Orange County Transportation Authority

Regional Transportation Planning Committee Agenda
Monday, April 7, 2025 at 10:30 a.m.

Board Room, 550 South Main Street, Orange, California

Committee Members

Stephanie Klopfenstein, Chair
John Stephens, Vice Chair
Mike Carroll
Jamey M. Federico
Katrina Foley
Patrick Harper

Accessibility

Any person with a disability who requires a modification or accommodation in order to participate in this meeting should contact the Orange County Transportation Authority (OCTA) Clerk of the Board's office at (714) 560-5676, no less than two business days prior to this meeting to enable OCTA to make reasonable arrangements to assure accessibility to this meeting.

Agenda Descriptions

Agenda descriptions are intended to give members of the public a general summary of items of business to be transacted or discussed. The posting of the recommended actions does not indicate what action will be taken. The Committee may take any action which it deems to be appropriate on the agenda item and is not limited in any way by the notice of the recommended action.

Public Availability of Agenda Materials

All documents relative to the items referenced in this agenda are available for public inspection at www.octa.net or through the Clerk of the Board's office at the OCTA Headquarters, 600 South Main Street, Orange, California.

Meeting Access and Public Comments on Agenda Items

Members of the public can either attend in-person or access live streaming of the Committee meetings by clicking this link: https://octa.legistar.com/Calendar.aspx

In-Person Comment

Members of the public may attend in-person and address the Board regarding any item within the subject matter jurisdiction of OCTA. Please complete a speaker's card and submit it to the Clerk of the Board and notify the Clerk regarding the agenda item number on which you wish to speak. Speakers will be recognized by the Chair at the time of the agenda item is to be considered by the Board. Comments will be limited to three minutes. The Brown Act prohibits the Board from either discussing or taking action on any non-agendized items.

Written Comment

Written public comments may also be submitted by emailing them to ClerkOffice@octa.net, and must be sent by 5:00 p.m. the day prior to the meeting. If you wish to comment on a specific agenda Item, please identify the Item number in your email. All public comments that are timely

received will be part of the public record and distributed to the Board. Public comments will be made available to the public upon request.

Call to Order

Pledge of Allegiance

Director Foley

Closed Session

There are no Closed Session items scheduled.

Special Calendar

There are no Special Calendar matters.

Consent Calendar (Items 1 through 4)

All items on the Consent Calendar are to be approved in one motion unless a Committee Member or a member of the public requests separate action or discussion on a specific item.

1. Approval of Minutes

Clerk of the Board

Recommendation(s)

Approve the minutes of the March 3, 2025, Regional Transportation Planning meeting.

Attachments:

Minutes

2. Cooperative Agreement with the California Department of Transportation for the State Route 91 Improvement Project Between La Palma Avenue and State Route 55

Jeannie Lee/James G. Beil

Overview

The Orange County Transportation Authority proposes to enter into a cooperative agreement with the California Department of Transportation for construction capital and construction management support services for the State Route 91 Improvement Project between La Palma Avenue and State Route 55.

Recommendation(s)

Authorize the Chief Executive Officer to negotiate and execute Cooperative Agreement No. C-5-3985 between the Orange County Transportation Authority and the California Department of Transportation, in the amount of $269,504,000, comprised of a construction capital share of $230,314,000 and a construction management services share of $39,190,000 for the State Route 91 Improvement Project between La Palma Avenue and State Route 55.

Attachments:

Staff Report

3. Amendment to Cooperative Agreement with the California Department of Transportation for the State Route 55 Improvement Project Between Interstate 5 and State Route 91

Jeannie Lee/James G. Beil

Overview

On July 10, 2023, the Orange County Transportation Authority Board of Directors approved a cooperative agreement with the California Department of Transportation to provide right-of-way support services, right-of-way engineering, right-of-way acquisition, and utility relocation for the State Route 55 Improvement Project between Interstate 5 and State Route 91. Board of Directors' approval is requested to amend the cooperative agreement for additional funding for right-of-way capital and right-of-way support services.

Recommendation(s)

Authorize the Chief Executive Officer to negotiate and execute Cooperative Agreement No. C-3-2465 between the Orange County Transportation Authority and the California Department of Transportation, in the amount of $1,042,000, for additional right-of-way support services, right-of-way engineering, right-of-way acquisition, and utility relocation for the State Route 55 Improvement Project between Interstate 5 and State Route 91. This will increase the maximum cumulative obligation of the cooperative agreement to a total contract value of $7,087,000.

Attachments:

Staff Report
Attachment A
Attachment B

4. Amendment to Agreement for Additional Design Services for State Route 91 Improvement Project Between Acacia Street and La Palma Avenue

Jeannie Lee/James G. Beil

Overview

On July 13, 2020, the Orange County Transportation Authority Board of Directors authorized an agreement with T.Y. Lin International, for the preparation of plans, specifications, and estimates for the State Route 91 Improvement Project between Acacia Street and La Palma Avenue. An amendment to the existing agreement is required for additional design services.

Recommendation(s)

Authorize the Chief Executive Officer to negotiate and execute Amendment No. 5 to Agreement No. C-0-2073 between the Orange County Transportation Authority and T.Y. Lin International, in the amount of $2,232,131, for additional design services for the State Route 91 Improvement Project between Acacia Street and La Palma Avenue. This will increase the maximum cumulative obligation of the agreement to a total contract value of $13,945,033.

Attachments:

Staff Report
Attachment A

Regular Calendar

5. Amendments to the Master Plan of Arterial Highways
Ivy Hang/Rose Casey

Overview
The Orange County Transportation Authority administers the Master Plan of Arterial Highways, including the review and approval of amendments requested by local agencies. The cities of Anaheim, Costa Mesa, Irvine, and Stanton have requested amendments to the Master Plan of Arterial Highways that are recommended for approval. In addition, removal of the Garfield-Gisler Santa Ana River crossing is recommended for approval, and support letters have been received from the cities of Costa Mesa, Fountain Valley, and Huntington Beach. A status update is also provided on Master Plan of Arterial Highways coordination activities, including ongoing collaboration with the cities of Costa Mesa and Newport Beach.

Recommendation(s)

A. Approve amending the Master Plan of Arterial Highways to fully remove the Garfield-Gisler Santa Ana River crossing.

B. Direct staff to close out the Memorandum of Understanding C-6-0834 among the cities of Costa Mesa, Fountain Valley, and Huntington Beach, and the Orange County Transportation Authority regarding agency responsibilities for implementing the consensus recommendation for the Garfield-Gisler Bridge Crossing over the Santa Ana River.

C. Approve amending the Master Plan of Arterial Highways to accommodate the following requests:

1. City of Anaheim: Remove Weir Canyon Road between Blue Sky Road and State Route 241 (not constructed).
2. City of Costa Mesa: Reclassify Merrimac Way from a primary (four-lane, divided) arterial to a divided collector (two-lane, divided) arterial between Harbor Boulevard and Fairview Road.
3. City of Irvine: Reclassify Yale Avenue from a secondary (four-lane, undivided) arterial to a collector (two-lane undivided) arterial between Michelson Drive and University Drive.
4. City of Stanton: Reclassify Orangewood Avenue from a secondary (four-lane, undivided) arterial to a divided collector (two-lane divided) arterial between Santa Rosalia Street and the eastern city boundary.

The Master Plan of Arterial Highways will be amended to reflect each approved request contingent upon receipt of documentation confirming that all affected general plans are consistent with the proposed amendment and are compliant with the California Environmental Quality Act. Amendment requests will expire if the Orange County Transportation Authority does not receive such documentation within three years of granting approval.

Should the proposed Master Plan of Arterial Highways amendment be modified for any reason after receiving approval, the modified Master Plan of Arterial Highways amendment must be returned to the Orange County Transportation Authority Board of Directors for reconsideration and action.

D. Direct the Executive Director of Planning, or her designee, to file a Notice of Exemption from the California Environmental Quality Act in support of the Master Plan of Arterial Highways amendment.

E. Receive and file a status report of ongoing Master Plan of Arterial Highways coordination activities.

Attachments:

Staff Report
Attachment A
Attachment B
Attachment C
Attachment D
Attachment E
Attachment F
Attachment G
Attachment H
Attachment I
Attachment J
Attachment K
Attachment L
Attachment M
Attachment N
Attachment O

6. Capital Programming Update

Ben Ku/Rose Casey

Overview

The Orange County Transportation Authority uses a combination of federal, state, and local funding sources to plan and deliver Board of Directors-approved capital improvement and transit projects, including those promised in the voter-approved sales tax program, Measure M2. As projects advance through the various stages of development, funding sources and amounts are updated and adjusted to reflect the most current cost estimates and to maximize the benefit of local sales tax dollars. Board of Directors' authorization is requested to commit funding for current and planned projects as further described herein.

Recommendation(s)

A. Authorize the use of up to $180.584 million to fund the construction phase and adjust costs associated with prior phases for the State Route 55 Improvement Project from Interstate 5 to State Route 91 (Project F) using Measure M2 funding.

B. Authorize the use of up to $334.367 million to fund the construction phase and adjust costs associated with prior phases for the State Route 91 Improvement Project from La Palma Avenue to State Route 55 (Segment 2) (Project I), using the following funding sources:
   - 91 Express Lanes Excess Revenue ($323.726 million)
   - Local Partnership Program - Formulaic ($6.641 million)
   - Community Project Funding / Congressionally Directed Spending ($4.000 million)

C. Authorize the use of up to an additional $132.149 million to supplement the construction funding and prior phase funding for the Interstate 5 Improvement Project from Interstate 405 to Yale Avenue (Segment 1) (Project B) using Measure M2 funding.

D. Authorize the use of up to an additional $80.172 million to supplement the construction funding and prior phase funding for the State Route 91 (Segments 1 and 3) (Project I) using 91 Express Lanes Excess Revenue.

E. Authorize the use of up to an additional $14.699 million to supplement the construction funding and prior phase funding for the Interstate 605/Katella Avenue Interchange Project (Project M) using Measure M2 funding.

F. Authorize the inclusion of $39.251 million in committed State Highway Operations and Protection Program funds and an additional $22.769 million in uncommitted future state funds to integrate the California Department of Transportation Multi-Asset Project into the Capital Funding Program report for:
   - Interstate 5 Improvement Project between Interstate 405 and Yale Avenue (Segment 1) (Project B) ($36.400 million in committed State Highway

Operations and Protection Program funds and $13.744 million in uncommitted future state funds)

- State Route 91 Improvement Project from Acacia Street to La Palma Avenue (Segment 3) (Project I) ($2.851 million in committed State Highway Operations and Protection Program funds and $9.025 million in uncommitted future state funds)

G. Authorize the use of up to $8.000 million for the Inland Slope Rehabilitation Phase II Project from the following fund sources:
- Measure M2 ($5.600 million)
- Local Partnership Program - Formulaic ($2.400 million)

H. Authorize the use of up to $12.830 million in Congestion Mitigation and Air Quality Improvement funds for the Future Zero-Emission Bus Project.

I. Authorize staff to process all necessary amendments to the Federal Transportation Improvement Program and execute or amend all necessary agreements to facilitate the above actions

Attachments:

Staff Report
Attachment A
Attachment B
Attachment C
Presentation

7. Comprehensive Transportation Funding Programs - 2025 Call for Projects Programming Recommendations

Charvalen Alacar/Rose Casey

Overview

The Orange County Transportation Authority issued the 2025 Measure M2 Comprehensive Transportation Funding Programs Regional Capacity Program and Regional Traffic Signal Synchronization Program call for projects in August 2024. Project applications were due in October 2024. A list of projects recommended for funding is presented for Board of Directors' review and approval.

Recommendation(s)

A. Approve the award of $25.72 million in 2025 Regional Capacity Program (Project O) funds to nine local jurisdiction projects.

B. Approve the award of $11.99 million in 2025 Regional Traffic Signal Synchronization Program (Project P) funds to six local jurisdiction projects.

Attachments:

Staff Report
Attachment A
Attachment B
Attachment C
Attachment D
Presentation

8. Active Transportation Program Biannual Update
Peter Sotherland/Rose Casey

Overview
The Orange County Transportation Authority coordinates regional active transportation efforts with local jurisdictions, key stakeholders, and the public. An update on recent and upcoming activities is provided.

Recommendation(s)
Receive and file as an information item.

Attachments:

Staff Report
Attachment A
Attachment B
Presentation

Discussion Items

9. Public Comments

10. Chief Executive Officer's Report

11. Committee Members' Reports

12. Adjournment
The next regularly scheduled meeting of this Committee will be held:
10:30 a.m. on Monday, May 5, 2025
OCTA Headquarters
550 South Main Street
Orange, California

Committee Members Present	Staff Present
Stephanie Klopfenstein, Chair	Darrell E. Johnson, Chief Executive Officer
John Stephens, Vice Chair	Jennifer L. Bergener, Deputy Chief Executive Officer
Jamey M. Federico	Allison Cheshire, Clerk of the Board Specialist, Senior
Patrick Harper	Gina Ramirez, Assistant Clerk of the Board
	Andrea West, Clerk of the Board
Committee Members Absent	James Donich, General Counsel
Mike Carroll	OCTA Staff
Jon Dumitru	
Katrina Foley	

Call to Order

The March 3, 2025, Regional Transportation Planning Committee meeting was called to order by Committee Chair Klopfenstein at 10:30 a.m.

Consent Calendar (Items 1 through 6)

1. Approval of Minutes

A motion was made by Committee Vice Chair Stephens, seconded by Director Federico, and declared passed by those present to approve the minutes of the February 3, 2025, Regional Transportation Planning Committee meeting.

2. Amendment to Cooperative Agreement with the California Department of Transportation for the Interstate 605/Katella Avenue Interchange Project

A motion was made by Committee Vice Chair Stephens, seconded by Director Federico, and declared passed by those present to authorize the Chief Executive Officer to negotiate and execute Amendment No. 2 to Agreement No. C-3-2384 between the Orange County Transportation Authority and the California Department of Transportation, in the amount of $1,760,000, for additional construction capital and construction management support services for the Interstate 605/Katella Avenue Interchange Project. This will increase the maximum cumulative obligation of the cooperative agreement to a total contract value of $32,220,000.

3. Cooperative Agreement with the California Highway Patrol for Services Related to the Freeway Service Patrol Program

A motion was made by Committee Vice Chair Stephens, seconded by Director Federico, and declared passed by those present to Authorize the Chief Executive Officer to negotiate and execute Cooperative Agreement No. C-5-3865 between the Orange County Transportation Authority and the California Highway Patrol, in the amount of $849,680, for overtime related to

supervision of the Freeway Service Patrol program.

4. Measure M2 Environmental Cleanup Program (Project X) - 2025 Tier 1 Grant Program Call for Projects

A motion was made by Committee Vice Chair Stephens, seconded by Director Federico, and declared passed by those present to:

A. Approve the proposed revisions to the Comprehensive Transportation Funding Programs Guidelines for the Environmental Cleanup Program (Project X) Tier 1 Grant Program.

B. Authorize staff to issue the 2025 Environmental Cleanup Program (Project X) Tier 1 Grant Program call for projects.

5. Revisions to the Measure M2 Eligibility Guidelines

A motion was made by Committee Vice Chair Stephens, seconded by Director Federico, and declared passed by those present to:

A. Approve proposed revisions to the Measure M2 Eligibility Guidelines.

B. Approve proposed revisions to the countywide Pavement Management Plan Guidelines.

6. Federal Fiscal Year 2026-2027 and 2027-2028 Surface Transportation Block Grant/Congestion Mitigation and Air Quality Program Prioritization Guidance

A motion was made by Committee Vice Chair Stephens, seconded by Director Federico, and declared passed by those present to:

A. Approve the prioritization guidance for federal fiscal year 2026-2027 and federal fiscal year 2027-2028 Surface Transportation Block Grant/ Congestion Mitigation and Air Quality Improvement Program.

B. Direct staff to return to the Board of Directors with a recommended priority for each project submitted through federal fiscal year 2026-2027 and federal fiscal year 2027-2028 Surface Transportation Block Grant/ Congestion Mitigation and Air Quality Improvement Program.

Regular Calendar

7. Capital Programming Update

Ben Ku, Section Manager, Formula Funding Programs, provided a presentation on this item.

Public comment was heard from from Kyler Chin.

Public comment was received via email on Sunday, March 2, 2025 and provided to the Committee Members prior to the meeting, from the following:

Youseff Kaddeche
Kyler Chin
Matt Takahashi
Debby Gale
Gilberto C.
Chelsea Wen
T. Lekawa
Adriana Maestas
Yui Saito
Elizabeth M.
Kailana Nishiura
John Brock
J. H. Zech
David Martinez
Zuri Rashad
Adam Zibell

A motion was made by Director Federico, seconded by Committee Vice Chair Stephens, and declared passed by those present to:

A. Authorize the use of up to $514.457 million to fund the construction phase of the State Route 55 Improvement Project from Interstate 5 to State Route 91 (Project F) and the State Route 91 Improvement Project from La Palma Avenue to State Route 5 (Segment 2) (Project I) using the following funding sources:
   - 91 Express Lanes Excess Revenue ($323.726 million)
   - Measure M2 ($180.090 million)
   - Local Partnership Program - Formulaic ($6.641 million)
   - Community Project Funding / Congressionally Directed Spending ($4.000 million)

B. Authorize the use of up to an additional $213.744 million to supplement the construction funding of four M2 freeway improvement projects, including one segment on Interstate 5 (Project B), two segments on State Route 91 (Project I), and an interchange on the Interstate 605 (Project M) from the following fund sources:
   - Measure M2 ($133.909 million)
   - 91 Express Lanes Excess Revenue ($79.835 million)

C. Authorize the inclusion of $31.781 million in committed State Highway Operations and Protection Program funds and an additional $30.239 million in uncommitted future state funds to integrate the California Department of Transportation Multi-Asset Project into the Capital Funding Program report for:
   - Interstate 5 Improvement Project between Interstate 405 and Yale Avenue (Segment 1) (Project B) ($28.930 million in committed State Highway Operations and Protection Program funds and $21.214 million in uncommitted future state funds)
   - State Route 91 Improvement Project from Acacia Street to La Palma Avenue (Segment 3) (Project I) ($2.851 million in committed State Highway Operations and Protection Program funds and $9.025 million in uncommitted future state funds)

D. Authorize the use of up to $12.830 million in Congestion Mitigation and Air Quality Improvement funds for the Future Zero-Emission Bus Project.

E. Authorize the use of up to $8.000 million for the Inland Slope Rehabilitation Phase II Project from the following fund sources:
   - Measure M2 ($5.600 million)
   - Local Partnership Program - Formulaic ($2.400 million)

F. Authorize staff to process all necessary amendments to the Federal Transportation Improvement Program and execute or amend all necessary agreements to facilitate the above actions.

Following the Committee presentation, an inconsistency was discovered in the staff report and corresponding recommendations related to project cost.

The staff report contained in the Board agenda has been revised to reflect the correct amounts and is updated.

Discussion Items

8. Upcoming Measure M2 Freeway Construction Projects Update

Jeff Mills, Director, Capital Project Delivery, provided a presentation on this item.

No action was taken on this item.

9. Public Comments

No public comments were received.

10. Chief Executive Officer's Report

Darrell E. Johnson, Chief Executive Officer, reported the following:

- Buy America Bonds update
- OCTA recognized as a Top Employer by Chapman University
- SR-91 Groundbreaking event on March 7

11. Committee Members' Reports

There were no Committee Member's reports.

12. Adjournment

The meeting was adjourned at 11:57 a.m.

The next regularly scheduled meeting of this Committee will be held:

10:30 a.m. on Monday, April 7, 2025
OCTA Headquarters
550 South Main Street
Orange, California.

April 7, 2025

To: Regional Transportation Planning Committee

From: Darrell E. Johnson, Chief Executive Officer

Subject: Cooperative Agreement with the California Department of Transportation for the State Route 91 Improvement Project Between La Palma Avenue and State Route 55

Overview

The Orange County Transportation Authority proposes to enter into a cooperative agreement with the California Department of Transportation for construction capital and construction management support services for the State Route 91 Improvement Project between La Palma Avenue and State Route 55.

Recommendation

Authorize the Chief Executive Officer to negotiate and execute Cooperative Agreement No. C-5-3985 between the Orange County Transportation Authority and the California Department of Transportation, in the amount of $269,504,000, comprised of a construction capital share of $230,314,000 and a construction management services share of $39,190,000 for the State Route 91 Improvement Project between La Palma Avenue and State Route 55.

Discussion

The Orange County Transportation Authority (OCTA), in partnership with the California Department of Transportation (Caltrans), is implementing the State Route 91 (SR-91) Improvement Project between State Route 57 (SR-57) and State Route 55 (SR-55) (Project). Measure M2 Project I was advanced as part of the updated Next 10 Delivery Plan approved by the OCTA Board of Directors (Board) in November 2024.

The Project will add general purpose lanes in the eastbound (EB) direction between SR-57 and SR-55 and provide westbound (WB) operational improvements between Lakeview Avenue and SR-55 and between La Palma Avenue and Acacia Street. In addition, the Project will reconstruct La Palma Avenue overcrossing and three interchanges at Lakeview Avenue,

Tustin Avenue and Glassell Street/Kraemer Boulevard, EB widening over the Santa Ana River and WB widening at State College Boulevard and add a new Orangethorpe bypass ramp. The Project is being developed as three separate design and construction projects to enhance the participation and competitive bidding of consultants and contractors, with the following project limits:

- Segment 1 extends from SR-55 to Lakeview Avenue
- Segment 2 extends from La Palma Avenue to SR-55
- Segment 3 extends from Acacia Street to La Palma Avenue

Segment 2 will provide a general purpose lane in the EB direction between La Palma Avenue and SR-55, bridge widening over the Santa Ana River, and reconstruction of the Glassell Street/Kraemer Boulevard and Tustin Avenue bridges over SR-91.

On June 15, 2019, the Board authorized Cooperative Agreement No. C-9-1274 with Caltrans to provide oversight of the plans, specifications, and estimates (PS&E), and to advertise and award the construction contract for Segment 2. On May 13, 2024, the Board authorized Cooperative Agreement No. C-4-2213 with Caltrans for the right-of-way phase for Segment 2.

A cooperative agreement for the construction phase for Segment 2 is now needed to define the specific roles and funding responsibilities, including construction capital and construction management (CM) support services.

Bid documents for Segment 2 are being prepared for advertisement of the construction contract in fall 2025. The total construction capital funding required for Segment 2 is $230,314,000, and the construction support funding required is $39,190,000. The total construction cost of $269,504,000 will be funded by a combination of $4,000,000 in federal Community Project Funding/ Congressionally Directed Spending (CPFCDS), $6,641,000 in state SB 1 (Chapter 5, Statues of 2017) Local Partnership Program – Formula (SB 1 LPP-F), and $258,863,000 in 91 Express Lanes (EL) net excess revenue.

A table depicting the proposed funding plan for the construction cooperative agreement with Caltrans is provided below.

Funding Programs	Proposed Funding
CPFCDS	$4,000,000
SB 1 LPP-F	$6,641,000
91 EL Excess Revenue	$258,863,000
Total:	$269,504,000

*OCTA is also continuing to pursue federal competitive program and other external grants and funding that would be used in place of 91 EL surplus revenues.

As the implementing agency for construction of the Project, Caltrans will be responsible for advertisement, award, approval, and administration of the construction contract. Under the proposed cooperative agreement, Caltrans and OCTA have agreed to share in the CM support services for the Project. Caltrans, as the construction phase implementing agency, will provide a resident engineer, structures representative, field surveying, and other field personnel, along with construction administrative support and environmental monitoring. OCTA will retain a consultant firm to augment Caltrans' field staff with electrical, structural and roadway inspection, office engineering, materials testing, and claims support services. OCTA's consultant will also provide a field office to house construction staff on the Project. Through separate contracts, OCTA will lead the public outreach and freeway service patrol efforts.

Fiscal Impact

The Project will be included in the proposed OCTA Fiscal Year (FY) 2025-26 Budget and subsequent FY budgets, Capital Programs Division, account nos. 0017-9084-FI105-1OR and 0017-9085-FI105-1OR, and will be funded with a combination of federal and local funds.

Summary

Staff requests Board approval for the Chief Executive Officer to negotiate and execute Cooperative Agreement No. C-5-3985 with Caltrans, in the amount of $269,504,000, comprised of a construction capital share of $230,314,000 and a construction management services share of $39,190,000 for Segment 2 of the Project.

Attachment

None.

Prepared by:

Jeannie Lee, P.E.
Senior Project Manager
(714) 560-5735

Approved by:

James G. Beil, P.E.
Executive Director, Capital Programs
(714) 560-5646

OCTA

April 7, 2025

To: Regional Transportation Planning Committee

From: Darrell E. Johnson, Chief Executive Officer

Subject: Amendment to Cooperative Agreement with the California Department of Transportation for the State Route 55 Improvement Project Between Interstate 5 and State Route 91

Overview

On July 10, 2023, the Orange County Transportation Authority Board of Directors approved a cooperative agreement with the California Department of Transportation to provide right-of-way support services, right-of-way engineering, right-of-way acquisition, and utility relocation for the State Route 55 Improvement Project between Interstate 5 and State Route 91. Board of Directors' approval is requested to amend the cooperative agreement for additional funding for right-of-way capital and right-of-way support services.

Recommendation

Authorize the Chief Executive Officer to negotiate and execute Cooperative Agreement No. C-3-2465 between the Orange County Transportation Authority and the California Department of Transportation, in the amount of $1,042,000, for additional right-of-way support services, right-of-way engineering, right-of-way acquisition, and utility relocation for the State Route 55 Improvement Project between Interstate 5 and State Route 91. This will increase the maximum cumulative obligation of the cooperative agreement to a total contract value of $7,087,000.

Discussion

The State Route 55 (SR-55) Improvement Project between Interstate 5 (I-5) and State Route 91 (SR-91) (Project) is part of Project F in the Measure M2 (M2) Freeway Program and is being advanced through the updated Next 10 Delivery Plan approved by the Orange County Transportation Authority (OCTA) Board of Directors (Board) in November 2024.

The Project will construct lane improvements in each direction between I-5 and State Route 22 and provide operational improvements to the southbound (SB) ramps at Katella Avenue and Lincoln Avenue. An additional lane will be added to the SB SR-55 Katella Avenue off- and on-ramps and the northbound and SB off-ramps at Fourth Street, and the existing SB SR-55 Lincoln Avenue off-ramp will be relocated 1,300 feet to the south, next to the existing SB SR-55 Lincoln Avenue hook on-ramp.

On March 10, 2023, the Board authorized Cooperative Agreement No. C-3-2465 with Caltrans to implement right-of-way (ROW) activities, which include property appraisals and acquisitions, if necessary, and coordination of utility relocations needed for ROW certification for the Project.

Additional ROW support services and ROW acquisition are needed due to additional ROW needs identified for the Project. There is an existing Caltrans overhead sign (OHS) that is within a landscape area of private property, and the OHS needs to be replaced to adhere to Caltrans standards. The replacement of an OHS structure requires additional ROW acquisition. An additional ROW acquisition is also needed for the relocation of the SB Lincoln Avenue off-ramp. The City of Orange (City) requested Caltrans to take over the maintenance of the intersection of Tustin Street and SB Lincoln Avenue on-ramp, where the new Lincoln Avenue off-ramp will be relocated, and the existing City easement on private commercial property is not transferable. Caltrans requested ROW acquisition of the entire intersection for placement and maintenance of their traffic signal. The efforts include the development of new ROW maps and documentation of the ROW needs, and acquisitions. The Project is estimated to impact a total of four properties, both privately and publicly-owned properties, and 16 utility conflicts. The current list of impacted properties has land uses, which include commercial/industrial, residential, and public use (Attachment A). The real property requirements are comprised of a combination of partial fee acquisitions and temporary construction easements. There are no anticipated full fee acquisitions. The property rights are required to implement the project scope as defined in the final environmental document.

The total ROW funding previously approved by the Board for the Project was $6,045,000 in local M2 funds, comprised of $5,025,000 for ROW capital and $1,020,000 for ROW support services. This request is for an additional $1,042,000 in local M2 funds, comprised of $312,000 for ROW capital and $730,000 for ROW support services, for a total contract value of $7,087,000 (Attachment B).

This Project is Project F in the Next 10 Delivery Plan and the use of M2 funds is consistent with the Board-approved Capital Programming Policies to support Next 10 Delivery Plan projects.

Fiscal Impact

Funding for the Project is proposed in OCTA's Fiscal Year 2025-26 Budget, Capital Programs Division, account nos. 0017-7514-FF102-0X0 and 0017-9081-FF102-0X0, and will be funded with local M2 funds.

Summary

Staff requests Board of Directors' approval to authorize the Chief Executive Officer to negotiate and execute Amendment No. 1 to Cooperative Agreement No. C-3-2465 with the California Department of Transportation, in the amount of $1,042,000, for additional right-of-way support services, right-of-way engineering, right-of-way acquisition, and utility relocation for the State Route 55 Improvement Project between Interstate 5 and State Route 91. This will increase the maximum obligation of the cooperative agreement to a total value of $7,087,000, comprised of a capital share of $5,337,000 and a support share of $1,750,000.

Attachments

A. State Route 55 Improvement Project (Interstate 5 to State Route 91) Right-of-Way
B. California Department of Transportation, Cooperative Agreement No. C-3-2465 Fact Sheet

Prepared by:

Jeannie Lee, P.E.
Senior Project Manager
(714) 560-5735

Approved by:

James G. Beil, P.E.
Executive Director, Capital Programs
(714) 560-5646

ATTACHMENT A

State Route 55 Improvement Project (Interstate 5 to State Route 91) Right-of-Way

No. of Parcels	Assessor Parcel No.	City	Location	Owner Name	ROW Impacts	Permanent (SF)	TCE (SF)	Permanent Easement (SF)	Land Use
1	Lot A of Tract 8940	Tustin	Marshall Lane	Marshall Lane Homeowners Association	Partial Fee/TCE	121	273	0	Residential
2	374-551-01	Orange	2550 North Tustin Avenue	2550 North Tustin Ave, LLC (Villa Ford)	Partial Fee	624	0	0	Commercial
3	374-541-35	Orange	2734 North Tustin Avenue	Joseph A Spray & Charles P. Gould, Co-Trustees (Nohl Plaza)	Partial Fee	722	0	0	Commercial
4	---	Orange	City of Orange	City of Orange	Partial Fee	20,666	0	0	Street

Notes: #4 will be acquired from the City of Orange to the California Department of Transportation through Streets and Highway Code.

Acronyms:
ROW - right-of-way
SF - square feet
TCE - temporary construction easement

ATTACHMENT B

California Department of Transportation
Cooperative Agreement No. C-3-2465 Fact Sheet

1. July 10, 2023, Cooperative Agreement No. C-3-2465, $6,045,000, approved by the Board of Directors (Board).

    - Define the terms, conditions, and funding responsibilities between the California Department of Transportation (Caltrans) and the Orange County Transportation Authority to provide right-of-way (ROW) support services, ROW engineering, ROW acquisition, and utility relocation.

2. April 14, 2025, Amendment No. 1 to Cooperative Agreement No. C-3-2465, $1,042,000, pending Board approval.

    - To add $1,042,000 in M2 funds for additional ROW capital and ROW support services.

Total committed to Caltrans after approval of Amendment No. 1 to Cooperative Agreement No. C-3-2465: $7,087,000.

April 7, 2025

To: Regional Transportation Planning Committee

From: Darrell E. Johnson, Chief Executive Officer

Subject: Amendment to Agreement for Additional Design Services for State Route 91 Improvement Project Between Acacia Street and La Palma Avenue

Overview

On July 13, 2020, the Orange County Transportation Authority Board of Directors authorized an agreement with T.Y. Lin International, for the preparation of plans, specifications, and estimates for the State Route 91 Improvement Project between Acacia Street and La Palma Avenue. An amendment to the existing agreement is required for additional design services.

Recommendation

Authorize the Chief Executive Officer to negotiate and execute Amendment No. 5 to Agreement No. C-0-2073 between the Orange County Transportation Authority and T.Y. Lin International, in the amount of $2,232,131, for additional design services for the State Route 91 Improvement Project between Acacia Street and La Palma Avenue. This will increase the maximum cumulative obligation of the agreement to a total contract value of $13,945,033.

Discussion

State Route 91 (SR-91) improvements between Acacia Street and La Palma Avenue (Project) is part of Project I in the Measure M2 (M2) Freeway Program. This Project is being advanced through the updated Next 10 Delivery Plan that was approved by the Orange County Transportation Authority (OCTA) Board of Directors (Board) in November 2024.

The project improvements include westbound (WB) operational improvements between Acacia Street and La Palma Avenue, WB improvements at State College Boulevard, and reconstruction of the La Palma Avenue overcrossing bridge. The Project will also provide a new bypass ramp that allows northbound (NB) State Route 57 (SR-57) traffic to exit at Orangethorpe Avenue

in advance of the SR-91/NB SR-57 connector merge. The WB SR-91/NB SR-57 connector will be adjusted to accommodate the new bypass ramp. The existing La Palma Avenue overcrossing bridge will be replaced with a new bridge that includes standard vertical clearance, two lanes with shoulders and sidewalks in each direction, and a median shoulder. The plans, specifications, and estimates (PS&E) for the Project are currently being prepared by T.Y. Lin International (TYLI).

Additional project scope has been identified, which requires further effort by TYLI to complete the design on schedule. An amendment to the project design agreement is recommended for the following additional services:

Roadway Design

- The California Department of Transportation (Caltrans) requested to revise the vertical design of the ramps and additional design revisions to eliminate nonstandard features along the State College Boulevard on- and off-ramps.
- Additional design surveys need to be conducted to support additional design and drainage improvements.
- Safety fencing was added on top of a concrete barrier on the top of a retaining wall along NB SR-57 next to the Miraloma Avenue overcrossing. Additional details need to be prepared and additional coordination to obtain approvals is needed.
- The City of Anaheim (City) requested a fire access path near the Casa La Palma complex to meet safety concerns. This area was evaluated and discussed early in the final design phase with the City; however, the City is now requesting for this path to be added to the design based on maps found recently. This request was deemed reasonable and necessary by OCTA and Caltrans. This change will require re-grading the area near the apartment complex, revisions to one of the retaining walls, adding a new retaining wall, drainage evaluations, and revisions to plans and quantities.
- Caltrans updates their standard plans and standard specifications twice a year, and roadway and structure designs need to conform to the new Caltrans standards. Design plans and specifications need to be updated and reviewed by various departments at Caltrans to obtain approval.

Right-of-Way (ROW) Engineering Services

New legal and plat acquisition documents are needed to delineate a ROW acquisition between Caltrans and the City for the new La Palma Avenue overcrossing bridge. Caltrans has requested that the widened bridge be within their ROW.

Reports

- Changes to add the Casa La Palma Apartments fire access path require a new retaining wall, which will require new calculations and changes to the geotechnical report.
- Due to the 2024 standard updates, all foundation reports will need to be reviewed, revised, and re-approved based on the new standards.
- Additional effort will be required to evaluate the approved materials report pavement sections to develop options to address Caltrans' comments.
- Drainage report and storm water data reports need to be updated to reflect the design changes.
- Additional effort is needed to update the supplemental design standard decision document (SDSDD) to document additional design exceptions due to updates from design changes. Caltrans also requested to update the accident data and analysis based on the recently available collision data, which is to be included in the SDSDD.
- Updates to the supplemental historic property survey report are needed to include the design changes.

Environmental Services

A community impact assessment memorandum is required for the Project to analyze the community impacts from a single-stage demolition and construction of the La Palma Avenue bridge.

Caltrans Multi-Asset Project (MAP)

Within the SR-91 corridor, including the segment from Acacia Street to La Palma Avenue, Caltrans has also developed a MAP within the project limits that is funded by the State Highway Operation and Protection Program (SHOPP). Caltrans' MAP scope of work (SOW) includes pavement rehabilitation, existing safety device upgrades, census stations installation, lighting replacement, and conduit replacement. The MAP SOW was combined with the Segment 3 PS&E at 100 percent design, which was then submitted to

Caltrans for review in January 2024. Due to Caltrans' comments, design changes at 100 percent design required additional submittals and additional efforts for TYLI to combine the PS&E package with the Caltrans MAP being prepared by others. The combined efforts would be shared by Caltrans' consultant and TYLI, and this amendment includes only additional efforts required by TYLI. Additional meetings and communication with Caltrans and their consultants are also needed to ensure the combined deliverables will be completed within the project schedule. The Caltrans MAP SOW is funded by Caltrans' SHOPP funding for the construction phase.

Procurement Approach

This procurement was handled in accordance with OCTA's Board-approved procedures for architectural and engineering services, which conform to both state and federal laws. The original firm-fixed price agreement was issued on November 30, 2020, in the amount of $8,709,608, for the preparation of the PS&E. This agreement has been previously amended as shown in Attachment A. It has become necessary to amend the existing agreement to include additional design services.

OCTA staff negotiated the required level of effort with TYLI to provide the additional design services as described above. Staff found TYLI's price proposal, in the amount of $2,232,131, to be fair and reasonable relative to the negotiated level of effort and the independent cost estimate prepared by the OCTA project manager. Proposed Amendment No. 5 to Agreement No. C-0-2073 will increase the total contract value to $13,945,033.

Fiscal Impact

The Project is included in OCTA's Fiscal Year 2024-25 Budget, Capital Programs Division, Account No. 0017-7519-FI104-0U9, and will be funded through the net 91 Express Lanes excess revenues.

Summary

Staff requests Board of Directors' approval to authorize the Chief Executive Officer to negotiate and execute Amendment No. 5 to Agreement No. C-0-2073 between the Orange County Transportation Authority and T.Y. Lin International to increase funding, in the amount of $2,232,131, for additional design services for the State Route 91 Improvement Project between Acacia Street and La Palma Avenue.

Attachment

A. T.Y. Lin International, Agreement No. C-0-2073 Fact Sheet

Prepared by:

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ATTACHMENT A

T.Y. Lin International
Agreement No. C-0-2073 Fact Sheet

1. July 13, 2020, Agreement No. C-0-2073, $8,709,608, approved by the Board of Directors (Board).

    - The agreement was executed on November 30, 2020, for the preparation of plans, specifications, and estimates for the State Route 91 Improvement Project between Acacia Street and La Palma Avenue.

2. February 14, 2022, Amendment No. 1 to Agreement No. C-0-2073, $1,964,639, approved by the Board.

    - Additional design and environmental clearance services for the new Orangethorpe Avenue bypass ramp bridge.
    - Electrical and lighting plans for the La Palma Avenue bridge.
    - Change in key personnel.

3. January 10, 2023, Amendment No. 2 to Agreement No. C-0-2073, $70,007, approved by the Contracts Administration and Materials Management (CAMM) Department.

    - Additional design services for the bypass ramp for the northbound State Route 57.

4. November 13, 2023, Amendment No. 3 to Agreement No. C-0-2073, $968,648, approved by the Board.

    - Additional design services for roadway design, supplemental reports, and additional efforts for combined deliverables that include the California Department of Transportation multi-asset project scope.

5. December 17, 2024, Amendment No. 4 to Agreement No. C-0-2073, $0, approved by the CAMM Department.

    - Change in key personnel.

6. April 14, 2025, Amendment No. 5 to Agreement No. C-0-2073, $2,232,131, pending approval by the Board.

    - Additional design services for roadway design, right-of-way engineering services, reports, and environmental services.

Total funds committed to T.Y. Lin International after approval of Amendment No. 5 to Agreement No. C-0-2073: $13,945,033.

OCTA

April 7, 2025

To: Regional Transportation Planning Committee

From: Darrell E. Johnson, Chief Executive Officer

Subject: Amendments to the Master Plan of Arterial Highways

Overview

The Orange County Transportation Authority administers the Master Plan of Arterial Highways, including the review and approval of amendments requested by local agencies. The cities of Anaheim, Costa Mesa, Irvine, and Stanton have requested amendments to the Master Plan of Arterial Highways that are recommended for approval. In addition, removal of the Garfield-Gisler Santa Ana River crossing is recommended for approval, and support letters have been received from the cities of Costa Mesa, Fountain Valley, and Huntington Beach. A status update is also provided on Master Plan of Arterial Highways coordination activities, including ongoing collaboration with the cities of Costa Mesa and Newport Beach.

Recommendations

A. Approve amending the Master Plan of Arterial Highways to fully remove the Garfield-Gisler Santa Ana River crossing.

B. Direct staff to close out the Memorandum of Understanding C-6-0834 among the cities of Costa Mesa, Fountain Valley, and Huntington Beach, and the Orange County Transportation Authority regarding agency responsibilities for implementing the consensus recommendation for the Garfield-Gisler Bridge Crossing over the Santa Ana River.

C. Approve amending the Master Plan of Arterial Highways to accommodate the following requests:

    1. City of Anaheim: Remove Weir Canyon Road between Blue Sky Road and State Route 241 (not constructed).
    2. City of Costa Mesa: Reclassify Merrimac Way from a primary (four-lane, divided) arterial to a divided collector (two-lane, divided) arterial between Harbor Boulevard and Fairview Road.

3. City of Irvine: Reclassify Yale Avenue from a secondary (four-lane, undivided) arterial to a collector (two-lane undivided) arterial between Michelson Drive and University Drive.
4. City of Stanton: Reclassify Orangewood Avenue from a secondary (four-lane, undivided) arterial to a divided collector (two-lane divided) arterial between Santa Rosalia Street and the eastern city boundary.

The Master Plan of Arterial Highways will be amended to reflect each approved request contingent upon receipt of documentation confirming that all affected general plans are consistent with the proposed amendment and are compliant with the California Environmental Quality Act. Amendment requests will expire if the Orange County Transportation Authority does not receive such documentation within three years of granting approval.

Should the proposed Master Plan of Arterial Highways amendment be modified for any reason after receiving approval, the modified Master Plan of Arterial Highways amendment must be returned to the Orange County Transportation Authority Board of Directors for reconsideration and action.

D. Direct the Executive Director of Planning, or her designee, to file a Notice of Exemption from the California Environmental Quality Act in support of the Master Plan of Arterial Highways amendment.

E. Receive and file a status report of ongoing Master Plan of Arterial Highways coordination activities.

Background

The Master Plan of Arterial Highways (MPAH) coordinates roadway system planning across Orange County jurisdictions. The MPAH was first adopted by the County of Orange in 1956, and the Orange County Transportation Authority (OCTA) assumed administration responsibilities in 1995. These responsibilities include the review and approval of MPAH amendments proposed by local agencies to maintain the integrity and continuity of the MPAH system. This is necessary to assess the potential for transportation-related concerns and ensure interagency collaboration to avoid unintended impacts in neighboring jurisdictions or regional transportation systems.

The following section provides details on the recommendation to remove the Garfield-Gisler Santa Ana River crossing, in collaboration with the cities of Costa Mesa, Fountain Valley, and Huntington Beach. Additional amendment requests from the cities of Anaheim, Costa Mesa, Irvine, and Stanton are discussed as well. Finally, a status report on other ongoing MPAH coordination activities is also provided that includes updates regarding collaborative efforts

with the cities of Costa Mesa and Newport Beach related to the active 19th Street amendment request by the City of Costa Mesa.

Discussion

Garfield-Gisler Bridge Removal

OCTA has been collaborating with the cities of Costa Mesa, Fountain Valley, and Huntington Beach (Cities) regarding the proposed MPAH amendment to remove the Garfield-Gisler bridge (Bridge). For nearly 20 years, the Cities have been jointly working to implement improvements in lieu of the Bridge, as agreed upon in the 2006 memorandum of understanding (MOU). The MOU required that OCTA, in coordination with the Cities, reevaluate the MPAH network performance with the implemented improvements before determining whether to delete the Bridge from the MPAH. Amendment No. 1 to the MOU extended the completion date of the reevaluation to the end of calendar year 2026. The intent of this change was to ensure that the Interstate 405 (I-405) Improvement Project would be completed and opened to traffic prior to conducting the reevaluation.

On March 4, 2025, the Garfield-Gisler Santa Ana River Crossing Technical Review (Attachment A [Technical Review]), prepared by OCTA, was provided to the Cities for their review and concurrence. A peer review of the Technical Review was also conducted by a third-party engineering firm to provide additional assurance to the Cities of OCTA's evaluation methodology and findings. The resulting peer review document prepared by Iteris Inc. (Attachment B) was also shared with the Cities. The 2006 MOU and Amendment No. 1 to the MOU noted above are included in the appendices to the Technical Review.

The Orange County Transportation Analysis Model (OCTAM) 3.1 was used for the original evaluation in 2006 to analyze 2030 MPAH network conditions without the Bridge. The reevaluation in the Technical Review uses OCTAM 5.1 to assess 2050 MPAH network conditions without the Bridge. The results were compared to determine if the network is still expected to perform at least as well as the original evaluation results, despite forecasting an additional 20 years. Below is a summary of the findings from this analysis:

- The forecasted traffic volumes and congestion levels in the study area have either remained stable or improved compared to the 2006 study forecasts.
- All major parallel corridors and key Santa Ana River crossings have experienced stable or improved levels of service, with most roadways showing either a reduction in traffic volumes or roadway capacity increases that accommodate increased volumes.
- The updated OCTAM 5.1 model reflects significant changes since the original study, including demographic shifts, the completion of the

I-405 Improvement Project, and improvements to the region's transportation modeling approach.

- A comparison of the 2025 OCTAM 5.1 forecasts against the 2006 study confirms that the Bridge is not needed to effectively accommodate forecasted traffic demand in the area.
- Given the findings, further in-depth study of the Bridge is not warranted.

Based on these findings, the reevaluation demonstrates that, without the Bridge, the MPAH meets or exceeds expectations set by the original evaluation results, which were the basis of the 2006 MOU. The peer review and reviews by the Cities confirmed that the methodology and findings in the Technical Review are valid. Therefore, due to the infrastructure improvements that have been made since 2006, and in consideration of the support letters received from the Cities (Attachments C, D, and E), staff recommends Board of Directors (Board) approval of the amendment to remove the Bridge from the MPAH.

Additional Amendment Requests

MPAH amendment requests were submitted to OCTA by the cities of Anaheim (Attachment F), Costa Mesa (Attachment G), Irvine (Attachment H), and Stanton (Attachment I). Most of the amendments, which are summarized in the table below, support local active transportation initiatives. Maps for each amendment request are provided in Attachments J, K, L, and M, respectively.

Agency	Current Configuration	MPAH Classification	Requested Classification
1. Weir Canyon Road Extension – between Blue Sky Road and State Route 241			
Anaheim	Not Constructed	Four-Lane, Divided	Removal
2. Merrimac Way – between Harbor Boulevard and Fairview Road			
Costa Mesa	Two-Lane, Divided	Four-Lane, Divided	Two-Lane, Divided
3. Yale Avenue – between Michelson Drive and University Drive			
Irvine	Two-Lane, Undivided	Four-Lane, Divided	Two-Lane, Undivided
4. Orangewood Avenue – between Santa Rosalia Street and eastern city boundary			
Stanton	Four-Lane, Undivided	Four-Lane, Undivided	Two-Lane, Divided

Detailed reviews of these amendment requests are documented in Attachment N. In brief, the performance of the MPAH and OCTA transit service is not expected to be adversely impacted by the requested amendments. They are, therefore, recommended for approval.

California Environmental Quality Act (CEQA)

Amendments to the MPAH are exempt from CEQA review. With direction from the Board, staff will file a Notice of Exemption from CEQA for the proposed MPAH amendment.

MPAH Amendment Status Update

There are currently 21 active amendments proposed for the MPAH (Attachment O). Several of the active amendments are awaiting local action to amend their respective general plans. Others are either under review, in the cooperative study process, or pending resolution of issues with other agencies.

One of the active amendment requests was submitted by the City of Costa Mesa in 2019 to reclassify West 19th Street from a primary arterial to a divided collector. At the time, the City of Newport Beach requested to delay consideration of the City of Costa Mesa's amendment request while updating its General Plan, citing potential traffic demand increases related to the proposed Banning Ranch development. In 2021, OCTA reengaged with the cities of Costa Mesa and Newport Beach, but discussions were complicated and ultimately stalled by the pending sale of Banning Ranch, now known as the Frank and Joan Randall Preserve (Randall Preserve), and other evolving land-use plans. In 2024, the Board directed staff to re-engage the cities of Costa Mesa and Newport Beach. This led to a May 2024 meeting where all parties agreed that OCTA should conduct a traffic study to assess MPAH facilities within the Randall Preserve area including the proposed MPAH amendment to reclassify West 19th Street, after state-mandated housing element updates are completed in February 2025.

OCTA recently executed a consultant contract to support this cooperative traffic study of MPAH facilities in the Randall Preserve area. The study aims to establish consensus on MPAH network needs before moving forward with recommending agreed upon amendments, including the West 19th Street amendment. At the time of preparing this staff report, a meeting with all parties was scheduled for April 4, 2025, to kick off the study and discuss the study's scope, timeline and next steps.

Summary

A consensus has been reached between OCTA and the Cities to remove the Bridge from the MPAH. Additionally, the cities of Anaheim, Costa Mesa, Irvine, and Stanton have requested further amendments to the MPAH. Based on an analysis of the changes requested, the MPAH guidance has been satisfied, and staff recommends Board approval of all the requested amendments. Finally, OCTA is initiating a study in collaboration with the cities of Costa Mesa and Newport Beach to determine MPAH network needs in the Randall Preserve area and to build consensus on a final set of amendments that will include a resolution to the 2019 request from the City of Costa Mesa regarding West 19th Street.

Attachments

A. Garfield-Gisler Santa Ana River Crossing Technical Review
B. FINAL Peer Review – Garfield-Gisler Santa Ana River Crossing Technical Review
C. Letter from Raja Sethuraman, Public Works Director, City of Costa Mesa, to Rose Casey, Executive Director, Planning, Orange County Transportation Authority, dated March 13, 2025, re: Master Plan of Arterial Highways – Concurrence with the Garfield-Gisler Santa Ana Crossing Technical Review
D. Letter from Scott Smith, Public Works Director, City of Fountain Valley, to Rose Casey, Executive Director, Planning, Orange County Transportation Authority, dated March 11, 2025, re: Master Plan of Arterial Highways – Concurrence with the Garfield-Gisler Santa Ana Crossing Technical Review
E. Letter from Chau Vu, Public Works Director, City of Huntington Beach, to Rose Casey, Executive Director, Planning, Orange County Transportation Authority, dated March 17, 2025, re: Master Plan of Arterial Highways – Concurrence with the Garfield-Gisler Santa Ana Crossing Technical Review
F. Request Letter from Rudy Emami, PE, Director of Public Works, City of Anaheim, to Rose Casey, Orange County Transportation Authority, dated February 4, 2025, re: City of Anaheim Master Plan of Arterial Highways Amendment Request – 2025 General Plan Update
G. Request Letter from Raja Sethuraman, Public Works Director, City of Costa Mesa, to Gregory Nord, Section Manager III, Orange County Transportation Authority, dated November 18, 2024, re: Master Plan of Arterial Highways (MPAH) Amendment Request – Merrimac Way, City of Costa Mesa, Focused Traffic Study
H. Request Letter from Sean Crumbly, Director Public Works & Sustainability Department, City of Irvine, to Kia Mortazavi, Executive Director, Planning, Orange County Transportation Authority, dated October 7, 2024, re: Master Plan of Arterial Highways (MPAH) Amendment Request – Yale Avenue between Michelson Drive and University Drive

I. Request Letter from Cesar Rangel, Public Works Director / City Engineer, City of Stanton, to Kia Mortazavi, Executive Director, Planning, Orange County Transportation Authority, dated December 18, 2024, re: Master Plan of Arterial Highways (MPAH) Amendment Request – Orangewood Avenue between Santa Rosalia Street and City Limits
J. City of Anaheim MPAH Amendment Map
K. City of Costa Mesa MPAH Amendment Map
L. City of Irvine MPAH Amendment Map
M. City of Stanton MPAH Amendment Map
N. Master Plan of Arterial Highways Amendment Detailed Discussion
O. Status Report on Pending Master Plan of Arterial Highways Amendments

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Final Report

Garfield-Gisler Santa Ana River Crossing Technical Review

Orange County, California

Prepared by:

Orange County Transportation Authority

550 S Main St, Orange, CA 92868

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BACKGROUND

The Orange County Master Plan of Arterial Highways (MPAH) was first adopted by the County of Orange (County) in 1956, and the Orange County Transportation Authority (OCTA) assumed administration responsibilities in 1995. These responsibilities include the review and approval of MPAH amendments proposed by local agencies to maintain the integrity and continuity of the MPAH system. This sometimes requires OCTA to lead cooperative traffic studies and facilitate discussions between local agencies to develop consensus on the proposal before approving amendments. This is consistent with Policy 1.3 in the Guidance for Administration of the Orange County Master Plan of Arterial Highways (MPAH Guidance), as approved by the OCTA Board of Directors (Board) on August 14, 2017. Policy 1.3 requires a coordinated planning process with affected agencies, which helps to avoid or mitigate potential and/or unintended impacts to communities and facilities in neighboring jurisdictions.

The Santa Ana River Crossings as discussed in this report refer to the roadway bridges over the Santa Ana River between Interstate 405 and Pacific Coast Highway that were planned to facilitate east-west traffic flow. These crossings have a long history dating back to the origins of the MPAH in 1956. At that time, the Garfield-Gisler bridge was identified on the MPAH as one of four Santa Ana River Crossings. Two of the four bridge crossings (Hamilton-Victoria and Adams Street) have been constructed. The other two (19th Street-Banning and Garfield-Gisler) bridges remained unbuilt and faced community opposition due to concerns with the potential for increased traffic in local neighborhoods.

In 1991, Costa Mesa requested that the County (the MPAH administrator at that time) remove the Garfield-Gisler bridge and 19th Street-Banning bridge from the MPAH. In 1993, the County and the cities of Costa Mesa, Huntington Beach, Fountain Valley, and Newport Beach (affected agencies) conducted the first traffic study of the proposed bridge deletions, called the Phase I Santa Ana River Crossing (SARX) Study. The study concluded that deletion of the bridges would require substantial improvements to the surrounding arterial highway system to mitigate the traffic that would be diverted. Consequently, the request to delete the bridges from the MPAH was not approved.

At the urging of neighborhood groups and Costa Mesa, the County led another effort to build consensus on alternatives to the planned bridges. An extensive public outreach effort and a Technical Advisory Group (TAG) consisting of the local agencies and citizens identified seven alternatives for further study. The County was on the verge of conducting a comprehensive environmental impact report (EIR) when the Orange County bankruptcy of 1994 occurred. As a result, the study was postponed while the MPAH was transferred to OCTA in 1995.

By 1998, OCTA initiated development of the Santa Ana River Crossings Study and a program level EIR (PEIR) in cooperation with the affected agencies. This effort engaged staff from the affected agencies through a TAG, as well as elected officials from the affected agencies through a Policy Advisory Committee (PAC). The initial range of alternatives was narrowed to one alternative that called for modifications to both the 19th Street-Banning Avenue and Garfield/Gisler Bridges. The Draft PEIR

was prepared in 2001, and a final version was presented to the Board in 2002. However, it was not certified by the Board and remained as a Draft PEIR due to unresolved differences of opinion amongst the jurisdictions.

In 2003, an item was brought to the Board to approve the Combined Transportation Funding Program projects, which included a project submitted by the City of Fountain Valley to develop preliminary designs and a project-level EIR for the Garfield-Gisler Bridge. A decision on funding this project was deferred multiple times to allow more time for the affected agencies to build consensus. In 2004, staff from OCTA and the cities of Fountain Valley and Costa Mesa agreed to recommending approval of the funding for the project with the condition that the study would be led by OCTA, in cooperation with the cities, and include analysis of an alternative to building the bridge. In August 2004, the Board approved the funding consistent with the agreed upon conditions.

In 2005, OCTA initiated the cooperative study, originally known as the Garfield-Gisler Preliminary Engineering and Supplemental Environmental Impact Report (PE/SEIR). The intent was to provide information that would enable the cities of Costa Mesa, Fountain Valley, and Huntington Beach to reach consensus as to whether the bridge should be deleted from the MPAH. As the study progressed, it was determined that the 2001 Draft PEIR could not be used as the basis for an SEIR. Therefore, the SEIR portion was dropped, and the study was renamed the Garfield-Gisler Area Study. OCTA staff held a series of meetings with the TAG and PAC to discuss options for reaching consensus. Through these meetings, it was agreed that:

1. OCTA would complete the Garfield-Gisler Area Study, in cooperation with the cities of Costa Mesa, Fountain Valley, Huntington Beach, Newport Beach, and the County of Orange.
2. The Garfield-Gisler Area Study would provide conceptual technical data and preliminary cost estimates for the following three alternatives:
    a. Build the Garfield-Gisler Bridge and implement associated roadway improvements
    b. Do not build the Garfield-Gisler Bridge, but implement roadway improvements generally consistent with those identified for the Garfield-Gisler area in the 2001 Draft PEIR
    c. Do not build the Garfield-Gisler Bridge, but implement alternative mitigation strategies such as Smart Street improvements on major arterials in the study area to achieve traffic flow enhancements generally equivalent to those that would be realized by constructing the bridge
3. Upon completion of the Garfield-Gisler Area Study, OCTA and the cities of Costa Mesa, Fountain Valley, and Huntington Beach would explore options to formalize the study's findings.

In 2006, the results of the study were shared with the PAC. The PAC unanimously voted to advance the Smart Street and Bridge Widening Alternative A improvements (consistent with alternative 2.C in the list above), and to amend the MPAH to reclassify the Garfield-Gisler Bridge as "Right-of-Way Reserve". This classification preserves the right-of-way on the MPAH but requires agencies to refrain from including the facility for general plan purposes or traffic analysis. This direction led to the 2006

memorandum of understanding (MOU) that is in place today, which includes the Smart Street and Bridge Widening Alternative A improvements. With the MOU in place, the party agencies have been working to implement the identified improvements consistent with the MOU terms. The signed 2006 MOU is provided in Appendix A.

In 2019, staff from the MOU party agencies met several times to discuss the status of the agreement. All agencies agreed that the MOU should be amended to allow the 405 Improvement Project to be completed and for traffic patterns to settle before making a final determination of the bridge's disposition on the MPAH. The MOU was officially amended in 2020, and the 405 Improvement Project was subsequently completed and opened to traffic on December 1, 2023. Now, in 2025, this Report has been prepared over one year since the opening of the 405 project and is intended to analyze traffic conditions and recommend a final determination of the requested deletion of the Garfield-Gisler Bridge from the MPAH and conclude the long-standing MOU. The executed amendment to the MOU is provided in Attachment B.

OVERVIEW OF 2025 SARX REVIEW

The 2006 Garfield-Gisler SARX study utilized future-year travel forecasts from the Orange County Transportation Analysis Model (OCTAM) version 3.2, which was the latest version of OCTA's travel forecasting model at the time. This review evaluates future-year traffic forecasts from OCTAM 5.1, the current version of OCTAM (as of February 2025), against those used in the original 2006 Garfield-Gisler study. Comparing different OCTAM versions is uncommon, as the numerous and significant model changes which occur over time result in inconsistent comparisons. However, the approach was necessary for this analysis as the goal was to evaluate how travel patterns changed between the different model versions in the vicinity of the Garfield-Gisler Right-of-Way (ROW) reserve. A key indicator guiding this review was that if congestion increased in the current version of the model, then a more detailed analysis of the MPAH status of the Garfield-Gisler Right-of-Way reserve might be warranted. Meanwhile, if congestion hasn't increased, then the conclusions of the 2006 Garfield-Gisler SARX study remain valid and the Garfield-Gisler ROW reserve can be fully removed from the MPAH without the need of another in-depth traffic study.

This study assessed congestion levels along nearby facilities to the Garfield-Gisler ROW reserve using daily Level-of-Service (LOS) measures as defined in OCTA's MPAH Guidance. Special attention was given to facilities that cross the Santa Ana River parallel to the Garfield-Gisler ROW reserve, but all significant facilities in the vicinity were also analyzed to determine the general trend in the area. Figure 1 below shows the study area and the Garfield-Gisler ROW reserve.

Figure 1: Garfield-Gisler ROW Reserve Study Area



MODEL VERSIONS

The current version of OCTA's travel forecasting model, OCTAM version 5.1, uses demographic data from OCP 2022. The base year for OCP 2022 is 2019 and reflects a population of 3.2 million residents. The OCP 2022 forecast projects a future Orange County population of 3.3 million for the year 2050. This latest forecast indicates a significant slowing of growth for Orange County compared with OCP 2004. This change includes the removal of the previously proposed Banning Ranch housing development, which was a significant land-use assumption in OCTAM 3.2, adding approximately 2,000 new residents near the Garfield-Gisler ROW reserve. Since then, the area has been designated an open space preserve, and the current OCTAM 5.1 model assumes no development there. Additionally, OCTAM 5.1 reflects the current built conditions including both the general purpose and express lane additions as constructed on I-405 in 2023, as well as the existing capacity on MacArthur Boulevard bridge over the Santa Ana River.

OCTAM 5.1 incorporates numerous other updates from OCTAM 3.2, including recalibrated parameters to reflect recently observed trends in travel behavior as well as changes to the overall modeling process to reflect the best state-of-the-practice. One example of such a difference is that OCTAM 3.2 was based in the TRANPLAN travel forecasting software while OCTAM 5.1 runs in TransCAD. TRANPLAN is a notably older travel modeling program that runs in the DOS environment and is no longer supported. TransCAD is considered more capable of developing more accurate models due to its superior data integration, advanced traffic assignment, and enhanced calibration, resulting in more reliable transportation analysis. Table 1 highlights the key differences between the different model versions.

Table 1: OCTAM Key Differences

Key Differences	OCTAM 3.2	OCTAM 5.1
Horizon Year	2030	2050
Software Platform	TRANPLAN	TransCAD
Demographics	OCP 2004 projected OC population at 3.6 million by 2030	OCP 2022 projects OC population at 3.3 million by 2050
MPAH Assumptions	Includes 2005 MPAH buildout	Includes 2024 MPAH buildout
I-405 Assumptions	Added two general-purpose lanes	Added two general-purpose lanes and one HOV lane, and converted HOV lanes to tolled Express Lanes

These differences highlight how transportation forecasting has evolved over time, incorporating updated land use projections, infrastructure improvements, and long-term regional mobility needs. The OCTAM 5.1 analysis reflects current conditions more accurately, reinforcing that the removal of the Garfield-Gisler Bridge from the MPAH will not result in significant adverse traffic impacts

FINDINGS

The forecast daily volume and Level of Service (LOS) comparisons between the original (2006) study and current (2025) travel model reveals significant changes in travel demand. Almost all facilities showed decreased forecast volumes, a trend which will be discussed later in the report.

The few locations where forecast traffic volumes increased had additional lanes added since the 2006 study, resulting in greater roadway capacity. For instance, the MacArthur Boulevard bridge over the Santa Ana River, two additional travel lanes were added per the 2006 MOU. The daily volumes on the bridge increased from 30,000 in the 2006 study to 35,000 in the 2025 model, but the additional lanes resulted in the LOS improving from LOS C to LOS B.

The Adams Avenue bridge over the Santa Ana River experienced a reduction in daily volumes from 44,000 to 40,000, maintaining an LOS of C. While congestion on I-405 was not analyzed, the forecasts were reviewed for the sake of completeness and a substantial decrease was observed, from 414,000 to 364,000. Tables 2 and 3 below compare the future LOS and volume forecasts for the key bridges that parallel the Garfield-Gisler ROW reserve.

Table 2: SARX Daily Future MPAH Level of Service Comparison

Roadway	Original (2006) Study	Current Model
MacArthur Blvd	C	B
Adams Ave	C	C

Table 3: SARX Daily Future Volume Comparison

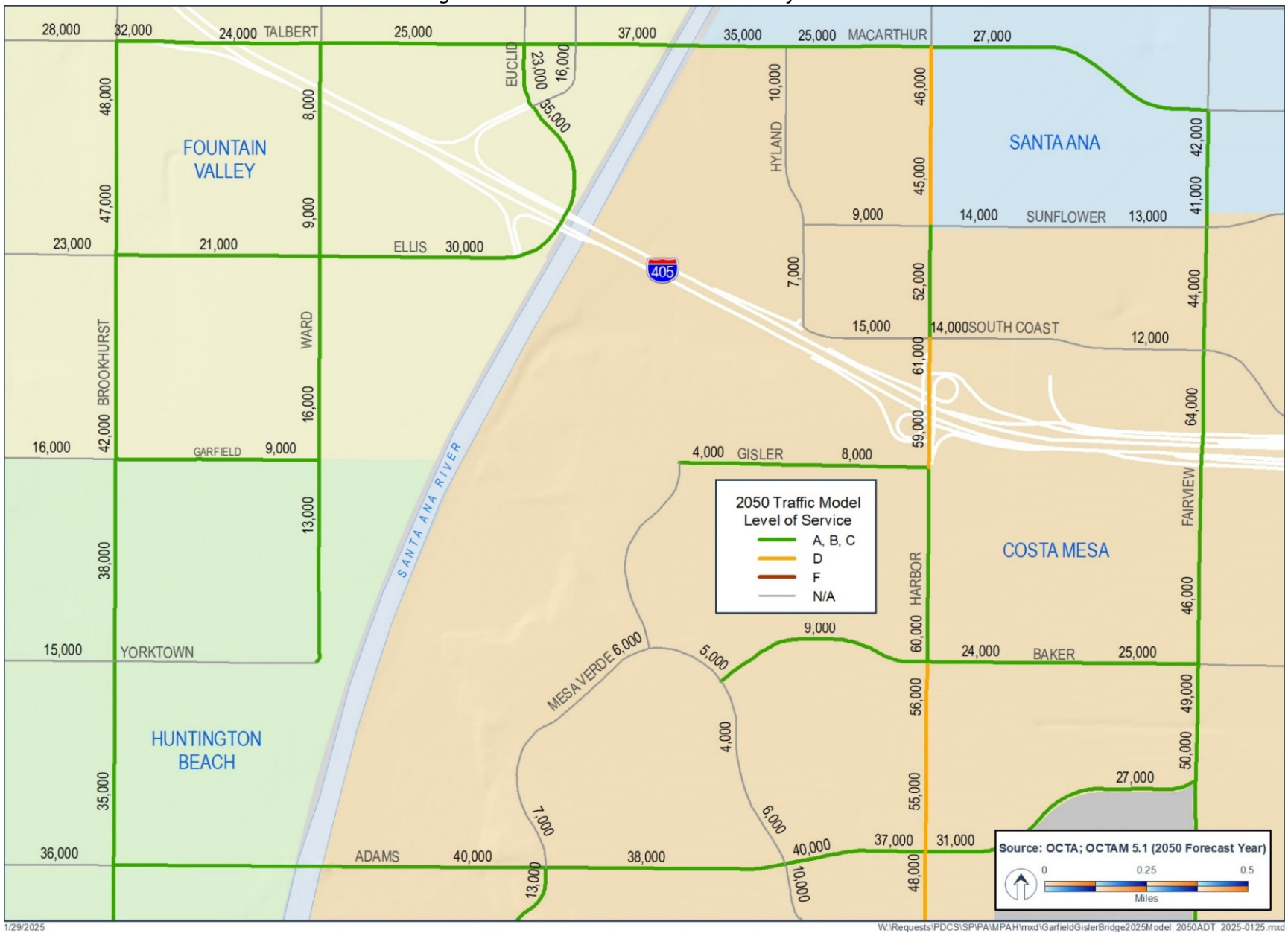
Roadway	Original (2006) Study	Current Model
MacArthur Blvd	30,000	35,000
Adams Ave	44,000	40,000
I-405	414,000	364,000

Across all facilities in the vicinity of the Garfield-Gisler ROW reserve, LOS remained the same or improved, indicating better traffic conditions compared to the results from 2006. A detailed regional comparison below in Table 4 further highlights reduced traffic volumes and/or improved LOS near the proposed Garfield-Gisler bridge. For example, MacArthur Boulevard (Brookhurst to Ward) saw a 1,000-vehicle increase in volume, but additional lanes resulted in an improvement in LOS from B to A. Ellis Avenue (Brookhurst to I-405 SB ramps) experienced a 4,000-vehicle decrease, with LOS improving from E to C. Similarly, all segments of Harbor Boulevard showed reduced volumes and corresponding LOS improvements, reflecting the positive changes on the surrounding roadway network.

Table 4: OCTAM Segment Level Analysis Comparisons: Original Study and Current Model

Roadway	From	To	Original (2006) Traffic Model Forecast			Current (2025) Traffic Model Forecast			ADT Original vs Current Model	Support for Garfield-Gisler Bridge Removal
			Lanes	ADT	LOS	Lanes	ADT	LOS		
MacArthur Boulevard/ Talbert Avenue	Brookhurst St	Ward Street	4	23,000	B	6	24,000	A	1,000	Yes
MacArthur Boulevard/ Talbert Avenue	Ward St	Newhope St	6	27,000	A	6	25,000	A	-2,000	Yes
MacArthur Boulevard/ Talbert Avenue	Newhope St	Mt. Washington St	7	38,000	A	7	37,000	A	-1,000	Yes
MacArthur Boulevard/ Talbert Avenue	Mt. Washington St	Hyland Ave	4	30,000	C	6	35,000	B	5,000	Yes
MacArthur Boulevard/ Talbert Avenue	Hyland Ave	Fairview Rd	6	31,000	A	6	25,000	A	-6,000	Yes
Ellis Avenue	Brookhurst St	I-405 SB ramps	4	34,000	E	4	30,000	C	-4,000	Yes
Euclid Street	I-405 underpass	Talbert Ave	6	37,000	B	6	29,000	A	-8,000	Yes
Garfield Avenue	Brookhurst St	Ward Street	4	10,000	A	4	9,000	A	-1,000	Yes
Gisler Avenue	Country Club Dr	Harbor Blvd	2	15,000	B	2	8,000	A	-7,000	Yes
Baker Street	Mesa Verde Dr	Royal Palm Dr	2	11,500	E	2	9,000	C	-2,500	Yes
Baker Street	Royal Palm Dr	Harbor Blvd	4	15,000	A	4	9,000	A	-6,000	Yes
Baker Street	Harbor Blvd	Fairview Rd	4	26,000	B	4	24,500	B	-1,500	Yes
Adams Avenue	Brookhurst St	Pinecreek Dr	6	44,000	C	6	40,000	C	-4,000	Yes
Adams Avenue	Pinecreek Dr	Fairview Rd	5	29,000	B	5	27,000	A	-2,000	Yes
Brookhurst Street	Adams Ave	Talbert Ave	6	47,000	D	6	43,800	C	-3,200	Yes
Ward Street	Talbert Ave	Garfield Ave	4	16,000	B	4	9,000	A	-7,000	Yes
Harbor Boulevard	Adams Ave	Baker St	7	66,000	F	7	56,000	D	-10,000	Yes
Harbor Boulevard	Baker St	Gisler Ave	8	67,500	D	8	60,000	C	-7,500	Yes
Harbor Boulevard	Gisler Ave	I-405 SB ramps	7	66,000	F	7	59,000	D	-7,000	Yes
Harbor Boulevard	I-405 SB ramps	South Coast Dr	8	61,000	D	8	61,000	D	0	Yes
Harbor Boulevard	South Coast Dr	Sunflower Ave	7	62,000	E	7	52,000	C	-10,000	Yes
Harbor Boulevard	Sunflower Ave	MacArthur Blvd	6	50,000	D	6	46,000	D	-4,000	Yes

Figure 2: OCTAM Current Model Level of Service



DISCUSSION AND CONCLUSIONS

A comparison of the 2025 OCTAM 5.1 forecasts with the original from the 2006 study (OCTAM 3.2) revealed that congestion has either remained the same or improved on all facilities near the Garfield-Gisler ROW reserve. The reduction in congestion is a trend that occurred through much of Orange County and is the result of numerous changes in the underlying data and assumptions between model versions.

An important change to highlight is the downward trend in forecasted population growth, as reflected in the OCP demographic data integrated into newer model versions. OCP 2004 projected Orange County's to reach 3.6 million by 2030, whereas OCP 2022 forecasts a population of 3.3 million by 2050. The slowing population growth in Orange County aligns with a broader trend observed across California. Part of this change in growth includes the removal of the previously proposed Banning Ranch housing development discussed earlier in the report.

Based on the fact that forecast congestion has not increased in the study area reviewed in this analysis, there is no indication of a need for further in-depth study of the MPAH status of the Garfield-Gisler ROW reserve. It is recommended that the facility be fully removed from the MPAH without significant impacts on traffic or congestion in the area.

APPENDIX 1 – 2006 MEMORANDUM OF UNDERSTANDING (MOU)

MEMORANDUM OF UNDERSTANDING C-6-0834

AMONG

CITIES OF COSTA MESA, FOUNTAIN VALLEY AND HUNTINGTON BEACH

AND

THE ORANGE COUNTY TRANSPORTATION AUTHORITY

REGARDING

AGENCY RESPONSIBILITIES FOR IMPLEMENTING THE CONSENSUS RECOMMENDATION

FOR THE

GARFIELD-GISLER BRIDGE CROSSING OVER THE SANTA ANA RIVER

This Memorandum of Understanding (MOU) is entered into among the Orange County Transportation Authority, hereinafter referred to as the OCTA, and the Cities of Fountain Valley, Costa Mesa and Huntington Beach, hereinafter referred to as Cities.

Consistent with the Garfield-Gisler ad-hoc Policy Advisory Committee's consensus recommendation on June 15, 2006, each of the parties to this MOU agrees to support the designation of the Garfield-Gisler Bridge as a "Right-of-Way Reserve[1]" corridor on the Orange County Master Plan of Arterial Highways (MPAH) and, within their respective General Plans/Long Range Plans, implement the Smart Street and Bridge Widening Strategy A (Strategy A) improvements within their jurisdictions and ensure that buildout of the Garfield-Gisler Bridge is not assumed for land use planning or traffic analysis purposes. This MOU describes the specific duties and responsibilities of each party with respect to supporting these actions.

This document establishes obligations on all parties and constitutes an exchange of promises.

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[1] The Right-of-Way Reserve classification allows local jurisdictions considering deletion of a planned MPAH facility to request OCTA to re-designate the adopted facility as a "Right of Way Reserve" corridor for a specific length of time in order to assess the actual need for it. If OCTA agrees to re-designate the subject facility as a "Right-of-Way Reserve" corridor on the MPAH, then all appropriate City General Plan Circulation Elements shall be revised to reflect such re-designation. During the "reserve" period, the right-of-way shall be preserved however, the planned street shall not be considered as mitigation for development planning purposes. At the end of the designated period, a final decision shall be made regarding reinstatement or deletion of the street on the MPAH.

Recital

The parties acknowledge that this MOU requires that certain actions be taken with regard to amending the general plans and capital improvement programs of the parties hereto and that the parties hereto cannot predetermine those actions that are the subject of public hearings. Nevertheless, the parties agree that the benefits of this MOU are dependent on such actions and therefore commit to conducting said hearings within 6 months of the effective date of this agreement. If such action is not taken within said time line, the benefits of this agreement shall not be available to the parties unless all parties consent to an extension or other arrangement.

Section 1. MPAH and General Plan/Long Range Plan Designations

1.1 OCTA Responsibilities

1.1.1 Amend Master Plan of Arterial Highways

After the cities have amended their General Plans, OCTA shall amend the MPAH to re-designate the Garfield-Gisler Bridge, and the eastbound and westbound approaches thereto, as a "Right-of-Way Reserve" corridor. Consistent with the MPAH's original concept for the Garfield-Gisler Bridge, the right-of-way reservation shall be for a secondary arterial highway in Costa Mesa and a primary arterial in Fountain Valley and Huntington Beach.

1.1.2 Amend Orange County Long Range Transportation Plan

After the MPAH has been amended and during the next update to the Orange County Long Range Transportation Plan (LRTP), OCTA shall ensure that the Garfield-Gisler Bridge, and the eastbound and westbound approaches thereto, are reflected as a "Right-of-Way Reserve" corridor in the LRTP.

1.2 Cities' Responsibilities

1.2.1 Amend General Plans

The Cities shall pursue amendment of their General Plan Circulation Elements to reflect that the Garfield- Gisler Bridge and the eastbound and westbound approaches thereto have been designated as a "Right-of-Way Reserve" corridor in the MPAH. Consistent with the MPAH's original concept for the Garfield-Gisler Bridge, the City of Costa Mesa's General Plan shall reserve right-of-way for a secondary

arterial highway within the Garfield-Gisler corridor and the Fountain Valley and Huntington Beach General Plans shall reserve right-of-way for a primary arterial highway within the Garfield-Gisler corridor. Cities shall endeavor to complete the General Plan amendment process within 6 months of final adoption of this MOU.

Section 2. Reasonable Progress Toward Implementing Strategy A Improvements

2.1 OCTA Responsibilities

2.1.1 OCTA Responsibilities for Strategy A Improvements

To ensure reasonable progress toward implementation of Strategy A improvements, OCTA shall:

a. Make funding for implementation of the Strategy A improvements, as defined in the *Circulation Feasibility Study and Cost Estimate for the Garfield-Gisler Crossing Over the Santa Ana River* (LSA, June 2006), available to the Cities through the Combined Transportation Funding Programs (CTFP). A list of the improvements included in Strategy A is provided as Attachment A hereto.

b. Utilize the renewed Measure M Signal Synchronization Program and other CTFP programs as funding sources for implementation of the roadway improvements included in Strategy A.

2.2 Cities' Responsibilities

2.2.1 Cities' Responsibilities for Strategy A Improvements

To ensure reasonable progress toward implementation of Strategy A improvements, the Cities shall:

a. Include Strategy A improvements, as defined in the *Circulation Feasibility Study and Cost Estimate for the Garfield-Gisler Crossing Over the Santa Ana River* (LSA, June 2006), in their Capital Improvement Programs. All projects that emanate from Strategy A shall be considered multi-jurisdictional projects and shall, therefore, be eligible for additional points in OCTA's project prioritization process under the CTFP. A list of the improvements included in Strategy A is provided as Attachment A hereto.

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b. Make applications to OCTA for CTFP funding to implement Strategy A improvements. Such applications shall be supported by local match commitments consistent with the requirements of the CTFP programs from which funds are being requested.

1. Cities agree to make Strategy A projects a priority for available GMA or other interregional funding programs.

c. Implement Strategy A improvements as expeditiously as possible.

1. Cities agree to initiate Smart Street improvements on Harbor, Brookhurst, Adams and Fairview by the end of calendar year 2010. For purposes of this MOU, Smart Street improvements are defined as synchronization of traffic signals, removal of on-street parking and re-striping within existing right-of-way.

2. Cities agree to make reasonable progress on the Capital Projects by 2015, subject to funding availability. "Reasonable progress" shall be defined as inclusion of noted projects in Capital Improvement Programs (CIPs), preparation of preliminary plans, environmental studies, etc. For the purposes of this MOU, Capital Projects are defined as construction of bus turnouts, consolidation of driveways, construction of turn-pockets, street widening or bridge widening.

3. Cities agree that all Strategy A improvements shall be completed by 2020. If the Cities of Costa Mesa and Huntington Beach do not complete their portions of Strategy A improvements by end of calendar year 2020, then the Garfield-Gisler Bridge will automatically be re-instated on the MPAH as a planned facility. If the City of Fountain Valley has not completed the Strategy A improvements in their city, the Garfield-Gisler Bridge will remain designated "Right of Way Reserve" corridor until all improvements are completed.

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Section 3. Land Use and Transportation Planning and Traffic Analysis

3.1 OCTA Responsibilities

3.1.1 OCTA Responsibilities with Respect to Transportation Planning and Traffic Analysis

a. OCTA shall ensure that buildout of the Garfield-Gisler Bridge, and the eastbound and westbound approaches thereto, is not assumed in any of its transportation planning or traffic modeling activities.

b. OCTA shall ensure that implementation of the Strategy A program of projects is assumed in its transportation planning, modeling, and analysis activities.

3.2 Cities' Responsibilities

3.2.1 Land Use Planning

The Cities shall ensure that buildout of the Garfield-Gisler Bridge, and the eastbound and westbound approaches thereto, is not assumed in any of its land use planning activities.

3.2.2 Transportation Planning and Traffic Analysis

The Cities shall ensure that buildout of the Garfield-Gisler Bridge, and the eastbound and westbound approaches thereto, is not assumed in any of its transportation planning, traffic modeling, or traffic analysis activities.

Section 4. Compliance Monitoring and Reporting

4.1 OCTA Responsibilities

4.1.1 OCTA Responsibilities for Monitoring & Reporting City Compliance

a. OCTA shall monitor the Cities' compliance with the provisions of this MOU every two years through the MPAH Certification Review Process to ensure that the Cities are complying fully with the provisions of this agreement and making reasonable progress toward implementation of the Strategy A improvements. Progress reports shall be presented to the OCTA Board of Directors and the Cities every two years, at the conclusion of the review process.

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b. Upon completion of all the Strategy A improvements, and consistent with OCTA guidance for MPAH Right-of-Way Reserve corridors, OCTA in coordination with the cities shall re-evaluate traffic levels of service in the project study area to determine whether to delete, continue the reserve, or re-instate the Garfield-Gisler Bridge onto the MPAH as a planned facility.

4.2 Cities' Responsibilities

4.2.1 Cities Responsibilities for Reporting Compliance

The Cities shall provide progress reports to OCTA every two years through the MPAH Certification Review Process as a means of communicating that the provisions included herein are being implemented fully and expeditiously and that reasonable progress is being made toward implementation of the Strategy A improvements.

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Section 5. Amendment

5.1 Amendment

This MOU may be amended by the written consent of all four parties which are signatories hereto.

Richard Bryan for ATL — 12-02-06

THE ORANGE COUNTY TRANSPORTATION AUTHORITY (Date)

12-4-06

MAYOR, CITY OF COSTA MESA (Date)

12.5.2006

MAYOR, CITY OF FOUNTAIN VALLEY Date)

11-30-06

MAYOR, CITY OF HUNTINGTON BEACH Date)

Introduction

Through its General Plan Circulation Element, each of the cities within the Garfield/Gisler Bridge Crossing Study Area has established traffic level of service (LOS) D or better as representative of acceptable operating conditions on roadways within its jurisdiction. The Garfield/Gisler Study Area currently experiences significant traffic delay at several locations. In addition, the OCTAM model predicts that several intersections in the project study area will operate below LOS D in the Year 2030 if no improvements are made. To help the cities achieve and/or maintain LOS D operations, where feasible, throughout the project study area, Smart Street and Bridge Widening Strategy A includes a list of improvements to offset the traffic impacts associated with projected growth in traffic volumes. That program of projects is presented below.

One of the key concepts included in the "Consensus MOU[2]" is that each of the cities within the Garfield/Gisler Bridge Crossing Study Area will make "reasonable progress" toward implementing the improvements included in Smart Street and Bridge Widening Strategy A. The intent of this concept is that the cities will, individually and collectively, make reasonable efforts to implement the proposed improvement(s) before traffic levels of service fall below the cities' LOS D standard at any of the locations included in the Smart Street and Bridge Widening Strategy A program of projects.

It should be noted that although the Smart Street and Bridge Widening Strategy A program of projects is specific, it is not meant to be prescriptive. If a city is able to identify an alternative traffic flow improvement which meets the overall objective of achieving and/or maintaining LOS D at any location within the study area, then that improvement shall be considered an acceptable alternative and shall be implemented as a substitute solution to the original recommendation.

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[2] *i.e.*, the "Memorandum of Understanding among Cities of Costa Mesa, Fountain Valley and Huntington Beach and the Orange County Transportation Authority Regarding Agency Responsibilities for Implementing the Consensus Recommendation for the Garfield/Gisler Bridge Crossing Over the Santa Ana River", October 27, 2006.

City of Costa Mesa

CM-1 Implement and maintain synchronized traffic signals along Harbor Boulevard between I-405 and Adams Ave.

CM-2 Implement and maintain synchronized traffic signals along Fairview Road between I-405 and Adams Avenue.

CM-3 Implement and maintain synchronized traffic signals along Adams Avenue between the Santa Ana River and Fairview Road; coordinate cross-jurisdictional traffic synchronization with the City of Huntington Beach.

CM-4 Install a bus turnout at the existing bus stop at northbound Harbor Boulevard at Adams Avenue.

CM-5 Install a bus turnout at the existing bus stop at northbound Harbor Boulevard at MacArthur Boulevard.

CM-6 Consolidate driveways on the northbound side of Harbor Boulevard at Adams Avenue.

CM-7 Modify the existing traffic signal at W. Mesa Verde Drive/Adams Avenue to provide a northbound right-turn overlap with the westbound left-turn phase.

CM-8 Maintain the existing northbound and southbound split phase at Hyland Avenue/ MacArthur Boulevard. Re-stripe the northbound approach to provide dual left-turn lanes, one shared left-through lane, and one right-turn lane.

CM-9 Add a fourth through lane in the northbound approach Harbor Boulevard/Gisler Avenue.[3]

CM-10 Add a third northbound left-turn lane at Harbor Boulevard/Adams Avenue, creating triple 200-foot northbound turn lanes with a 120-foot bay taper. Add a southbound right-turn lane for 150 feet with a 90-foot bay taper. Convert the fourth southbound through lane into a shared through-right lane. Add a third eastbound left-turn lane, creating triple 350-foot eastbound left-turn lanes with a 120-foot bay taper.

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CM-11 Modify the existing traffic signal at Fairview Road/Baker Avenue to provide a northbound right-turn overlap with the westbound left-turn phase.

City of Fountain Valley

FV-1 Implement and maintain synchronized traffic signals along Brookhurst Street between Ellis Avenue and Garfield Avenue; coordinate cross-jurisdictional traffic synchronization with the City of Huntington Beach.

FV-2 Under the lead of the County of Orange or the Orange County Transportation Authority and in coordination with the cities of Costa Mesa and Santa Ana, widen the Talbert Avenue/MacArthur Boulevard Bridge over the Santa Ana River from four to six lanes.

FV-3 Remove on-street parking on northbound Brookhurst Street between Ellis Avenue and Garfield Avenue.

FV-4 Modify the existing traffic signal at Ward Street/Talbert Avenue to provide a northbound right-turn overlap with the westbound left-turn phase.

FV-5 Under the lead of Caltrans or the Orange County Transportation Authority, reconstruct the westbound right-turn lane at I-405 Southbound Ramp/Ellis Avenue as a channelized free right-turn lane onto the I-405 southbound on-ramp. Eliminate the eastbound left-turn movements by constructing a dedicated eastbound through lane that becomes a slip on-ramp to southbound I-405.[4]

FV-6 Reconstruct the northbound right-turn lane on Newhope Street as a channelized free right-turn lane from to eastbound Talbert Avenue (or a City-defined alternative which would achieve LOS D or better in the year 2030).

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[3] Improvements to this intersection are already planned and funded.

[4] These improvements will be most effective with associated ramp and mainline improvements as part of a separate effort to improve traffic flow along I-405.

City of Huntington Beach

HB-1 Implement and maintain synchronized traffic signals along Brookhurst Street between Garfield Avenue and Adams Avenue; coordinate cross-jurisdictional traffic synchronization with the City of Fountain Valley.

HB-2 Implement and maintain synchronized traffic signals along Adams Avenue between Brookhurst Street and the Santa Ana River; coordinate cross-jurisdictional traffic synchronization with the City of Costa Mesa.

HB-3 Remove on-street parking on northbound Brookhurst Street between Garfield Avenue and Adams Avenue.

HB-4 Install a bus turnout at the existing bus stop at northbound Brookhurst Street at Adams Avenue.

HB-5 Install a bus turnout at the existing bus stop at southbound Brookhurst Street at Adams Avenue.

HB-6 Consolidate driveways on the northbound and southbound sides of Brookhurst Street at Adams Avenue.

HB-7 Add a fourth through lane in the north, south, east, and westbound approaches at Brookhurst Street/Adams Avenue. Add dedicated right-turn lanes in the north and southbound approaches.

HB-8 Add a second southbound left-turn lane at Bushard Street/Adams Avenue, creating dual 200-foot southbound left-turn lanes with a 120-bay taper.

APPENDIX 2 – 2020 AMENDMENT TO THE 2006 MOU

ATTACHMENT

AMENDMENT NO. 1 TO

MEMORANDUM OF UNDERSTANDING C-6-0834

AMONG

CITIES OF COSTA MESA, FOUNTAIN VALLEY AND HUNTINGTON BEACH

AND

ORANGE COUNTY TRANSPORTATION AUTHORITY

REGARDING

AGENCY RESPONSIBILITIES FOR IMPLEMENTING THE CONSENSUS RECOMMENDATION

FOR THE

GARFIELD-GISLER BRIDGE CROSSING OVER THE SANTA ANA RIVER

THIS AMENDMENT NO. 1 to the Memorandum of Understanding (MOU) is effective this 22nd day of April 2020 (Effective Date), entered into among the Orange County Transportation Authority ("OCTA"), and the cities of Fountain Valley, Costa Mesa and Huntington Beach, ("Cities").

WITNESSETH:

WHEREAS, by MOU C-6-0834 executed on December 12, 2006, OCTA and Cities entered into a contract describing the specific duties and responsibilities of each party with respect to supporting the actions consistent with the Garfield-Gisler ad-hoc Policy Advisory Committee's consensus recommendation on June 15, 2006, and each of the parties to the MOU agreed to support the designation of the Garfield-Gisler Bridge as a "Right-of-Way Reserve" corridor on the Orange County Master Plan of Arterial Highways (MPAH) and, within their respective General Plans/Long Range Plans, implement the Smart Street and Bridge Widening Strategy A (Strategy A) improvements within their jurisdictions and ensure that buildout of the Garfield-Gisler Bridge is not assumed for land use planning or traffic analysis purposes; and

WHEREAS, OCTA and Cities agree to extend the deadline for completion of the Strategy A improvements and to clarify Subsection 4.1.1 relating to OCTA's responsibilities for monitoring and

reporting city compliance;

NOW, THEREFORE, it is mutually understood and agreed by OCTA and Cities that MOU C-6-0834 is hereby amended in the following particulars only:

1. Amend Subsection 2.2.1, Cities' Responsibilities for Strategy A Improvements, page 4 of 11, Item c, Subitem 3, to delete in its entirety and replace with the following:

"3. Cities agree that all Strategy A Improvements shall be completed by 2025 consistent with the approach and goals identified in Attachment A of the MOU. If the cities of Costa Mesa and Huntington Beach do not complete their portions of Strategy A improvements by end of calendar year 2025, then the Garfield-Gisler Bridge will automatically be re-instated on the MPAH as a planned facility. If the City of Fountain Valley has not completed the Strategy A improvements in their city, the Garfield-Gisler Bridge will remain designated "Right of Way Reserve" corridor until all improvements are completed."

2. Amend Subsection, 4.1.1, OCTA Responsibilities for Monitoring & Reporting City Compliance, Item b, line 1, page 6 of 11, to delete "Upon completion of all the Strategy A improvements" and in lieu thereof replace with "By the end of calendar year 2026".

