



FINAL Peer Review – Garfield-Gisler Santa Ana River Crossing Technical Review

Moffatt & Nichol/Orange County Transportation Authority

Peer Review by:

A handwritten signature in blue ink, appearing to read "Ted Huynh".

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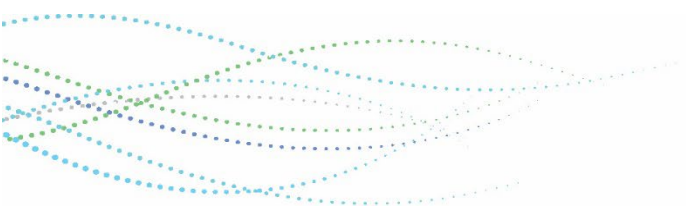




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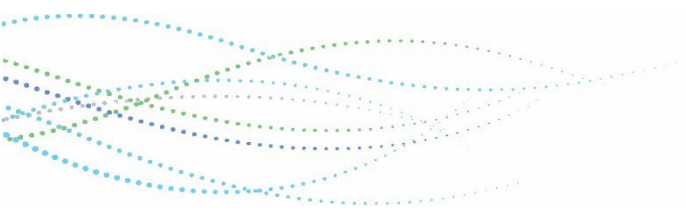
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1 INTRODUCTION

Iteris has reviewed the Garfield-Gisler Santa Ana River Crossing Technical Review (Report) prepared by the Orange County Transportation Authority (OCTA), which was provided to Iteris on February 12, 2025.

The Report summarizes a traffic and transportation assessment comparing daily arterial segment volumes and Levels of Service (LOS) using two different versions of the Orange County Transportation Analysis Model (OCTAM) without the inclusion of the Garfield Avenue-Gisler Avenue Master Plan of Arterial Highways (MPAH) river crossing improvement. The model versions used in the Report are the original OCTAM 3.2 used in the 2006 Garfield-Gisler Circulation Feasibility Study and Cost Estimate (CFS & CE) and the most current version of OCTAM 5.1.

Iteris' role is to identify and provide technical feedback and/or concurrence with the findings presented in the analysis. The results of the review are described in this memorandum as comments referenced to each section of the revised report.

2 REPORT FINDINGS

Below are the peer review findings, which are organized by the headings within the Report.

General

- The cover page has no date or version number.

Background (Pages 1-3)

- This section provides a thorough and comprehensive background to the history of the Santa Ana River crossings from 1991 before OCTA took over managing the Master Plan of Arterial Highways (MPAH) to current day.
- Since 2006, party agencies have been working to implement the 25 mitigation measures in the Cities of Costa Mesa, Huntington Beach, and Fountain Valley, identified in the “Smart Street and Bridge Widening Alternative A Improvements” (Alternative A) scenario from the 2006 Memorandum of Understanding (MOU) developed at that time. Twenty-one (21) of those mitigation measures are either completed or have not triggered the LOS for improvement. Additionally, the I-405 Express Lanes, which were not identified as part of the 2006 MOU, have also been implemented since that time, providing additional roadway capacity across the Santa Ana River, over and above what was assumed in the future year forecasts in the 2006 study.
- The “bridge widening” from the Alternative A scenario refers to the widening of MacArthur Boulevard bridge over the Santa Ana River (actually restriping from four to six lanes within the existing bridge structure). This roadway capacity improvement was completed by 2012. This bridge widening is one of the 25 mitigation measures identified in the 2006 MOU (Fountain Valley FV2) and provides additional east-west capacity over the Santa Ana River.

Summary: This section provides a good general background for a reader unfamiliar with the project.

Overview of 2025 SARX Review (Pages 4-5)

- The premise of this section is that the 2006 CFS & CE study identified a list of 25 mitigation measures that, when implemented, would provide additional roadway throughput in the vicinity of the Garfield-Gisler area, thus eliminating the need for this river crossing. OCTA has tracked these 25 mitigation measures since 2006, and they have either been implemented or are no longer desired or considered necessary. OCTA staff indicated that the relevant enhancements are included in the 2050 OCTAM model networks.
- The methodology states that if future congestion levels are not forecast to be above those in the 2006 study, then the conclusions of the 2006 study will remain valid, and no additional detailed traffic study is necessary. Iteris concurs with this overall methodology.
- This approach is reasonable and is consistent with the approach taken on other projects in the region where older traffic forecasts overstated the most recent traffic volume forecasts, mainly due to significant downward revision of population forecasts throughout the region and state. For example, Caltrans District 8 and the SCAG Transportation Conformity Working Group (TCWG) approved a study with a similar methodology for the future SR-60 Potrero Interchange in the City of Beaumont in December 2024.

