MEMORANDUM

To: Ali Pezeshkpour, Planning Manager
City of Santa Ana Planning Division

Date: September 13, 2023

xc: Zdenek "Zed" Kekula, P.E. Principal Civil Engineer
City of Santa Ana Public Works Agency – Traffic Engineering

From: Richard Barretto, P.E., Principal
Linscott, Law & Greenspan, Engineers

LLG Ref: 2.21.4410

Subject: ***Supplemental Traffic Analysis***
Response to Caltrans Traffic Operations Comments on Related Bristol Specific Plan - Santa Ana, CA

LINSCOTT LAW & GREENSPAN
engineers

Engineers & Planners
Traffic
Transportation
Parking

Linscott, Law & Greenspan, Engineers
2 Executive Circle
Suite 250
Irvine, CA 92614
949.825.6175 T
949.825.6173 F
www.llgengineers.com

Pasadena
Irvine
San Diego
Woodland Hills

Linscott, Law & Greenspan, Engineers (LLG) is pleased to provide the following responses to address the Traffic Operations division comments prepared by the California Department of Transportation (Caltrans) which were provided in a letter dated April 13, 2023 as it pertains to the *Notice of Preparation of a Supplemental Environmental Impact Report and Public Scoping Meeting for the Related Bristol Specific Plan Project*. The Caltrans NOP comment letter is attached and is referenced in our responses specifically to address the comments of the Traffic Operations division as provided below .

Caltrans Traffic Operations

Traffic Operations Comment 1: A *Vehicle Miles Traveled (VMT) Traffic Impact Study (TIS) should be provided for this project. Please use the Governor's Office of Planning and Research guidance to identity VMT related impacts*

Response to Comment 1: The City of Santa Ana adopted new traffic impact criteria to be consistent with the Governor's Office of Planning and Research (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 Related Bristol Project, dated June 2023*.

Briefly, per the *City of Santa Ana Traffic Impact Study Guidelines (dated September 2019)* and based on the City's VMT screening criteria and guidance from OPR, the proposed Project is located within a TPA and the land use is consistent with the RTP/SCS as contained in Southern California Association of Governments' (SCAG) adopted Connect SoCal (2020–2045 Regional Transportation Plan/Sustainable Communities Strategy). Therefore, in accordance with the City of Santa Ana's guidelines, the proposed Project would have a less than significant CEQA-related transportation impact related to VMT.

Traffic Operations Comment 2: *The TIS should identify the proposed project's near-term and long-term safety or operational impacts on or adjacent to any or proposed state facilities.*

Response to Comment 2: Although Caltrans has also formally adopted VMT as the metric for reviewing the transportation impacts of a land use development project, to address the Project's potential operational impacts, 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 results of this supplemental analysis are summarized herein.

The existing and projected peak hour operating conditions at the following nine (9) state-controlled study intersections have been evaluated using the *Highway Capacity Manual* operations method of analysis:

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)

Briefly, the results of the LOS (operations) analysis prepared for the Project indicate that proposed Project would not have an affect on the operating conditions (LOS) at the nine (9) state-controlled study intersections under the following scenarios:

A. Existing Plus Project (Phase 1) Traffic Conditions;
B. Existing Plus Project (Phase 1 and 2) Traffic Conditions;
C. Existing Plus Project (Phase 1, 2 and 3) Traffic Conditions;
D. Year 2030 Cumulative Traffic Conditions Project (Phase 1) Traffic Conditions;
E. Year 2032 Cumulative Traffic Conditions;
F. Year 2032 Cumulative Traffic Conditions Project (Phase 1 and 2) Traffic Conditions;

G. Year 2036 Cumulative Traffic Conditions Project (Phase 1, 2 and 3) Traffic Conditions;

For a review of ***Table 1*** through ***Table 6***, all nine (9) state-controlled study intersections are forecast operate at acceptable LOS during the AM and PM peak hours with the addition of Project traffic under future near-term (Year 2032 and Year 2036) traffic conditions. ***Attachment 1*** presents the Year 2032 and Year 2036 HCM/LOS calculations for the nine (9) state-controlled study intersections.

