard:** *(Same as those identified in Section 12.2.1)* Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

12.2.4 *Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions*

The results of the intersection capacity analyses summarized in *Table 8-4 and 9-7* identifies improvements at two (2) study intersections under Year 2030 Cumulative Plus Project Phase 1 traffic conditions. The recommended improvements consist of the following:

- **No. 9 – Bristol Street at MacArthur Boulevard:** Improvements at this location include restriping the westbound right-turn lane into a shared through/right-turn lane and widening the westbound departure to provide an additional through lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing commercial centers located adjacent to the intersection. Therefore, improvements at this location are considered to be infeasible. Therefore, no improvements are recommended at this location. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- **No. 10 – Flower Street at MacArthur Boulevard:** *(Same as those identified in Section 12.2.1)* Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

12.2.5 *Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions*

The results of the intersection capacity analyses summarized in *Table 8-5 and 9-9* identifies improvements at four (4) study intersections under Year 2032 Cumulative Plus Project Phases 1 and 2 traffic conditions. The recommended improvements consist of the following:

- **No. 1 – Fairview Street at Segerstrom Avenue:** Restripe the westbound approach to provide an exclusive right-turn lane; the removal of on-street parking may be required to accommodate the new turn pocket. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

- **No. 3 – Bristol Street at Segerstrom Avenue:** Restripe the northbound approach to provide an exclusive right-turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

  This improvement is consistent with the recommendation identified in the City of Santa Ana General Plan. It should be noted that the General Plan also recommends widening Segerstrom Avenue to accommodate a third through lane in both the eastbound and westbound directions. Per this analysis, these additional improvements are not necessary to offset the Project's increment and have therefore not been included.

- **No. 10 – Flower Street at MacArthur Boulevard:** *(Same as those identified in Section 12.2.1)* Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

- **No. 23 – Red Hill Avenue at Main Street:** Improvements at this location include widening the southbound approach to construct an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact the property adjacent to the intersection. Therefore, improvements at this location are considered to be infeasible and no improvements are recommended. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

12.2.6 *Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions*

The results of the intersection capacity analyses summarized in *Table 8-6 and 9-11* identifies improvements at five (5) study intersections under Year 2036 Cumulative Plus Project Phases 1, 2 and 3 traffic conditions. The recommended improvements consist of the following:

- **No. 1 – Fairview Street at Segerstrom Avenue:** *(Same as those identified in Section 12.2.5)* Restripe the westbound approach to provide an exclusive right-turn lane; the removal of on-street parking may be required to accommodate the new turn pocket. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

- **No. 3 – Bristol Street at Segerstrom Avenue:** *(Same as those identified in Section 12.2.5)* Restripe the northbound approach to provide an exclusive right-turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

  This improvement is consistent with the recommendation identified in the City of Santa Ana General Plan. It should be noted that the General Plan also recommends widening Segerstrom Avenue to accommodate a third through lane in both the eastbound and westbound directions. Per this analysis, these additional improvements are not necessary to offset the Project's increment and have therefore not been included.

- **No. 9 – Bristol Street at MacArthur Boulevard:** Improvements at this location include widening the southbound approach to construct an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing retail center adjacent to the intersection. Therefore, improvements at this location are considered to be infeasible and no improvements are recommended. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- **No. 10 – Flower Street at MacArthur Boulevard:** *(Same as those identified in Section 12.2.1)* Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

- **No. 11 – Main Street at MacArthur Boulevard:** Modify the existing traffic signal to include a right-turn overlap phase for both the northbound and southbound directions. This improvement is subject to the review of the City of Santa Ana.

  It should be noted that the improvements noted above do not offset the Project's increment. Additional improvements would be required to offset the Project's increment which include widening the westbound approach to construct a fourth through lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing apartment complex located adjacent to the intersection. Therefore, these additional improvements are considered to be infeasible and have not been included. It is important to

note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

12.2.7 *Year 2045 Buildout Plus Project Phases 1, 2 and 3Traffic Conditions*

The results of the intersection capacity analyses summarized in *Tables 8-7 and 9-13* identifies improvements at eight (8) study intersections under Year 2045 Buildout Plus Project Phases 1, 2 and 3 traffic conditions. The recommended improvements consist of the following:

- **No. 1 – Fairview Street at Segerstrom Avenue:** *(Same as those identified in Section 12.2.5)* Restripe the westbound approach to provide an exclusive right-turn lane; the removal of on-street parking may be required to accommodate the new turn pocket. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

  It should be noted that the improvements noted above do not offset the Project's increment. Additional improvements would be required to offset the Project's increment which include widening the southbound approach to construct an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which is considered to be infeasible and have not been included.

- **No. 3 – Bristol Street at Segerstrom Avenue:** *(Same as those identified in Section 12.2.5)* Restripe the northbound approach to provide an exclusive right-turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

  This improvement is consistent with the recommendation identified in the City of Santa Ana General Plan. It should be noted that the General Plan also recommends widening Segerstrom Avenue to accommodate a third through lane in both the eastbound and westbound directions. Per this analysis, these additional improvements are not necessary to offset the Project's increment and have therefore not been included.

- **No. 4 – Flower Street at Segerstrom Avenue/Dyer Road:** Improvements at this location include widening the eastbound approach to construct an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing property adjacent to the intersection. Therefore, improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

- **No. 9 – Bristol Street at MacArthur Boulevard:** *(Same as those identified in Section 12.2.6)* Improvements at this location include widening the southbound approach to construct an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing retail center adjacent to the intersection. Therefore, improvements at this location are considered to be infeasible and no improvements are recommended. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- **No. 10 – Flower Street at MacArthur Boulevard:** Improvements at this location include widening both the eastbound and westbound approaches to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

- **No. 11 – Main Street at MacArthur Boulevard:** *(Same as those identified in Section 12.2.6)* Modify the existing traffic signal to include a right-turn overlap phase for both the northbound and southbound directions. This improvement is subject to the review of the City of Santa Ana.

  It should be noted that the improvements noted above do not offset the Project's increment. Additional improvements would be required to offset the Project's increment which include widening the westbound approach to construct a fourth through lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing apartment complex located adjacent to the intersection. Therefore, these additional improvements are considered to be infeasible and have not been included. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- **No. 20 – Bristol Street at Sunflower Avenue:** Improvements at this location include widening the northbound approach to provide a third left-turn lane, widening the eastbound approach to provide a second right-turn lane, and restriping the existing eastbound shared through/right-turn lane into an exclusive through lane. However, these improvements would require acquisition of additional right-of-way from South Coast Plaza. Therefore, improvements at this

location are considered to be infeasible. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- **No. 37 – Bear Street at SR-73 NB Ramps:** Restripe the existing westbound left-turn lane to provide a shared left/right-turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review of the Caltrans and the City of Costa Mesa.

Table 12-1 provides a summary of recommended improvements as identified in this section, inclusive of the traffic analysis scenario of when the improvements are required, and ***Figure 12-1*** schematically illustrates the planned and recommended improvements at the affected study intersections.

12.3 Project-Related Fair-Share Contribution

The circulation effects associated with the development of the Project were determined based on the Existing Plus Project, Opening Year (Years 2030, 2032 and 2036) and Year 2045 Buildout traffic analyses. As summarized in *Sections 8.0 and 9.0,* the development of the Project is anticipated to need improvements at a total of ten (10) locations in which the Project can be expected to pay its fair share of the improvement costs.

Table 12-2 presents the Project's fair-share contribution to construct the recommended improvements at the nine (9) study intersections. As presented in *Table 12-2*, the first column (1) lists the recommended improvements at the nine (9) locations. The second column (2) presents a total of all intersection peak hour movements for existing conditions. The third column (3) and fourth column (4) present Year 2045 Buildout traffic and Year 2045 Building traffic conditions with Project Phases 1, 2 and 3 traffic, respectively. The fifth column (5) presents Project-related added traffic volumes during AM peak hour and PM peak hour. The sixth column (6) presents total new (added) traffic volumes at the study locations. The seventh column (5) represents what percentage of total new (added intersection) peak hour traffic is Project-related traffic.