Summary: The general approach of the study is reasonable and has recently been utilized in other infrastructure projects in the region.

Model Versions (Page 6)

- This section outlines the differences between the two versions of OCTA’s in-house traffic model OCTAM. Namely, OCTAM 3.2, which was used to forecast future Year 2030 traffic volumes in the 2006 traffic study, and the most current version, OCTAM 5.1 with a forecast year of 2050. Notable differences include:
 - Updated modeling software;
 - Updated population and employment forecasts;
 - Updated transportation networks and transit services (including the I-405 Express Lanes project); and
 - Updated model parameters to reflect the latest observed trend in travel behavior.

Demographic Forecasts

- A key difference between the demographic forecasts used in the two studies is that since the 2006 study future population forecasts have reduced significantly. The future population and employment forecasts used as inputs to OCTAM are determined by the Orange County Projections (OCP) forecasts from Cal-State Fullerton’s Center for Demographic Research (CDR), who provide the official population forecast for Orange County. Table 1 in the Report indicates that the 2004 OCP used in the 2006 study forecasts show a forecasted Orange County population of 3.6 million by 2030, while the current projections for 2050 estimate a population of 3.3 million. These projections were reviewed and verified against the OCP website at the CDR.
 - OCP 2004 (Forecast year 2030) population of 3,552,724 (3.6 million)
<https://www.fullerton.edu/cdr/resources/pdf/profiles/profilesv9n2.pdf>



- OCP 2022 (Forecast year 2050) population of 3,327,124 (3.3 million)
https://www.fullerton.edu/cdr/_resources/pdf/ocff.pdf

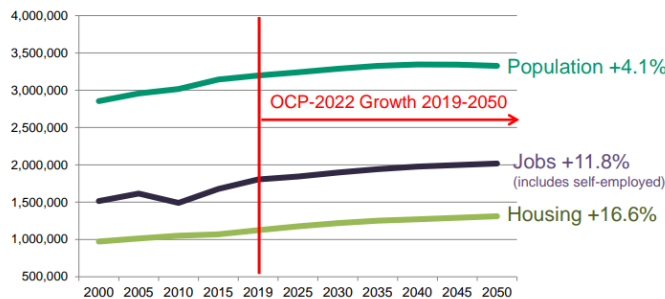
Figure 1 shows details of the OCP 2022 projections in five-year increments, showing Orange County's population peaking around 2040.

Table 1 compares OCP projections for the three Cities adjacent to the Garfield-Gisler study area (Huntington Beach, Costa Mesa, and Fountain Valley). The reduction in population in the three Cities between the two OCP forecasts is 8% compared to 6% for Orange County as a whole. Also, the reduction in population in the three Cities between 2020 and 2024, according to the US Census, is 4% compared to a 2% reduction for the County a whole.

Figure 1: OCP 2022 Projections - Demographic Data by Year

OCP-2022

	Estimate 2019	Projections					
		2025	2030	2035	2040	2045	2050
Employment	1,805,476	1,843,470	1,897,773	1,941,915	1,976,791	1,997,885	2,018,954
Housing Units	1,124,849	1,176,165	1,220,390	1,252,783	1,271,438	1,290,931	1,311,738
Population	3,196,231	3,239,474	3,287,447	3,327,150	3,345,665	3,343,718	3,327,124



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Table 1: OCP Projections and Census Data in Cities around Garfield-Gisler Bridge Study Area

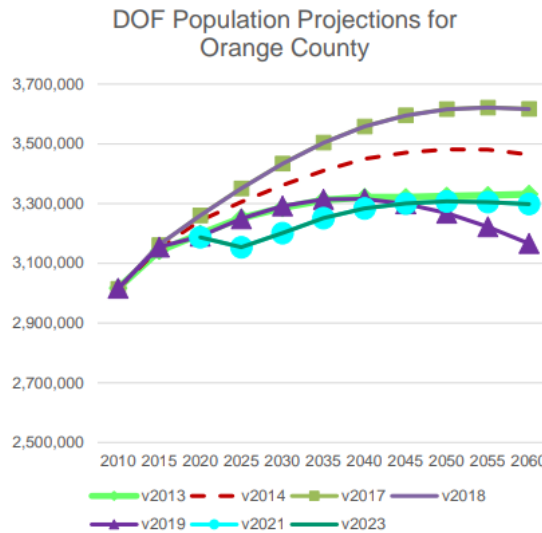
City	OCP 2004	OCP 2022	OCP	Census		
	2030	2050	2050 vs 2030	2020	2024	2024 vs 2020
Huntington Beach	223,992	190,719	-15%	198,405	190,037	-4%
Costa Mesa	129,098	129,864	1%	111,918	107,211	-4%
Fountain Valley	66,107	66,213	0%	57,047	54,966	-4%
Three Cities Combined	419,197	386,796	-8%	369,390	354,238	-4%
Orange County	3,552,724	3,327,124	-6%	3,198,050	3,142,009	-2%