The balance of MOU C-6-0834 remains unchanged.

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IN WITNESS WHEREOF, the parties hereto have caused this Amendment No. 1 to MOU C-6-0834 to be executed as of the date of the last signature below.

Darrell E. Johnson, Chief Executive Officer — 4/21/2020 (Date)

ORANGE COUNTY TRANSPORTATION AUTHORITY

James M. Donich, General Counsel — 4/20/2020 (Date)

ORANGE COUNTY TRANSPORTATION AUTHORITY

Katrina Foley, Mayor — 3/12/20 (Date)

CITY OF COSTA MESA

Cheryl Brothers, Mayor — 2/18/2020 (Date)

CITY OF FOUNTAIN VALLEY

Lyn Semeta, Mayor — 2/3/2020 (Date)

CITY OF HUNTINGTON BEACH

Approved as to form:

Kimberly Hall Barlow
Attorney for Costa Mesa

Colin Burns
Attorney for Fountain Valley

Michael Gates
Attorney for Huntington Beach

PN

GM

APPROVAL RECOMMENDED:

By: _____
Kia Mortazavi
Executive Director, Planning

Dated: 4/20/20

ATTACHMENT B

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

Moffatt & Nichol/Orange County Transportation Authority

Peer Review by:

February 28, 2025

Ted Huynh, P.E., T.E.
Senior Manager

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Exp. 9/30/26

February 28, 2025

Submitted to:

OCTA

25-12782 | Prepared by **Iteris, Inc.**

DOCUMENT VERSION CONTROL

DOCUMENT NAME	SUBMITTAL DATE	VERSION NO.
Draft Memorandum	February 20, 2025	1.0
Draft Memorandum	February 28, 2025	1.1
Final Memorandum	February 28, 2025	2.0

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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

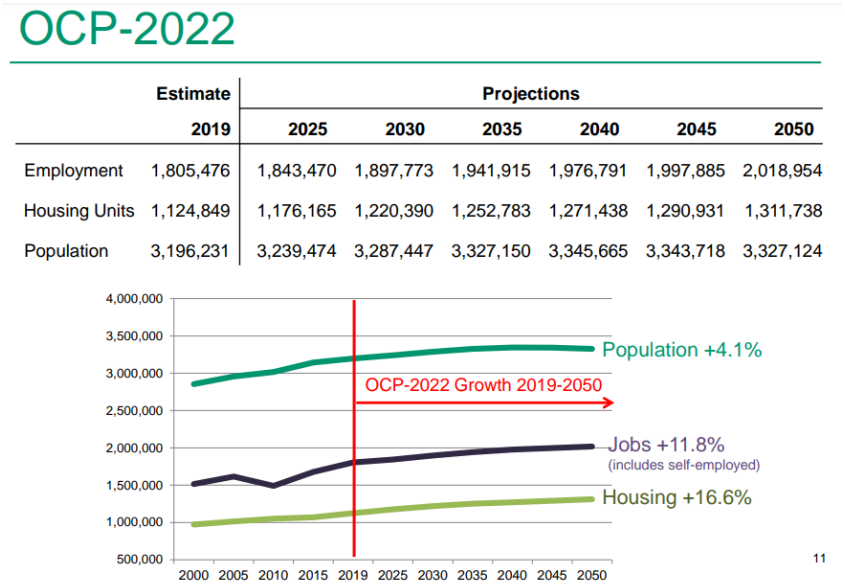


Table 1: OCP Projections and Census Data in Cities around Garfield-Gisler Bridge Study Area

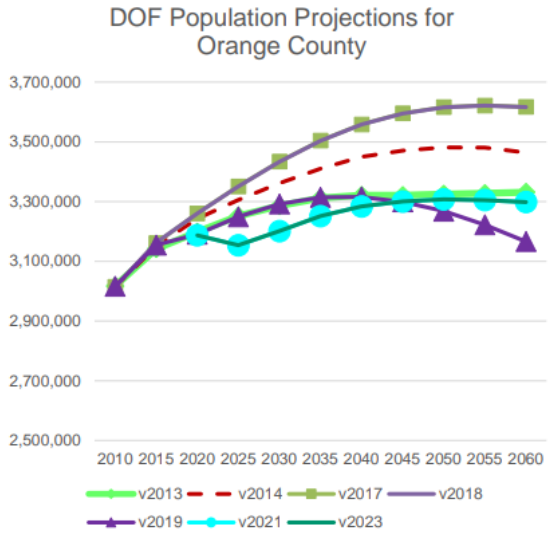
	OCP 2004	OCP 2022	OCP	Census		
City	2030	2050	2050 vs 2030	2020	2024	2024 vs 2020
Huntington Beach	223,992	190,719	**-15%**	198,405	190,037	-4%
Costa Mesa	129,098	129,864	**1%**	111,918	107,211	-4%
Fountain Valley	66,107	66,213	**0%**	57,047	54,966	-4%
Three Cities Combined	**419,197**	**386,796**	**-8%**	**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_guidlines.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

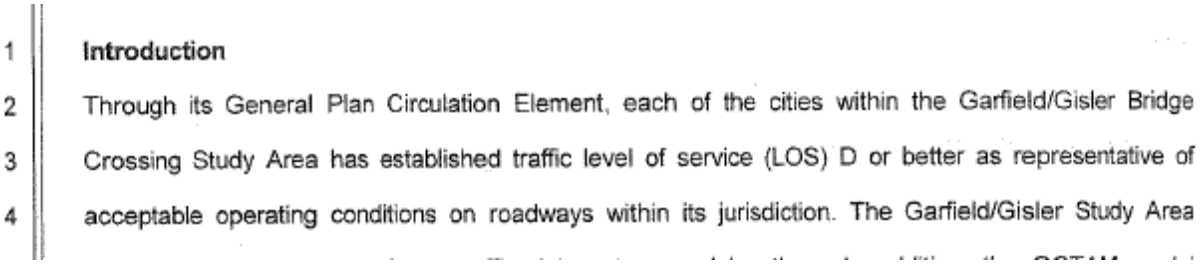
It is noted that four (4) segments are forecast to operate LOS D along Harbor Boulevard in 2050 in OCTAM 5.1:

- #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 by 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.

ATTACHMENT C

CITY OF COSTA MESA

CALIFORNIA 92628-1200 P.O. Box 1200

FROM THE OFFICE OF THE PUBLIC WORKS DIRECTOR

March 13, 2025

Rose Casey, PE
Executive Director, Planning
Orange County Transportation Authority
550 South Main Street
Orange, CA 92868

Subject: **Master Plan of Arterial Highways – Concurrence with the Garfield-Gisler Santa Ana River Crossing Technical Review**

Dear Ms. Casey:

In response to the transmittal dated March 4, 2025, the City of Costa Mesa (City) acknowledges receipt of the Garfield-Gisler Santa Ana River Crossing Technical Review (Technical Review), as prepared by the Orange County Transportation Authority (OCTA) and peer reviewed by Iteris Inc, and which includes the 2006 Memorandum of Understanding (MOU) and Amendment 1 to the MOU signed in 2020.

The Technical Review assesses whether network improvements near the planned Garfield-Gisler bridge—including the implemented Smart Street and Bridge Widening Strategy A (Strategy A) improvements from the MOU—can maintain or enhance the performance forecasted in the 2006 Garfield-Gisler Circulation Feasibility Study. Therefore, the 2006 results, which used the Orange County Transportation Analysis Model (OCTAM) 3.2, were compared with results from the latest model, OCTAM 5.1. Key differences in the model versions include updated demographic forecasts, addition of the 405 Express Lanes, and use of more advanced modeling software.

Based on the Technical Review and coordination with the MOU parties, the City finds that:

1. The methodology used by OCTA was appropriate for this analysis, and the findings and conclusions of the Technical Review are sufficient and do not indicate a need for further analysis.
2. All parties have fulfilled their obligations as specified in the MOU, as amended in 2020, and all necessary Strategy A improvements have been successfully implemented/fulfilled to ensure acceptable traffic operations.
3. The City fully supports amending the Master Plan of Arterial Highways to remove the Garfield-Gisler bridge with no need for any mitigation measures.

If you require any additional information or clarification, please feel free to contact me at (714) 754-5343 or by e-mail at raja.sethuraman@costamesaca.gov.

Sincerely,

Raja Sethuraman

Raja Sethuraman
Public Works Director

ATTACHMENT D

CITY OF FOUNTAIN VALLEY
www.fountainvalley.org
10200 SLATER AVENUE • FOUNTAIN VALLEY, CA 92708-4736 • (714) 593-4400, FAX: (714) 593-4498

March 11, 2025

Rose Casey, PE
Executive Director, Planning
Orange County Transportation Authority
550 South Main Street
Orange, CA 92868

Subject: **Master Plan of Arterial Highways – Concurrence with the Garfield-Gisler Santa Ana River Crossing Technical Review**

Dear Ms. Casey:

In response to the transmittal dated March 4, 2025, the City of Fountain Valley (City) acknowledges receipt of the Garfield-Gisler Santa Ana River Crossing Technical Review (Technical Review), as prepared by the Orange County Transportation Authority (OCTA) and peer reviewed by Iteris Inc. (Ted Huynh, P.E., Senior Manager), and which includes the 2006 Memorandum of Understanding (MOU) and Amendment 1 to the MOU signed in 2020.

The Technical Review assesses whether network improvements near the planned Garfield-Gisler bridge—including the implemented Smart Street and Bridge Widening Strategy A (Strategy A) improvements from the MOU—can maintain or enhance the performance forecasted in the 2006 Garfield-Gisler Circulation Feasibility Study. Therefore, the 2006 results, which used the Orange County Transportation Analysis Model (OCTAM) 3.2, were compared with results from the latest model, OCTAM 5.1. Key differences in the model versions include updated demographic forecasts, addition of the 405 Express Lanes, and use of more advanced modeling software.

Based on the Technical Review and coordination with the MOU parties, the City concurs with Iteris' and OCTA's findings that:

1. The methodology used by OCTA was appropriate for this analysis, and the findings and conclusions of the Technical Review appear sufficient, indicating there is no need for further analysis.
2. All parties have reasonably fulfilled their obligations as specified in the MOU, as amended in 2020, and all necessary Strategy A improvements have been successfully implemented/fulfilled to ensure acceptable traffic operations.
3. The City does not object to amending the Master Plan of Arterial Highways to remove the Garfield-Gisler bridge, denoting there is no need for respective mitigation measures.

If you require any additional information or clarification, please feel free to contact me at (714) 593-4435 or scott.smith@fountainvally.gov.

Sincerely,

Scott Smith P.E., P.L.S., T.E.
Public Works Director

ATTACHMENT E

CITY OF
HUNTINGTON BEACH

Chau Vu | *Director of Public Works*

March 17, 2025

Rose Casey, PE
Executive Director, Planning
Orange County Transportation Authority
550 South Main Street
Orange, CA 92868

Subject: **Master Plan of Arterial Highways – Concurrence with the Garfield-Gisler Santa Ana River Crossing Technical Review**

Dear Ms. Casey:

In response to the transmittal dated March 4, 2025, the City of Huntington Beach (City) acknowledges receipt of the Garfield-Gisler Santa Ana River Crossing Technical Review (Technical Review), as prepared by the Orange County Transportation Authority (OCTA) and peer reviewed by Iteris Inc, and which includes the 2006 Memorandum of Understanding (MOU) and Amendment 1 to the MOU signed in 2020.

The Technical Review assesses whether network improvements near the planned Garfield-Gisler bridge—including the implemented Smart Street and Bridge Widening Strategy A (Strategy A) improvements from the MOU—can maintain or enhance the performance forecasted in the 2006 Garfield-Gisler Circulation Feasibility Study. Therefore, the 2006 results, which used the Orange County Transportation Analysis Model (OCTAM) 3.2, were compared with results from the latest model, OCTAM 5.1. Key differences in the model versions include updated demographic forecasts, addition of the 405 Express Lanes, and use of more advanced modeling software.

Based on the Technical Review and coordination with the MOU parties, the City finds that:

1. The methodology used by OCTA was appropriate for this analysis, and the findings and conclusions of the Technical Review are sufficient and do not indicate a need for further analysis.
2. All parties have fulfilled their obligations as specified in the MOU, as amended in 2020, and all necessary Strategy A improvements have been successfully implemented/fulfilled to ensure acceptable traffic operations.
3. The City fully supports amending the Master Plan of Arterial Highways to remove the Garfield-Gisler bridge with no need for any mitigation measures.

If you require any additional information or clarification, please feel free to contact Bob Stachelski at (714) 536-5523 or bstachelski@surfcity-hb.org.

Sincerely,

FOR Chau Vu
Director of Public Works

ATTACHMENT F

City of Anaheim
DEPARTMENT OF PUBLIC WORKS

February 4, 2025

Ms. Rose Casey
Orange County Transportation Authority
550 S. Main Street
Orange, CA 92868

RE: City of Anaheim Master Plan of Arterial Highways Amendment Request – 2025 General Plan Update

Dear Ms. Casey:

The City of Anaheim (City) would like to request initiation of the Orange County Transportation Authority's (OCTA) Master Plan of Arterial Highways (MPAH) amendment process to implement proposed Circulation Element changes which have been identified as part of the City's 2025 General Plan Update.

More specifically, the City would like to request OCTA's approval of the following proposed MPAH change.

- Remove the Weir Canyon Extension (from Blue Sky Road to State Route 241).

Based upon the attached traffic modeling results, which were developed for the 2025 General Plan Update, these proposed MPAH modification will not result in negative impacts to the MPAH system or the City's Circulation network.

Therefore, the City would like to respectfully request that OCTA initiate the MPAH amendment process for this change. Thank you for your assistance with this matter. We look forward to working with OCTA on processing this important MPAH change in support of the City's General Plan Update efforts.

Should you have any questions regarding this MPAH amendment request, please feel free to contact Rafael Cobian, City Traffic Engineer, at (714) 765-4991.

Sincerely,

Rudy Emami, P.E.
Director of Public Works

c. Rafael Cobian, City Traffic Engineer

Attachment

200 S. Anaheim Blvd., Suite 276
Anaheim, CA 92805

TEL (714) 765-5176
FAX (714) 765-5225

www.anaheim.net

Intersection		Existing (2021)		2004 GP		CE Update	
		V/C	LOS	V/C	LOS	V/C	LOS
209	Lakeview Ave / SR-91 EB Off Ramp	0.390	A	0.58	A	0.477	A
210	Meats Ave / Nohl Ranch Rd	0.305	A	0.29	A	0.463	A
211	Kellogg Dr / Orangethorpe Ave (E)	0.519	A	0.58	A	0.445	A
212	Kellogg Dr / Orangethorpe Ave (W)	0.371	A	0.67	B	0.385	A
213	Kellogg Dr / La Palma Ave	0.364	A	0.50	A	0.349	A
214	Royal Oak Rd/Pinney Dr / Santa Ana Canyon Rd	0.562	A	0.60	A	0.429	A
215	Royal Oak Rd / Nohl Ranch Rd	0.311	A	0.36	A	0.358	A
216	Wescom Center / La Palma Ave	0.348	A	0.37	A	0.393	A
217	Cinema City / La Palma Ave	0.493	A	0.57	A	0.593	A
218	Avd Margarita / Santa Ana Canyon Rd	0.434	A	0.63	B	0.409	A
219	SR-90 Connector / Orangethorpe Ave	0.402	A	0.94	E	0.347	A
220	Imperial Hwy / La Palma Ave	0.747	C	0.95	E	0.929	E
221	Imperial Hwy / SR-91 WB Ramps	0.572	A	0.72	C	0.559	A
222	Imperial Hwy / SR-91 EB Ramps	0.637	B	0.76	C	0.625	B
223	Imperial Hwy / Santa Ana Canyon Rd	0.745	C	1.01	F	0.707	C
224	Imperial Hwy / Ave Bernardo N	0.491	A	0.49	A	0.460	A
225	Imperial Hwy / Nohl Ranch Rd	0.627	B	0.95	E	0.694	B
226	Imperial Hwy / Big Sky Ln/River Valley Trail	0.406	A	0.49	A	0.375	A
227	Chrisden St / La Palma Ave	0.559	A	0.54	A	0.580	A
228	Via Cortez / Santa Ana Canyon Rd	0.681	B	0.67	B	0.653	B
229	Fairmont Blvd / La Palma Ave	0.494	A	0.58	A	0.383	A
230	Anaheim Hills Rd / Santa Ana Canyon Rd	0.779	C	0.76	C	0.764	C
231	Anaheim Hills Rd / Nohl Ranch Rd	0.452	A	0.66	B	0.473	A
232	Canyon Rim Rd / Nohl Ranch Rd	0.480	A	0.56	A	0.554	A
233	Fairmont Blvd / Santa Ana Canyon Rd	0.636	B	0.57	A	0.620	B
234	Mohler Dr / Santa Ana Canyon Rd	0.635	B	0.51	A	0.591	A
235	Festival Dr / Santa Ana Canyon Rd	0.365	A	0.43	A	0.349	A
236	Roosevelt Rd / Santa Ana Canyon Rd	0.532	A	0.53	A	0.466	A
237	Yorba Linda Blvd / La Palma Ave	0.725	C	0.84	D	0.709	C
238	Weir Canyon Rd / SR-91 WB Ramps	0.618	B	0.78	C	0.595	A
239	Weir Canyon Rd / SR-91 EB Ramps	0.496	A	0.92	E	0.483	A
240	Weir Canyon Rd / Santa Ana Canyon Rd	0.686	B	0.96	E	0.633	B
241	Weir Canyon Rd / Monte Vista Rd	0.502	A	0.75	C	0.509	A
242	Weir Canyon Rd / Serrano Ave	0.631	B	0.73	C	0.666	B
243	Weir Canyon Rd / Oak Canyon Dr	0.125	A	0.36	A	0.126	A
244	Serrano Ave / Oak Canyon Dr	0.411	A	0.58	A	0.414	A
245	Serrano Ave / Canyon Rim Rd	0.437	A	0.45	A	0.485	A
246	Serrano Ave / Nohl Ranch Rd	0.437	A	0.33	A	0.504	A
247	Placentia Ave / Orangethorpe Ave	0.474	A	0.66	B	0.575	A
248	Anaheim Shores Dr / Fairview St / La Palma Ave	0.549	A	0.50	A	0.517	A
249	Loara St / Ball Rd	0.555	A	0.33	A	0.489	A
250	9th St / Katella Ave	0.530	A	0.39	A	0.665	B

ATTACHMENT G

CITY OF COSTA MESA

CALIFORNIA 92628-1200 P. O. BOX 1200

FROM THE OFFICE OF THE DIRECTOR, DEPARTMENT OF PUBLIC SERVICES

November 18, 2024

Gregory Nord
Section Manager III
Orange County Transportation Authority
550 S Main St.
Orange, CA 92863

RE: MASTER PLAN OF ARTERIAL HIGHWAYS (MPAH) AMENDMENT REQUEST – MERRIMAC WAY, CITY OF COSTA MESA, FOCUSED TRAFFIC STUDY

Dear Mr. Nord:

On February 1, 2024, the City submitted a traffic monitoring report for Merrimac Way pursuant to your letter dated December 6, 2023. Per the original letter agreement with OCTA dated February 2020, the City is responsible for monitoring and evaluating traffic conditions on Merrimac Way every three years until the MPAH is amended to reflect the configuration of a two lane, divided facility with Class II and Class IV bicycle lanes. This letter serves as the City's official request for an MPAH Amendment for Merrimac Way within the City of Costa Mesa to change its Primary Collector classification.

Per the MPAH guidelines, a traffic study was prepared for Merrimac Way. The traffic study is attached as **Appendix A** and was prepared using new traffic counts taken in February 2024 to account for school traffic. The study shows that Merrimac Way is anticipated to operate at an acceptable level of service for both current year 2024 and future year 2050. If OCTA concurs and the amendment is approved, the City will adjust the classification of Merrimac Way during the next update of the City's General Plan Circulation Element.

If you have any questions or require further clarification, please contact me at (714) 754-5343.

Respectfully,

Raja Sethuraman
Public Works Director

c Ramin Nikoui, Senior Engineer
Brett Atencio Thomas, Active Transportation Coordinator
Ivy Hang, Senior Transportation Analyst, OCTA

Appendix A: Focused Traffic Study, Merrimac Way Master Plan Arterial Highway Amendment

Focused Traffic Study

Merrimac Way
Master Plan Arterial Highway Amendment

Submitted to

City of Costa Mesa
77 Fair Drive, Costa Mesa City Hall, CA 92626

November 4, 2024

Submitted by

AGA Engineers, Inc.
211 Imperial Highway, Suite 208
Fullerton, CA 92835
(714) 992-4592
aga@agaengineersinc.com

November 4, 2024

Ramin Nikoui
Senior Engineer – Transportation Service Division
City of Costa Mesa
77 Fair Drive
Costa Mesa, CA 92626

RE: Proposed Amendment to OCTA MPAH – Merrimac Way

Dear Nikoui,

Pursuant to City of Costa Mesa's request, AGA Engineers has conducted a focused traffic study to evaluate potential traffic impacts along Merrimac Way resulting from the proposed amendment to the Orange County Master Plan of Arterial Highways (MPAH) to reduce the number of lanes. Between Harbor Boulevard and Fairview Road, Merrimac Way has been reduced from four lanes with a raised median to two lanes with a raised median and Class II and Class IV bike lanes.

This traffic analysis is to assess the reduction of lanes on Merrimac way and if it will have a significant impact on the traffic conditions.

Should you have any questions regarding this study, please do not hesitate to contact Greg Wong or Vannessa Pedroza at (714) 992-4592.

Respectfully submitted,

AGA ENGINEERS, INC.



Greg Wong, P.E.
Vice President

Vannessa Pedroza
Associate Transportation Engineer

AGA Engineers, Inc.
211 Imperial Highway, Suite 208, Fullerton, CA 92835
(714) 992-4592 Email: aga@agaengineersinc.com

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A Year 2024 Average Daily Traffic
B Year 2024 Turning Movement Counts
C Year 2024 Intersection Capacity Utilization (ICU) Analysis
D OCTAM Model Data
E Year 2050 Intersection Capacity Utilization (ICU) Analysis

Project Objective and Purpose

The purpose of this study is to evaluate the proposed change in roadway classification of Merrimac Way between Harbor Boulevard and Fairview Road from a Four-Lane Primary Arterial to a Two-Lane Collector Arterial, and to determine any impacts due to the proposed modification. The City of Costa Mesa will be requesting the Master Plan of Arterial Highway (MPAH) Amendment with the Orange County Transportation Authority (OCTA) for the proposed modification.

Project Study Area

Typically, an MPAH Amendment is conducted prior to the change of a roadway to determine if there would be any impacts from the proposed change. For the purposes of this MPAH report, it was assumed that the proposed change has not taken place. Therefore, the "current configuration" was evaluated as the Four-Lane configuration, and the "proposed configuration" was evaluated as the Two-Lane configuration.

Merrimac Way is a Four-Lane Arterial between Harbor Boulevard and Fairview Road with a raised median, located south of Orange Coast College, and is classified as a Primary Arterial. With the proposed lane modifications, the arterial is proposed to be classified as a Two-Lane Divided Collector Arterial with Class II and Class IV bike lanes. The study segment on Merrimac Way between Harbor Boulevard and Fairview Road were analyzed. A total of two intersections were analyzed in this study area, Harbor Boulevard/Merrimac Way and Fairview Road/Merrimac Way, both of which are signalized intersections controlled by the City of Costa Mesa. A project vicinity map is shown on **Figure 1A** and the study area is identified on **Figure 1B** and listed below. While lane modifications are to be applied on Merrimac Way, the curb-to-curb street width will remain unchanged. At the intersection of Harbor Boulevard/Merrimac Way, the lane configuration changes for the westbound approach, from having the middle lane as a shared through/right turn lane to a through only lane. There are no proposed changes to the intersection of Fairview Road/ Merrimac Way.

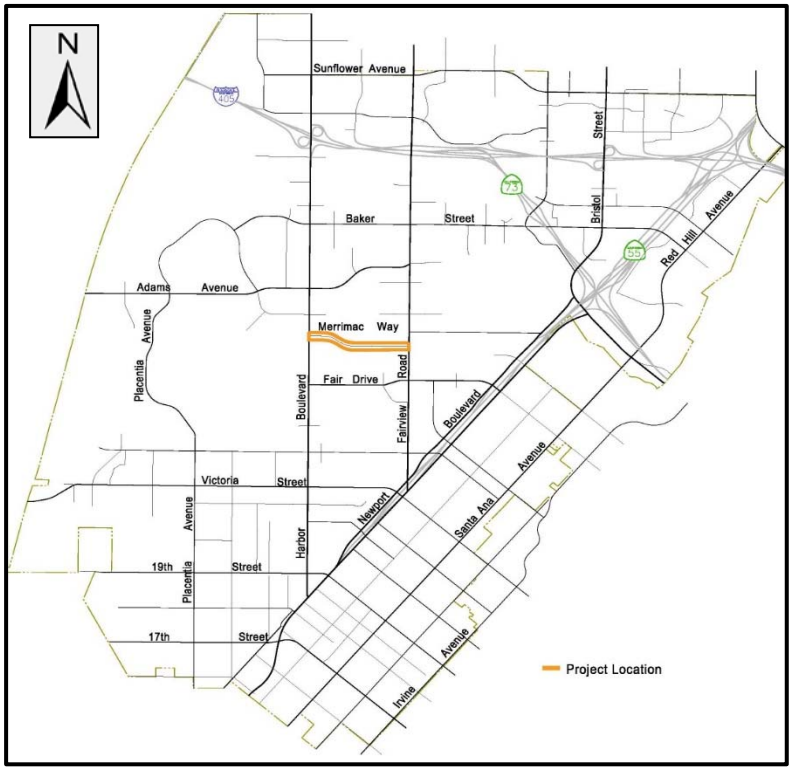


Figure 1A. Vicinity Map

Study Arterial

- Merrimac Way: Harbor Boulevard – Fairview Road

Study Intersections

- Harbor Boulevard/Merrimac Way
- Fairview Road/Merrimac Way

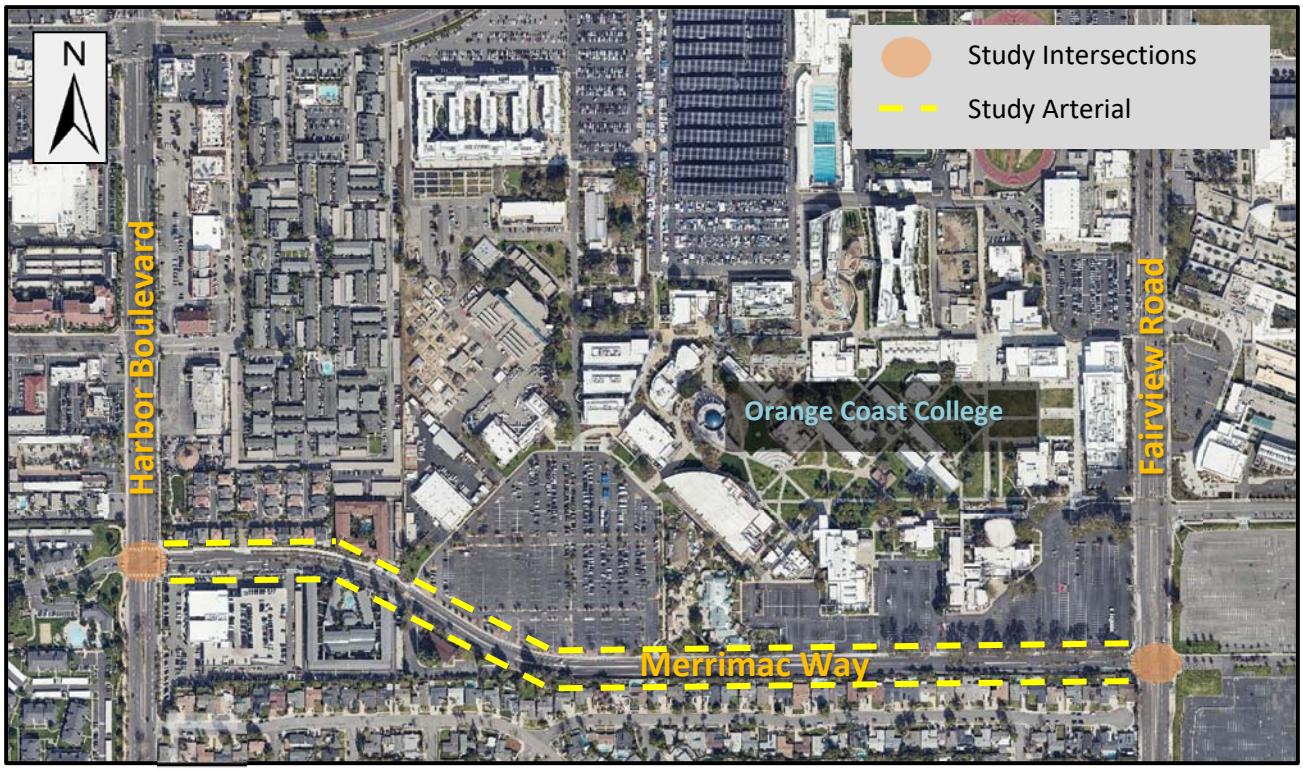


Figure 1B. Study Area

Level of Service (LOS) Analysis and Methodology

Arterial LOS Analysis

For arterial Level of Service (LOS) analysis, OCTA utilizes LOS C for acceptable LOS. For the current configuration of the Four-Lane divided Primary Arterial, the arterial capacity for LOS C is 30,000 (vpd). For the proposed configuration of the Two-Lane Divided Collector Arterial, the arterial capacity for LOS C is 15,000 (vpd). If the existing or future traffic volumes on Merrimac Way exceed LOS C capacity for the proposed configuration, then the current configuration of four lanes divided roadway should

remain on Merrimac Way. The Arterial Highway Master Plan of Arterial Highways (MPAH) capacity values are shown below on **Table 1.**

Table 1. Arterial Highway MPAH Capacity Values

Configuration	Type of Arterial	Level of Service				
		A	B	C	D	E
Current	Four-lane divided	22,500	26,300	30,000	33,800	37,500
Proposed	Two-lane divided	9,000	12,000	15,000	20,000	22,000

Intersection LOS Analysis

The intersection LOS analysis for the two study intersections was determined using the Intersection Capacity Utilization (ICU) Methodology per the Orange County Transportation Authority Congestion Management Program (OCTA CMP) guidelines. The ICU methodology is a simple demand-over-capacity assessment of key intersection movements. This methodology assigns LOS rankings from LOS A to LOS F based on the ratio of vehicles utilizing the intersection to the overall intersection capacity, which is also known as the volume-to-capacity (V/C) ratio (see **Table 2**). The saturation flow rate, or lane capacity, is 1700 vehicles per hour per lane and used for the left, through and right turn lanes. This rate was derived from historical research performed on intersections in Orange County, during peak periods.

Table 2. Level-of-Service by Capacity

Volume/Capacity Ratio (V/C)	LOS
0.00 to 0.60	A
0.61 to 0.70	B
0.71 to 0.80	C
0.81 to 0.90	D
0.91 to 1.00	E
Greater than 1.00	F

Intersection Significant Impact Criteria

Per the OCTA guidelines, traffic impacts for a given intersection are identified as significant if the proposed project results in a downgrade of LOS from an acceptable LOS D (or better) to LOS E/F, or a downgrade from LOS E "without project" to LOS F "with project". Additionally, for an intersection that already operates at LOS E/F "without project", a change in ICU value of 0.01 or more will result in a significant impact for that intersection.

Study Scenarios

LOS analyses were conducted for the following Project Year 2024 and Project Year 2050 scenarios for both the arterial LOS and intersection LOS as shown below:

- Year 2024
  - Current Configuration – Four-Lane, Divided Primary Arterial
  - Proposed Configuration – Two-Lane, Divided Collector Arterial
- Year 2050
  - Current Configuration – Four-Lane, Divided Primary Arterial
  - Proposed Configuration – Two-Lane, Divided Collector Arterial

Lane configurations for Harbor Boulevard and Fairview Road are shown on **Figures 2A** and **2B** for existing conditions and **Figures 3A** and **3B** for proposed conditions.

Year 2024 LOS Analysis

Arterial LOS Analysis

Weekday 24-hour traffic counts were taken in order to assess the LOS for Merrimac Way for both configurations. The traffic counts were taken on Merrimac Way on Thursday February 15, 2024 between Harbor Boulevard and Fairview Road and showed a total of 6,514 vehicles per day (see **Table 3**), which is well under the arterial LOS C capacity. The analysis show that Merrimac Way operates at a LOS A for both a Four-Lane Divided Primary Arterial and a Two-Lane Divided Collector Arterial. Detailed 24-hour traffic counts are included in **Attachments A**.

Table 3. Average Daily Traffic on Merrimac Way for Year 2024

Year	ADT for Merrimac Way (vpd)	MPAH Arterial LOS A Capacity (vpd)		LOS for Merrimac Way
		Current Configuration for Primary Divided Arterial (four-lanes)	Proposed Configuration for Divided Collector Arterial (two-lanes)	
2024	6,514	22,500	9,000	A

Intersection LOS Analysis

Lane configurations for Harbor Boulevard at Merrimac Way and Fairview Road at Merrimac Way are shown on **Figures 2A** and **2B** for existing conditions and **Figures 3A** and **3B** for proposed conditions.

The lane configuration change for Harbor Boulevard/Merrimac Way from existing to proposed is only for the westbound approach, where the shared through and right turn lane will be striped as a through lane only. The lane configuration change for Fairview Road/Merrimac Way from existing to proposed is only for the eastbound approach, where a bike lane is implemented.

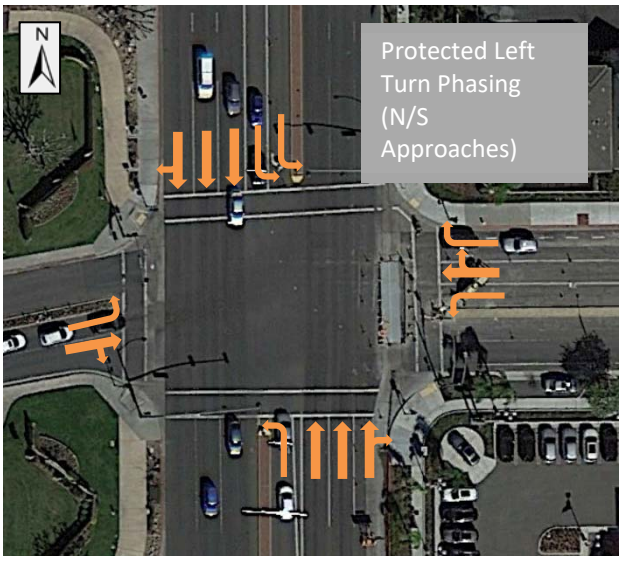


Figure 2A. Existing Lane Configuration on Harbor Boulevard/Merrimac Way

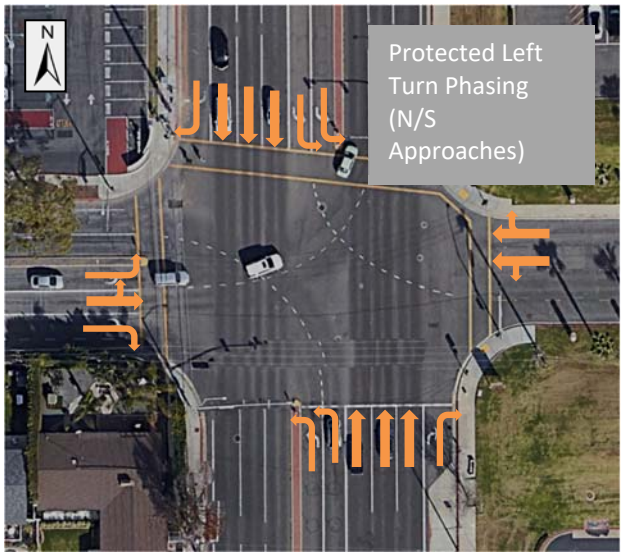


Figure 2B. Existing Lane Configuration on Fairview Road/Merrimac Way

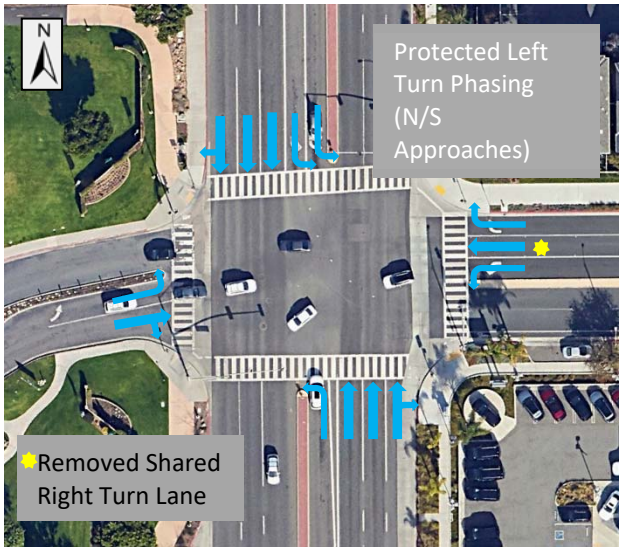


Figure 3A. Proposed Lane Configuration on Harbor Boulevard/Merrimac Way

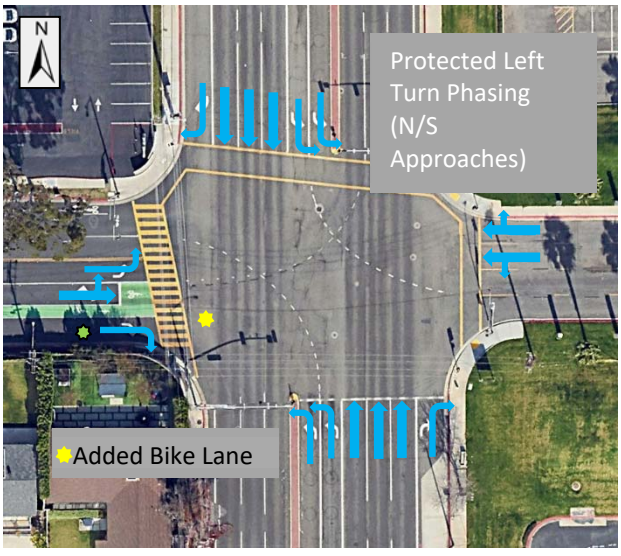


Figure 3B. Proposed Lane Configuration on Fairview Road/Merrimac Way

For the intersection LOS analysis, peak period turning movement counts were taken on Thursday February 15, 2024. The AM and PM peak hour traffic volumes are shown in **Figures 4A and 4B**, respectively. Detailed peak hour turning movement counts are included in **Attachment B.** For low vehicle volumes a minimum of 10 vehicles per hour was used.

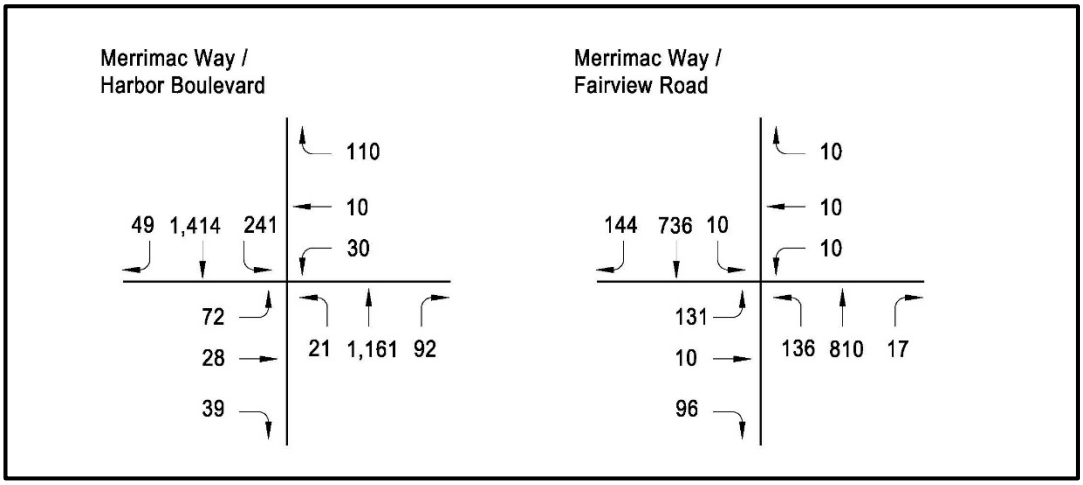


Figure 4A. Year 2024 AM Peak Hour Turning Movement Counts

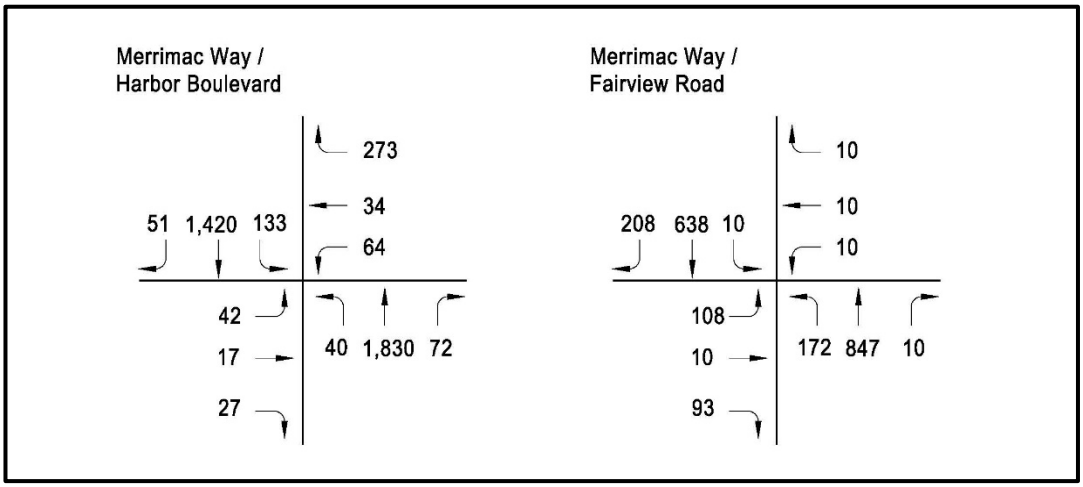


Figure 4B. Year 2024 PM Peak Hour Turning Movement Counts

For this Current Configuration scenario, Fairview Road/Merrimac Way operates at a LOS A for both peak hours, while Harbor Boulevard/Merrimac Way operates at LOS A for both peak hours as well. For Proposed Configuration scenario, the LOS remained the same as the current configuration for

both intersections. Intersection LOS analysis for the current configuration and proposed configuration scenarios are summarized in **Table 4.** The intersection LOS analysis ICU worksheets are provided in **Attachment C**.

Table 4. Intersection Level of Service Analysis for Year 2024

	No.	Location	Year 2024			
			AM Peak Hour		PM Peak Hour	
			ICU	LOS	ICU	LOS
Current Configuration	1	Merrimac Way/Harbor Boulevard	0.42	A	0.56	A
	2	Merrimac Way/Fairview Road	0.29	A	0.28	A
Proposed Configuration	1	Merrimac Way/Harbor Boulevard	0.42	A	0.61	B
	2	Merrimac Way/Fairview Road	0.29	A	0.28	A

Year 2050 LOS Analysis

Data from the Orange County Transportation Analysis Model (OCTAM) was utilized to determine the projected future growth rate from Base Year 2019 to Future Year 2050. Based on the data (see **Attachment D**), there was no significant increase except for northbound approach in the AM peak hour and the southbound approach in the PM peak hour for Harbor Boulevard, with a growth of 32% and 14%, respectively. All other movements had a 5% growth or less. Therefore, the projected growth provided by OCTAM was used only for the AM northbound approach and PM southbound approach, at Harbor Boulevard. In order to account for other ambient growth in the study area and for a conservative analysis, a 10% increase was used for all other approaches. For the northbound approach at Harbor Boulevard, during the AM peak hour, extrapolating the growth of 32% from Year 2019 to Year 2050 equates to approximately 1% growth, per year. Therefore, from Year 2024 to Year 2050, the northbound approach is expected to have a growth rate total of 26%. For the southbound approach at Harbor Boulevard, during the PM peak hour, extrapolating the growth of 14% from Year 2019 to Year 2050 equates to approximately 0.5% growth per year. Therefore, from Year 2024 to Year 2050, the southbound approach is expected to have a growth rate total of 13%. The growth rates are summarized below.

- OCTAM Year 2019 – Year 2050, Weekday AM Peak Period Growth
    - Harbor Boulevard, Northbound – 32% growth, Equates to approximately 1% per year
        - Year 2024 to Year 2050 = 26% total growth
- OCTAM Year 2019 – Year 2050, Weekday PM Peak Period Growth

- Harbor Boulevard, Southbound – 14% growth, Equates to approximately 0.5% per year
  - Year 2024 to Year 2050 = 13% total growth
- All other movements, 10% total growth

Arterial LOS Analysis

Year 2050 traffic reflects the 2024 traffic volumes plus a projected growth rate for the daily traffic. The projected 10% growth was applied to the 2024 daily traffic volumes on Merrimac Way to develop Year 2050 traffic volumes. The traffic volumes increased to 7,166 vehicles per day for the Year 2050 using the 10% growth as shown in **Table 5.** Based on the projected 2050 traffic volumes on Merrimac Way, the arterial is expected to continue to operate at LOS A under both the Four-Lane Divided Primary Arterial and the Two-Lane Divided Collector Arterial scenarios.

Table 5. Average Daily Traffic on Merrimac Way for Year 2050

Count Year	10% Growth ADT for Merrimac Way (vpd)	MPAH Arterial LOS A Capacity (vpd)		LOS for Merrimac Way
		Current Configuration for Primary Divided Arterial (four-lanes)	Proposed Configuration for Divided Collector Arterial (two-lanes)	
2024	7,166	22,500	9,000	A

Intersection LOS Analysis

The growth rates were applied to the 2024 turning movement counts to develop the 2050 intersection traffic volumes. The 10% growth rate was applied to all movements except for the AM northbound and PM southbound at Harbor Boulevard. These movements were increased by 26% for the AM peak hour and 13% for the PM peak hour. Year 2050 for AM and PM peak hour turning movement traffic volumes are shown in **Figures 5A and 5B,** respectively.

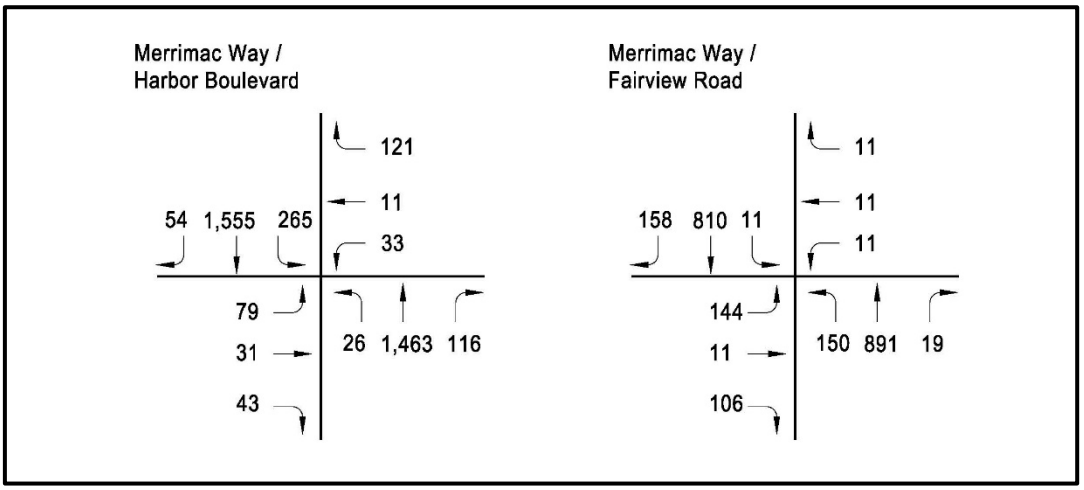


Figure 5A: Year 2050 AM Peak Hour Turning Movement Counts

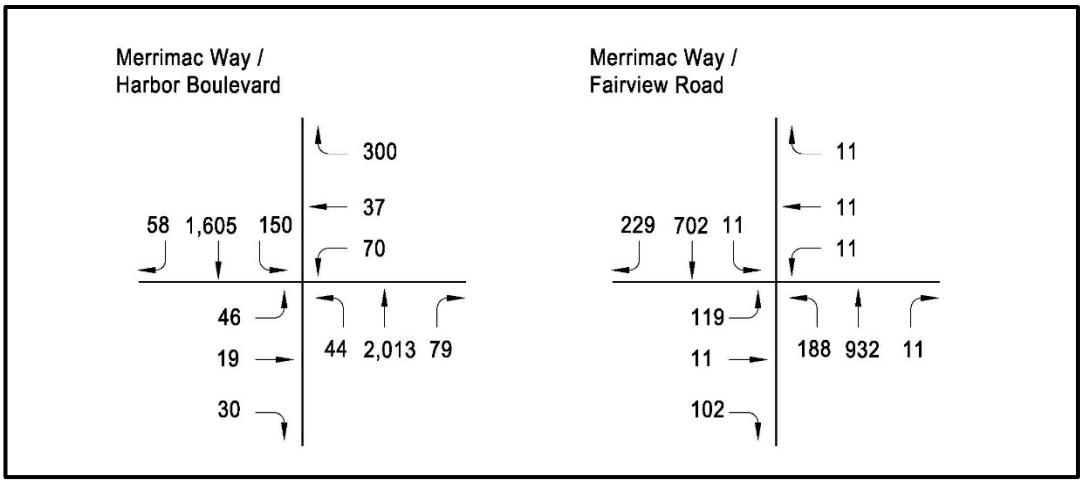


Figure 5B: Year 2050 PM Peak Hour Turning Movement Counts

For the Current Configuration scenario, Harbor Boulevard/Merrimac Way intersection is expected to operate at a LOS A for the AM peak hour and LOS B for the PM peak hour. The Fairview Road/Merrimac Way intersection is expected to operate at a LOS A for both the AM peak hour and the PM peak hour. For Proposed Configuration scenario, the LOS for both intersections remain the same as the current configuration. Intersection LOS analysis for the current configuration and proposed configuration Year 2050 scenarios are summarized in **Table 6**, and intersection LOS analysis worksheets are provided in **Attachment E.**

Table 6. Intersection Level of Service Analysis for Year 2050

	No.	Location	Year 2050			
			AM Peak Hour		PM Peak Hour	
			ICU	LOS	ICU	LOS
Current Configuration	1	Merrimac Way/Harbor Boulevard	0.50	A	0.61	B
	2	Merrimac Way/Fairview Road	0.32	A	0.30	A
Proposed Configuration	1	Merrimac Way/Harbor Boulevard	0.50	A	0.66	B
	2	Merrimac Way/Fairview Road	0.32	A	0.30	A

Conclusion

This traffic study evaluated Merrimac Way between Harbor Boulevard and Fairview Road from a Four-Lane Primary Arterial to a Two-Lane Collector Arterial and to determine any impacts due to the proposed modification.

After analyzing the current conditions for Merrimac Way between Harbor Boulevard and Fairview Road for Year 2024, the proposed configuration of two-lanes and with Class II and Class IV bike lanes will have no significant impact on traffic conditions. The arterial LOS analysis for Merrimac Way, showed a LOS A for the current and proposed configurations. Intersection LOS was conducted for two intersections on Merrimac Way at Harbor Boulevard and at Fairview Road. The intersection LOS analysis determined that both intersections will operate at an acceptable LOS B or better with the proposed configuration. Using the OCTAM model for the Year 2050 analysis, growth rates were determined and applied to the 2024 traffic volumes to develop 2050 traffic conditions. The roadway segment LOS analysis conducted for Year 2050, determined that Merrimac Way is expected to operate at LOS A for the current and proposed configurations. The intersection LOS analysis for Year 2050, determined that neither of the two intersections on Merrimac Way – at Harbor Boulevard and at Fairview Road will be significantly impacted by the proposed configuration. Both study intersections are expected to operate at an acceptable LOS B or better with the proposed configuration.

Merrimac Way, between Harbor Boulevard and Fairview Road, and the intersections of Harbor Boulevard/Merrimac Way and Fairview Road/Merrimac Way, are expected to operate at an acceptable LOS for the proposed configuration for both Current Year 2024 and Future Year 2050. Therefore, it is recommended to reclassify Merrimac Way from a Four-Lane Divided Primary Arterial to a Two-Lane Divided Collector Arterial.

Merrimac Way MPAH Amendment

Year 2024 Average Daily Traffic

Attachment A

AGA Engineers, Inc.

Thursday, February 15, 2024 CITY: Costa Mesa PROJECT: SC4414

ADT1 Merrimac Way between Harbor Blvd and Fairview Rd. Suhsduhg#e|#DlpWG#OOF##who1#:47#586#:;;;

AM Period	EB		WB			PM Period	EB		WB		
0:00	3		4			12:00	80		73		
0:15	0		3			12:15	49		61		
0:30	0		2			12:30	106		86		
0:45	2	5	1	10	15	12:45	72	307	82	302	609
1:00	1		1			13:00	37		49		
1:15	0		0			13:15	38		45		
1:30	0		1			13:30	39		61		
1:45	2	3	3	5	8	13:45	52	166	49	204	370
2:00	2		2			14:00	69		87		
2:15	0		0			14:15	70		61		
2:30	0		0			14:30	37		46		
2:45	0	2	0	2	4	14:45	49	225	55	249	474
3:00	0		0			15:00	56		69		
3:15	1		0			15:15	66		55		
3:30	0		0			15:30	66		70		
3:45	1	2	0	0	2	15:45	85	273	86	280	553
4:00	0		1			16:00	49		65		
4:15	1		1			16:15	51		86		
4:30	1		1			16:30	51		73		
4:45	1	3	2	5	8	16:45	30	181	96	320	501
5:00	2		0			17:00	52		112		
5:15	4		3			17:15	61		100		
5:30	3		15			17:30	58		126		
5:45	16	25	10	28	53	17:45	61	232	98	436	668
6:00	5		4			18:00	52		71		
6:15	5		5			18:15	39		68		
6:30	7		7			18:30	29		50		
6:45	17	34	17	33	67	18:45	28	148	52	241	389
7:00	17		14			19:00	26		44		
7:15	35		21			19:15	27		40		
7:30	42		35			19:30	22		29		
7:45	70	164	67	137	301	19:45	24	99	23	136	235
8:00	77		61			20:00	24		27		
8:15	80		62			20:15	30		52		
8:30	92		67			20:30	21		23		
8:45	63	312	51	241	553	20:45	54	129	23	125	254
9:00	60		48			21:00	138		28		
9:15	52		42			21:15	40		20		
9:30	49		38			21:30	38		14		
9:45	20	181	31	159	340	21:45	33	249	7	69	318
10:00	30		26			22:00	22		9		
10:15	28		29			22:15	12		17		
10:30	31		34			22:30	3		12		
10:45	28	117	27	116	233	22:45	2	39	6	44	83
11:00	75		53			23:00	2		7		
11:15	39		42			23:15	2		3		
11:30	72		56			23:30	1		5		
11:45	48	234	64	215	449	23:45	2	7	5	20	27
Total Vol.	1082		951		**2033**		2055		2426		**4481**

	Daily Totals		
	EB	WB	**Combined**
	3137	3377	**6514**

	AM			**PM**		
Split %	53.2%	46.8%	**31.2%**	45.9%	54.1%	**68.8%**
Peak Hour	7:45	11:45	**7:45**	12:00	17:00	**17:00**
Volume	319	284	**576**	307	436	**668**
P.H.F.	0.87	0.83	**0.91**	0.80	0.87	**0.91**

cs@aimtd.com Tell. 714 253 7888

Merrimac Way MPAH Amendment

Year 2024 Turning Movement Counts

Attachment B

AGA Engineers, Inc.

INTERSECTION TURNING MOVEMENT COUNTS

T012524

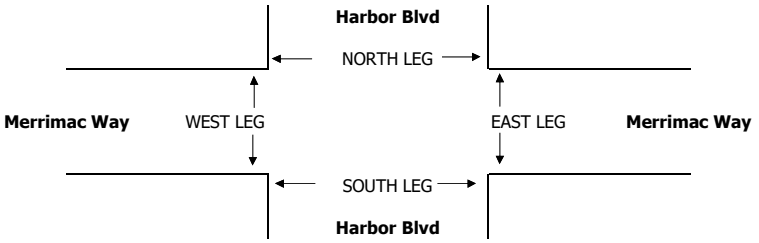
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Costa Mesa	PROJECT #:	SC4414
Thu, Feb 15, 24	NORTH & SOUTH:	Harbor Blvd	LOCATION #:	1
	EAST & WEST:	Merrimac Way	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

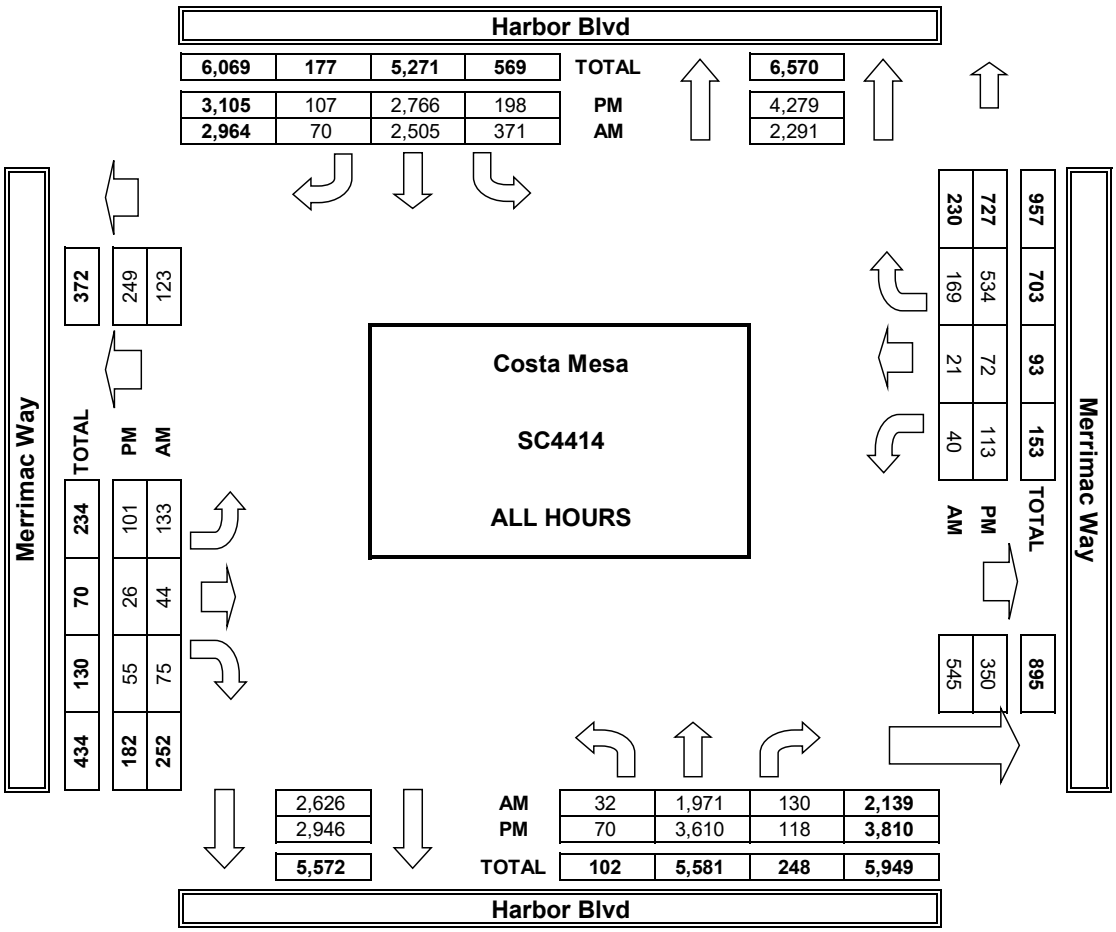
		NORTHBOUND Harbor Blvd			SOUTHBOUND Harbor Blvd			EASTBOUND Merrimac Way			WESTBOUND Merrimac Way				U-TURNS				
	LANES:	NL 1	NT 3	NR 0	SL 2	ST 3	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 1	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	3	154	5	11	196	9	18	2	11	3	1	6	419	2	0	0	0	2
	7:15 AM	2	186	5	28	235	0	15	2	9	2	4	4	492	1	1	0	0	2
	7:30 AM	4	223	12	30	286	5	17	6	10	1	4	16	614	1	1	0	0	2
	7:45 AM	2	323	17	52	373	25	20	8	9	8	3	22	862	1	6	0	0	7
	8:00 AM	9	258	26	51	346	8	26	6	15	10	1	35	791	0	1	0	0	1
	8:15 AM	6	298	33	64	342	9	13	9	9	5	4	27	819	0	3	0	0	3
	8:30 AM	3	282	16	62	353	7	13	5	6	7	2	26	782	0	2	0	0	2
	8:45 AM	3	247	16	73	374	7	11	6	6	4	2	33	782	1	4	0	0	5
	VOLUMES	32	1,971	130	371	2,505	70	133	44	75	40	21	169	5,585	6	18	0	0	24
	APPROACH %	1%	92%	6%	13%	85%	2%	53%	17%	30%	17%	9%	73%						
	APP/DEPART	2,139	/	2,291	2,964	/	2,626	252	/	545	230	/	123	0					
	BEGIN PEAK HR		7:45 AM																
	VOLUMES	20	1,161	92	229	1,414	49	72	28	39	30	10	110	3,267	1	12	0	0	
	APPROACH %	2%	91%	7%	13%	83%	3%	52%	20%	28%	20%	7%	73%						
	PEAK HR FACTOR		0.929			0.934			0.739			0.815		0.940					
	APP/DEPART	1,274	/	1,355	1,704	/	1,484	139	/	349	150	/	79	0					
PM	4:00 PM	9	461	10	18	318	16	21	4	8	13	9	81	968	2	3	0	0	5
	4:15 PM	6	412	10	21	367	15	11	2	9	16	8	65	942	2	5	0	1	8
	4:30 PM	11	463	12	24	318	15	10	3	10	12	11	69	958	1	6	0	1	8
	4:45 PM	10	444	14	17	343	10	17	0	1	13	10	46	925	1	5	0	1	7
	5:00 PM	10	447	11	23	385	9	9	5	5	16	10	76	1,006	3	3	0	1	7
	5:15 PM	8	474	23	23	333	10	15	5	9	12	8	62	982	2	3	0	2	7
	5:30 PM	8	435	19	34	320	21	11	4	6	16	9	70	953	1	3	0	2	6
	5:45 PM	8	474	19	38	382	11	7	3	7	15	7	65	1,036	0	6	0	0	6
	VOLUMES	70	3,610	118	198	2,766	107	101	26	55	113	72	534	7,824	12	34	0	8	54
	APPROACH %	2%	95%	3%	6%	89%	3%	55%	14%	30%	16%	10%	73%						
	APP/DEPART	3,810	/	4,279	3,105	/	2,946	182	/	350	727	/	249	0					
	BEGIN PEAK HR		5:00 PM																
	VOLUMES	34	1,830	72	118	1,420	51	42	17	27	59	34	273	4,003	6	15	0	5	
	APPROACH %	2%	94%	4%	7%	89%	3%	49%	20%	31%	16%	9%	74%						
	PEAK HR FACTOR		0.958			0.918			0.741			0.900		0.960					
	APP/DEPART	1,942	/	2,160	1,604	/	1,512	86	/	212	371	/	119	0					

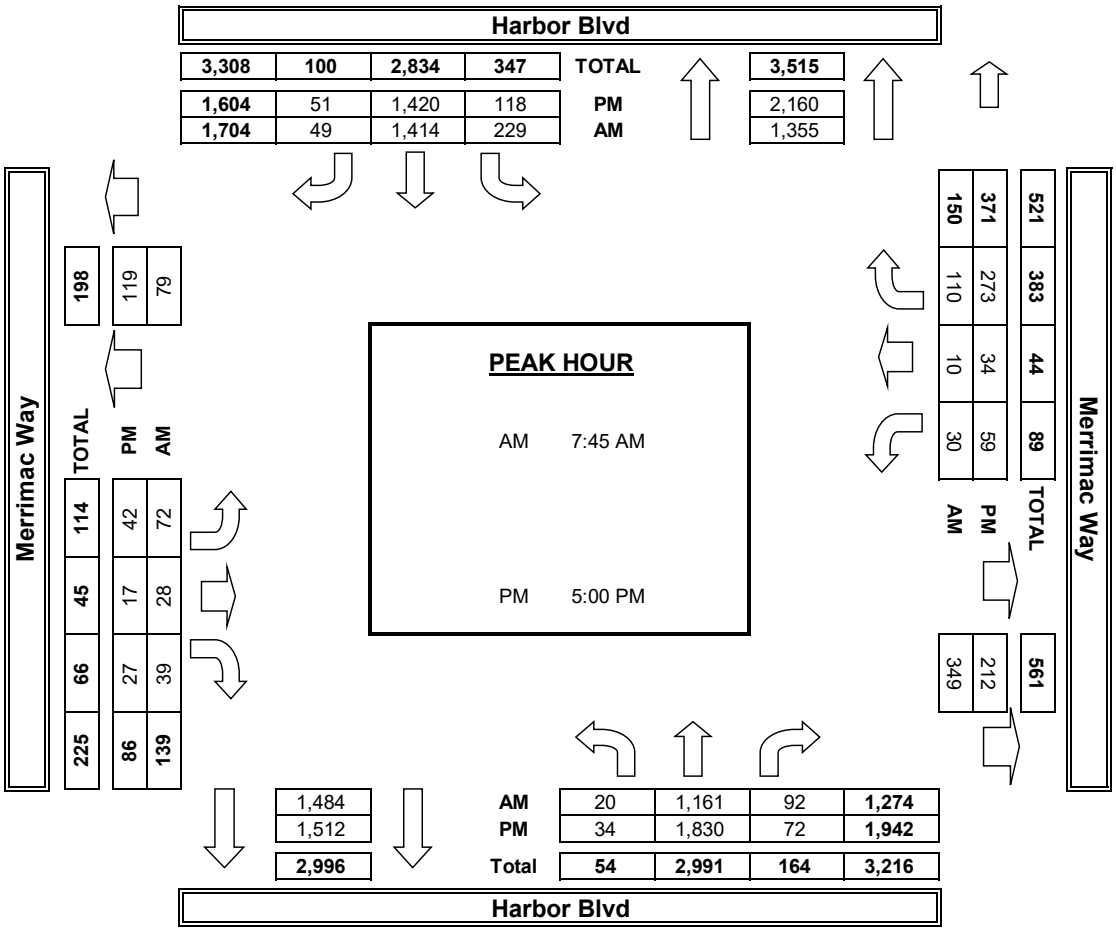


		ALL PED + BIKE & SCOOTER					PEDESTRIAN CROSSINGS					BICYCLE & SCOOTER CROSSINGS				
		N LEG	S LEG	E LEG	W LEG	TOTAL	N LEG	S LEG	E LEG	W LEG	TOTAL	NL	SL	EL	WL	TOTAL
AM	7:00 AM	1	3	3	4	11	1	1	1	1	4	0	2	2	3	7
	7:15 AM	0	5	3	2	10	0	4	2	1	7	0	1	1	1	3
	7:30 AM	4	0	2	11	17	3	0	1	2	6	1	0	1	9	11
	7:45 AM	10	2	1	7	20	6	2	1	2	11	4	0	0	5	9
	8:00 AM	3	2	1	5	11	1	0	0	0	1	2	2	1	5	10
	8:15 AM	5	3	2	7	17	2	0	1	2	5	3	3	1	5	12
	8:30 AM	3	4	4	7	18	2	3	2	6	13	1	1	2	1	5
	8:45 AM	2	1	3	1	7	1	0	2	0	3	1	1	1	1	4
	TOTAL	28	20	19	44	111	16	10	10	14	50	12	10	9	30	61
	BEGIN PEAK HR			7:45 AM			11	5	4	10	30					
PM	4:00 PM	3	4	4	9	20	1	2	3	4	10	2	2	1	5	10
	4:15 PM	6	1	4	8	19	4	1	3	2	10	2	0	1	6	9
	4:30 PM	2	0	2	9	13	0	0	0	7	7	2	0	2	2	6
	4:45 PM	3	0	2	11	16	0	0	1	3	4	3	0	1	8	12
	5:00 PM	2	0	2	6	10	2	0	1	2	5	0	0	1	4	5
	5:15 PM	2	0	4	5	11	1	0	3	1	5	1	0	1	4	6
	5:30 PM	4	2	1	8	15	3	2	0	2	7	1	0	1	6	8
	5:45 PM	3	2	1	3	9	1	1	0	1	3	2	1	1	2	6
	TOTAL	25	9	20	59	113	12	6	11	22	51	13	3	9	37	62
	BEGIN PEAK HR			5:00 PM			7	3	4	6	20					

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T012524

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Feb 15, 24

LOCATION: Costa Mela
NORTH & SOUTH: Fairview Rd
EAST & WEST: Merrimac Way

PROJECT #: SC4414
LOCATION #: 2
CONTROL: SIGNAL

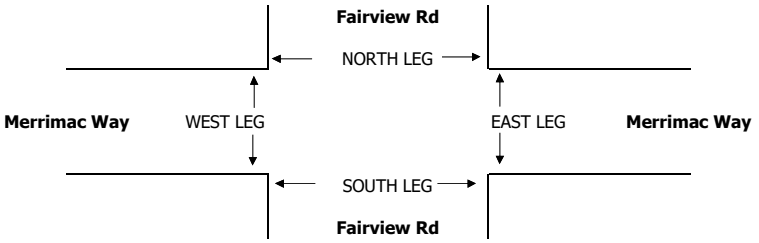
NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

		NORTHBOUND Fairview Rd			SOUTHBOUND Fairview Rd			EASTBOUND Merrimac Way			WESTBOUND Merrimac Way			
	LANES:	NL 2	NT 3	NR 1	SL 2	ST 3	SR 1	EL 1,5	ET 0,5	ER 1	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	15	68	2	0	60	12	0	0	13	0	0	0	170
	7:15 AM	16	122	0	0	100	15	13	1	11	0	0	0	278
	7:30 AM	20	146	4	0	131	20	19	0	13	1	0	0	354
	7:45 AM	23	197	1	0	156	29	26	0	26	0	0	0	458
	8:00 AM	25	257	4	0	182	34	39	0	17	0	0	0	558
	8:15 AM	42	246	9	1	213	43	47	0	18	0	1	3	623
	8:30 AM	45	110	3	1	185	38	19	1	35	0	1	0	438
	8:45 AM	54	130	7	3	121	70	16	2	21	0	0	2	426
	VOLUMES	240	1,276	30	5	1,148	261	179	4	154	1	2	5	3,307
	APPROACH %	16%	82%	2%	0%	81%	18%	53%	1%	46%	13%	25%	63%	
	APP/DEPART	1,547	/	1,461	1,415	/	1,304	337	/	39	8	/	503	0
	BEGIN PEAK HR		7:45 AM											
	VOLUMES	135	810	17	2	736	144	131	1	96	0	2	3	2,079
	APPROACH %	14%	84%	2%	0%	83%	16%	57%	0%	42%	0%	40%	60%	
	PEAK HR FACTOR		0.811			0.856			0.877			0.313		0.833
	APP/DEPART	963	/	945	883	/	833	228	/	20	5	/	281	0
PM	4:00 PM	35	162	0	0	155	46	36	0	24	0	0	0	458
	4:15 PM	34	178	0	0	137	31	31	0	18	0	0	0	429
	4:30 PM	33	184	1	0	151	30	24	0	22	0	1	0	446
	4:45 PM	35	220	0	0	154	39	20	0	13	0	0	0	481
	5:00 PM	45	199	0	0	156	40	30	0	17	0	0	0	487
	5:15 PM	36	211	0	0	156	57	28	0	20	0	0	0	508
	5:30 PM	49	189	0	0	168	45	26	0	30	0	0	0	507
	5:45 PM	41	248	1	0	158	66	23	0	26	0	0	1	564
	VOLUMES	308	1,591	2	0	1,235	354	218	0	170	0	1	1	3,884
	APPROACH %	16%	84%	0%	0%	78%	22%	56%	0%	44%	0%	50%	50%	
	APP/DEPART	1,902	/	1,812	1,591	/	1,406	389	/	2	2	/	664	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	171	847	1	0	638	208	107	0	93	0	0	1	2,070
	APPROACH %	17%	83%	0%	0%	75%	25%	53%	0%	46%	0%	0%	100%	
	PEAK HR FACTOR		0.876			0.946			0.897			0.250		0.914
	APP/DEPART	1,020	/	957	848	/	732	201	/	1	1	/	380	0

U-TURNS

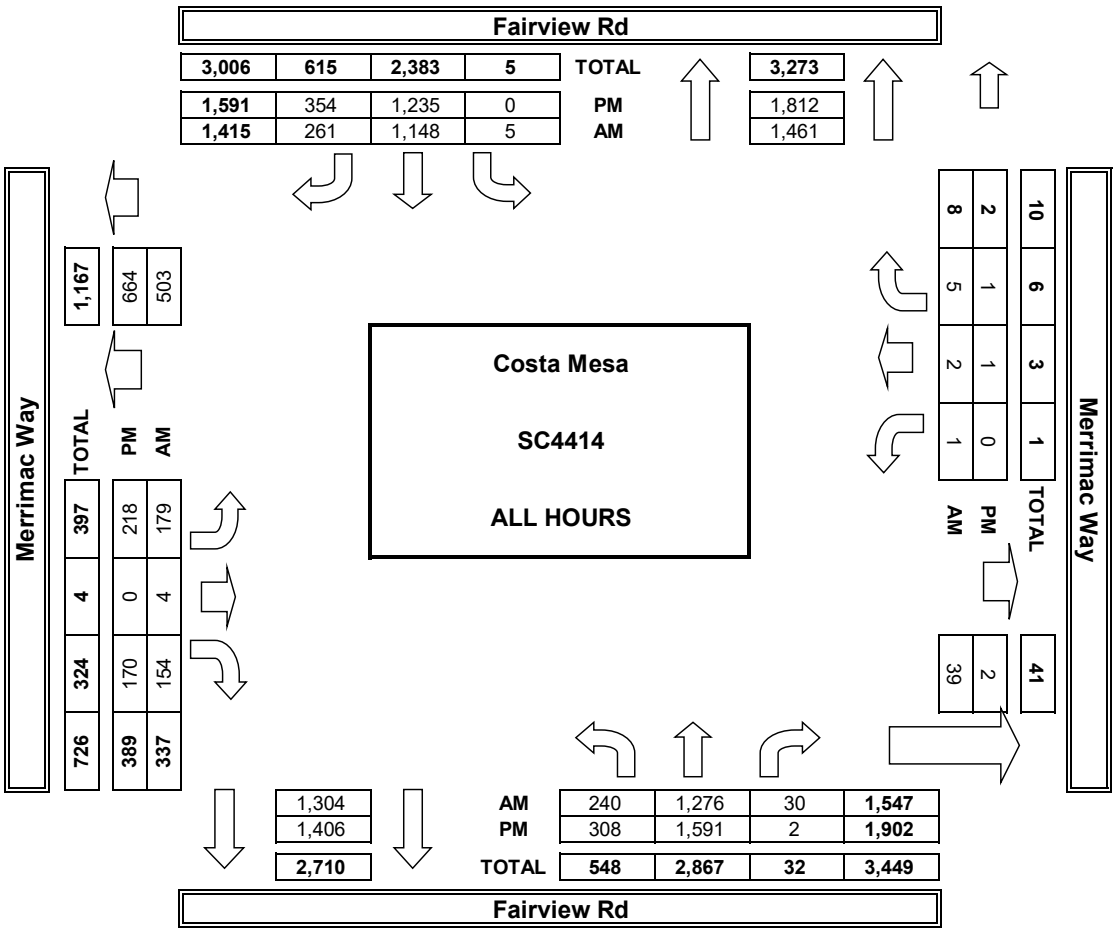
	NB	SB	EB	WB	TTL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	1	0	0	0	1
8:15 AM	0	1	0	0	1
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	1	1	0	0	2
BEGIN PEAK HR	1	1	0	0	
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1
5:30 PM	0	1	0	0	1
5:45 PM	1	0	1	0	2
VOLUMES	1	2	1	0	4
BEGIN PEAK HR	1	2	1	0	

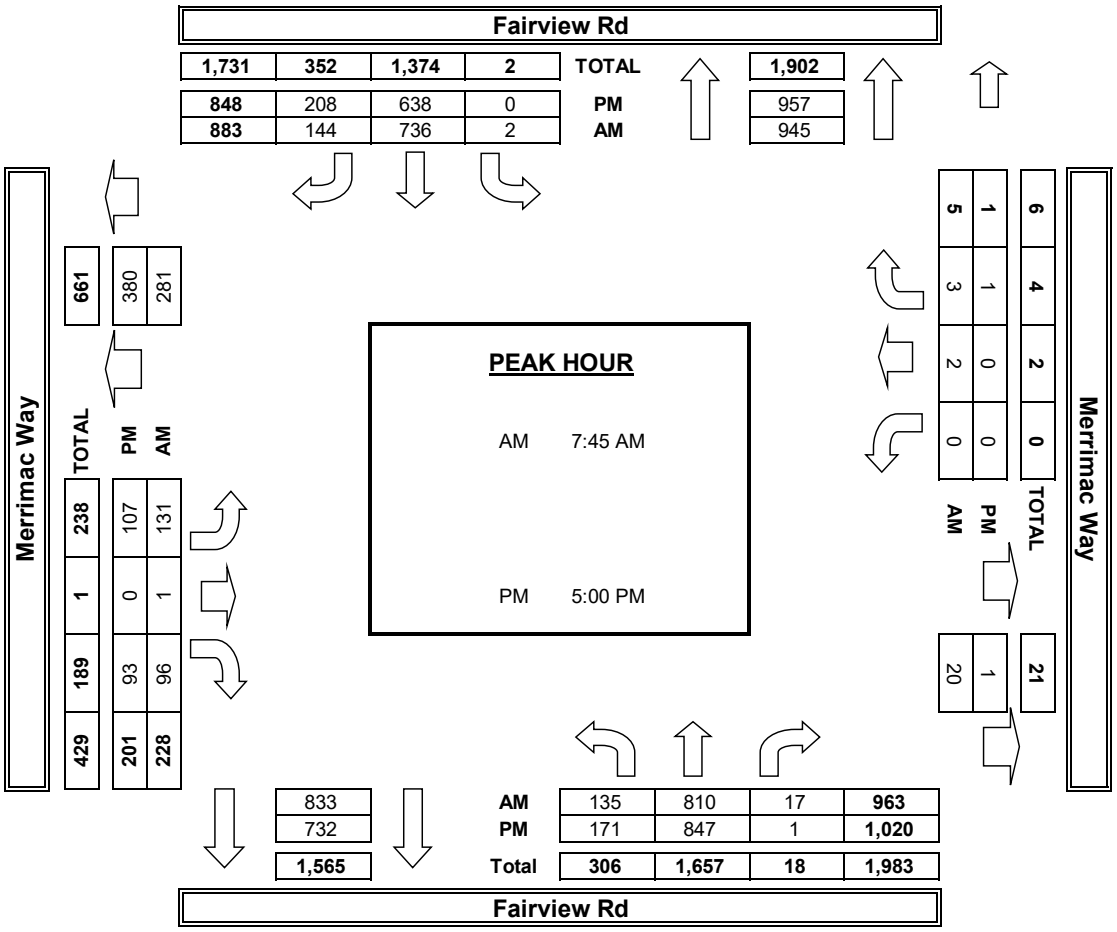


		ALL PED + BIKE & SCOOTER					PEDESTRIAN CROSSINGS					BICYCLE & SCOOTER CROSSINGS				
		N LEG	S LEG	E LEG	W LEG	TOTAL	N LEG	S LEG	E LEG	W LEG	TOTAL	NL	SL	EL	WL	TOTAL
AM	7:00 AM	0	1	2	1	4	0	0	1	0	1	0	1	1	1	3
	7:15 AM	1	0	1	1	3	0	0	0	1	1	1	0	1	0	2
	7:30 AM	2	0	2	1	5	1	0	0	0	1	1	0	2	1	4
	7:45 AM	2	0	5	3	10	1	0	3	2	6	1	0	2	1	4
	8:00 AM	2	1	7	5	15	2	0	3	2	7	0	1	4	3	8
	8:15 AM	0	1	11	7	19	0	0	6	5	11	0	1	5	2	8
	8:30 AM	0	0	3	2	5	0	0	1	0	1	0	0	2	2	4
	8:45 AM	5	0	3	3	11	1	0	2	2	5	4	0	1	1	6
	TOTAL	12	3	34	23	72	5	0	16	12	33	7	3	18	11	39
	BEGIN PEAK HR			7:45 AM			3	0	13	9	25					
PM	4:00 PM	0	0	0	3	3	0	0	0	0	0	0	0	0	3	3
	4:15 PM	0	0	4	3	7	0	0	2	0	2	0	0	2	3	5
	4:30 PM	3	0	3	6	12	3	0	1	4	8	0	0	2	2	4
	4:45 PM	1	0	3	3	7	0	0	2	0	2	1	0	1	3	5
	5:00 PM	0	0	4	2	6	0	0	2	0	2	0	0	2	2	4
	5:15 PM	1	0	3	2	6	1	0	1	1	3	0	0	2	1	3
	5:30 PM	0	0	2	2	4	0	0	0	0	0	0	0	2	2	4
	5:45 PM	1	2	8	4	15	0	0	0	3	3	1	2	8	1	12
	TOTAL	6	2	27	25	60	4	0	8	8	20	2	2	19	17	40
	BEGIN PEAK HR			5:00 PM			1	0	3	4	8					

AimTD LLC

TURNING MOVEMENT COUNTS





Merrimac Way MPAH Amendment

Year 2024 Intersection Capacity Utilization (ICU) Analysis

Attachment C

AGA Engineers, Inc.

INTERSECTION CAPACITY UTILIZATION

Intersection: Harbor Blvd & Merrimac Way
Scenario: Year 2024 Current — Peak Hr: AM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	21	1	1,700	21/1,700=	0.012		
NB Thru	1,161	3	5,100	1,253/5,100=	0.246	< ==	
NB Right	92	0	0		----		
SB Left	241	2	3,400	241/3,400=	0.071	< ==	
SB Thru	1,414	3	5,100	1,463/5,100=	0.287		
SB Right	49	0	0		----		
							0.317
EB Left	72	1	1,700	72/1,700=	0.042		
EB Thru	28	1	1,700	67/1,700=	0.039	< ==	
EB Right	39	0	0		----		
WB Left	30	1	1,700	30/1,700=	0.018	< ==	
WB Thru	10	0.5	850	10/850=	0.012		
WB Right **	110	1.5	2550	110/2,550=	0.043		
							0.057
Sum of Critical V/C Ratios							0.374
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.424**
Level of Service (LOS) - Refer to table below							**A**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour
Dual left turn lane capacity = 3,400 vph
Shared lane capacity = 1,700 vph/2 = 850 vph
** WBR can clear with SBL movement; therefore, WBL is used as critical movement

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

INTERSECTION CAPACITY UTILIZATION

Intersection: Harbor Blvd & Merrimac Way
Scenario: Year 2024 Current — Peak Hr: PM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	40	1	1,700	40/1,700=	0.024		
NB Thru	1,830	3	5,100	1,902/5,100=	0.373	< ==	
NB Right	72	0	0		----		
SB Left	133	2	3,400	133/3,400=	0.039	< ==	
SB Thru	1,420	3	5,100	1,471/5,100=	0.288		
SB Right	51	0	0		----		
							0.412
EB Left	42	1	1,700	42/1,700=	0.025	< ==	
EB Thru	17	1	1,700	44/1,700=	0.026		
EB Right	27	0	0		----		
WB Left	64	1	1,700	64/1,700=	0.038		
WB Thru	34	0.5	850	34/850=	0.040		
WB Right **	273	1.5	2550	273/2,550=	0.107	< ==	
							0.093
Sum of Critical V/C Ratios							0.505
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.555**
Level of Service (LOS) - Refer to table below							**A**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour

Dual left turn lane capacity = 3,400 vph

Shared lane capacity = 1,700 vph/2 = 850 vph

** WBR partially clears w/SBL movement (.107-.039=.068); WBR still remains as critical movement over WBT movement. Use 0.068 as Critical V/C for WB movement.

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

INTERSECTION CAPACITY UTILIZATION

Intersection: Harbor Blvd & Merrimac Way
Scenario: Year 2024 Proposed — Peak Hr: AM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	21	1	1,700	21/1,700=	0.012		
NB Thru	1,161	3	5,100	1,253/5,100=	0.246	< ==	
NB Right	92	0	0		----		
SB Left	241	2	3,400	241/3,400=	0.071	< ==	
SB Thru	1,414	3	5,100	1,463/5,100=	0.287		
SB Right	49	0	0		----		
							0.317
EB Left	72	1	1,700	72/1,700=	0.042		
EB Thru	28	1	1,700	67/1,700=	0.039	< ==	
EB Right	39	0	0		----		
WB Left	30	1	1,700	30/1,700=	0.018	< ==	
WB Thru	10	1	1,700	10/1,700=	0.006		
WB Right **	110	1	1,700	110/1,700=	0.065		
							0.057
Sum of Critical V/C Ratios							0.374
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.424**
Level of Service (LOS) - Refer to table below							**A**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour

Dual left turn lane capacity = 3,400 vph

** WBR can clear with SBL movement; therefore, WBL is used as critical movement

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

INTERSECTION CAPACITY UTILIZATION

Intersection: Harbor Blvd & Merrimac Way
Scenario: Year 2024 Proposed — Peak Hr: PM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	40	1	1,700	40/1,700=	0.024		
NB Thru	1,830	3	5,100	1,902/5,100=	0.373	< ==	
NB Right	72	0	0		----		
SB Left	133	2	3,400	133/3,400=	0.039	< ==	
SB Thru	1,420	3	5,100	1,471/5,100=	0.288		
SB Right	51	0	0		----		
							0.412
EB Left	42	1	1,700	42/1,700=	0.025	< ==	
EB Thru	17	1	1,700	44/1,700=	0.026		
EB Right	27	0	0		----		
WB Left	64	1	1,700	64/1,700=	0.038		
WB Thru	34	1	1,700	34/1,700=	0.020		
WB Right **	273	1	1,700	273/1,700=	0.161	< ==	
							0.147
Sum of Critical V/C Ratios							0.559
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.609**
Level of Service (LOS) - Refer to table below							**B**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour

Dual left turn lane capacity = 3,400 vph

** WBR partially clears w/SBL movement (.161-.039=.122); WBR still remains as critical movement over WBT movement. Use 0.122 as Critical V/C for WB movement.