For the following long-term traffic conditions, a review of columns (2) and (3) of ***Table*** indicates that the intersection of Bear Street at SR-73 NB Ramps (Intersection No. 37) is forecast to operate at unacceptable LOS E in the PM peak hour, without or with Project traffic.

H. Year 2045 Buildout Plus Project (Phase 1, 2 and 3) Traffic Conditions.

The addition of Project traffic on the operating conditions would be negligible at the remaining eight (8) state-controlled study intersections are forecast to operate at an acceptable level of service during the AM and PM peak hours.

To offset the impact of future buildout traffic as well as Project-related traffic, the implementation of recommended improvements for Bear Street at SR-73 NB Ramps (Intersection No. 37) will result in acceptable operating conditions in the Year 2045 (See column (4) of *Table 7*). The recommended improvements include the following:

> **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.

Table A presents the Project's fair-share contribution to construct the recommended improvements at Bear Street and SR-73 NB Ramps. As presented in *Table A*, the first column (1) lists the total intersection peak hour traffic for existing conditions. The second column (2) presents Year 2045 Buildout Traffic, while the third column (3) presents Year 2045 Buildout Plus Project Phases 1, 2 and 3 traffic. The Project-related added traffic volumes during AM peak hour and PM peak hour are presented in the fourth column (4). The fifth column (5) represents what percentage of total added intersection peak hour traffic is Project-related traffic.

Review of *Table A* shows that the proposed Project fair-share cost responsibility at the Bear Street / SR-73 NB Ramps intersection totals **6.31%.**

Attachment 1 also includes the Year 2045 HCM/LOS calculations for the nine (9) state-controlled study intersections.

Traffic Operations Comment 3: *The TIS needs to address potential impacts on storage capacity for the right-turn and left-turn pockets for the on-ramps and off-ramps from local city streets within the State right-of-way. In addition, all potential spill beyond designated storage lane must be addressed for safety concern.*

Response to Comment 3: 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 ***Attachment 1.***

The queuing analysis was prepared for future near-term and long-term traffic conditions, consistent with the LOS calculations at the nine (9) ramp study intersections as presented in response to comment 2, above. The results of the queuing evaluation is summarized herein.

Briefly, the results of the queuing analysis indicate that proposed Project will not cause or contribute towards vehicle queuing to extend back into the SR-55 Freeway or I-405 Freeway mainline travel lanes at the nine (9) state-controlled study intersections under the following scenarios:

A. Existing Plus Project (Phase 1) Traffic Conditions;
B. Existing Plus Project (Phase 1 and 2) Traffic Conditions;
C. Existing Plus Project (Phase 1, 2 and 3) Traffic Conditions;
D. Year 2030 Cumulative Traffic Conditions Project (Phase 1) Traffic Conditions;
E. Year 2032 Cumulative Traffic Conditions;
F. Year 2032 Cumulative Traffic Conditions Project (Phase 1 and 2) Traffic Conditions;
G. Year 2036 Cumulative Traffic Conditions Project (Phase 1, 2 and 3) Traffic Conditions;

For a review of ***Table 8*** through ***Table 13***, adequate storage is provided to accommodate the forecast 95th percentile queues under traffic conditions noted above at the nine (9) off-ramp locations. 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.
However, under the following long-term traffic conditions, a review of columns (1) and (2) of ***Table 14*** indicates that 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 in the Year 2045 without or with the Project.

H. Year 2045 Buildout Plus Project (Phase 1, 2 and 3) Traffic Conditions.

However, the implementation of the recommended improvements noted in response to comment 2 will increase storage capacity and result in adequate storage to accommodate forecast vehicular queues in the Year 2045. As previously noted, the proposed Project fair-share cost responsibility at the Bear Street / SR-73 NB Ramps intersection totals 6.31%.

At the eight (8) other ramp locations, the proposed Project is not anticipated to negatively affect traffic flow on the SR-55 Freeway or I-405 Freeway as the existing vehicular storage capacity on the eight (8) other off-ramps are considered adequate.

* * * * * * * * * * *

We appreciate the opportunity to provide this Supplemental Analysis. Please let us know if you have any questions regarding this response memorandum.