- The reduction in the OCP demographic forecasts is consistent with Statewide population forecasts declining over time. In 2007, the California Department of Finance (DOF) forecasted a statewide population of 59.7 million by 2050, which was revised to 49.8 million in 2014. The most current DOF population estimates show a projected statewide population of 41.7 million in 2050, representing only a six (6) percent increase from 2024.

(See <https://dof.ca.gov/forecasting/demographics/projections/>)

- **Figure 2** shows the DOF maximum population forecasts for Orange County also declining over time between 2013 and 2023. The current DOF forecast shows Orange County’s population peaking in 2046, then slowly declining.

Figure 2: Orange County Population Forecasts over Time (California Department of Finance)



https://www.mwdoc.com/wp-content/uploads/2023/11/2024.02.05_CDR_OCP_MWDOC_rev.pdf

Another difference between the two versions of OCTAM is the population composition. In 2050, there will be a higher percentage of retired people aged over 65 compared to the 2030 forecasts. That means fewer total trips per capita with a lower percentage of home-to-work trips, which tend to be longer than the average trip length and more likely to occur in the peak hours. In the 2050 forecasts, future trips per person will be fewer, shorter, and less concentrated in the peak hours compared to the 2030 forecasts and, therefore, less likely to exacerbate peak hour congestion.

Summary: Reductions in forecast population increases have been ongoing throughout the state and region for the last 20 years, meaning current traffic volumes forecasts will generally be lower compared to comparable older studies. In addition, the aging population overall will also contribute towards lower future traffic volumes compared to the 2006 study.

Findings (Pages 7-9)

- This section lays out the segment LOS analysis comparing current forecasts against the 2030 forecast performed in 2006 (OCP 2004). The LOS calculations are consistent with the approach in OCTA’s MPAH Amendment guidelines (https://www.octa.net/pdf/mpah_guidelines.pdf).
- Tables 2 and 3 from the Report indicate the volumes have either declined in the 2050 OCTAM 5.1 model when compared to the 2030 OCTAM 3.2 model, and can be attributed to model changes. In the case of the MacArthur Boulevard bridge, additional capacity was provided for this facility,



resulting in additional volumes being reassigned to use this facility with the increased capacity provided.

- Table 4 within the Report summarizes the daily segment LOS results, although daily capacity for each roadway segment and Volume/Capacity (V/C) ratios are not shown in the table. OCTA provided the original spreadsheet data for Iteris' review, which includes the daily segment capacity, V/C ratios, and existing average daily traffic (ADT) counts. The daily capacities were checked against capacity assumptions from Table A-4-1 of the MPAH Guidelines and against the most current MPAH map on the OCTA website. **Table 2** below compares the MPAH classification in the OCTA spreadsheet, the OCTA MPAH Map, and the capacity used for the 2030 and 2050 V/C and LOS calculations. There was one location where additional clarification regarding the daily capacity change was provided by OCTA.
 - **#16 Ward Street between Talbert Ave and Garfield Ave** was noted in the OCTA spreadsheet as having an increase in capacity since 2006. The Ward Street bridge roadway over I-405 was widened from two (2) lanes to four (4) lanes as part of the I-405 Express Lanes project in 2023. This widening converted Ward Street into a divided arterial with a striped median. A review of Google Street View and aerial maps confirm this change was made in 2023, with applicable capacity increase provided as a result. This change in capacity and functional conversion is reflected as going from a secondary arterial in OCTAM 3.2 to a primary arterial in OCTAM 5.1 following the actual I-405 Express Lanes project improvement at this location.