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

INTERSECTION CAPACITY UTILIZATION

Intersection: Fairview Rd & Merrimac Way
Scenario: Year 2024 Current/Proposed — Peak Hr: AM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	136	2	3,400	136/3,400=	0.040	< ==	
NB Thru	810	3	5,100	810/5,100=	0.159		
NB Right	17	1	1,700	17/1,700=	0.010		
SB Left	10	2	3,400	10/3,400=	0.003		
SB Thru	736	3	5,100	736/5,100=	0.144	< ==	
SB Right	144	1	1,700	144/1,700=	0.085		
							0.184
EB Left	131	1.5	2550	131/2,550=	0.051	< ==	
EB Thru	10	0.5	850	10/850=	0.012		
EB Right **	96	1	1,700	96/1,700=	0.056		
WB Left	10	0	0		----		
WB Thru	10	2	3,400	30/3,400=	0.009	< ==	
WB Right	10	0	0		----		
							0.060
Sum of Critical V/C Ratios							0.244
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.294**
Level of Service (LOS) - Refer to table below							**A**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour
Dual left turn lane capacity = 3,400 vph
For low volumes a minimum of 10 vph is used
** EBR partially clears w/NBL movement (.056-.04=.016); therefore, EBL is the higher critical movement

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

INTERSECTION CAPACITY UTILIZATION

Intersection: Fairview Rd & Merrimac Way
Scenario: Year 2024 Current/Proposed — Peak Hr: PM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	172	2	3,400	172/3,400=	0.051	< ==	
NB Thru	847	3	5,100	847/5,100=	0.166		
NB Right	10	1	1,700	10/1,700=	0.006		
SB Left	10	2	3,400	10/3,400=	0.003		
SB Thru	638	3	5,100	638/5,100=	0.125	< ==	
SB Right	208	1	1,700	208/1,700=	0.122		
							0.176
EB Left	108	1.5	2,550	108/2,550=	0.042	< ==	
EB Thru	10	0.5	850	10/850=	0.012		
EB Right **	93	1	1,700	93/1,700=	0.055		
WB Left	10	0	0		----		
WB Thru	10	2	3,400	30/3,400=	0.009	< ==	
WB Right	10	0	0		----		
							0.051
Sum of Critical V/C Ratios							0.227
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.277**
Level of Service (LOS) - Refer to table below							**A**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour
Dual left turn lane capacity = 3,400 vph
For low volumes a minimum of 10 vph is used
** EBR partially clears w/NBL movement (.055-.051=.004); therefore, EBL is the higher critical movement

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

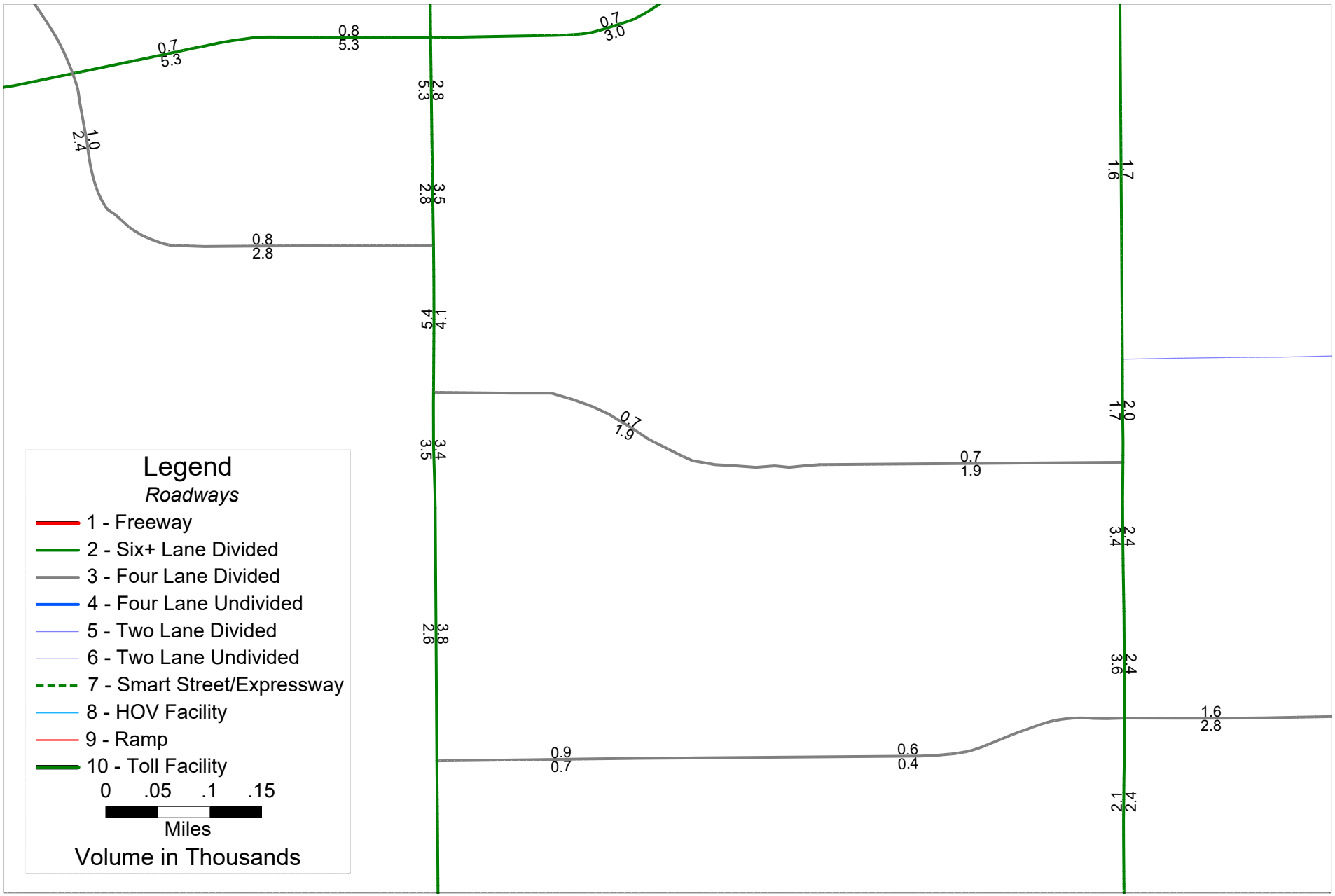
Merrimac Way MPAH Amendment

OCTAM Model Data

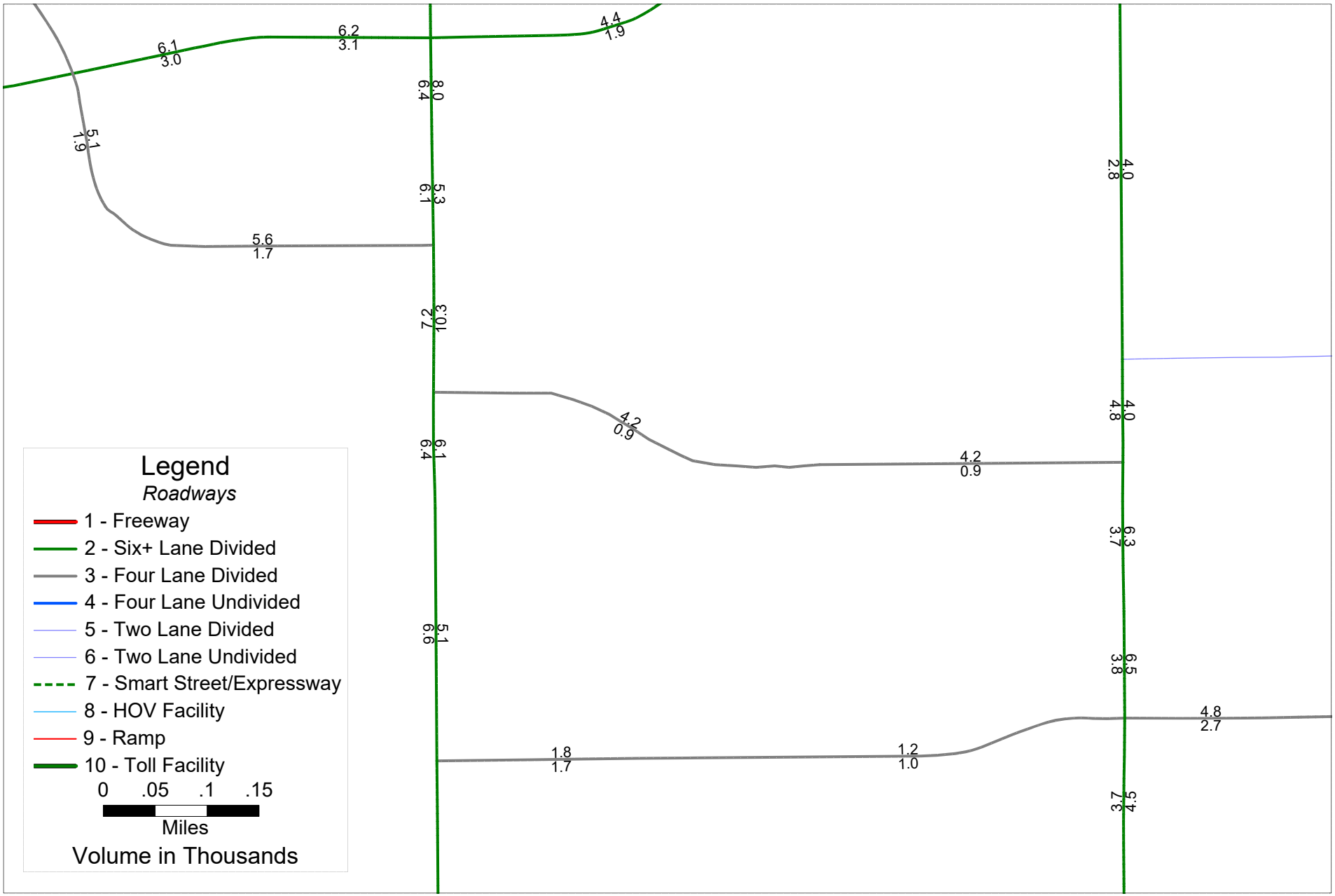
Attachment D

AGA Engineers, Inc.

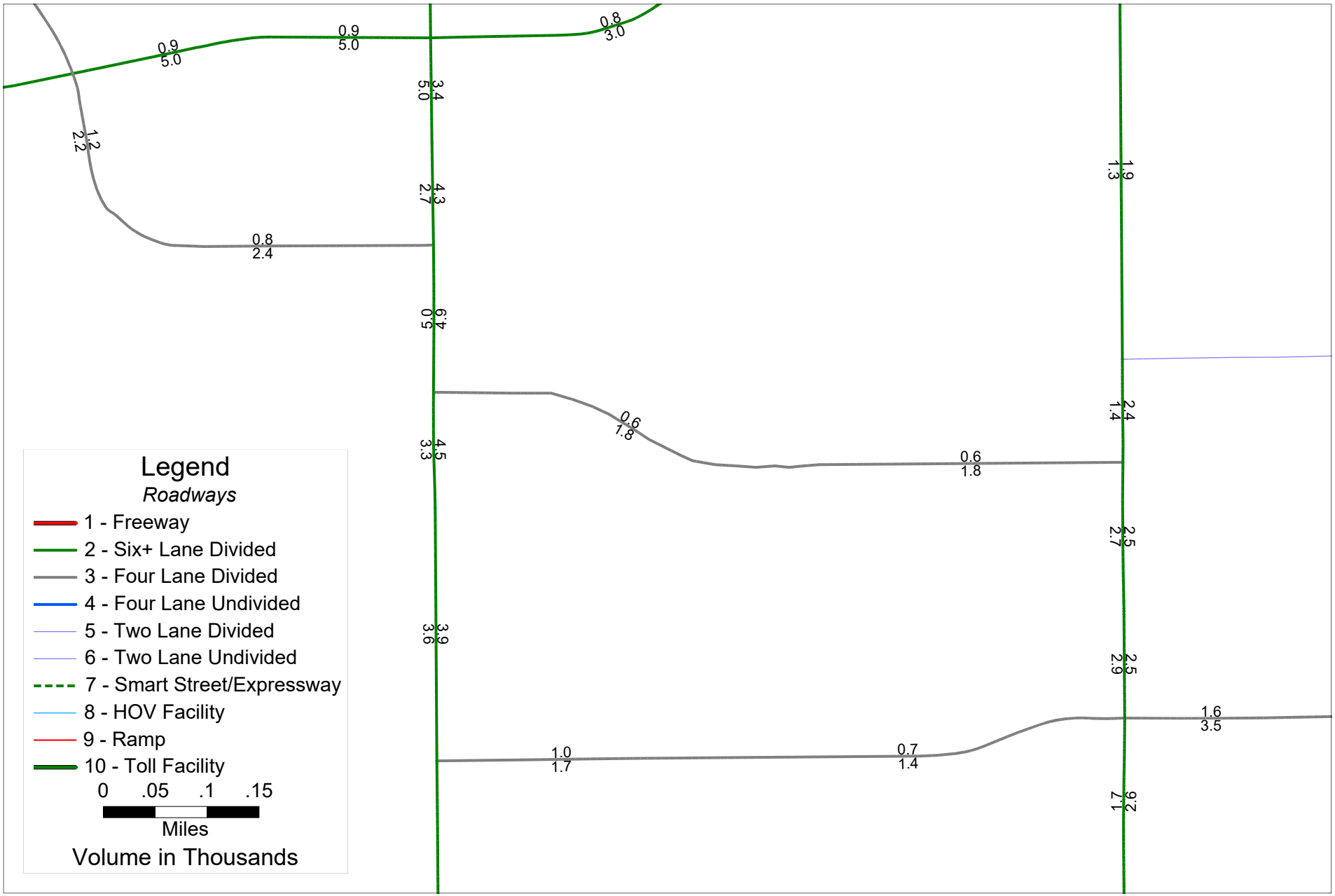
OCTAM 5.1 Year 2019 AM Peak Forecasts
Volumes in Thousands
Raw volumes - DO NOT DISTRIBUTE



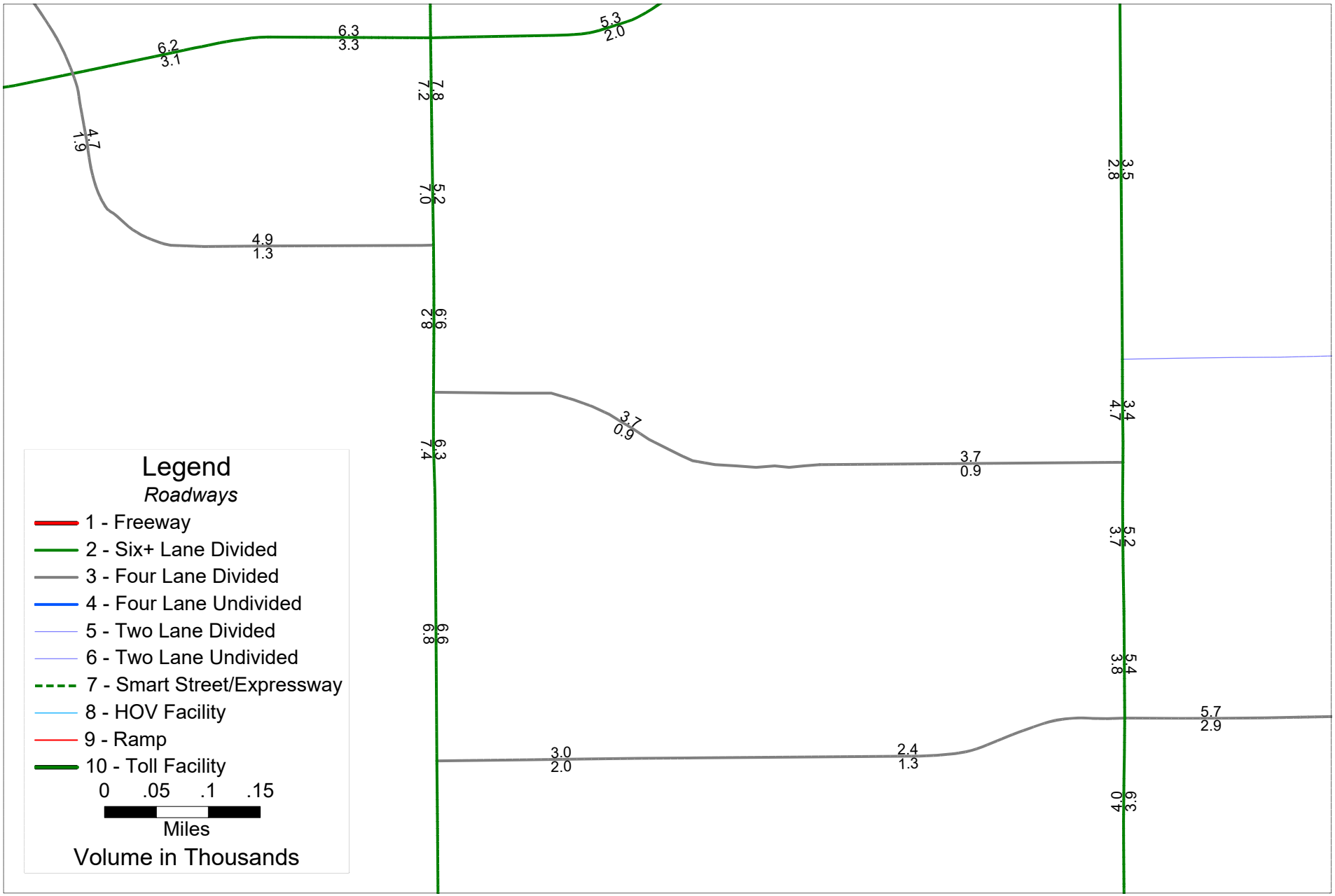
OCTAM 5.1 Year 2019 PM Peak Forecasts
Volumes in Thousands
Raw volumes - DO NOT DISTRIBUTE



OCTAM 5.1 Year 2050 AM Peak Forecasts
Volumes in Thousands
Raw volumes - DO NOT DISTRIBUTE



OCTAM 5.1 Year 2050 PM Peak Forecasts
Volumes in Thousands
Raw volumes - DO NOT DISTRIBUTE



Merrimac Way MPAH Amendment

Year 2050 Intersection Capacity Utilization (ICU) Analysis

Attachment E

AGA Engineers, Inc.

INTERSECTION CAPACITY UTILIZATION

Intersection: Harbor Blvd & Merrimac Way
Scenario: Year 2050 Current — Peak Hr: AM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	26	1	1,700	26/1,700=	0.015		
NB Thru	1,463	3	5,100	1,579/5,100=	0.310	< ==	
NB Right	116	0	0		----		
SB Left	265	2	3,400	265/3,400=	0.078	< ==	
SB Thru	1,555	3	5,100	1,609/5,100=	0.315		
SB Right	54	0	0		----		
							0.388
EB Left	79	1	1,700	79/1,700=	0.046		
EB Thru	31	1	1,700	74/1,700=	0.044	< ==	
EB Right	43	0	0		----		
WB Left	33	1	1,700	33/1,700=	0.019	< ==	
WB Thru	11	0.5	850	11/850=	0.013		
WB Right **	121	1.5	2550	121/2,550=	0.047		
							0.063
Sum of Critical V/C Ratios							0.451
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.501**
Level of Service (LOS) - Refer to table below							**A**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour
Dual left turn lane capacity = 3,400 vph
Shared lane capacity = 1,700 vph/2 = 850 vph
** WBR can clear with SBL movement; therefore, WBL is used as critical movement

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

INTERSECTION CAPACITY UTILIZATION

Intersection: Harbor Blvd & Merrimac Way
Scenario: Year 2050 Current — Peak Hr: PM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	44	1	1,700	44/1,700=	0.026		
NB Thru	2,013	3	5,100	2,092/5,100=	0.410	< ==	
NB Right	79	0	0		----		
SB Left	150	2	3,400	150/3,400=	0.044	< ==	
SB Thru	1,605	3	5,100	1663/5,100=	0.326		
SB Right	58	0	0		----		
							0.454
EB Left	46	1	1,700	46/1,700=	0.027	< ==	
EB Thru	19	1	1,700	49/1,700=	0.029		
EB Right	30	0	0		----		
WB Left	70	1	1,700	70/1,700=	0.041		
WB Thru	37	0.5	850	37/850=	0.044		
WB Right **	300	1.5	2550	300/2,550=	0.118	< ==	
							0.101
Sum of Critical V/C Ratios							0.555
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.605**
Level of Service (LOS) - Refer to table below							**B**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour
Dual left turn lane capacity = 3,400 vph
Shared lane capacity = 1,700 vph/2 = 850 vph
** WBR partially clears w/SBL movement (.118-.044=.074); WBR still remains as critical movement over WBT movement. Use 0.074 as Critical V/C for WB movement

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

INTERSECTION CAPACITY UTILIZATION

Intersection: Harbor Blvd & Merrimac Way
Scenario: Year 2050 Proposed — Peak Hr: AM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	26	1	1,700	26/1,700=	0.015		
NB Thru	1,463	3	5,100	1,579/5,100=	0.310	< ==	
NB Right	116	0	0		----		
SB Left	265	2	3,400	265/3,400=	0.078	< ==	
SB Thru	1,555	3	5,100	1,609/5,100=	0.315		
SB Right	54	0	0		----		
							0.388
EB Left	79	1	1,700	79/1,700=	0.046		
EB Thru	31	1	1,700	74/1,700=	0.044	< ==	
EB Right	43	0	0		----		
WB Left	33	1	1,700	33/1,700=	0.019	< ==	
WB Thru	11	1	1,700	11/1,700=	0.006		
WB Right **	121	1	1,700	121/1,700=	0.071		
							0.063
Sum of Critical V/C Ratios							0.451
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.501**
Level of Service (LOS) - Refer to table below							**A**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour

Dual left turn lane capacity = 3,400 vph

** WBR can clear with SBL movement; therefore, WBL is used as critical movement

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

INTERSECTION CAPACITY UTILIZATION

Intersection: Harbor Blvd & Merrimac Way
Scenario: Year 2050 Proposed — Peak Hr: PM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	44	1	1,700	44/1,700=	0.026		
NB Thru	2,013	3	5,100	2,092/5,100=	0.410	< ==	
NB Right	79	0	0		----		
SB Left	150	2	3,400	150/3,400=	0.044	< ==	
SB Thru	1,605	3	5,100	1,663/5,100=	0.326		
SB Right	58	0	0		----		
							0.454
EB Left	46	1	1,700	46/1,700=	0.027	< ==	
EB Thru	19	1	1,700	49/1,700=	0.029		
EB Right	30	0	0		----		
WB Left	70	1	1,700	70/1,700=	0.041		
WB Thru	37	1	1,700	37/1,700=	0.022		
WB Right **	300	1	1,700	300/1,700=	0.176	< ==	
							0.159
Sum of Critical V/C Ratios							0.613
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.663**
Level of Service (LOS) - Refer to table below							**B**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour

Dual left turn lane capacity = 3,400 vph

** WBR partially clears w/SBL movement (.176-.044=.132); WBR still remains as critical movement over WBT movement. Use 0.132 as critical V/C for WB movement

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

INTERSECTION CAPACITY UTILIZATION

Intersection: Fairview Rd & Merrimac Way
Scenario: Year 2050 Current/Proposed — Peak Hr: AM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	150	2	3,400	150/3,400=	0.044	< ==	
NB Thru	891	3	5,100	891/5,100=	0.175		
NB Right	19	1	1,700	19/1,700=	0.011		
SB Left	11	2	3,400	11/3,400=	0.003		
SB Thru	810	3	5,100	810/5,100=	0.159	< ==	
SB Right	158	1	1,700	158/1,700=	0.093		
							0.203
EB Left	144	1.5	2550	144/2,550=	0.056	< ==	
EB Thru	11	0.5	850	11/850=	0.013		
EB Right **	106	1	1,700	106/1,700=	0.062		
WB Left	11	0	0		----		
WB Thru	11	2	3,400	33/3,400=	0.010	< ==	
WB Right	11	0	0		----		
							0.066
Sum of Critical V/C Ratios							0.269
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.319**
Level of Service (LOS) - Refer to table below							**A**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour
Dual left turn lane capacity = 3,400 vph
For low volumes a minimum of 10 vph is used
** EBR partially clears w/NBL movement (.062-.044=.018); therefore, EBL is the higher critical movement

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

INTERSECTION CAPACITY UTILIZATION

Intersection: Fairview Rd & Merrimac Way
Scenario: Year 2050 Current/Proposed — Peak Hr: PM Peak
Analyst: AGA Engineers, Inc. — Agency: City of Costa Mesa

Movement	Volume	No. of Lanes	Capacity*	V/C Ratio		Critical V/C	Total
NB Left	189	2	3,400	189/3,400=	0.056	< ==	
NB Thru	932	3	5,100	932/5,100=	0.183		
NB Right	11	1	1,700	11/1,700=	0.006		
SB Left	11	2	3,400	11/3,400=	0.003		
SB Thru	702	3	5,100	702/5,100=	0.138	< ==	
SB Right	229	1	1,700	229/1,700=	0.135		
							0.194
EB Left	119	1.5	2,550	119/2,550=	0.047	< ==	
EB Thru	11	0.5	850	11/850=	0.013		
EB Right **	102	1	1,700	102/1,700=	0.060		
WB Left	11	0	0		----		
WB Thru	11	2	3,400	33/3,400=	0.010	< ==	
WB Right	11	0	0		----		
							0.057
Sum of Critical V/C Ratios							0.251
Adjustment for Lost Time							0.050
Intersection Capacity Utilization (ICU)							**0.301**
Level of Service (LOS) - Refer to table below							**A**

* NOTES

Per-lane Capacity = 1,700 vehicles/hour
Dual left turn lane capacity = 3,400 vph
For low volumes a minimum of 10 vph is used
** EBR partially clears w/NBL movement (.060-.056=.004); therefore, EBL is the higher critical movement

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	N/A

ATTACHMENT H

Public Works & Sustainability cityofirvine.org

1 Civic Center Plaza, P.O. Box 19575, Irvine, California 92623-9575 949-724-7365

October 7, 2024

Kia Mortazavi
Executive Director, Planning
Orange County Transportation Authority
550 South Main Street
Orange, CA 92863-1584

RE: Master Plan of Arterial Highways (MPAH) Amendment Request – Yale Avenue between Michelson Drive and University Drive

Dear Mr. Mortazavi,

The City of Irvine is requesting an amendment of the MPAH for Yale Avenue between Michelson Drive and University Drive to change the segment from Secondary Arterial to Commuter Arterial. This designation would include one through lane in each direction and a left-turn lane at intersections.

The segment of Yale Avenue between Michelson Drive and University Drive is currently a two-lane (one lane each direction) Commuter arterial roadway. In the Orange County MPAH, this segment is identified as a four-lane (two lanes each direction) Secondary arterial roadway. Currently, the segment of Yale Avenue north of Michelson is connected to a bike and pedestrian only bridge over I-405. The segment of Yale Avenue between Michelson Drive and Yale Loop including the bridge over I-405 is classified as a two-lane (one lane each direction) Commuter arterial roadway in the MPAH network.

The current configuration of Yale Avenue between Michelson Drive and University Drive includes a 24-foot-wide travel lane and an 8-foot-wide Class II bike lane in each direction. After analysis and community engagement, the City is planning to maintain the existing number of travel lanes, but reduce the wider than necessary lane widths and reallocate a portion of the roadway width to better serve the community by adding a Class IV bikeway (refer to Attachment 1 for location map). The implementation will address concerns along the existing roadway, such as speeding, wrong way riding of bicycles, and conflicts between bicyclists and pedestrians on sidewalks. It is also intended to accommodate the increasing use of bicycles by students going to and from the middle school in the project area and the high school to the south. The project will also enhance bicycling facilities and provide additional opportunities for low stress and multimodal travel within the City.

The Class IV bikeway will be added to the two-lane configuration within the existing roadway. The proposed roadway configuration is depicted in Attachment 2 and consists of the following:

- An 11-foot travel lane in each direction
- A cycle track for dedicated bicycle travel, separated by either a landscaped buffer (7-14 feet wide) or raised concrete buffer (3-7 feet wide) where appropriate

The project will also include improved crosswalks and signal enhancements for bicyclists and pedestrians and provide support for circulation to the adjacent Middle School, providing significant benefits including improved safety for all roadway users and enhanced quality of life.

The daily traffic volumes on this segment of Yale Avenue range from 1,230 to 1,770 vehicles per day based on traffic counts collected in November 2022. The City's traffic model forecasts the buildout volumes to be between 6,300 and 6,800 for the two-lane arterial configuration with the I-405 Vehicular overcrossing. The MPAH roadway capacity values indicate that a two-lane undivided arterial can accommodate 13,000 vehicles per day while still maintaining favorable performance conditions. In addition, a traffic analysis (Attachment 3) was conducted and showed that this segment of Yale Avenue is forecast to operate at Level of Service (LOS) C or better in the buildout scenarios. Therefore, the proposed MPAH amendment can support existing and forecast traffic volumes per adopted performance criteria.

Thank you for your consideration regarding this request. If you have any questions, please feel free to contact Wendy Wang, Supervising Transportation Analyst at 949-724-7438 or wwang@cityofirvine.org.

Sincerely,

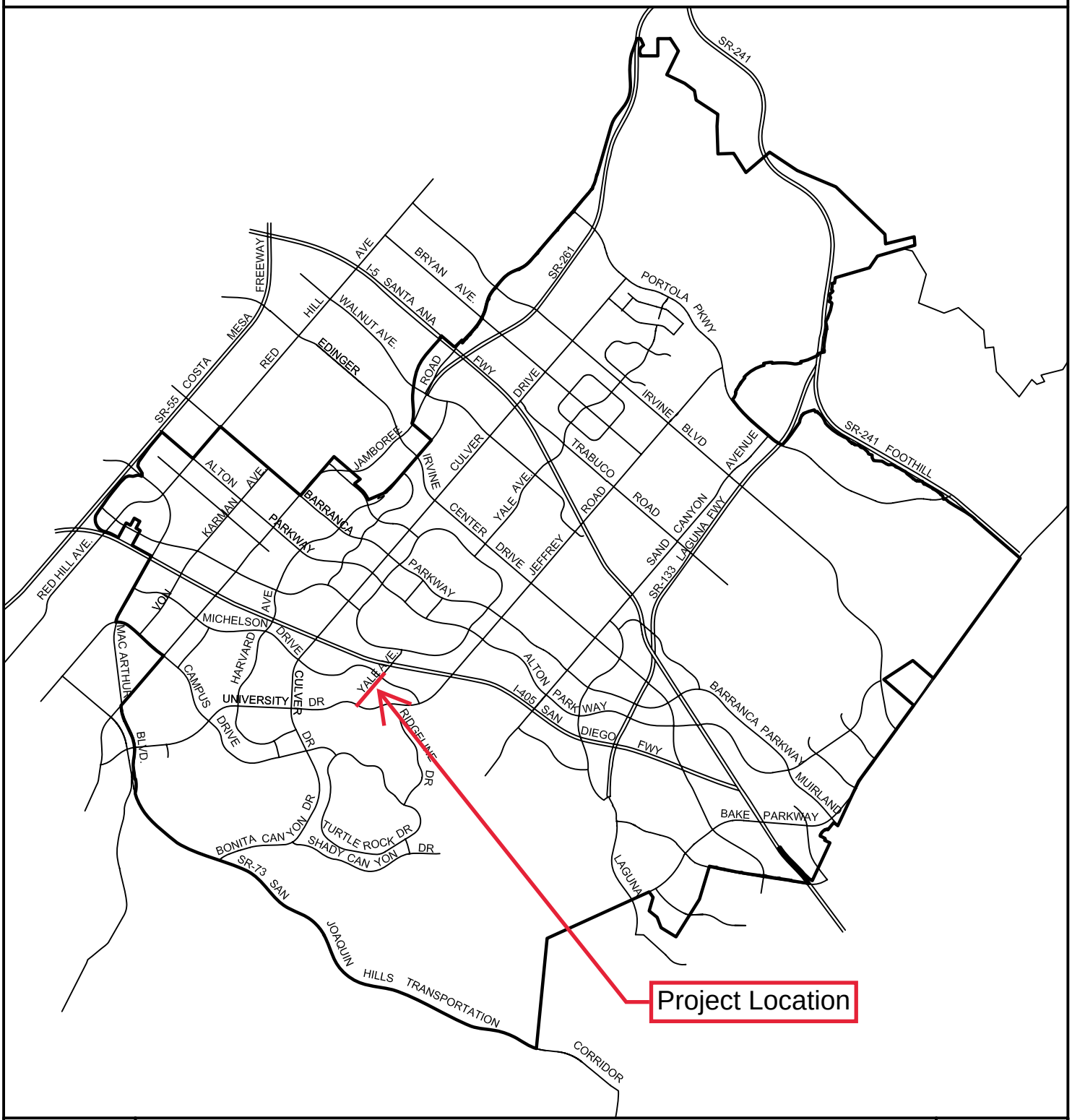
Sean Crumby

Sean Crumby
Director
Public Works & Sustainability Department

Attachments:

1. Location Map
2. Yale Avenue Class IV Concept Plans
3. South Yale Corridor Improvement Project Report

IRVINE CITYWIDE CATCH BASIN CONNECTOR PIPE SCREEN (CPS) INSTALLATION PHASE 4 PROJECT



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PROJECT LOCATION

CITY OF IRVINE 1971

ATTACHMENT 1

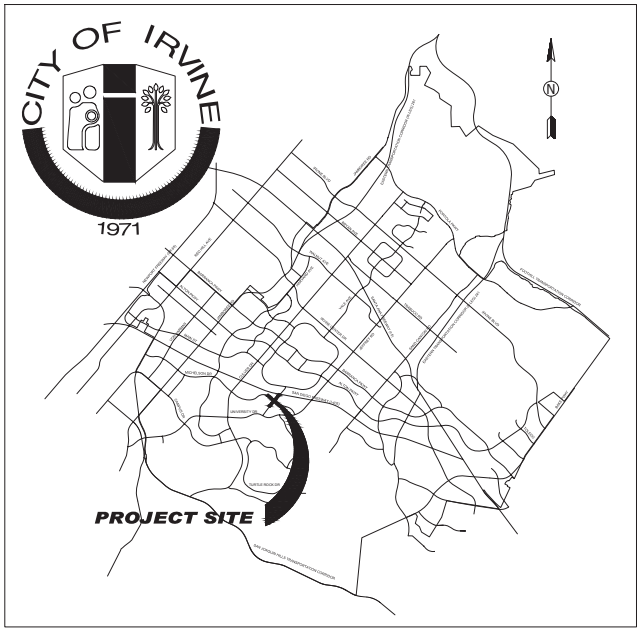
CONSTRUCTION PLANS FOR THE IMPROVEMENT OF

SOUTH YALE CORRIDOR IMPROVEMENTS

CIP# 312204

INDEX OF DRAWINGS

SHEET No.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL SECTIONS
3-4	LAYOUT



VICINITY MAP

NOT TO SCALE

DIGALERT

DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG

TOLL FREE 1-800-227-2600

Underground Service Alert of Southern California

REGISTERED PROFESSIONAL ENGINEER — XXX — No. _____ Exp. _____ CIVIL — STATE OF CALIFORNIA

CITY APPROVAL:

30% CONCEPT PLANS

PLAN CHECK NO. X

CIP NO. 312204

NO.	DATE	REVISIONS	ENGR.	APPROV.	DATE
7					
6					
5					
4					
3					
2					
1					

PLAN PREPARED BY:
MARK THOMAS
MARK THOMAS & COMPANY
2121 ALTON PARKWAY, SUITE 210
IRVINE, CA 92606

DESIGN ENGINEER R.C.E. No. DATE

DRAWN BY:	T. MIYATA	DATE 2/20/2024
DESIGNED BY:	T. MIYATA	DATE 2/20/2024
CHECKED BY:	A. SILVA	DATE 2/20/2024
RECOMMENDED BY:		DATE

APPROVED BY:
CITY ENGINEER

STEVEN CARRILLO R.C.E. NO. 73170 DATE

IRVINE RANCH WATER DISTRICT
APPROVED OF DOMESTIC WATER, SANITARY SEWER & RECYCLED WATER FACILITIES IRWD CODE 7969, PROJECT NUMBER 311611

APPROVED BY: DATE
SUPERVISED BY: DATE
REVIEWED BY: DATE

SOUTH YALE
CORRIDOR IMPROVMENTS

TITLE SHEET

CITY OF IRVINE
PUBLIC WORKS DEPARTMENT

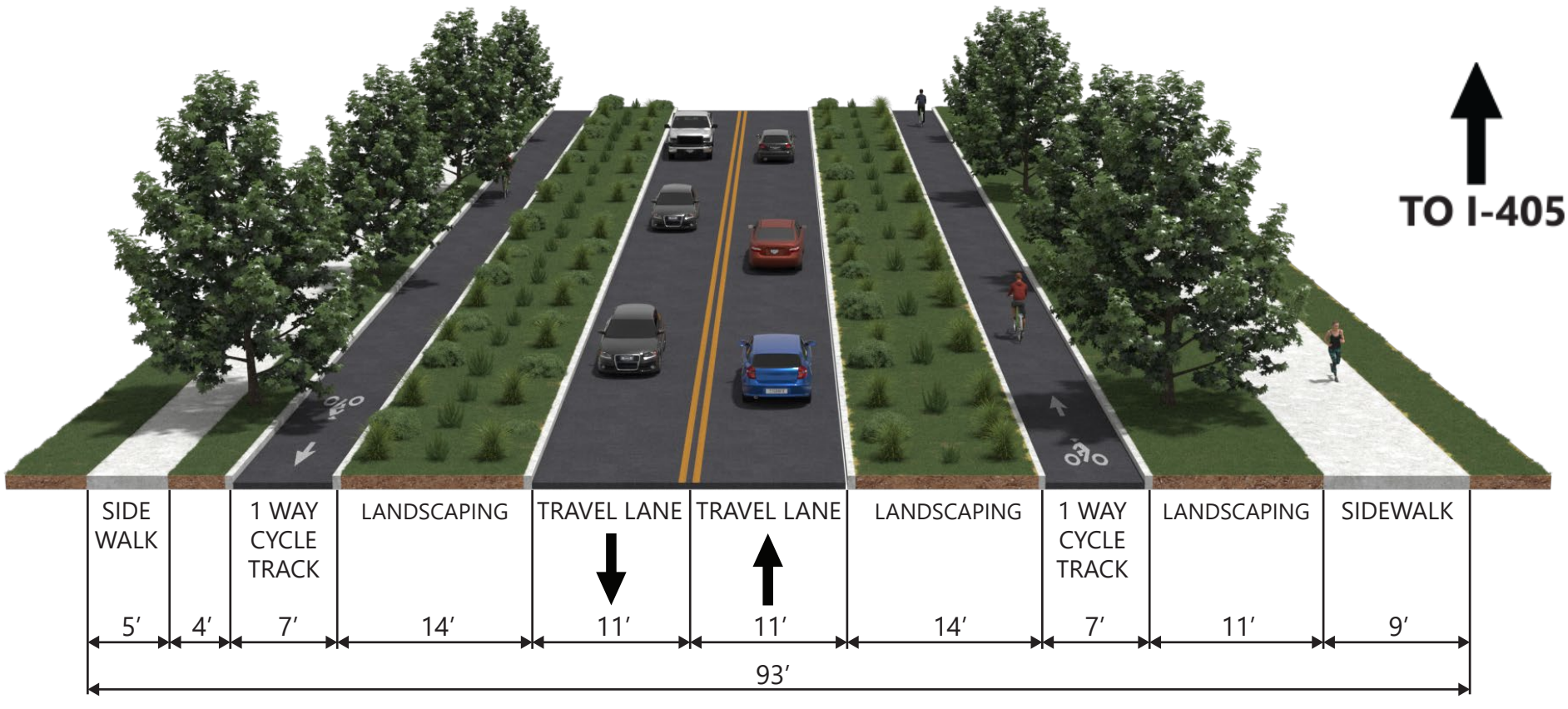
PROJECT NO. X

SHEET 1 of 4

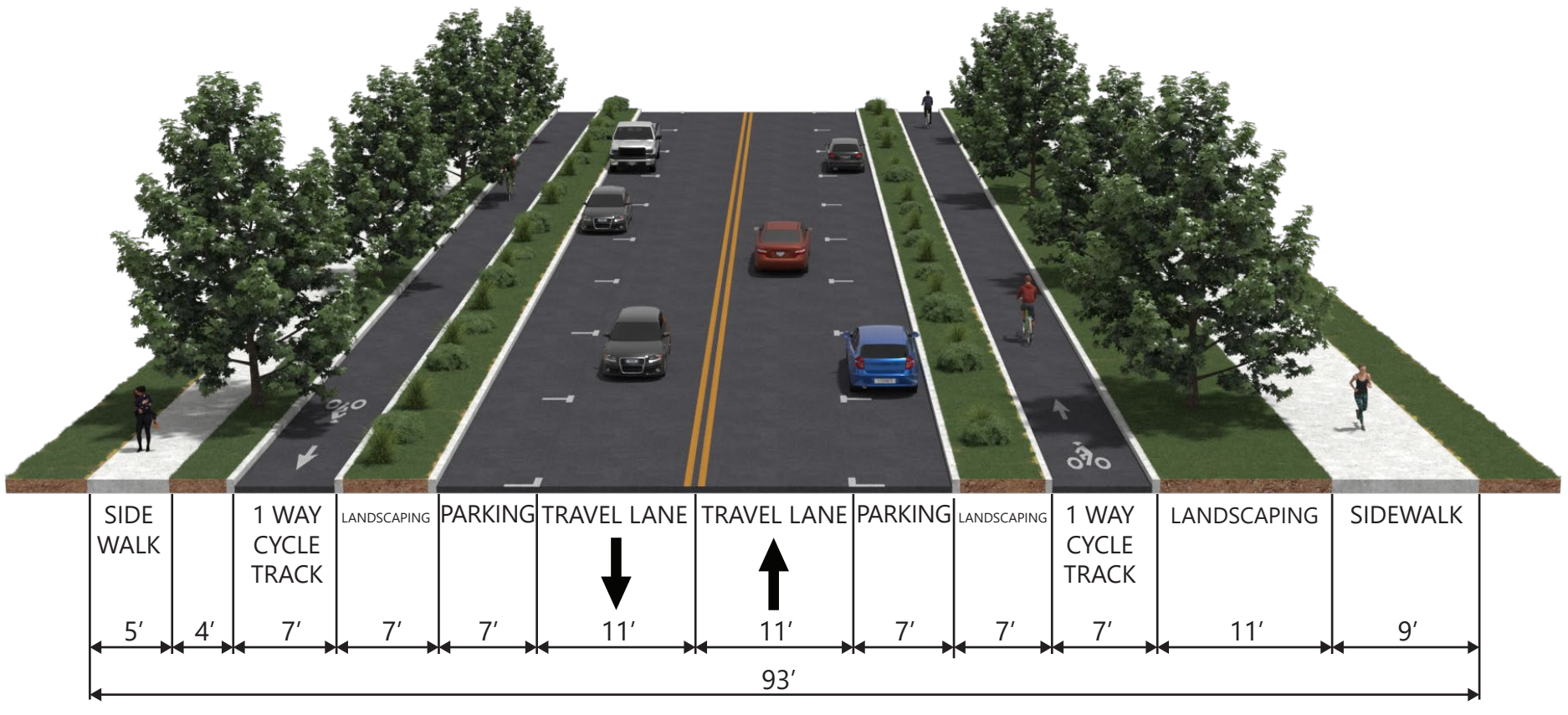
J:\Irvine-22-00078-South Yale Corridor Imp\CADD\Sheets\Yale_Title.dwg

SHEET REVISED: 8/15/07

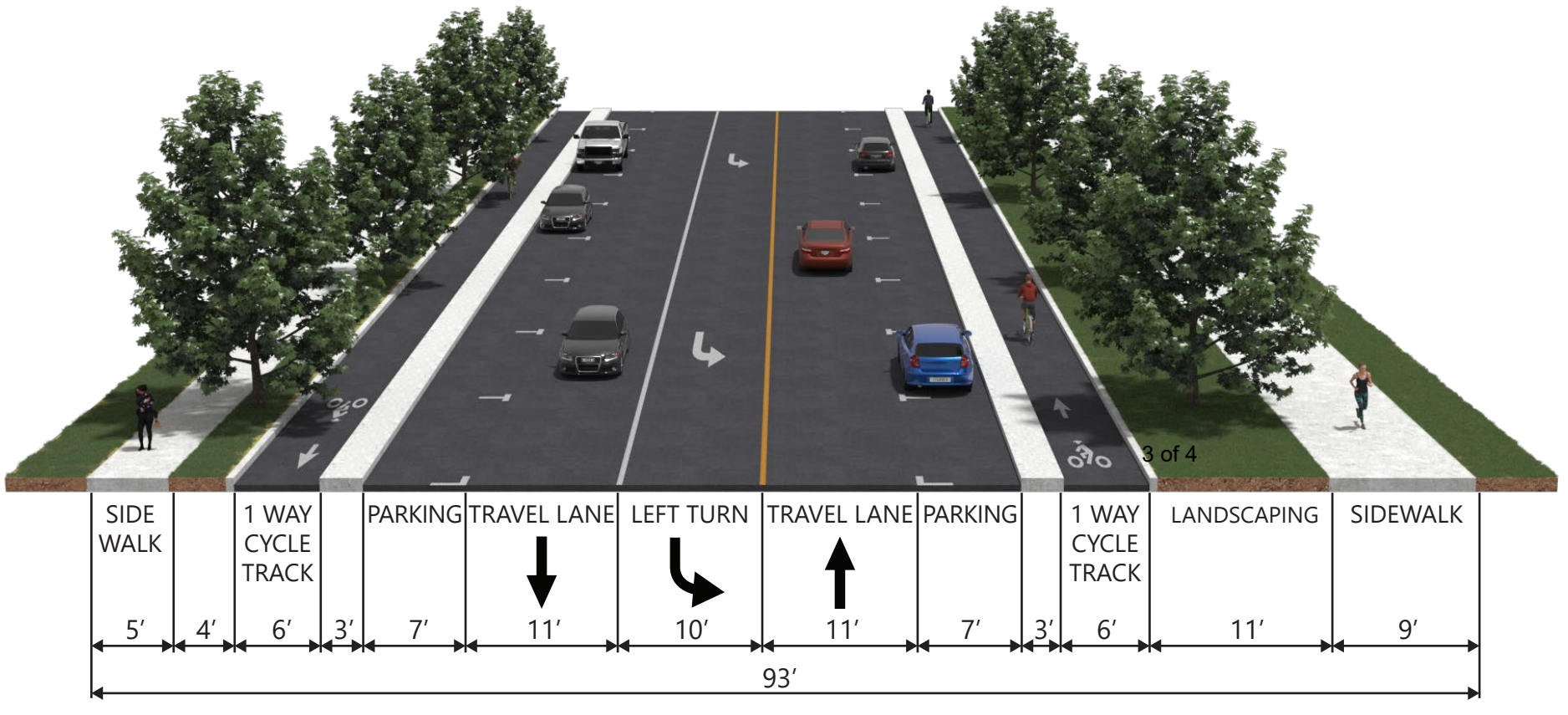
ATTACHMENT 2



CROSS-SECTION NORTH OF UNIVERSITY DRIVE



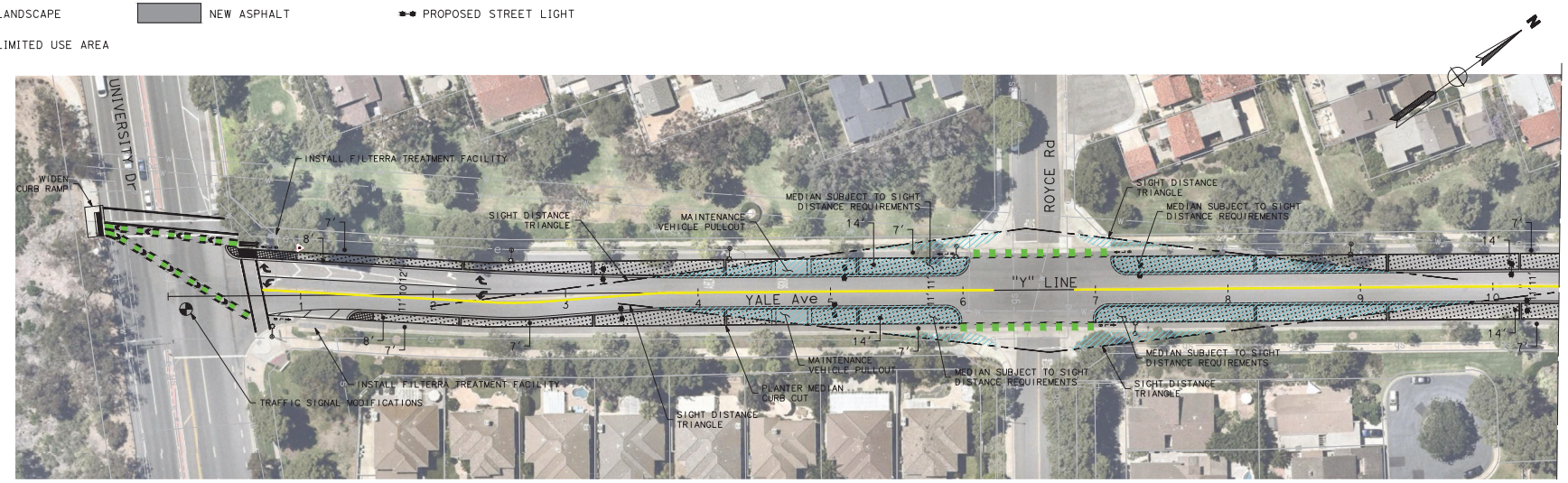
CROSS-SECTION SOUTH OF MICHELSON DRIVE

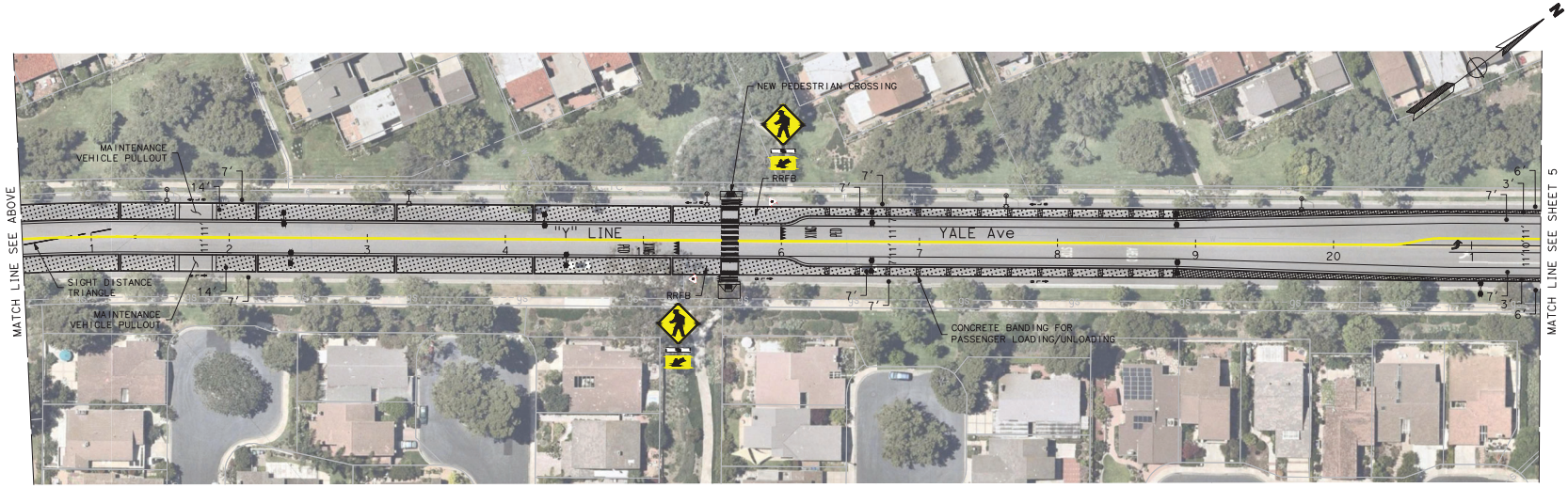


CROSS-SECTION NORTH OF MICHELSON DRIVE

LEGEND:

EXPOSED AGGREGATE CONCRETE
LANDSCAPE
LIMITED USE AREA
NEW SIDEWALK
NEW ASPHALT
EXISTING STREET LIGHT
PROPOSED STREET LIGHT





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DRAWN BY: T. MIYATA — DATE 2/20/2024
DESIGNED BY: T. MIYATA — DATE 2/20/2024
CHECKED BY: A. SILVA — DATE 2/20/2024

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IRVINE, CA 92606
DESIGN ENGINEER — R.C.E. No. — DATE

SOUTH YALE
CORRIDOR IMPROVEMENTS
LAYOUT

CITY OF IRVINE
PUBLIC WORKS DEPARTMENT

CIP NO. 312204

SHEET 3 of 4

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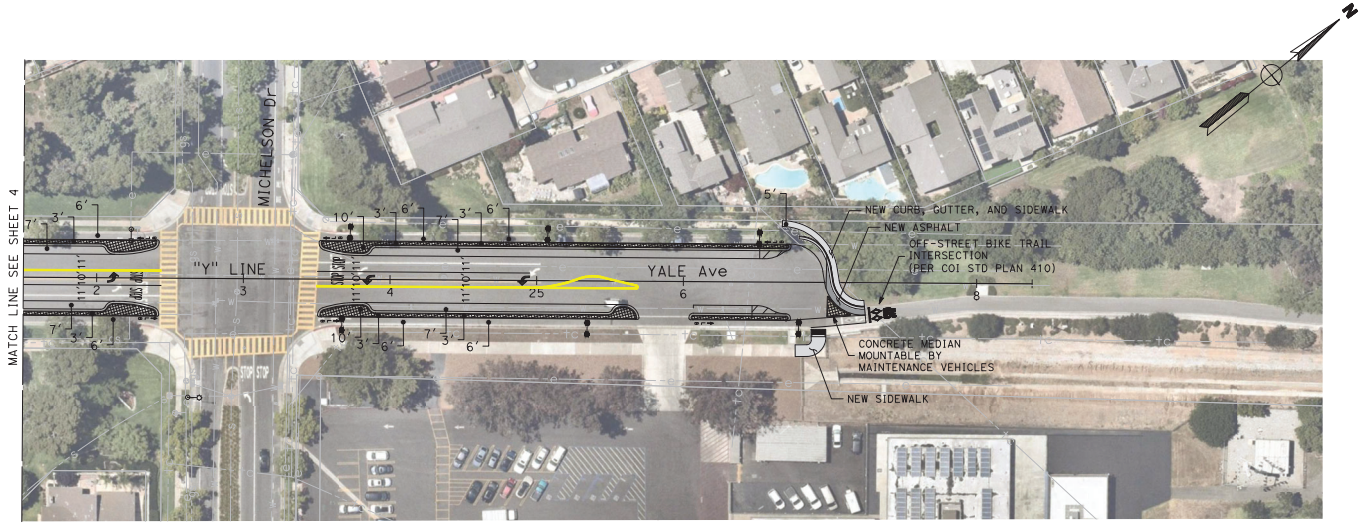

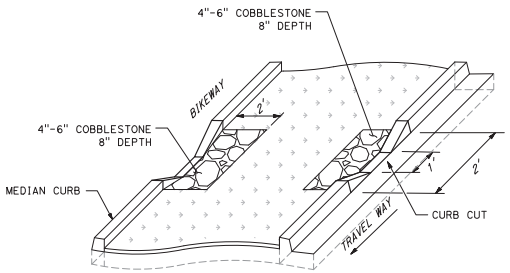

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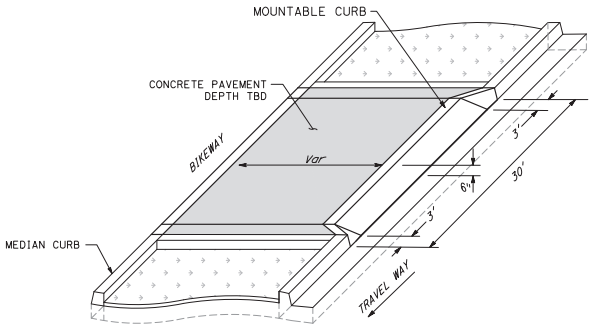

MAINTENANCE VEHICLE PULLOUT
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DRAWN BY: T. MIYATA — DATE 2/20/2024
DESIGNED BY: T. MIYATA — DATE 2/20/2024
CHECKED BY: A. SILVA — DATE 2/20/2024

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SOUTH YALE
CORRIDOR IMPROVEMENTS
LAYOUT

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PUBLIC WORKS DEPARTMENT

CIP NO. 312204
SHEET 4 of 4

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SOUTH YALE IMPROVEMENTS



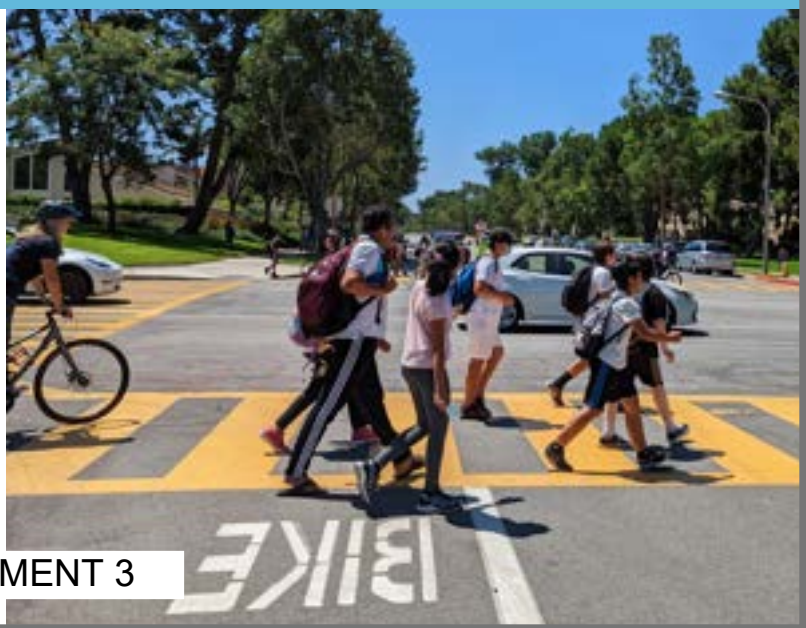
SOUTH YALE CORRIDOR IMPROVEMENTS PROJECT

Project Report

April 2024

CIP No. 312204

prepared for: CITY OF IRVINE 1971



ATTACHMENT 3

MARK THOMAS

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I. Introduction

The South Yale Corridor Improvements Project (Project) is located in the City of Irvine (City) along Yale Avenue between Interstate 405 (I-405) and University Drive. Originally identified in the City's 2020 Strategic Active Transportation Plan, the Project recommends improvements to multi-modal mobility and access along Yale Avenue to address City goals of reducing greenhouse gas emissions, diversifying mobility options, and improving safety. The Project study corridor is within the University Park community, adjacent to Rancho San Joaquin Middle School (RSJMS), and connects to the University Trail off-street multi-use path within the OC Parks managed William R. Mason Regional Park.

The Project boundaries are approximately 350-feet north of Michelson Drive to the north and University Drive to the south, which covers a distance of 2,700-feet. The segment of Yale Avenue that's located in the study area currently includes landscaped parkways, sidewalks, on-street bike lanes (Class II bikeways), and two travel lanes. Marked crosswalks exist at the Yale Avenue and University Drive intersection and the Yale Avenue and Michelson Drive intersection. The 64-feet wide roadway is considered for redesign to improve current mobility and traffic operation. Potential Project benefits include but are not limited to:

- Improved safety for all roadway users;
- Diversified travel options; enhanced connections to the City's off-street trail network;
- Reduced air, noise, and stormwater pollution; and
- Community-building and increased quality of life with recreational opportunities.

Through agency review and significant community engagement activities, a roadway cross-section concept was approved and advanced to conceptual engineering design and environmental review. The Project improvements include modifications at three (3) intersections and a designated pedestrian crossing located approximately 715-feet south of Michelson Drive.

The proposed roadway cross-section recommends the following:

- One-way cycletracks (Class IV bikeway) in each direction,
- raised buffer,
- some on-street motor vehicle parking, and
- one motor vehicle travel lane in each direction.

Time restricted parking will be allowed north and south of Michelson for approximately 700 feet, then a wider raised landscaped buffer will be provided. The Project modifications are planned to occur within the existing curb-to-curb width. The Project recommends signage,

pavement markings, and intersection modifications at the Yale Avenue/Michelson Drive intersection and signage, pavement markings, and traffic signal modifications at the Yale Avenue/University Drive intersection. Additional recommendations include pedestrian crossing enhancements such as improved signing and striping, and reduced crossing distance as a result of the cycletracks' raised buffers.

Construction is anticipated to have a duration of approximately one (1) year.

II. Background

A. Project History

The South Yale Avenue corridor was originally identified in the City's 2020 Strategic Active Transportation Plan (SATP) as an opportunity to implement enhanced bicycle facilities, with the SATP recommending buffered Class II bicycle lanes or a Class IV separated cycletrack. In the recently adopted 2024 Sustainable Mobility Plan (SMP), Class IV separated bikeway (cycletrack) is also proposed along Yale Avenue south of I-405. Yale Avenue currently is striped for two (2) travel lanes while the roadway width can accommodate four (4) travel lanes. In the adopted General Plan Circulation Element, Yale Avenue is classified as a secondary highway between University Drive and Michelson Drive. North of Michelson Drive, Yale Avenue is classified as a commuter highway with a planned vehicular overcrossing over I-405.

B. Previous Community Interaction

The Project was a recommendation of the City's SATP and SMP, both of which incorporated robust community engagement in their development. Engagement methods included social media posts (i.e. Facebook, Twitter, Nextdoor), email communication, online mapping, surveys, and other in person events. The online mapper and online survey allowed community members to provide anecdotal feedback on a geo-coded map that highlighted the community's areas of interest.

III. Existing Facility

As shown in Figure 1, the Project is located along Yale Avenue and entirely within the City-owned ROW. The curb-to-curb width for the entire Project limit is 64-feet. The Project distance measures at approximately 2,700 feet in length, with the north extent starting 300 feet north of Michelson Drive and extending south to University Drive. The posted speed limit along Yale Avenue is 40 miles per hour between University Drive and Royce Road and is 45 miles per hour between Royce Road and Michelson Drive.

The Project connects to existing bicycle and pedestrian facilities on both ends. To the north, the Project connects to a Class I path that provides connectivity to the pedestrian and bicycle

bridge over I-405. To the south, the Project provides access to the University Trail off-street multi-use path via the Yale Avenue and University Drive intersection crosswalk's western leg. Sidewalks exist on both sides of Yale Avenue. The east side of the roadway provides a wider 9-foot width whereas the west sidewalk is 5-feet wide. Marked crosswalks exist at the Yale Avenue intersections with University Drive and Michelson Drive. The intersection at University Drive provides crosswalks on the west and north intersection legs only. A community paseo connects to the sidewalks on both the east and west sides of Yale Avenue approximately 700-feet south of Michelson Drive. The mid-block paseo south of Michelson Drive does not include a marked crosswalk, pedestrian curb ramp, or other pedestrian crossing features.

Existing Adjoining Land Uses and Facilities

1. Land Uses

The Project is adjacent to several land use types that impact its functionality, including low and medium density residential, the RSJMS educational facility, and the William M. Mason Park recreational area. On the west side of Yale Avenue between Royce Road and University Drive and Michelson Drive and the I-405, there is zoning for low-density residential (0-5 units per acre). On the east side of the Project area and west side between Royce Road and Michelson Drive, the land is zoned for medium-density residential (0-10 units per acre). The only non-residential land use within the Project area is at RSJMS. Nearby land uses include parks and medium high density residential (0-25 units per acre). Figure 2 identifies land uses and key destinations within the study area.

The Project is primarily surrounded by residential land uses to the east and west, with no residential units fronting Yale Avenue. Permanent on-street parking within the project limit is currently prohibited. Temporary parking occurs on special occasions through special permits during RSJMS school events. As seen in Section IV. Traffic Data, the majority of average daily traffic along the corridor occurs in the morning peak period reflecting an overlap in morning commutes and school drop-off times.

RSJMS is located adjacent to the northern study limits and directly influences Yale Avenue traffic, especially during the school year from August to June. Traffic and parking are particularly affected during morning drop-off, afternoon pick-up, and school special events. Although the school driveway along Michelson Drive is the designated drop-off location, a considerable number of students are dropped off along Yale Avenue. Additionally, many students walk and bicycle to school along the existing sidewalks along Yale Avenue.

William R. Mason Park is located at the southern end of the study area and provides bicycle and pedestrian connectivity to land uses adjacent to the Project location. Adjacent to the

intersection of Yale Avenue and University Drive in William R. Mason Park is environmentally sensitive OC Parks land that limits development.

Yale Avenue is located within 2-miles of various pedestrian generators including parks, multi-use paths, trails, schools, hospitals and health care facilities, senior centers, recreation centers, libraries, transit stations, retail, places of worship, office facilities, and bus stops. The closest destinations and trip generators near the Project area include University Community Park and the Adventure Playground, University Elementary School, OC Library- University Park, Parkview Shopping Center, and University Park Shopping Center, which can be accessed via Michelson Drive and University Drive. Other nearby destinations include the University of California Irvine, Concordia University Irvine, South Lake Middle School, Rancho Senior Center, Woodbridge Community Park, Hoag Hospital, and Kaiser Permanente Medical Center.

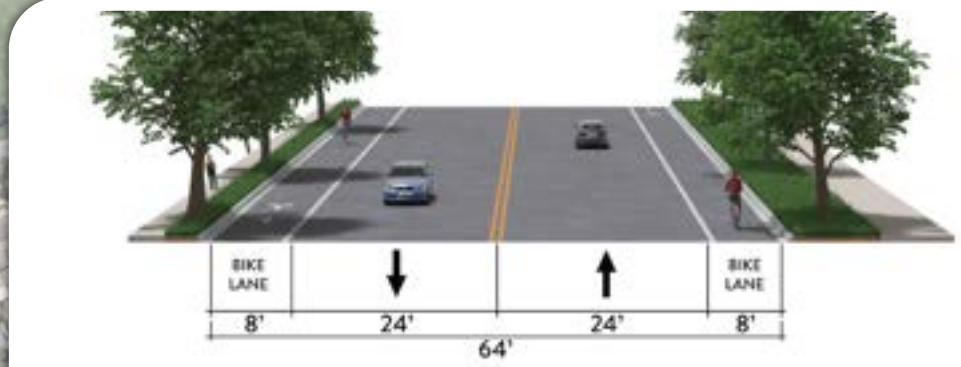
2. Facilities

The Project intersects or connects to several facilities including I-405 pedestrian and bicycle bridge, Michelson Drive, Royce Road, University Drive and University Trail. The I-405 pedestrian and bicycle bridge is located north of the study area and provides a connection between the Project area and the Class II bike lanes on Yale Avenue and Yale Loop north of the freeway.

Michelson Drive is an east-west commuter roadway that intersects Yale Avenue south of the Project's northern terminus and the I-405 pedestrian and bicycle bridge. The two-lane Michelson Drive features Class II bike lanes on both sides and includes a landscaped center median. The posted speed limit along Michelson Drive is 35 MPH. The stop-controlled intersection with Yale Avenue provides high-visibility crosswalks, curb ramps, and tactile bumps at each leg of the intersection.

Royce Road is an east-west residential street that intersects with Yale Avenue south of the Michelson Drive intersection. The Yale Avenue and Royce Road intersection does not feature marked crossings but does provide curb ramps with tactile bumps at each leg of the intersection.

Located at the southern Project limits, University Drive is a four-lane Primary roadway with Class II bike lanes on both sides. The posted speed limit on University Drive is 50 MPH east of Yale Avenue and 55 MPH west of Yale Avenue. The signalized intersection at University Drive and Yale Avenue features crosswalks on the west and north legs along with curb ramps and tactile bumps. Pedestrian crossing is prohibited on the east leg. The University Trail multi-use path is located south of the Project limits and can be accessed via the western leg crosswalk of the Yale Avenue and University Drive intersection. University Trail connects to several trails that provide access to destinations including William R. Mason Park, University High School and Concordia University.



EXISTING YALE CROSS-SECTION

ROYCE RD

YALE AVE

STOP

STOP

STOP 4-WAY

MASON REGIONAL PARK

UNIVERSITY DR

MICHELSON DR

Rancho San Joaquin Middle School

INTERSTATE 405

SOUTH YALE IMPROVEMENTS

Figure 1. Project Location Map

SOUTH YALE IMPROVEMENTS

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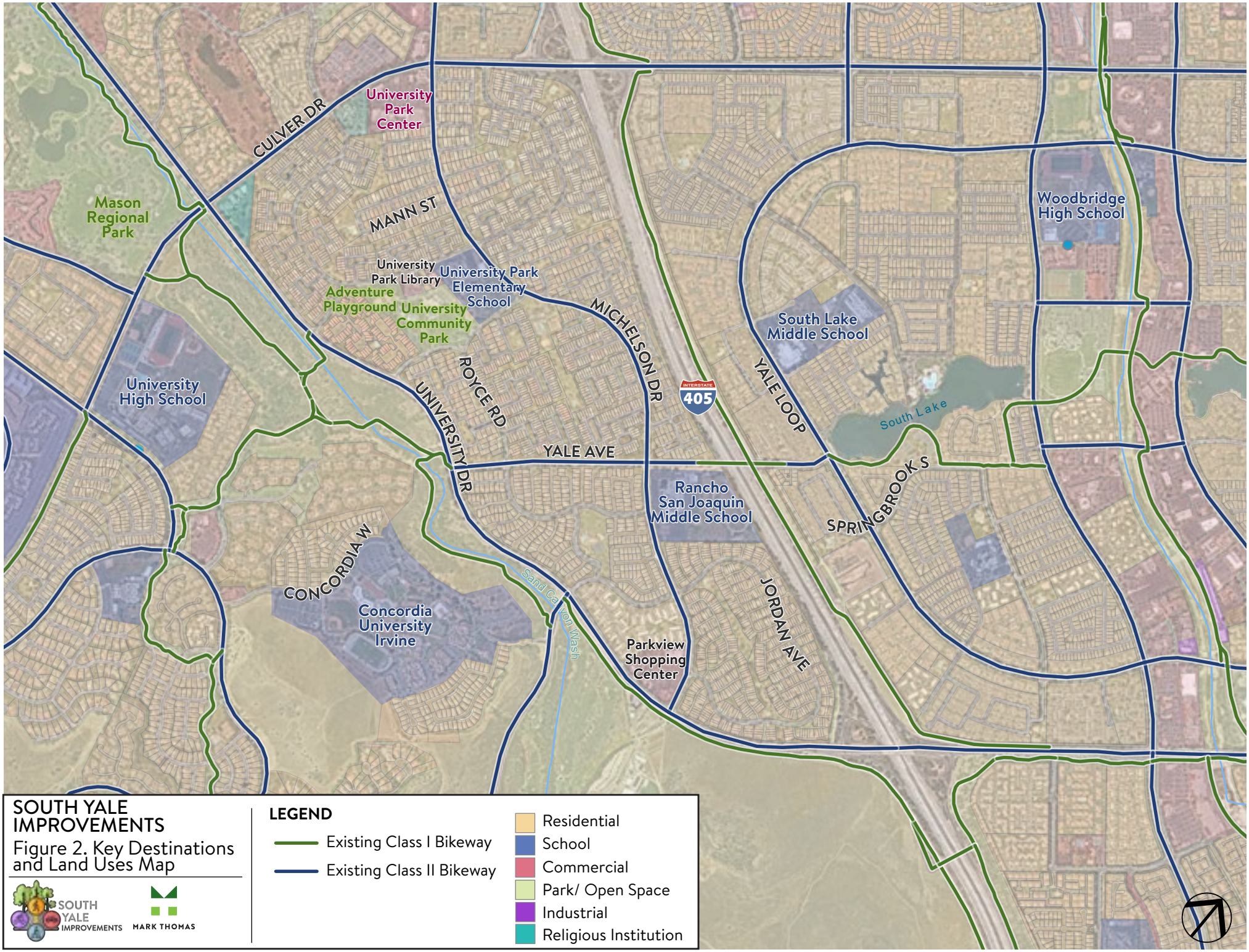
LEGEND

- Existing Signal
- Existing 4-Way Stop
- Study Corridor
- Trail



SOUTH YALE IMPROVEMENTS

Figure 2. Key Destinations and Land Uses Map

SOUTH YALE IMPROVEMENTS

MARK THOMAS

LEGEND

- Existing Class I Bikeway
- Existing Class II Bikeway
- Residential
- School
- Commercial
- Park/ Open Space
- Industrial
- Religious Institution

IV. Traffic Data

A. Existing Traffic Conditions

Traffic counts were performed on Tuesday 15th and Wednesday 16th of November 2022. Morning peak period (AM) and afternoon peak period (PM) traffic counts were collected between 7:00 AM to 9:00 AM and 2:30 PM to 6:00 PM, respectively, along with roadway average daily traffic (ADT) counts. Table 1 summarizes the motor vehicle traffic count data. Generally, the highest traffic volumes were observed during the morning peak period, aligning with morning commutes and the RSJMS drop-off time. Almost half of the observed daily traffic along Yale Avenue north of Michelson Drive occurred during the morning peak period. Yale Avenue south of Royce Road had higher traffic volumes than north of Royce Road.

Table 1 - Daily and Peak Period Traffic Summary

Location	ADT	AM Peak	PM School Peak	PM Evening	AM Peak %	PM School Peak%	PM Evening%
Yale Avenue north of Michelson Drive	540	250	135	8	46%	25%	1%
Yale Avenue north of Royce Road	1,230	253	188	89	21%	15%	7%
Yale Avenue south of Royce Road	1,770	295	217	133	17%	12%	8%

The Yale Avenue intersection movement counts are shown in Table 2 for the two days of collected counts. Traffic volumes at the three intersections show higher volumes at the Yale Avenue and University Drive intersection reflecting the higher volumes along University Drive.

Table 2 - Yale Avenue Intersection Movement Counts by Period

Intersection	Date	Peak	Hour Starting	TOTAL
Yale/Michelson	Tue, Nov 15, 2022	AM	7:45 AM	710
		PM	2:30 PM	581
		PM	4:45 PM	597
	Wed, Nov 16, 2022	AM	7:45 AM	753
		PM	2:30 PM	604
		PM	4:45 PM	575
	Average	AM	7:45 AM	732
		PM	2:30 PM	593
		PM	4:45 PM	586
Yale/Royce	Tue, Nov 15, 2022	AM	7:45 AM	380
		PM	2:15 PM	285
		PM	4:45 PM	214
	Wed, Nov 16, 2022	AM	7:45 AM	385
		PM	2:15 PM	291
		PM	4:45 PM	177
	Average	AM	7:45 AM	383
		PM	2:15 PM	288
		PM	4:45 PM	196
Yale/University	Tue, Nov 15, 2022	AM	7:45 AM	2,393
		PM	2:30 PM	1,578
		PM	4:45 PM	2,556
	Wed, Nov 16, 2022	AM	8:00 AM	2,373
		PM	2:30 PM	1,651
		PM	4:45 PM	2,544
	Average	AM	8:00 AM	2,383
		PM	2:30 PM	1,615
		PM	4:45 PM	2,550

Intersection Level of Service (LOS) analysis was prepared during the AM, PM, and school peak hours for Existing conditions and results are shown in Table 3. Under Existing conditions, the study intersections are operating at acceptable LOS (LOS C or better) during both AM and PM peak periods.

Table 3 - Existing Conditions Intersection Peak Hour LOS

#	Intersection	Methodology	Existing					
			AM		Evening PM		School PM	
			V/C Delay	LOS	V/C Delay	LOS	V/C Delay	LOS
1	Yale Ave and Michelson Dr	HCM[1] 4-WSC[2]	17.7	C	14.0	B	13.3	B
2	Yale Ave and Royce Rd	HCM 2-WSC[3]	17.9	C	10.6	B	10.6	B
3	Yale Ave and University Dr	ICU[4]	0.53	A	0.48	A	0.32	A

As shown in Table 4, the roadway segment analysis illustrates Yale Avenue operations at LOS A for Existing conditions.

Table 4 - Existing Conditions Roadway Study Segment LOS

#	Segment	Existing				
		Type	Total Capacity	ADT	V/C	LOS
A	Yale Ave North of Michelson Dr	Commuter	13,000	540	0.04	A
B	Yale Avenue between Michelson Drive and Royce Road	Commuter	13,000	1,230	0.09	A
C	Yale Avenue between Royce Road and University Drive	Commuter	13,000	1,770	0.14	A

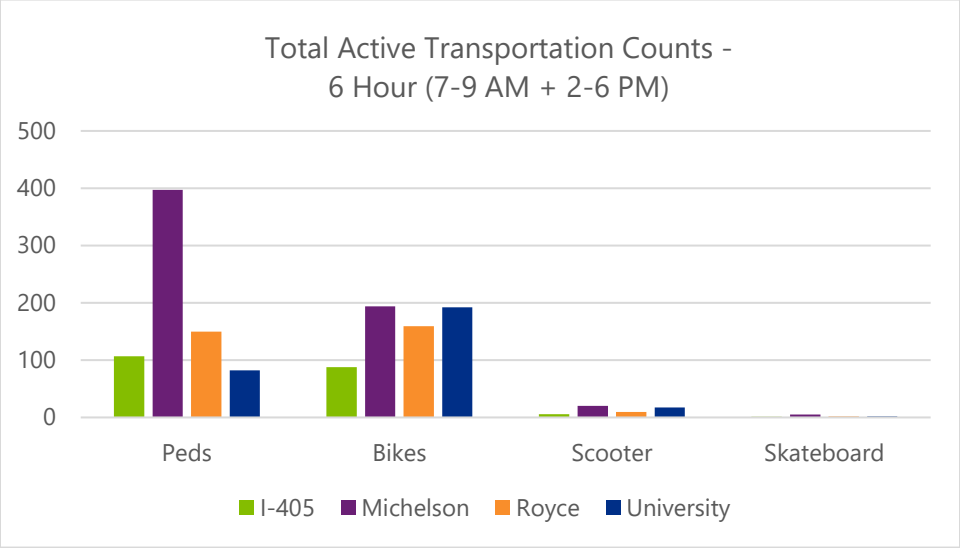
Table 5 and Figure 3 show the total active transportation movement counts during AM (7AM-9AM) and PM (2PM-6PM) periods (six hours) at the study intersections and at I-405 overcrossing by mode. The highest pedestrian movement is at Yale Avenue and Michelson Drive directly adjacent RSJMS. Bicycle counts show more even distribution throughout the study area, suggesting bicyclists traverse the entire study corridor while pedestrians are either walking to nearby homes or loading by automobile along adjacent streets. This observation was supported by field observations. Scooters and skateboards were observed as a less common travel mode, with a total of 53 and 10 observed respectively.

[1] Highway Capacity Manual 6th Edition
[2] Four-way stop controlled
[3] Two-way stop controlled
[4] Intersection Capacity Utilization

Table 5 - November 2022 AM and PM Periods Active Transportation Counts

Mode	I-405 Overcrossing	Yale/Michelson	Yale/Royce	Yale/University	Total by Mode
Pedestrians	107	397	150	82	735
Bicyclists	88	194	160	192	634
Scooter	6	20	10	18	53
Skateboard	1	5	2	2	10
Total by Segment	**201**	**616**	**321**	**294**	**1431**

Figure 3—Total Active Transportation Counts along Yale Avenue



B. Buildout Conditions

In the adopted General Plan Circulation Element, Yale Avenue is classified as a secondary highway between University Drive and Michelson Drive. North of Michelson Drive, Yale Avenue is classified as a commuter highway with a planned vehicular overcrossing over I-405. The City has coordinated with OCTA regarding implementation of the Project and the Project does not intend to formally change the OCTA managed Master Plan of Arterial Highways (MPAH) classification of Yale Avenue.

Since the City General Plan identifies the potential future construction of Yale Avenue over I-405 to serve car traffic, additional traffic scenarios were analysis with and without the roadway crossing. Therefore, the following four (4) buildout conditions are evaluated for traffic analysis considering the possibility of a vehicular overcrossing and the number of vehicle travel lanes on Yale Avenue:

- I-405 Vehicular Overcrossing (OC) with Four-Lane Yale Avenue
- I-405 Vehicular OC with Two-Lane Yale Avenue
- No I-405 Vehicular OC with Four-Lane Yale Avenue
- No I-405 Vehicular OC With Two-lane Yale Avenue

The study intersection forecast LOS analysis was prepared during the AM and PM peak periods as shown in Table 6.

Table 6 – Forecast Buildout Conditions Study Intersection Peak Hour LOS

#	Intersection	Methodology	Buildout Year I-405 Vehicular OC With Four-Lane Yale Ave		Buildout Year I-405 Vehicular OC With Two-Lane Yale Ave		Buildout Year No I-405 Vehicular OC With Four-Lane Yale Ave		Buildout Year No I-405 Vehicular OC With Two-Lane Yale Ave	
			AM	PM	AM	PM	AM	PM	AM	PM
			LOS	LOS	LOS	LOS	LOS	LOS	LOS	LOS
1	Yale Avenue and Michelson Drive	HCM[5] 4-WSC[6]	F	F	F	F	C	C	C	C
2	Yale Avenue and Royce Road	HCM 2-WSC[7]	E	C	E	C	C	B	C	B
3	Yale Avenue and University Drive	ICU[8]	B	A	B	A	B	A	B	A

N/A = Not Applicable

The following intersections under buildout year I-405 vehicular OC with four-lane Yale Avenue are expected to operate at LOS E or worse during either AM or PM peak hours:

- Yale Avenue and Michelson Drive (AM LOS F | PM LOS F for four-way stop-controlled operation)
- Yale Avenue and Royce Road (AM LOS E for two-way stop-controlled operation)

The following intersections under buildout year I-405 vehicular OC with two-lane Yale Avenue are expected to operate at LOS E or worse during either AM or PM peak hours:

- Yale Avenue and Michelson Drive (AM LOS F | PM LOS F for four-way stop-controlled operation)
- Yale Avenue and Royce Road (AM LOS E for two two-way stop-controlled operation)

Signalization is identified as a potential improvement to provide acceptable LOS at Yale Avenue and Michelson Drive as it meets signal warrants. A four-way stop controlled

[5] Highway Capacity Manual 6th Edition
[6] Four-way stop controlled
[7] Two-way stop controlled
[8] Intersection Capacity Utilization

intersection at Yale Avenue and Royce Road is identified as a potential improvement to reduce delay.

The study roadway segment forecast LOS analysis was prepared for daily traffic as shown in Table 7.

Table 7 - Buildout Conditions Roadway Study Segment LOS

#	Segment	Buildout Year I-405 Vehicular OC with Four-Lane Yale Ave	Buildout Year I-405 Vehicular OC with Two-Lane Yale Ave	Buildout Year No I-405 Vehicular OC with Four-Lane Yale Ave	Buildout Year No I-405 Vehicular OC with Two-Lane Yale Ave
		LOS	LOS	LOS	LOS
A	Yale Avenue North of Michelson Drive	D	D	A	A
B	Yale Avenue between Michelson Drive and Royce Road	A	A	A	A
C	Yale Avenue between Royce Road and University Drive	A	A	A	A

As shown in Table 7, the study segments are forecast to operate at acceptable LOS (LOS D or better) operations under all four buildout conditions scenarios.

Collision Data

Within the study area, a total of six collisions were recorded between March 2016 and March 2018 and are identified in Figure 4. Of the six collisions, four property damage only collisions were reported at the intersection of Yale Avenue and University Drive. At the intersection of Yale Avenue and Michelson Drive two collisions with bicyclists are recorded near the south leg crosswalk.


3/6/2016
2/24/2018
3/24/2018
12/23/2017
11/8/2017
3/19/2016
2/23/2017
2/8/2016
YALE AVE
MICHELSON DR
UNIVERSITY DR
ROYCE DR
Rancho San Joaquin Middle School
SOUTH YALE IMPROVEMENTS
Figure 4. Collision Map
SOUTH YALE IMPROVEMENTS
MARK THOMAS
LEGEND
XX/XX/XX Collision Date
Property Damage Only Collision
Cyclist Collision
Vehicle, Nighttime
Vehicle, Daytime

V. Deficiencies and Justifications

The City of Irvine General Plan Circulation Element designates Yale Avenue as a secondary highway, where secondary highways provide for the movement of traffic between planning areas and/or the movement of traffic to and from activity centers within planning areas. North of Michelson Drive and over I-405, Yale Avenue is designated as a commuter highway. A commuter highway functions primarily as a collector facility which has the ability to handle through traffic movements between arterials. However, the commuter highway segment over I-405 remains undeveloped, resulting in Yale Avenue being built for more vehicular travel lanes than needed for traffic demands.

In addition to an excess roadway ROW for current traffic demand, the existing bicycle facilities along Yale Avenue are not separated from motor vehicles. The feedback from the Project's community engagement largely supported a separated cycletrack along Yale Avenue to lower the bicyclist level of stress which in turn can improve multi-modal conditions and encourage more bicycle trips. As shown by the 2023 United States Federal Highway Administration (FHWA) study titled "Developing Crash Modification Factors for Separated Bicycle Lanes", converting a Class II bike lane to a Class IV separated bikeway yields a 50% or more reduction in crashes. Implementation of lower stress bicycle facilities may encourage additional pedestrian trips through increased separation from moving car traffic and with less cyclists use of the sidewalk.

The community also noted an absence of pedestrian crossings, particularly at the community paseos south of Michelson Drive. The FHWA utilizes a chart for pedestrian crash countermeasures by roadway features, included in the "Guide for Improving Safety at Uncontrolled Crossing Locations". The City also considers factors such as posted speed limits, number of vehicle lanes, and vehicle and pedestrians volumes for installation of countermeasures at uncontrolled crossing. A Rectangular Rapid Flashing Beacon (RRFB) is proposed in conjunction with the proposed pedestrian crosswalk under the Project location conditions.

Other identified Project corridor challenges include:

- The lack of a crosswalk on the east leg of the Yale Avenue and University Drive intersection.
- Bicycle riding behavior observed along sidewalks introduces potential conflicts with pedestrians.
- Bicyclists counter-flow riding observed within the roadway introduces potential conflicts with other bicyclists and vehicles.

- An unmarked crossing at Royce Road intersection where there are sight distance concerns.

The Project will address existing challenges and reconfigure underutilized roadway space to provide improved bicycle facilities with a higher level of comfort and enhance pedestrian facilities for those who walk and bicycle and roll (skateboard, scooter, etc.) along Yale Avenue.

VI. Project Description

A. Proposal and Alternatives

Criteria was developed to support an evaluation of potential bicycle facility and roadway elements in December 2022. The criteria sought to identify positive outcomes or avoidance of issues of potential roadway concepts. The criteria included the following:

- Explores a new bikeway concept;
- Offers low stress bicycle facilities;
- Offers low stress pedestrian facilities;
- Provides direct access to University Trail and William R. Mason Regional Park;
- Provides direct access to RSJMS;
- Avoids conflicts with RSJMS parking and circulation;
- Matches drivers expectations;
- Avoids tree impacts;
- Impose minor impact on traffic operations;
- Allows for center medians or raised buffers;
- Avoids utility impacts;
- Avoids requiring new maintenance equipment; and
- Avoids complex reconfiguration of University Drive signal operations.

Potential roadway concepts evaluated through the criteria included the following:

- Two-way Class IV (cycletrack) on east side;
- Two-way Class IV (cycletrack) on west side;
- Class I (multi-use path) on east side;
- Class I (multi-use path) on west side;
- One-way Class IV (cycletrack) on both sides; and
- Class II (on-street bike lanes) with median (similar to Michelson Drive).

Utilizing the criteria, the concepts were narrowed to four (4) cross-section alternatives for subsequent public review and are shown in Attachment B – Cross Section Alternatives. The four alternatives included:

1. Alternative 1: 2-Way Class IV (Cycletrack) -West Side
    a. Provides a 12′ wide two-way cycletrack with a 4′ landscaped median on the west side of the roadway. Provides one 11′ vehicle travel lane and parking is available on both sides of the roadway. Includes a 10′ middle two-way turn lane.

2. Alternative 2: 2-Way Class IV (Cycletrack) -West Side Hybrid
    a. Provides a 12′ wide two-way cycletrack with a 4′ landscaped median on the west side of the roadway. Provides one 12′ vehicle travel lane and 6′ buffered Class II bike lane in each direction. Parking is available only on the east side of the roadway.
3. Alternative 3: 1-Way Class IV (Cycletrack)
    a. Provides a 7′ one-way cycletrack, 5′ landscaped median, and one 12′ vehicle travel lane in both directions. Parking is available on both sides of the roadway.
4. Alternative 4: Class II Buffered Bike Lanes and Widened Shared Use Path
    a. A 6′ Class II bike lane, 3′ buffer, and 12′ vehicle travel lane is provided in each direction. A 14′ median runs along the center of the roadway.

1. Preferred Project

Based on public feedback, Alternative 3, a one-way Class IV (cycletrack), was identified as the most desired Project cross-section. The public's support for the one-way Class IV (cycletrack) concept was documented during the second community workshop, where potential cross-sections were presented, and during the second public survey, where participants were asked to identify and rank the Project alternatives. The public's endorsement of Alternative 3 was further demonstrated through a Southern California Association of Governments (SCAG) *Go Human* demonstration event. One-way Class IV (cycletracks) were temporarily installed between Michelson Drive and Royce Road with materials from the SCAG *Go Human* Kit of Parts. This event provided an opportunity for the public to experience the Alternative 3 concept firsthand and provide immediate feedback. Alternative 3 was further refined with more design features in the finalized concept.

The preferred Project concept includes:

- One-way Class IV (cycletracks) on each side of the roadway that are 6 to 7-feet wide with raised landscaped/concrete buffers.
- New and modified pavement delineation (striping) and signage.
- Parking and passenger loading/unloading zones adjacent to the landscaped/concrete buffers between north end of Yale Avenue and the community paseo approximately 700 feet south of Michelson Drive. Approximately 46 vehicles could park south of Michelson Drive and 19 could park north of Michelson Drive after implementation of the Project.
- Reduced crossing distances for pedestrians at all intersections and the paseo (via the Class IV cycletrack buffers).
- High-visibility crosswalk markings, advanced yield lines, pedestrian refuge islands (via the Class IV cycletrack buffers), and installation of a Rectangular Rapid Flashing Beacons (RRFB) traffic control device at the paseo approximately 700 feet south of Michelson Drive.
- Traffic signal modifications for bicycle operations and green crossbike paint at the Yale Avenue and University Drive intersection. Additional improvements at the Yale Avenue and University Drive intersection include modification to the southwest corner guard rail for a widened and upgraded ADA curb ramp within City ROW.
- Additional streetlights throughout the Project area.
- New sidewalk, curb, and gutter at north end of Yale Avenue to connect to the pedestrian and bicycle I-405 overcrossing.

The proposed Project recommends modification to the traffic signal operations to provide a dedicated phase to allow bicyclists and pedestrians to cross University and for northbound cyclists to access the cycletrack. The traffic signal modifications are included in the cost estimates for the project and the operations have been reviewed assuming the signal phasing operations which is not forecast to cause deficient level of service operations.

The preferred Project improvements are located within the existing City owned ROW and will have minimal impacts on existing landscaping and sidewalks. Project benefits include but are not limited to a reduction in roadway collisions; diversified travel options; enhanced connections to the City's off-street trail network; reduced air, noise, and stormwater pollution; reduced motorist speeding behavior, and community-building and increased quality of life with recreational facilities.



Figure 5 —Bicyclists riding in the temporary Class IV cycletrack on Yale Avenue during the SCAG Go Human Demonstration Event on August 26th, 2023

2. Alternatives Withdrawn from Consideration

The first online public survey was open from October 4th, 2022 to November 4th, 2022 which identified the following improvements as most effective in encouraging walking and biking along the Project Corridor:

1. Enhanced bicycle/pedestrian separation from moving cars
2. Improved crossings at existing intersections
3. Wider bike lanes
4. Slower vehicle speeds

On October 22nd, 2022, a Project workshop was held in-person at the University Community Center in Irvine. Approximately 50 attendees attended. From the engagement at the public workshop, the Project Team identified the following considerations for the corridor;

- Enhanced bicycle/pedestrian separation from moving cars
- Support improved crossings at existing intersections
- Slower motor vehicle speeds
- Suggestions for a center median
- Additional pedestrian crossings
    - Particularly at Yale Avenue and Royce Road intersection and at paseo north of Tamarack Way where there is no marked crossing or pedestrian curb ramps

In December 2022, the following concepts were evaluated for consideration in the development of Project alternatives:

- Two-way Class IV (cycletrack) on east side;
- Two-way Class IV (cycletrack) on west side;
- Class I (multi-use path) on east side;
- Class I (multi-use path) on west side;
- One-way Class IV (cycletrack) on both sides; and
- Class II (on-street bike lanes) with median (similar to Michelson Drive).

The initial scoring identified the top three concepts as the two-way cycletrack on the west side, two-way cycletrack on the east side, and the one-way cycletrack on both sides of Yale Avenue. Four cross-section alternatives were developed based on this initial evaluation of concepts. Feedback was sought on the cross-section alternatives in the second public survey that was open from March 8th, 2023 to April 7th, 2023. Table 8 below details the results of the survey when respondents were asked for their first and second choice cross-section alternative:

Table 8 - Survey Results for Preferred Cross-Section Alternatives

Cross-Section Alternative	1st Choice for % of Respondents	2nd Choice for % of Respondents
Alternative 3 (One-Way Cycletrack)	30%	33%
Alternative 4 (Buffered Bike Lanes and Widened Shared Use Path)	28%	17%
Alternative 1 (Two-Way Cycletrack-West Side)	23%	29%
Existing Conditions	13%	9%
Alternative 2 (Two-Way Cycletrack- West Side Hybrid)	6%	13%

Alternatives 1, 2, and 4 were removed from consideration following strong support for Alternative 3 from the public and City staff.

3. No Project Alternative

In the No Project alternative, no improvements are proposed along the Yale Avenue corridor. Consequently, the Yale Avenue corridor would remain a wide roadway without the benefit of enhancing bicyclist and pedestrian mobility and safety that support the City's goal of GHG reductions and potential management of travel speeds.

4. Project Phasing

Implementation of the Project would be carried out in a single project phase.

B. Material Alternatives and Restrictions

The Project implementation will include construction of two one-way Class IV cycletracks and two raised buffers. Cycletrack construction would consist of concrete, asphalt concrete, and aggregates for base materials as available to the City.

The Project team has also identified and analyzed landscaped and hardscaped options for the proposed raised buffers. Selected materials will be identified during the Plan, Specification, and Estimate (PS&E) phase and will be indicated on the Project construction plans.