Attachments

cc: Shane S. Green, P.E., LLG
File

LINSCOTT LAW & GREENSPAN engineers

TABLES 1 THROUGH 14
LEVEL OF SERVICE (OPERATIONS) ANALYSIS AND QUEUING ANALYSIS SUMMARY

LINSCOTT LAW & GREENSPAN engineers

TABLE 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 MacArthur Boulevard	AM	13.2	B	14.0	B	0.8	No	--	--
	PM	11.3	B	11.9	B	0.6	No	--	--
13. SR-55 NB Ramps at MacArthur Boulevard	AM	18.0	B	19.2	B	1.2	No	--	--
	PM	8.5	A	8.5	A	0.0	No	--	--
25. I-405 NB Off-Ramp at South Coast Drive	AM	21.8	C	22.9	C	1.1	No	--	--
	PM	21.2	C	21.2	C	0.0	No	--	--
28. Fairview Road at I-405 NB Ramps	AM	25.5	C	25.5	C	0.0	No	--	--
	PM	30.2	C	30.2	C	0.0	No	--	--
29. Fairview Road at I-405 SB Ramps	AM	35.1	D	35.1	D	0.0	No	--	--
	PM	19.8	B	20.5	C	0.7	No	--	--
30. Bristol Street at I-405 NB Ramps	AM	6.3	A	6.3	A	0.0	No	--	--
	PM	13.9	B	14.1	B	0.2	No	--	--
31. Bristol Street at I-405 SB Ramps	AM	14.2	B	14.4	B	0.2	No	--	--
	PM	15.1	B	15.5	B	0.4	No	--	--

LINSCOTT LAW & GREENSPAN engineers

TABLE 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)

LINSCOTT LAW & GREENSPAN engineers

TABLE 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 MacArthur Boulevard	AM	13.2	B	14.3	B	1.1	No	--	--
	PM	11.3	B	12.4	B	1.1	No	--	--
13. SR-55 NB Ramps at MacArthur Boulevard	AM	18.0	B	20.5	C	2.5	No	--	--
	PM	8.5	A	8.7	A	0.2	No	--	--
25. I-405 NB Off-Ramp at South Coast Drive	AM	21.8	C	22.9	C	1.1	No	--	--
	PM	21.2	C	21.2	C	0.0	No	--	--
28. Fairview Road at I-405 NB Ramps	AM	25.5	C	25.5	C	0.0	No	--	--
	PM	30.2	C	30.2	C	0.0	No	--	--
29. Fairview Road at I-405 SB Ramps	AM	35.1	D	35.1	D	0.0	No	--	--
	PM	19.8	B	19.8	B	0.0	No	--	--
30. Bristol Street at I-405 NB Ramps	AM	6.3	A	6.3	A	0.0	No	--	--
	PM	13.9	B	14.4	A	0.5	No	--	--
31. Bristol Street at I-405 SB Ramps	AM	14.2	B	15.1	B	0.9	No	--	--
	PM	15.1	B	15.8	B	0.7	No	--	--

LINSCOTT LAW & GREENSPAN engineers

TABLE 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 SR-73 NB Ramps	AM	22.7	C	23.0	C	0.3	No	--	--
	PM	41.9	D	43.5	D	1.6	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)

LINSCOTT LAW & GREENSPAN engineers

TABLE 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 MacArthur Boulevard	AM	13.2	B	14.8	B	1.6	No	--	--
	PM	11.3	B	12.7	B	1.4	No	--	--
13. SR-55 NB Ramps at MacArthur Boulevard	AM	18.0	B	22.4	C	4.4	No	--	--
	PM	8.5	A	8.8	A	0.3	No	--	--
25. I-405 NB Off-Ramp at South Coast Drive	AM	21.8	C	22.8	C	1.0	No	--	--
	PM	21.2	C	21.2	C	0.0	No	--	--
28. Fairview Road at I-405 NB Ramps	AM	25.5	C	25.5	C	0.0	No	--	--
	PM	30.2	C	30.2	C	0.0	No	--	--
29. Fairview Road at I-405 SB Ramps	AM	35.1	D	35.2	D	0.1	No	--	--
	PM	19.8	B	19.8	B	0.0	No	--	--
30. Bristol Street at I-405 NB Ramps	AM	6.3	A	6.3	A	0.0	No	--	--
	PM	13.9	B	14.1	B	0.2	No	--	--
31. Bristol Street at I-405 SB Ramps	AM	14.2	B	14.6	B	0.4	No	--	--
	PM	15.1	B	16.0	B	0.9	No	--	--