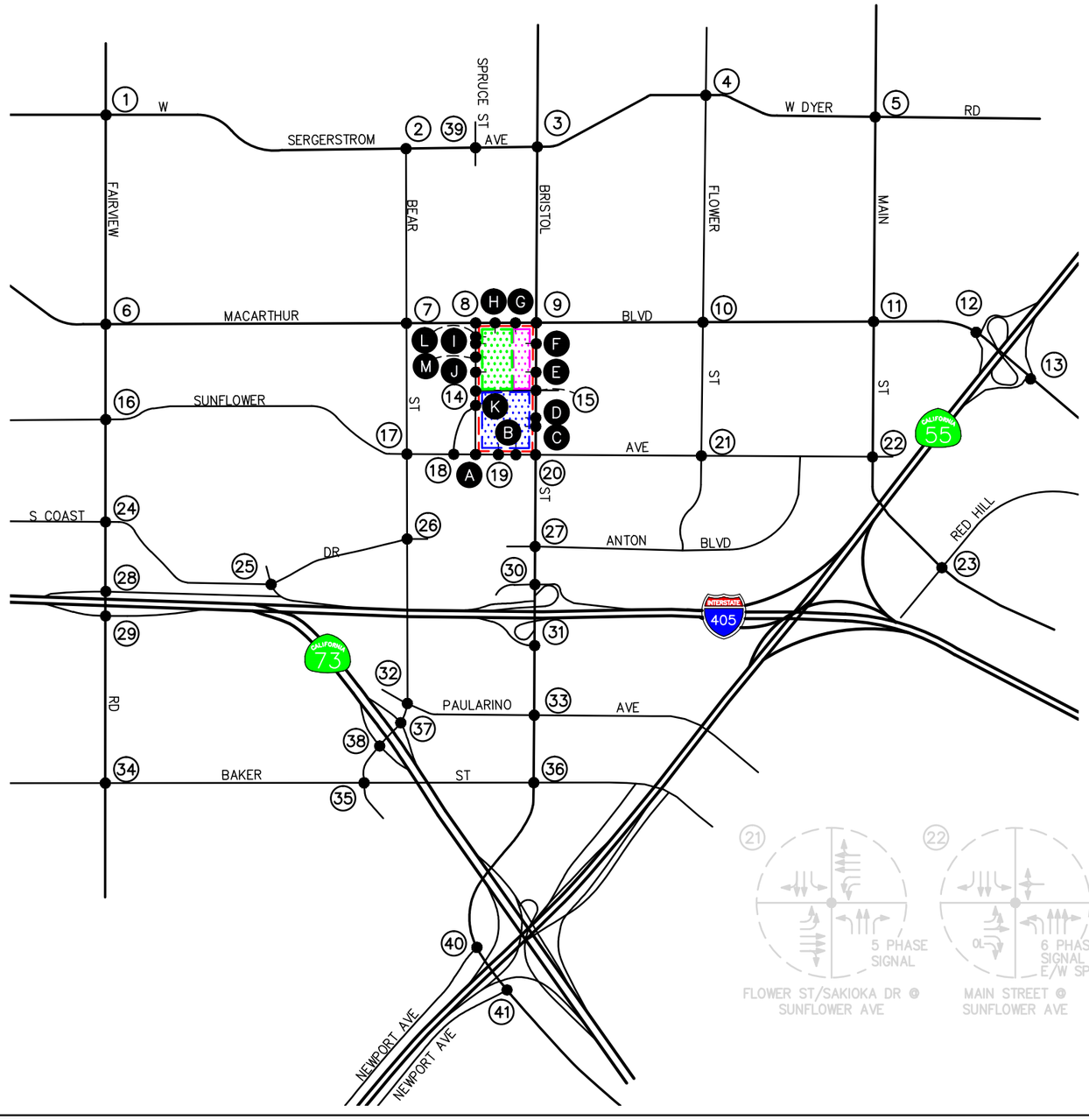
Review of *Table 12-2* shows that the proposed Project fair-share cost responsibility at the nine (9) study intersections ranges between **2.51%** and **17.99%.**

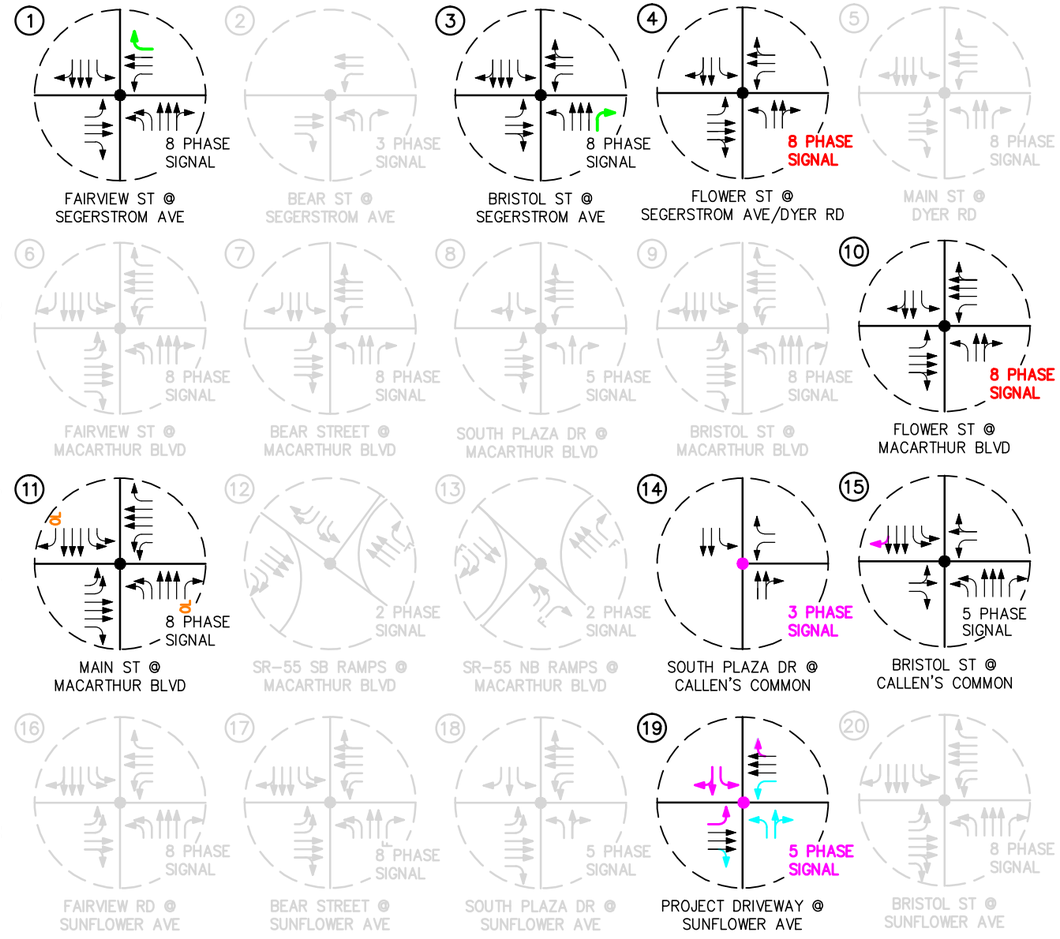
TABLE 12-1
SUMMARY OF RECOMMENDED IMPROVEMENTS

Key Intersections	Jurisdiction	Improvement Description	Improvements by Scenario						
			(1) Existing Plus Project Phase 1	(2) Existing Plus Project Phases 1 and 2	(3) Existing Plus Project Phases 1, 2 and 3	(4) Year 2030 Cumulative Plus Project Phase 1	(5) Year 2032 Cumulative Plus Project Phases 1 and 2	(6) Year 2036 Cumulative Plus Project Phases 1, 2 and 3	(7) Year 2045 Buildout Plus Project Phases 1, 2 and 3
1. Fairview Street at Segerstrom Avenue	Santa Ana	▪ Restripe to provide an exclusive WB right-turn lane ▪ Modify the existing traffic signal as necessary	--	--	--	--	X	X	X
3. Bristol Street at Segerstrom Avenue	Santa Ana	▪ Restripe to provide an exclusive NB right-turn lane ▪ Modify the existing traffic signal as necessary	--	--	--	--	X	X	X
4. Flower Street at Segerstrom Avenue/Dyer Road	Santa Ana	▪ Modify the existing traffic signal to provide protected phasing in the northbound and southbound directions	[c]	[c]	[c]	[c]	[c]	[c]	[c]
9. Bristol Street at MacArthur Boulevard	Santa Ana	▪ Improvements at this location are not feasible	--	--	--	[a]	[b]	[a]	[a]
10. Flower Street at MacArthur Boulevard	Santa Ana	▪ Modify the existing traffic signal to provide protected phasing in the northbound and southbound directions	[c]	[c]	[c]	[c]	[c]	[c]	[c]
11. Main Street at MacArthur Boulevard	Santa Ana	▪ Modify the existing traffic signal to provide a NB and SB right-turn overlap phase	--	--	--	--	--	X	X
20. Bristol Street at Sunflower Avenue	Santa Ana/ Costa Mesa	▪ Improvements at this location are not feasible	--	--	--	--	--	--	[a]
23. Red Hill Avenue at Main Street	Irvine	▪ Improvements at this location are not feasible	--	--	--	--	[a]	[b]	[b]
37. Bear Street at SR-73 NB Ramps	Costa Mesa/ Caltrans	▪ Restripe the existing WB left-turn lane to provide a shared left/right-turn lane	--	--	--	--	--	--	X

Notes:

- X = Denotes that the improvement carries over from the previous scenario and is assumed to be already implemented, and therefore is not considered
- [a] = Denotes that improvements at this location are not feasible
- [b] = Denotes that the proposed Project adds less than the required increment threshold to the intersection therefore does not require recommended improvements based on the LOS standards and criteria specified in this report.
- [c] = Denotes that improvements have been added to the City's traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that phase I construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.





LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

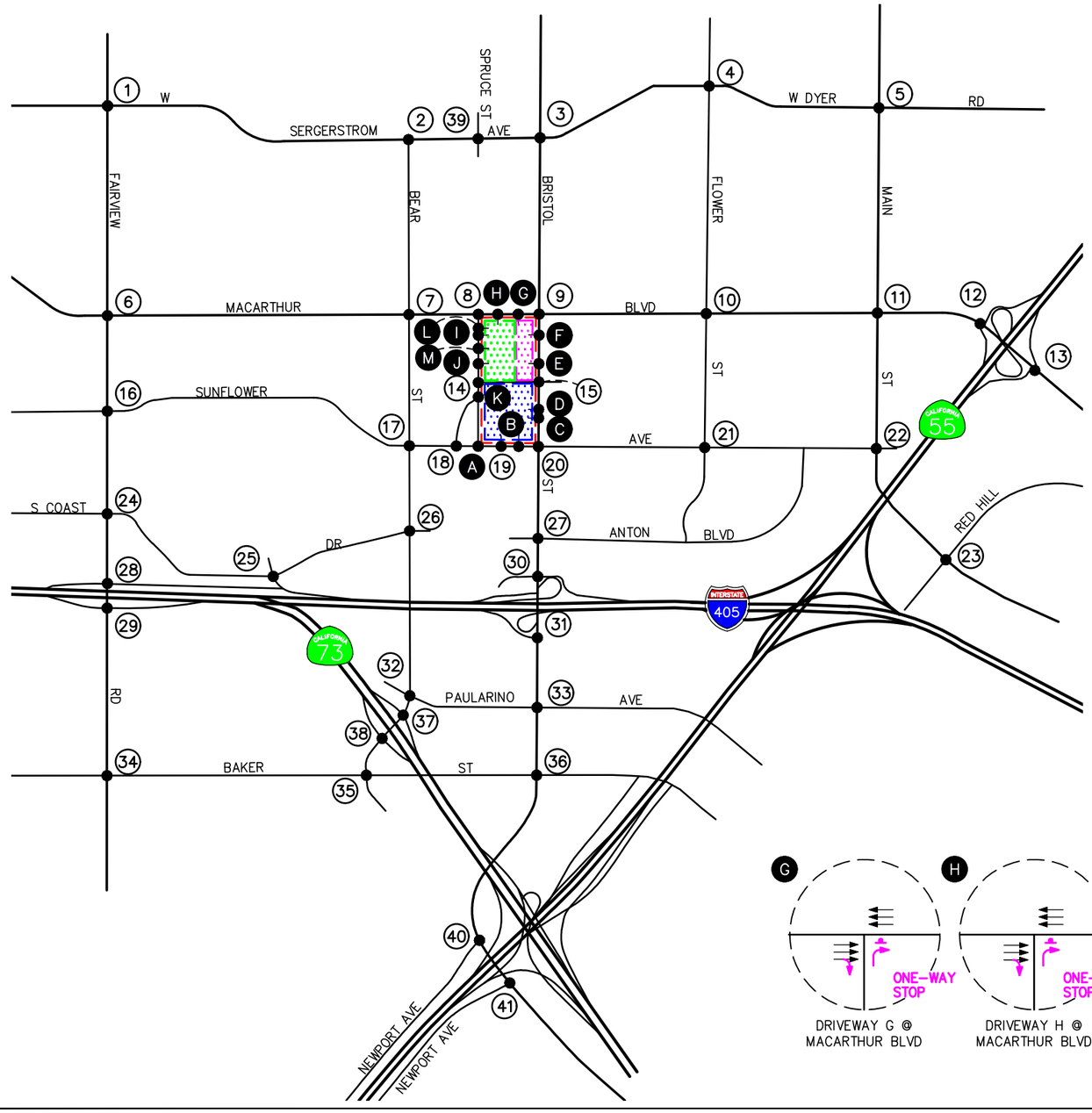
KEY

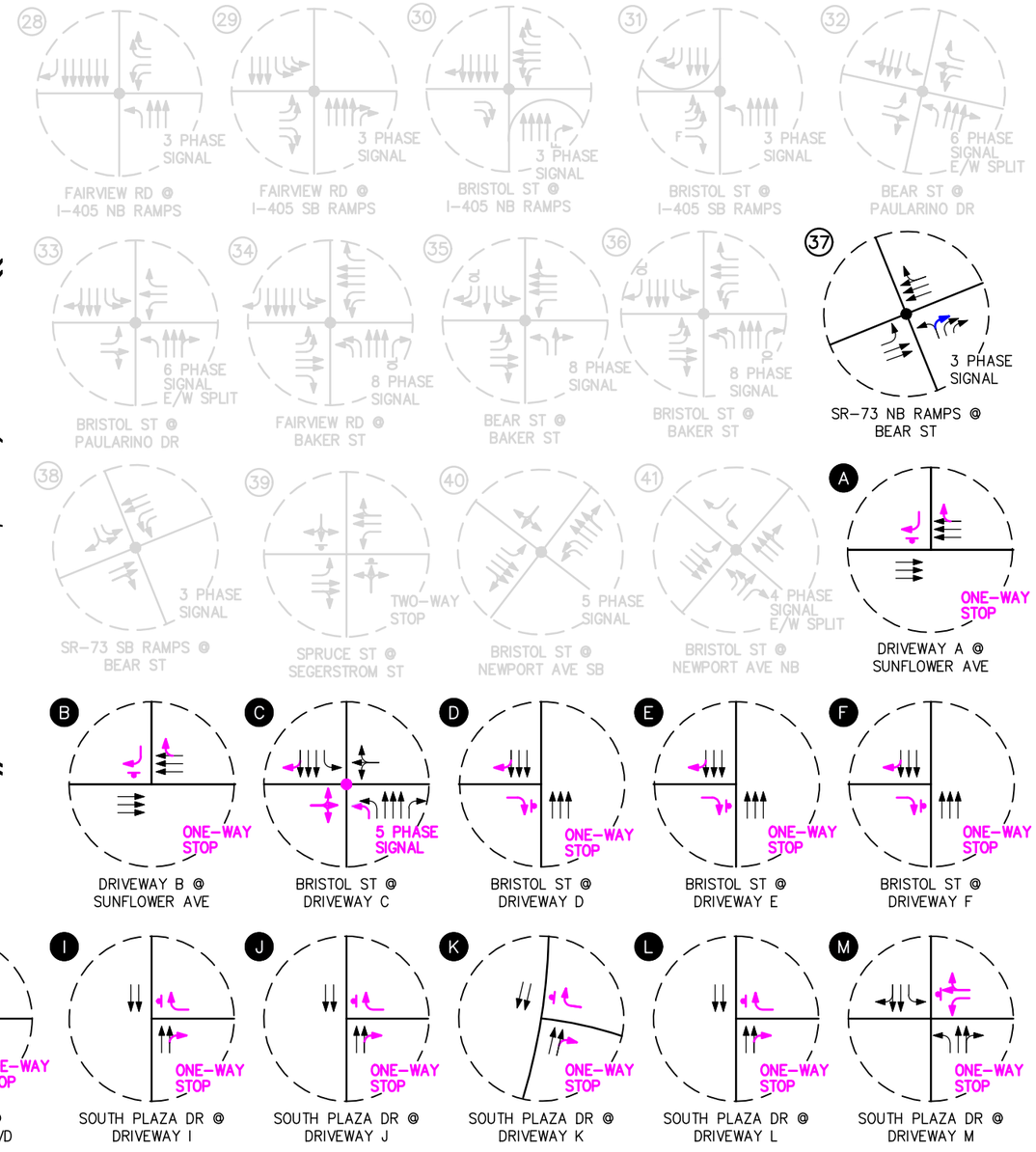
- = EXISTING PLUS PROJECT RECOMMENDED IMPROVEMENT
- = YEAR 2032 RECOMMENDED IMPROVEMENT
- = YEAR 2036 RECOMMENDED IMPROVEMENT
- = YEAR 2045 RECOMMENDED IMPROVEMENT
- = PLANNED IMPROVEMENT
- = PROJECT SPECIFIC IMPROVEMENT
- = PROJECT SITE
- = PHASE 1
- = PHASE 2
- = PHASE 3

FIGURE 12-1A

PLANNED AND FEASIBLE RECOMMENDED IMPROVEMENTS

RELATED BRISTOL, SANTA ANA





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N NO SCALE

KEY

- = EXISTING PLUS PROJECT RECOMMENDED IMPROVEMENT
- = YEAR 2032 RECOMMENDED IMPROVEMENT
- = YEAR 2036 RECOMMENDED IMPROVEMENT
- = YEAR 2045 RECOMMENDED IMPROVEMENT
- = PLANNED IMPROVEMENT
- = PROJECT SPECIFIC IMPROVEMENT
- = PROJECT SITE
- = PHASE 1
- = PHASE 2
- = PHASE 3