C. Non-Standard Design Features / Variances

The Project concept includes variances from the City Standard Plans with vehicle travel lane widths and parking lane widths.

The Class IV separated cycletrack may be the first facility of its kind within the City, subject to other parallel City efforts, that requires a deviation from the current City standards or minimum requirements. Standard Plan 104 note 9 from the City Standard Plans states each parallel parking space shall have a minimum dimension of 8 feet wide by 22 feet long and shall be in accordance with the zoning ordinance section 4-4-1 A.5. The Project concept proposes 7-foot

wide parking along a landscaped buffer, consistent with the National City Transportation Officials (NACTO) Urban Street Design Guide which recommends parking stalls be 7-9 feet wide. The City Signing and Striping Guidelines also call for 13-foot travel lanes next to raised medians, while the project proposes 11-foot-wide travel lanes. Caltrans Design Information Bulletin 94 (DIB 94) provides justification for the concept travel lane widths in *Table 5.3 Suggested Minimum Lane Widths by Place Type and Proposed Operating Speed*. As the Project is in a suburban area and has posted speed limits of 40-45 miles per hour, DIB 94 recommends 11 to 12-foot vehicle travel lane widths.

D. Utilities

Table 9 identifies the companies and agencies who own utilities within or near the study limits.

Table 9—Yale Avenue Utility Inventory

Company	Utility Equipment	Required Relocations
AT&T Distribution	• Buried, conduit, building, and underground substructures	No
COX Communications	• Underground 2" Conduit	No
Irvine Ranch Water District	• 12" RCP Sewer • 8" Water Line • 6" ACP RW • 4" Service Line RW	Potential
Municipal Water District of Orange County	• 12" ACP water main • 54" inside-diameter welded-steel East Orange County Feeder No. 2 and accompanying manhole structures, air-release-vacuum-valve structure • 40' wide permanent easement right-of-way	Potential
Southern California Edison	• UG Conductor 0-750V	No
Southern California Gas Company	• 8" HSL 35-20-4 • 3" PA	No

1. Determination of Prior Rights

Prior rights have yet to be confirmed but will be identified in the Caltrans B-letters process via coordination with the identified utility companies in the Project area. Through this process the utilities companies will provide their rights within the roadway.

From a review of received As-Builts and GIS maps, it can be assumed that AT&T Distribution, COX Communications, Irvine Ranch Water District, Southern California Edison, and Southern California Gas Company have a franchise agreement with the City as they all have infrastructure within the roadway and/or sidewalk of Yale Avenue. Metropolitan Water District (MWD) is assumed to pre-exist the roadway and appears to have permanent right-of-way 20 feet to either side of the 55-inch pipeline. It is assumed at this point that they have prior rights and would likely be the City's liability for any potential cost for adjustments.

2. Required Relocations

The Project utility mapping analysis revealed challenges in accurately determining the locations of various utilities but relocations of all utilities were determined to be unlikely. Continued utility coordination will be necessary during the Project's preliminary engineering phase. The telecommunications GIS maps did not provide accurate alignments for manholes or pull boxes so aerial imagery and site visit review was utilized to identify their locations. Additionally, most utilities lack elevation details, except for the water lines. The available information suggests that the water lines were placed approximately 10 feet below elevation.

Anticipated conflicts which are likely to require relocations within the study area include water valve covers in the proposed landscaped/concrete buffers and Class IV cycletracks. The water lines located 10 feet under the surface and running parallel to the buffers are unlikely to require relocation and instead may constrain the types and placements of plants within the proposed landscaped/concrete buffers.

E. Drainage

The Project proposes two total Filterra treatments at the storm drain inlets on the west and east sides of Yale Avenue near the University Drive intersection.

F. Landscaping & Irrigation

The Project will incorporate plant selections harmonizing with the surrounding landscape areas and adhere to the guidelines outlined in the City Landscape Manual and Standard Plans. The Project irrigation strategy will prioritize water efficiency, employing techniques such as bubblers and drip irrigation systems detailed in the City Landscape Manual and Standard Plans.

G. Traffic Signal Improvements

The proposed Project recommends modification to the traffic signal operations to provide a dedicated phase to stop motor vehicle traffic and allow bicyclists and pedestrians to cross University and for northbound cyclists to access the cycletrack. The traffic signal modifications are included in the cost estimates for the project and the operations have been reviewed assuming the signal phasing operations which is not forecast to cause deficient level of service operations.

H. Conformance with General Plan and Zoning Code Standards

The Project is in conformance with the following objectives from the City's General Plan:

Element B Circulation

Objective B-3 addresses multi-modal goals by finding policies that support a pedestrian circulation system to support and encourage walking as a mode of transportation.

Element K Parks and Recreation

Objective K-3 aims to establish parks and recreation facilities with safe and easy access via policy (c), which uses the adopted 2017 Parks Master Plan to locate parks adjacent to public shared-use paths in an effort to connect parks to nearby paths for enhanced connectivity.

In addition to conformance with the City's General Plan, the Project was identified in the City's SATP as a potential opportunity to support mobility for bicyclists by implementing a Class IV cycletrack.

The Project also supports regional bicycle planning efforts which include OC Active, Orange County Transportation Agency's (OCTA) 2022 Long-Range Transportation Plan, and the 2016 OC Foothills Bikeways Strategy. The Project will connect to the existing bikeways on University Drive that are part of Corridor J, the Jeffrey Corridor of the OC Foothills Bikeways Strategy. When completed, Corridor J will provide over nine (9) miles of connected Class I and Class II bikeways.

I. Inter-Agency Considerations

The City is the lead agency for the Project. Inter-agency coordination has been ongoing throughout the Project planning process with OC Parks, Orange County Fire Authority (OCFA), and Irvine Police Department. OC Parks manages William R. Mason Regional Park which is adjacent to the Project area and located south of University Drive. The Project team has consulted with OCFA on allowable roadway design and with OC Parks related to potential habitat impacts in the regional park.

The following utility companies have infrastructure within the Project area where continued coordination will be needed; AT&T Distribution, Cox Communications, Irvine Ranch Water District, Municipal Water District of Orange County, Southern California Edison, and Southern California Gas Company.

J. Project Schedule

The Project's planning phase concluded in Summer 2024. The Project engineering phase is expected to begin in Fall 2024 and be completed within one (1) to two (2) years and one (1) additional year for Project construction.

K. Project Costs

The estimate cost of construction of the Project, based on 30% concept plans, is $7,865,000. Components of the Project cost include the construction of curb ramps, sidewalk, bike paths, landscaping, drainage, RRFB, traffic signal modification, and street lighting. A detailed construction cost estimate is provided in Attachment D- Engineering Cost Estimate. The total project cost is estimated to be $9,440,000, which includes the following project phases - preliminary engineering, final design, construction, construction engineering and other supporting costs, as detailed in Table 10.

Table 10 - Summary of Project Costs

Phase	Assumptions	Amount
Preliminary Engineering and Environmental Document	Completed	$325,000
Final Design and Right of Way Engineering and Administration	Includes contingency and management estimate	$500,000
Construction	Includes 25% contingency	$7,865,000
Construction Engineering and Administration	Includes contingency and management estimate	$573,000
Other Costs	Administration Costs	$177,000
	Total - All Phases	**$9,440,000**

VII. Agreements/Permits

The following coordination, agreements, and permit approvals will be required prior to commencement of project construction:

A. Utilities

Utility notification letters were sent to utility companies identified by the Dig Alert website for the study area. Continued coordination with the following companies will be required to confirm the locations, extents, and costs of necessary relocations:

- AT&T Distribution
- COX Communications
- Irvine Ranch Water District
- Municipal Water District of Orange County
- Southern California Gas Company
- Southern California Edison

B. Inter-Agency

OC Parks; Review of proposed improvements within City ROW along Yale Avenue and at the Yale Avenue and University Drive intersection.

OCTA; Review of proposed improvements within City ROW along Yale Avenue as it relates to the MPAH.

C. Intra-Agency

City of Irvine – California Environmental Quality Act Clearance documents; Approval of construction bid documents.

VIII. Right-of-Way

A. Existing ROW

The existing ROW is 91-feet wide along Yale Avenue within the project limit. The proposed Project improvements are to be implemented within the existing 64-foot curb-to-curb width within the existing City owned ROW. The improvements will have minimal changes to existing landscaping and sidewalks. Yale Avenue's existing roadway configuration is as follows:

- 5-foot sidewalk on the west side of the roadway.
- 4-foot landscaped area on the west side of the roadway.
- One 8-foot Class II bike lane.
- Two 24-foot motor vehicle travel lanes.
- One 8-foot Class II bike lane.

- 11-foot landscaped area on the east side of the roadway.
- 9-foot sidewalk on the east side of the roadway.

B. Constraints

William R. Mason Park

William R. Mason Park, located south of the University Drive and Yale Avenue intersection, is maintained by OC Parks and is an environmentally sensitive area. As an environmentally sensitive area, there are constraints on allowable development at the Yale Avenue and University Drive intersection. While an additional crossing on the east leg would benefit bicycle and pedestrian access to and from the University Trail, the nearby environmentally sensitive OC Parks land limits the development of a direct north-south crosswalk. Modification of the OC Parks managed area would impact protected habitat and require notable landform modifications that could also affect the creek flowlines. The existing University Drive and Yale Avenue intersection only provides crosswalks on the north and west legs of the intersection and therefore does not provide direct pedestrian and bicycle connectivity to the east side of Yale Avenue.

To address this constraint, the Project proposes providing a diagonal crossbike through the intersection. The Project improvements will accomplish greater bicycle access to and from the University trail and William R. Mason Park and support the implementation of one-way Class IV cycletracks.

University Park Homeowner's Association (HOA)

The University Park HOA owns the ROW adjacent to the roadway between University Drive and Michelson Drive as well as the community paseos. The Project's enhancements will not encroach on the HOA's ROW.

C. Proposed ROW

The Project improvements are planned within the existing City owned ROW. No additional ROW is proposed.

IX. Environmental Clearance

The proposed improvements will not create additional travel lanes and instead will include one-way Class IV bicycle facilities and pedestrian crossings that qualify for both a California Environmental Quality Act (CEQA) Class 1 Categorical Exemption (per Section 15301 of the CEQA Guidelines), the California Public Resources Code (PRC) 21080.25, as well as a Statutory Exemption under Senate Bill (SB) 922. The City is preparing a Notice of Exemption per the statutory exemption identified in PRC 21080.25.

The Project is statutorily exempt from a Water Quality Management Plan (WQMP) as the Project would reduce overall impervious areas in the study area. Despite this, a WQMP was prepared before the notice of the statutory exemption. The WQMP found that the post-Project conditions will increase the pervious roadway area to a total of 0.79 acres.

A biological study for the Project area was conducted which resulted in the following findings and recommendations:

- Due to the nature of the Project activities, no impacts are anticipated on special-status species, and existing landscaped and ornamental habitat on-site will be protected to the greatest extent possible through implementation of measure BIO - 1.
- Project activities should be conducted outside of the nesting bird season if feasibly possible as per measure BIO - 2.
- If the Project must occur during the nesting season (February 1–September 15), then preconstruction nesting bird surveys should be conducted by a qualified biologist as described in measure BIO - 3.
- In order to prevent the proliferation and spread of noxious, invasive weed species, all construction equipment, associated tools, and personnel footwear should be thoroughly washed before arriving on-site, as stated in measure BIO - 4.

A cultural study was conducted for the Project area. No archaeological resources were identified in the Project area and the potential for the Project to encounter or affect subsurface cultural materials during construction and its excavations is low. Additionally, no historic resources exist within or directly adjacent to the Project limits. The University Park neighborhood is not locally designated or identified as a potential historic district in the City of Irvine's General Plan. Therefore, the Project area contains no historical resources under CEQA. The Project does not have the potential to cause significant adverse impacts on historical resources under CEQA.

An Initial Site Assessment (ISA) was performed with the purpose to review, evaluate, and document present and past land uses and practices, and visually examine Project area conditions to identify recognized environmental conditions (RECs). A REC is defined as the presence or likely presence of any hazardous substances or petroleum hydrocarbons on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum hydrocarbons into structures or into the ground, groundwater, or surface water of the Project area. The REC term does not include de minimis conditions that generally do not present a threat to human health or the environment, and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. The ISA assessment did not reveal any RECs in connection with the proposed Project area.

X. Public Involvement/Hearing Process

The Project engagement, which included Phase I, Phase II, and the *Go Human* demonstration event, identified a variety of challenges and concerns as well as improvements.

Phase I included the following activities:

- Three (3) meetings at Rancho San Joaquin Middle School
  - School District meeting – August 26th, 2022
  - Executive Board Parent Teacher's Association – October 4th, 2022
  - Associated Study Body meeting – October 4th, 2022
- One (1) stakeholder meeting
  - In-Person Meeting – October 12th, 2022
- Five (5) Community Homeowner Association (HOA) meetings
  - Parkcrest HOA – October 6th, 2022
  - Parkside HOA – October 11th, 2022
  - University HOA – October 12th, 2022
  - The Terrace HOA – October 25th, 2022
  - Village Park – November 2nd, 2022
- One (1) in-person public workshop
  - October 22nd, 2022
- One (1) online survey
  - Via Mentimeter - October 4th, 2022 to November 4th, 2022
- Digital and print promotion of the Project

Phase II included the following activities:

- One (1) stakeholder meeting
  - Virtual Meeting – March 7th 2023
- One (1) virtual public workshop
  - Zoom Workshop – March 8th, 2023
- One (1) presentation at Rancho San Joaquin Middle School
  - Parent Teacher Association Presentation – March 16th, 2023
- Two (2) Community Homeowner Association (HOA) meetings
  - Parkside HOA – February 28th, 2023
  - Village Park HOA – March 30th, 2023
- One (1) online survey
  - Via Mentimeter – March 8th, 2023 to April 7th, 2023
- Digital and print promotion of the Project

- One (1) SCAG *Go Human* Demonstration event on August 26, 2023, which included the following:
    - Demonstration of separated one-way Class IV cycletrack
    - Community engagement hubs at Royce Road and University Drive
    - Digital and print promotion of the Go Human Demonstration event

Tribal consultation pursuant to Assembly Bill 52 is not required for the Project because the project is statutorily exempt from the requirement to comply with CEQA. The construction will be minor and will occur within the confines of the existing roadway.

The Project engagement was critical for guiding the vision for Yale Avenue and advancing the Project from its initial identification in the City's 2020 SATP. The engagement feedback will continue to be instrumental in the development of the Project through engineering and design. From Phase I, Phase II, and the *Go Human* demonstration event, the following Project priorities were identified:

- Incorporate physical separation between transportation modes, most especially between vehicles and bicyclists and bicyclists and pedestrians, through the construction of one-way Class IV cycletracks.
- Promote traffic calming through travel lane narrowing and other engineering and signage measures.
- Install crosswalks and other pedestrian crossing enhancements at the community paseos and at Royce Road.
- Install crossing enhancements at the existing crosswalks at Michelson Drive and University Drive.
- Consider parking and/or loading spaces near RSJMS that support student pick-up and drop-off as well as parking lot overflow during special events.
- Balance muti-modal travel needs and the community desire to maintain limited parking on Yale Avenue.

XI. Other Considerations

A. Impacts on Non-Motorized Transportation and Pedestrian Modes

During construction, modifications between existing curbs along Yale Avenue between the I-405 bridge and University Drive may require temporary impacts to bicycle and pedestrian routes within the study area. Detour routes will be accessible and clearly signed to direct bicyclists and pedestrians around the construction areas. The Project's one-way Class IV facilities will ultimately improve active transportation roadway user mobility and safety due to the physical separation between vehicles.

B. Prolonged Temporary Road and/or Ramp Closure

Construction of the proposed improvements will not require prolonged temporary road closures. To minimize construction impacts to local circulation, measures will be taken to minimize street/lane closures and detours, particularly during weekday rush hours and RSJMS related loading activity. Traffic control/detour plans will be prepared for necessary closures using approved City of Irvine traffic control guidelines.

C. Hazardous Waste or Material

Within the Project area, there is record of one site with recognized environmental conditions (REC). In May 1997, the Irvine Ranch Water District reported a release of 9,000 gallons of reclaimed water to the Orange County Emergency Management Division. Reportedly, a line broke on the customers side of a meter due to new installation of a gate valve. The reclaimed water flowed down the road into San Diego Creek down to Newport Back Bay. Based on this information, this listing does not represent a recognized environmental condition to the Project.

The following precautionary recommendation is provided in the event of unknown or suspect materials are encountered during construction:

<u>General Site Disturbance Activities</u>

If unknown wastes or suspect materials are discovered during construction by the contractor, which they believe may involve hazardous waste/materials, the contractor shall:

- Immediately stop work in the vicinity of the suspected contaminant, removing workers and the public from the area;
- Notify the City of Irvine Director of Public Works;
- Secure the areas as directed by the City;
- Notify the implementing agency's Hazardous Waste/Materials Coordinator; and
- Perform remedial activities as required under existing regulatory agency standards.

D. Wetland and Floodplain

The Project area lies on the Orange County Coastal Plain approximately 114 feet above mean sea level. The Orange County Basin is bounded to the north by the Puente and Chino Hills, to the east by the Santa Ana Mountains, to the south by the San Joaquin Hills, and to the southwest by the Pacific Ocean (DWR, 2003).

The Orange County basin underlies the lower Santa Ana River watershed and is characterized by a deep structural alluvial basin containing a thick accumulation of interbedded sand, silt and clay. The Irvine subbasin, bounded by the Santa Ana Mountains and the San Joaquin Hills, forms the southern-most portion of the basin. Irvine area aquifers are thinner and contain

greater percentages of clay and silt deposits than aquifers in the main portion of the basin (DWR, 2003).

The nearest groundwater monitoring well is located approximately 1,800 feet southeast of the Project area and the average depth-to-groundwater during the June 2023 groundwater event was approximately 48 feet below the top of well casing, with general groundwater flow direction to the northwest (Geotracker Global ID T0605900193).

According to the 2004 Preliminary Digital Geologic Map of the Santa Ana 30' x 50' Quadrangle, Southern California, version 2.0 compiled by Douglas M. Morton, subsurface materials at the Project area are primarily Marine deposits which in part are overlain by local, mostly alluvial fan, deposits. A concealed fault is depicted in the northern portion of the Project area.

As presented in the Environmental Data Resources (EDR) Radius map report, the Project area surface soil (to a depth of 22 inches) is a sandy loam, with very slow infiltration rates, which is underlain by a sandy clay/sandy clay loam. The soil has a high corrosion potential for uncoated steel.

E. Roadway Reconstruction, Restoration, Pavement Rehabilitation

The existing pavement along Yale Avenue is in very good condition and shows minimal signs of wear throughout the study limits. The City of Irvine prepared a Pavement Management Plan in 2023 which identified Yale Avenue with a Pavement Condition Index (PCI) ranging from 85 to 100 within the Project limits. The construction of the proposed roadway improvements will also be with materials consistent with the standard City requirements and shall be identified during the PS&E phase of the Project.

F. Bus and Emergency Lanes

The Project will not include bus or emergency lanes but through coordination with the OCFA, the Project design will provide facilities that accommodate emergency vehicles.

G. Interim Features

No interim improvements are proposed.

H. Traffic Management Plan

A Traffic Management Plan (TMP) will be prepared for approval by the City of Irvine prior to the commencement of construction activities. The TMP will describe necessary detours, emergency routes, and other measures to provide congestion relief and safety during short-term construction activities. Construction staging should be developed to minimize traffic impacts with considerations for phased implementation. Local residents and RSJMS stakeholders will be consulted in the development of construction staging and the TMP to best reflect school-

related traffic and activities and to maintain access to the residential communities directly adjacent to Yale Avenue. Detour routes for pass through traffic shall be identified where appropriate. The TMP will meet City of Irvine traffic control guidelines.

I. Biological Requirements

No materials or equipment shall be placed on the dirt or vegetation adjacent to the developed portions of the Project area (i.e., outside of the existing concrete footprint). Work should occur outside of nesting bird season which occurs annually between February 15th and September 15th. Should work be required during nesting bird season, pre-disturbance avian nesting surveys must be conducted by a qualified biologist. Survey reports shall be furnished to OC Parks upon request. If nests or nesting behaviors are identified, the biologist shall notify the OC Parks Natural Resources Program Coordinator within 24 hours with a report summarizing survey findings. The biologist shall establish appropriate no-work buffers, and the City shall be solely responsible for complying with all federal, state, and local laws.

To prevent invasive weed seed spread, vehicles, equipment, tools, and personnel footwear shall be cleaned before each entrance onto the Project site.

XII. Recommendations

After extensive community and stakeholder engagement and close collaboration between City and Mark Thomas staff, the Project team recommends Alternative 3 (Class IV Separated Bikeway/Cycletrack) with the following improvements be advanced for final design and implementation:

<u>Bicycle Enhancements</u>

- Separated, one-way Class IV cycletracks along both sides of Yale Avenue from the southern boundary at University Drive to the north terminus that connects to the I-405 pedestrian and bicycle bridge.
- Intersection improvements at Yale Avenue and University Drive which include a diagonal bicycle crossing with green markings.
- Intersection improvements at Yale Avenue and Royce Road which include green conflict paint



Pedestrian Enhancements

- Crossing enhancements at the community paseos.
- High-visibility crosswalk markings, advanced yield lines, pedestrian refuges (via the Class IV cycletrack buffers), and installation of an RRFB are likely to be recommended by the City at the paseos.
- Crossing enhancements including an upgraded ADA ramp at the southwest corner of Yale Avenue and University Drive intersection.



RECOMMENDED BY:

Melissa Dugan
Project Development Administrator
City of Irvine

Paul Martin, PE, TE
Project Manager
Mark Thomas

MARK THOMAS

Attachment A – Engineering Concepts

CONSTRUCTION PLANS FOR THE IMPROVEMENT OF

SOUTH YALE CORRIDOR IMPROVEMENTS

CIP# 312204

INDEX OF DRAWINGS

SHEET No.	DESCRIPTION
1	TITLE SHEET
2-3	TYPICAL SECTIONS
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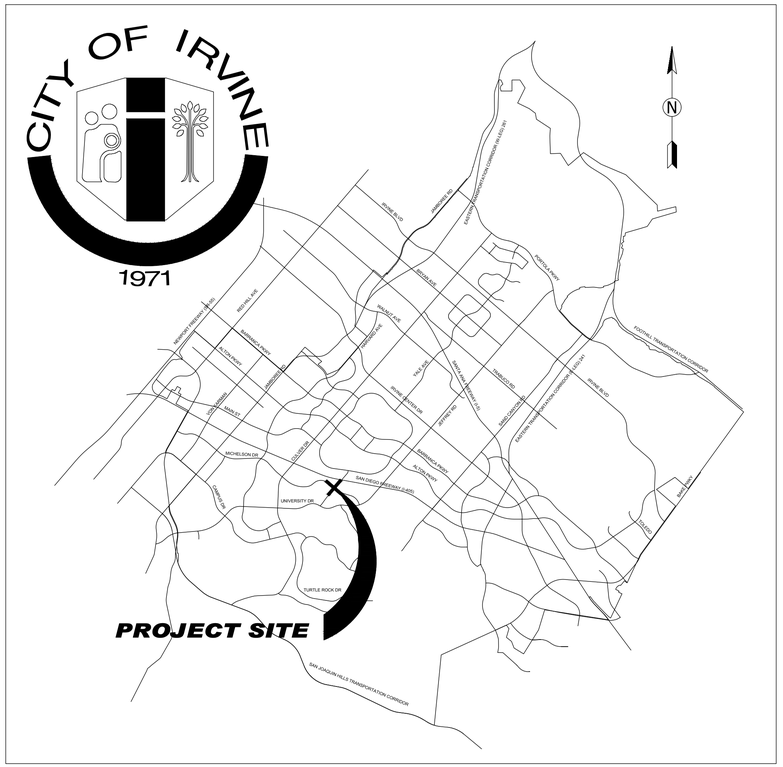

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CHECKED BY:	A. SILVA	DATE 2/20/2024
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SOUTH YALE CORRIDOR IMPROVMENTS

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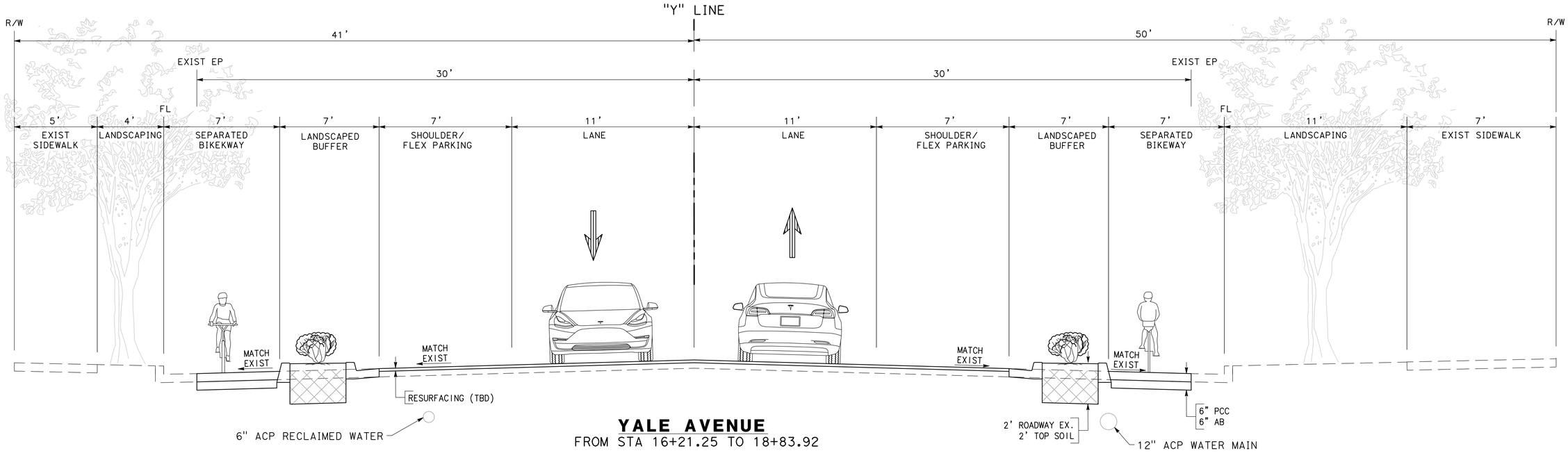
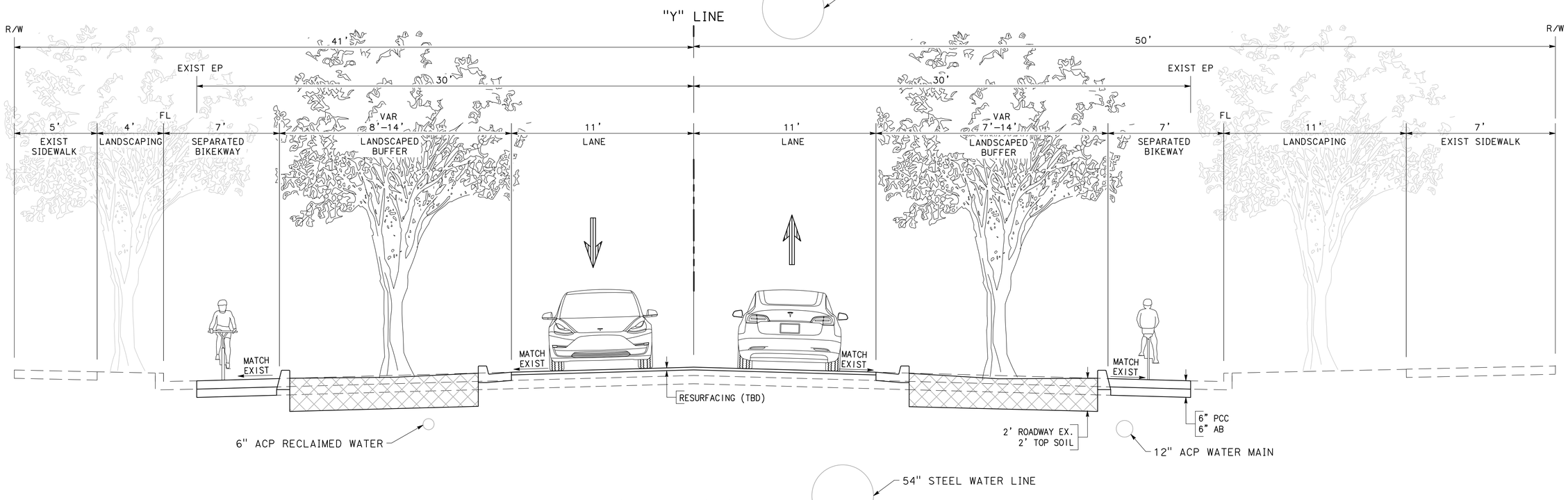


YALE AVENUE
FROM STA 16+21.25 TO 18+83.92



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SOUTH YALE
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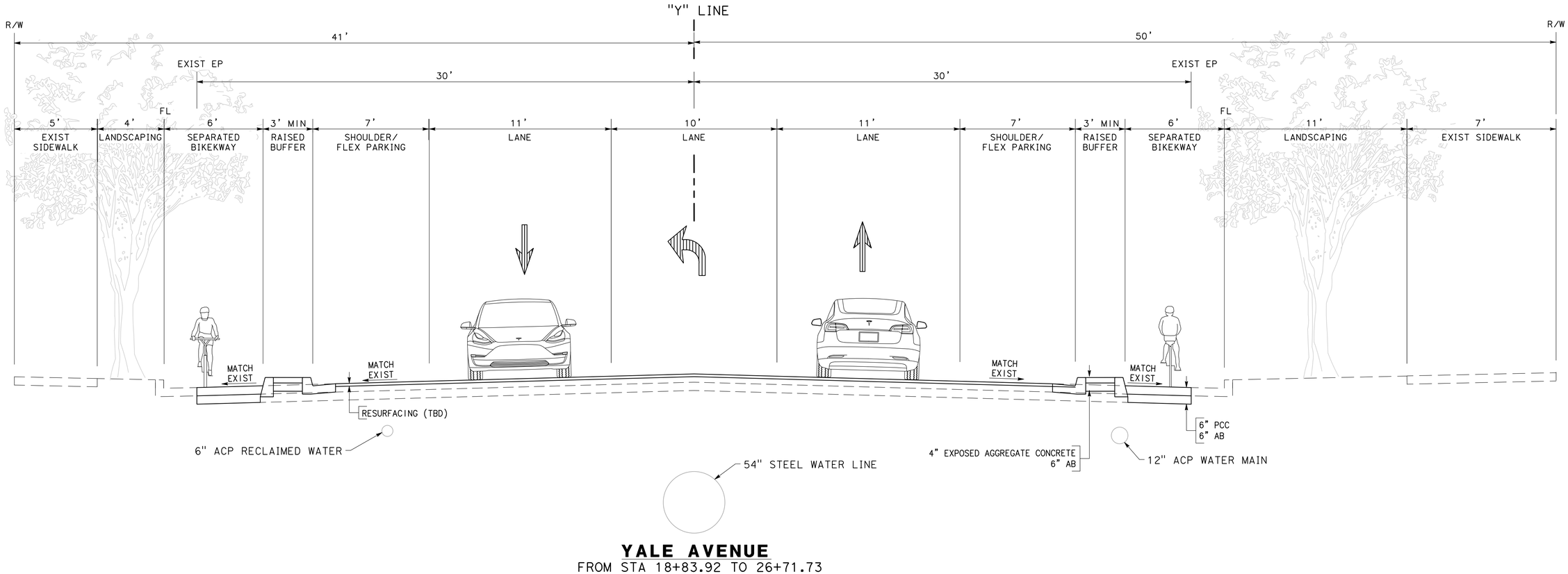

YALE AVENUE

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LEGEND:

EXPOSED AGGREGATE CONCRETE

LANDSCAPE

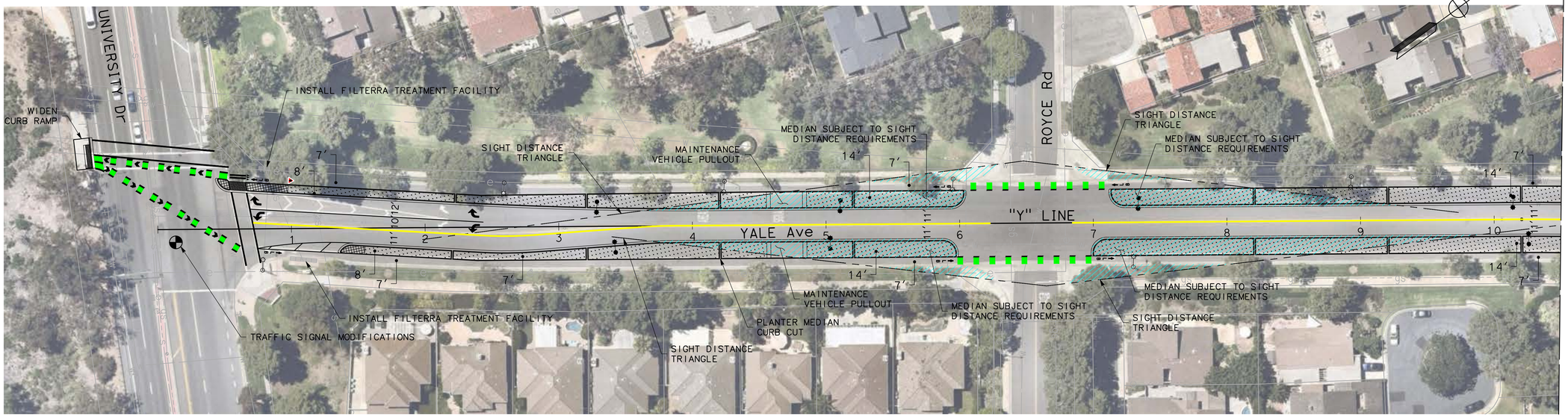
LIMITED USE AREA

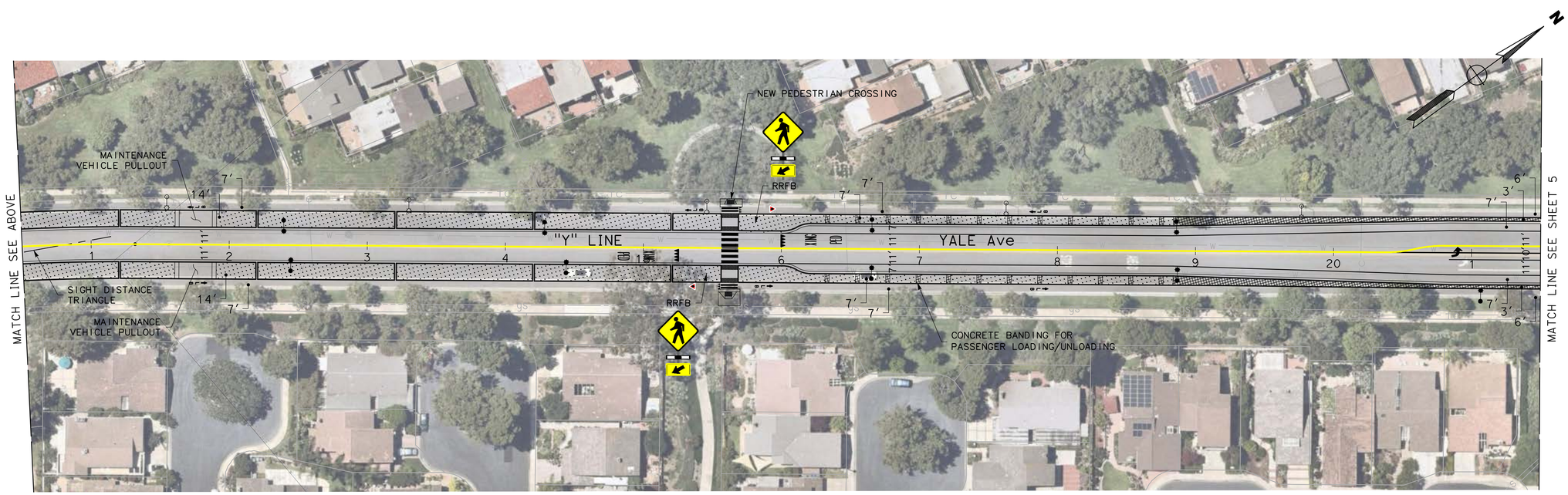
NEW SIDEWALK

NEW ASPHALT

EXISTING STREET LIGHT

PROPOSED STREET LIGHT





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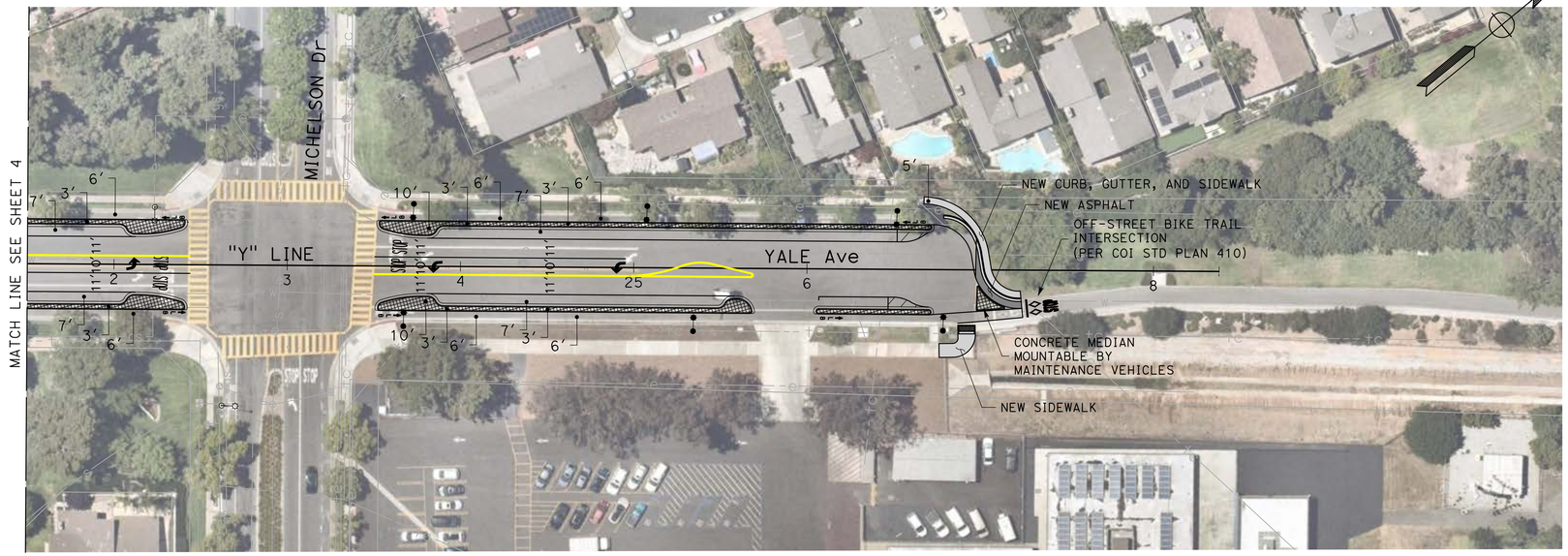

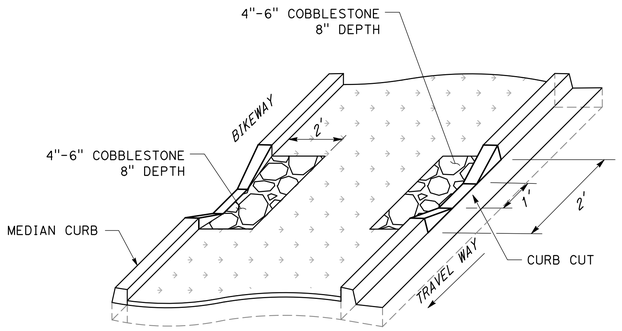

PLANTER MEDIAN CURB CUT AND COBBLESTONE DETAIL

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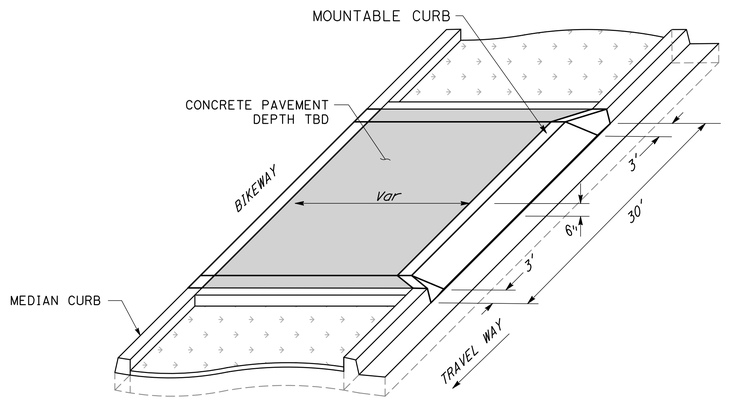

MAINTENANCE VEHICLE PULLOUT

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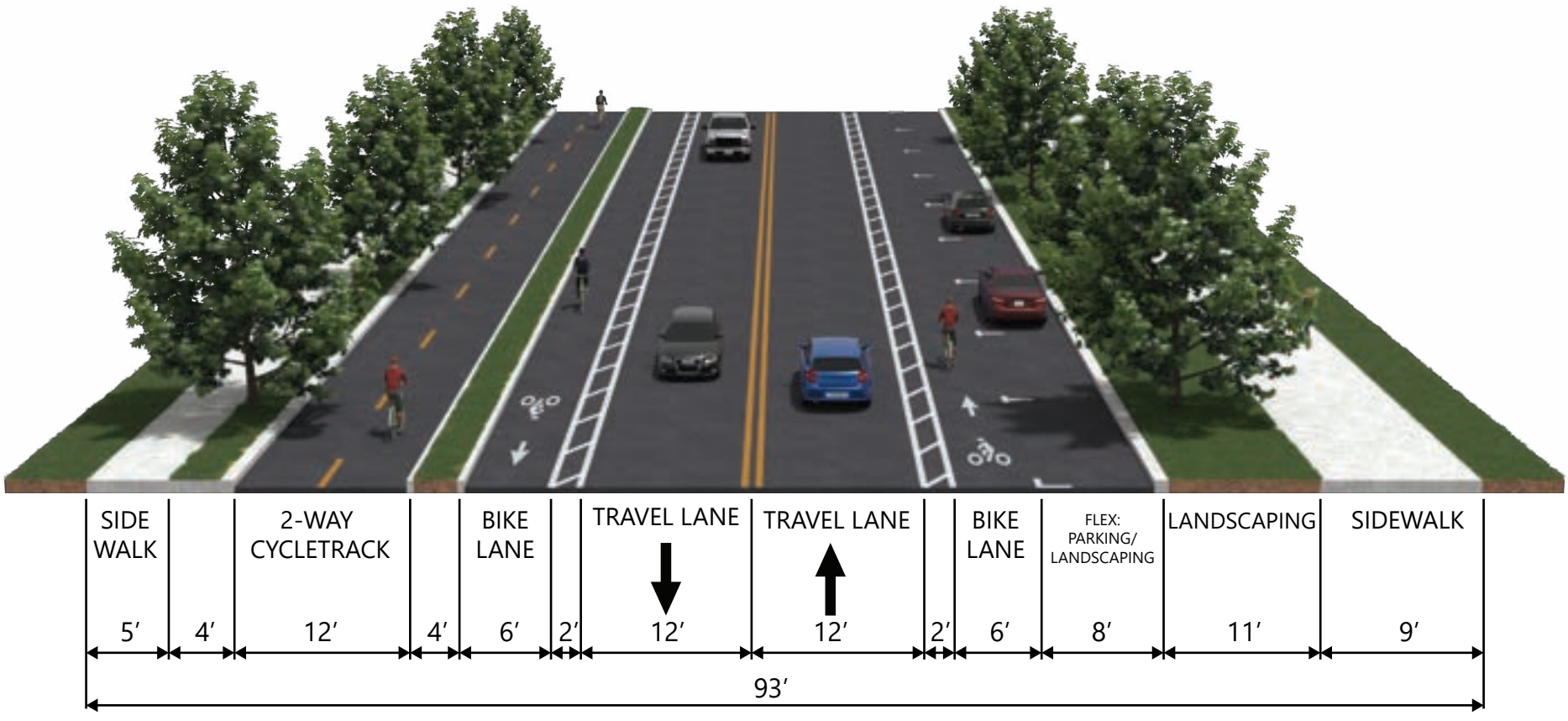
Attachment B – Cross-Section Alternatives



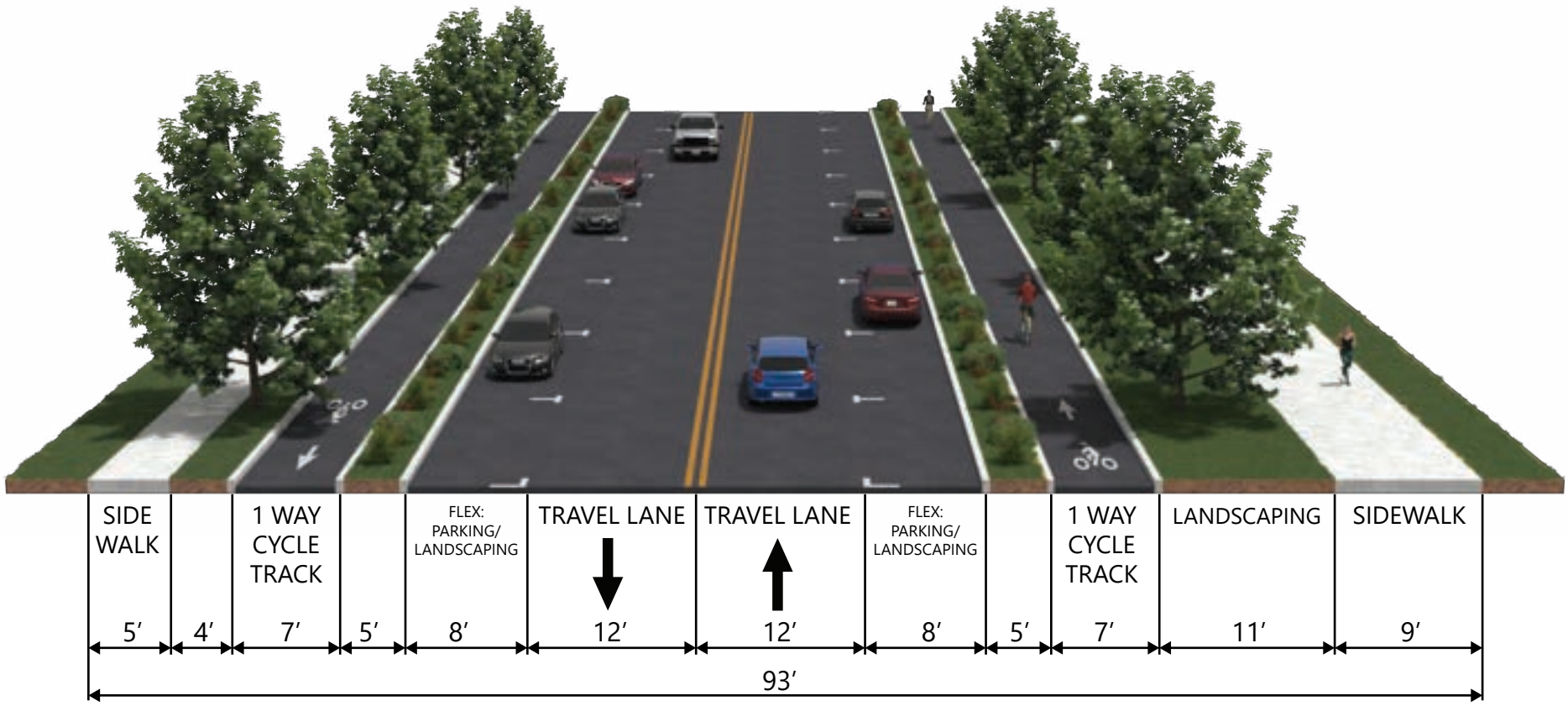
YALE AVENUE EXISTING



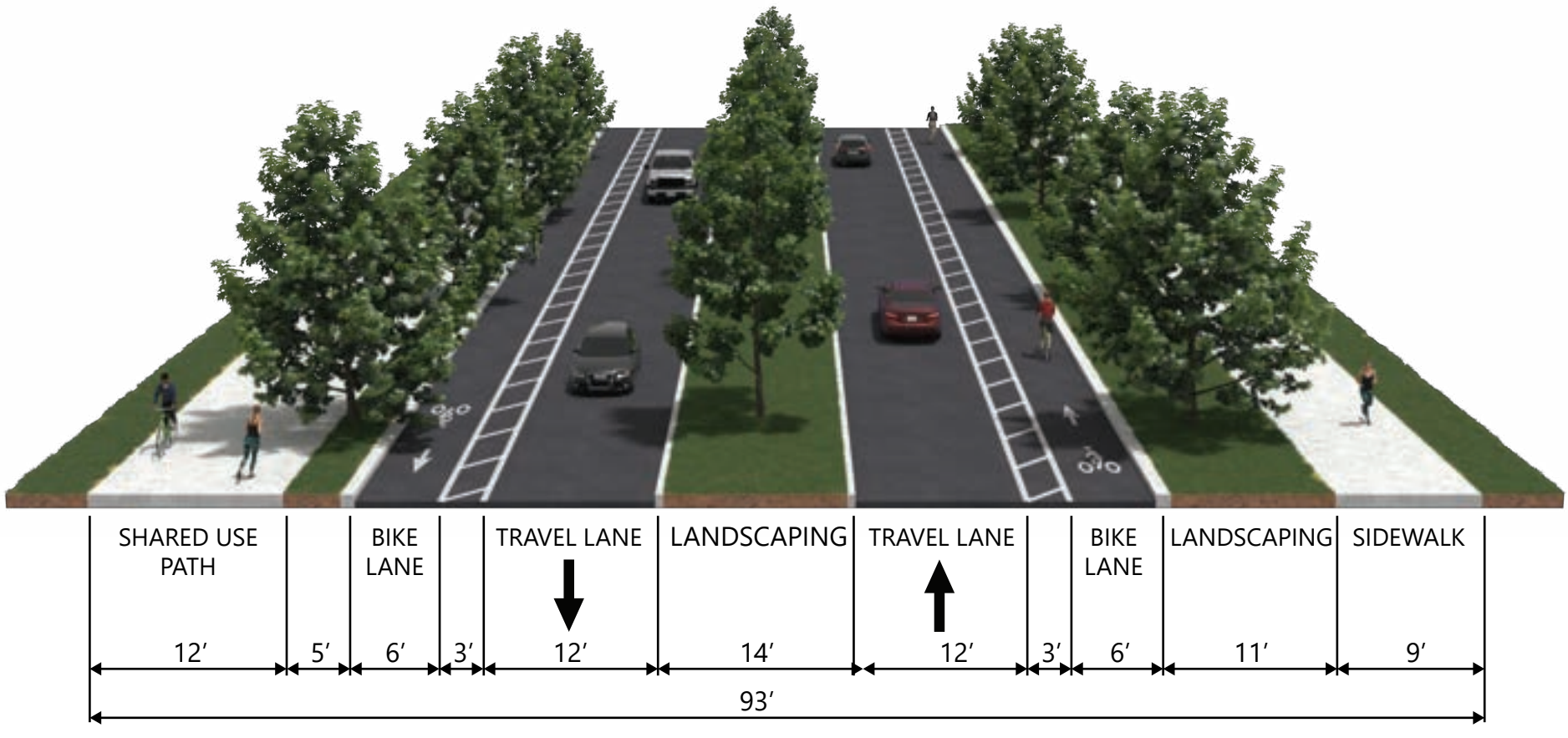
ALTERNATIVE 1: 2-WAY CYCLETRACK - WEST SIDE



ALTERNATIVE 2: 2-WAY CYCLETRACK - WEST SIDE HYBRID



ALTERNATIVE 3: 1-WAY CYCLETRACK



ALTERNATIVE 4: BUFFERED BIKE LANES AND WIDENED SHARED USE PATH

Attachment C – Utility Maps

LEGEND:

TEXTURED CONCRETE

LANDSCAPE

EXISTING STREET LIGHT

PROPOSED STREET LIGHT

WATER

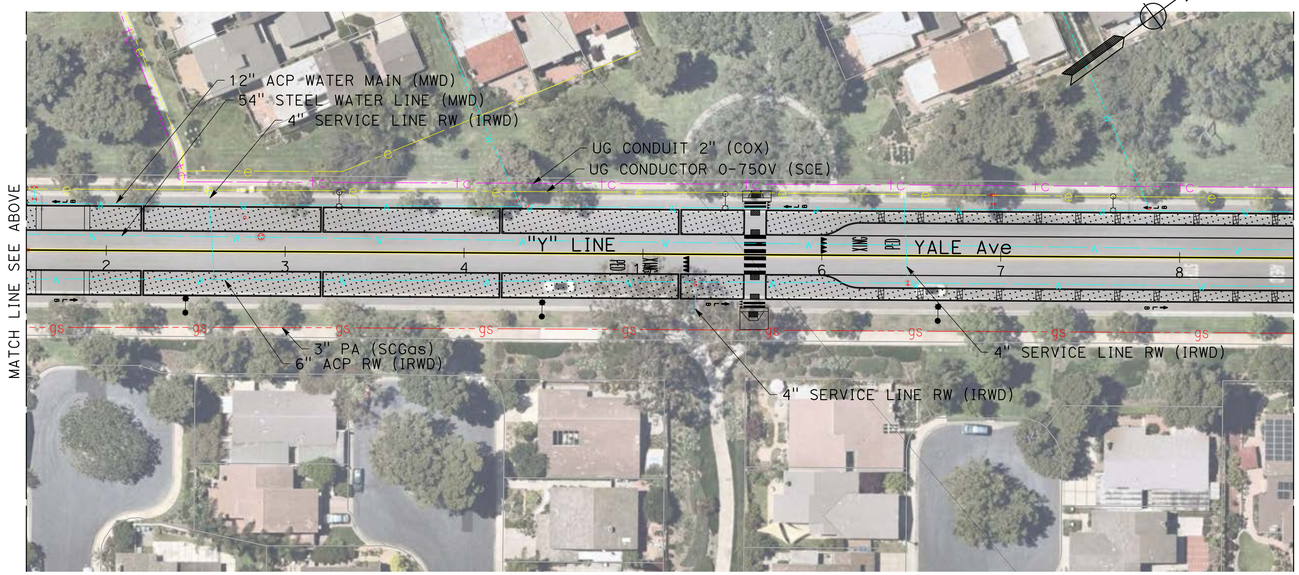
SEWER

GAS

TELECOM

ELECTRIC





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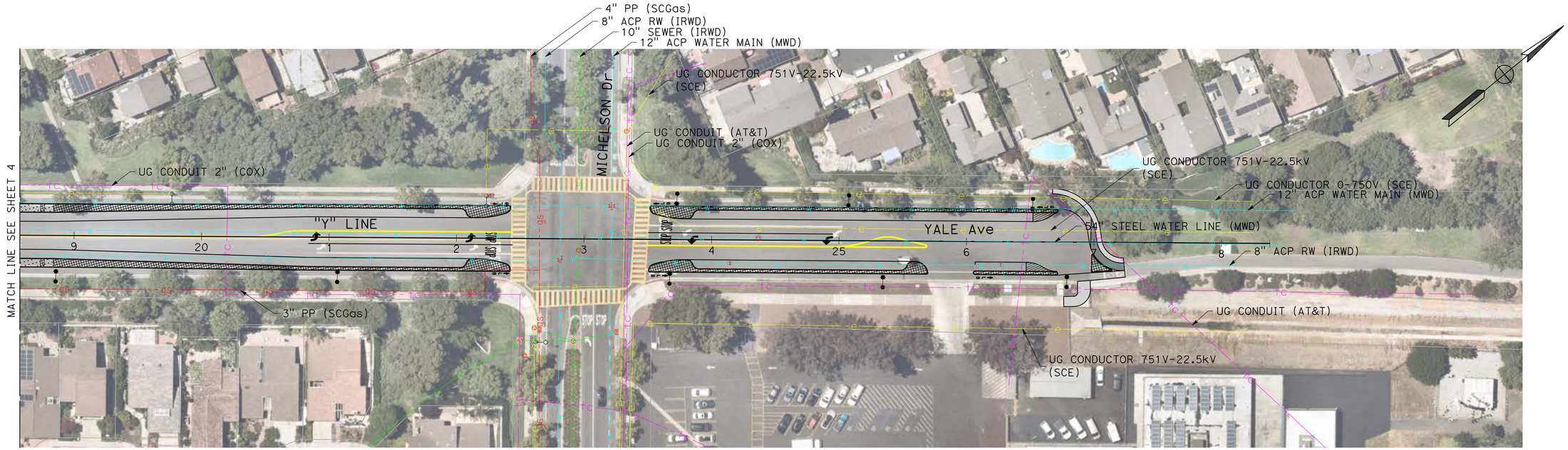

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MARK THOMAS

Attachment D – Engineering Cost Estimates

South Yale Corridor Improvements

Yale Avenue (University Drive to I-405)

(30% Concept Plans)

MARK THOMAS

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
ROADWAY					
1	Install Concrete - Curb Ramp	EA	3	$ 8,000	$24,000
2	Install Concrete - Curb	LF	9590	$ 30	$287,700
3	Install Concrete - Maintenance	SF	1570	$ 15	$23,550
4	Install Concrete - Sidewalk	SF	1480	$ 15	$22,200
5	Install Concrete - Textured Pavment	SF	6510	$ 25	$162,750
6	Install Concrete - Bike Path	SF	22860	$ 15	$342,900
7	Roadway Excavation	CY	31900	$ 65	$2,073,500
8	Remove Concrete	SF	1200	$ 2	$2,400
9	Hot Mix Asphalt	TON	360	$ 260	$93,600
10	Slurry Seal	SF	104000	$ 0.33	$34,320
11	CL2 Aggregate Base	CY	16000	$ 45	$720,000
12	Signing and Striping	LS	1	$ 33,000	$33,000
13	Landscape, Irrigation, Green Infrastructure	SF	34420	$ 35	$1,204,700
				SUBTOTAL	**$5,024,620**
DRAINAGE					
14	Minor Drainage	EA	2	$ 15,000	$30,000
				SUBTOTAL	**$30,000**
ELECTRICAL					
15	Rapid Rectangular Flashing Beacon System	EA	1	$ 45,000	$45,000
16	Traffic Signal Modification	EA	1	$ 100,000	$100,000
17	Street Lighting	EA	14	$ 20,000	$280,000
18	Cycle Track Lighting	LS	1	$ 240,000	$240,000
				SUBTOTAL	**$665,000**
19	Mobilization (10% of Items 1-18)	LS	1	$ 572,000	$572,000
				CONTINGENCY (25%) *	$1,573,000
				CONSTRUCTION SUBTOTAL	$5,719,620
GRAND TOTAL					
				CONSTRUCTION TOTAL=	**$7,864,620**

* This concept level estimate includes a 25% contingency intended to compensate for the use of preliminary and limited information.

General Note: Where applicable, only minor drainage improvements for transportation projects to address safety are included.

Utility improvements such as water, communication, gas, etc. are not included in these estimates.

MARK THOMAS

Attachment E – Traffic Analysis

City of Irvine

South Yale Corridor Improvements Traffic Analysis





April 12, 2024

Submitted to:

11797.23 | Prepared by **Iteris, Inc.**

Innovating Through Informatics™

DOCUMENT VERSION CONTROL

DOCUMENT NAME	SUBMITTAL DATE	VERSION NO.
Draft 1	May 10, 2023	1.0
Final Draft	February 28, 2024	2.0
Final	April 12, 2024	3.0

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Appendix A – 2022 Traffic Counts

Appendix B – ICU Calculation Sheets

Appendix C – HCM Synchro Worksheets

Appendix D – Traffic Signal Warrants

1 EXECUTIVE SUMMARY

The purpose of this report is to study the traffic impacts of the potential elimination of a future street upgrade of Yale Avenue from an existing two-lane commuter street to a four-lane secondary arterial between Michelson Drive and University Drive. This future reclassification is currently assumed in the City of Irvine's General Plan and OCTA's Master Plan of Arterial Highways (MPAH).

The Irvine Strategic Active Transportation Plan (ISATP) includes analysis of existing conditions and potential barriers to active transportation within the City. The plan identified the South Yale Corridor as a potential active transportation project. Therefore, instead of a street upgrade for vehicular traffic, bicycle and pedestrian friendly street design solutions are under consideration for this roadway segment which would be incompatible with upgrading the street classification.

Traffic counts were collected along Yale Avenue and at the intersections of Yale Avenue and Michelson Drive, Yale Avenue and Royce Road, and Yale Avenue and University Drive in November 2022. In existing conditions all three study area intersections and roadway segments operate at satisfactory levels of service. There are two pairs of Buildout Scenarios with and without the widening to four lanes.

1. **No Future Vehicular crossing of Yale Avenue over I-405** – In this scenario pair the elimination of the future widening Yale Avenue from two-lanes to four-lanes will not result in any deficient level of service at any of the three study intersections or roadway segments. All intersections and arterial segments will continue to operate at satisfactory levels of service.

2. **Future Vehicular crossing of Yale Avenue over I-405** – This is the current General Plan and MPAH scenario. In this scenario pair, in both the four-lane and two-lane scenarios the intersection of Yale Avenue and Michelson Drive would operate and unsatisfactory levels of service with the existing four-way stop control. However, this intersection meets signal warrants based on future peak hour volumes. Based on the assumption that the intersection would be signalized should a vehicular overcrossing of I-405 be implemented, then the intersection would operate at satisfactory levels of service using the ICU methodology.

   The intersection of Yale Avenue and Royce Avenue would operate at unsatisfactory levels of service using the existing two-way stop control configuration. The future volumes at the intersection do not warrant a traffic signal. A four-lane stop controlled analysis was therefore performed as a sensitivity test. Although the overall intersection delay increases with a four-way control the intersection level of service as defined by the approach with maximum delay would improve in both two-lane and four-lane Yale Avenue scenarios. In the case of the four-lane Yale Avenue scenario, the intersection would operate at a satisfactory level of service but with the two-lane stop control (the existing configuration) the level of service would remain unsatisfactory.

- Since the purpose of the study is for the potential removal of the street widening of Yale Avenue, there is no VMT impact under CEQA.

2 INTRODUCTION

The purpose of this report is to study the traffic impacts of the potential elimination of a future street upgrade of Yale Avenue from an existing two-lane commuter street to a four-lane secondary arterial between Michelson Drive and University Drive. This future reclassification is currently assumed in the City of Irvine's General Plan and OCTA's Master Plan of Arterial Highways (MPAH).

The Irvine Strategic Active Transportation Plan (ISATP) includes analysis of existing conditions and potential barriers to active transportation within the City. The plan identified the South Yale Corridor as a potential active transportation project. Therefore, instead of a street upgrade for vehicular traffic, bicycle and pedestrian friendly street design solutions are under consideration for this roadway segment, which would be incompatible with upgrading the street classification.

2.1 Project Description

The study analyses existing traffic conditions and operations as well as four future scenarios as described below. The current Yale Avenue overcrossing of I-405 is for non-vehicular traffic only. As part of the City of Irvine's General Plan and OCTA's MPAH Buildout conditions, a two-lane vehicular overcrossing (OC) of I-405 is assumed to be built. However, since there are currently no plans to build a vehicular OC, traffic analysis was performed with and without the vehicular OC. Future year No Project and With Project scenarios were analyzed using the Irvine Transportation Analysis Model (ITAM). The four future scenarios are:

1. **Buildout Year I-405 Vehicular OC with Four-lane Yale Avenue** – Analyzes the widening of Yale Avenue from a two-lane to a four-lane Secondary arterial between University Drive and Michelson Drive. The I-405 OC along Yale Avenue was modeled as a two-lane Commuter consistent with the current Master Plan of Arterial Highways (MPAH).
2. **Buildout Year I-405 Vehicular OC with Two-lane Yale Avenue** – Analyzes the removal of future street widening of Yale Avenue, keeping Yale Avenue as a two-lane Commuter Street between University Drive and Michelson Drive. The I-405 vehicular OC along Yale Avenue was modeled as a Commuter Street.
3. **Buildout Year No I-405 Vehicular OC with Four-lane Yale Avenue** – Analyzes the widening of Yale Avenue from a two-lane to a four-lane Secondary arterial between University Drive and Michelson Drive consistent with the current Master Plan of Arterial Highway (MPAH). I-405 OC along Yale Avenue will remain as pedestrians and bicycles only.
4. **Buildout Year No I-405 Vehicular OC with Two-lane Yale Avenue** – Analyzes the removal of street widening of Yale Avenue, keeping Yale Avenue two-lane Commuter Street between University Drive and Michelson Drive. I-405 OC along Yale Avenue will remain as pedestrians and bicycles only.

2.2 Project Site

The project study area is Yale Avenue bounded by University Drive (to the south) and the pedestrian and bicycle crossing over Interstate 405 (to the north). Along the roadway, three segments and three intersections were analyzed. The three segments are:

1. Yale Avenue north of Michelson Drive;
2. Yale Avenue between Michelson Drive and Royce Road; and
3. Yale Avenue between Royce Road and University Drive.

The three intersections are:

A. Yale Avenue and Michelson Drive;
B. Yale Avenue and Royce Road; and
C. Yale Avenue and University Drive.

Figure 2-1 illustrates the study area within the City of Irvine boundary and **Figure 2-2** illustrates the project site and the study intersections.

Figure 2-1: Study Area within the City of Irvine

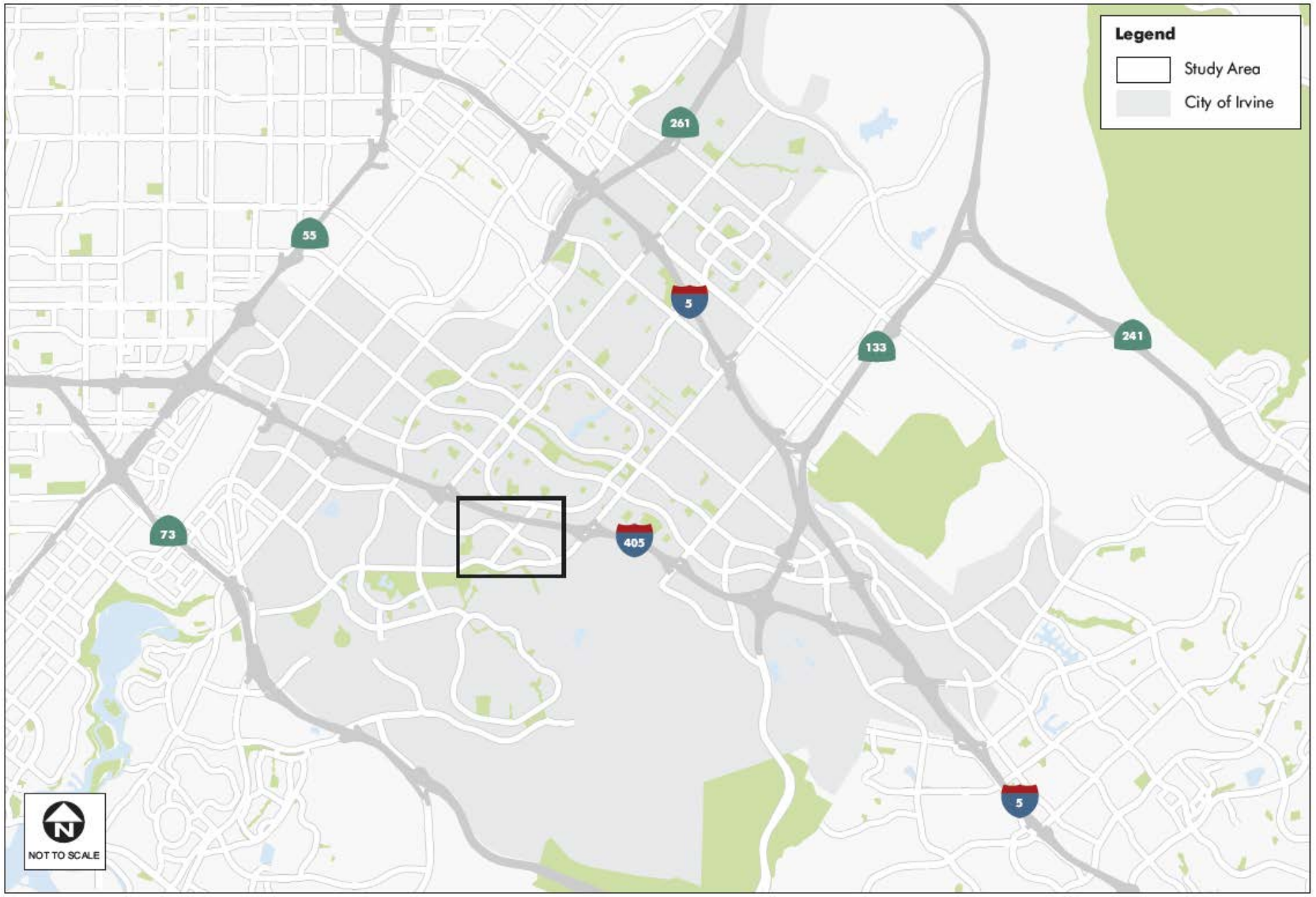
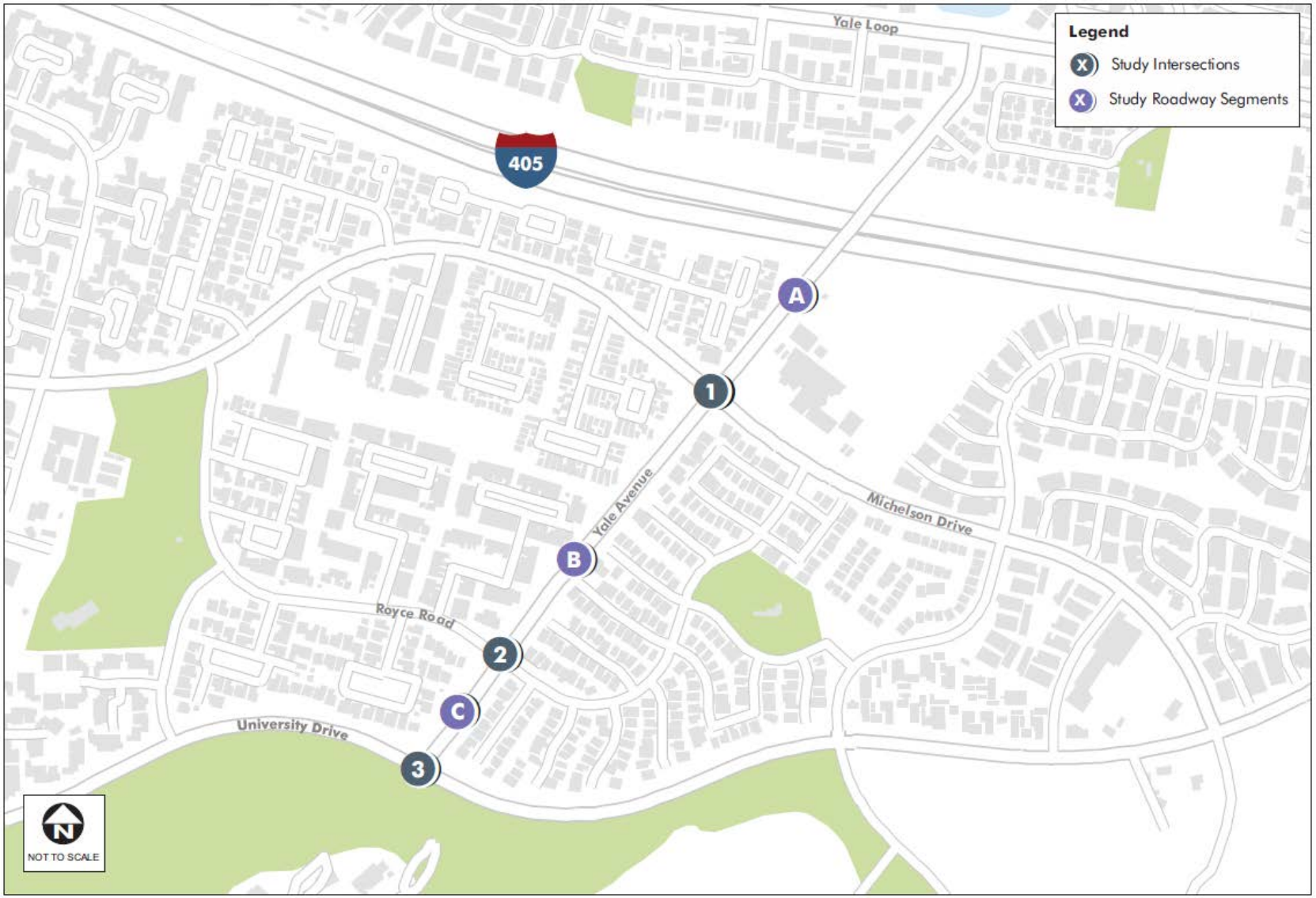


Figure 2-2: South Yale Corridor Project Site



3 INTERSECTION ANALYSIS METHODOLOGY

The City of Irvine uses the Intersection Capacity Utilization (ICU) methodology for the calculation of signalized intersection Level of Service (LOS). The ICU methodology compares the volume-to-capacity (V/C) ratios of conflicting turn movements at an intersection, sums these critical conflicting V/C ratios for each intersection approach, and determines the overall ICU. The resulting ICU is expressed in terms of level of service (LOS), where LOS A represents free-flow activity and LOS F represents overcapacity operation. Parameters set by the City for ICU calculations, including lane capacity, right-turn treatment, and clearance interval are included in the analysis.

LOS definitions for signalized intersections and roadways are provided in **Table 3-1.** LOS E or worse is considered deficient at these locations by the City of Irvine.

Table 3-1: ICU Level of Service Definitions

LOS	Description	ICU
A	At this LOS, traffic volumes are low and speed is not restricted by other vehicles. All signal cycles clear with no vehicles waiting through more than one original cycle.	≤ 0.60
B	At this LOS, traffic volumes begin to be affected by other traffic. Between one and ten percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.	0.61 – 0.70
C	At this LOS, operating speeds and maneuverability are closely controlled by other traffic. Between 11 and 30 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.	0.71 – 0.80
D	At this LOS, traffic will operate at tolerable operating speeds, although with restricted maneuverability.	0.81 – 0.90
E	Traffic will experience restricted speeds, vehicles will frequently have to wait through two or more cycles at signalized intersections, and any additional traffic will result in breakdown of the traffic carrying ability of the system.	0.91 – 1.00
F	Long queues of traffic, unstable flow, stoppages of long duration with traffic volumes and traffic, speed can drop to zero. Traffic volumes will be less than the volume which occurs at LOS E.	>1.00

The City of Irvine does not have any criteria for HCM analysis for unsignalized intersections. The unsignalized intersection will be evaluated using the latest Highway Capacity Manual 6th Edition (HCM 6) methodology. The HCM 6 methodology defines LOS by the average vehicle delay experienced by all vehicles traveling through the intersection. Traffic operations analysis for HCM methodologies will be completed using Synchro software.

Table 3-2 presents the average delay associated with each LOS grade as well as a qualitative description of intersection operations at that grade.

Table 3-2: HCM Level of Service Definitions

LOS	Description	Unsignalized Intersection Delay (Seconds)
A	• Free flowing, virtually no delay. • Minimal traffic.	≤ 10.0
B	• Free flow and choice of lanes. • Delays are minimal. • All cars clear intersection easily.	>10.0 – 15.0
C	• Good operation. • Delays starting to become a factor but still within acceptable limits.	>15.0 – 25.0

D	• Approaching unstable flow. • Queues at intersection are quite long but most cars clear intersection on their green signal. • Occasionally, several vehicles must wait for a second green signal. • Congestion is moderate.	>25.0 – 35.0
E	• Severe congestion and delay. • Most of the available capacity is used. • Many cars must wait through a complete signal cycle to clear the intersection.	>35.0 – 50.0
F	• Excessive delay and congestion. • Most cars must wait through more than one on one signal cycle. • Queues are very long, and drivers are obviously irritated.	>50.0

Source: Highway Capacity Manual 6th Edition

The arterial roadway analysis involved the calculation of average daily traffic (ADT) volume-to-capacity (V/C) ratios on study roadway segments. **Table 3-3** summarizes the roadway capacities per the City of Irvine Traffic Study Guidelines 2023 within the study area.

Table 3-3: Roadway Classification and Daily Capacities

Roadway Classification	Number of Lanes	Daily Capacity
Expressway	6 Lanes	135,000
Major Arterial	8 Lanes Divided	72,000
	6 Lanes Divided	54,000
Primary Arterial	4 Lanes Divided	32,000
Secondary Arterial	4 Lanes Undivided	28,000
Commuter	2 Lanes Undivided	13,000

4 EXISTING CONDITIONS

4.1 Existing Corridor Land Uses

The adjacent land use along the South Yale Corridor is primarily residential with Rancho San Joaquin Middle School located in the northeast quadrant of the intersection of Michelson Drive and Yale Avenue.

4.2 Existing Roadways and Intersections

The speed limit on Yale Avenue between Michelson Drive and Royce Road is currently 45 miles per hour (mph) and between Royce Road and University Drive the speed limit is 40 mph. Yale Avenue is a two-lane roadway (one-lane in each direction) with Class II bike lane in each direction. The intersections of Yale Avenue and Michelson Drive (four-way stop-controlled) and Yale Avenue and Royce Road (two-way stop-controlled) are unsignalized. Yale Avenue and University Drive is a signalized intersection.

Figure 4-1 illustrates the land uses within the study area and **Figure 4-2** illustrates the lane configurations for each study intersection.

4.3 Transit Services

The study area is currently served by one bus transit service operated by OCTA, which is Community Route 167 as shown in **Figure 4-3**. This service operates between the Village in the City of Orange and University Center Area in UCI. The route traverses Michelson Drive between University Drive and Culver Drive within the study area. The service operates an hourly service on weekdays only, with 18 buses per day in each direction.

Figure 4-1: South Yale Corridor Land Use

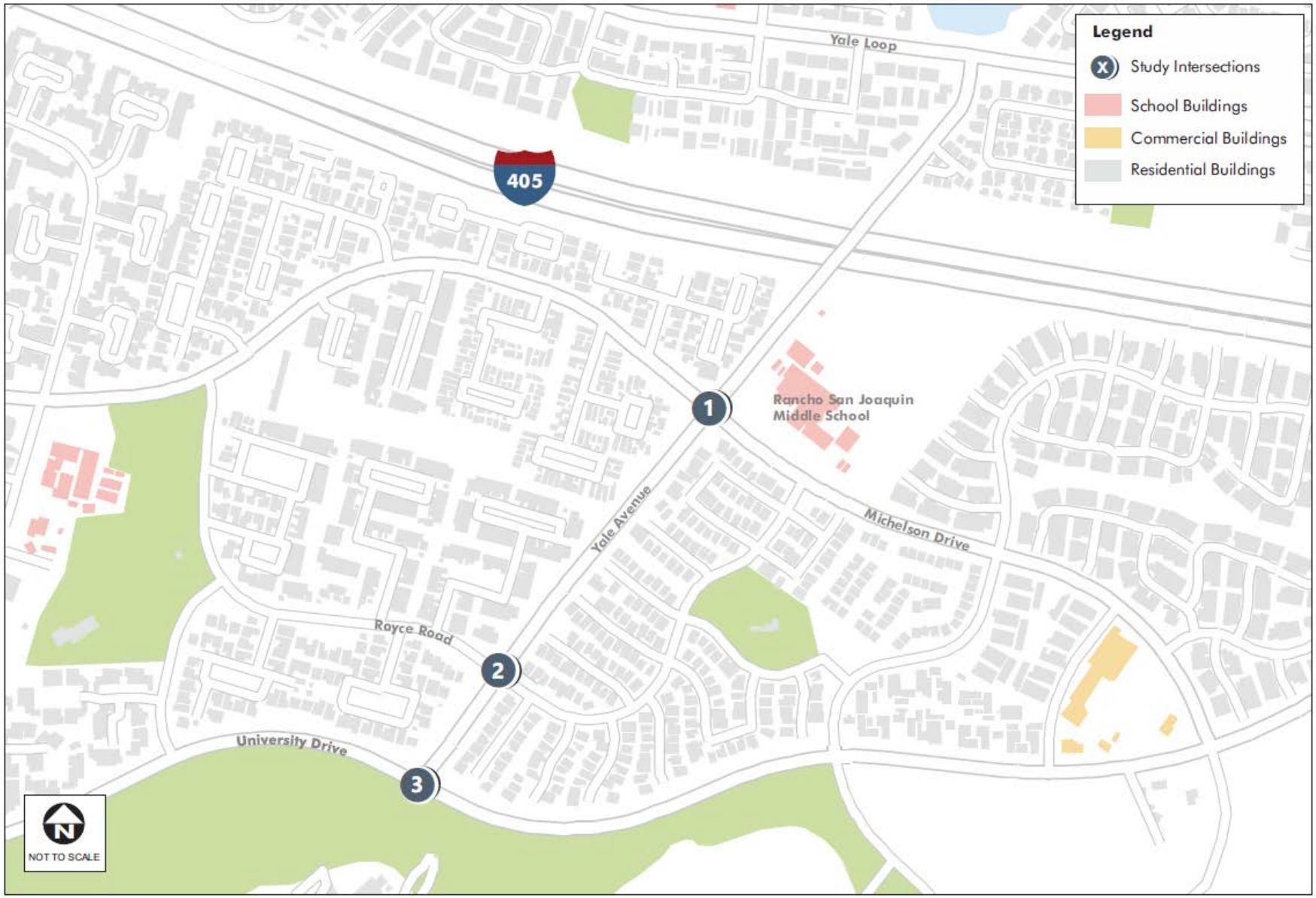
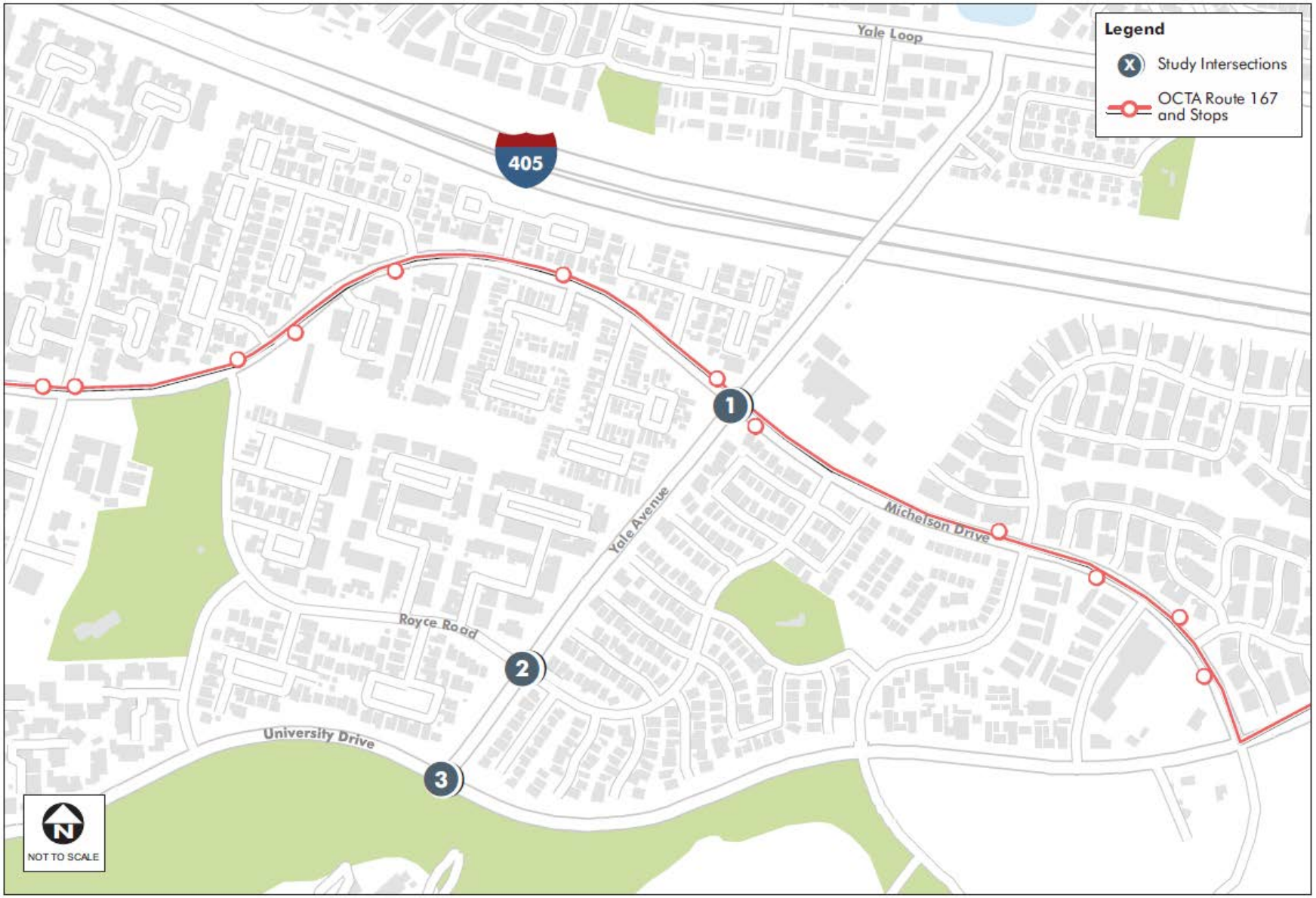


Figure 4-2: Existing Lane Configurations



Figure 4-3: South Yale Corridor Commuter Route 167 Bus Stops



4.4 Existing Traffic Counts

Traffic counts were performed on Tuesday 15th and Wednesday 16th of November 2022. AM and PM peak hour counts were collected between 7:00 AM to 9:00 AM and 2:30 PM to 6:00 PM, respectively, along with arterial average daily traffic (ADT) counts which are provided in **Appendix A**. The two-day weekday counts were averaged as is per City standard practice. PM traffic counts were extended beyond the traditional 4:00 PM to 6:00 PM time period to include the school peak hour at Rancho San Joaquin Middle School.

The Covid-19 pandemic along with the associated lockdowns and remote work requirements has affected traffic patterns and volumes, including shifting traffic to different times of the day. While traffic volumes recovered during 2022 a comparison with available pre-Covid counts was performed to determine the most existing traffic counts to use for the analysis. Year 2018/2019 intersection turning movement counts for two of the three intersection turning movements were available from the ITAM post-processor. **Table 4-1** shows the intersection turning movement count comparison between 2022 and 2018/2019 for the traditional AM and PM peak periods.

In November 2022, the AM peak hour traffic volumes at the intersection of Yale Avenue and Michelson Drive were around 67% higher than pre-Covid conditions, while the evening PM peak hour traffic volumes were around 32% lower than pre-Covid conditions. At the intersection of Yale Avenue and University Drive, the AM peak hour traffic volumes were approximately 32% lower than pre-Covid conditions and 30% lower in the evening PM peak hour.

While the volumes along University Drive are higher in 2018 compared to 2022 this mainly relates to the east-west through movements. At the time of the 2022 count, there was construction on eastbound University Drive near I-405 but since volumes were lower in both eastbound and westbound directions it seems more likely that this is due to a secular reduction in weekday peak hour traffic due to increased working from home. The volumes on Yale Avenue itself are actually higher in 2022 compared to 2018 so it was determined that the year 2022 counts would better reflect current conditions.

Table 4-1: Intersection Turning Movement Count Comparison

Intersection	Peak Hour	Year	Northbound			Southbound			Eastbound			Westbound			Int. Total	LT Total	THRU Total	RT Total
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right				
Yale Avenue and Michelson Drive	AM	2022	13	56	33	21	37	52	65	135	21	88	193	20	732	186	420	126
		2018/2019	10	4	14	5	1	4	7	173	25	16	177	1	437	38	355	44
		Diff	3	52	19	16	36	48	58	-39	-5	72	16	19	295	148	65	82
		% Diff	30%	>100%	>100%	>100%	>100%	>100%	>100%	-22%	-18%	>100%	9%	>100%	67%	>100%	18%	>100%
	PM (4:45 PM)	2022	14	1	57	2	0	3	2	284	7	13	204	1	586	30	489	68
		2018/2019	11	1	58	1	2	2	2	505	15	19	241	2	859	33	749	77
		Diff	3	-1	-1	1	-2	1	-1	-221	-8	-6	-37	-1	-273	-4	-261	-9
		% Diff	23%	-50%	-2%	50%	-100%	50%	-25%	-44%	-53%	-32%	-15%	-50%	-32%	-11%	-35%	-12%
Yale Avenue and University Drive	AM	2022	0	0	0	76	0	104	81	769	0	0	1,319	35	2,382	156	2,088	139
		2018/2019	0	0	0	67	0	119	67	1,278	0	0	1,930	33	3,494	134	3,208	152
		Diff	0	0	0	9	0	-15	14	-509	0	0	-612	2	-1,112	22	-1,121	-14
		% Diff	---	---	---	13%	---	-13%	20%	-40%	---	---	-32%	5%	-32%	16%	-35%	-9%
	PM (4:45 PM)	2022	0	0	0	13	0	21	68	1,416	0	0	1,001	32	2,550	81	2,417	53
		2018/2019	0	0	0	27	0	30	64	2,071	0	0	1,406	37	3,635	91	3,477	67
		Diff	0	0	0	-14	0	-9	4	-656	0	0	-405	-6	-1,086	-11	-1,061	-15
		% Diff	---	---	---	-52%	---	-30%	5%	-32%	---	---	-29%	-15%	-30%	-12%	-31%	-22%

The 2022 ADT counts on the arterial roadways shown in **Table 4-2** indicate that traffic volume on Yale Avenue was higher than pre-Covid volumes.

Table 4-2: Arterial Daily Flow Comparison

#	Segment	Year 2022	Year 2018	% Difference
A	Yale Avenue north of Michelson Drive	540	Not Available	Not Available
B	Yale Avenue between Michelson Drive and Royce Road	1,230	1,130	9%
C	Yale Avenue between Royce Road and University Drive	1,770	1,160	53%

Figure 4-4 illustrates the existing vehicle traffic counts.