LINSCOTT LAW & GREENSPAN engineers

TABLE 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)

LINSCOTT LAW & GREENSPAN engineers

TABLE 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 MacArthur Boulevard	AM	13.2	B	14.4	B	15.0	B	0.6	No	--	--
	PM	11.3	B	11.5	B	12.0	B	0.5	No	--	--
13. SR-55 NB Ramps at MacArthur Boulevard	AM	18.0	B	17.4	B	18.4	B	1.0	No	--	--
	PM	8.5	A	8.8	A	8.8	A	0.0	No	--	--
25. I-405 NB Off-Ramp at South Coast Drive	AM	21.8	C	21.7	C	22.8	C	1.1	No	--	--
	PM	21.2	C	21.4	C	21.4	C	0.0	No	--	--
28. Fairview Road at I-405 NB Ramps	AM	25.5	C	25.2	C	25.2	C	0.0	No	--	--
	PM	30.2	C	31.6	C	31.6	C	0.0	No	--	--
29. Fairview Road at I-405 SB Ramps	AM	35.1	D	31.1	C	31.1	C	0.0	No	--	--
	PM	19.8	B	20.4	C	20.4	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	15.0	B	15.0	B	0.0	No	--	--
31. Bristol Street at I-405 SB Ramps	AM	14.2	B	15.3	B	15.5	B	0.2	No	--	--
	PM	15.1	B	16.8	B	17.2	B	0.4	No	--	--

TABLE 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)

LINSCOTT LAW & GREENSPAN engineers

TABLE 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	--	--

LINSCOTT LAW & GREENSPAN engineers

TABLE 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)

LINSCOTT LAW & GREENSPAN engineers

TABLE 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	--	--

LINSCOTT LAW & GREENSPAN engineers

TABLE 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)

LINSCOTT LAW & GREENSPAN engineers

TABLE 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 MacArthur Boulevard	AM	13.2	B	17.6	B	19.0	B	1.4	No	--	--
	PM	11.3	B	14.0	B	15.4	B	1.4	No	--	--
13. SR-55 NB Ramps at MacArthur Boulevard	AM	18.0	B	26.9	C	34.2	C	7.3	No	--	--
	PM	8.5	A	9.8	A	10.1	B	0.3	No	--	--
25. I-405 NB Off-Ramp at South Coast Drive	AM	21.8	C	21.3	C	21.3	C	0.0	No	--	--
	PM	21.2	C	22.6	C	22.6	C	0.0	No	--	--
28. Fairview Road at I-405 NB Ramps	AM	25.5	C	28.0	C	29.6	C	1.6	No	--	--
	PM	30.2	C	37.9	D	37.9	D	0.0	No	--	--
29. Fairview Road at I-405 SB Ramps	AM	35.1	D	41.7	D	42.7	D	1.0	No	--	--
	PM	19.8	B	30.9	C	31.0	C	0.1	No	--	--
30. Bristol Street at I-405 NB Ramps	AM	6.3	A	8.8	A	9.1	A	0.3	No	--	--
	PM	13.9	B	16.8	B	17.1	B	0.3	No	--	--
31. Bristol Street at I-405 SB Ramps	AM	14.2	B	15.6	B	16.1	B	0.5	No	--	--
	PM	15.1	B	19.8	B	20.3	C	0.5	No	--	--

LINSCOTT LAW & GREENSPAN engineers

TABLE 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)

LINSCOTT LAW & GREENSPAN engineers

TABLE A

YEAR 2045 BUILDOUT PROJECT FAIR-SHARE COST CONTRIBUTION

Key Intersection	Jurisdiction	Time Period	Improvement Description	(1) Existing Traffic	(2) Year 2045 Buildout Traffic	(3) Year 2045 Buildout Plus Project Phases 1, 2 and 3 Traffic	(4) Project Traffic	(5) Project Fair-Share Percent
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	**6.31%**

Note:
Project fair-share percentage, which considers both the AM peak hour and PM peak hour traffic volumes, is calculated as such:
Column (5) = [Column (4)] / [Column (3) – Column (1)] x 100%.