FIGURE 12-1B

PLANNED AND FEASIBLE RECOMMENDED IMPROVEMENTS

RELATED BRISTOL, SANTA ANA

TABLE 12-2
YEAR 2045 BUILDOUT PROJECT FAIR-SHARE COST CONTRIBUTION

Key Intersection	Jurisdiction	Time Period	(1) Improvement Description	(2) Existing Traffic	(3) Year 2045 Buildout Traffic	(4) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic	(5) Project Traffic	(6) Total New Trafic	(7) Project Fair-Share Percent[161]
1. Fairview Street at Segerstrom Avenue	Santa Ana	AM PM	▪ Restripe to provide an exclusive WB right-turn lane ▪ Modify the existing traffic signal as necessary	5,298 5,729	6,799 7,209	6,830 7,221	64 12	1,532 1,492	**2.51%**
3. Bristol Street at Segerstrom Avenue	Santa Ana	AM PM	▪ Restripe to provide an exclusive NB right-turn lane ▪ Modify the existing traffic signal as necessary	4,315 5,116	5,599 7,436	5,771 7,523	172 877	1,456 2,407	**6.70%**
4. Flower Street at Segerstrom Avenue/ Dyer Road	Santa Ana	AM PM	▪ Modify the existing traffic signal to provide protected phasing in the northbound and southbound directions	3,461 4,067	4,503 5,132	4,574 5,151	71 19	1,113 1,084	**4.10%**[162]
9. Bristol Street at MacArthur Boulevard	Santa Ana	AM PM	▪ *Improvements at this location are not feasible*	-- --	-- --	-- --	-- --	-- --	**--** **--**
10. Flower Street at MacArthur Boulevard	Santa Ana	AM PM	▪ Modify the existing traffic signal to provide protected phasing in the northbound and southbound directions	4,205 4,871	5,429 6,168	5,780 6,279	351 202	1,575 1,499	**17.99%**[162]
11. Main Street at MacArthur Boulevard	Santa Ana	AM PM	▪ Modify the traffic signal to provide a NB and SB right-turn overlap phase	5,047 6,164	6,318 7,647	6,635 7,841	317 194	1,588 1,677	**15.65%**
20. Bristol Street at Sunflower Avenue	Santa Ana/ Costa Mesa	AM PM	▪ *Improvements at this location are not feasible*	-- --	-- --	-- --	-- --	-- --	**--** **--**
23. Red Hill Avenue at Main Street	Irvine	AM PM	▪ *Improvements at this location are not feasible*	-- --	-- --	-- --	-- --	-- --	**--** **--**
37. Bear Street at SR-73 NB Ramps	Costa Mesa/ Caltrans	AM PM	▪ Restripe the existing WB left-turn lane to provide a shared left/right-turn lane	2,166 3,664	2,788 4,706	2,859 4,747	71 41	693 1,083	**6.31%**

[161] Project fair-share percentage, which considers both the AM peak hour and PM peak hour traffic volumes, is calculated using the combined total volumes as such: Column (7) = [Column (5) / Column (6)] x 100%. ***(e.g. Fairview Street at Segerstrom Fair-Share %: [(64+12) / (1,532+1,492)] x 100% = 2.51%)***

[162] In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be responsible for the improvement costs.

13.0 SUMMARY OF FINDINGS AND CONCLUSIONS

- ***Project Description*** – The Project site, currently known as Metro Town Square, is a 41.3±-acre rectangular-shaped parcel of land generally located west of Bristol Street, east of S. Plaza Drive, north of Sunflower Avenue, and south of MacArthur Boulevard in the City of Santa Ana, California. The subject property's land use designation in the newly adopted Santa Ana General Plan is District Center-High (DC-5) which is designed to serve as anchors to the City's commercial corridors and to accommodate major development activity.

  The subject property is currently developed with 465,063 square-feet (SF) of retail/commercial uses. The northern half of the property is developed with approximately 45% of floor area whose tenants include Vons, LA Fitness, Bank of America, and a variety of retail, service retail/commercial, medical, restaurant, and fast-food uses. The southern half of the property contains approximately 55% of floor area with a tenant mix of retail, service retail/commercial, restaurant, and fast-food uses. Existing major tenants on the southern half of the center include TJ Maxx, Ross Dress for Less, Cost Plus World Market, and Red Robin. Vehicular access to the Project site is currently provided via unsignalized driveways located along MacArthur Boulevard, Bristol Street, Sunflower Avenue, S. Plaza Drive, and Callen's Common. Signalized access is provided along Bristol Street at Callen's Common.

  The proposed Project, which will be contained in a Specific Plan, will include the development of up to 3,750 apartment units, 200-unit senior continuum care, 250 hotel rooms, and 350,000 SF retail/commercial. The Project is expected to be completed in three phases. Completion of Phase 1 is anticipated by Year 2030 which is the southern half of the site, with Phase 2 completion by Year 2032 which is the northern half of the site adjacent to Bristol Street and Phase 3 completion by Year 2036 which is the northern half of the site adjacent to Plaza Drive.

  Vehicular access to the Project site will be provided via four (4) unsignalized right-turn only driveways along S. Plaza Drive (Driveways I, J, K, and L), one (1) unsignalized full-access driveway along S. Plaza Drive (Driveway M), one (1) signalized driveway (Callen's Common) on S. Plaza Drive, two (2) unsignalized right-turn only driveways along MacArthur Boulevard (Driveways G and H), three (3) unsignalized right-turn only driveways along Bristol Street (Driveways D, E and F), two (2) signalized driveways (Callen's Common and Driveway C) on Bristol Street, two (2) unsignalized right-turn only driveways along Sunflower Avenue (Driveways A and B), and one signalized driveway along Sunflower Avenue. It should be noted that Driveway D is designated for service access only to service the truck deliveries for the grocery store.

- ***Project Design Features*** – The following improvements within the public right-of-way along Bristol Street, MacArthur Boulevard, Sunflower Avenue, and South Plaza Drive are anticipated to be constructed as part of the proposed Project:

  - Bristol Street planned improvements include a widened parkway, street trees, planted setback areas, new curb cuts for ingress/egress to/from Bristol Street, new sidewalks, median modifications, and construction of Class IV bikeway improvements per City design. The project driveways along the roadway are anticipated to include the following specific improvements along Bristol Street:

- Bristol Street at Driveway C: Modify the northbound approach to provide a second left-turn lane and demolish the existing median. Demolish the existing median on the southbound approach. Install a five-phase traffic signal.

- MacArthur Boulevard planned improvements include installation of a Class IV bike lane per the City's Mobility Element, construction of new landscaped median, planted setback areas with new sidewalks and street trees.

- Sunflower Avenue planned improvements include median modification, new sidewalks, and installation of Class IV bike lanes per the City Mobility Element. The project driveways along the roadway are anticipated to include the following specific improvements along Sunflower Avenue:

  - No. 19 – Project Driveway at Sunflower Avenue: As part of the proposed Project, the existing driveway will be realigned approximately 110-feet to the east of the existing driveway. Restriping along Sunflower Avenue and modification of the existing median will be required to accommodate the new driveway. Install a five-phase traffic signal, subject to the improvements/realignment of South Coast Plaza driveway and the coordination with the City of Costa Mesa. An alternate design will be completed to configure this intersection as a three-leg intersection in the event that the south leg access is not constructed. Further coordination will be made with the Cities of Santa Ana and Costa Mesa for the alternate design approach.

- South Plaza Drive planned improvements include new curb cutouts for ingress/egress and planted setback areas with new sidewalks and street trees. The project driveways along the roadway are anticipated to include the following specific improvements along South Plaza Drive:

  - No. 14 – South Plaza Drive at Callen's Common: Install a three-phase traffic signal.

- ***Study Scope*** – The forty-one (41) intersections and forty-three (43) roadway segments listed below provide regional and local access to the study area and define the extent of the boundaries for this traffic analysis.

Key Study Intersections

1. Fairview Street at Segerstrom Avenue (Santa Ana)
2. Bear Street at Segerstrom Avenue (Santa Ana)
3. Bristol Street at Segerstrom Avenue (Santa Ana)
4. Flower Street at Segerstrom Avenue/Dyer Road (Santa Ana)
5. Main Street at Dyer Road (Santa Ana)
6. Fairview Street at MacArthur Boulevard (Santa Ana)
7. Bear Street at MacArthur Boulevard (Santa Ana)
8. S. Plaza Drive at MacArthur Boulevard (Santa Ana)
22. Main Street at Sunflower Avenue (Santa Ana/Costa Mesa)
23. Red Hill Avenue at Main Street (Irvine)
24. Fairview Road at S. Coast Drive (Costa Mesa)
25. I-405 NB Off-Ramp at S. Coast Drive (Costa Mesa/Caltrans)
26. Bear Street at S. Coast Drive (Costa Mesa)
27. Bristol Street at Anton Boulevard (Costa Mesa)
28. Fairview Road at I-405 NB Ramps (Costa Mesa/Caltrans)
29. Fairview Road at I-405 SB Ramps (Costa Mesa/Caltrans)