Figure 4-4: Existing Vehicle Traffic Counts

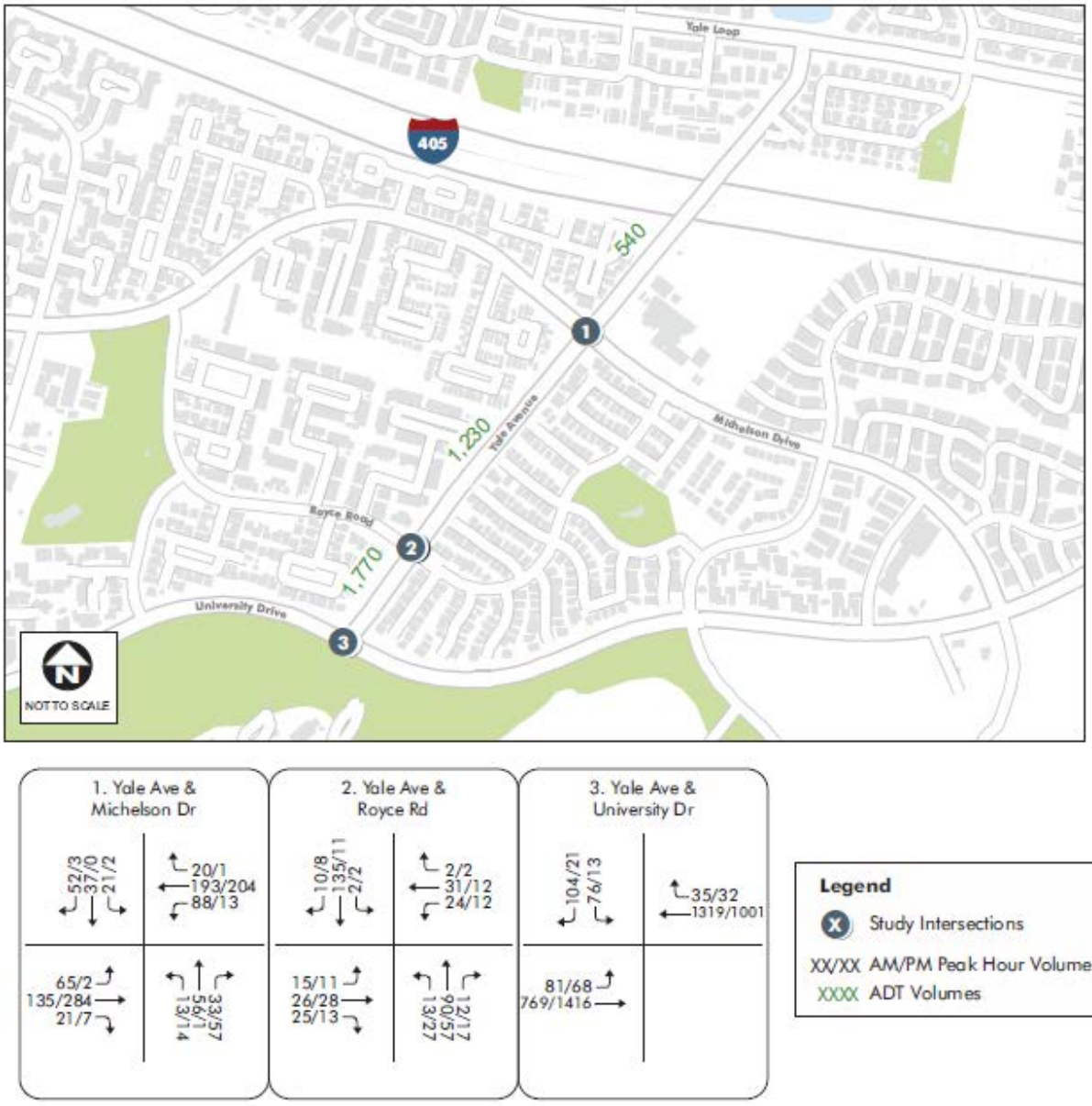


Figure 4-5 illustrates the existing conditions bicycle and pedestrian counts during the AM and PM peak hours (1hr).

Figure 4-5: Existing Pedestrian and Bike Counts AM and Evening PM Peak Hours (1Hr)

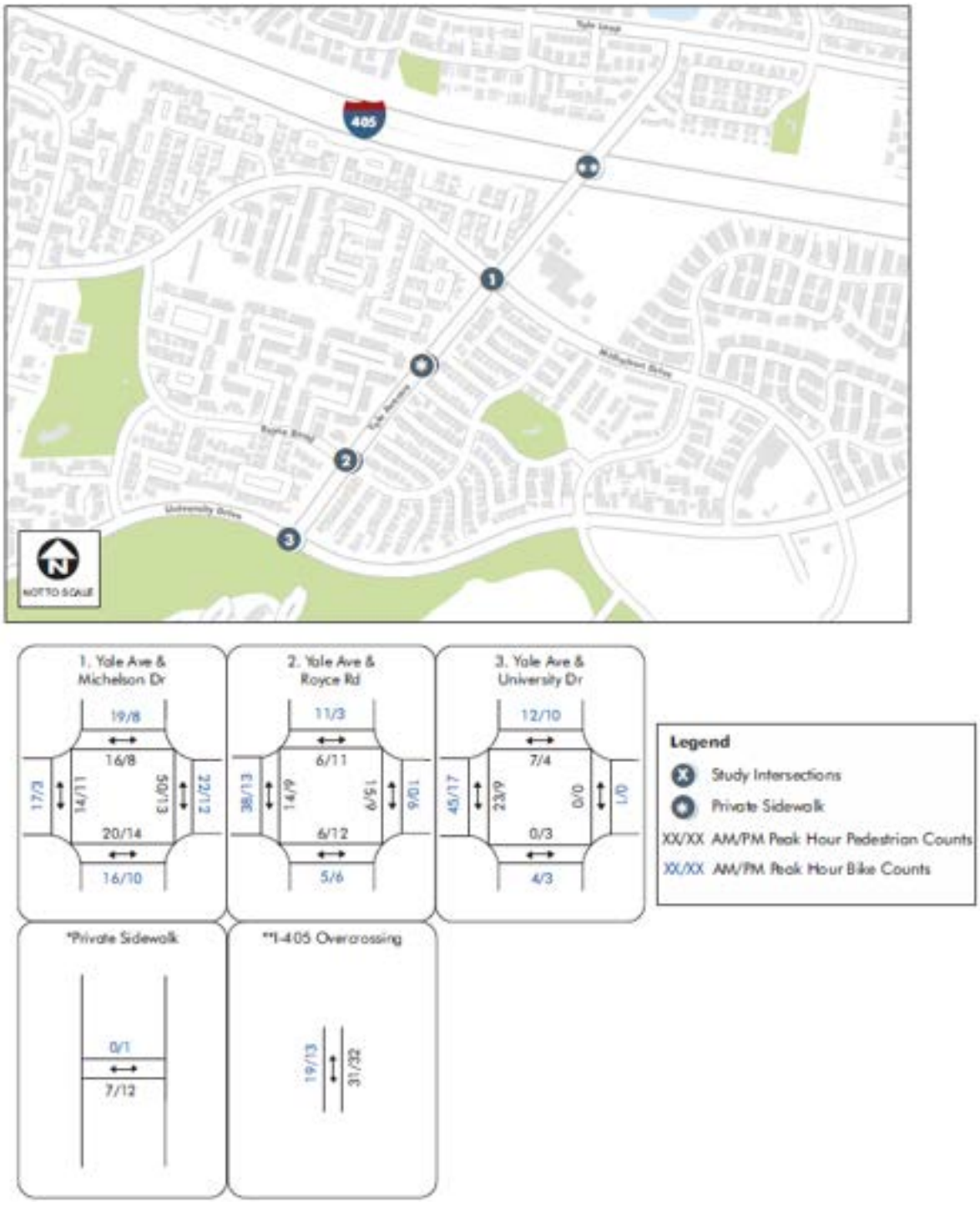


Figure 4-6 illustrates the existing conditions bicycle and pedestrian counts during school peak hour (1hr).

Figure 4-6: Existing Pedestrian and Bike Counts School Peak Hour (1Hr)

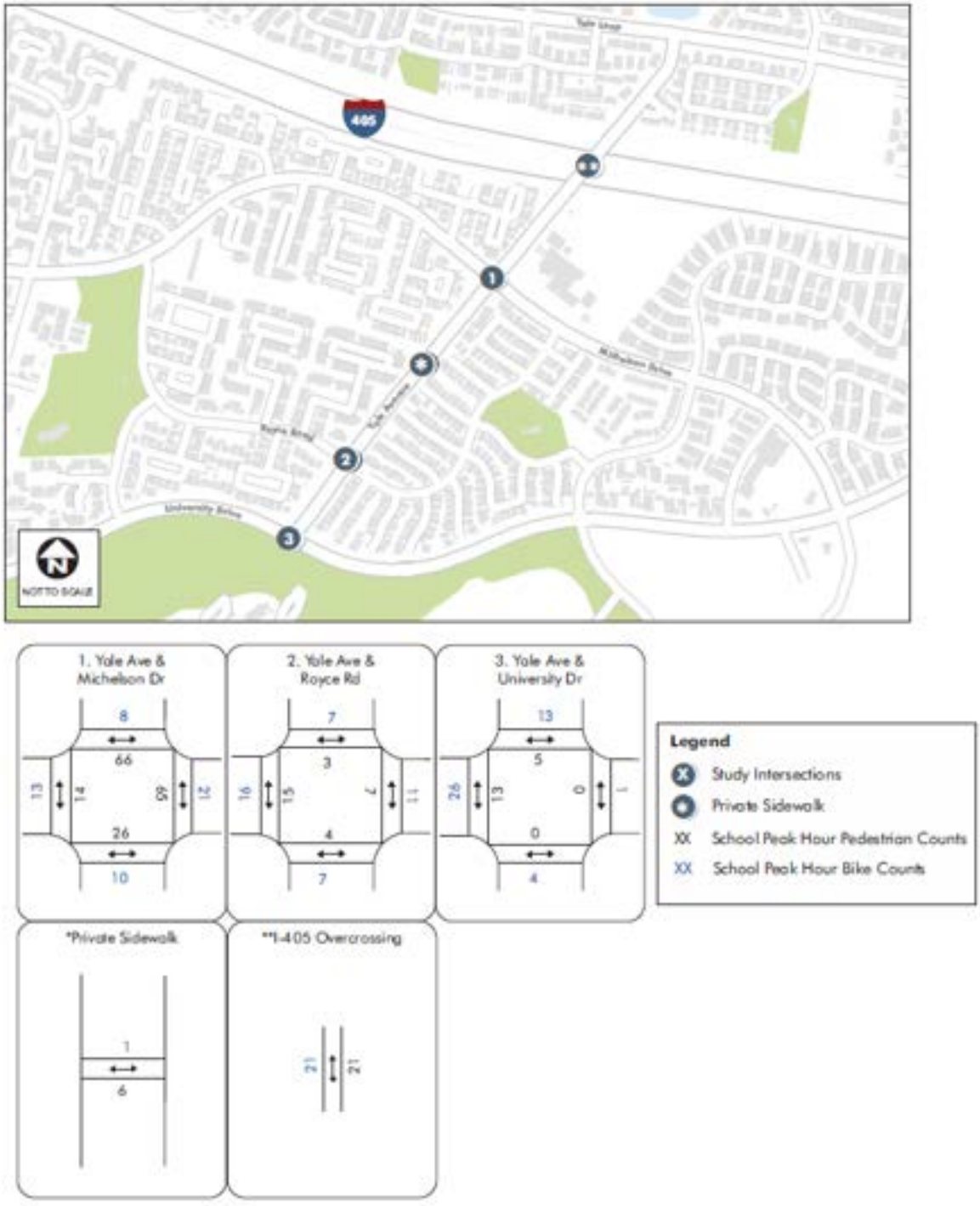
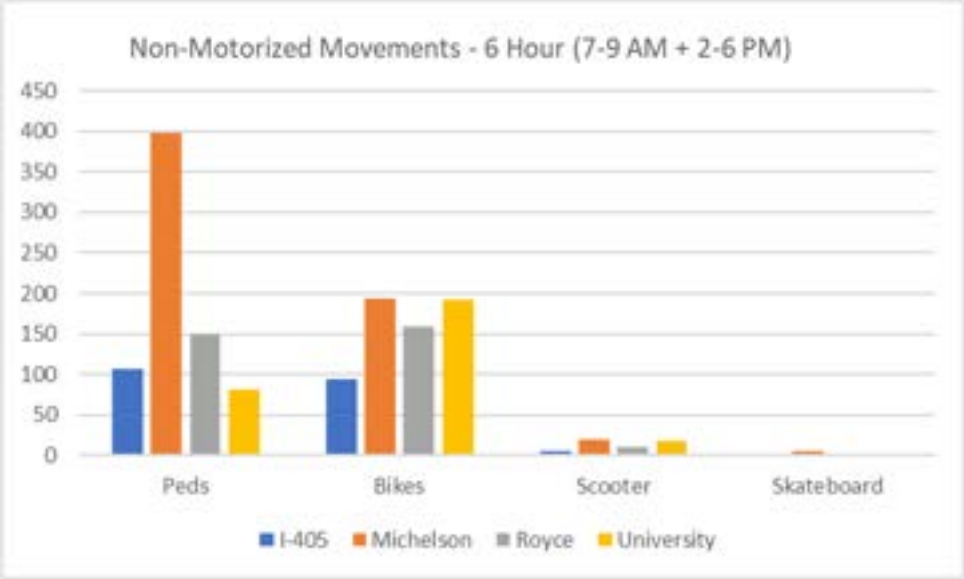


Table 4-3 and Figure 4-7 shows the total non-motorized movements during AM (7AM-9AM) and PM (2:30 PM-6PM) periods (six hours) at the study intersections and at I-405 overcrossing by mode. The main pedestrian movement is at Yale Avenue and Michelson Drive around the Rancho San Joaquin Middle School. Bicycles are more evenly spread throughout the study area. This suggests bikes traversing the whole corridor while pedestrians are either walking to nearby homes or being picked up by parents from school who are waiting on adjacent streets. This observation was supported by field observations. Only a small number of scooters and skateboards were observed.

Table 4-3: November 2022 AM and PM Periods Non-Motorized Counts

Mode	I-405 Overcrossing	Yale Avenue and Michelson Drive	Yale Avenue and Royce Road	Yale Avenue and University Drive
Pedestrian	107	397	150	82
Bicycle	88	194	160	192
Scooter	6	20	10	18
Skateboard	1	5	2	2
Total	**201**	**616**	**321**	**294**

Figure 4-7: Non-motorized movements by Location and Mode



4.5 Existing Conditions Traffic Analysis

The intersection LOS results were calculated during the AM, PM, and school peak hours for Existing conditions and the results are shown in **Table 4-4**. The ICU worksheets are provided in **Appendix B**. The synchro worksheets are provided in **Appendix C**. Under Existing conditions, the study intersections are operating at LOS C or better during both AM and PM peak hours.

Table 4-4: Existing Conditions Intersection Peak Hour LOS

#	Intersection	Methodology	Existing					
			AM		Evening PM		School PM	
			V/C Delay	LOS	V/C Delay	LOS	V/C Delay	LOS
1	Yale Avenue and Michelson Drive[1]	HCM 6th 4-WSC	17.7	C	14.0	B	13.3	B
2	Yale Avenue and Royce Road[1]	HCM 6th 2-WSC	17.9	C	10.6	B	10.6	B
3	Yale Avenue and University Drive	ICU	0.53	A	0.48	A	0.32	A

Note:

[1] Unsignalized intersection

2-WSC: 2-way stop control

4-WSC: 4-way stop control

The roadway segment LOS results during existing conditions are shown in **Table 4-5**. The study roadway segments operate at LOS A under Existing conditions.

Table 4-5: Existing Conditions Roadway Segment LOS

#	Segment	Existing				
		Type	Total Capacity	ADT	V/C	LOS
A	Yale Avenue north of Michelson Drive	Commuter	13,000	540	0.04	A
B	Yale Avenue between Michelson Drive and Royce Road	Commuter	13,000	1,230	0.09	A
C	Yale Avenue between Royce Road and University Drive	Commuter	13,000	1,770	0.14	A

5 DEVELOPMENT OF FUTURE FORECAST TRAFFIC VOLUMES AND METHODOLOGY

Future traffic volumes were extracted from the City's traffic model ITAM. Prior to running ITAM, the highway networks were reviewed to ensure that they adequately represented the roadway system in the study area.

ITAM uses future model forecasts along with existing model volumes and existing traffic counts to generate post-processed forecast model volumes for the four Buildout year scenarios. **Figure 5-1** through **Figure 5-4** illustrates the buildout year turning movement volumes from ITAM while **Table 5-1** summarizes the buildout year daily volumes on the arterial segments.

Figure 5-1: Buildout Year I-405 Vehicular OC with Four-Lane Yale Avenue Traffic Volumes

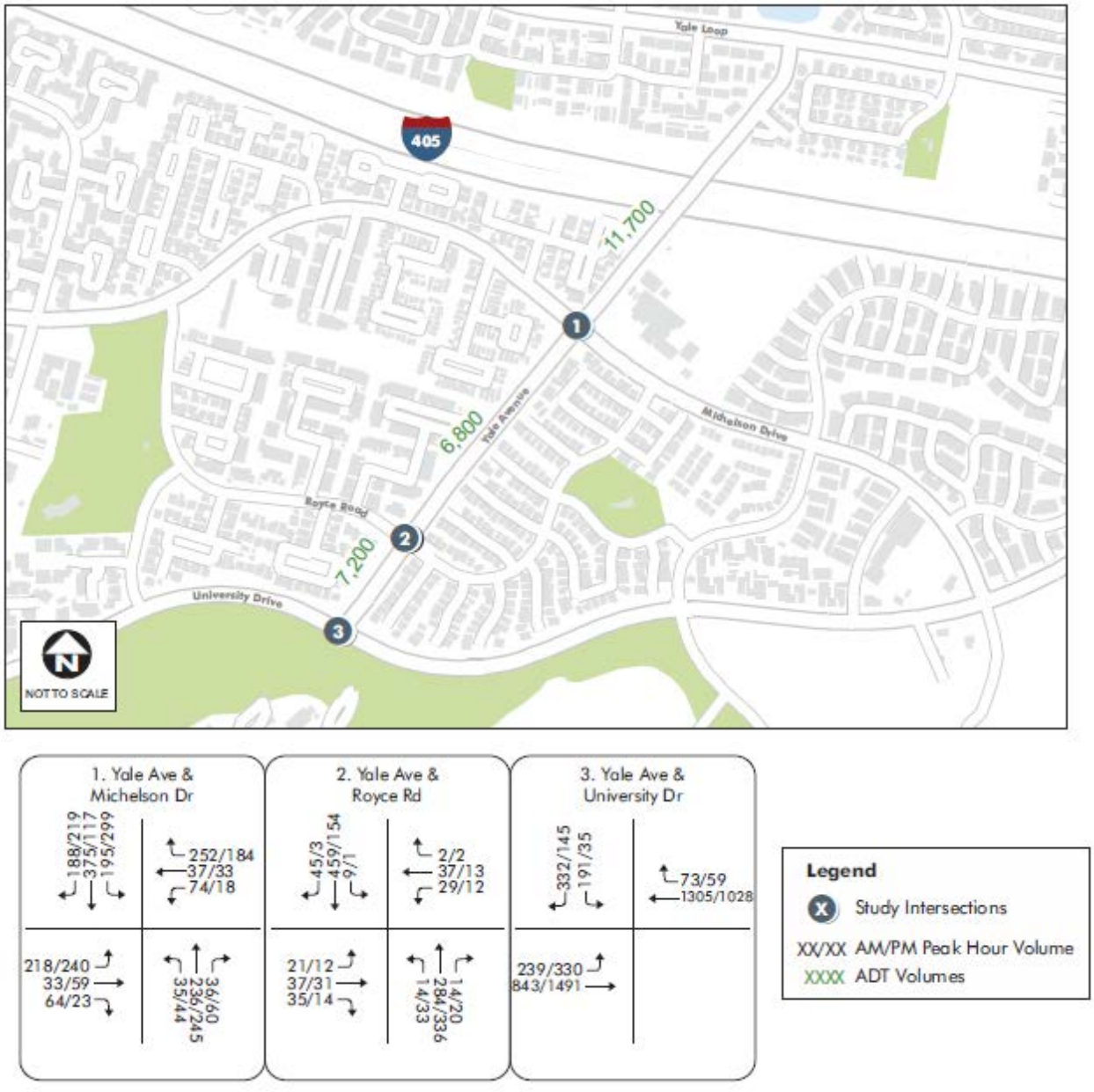


Figure 5-2: Buildout Year I-405 Vehicular OC with Two-Lane Yale Avenue Traffic Volumes



Figure 5-3: Buildout Year No I-405 Vehicular OC with Four-Lane Yale Avenue Traffic Volumes



Figure 5-4: Buildout Year No I-405 Vehicular OC with Two-Lane Yale Avenue Traffic Volumes



Table 5-1: Forecast Buildout Year Arterial Segment Volumes

#	Segment	Existing	Buildout Year Post-Processed ADT			
			I-405 Vehicular OC with 4-Lane Yale Avenue	I-405 Vehicular OC with 2-Lane Yale Avenue	No I-405 Vehicular OC with 4-Lane Yale Avenue	No I-405 Vehicular OC with 2-Lane Yale Avenue
A	Yale Avenue north of Michelson Drive	540	11,700	11,400	570	570
B	Yale Avenue between Michelson Drive and Royce Road	1,230	6,800	6,300	2,600	2,400
C	Yale Avenue between Royce Road and University Drive	1,770	7,200	6,800	3,200	3,000

Two different Buildout networks were used, one with an I-405 vehicular OC along Yale Avenue and the other with an I-405 pedestrians and bicyclists-only OC along Yale Avenue. Using traffic forecasts based on the City of Irvine's traffic model ITAM, Yale Avenue volumes from both Buildout scenarios with 2 lanes are lower than with 4 lanes. Also, the Buildout scenario with I-405 vehicular OC are higher than the scenarios with No I-405 vehicular OC, likely due to the network using Yale Avenue as an alternative route for some origin-destination pairs which could potentially increase traffic along Yale Avenue.

6 BUILDOUT YEAR TRAFFIC OPERATIONS

LOS analysis was conducted to evaluate the future scenarios:

- Buildout Year I-405 Vehicular OC with Four-lane Yale Avenue,
- Buildout Year I-405 Vehicular OC with Two-lane Yale Avenue,
- Buildout Year No I-405 Vehicular OC with Four-lane Yale Avenue, and
- Buildout Year No I-405 Vehicular OC with Two-lane Yale Avenue during AM and PM peak hours.

The signalized intersections were analyzed using the ICU methodology, and additional HCM analyses were completed at the unsignalized intersections.

6.1 Buildout Year I-405 Vehicular OC with Four-Lane Yale Avenue

The intersection LOS results were calculated during the AM and PM peak hours are shown in **Table 6-1**. The ICU worksheets are provided in **Appendix B**. The synchro worksheets are provided in **Appendix C**. Two (2) intersections are expected to operate at LOS E or worse during either AM or PM peak hours:

- Yale Avenue and Michelson Drive (AM LOS F | PM LOS F for 4-way stop-controlled operation)
- Yale Avenue and Royce Road (AM LOS E for 2-way stop-controlled operation)

LOS is also shown for informational purposes using the ICU methodology at Yale Avenue and Michelson Drive and using a four-way stop-controlled methodology at Yale Avenue and Royce Road, which both operate at satisfactory levels of service. Unlike ICU analysis, for HCM analysis typically the delay for the most restrictive approach is reported rather than the delay for the intersection. Therefore, in the case of Royce Road, the delay in the eastbound and westbound direction is reduced significantly. Although there is an increase in delay for the northbound and southbound movements compared to 2-way stop-controlled operation, overall delay for the intersection increases, but with an improvement in reported LOS (since stop-controlled intersections are reported by worst approach).

Table 6-1: Buildout Year I-405 Vehicular OC with Four-Lane Yale Avenue Intersection LOS

#	Intersection	Methodology	Existing				Buildout Year I-405 Vehicular OC with Four-Lane Yale Avenue			
			AM		PM		AM		PM	
			V/C Delay	LOS	V/C Delay	LOS	V/C Delay	LOS	V/C Delay	LOS
1	Yale Avenue and Michelson Drive	HCM 6th 4-WSC	17.7	C	14.0	B	**388.4**	**F**	**341.5**	**F**
		ICU	--	--	--	--	0.43	A	0.46	A
2	Yale Avenue and Royce Road[1]	HCM 6th 2-WSC	17.9	C	10.6	B	**41.5**	**E**	19.5	C
		HCM 6th 4-WSC	--	--	--	--	16.0	C	11.2	B
3	Yale Avenue and University Drive	ICU	0.53	A	0.48	A	0.68	B	0.56	A

Note: Bolded *cell denotes deficient LOS (V/C ≥ 0.91)*

[1] Unsignalized intersection

2-WSC: 2-way stop control

4-WSC: 4-way stop control

A traffic signal warrant study per Manual on Uniform Traffic Control Devices (MUTCD) was performed for both intersections. The unsignalized intersection of Yale Avenue and Royce Road does not meet the peak hour volume warrant, while the unsignalized intersection of Yale Avenue and Michelson Drive does meet the peak hour volume warrant, meaning that signal installation may be recommended. The peak hour volume warrant is provided in

Appendix D.

The roadway segment LOS results during Buildout Year I-405 Vehicular OC with four-lane Yale Avenue are shown in **Table 6-2**. The study roadway segments are expected to operate at LOS D or better under Buildout Year I-405 Vehicular OC with Four-Lane Yale Avenue scenario conditions.

Table 6-2: Buildout Year I-405 Vehicular OC with Four-Lane Yale Avenue Roadway Segment LOS

#	Segment	Existing					Buildout Year I-405 Vehicular OC with Four-Lane Yale Avenue				
		Type	Total Capacity	ADT	V/C	LOS	Type	Total Capacity	ADT	V/C	LOS
A	Yale Avenue north of Michelson Drive	Commuter	13,000	540	0.04	A	Commuter	13,000	11,700	0.90	D
B	Yale Avenue between Michelson Drive and Royce Road	Commuter	13,000	1,230	0.09	A	Secondary	28,000	6,800	0.24	A
C	Yale Avenue between Royce Road and University Drive	Commuter	13,000	1,770	0.14	A	Secondary	28,000	7,200	0.26	A

6.2 Buildout Year I-405 Vehicular OC with Two-Lane Yale Avenue

The intersection LOS results were calculated during the AM and PM peak hours for as shown in **Table 6-3**. The ICU worksheets are provided in **Appendix B**. The synchro worksheets are provided in **Appendix C**.

As shown in **Table 6-3**, the following two (2) intersections are expected to operate at LOS E or worse during AM or PM peak hours:

- Yale Avenue and Michelson Drive (AM LOS F | PM LOS F for 4-way stop-controlled operation)
- Yale Avenue and Royce Road (AM LOS E for 2-way stop-controlled operation)

LOS is also shown for informational purposes using the ICU methodology at Yale Avenue and Michelson Drive and using a four-way stop-controlled methodology for Yale Avenue and Royce Road. Unlike the four-lane Yale Avenue conditions (summarized in *Section 6.1*), the two-way stop-control would not result in a satisfactory level of service in the AM peak.

Table 6-3: Buildout Year I-405 Vehicular OC with Two-Lane Yale Avenue Intersection LOS

#	Intersection	Methodology	Existing				Buildout Year I-405 Vehicular OC with Two-Lane Yale Avenue			
			AM		PM		AM		PM	
			V/C Delay	LOS	V/C Delay	LOS	V/C Delay	LOS	V/C Delay	LOS
1	Yale Avenue and Michelson Drive	HCM 6th 4-WSC	17.7	C	14.0	B	**903.6**	**F**	**456.8**	**F**
		ICU	--	--	--	--	0.51	A	0.54	A
2	Yale Avenue and Royce Road[1]	HCM 6th 2-WSC	17.9	C	10.6	B	**46.3**	**E**	19.1	C
		HCM 6th 4-WSC	--	--	--	--	38.8	**E**	16.1	C
3	Yale Avenue and University Drive	ICU	0.53	A	0.48	A	0.68	B	0.56	A

Note: Bolded *cell denotes deficient LOS (V/C ≥ 0.91)*

[1] Unsignalized intersection

2-WSC: 2-way stop control

4-WSC: 4-way stop control

A traffic signal warrant study per Manual on Uniform Traffic Control Devices (MUTCD) was performed for both intersections. The unsignalized intersection of Yale Avenue and Royce Road does not meet the peak hour volume warrant, while the unsignalized intersection of Yale Avenue and Michelson Drive does meet the peak hour volume warrant and signal installation should be considered. The peak hour volume warrant is provided in **Appendix D.**

The roadway segment LOS results during Buildout Year I-405 Vehicular OC with Two-Lane Yale Avenue are summarized in **Table 6-4**. The study roadway segments are expected to operate at LOS D or better under Buildout Year I-405 Vehicular OC with Two-Lane Yale Avenue scenario conditions.

Table 6-4: Buildout Year I-405 Vehicular OC with Two-Lane Yale Avenue Roadway Segment LOS

#	Segment	Existing					Buildout Year I-405 Vehicular OC with Two-Lane Yale Avenue				
		Type	Total Capacity	ADT	V/C	LOS	Type	Total Capacity	ADT	V/C	LOS
A	Yale Avenue north of Michelson Drive	Commuter	13,000	540	0.04	A	Commuter	13,000	11,400	0.88	D
B	Yale Avenue between Michelson Drive and Royce Road	Commuter	13,000	1,230	0.09	A	Secondary	28,000	6,300	0.23	A
C	Yale Avenue between Royce Road and University Drive	Commuter	13,000	1,770	0.14	A	Secondary	28,000	6,800	0.24	A

6.3 Buildout Year No I-405 Vehicular OC with Four-Lane Yale Avenue

The intersection LOS results were calculated during the AM and PM peak hours for Buildout Year No I-405 Vehicular OC with Four-Lane Yale Avenue scenario, and the results are summarized in **Table 6-5**. The ICU worksheets are provided in **Appendix B**. The synchro worksheets are provided in **Appendix C**. The study intersections are expected to operate at LOS C or better during both AM and PM peak hours under the Buildout Year No I-405 Vehicular OC with Four-Lane Yale Avenue scenario conditions.

Table 6-5: Buildout Year No I-405 Vehicular OC with Four-Lane Yale Avenue Intersection LOS

#	Intersection	Methodology	Existing				Buildout Year No I-405 Vehicular OC with Four-Lane Yale Avenue			
			AM		PM		AM		PM	
			V/C Delay	LOS	V/C Delay	LOS	V/C Delay	LOS	V/C Delay	LOS
1	Yale Avenue and Michelson Drive[1]	HCM 6th 4-WSC	17.7	C	14.0	B	24.2	C	18.1	C
2	Yale Avenue and Royce Road[1]	HCM 6th 2-WSC	17.9	C	10.6	B	22.9	C	12.0	B
3	Yale Avenue and University Drive	ICU	0.53	A	0.48	A	0.61	B	0.55	A

Note:

[1] Unsignalized intersection

2-WSC: 2-way stop control

4-WSC: 4-way stop control

The roadway segment LOS results during Buildout Year No I-405 Vehicular OC with Four-Lane Yale Avenue are summarized in **Table 6-6**. The study roadway segments are expected to operate at LOS A under Buildout Year No I-405 Vehicular OC Four-Lane Yale Avenue scenario conditions.

Table 6-6: Buildout Year No I-405 Vehicular OC Four-Lane Yale Avenue Roadway Segment LOS

#	Segment	Existing					Buildout Year No I-405 Vehicular OC with Four-Lane Yale Avenue				
		Type	Total Capacity	ADT	V/C	LOS	Type	Total Capacity	ADT	V/C	LOS
A	Yale Avenue north of Michelson Drive	Commuter	13,000	540	0.04	A	Commuter	13,000	570	0.04	A
B	Yale Avenue between Michelson Drive and Royce Road	Commuter	13,000	1,230	0.09	A	Secondary	28,000	2,600	0.09	A
C	Yale Avenue between Royce Road and University Drive	Commuter	13,000	1,770	0.14	A	Secondary	28,000	3,200	0.11	A

6.4 Buildout Year No I-405 Vehicular OC with Two-Lane Yale Avenue

The intersection LOS results were calculated during the AM and PM peak hours for Buildout Year No I-405 Vehicular OC with Two-Lane Yale Avenue conditions, and the results are summarized in **Table 6-7**. The ICU worksheets are provided in **Appendix B**. The synchro worksheets are provided in **Appendix C**. The study intersections are expected to operate at LOS C or better during both AM and PM peak hours under Buildout Year No I-405 Vehicular OC with Two-Lane Yale Avenue scenarios conditions.

Table 6-7: Buildout Year No I-405 Vehicular OC with Two-Lane Yale Avenue Intersection LOS

#	Intersection	Methodology	Existing				Buildout Year No I-405 Vehicular OC with Two-Lane Yale Avenue			
			AM		PM		AM		PM	
			V/C Delay	LOS	V/C Delay	LOS	V/C Delay	LOS	V/C Delay	LOS
1	Yale Avenue and Michelson Drive[1]	HCM 6th 4-WSC	17.7	C	14.0	B	20.4	C	18.4	C
2	Yale Avenue and Royce Road[1]	HCM 6th 2-WSC	17.9	C	10.6	B	24.7	C	11.9	B
3	Yale Avenue and University Drive	ICU	0.53	A	0.48	A	0.61	B	0.55	A

Note:

[1] Unsignalized intersection

2-WSC: 2 ways stop control

4-WSC: 4 ways stop control

The roadway segments LOS results during Buildout Year No I-405 Vehicular OC with Two-Lane Yale Avenue conditions are summarized in **Table 6-8**. The study roadway segments are expected to operate at LOS A under Buildout Year No I-405 Vehicular OC Two-Lane Yale Avenue scenario conditions.

Table 6-8: Buildout Year No I-405 Vehicular OC with Two-Lane Yale Avenue Roadway Segment LOS

#	Segment	Existing					Buildout Year No I-405 Vehicular OC with Two-Lane Yale Avenue				
		Type	Total Capacity	ADT	V/C	LOS	Type	Total Capacity	ADT	V/C	LOS
A	Yale Avenue north of Michelson Drive	Commuter	13,000	540	0.04	A	Commuter	13,000	570	0.04	A
B	Yale Avenue between Michelson Drive and Royce Road	Commuter	13,000	1,230	0.09	A	Secondary	28,000	2,400	0.09	A
C	Yale Avenue between Royce Road and University Drive	Commuter	13,000	1,770	0.14	A	Secondary	28,000	3,000	0.11	A

7 SIGNAL WARRANTS

The following unsignalized intersections are expected to operate deficiently under Buildout Year I-405 vehicular overcrossing under both four-lane Yale Avenue and two-lane Yale Avenue scenarios:

- Yale Avenue and Michelson Drive
- Yale Avenue and Royce Road

Traffic signal warrant studies per Manual on Uniform Control Devices (MUTCD) was performed for both intersections. The intersection of Yale Avenue and Michelson Drive met the conditions for Warrant 3 (Peak Hour) with AM and PM peak hour volumes as shown in **Figure 7-1** and **Figure 7-2**, while the intersection of Yale Avenue and Royce Road did not meet the conditions for Warrant 3 (Peak Hour) for either AM or PM peak hour volumes.

Figure 7-1: Buildout Year I-405 Vehicular OC with Four-Lane Yale Avenue – MUTCD Traffic Signal Warrant (Yale Avenue and Michelson Drive)

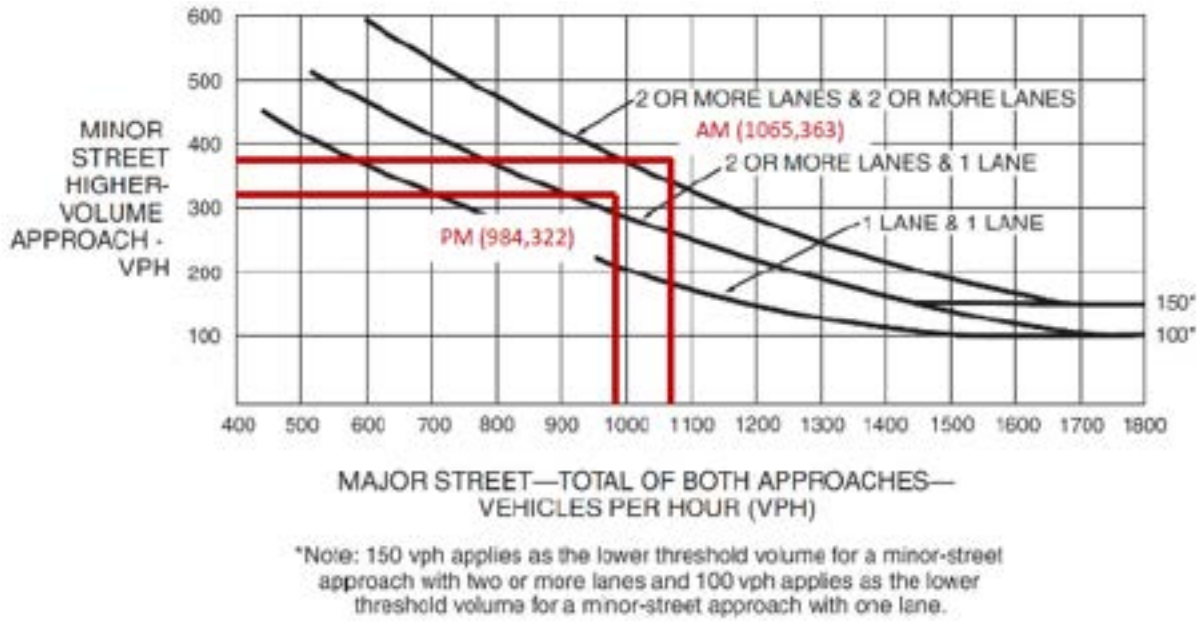
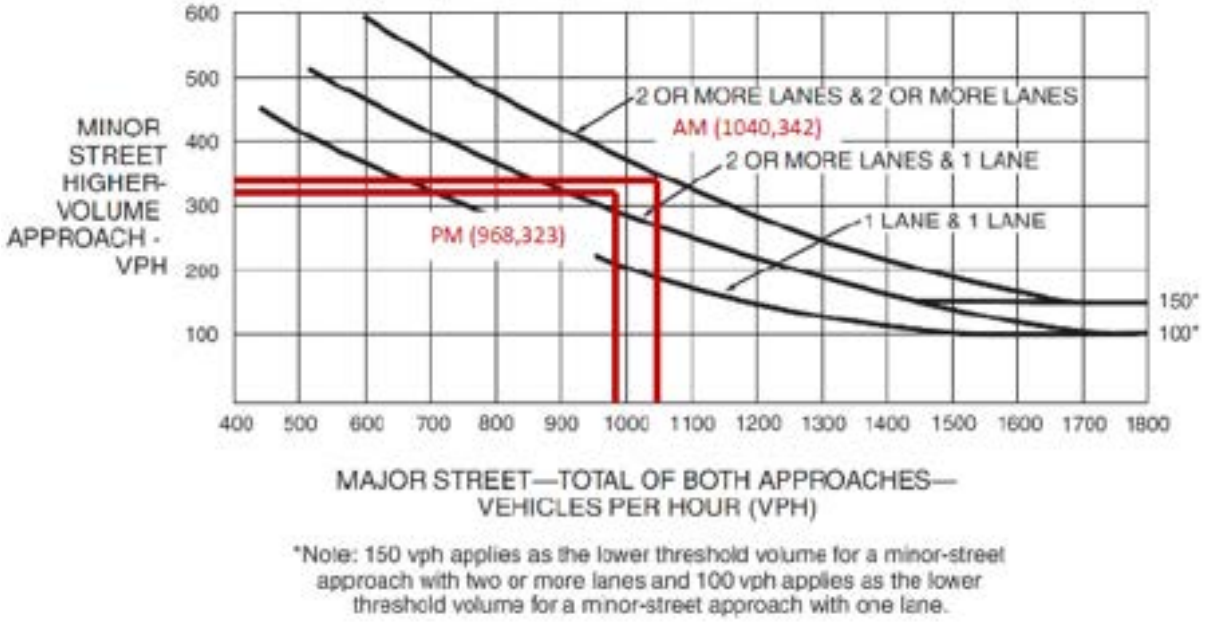


Figure 7-2: Buildout Year I-405 Vehicular OC with Two-Lane Yale Avenue – MUTCD Traffic Signal Warrant (Yale Avenue and Michelson Drive)



8 FINDINGS AND RECOMMENDATIONS

In existing conditions all three study area intersections and roadway segments operate at satisfactory levels of service. There are two pairs of Buildout Scenarios with and without the widening to four lanes.

1. **No Future Vehicular crossing of Yale Avenue over I-405** – In this scenario pair, the elimination of the future widening Yale Avenue from two-lanes to four-lanes will not result in any deficient level of service at any of the three study intersections or roadway segments. All intersections and arterial segments will continue to operate at satisfactory levels of service.

2. **Future Vehicular crossing of Yale Avenue over I-405** – This is the current General Plan and MPAH scenario. In this scenario pair, in both the four-lane and two-lane scenarios the intersection of Yale Avenue and Michelson Drive would operate and unsatisfactory levels of service with the existing four-way stop control. However, this intersection meets signal warrants based on future peak hour volumes. Based on the assumption that the intersection would be signalized should a vehicular overcrossing of I-405 be implemented, then the intersection would operate at satisfactory levels of service using the ICU methodology.

   The intersection of Yale Avenue and Royce Avenue would operate at unsatisfactory levels of service using the existing two-way stop control configuration. The future volumes at the intersection do not warrant a traffic signal. A four-lane stop controlled analysis was therefore performed as a sensitivity test. Although the overall intersection delay increases with a four-way control the intersection level of service as defined by the approach with maximum delay would improve in both two -lane and four lane Yale Avenue scenarios. In the case of the four-lane Yale Avenue configuration, the intersection would operate at a satisfactory level of service, but with the two-lane stop control (the existing configuration), the level of service would remain unsatisfactory.

Since the purpose of the study is for the potential removal of the street widening of Yale Avenue, there is no VMT impact under CEQA.



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Santa Ana, CA 92705

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City of Irvine

South Yale Avenue Traffic Study

Technical Appendix





Submitted to:

11797 | Prepared by **Iteris, Inc.**

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APPENDIX A– 2022 TRAFFIC COUNTS

South Yale Corridor Study -Average Daily Traffic Summary

ID	Location	ADT	AM Peak	PM School Peak	PM Evening	AM Peak %	PM School Peak%	PM Evening%
1	Yale Ave north of Michelson Dr	540	250	135	8	46%	25%	1%
2	Yale Ave north of Royce Rd	1,230	253	188	89	21%	15%	7%
3	Yale Ave south of Royce Rd	1,770	295	217	133	17%	12%	8%

		Tuesday			Wednesday					
		11/15/2022			11/16/2022			Average		
ID	Location	NB	SB	Combined	NB	SB	Combined	NB	SB	Combined
1	Yale Ave north of Michelson Dr	259	253	512	280	288	568	270	270	540
2	Yale Ave north of Royce Rd	722	563	1,285	646	522	1,168	680	540	1,230
3	Yale Ave south of Royce Rd	978	821	1,799	926	811	1,737	950	820	1,770

Volumes for: Tuesday, November 15, 2022 **CITY:** Irvine Rancho San Joaquin **PROJECT:** SC3579

Location: **ADT1 Yale north of Michelson** Prepared by: Field Data Services of Arizona, Inc. Suhsduhg#e|#DlpWG#OOF##who1#:47#586#:;;;

DAY 1

AM Period	NB		SB			PM Period	NB		SB		
0:00	0		0			12:00	0		1		
0:15	0		0			12:15	1		0		
0:30	0		0			12:30	1		0		
0:45	0	0	0	0	0	12:45	0	2	0	1	3
1:00	0		0			13:00	1		0		
1:15	0		0			13:15	0		0		
1:30	0		0			13:30	0		1		
1:45	0	0	0	0	0	13:45	0	1	0	1	2
2:00	0		0			14:00	1		1		
2:15	0		0			14:15	4		2		
2:30	0		0			14:30	14		0		
2:45	0	0	0	0	0	14:45	22	41	4	7	48
3:00	0		0			15:00	19		45		
3:15	0		0			15:15	7		16		
3:30	0		0			15:30	1		3		
3:45	0	0	0	0	0	15:45	5	32	2	66	98
4:00	0		0			16:00	7		21		
4:15	0		0			16:15	1		3		
4:30	0		0			16:30	1		2		
4:45	0	0	0	0	0	16:45	0	9	0	26	35
5:00	1		1			17:00	1		0		
5:15	1		0			17:15	0		1		
5:30	0		0			17:30	0		1		
5:45	0	2	0	1	3	17:45	0	1	1	3	4
6:00	1		1			18:00	0		2		
6:15	1		0			18:15	0		0		
6:30	0		2			18:30	1		1		
6:45	0	2	0	3	5	18:45	2	3	3	6	9
7:00	3		0			19:00	2		3		
7:15	11		6			19:15	0		0		
7:30	10		11			19:30	0		0		
7:45	15	39	5	22	61	19:45	0	2	0	3	5
8:00	47		29			20:00	0		0		
8:15	64		61			20:15	0		0		
8:30	3		5			20:30	0		0		
8:45	0	114	6	101	215	20:45	0	0	0	0	0
9:00	1		2			21:00	0		0		
9:15	2		2			21:15	0		0		
9:30	1		0			21:30	0		1		
9:45	1	5	2	6	11	21:45	0	0	0	1	1
10:00	0		1			22:00	0		0		
10:15	2		1			22:15	0		0		
10:30	1		0			22:30	0		0		
10:45	1	4	0	2	6	22:45	0	0	0	0	0
11:00	0		0			23:00	0		0		
11:15	1		0			23:15	0		0		
11:30	0		1			23:30	0		1		
11:45	1	2	2	3	5	23:45	0	0	0	1	1
Total Vol.		168		138	**306**			91		115	**206**

Daily Totals

NB	SB	Combined
259	253	**512**

	AM			PM		
Split %	54.9%	45.1%	**59.8%**	44.2%	55.8%	**40.2%**
Peak Hour	7:30	7:30	**7:30**	14:30	14:45	**14:30**
Volume	136	106	**242**	62	68	**127**
P.H.F.	0.53	0.43	**0.48**	0.84	0.38	**0.50**

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Volumes for: Wednesday, November 16, 2022 **CITY:** Irvine Rancho San Joaquin **PROJECT:** SC3579

Location: **ADT1 Yale north of Michelson** Prepared by: Field Data Services of Arizona, Inc. Suhsduhg#e|#DlpWG#OOF##who1#:47#586#:;;;

DAY 2

AM Period	NB		SB			PM Period	NB		SB		
0:00	0		0			12:00	0		2		
0:15	0		0			12:15	0		0		
0:30	0		0			12:30	1		1		
0:45	0	0	0	0	0	12:45	0	1	1	4	5
1:00	0		0			13:00	0		0		
1:15	0		0			13:15	2		0		
1:30	0		0			13:30	0		1		
1:45	0	0	0	0	0	13:45	0	2	0	1	3
2:00	0		0			14:00	7		4		
2:15	0		0			14:15	6		1		
2:30	0		0			14:30	9		3		
2:45	0	0	0	0	0	14:45	22	44	4	12	56
3:00	0		0			15:00	25		58		
3:15	0		0			15:15	6		16		
3:30	0		0			15:30	2		3		
3:45	0	0	0	0	0	15:45	5	38	4	81	119
4:00	0		0			16:00	7		19		
4:15	0		0			16:15	0		1		
4:30	0		0			16:30	0		0		
4:45	0	0	0	0	0	16:45	2	9	0	20	29
5:00	0		0			17:00	1		5		
5:15	0		0			17:15	0		0		
5:30	0		0			17:30	1		2		
5:45	1	1	1	1	2	17:45	0	2	0	7	9
6:00	0		0			18:00	0		1		
6:15	0		0			18:15	0		0		
6:30	0		0			18:30	0		1		
6:45	1	1	0	0	1	18:45	0	0	0	2	2
7:00	1		3			19:00	0		0		
7:15	7		0			19:15	0		0		
7:30	4		1			19:30	0		1		
7:45	23	35	8	12	47	19:45	0	0	0	1	1
8:00	57		34			20:00	0		1		
8:15	68		71			20:15	0		0		
8:30	3		6			20:30	0		0		
8:45	7	135	6	117	252	20:45	0	0	0	1	1
9:00	0		2			21:00	1		2		
9:15	2		2			21:15	1		0		
9:30	1		1			21:30	0		2		
9:45	1	4	3	8	12	21:45	0	2	0	4	6
10:00	1		3			22:00	0		0		
10:15	2		0			22:15	0		0		
10:30	1		1			22:30	0		0		
10:45	0	4	0	4	8	22:45	0	0	0	0	0
11:00	1		1			23:00	0		2		
11:15	0		5			23:15	0		0		
11:30	0		3			23:30	0		1		
11:45	1	2	1	10	12	23:45	0	0	0	3	3
Total Vol.		182		152	**334**			98		136	**234**

Daily Totals

NB	SB	Combined
280	288	**568**

	AM			PM		
Split %	54.5%	45.5%	**58.8%**	41.9%	58.1%	**41.2%**
Peak Hour	7:30	7:45	**7:45**	14:15	14:30	**14:30**
Volume	152	119	**270**	62	81	**143**
P.H.F.	0.56	0.42	**0.49**	0.67	0.35	**0.43**

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Volumes for: Tuesday, November 15, 2022 **CITY:** Irvine Rancho San Joaquin **PROJECT:** SC3579

Location: **ADT2 Yale north of Royce** Prepared by: Field Data Services of Arizona, Inc. Suhsduhg#e|#DlpWG#OOF##who1#:47#586#:;;;

DAY 1

AM Period	NB		SB			PM Period	NB		SB		
0:00	1		0			12:00	21		13		
0:15	0		0			12:15	12		6		
0:30	0		0			12:30	9		8		
0:45	0	1	0	0	1	12:45	18	60	7	34	94
1:00	1		0			13:00	12		6		
1:15	0		0			13:15	8		3		
1:30	0		0			13:30	12		9		
1:45	0	1	0	0	1	13:45	7	39	6	24	63
2:00	0		0			14:00	27		7		
2:15	0		0			14:15	25		7		
2:30	0		0			14:30	18		5		
2:45	0	0	0	0	0	14:45	43	113	4	23	136
3:00	0		0			15:00	27		61		
3:15	0		0			15:15	6		19		
3:30	0		0			15:30	10		7		
3:45	0	0	0	0	0	15:45	16	59	7	94	153
4:00	0		0			16:00	21		25		
4:15	0		0			16:15	20		8		
4:30	0		0			16:30	6		9		
4:45	0	0	1	1	1	16:45	13	60	2	44	104
5:00	0		0			17:00	19		4		
5:15	0		0			17:15	18		4		
5:30	1		1			17:30	30		7		
5:45	0	1	0	1	2	17:45	13	80	5	20	100
6:00	1		1			18:00	9		6		
6:15	2		2			18:15	8		3		
6:30	2		0			18:30	4		1		
6:45	4	9	3	6	15	18:45	6	27	2	12	39
7:00	3		1			19:00	8		4		
7:15	6		6			19:15	4		5		
7:30	6		10			19:30	4		3		
7:45	11	26	13	30	56	19:45	3	19	2	14	33
8:00	36		40			20:00	4		0		
8:15	46		82			20:15	6		1		
8:30	10		9			20:30	3		0		
8:45	8	100	9	140	240	20:45	1	14	1	2	16
9:00	12		5			21:00	2		2		
9:15	5		4			21:15	1		1		
9:30	15		6			21:30	0		1		
9:45	7	39	10	25	64	21:45	4	7	0	4	11
10:00	7		17			22:00	2		0		
10:15	8		12			22:15	1		0		
10:30	9		5			22:30	0		0		
10:45	7	31	3	37	68	22:45	2	5	1	1	6
11:00	5		15			23:00	1		0		
11:15	9		14			23:15	1		0		
11:30	6		9			23:30	0		1		
11:45	9	29	11	49	78	23:45	0	2	1	2	4
Total Vol.		237		289	**526**			485		274	**759**

Daily Totals

NB	SB	Combined
722	563	**1285**

	AM			PM		
Split %	45.1%	54.9%	**40.9%**	63.9%	36.1%	**59.1%**
Peak Hour	7:45	7:30	**7:45**	14:00	15:00	**14:15**
Volume	103	145	**247**	113	94	**190**
P.H.F.	0.56	0.44	**0.48**	0.81	0.39	**0.54**

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Volumes for: ################## **CITY:** Irvine Rancho San Joaquin **PROJECT:** SC3579

Location: ADT2 Yale north of Royce Prepared by: Field Data Services of Arizona, Inc. Suhsduhg#e|#DlpWG#OOF##who1#:47#586#:;;;

DAY 2

AM Period	NB		SB			PM Period	NB		SB		
0:00	0		0			12:00	11		6		
0:15	1		0			12:15	9		4		
0:30	0		0			12:30	9		3		
0:45	0	1	0	0	1	12:45	9	38	6	19	57
1:00	0		0			13:00	11		3		
1:15	0		0			13:15	10		6		
1:30	0		0			13:30	5		7		
1:45	0	0	0	0	0	13:45	16	42	8	24	66
2:00	0		0			14:00	11		14		
2:15	0		0			14:15	23		5		
2:30	0		0			14:30	13		11		
2:45	0	0	0	0	0	14:45	41	88	2	32	120
3:00	0		0			15:00	17		76		
3:15	0		0			15:15	11		10		
3:30	0		0			15:30	17		10		
3:45	0	0	0	0	0	15:45	17	62	5	101	163
4:00	0		0			16:00	15		17		
4:15	0		0			16:15	11		9		
4:30	0		1			16:30	10		5		
4:45	0	0	1	2	2	16:45	16	52	6	37	89
5:00	0		0			17:00	8		5		
5:15	0		0			17:15	14		6		
5:30	0		0			17:30	20		5		
5:45	0	0	2	2	2	17:45	18	60	4	20	80
6:00	0		0			18:00	8		5		
6:15	1		2			18:15	10		4		
6:30	2		3			18:30	4		5		
6:45	2	5	4	9	14	18:45	6	28	4	18	46
7:00	3		6			19:00	2		6		
7:15	6		3			19:15	3		3		
7:30	3		6			19:30	5		1		
7:45	10	22	9	24	46	19:45	3	13	0	10	23
8:00	49		45			20:00	5		5		
8:15	40		85			20:15	4		3		
8:30	9		10			20:30	2		1		
8:45	5	103	8	148	251	20:45	4	15	3	12	27
9:00	6		2			21:00	2		0		
9:15	7		10			21:15	2		0		
9:30	5		7			21:30	1		2		
9:45	8	26	9	28	54	21:45	3	8	2	4	12
10:00	5		8			22:00	2		0		
10:15	12		1			22:15	2		0		
10:30	7		3			22:30	1		1		
10:45	12	36	3	15	51	22:45	4	9	2	3	12
11:00	10		5			23:00	1		1		
11:15	5		1			23:15	1		1		
11:30	7		1			23:30	2		1		
11:45	12	34	4	11	45	23:45	0	4	0	3	7
Total Vol.		227		239	**466**			419		283	**702**

Daily Totals

NB	SB	Combined
646	522	**1168**

	AM			PM		
Split %	48.7%	51.3%	**39.9%**	59.7%	40.3%	**60.1%**
Peak Hour	7:45	7:45	**7:45**	14:15	15:00	**14:15**
Volume	108	149	**257**	94	101	**188**
P.H.F.	0.55	0.44	**0.51**	0.72	0.33	**0.51**

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Volumes for: Tuesday, November 15, 2022 **CITY:** Irvine Rancho San Joaquin **PROJECT:** SC3579

Location: **ADT3 Yale south of Royce** Prepared by: Field Data Services of Arizona, Inc. Suhsduhg#e|#DlpWG#OOF##who1#:47#586#:;;;

DAY 1

AM Period	NB		SB			PM Period	NB		SB		
0:00	3		0			12:00	26		15		
0:15	0		1			12:15	19		13		
0:30	1		0			12:30	16		7		
0:45	0	4	1	2	6	12:45	18	79	15	50	129
1:00	1		0			13:00	17		5		
1:15	0		0			13:15	13		10		
1:30	1		2			13:30	19		15		
1:45	1	3	0	2	5	13:45	13	62	11	41	103
2:00	0		0			14:00	34		14		
2:15	0		0			14:15	38		6		
2:30	1		0			14:30	18		12		
2:45	1	2	0	0	2	14:45	45	135	8	40	175
3:00	1		0			15:00	32		59		
3:15	0		1			15:15	10		22		
3:30	0		0			15:30	15		6		
3:45	1	2	0	1	3	15:45	23	80	11	98	178
4:00	0		0			16:00	20		25		
4:15	0		0			16:15	13		9		
4:30	0		0			16:30	11		16		
4:45	0	0	2	2	2	16:45	18	62	6	56	118
5:00	0		1			17:00	25		13		
5:15	0		0			17:15	27		6		
5:30	1		3			17:30	37		7		
5:45	1	2	2	6	8	17:45	21	110	7	33	143
6:00	2		1			18:00	15		8		
6:15	1		2			18:15	19		8		
6:30	2		3			18:30	14		8		
6:45	4	9	5	11	20	18:45	8	56	8	32	88
7:00	4		4			19:00	12		7		
7:15	7		11			19:15	12		8		
7:30	6		14			19:30	4		7		
7:45	15	32	23	52	84	19:45	6	34	4	26	60
8:00	37		55			20:00	9		7		
8:15	47		86			20:15	13		4		
8:30	13		14			20:30	5		2		
8:45	11	108	18	173	281	20:45	5	32	4	17	49
9:00	18		7			21:00	2		7		
9:15	8		4			21:15	4		1		
9:30	15		10			21:30	4		4		
9:45	13	54	11	32	86	21:45	7	17	3	15	32
10:00	7		23			22:00	6		1		
10:15	7		13			22:15	2		3		
10:30	9		14			22:30	6		2		
10:45	4	27	10	60	87	22:45	5	19	4	10	29
11:00	7		19			23:00	5		1		
11:15	6		14			23:15	4		0		
11:30	10		9			23:30	2		3		
11:45	12	35	15	57	92	23:45	3	14	1	5	19
Total Vol.		278		398	**676**			700		423	**1123**

Daily Totals

NB	SB	Combined
978	821	**1799**

	AM			PM		
Split %	41.1%	58.9%	**37.6%**	62.3%	37.7%	**62.4%**
Peak Hour	7:45	7:30	**7:45**	14:00	14:30	**14:15**
Volume	112	178	**290**	135	101	**218**
P.H.F.	0.60	0.52	**0.55**	0.71	0.43	**0.60**

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Volumes for: Wednesday, November 16, 2022 **CITY:** Irvine Rancho San Joaquin **PROJECT:** SC3579

Location: **ADT3 Yale south of Royce** Prepared by: Field Data Services of Arizona, Inc. Suhsduhg#e|#DlpWG#OOF##who1#:47#586#:;;;

DAY 2

AM Period	NB		SB			PM Period	NB		SB		
0:00	2		1			12:00	14		12		
0:15	2		0			12:15	20		8		
0:30	1		0			12:30	13		7		
0:45	0	5	0	1	6	12:45	9	56	14	41	97
1:00	2		1			13:00	17		4		
1:15	1		1			13:15	13		13		
1:30	0		0			13:30	13		10		
1:45	0	3	1	3	6	13:45	24	67	16	43	110
2:00	1		0			14:00	23		17		
2:15	1		0			14:15	29		8		
2:30	0		0			14:30	14		13		
2:45	0	2	0	0	2	14:45	40	106	10	48	154
3:00	0		2			15:00	23		75		
3:15	0		0			15:15	12		13		
3:30	0		1			15:30	16		10		
3:45	0	0	0	3	3	15:45	18	69	15	113	182
4:00	0		0			16:00	25		21		
4:15	0		0			16:15	22		12		
4:30	0		1			16:30	19		7		
4:45	0	0	1	2	2	16:45	21	87	7	47	134
5:00	0		1			17:00	18		13		
5:15	0		1			17:15	20		10		
5:30	0		0			17:30	34		7		
5:45	1	1	2	4	5	17:45	25	97	12	42	139
6:00	1		0			18:00	12		9		
6:15	2		6			18:15	21		10		
6:30	1		6			18:30	9		10		
6:45	3	7	5	17	24	18:45	11	53	4	33	86
7:00	4		8			19:00	16		10		
7:15	8		8			19:15	6		5		
7:30	7		14			19:30	11		4		
7:45	10	29	20	50	79	19:45	10	43	2	21	64
8:00	49		59			20:00	12		7		
8:15	46		93			20:15	10		2		
8:30	12		16			20:30	4		4		
8:45	13	120	14	182	302	20:45	4	30	3	16	46
9:00	6		7			21:00	6		0		
9:15	8		13			21:15	4		1		
9:30	4		11			21:30	3		2		
9:45	7	25	17	48	73	21:45	3	16	6	9	25
10:00	6		12			22:00	8		2		
10:15	9		7			22:15	2		3		
10:30	8		7			22:30	1		5		
10:45	13	36	8	34	70	22:45	5	16	3	13	29
11:00	9		12			23:00	3		2		
11:15	5		5			23:15	3		2		
11:30	12		9			23:30	5		1		
11:45	18	44	9	35	79	23:45	3	14	1	6	20
Total Vol.		272		379	**651**			654		432	**1086**

Daily Totals

NB	SB	Combined
926	811	**1737**

	AM			PM		
Split %	41.8%	58.2%	**37.5%**	60.2%	39.8%	**62.5%**
Peak Hour	8:00	7:45	**7:45**	14:00	15:00	**14:15**
Volume	120	188	**305**	106	113	**212**
P.H.F.	0.61	0.51	**0.55**	0.69	0.38	**0.54**

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South Yale Corridor Study -Intersection Turning Movement Count Summary

				NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
				Yale			Yale			Michelson			Michelson			
Intersection	Date	Peak	Hour Starting	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Yale/Michelson	Tue, Nov 15, 22	AM	7:45 AM	13	53	34	18	36	46	56	125	25	83	200	21	710
		PM	2:30 PM	14	21	48	20	19	26	23	164	15	46	168	17	581
		PM	4:45 PM	15	1	65	1	0	1	1	283	4	14	212	0	597
	Wed, Nov 16, 22	AM	7:45 AM	13	58	32	23	38	58	74	144	16	92	186	19	753
		PM	2:30 PM	16	17	40	27	23	31	30	171	24	46	164	15	604
		PM	4:45 PM	12	0	49	2	0	5	2	285	10	12	196	2	575
	Average	AM	7:45 AM	13	56	33	21	37	52	65	135	21	88	193	20	732
		PM	2:30 PM	15	19	44	24	21	29	27	168	20	46	166	16	593
		PM	4:45 PM	14	1	57	2	0	3	2	284	7	13	204	1	586

				NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
				Yale			Yale			Royce			Royce			
Intersection	Date	Peak	Hour Starting	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Yale/Royce	Tue, Nov 15, 22	AM	7:45 AM	13	87	12	3	130	11	16	27	22	26	31	2	380
		PM	2:15 PM	13	97	23	3	64	8	14	26	7	12	16	2	285
		PM	4:45 PM	27	64	16	1	8	8	14	34	14	10	16	2	214
	Wed, Nov 16, 22	AM	7:45 AM	12	93	12	1	139	9	14	24	27	22	31	1	385
		PM	2:15 PM	14	70	22	0	83	11	20	26	6	16	19	4	291
		PM	4:45 PM	26	50	17	2	13	7	7	22	11	13	8	1	177
	Average	AM	7:45 AM	13	90	12	2	135	10	15	26	25	24	31	2	383
		PM	2:15 PM	14	84	23	2	74	10	17	26	7	14	18	3	288
		PM	4:45 PM	27	57	17	2	11	8	11	28	13	12	12	2	196

				NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
				Yale			Yale			University			University			
Intersection	Date	Peak	Hour Starting	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Yale/University	Tue, Nov 15, 22	AM	7:45 AM	0	0	0	76	0	103	74	729	0	0	1,373	36	2,393
		PM	2:30 PM	0	0	0	32	0	70	89	627	0	0	727	33	1,578
		PM	4:45 PM	0	0	0	10	0	22	69	1,438	0	0	984	32	2,556
	Wed, Nov 16, 22	AM	8:00 AM	0	0	0	75	0	105	87	809	0	0	1,264	33	2,373
		PM	2:30 PM	0	0	0	44	0	74	61	750	0	0	691	31	1,651
		PM	4:45 PM	0	0	0	16	0	20	66	1,393	0	0	1,018	31	2,544
	Average	AM	8:00 AM	0	0	0	76	0	104	81	769	0	0	1,319	35	2,383
		PM	2:30 PM	0	0	0	38	0	72	75	689	0	0	709	32	1,615
		PM	4:45 PM	0	0	0	13	0	21	68	1,416	0	0	1,001	32	2,550

INTERSECTION TURNING MOVEMENT COUNTS

T319

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Nov 15, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: Michelson

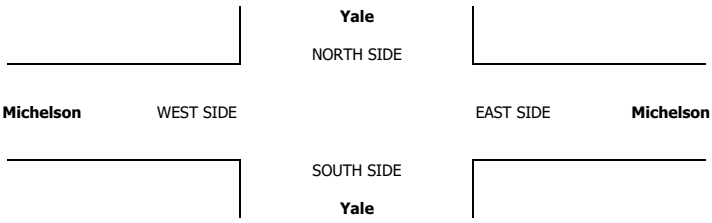
PROJECT #: SC3579
LOCATION #: 1
CONTROL: STOP ALL

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

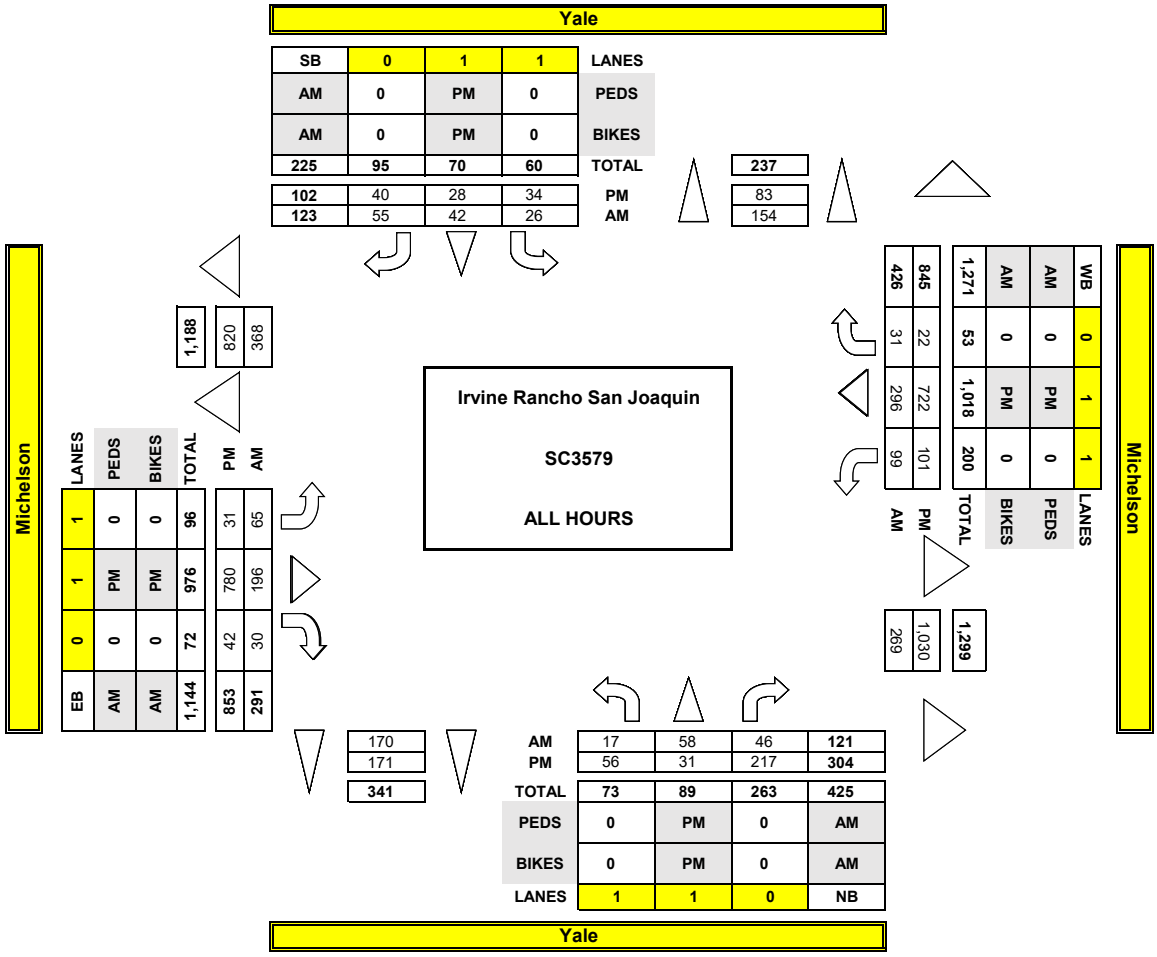
		NORTHBOUND Yale			SOUTHBOUND Yale			EASTBOUND Michelson			WESTBOUND Michelson				U-TURNS				
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	1	0	2	0	0	0	1	15	1	0	17	2	39	0	0	0	0	0
	7:15 AM	2	2	1	2	3	1	4	11	2	4	21	5	58	0	0	0	0	0
	7:30 AM	1	3	2	3	2	6	4	18	2	4	21	3	69	0	0	0	0	0
	7:45 AM	3	4	1	0	2	3	5	27	5	5	62	6	123	0	0	0	0	0
	8:00 AM	2	17	9	7	12	10	20	49	9	22	30	9	196	0	0	0	0	0
	8:15 AM	7	31	16	9	21	31	30	35	10	48	71	5	314	0	0	0	0	0
	8:30 AM	1	1	8	2	1	2	1	14	1	8	37	1	77	0	0	0	0	0
	8:45 AM	0	0	7	3	1	2	0	27	0	8	37	0	85	0	0	0	1	1
	VOLUMES	17	58	46	26	42	55	65	196	30	99	296	31	961	0	0	0	1	1
	APPROACH %	14%	48%	38%	21%	34%	45%	22%	67%	10%	23%	69%	7%						
	APP/DEPART	121	/	154	123	/	170	291	/	269	426	/	368	0					
	BEGIN PEAK HR		7:45 AM																
	VOLUMES	13	53	34	18	36	46	56	125	25	83	200	21	710					
	APPROACH %	13%	53%	34%	18%	36%	46%	27%	61%	12%	27%	66%	7%						
	PEAK HR FACTOR		0.463			0.410			0.660			0.613		0.565					
	APP/DEPART	100	/	130	100	/	144	206	/	177	304	/	259	0					
PM	02:00 PM	2	0	25	0	0	1	2	27	2	3	41	0	103	0	0	1	0	1
	2:15 PM	2	2	20	2	0	0	1	43	3	4	49	1	127	0	0	0	0	0
	2:30 PM	1	4	10	0	0	0	4	59	3	4	34	6	125	0	0	0	0	0
	2:45 PM	3	8	19	2	1	1	9	36	6	4	32	5	126	0	0	0	0	0
	3:00 PM	7	6	13	12	14	19	8	37	3	29	60	4	212	0	1	0	0	1
	3:15 PM	3	3	6	6	4	6	2	32	3	9	42	2	118	0	0	0	0	0
	3:30 PM	2	0	7	1	0	2	1	37	2	5	46	0	103	0	0	0	0	0
	3:45 PM	6	2	11	2	0	0	1	36	4	3	31	2	98	0	0	0	0	0
	4:00 PM	3	4	12	6	8	7	2	38	1	16	46	1	144	0	0	0	0	0
	4:15 PM	6	1	15	0	1	2	0	51	3	4	51	0	134	0	0	0	0	0
	4:30 PM	2	0	5	1	0	1	0	48	5	5	37	1	105	0	0	0	0	0
	4:45 PM	6	0	8	0	0	0	0	55	1	2	45	0	117	0	0	0	0	0
	5:00 PM	2	1	17	0	0	0	1	70	0	3	50	0	144	0	0	1	0	1
	5:15 PM	4	0	14	1	0	0	0	82	3	1	46	0	151	0	0	0	0	0
	5:30 PM	3	0	26	0	0	1	0	76	0	8	71	0	185	0	0	0	0	0
	5:45 PM	4	0	9	1	0	0	0	53	3	1	41	0	112	0	0	0	0	0
	VOLUMES	56	31	217	34	28	40	31	780	42	101	722	22	2,104	0	1	2	0	3
	APPROACH %	18%	10%	71%	33%	27%	39%	4%	91%	5%	12%	85%	3%						
	APP/DEPART	304	/	83	102	/	171	853	/	1,030	845	/	820	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	15	1	65	1	0	1	1	283	4	14	212	0	597					
	APPROACH %	19%	1%	80%	50%	0%	50%	0%	98%	1%	6%	94%	0%						
	PEAK HR FACTOR		0.698			0.500			0.847			0.715		0.807					
	APP/DEPART	81	/	1	2	/	18	288	/	349	226	/	229	0					

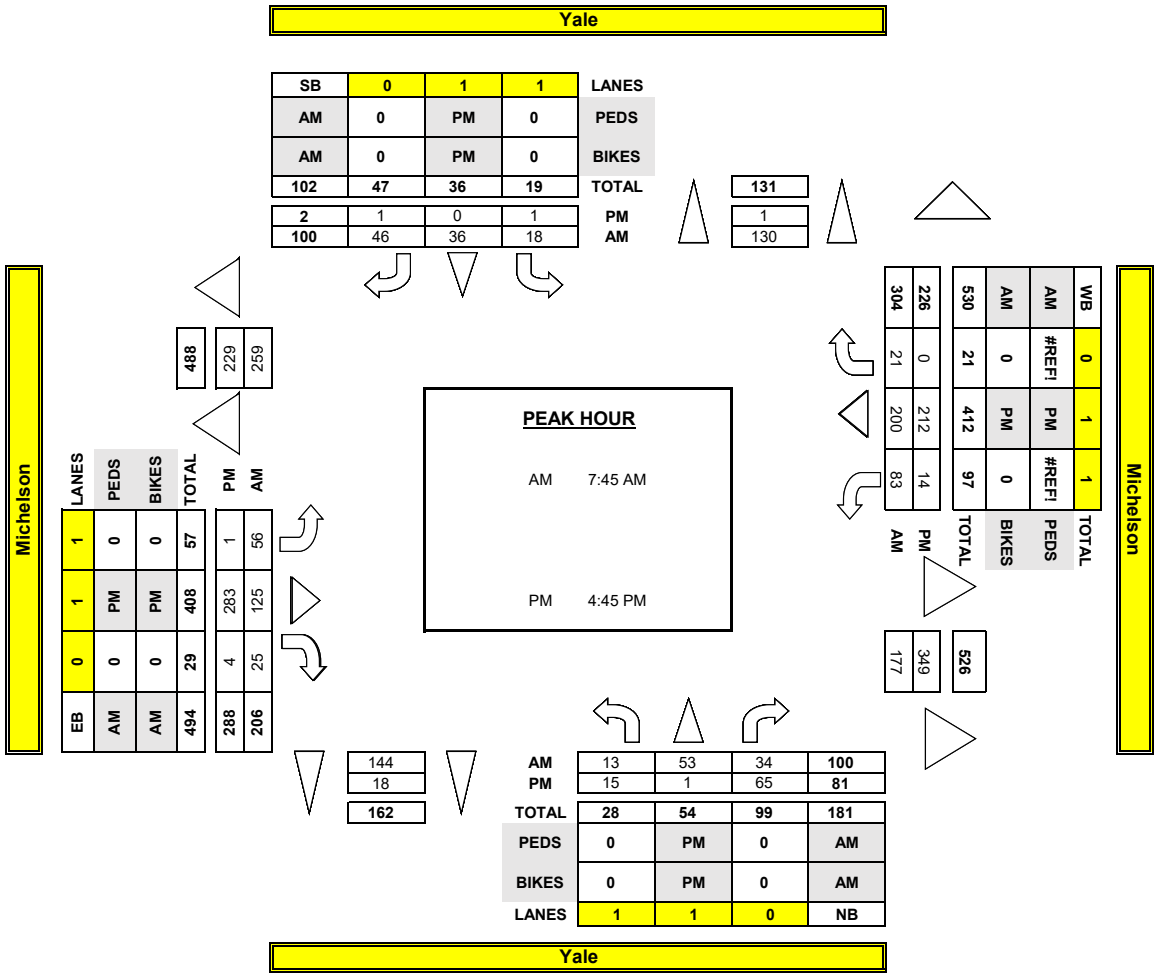


2:30 PM	14	21	48	20	19	26	23	164	15	46	168	17	581

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T319

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Nov 16, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: Michelson

PROJECT #: SC3579
LOCATION #: 1
CONTROL: STOP ALL

NOTES:

AM PM MD OTHER OTHER — ▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

		NORTHBOUND Yale			SOUTHBOUND Yale			EASTBOUND Michelson			WESTBOUND Michelson				U-TURNS				
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	1	0	2	0	1	2	1	16	2	2	11	0	38	0	0	0	0	0
	7:15 AM	0	0	4	0	0	0	1	12	3	0	30	6	56	0	0	0	0	0
	7:30 AM	1	1	3	0	0	1	1	23	0	6	23	2	61	0	0	0	0	0
	7:45 AM	3	4	3	0	1	7	15	32	6	4	46	4	125	0	0	0	0	0
	8:00 AM	5	21	13	5	13	16	25	54	6	27	44	11	240	0	0	0	0	0
	8:15 AM	2	32	11	14	23	34	33	41	3	53	64	3	313	0	0	0	0	0
	8:30 AM	3	1	5	4	1	1	1	17	1	8	32	1	75	0	0	0	0	0
	8:45 AM	0	2	3	5	0	1	4	41	3	5	43	0	107	0	1	0	0	1
	VOLUMES	15	61	44	28	39	62	81	236	24	105	293	27	1,015	0	1	0	0	1
	APPROACH %	13%	51%	37%	22%	30%	48%	24%	69%	7%	25%	69%	6%						
	APP/DEPART	120	/	170	129	/	168	341	/	307	425	/	370	0					
	BEGIN PEAK HR		7:45 AM																
	VOLUMES	13	58	32	23	38	58	74	144	16	92	186	19	753					
	APPROACH %	13%	56%	31%	19%	32%	49%	32%	62%	7%	31%	63%	6%						
	PEAK HR FACTOR		0.572			0.419			0.688			0.619		0.601					
	APP/DEPART	103	/	151	119	/	146	234	/	199	297	/	257	0					
PM	02:00 PM	3	2	7	2	1	1	4	29	3	9	44	2	107	0	0	1	0	1
	2:15 PM	3	2	17	1	0	0	2	44	2	4	29	2	106	0	0	0	0	0
	2:30 PM	2	4	6	2	1	0	3	37	4	10	21	2	92	0	0	0	0	0
	2:45 PM	6	7	12	1	2	1	10	45	6	5	40	5	140	0	0	0	0	0
	3:00 PM	7	4	13	14	18	26	16	45	13	26	62	5	249	1	0	0	0	1
	3:15 PM	1	2	9	10	2	4	1	44	1	5	41	3	123	0	0	0	0	0
	3:30 PM	4	0	11	2	0	1	2	28	1	5	32	0	86	0	0	0	0	0
	3:45 PM	5	2	10	0	2	2	3	46	1	2	46	0	119	0	0	0	0	0
	4:00 PM	3	5	6	4	6	9	2	52	5	5	53	0	150	0	0	0	0	0
	4:15 PM	2	0	9	0	0	1	0	43	1	8	37	0	101	0	0	0	0	0
	4:30 PM	1	0	7	0	0	0	0	54	4	1	48	0	115	0	0	0	0	0
	4:45 PM	4	0	11	0	0	0	1	56	3	3	42	1	121	0	0	0	0	0
	5:00 PM	2	0	8	2	0	3	1	61	1	4	44	0	126	0	0	0	0	0
	5:15 PM	2	0	11	0	0	0	0	88	4	3	59	0	167	0	0	0	0	0
	5:30 PM	4	0	19	0	0	2	0	80	2	2	51	1	161	0	0	0	0	0
	5:45 PM	3	0	17	0	0	0	1	63	1	4	42	0	131	0	0	1	0	1
	VOLUMES	52	28	173	38	32	50	46	815	52	96	691	21	2,094	1	0	2	0	3
	APPROACH %	21%	11%	68%	32%	27%	42%	5%	89%	6%	12%	86%	3%						
	APP/DEPART	253	/	93	120	/	181	913	/	1,026	808	/	794	0					
	BEGIN PEAK HR		2:30 PM																
	VOLUMES	16	17	40	27	23	31	30	171	24	46	164	15	604					
	APPROACH %	22%	23%	55%	33%	28%	38%	13%	76%	11%	20%	73%	7%						
	PEAK HR FACTOR		0.730			0.349			0.760			0.605		0.606					
	APP/DEPART	73	/	62	81	/	94	225	/	238	225	/	210	0					

Yale

NORTH SIDE

Michelson WEST SIDE EAST SIDE **Michelson**

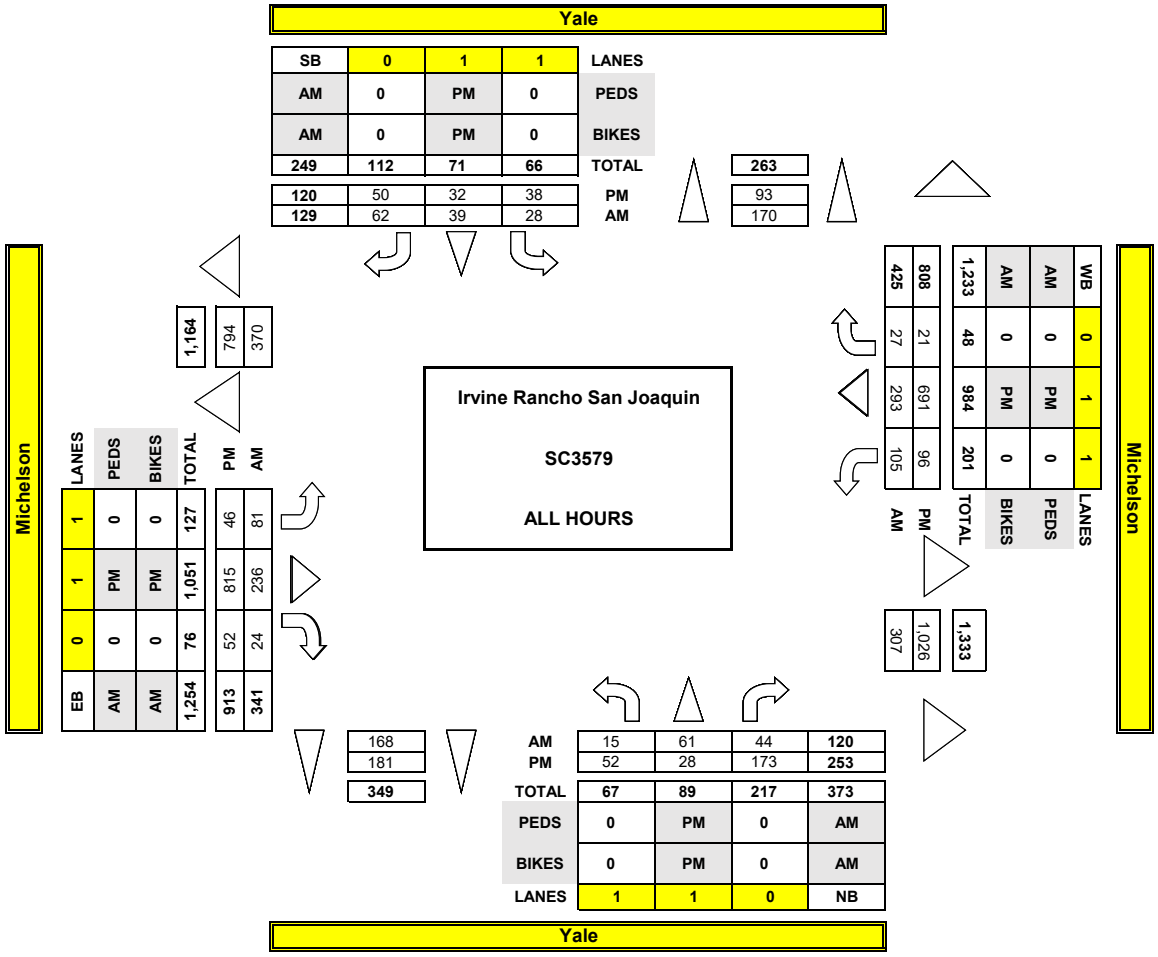
SOUTH SIDE

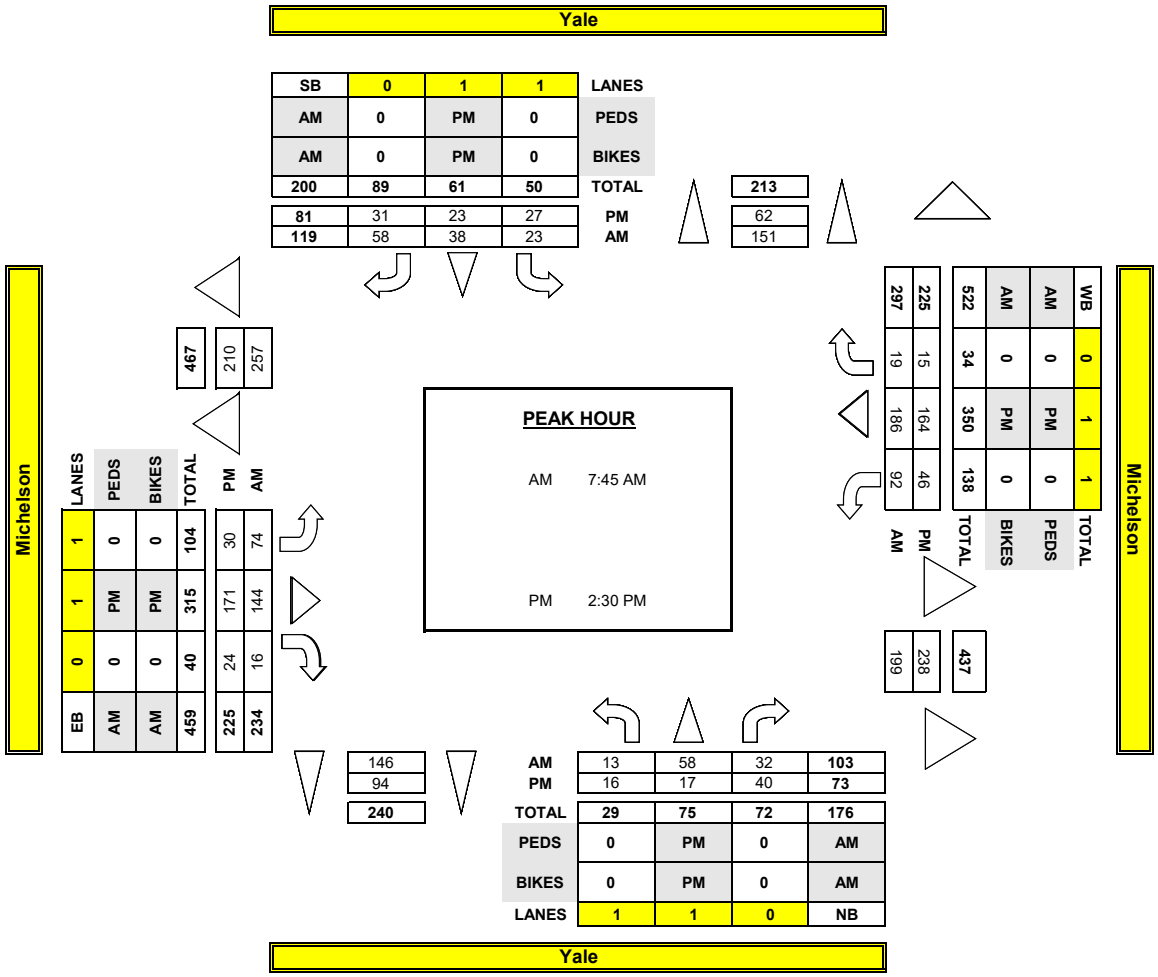
Yale

4:45 PM	12	0	49	2	0	5	2	285	10	12	196	2	575

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T319

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Nov 15, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: Royce