LINSCOTT LAW & GREENSPAN engineers

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

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[2]	1,415	187	Yes	50	Yes	202	Yes	52	Yes	--	--	--	--
Southbound Right-Turn[2]	265	180	Yes	159	Yes	203	Yes	176	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[2]	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[3]	393	Yes[3]	347	Yes[3]	393	Yes[3]	--	--	--	--
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[2]	1,480	262	Yes	314	Yes	262	Yes	314	Yes	--	--	--	--
Westbound Right-Turn[4]	880	364	Yes	467	Yes	364	Yes	467	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[5]	625	133	Yes	147	Yes	133	Yes	157	Yes	--	--	--	--
Eastbound Right-Turn[6]	625	270	Yes	182	Yes	270	Yes	192	Yes	--	--	--	--

1 Queues are based on HCM 95th Percentile methodology.

2 This movement consists of dual turn lanes.

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

4 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.

5 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.

6 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 8 (CONTINUED)
EXISTING PLUS PROJECT PHASE 1 CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[7]

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[8]	385	25	Yes	105	Yes	25	Yes	112	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[9]	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[10]	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	--	--	--	--

7 Queues are based on HCM 95th Percentile methodology.

8 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.

9 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.

10 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 9

EXISTING PLUS PROJECT PHASES 1 AND 2 CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[11]

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[12]	1,415	187	Yes	50	Yes	209	Yes	53	Yes	--	--	--	--
Southbound Right-Turn[12]	265	180	Yes	159	Yes	213	Yes	190	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[12]	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[13]	393	Yes[13]	347	Yes[13]	393	Yes[13]	--	--	--	--
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[12]	1,480	262	Yes	314	Yes	262	Yes	314	Yes	--	--	--	--
Westbound Right-Turn[14]	880	364	Yes	467	Yes	364	Yes	467	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[15]	625	133	Yes	147	Yes	133	Yes	147	Yes	--	--	--	--
Eastbound Right-Turn[16]	625	270	Yes	182	Yes	270	Yes	182	Yes	--	--	--	--

11 Queues are based on HCM 95th Percentile methodology.

12 This movement consists of dual turn lanes.

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

14 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.

15 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.

16 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 9 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1 AND 2 CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[17]

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[18]	385	25	Yes	105	Yes	25	Yes	122	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[19]	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[20]	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	--	--	--	--

17 Queues are based on HCM 95th Percentile methodology.

18 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.

19 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.

20 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 10

EXISTING PLUS PROJECT PHASES 1, 2 AND 3 CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[21]

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[22]	1,415	187	Yes	50	Yes	219	Yes	54	Yes	--	--	--	--
Southbound Right-Turn[22]	265	180	Yes	159	Yes	227	Yes	199	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[22]	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[23]	393	Yes[23]	347	Yes[23]	393	Yes[23]	--	--	--	--
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[22]	1,480	262	Yes	314	Yes	262	Yes	314	Yes	--	--	--	--
Westbound Right-Turn[24]	880	364	Yes	467	Yes	364	Yes	467	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[25]	625	133	Yes	147	Yes	133	Yes	147	Yes	--	--	--	--
Eastbound Right-Turn[26]	625	270	Yes	182	Yes	270	Yes	182	Yes	--	--	--	--

21 Queues are based on HCM 95th Percentile methodology.

22 This movement consists of dual turn lanes.

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

24 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.

25 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.

26 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 10 (CONTINUED)
EXISTING PLUS PROJECT PHASES 1, 2 AND 3 CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[27]

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[28]	385	25	Yes	105	Yes	25	Yes	120	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[29]	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[30]	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	--	--	--	--

27 Queues are based on HCM 95th Percentile methodology.

28 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.

29 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.