9. Bristol Street at MacArthur Boulevard (Santa Ana)
10. Flower Street at MacArthur Boulevard (Santa Ana)
11. Main Street at MacArthur Boulevard (Santa Ana)
12. SR-55 SB Ramps at MacArthur Boulevard (Santa Ana/Caltrans)
13. SR-55 NB Ramps at MacArthur Boulevard (Irvine/Caltrans)
14. S. Plaza Drive at Callen's Common (Santa Ana)
15. Bristol Street at Callen's Common (Santa Ana)
16. Fairview Road at Sunflower Avenue (Santa Ana/Costa Mesa)
17. Bear Street at Sunflower Avenue (Santa Ana/Costa Mesa)
18 S. Plaza Drive at Sunflower Avenue (Santa Ana/Costa Mesa)
19. Project Driveway at Sunflower Avenue (Santa Ana/Costa Mesa)
20. Bristol Street at Sunflower Avenue (Santa Ana/Costa Mesa)
21. Flower Street/Sakioka Drive at Sunflower Avenue (Santa Ana/Costa Mesa)
30. Bristol Street at I-405 NB Ramps (Costa Mesa/Caltrans)
31. Bristol Street at I-405 SB Ramps (Costa Mesa/Caltrans)
32. Bear Street at Paularino Avenue (Costa Mesa)
33. Bristol Street at Paularino Avenue (Costa Mesa)
34. Fairview Road at Baker Street (Costa Mesa)
35. Bear Street at Baker Street (Costa Mesa)
36. Bristol Street at Baker Street (Costa Mesa)
37. Bear Street at SR-73 NB Ramps (Costa Mesa/Caltrans)
38. Bear Street at SR-73 SB Ramps (Costa Mesa/Caltrans)
39. Spruce Street at Segerstrom Avenue (Santa Ana)
40. Bristol Street at Newport Avenue (SB) (Costa Mesa)
41. Bristol Street at Newport Avenue (NB) (Costa Mesa)

Key Roadway Segments

A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)
C. Fairview Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps (Costa Mesa)
E. Fairview Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)
F. Fairview Street, between I-405 SB Ramps and Baker Street (Costa Mesa)
G. Bear Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)
H. Bear Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana/Costa Mesa)
I. Bear Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)
J. Bear Street, between S. Coast Drive and Paularino Avenue (Costa Mesa)
K. Bear Street, between Paularino Avenue and Baker Street (Costa Mesa)
L. S. Plaza Drive, between MacArthur Boulevard and Callen's Common (Santa Ana)
M. S. Plaza Drive, between Callen's Common and Sunflower Avenue (Santa Ana)
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)
O. Bristol Street, between MacArthur Boulevard and Callen's Common (Santa Ana)
P. Bristol Street, between Callen's Common and Sunflower Avenue (Santa Ana)
Q. Bristol Street, between Sunflower Avenue and Anton Boulevard (Costa Mesa)
R. Bristol Street, between Anton Boulevard and I-405 NB Ramps (Costa Mesa)
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)
T. Bristol Street, between I-405 SB Ramps and Paularino Avenue (Costa Mesa)
W. Flower Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)
X. Main Street, between Dyer Road and MacArthur Boulevard (Santa Ana)
Y. Main Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)
Z. Main Street, between Sunflower Avenue and Red Hill Avenue (Santa Ana/Irvine)
AA. Segerstrom Avenue, between Fairview Street and Bear Street (Santa Ana)
BB. Segerstrom Avenue, between Bear Street and Bristol Street (Santa Ana)
CC. Segerstrom Avenue, between Bristol Street and Flower Street (Santa Ana)
DD. Dyer Road, between Flower Street and Main Street (Santa Ana)
EE. MacArthur Boulevard, between Fairview Street and Bear Street (Santa Ana)
FF. MacArthur Boulevard, between Bear Street and S. Plaza Drive (Santa Ana)
GG. MacArthur Boulevard, between S. Plaza Drive and Bristol Street (Santa Ana)
HH. MacArthur Boulevard, between Bristol Street and Flower Street (Santa Ana)
II. MacArthur Boulevard, between Flower Street and Main Street (Santa Ana)
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Santa Ana)
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps (Santa Ana/Irvine/Caltrans)
LL. Sunflower Avenue, between Fairview Street and Bear Street (Santa Ana/Costa Mesa)
MM. Sunflower Avenue, between Bear Street and S. Plaza Drive (Santa Ana/Costa Mesa)
NN. Sunflower Avenue, between S. Plaza Drive and Bristol Street (Santa Ana/Costa Mesa)
OO. Sunflower Avenue, between Bristol Street and Flower Street (Santa Ana/Costa Mesa)
PP. Sunflower Avenue, between Bristol Street and Flower Street (Santa Ana/Costa Mesa)

U. Bristol Street, between Paularino Avenue and Baker Street (Costa Mesa)
V. Flower Street, between Dyer Road and MacArthur Boulevard (Santa Ana)
QQ. Bristol Street, south of Baker Street (Costa Mesa)

- ***Intersection Existing Traffic Conditions*** – Six (6) of the forty-one (41) study intersections currently operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections currently operate at acceptable level of service during the AM and PM peak hours. The intersections which operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	0.944	E
3. Bristol Street at Segerstrom Avenue	--	--	0.918	E
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.906	E
5. Main Street at Dyer Road	--	--	0.924	E
10. Flower Street at MacArthur Boulevard	--	--	0.915	E
39. Spruce Street at Segerstrom Avenue	51.6 s/v	F	65.3 s/v	F

- ***Daily Roadway Segment Existing Traffic Conditions*** – Four (4) of the forty-three (43) roadway segments currently operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	56,973	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	54,025	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	58,231	F
K. Bear Street, between Paularino Avenue and Baker Street	38,267	F

- ***Project Trip Generation*** – Phase 1 of the Project is forecast to generate 4,167 "net" daily trips, with 545 "net" trips (157 inbound, 388 outbound) produced in the AM peak hour and 359 "net" trips (233 inbound, 126 outbound) produced in the PM peak hour on a "typical" weekday.

  Phase 2 of the Project is forecast to generate 3,241 "net" daily trips, with 293 "net" trips (69 inbound, 224 outbound) produced in the AM peak hour and 271 "net" trips (164 inbound, 107 outbound) produced in the PM peak hour on a "typical" weekday.

  Phase 3 of the Project is forecast to generate 80 fewer "net" daily trips, with 381 "net" trips (41 inbound, 340 outbound) produced in the AM peak hour and 58 "net" trips (79 inbound, -21 outbound) produced in the PM peak hour on a "typical" weekday.

The proposed Project for Phases 1, 2 and 3 are forecast to generate 7,328 "net" daily trips, with 1,219 "net" trips (267 inbound, 952 outbound) produced in the AM peak hour and 688 "net" trips (476 inbound, 212 outbound) produced in the PM peak hour on a "typical" weekday.

- ***Related Projects Traffic Characteristics –*** Twenty (20) related projects were considered as part of the cumulative background setting. The twenty (20) related projects are forecast to generate 28,993 daily trips, with 2,517 trips (1,477 inbound, 1,040 outbound) anticipated during the AM peak hour and 2,899 trips (1,194 inbound, 1,705 outbound) produced during the PM peak hour.

- ***Existing Plus Project Phase 1 Traffic Conditions*** – Six (6) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	0.946	E
3. Bristol Street at Segerstrom Avenue	--	--	0.920	E
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.908	E
5. Main Street at Dyer Road	--	--	0.925	E
10. Flower Street at MacArthur Boulevard	--	--	0.926	E
39. Spruce Street at Segerstrom Avenue	52.3 s/v	F	65.8 s/v	F

Out of the six (6) study intersections operating adversely, the intersection of Flower Street at MacArthur Boulevard (Intersection No. 10) exceeds the level of service thresholds. The proposed Project adds less than the required increment thresholds to the remaining four (4) study intersections. Improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) to pre-project LOS conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

- ***Existing Plus Project Phases 1 and 2 Traffic Conditions*** – Six (6) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	0.951	E
3. Bristol Street at Segerstrom Avenue	--	--	0.923	E

4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.911	E
5. Main Street at Dyer Road	--	--	0.927	E
10. Flower Street at MacArthur Boulevard	--	--	0.937	E
39. Spruce Street at Segerstrom Avenue	53.2 s/v	F	67.0 s/v	F

Out of the six (6) study intersections operating adversely, the intersection of Flower Street at MacArthur Boulevard (Intersection No. 10) exceeds the level of service thresholds. The proposed Project adds less than the required increment threshold to the remaining four (4) study intersections. Improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) to pre-project LOS conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

- ***Existing Plus Project Phases 1, 2 and 3 Traffic Conditions*** – Six (6) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	0.948	E
3. Bristol Street at Segerstrom Avenue	--	--	0.922	E
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.909	E
5. Main Street at Dyer Road	--	--	0.927	E
10. Flower Street at MacArthur Boulevard	--	--	0.941	E
39. Spruce Street at Segerstrom Avenue	53.2 s/v	F	67.0 s/v	F

Out of the six (6) study intersections operating adversely, the intersection of Flower Street at MacArthur Boulevard (Intersection No. 10) exceeds the level of service thresholds. The proposed Project adds less than the required increment thresholds to the remaining four (4) study intersections. Improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project LOS conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

- ***Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions***– Ten (10) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	--	--	1.034	F
3. Bristol Street at Segerstrom Avenue	--	--	1.009	F
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	0.983	E
5. Main Street at Dyer Road	--	--	1.009	F
6. Fairview Street at MacArthur Boulevard	--	--	0.917	E
7. Bear Street at MacArthur Boulevard	--	--	0.952	E
9. Bristol Street at MacArthur Boulevard	--	--	0.901	E
10. Flower Street at MacArthur Boulevard	--	--	1.008	F
24. Fairview Road at South Coast Drive	--	--	0.905	E
39. Spruce Street at Segerstrom Avenue	92.3 s/v	F	112.1 s/v	F