PROJECT #: SC3579
LOCATION #: 2
CONTROL: STOP E/W

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

☐ Add U-Turns to Left Turns

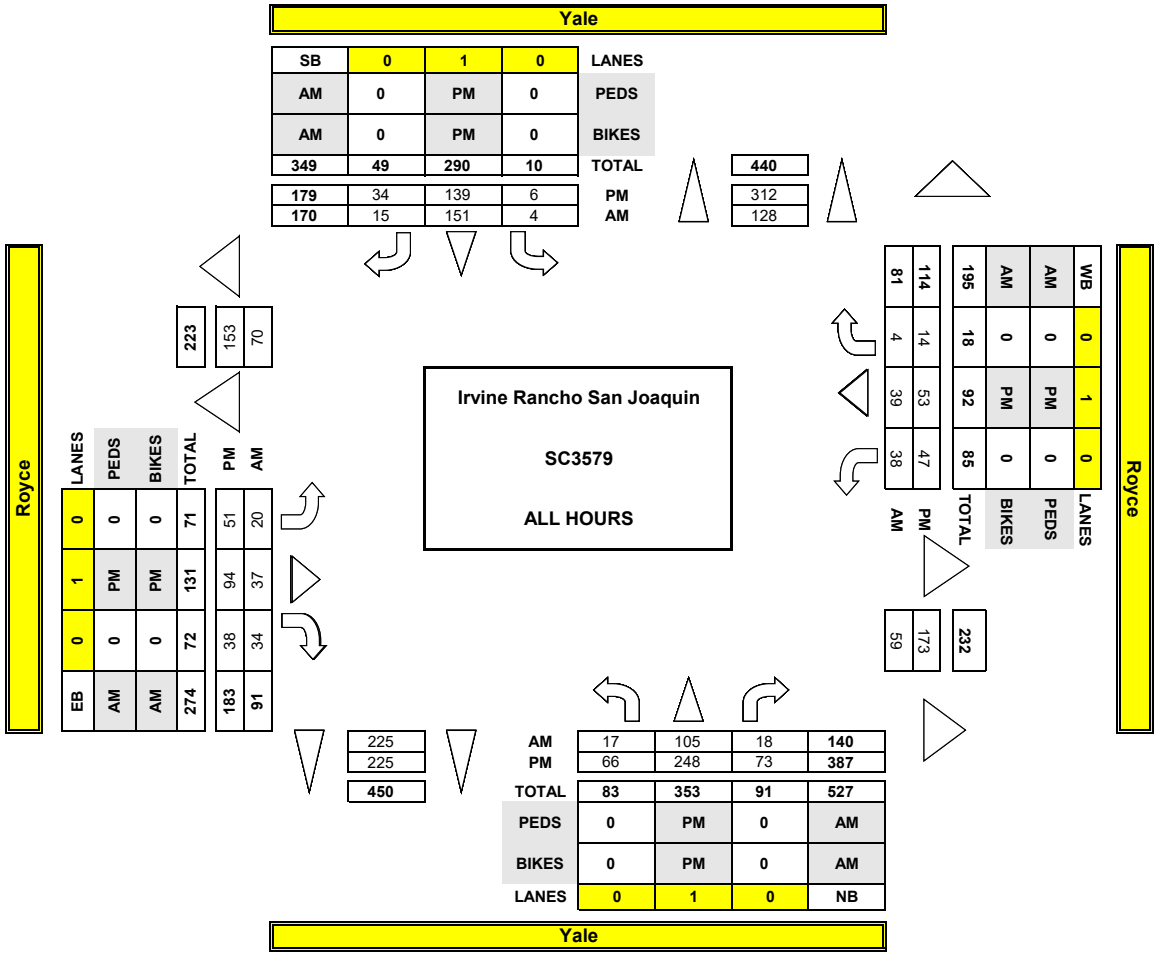
		NORTHBOUND Yale			SOUTHBOUND Yale			EASTBOUND Royce			WESTBOUND Royce				U-TURNS				
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	1	3	0	0	1	0	0	2	2	1	0	0	10	0	0	0	0	0
	7:15 AM	0	5	2	1	4	1	1	2	3	4	4	1	28	0	0	1	0	1
	7:30 AM	0	3	3	0	9	1	2	1	2	3	2	1	27	0	0	0	0	0
	7:45 AM	3	15	2	0	13	0	0	4	3	7	10	1	58	0	0	0	0	0
	8:00 AM	5	27	5	1	37	2	5	7	10	8	7	1	115	0	0	0	0	0
	8:15 AM	4	36	2	2	72	8	10	12	6	8	10	0	170	0	0	0	0	0
	8:30 AM	1	9	3	0	8	1	1	4	3	3	4	0	37	0	0	0	0	0
	8:45 AM	3	7	1	0	7	2	1	5	5	4	2	0	37	2	0	0	0	2
	VOLUMES	17	105	18	4	151	15	20	37	34	38	39	4	482	2	0	1	0	3
	APPROACH %	12%	75%	13%	2%	89%	9%	22%	41%	37%	47%	48%	5%						
	APP/DEPART	140	/	128	170	/	225	91	/	59	81	/	70	0					
	BEGIN PEAK HR		7:45 AM																
	VOLUMES	13	87	12	3	130	11	16	27	22	26	31	2	380					
	APPROACH %	12%	78%	11%	2%	90%	8%	25%	42%	34%	44%	53%	3%						
	PEAK HR FACTOR		0.667			0.439			0.580			0.819		0.559					
	APP/DEPART	112	/	105	144	/	178	65	/	42	59	/	55	0					
PM	02:00 PM	2	20	12	0	5	2	7	3	3	6	4	0	64	0	0	0	0	0
	2:15 PM	8	23	7	0	5	2	2	6	1	0	3	0	57	0	0	0	0	0
	2:30 PM	2	15	1	0	4	1	3	9	2	6	3	0	46	0	0	0	0	0
	2:45 PM	0	37	8	0	4	0	5	2	2	2	5	1	66	0	0	0	0	0
	3:00 PM	3	22	7	3	51	5	4	9	2	4	5	1	116	0	0	0	0	0
	3:15 PM	1	4	5	0	17	2	2	2	2	3	2	0	40	0	0	0	0	0
	3:30 PM	5	8	2	0	4	3	1	2	0	1	2	1	29	1	0	0	0	1
	3:45 PM	7	14	2	0	7	0	1	9	3	1	1	1	46	0	0	0	0	0
	4:00 PM	2	15	3	0	19	6	5	4	1	5	3	2	65	0	0	1	0	1
	4:15 PM	1	10	2	1	5	2	5	1	1	3	1	5	37	0	0	0	0	0
	4:30 PM	4	4	3	1	5	3	1	6	6	5	7	1	46	0	0	0	0	0
	4:45 PM	5	9	4	0	0	2	4	11	4	2	6	0	47	0	0	0	0	0
	5:00 PM	9	13	3	0	2	2	5	9	8	3	5	1	60	0	0	0	0	0
	5:15 PM	6	17	4	1	2	1	1	6	1	3	2	0	44	0	0	0	0	0
	5:30 PM	7	25	5	0	4	3	4	8	1	2	3	1	63	0	0	0	0	0
	5:45 PM	4	12	5	0	5	0	1	7	1	1	1	0	37	0	0	0	0	0
	VOLUMES	66	248	73	6	139	34	51	94	38	47	53	14	863	1	0	1	0	2
	APPROACH %	17%	64%	19%	3%	78%	19%	28%	51%	21%	41%	46%	12%						
	APP/DEPART	387	/	312	179	/	225	183	/	173	114	/	153	0					
	BEGIN PEAK HR		2:15 PM																
	VOLUMES	13	97	23	3	64	8	14	26	7	12	16	2	285					
	APPROACH %	10%	73%	17%	4%	85%	11%	30%	55%	15%	40%	53%	7%						
	PEAK HR FACTOR		0.739			0.318			0.783			0.750		0.614					
	APP/DEPART	133	/	113	75	/	83	47	/	52	30	/	37	0					

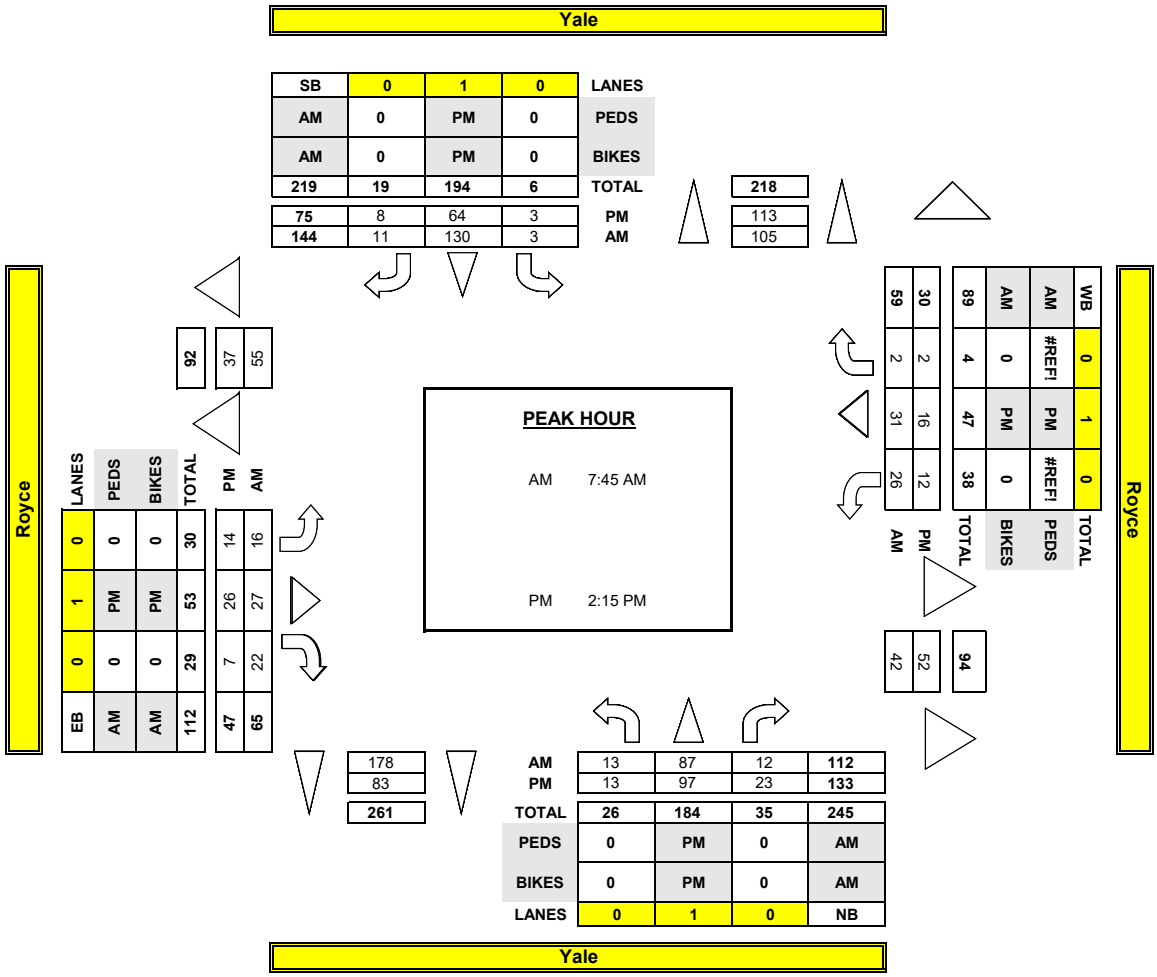


4:45 PM	27	64	16	1	8	8	14	34	14	10	16	2	214

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T319

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Nov 16, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: Royce

PROJECT #: SC3579
LOCATION #: 2
CONTROL: STOP E/W

NOTES:

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

Add U-Turns to Left Turns

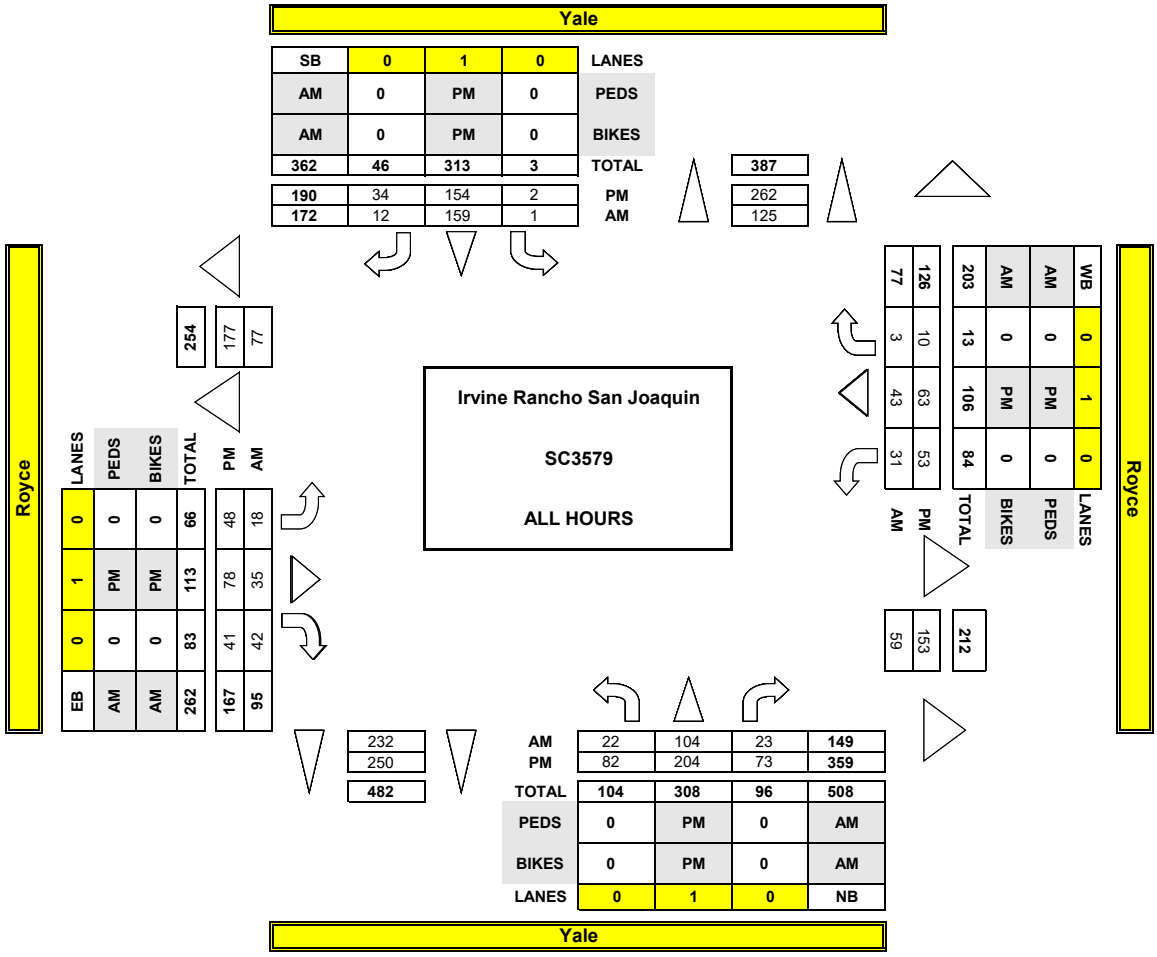
		NORTHBOUND Yale			SOUTHBOUND Yale			EASTBOUND Royce			WESTBOUND Royce				U-TURNS				
	LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	1	3	0	4	2	2	2	1	3	0	0	18	0	0	0	0	0
	7:15 AM	3	3	2	0	2	1	2	5	4	2	5	1	30	0	0	0	0	0
	7:30 AM	4	2	1	0	6	0	0	2	4	4	4	1	28	0	0	0	0	0
	7:45 AM	0	8	2	0	9	0	2	6	9	2	9	0	47	0	0	0	0	0
	8:00 AM	2	43	4	0	43	2	6	8	10	6	9	0	133	0	0	0	0	0
	8:15 AM	7	35	4	1	78	6	5	7	5	10	9	0	167	0	0	0	0	0
	8:30 AM	3	7	2	0	9	1	1	3	3	4	4	1	38	0	0	0	0	0
	8:45 AM	3	5	5	0	8	0	0	2	6	0	3	0	32	0	0	0	0	0
	VOLUMES	22	104	23	1	159	12	18	35	42	31	43	3	493	0	0	0	0	0
	APPROACH %	15%	70%	15%	1%	92%	7%	19%	37%	44%	40%	56%	4%						
	APP/DEPART	149	/	125	172	/	232	95	/	59	77	/	77	0					
	BEGIN PEAK HR		7:45 AM																
	VOLUMES	12	93	12	1	139	9	14	24	27	22	31	1	385					
	APPROACH %	10%	79%	10%	1%	93%	6%	22%	37%	42%	41%	57%	2%						
	PEAK HR FACTOR		0.597			0.438			0.677			0.711		0.576					
	APP/DEPART	117	/	108	149	/	188	65	/	37	54	/	52	0					
PM	02:00 PM	8	9	6	0	9	5	1	1	3	4	4	1	51	1	0	0	0	1
	2:15 PM	9	14	6	0	3	2	7	11	0	4	3	2	61	1	0	0	0	1
	2:30 PM	1	10	3	0	10	1	1	5	1	2	4	2	40	0	0	0	0	0
	2:45 PM	4	32	4	0	2	0	9	8	2	6	4	0	71	0	0	0	0	0
	3:00 PM	0	14	9	0	68	8	3	2	3	4	8	0	119	0	0	0	0	0
	3:15 PM	4	5	3	0	7	3	4	1	2	4	2	2	37	0	0	0	0	0
	3:30 PM	1	12	3	0	6	4	3	2	3	1	4	2	41	0	0	0	0	0
	3:45 PM	2	15	1	0	4	1	2	3	8	3	7	0	46	0	0	0	0	0
	4:00 PM	3	14	8	0	17	0	1	3	1	3	5	0	55	0	0	0	0	0
	4:15 PM	8	10	4	0	8	1	1	7	1	3	3	0	46	0	0	0	0	0
	4:30 PM	8	6	5	0	5	0	4	8	2	0	6	0	44	0	0	0	0	0
	4:45 PM	4	13	4	1	2	3	2	7	1	4	0	1	42	0	0	0	0	0
	5:00 PM	8	5	5	0	4	1	3	6	5	4	4	0	45	0	0	0	0	0
	5:15 PM	5	14	1	0	5	1	0	5	2	3	3	0	39	0	0	0	0	0
	5:30 PM	9	18	7	1	2	2	2	4	3	2	1	0	51	0	0	0	0	0
	5:45 PM	8	13	4	0	2	2	5	5	4	6	5	0	54	0	0	0	0	0
	VOLUMES	82	204	73	2	154	34	48	78	41	53	63	10	842	2	0	0	0	2
	APPROACH %	23%	57%	20%	1%	81%	18%	29%	47%	25%	42%	50%	8%						
	APP/DEPART	359	/	262	190	/	250	167	/	153	126	/	177	0					
	BEGIN PEAK HR		2:15 PM																
	VOLUMES	14	70	22	0	83	11	20	26	6	16	19	4	291					
	APPROACH %	13%	66%	21%	0%	88%	12%	38%	50%	12%	41%	49%	10%						
	PEAK HR FACTOR		0.663			0.309			0.684			0.813		0.611					
	APP/DEPART	106	/	94	94	/	106	52	/	48	39	/	43	0					

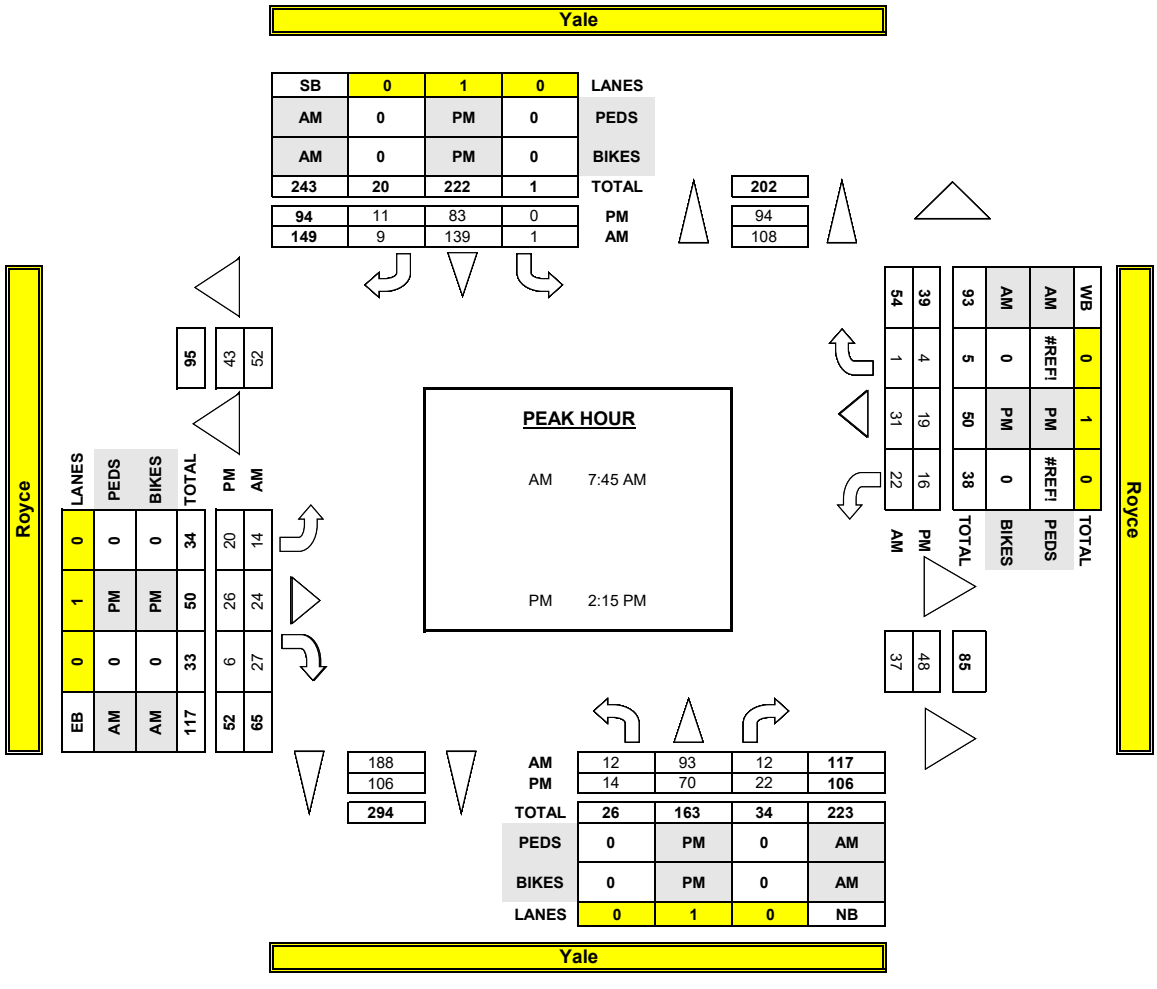


4:45 PM	26	50	17	2	13	7	7	22	11	13	8	1	177

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

T319

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Nov 15, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: University

PROJECT #: SC3579
LOCATION #: 3
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

☐ Add U-Turns to Left Turns

		NORTHBOUND Yale			SOUTHBOUND Yale			EASTBOUND University			WESTBOUND University				U-TURNS				
	LANES:	NL X	NT X	NR X	SL 1	ST X	SR 1	EL 1	ET 2	ER X	WL X	WT 2	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	0	0	4	0	2	3	68	0	0	139	3	219	0	0	0	0	0
	7:15 AM	0	0	0	4	0	7	5	115	0	0	204	4	339	0	0	0	0	0
	7:30 AM	0	0	0	4	0	12	4	128	0	0	339	5	492	0	0	1	0	1
	7:45 AM	0	0	0	7	0	17	9	155	0	0	370	7	565	0	0	0	0	0
	8:00 AM	0	0	0	18	0	34	26	165	0	0	317	12	572	0	0	0	0	0
	8:15 AM	0	0	0	40	0	43	29	190	0	0	339	13	654	0	0	0	1	1
	8:30 AM	0	0	0	11	0	9	10	219	0	0	347	4	600	0	0	1	0	1
	8:45 AM	0	0	0	6	0	11	5	122	0	0	320	5	469	0	0	4	0	4
	VOLUMES	0	0	0	94	0	135	91	1,162	0	0	2,375	53	3,917	0	0	6	1	7
	APPROACH %	0%	0%	0%	41%	0%	59%	7%	92%	0%	0%	98%	2%						
	APP/DEPART	0	/	144	229	/	0	1,259	/	1,257	2,429	/	2,516	0					
	BEGIN PEAK HR		7:45 AM																
	VOLUMES	0	0	0	76	0	103	74	729	0	0	1,373	36	2,393					
	APPROACH %	0%	0%	0%	42%	0%	58%	9%	91%	0%	0%	97%	3%						
	PEAK HR FACTOR		0.000			0.539			0.874			0.935		0.913					
	APP/DEPART	0	/	110	179	/	0	804	/	806	1,410	/	1,477	0					
PM	02:00 PM	0	0	0	3	0	8	26	116	0	0	130	4	287	0	1	1	0	2
	2:15 PM	0	0	0	1	0	6	31	117	0	0	176	9	340	0	0	6	0	6
	2:30 PM	0	0	0	2	0	11	9	125	0	0	198	5	350	0	0	0	0	0
	2:45 PM	0	0	0	3	0	6	35	117	0	0	156	12	329	0	0	0	0	0
	3:00 PM	0	0	0	21	0	40	24	134	0	0	197	12	428	0	0	0	0	0
	3:15 PM	0	0	0	5	0	18	7	189	0	0	203	4	426	0	0	0	0	0
	3:30 PM	0	0	0	3	0	6	23	187	0	0	171	5	395	0	0	0	0	0
	3:45 PM	0	0	0	2	0	8	14	296	0	0	195	9	524	0	0	0	0	0
	4:00 PM	0	0	0	2	0	23	15	245	0	0	207	5	497	0	0	0	0	0
	4:15 PM	0	0	0	2	0	6	11	297	0	0	231	2	549	0	0	0	0	0
	4:30 PM	0	0	0	5	0	12	10	296	0	0	248	4	575	0	0	0	0	0
	4:45 PM	0	0	0	3	0	3	8	384	0	0	245	7	650	0	0	0	0	0
	5:00 PM	0	0	0	6	0	8	15	347	0	0	222	9	607	0	0	1	0	1
	5:15 PM	0	0	0	0	0	5	18	401	0	0	256	8	688	0	0	0	0	0
	5:30 PM	0	0	0	1	0	6	28	306	0	0	261	8	610	0	0	0	0	0
	5:45 PM	0	0	0	3	0	4	14	294	0	0	251	5	571	0	0	1	0	1
	VOLUMES	0	0	0	62	0	170	288	3,851	0	0	3,347	108	7,836	0	1	9	0	10
	APPROACH %	0%	0%	0%	27%	0%	73%	7%	93%	0%	0%	97%	3%						
	APP/DEPART	0	/	397	233	/	0	4,148	/	3,913	3,455	/	3,526	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	0	0	0	10	0	22	69	1,438	0	0	984	32	2,556					
	APPROACH %	0%	0%	0%	31%	0%	69%	5%	95%	0%	0%	97%	3%						
	PEAK HR FACTOR		0.000			0.571			0.900			0.944		0.929					
	APP/DEPART	0	/	101	32	/	0	1,508	/	1,448	1,016	/	1,007	0					

Yale

NORTH SIDE

University WEST SIDE EAST SIDE **University**

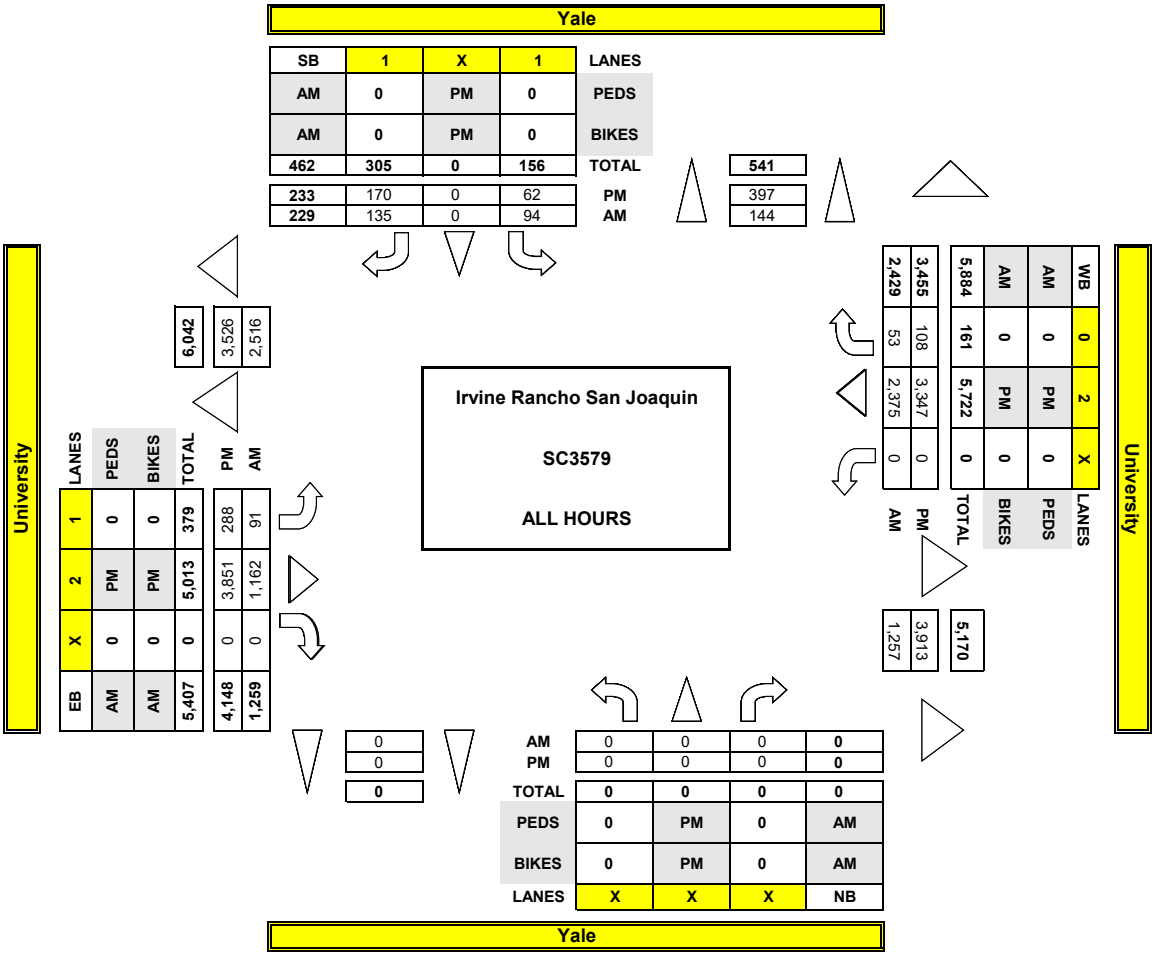
SOUTH SIDE

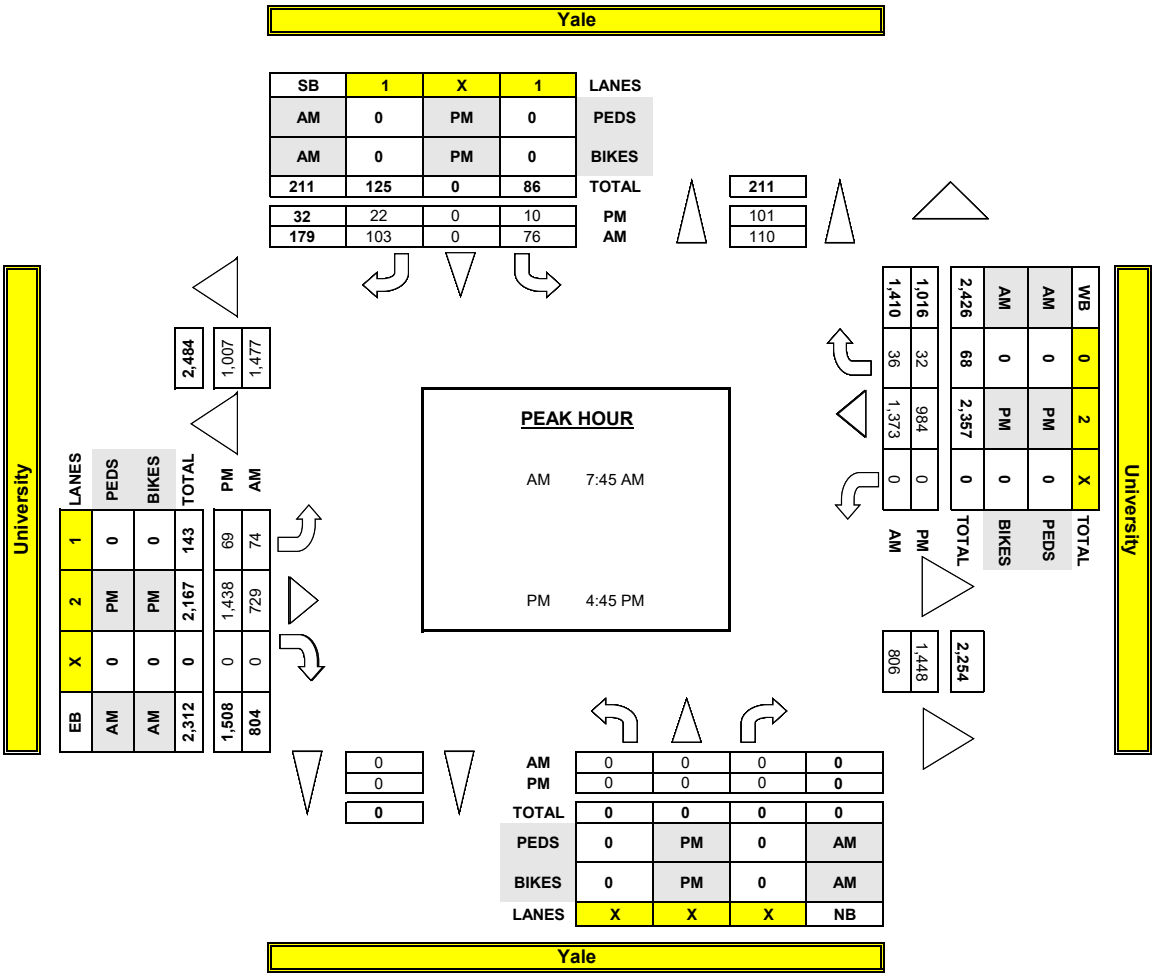
Yale

2:30 PM	0	0	0	32	0	70	89	627	0	0	727	33	1,578

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Nov 16, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: University

PROJECT #: SC3579
LOCATION #: 3
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N
◄ W E ►
S ▼

Add U-Turns to Left Turns

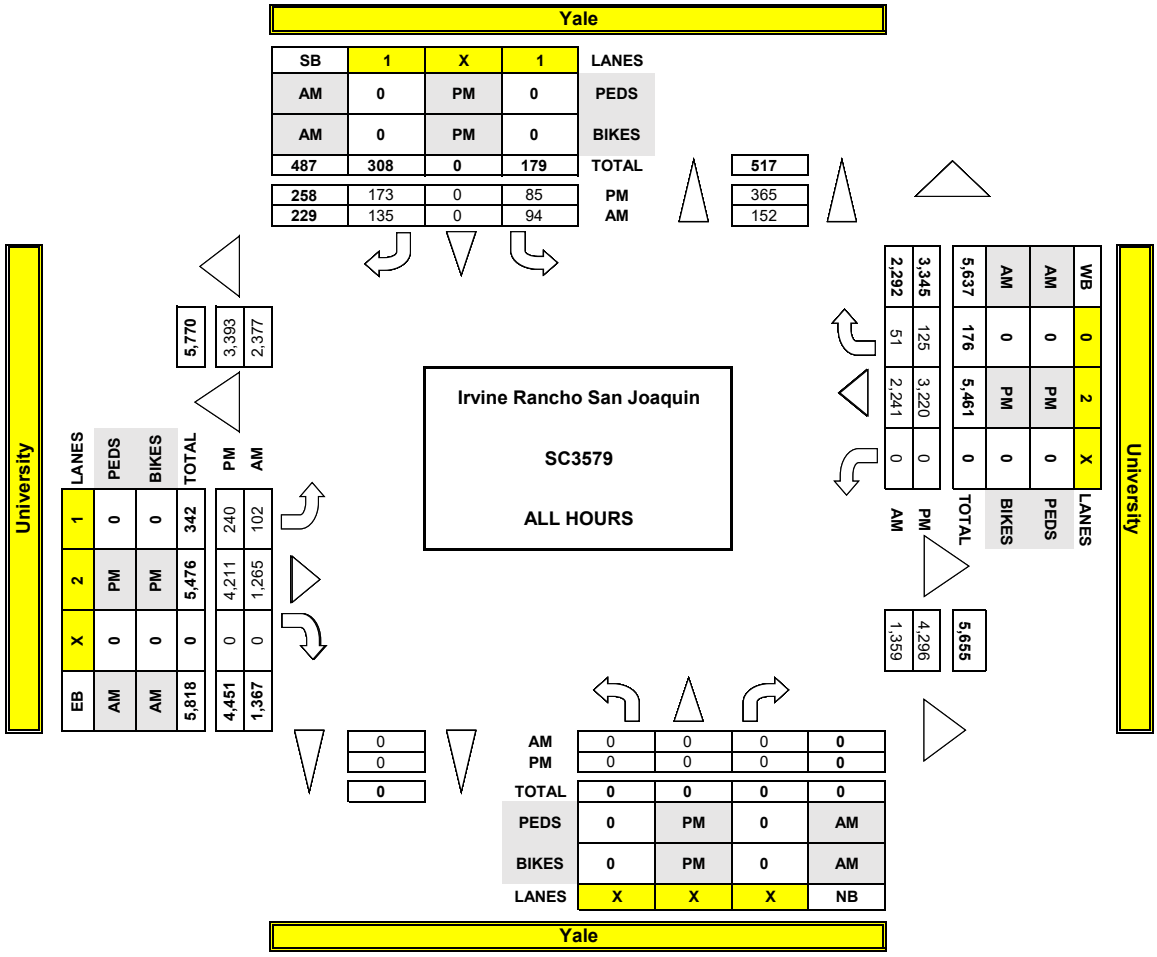
		NORTHBOUND Yale			SOUTHBOUND Yale			EASTBOUND University			WESTBOUND University				U-TURNS				
	LANES:	NL X	NT X	NR X	SL 1	ST X	SR 1	EL 1	ET 2	ER X	WL X	WT 2	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	0	0	0	2	0	7	2	71	0	0	129	3	214	0	0	0	0	0
	7:15 AM	0	0	0	3	0	3	2	102	0	0	204	6	320	0	0	0	0	0
	7:30 AM	0	0	0	7	0	6	3	123	0	0	310	4	453	0	0	0	0	0
	7:45 AM	0	0	0	7	0	14	8	160	0	0	334	5	528	0	0	1	0	1
	8:00 AM	0	0	0	17	0	32	37	164	0	0	381	10	641	0	0	0	0	0
	8:15 AM	0	0	0	45	0	54	32	193	0	0	256	13	593	0	0	0	0	0
	8:30 AM	0	0	0	10	0	9	9	286	0	0	281	6	601	0	0	0	0	0
	8:45 AM	0	0	0	3	0	10	9	166	0	0	346	4	538	0	0	0	0	0
	VOLUMES	0	0	0	94	0	135	102	1,265	0	0	2,241	51	3,888	0	0	1	0	1
	APPROACH %	0%	0%	0%	41%	0%	59%	7%	93%	0%	0%	98%	2%						
	APP/DEPART	0	/	152	229	/	0	1,367	/	1,359	2,292	/	2,377	0					
	BEGIN PEAK HR		8:00 AM																
	VOLUMES	0	0	0	75	0	105	87	809	0	0	1,264	33	2,373					
	APPROACH %	0%	0%	0%	42%	0%	58%	10%	90%	0%	0%	97%	3%						
	PEAK HR FACTOR		0.000			0.455			0.759			0.829		0.926					
	APP/DEPART	0	/	120	180	/	0	896	/	884	1,297	/	1,369	0					
PM	02:00 PM	0	0	0	3	0	10	11	166	0	0	151	10	351	0	0	0	0	0
	2:15 PM	0	0	0	4	0	7	17	173	0	0	139	14	354	0	0	0	0	0
	2:30 PM	0	0	0	6	0	8	7	182	0	0	157	8	368	0	0	0	0	0
	2:45 PM	0	0	0	3	0	9	31	186	0	0	171	10	410	0	0	0	0	0
	3:00 PM	0	0	0	33	0	42	15	180	0	0	186	9	465	0	0	0	0	0
	3:15 PM	0	0	0	2	0	15	8	202	0	0	177	4	408	0	0	0	0	0
	3:30 PM	0	0	0	2	0	9	16	238	0	0	188	1	454	0	0	0	0	0
	3:45 PM	0	0	0	5	0	9	9	274	0	0	199	9	505	0	0	0	0	0
	4:00 PM	0	0	0	5	0	16	22	276	0	0	193	7	519	0	0	0	0	0
	4:15 PM	0	0	0	1	0	12	11	341	0	0	181	7	553	0	0	0	0	0
	4:30 PM	0	0	0	3	0	4	10	330	0	0	233	9	589	0	0	0	0	0
	4:45 PM	0	0	0	0	0	7	16	373	0	0	253	7	656	0	0	0	0	0
	5:00 PM	0	0	0	6	0	6	8	326	0	0	261	10	617	0	0	0	0	0
	5:15 PM	0	0	0	8	0	2	16	371	0	0	227	4	628	0	0	0	0	0
	5:30 PM	0	0	0	2	0	5	26	323	0	0	277	10	643	0	0	0	0	0
	5:45 PM	0	0	0	2	0	12	17	270	0	0	227	6	534	0	0	0	0	0
	VOLUMES	0	0	0	85	0	173	240	4,211	0	0	3,220	125	8,054	0	0	0	0	0
	APPROACH %	0%	0%	0%	33%	0%	67%	5%	95%	0%	0%	96%	4%						
	APP/DEPART	0	/	365	258	/	0	4,451	/	4,296	3,345	/	3,393	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	0	0	0	16	0	20	66	1,393	0	0	1,018	31	2,544					
	APPROACH %	0%	0%	0%	44%	0%	56%	5%	95%	0%	0%	97%	3%						
	PEAK HR FACTOR		0.000			0.750			0.938			0.914		0.970					
	APP/DEPART	0	/	97	36	/	0	1,459	/	1,409	1,049	/	1,038	0					

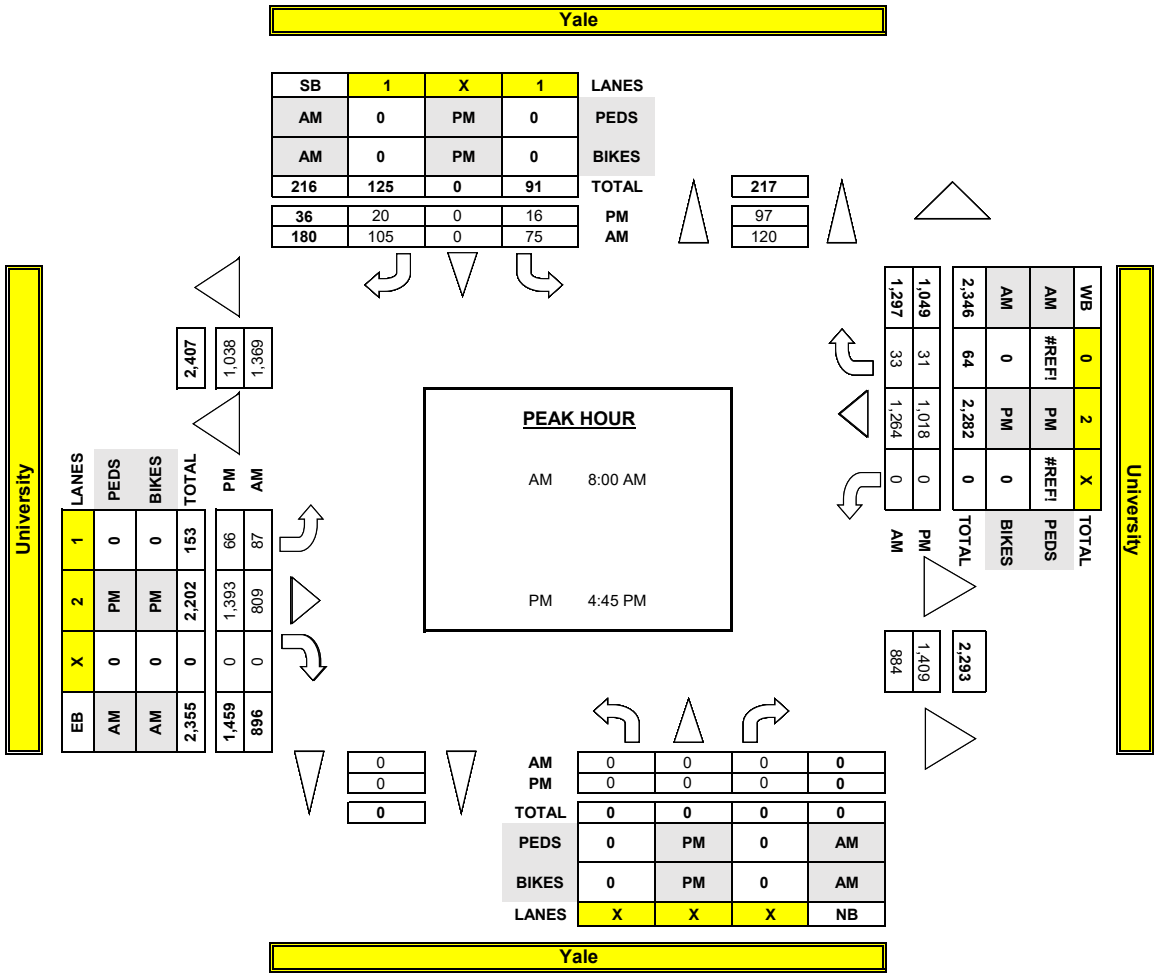


2:30 PM	0	0	0	44	0	74	61	750	0	0	691	31	1,651

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Nov 15, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: Michelson

PROJECT #: SC3579
LOCATION #: 1
CONTROL: STOP ALL

NORTH SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
AM	7:00 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
	7:15 AM	0	1	1	0	0	0	0	1	0	0	0	0	0	0	2
	7:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	7:45 AM	0	0	0	0	1	3	0	0	0	0	0	0	0	0	4
	8:00 AM	0	0	3	1	5	0	0	0	0	0	0	0	0	0	9
	8:15 AM	0	0	9	0	2	2	1	0	1	0	0	0	0	0	15
	8:30 AM	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL AM	0	2	14	1	8	6	1	1	2	0	0	0	0	0	35
PM	02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	2:45 PM	2	0	0	0	0	0	0	0	1	0	0	0	0	0	3
	3:00 PM	0	4	1	51	0	4	0	2	0	3	0	0	0	0	65
	3:15 PM	1	0	0	0	1	0	0	1	0	0	0	0	0	0	3
	3:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	3:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	4:00 PM	0	0	1	2	0	2	0	0	0	1	0	0	0	0	6
	4:15 PM	2	2	0	0	0	0	0	0	0	1	0	0	0	0	5
	4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	4:45 PM	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	3	2	0	0	0	1	0	0	0	0	0	0	0	0	6
	5:30 PM	1	0	0	0	1	1	0	0	0	0	0	0	0	0	3
	5:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
	TOTAL PM	12	10	2	53	2	9	0	5	1	5	0	0	0	0	99

SOUTH SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
AM	7:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
	7:15 AM	1	0	1	0	1	1	0	0	0	0	0	0	0	0	4
	7:30 AM	1	5	2	0	0	3	0	0	0	0	0	0	0	0	11
	7:45 AM	0	0	2	0	2	2	0	0	0	0	0	0	0	0	6
	8:00 AM	0	1	4	0	5	3	0	0	0	0	0	0	0	0	13
	8:15 AM	1	0	8	1	1	0	0	0	0	0	0	0	1	0	12
	8:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
	8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	TOTAL AM	3	10	17	1	10	9	0	0	0	0	0	0	1	0	51
PM	02:00 PM	0	1	0	0	2	0	0	0	0	0	0	0	0	0	3
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:30 PM	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
	2:45 PM	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
	3:00 PM	0	3	0	15	0	4	0	0	0	1	0	0	0	0	23
	3:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
	3:30 PM	1	3	0	0	0	0	0	0	0	0	0	0	0	0	4
	3:45 PM	2	0	0	0	1	0	1	0	0	0	0	0	0	0	4
	4:00 PM	1	1	1	0	0	7	0	0	0	0	0	0	0	0	10
	4:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
	4:30 PM	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
	4:45 PM	2	0	0	0	0	1	0	0	0	0	0	0	0	0	3
	5:00 PM	1	2	0	0	2	0	0	0	0	0	0	0	0	0	5
	5:15 PM	6	0	0	0	0	0	0	0	0	0	0	0	0	0	6
	5:30 PM	1	3	0	0	0	0	0	0	0	0	0	0	0	0	4
	5:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	TOTAL PM	15	20	1	15	14	12	1	0	0	1	0	0	0	0	79

EAST SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
AM	7:00 AM	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3
	7:15 AM	1	1	3	0	3	1	0	0	0	0	0	0	0	0	9
	7:30 AM	1	3	2	0	1	0	0	0	0	0	0	0	0	0	7
	7:45 AM	0	1	2	0	3	0	0	0	0	0	0	0	0	0	6
	8:00 AM	0	1	11	0	11	0	1	0	2	0	0	0	0	0	26
	8:15 AM	1	2	22	0	4	0	0	1	0	0	0	0	1	0	31
	8:30 AM	2	0	0	0	0	1	0	0	0	0	0	0	0	0	3
	8:45 AM	0	2	0	0	1	0	0	0	0	0	0	0	0	0	3
	TOTAL AM	6	12	40	0	23	2	1	1	2	0	0	0	1	0	88
PM	02:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	2:15 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
	2:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	2:45 PM	3	0	0	2	0	0	0	0	0	1	0	0	0	0	6
	3:00 PM	0	2	0	55	0	13	0	1	0	0	0	0	0	0	71
	3:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	3:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	3:45 PM	2	0	0	0	1	1	0	0	0	0	0	0	0	0	4
	4:00 PM	0	0	0	1	0	7	0	0	0	0	0	0	0	0	8
	4:15 PM	1	3	0	0	0	0	0	0	0	0	0	0	1	0	5
	4:30 PM	0	2	0	0	1	1	0	0	0	1	0	0	0	0	5
	4:45 PM	2	1	0	0	0	0	0	1	0	0	0	0	0	0	4
	5:00 PM	1	0	0	0	0	1	1	0	0	0	0	0	0	0	3
	5:15 PM	0	1	0	0	2	0	0	0	1	0	0	0	0	0	4
	5:30 PM	2	1	0	0	1	1	0	0	0	0	0	0	0	0	5
	5:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
	TOTAL PM	13	12	0	58	8	25	1	2	1	2	0	0	1	0	123

WEST SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
AM	7:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	7:15 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	2	0	0	0	1	3	0	0	0	0	0	0	0	0	6
	8:00 AM	0	0	3	0	2	1	0	0	0	0	0	0	0	0	6
	8:15 AM	0	1	3	1	1	4	0	0	1	0	0	0	0	0	11
	8:30 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
	8:45 AM	1	0	0	0	1	4	1	0	0	0	0	0	0	0	7
	TOTAL AM	3	1	8	1	6	14	1	0	1	0	0	0	0	0	35
PM	02:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
	2:15 PM	2	0	0	0	1	1	0	1	0	0	0	0	0	0	5
	2:30 PM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	2
	2:45 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
	3:00 PM	1	1	0	21	0	6	0	1	0	2	0	0	0	1	33
	3:15 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2
	3:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
	3:45 PM	2	1	0	0	0	2	0	0	0	1	0	0	0	1	7
	4:00 PM	1	0	0	1	0	1	0	0	0	1	0	0	0	0	4
	4:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
	4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	4:45 PM	2	2	0	0	0	0	0	0	0	0	0	0	0	0	4
	5:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	5:15 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
	5:30 PM	2	0	0	0	0	1	0	0	0	0	0	0	0	0	3
	5:45 PM	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2
	TOTAL PM	12	9	0	22	4	17	0	2	0	6	0	0	0	2	74

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Nov 16, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: Michelson

PROJECT #: SC3579
LOCATION #: 1
CONTROL: STOP ALL

NORTH SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
AM	7:00 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
	7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	7:30 AM	2	0	0	0	0	1	0	0	0	0	0	0	0	0	3
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	9	0	2	0	0	0	0	0	0	0	0	0	11
	8:15 AM	0	0	7	0	5	12	0	0	0	0	0	0	0	0	24
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL AM	2	1	17	0	7	13	0	1	0	0	0	0	0	0	41
PM	02:00 PM	0	1	0	1	0	1	0	0	1	0	0	0	0	0	4
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	2:45 PM	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2
	3:00 PM	0	4	3	52	0	5	0	1	0	0	0	0	0	0	65
	3:15 PM	0	0	2	7	0	0	0	0	0	0	0	0	0	0	9
	3:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2
	3:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
	4:00 PM	0	1	0	2	0	5	0	0	0	2	0	0	0	0	10
	4:15 PM	0	2	0	0	0	0	1	1	0	0	0	0	0	0	4
	4:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	4:45 PM	1	0	0	1	0	1	0	0	0	0	0	0	0	0	3
	5:00 PM	0	2	0	0	0	0	0	1	0	1	0	0	0	0	4
	5:15 PM	2	2	0	0	0	0	0	0	0	0	0	0	0	0	4
	5:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
	5:45 PM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
	TOTAL PM	5	14	6	64	1	15	1	3	1	4	0	0	0	0	114

SOUTH SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
	7:30 AM	0	0	0	0	2	3	0	0	0	0	0	0	0	0	5
	7:45 AM	0	0	1	0	1	2	0	0	0	0	0	0	0	0	4
	8:00 AM	0	2	4	0	1	2	0	0	0	0	0	0	0	0	9
	8:15 AM	0	2	5	0	3	1	0	0	1	0	0	0	1	0	13
	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	8:45 AM	0	1	0	0	2	0	0	0	0	0	0	0	0	0	3
	TOTAL AM	0	9	10	0	9	8	0	0	1	0	0	0	1	0	38
PM	02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	2:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	3:00 PM	1	0	3	18	3	2	0	0	0	2	0	0	0	1	30
	3:15 PM	0	0	1	0	2	0	0	0	0	0	0	0	0	0	3
	3:30 PM	2	1	0	0	0	0	0	0	0	0	0	0	0	0	3
	3:45 PM	1	1	0	0	0	2	0	0	0	1	0	0	0	0	5
	4:00 PM	5	1	0	0	0	3	1	0	0	0	0	0	0	0	10
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	1	0	0	3	0	0	0	0	0	0	0	0	0	4
	4:45 PM	2	0	2	0	1	0	0	0	0	0	0	0	0	0	5
	5:00 PM	1	2	0	0	1	0	0	0	1	0	0	0	0	0	5
	5:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
	5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
	5:45 PM	2	4	1	0	0	0	0	0	0	0	0	0	0	0	7
	TOTAL PM	15	12	7	18	11	7	2	0	1	3	0	0	0	1	77

EAST SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
AM	7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	7:15 AM	1	1	2	0	0	0	0	0	0	0	0	0	0	0	4
	7:30 AM	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
	7:45 AM	9	0	2	0	4	0	0	0	0	0	0	0	0	0	15
	8:00 AM	3	4	14	0	5	0	0	0	0	0	0	0	0	0	26
	8:15 AM	1	3	15	0	11	0	1	1	1	0	0	0	2	0	35
	8:30 AM	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
	8:45 AM	0	4	0	0	1	0	0	0	0	0	0	0	0	0	5
	TOTAL AM	16	13	33	0	25	0	1	1	1	0	0	0	2	0	92
PM	02:00 PM	1	2	0	0	4	0	1	0	0	0	0	0	0	0	8
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:45 PM	1	0	1	1	0	0	0	0	0	0	0	0	0	0	3
	3:00 PM	0	2	0	53	3	13	0	1	0	2	0	0	0	1	75
	3:15 PM	2	1	1	0	1	0	0	0	0	0	0	0	0	0	5
	3:30 PM	1	2	0	0	0	2	1	0	0	0	0	0	0	0	6
	3:45 PM	1	3	0	0	2	0	0	0	0	0	0	0	0	0	6
	4:00 PM	1	2	0	2	0	2	0	0	1	0	0	0	0	0	8
	4:15 PM	1	1	0	0	0	1	1	0	0	0	0	0	0	0	4
	4:30 PM	5	1	0	0	5	0	0	0	0	0	0	0	0	0	11
	4:45 PM	1	2	0	0	0	3	0	0	0	0	0	0	0	0	6
	5:00 PM	1	0	0	0	2	3	0	0	1	0	0	0	0	0	7
	5:15 PM	2	1	0	0	1	0	0	0	0	0	0	0	0	0	4
	5:30 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	2
	5:45 PM	0	1	0	0	1	0	0	0	1	0	0	0	0	0	3
	TOTAL PM	17	19	2	56	19	24	4	1	3	2	0	0	0	1	148

WEST SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
AM	7:00 AM	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
	7:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	7:30 AM	0	0	0	1	0	2	0	0	0	0	0	0	0	0	3
	7:45 AM	1	0	1	0	1	1	0	0	0	0	0	0	0	0	4
	8:00 AM	0	0	5	0	0	0	0	0	0	0	0	0	0	0	5
	8:15 AM	0	0	7	0	2	13	1	0	0	0	0	0	0	0	23
	8:30 AM	1	1	0	0	0	1	0	0	0	0	0	0	0	0	3
	8:45 AM	0	3	0	0	0	2	0	0	0	1	0	0	0	0	6
	TOTAL AM	2	6	14	1	3	20	1	0	0	1	0	0	0	0	48
PM	02:00 PM	3	0	0	1	0	4	0	0	0	0	0	0	0	0	8
	2:15 PM	1	1	0	0	0	0	0	1	0	0	0	0	0	0	3
	2:30 PM	2	1	0	0	0	0	0	0	0	0	0	0	0	0	3
	2:45 PM	1	1	0	0	1	1	0	0	0	0	0	0	0	0	4
	3:00 PM	1	1	0	25	0	3	0	0	0	0	0	0	0	0	30
	3:15 PM	0	1	0	0	1	1	0	0	0	0	0	0	0	0	3
	3:30 PM	2	1	0	0	2	2	0	0	0	0	0	0	0	0	7
	3:45 PM	0	0	0	1	0	2	0	0	0	0	0	0	0	0	3
	4:00 PM	0	2	0	2	0	1	0	0	0	0	0	0	0	0	5
	4:15 PM	1	1	0	0	0	0	1	0	1	0	0	0	0	0	4
	4:30 PM	1	1	0	0	0	0	0	1	0	0	0	0	0	0	3
	4:45 PM	0	2	0	1	0	0	0	0	0	0	0	0	0	0	3
	5:00 PM	1	2	0	0	0	0	0	1	0	1	0	0	0	0	5
	5:15 PM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
	5:30 PM	1	1	0	0	0	2	0	0	0	0	0	0	0	0	4
	5:45 PM	1	0	0	0	1	1	0	0	0	0	0	0	0	0	3
	TOTAL PM	16	16	0	30	5	17	1	3	1	1	0	0	0	0	90

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Nov 16, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: Royce

PROJECT #: SC3579
LOCATION #: 2
CONTROL: STOP E/W

NORTH SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
AM	7:00 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	2
	8:00 AM	4	0	2	0	3	0	0	0	0	0	0	0	0	0	9
	8:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	TOTAL AM	6	2	2	0	3	1	1	0	0	0	0	0	0	0	15
PM	02:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	3:00 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5
	3:15 PM	0	0	2	0	1	0	0	0	0	0	0	0	0	0	3
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	2	0	1	0	0	0	1	0	0	0	0	0	0	4
	4:15 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
	4:30 PM	2	2	0	0	0	0	1	0	0	0	0	0	0	0	5
	4:45 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
	5:00 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
	5:15 PM	0	1	0	0	2	0	0	0	0	0	0	0	0	0	3
	5:30 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	5:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	TOTAL PM	5	8	3	1	3	9	2	1	0	0	0	0	0	0	32

SOUTH SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
AM	7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0	2
	7:15 AM	2	1	0	0	0	0	0	0	0	0	0	0	0	0	3
	7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	7:45 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
	8:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	8:15 AM	1	1	0	0	0	2	0	0	0	0	0	0	0	0	4
	8:30 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
	8:45 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
	TOTAL AM	6	6	0	0	2	2	0	0	0	0	0	0	1	0	17
PM	02:00 PM	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
	2:15 PM	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3
	2:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
	2:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
	3:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
	3:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	3:30 PM	0	0	0	0	0	2	0	1	0	0	0	0	0	0	3
	3:45 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	4:00 PM	0	2	0	0	0	0	1	0	0	0	0	0	0	0	3
	4:15 PM	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3
	4:30 PM	1	1	0	1	2	0	0	0	0	0	0	0	0	0	5
	4:45 PM	1	1	0	0	1	0	0	0	0	0	0	0	0	0	3
	5:00 PM	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
	5:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	5:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL PM	9	8	0	1	8	5	2	1	1	0	0	0	0	0	35

EAST SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
AM	7:00 AM	1	1	0	0	0	0	0	0	0	0	0	0	1	0	3
	7:15 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
	7:30 AM	0	1	0	0	2	0	0	0	0	0	0	0	0	0	3
	7:45 AM	1	1	0	0	1	0	0	1	0	0	0	0	0	0	4
	8:00 AM	2	2	2	0	2	0	1	0	0	0	0	0	0	0	9
	8:15 AM	0	1	0	0	2	4	0	1	0	0	0	0	0	0	8
	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL AM	5	8	2	0	7	4	1	2	0	0	0	0	1	0	30
PM	02:00 PM	1	0	0	0	8	0	0	0	0	0	0	0	0	0	9
	2:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
	2:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
	2:45 PM	1	2	0	0	0	0	1	0	0	0	0	0	0	0	4
	3:00 PM	1	0	0	1	0	4	0	1	0	0	0	0	0	0	7
	3:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	3:30 PM	0	0	0	0	1	0	2	1	0	0	0	0	0	0	4
	3:45 PM	0	2	0	0	1	0	0	0	0	0	0	0	0	0	3
	4:00 PM	1	2	0	1	0	0	0	0	1	0	0	0	0	0	5
	4:15 PM	2	1	0	0	0	0	1	0	0	0	0	0	0	0	4
	4:30 PM	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
	4:45 PM	0	1	0	0	5	0	0	0	0	0	0	0	0	0	6
	5:00 PM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
	5:15 PM	2	1	0	0	1	0	0	0	0	0	0	0	0	0	4
	5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	5:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
	TOTAL PM	11	12	0	2	21	4	4	2	2	0	0	0	0	0	58

WEST SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
AM	7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	7:15 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
	7:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	7:45 AM	2	1	1	0	0	3	1	0	0	0	0	0	0	0	8
	8:00 AM	0	0	3	0	6	1	1	0	0	0	0	0	0	0	11
	8:15 AM	2	1	1	0	3	22	0	0	0	0	0	0	0	0	29
	8:30 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
	8:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
	TOTAL AM	6	5	5	0	9	29	2	0	0	0	0	0	0	0	56
PM	02:00 PM	2	2	0	0	2	3	0	0	0	0	0	0	0	0	9
	2:15 PM	1	1	0	0	0	0	0	1	0	0	0	0	0	0	3
	2:30 PM	2	1	0	0	1	0	0	0	0	0	0	0	0	0	4
	2:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	3:00 PM	0	2	0	1	0	6	0	0	0	0	0	0	0	0	9
	3:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	3:30 PM	1	1	0	0	2	2	0	0	0	0	0	0	0	0	6
	3:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
	4:00 PM	0	2	0	3	0	4	1	0	0	0	0	0	0	0	10
	4:15 PM	1	0	0	0	1	1	0	0	0	0	0	0	0	0	3
	4:30 PM	1	1	0	0	2	1	0	0	0	0	0	0	0	0	5
	4:45 PM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
	5:00 PM	2	0	0	0	0	1	0	0	0	1	0	0	0	0	4
	5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	5:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	5:45 PM	1	0	0	0	1	4	0	0	0	0	0	0	0	0	6
	TOTAL PM	14	12	0	4	12	22	1	1	0	1	0	0	0	0	67

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Nov 15, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: Royce

PROJECT #: SC3579
LOCATION #: 2
CONTROL: STOP E/W

NORTH SIDE

	PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
	Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	4
7:45 AM	1	0	0	0	1	2	0	0	0	0	0	0	0	0	4
8:00 AM	0	0	0	0	5	1	1	0	1	0	0	0	0	0	8
8:15 AM	1	1	0	0	0	2	0	1	0	0	0	0	0	0	5
8:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
8:45 AM	3	1	0	0	0	0	0	0	0	0	0	0	0	0	4
TOTAL AM	7	3	0	0	8	6	1	1	1	0	0	0	0	0	27
02:00 PM	0	3	0	1	0	0	1	0	0	0	0	0	0	0	5
2:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	1	0	1	0	4	0	1	0	0	0	0	0	0	7
3:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
3:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:45 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
4:30 PM	3	0	0	0	0	1	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
5:15 PM	1	1	0	0	0	1	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL PM	12	7	0	2	2	7	1	1	0	1	0	0	0	0	33

SOUTH SIDE

	PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
	Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
7:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3
7:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
8:00 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3
8:15 AM	1	1	0	0	0	2	0	1	0	0	0	0	0	0	5
8:30 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL AM	1	7	1	0	0	5	0	1	0	0	0	0	1	0	16
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3:15 PM	2	0	1	0	0	0	0	0	0	1	0	0	0	0	4
3:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3:45 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2
4:00 PM	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2
4:15 PM	2	1	0	0	3	1	0	0	0	0	0	0	0	0	7
4:30 PM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	3	1	1	0	1	0	0	0	0	0	0	0	0	0	6
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL PM	11	4	2	0	5	4	0	0	0	2	0	0	0	0	28

EAST SIDE

	PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
	Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
7:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2
7:15 AM	0	0	1	0	3	0	0	0	0	0	0	0	0	0	4
7:30 AM	1	2	0	1	0	0	0	0	0	0	0	0	0	0	4
7:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
8:00 AM	5	0	3	0	2	0	0	0	0	0	0	0	0	0	10
8:15 AM	1	3	0	0	0	0	2	0	0	0	0	0	0	0	6
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	2	1	0	0	2	1	0	0	0	0	0	0	0	0	6
TOTAL AM	9	7	4	1	9	1	2	0	0	0	0	0	1	0	34
02:00 PM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
2:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	0	0	1	0	2	1	3	0	0	0	0	0	0	7
3:15 PM	2	0	0	0	2	0	0	0	0	1	0	0	0	0	5
3:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:45 PM	1	1	0	0	3	0	0	0	0	0	0	0	0	0	5
4:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
4:15 PM	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
4:45 PM	1	1	1	0	0	0	0	0	0	0	0	0	0	0	3
5:00 PM	1	0	0	0	1	0	0	0	0	2	0	0	0	0	4
5:15 PM	0	0	0	0	2	0	0	0	1	0	0	0	0	0	3
5:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
5:45 PM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL PM	12	5	1	1	13	2	2	3	1	3	0	0	0	0	43

WEST SIDE

	PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
	Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
7:30 AM	3	1	0	0	0	0	0	0	0	0	0	0	0	0	4
7:45 AM	3	2	0	0	0	2	0	0	0	0	0	0	0	0	7
8:00 AM	2	1	0	0	9	5	1	0	1	0	0	0	0	0	19
8:15 AM	0	1	1	0	4	9	0	3	0	0	0	0	0	0	18
8:30 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
8:45 AM	3	0	0	0	0	3	1	0	0	0	0	0	0	0	7
TOTAL AM	11	6	1	0	13	23	2	3	1	0	0	0	0	0	60
02:00 PM	0	0	0	0	2	0	2	0	0	0	0	0	0	0	4
2:15 PM	1	0	0	0	2	1	0	1	0	0	0	0	0	0	5
2:30 PM	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3
2:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	2	0	5	0	8	0	2	0	2	0	0	0	0	19
3:15 PM	0	1	0	2	0	4	0	0	0	1	0	0	0	0	8
3:30 PM	1	2	0	0	1	0	1	0	0	0	0	0	0	0	5
3:45 PM	2	3	0	0	1	1	0	0	0	1	0	0	0	0	8
4:00 PM	1	1	0	1	2	5	0	0	0	1	0	0	0	0	11
4:15 PM	1	0	0	1	2	2	0	0	0	1	0	0	0	0	7
4:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	2	0	0	1	0	0	1	0	0	0	0	0	0	4
5:00 PM	3	0	0	0	1	1	0	0	0	0	0	0	0	0	5
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	5	1	0	0	0	0	0	0	0	0	0	0	0	0	6
5:45 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL PM	17	15	0	9	13	23	3	4	0	6	0	0	0	0	90

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Nov 15, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: University

PROJECT #: SC3579
LOCATION #: 3
CONTROL: SIGNAL

NORTH SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
	7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	7:45 AM	0	0	0	0	1	3	0	0	0	0	0	0	0	0	4
	8:00 AM	4	1	2	0	2	3	0	0	0	0	0	0	0	0	12
	8:15 AM	0	3	0	0	0	4	0	0	0	0	0	0	0	0	7
	8:30 AM	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
	8:45 AM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
	TOTAL AM	4	4	2	0	8	11	0	1	1	0	0	0	0	0	31
PM	02:00 PM	1	0	0	0	9	0	1	0	0	1	0	0	0	0	12
	2:15 PM	0	1	0	0	2	0	0	0	0	0	0	0	0	0	3
	2:30 PM	1	0	0	0	2	1	0	0	0	0	0	0	0	0	4
	2:45 PM	0	1	0	0	0	1	0	0	1	0	0	0	0	0	3
	3:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
	3:15 PM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	4
	3:30 PM	0	2	0	0	1	0	0	0	1	0	0	0	0	0	4
	3:45 PM	1	0	0	0	7	1	0	0	2	0	0	0	0	0	11
	4:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
	4:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
	4:30 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4
	4:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2
	5:00 PM	0	0	0	0	1	1	1	1	1	0	0	0	0	0	5
	5:15 PM	0	0	0	0	2	0	0	1	1	0	0	0	0	0	4
	5:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	5:45 PM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
	TOTAL PM	6	6	0	0	28	9	2	4	7	2	0	0	1	0	65

SOUTH SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
	8:00 AM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL AM	0	0	0	0	3	1	1	0	0	0	0	0	0	0	5
PM	02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:00 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
	3:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	3:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	1	1	0	1	2	0	0	0	0	0	0	0	0	0	5
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL PM	1	1	0	1	9	0	0	0	0	0	0	0	0	0	12

EAST SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1

WEST SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
AM	7:00 AM	1	0	1	0	1	3	0	0	0	0	0	0	0	0	6
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	7:45 AM	0	2	0	1	2	6	0	0	0	0	0	0	0	0	11
	8:00 AM	5	1	4	0	10	7	0	1	0	0	0	0	0	0	28
	8:15 AM	2	4	0	1	5	13	0	3	0	0	0	0	0	0	28
	8:30 AM	1	1	0	0	0	3	0	0	0	1	0	0	0	0	6
	8:45 AM	2	0	0	0	1	1	0	1	0	0	0	0	0	0	5
	TOTAL AM	12	8	5	2	19	33	0	5	0	1	0	0	0	0	85
PM	02:00 PM	1	1	0	0	10	0	3	0	0	0	0	0	0	0	15
	2:15 PM	2	1	0	0	3	1	0	1	0	0	0	0	0	0	8
	2:30 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
	2:45 PM	1	0	0	0	3	0	0	0	1	0	0	0	0	0	5
	3:00 PM	0	5	0	0	1	9	0	0	0	1	0	0	0	0	16
	3:15 PM	0	0	0	0	2	4	0	0	0	1	0	0	0	0	7
	3:30 PM	0	1	0	0	1	0	1	0	1	0	0	0	0	0	4
	3:45 PM	2	1	0	0	6	2	0	0	1	2	0	0	0	0	14
	4:00 PM	1	0	1	0	3	5	0	0	0	1	0	0	0	0	11
	4:15 PM	1	2	0	1	2	1	0	0	0	1	0	0	1	0	9
	4:30 PM	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
	4:45 PM	1	2	0	0	1	0	0	0	0	0	0	0	0	0	4
	5:00 PM	2	0	1	0	1	0	2	0	1	0	0	0	0	0	7
	5:15 PM	0	1	0	0	2	1	0	0	1	0	0	0	0	0	5
	5:30 PM	4	0	0	0	1	0	0	0	0	0	0	0	0	0	5
	5:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
	TOTAL PM	16	14	2	1	41	24	6	1	5	6	0	0	1	0	117

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Nov 16, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST: University

PROJECT #: SC3579
LOCATION #: 3
CONTROL: SIGNAL

NORTH SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
AM	7:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	7:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	7:30 AM	0	0	0	0	1	0	0	2	0	1	0	0	0	0	4
	7:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	8:00 AM	1	0	1	0	0	3	2	0	0	0	0	0	0	0	7
	8:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
	TOTAL AM	2	0	1	0	2	8	2	2	0	2	0	0	0	0	19
PM	02:00 PM	0	0	0	0	6	0	1	1	0	0	0	0	0	0	8
	2:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2
	2:30 PM	0	3	0	0	2	0	0	0	0	0	0	0	0	0	5
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:00 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2
	3:15 PM	0	0	0	0	1	1	0	1	0	0	0	0	0	0	3
	3:30 PM	1	0	0	0	1	0	1	1	0	0	0	0	0	0	4
	3:45 PM	3	0	0	0	3	0	0	0	1	0	0	0	0	0	7
	4:00 PM	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2
	4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	4:30 PM	1	0	0	0	2	1	0	0	0	0	0	0	0	0	4
	4:45 PM	0	1	0	0	5	0	0	0	1	0	0	0	0	0	7
	5:00 PM	0	0	0	0	2	0	0	0	1	0	0	0	0	0	3
	5:15 PM	1	0	0	0	2	0	0	0	0	0	0	0	0	0	3
	5:30 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2
	5:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	TOTAL PM	8	5	2	0	25	5	2	3	4	0	0	0	0	0	54

SOUTH SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
	TOTAL AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
PM	02:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
	TOTAL PM	0	0	0	0	4	0	1	0	1	0	0	0	1	0	7

EAST SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
	TOTAL PM	0	0	0	0	3	0	0	0	1	0	0	0	1	0	5

WEST SIDE

		PEDS				BYCICLIST				SCOOTER				SKATEBOARD		TOTAL
		Adult		School Age		Bike		E-Bike		Scooter		Mobility Assistance				
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
AM	7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	7:15 AM	4	2	0	0	0	0	0	0	0	0	0	0	0	0	6
	7:30 AM	1	0	0	0	1	0	0	1	0	0	0	0	0	0	3
	7:45 AM	2	1	2	0	1	3	0	1	0	0	0	0	0	0	10
	8:00 AM	6	0	4	0	9	8	0	1	0	0	0	0	0	0	28
	8:15 AM	0	2	0	1	3	9	0	1	0	1	0	0	0	0	17
	8:30 AM	1	2	0	1	0	1	0	0	0	0	0	0	0	0	5
	8:45 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	3
	TOTAL AM	14	9	6	2	14	23	0	4	0	1	0	0	0	0	73
PM	02:00 PM	0	0	0	0	13	3	1	0	0	0	0	0	0	0	17
	2:15 PM	1	1	1	0	1	0	2	1	0	0	0	0	0	0	7
	2:30 PM	0	1	1	0	2	0	1	0	0	0	0	0	0	0	5
	2:45 PM	1	2	1	0	2	0	1	1	0	0	0	0	0	0	8
	3:00 PM	0	1	0	3	0	7	0	0	0	0	0	0	0	0	11
	3:15 PM	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
	3:30 PM	1	1	0	0	3	1	1	0	0	0	0	0	0	0	7
	3:45 PM	2	0	0	0	7	0	0	1	1	0	0	0	0	0	11
	4:00 PM	0	2	1	3	0	4	2	0	1	0	0	0	0	0	13
	4:15 PM	0	1	0	0	1	1	0	0	0	0	0	0	0	0	3
	4:30 PM	0	0	0	0	6	0	0	1	0	0	0	0	0	0	7
	4:45 PM	0	1	0	0	5	0	0	0	1	0	0	0	0	0	7
	5:00 PM	1	1	0	1	3	1	0	0	0	0	0	0	0	0	7
	5:15 PM	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
	TOTAL PM	8	11	4	7	48	18	8	3	4	0	0	0	0	0	111

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:					
Tue, Nov 15, 22	LOCATION:	Irvine Rancho San Joaquin	PROJECT #:	SC3579	
	NORTH & SOUTH:	Yale	LOCATION #:	4	
	EAST & WEST:		CONTROL:	NO CONTRO	

DIRECTIONALLY COUNTS

	Yale Crossing				TOTAL
	PEDS		BIKES		
	EB	WB	EB	WB	
7:00 AM	0	0	0	0	0
7:15 AM	0	1	0	0	1
7:30 AM	1	0	0	0	1
7:45 AM	1	1	0	0	2
8:00 AM	0	0	0	0	0
8:15 AM	1	0	0	0	1
8:30 AM	1	2	0	0	3
8:45 AM	0	2	0	0	2
TOTAL	4	6	0	0	10
2:00 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0
3:00 PM	0	3	0	0	3
3:15 PM	1	1	0	0	2
3:30 PM	1	1	0	0	2
3:45 PM	1	0	0	0	1
4:00 PM	1	4	0	0	5
4:15 PM	3	0	0	0	3
4:30 PM	0	3	0	0	3
4:45 PM	1	4	0	1	6
5:00 PM	3	0	0	0	3
5:15 PM	1	0	0	0	1
5:30 PM	3	0	0	0	3
5:45 PM	1	0	0	0	1
TOTAL	16	16	0	1	33

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Irvine Rancho San Joaquin	PROJECT #:	SC3579
Wed, Nov 16, 22	NORTH & SOUTH:	Yale	LOCATION #:	4
	EAST & WEST:		CONTROL:	NO CONTROL

DIRECTIONALLY COUNTS

	Yale Crossing				TOTAL
	PEDS		BIKES		
	EB	WB	EB	WB	
7:00 AM	3	0	0	0	3
7:15 AM	0	1	0	0	1
7:30 AM	1	1	0	0	2
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	4	1	0	0	5
8:45 AM	0	2	0	0	2
TOTAL	8	5	0	0	13
2:00 PM	0	1	1	0	2
2:15 PM	1	0	0	0	1
2:30 PM	0	0	0	0	0
2:45 PM	0	1	0	0	1
3:00 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:30 PM	1	0	0	0	1
3:45 PM	0	2	0	0	2
4:00 PM	0	0	0	0	0
4:15 PM	2	2	0	0	4
4:30 PM	0	2	0	0	2
4:45 PM	1	0	0	0	1
5:00 PM	0	1	0	0	1
5:15 PM	2	0	0	0	2
5:30 PM	2	1	0	0	3
5:45 PM	0	1	0	0	1
TOTAL	9	11	1	0	21

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Nov 15, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST:

PROJECT #: SC3474
LOCATION #: 1
CONTROL: NO CONTROL

DIRECTIONALLY COUNTS

	PEDS				BIKES				SKATEBOARDS/SCOOTERS				TOTAL
	ADULT		SCHOOL AGE		ADULT		SCHOOL AGE		ADULT		SCHOOL AGE		
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
7:00 AM	1	1	0	0	1	0	1	0	0	0	0	0	4
7:15 AM	1	1	0	0	2	3	0	0	0	0	0	0	7
7:30 AM	1	2	0	0	1	0	0	0	0	0	0	0	4
7:45 AM	4	2	0	0	2	2	0	1	0	0	0	0	11
8:00 AM	3	1	0	4	1	0	0	0	0	0	0	0	9
8:15 AM	1	3	0	1	1	4	0	2	0	0	0	0	12
8:30 AM	1	0	0	0	1	2	0	0	0	0	0	0	4
8:45 AM	0	2	0	0	2	5	0	0	0	0	0	0	9
TOTAL	12	12	0	5	11	16	1	3	0	0	0	0	60
2:00 PM	1	0	0	0	2	3	0	0	0	0	0	0	6
2:15 PM	3	0	0	0	2	3	0	0	0	0	0	0	8
2:30 PM	2	0	0	0	2	0	0	0	0	0	0	0	4
2:45 PM	0	0	0	0	1	2	0	0	0	1	0	0	4
3:00 PM	1	1	1	0	0	5	2	0	0	0	1	1	12
3:15 PM	2	1	3	0	2	2	0	0	0	0	0	0	10
3:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
3:45 PM	2	4	2	1	2	2	0	0	0	2	0	0	15
4:00 PM	0	1	2	0	0	1	2	0	0	0	0	0	6
4:15 PM	3	3	0	0	0	1	0	0	1	0	0	0	8
4:30 PM	1	2	1	1	1	0	0	0	0	0	0	0	6
4:45 PM	1	5	0	0	0	0	0	1	0	0	0	0	7
5:00 PM	1	0	0	0	1	3	0	0	0	0	0	0	5
5:15 PM	2	1	0	0	3	0	0	0	0	0	0	0	6
5:30 PM	1	2	0	0	1	0	0	0	0	0	0	0	4
5:45 PM	0	3	0	0	0	1	0	0	0	0	0	0	4
TOTAL	20	23	9	2	17	24	4	1	1	3	1	1	106

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Nov 16, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST:

PROJECT #: SC3474
LOCATION #: 405
CONTROL: NO CONTROL

DIRECTIONALLY COUNTS

	PEDS				BIKES				SKATEBOARDS/SCOOTERS				TOTAL
	ADULT		SCHOOL AGE		ADULT		SCHOOL AGE		ADULT		SCHOOL AGE		
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
7:00 AM	1	4	0	0	1	0	0	0	0	0	0	0	6
7:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
7:30 AM	2	1	0	0	1	3	0	0	0	0	0	0	7
7:45 AM	8	0	0	0	5	1	0	2	0	0	0	0	16
8:00 AM	3	4	0	2	0	1	0	0	0	0	0	0	10
8:15 AM	1	3	0	0	0	2	0	1	0	0	0	0	7
8:30 AM	1	0	1	0	1	1	0	0	0	0	0	0	4
8:45 AM	0	4	0	0	2	1	0	0	0	1	0	0	8
TOTAL	16	16	1	2	10	10	0	3	0	1	0	0	59
2:00 PM	1	4	0	0	4	2	1	0	0	0	0	0	12
2:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
2:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	2
2:45 PM	0	1	0	0	1	1	0	0	0	0	0	0	3
3:00 PM	0	0	2	0	3	0	2	1	0	1	0	1	10
3:15 PM	3	1	1	0	1	1	0	0	0	0	0	0	7
3:30 PM	2	0	0	0	3	2	1	2	0	0	0	0	10
3:45 PM	2	1	0	1	3	2	0	0	1	0	0	0	10
4:00 PM	1	6	0	1	0	0	2	0	0	0	0	0	10
4:15 PM	3	1	0	0	2	0	0	0	1	0	0	0	7
4:30 PM	5	6	0	0	2	1	1	0	0	0	0	0	15
4:45 PM	0	5	0	1	4	2	0	0	0	1	0	0	13
5:00 PM	1	0	1	0	0	1	0	0	0	0	0	0	3
5:15 PM	2	0	0	0	1	1	0	0	0	0	0	0	4
5:30 PM	1	1	0	0	4	1	0	0	0	0	0	0	7
5:45 PM	0	1	0	0	1	1	0	0	1	1	0	0	5
TOTAL	21	27	4	3	30	15	7	5	3	3	0	1	119

SB - el powered wheelchair (1)

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Nov 15, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST:

PROJECT #: SC3474
LOCATION #: 1
CONTROL: NO CONTROL

DIRECTIONALLY COUNTS

	PEDS				BIKES				SKATEBOARDS/SCOOTERS				TOTAL
	ADULT		SCHOOL AGE		ADULT		SCHOOL AGE		ADULT		SCHOOL AGE		
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	2	0	0	0	0	0	0	1	0	0	0	0	3
8:00 AM	0	1	0	4	0	0	0	0	0	0	0	0	5
8:15 AM	0	1	0	1	0	0	0	2	0	0	0	0	4
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	2	0	5	0	0	0	3	0	0	0	0	13
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
2:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
3:00 PM	0	0	1	0	0	0	2	0	0	0	0	0	3
3:15 PM	0	0	3	0	0	1	0	0	0	0	0	0	4
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	2	1	0	0	0	0	0	0	0	0	3
4:00 PM	0	1	2	0	0	0	2	0	0	0	0	0	5
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
5:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	2	2	9	1	0	2	4	1	0	1	0	0	22

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Nov 16, 22

LOCATION: Irvine Rancho San Joaquin
NORTH & SOUTH: Yale
EAST & WEST:

PROJECT #: SC3474
LOCATION #: 405
CONTROL: NO CONTROL

DIRECTIONALLY COUNTS

	PEDS				BIKES				SKATEBOARDS/SCOOTERS				TOTAL
	ADULT		SCHOOL AGE		ADULT		SCHOOL AGE		ADULT		SCHOOL AGE		
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	
7:00 AM	1	1	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	1	1	0	0	0	0	0	0	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	2	0	0	0	0	2
8:00 AM	0	0	0	2	0	1	0	0	0	0	0	0	3
8:15 AM	1	1	0	0	0	0	0	1	0	0	0	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
TOTAL	3	3	0	2	1	1	0	3	0	0	0	0	13
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	2
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	2	0	0	0	2	0	0	0	0	0	4
3:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	1
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	2	0	0	0	0	2	0	0	0	0	0	4
4:15 PM	2	1	0	0	0	0	0	0	0	0	0	0	3
4:30 PM	0	3	0	0	0	0	0	0	0	0	0	0	3
4:45 PM	0	2	0	0	1	0	0	0	0	0	0	0	3
5:00 PM	1	0	1	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3	8	4	0	2	0	4	1	0	0	0	0	22

APPENDIX B– ICU Calculation Sheets

273 Yale Av. @ Michelson Dr.

Existing S Yale

	Ln	Cap	AM PK Hour Vol	AM PK Hour V/C	PM PK Hour Vol	PM PK Hour V/C
NL	1	1700	13	0.01	14	0.01*
NT	1	1700	56	0.03*	1	
NR	D	1700	33	0.02	57	0.03
SL	1	1700	21	0.01*	2	
ST	1	1700	37	0.02	0	*
SR	D	1700	52	0.03	3	
EL	1	1700	65	0.04*	2	
ET	1	1700	135	0.08	284	0.17*
ER	D	1700	21	0.01	7	
WL	1	1700	88	0.05	13	0.01*
WT	1	1700	193	0.11*	204	0.12
WR	D	1700	20	0.01	1	

Adjustment NBR .01
Overlaps Clearance .05

Total ICU 0.24 0.25

275 Yale Av. @ University Dr.

Existing S Yale

	Ln	Cap	AM PK Hour Vol	AM PK Hour V/C	PM PK Hour Vol	PM PK Hour V/C
NL	0		0		0	
NT	0		0	*	0	*
NR	0		0		0	
SL	1	1700	76	0.04*	13	0.01*
ST	0		0		0	
SR	1	1700	104	0.06	21	0.01
EL	1	1700	81	0.05*	68	0.04
ET	2	3400	769	0.23	1416	0.42*
ER	0		0		0	
WL	0		0		0	*
WT	2	3400	1319	0.39*	1001	0.29
WR	D	1700	35	0.02	32	0.02

Overlaps Clearance .05

Total ICU 0.53 0.48

273 Yale Av. @ Michelson Dr.

Existing S Yale_School

	Ln	Cap	AM PK Hour Vol	AM PK Hour V/C	PM PK Hour Vol	PM PK Hour V/C
NL	1	1700	13	0.01	15	0.01
NT	1	1700	56	0.03*	19	0.01*
NR	D	1700	33	0.02	44	0.03
SL	1	1700	21	0.01*	24	0.01*
ST	1	1700	37	0.02	21	0.01
SR	D	1700	52	0.03	29	0.02
EL	1	1700	65	0.04*	27	0.02
ET	1	1700	135	0.08	168	0.10*
ER	D	1700	21	0.01	20	0.01
WL	1	1700	88	0.05	46	0.03*
WT	1	1700	193	0.11*	166	0.10
WR	D	1700	20	0.01	16	0.01

Overlaps Clearance .05

Total ICU 0.24 0.20

275 Yale Av. @ University Dr.

Existing S Yale_School

	Ln	Cap	AM PK Hour Vol	AM PK Hour V/C	PM PK Hour Vol	PM PK Hour V/C
NL	0		0		0	
NT	0		0	*	0	*
NR	0		0		0	
SL	1	1700	76	0.04*	38	0.02*
ST	0		0		0	
SR	1	1700	104	0.06	72	0.04
EL	1	1700	81	0.05*	75	0.04*
ET	2	3400	769	0.23	689	0.20
ER	0		0		0	
WL	0		0		0	
WT	2	3400	1319	0.39*	709	0.21*
WR	D	1700	35	0.02	32	0.02

Overlaps Clearance .05

Total ICU 0.53 0.32

273 Yale Av. @ Michelson Dr.

BO I-405 Veh OC 4-Lane S Yale IRVINE

	Ln	Cap	AM PK Hour Vol	AM PK Hour V/C	PM PK Hour Vol	PM PK Hour V/C
NL	1	1700	35	0.02	44	0.03
NT	2	3400	236	0.07*	245	0.07*
NR	D	1700	36	0.02	60	0.04
SL	1	1700	195	0.11*	299	0.18*
ST	2	3400	375	0.11	117	0.04
SR	D	1700	188	0.11	219	0.13
EL	1	1700	218	0.13*	240	0.14*
ET	1	1700	33	0.02	59	0.03
ER	D	1700	64	0.04	23	0.01
WL	1	1700	74	0.04	18	0.01
WT	1	1700	37	0.02*	33	0.02*
WR	D	1700	252	0.15	184	0.11

Adjustment WBR .05
Overlaps Clearance .05

Total ICU 0.43 0.46

275 Yale Av. @ University Dr.

BO I-405 Veh OC 4-Lane S Yale IRVINE

	Ln	Cap	AM PK Hour Vol	AM PK Hour V/C	PM PK Hour Vol	PM PK Hour V/C
NL	0		0		0	
NT	0		0	*	0	*
NR	0		0		0	
SL	1	1700	191	0.11*	35	0.02*
ST	0		0		0	
SR	1	1700	332	0.20	145	0.09
EL	1	1700	239	0.14*	330	0.19*
ET	2	3400	843	0.25	1491	0.44
ER	0		0		0	
WL	0		0		0	
WT	2	3400	1305	0.38*	1028	0.30*
WR	D	1700	73	0.04	59	0.03

Overlaps Clearance .05

Total ICU 0.68 0.56

273 Yale Av. @ Michelson Dr.

BO I-405 Veh OC 2-Lane S Yale			AM PK Hour		PM PK Hour	IRVINE
	Ln	Cap	Vol	V/C	Vol	V/C
NL	1	1700	32	0.02	41	0.02
NT	1	1700	230	0.14*	243	0.14*
NR	D	1700	33	0.02	56	0.03
SL	1	1700	203	0.12*	303	0.18*
ST	1	1700	346	0.20	103	0.06
SR	D	1700	196	0.12	222	0.13
EL	1	1700	232	0.14*	247	0.15*
ET	1	1700	33	0.02	57	0.03
ER	D	1700	56	0.03	19	0.01
WL	1	1700	60	0.04	14	0.01
WT	1	1700	34	0.02*	29	0.02*
WR	D	1700	248	0.15	173	0.10
Adjustment			WBR	.04		
Overlaps				Clearance	.05	
Total ICU				0.51		0.54

275 Yale Av. @ University Dr.

BO I-405 Veh OC 2-Lane S Yale			AM PK Hour		PM PK Hour	IRVINE
	Ln	Cap	Vol	V/C	Vol	V/C
NL	0		0		0	
NT	0		0	*	0	*
NR	0		0		0	
SL	1	1700	174	0.10*	19	0.01*
ST	0		0		0	
SR	1	1700	298	0.18	140	0.08
EL	1	1700	230	0.14*	341	0.20*
ET	2	3400	858	0.25	1481	0.44
ER	0		0		0	
WL	0		0		0	
WT	2	3400	1315	0.39*	1022	0.30*
WR	D	1700	71	0.04	35	0.02
Overlaps				Clearance	.05	
Total ICU				0.68		0.56

273 Yale Av. @ Michelson Dr.

BO No I-405 Veh OC 4-Lane S Yale			AM PK Hour		PM PK Hour	IRVINE
	Ln	Cap	Vol	V/C	Vol	V/C
NL	1	1700	74	0.04*	2	*
NT	1	1700	0		0	
NR	D	1700	97	0.06	94	0.06
SL	1	1700	0		0	
ST	1	1700	0	*	0	*
SR	D	1700	0		0	
EL	1	1700	0		0	
ET	1	1700	169	0.10*	311	0.18*
ER	D	1700	139	0.08	3	
WL	1	1700	229	0.13*	81	0.05*
WT	1	1700	185	0.11	235	0.14
WR	D	1700	0		0	