30 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 11

YEAR 2030 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[31]

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[32]	1,415	213	Yes	49	Yes	225	Yes	51	Yes	--	--	--	--
Southbound Right-Turn[32]	265	212	Yes	164	Yes	231	Yes	180	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[32]	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[33]	401	Yes[33]	332	Yes[33]	401	Yes[33]	--	--	--	--
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[32]	1,480	258	Yes	329	Yes	258	Yes	329	Yes	--	--	--	--
Westbound Right-Turn[34]	880	362	Yes	491	Yes	362	Yes	491	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[35]	625	126	Yes	153	Yes	126	Yes	153	Yes	--	--	--	--
Eastbound Right-Turn[36]	625	231	Yes	191	Yes	231	Yes	191	Yes	--	--	--	--

31 Queues are based on HCM 95th Percentile methodology.

32 This movement consists of dual turn lanes.

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

34 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.

35 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.

36 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 11 (CONTINUED)
YEAR 2030 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[37]

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[38]	385	25	Yes	132	Yes	25	Yes	140	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[39]	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[40]	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	--	--	--	--

37 Queues are based on HCM 95th Percentile methodology.

38 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.

39 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.

40 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 12
YEAR 2032 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[41]

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[42]	1,415	223	Yes	52	Yes	240	Yes	55	Yes	--	--	--	--
Southbound Right-Turn[42]	265	222	Yes	174	Yes	250	Yes	200	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[42]	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[43]	408	Yes[43]	337	Yes[43]	408	Yes[43]	--	--	--	--
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[42]	1,480	260	Yes	271	Yes	260	Yes	271	Yes	--	--	--	--
Westbound Right-Turn[44]	880	367	Yes	406	Yes	367	Yes	406	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[45]	625	135	Yes	156	Yes	135	Yes	156	Yes	--	--	--	--
Eastbound Right-Turn[46]	625	242	Yes	194	Yes	242	Yes	194	Yes	--	--	--	--

41 Queues are based on HCM 95th Percentile methodology.

42 This movement consists of dual turn lanes.

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

44 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.

45 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.

46 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 12 (CONTINUED)
YEAR 2032 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[47]

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[48]	385	25	Yes	139	Yes	25	Yes	153	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[49]	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[50]	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	--	--	--	--

47 Queues are based on HCM 95th Percentile methodology.

48 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.

49 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.

50 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 13

YEAR 2036 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[51]

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[52]	1,415	247	Yes	58	Yes	263	Yes	61	Yes	--	--	--	--
Southbound Right-Turn[52]	265	251	Yes	197	Yes	283	Yes[53]	228	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[52]	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[53]	422	Yes[53]	345	Yes[53]	422	Yes[53]	--	--	--	--
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[52]	1,480	238	Yes	312	Yes	238	Yes	312	Yes	--	--	--	--
Westbound Right-Turn[54]	880	336	Yes	478	Yes	336	Yes	478	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[55]	625	128	Yes	172	Yes	128	Yes	192	Yes	--	--	--	--
Eastbound Right-Turn[56]	625	247	Yes	209	Yes	247	Yes	229	Yes	--	--	--	--

51 Queues are based on HCM 95th Percentile methodology.

52 This movement consists of dual turn lanes.

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

54 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.

55 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.

56 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 13 (CONTINUED)
YEAR 2036 CUMULATIVE CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[57]

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[58]	385	25	Yes	164	Yes	25	Yes	193	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[59]	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[60]	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	--	--	--	--

57 Queues are based on HCM 95th Percentile methodology.

58 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.

59 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.

60 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 14

YEAR 2045 BUILDOUT CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[61]

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[62]	1,415	277	Yes	65	Yes	282	Yes	67	Yes	--	--	--	--
Southbound Right-Turn[62]	265	304	Yes[63]	223	Yes	334	Yes[63]	254	Yes	--	--	--	--
13. SR-55 NB Ramps at MacArthur Boulevard													
Northbound Left-Turn[62]	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[63]	439	Yes[63]	342	Yes[63]	439	Yes[63]	--	--	--	--
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[62]	1,480	258	Yes	367	Yes	305	Yes	367	Yes	--	--	--	--
Westbound Right-Turn[64]	880	368	Yes	574	Yes	440	Yes	574	Yes	--	--	--	--
29. Fairview Road at I-405 SB Ramps													
Eastbound Left-Turn[65]	625	147	Yes	225	Yes	147	Yes	225	Yes	--	--	--	--
Eastbound Right-Turn[66]	625	278	Yes	271	Yes	278	Yes	271	Yes	--	--	--	--

61 Queues are based on HCM 95th Percentile methodology.

62 This movement consists of dual turn lanes.

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

64 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.