Table 2: Comparison of MPAH Arterial Segment Classifications and Assumed Daily Capacity (vehicles)

ID	Arterial Segment	From	To	Classification per OCTA spreadsheet	MPAH Map Classification	OCTAM 3.2 2030 Classification	2030 Capacity	OCTAM 5.1 2050 Classification	2050 Capacity	2050 Capacity OK?
1	Talbert Ave	Brookhurst St	Ward Street	Primary**	Primary	Primary	37,500	Major	56,300	Yes
2	Talbert Ave	Ward St	Newhope St	Primary*	Major	Major	56,300	Major	56,300	Yes
3	Talbert Ave	Newhope St	Mt. Washington St	Primary*	Major	Major	65,700	Major	65,700	Yes
4	MacArthur Blvd	Mt. Washington St	Hyland Ave	Primary**	Major	Primary	37,500	Major	56,300	Yes
5	MacArthur Blvd	Hyland Ave	Fairview Rd	Major	Major	Major	56,300	Major	56,300	Yes
6	Ellis Ave	Brookhurst St	I-405 SB ramps	Secondary*	Secondary	Primary	37,500	Primary	37,500	Yes
7	Euclid St	I-405 underpass	Talbert Ave	Primary*	Primary	Major	56,300	Major	56,300	Yes
8	Garfield Ave	Brookhurst St	Ward Street	Primary	Primary	Primary	37,500	Primary	37,500	Yes
9	Gisler Ave	Country Club Dr	Harbor Blvd	Secondary	Secondary	Secondary	22,000	Secondary	22,000	Yes
10	Baker St	Mesa Verde Dr	Royal Palm Dr	Secondary	Secondary	Collector	12,500	Collector	12,500	Yes
11	Baker St	Royal Palm Dr	Harbor Blvd	Secondary	Secondary	Secondary	25,000	Secondary	25,000	Yes
12	Baker St	Harbor Blvd	Fairview Rd	Primary	Primary	Primary	37,500	Primary	37,500	Yes
13	Adams Ave	Brookhurst St	Pinecreek Dr	Major	Major	Major	56,300	Major	56,300	Yes
14	Adams Ave	Pinecreek Dr	Fairview Rd	Major	Major	Major	46,900	Major	46,900	Yes
15	Brookhurst St	Adams Ave	Talbert Ave	Major	Major	Major	56,300	Major	56,300	Yes
16	Ward St	Talbert Ave	Garfield Ave	Secondary**	Secondary	Secondary	25,000	Primary	37,500	Yes
17	Harbor Blvd	Adams Ave	Baker St	Major	Major	Major	65,700	Major	65,700	Yes
18	Harbor Blvd	Baker St	Gisler Ave	Major	Major	Major	75,000	Major	75,000	Yes
19	Harbor Blvd	Gisler Ave	I-405 SB ramps	Major	Major	Major	65,700	Major	65,700	Yes
20	Harbor Blvd	I-405 SB ramps	South Coast Dr	Major	Major	Major	75,000	Major	75,000	Yes
21	Harbor Blvd	South Coast Dr	Sunflower Ave	Major	Major	Major	65,700	Major	65,700	Yes
22	Harbor Blvd	Sunflower Ave	MacArthur Blvd	Major	Major	Major	56,300	Major	56,300	Yes

***Notes (from OCTA spreadsheet):**

- Capacity used in analysis may be different than MPAH designation due to current road configuration
- Roadway widened in current version of model per construction that was completed since 2006



- There were two other roadway segments which were noted as increasing in capacity between the 2006 study and the current forecasts.
 - **#1 Talbert Avenue between Brookhurst Street and Ward Street.** This location is the bridge over I-405 which was widened from four (4) to six (6) lanes as part of the I-405 Express Lanes project.
 - **#4 MacArthur Boulevard between Mt. Washington Street and Hyland Avenue** is the restriping of the bridge over the Santa Ana River trail from four (4) to six (6) lanes, and one of the 25 mitigation measures in the 2006 MOU.
- The Report correctly notes that the only locations where traffic volumes actually increased between the two studies are where throughput improvements were implemented, and where traffic is then reassigned to take advantage of the increased capacity. As OCTA wrote, all other segments experienced decreases in daily traffic volume in the current model compared to the 2006 study. **Table 3** shows the total study area roadway segment volumes are reduced by 11%, while the average V/C ratio correspondingly is reduced by 15% to 17%, depending on the calculation methodology. This indicates that the future forecast model traffic volumes and V/C are both substantially lower throughout the study area than in the 2006 study.