Out of the ten (10) study intersections operating adversely, the intersections of Bristol Street at MacArthur Boulevard (Intersection No. 9) and Flower Street at MacArthur Boulevard (Intersection No. 10) exceeds the level of service thresholds. The proposed Project adds less than the required increment thresholds to the remaining eight (8) study intersections and therefore no improvements are recommended. Improvements for Bristol Street at MacArthur Boulevard (Intersection No. 9) are considered infeasible. Improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project LOS conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

- ***Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions*** – Eleven (11) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	0.903	E	1.058	F
3. Bristol Street at Segerstrom Avenue	0.914	E	1.030	F

4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	1.003	F
5. Main Street at Dyer Road	--	--	1.028	F
6. Fairview Street at MacArthur Boulevard	--	--	0.933	E
7. Bear Street at MacArthur Boulevard	--	--	0.973	E
9. Bristol Street at MacArthur Boulevard	--	--	0.919	E
10. Flower Street at MacArthur Boulevard	--	--	1.038	F
23. Red Hill Avenue at Main Street	--	--	0.903	E
24. Fairview Road at South Coast Drive	--	--	0.921	E
39. Spruce Street at Segerstrom Avenue	127.2 s/v	F	136.0 s/v	F

Out of the eleven (11) study intersections operating adversely, the following five (5) study intersections exceed the level of service thresholds:

Key Intersection

1. Fairview Street at Segerstrom Avenue
3. Bristol Street at Segerstrom Avenue
10. Flower Street at MacArthur Boulevard
23. Red Hill Avenue at Main Street
39. Spruce Street at Segerstrom Avenue

The proposed Project adds less than the required increment threshold to the remaining six (6) study intersections and therefore no improvements are recommended. The implementation of feasible improvements for Fairview Street at Segerstrom Avenue (Intersection No. 1) and Bristol Street at Segerstrom Avenue (Intersection No. 3) would ensure the intersection operates efficiently. Improvements for Red Hill Avenue at Main Street (Intersection No. 23) are considered infeasible. Additionally, improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project LOS conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

- ***Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions*** – Thirteen (13) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS
1. Fairview Street at Segerstrom Avenue	0.941	E	1.088	F
3. Bristol Street at Segerstrom Avenue	0.957	E	1.064	F
4. Flower Street at Segerstrom Avenue/Dyer Road	--	--	1.034	F

5. Main Street at Dyer Road	--	--	1.062	F
6. Fairview Street at MacArthur Boulevard	--	--	0.962	E
7. Bear Street at MacArthur Boulevard	--	--	1.002	F
9. Bristol Street at MacArthur Boulevard	0.922	E	0.952	E
10. Flower Street at MacArthur Boulevard	--	--	1.079	F
11. Main Street at MacArthur Boulevard	0.912	E	0.918	E
23. Red Hill Avenue at Main Street	--	--	0.934	E
24. Fairview Road at South Coast Drive	--	--	0.954	E
33. Bristol Street at Paularino Avenue	--	--	0.925	E
39. Spruce Street at Segerstrom Avenue	177.8 s/v	F	184.2 s/v	F

Out of the thirteen (13) study intersections operating adversely, the following six (6) study intersections exceed the level of service thresholds:

Key Intersection	
1. Fairview Street at Segerstrom Avenue	10. Flower Street at MacArthur Boulevard
3. Bristol Street at Segerstrom Avenue	11. Main Street at MacArthur Boulevard
9. Bristol Street at MacArthur Boulevard	39. Spruce Street at Segerstrom Avenue

The proposed Project adds less than the required increment threshold to the remaining seven (7) study intersections and therefore no improvements are recommended. The implementation of feasible improvements for Fairview Street at Segerstrom Avenue (Intersection No. 1) and Bristol Street at Segerstrom Avenue (Intersection No. 3) would ensure the intersection operates efficiently. The implementation of feasible improvements for Main Street at MacArthur Boulevard (Intersection No. 11) will improve service levels but not enough to offset the Project's increment. Improvements for Bristol Street at MacArthur Boulevard (Intersection No. 9) are considered infeasible. Additionally, improvements which are required to return Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project LOS conditions are considered infeasible. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

- ***Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions*** – Fifteen (15) of the forty-one (41) study intersections will operate at unacceptable service levels during the AM and/or PM peak hours. The remaining study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The intersections forecast to operate adversely consist of the following:

	AM Peak Hour		PM Peak Hour	
Key Intersection	ICU/HCM	LOS	ICU/HCM	LOS

1. Fairview Street at Segerstrom Avenue	1.009	E	1.207	F
3. Bristol Street at Segerstrom Avenue	1.065	F	1.351	F
4. Flower Street at Segerstrom Avenue/Dyer Road	1.027	F	1.197	F
5. Main Street at Dyer Road	0.954	E	1.217	F
6. Fairview Street at MacArthur Boulevard	--	--	1.014	F
7. Bear Street at MacArthur Boulevard	0.912	E	1.085	F
9. Bristol Street at MacArthur Boulevard	0.990	E	1.013	F
10. Flower Street at MacArthur Boulevard	0.932	E	1.178	F
11. Main Street at MacArthur Boulevard	0.962	E	0.963	E
20. Bristol Street at Sunflower Avenue	0.956	E	0.915	E
Cost Mesa:	*0.930*	*E*	--	--
23. Red Hill Avenue at Main Street	--	--	0.971	E
24. Fairview Road at South Coast Drive	--	--	1.003	F
33. Bristol Street at Paularino Avenue	--	--	0.984	E
34. Fairview Road at Baker Street	--	--	1.003	F
39. Spruce Street at Segerstrom Avenue	464.9 s/v	F	404.5 s/v	F

Out of the fifteen (15) study intersections operating adversely, the following eight (8) study intersections exceed the level of service thresholds:

Key Intersection	
1. Fairview Street at Segerstrom Avenue	10. Flower Street at MacArthur Boulevard
3. Bristol Street at Segerstrom Avenue	11. Main Street at MacArthur Boulevard
4. Flower Street at Segerstrom Avenue/Dyer Road	20. Bristol Street at Sunflower Avenue
9. Bristol Street at MacArthur Boulevard	39. Spruce Street at Segerstrom Avenue

The proposed Project adds less than the required increment threshold to the remaining seven (7) study intersections and therefore no improvements are recommended. The implementation of feasible improvements for Bristol Street at Segerstrom Avenue (Intersection No. 3) would ensure the intersection operates efficiently. The implementation of feasible improvements for Fairview Street at Segerstrom Avenue (Intersection No. 1) and Main Street at MacArthur Boulevard (Intersection No. 11) will improve service levels but not enough to offset the Project's increment. Improvements for, Bristol Street at MacArthur Boulevard (Intersection No. 9) and Bristol Street at Sunflower Avenue (Intersection No. 20) are considered infeasible.

Additionally, that improvements which are required to return both intersections of Flower Street at Segerstrom Avenue (Intersection No. 4) and Flower Street at MacArthur Boulevard (Intersection No. 10) back to pre-project LOS conditions are considered infeasible. These recommended improvements are discussed in Section 12.0. Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signals at both locations to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the

intersections have been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signals to add the left-turn arrows for the northbound and southbound directions.

- ***Caltrans Existing Plus Project Phase 1 Traffic Conditions*** – The nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic. Additionally, queues at the nine (9) state-controlled study intersections were reviewed and the existing vehicular storage capacity is considered adequate.

- ***Caltrans Existing Plus Project Phases 1 and 2 Traffic Conditions*** – The nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic. Additionally, queues at the nine (9) state-controlled study intersections were reviewed and the existing vehicular storage capacity is considered adequate.

- ***Caltrans Existing Plus Project Phases 1, 2 and 3 Traffic Conditions*** – The nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic. Additionally, queues at the nine (9) state-controlled study intersections were reviewed and the existing vehicular storage capacity is considered adequate.

- ***Caltrans Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions*** – The nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic. Additionally, queues at the nine (9) state-controlled study intersections were reviewed and the existing vehicular storage capacity is considered adequate.

- ***Caltrans Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions*** – The nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic. Additionally, queues at the nine (9) state-controlled study intersections were reviewed and the existing vehicular storage capacity is considered adequate.

- ***Caltrans Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions*** – The nine (9) state-controlled study intersections are forecast operate at acceptable level of service during the AM and PM peak hours with the addition of Project traffic. Additionally, queues at the nine (9) state-controlled study intersections were reviewed and the existing vehicular storage capacity is considered adequate.

- ***Caltrans Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions*** – The intersection Bear Street at SR-73 NB Ramps (Intersection No. 37) is forecast to operate at unacceptable LOS E in the PM peak hour. The remaining state-controlled study intersections are forecast to operate at acceptable level of service during the AM and PM peak hours. The implementation of feasible improvements for Bear Street at SR-73 NB Ramps (Intersection No. 37) will help the intersection operate at acceptable level of service. Additionally, queues at the

nine (9) state-controlled study intersections were reviewed and the existing vehicular storage capacity is considered adequate with the exception of the westbound right-turn at Bear Street at SR-73 NB Ramps (Intersection No. 37) during the PM peak hour. However, the implementation of feasible improvements at the intersection will help improve the queues.