65 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.

66 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.

LINSCOTT LAW & GREENSPAN engineers

TABLE 14 (CONTINUED)
YEAR 2045 BUILDOUT CALTRANS OFF-RAMP PEAK HOUR QUEUING ANALYSIS[67]

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[68]	385	25	Yes	181	Yes	25	Yes	200	Yes	--	--	--	--
31. Bristol Street at I-405 SB Ramps													
Eastbound Left-Turn[69]	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[70]	470	--	--	--	--	--	--	--	--	276	Yes	630	Yes[71]
Westbound Right-Turn[72]	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	--	--	--	--

67 Queues are based on HCM 95th Percentile methodology.

68 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.

69 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.

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

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

72 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.

LINSCOTT LAW & GREENSPAN engineers

CALTRANS COMMENT LETTER

LINSCOTT LAW & GREENSPAN engineers

ATTACHMENT 1
APPENDIX E FROM
REVISED TRAFFIC CIRCULATION ANALYSIS FOR THE RELATED BRISTOL
DATED JUNE 2023

LINSCOTT LAW & GREENSPAN engineers

CALTRANS COMMENT LETTER

California Department of Transportation

DISTRICT 12
1750 East 4th Street, Suite 100 | SANTA ANA, CA 92705
(657) 328-6000 | FAX (657) 328-6522 TTY 711
https://dot.ca.gov/caltrans-near-me/district-12

April 13, 2023

Ali Pezeshkpour
City of Santa Ana Planning Division
20 Civic Center Plaza, M-20
Santa Ana, CA 92701

File: IGR/CEQA
SCH#2020029087
LDR LOG #2020-02243
I-405 & SR-55

Dear Mr. Pezeshkpour

Thank you for including the California Department of Transportation (Caltrans) in the review of the Notice of Preparation of a Supplemental Environmental Impact Report and Public Scoping Meeting for the Related Bristol Specific Plan Project. The Project proposes a Specific Plan to replace the existing General Commercial (C2) and Regional Commercial (CR) zoning on the Project site. The Specific Plan would include a site-specific plan for the Project site, identifying the allowable site uses, development standards, design guidelines, and the processes and procedures for the approval of future development within the Specific Plan area. In addition to the proposed Specific Plan, the Project also includes redevelopment of the site in three phases. The Project proposes to demolish the existing shopping center and related infrastructure and provide a mixed-use development with (i) up to 3,750 multi-family residential units; (ii) up to 350,000 sf of commercial uses; (iii) a hotel with up to 250 rooms; (iv) a senior living/continuum of care use with up to 200 units; and (v) approximately 13.1 acres of parks, pedestrian paseos, and common open space. The Project would result in a FAR of 2.7 and density of 92 du/ac. Parking would be provided by above- and below-ground parking structures providing shared parking as well as ground level parking. The nearest state facility to the project site is Interstate 405 (I-405-).

The mission of Caltrans is to provide a safe and reliable transportation network that serves all people and respects the environment. Caltrans is a responsible agency on this project and has the following comments:

Traffic Operations

1. A Vehicle Miles Traveled (VMT) based Traffic Impact Study (TIS) should be provided for this project. Please use the Governor's Office of Planning and research guidance to identify VMT related impacts.

2. The TIS should identify the proposed project's near term and long-term potential safety or operational impacts on or adjacent to any existing or proposed state facilities.

3. The TIS needs to address potential impacts on storage capacity for the right turn and left turn pockets for the on-ramps and off-ramps from local city streets within the State right of way. In addition, all potential spill beyond designated storage lane must be addressed for safety concern.