Adjustment NBR .02
Overlaps Clearance .05

Total ICU 0.32 0.30

275 Yale Av. @ University Dr.

BO No I-405 Veh OC 4-Lane S Yale			AM PK Hour		PM PK Hour	IRVINE
	Ln	Cap	Vol	V/C	Vol	V/C
NL	0		0		0	
NT	0		0	*	0	*
NR	0		0		0	
SL	1	1700	159	0.09*	40	0.02*
ST	0		0		0	
SR	1	1700	238	0.14	66	0.04
EL	1	1700	129	0.08*	90	0.05
ET	2	3400	901	0.27	1636	0.48*
ER	0		0		0	
WL	0		0		0	*
WT	2	3400	1334	0.39*	1041	0.31
WR	D	1700	44	0.03	37	0.02

Overlaps Clearance .05

Total ICU 0.61 0.55

273 Yale Av. @ Michelson Dr.

BO	No	I-405 Veh	OC	2-Lane S Yale		IRVINE	
				AM PK Hour		PM PK Hour	
	Ln	Cap		Vol	V/C	Vol	V/C
NL	1	1700		71	0.04*	0	*
NT	1	1700		0		0	
NR	D	1700		88	0.05	92	0.05
SL	1	1700		0		0	
ST	1	1700		0	*	0	*
SR	D	1700		0		0	
EL	1	1700		0		0	
ET	1	1700		178	0.10*	318	0.19*
ER	D	1700		132	0.08	0	
WL	1	1700		202	0.12*	75	0.04*
WT	1	1700		191	0.11	227	0.13
WR	D	1700		0		0	
Adjustment					NBR	.02	
Overlaps					Clearance	.05	
Total ICU					0.31		0.30

275 Yale Av. @ University Dr.

BO	No	I-405 Veh	OC	2-Lane S Yale		IRVINE	
				AM PK Hour		PM PK Hour	
	Ln	Cap		Vol	V/C	Vol	V/C
NL	0			0		0	
NT	0			0	*	0	*
NR	0			0		0	
SL	1	1700		146	0.09*	22	0.01*
ST	0			0		0	
SR	1	1700		214	0.13	74	0.04
EL	1	1700		121	0.07*	101	0.06
ET	2	3400		924	0.27	1650	0.49*
ER	0			0		0	
WL	0			0		0	*
WT	2	3400		1344	0.40*	1021	0.30
WR	D	1700		42	0.02	20	0.01
Overlaps					Clearance	.05	
Total ICU					0.61		0.55

APPENDIX C– HCM Synchro Worksheets

Intersection	
Intersection Delay, s/veh	14.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	135	21	88	193	20	13	56	33	21	37	52
Future Vol, veh/h	65	135	21	88	193	20	13	56	33	21	37	52
Peak Hour Factor	0.67	0.67	0.67	0.62	0.62	0.62	0.52	0.52	0.52	0.41	0.41	0.41
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	97	201	31	142	311	32	25	108	63	51	90	127
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	14.1	17.7	12.1	12.1
HCM LOS	B	C	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	13	56	33	65	135	21	88	193	20	21	37
LT Vol	13	0	0	65	0	0	88	0	0	21	0
Through Vol	0	56	0	0	135	0	0	193	0	0	37
RT Vol	0	0	33	0	0	21	0	0	20	0	0
Lane Flow Rate	25	108	63	97	201	31	142	311	32	51	90
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.058	0.235	0.126	0.213	0.414	0.058	0.299	0.612	0.057	0.117	0.193
Departure Headway (Hd)	8.362	7.862	7.162	7.903	7.403	6.703	7.573	7.073	6.373	8.19	7.69
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	429	457	500	455	486	534	475	511	562	438	467
Service Time	6.109	5.609	4.909	5.645	5.145	4.445	5.31	4.81	4.11	5.934	5.434
HCM Lane V/C Ratio	0.058	0.236	0.126	0.213	0.414	0.058	0.299	0.609	0.057	0.116	0.193
HCM Control Delay	11.6	13	10.9	12.8	15.3	9.9	13.5	20.4	9.5	12	12.3
HCM Lane LOS	B	B	B	B	C	A	B	C	A	B	B
HCM 95th-tile Q	0.2	0.9	0.4	0.8	2	0.2	1.2	4.1	0.2	0.4	0.7

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	26	25	24	31	2	13	90	12	2	135	10
Future Vol, veh/h	15	26	25	24	31	2	13	90	12	2	135	10
Conflicting Peds, #/hr	6	0	6	6	0	6	14	0	14	14	0	14
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	200	-	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	59	59	59	77	77	77	52	52	52	39	39	39
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	44	42	31	40	3	25	173	23	5	346	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	632	630	366	655	633	193	386	0	0	210	0	0
Stage 1	370	370	-	237	237	-	-	-	-	-	-	-
Stage 2	262	260	-	418	396	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	393	399	679	379	397	849	1172	-	-	1361	-	-
Stage 1	650	620	-	766	709	-	-	-	-	-	-	-
Stage 2	743	693	-	612	604	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	346	378	668	311	376	835	1158	-	-	1345	-	-
Mov Cap-2 Maneuver	346	378	-	311	376	-	-	-	-	-	-	-
Stage 1	627	609	-	739	683	-	-	-	-	-	-	-
Stage 2	677	668	-	526	594	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.9	17.9	0.9	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1158	-	-	441	352	1345	-	-
HCM Lane V/C Ratio	0.022	-	-	0.254	0.21	0.004	-	-
HCM Control Delay (s)	8.2	0	-	15.9	17.9	7.7	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1	0.8	0	-	-

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	284	7	13	204	1	14	1	57	2	0	3
Future Vol, veh/h	2	284	7	13	204	1	14	1	57	2	0	3
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.68	0.68	0.68	0.43	0.43	0.43
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	342	8	17	262	1	21	1	84	5	0	7
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	14	12.2	9.4	9.2
HCM LOS	B	B	A	A

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	1	57	2	284	7	13	204	1	2	0
LT Vol	14	0	0	2	0	0	13	0	0	2	0
Through Vol	0	1	0	0	284	0	0	204	0	0	0
RT Vol	0	0	57	0	0	7	0	0	1	0	0
Lane Flow Rate	21	1	84	2	342	8	17	262	1	5	0
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.039	0.003	0.132	0.004	0.521	0.011	0.029	0.415	0.002	0.009	0
Departure Headway (Hd)	6.881	6.381	5.681	6.084	5.583	4.881	6.221	5.719	5.018	7.077	6.577
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	522	563	634	592	650	738	579	633	717	508	0
Service Time	4.595	4.095	3.395	3.784	3.283	2.581	3.921	3.419	2.718	4.793	4.293
HCM Lane V/C Ratio	0.04	0.002	0.132	0.003	0.526	0.011	0.029	0.414	0.001	0.01	0
HCM Control Delay	9.9	9.1	9.3	8.8	14.2	7.6	9.1	12.4	7.7	9.9	9.3
HCM Lane LOS	A	A	A	A	B	A	A	B	A	A	N
HCM 95th-tile Q	0.1	0	0.5	0	3	0	0.1	2	0	0	0

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	28	13	12	12	2	27	57	17	2	11	8
Future Vol, veh/h	11	28	13	12	12	2	27	57	17	2	11	8
Conflicting Peds, #/hr	10	0	10	10	0	10	9	0	8	8	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	200	-	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	73	73	73	70	70	70	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	39	18	16	16	3	39	81	24	3	14	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	220	220	33	231	207	99	34	0	0	113	0	0
Stage 1	29	29	-	167	167	-	-	-	-	-	-	-
Stage 2	191	191	-	64	40	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	736	678	1041	724	690	957	1578	-	-	1476	-	-
Stage 1	988	871	-	835	760	-	-	-	-	-	-	-
Stage 2	811	742	-	947	862	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	693	650	1025	653	661	943	1566	-	-	1466	-	-
Mov Cap-2 Maneuver	693	650	-	653	661	-	-	-	-	-	-	-
Stage 1	954	863	-	807	734	-	-	-	-	-	-	-
Stage 2	763	717	-	878	854	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.5	10.6	2	0.7
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1566	-	-	726	673	1466	-	-
HCM Lane V/C Ratio	0.025	-	-	0.101	0.053	0.002	-	-
HCM Control Delay (s)	7.4	0	-	10.5	10.6	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.2	0	-	-

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	168	20	46	166	16	15	19	44	24	21	29
Future Vol, veh/h	27	168	20	46	166	16	15	19	44	24	21	29
Peak Hour Factor	0.76	0.76	0.76	0.61	0.61	0.61	0.71	0.71	0.71	0.36	0.36	0.36
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	36	221	26	75	272	26	21	27	62	67	58	81
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	12.5	13.3	10	10.4
HCM LOS	B	B	A	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	19	44	27	168	20	46	166	16	24	21
LT Vol	15	0	0	27	0	0	46	0	0	24	0
Through Vol	0	19	0	0	168	0	0	166	0	0	21
RT Vol	0	0	44	0	0	20	0	0	16	0	0
Lane Flow Rate	21	27	62	36	221	26	75	272	26	67	58
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.044	0.052	0.108	0.068	0.394	0.042	0.141	0.471	0.04	0.134	0.109
Departure Headway (Hd)	7.476	6.976	6.276	6.914	6.414	5.714	6.735	6.235	5.535	7.251	6.751
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	478	512	568	517	559	624	532	577	645	493	529
Service Time	5.242	4.742	4.042	4.669	4.169	3.469	4.487	3.987	3.287	5.013	4.513
HCM Lane V/C Ratio	0.044	0.053	0.109	0.07	0.395	0.042	0.141	0.471	0.04	0.136	0.11
HCM Control Delay	10.6	10.1	9.8	10.2	13.3	8.7	10.6	14.5	8.5	11.1	10.3
HCM Lane LOS	B	B	A	B	B	A	B	B	A	B	B
HCM 95th-tile Q	0.1	0.2	0.4	0.2	1.9	0.1	0.5	2.5	0.1	0.5	0.4

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↰	↱		↰	↱
Traffic Vol, veh/h	17	26	7	14	18	3	14	84	23	2	74	10
Future Vol, veh/h	17	26	7	14	18	3	14	84	23	2	74	10
Conflicting Peds, #/hr	3	0	4	4	0	3	14	0	6	6	0	14
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	200	-	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	78	78	78	70	70	70	31	31	31
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	36	10	18	23	4	20	120	33	6	239	32

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	458	464	257	460	463	129	285	0	0	159	0	0
Stage 1	265	265	-	166	166	-	-	-	-	-	-	-
Stage 2	193	199	-	294	297	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	513	495	782	512	496	921	1277	-	-	1420	-	-
Stage 1	740	689	-	836	761	-	-	-	-	-	-	-
Stage 2	809	736	-	714	668	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	477	476	770	465	477	914	1262	-	-	1413	-	-
Mov Cap-2 Maneuver	477	476	-	465	477	-	-	-	-	-	-	-
Stage 1	719	677	-	818	744	-	-	-	-	-	-	-
Stage 2	765	720	-	662	657	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.3	13.1	0.9	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1262	-	-	503	492	1413	-	-
HCM Lane V/C Ratio	0.016	-	-	0.136	0.091	0.005	-	-
HCM Control Delay (s)	7.9	0	-	13.3	13.1	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.3	0	-	-

Intersection	
Intersection Delay, s/veh	251.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	218	33	64	74	37	252	35	236	36	195	375	188
Future Vol, veh/h	218	33	64	74	37	252	35	236	36	195	375	188
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.68	0.68	0.68	0.43	0.43	0.43
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	263	40	77	95	47	323	51	347	53	453	872	437
Number of Lanes	1	1	1	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	67.7	83.3	44.7	388.4
HCM LOS	F	F	E	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	69%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	31%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	157	115	218	33	64	74	37	252	195	250
LT Vol	35	0	0	218	0	0	74	0	0	195	0
Through Vol	0	157	79	0	33	0	0	37	0	0	250
RT Vol	0	0	36	0	0	64	0	0	252	0	0
Lane Flow Rate	51	231	169	263	40	77	95	47	323	453	581
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.185	0.8	0.573	0.955	0.139	0.255	0.339	0.163	1.048	1.399	1.716
Departure Headway (Hd)	14.991	14.491	14.272	15.063	14.563	13.863	15.218	14.718	14.018	11.221	10.626
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	241	252	255	242	248	261	238	245	262	327	343
Service Time	12.691	12.191	11.972	12.763	12.263	11.563	12.918	12.418	11.718	8.921	8.421
HCM Lane V/C Ratio	0.212	0.917	0.663	1.087	0.161	0.295	0.399	0.192	1.233	1.385	1.694
HCM Control Delay	21.1	57.3	34.5	88.7	19.6	21.2	25.5	20.3	109.5	226.7	359.5
HCM Lane LOS	C	F	D	F	C	C	D	C	F	F	F
HCM 95th-tile Q	0.7	6.1	3.2	8.6	0.5	1	1.4	0.6	10.8	23.2	36

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	37	35	29	37	2	14	284	14	9	459	45
Future Vol, veh/h	21	37	35	29	37	2	14	284	14	9	459	45
Conflicting Peds, #/hr	10	0	10	10	0	10	9	0	8	8	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	73	73	73	70	70	70	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	52	49	40	51	3	20	406	20	12	604	59

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	946	1141	351	826	1160	231	672	0	0	434	0	0
Stage 1	667	667	-	464	464	-	-	-	-	-	-	-
Stage 2	279	474	-	362	696	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	216	199	645	264	194	771	915	-	-	1122	-	-
Stage 1	414	455	-	548	562	-	-	-	-	-	-	-
Stage 2	704	556	-	629	441	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	161	187	635	182	183	759	908	-	-	1115	-	-
Mov Cap-2 Maneuver	161	187	-	182	183	-	-	-	-	-	-	-
Stage 1	399	444	-	529	542	-	-	-	-	-	-	-
Stage 2	612	536	-	499	430	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.2	41.5	0.5	0.2
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	908	-	-	177	635	183	759	1115	-	-
HCM Lane V/C Ratio	0.022	-	-	0.462	0.078	0.494	0.004	0.011	-	-
HCM Control Delay (s)	9.1	0.1	-	41.7	11.1	42.5	9.8	8.3	0.1	-
HCM Lane LOS	A	A	-	E	B	E	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.2	0.3	2.4	0	0	-	-

Intersection	
Intersection Delay, s/veh	14.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	37	35	29	37	2	14	284	14	9	459	45
Future Vol, veh/h	21	37	35	29	37	2	14	284	14	9	459	45
Peak Hour Factor	0.71	0.71	0.71	0.73	0.73	0.73	0.70	0.70	0.70	0.76	0.76	0.76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	52	49	40	51	3	20	406	20	12	604	59
Number of Lanes	0	1	1	0	1	1	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	11.3	12.3	13	16
HCM LOS	B	B	B	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	9%	0%	36%	0%	44%	0%	4%	0%
Vol Thru, %	91%	91%	64%	0%	56%	0%	96%	84%
Vol Right, %	0%	9%	0%	100%	0%	100%	0%	16%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	156	156	58	35	66	2	239	275
LT Vol	14	0	21	0	29	0	9	0
Through Vol	142	142	37	0	37	0	230	230
RT Vol	0	14	0	35	0	2	0	45
Lane Flow Rate	223	223	82	49	90	3	314	361
Geometry Grp	5	5	5	5	5	5	5	5
Degree of Util (X)	0.39	0.383	0.173	0.092	0.194	0.005	0.523	0.588
Departure Headway (Hd)	6.302	6.193	7.606	6.704	7.726	6.783	6	5.865
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	568	579	470	532	463	525	599	614
Service Time	4.067	3.957	5.381	4.477	5.505	4.561	3.757	3.621
HCM Lane V/C Ratio	0.393	0.385	0.174	0.092	0.194	0.006	0.524	0.588
HCM Control Delay	13.1	12.8	12	10.2	12.4	9.6	15.2	16.7
HCM Lane LOS	B	B	B	B	B	A	C	C
HCM 95th-tile Q	1.8	1.8	0.6	0.3	0.7	0	3	3.8

Intersection	
Intersection Delay, s/veh	208
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	240	59	23	18	33	184	44	245	60	299	117	219
Future Vol, veh/h	240	59	23	18	33	184	44	245	60	299	117	219
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.68	0.68	0.68	0.43	0.43	0.43
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	289	71	28	23	42	236	65	360	88	695	272	509
Number of Lanes	1	1	1	1	1	1	1	2	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	63.1	35.4	34.5	341.5
HCM LOS	F	E	D	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	58%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	42%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	44	163	142	240	59	23	18	33	184	299	78
LT Vol	44	0	0	240	0	0	18	0	0	299	0
Through Vol	0	163	82	0	59	0	0	33	0	0	78
RT Vol	0	0	60	0	0	23	0	0	184	0	0
Lane Flow Rate	65	240	208	289	71	28	23	42	236	695	181
Geometry Grp	6	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.206	0.733	0.618	0.945	0.223	0.082	0.078	0.137	0.72	1.993	0.495
Departure Headway (Hd)	12.455	11.955	11.658	12.984	12.484	11.784	13.209	12.709	12.009	10.318	9.818
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	290	305	312	280	289	306	273	284	304	355	368
Service Time	10.155	9.655	9.358	10.684	10.184	9.484	10.909	10.409	9.709	8.073	7.573
HCM Lane V/C Ratio	0.224	0.787	0.667	1.032	0.246	0.092	0.084	0.148	0.776	1.958	0.492
HCM Control Delay	18.4	41.5	31.5	78.6	18.7	15.5	17	17.4	40.4	479.9	21.9
HCM Lane LOS	C	E	D	F	C	C	C	C	E	F	C
HCM 95th-tile Q	0.8	5.4	3.8	9	0.8	0.3	0.3	0.5	5.2	48.4	2.6

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	31	14	12	13	2	33	336	20	1	154	3
Future Vol, veh/h	12	31	14	12	13	2	33	336	20	1	154	3
Conflicting Peds, #/hr	10	0	10	10	0	10	9	0	8	8	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	73	73	73	70	70	70	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	44	20	16	18	3	47	480	29	1	203	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	569	827	123	733	815	273	216	0	0	517	0	0
Stage 1	216	216	-	597	597	-	-	-	-	-	-	-
Stage 2	353	611	-	136	218	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	405	305	905	309	310	725	1351	-	-	1045	-	-
Stage 1	766	723	-	456	490	-	-	-	-	-	-	-
Stage 2	637	482	-	853	721	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	364	286	891	253	290	714	1341	-	-	1038	-	-
Mov Cap-2 Maneuver	364	286	-	253	290	-	-	-	-	-	-	-
Stage 1	723	717	-	431	463	-	-	-	-	-	-	-
Stage 2	575	455	-	776	715	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	19.5	0.8	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1341	-	-	304	891	271	714	1038	-	-
HCM Lane V/C Ratio	0.035	-	-	0.199	0.022	0.126	0.004	0.001	-	-
HCM Control Delay (s)	7.8	0.2	-	19.8	9.1	20.2	10.1	8.5	0	-
HCM Lane LOS	A	A	-	C	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.1	0.4	0	0	-	-

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	31	14	12	13	2	33	336	20	1	154	3
Future Vol, veh/h	12	31	14	12	13	2	33	336	20	1	154	3
Peak Hour Factor	0.71	0.71	0.71	0.73	0.73	0.73	0.70	0.70	0.70	0.76	0.76	0.76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	44	20	16	18	3	47	480	29	1	203	4
Number of Lanes	0	1	1	0	1	1	0	2	0	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	9.7	9.8	11.2	9.2
HCM LOS	A	A	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	16%	0%	28%	0%	48%	0%	1%	0%
Vol Thru, %	84%	89%	72%	0%	52%	0%	99%	96%
Vol Right, %	0%	11%	0%	100%	0%	100%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	201	188	43	14	25	2	78	80
LT Vol	33	0	12	0	12	0	1	0
Through Vol	168	168	31	0	13	0	77	77
RT Vol	0	20	0	14	0	2	0	3
Lane Flow Rate	287	269	61	20	34	3	103	105
Geometry Grp	5	5	5	5	5	5	5	5
Degree of Util (X)	0.413	0.374	0.108	0.031	0.063	0.004	0.155	0.158
Departure Headway (Hd)	5.172	5.014	6.437	5.587	6.614	5.661	5.443	5.41
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	692	714	552	635	537	625	655	659
Service Time	2.924	2.767	4.225	3.375	4.41	3.457	3.212	3.179
HCM Lane V/C Ratio	0.415	0.377	0.111	0.031	0.063	0.005	0.157	0.159
HCM Control Delay	11.5	10.8	10	8.6	9.9	8.5	9.2	9.2
HCM Lane LOS	B	B	A	A	A	A	A	A
HCM 95th-tile Q	2	1.7	0.4	0.1	0.2	0	0.5	0.6

Intersection	
Intersection Delay, s/veh	558.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	232	33	56	60	34	248	32	230	33	203	346	196
Future Vol, veh/h	232	33	56	60	34	248	32	230	33	203	346	196
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.68	0.68	0.68	0.43	0.43	0.43
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	280	40	67	77	44	318	47	338	49	472	805	456
Number of Lanes	1	1	1	1	1	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	57.9	57.1	133.3	903.6
HCM LOS	F	F	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	87%	0%	100%	0%	0%	100%	0%	0%	64%
Vol Right, %	0%	13%	0%	0%	100%	0%	0%	100%	0%	36%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	32	263	232	33	56	60	34	248	203	542
LT Vol	32	0	232	0	0	60	0	0	203	0
Through Vol	0	230	0	33	0	0	34	0	0	346
RT Vol	0	33	0	0	56	0	0	248	0	196
Lane Flow Rate	47	387	280	40	67	77	44	318	472	1260
Geometry Grp	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.152	1.183	0.909	0.124	0.197	0.249	0.135	0.922	1.41	3.505
Departure Headway (Hd)	12.988	12.395	13.61	13.092	12.366	13.622	13.104	12.378	11.373	10.592
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	278	298	268	276	292	265	275	296	326	353
Service Time	10.688	10.095	11.31	10.792	10.066	11.322	10.804	10.078	9.073	8.292
HCM Lane V/C Ratio	0.169	1.299	1.045	0.145	0.229	0.291	0.16	1.074	1.448	3.569
HCM Control Delay	18	147.3	73.2	17.6	18.1	20.8	17.8	71.3	231.7	1155.2
HCM Lane LOS	C	F	F	C	C	C	C	F	F	F
HCM 95th-tile Q	0.5	15.1	8.1	0.4	0.7	1	0.5	8.7	23.4	110.5

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	37	36	27	35	2	15	271	14	9	409	44
Future Vol, veh/h	22	37	36	27	35	2	15	271	14	9	409	44
Conflicting Peds, #/hr	10	0	10	10	0	10	9	0	8	8	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	73	73	73	70	70	70	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	31	52	51	37	48	3	21	387	20	12	538	58

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1075	1057	586	1100	1076	415	605	0	0	415	0	0
Stage 1	600	600	-	447	447	-	-	-	-	-	-	-
Stage 2	475	457	-	653	629	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	197	225	510	190	219	637	973	-	-	1144	-	-
Stage 1	488	490	-	591	573	-	-	-	-	-	-	-
Stage 2	570	568	-	456	475	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	153	212	502	132	207	627	966	-	-	1136	-	-
Mov Cap-2 Maneuver	153	212	-	132	207	-	-	-	-	-	-	-
Stage 1	471	479	-	571	553	-	-	-	-	-	-	-
Stage 2	500	548	-	357	464	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.4	46.3	0.4	0.2
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	966	-	-	185	502	166	627	1136	-	-
HCM Lane V/C Ratio	0.022	-	-	0.449	0.101	0.512	0.004	0.01	-	-
HCM Control Delay (s)	8.8	0	-	39.4	13	47.4	10.8	8.2	0	-
HCM Lane LOS	A	A	-	E	B	E	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.1	0.3	2.5	0	0	-	-

Intersection	
Intersection Delay, s/veh	27.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	37	36	27	35	2	15	271	14	9	409	44
Future Vol, veh/h	22	37	36	27	35	2	15	271	14	9	409	44
Peak Hour Factor	0.71	0.71	0.71	0.73	0.73	0.73	0.70	0.70	0.70	0.76	0.76	0.76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	31	52	51	37	48	3	21	387	20	12	538	58
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	11.5	12.3	19.6	38.8
HCM LOS	B	B	C	E

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	5%	37%	0%	44%	0%	2%
Vol Thru, %	90%	63%	0%	56%	0%	89%
Vol Right, %	5%	0%	100%	0%	100%	10%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	300	59	36	62	2	462
LT Vol	15	22	0	27	0	9
Through Vol	271	37	0	35	0	409
RT Vol	14	0	36	0	2	44
Lane Flow Rate	429	83	51	85	3	608
Geometry Grp	2	5	5	5	5	2
Degree of Util (X)	0.671	0.179	0.097	0.187	0.005	0.905
Departure Headway (Hd)	5.637	7.771	6.856	7.927	6.978	5.357
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	634	465	525	455	515	669
Service Time	3.731	5.477	4.561	5.634	4.685	3.44
HCM Lane V/C Ratio	0.677	0.178	0.097	0.187	0.006	0.909
HCM Control Delay	19.6	12.2	10.3	12.4	9.7	38.8
HCM Lane LOS	C	B	B	B	A	E
HCM 95th-tile Q	5.1	0.6	0.3	0.7	0	11.6

Intersection	
Intersection Delay, s/veh	293.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	247	57	19	14	29	173	41	243	56	303	103	222
Future Vol, veh/h	247	57	19	14	29	173	41	243	56	303	103	222
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.68	0.68	0.68	0.43	0.43	0.43
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	298	69	23	18	37	222	60	357	82	705	240	516
Number of Lanes	1	1	1	1	1	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	57.3	30.1	147.9	456.8
HCM LOS	F	D	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	81%	0%	100%	0%	0%	100%	0%	0%	32%
Vol Right, %	0%	19%	0%	0%	100%	0%	0%	100%	0%	68%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	41	299	247	57	19	14	29	173	303	325
LT Vol	41	0	247	0	0	14	0	0	303	0
Through Vol	0	243	0	57	0	0	29	0	0	103
RT Vol	0	56	0	0	19	0	0	173	0	222
Lane Flow Rate	60	440	298	69	23	18	37	222	705	756
Geometry Grp	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.182	1.249	0.913	0.201	0.063	0.058	0.115	0.642	1.973	1.913
Departure Headway (Hd)	11.547	10.911	12.435	11.917	11.191	13.035	12.514	11.784	10.702	9.693
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	313	339	295	303	322	276	288	308	345	385
Service Time	9.247	8.611	10.135	9.617	8.891	10.735	10.214	9.484	8.402	7.393
HCM Lane V/C Ratio	0.192	1.298	1.01	0.228	0.071	0.065	0.128	0.721	2.043	1.964
HCM Control Delay	16.8	165.9	69.7	17.6	14.6	16.5	16.8	33.4	472	442.6
HCM Lane LOS	C	F	F	C	B	C	C	D	F	F
HCM 95th-tile Q	0.7	18.6	8.5	0.7	0.2	0.2	0.4	4.1	46.3	47.9

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	31	14	11	12	1	30	327	19	1	134	2
Future Vol, veh/h	12	31	14	11	12	1	30	327	19	1	134	2
Conflicting Peds, #/hr	10	0	10	10	0	10	9	0	8	8	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	73	73	73	70	70	70	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	44	20	15	16	1	43	467	27	1	176	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	774	777	197	797	765	499	188	0	0	502	0	0
Stage 1	189	189	-	575	575	-	-	-	-	-	-	-
Stage 2	585	588	-	222	190	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	316	328	844	305	333	572	1386	-	-	1062	-	-
Stage 1	813	744	-	503	503	-	-	-	-	-	-	-
Stage 2	497	496	-	780	743	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	288	309	831	253	314	563	1376	-	-	1055	-	-
Mov Cap-2 Maneuver	288	309	-	253	314	-	-	-	-	-	-	-
Stage 1	772	738	-	478	478	-	-	-	-	-	-	-
Stage 2	454	471	-	710	737	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	19.1	0.6	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1376	-	-	303	831	282	563	1055	-	-
HCM Lane V/C Ratio	0.031	-	-	0.2	0.024	0.112	0.002	0.001	-	-
HCM Control Delay (s)	7.7	0	-	19.8	9.4	19.4	11.4	8.4	0	-
HCM Lane LOS	A	A	-	C	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.1	0.4	0	0	-	-

Intersection	
Intersection Delay, s/veh	13.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	31	14	11	12	1	30	327	19	1	134	2
Future Vol, veh/h	12	31	14	11	12	1	30	327	19	1	134	2
Peak Hour Factor	0.71	0.71	0.71	0.73	0.73	0.73	0.70	0.70	0.70	0.76	0.76	0.76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	44	20	15	16	1	43	467	27	1	176	3
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	9.6	9.6	16.1	9.5
HCM LOS	A	A	C	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	8%	28%	0%	48%	0%	1%
Vol Thru, %	87%	72%	0%	52%	0%	98%
Vol Right, %	5%	0%	100%	0%	100%	1%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	376	43	14	23	1	137
LT Vol	30	12	0	11	0	1
Through Vol	327	31	0	12	0	134
RT Vol	19	0	14	0	1	2
Lane Flow Rate	537	61	20	32	1	180
Geometry Grp	2	5	5	5	5	2
Degree of Util (X)	0.667	0.107	0.03	0.058	0.002	0.243
Departure Headway (Hd)	4.469	6.351	5.497	6.639	5.582	4.852
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	806	560	644	543	634	735
Service Time	2.511	4.144	3.289	4.339	3.381	2.913
HCM Lane V/C Ratio	0.666	0.109	0.031	0.059	0.002	0.245
HCM Control Delay	16.1	9.9	8.5	9.7	8.4	9.5
HCM Lane LOS	C	A	A	A	A	A
HCM 95th-tile Q	5.2	0.4	0.1	0.2	0	0.9

Intersection	
Intersection Delay, s/veh	19.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	119	139	229	173	12	22	94	56	22	39	55
Future Vol, veh/h	50	119	139	229	173	12	22	94	56	22	39	55
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.68	0.68	0.68	0.43	0.43	0.43
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	60	143	167	294	222	15	32	138	82	51	91	128
Number of Lanes	1	1	1	1	1	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	15	24.2	19.1	18.1
HCM LOS	B	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	63%	0%	100%	0%	0%	100%	0%	0%	41%
Vol Right, %	0%	37%	0%	0%	100%	0%	0%	100%	0%	59%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	22	150	50	119	139	229	173	12	22	94
LT Vol	22	0	50	0	0	229	0	0	22	0
Through Vol	0	94	0	119	0	0	173	0	0	39
RT Vol	0	56	0	0	139	0	0	12	0	55
Lane Flow Rate	32	221	60	143	167	294	222	15	51	219
Geometry Grp	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.083	0.519	0.152	0.341	0.364	0.7	0.497	0.031	0.131	0.503
Departure Headway (Hd)	9.239	8.466	9.071	8.554	7.831	8.589	8.074	7.353	9.205	8.281
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	388	426	396	420	459	423	446	487	390	435
Service Time	6.987	6.214	6.82	6.303	5.579	6.335	5.82	5.099	6.952	6.028
HCM Lane V/C Ratio	0.082	0.519	0.152	0.34	0.364	0.695	0.498	0.031	0.131	0.503
HCM Control Delay	12.8	20	13.4	15.7	15	29.1	18.6	10.3	13.3	19.2
HCM Lane LOS	B	C	B	C	B	D	C	B	B	C
HCM 95th-tile Q	0.3	2.9	0.5	1.5	1.6	5.2	2.7	0.1	0.4	2.8

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	36	34	33	43	2	19	136	18	13	330	64
Future Vol, veh/h	21	36	34	33	43	2	19	136	18	13	330	64
Conflicting Peds, #/hr	10	0	10	10	0	10	9	0	8	8	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	73	73	73	70	70	70	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	51	48	45	59	3	27	194	26	17	434	84

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	710	801	278	556	830	128	527	0	0	228	0	0
Stage 1	519	519	-	269	269	-	-	-	-	-	-	-
Stage 2	191	282	-	287	561	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	321	316	719	414	304	898	1036	-	-	1337	-	-
Stage 1	508	531	-	713	685	-	-	-	-	-	-	-
Stage 2	792	676	-	696	508	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	256	297	708	319	285	885	1028	-	-	1328	-	-
Mov Cap-2 Maneuver	256	297	-	319	285	-	-	-	-	-	-	-
Stage 1	489	518	-	687	660	-	-	-	-	-	-	-
Stage 2	692	651	-	570	495	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.3	22.9	1	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1028	-	-	280	708	299	885	1328	-	-
HCM Lane V/C Ratio	0.026	-	-	0.287	0.068	0.348	0.003	0.013	-	-
HCM Control Delay (s)	8.6	0.1	-	22.9	10.5	23.3	9.1	7.7	0.1	-
HCM Lane LOS	A	A	-	C	B	C	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.2	1.5	0	0	-	-

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	309	3	81	234	1	18	1	77	2	0	3
Future Vol, veh/h	2	309	3	81	234	1	18	1	77	2	0	3
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.68	0.68	0.68	0.43	0.43	0.43
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	372	4	104	300	1	26	1	113	5	0	7
Number of Lanes	1	1	1	1	1	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	18.1	13.7	10.4	9.9
HCM LOS	C	B	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	1%	0%	100%	0%	0%	100%	0%	0%	0%
Vol Right, %	0%	99%	0%	0%	100%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	18	78	2	309	3	81	234	1	2	3
LT Vol	18	0	2	0	0	81	0	0	2	0
Through Vol	0	1	0	309	0	0	234	0	0	0
RT Vol	0	77	0	0	3	0	0	1	0	3
Lane Flow Rate	26	115	2	372	4	104	300	1	5	7
Geometry Grp	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.054	0.196	0.004	0.624	0.005	0.188	0.501	0.002	0.01	0.013
Departure Headway (Hd)	7.353	6.159	6.534	6.031	5.326	6.514	6.01	5.305	7.719	6.513
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	487	582	548	599	671	550	600	673	462	547
Service Time	5.107	3.914	4.274	3.771	3.066	4.254	3.751	3.046	5.486	4.279
HCM Lane V/C Ratio	0.053	0.198	0.004	0.621	0.006	0.189	0.5	0.001	0.011	0.013
HCM Control Delay	10.5	10.4	9.3	18.3	8.1	10.8	14.7	8.1	10.6	9.4
HCM Lane LOS	B	B	A	C	A	B	B	A	B	A
HCM 95th-tile Q	0.2	0.7	0	4.3	0	0.7	2.8	0	0	0

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	30	13	17	17	2	34	72	21	1	76	7
Future Vol, veh/h	11	30	13	17	17	2	34	72	21	1	76	7
Conflicting Peds, #/hr	10	0	10	10	0	10	9	0	8	8	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	73	73	73	70	70	70	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	42	18	23	23	3	49	103	30	1	100	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	287	355	74	307	344	85	118	0	0	141	0	0
Stage 1	116	116	-	224	224	-	-	-	-	-	-	-
Stage 2	171	239	-	83	120	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	643	569	973	622	577	957	1468	-	-	1440	-	-
Stage 1	876	799	-	758	717	-	-	-	-	-	-	-
Stage 2	814	706	-	916	796	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	593	541	958	549	548	943	1457	-	-	1430	-	-
Mov Cap-2 Maneuver	593	541	-	549	548	-	-	-	-	-	-	-
Stage 1	838	793	-	726	686	-	-	-	-	-	-	-
Stage 2	750	676	-	843	790	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.5	12	2.1	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1457	-	-	554	958	548	943	1430	-	-
HCM Lane V/C Ratio	0.033	-	-	0.104	0.019	0.085	0.003	0.001	-	-
HCM Control Delay (s)	7.6	0.1	-	12.3	8.8	12.2	8.8	7.5	0	-
HCM Lane LOS	A	A	-	B	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	0.3	0	0	-	-

Intersection	
Intersection Delay, s/veh	17.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	53	125	132	202	178	13	20	87	52	22	39	55
Future Vol, veh/h	53	125	132	202	178	13	20	87	52	22	39	55
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.68	0.68	0.68	0.43	0.43	0.43
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	64	151	159	259	228	17	29	128	76	51	91	128
Number of Lanes	1	1	1	1	1	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	14.4	20.4	17.3	17.1
HCM LOS	B	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	63%	0%	100%	0%	0%	100%	0%	0%	41%
Vol Right, %	0%	37%	0%	0%	100%	0%	0%	100%	0%	59%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	139	53	125	132	202	178	13	22	94
LT Vol	20	0	53	0	0	202	0	0	22	0
Through Vol	0	87	0	125	0	0	178	0	0	39
RT Vol	0	52	0	0	132	0	0	13	0	55
Lane Flow Rate	29	204	64	151	159	259	228	17	51	219
Geometry Grp	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.073	0.466	0.155	0.344	0.331	0.6	0.496	0.033	0.126	0.483
Departure Headway (Hd)	8.977	8.205	8.728	8.213	7.492	8.344	7.831	7.112	8.878	7.957
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	397	437	409	435	477	430	459	500	402	450
Service Time	6.777	6.004	6.528	6.012	5.291	6.136	5.622	4.903	6.677	5.755
HCM Lane V/C Ratio	0.073	0.467	0.156	0.347	0.333	0.602	0.497	0.034	0.127	0.487
HCM Control Delay	12.5	18	13.1	15.3	14	23	18.2	10.1	13	18.1
HCM Lane LOS	B	C	B	C	B	C	C	B	B	C
HCM 95th-tile Q	0.2	2.4	0.5	1.5	1.4	3.8	2.7	0.1	0.4	2.6

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	36	35	31	41	2	18	128	17	13	294	66
Future Vol, veh/h	21	36	35	31	41	2	18	128	17	13	294	66
Conflicting Peds, #/hr	10	0	10	10	0	10	9	0	8	8	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	73	73	73	70	70	70	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	51	49	42	56	3	26	183	24	17	387	87

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	761	741	450	780	772	213	483	0	0	215	0	0
Stage 1	474	474	-	255	255	-	-	-	-	-	-	-
Stage 2	287	267	-	525	517	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	322	344	609	313	330	827	1080	-	-	1355	-	-
Stage 1	571	558	-	749	696	-	-	-	-	-	-	-
Stage 2	720	688	-	536	534	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	263	324	599	241	311	815	1072	-	-	1346	-	-
Mov Cap-2 Maneuver	263	324	-	241	311	-	-	-	-	-	-	-
Stage 1	552	545	-	724	672	-	-	-	-	-	-	-
Stage 2	635	665	-	435	521	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.7	24.7	0.9	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1072	-	-	298	599	276	815	1346	-	-
HCM Lane V/C Ratio	0.024	-	-	0.269	0.082	0.357	0.003	0.013	-	-
HCM Control Delay (s)	8.4	0	-	21.5	11.5	25.1	9.4	7.7	0	-
HCM Lane LOS	A	A	-	C	B	D	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	0.3	1.6	0	0	-	-

Intersection	
Intersection Delay, s/veh	15
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	316	0	75	226	1	17	1	74	2	0	3
Future Vol, veh/h	2	316	0	75	226	1	17	1	74	2	0	3
Peak Hour Factor	0.83	0.83	0.83	0.78	0.78	0.78	0.68	0.68	0.68	0.43	0.43	0.43
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	381	0	96	290	1	25	1	109	5	0	7
Number of Lanes	1	1	1	1	1	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	18.4	13.4	10.4	9.9
HCM LOS	C	B	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	1%	0%	100%	100%	0%	100%	0%	0%	0%
Vol Right, %	0%	99%	0%	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	75	2	316	0	75	226	1	2	3
LT Vol	17	0	2	0	0	75	0	0	2	0
Through Vol	0	1	0	316	0	0	226	0	0	0
RT Vol	0	74	0	0	0	0	0	1	0	3
Lane Flow Rate	25	110	2	381	0	96	290	1	5	7
Geometry Grp	6	6	6	6	6	6	6	6	6	6
Degree of Util (X)	0.051	0.19	0.004	0.632	0	0.174	0.484	0.002	0.01	0.013
Departure Headway (Hd)	7.403	6.2	6.478	5.975	5.975	6.519	6.015	5.309	7.768	6.55
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	483	577	552	605	0	550	600	673	459	544
Service Time	5.159	3.955	4.217	3.714	3.714	4.261	3.756	3.05	5.536	4.317
HCM Lane V/C Ratio	0.052	0.191	0.004	0.63	0	0.175	0.483	0.001	0.011	0.013
HCM Control Delay	10.6	10.4	9.2	18.5	8.7	10.6	14.3	8.1	10.6	9.4
HCM Lane LOS	B	B	A	C	N	B	B	A	B	A
HCM 95th-tile Q	0.2	0.7	0	4.4	0	0.6	2.6	0	0	0

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	30	14	16	17	2	32	69	20	1	66	7
Future Vol, veh/h	11	30	14	16	17	2	32	69	20	1	66	7
Conflicting Peds, #/hr	10	0	10	10	0	10	9	0	8	8	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	50	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	73	73	73	70	70	70	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	42	20	22	23	3	46	99	29	1	87	9

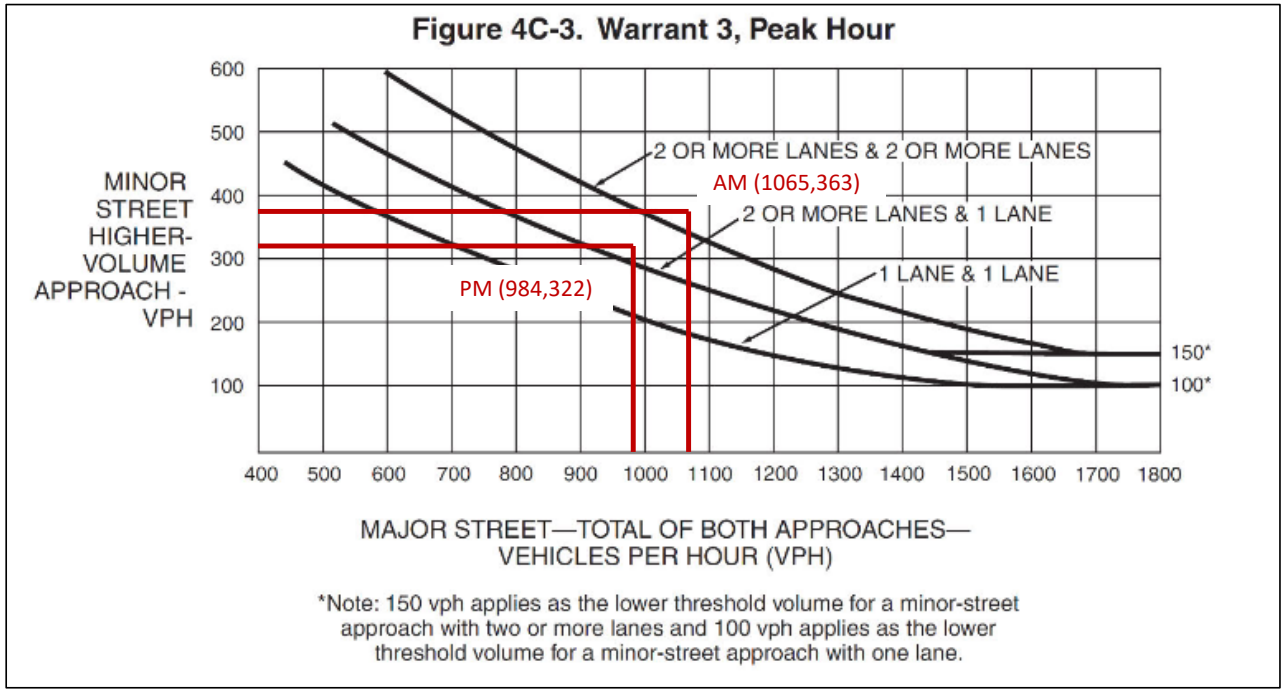
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	332	331	111	349	321	132	105	0	0	136	0	0
Stage 1	103	103	-	214	214	-	-	-	-	-	-	-
Stage 2	229	228	-	135	107	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	621	588	942	606	596	917	1486	-	-	1448	-	-
Stage 1	903	810	-	788	725	-	-	-	-	-	-	-
Stage 2	774	715	-	868	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	574	560	927	536	567	903	1475	-	-	1438	-	-
Mov Cap-2 Maneuver	574	560	-	536	567	-	-	-	-	-	-	-
Stage 1	866	804	-	756	695	-	-	-	-	-	-	-
Stage 2	714	686	-	797	801	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.3	11.9	2	0.1
HCM LOS	B	B		

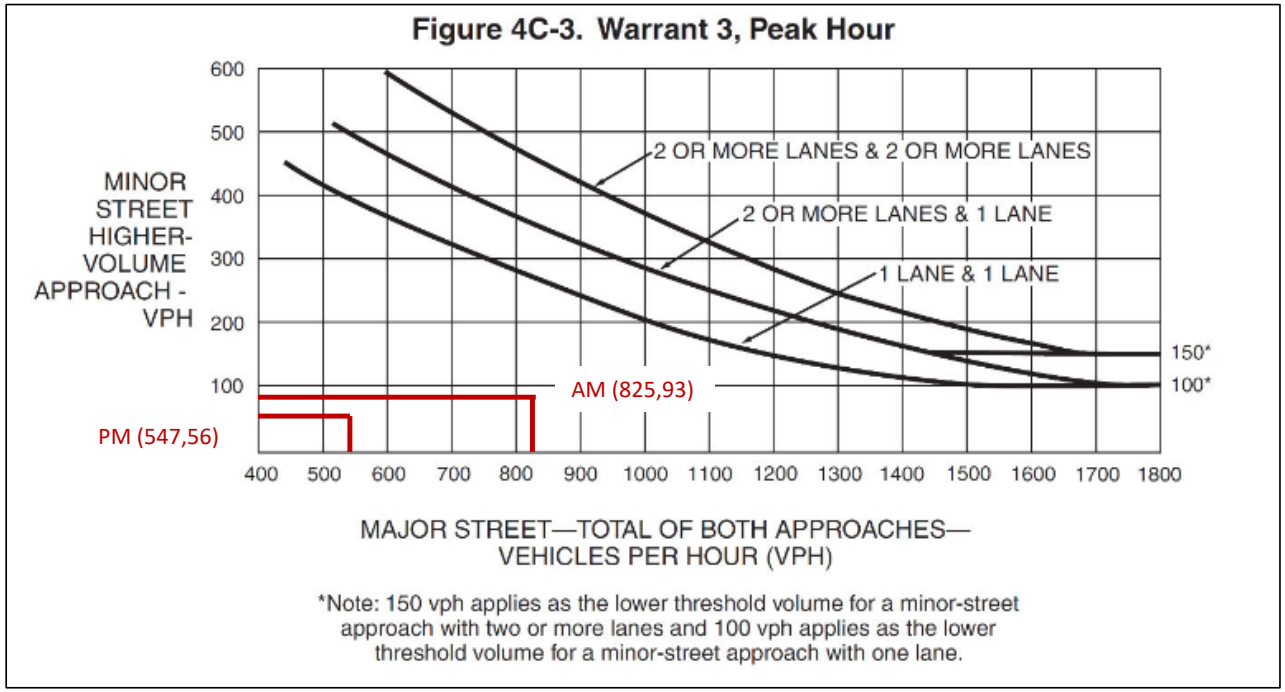
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1475	-	-	564	927	552	903	1438	-	-
HCM Lane V/C Ratio	0.031	-	-	0.102	0.021	0.082	0.003	0.001	-	-
HCM Control Delay (s)	7.5	0	-	12.1	9	12.1	9	7.5	0	-
HCM Lane LOS	A	A	-	B	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	0.3	0	0	-	-

APPENDIX D– Traffic Signal Warrants

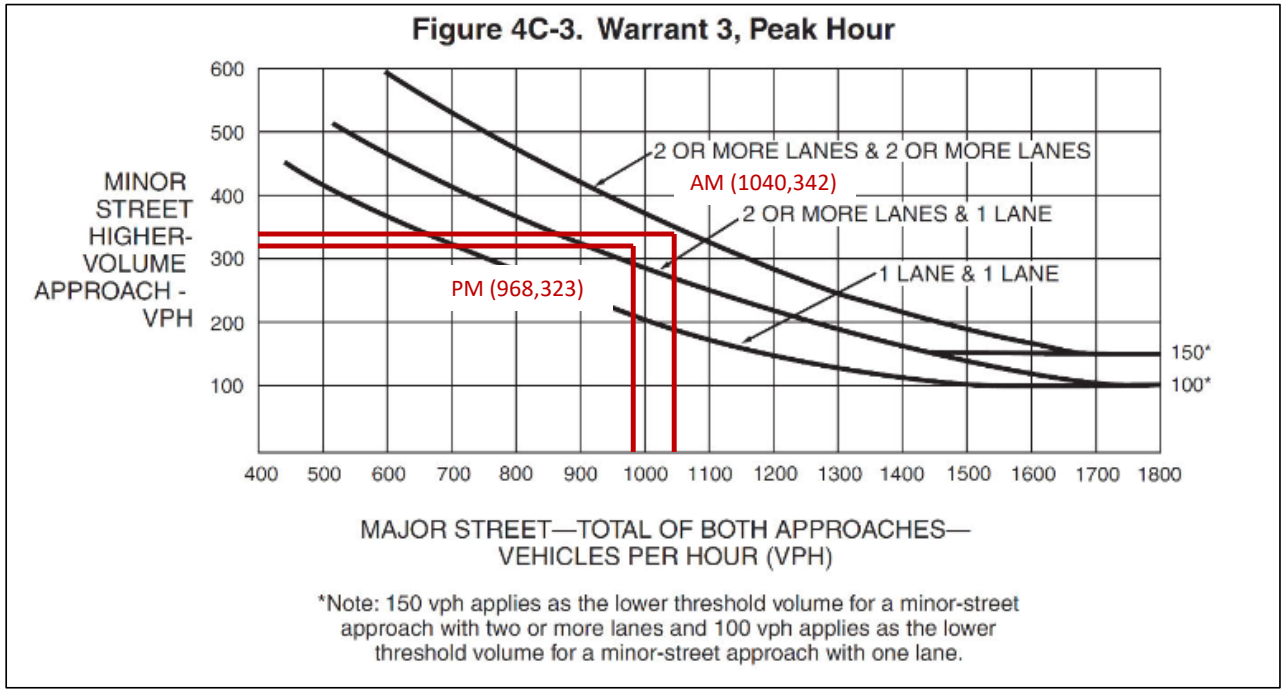
Buildout Year I-405 Vehicular OC With 4-Lane Yale Ave AM/PM Peaks at Yale Ave / Michelson Dr



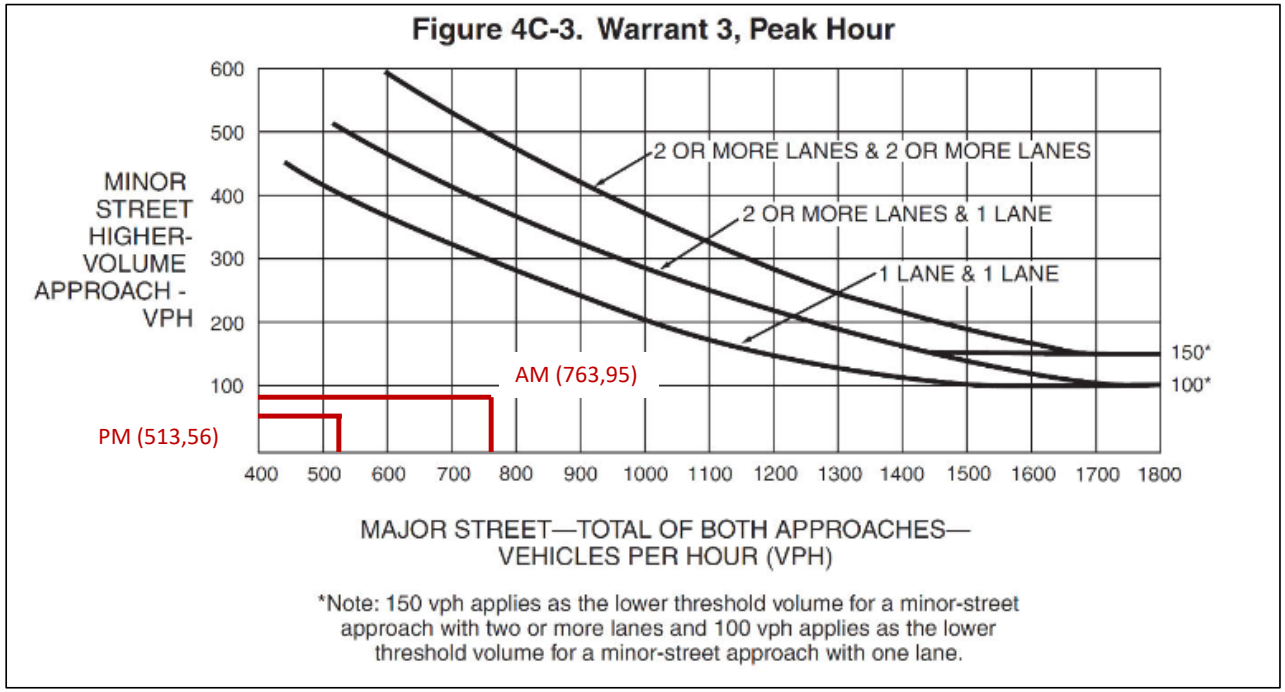
Buildout Year I-405 Vehicular OC With 4-Lane Yale Ave AM/PM Peaks at Yale Ave / Royce Rd



Buildout Year I-405 Vehicular OC With 2-Lane Yale Ave AM/PM Peaks at Yale Ave / Michelson Dr



Buildout Year I-405 Vehicular OC With 2-Lane Yale Ave AM/PM Peaks at Yale Ave / Royce Rd





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MARK THOMAS

Attachment F – Yale Avenue and University Drive Bike and Pedestrian Traffic Analysis

Technical Memorandum

To:	City of Irvine	From:	Iteris, Inc.
Date:	April 25, 2024		
RE:	South Yale Corridor Improvements Traffic Analysis (Bicycle Scramble for Yale/University)		

This memorandum analyzes the traffic impacts of the addition of a bicycle scramble phase or bicycle/pedestrian scramble phase at the intersection of Yale Avenue/University Drive in the City of Irvine.

A diagonal bicycle crossing signal phase has been proposed at the intersection of Yale Avenue and University Drive in the City of Irvine. The City typically uses Intersection Capacity Utilization (ICU) analysis to evaluate intersection capacity. However, this diagonal bicycle crossing signal phase at this intersection would not have an effect on the ICU analysis, but the signal operations. Therefore, the City would like to analyze the intersection using the Highway Capacity Manual 6 (HCM) methodology, using Synchro software version 11.

Study Background

1.1 Study Scenarios

A total of three (3) study scenarios were identified and analyzed. The scenarios include:

1. Future Year No Build Scenario
    - Current signal timing will be used for no build conditions.
2. Future Year Build Scenario Alternative 1
    - Proposed conditions Alternative 1 includes exclusive bicycle only phase (bicycle scramble). A bicycle phase will be added to the existing signal timing, which is in addition to the existing pedestrian phases.
3. Future Year Build Scenario Alternative 2
    - Proposed conditions Alternative 2 includes exclusive bicycle and pedestrian phase (bicycle/pedestrian scramble). An exclusive bicycle and pedestrian phase will be added to the existing signal phasing assuming pedestrian travel at 3.5 feet per second. Additionally, the pedestrian phase concurrent with Yale Avenue motor vehicle phase (west leg of the intersection) will be removed. The crosswalks would not be modified, but the signal phasing would provide bicycle and pedestrian travel only during the exclusive scramble phase when actuated by a pedestrian or cyclist.

1.2 Study Periods

Traffic operations were evaluated for all 3 scenarios during the weekday AM (7:00AM – 9:00AM) and PM (4:00PM – 6:00PM) peak hours under typical weekday conditions.

Traffic Volume Input

1.3 Data Source

Traffic volumes used at the study intersection were obtained from the South Yale Corridor Improvements Traffic Analysis, prepared by Iteris in May 2023. And are based on the Irvine Transportation Analysis Model (ITAM). In the South Yale Corridor Improvements Traffic Analysis, four future scenarios were analyzed. Traffic volumes for Buildout Year No I-405 Vehicular Overcrossing (OC) with Two-lane Yale Avenue was used for the purpose of this analysis, since the future scenario analyzes the removal of street modification of Yale Avenue, keeping Yale Avenue two-lane

Commuter Street between University Drive and Michelson Drive. I-405 OC along Yale Avenue will remain as pedestrians and bicycles only. **Figure 1** illustrates the South Yale Corridor under Buildout Year No I-405 Vehicular OC with Two-lane Yale Avenue. **Table 1** summarizes the intersection traffic volumes for all scenarios.

Figure 1: South Yale Corridor (Buildout Year No I-405 Vehicular OC with Two-lane Yale Avenue)



Table 2: Buildout Intersection Traffic Volumes (All Scenarios)

#	Intersection	Time Period	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	Yale Avenue and University Drive	AM Peak Hour	*Does Not Exist*			146	-	214	121	924	-	-	1,344	42
		PM Peak Hour				22	-	74	101	1,650	-	-	1,021	20

Note:
NB: Northbound, SB: Southbound, EB: Eastbound, WB: Westbound
L: Left, T: Through, R: Right

It should be noted that traffic volumes for the intersection of Yale Avenue/University are consistent across all 3 scenarios for their respective AM and PM peak hours. The 3 study scenarios only involve the addition of bicycle scramble or bicycle/pedestrian scramble of the intersection, without considering any future street upgrade of Yale Avenue from an existing two-lane commuter street to a four-lane secondary arterial between Michelson Drive and University Drive.

Traffic Operations Analysis

Traffic operations for the three alternatives are documented in this section of the technical memorandum for the intersection of Yale Avenue/University Drive consistent with the current *City of Irvine Traffic Study Guidelines, dated December 2020.*

1.4 Intersection Analysis Methodology

The Highway Capacity Manual (HCM) 6th Edition methodology will be used to evaluate the study intersections. This approach defines the level of service (LOS) by the average vehicle delay in seconds for the turning movements and intersection characteristics at signalized and unsignalized intersections. LOS A represents free-flow activity and LOS F represents overcapacity operation. Traffic operations analysis for HCM methodologies will be completed using Synchro 11 traffic analysis software. Signal timing for future year no build scenario is based on the existing signal timing, which was confirmed on February 6, 2024.

The length of the proposed bicycle crossing or bicycle/pedestrian crossing was provided by Mark Thomas. The diagonal length of crossing was provided as 130 feet. Signal timing for the exclusive bicycle only phase (bicycle scramble) and exclusive bicycle/pedestrian phase (bicycle/pedestrian scramble) was based on the Caltrans speed for bicycles and pedestrians and California Manual on Uniform Traffic Control Devices (CA MUTCD). Following are the Caltrans and CA MUTCD suggested speed for bicycles and pedestrians:

- Bicycle Speed: 14.7 feet/sec
    - *As a note, the minimum green time for bicycle was calculated using a 10 second startup time to provide adequate/additional time for less experienced cyclists*
- Pedestrian Speed: 3.5 feet/sec

LOS definitions for signalized intersections are provided in **Table 2**.

Table 2: Level of Service Definitions

LOS	Description
A	At this LOS, traffic volumes are low, and speed is not restricted by other vehicles. All signal cycles clear with no vehicles waiting through more than one original cycle.
B	At this LOS, traffic volumes begin to be affected by other traffic. Between one and ten percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.
C	At this LOS, operating speeds and maneuverability are closely controlled by other traffic. Between 11 and 30 percent of the signal cycles have one or more vehicles which wait through more than one signal cycle during peak traffic periods.
D	At this LOS, traffic will operate at tolerable operating speeds, although with restricted maneuverability.
E	Traffic will experience restricted speeds, vehicles will frequently have to wait through two or more cycles at signalized intersections, and any additional traffic will result in breakdown of the traffic carrying ability of the system.
F	Long queues of traffic, unstable flow, stoppages of long duration with traffic volumes and traffic, speed can drop to zero. Traffic volumes will be less than the volume which occurs at LOS E.

Table 3 and **Table 4** list the signal timing for each phase for all analysis scenarios during AM and PM peak hours, separately. Please note that the total cycle length for each scenario remains consistent.

Table 3: Signal Timing (Total Spilt) for All Analysis Scenarios (AM Peak Hour)

#	Intersection	Analysis Scenario	AM Peak Hour					
			EBL	EBT	WBT	SBL	BIKE/PED	Total Cycle Length
1	Yale Avenue and University Drive	Future Year No Build	30.0	140.0	110.0	60.0	-	200.0
		Future Year Build Alternative 1 (Exclusive Bicycle Only Phase)	50.0	130.0	80.0	50.0	20.0	200.0
		Future Year Build Alternative 2 (Exclusive Bicycle and Pedestrian Phase)	23.0	125.0	102.0	25.0	50.0	200.0

Note:
NB: Northbound, SB: Southbound, EB: Eastbound, WB: Westbound. All timings are in seconds.
L: Left, T: Through, R: Right

Table 4: Signal Timing (Total Spilt) for All Analysis Scenarios (PM Peak Hour)

#	Intersection	Analysis Scenario	PM Peak Hour					
			EBL	EBT	WBT	SBL	BIKE/PED	Total Cycle Length
1	Yale Avenue and University Drive	Future Year No Build	20.0	106.0	86.0	34.0	-	140.0
		Future Year Build Alternative 1 (Exclusive Bicycle Only Phase)	25.0	86.0	61.0	34.0	20.0	140.0
		Future Year Build Alternative 2 (Exclusive Bicycle and Pedestrian Phase)	20.0	56.0	36.0	34.0	50.0	140.0

Note:
NB: Northbound, SB: Southbound, EB: Eastbound, WB: Westbound. All timings are in seconds.
L: Left, T: Through, R: Right

According to the City of Irvine Traffic Study Guidelines, LOS D shall be considered acceptable for the study area. A traffic LOS impact occurs when the intersection operates at an acceptable LOS in the baseline condition and the project causes the location to become deficient. If an intersection is determined to have an LOS impact, then the project will be required to mitigate the intersection, at a minimum, back to the baseline condition.

Table 5 summarizes the intersection LOS results for all analysis scenarios during AM and PM peak hours. Synchro worksheets are provided in **Appendix A**.

Table 5: Intersection LOS for All Analysis Scenarios

#	Intersection	Analysis Scenario	AM Peak Hour		PM Peak Hour	
			Intersection Delay (s)	LOS	Intersection Delay (s)	LOS
1	Yale Avenue and University Drive	Future Year No Build	25.7	C	13.3	B
		Future Year Build Alternative 1 (Exclusive Bicycle Only Phase)	33.9	C	19.8	B
		Future Year Build Alternative 2 (Exclusive Bicycle and Pedestrian Phase)	53.1	D	32.8	C

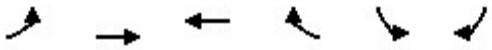
Note: *Permissive + Overlap phasing has been added to SBR Alternative 2 in this analysis.*

As indicated in **Table 5**, the study intersection is anticipated to operate at LOS D or better during both AM and PM peak hours for all analysis scenarios, with the addition of permissive + overlap phasing for the southbound right turn (SBR) movement in Alternative 2. The additional intersection delay associated with Alternative 1 and Alternative 2 are solely related to the addition of exclusive non-vehicular phase, reducing the vehicular green time, and maintaining the overall cycle length.

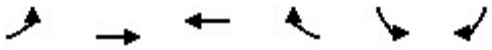
In conclusion, the addition of an exclusive bicycle only phase (bicycle scramble) or the addition of an exclusive bicycle and pedestrian phase (bicycle/pedestrian scramble) will not result in any deficient level of service at the study intersection. However, it should be noted that any increase in active transportation cycle length will degrade the vehicular delay at an intersection. The intersection of Yale Avenue/University Drive will continue to operate at a satisfactory LOS based on traffic volumes from “Buildout Year No I-405 Vehicular Overcrossing with Two-lane Yale Avenue” scenario in the South Yale Corridor Improvements Traffic Analysis.

Appendix A

Future Year No Build



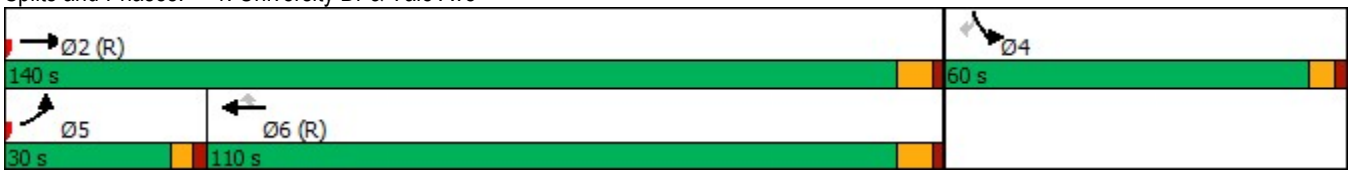
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	121	924	1344	42	146	214
Future Volume (vph)	121	924	1344	42	146	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145			225	0	150
Storage Lanes	1			1	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor				0.94		0.90
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	3539	3539	1489	1770	1431
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				22		227
Link Speed (mph)		55	50		40	
Link Distance (ft)		583	683		620	
Travel Time (s)		7.2	9.3		10.6	
Confl. Peds. (#/hr)				7		23
Confl. Bikes (#/hr)				12		45
Peak Hour Factor	0.82	0.82	0.88	0.88	0.80	0.80
Adj. Flow (vph)	148	1127	1527	48	183	268
Shared Lane Traffic (%)						
Lane Group Flow (vph)	148	1127	1527	48	183	268
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

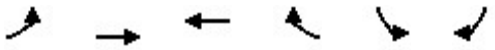


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	14.0	10.0	9.0	9.0	14.0	14.0
Minimum Split (s)	19.2	17.4	29.4	29.4	32.9	32.9
Total Split (s)	30.0	140.0	110.0	110.0	60.0	60.0
Total Split (%)	15.0%	70.0%	55.0%	55.0%	30.0%	30.0%
Maximum Green (s)	24.8	132.6	102.6	102.6	54.1	54.1
Yellow Time (s)	3.2	5.4	5.4	5.4	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	7.4	7.4	7.4	5.9	5.9
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			5.0	5.0	5.0	5.0
Flash Dont Walk (s)			17.0	17.0	22.0	22.0
Pedestrian Calls (#/hr)			7	7	23	23
Act Effct Green (s)	21.9	161.1	134.0	134.0	25.6	25.6
Actuated g/C Ratio	0.11	0.81	0.67	0.67	0.13	0.13
v/c Ratio	0.76	0.40	0.64	0.05	0.81	0.70
Control Delay	110.3	6.4	22.3	8.6	110.0	25.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.3	6.4	22.3	8.6	110.0	25.1
LOS	F	A	C	A	F	C
Approach Delay		18.5	21.9		59.6	
Approach LOS		B	C		E	

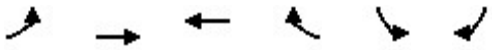
Intersection Summary			
Area Type:	Other		
Cycle Length: 200			
Actuated Cycle Length: 200			
Offset: 124 (62%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 25.7		Intersection LOS: C	
Intersection Capacity Utilization 81.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: University Dr & Yale Ave





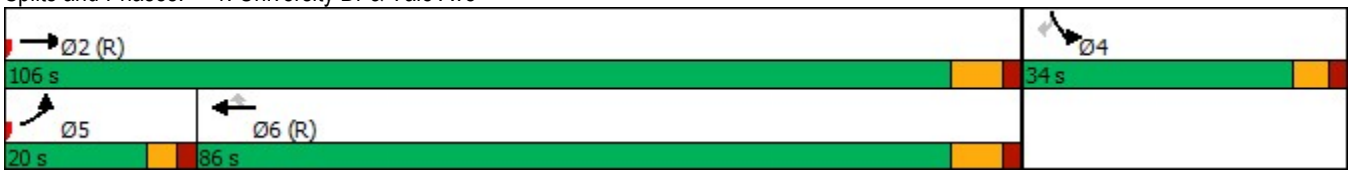
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	101	1650	1021	20	22	74
Future Volume (vph)	101	1650	1021	20	22	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	145			225	0	150
Storage Lanes	1			1	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor				0.96		0.95
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	3539	3539	1522	1770	1512
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				22		93
Link Speed (mph)		55	50		40	
Link Distance (ft)		583	683		620	
Travel Time (s)		7.2	9.3		10.6	
Confl. Peds. (#/hr)				4		9
Confl. Bikes (#/hr)				10		18
Peak Hour Factor	0.92	0.92	0.93	0.93	0.80	0.80
Adj. Flow (vph)	110	1793	1098	22	28	93
Shared Lane Traffic (%)						
Lane Group Flow (vph)	110	1793	1098	22	28	93
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	14.0	10.0	9.0	9.0	14.0	14.0
Minimum Split (s)	19.2	17.4	29.4	29.4	32.9	32.9
Total Split (s)	20.0	106.0	86.0	86.0	34.0	34.0
Total Split (%)	14.3%	75.7%	61.4%	61.4%	24.3%	24.3%
Maximum Green (s)	14.8	98.6	78.6	78.6	28.1	28.1
Yellow Time (s)	3.2	5.4	5.4	5.4	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	7.4	7.4	7.4	5.9	5.9
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			5.0	5.0	5.0	5.0
Flash Dont Walk (s)			17.0	17.0	22.0	22.0
Pedestrian Calls (#/hr)			4	4	9	9
Act Effct Green (s)	14.8	110.1	90.1	90.1	16.6	16.6
Actuated g/C Ratio	0.11	0.79	0.64	0.64	0.12	0.12
v/c Ratio	0.59	0.64	0.48	0.02	0.13	0.36
Control Delay	72.9	8.4	14.5	4.4	54.6	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.9	8.4	14.5	4.4	54.6	13.5
LOS	E	A	B	A	D	B
Approach Delay		12.2	14.3		23.0	
Approach LOS		B	B		C	

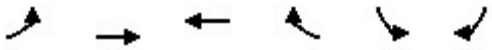
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 104 (74%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 13.3		Intersection LOS: B	
Intersection Capacity Utilization 71.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: University Dr & Yale Ave

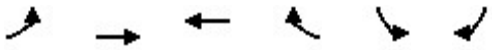


Future Year Build Alternative 1

(Exclusive Bicycle Only Phase)



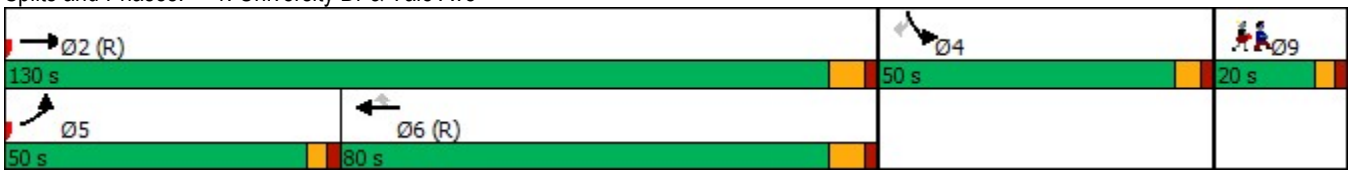
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	121	924	1344	42	146	214	
Future Volume (vph)	121	924	1344	42	146	214	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	145			225	0	150	
Storage Lanes	1			1	1	1	
Taper Length (ft)	75				25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	
Ped Bike Factor				0.94		0.94	
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1770	3539	3539	1484	1770	1485	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				17		237	
Link Speed (mph)		55	50		40		
Link Distance (ft)		583	683		620		
Travel Time (s)		7.2	9.3		10.6		
Confl. Peds. (#/hr)				7		23	
Confl. Bikes (#/hr)				12			
Peak Hour Factor	0.82	0.82	0.88	0.88	0.80	0.80	
Adj. Flow (vph)	148	1127	1527	48	183	268	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	148	1127	1527	48	183	268	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		12	12		12		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Number of Detectors	1	2	2	1	1	1	
Detector Template	Left	Thru	Thru	Right	Left	Right	
Leading Detector (ft)	20	100	100	20	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	6	20	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94	94				
Detector 2 Size(ft)		6	6				
Detector 2 Type		Cl+Ex	Cl+Ex				
Detector 2 Channel							
Detector 2 Extend (s)		0.0	0.0				

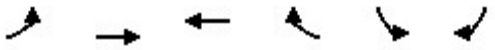


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Turn Type	Prot	NA	NA	Perm	Prot	Perm	
Protected Phases	5	2	6		4		9
Permitted Phases				6		4	
Detector Phase	5	2	6	6	4	4	
Switch Phase							
Minimum Initial (s)	14.0	10.0	9.0	9.0	14.0	14.0	15.0
Minimum Split (s)	19.2	17.4	29.4	29.4	32.9	32.9	20.0
Total Split (s)	50.0	130.0	80.0	80.0	50.0	50.0	20.0
Total Split (%)	25.0%	65.0%	40.0%	40.0%	25.0%	25.0%	10%
Maximum Green (s)	44.8	122.6	72.6	72.6	44.1	44.1	15.0
Yellow Time (s)	3.2	5.4	5.4	5.4	3.9	3.9	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	7.4	7.4	7.4	5.9	5.9	
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None
Walk Time (s)			5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)			17.0	17.0	22.0	22.0	6.0
Pedestrian Calls (#/hr)			7	7	23	23	45
Act Effct Green (s)	22.1	145.2	117.9	117.9	25.5	25.5	
Actuated g/C Ratio	0.11	0.73	0.59	0.59	0.13	0.13	
v/c Ratio	0.76	0.44	0.73	0.05	0.81	0.68	
Control Delay	109.2	12.9	35.6	15.7	110.5	21.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	109.2	12.9	35.6	15.7	110.5	21.5	
LOS	F	B	D	B	F	C	
Approach Delay		24.1	35.0		57.6		
Approach LOS		C	C		E		

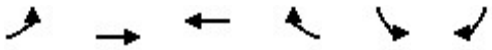
Intersection Summary			
Area Type:	Other		
Cycle Length: 200			
Actuated Cycle Length: 200			
Offset: 124 (62%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 33.9		Intersection LOS: C	
Intersection Capacity Utilization 81.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: University Dr & Yale Ave





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	101	1650	1021	20	22	74	
Future Volume (vph)	101	1650	1021	20	22	74	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	145			225	0	150	
Storage Lanes	1			1	1	1	
Taper Length (ft)	75				25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	
Ped Bike Factor				0.96		0.97	
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1770	3539	3539	1517	1770	1543	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				16		93	
Link Speed (mph)		55	50		40		
Link Distance (ft)		583	683		620		
Travel Time (s)		7.2	9.3		10.6		
Confl. Peds. (#/hr)				4		9	
Confl. Bikes (#/hr)				10			
Peak Hour Factor	0.92	0.92	0.93	0.93	0.80	0.80	
Adj. Flow (vph)	110	1793	1098	22	28	93	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	110	1793	1098	22	28	93	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		12	12		12		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Number of Detectors	1	2	2	1	1	1	
Detector Template	Left	Thru	Thru	Right	Left	Right	
Leading Detector (ft)	20	100	100	20	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	6	20	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94	94				
Detector 2 Size(ft)		6	6				
Detector 2 Type		Cl+Ex	Cl+Ex				
Detector 2 Channel							
Detector 2 Extend (s)		0.0	0.0				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Turn Type	Prot	NA	NA	Perm	Prot	Perm	
Protected Phases	5	2	6		4		9
Permitted Phases				6		4	
Detector Phase	5	2	6	6	4	4	
Switch Phase							
Minimum Initial (s)	14.0	10.0	9.0	9.0	14.0	14.0	15.0
Minimum Split (s)	19.2	17.4	29.4	29.4	32.9	32.9	20.0
Total Split (s)	25.0	86.0	61.0	61.0	34.0	34.0	20.0
Total Split (%)	17.9%	61.4%	43.6%	43.6%	24.3%	24.3%	14%
Maximum Green (s)	19.8	78.6	53.6	53.6	28.1	28.1	15.0
Yellow Time (s)	3.2	5.4	5.4	5.4	3.9	3.9	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	7.4	7.4	7.4	5.9	5.9	
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None
Walk Time (s)			5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)			17.0	17.0	22.0	22.0	6.0
Pedestrian Calls (#/hr)			4	4	9	9	18
Act Effct Green (s)	15.5	102.1	81.4	81.4	16.6	16.6	
Actuated g/C Ratio	0.11	0.73	0.58	0.58	0.12	0.12	
v/c Ratio	0.56	0.69	0.53	0.02	0.13	0.35	
Control Delay	70.2	15.2	22.1	11.1	54.6	13.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	70.2	15.2	22.1	11.1	54.6	13.3	
LOS	E	B	C	B	D	B	
Approach Delay		18.4	21.9		22.9		
Approach LOS		B	C		C		

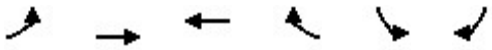
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 104 (74%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 19.8		Intersection LOS: B	
Intersection Capacity Utilization 71.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: University Dr & Yale Ave

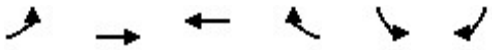


Future Year Build Alternative 2

(Exclusive Bicycle and Pedestrian Phase)



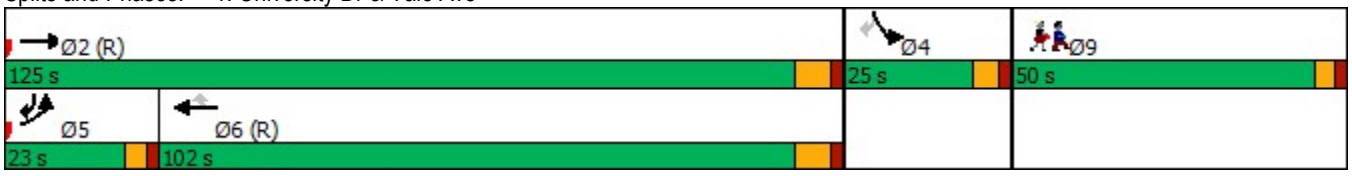
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	121	924	1344	42	146	214	
Future Volume (vph)	121	924	1344	42	146	214	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	145			225	0	150	
Storage Lanes	1			1	1	1	
Taper Length (ft)	75				25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	
Ped Bike Factor				0.94			
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1770	3539	3539	1488	1770	1583	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				20		227	
Link Speed (mph)		55	50		40		
Link Distance (ft)		583	683		620		
Travel Time (s)		7.2	9.3		10.6		
Confl. Peds. (#/hr)				7			
Confl. Bikes (#/hr)				12			
Peak Hour Factor	0.82	0.82	0.88	0.88	0.80	0.80	
Adj. Flow (vph)	148	1127	1527	48	183	268	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	148	1127	1527	48	183	268	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		12	12		12		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Number of Detectors	1	2	2	1	1	1	
Detector Template	Left	Thru	Thru	Right	Left	Right	
Leading Detector (ft)	20	100	100	20	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	6	20	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94	94				
Detector 2 Size(ft)		6	6				
Detector 2 Type		Cl+Ex	Cl+Ex				
Detector 2 Channel							
Detector 2 Extend (s)		0.0	0.0				

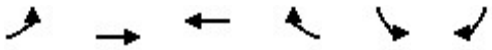


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Turn Type	Prot	NA	NA	Perm	Prot	pm+ov	
Protected Phases	5	2	6		4	5	9
Permitted Phases				6		4	
Detector Phase	5	2	6	6	4	5	
Switch Phase							
Minimum Initial (s)	14.0	10.0	9.0	9.0	14.0	14.0	45.0
Minimum Split (s)	19.2	17.4	29.4	29.4	19.9	19.2	50.0
Total Split (s)	23.0	125.0	102.0	102.0	25.0	23.0	50.0
Total Split (%)	11.5%	62.5%	51.0%	51.0%	12.5%	11.5%	25%
Maximum Green (s)	17.8	117.6	94.6	94.6	19.1	17.8	45.0
Yellow Time (s)	3.2	5.4	5.4	5.4	3.9	3.2	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	7.4	7.4	7.4	5.9	5.2	
Lead/Lag	Lead		Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	3.0	2.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None
Walk Time (s)			5.0	5.0			5.0
Flash Dont Walk (s)			17.0	17.0			35.0
Pedestrian Calls (#/hr)			7	7			68
Act Effct Green (s)	17.8	117.6	94.6	94.6	19.1	37.6	
Actuated g/C Ratio	0.09	0.59	0.47	0.47	0.10	0.19	
v/c Ratio	0.94	0.54	0.91	0.07	1.08	0.56	
Control Delay	145.1	26.1	58.2	18.1	171.6	12.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	145.1	26.1	58.2	18.1	171.6	12.0	
LOS	F	C	E	B	F	B	
Approach Delay		39.9	57.0		76.7		
Approach LOS		D	E		E		

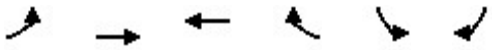
Intersection Summary			
Area Type:	Other		
Cycle Length: 200			
Actuated Cycle Length: 200			
Offset: 124 (62%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.08			
Intersection Signal Delay: 53.1		Intersection LOS: D	
Intersection Capacity Utilization 75.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: University Dr & Yale Ave





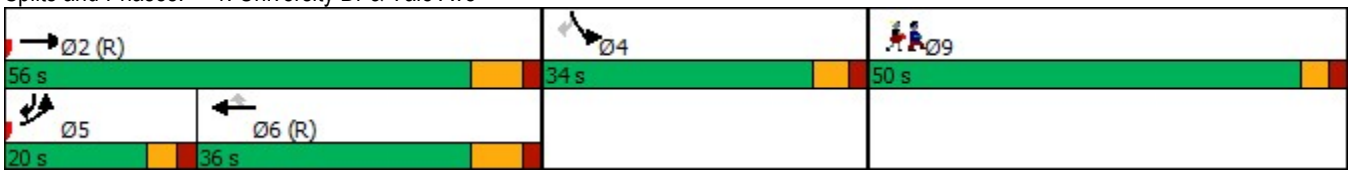
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	101	1650	1021	20	22	74	
Future Volume (vph)	101	1650	1021	20	22	74	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	145			225	0	150	
Storage Lanes	1			1	1	1	
Taper Length (ft)	75				25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	
Ped Bike Factor				0.95			
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583	
Flt Permitted	0.950				0.950		
Satd. Flow (perm)	1770	3539	3539	1504	1770	1583	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				12		93	
Link Speed (mph)		55	50		40		
Link Distance (ft)		583	683		620		
Travel Time (s)		7.2	9.3		10.6		
Confl. Peds. (#/hr)				4			
Confl. Bikes (#/hr)				10			
Peak Hour Factor	0.92	0.92	0.93	0.93	0.80	0.80	
Adj. Flow (vph)	110	1793	1098	22	28	93	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	110	1793	1098	22	28	93	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		12	12		12		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Number of Detectors	1	2	2	1	1	1	
Detector Template	Left	Thru	Thru	Right	Left	Right	
Leading Detector (ft)	20	100	100	20	20	20	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	6	20	20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94	94				
Detector 2 Size(ft)		6	6				
Detector 2 Type		Cl+Ex	Cl+Ex				
Detector 2 Channel							
Detector 2 Extend (s)		0.0	0.0				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Turn Type	Prot	NA	NA	Perm	Prot	pm+ov	
Protected Phases	5	2	6		4	5	9
Permitted Phases				6		4	
Detector Phase	5	2	6	6	4	5	
Switch Phase							
Minimum Initial (s)	14.0	10.0	9.0	9.0	14.0	14.0	45.0
Minimum Split (s)	19.2	17.4	29.4	29.4	19.9	19.2	50.0
Total Split (s)	20.0	56.0	36.0	36.0	34.0	20.0	50.0
Total Split (%)	14.3%	40.0%	25.7%	25.7%	24.3%	14.3%	36%
Maximum Green (s)	14.8	48.6	28.6	28.6	28.1	14.8	45.0
Yellow Time (s)	3.2	5.4	5.4	5.4	3.9	3.2	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	7.4	7.4	7.4	5.9	5.2	
Lead/Lag	Lead		Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	2.0	2.0	2.0	2.0	3.0	2.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None	None
Walk Time (s)			5.0	5.0			5.0
Flash Dont Walk (s)			17.0	17.0			35.0
Pedestrian Calls (#/hr)			4	4			27
Act Effct Green (s)	15.5	93.6	70.0	70.0	14.0	24.3	
Actuated g/C Ratio	0.11	0.67	0.50	0.50	0.10	0.17	
v/c Ratio	0.56	0.76	0.62	0.03	0.16	0.26	
Control Delay	70.3	29.6	36.1	22.4	60.0	5.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	70.3	29.6	36.1	22.4	60.0	5.9	
LOS	E	C	D	C	E	A	
Approach Delay		31.9	35.9		18.4		
Approach LOS		C	D		B		

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 104 (74%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 32.8		Intersection LOS: C	
Intersection Capacity Utilization 68.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: University Dr & Yale Ave



SOUTH YALE IMPROVEMENTS







prepared by:

MARK THOMAS

ATTACHMENT I

7800 Katella Avenue
Stanton, CA 90680

P | (714) 379-9222
F | (714) 890-1443

Stanton@StantonCA.gov
StantonCA.gov

Date:
December 18, 2024

Kia Mortazavi
Executive Director, Planning

Orange County Transportation Authority
550 South Main Street
Orange, CA 92863-1584

RE: Master Plan of Arterial Highways (MPAH) Amendment Request – Orangewood Avenue between Santa Rosalia Street and City Limits

To Mortazavi,

The City of Stanton is requesting an amendment of the MPAH for Orangewood Avenue between Santa Rosalia Street and City Limits to change the segment from Secondary Arterial to Collector Arterial. This designation would alter large segments of the existing roadway configuration from 4 travel lanes reduce to 2 travel lanes.

The segment of Orangewood Avenue between Santa Rosalia Street and City Limits is currently a 4 lane (two lanes each direction) collector roadway. In the Orange County MPAH, this segment is identified as a four-lane (two lanes each direction) Secondary arterial roadway.

The current configuration of Orangewood Avenue between Santa Rosalia Street and City Limits includes a 64-foot-wide street with two travel lanes in each direction. After analysis and community engagement, the City is proposing to implement roadway features that include 9000 linear feet of Class II Bicycle Lanes on Orangewood Avenue.

The implementation will address concerns along the existing roadway, such as speeding, wrong way riding of bicycles, and conflicts between bicyclists and pedestrians on sidewalks. It is also intended to improve safety and connectivity, increase rates of bicycling and walking, improve safety outcomes on the corridors. The project will also enhance bicycling facilities and provide additional opportunities for low stress and multimodal travel within the City.

A Class II bikeway will be added to the existing roadway. The proposed roadway configuration will consists of the following:

- One travel lane in each direction
- Class II bicycle lanes in each direction
- On-street parking

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Stanton, CA 90680

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StantonCA.gov

Date:
December 18, 2024

Kia Mortazavi
Executive Director, Planning

Orange County Transportation Authority
550 South Main Street
Orange, CA 92863-1584

The project will also include the installation of bulb-outs, upgrades for ADA compliant curb ramps, parkways and landscaping, installation of high visibility roadway markings such as continental crosswalks and bicycle markings, signage upgrades, street lighting upgrades, traffic signal modifications, replacement of sidewalks, curb & gutters, and cross gutters, and a complete grind & overlay of both street segments, providing significant benefits including improved safety for all roadway users and enhanced quality of life.

The average daily traffic volumes on this segment of Orangewood Avenue range from 2,600 to 11,800 vehicles per day based on traffic counts collected in September 2023.

The City's traffic model forecasts the buildout volumes to be between 6,300 and 6,800 for the two-lane arterial configuration with the I-405 Vehicular overcrossing. Per the Orange County Highway Design Manual, the MPAH roadway capacity values indicate the MPAH amendment can still maintain favorable performance conditions. Therefore, the proposed MPAH amendment can support existing and forecast traffic volumes per adopted performance criteria.

There is also an existing Class II bicycle facility along Orangewood Avenue, east of the City Limits, and this amendment would help improve connectivity and consistency between jurisdictions.

Thank you for your consideration regarding this request. If you have any questions, please feel

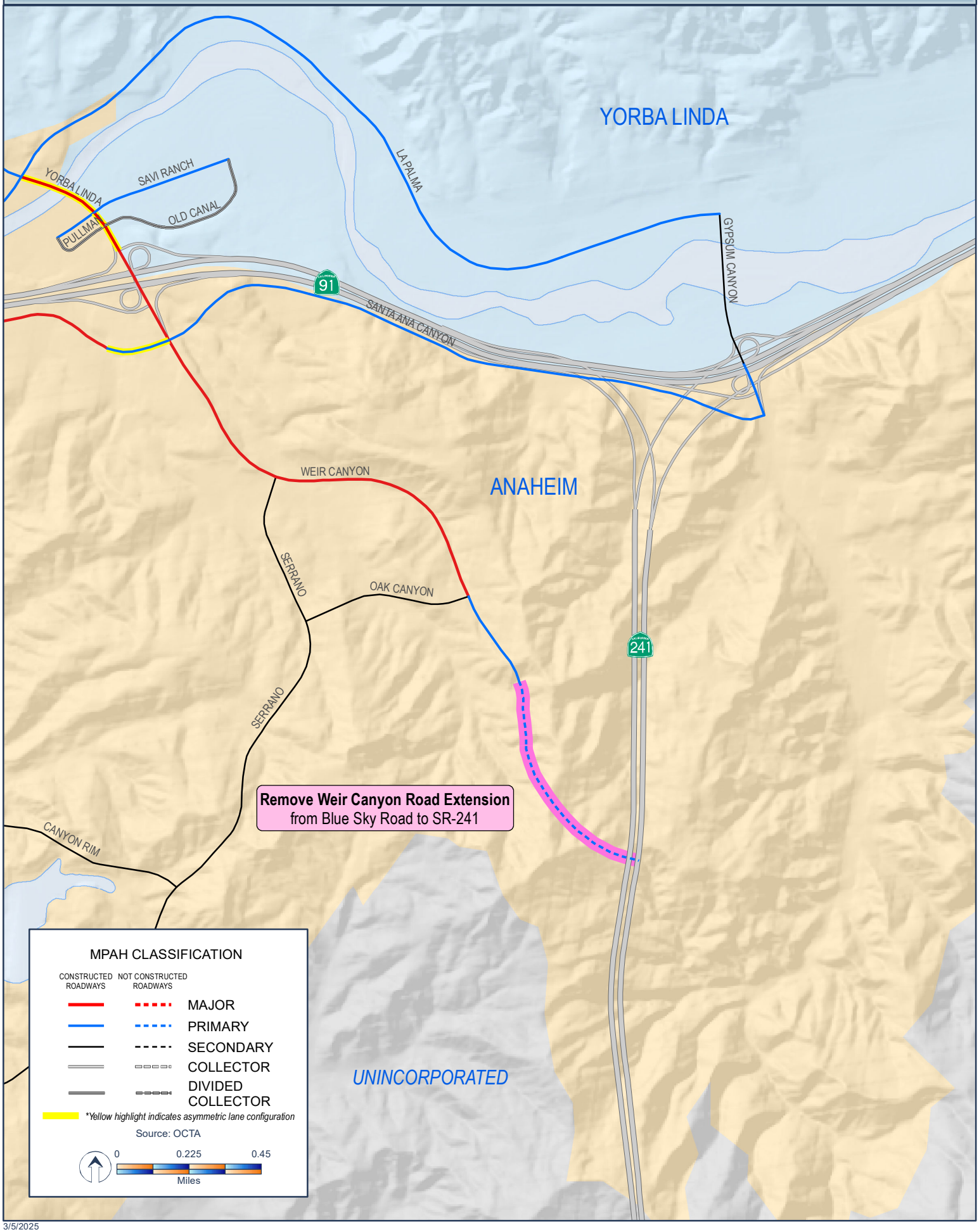
free to contact Elias Garcia, Assistant City Engineer at 714-890-4237 or EGarcia@StantonCA.gov.