Table 3: Comparison of 2030 and 2050 Daily Segment Volume and V/C Ratios

Metric	OCTAM 3.2 (2030)	OCTAM 5.1 (2050)	2050 vs 2030
Total Volume	806,000	718,300	-11%
Average V/C (simple average)	0.74	0.61	-17%
Average V/C (weighted average)	0.75	0.64	-15%

- **Table 4** shows the change in daily LOS for the 22 link segments in the report. In the current analysis there are no segments forecast to operate at LOS E or F compared to five (5) segments in the 2006 study.

Table 4: Summary of Daily Link Segment LOS

LOS	OCTAM 3.2 (2030)	OCTAM 5.1 (2050)
A	5	10
B	6	2
C	2	6
D	4	4
E	3	-
F	2	-
Total	22	22

It is noted that four (4) segments are forecast to operate LOS D along Harbor Boulevard in 2050 in OCTAM 5.1:

- #17 Harbor Boulevard between Adams Avenue and Baker Street
- #19 Harbor Boulevard between Gisler Avenue and the I-405 SB Ramps

- #20 Harbor Boulevard between the I-405 SB Ramps and South Coast Drive
- #22 Harbor Boulevard between Sunflower Avenue and MacArthur Boulevard

Appendix C of the MPAH Guidelines recommends the acceptable standard for link segment LOS as LOS C. However, the 2006 MOU states that LOS D is acceptable for operating conditions on roadways within each jurisdiction, as shown in **Figure 3**. Therefore, the four segments along Harbor Boulevard estimated to operate at LOS D in 2050 meet the acceptable standard established in the MOU, along with the other 18 segments expected to operate LOS C or better.

Figure 3: Level of Service Standards from the 2006 MOU

1	Introduction
2	Through its General Plan Circulation Element, each of the cities within the Garfield/Gisler Bridge
3	Crossing Study Area has established traffic level of service (LOS) D or better as representative of
4	acceptable operating conditions on roadways within its jurisdiction. The Garfield/Gisler Study Area

Summary: Overall forecast traffic volumes and level of service are significantly lower in the 2050 forecasts compared to the older 2030 forecasts. All adjacent roadway segments meet the LOS D acceptable standard per the adjacent City's General Plan Guidelines and the 2006 MOU. It is suggested that Table 4 in the OCTA report provide additional notes to explain changes in capacity from the original MPAH designation where appropriate and where model volumes have increased, since they correspond to throughput increases and subsequent traffic demand reassignment, not due to increased traffic itself.

Discussion and Conclusions (Page 10)

- This section of the Report states that the current 2050 traffic forecasts and operational analysis show reduced projections in traffic volumes and reduced congestion compared to the 2030 forecasts in the 2006 study, largely as a result of reduced population forecasts within the study area and throughout Orange County. Part of the reduction is the recent elimination of the proposed Banning Ranch housing development approximately three miles south of the Garfield-Gisler area. This area is in the process of being converted to a public park and the future housing previously included in OCTAM TAZ 1276 has been therefore removed from OCTAM 5.1.
- The Report's conclusion is that since current forecast future traffic volumes are lower than the 2006 study and forecast congestion is significantly lower, there is no need for further in-depth study on the MPAH status of the Garfield-Gisler river crossing and the facility can be fully removed from the MPAH without significant impacts on traffic volumes or congestion in the surrounding area.

Summary: The analysis in the Report clearly reviews and shows that forecasted traffic volumes in the 2050 forecast year scenario in OCTAM 5.1 are significantly lower than when compared to the forecast 2030 volumes from the 2006 traffic study and its use of OCTAM 3.2. The cities of Fountain Valley, Costa Mesa, and Huntington Beach agreed to the Alternative A scenario improvements based on the 2006 study results, and the OCTAM 5.1 results provided in the report indicate that these mitigation measures have limited or reduced nearby future forecast roadway segment traffic volumes and corresponding V/C



and LOS. The results in this Report are also based on the 2050 forecast year, an additional 20 years beyond the original 2006 study. The findings from the Report show that declining forecasts in future population have correlated to a reduction in forecast traffic volumes and V/C ratios in the Garfield-Gisler study area, as discussed in the Model Versions section. Furthermore, all roadway segments in 2050 continue to satisfy the LOS D standard established in the 2006 MOU agreed to by the three cities.

Iteris therefore concurs with and supports OCTA's conclusion that there is no need to further study the MPAH status of the Garfield-Gisler river crossing. The Report's overall conclusion and findings are technically sound and are supported by the overall comparison of OCTAM 3.2's year 2030 forecast from 2006, and the current OCTAM 5.1's year 2050 forecast, in terms of projected traffic volumes and corresponding LOS.