- ***Daily Existing Plus Project Phase 1 Traffic Conditions*** – Four (4) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	56,998	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	54,050	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	58,271	F
K. Bear Street, between Paularino Avenue and Baker Street	38,514	F

The proposed Project adds less than the required increment threshold to the four (4) roadway segments operating adversely and therefore recommended improvements are not identified.

- ***Daily Existing Plus Project Phases 1 and 2 Traffic Conditions*** – Five (5) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	56,998	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	54,050	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	58,338	F
K. Bear Street, between Paularino Avenue and Baker Street	38,550	F
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	50,798	E

Out of the five (5) roadway segments operating adversely, the segment of MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Segment JJ) exceeds the level of service thresholds. The proposed Project adds less than the required increment threshold to the remaining four (4) roadway segments and therefore recommended improvements are not identified.

A peak hour link assessment was completed for the one (1) roadway segments that exceeds the level of service thresholds. The one (1) roadway segment is forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended. It is important to note that the project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- ***Daily Existing Plus Project Phases 1, 2 and 3 Traffic Conditions*** – Five (5) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	56,998	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	54,050	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	58,283	F
K. Bear Street, between Paularino Avenue and Baker Street	38,496	F
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	51,040	E

Out of the five (5) roadway segments operating adversely, the segment of MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Segment JJ) exceeds the level of service thresholds. The proposed Project adds less than the required increment threshold to the remaining four (4) roadway segments and therefore recommended improvements are not identified.

A peak hour link assessment was completed for the one (1) roadway segments that exceeds the level of service thresholds. The one (1) roadway segment is forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended. It is important to note that the project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- ***Daily Year 2030 Cumulative Plus Project Phase 1 Traffic Conditions*** – Ten (10) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	62,925	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	59,979	F
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	53,475	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	63,952	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	53,243	E
K. Bear Street, between Paularino Avenue and Baker Street	41,997	F
O. Bristol Street, between MacArthur Boulevard and Callen's Common	53,000	E
P. Bristol Street, between Callen's Common and Sunflower Avenue	51,128	E
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	67,767	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	55,488	E

Out of the ten (10) roadway segments operating adversely, the following four (4) locations exceed the level of service thresholds:

Roadway Segment
O. Bristol Street, between MacArthur Boulevard and Callen's Common
P. Bristol Street, between Callen's Common and Sunflower Avenue
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps

The proposed Project adds less than the required increment threshold to the remaining six (6) roadway segments and therefore recommended improvements are not identified.

A peak hour link assessment was completed for the four (4) roadway segments that exceed the level of service thresholds. The four (4) roadway segments are forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended. It is important to note that the project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- ***Daily Year 2032 Cumulative Plus Project Phases 1 and 2 Traffic Conditions*** – Eleven (11) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	64,064	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	61,060	F
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	54,470	E
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	65,184	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	54,278	E
K. Bear Street, between Paularino Avenue and Baker Street	42,799	F
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	51,395	E
O. Bristol Street, between MacArthur Boulevard and Callen's Common	55,126	E
P. Bristol Street, between Callen's Common and Sunflower Avenue	53,300	E
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	69,802	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	57,425	F

Out of the eleven (11) roadway segments operating adversely, the following five (5) locations exceed the level of service thresholds:

Roadway Segment
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard

O. Bristol Street, between MacArthur Boulevard and Callen's Common

P. Bristol Street, between Callen's Common and Sunflower Avenue

S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps

JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps

The proposed Project adds less than the required increment threshold to the remaining six (6) roadway segments and therefore recommended improvements are not identified.

A peak hour link assessment was completed for the five (5) roadway segments that exceed the level of service thresholds. The five (5) roadway segments are forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended. It is important to note that the project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- ***Daily Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Traffic Conditions*** – Twelve (12) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	66,343	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	63,221	F
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	56,403	F
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	67,443	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	56,144	E
K. Bear Street, between Paularino Avenue and Baker Street	44,298	F
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	53,086	E
O. Bristol Street, between MacArthur Boulevard and Callen's Common	57,194	F
P. Bristol Street, between Callen's Common and Sunflower Avenue	55,336	E
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	72,873	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	59,987	F
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	60,072	E

Out of the twelve (12) roadway segments operating adversely, the following six (6) locations exceed the level of service thresholds:

Roadway Segment

N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard

O. Bristol Street, between MacArthur Boulevard and Callen's Common

P. Bristol Street, between Callen's Common and Sunflower Avenue

S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps

JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps

The proposed Project adds less than the required increment threshold to the remaining six (6) roadway segments and therefore recommended improvements are not identified.

A peak hour link assessment was completed for the six (6) roadway segments that exceed the level of service thresholds. The six (6) roadway segments are forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended. It is important to note that the project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- ***Daily Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic Conditions*** – Fourteen (14) of the forty-three (43) roadway segments will operate at unacceptable service levels. The remaining roadway segments are forecast to operate at acceptable level of service. The roadway segments forecast to operate adversely consist of the following:

Roadway Segment	Daily Volume	LOS
A. Fairview Street, between Segerstrom Avenue and MacArthur Boulevard	69,659	F
B. Fairview Street, between MacArthur Boulevard and Sunflower Avenue	66,381	F
C. Fairview Street, between Sunflower Avenue and S. Coast Drive	59,220	F
D. Fairview Street, between S. Coast Drive and I-405 NB Ramps	70,813	F
F. Fairview Street, between I-405 SB Ramps and Baker Street	58,949	F
K. Bear Street, between Paularino Avenue and Baker Street	46,501	F
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard	55,696	E
O. Bristol Street, between MacArthur Boulevard and Callen's Common	59,916	F
P. Bristol Street, between Callen's Common and Sunflower Avenue	57,980	F
S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps	76,384	F
BB. Segerstrom Avenue, between Bear Street and Bristol Street	34,652	E
DD. Dyer Road, between Flower Street and Main Street	34,766	E
JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps	62,881	F
KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps	72,858	F

Out of the fourteen (14) roadway segments operating adversely, the following six (6) locations exceed the level of service thresholds:

Roadway Segment
N. Bristol Street, between Segerstrom Avenue and MacArthur Boulevard
O. Bristol Street, between MacArthur Boulevard and Callen's Common
P. Bristol Street, between Callen's Common and Sunflower Avenue

S. Bristol Street, between I-405 NB Ramps and I-405 SB Ramps

JJ. MacArthur Boulevard, between Main Street and SR-55 SB Ramps

KK. MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps

The proposed Project adds less than the required increment threshold to the remaining eight (8) roadway segments and therefore recommended improvements are not identified.

A peak hour link assessment was completed for the six (6) roadway segments that exceed the level of service thresholds. The six (6) roadway segments are forecast to operate at acceptable service levels during the AM and PM peak hours. Therefore, it can be concluded that the proposed Project will not exceed the level of service thresholds at any of these roadway segments during the critical peak hours, and as such, improvements at these locations are not recommended. It is important to note that the project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- ***Project Site Access Level of Service and Queueing*** – The Project driveways are forecast to operate at acceptable service levels with the exception of Driveway G, which is forecast to operate at LOS F during the AM peak hour under Existing Plus Project Phases 1, 2 and 3.
  The Project driveways are forecast to operate at acceptable service levels with the exception of Driveways G and H, which are forecast to operate at LOS F and E, respectively, during the AM peak hour under Year 2036 Cumulative Plus Project Phases 1, 2 and 3.

  The Project driveways are forecast to operate at acceptable service levels with the exception of Driveways E, F, G, and H, which are forecast to operate at LOS E or F during the AM peak hour under Year 2045 Buildout Plus Project Phases 1, 2 and 3.

  Although Driveways E, F, G, and H are forecast to operate adversely during the AM peak hour with Project Phases 1, 2 and 3, it is not uncommon for private unsignalized driveways to experience a longer delay due to the heavy volumes on the major streets, such as MacArthur Boulevard and Bristol Street. Furthermore, due to the driveway being in close proximity to other signalized intersections, it is expected that gaps in traffic would occur and actual vehicular delay experienced would be lower than what is being reported within the HCM methodology. Additionally, the project site provides multiple entry/exit points of which some are signalized. Therefore, motorists that do not wish to wait can find alternative routes in/out of the site.

  The existing and/or proposed storage is adequate to accommodate the anticipated queues. It should be noted that Project Driveways C, D, K, L and M may queue past a parking garage ramp. As such, during the development plan review further consideration should be taken to ensure adequate ingress and egress.

- ***Existing Plus Project Phase 1 Recommended Improvements*** – Recommended improvements are provided for one (1) study intersection under Existing Plus Project Phase 1 traffic conditions. The recommended improvements consist of the following:

- No. 10 – Flower Street at MacArthur Boulevard: Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

- ***Existing Plus Project Phases 1 and 2 Recommended Improvements*** – Recommended improvements are provided for one (1) study intersection under Existing Plus Project Phases 1 and 2 traffic conditions. The recommended improvements consist of the following:

  - No. 10 – Flower Street at MacArthur Boulevard: *(Same as those identified in Existing Plus Project Phase 1)* Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

    Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

- ***Existing Plus Project Phases 1, 2 and 3 Recommended Improvements*** – Recommended improvements are provided for one (1) study intersections under Existing Plus Project Phases 1, 2 and 3 traffic conditions. The recommended improvements consist of the following:

  - No. 10 – Flower Street at MacArthur Boulevard: *(Same as those identified in Existing Plus Project Phase 1)* Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible. Therefore, no improvements are recommended at this location.

Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

- ***Year 2030 Cumulative Plus Project Phase 1 Recommended Improvements*** – Recommended improvements are provided for two (2) study intersections under Year 2030 Cumulative Plus Project Phase 1 traffic conditions. The recommended improvements consist of the following:

  - No. 9 – Bristol Street at MacArthur Boulevard: Improvements at this location include restriping the westbound right-turn lane into a shared through/right-turn lane and widening the westbound departure to provide an additional through lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing commercial centers located adjacent to the intersection. Therefore, improvements at this location are considered to be infeasible. Therefore, no improvements are recommended at this location. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

  - No. 10 – Flower Street at MacArthur Boulevard: *(Same as those identified in Existing Plus Project Phase 1)* Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

    Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

- ***Year 2032 Cumulative Plus Project Phases 1 and 2 Recommended Improvements*** – Recommended improvements are provided for four (4) study intersections under Year 2032 Cumulative Plus Project Phases 1 and 2 traffic conditions. The recommended improvements consist of the following:

  - No. 1 – Fairview Street at Segerstrom Avenue: Restripe the westbound approach to provide an exclusive right-turn lane; the removal of on-street parking may be required to accommodate

the new turn pocket. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

- No. 3 – Bristol Street at Segerstrom Avenue: Restripe the northbound approach to provide an exclusive right-turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

  This improvement is consistent with the recommendation identified in the City of Santa Ana General Plan. It should be noted that the General Plan also recommends widening Segerstrom Avenue to accommodate a third through lane in both the eastbound and westbound directions. Per this analysis, these additional improvements are not necessary to offset the Project's increment and have therefore not been included.

- No. 10 – Flower Street at MacArthur Boulevard: *(Same as those identified in Existing Plus Project Phase 1)* Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

- No. 23 – Red Hill Avenue at Main Street: Improvements at this location include widening the southbound approach to construct an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact the property adjacent to the intersection. Therefore, improvements at this location are considered to be infeasible and no improvements are recommended. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- ***Year 2036 Cumulative Plus Project Phases 1, 2 and 3 Recommended Improvements*** – Recommended improvements are provided for five (5) study intersections under Year 2036 Cumulative Plus Project Phases 1, 2 and 3 traffic conditions. The recommended improvements consist of the following:

  - No. 1 – Fairview Street at Segerstrom Avenue: *(Same as those identified in Year 2032 Cumulative Plus Project Phases 1 and 2)* Restripe the westbound approach to provide an

exclusive right-turn lane; the removal of on-street parking may be required to accommodate the new turn pocket. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

- No. 3 – Bristol Street at Segerstrom Avenue: *(Same as those identified in Year 2032 Cumulative Plus Project Phases 1 and 2)* Restripe the northbound approach to provide an exclusive right-turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

  This improvement is consistent with the recommendation identified in the City of Santa Ana General Plan. It should be noted that the General Plan also recommends widening Segerstrom Avenue to accommodate a third through lane in both the eastbound and westbound directions. Per this analysis, these additional improvements are not necessary to offset the Project's increment and have therefore not been included.

- No. 9 – Bristol Street at MacArthur Boulevard: Improvements at this location include widening the southbound approach to construct an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing retail enter adjacent to the intersection. Therefore, improvements at this location are considered to be infeasible and no improvements are recommended. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- No. 10 – Flower Street at MacArthur Boulevard: *(Same as those identified in Existing Plus Project Phase 1)* Improvements at this location include widening the westbound approach to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

- No. 11 – Main Street at MacArthur Boulevard: Modify the existing traffic signal to include a right-turn overlap phase for both the northbound and southbound directions. This improvement is subject to the review of the City of Santa Ana.

It should be noted that the improvements noted above do not offset the Project's increment. Additional improvements would be required to offset the Project's increment which include widening the westbound approach to construct a fourth through lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing apartment complex located adjacent to the intersection. Therefore, these additional improvements are considered to be infeasible and have not been included. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- ***Year 2045 Buildout Plus Project Phases 1, 2 and 3 Recommended Improvements*** – Recommended improvements are provided for eight (8) study intersections under Year 2045 Buildout Plus Project Phases 1, 2 and 3 traffic conditions. The recommended improvements consist of the following:

  - No. 1 – Fairview Street at Segerstrom Avenue: *(Same as those identified in Year 2032 Cumulative Plus Project Phases 1 and 2)* Restripe the westbound approach to provide an exclusive right-turn lane; the removal of on-street parking may be required to accommodate the new turn pocket. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

    It should be noted that the improvements noted above do not offset the Project's increment. Additional improvements would be required to offset the Project's increment which include widening the southbound approach to construct an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which is considered to be infeasible and have not been included.

  - No. 3 – Bristol Street at Segerstrom Avenue: *(Same as those identified in Year 2032 Cumulative Plus Project Phases 1 and 2)* Restripe the northbound approach to provide an exclusive right-turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review of the City of Santa Ana.

    This improvement is consistent with the recommendation identified in the City of Santa Ana General Plan. It should be noted that the General Plan also recommends widening Segerstrom Avenue to accommodate a third through lane in both the eastbound and westbound directions. Per this analysis, these additional improvements are not necessary to offset the Project's increment and have therefore not been included.

  - No. 4 – Flower Street at Segerstrom Avenue/Dyer Road: Improvements at this location include widening the eastbound approach to construct an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing property adjacent to the intersection. Therefore, improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan considered improvements at this intersection to be infeasible.

Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase I construction of this Project is initiated, the project applicant will be required to modify the traffic signal to add the left turn arrows for the northbound and southbound directions.

- No. 9 – Bristol Street at MacArthur Boulevard: *(Same as those identified in Year 2036 Cumulative Plus Project Phases 1, 2 and 3)* Improvements at this location include widening the southbound approach to construct an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing retail enter adjacent to the intersection. Therefore, improvements at this location are considered to be infeasible and no improvements are recommended. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- No. 10 – Flower Street at MacArthur Boulevard: Improvements at this location include widening both the eastbound and westbound approaches to provide an exclusive right-turn lane. However, these improvements would require acquisition of additional right-of-way which would impact existing residencies located adjacent to the intersection. Therefore, these improvements at this location are considered to be infeasible. It should be noted that the City of Santa Ana General Plan also considered improvements at this intersection to be infeasible.

  Nonetheless, the City of Santa Ana has identified the necessity to modify the traffic signal to improve its operations and safety by adding left-turn signal indications for the northbound and southbound directions. As a result, the intersection has been added to their traffic signal priority list for pursuit of funding. In the event that the City is unable to secure funding by the time that Phase 1 construction of this project is initiated, the project applicant will be required to modify the traffic signal to add the left-turn arrows for the northbound and southbound directions.

- No. 11 – Main Street at MacArthur Boulevard: *(Same as those identified in Year 2036 Cumulative Plus Project Phases 1, 2 and 3)* Modify the existing traffic signal to include a right-turn overlap phase for both the northbound and southbound directions. This improvement is subject to the review of the City of Santa Ana.

  It should be noted that the improvements noted above do not offset the Project's increment. Additional improvements would be required to offset the Project's increment which include widening the westbound approach to construct a fourth through lane. However, these improvements would require acquisition of additional right-of-way which would impact the existing apartment complex located adjacent to the intersection. Therefore, these additional improvements are considered to be infeasible and have not been included. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed

with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- No. 20 – Bristol Street at Sunflower Avenue: Improvements at this location include widening the northbound approach to provide a third left-turn lane, widening the eastbound approach to provide a second right-turn lane, and restriping the existing eastbound shared through/right-turn lane into an exclusive through lane. However, these improvements would require acquisition of additional right-of-way from South Coast Plaza. Therefore, improvements at this location are considered to be infeasible. It is important to note that the Project's internal and surrounding infrastructure will be designed and constructed with the goal of promoting a more active lifestyle that is less dependent on the vehicle. The Project will promote walking, bicycling, and the use of public transportation.

- No. 37 – Bear Street at SR-73 NB Ramps: Restripe the existing westbound left-turn lane to provide a shared left/right-turn lane. Modify the existing traffic signal as necessary. This improvement is subject to the review of the Caltrans and the City of Costa Mesa.

- ***Alternative Analysis:*** There are multiple factors that come into play to allow for the installation of the proposed signal at Project Driveway at Sunflower (Intersection No. 19). Two main factors are that South Coast Plaza would have to agree to construct the south leg of the signal and that City of Costa Mesa would also have to provide construction permits since half of the street falls within the jurisdiction of the City of Costa Mesa. Since both of these factors cannot be fully guaranteed two alternatives have been considered. In the event that the south leg is not built by South Coast Plaza the intersection would operate as a 3-legged intersection with a three-phase traffic signal (Alternative 1). If Costa Mesa does not allow the proposed signal the intersection would operate as a 3-leg unsignalized right-turn only intersection (Alternative 2). Results of these analyses indicate that the study intersections will still operate at acceptable service levels.

- ***Project Fair-Share Contribution*** – The proposed Project fair-share cost responsibility at the nine (9) study intersections ranges between 2.51% and 18.54%.