System Planning

4. Caltrans supports the inclusion of bicycle storage facilities pursuant to CALGreen code. Caltrans also recommends following bicycle parking best practices described in the "Essentials of Bike Parking" guide created by the Association of Pedestrian and Bicycle Professionals (link to online PDF: https://www.apbp.org/Publications). Bike parking should be installed a minimum of 24" away from walls and other objects (e.g., trash cans, plants, etc.). With the growing popularity of electric bikes and cargo/utility bikes (which tend to be bigger and heavier), Caltrans also recommends that bicycle storage facilities be designed to accommodate a range of bicycle styles, sizes, and weights.

5. Caltrans supports the design of Complete Streets that include high-quality pedestrian, bicycle, and transit facilities that are safe and comfortable for users of all ages and abilities. Improvements may include providing secure bicycle parking, pedestrian-oriented LED lighting, wayfinding signage, and comfortable connections to nearby active transportation and/or transit facilities. Complete Streets improvements also promote regional connectivity, improve air quality, reduce congestion, promote improved first-/last-mile connections, and increase safety for all modes of transportation. Continue to incorporate Complete Streets in project development.

Transportation Planning (Goods Movement/Freight)

6. Consider how many individual packages will be delivered daily to individual residences within the areas identified for increased housing production. Shared drop-off locations can help reduce the amount of driving done by delivery trucks and can increase the efficiency of deliveries in densely developed areas. Similarly, high-density residential developments should consider automated parcel systems (i.e., Amazon Lockers) so that deliveries can be made with one truck stop instead of multiple stops to individual residences.

7. As the General Plan is implemented, consider accounting for off-street truck parking to help free up on-street space for other modes, such as city traffic, walking, and bicycling. Similarly, utilize alley space or similar areas, if available, to reduce the need for on-street parking which may conflict with highway/street flows.

8. If truck parking (i.e., for home deliveries) is to be on-street, ensure the width of the parking lane is wide enough for freight trucks without encroaching on bicycle lanes or street lanes.

9. Please consider designated on-street freight-only parking and delivery time windows to reduce the need for double parking. This strategy also helps prevent street traffic congestion.

10. Please ensure that, throughout the individual study areas, the city provides posted speed signs for truckers to follow.

11. Bicycle parking design may need to accommodate cargo bikes, such as for food delivery services, to encourage and facilitate the growing use of food delivery services and parcel deliveries. This can alleviate the need for delivery trucks and associated GHG emissions.

12. Caltrans recognizes our responsibility to assist communities of color and under-served communities by removing barriers to provide a more equitable transportation system for all.

Equity

13. The Department firmly embraces racial equity, inclusion, and diversity. These values are foundational to achieving our vision of a cleaner, safer, and more accessible and more connected transportation system. Please consider including a discussion on equity in the environmental document.

Transit

14. Provide discussion about City's multimodal mobility strategies. City should look for transit opportunities to connect current bus services and expand services for regional connectivity to include connectivity to the closest train station for Metrolink and Amtrak Pacific Surfliner rail services.

15. Encourage the use of transit among future residents, visitors, and workers of the development. Increasing multimodal transportation will lead to a reduction to congestion, Vehicle Miles Traveled, and improve air quality.

16. Provide adequate wayfinding signage to transit stops within the project vicinity and local roadways.

Encroachment Permit

17. Any project work proposed in the vicinity of the State right of way would require an encroachment permit and all environmental concerns must be adequately addressed. If the environmental documentation for the project does not meet Caltrans's requirements for work done within State right of way, additional documentation would be required before approval of the encroachment permit. Please coordinate with Caltrans to meet requirements for any work within or near State right of way. For specific details for Encroachment Permits procedure, please refer to the Caltrans's Encroachment Permits Manual at: http://www.dot.ca.gov/hq/traffops/developserv/permits

Please continue to coordinate with Caltrans for any future developments that could potentially impact State transportation facilities. If you have any questions, please do not hesitate to contact Maryam Molavi, at Maryam.Molavi@dot.ca.gov.

Sincerely,

Scott Shelley
Branch Chief, Regional-LDR-Transit Planning
District 12