Sincerely,

Cesar Rangel, P.E.
Public Works Director / City Engineer

City of Anaheim MPAH Amendment

ATTACHMENT J



3/5/2025

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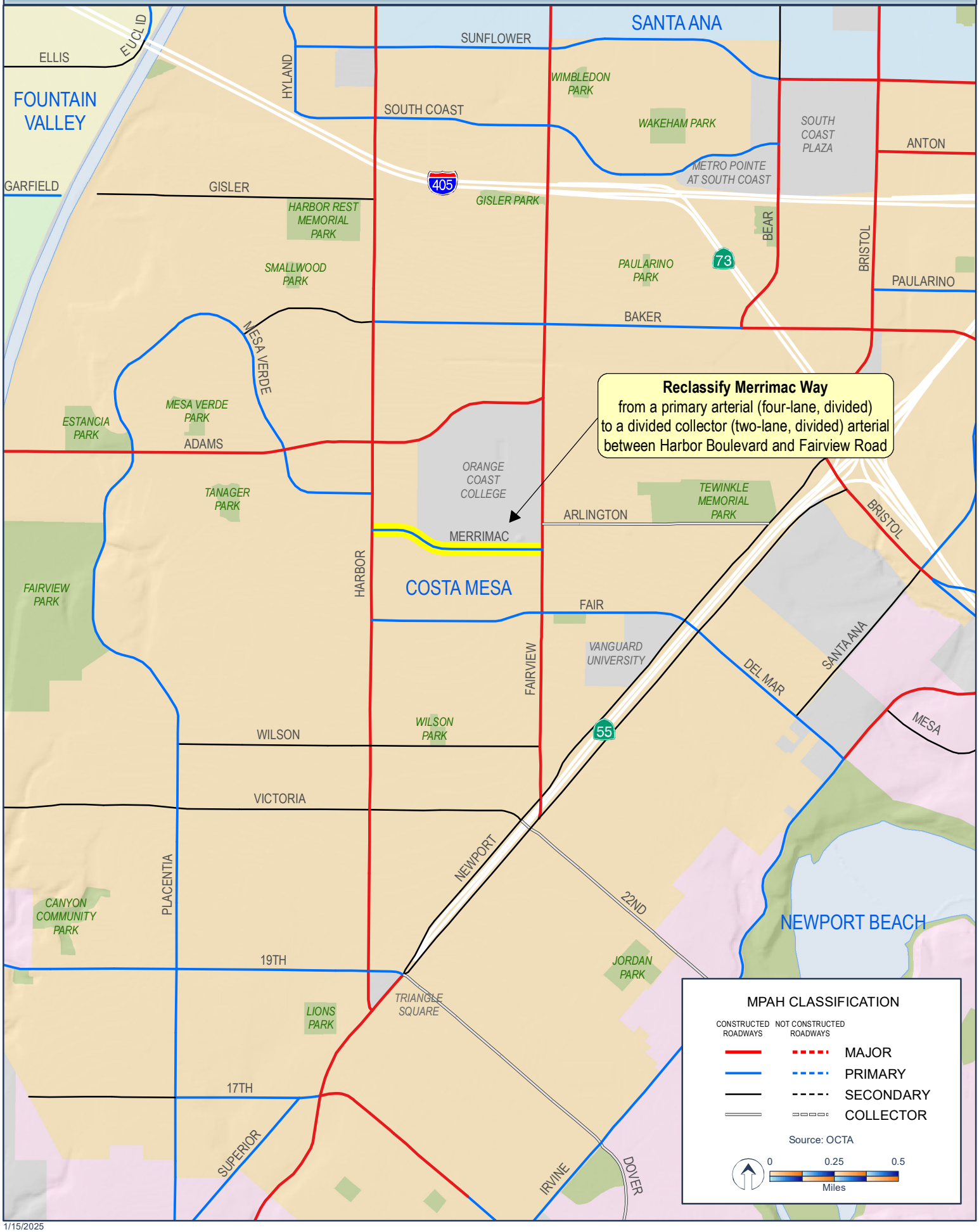
City of Costa Mesa MPAH Amendment

ATTACHMENT K



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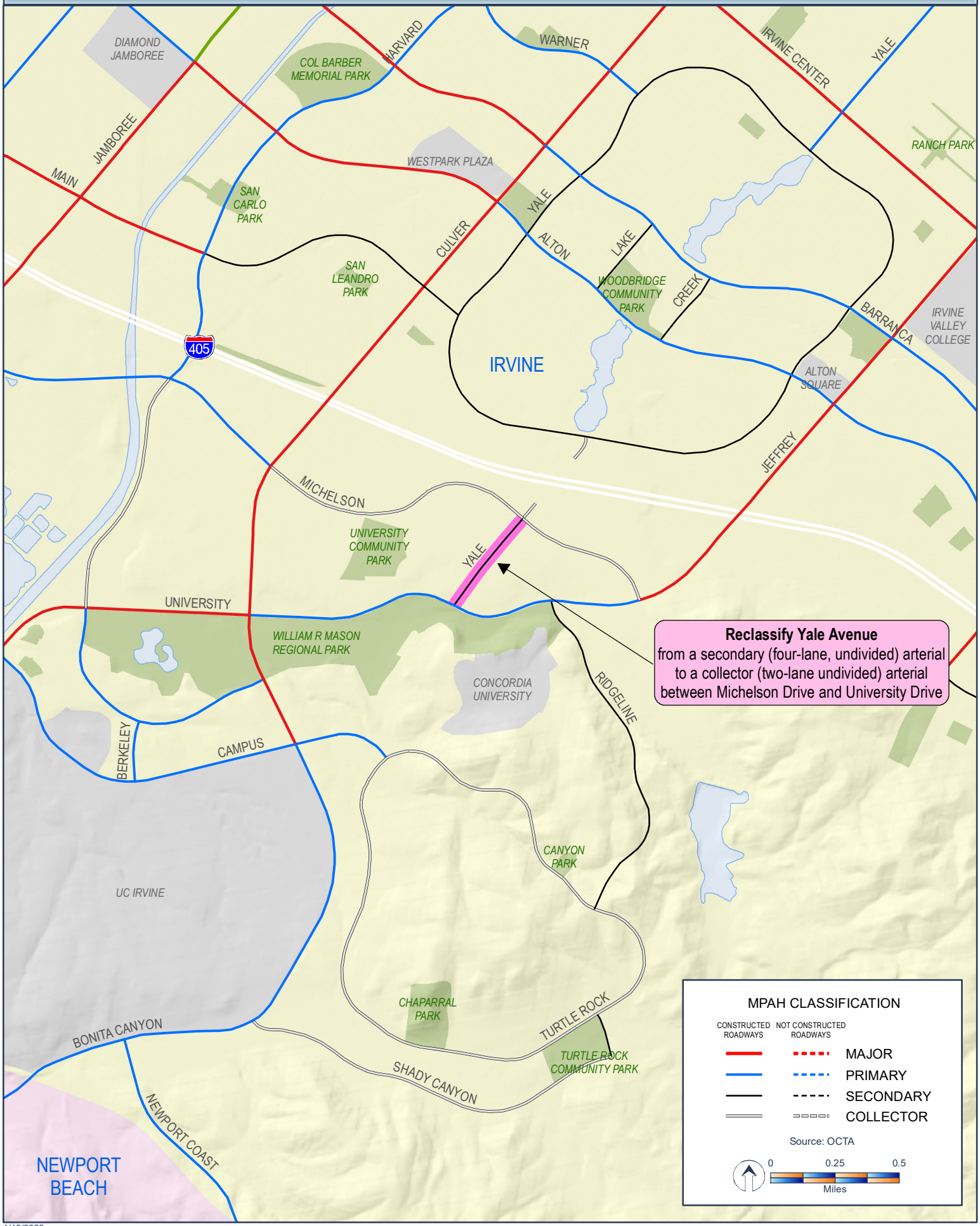
City of Irvine MPAH Amendment

ATTACHMENT L



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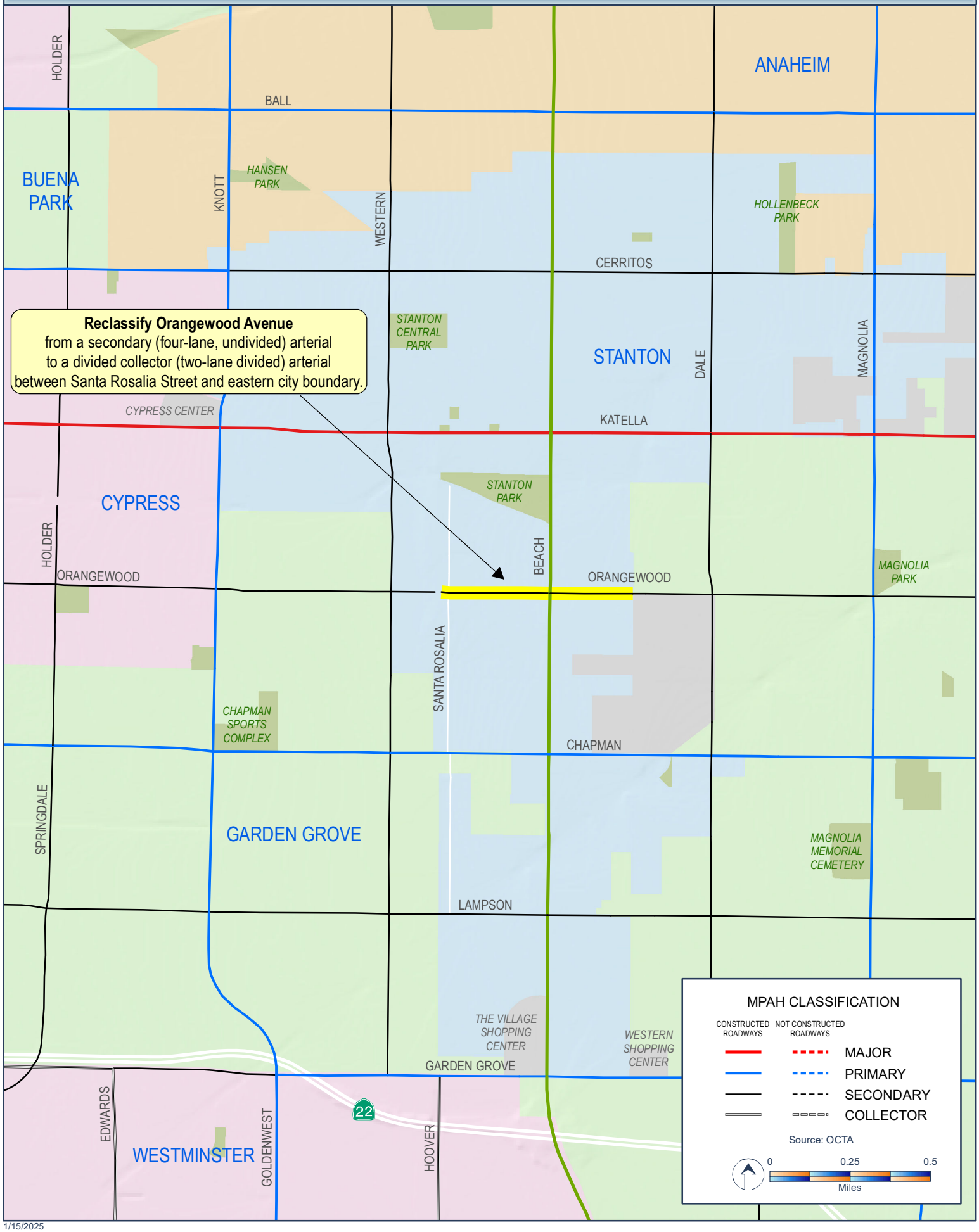
City of Stanton MPAH Amendment

ATTACHMENT M



1/15/2025

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ATTACHMENT N

Master Plan of Arterial Highways Amendments Detailed Discussion

City of Anaheim – Remove Weir Canyon Extension

The City of Anaheim (Anaheim) has requested to remove the Weir Canyon Extension, between Sky Blue Road and State Route 241 from the Master Plan of Arterial Highways (MPAH). This segment has not been constructed, and the findings from Anaheim's 2025 Circulation Element Update indicate that its removal would not impact the MPAH network. Additionally, staff analyzed the MPAH buildout network to forecast 2050 traffic conditions, which confirmed that removing the Weir Canyon Extension does not create any significant impact on the MPAH network.

City of Costa Mesa – Reclassify Merrimac Way

The City of Costa Mesa (Costa Mesa) has requested the reclassification of Merrimac Way, between Harbor Boulevard and Fairview Road, from a primary (four-lane, divided) arterial to a divided collector (two-lane, divided) arterial. The segment is currently built as a divided collector (two-lanes) with buffered bicycle lanes and tracks. Costa Mesa had coordinated with OCTA in 2020 for temporary improvements, and now Costa Mesa has proposed to reclassify the Merrimac Way segment to reflect the changes of the current roadway configuration.

The MPAH buildout network was modeled to forecast 2050 traffic conditions. The model indicates that this segment on Merrimac Way will have 7,000 daily vehicles with the proposed changes. These traffic volumes are well within the acceptable level of service for a divided collector street, which typically accommodates up to 15,000 average daily traffic. As such the proposed reclassification does not result in any significant impacts on the MPAH system.

City of Irvine – Reclassify Yale Avenue

The City of Irvine (Irvine) has requested the reclassification of Yale Avenue, between Michelson Drive and University Drive on the MPAH, from a secondary (four-lane undivided) arterial to a collector (two-lane, undivided). The segment is currently built as a collector arterial. The proposed Class IV bicycle tracks provide a separated bikeway for bicyclists by reducing conflicts with vehicle traffic and pedestrians. It aims to support increased bicycle use among students commuting to nearby schools and provides a safer, low-stress bicycling environment that encourages active transportation.

The MPAH buildout network was modeled to forecast 2050 traffic conditions. The model indicates that this segment on Yale Avenue will have 7,000 daily vehicles with the proposed amendment. These traffic volumes are well within the acceptable level of service for collector streets, which typically accommodate up to 10,000 average daily traffic. As such, the proposed reclassification does not result in any significant impacts on the MPAH system.

Master Plan of Arterial Highways Amendments Detailed Discussion

City of Stanton – Reclassify Orangewood Avenue

The City of Stanton (Stanton) has requested the reclassification of Orangewood Avenue, between Stanta Rosalia Street to the eastern city limit (Nearing Drive) from a secondary (four-lane, undivided) arterial to a collector (two-lane, undivided). The segment currently has four travel lanes and transitions to two travel lanes east of Nearing Drive. The proposed Class II bicycle lanes will address concerns of speeding, bicyclists riding on the wrong side of the roadway, and bicyclist and pedestrian conflicts on the sidewalk. This amendment request is associated with the Orange County Complete Streets Program.

The MPAH buildout network was modeled to forecast 2025 traffic conditions. The model indicates that this segment on Orangewood Avenue will have 9,000 daily vehicles with the proposed amendment. These traffic volumes are well within the acceptable level of service for collector streets, which typically accommodate up to 10,000 average daily traffic. As such, the proposed reclassification does not result in any significant impacts on the MPAH system.

ATTACHMENT O

Status Report on Pending Master Plan of Arterial Highways Amendments

#	City	Street	From	To	Type of Amendment	Status	Board Approval Date
1	Brea / County of Orange	Tonner Canyon Road	Brea Canyon Road	Planned Valencia Avenue	Delete	Amendment expired, requires City to submit a new request.	7/12/2021
2	Brea / County of Orange	Valencia Avenue	Carbon Canyon Road	Planned Tonner Canyon Road	Delete	Amendment expired, requires City to submit a new request.	7/12/2021
3	Costa Mesa	Bluff Road	19th Street	Victoria Street	Delete	On hold pending final consensus between Costa Mesa and Newport Beach on circulation plans.	
4	Costa Mesa	19th Street	Placentia Avenue	west city limit	Reclassify from primary to divided collector	On hold pending final consensus between the cities of Costa Mesa and Newport Beach on circulation plans.	
5	County of Orange / Irvine	Jeffrey Road	SR-241	Santiago Canyon Road	Delete	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	5/8/2017
6	Santa Ana/Orange	Fairhaven Avenue	Grand Avenue	Tustin Avenue	Reclassify from secondary to divided collector	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	11/9/2020
7	Irvine	Red Hill Avenue	MacArthur Boulevard	Main Street	Reclassify from major to primary	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	4/10/2023
8	Fullerton	Associated Road	Bastanchury Road	Imperial Highway	Reclassify from a secondary to a collector	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	4/10/2023
9	County	Villa Park Road	Hewes Street	Cannon Street	Reclassify from a major to a asymmetric primary	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	9/9/2024
10	County	Santiago Canyon Road	SR-241	Live Oak Canyon Road	Reclassify	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	9/9/2024
11	County	El Toro Road	Live Oak Canyon Road	Portola Parkway	Reclassify	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	9/9/2024
12	County	Black Star Canyon Road	Silverado Canyon Road	Orange County/Riverside County Line	Delete	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	9/9/2024
13	County	Bucker Way	Ranch Canyon Road	Coyotes Road	Reclassify	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	9/9/2024
14	County	Ranch Canyon Road	Bucker Way	Cow Camp Road	Reclassify	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	9/9/2024
15	Fullerton	Harbor Boulevard	Bastanchury Road	Berkeley Avenue	Reclassify	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	9/9/2024

Status Report on Pending Master Plan of Arterial Highways Amendments

#	City	Street	From	To	Type of Amendment	Status	Board Approval Date
16	Laguna Hills	Paseo De Valencia	Alicia Parkway	Cabot Road	Reclassify	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	9/9/2024
17	Laguna Hills	Cabot Road	Paseo De Valencia	El Paseo	Reclassify	The amendment was conditionally approved by the Board. Waiting for documentation confirming completion of CEQA and general plan change.	9/9/2024
18	Irvine	Yale Avenue	University Drive	Michelson Drive	Reclassify	Amendment will be presented to the Board for consideration 4/14/2025.	
19	Costa Mesa	Merrimac Way	Fairview Road	Harbor Boulevard	Reclassify	Amendment will be presented to the Board for consideration 4/14/2025.	
20	Stanton	Orangewood Avenue	Santa Rosalia Street	Eastern city boundary	Reclassify	Amendment will be presented to the Board for consideration 4/14/2025.	
21	Anaheim	Weir Canyon Road	Blue Sky Road	SR-241	Delete	Amendment will be presented to the Board for consideration 4/14/2025.	
MOU	Costa Mesa/ Fountain Valley/ Huntington Beach	Garfield Avenue/ Gisler Avenue Crossing over the Santa Ana River	Santa Ana River Westbank	Santa Ana River Eastbank	Delete	MOU close out and an associated amendment will be presented to the Board for consideration 4/14/2025.	

Board – Board of Directors
CEQA – California Environmental Quality Act
MOU – Memorandum of understanding
MPAH – Master Plan of Arterial Highways
OCTA - Orange County Transportation Authority
SR-241 – State Route 241

OCTA

April 7, 2025

To: Regional Transportation Planning Committee

From: Darrell E. Johnson, Chief Executive Officer

Subject: Capital Programming Update

Overview

The Orange County Transportation Authority uses a combination of federal, state, and local funding sources to plan and deliver Board of Directors-approved capital improvement and transit projects, including those promised in the voter-approved sales tax program, Measure M2. As projects advance through the various stages of development, funding sources and amounts are updated and adjusted to reflect the most current cost estimates and to maximize the benefit of local sales tax dollars. Board of Directors' authorization is requested to commit funding for current and planned projects as further described herein.

Recommendations

A. Authorize the use of up to $180.584 million to fund the construction phase and adjust costs associated with prior phases for the State Route 55 Improvement Project from Interstate 5 to State Route 91 (Project F) using Measure M2 funding.

B. Authorize the use of up to $334.367 million to fund the construction phase and adjust costs associated with prior phases for the State Route 91 Improvement Project from La Palma Avenue to State Route 55 (Segment 2) (Project I), using the following funding sources:
   - 91 Express Lanes Excess Revenue ($323.726 million)
   - Local Partnership Program – Formulaic ($6.641 million)
   - Community Project Funding / Congressionally Directed Spending ($4.000 million)

C. Authorize the use of up to an additional $132.149 million to supplement the construction funding and prior phase funding for the Interstate 5 Improvement Project from Interstate 405 to Yale Avenue (Segment 1) (Project B) using Measure M2 funding.

D. Authorize the use of up to an additional $80.172 million to supplement the construction funding and prior phase funding for the State Route 91 (Segments 1 and 3) (Project I) using 91 Express Lanes Excess Revenue.

E. Authorize the use of up to an additional $14.699 million to supplement the construction funding and prior phase funding for the Interstate 605/Katella Avenue Interchange Project (Project M) using Measure M2 funding.

F. Authorize the inclusion of $39.251 million in committed State Highway Operations and Protection Program funds and an additional $22.769 million in uncommitted future state funds to integrate the California Department of Transportation Multi-Asset Project into the Capital Funding Program report for:
- Interstate 5 Improvement Project between Interstate 405 and Yale Avenue (Segment 1) (Project B) ($36.400 million in committed State Highway Operations and Protection Program funds and $13.744 million in uncommitted future state funds)
- State Route 91 Improvement Project from Acacia Street to La Palma Avenue (Segment 3) (Project I) ($2.851 million in committed State Highway Operations and Protection Program funds and $9.025 million in uncommitted future state funds)

G. Authorize the use of up to $8.000 million for the Inland Slope Rehabilitation Phase II Project from the following fund sources:
- Measure M2 ($5.600 million)
- Local Partnership Program – Formulaic ($2.400 million)

H. Authorize the use of up to $12.830 million in Congestion Mitigation and Air Quality Improvement funds for the Future Zero-Emission Bus Project.

I. Authorize staff to process all necessary amendments to the Federal Transportation Improvement Program and execute or amend all necessary agreements to facilitate the above actions.

Background

The Orange County Transportation Authority (OCTA) is underway with a robust program of Board of Directors (Board)-approved capital projects that support OCTA's mission to develop and deliver transportation solutions to enhance the quality of life and keep Orange County moving, and to continue delivering on promises made to voters through the Measure M2 (M2) half-cent sales tax program.

As projects advance through development, several different factors may influence cost and funding including cost changes as the project is further developed, funding requirements may limit the anticipated use of funds, opportunities to maximize external funding may arise, savings may be identified, and additional or different funding may be required. Staff regularly provides project updates for specific freeway and transit project costs individually and through the quarterly Capital Action Plan (CAP), which highlights project costs, schedules, and status.

Board action to update funding amounts and sources for projects is periodically requested, consistent with revised project needs as the project advances to the next phase of delivery. This item recommends adjustments to individual project funding by project phase to match actual and updated project costs and seeks approval to program the funds necessary for Board-approved freeway and transit improvements promised to the public throughout Orange County.

The Board has approved a set of policies, referred to as the Capital Programming Policies (CPP), that guide how OCTA uses federal, state, and local formula funds, such as Congestion Mitigation and Air Quality Improvement Program (CMAQ), Local Partnership Program – Formula (LPP-F), and 91 Express Lane (91 EL) Excess Revenues funds (Attachment A). The Board also previously took action to approve the policy regarding the use of 91 EL funds for M2 Freeway Project I on State Route 91 (SR-91).

Consistent with M2 and the CPP, staff recommends the use of external funds whenever possible to maximize the benefit of local funds. One fund source recommended in this item is LPP-F, which funds transportation improvements in jurisdictions that have voter-approved taxes dedicated to transportation such as the M2 program. On August 15, 2024, the California Transportation Commission (CTC) adopted LPP guidelines for the fifth round of LPP-F. OCTA's share is approximately $18.821 million. The Board previously approved the use of approximately $9.780 million of this funding for a separate project. This item will address the use of the remaining unprogrammed funds.

The State Highways Operation and Protection Program (SHOPP) funds are prioritized by the state to maintain and operate the state highways. Use of these funds is not governed by OCTA policies. However, OCTA and the California Department of Transportation (Caltrans) are integrating planned M2 freeway improvements and state highway maintenance projects, referred to as multi-asset projects (MAP). When OCTA M2 freeway projects and Caltrans MAP are combined into one construction package, the Caltrans SHOPP funds are included in the OCTA CAP project funding plans.

Discussion

Programming staff refers to the CAP and works directly with OCTA project managers to develop funding plans for Board-approved planned and ongoing projects that have met key milestones or require other adjustments. Other projects that may be developed outside of the CAP are also reviewed and may be recommended for funding adjustments through a similar process as appropriate.

Freeway Projects

Two M2 freeway improvement projects have progressed to final design and are recommended for construction funding:

- The State Route 55 (SR-55) Improvement Project from Interstate 5 (I-5) to SR-91 (Project F)
- The SR-91 Improvement Project from La Palma Avenue to SR-55 (Segment 2) (Project I)

Both projects, currently funded through the right-of-way (ROW) phase, are targeted for construction completion by 2030 in the updated Next 10 Delivery Plan, adopted by the Board on November 12, 2024.

Staff recommends the use of 91 EL, M2, LPP-F, and Community Project Funding/ Congressionally Directed Spending (CPF/CDS) as outlined in the table below. The recommended funding will support the construction phase. Additional changes to prior phases are also included to match actual costs. The combined funding need to meet the estimated cost is $514.951 million. Project descriptions, funding justifications, and the funding breakdown for all phases of work are provided in Attachment B.

Existing Funding through ROW (000s)	91 EL	M2	STBG	HIP	Total
SR-55, I-5 to SR-91	$ -	$ 11,045	$ 8,359	$ 2,641	$ 22,045
SR-91, La Palma Avenue to SR-55 (Segment 2)	$ 42,814	$ 40	$ 3,460	$ -	$ 46,314
Total	**$ 42,814**	**$ 11,085**	**$ 11,819**	**$ 2,641**	**$ 68,359**

STBG – Surface Transportation Block Grant
HIP – Highway Infrastructure Program

Recommended Funding (000s)	91 EL	M2	LPP-F	CPF/CDS	Total
SR-55, I-5 to SR-91	$ -	$180,584	$ -	$ -	$180,584
SR-91, La Palma Avenue to SR-55 (Segment 2)	$323,726	$ -	$ 6,641	$ 4,000	$334,367
Total	**$323,726**	**$180,584**	**$ 6,641**	**$ 4,000**	**$514,951**

Four additional M2 freeway improvement projects are recommended for supplemental funding due to revised cost estimates and adjustments to prior phases:

- The I-5 Improvement Project from Interstate 405 (I-405) to Yale Avenue (Segment 1) (Project B)
- The SR-91 Improvement Project from SR-55 to Lakeview Avenue (Segment 1) (Project I)
- The SR-91 Improvement Project from Acacia Street to La Palma Avenue (Segment 3) (Project I)
- The Interstate 605 (I-605) and Katella Avenue Interchange (Project M)

The I-5 Improvement Project from I-405 to Yale Avenue (Segment 1) and the SR-91 Improvement Project from Acacia Street to La Palma Avenue (Segment 3) have both reached 100 percent design, and the project cost estimates have been updated. The updated costs include escalated material costs, additional items that were not included in the environmental phase estimate, and design updates based on revised Caltrans standards and requirements. These projects were previously approved by the Board for construction funding.

On October 16, 2024, bids were opened by Caltrans for the SR-91 Improvement Project from SR-55 to Lakeview Avenue (Segment 1). A total of five bidders submitted bids for the project. The low bid came in 14.11 percent higher than the project engineer's estimate. Caltrans, as the lead agency for the construction phase, completed the bid review and awarded the contract to the lowest bidder. Additional construction capital funds are required to address the funding shortfall for the awarded construction contract value.

On January 23, 2025, the project bids were opened by Caltrans for the I-605 Katella Avenue Interchange, and the apparent low bidder came in 6.4 percent higher than the project engineer's estimate. Caltrans and OCTA have analyzed the bid results, and staff is recommending additional funding for construction capital and construction support activities.

The above four projects combined funding need is $227.020 million as outlined in the table below and are recommended to use up to $80.172 million in 91 EL for the SR-91 projects and $146.848 million in M2 for the I-5 and I-605 projects. OCTA will continue to assess competitive grant opportunities for the SR-91 project and the use of 91 EL revenues will be adjusted if OCTA receives a grant. Project descriptions, funding justifications, and a funding breakdown are provided below and in additional detail provided in Attachment B.

Existing Funding (000s)	Federal [1]	State [2]	Local [3]	Total
I-5, I-405 to Yale Avenue (Segment 1)	$ 52,894	$ 106,712	$ 46,188	$ 205,794
SR-91, SR-55 to Lakeview Avenue (Segment 1)*	$ 6,770	$ 42,566	$ 61,181	$ 110,517
SR-91, Acacia Street to La Palma Avenue (Segment 3)	$ 4,770	$ -	$ 159,722	$ 164,492
I-605/Katella Avenue Interchange	$ 17,800	$ -	$ 20,515	$ 38,315
Total	**$ 82,234**	**$ 149,278**	**$ 287,606**	**$ 519,118**

1. Federal funding includes CPF/CDS, National Highway Performance Program, and STBG.
2. State funding includes LPP-F, State Transportation Improvement Program, and Trade Corridor Enhancement Program.
3. Local funding includes 91 EL and M2.

*The SR-91 Improvement Project from SR-55 to Lakeview Avenue (Segment 1) funding table does not include the associated Caltrans MAP which is currently programmed with $7.968 million in SHOPP and is being implemented with this project.

Funding Need (000s)	91 EL	M2	Total
I-5, I-405 to Yale Avenue (Segment 1)	$ -	$ 132,149	$ 132,149
SR-91, SR-55 to Lakeview Avenue (Segment 1)	$ 22,260	$ -	$ 22,260
SR-91, Acacia Street to La Palma Avenue (Segment 3)	$ 57,912	$ -	$ 57,912
I-605/Katella Avenue Interchange	$ -	$ 14,699	$ 14,699
Total	**$ 80,172**	**$ 146,848**	**$ 227,020**

The Caltrans MAP within the limits of the I-5 Improvement Project from I-405 to Yale Avenue is recommended to be added into the Capital Funding Program (CFP) report (Attachment C). This project is being supported and administered by Caltrans as part of the overall freeway improvement project. The I-5 from I-405 to Yale Avenue MAP components include grinding and overlaying hot mix asphalt along the freeway mainline and the introduction of new weigh-in-motion facilities. Integrating the I-5 from I-405 to Yale Avenue MAP components allows for concurrent construction rather than sequential construction in the interest of efficiency and minimizing public impacts.

The SHOPP funding that Caltrans has committed for the I-5 from I-405 to Yale Avenue MAP is $36.400 million. OCTA has identified additional contingency and other costs, which are typical for OCTA projects, that yield a total estimated construction cost for the MAP to be $50.144 million. Caltrans is responsible for all costs associated with the I-5 from I-405 to Yale Avenue MAP, and staff is recommending that the total estimated cost be included in the CFP, which results in the inclusion of $13.744 million in unidentified, uncommitted future state funds, assuming Caltrans will provide the funding, when needed and as specified in the executed cooperative agreement with Caltrans.

Similarly, the project costs for the MAP which will be delivered in conjunction with the SR-91 Improvement Project from Acacia Street to La Palma Avenue (Segment 3) have increased by $11.876 million from what is currently listed in the CFP to $35.046 million. The SR-91 from Acacia Street to La Palma Avenue MAP

will include pavement rehabilitation, safety device upgrades, traffic census stations, updated smart street lighting, and electrical system upgrades. Like the previous MAP, OCTA has identified additional contingency and other costs which must be shown as funded in the CFP. The increase is partially supported by an additional $2.851 million in committed SHOPP funds. The difference of $9.025 million is recommended to be included in the CFP as future uncommitted state funds. Caltrans is responsible for all costs associated with the MAP. The inclusion of the additional committed SHOPP and future state funds will allow the project cost and potential funding to match the CAP quarterly report that was presented to the Board on February 10, 2025.

Transit Projects

There are two transit projects which are recommended for a total of $20.830 million in federal, state, and local funds:

- Inland Slope Rehabilitation Phase II – Along the OCTA-owned railroad ROW, several locations are experiencing significant soil instability and slope erosion in the cities of Laguna Niguel, Lake Forest, and Mission Viejo. The slope rehabilitation project will stabilize the slopes through different techniques including spraying concrete on the exposed slope faces, compacting slopes, and introducing new vegetation where appropriate to ensure long-term stability.
- Future Zero-Emission Bus (ZEB Project) – The project will help OCTA to achieve compliance with the California Air Resources Board's (CARB) Innovative Clean Transit (ICT) regulation and meet the ZEB deployment and transition goals.

The recommended fund sources include LPP-F, CMAQ, and M2 funds. Project descriptions, funding justifications, and a funding breakdown are provided in Attachment B.

Funding Need (000s)	CMAQ	M2	LPP-F	Total
Inland Slope Rehabilitation Phase II	$ -	$ 5,600	$ 2,400	$ 8,000
Future ZEB	$ 12,830	$ -	$ -	$ 12,830
Total	**$ 12,830**	**$ 5,600**	**$ 2,400**	**$ 20,830**

Staff is recommending $2.4 million in LPP-F and $5.6 million in M2 to fully fund the Inland Slope Rehabilitation Phase II Project.

On December 12, 2022, the Board approved $16.5 million in CMAQ for the design phase of the I-5 High-Occupancy Vehicle Project (HOV Project) from Avenida Pico to the Orange County/San Diego County Line. This funding must be obligated to a project by September 30, 2026. However, the design phase has been delayed due to recently enacted vehicle miles traveled mitigation

requirements as part of the current environmental process. That delay and new requirements have resulted in a significant cost increase to the design phase. To ensure the timely use of funds, staff proposes redirecting and using up to $12.830 million of this CMAQ funding for the future ZEB Project. The remaining $3.67 million in CMAQ funding was previously approved by the Board on February 10, 2025, to be allocated to a 2023 Orange County Complete Streets Program (OCCSP) Project as part of the Competitive Grant Programs – Update and Recommendations item. Funding recommendations for the design of the I-5 HOV Project will be presented at a later date, when issues around the required environmental mitigations have been resolved.

The CFP is included as Attachment C. It is a report that provides a summary of how OCTA's capital projects are currently funded and is updated with every funding action for capital projects, including the proposed changes in this item.

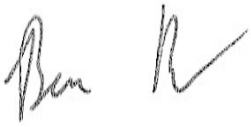
Summary

To ensure that OCTA projects are fully funded, external funds are maximized, and funding levels are consistent with the estimate at completion listed in the quarterly CAP, staff is seeking Board approval to use federal, state, and local funds for six freeway projects and two transit projects.

Attachments

A. Capital Programming Policies by Fund Source, December 2021
B. Capital Programming Update Project Descriptions
C. Capital Funding Program Report

Prepared by:



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Capital Programming Policies by Fund Source
December 2021

Equity Consideration for All Funding Programs: In addressing the mobility needs of the County, the Orange County Transportation Authority (OCTA) will consider both benefits and impacts of improvements to low-income and disadvantaged communities, with the goal of improving transportation and mobility options.	
Funding Source	Updated Measure M2 (M2) Programming Policies
M2 Programs	
Projects A-M (Freeway projects on Interstate 5, State Route 22, State Route 55, State Route 57, State Route 91, Interstate 405, and Interstate 605)	Use projects A-M M2 funding consistent with the M2 Transportation Investment Plan (TIP), the M2020 Plan, and subsequent Board of Directors (Board)-approved plans and updates to the M2 Program. Program funds to projects through formal programming actions.
Freeway Environmental Mitigation Program (Tied to projects A-M)	Utilize five percent net revenues derived from M2 funding for projects A-M consistent with the M2 TIP, the M2020 Plan, and subsequent Board-approved plans and updates to the M2 Program. Program funds to projects through Board-approved actions for needed environmental mitigation projects.
Project N (Freeway Service Patrol)	Use Project N funds for the Freeway Service Patrol Program. Funds are programmed through the annual budget process.
Project O (Regional Capacity Program) and Project P (Regional Traffic Signal Synchronization Program)	Use Project O and Project P M2 funding consistent with Measure M Ordinance No. 3, and consistent with the Comprehensive Transportation Funding Programs (CTFP) guidelines. Program funds to projects through the cyclical CTFP call for projects (call) programming recommendations
Project R (High-Frequency Metrolink Service)	Use Project R M2 funding consistent with the M2 TIP, with the latest Next 10 Delivery Plan (Next 10 Plan), the Comprehensive Business Plan, and subsequent Board-approved plans and updates to the M2 Program. Program funds to projects through formal programming actions.
Project S (Transit Extensions to Metrolink) and Project T (Metrolink Gateways)	Use Project S and Project T M2 funding consistent with the M2 TIP, and consistent with CTFP guidelines. Program funds to projects through formal call awards. Supplemental funds for approved competitive projects may be changed through Board action.
Project U (Expand Mobility Choices for Seniors and Persons with Disabilities)	Use Project U M2 funds, consistent with Measure M Ordinance No. 3, the Comprehensive Business Plan, and subsequent Board-approved plansand updates to the M2 Program. Funds are programmed through the annual budget process.

Capital Programming Policies by Fund Source
December 2021

Funding Source	Updated Measure M2 (M2) Programming Policies
Project V (Community-Based Transit Circulators) and Project W (Safe Transit Stops)	Use Project V and Project W M2 funding consistent with the M2 TIP, and consistent with CTFP guidelines. Program funds to projects through formal call awards and/or Board action. Funds for the OCTA-approved projects may be programmed through Board action.
Project X (Environmental Cleanup)	Use Project X M2 funding consistent with the M2 TIP and consistent with CTFP guidelines. Program funds to projects through the CTFP call. The Environmental Cleanup Program consists of two programs. The Tier 1 Grant Program is designed to mitigate the more visible forms of pollution. Tier 1 consists of funding for equipment purchases and upgrades to existing catch basins and related devices such as screens, filters, and inserts. The Tier 2 Grant Program consists of funding regional, multi-jurisdictional, and capital-intensive projects, such as constructed wetlands, detention/infiltration basins, and bioswales.
Funding Source/Agency	Other Local Funding Programming Policies
91 Express Lanes Excess Revenues/OCTA	Please see the Policy for the Use of Excess 91 Express Lanes Toll Revenue finalized through Board action on June 9, 2014.
County Transportation Commission/Mobile Source Air Pollution Reduction Review Committee (MSRC)	Prioritize activities that encourage transit ridership and support zero-emission bus initiatives. Depending on work program criteria, submit OCTA priority projects that meet program criteria, and work to support a return to source program for Orange County through all MSRC programs, including but not limited to freight focused programs. Funds are programmed through formal programming action.
Funding Source/Agency	State and Federal Programming Policies
All State and Federal Fund Sources and New Funding Programs	OCTA's goal for external funding is to be successful in increasing the use of external funds and decrease the use of local funds, when possible. First priority of all funding sources, when consistent with the funding agency priority and policies, is to fulfill commitments to the latest Next 10 Plan, specifically M2 projects, and to maintain existing OCTA assets in a state of good repair and support OCTA priorities. Consideration will be given to use state and federal funds for projects that are complementary to M2 projects and that share the M2 Program goals to reduce congestion, strengthen the economy, and improve the quality of life. All fund sources must be programmed through formal programming actions.

Capital Programming Policies by Fund Source
December 2021

State	
Funding Source/Agency	State Programming Policies
Active Transportation Program (ATP) – Southern California Association of Governments (SCAG) Regional Selection (Formula)/California Transportation Commission (CTC)/SCAG	OCTA, through Board action, will establish prioritization criteria, based on regional planning for SCAG regional call through Board action with every cycle.
Cap-and-Trade (Formula) – Low Carbon Transit Operations Program (LCTOP)/California Department of Transportation (Caltrans)	Use LCTOP for transit operations or capital for expansion of bus transit service, fare reduction programs, and other bus and commuter rail transit efforts that increase ridership and reduce greenhouse gas (GHG) emissions, where 50 percent of the funds provide benefit for passengers in disadvantaged communities, as appropriate. Funds generated from commuter rail service in Orange County may be used in Orange County for the expansion of commuter rail service, fare reduction programs for commuter rail, and other eligible commuter rail efforts that increase ridership and reduce GHG emissions.
SB 1 (Chapter 5, Statutes of 2017)- Local Partnership Program (LPP) – Formula/CTC	Use LPP for ready-to-deliver committed and prioritized projects which are compatible with state goals and seek to balance funds between freeways, streets and roads, transit capital, and eligible environmental clean-up and based on the timing for the request for project nominations.
SB 1 - State of Good Repair (SGR)/Caltrans	Use funds for bus transit capital projects and for maintenance, rehabilitation, and replacement of existing OCTA transit assets. Funds may be used for transit operations, if allowed by the state.
SB 1 - Trade Corridors Enhancement Program (TCEP)/CTC	Use TCEP for eligible trade corridor projects that meet the requirements and goals of the program.
State Transportation Improvement Program (STIP)/CTC	Use STIP for eligible transit capital, freeway, traffic system management, complete streets, commuter rail, fixed-guideway projects, planning/programming, and complementary activities, which seek an equitable balance among all modes and are consistent with state goals.

Capital Programming Policies by Fund Source
December 2021

Funding Source/Agency	State and Federal Programming Policies
Federal	
Congestion Mitigation and Air Quality (CMAQ)/Caltrans for Federal Highways Administration (FHWA)	Use CMAQ funding for: • Fixed-guideway and/or high-occupancy vehicle or high-occupancy toll operational improvements, • vanpool program and rideshare services, • rail and bus transit capital projects, • traffic light synchronization projects, • new or expanded transit operations (three years of CMAQ funding may be used for the first five years), and • eligible bicycle and pedestrian projects. All projects that use CMAQ funds must demonstrate a quantifiable air quality benefit. Projects must be recommended based on performance.
Federal Transit Administration (FTA) Section 5307 Formula/FTA	Use funds to support ongoing transit operations and SGR through (not in priority order): • Preventive maintenance, • capital cost of contracting, and • bus replacement. Lower priority but eligible if funding available: • Other priority capital projects that are consistent with the Comprehensive Business Plan. Set-Asides: Up to 20 percent for paratransit operating assistance, one percent for transit security (unless funded using local, state, or other federal funds), and percent of funds generated by rail operations to be used for rail operations and capital projects.
FTA Section 5310 Formula/FTA	Use funds for eligible enhancements to paratransit capital and operations.

Capital Programming Policies by Fund Source
December 2021

Funding Source/Agency	Federal Programming Policies
FTA Section 5337 Formula/FTA	Use funds for commuter rail rehabilitation and/or renovation projects, for capital projects that maintain and/or replace equipment and facilities to keep the commuter rail system in a state of good repair, and for preventive maintenance. Use funds generated by express bus transit for bus transit capital maintenance. Use of funding must also benefit OCTA Express bus services.
FTA Section 5339 Formula/FTA	Use funds for: • Capital maintenance, • capital cost of contracting, • bus replacement, and • other bus capital projects as identified in the Transit Asset Management Plan.
Highway Infrastructure Program/Caltrans for FHWA	Use funds for M2 Freeway Program (consistent with the latest Next 10 Plan).
National Highway Freight Program/CTC for FHWA	These funds are administered by the state through the TCEP (see TCEP above).
Surface Transportation Block Grant Program - Formerly the Regional Surface Transportation Program/Caltrans for FHWA	Use funds for M2 Freeway Program (consistent with the latest Next 10 Plan) and for other non-M2 freeway projects that are complementary with the M2 freeway program, local streets and roads, and bicycle, pedestrian, and/or Complete Streets projects. Funds may also be used for countywide planning activities up to five percent annually Projects will be recommended based on performance.
Transportation Alternatives Program – CTC/SCAG through ATP	These funds are administered by the state through the ATP. See ATP above.

ATTACHMENT B

Capital Programming Update Project Descriptions

State Route 55 (SR-55) Improvement Project from Interstate 5 (I-5) to State Route 91 (SR-91)

In the cities of Anaheim, Orange, Santa Ana, and Tustin, the SR-55 Improvement Project from I-5 to SR-91 will add one general purpose lane in each direction between I-5 and State Route 22 (SR-22) and include operational improvements between SR-22 and SR-91. Existing traffic volumes, traffic congestion, and travel delays along the SR-55 corridor are anticipated to grow as a result of forecasted increases in population, housing, and employment. The objective of the project is to reduce traffic congestion, improve mobility, and improve traffic operations. The project is funded through the right-of-way (ROW) phase.

Staff is recommending $172.430 million in Measure M2 (M2) for construction and construction support for this project, which is Project F in the Next 10 Delivery Plan (Next 10 Plan). Additionally, the table below acknowledges downward adjustments to Project Approval/Environmental Documentation (PA/ED) and Plans, Specifications, and Estimates (PS&E) to reflect actual costs that have been incurred. The ROW cost estimate has increased due to the project requiring the acquisition of temporary construction easements or permanent easements from three additional privately-owned parcels. The total M2 funding requested is $180.584 million. This recommendation is consistent with the Capital Programming Policies (CPP) regarding the use of M2 funds.

Existing Funding ($000s)	**STBG**	**M2**	**HIP**	**Total**
PA/ED	$5,000	-	-	$5,000
PS&E	$3,359	$5,000	$2,641	$11,000
ROW	-	$6,045	-	$6,045
CON	-	-	-	$0
TOTAL	**$8,359**	**$11,045**	**$2,641**	**$22,045**

Proposed Funding ($000s)	**STBG**	**M2**	**HIP**	**Total**
PA/ED	$4,506	-	-	$4,506
PS&E	$3,359	$4,294	$2,641	$10,294
ROW	-	$14,905	-	$14,905
CON	-	$172,430	-	$172,430
TOTAL	**$7,865**	**$191,629**	**$2,641**	**$202,135**
CHANGE	-$494	$180,584	-	$180,090

CON – Construction
HIP – Highway Infrastructure Program
STBG – Surface Transportation Block Grant

SR-91 Improvement Project from La Palma Avenue to SR-55 (Segment 2)

In the City of Anaheim, the SR-91 Improvement Project from La Palma Avenue to SR-55 (Segment 2) will add one general purpose lane in the eastbound (EB) direction on SR-91 from La Palma Avenue to SR-55, widen the EB Santa Ana River bridge, and reconstruct the Glassell Street/Kraemer Boulevard and Tustin Avenue bridges over the SR-91. The project aims to further optimize traffic operations and reduce congestion. The project is funded through the ROW phase.

Staff recommends the use of $323.726 million in 91 Express Lanes (91 EL) Excess Revenues, $4 million in Community Project Funding/Congressionally Directed Spending (CPF/CDS), and $6.641 million in SB 1 (Chapter 5, Statutes of 2017) Local Partnership Program Formulaic (LPP-F) funding for the project. Additionally, staff is requesting adjustments for PA/ED, PS&E, and ROW to reflect actual costs or updated cost estimates. The construction cost estimate has increased to include the most up-to-date cost estimates, which consider escalated material costs, additional items not included in the environmental phase, and design updates based on revised California Department of Transportation (Caltrans) standards and requirements. The ROW cost estimate was also updated to include additional acquisition costs. This is Project I in the Next 10 Plan and this recommendation is consistent with the CPP regarding the use of 91 EL and LPP-F funds. It is also consistent with a separate Board of Directors (Board)-adopted policy that allows the use of 91 EL for M2 freeway projects on SR-91. CPF/CDS funds are specifically directed by the United States Congress for the SR-91 project.

Existing Funding ($000s)	STBG	M2	91 EL	Total
PA/ED	$3,460	$40	-	$3,500
PS&E	-	-	$14,648	$14,648
ROW	-	-	$28,166	$28,166
CON	-	-	-	-
TOTAL	**$3,460**	**$40**	**$42,814**	**$46,314**

Proposed Funding ($000s)	STBG	M2	91 EL	CPF/CDS	LPP-F	Total
PA/ED	$3,460	$40	$950	-	-	$4,450
PS&E	-	-	$20,095	-	-	$20,095
ROW	-	-	$31,278	-	-	$31,278
CON	-	-	$314,217	$4,000	$6,641	$324,858
TOTAL	**$3,460**	**$40**	**$366,540**	**$4,000**	**$6,641**	**$380,681**
CHANGE	-	-	$323,726	$4,000	$6,641	$334,367

I-5 Improvement Project from Interstate 405 (I-405) to Yale Avenue (Segment 1)

The I-5 Improvement Project from I-405 to Yale Avenue (Segment 1) will add one mixed-flow lane in both directions in the City of Irvine. This segment of the I-5 corridor is experiencing congestion and long traffic delays due to demand exceeding capacity. The project will reduce corridor traffic congestion, improve traffic operations, and improve access to high-occupancy vehicle lanes.

Staff is recommending the use of an additional $132.149 million in M2 for the project. The project cost estimates were last updated in 2021 when the project report was finalized. The construction cost estimate has increased to include the most up-to-date cost estimates, which consider escalated material costs, additional items not included in the environmental phase, and design updates based on revised Caltrans standards and requirements. As part of this request, staff is recommending adjustments to PS&E and ROW to reflect actual costs or updated cost estimates. PS&E has increased to include the most up-to-date cost estimates and ROW has increased to include additional utility relocation costs. This is Project B in the Next 10 Plan and the recommendations are consistent with the CPP regarding the use of M2 funds.

Existing Funding ($000s)	STBG	M2	STIP	NH	LPP-F	Total
PA/ED	$4,473	-	-	-	-	$4,473
PS&E	-	$7,396	-	-	$7,395	$14,791
ROW	-	$100	-	$5,421	$3,979	$9,500
CON	$43,000	$38,692	$95,338	-	-	$177,030
TOTAL	**$47,473**	**$46,188**	**$95,338**	**$5,421**	**$11,374**	**$205,794**

Proposed Funding ($000s)	STBG	M2	STIP	NH	LPP-F	Total
PA/ED	$4,473	-	-	-	-	$4,473
PS&E	-	$8,642	-	-	$7,395	$16,037
ROW	-	$2,131	-	$5,421	$3,979	$11,531
CON	$43,000	$167,564	$95,338	-	-	$305,902
TOTAL	**$47,473**	**$178,337**	**$95,338**	**$5,421**	**$11,374**	**$337,943**
CHANGE		$132,149	-	-	-	$132,149

STIP – State Transportation Improvement Program NH – National Highway Performance Program

I-5 Improvement Project from I-405 to Yale Avenue (Segment 1) Multi-Asset Project (MAP)

The State Highway Operation and Protection Program (SHOPP) funding for the Caltrans MAP will be added as a separate project into the Capital Funding Program (CFP) report so staff can keep track of this as part of the larger project. However, this funding is directly programmed by Caltrans. The MAP components include grinding and overlaying hot mix asphalt along the freeway mainline, as well as the introduction of new weigh-in-motion facilities in both northbound (NB) and southbound (SB) directions.

OCTA has identified additional contingency, outreach, and other costs that should be included. Caltrans is still responsible for all costs associated with the MAP and staff is recommending listing the total project cost of $50.144 million, which includes $13.744 million in uncommitted future state funds in the CFP report. These funds are for the CON phase and the inclusion of SHOPP and future state funds in the CFP will match the costs outlined in the Capital Action Plan that is presented to the Board quarterly.

Proposed Funding ($000s)	SHOPP	Future State Funds	Total
TOTAL	**$36,400**	**$13,744**	**$50,144**

SR-91 Improvement Project from SR-55 to Lakeview Avenue (Segment 1)

The SR-91 Improvement Project from SR-55 to Lakeview Avenue will improve operations, reliability, safety, and throughput, thereby improving the economic vitality of Orange County and beyond. The project will realign the westbound (WB) on-ramp to direct traffic to WB SR-91, construct a new drop ramp that will connect the Lakeview Avenue bridge directly to the southbound SR-55, separate traffic on WB SR-91 from SB SR-55, and replace the Lakeview Avenue bridge with standard lanes, shoulders, and sidewalks in each direction. These improvements will help improve safety, reduce collisions, and add connections to the regional Santa Ana River Trail.

This project was initially approved for funding on July 10, 2023. On October 16, 2024, the project bids were opened by Caltrans and the apparent low bid came in 14.11 percent higher than the project engineer's estimate. Due primarily to this, the project needs additional funding and $22.260 million in 91 EL funding is being requested for the project. PA/ED and PS&E adjustments are due to the additional coordination needed for the MAP, and ROW is being adjusted downward due to updated cost estimates. This is Project I in the Next 10 Plan and is consistent with the CPP regarding the use of 91 EL funds. It is also consistent with a separate Board-adopted policy that allows the use of 91 EL for M2 freeway projects on SR-91.

Existing Funding ($000s)	STBG	M2	TCEP	91 EL	CPF/CDS	Total*
PA/ED	$1,770	$30	-	-	-	$1,800
PS&E	-	-	-	$8,503	-	$8,503
ROW	-	-	-	$5,926	-	$5,926
CON	-	-	$42,566	$46,722	$5,000	$94,288
TOTAL	**$1,770**	**$30**	**$42,566**	**$61,151**	**$5,000**	**$110,517**

Proposed Funding ($000s)	STBG	M2	TCEP	91 EL	CPF/CDS	Total
PA/ED	$1,770	$30	-	$430	-	$2,230
PS&E	-	-	-	$8,837	-	$8,837
ROW	-	-	-	$2,046	-	$2,046
CON	-	-	$42,566	$72,098	$5,000	$119,664
TOTAL	**$1,770**	**$30**	**$42,566**	**$83,411**	**$5,000**	**$132,777**
CHANGE	-	-	-	$22,260	-	$22,260

TCEP – Trade Corridor Enhancement Program

*The SR-91 Improvement Project from SR-55 to Lakeview Avenue (Segment 1) funding table does not include the associated Caltrans MAP which is currently programmed through all phases of work with $7.968 million in SHOPP and is being implemented with this project.

SR-91 Improvement Project from Acacia Street to La Palma Ave (Segment 3)

The SR-91 Improvement Project between Acacia Street and La Palma Avenue (Segment 3) will provide WB operational improvements between Acacia Street and La Palma Avenue, WB improvements at State College Boulevard, and reconstruction of the La Palma Avenue overcrossing bridge. The project will also provide a new bypass ramp that allows NB State Route 57 (SR-57) traffic to exit at Orangethorpe Avenue in advance of the SR-91/NB SR-57 connector merge.

The project was approved for funding through construction in July 2024. This project currently needs $57.912 million in additional 91 EL funding due to a revised construction cost estimate which considers the higher-than-expected bids on the SR-91 Improvement Project from SR-55 to Lakeview Avenue (Segment 1) and other comparable recent projects in the region. Similar to the SR-91 Segment 1, PA/ED and PS&E cost increases are due to the additional coordination needed to incorporate the MAP scope and also due to design refinements to minimize the ROW needed, which has reduced the ROW cost estimate. This is Project I in the Next 10 Plan and is consistent with the CPP regarding the use of 91 EL funds. It is also consistent with a separate Board-adopted policy that allows the use of 91 EL for M2 freeway projects on SR- 91.

Existing Funding ($000s)	STBG	M2	91 EL	CPF/CDS	Total
PA/ED	$1,770	$30	-	-	$1,800
PS&E	-	-	$10,861	-	$10,861
ROW	-	-	$5,510	-	$5,510
CON	-	-	$143,321	$3,000	$146,321
TOTAL	**$1,770**	**$30**	**$159,692**	**$3,000**	**$164,492**

Proposed Funding ($000s)	STBG	M2	91 EL	CPF/CDS	Total
PA/ED	$1,770	$30	$418	-	$2,218
PS&E	-	-	$12,213	-	$12,213
ROW	-	-	$5,290	-	$5,290
CON	-		$199,683	$3,000	$202,683
TOTAL	**$1,770**	**$30**	**$217,604**	**$3,000**	**$222,404**
CHANGE	-	-	$57,912	-	$57,912

SR-91 Improvement Project from Acacia Street to La Palma Avenue (Segment 3) MAP

The SHOPP funding for the Caltrans MAP component of the SR-91 Improvement Project from Acacia Street to La Palma Avenue (Segment 3) is detailed below. The project includes pavement rehabilitation, safety device upgrades, census stations, updated smart street lighting, and electrical conduit replacements.

OCTA staff has identified additional contingency, outreach, and other costs that increase the estimated cost for the project by $11.876 million to $35.046 million. Caltrans has committed an additional $2.851 million in SHOPP funding to support additional costs. Caltrans is responsible for all costs associated with the MAP. In order to meet the updated costs as identified by OCTA, it is recommended to include $9.025 million in uncommitted future state funds. These project costs include all phases of work and allow the project funding listed in the CFP to match costs identified in the Capital Action Plan that is presented to the Board quarterly.

Existing Funding ($000s)	SHOPP	Total
TOTAL	**$23,170**	**$23,170**

Proposed Funding ($000s)	SHOPP	Future State Funds	Total
TOTAL	**$26,021**	**$9,025**	**$35,046**
CHANGE	$2,851	$9,025	$11,876

Interstate 605 and Katella Avenue Interchange

The Interstate 605 (I-605) and Katella Avenue Interchange Project will improve interchange traffic operations and pedestrian and bicycle facilities at I-605 and the Katella Avenue interchange, located in the western portion of the City of Los Alamitos. The I-605/Katella Avenue interchange currently experiences roadway and operational deficiencies in the form of inefficient traffic operations and deficiencies in community mobility for automobiles, pedestrians, and bicycle traffic.

On January 23, 2025, the project bids were opened by Caltrans and the apparent low bidder came in 6.4 percent higher than the project engineer's estimate. Caltrans and OCTA analyzed the bid results. Some of the cost increases are attributable to higher bid unit costs associated with retaining walls, paving materials, and clearing and grubbing. The associated estimated costs for construction support services to be performed by Caltrans and OCTA's consultants were also adjusted, respectively. Additionally, prior phase cost estimates have been adjusted. PA/ED has decreased to match actual costs, and the PS&E increase was due to adjustments to incorporate an overlapping Caltrans safety lighting and electrical project that was within the project footprint. ROW increased due to the costs of two utility relocations being higher than anticipated as well as some improvements that were not included in the environmental phase. This included a water line that had to be relocated deeper than previously estimated. This is Project M in the Next 10 Plan and is consistent with the CPP regarding the use of M2 funds. Staff is recommending increasing M2 funds by $14.699 million and increasing the overall project cost to $53.014 million to support the cost at contract award.

Existing Funding ($000s)	STBG	M2	Total
PA/ED	-	$1,824	$1,824
PS&E	-	$3,000	$3,000
ROW	-	$3,031	$3,031
CON	$17,800	$12,660	$30,460
TOTAL	**$17,800**	**$20,515**	**$38,315**

Proposed Funding ($000s)	STBG	M2	Total
PA/ED	-	$1,012	$1,012
PS&E	-	$4,115	$4,115
ROW	-	$7,209	$7,209
CON	$17,800	$22,878	$40,678
TOTAL	**$17,800**	**$35,214**	**$53,014**
CHANGE	-	$14,699	$14,699

Inland Slope Rehabilitation Phase II

Within the OCTA-owned ROW between Mile Post (MP) 187.3 and 193.2 in the cities of Laguna Niguel, Lake Forest, and Mission Viejo, several sloped areas along the railroad are experiencing soil stability and erosion issues, posing risks to the railway's structural integrity. To address these challenges, OCTA engaged its Rail Project Management Consultant to assess and propose cost-effective solutions, such as stabilizing slopes with shotcrete or recompacting soil and adding vegetation for long-term stability. Additionally, a severely eroded earthen culvert at MP 193.0-193.2 in the City of Laguna Niguel, exacerbated by a concrete wall from an adjacent property, has been identified for remediation, with concrete lining proposed as a solution. In collaboration with Metrolink, OCTA is finalizing plans to implement these improvements, ensuring the safety, functionality, and longevity of its infrastructure while addressing environmental concerns.

Staff recommends using up to $2.4 million in LPP-F Cycle 4 funds and Cycle 5 funds with $5.6 million matching M2 funds for the construction phase. Inland Slope Rehabilitation Phase II is part of Project R and the use of M2 and LPP-F for the project is consistent with the Board-approved CPP.

Existing Funding ($000s)	M2	Total
PA/ED	$170	$170
PS&E	-	-
ROW	-	-
CON	-	-
TOTAL	**$170**	**$170**

Proposed Funding ($000s)	M2	LPP-F	Total
PA/ED	$170	-	$170
PS&E	-	-	-
ROW	-	-	-
CON	$5,600	$2,400	$8,000
TOTAL	**$5,770**	**$2,400**	**$8,170**
CHANGE	**$5,600**	**$2,400**	**$8,000**

Future Zero-Emission Bus (ZEB)

OCTA has developed the ZEB Rollout Plan to comply with the California Air Resources Board's Innovative Clean Transit regulation. The regulation requires transit agencies to begin purchasing ZEBs in 2023, with the goal of transitioning all transit buses to zero-emission technology by 2040. In 2020, OCTA initiated the ZEB Pilot Program with ten hydrogen fuel-cell electric buses (FCEB) and ten battery electric buses (BEB). Currently, OCTA plans to purchase additional FCEBs and BEBs to replace compressed natural gas (CNG) buses to meet the ZEB deployment goals. This project aims to replace approximately 200 buses by 2031.

This project is currently funded with $9.794 million in Congestion Mitigation and Air Quality Improvement (CMAQ) and $11.460 million in SB 125* funds. Staff is proposing an additional $12.830 million in CMAQ funds. The use of CMAQ for ZEB replacement is consistent with the CPP regarding CMAQ for rail and bus transit capital projects. This funding is intended to support a portion of the additional cost of replacing the CNG buses with ZEBs. Based on the cost of buses today, the estimated total additional cost ranges from $120 million to $150 million.

Existing Funding ($000s)	CMAQ	SB125	Total
PA/ED	-	-	-
PS&E	-	-	-
ROW	-	-	-
CON	$9,794	$11,460	$21,254
TOTAL	**$9,794**	**$11,460**	**$21,254**

Proposed Funding ($000s)	CMAQ	SB125	Total
PA/ED	-	-	-
PS&E	-	-	-
ROW	-	-	-
CON	$22,624	$11,460	$34,084
TOTAL	**$22,624**	**$11,460**	**$34,084**
CHANGE	$12,830	-	$12,830

*SB 125 – SB 125 (Chapter 54, Statutes of 2023) Transit and Intercity Rail Capital Program Formula

Capital Funding Program Report

ATTACHMENT C

Pending Approval by OCTA Board of Directors - April 14, 2025

State Highway Project

			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local
I-5 widening, I-405 to Yale Avenue (Segment 1) [2]	B	$337,943	$47,473		$5,421	$95,338	$11,374			$178,337	
I-5 widening, Yale Avenue to SR-55 (Segment 2)	B	$261,164	$32,527				$9,780			$218,857	
I-5 widening, Alicia Parkway to El Toro Road (Segment 3)	C	$227,523	$49,897		$4,728		$16,915			$155,983	
I-5 widening, Oso Parkway to Alicia Parkway (Segment 2)	C	$228,675	$48,676		$7,921					$172,078	
I-5 widening, SR-73 to Oso Parkway (Segment 1)	C	$248,198	$28,167		$6,433	$73,735	$18,242	$29,832		$91,789	
I-5, SR-73 to El Toro Road landscaping/replacement planting	C	$12,335	$790			$6,000				$5,545	
I-5/El Toro Interchange	D	$9,713	$9,213							$500	
SR-55 (I-5 to SR-91) [1]	F	$202,135	$7,865		$2,641					$191,629	
SR-55 widening between I-405 and I-5	F	$505,720	$160,500		$42,375	$80,000	$140,000			$82,845	
SR-57 Orangewood Avenue to Katella Avenue	G	$120,921	$11,500		$3,240					$106,181	
SR-57 truck climbing lane phase II: Lambert Road to LA County Line	G	$24,500				$24,500					
SR-91, Acacia Avenue to La Palma Avenue (Segment 3) [2]	I	$222,404	$1,770		$3,000					$30	$217,604
SR-91, La Palma Avenue to SR-55 (Segment 2) [1]	I	$380,681	$3,460		$4,000		$6,641			$40	$366,540
SR-91, SR-55 to Lakeview Avenue (Segment 1) [2]	I	$132,777	$1,770		$5,000		$42,566			$30	$83,411
SR-91, SR-57 to SR-55 (Segment 1,2 and 3) Outreach	I	$2,000									$2,000
SR-91, SR-241 to I-15	J	$41,800									$41,800
I-405 improvements, SR-73 to I-605	K	$2,159,999	$35,000		$10,648			$89,771		$1,395,650	$628,930
I-405 (I-5 to SR-55)	L	$8,000	$8,000								
I-605/ Katella Avenue interchange [2]	M	$53,014	$17,800							$35,214	
241/91 Express Lanes (HOT) connector		$182,298	$50								$182,248
I-5 Managed Lane Project from Avenida Pico to San Diego County Line		$24,228	$23,478								$750
I-5 widening, I-405 to Yale Avenue (Segment 1) Multi Asset Project [3,4]		$50,144			$36,400			$13,744			
I-5 widening, Yale Avenue to SR-55 (Segment 2) Multi Asset Project		$27,861			$27,861						
SR-74 - Gap closure for 0.9 mile and multimodal improvements		$87,513	$30,000		$4,250	$43,913				$7,200	$2,150
SR-74 widening, City/County line to Antonio Parkway		$40,905	$5,285			$10,000					$25,620
SR-91, Acacia Avenue to La Palma Avenue (Segment 3) Multi Asset Project [3,4]		$35,046			$26,021			$9,025			
SR-91, SR-55 to Lakeview Avenue (Segment 1) Multi Asset Project		$7,968			$7,968						
State Highway Project Totals		**$5,635,465**	**$523,221**		**$197,907**	**$333,486**	**$245,518**	**$142,372**		**$2,641,908**	**$1,551,053**

Federal Funding Total	**$721,128**
State Funding Total	**$721,376**
Local Funding Total	**$4,192,961**
Total Funding (000's)	**$5,635,465**

Capital Funding Program Report

Pending Approval by OCTA Board of Directors - April 14, 2025

State Highway Project Completed												
			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local
I-5 from SR-55 to SR-57, add one HOV lane each direction	A	$41,500	$36,191							$5,309	
I-5 HOV lane each direction s/o PCH to San Juan Creek Road	C	$74,300	$11,326					$20,789		$42,185	
I-5 HOV lanes from s/o Avenida Vista Hermosa to s/o PCH	C	$75,300	$12,065			$46,779				$16,456	
I-5 HOV lanes: s/o Avenida Pico to s/o Avenida Vista Hermosa	C	$83,500	$26,867		$1,600	$43,735				$11,298	
I-5/SR-74 interchange improvements	D	$80,300				$48,683		$24,109	$2,500		$5,008
I-5/SR-74 interchange landscaping/replacement planting	D	$1,440			$752	$688					
SR- 57 n/b widening, Katella Avenue to Lincoln Avenue - landscaping	G	$2,172								$2,172	
SR- 57 n/b widening, SR-91 to Yorba Linda Boulevard - landscaping	G	$946								$946	
SR-57 n/b widening, Katella Avenue to Lincoln Avenue	G	$35,827						$24,127		$11,700	
SR-57 n/b widening, SR-91 to Yorba Linda Boulevard	G	$51,354						$39,475		$11,879	
SR-57 n/b widening, Yorba Linda to Lambert Road	G	$52,871						$41,250		$11,621	
SR-57 n/b widening, Yorba Linda to Lambert Road - landscaping	G	$1,193								$1,193	
SR-91 w/b connect existing aux lanes, I-5 to SR-57	H	$62,977						$27,227		$35,750	
SR-91 w/b connecting existing aux lanes, I-5 to SR-57 - landscaping	H	$2,290								$2,290	
SR-91 w/b (SR-55 - Tustin interchange) improvements	I	$43,753				$15,753		$14,000		$14,000	
SR-91 e/b widening, SR-241 to SR-71	J	$57,773			$45,911					$6,942	$4,920
SR-91 w/b routes 91/55 - e/o Weir Canyon Road replacement planting	J	$2,898				$2,898					
SR-91 widening, SR-55 to Gypsum Canyon Road (Weir Canyon Road/SR-241)	J	$76,993				$22,250		$54,045		$698	
I-405 s/b aux lane - University Drive to Sand Canyon Avenue and Sand Canyon Avenue to SR-133		$2,328				$2,328					
I-405/SR-22/I-605 HOV connector - landscaping		$4,600	$4,600								
HOV connectors from I-405 and I-605	M1	$173,091	$14,787					$135,430	$16,200		$6,674
HOV connectors from SR-22 to I-405	M1	$115,878	$64,375		$49,625				$1,878		
State Highway Project Completed Totals		**$1,043,284**	**$170,211**		**$97,888**	**$183,114**		**$380,452**	**$20,578**	**$174,439**	**$16,602**

Federal Funding Total	**$268,099**
State Funding Total	**$563,566**
Local Funding Total	**$211,619**
Total Funding (000's)	**$1,043,284**

Capital Funding Program Report

Pending Approval by OCTA Board of Directors - April 14, 2025

1. Authorize the use of up to $514.951 million to fund the construction phase and adjust costs associated with prior phases of the State Route 55 Improvement Project from Interstate 5 to State Route 91 (Project F) and the State Route 91 Improvement Project from La Palma Avenue to State Route 55 (Segment 2) (Project I) using the following funding sources:

a. 91 Express Lanes Excess Revenue ($323.726 million)
b. Measure M2 ($180.584 million)
c. Local Partnership Program – Formulaic ($6.641 million)
d. Community Project Funding / Congressionally Directed Spending ($4.000 million)

2. Authorize the use of up to an additional $227.020 million to supplement the construction funding and prior phases of four M2 freeway improvement projects, including one segment on Interstate 5 (Project B), two segments on State Route 91 (Project I), and the Interstate 605/Katella Avenue Interchange Project (Project M) from the following fund sources:

a. Measure M2 ($146.848 million)
b. 91 Express Lanes Excess Revenue ($80.172 million)

3. Authorize the inclusion of $39.251 million in committed State Highway Operations and Protection Program funds and an additional $22.769 million in uncommitted future state funds to integrate the California Department of Transportation Multi-Asset Project into the Capital Funding Program report for:

a. Interstate 5 Improvement Project between Interstate 405 and Yale Avenue (Segment 1) (Project B) ($36.400 million in committed State Highway Operations and Protection Program funds and $13.744 million in uncommitted future state funds)
b. State Route 91 Improvement Project from Acacia Street to La Palma Avenue (Segment 3) (Project I) ($2.851 million in committed State Highway Operations and Protection Program funds and $9.025 million in uncommitted future state funds)

4. OCTA is estimating that additional funding will be required from the California State Department of Transportation for the Multi-Asset Project than what has been committed. It is the California State Department of Transportations responsibility to fully fund the Multi-Asset Project at whatever level is required.

Acronyms:

Aux - Auxilliary
Board - Board of Directors
CMAQ - Congestion Mitigation Air Quality Improvement Program
E/B - Eastbound
E/O - East of
FTA - Federal Transit Administration
HOT - High-Occupancy Toll
HOV - High-Occupancy Vehicle
I-405 - Interstate 405
I-5 - Interstate 5
I-605 - Interstate 605
LA - Los Angeles
M Code - Project Codes in Measure M1 and M2
M1 - Measure M1
M2 - Measure M2
N/B - Northbound
OC - Orange County
OCTA - Orange County Transportation Authority
PCH - Pacific Coast Highway
S/B - Southbound
S/O - South of
SB 1 - SB 1 (Chapter 5, Statutes of 2017)
SR-133 - State Route 133
SR-22 - State Route 22
SR-241 - State Route 241
SR-55 - State Route 55
SR-57 - State Route 57
SR-71 - State Route 71
SR-73 - State Route 73
SR-74 - State Route 74
SR-91 - State Route 91
STBG - Surface Transportation Block Grant
STIP - State Transportation Improvement Program
W/B - Westbound

Capital Funding Program Report

Pending Approval by OCTA Board of Directors - April 14, 2025

Bus Transit Project

			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local
Go Local - Step 1	S	$5,730							$5,730		
Mobile ticketing equipment	S	$4,036						$4,036			
M2 Project V Community Circulators	V	$53,767								$53,767	
M2 Project W Safe Transit Stops (City)	W	$1,708								$1,708	
M2 Project W Safe Transit Stops (OCTA)	W	$370								$370	
40 Hydrogen Fuel-Cell 40-Foot Buses		$65,595	$29,831					$35,764			
Anaheim Transportation Network suballocation		$8,942		$8,942							
Associated Transportation Improvements		$556		$556							
Bike Lockers at Santa Ana Regional Transportation Center (SARTC)		$2,000						$2,000			
Bravo! 553 (operating costs)		$7,275	$5,721					$1,554			
Bus engine repowers (173)		$12,365	$12,365								
Capitalized cost of contracted services FY 2021-22 to FY 2025-26 (ACCESS and contracted fixed-route contracts)		$347,334		$249,882							$97,452
DCFC Charging at Fullerton Transportation Center and SARTC		$1,250						$1,250			
Digital bus stop sign 13" along high quality transit corridors (143 sign)		$2,500				$2,500					
Engine repower/rebuild contract		$4,071					$4,071				
Enhanced Mobility for Seniors and Disabled (EMSD) Call		$2,280									$2,280
Facilities upgrades, modifications, and replacement projects		$1,739					$1,739				
Harbor Blvd. dynamic bus lane (env./engineering)		$5,100						$5,100			
Harbor Boulevard Connected Bus Pilot Stage I		$2,000		$1,600				$400			
Harbor Boulevard Connected Bus Pilot Stage II		$6,800						$5,400		$1,400	
Harbor Boulevard high-capacity transit expansion environmental		$14,000	$14,000								
Heating-Ventilation Unit Replacement at Santa Ana bus base		$7,000					$7,000				
Hydrogen Fueling Station at Garden Grove		$13,500						$13,500			
Installation of Battery-Electric Chargers at Santa Ana Base		$1,500					$1,500				
Non-fixed-route paratransit operations assistance - FY 2021-22 to FY 2025-26		$257,046		$97,682							$159,364
OC Bus Operations - Connections to OC Streetcar		$6,072						$6,072			
OC Mobility Hubs Strategy		$297	$263			$34					
Open payment system and smart fareboxes		$26,500						$26,500			
Preventive maintenance - including salaries and benefits (includes ATN & Laguna Beach)		$362,772		$362,772							
Purchase 117 replacement paratransit vehicles		$14,995		$14,995							
Purchase 131 replacement paratransit vehicles		$32,165		$32,165							
Rehabilitation and renovation at OCTA bus facilities		$1,509		$1,207							$302
Rideshare/vanpool		$20,232	$20,232								
Security Gates at Garden Grove, Santa Ana, Anaheim bases		$5,646					$5,646				
Standby backup generators at Anaheim and IRCC bases		$1,374					$1,374				
Transit Security and Operations Center		$68,261			$3,660	$10,381	$43,828	$5,603			$4,789

Capital Funding Program Report

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Bus Transit Project

			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local
Transit service expansion planning		$9,000	$9,000								
Vanpool Program - capital lease		$12,999	$12,999								
Zero emission bus (future) [1]		$34,084	$22,624					$11,460			
Zero emission bus and bus facility		$142,955	$115,594					$27,361			
Zero-emission Bravo! buses (ten-battery electric) and bus infrastructure		$14,004					$6,466	$7,538			
Zero-Emission Paratransit Vehicle Pilot		$5,016		$2,508				$2,507			$1
Bus Transit Project Totals		**$1,586,345**	**$242,629**	**$772,309**	**$3,660**	**$12,915**	**$71,624**	**$156,045**	**$5,730**	**$57,245**	**$264,188**

Federal Funding Total	**$1,018,598**
State Funding Total	**$240,584**
Local Funding Total	**$327,163**
Total Funding (000's)	**$1,586,345**

Bus Transit Project Completed

			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local
ACCESS and fixed-route radio systems upgrade		$22,465		$4,434	$341			$16,239			$1,451
Bravo! 529 buses (six)		$3,595	$549					$3,046			
Bus replacement - articulated alternative fuel buses (60')		$31,105	$22,250	$8,855							
Bus replacement (40' and ACCESS)		$149,009	$29,198	$68,139							$51,672
Engine rebuild		$16,294		$14,824				$1,470			
FTA Section 5310 Enhanced Mobility of Seniors and Individuals with Disabilities		$3,657		$3,657							
FTA Section 5316 Jobs Access and Reverse Commute		$13,962		$13,962							
FTA Section 5317 New Freedom		$6,388		$6,388							
Goldenwest Transportation Center parking structure		$4,000	$3,400								$600
Goldenwest Transportation Center surface lot		$2,000						$1,200			$800
Heating ventilation unit replacements		$405		$313			$92				
iShuttle replacement buses (12)		$6,760					$6,084				$676
MSRC County Transportation Commission Partnership Program		$2,761						$1,924			$837
Purchase 201 40-foot alternative fuel replacement buses (OCTA)		$94,599		$64,148							$30,451
Transit Security Program		$3,167						$3,167			
VSS upgrades at OCTA facilities		$1,159		$960				$199			
Zero-emission hydrogen fuel cell buses (ten)		$12,978					$5,640	$7,338			
Bus Transit Project Completed Totals		**$374,304**	**$55,397**	**$185,680**	**$341**		**$11,816**	**$34,583**			**$86,487**

Capital Funding Program Report

Pending Approval by OCTA Board of Directors - April 14, 2025

Bus Transit Project Completed												
			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local

Federal Funding Total	$241,418
State Funding Total	$46,399
Local Funding Total	$86,487
Total Funding (000's)	$374,304

Capital Funding Program Report

Pending Approval by OCTA Board of Directors - April 14, 2025

1. Authorize the use of up to $12.830 million in Congestion Mitigation and Air Quality Improvement funds for the Future Zero-Emission Bus Project.

Acronyms:

ATN - Anaheim Transportation Network
Board - Board of Directors
CMAQ - Congestion Mitigation Air Quality Improvement Program
DCFC - Direct Current Fast Charging
FTA - Federal Transit Administration
FY - Fiscal Year
IRCC - Irvine Construction Circle
M Code - Project Codes in Measure M1 and M2
M1 - Measure M1
M2 - Measure M2
MSRC - Mobile Source Air Pollution Reduction Review Committee
OCTA - Orange County Transportation Authority
SB 1 - SB 1 (Chapter 5, Statutes of 2017)
STBG - Surface Transportation Block Grant
STIP - State Transportation Improvement Program
VSS - Video Surveillance System

Capital Funding Program Report

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Rail Project												
			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local
OC Streetcar (New Starts)	M1/S	$649,000	$130,132	$171,961				$175,427		$171,480	
OC Streetcar (non-New Starts)	M1/S	$16,702		$342					$6,904	$9,313	$143
OC Streetcar (operations and potential future capital needs)	M1/S	$0	$0								
Anaheim Canyon Station	R	$34,200	$30,432							$2,000	$1,768
Coastal Rail Infrastructure Resiliency Project Environmental Phase 2	R	$10,220			$8,176					$2,044	
Coastal Rail Stabilization Priority Project	R	$313,580			$103,824		$80,000	$128,800		$956	
Cyprus Shore Initial Track Stabilization Projects (MP 206.8)	R	$8,000								$7,000	$1,000
Cyprus Shore Track Stabilization Projects (MP 206.8)	R	$14,110	$6,000		$1,210	$6,000		$200		$700	
Fullerton Transportation Center stair rehabilitation	R	$1,065		$1,030							$35
Future VSS	R	$217		$174							$43
Inland Slope Rehabilitation Phase II [1]	R	$8,170					$2,400			$5,770	
Irvine Station Improvement Project	R	$6,330						$6,330			
Laguna Niguel to San Juan Capistrano passing siding	R	$35,956	$24,652	$1,015		$3,000		$6,734			$555
Metrolink fare revenue loss	R	$135,745						$135,745			
Metrolink new capital	R	$11,249	$2,121	$9,128							
Metrolink rehabilitation/renovation - FY 2021-22 to FY 2025-26	R	$199,302		$199,302							
Metrolink station and track improvements, and rehabilitation	R	$3,063		$2,617							$446
MP 204.2 Mariposa Point	R	$9,200				$9,200					
OC Maintenance Facility	R	$91,428		$198		$20,000		$71,230			
Orange Olive Wye connection	R	$16,000				$16,000					
Placentia Commuter Rail Station	R	$34,825	$50			$2,500		$400		$8,000	$23,875
Preventive maintenance (SCRRA - Metrolink)	R	$92,953		$92,953							
Rail track and structures	R	$88,504						$88,504			
San Clemente Track Protection (MP 204.6)	R	$5,500				$3,000	$2,500				
San Juan Creek Bridge replacement	R	$65,670	$908	$39,833	$913		$5,578	$17,059		$1,379	
SCRRA operating subsidy assistance	R	$2,510								$2,510	
Slope and culvert improvements	R	$300		$300							
Slope stabilization Laguna Niguel-Lake Forest	R	$5,168		$4,834						$334	
Tactile tile project	R	$1,569		$1,538						$31	
VSS at commuter rail stations	R	$4,409		$3,594				$56			$759
M2 Project S Transit extensions to Metrolink (Rubber Tire)	S	$733								$733	
OC Streetcar operations	S	$78,874	$19,500					$59,374			
ARTIC environmental, ROW, program management support, site plan	M1	$41,369							$8,869		$32,500
Rail Project Totals		**$1,985,921**	**$213,795**	**$528,819**	**$114,123**	**$59,700**	**$90,478**	**$689,859**	**$15,773**	**$212,250**	**$61,124**

Capital Funding Program Report

Pending Approval by OCTA Board of Directors - April 14, 2025

Rail Project												
			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local

Federal Funding Total	$856,737
State Funding Total	$840,037
Local Funding Total	$289,147
Total Funding (000's)	$1,985,921

Rail Project Completed											
			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local
Fullerton Transportation Center parking expansion	M1/R	$33,667				$11,250		$11,035	$9,718		$1,664
Laguna Niguel-Mission Viejo Station parking improvements and expansion (ADA ramps)	M1/R	$5,581	$3,204	$732					$1,645		
Metrolink Grade Crossing safety improvements (OCX)	M1/R	$80,618						$18,250	$7,600	$30,710	$24,058
Metrolink rolling stock	M1/R	$158,009	$42,230	$35,390				$36,300	$44,089		
Metrolink service track expansion	M1/R	$119,957						$51,399	$68,558		
Orange Transportation Center parking structure	M1/R	$31,003	$2,555	$2,644		$13,762			$1,850	$420	$9,772
Sand Canyon Avenue grade separation	M1/R	$62,050	$10,536					$28,192	$3,116	$5,352	$14,854
M2 Project S Fixed-Guideway Anaheim Rapid connection	M1/S	$9,924		$1,516					$6,000	$1,286	$1,122
Anaheim Regional Intermodal Transportation Center (ARTIC) construction	M1/T	$184,164	$33,250	$37,253	$3,501	$29,219			$43,900	$35,291	$1,750
Fullerton Transportation Station expansion planning, environmental PSR	M1/T	$0	$0						$0		
Santa Ana grade separation planning and environmental PSR	M1/T	$1,333	$1,180						$153		
Santa Ana Transportation Station planning and environmental PSR	M1/T	$1,003	$888						$115		
17th Street grade separation environmental	R	$2,476								$2,476	
Control Point at 4th Street	R	$2,985		$2,985							
Control Point Stadium crossover	R	$6,490		$3,245				$3,245			
LOSSAN Corridor grade separations PSR in Anaheim, Orange, and Santa Ana	R	$2,699								$2,699	
Metrolink grade crossing safety improvements ROW	R	$3,025								$3,025	
North Beach crossings safety enhancements	R	$348						$166		$182	
Positive Train Control (Metrolink)	R	$39,916		$4,492	$1,234			$34,190			
Rail Crossing signal lights and pedestrian gates	R	$252						$252			
Rail station platform safety improvements (Fullerton, Irvine, and Tustin)	R	$553						$553			
Safety repairs for San Clemente Pier Station	R	$122						$122			
San Clemente Beach Trail crossings safety enhancements	R	$4,999						$2,170		$2,251	$578
Ticket vending machines	R	$6,857									$6,857
Transit Rail Security (monitors, fencing, video surveillance)	R	$163						$163			
Go Local	S	$7,730							$7,730		
Fiber Optics installation (Metrolink)	M1	$23,183		$10,903				$10,479	$1,801		
Laguna Niguel-Mission Viejo Station parking expansion (south lot)	M1	$4,135						$695	$3,440		

Capital Funding Program Report

Pending Approval by OCTA Board of Directors - April 14, 2025

Rail Project Completed												
			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local
Tustin Rail Station parking expansion	M1	$15,390				$1,100		$7,181	$7,109		
Rail Project Completed Totals		**$808,632**	**$93,843**	**$99,160**	**$4,735**	**$55,331**		**$204,392**	**$206,824**	**$83,692**	**$60,655**

Federal Funding Total	**$197,738**
State Funding Total	**$259,723**
Local Funding Total	**$351,171**
Total Funding (000's)	**$808,632**

Capital Funding Program Report

Pending Approval by OCTA Board of Directors - April 14, 2025

1. Authorize the use of up to $8.000 million for the Inland Slope Rehabilitation Phase II Project from the following fund sources:
- Measure M2 ($5.600 million)
- Local Partnership Program – Formulaic ($2.400 million)

Acronyms:

ADA - Americans with Disabilities Act
Board - Board of Directors
CMAQ - Congestion Mitigation Air Quality Improvement Program
FFY - Federal Fiscal Year
FTA - Federal Transit Administration
FY - Fiscal Year
LOSSAN - Los Angeles-San Diego-San Luis Obispo Rail Corridor M
Code - Project Codes in Measure M1 and M2
M1 - Measure M1
M2 - Measure M2
MP - Mile Post
OC - Orange County
OCTA - Orange County Transportation Authority
OCX - Rail-Highway Grade Crossing/Safety Enhancement Project PSR - Project Study Report
ROW - Right-of-Way
SB 1 - SB 1 (Chapter 5, Statutes of 2017)
SCRRA - Southern California Regional Rail Authority/Metrolink
STBG - Surface Transportation Block Grant
STIP - State Transportation Improvement Program
VSS - Video Surveillance System

Capital Funding Program Report

Approved by OCTA Board of Directors - February 10, 2025

Local Road Project

			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local
State-Local Partnership Program (SLPP) formula grant call	M1/Q	$54,445						$24,945	$1,280	$27,249	$971
M2 Project O Regional Capacity Program call	O	$402,211						$24,254		$377,957	
SR-57 truck climbing lane phase I - Lambert Road interchange improvement	O	$121,500			$7,719	$74,705				$19,254	$19,822
M2 Project P Regional Signal Synchronization Program call	P	$158,828	$1,774					$11,762	$4,546	$140,746	
Regional Traffic Signal Synch (Edinger Avenue, MacArthur Boulevard /Talbert Avenue, and Warner Ave)	P	$15,000					$10,200			$4,200	$600
M2 Project Q Fair Share Program (FY 2016-17 through FY 2021-22)	Q	$361,621								$361,621	
M2 Project X Environmental Clean Up	X	$64,449								$64,449	
Active Transportation Program - regional call		$82,704	$6,359		$62,653	$92		$107			$13,493
Bicycle Corridor Improvement Program (BCIP)		$63,128	$43,755								$19,373
Bristol Street widening		$44,750									$44,750
Countywide Signal Synchronization Baseline		$15,000	$15,000								
First Street Multimodal Boulevard Design		$4,300						$4,300			
Local Agency led SCCP projects		$3,357					$3,357				
M1 Combined Transportation Funding Program (CTFP)		$34,000							$34,000		
McFadden Avenue Transit Signal Priority Pilot		$3,690						$3,690			
OC Connect Santa Ana - Garden Grove Rails-to-Trails		$8,000			$3,750	$3,900		$350			
OC Loop - Segment A		$38,233				$38,233					
Orange County Complete Streets (Wave 3)		$34,706	$26,316								$8,390
Orange County Complete Streets (Wave 4)		$5,229	$4,687								$542
Orange County Complete Streets Program (Wave 1)		$40,915	$25,062								$15,853
Orange County Complete Streets Program (Wave 2)		$40,072	$33,421								$6,651
Pavement Management Relief Funding Program		$9,469			$3,811			$5,658			
SCAG sustainability planning grants		$720			$671						$49
Traffic signal improvements		$15,000				$12,000					$3,000
Transportation enhancement activities		$22,172			$15,628						$6,544
		$1,643,499	**$156,374**		**$94,232**	**$128,930**	**$13,557**	**$75,066**	**$39,826**	**$995,476**	**$140,038**

Local Road Project Totals	
Federal Funding Total	$250,606
State Funding Total	$217,553
Local Funding Total	$1,175,340
Total Funding (000's)	$1,643,499

Local Road Project Completed

			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local
Grand Avenue widening, 1st Street to 4th Street	O	$12,537	$6,708								$5,829

Capital Funding Program Report

Approved by OCTA Board of Directors - February 10, 2025

Local Road Project Completed

			Federal Funds			State Funds			Local Funds		
Project Title	M Code	Total Funding	STBG/CMAQ	FTA	Other Fed.	STIP	SB1	Other State	M1	M2	Other Local
Kraemer Boulevard grade separation	O	$63,830	$22,044					$16,973		$22,981	$1,832
Lakeview Avenue grade separation	O	$110,702	$37,102		$9,709			$27,344		$21,792	$14,755
Orangethorpe Avenue grade separation	O	$106,043	$38,240		$18,600			$30,324		$16,182	$2,697
Placentia Avenue grade separation	O	$64,539						$33,386		$27,453	$3,700
Raymond Avenue grade separation	O	$125,419						$95,482		$22,373	$7,564
State College Boulevard grade separation	O	$99,380	$27,161		$10,887			$34,785		$15,460	$11,087
Tustin Avenue/Rose Drive grade separation	O	$96,638	$45,957					$22,534		$26,384	$1,763
M2 Fair Share State - Local Partnership Grant Program	Q	$7,032						$3,516		$3,516	
Antonio Parkway widening		$32,553	$15,499								$17,054
ARRA transportation enhancements		$6,833			$4,049				$500		$2,284
Arterial Pavement Management Program		$50,951	$19,655		$604						$30,692
Atlanta Avenue widening		$4,160	$2,278								$1,882
Firestone Boulevard widening at Artesia Boulevard		$2,468	$2,059								$409
Local Agency American Reinvestment and Recovery Act of 2009 rehabiliation projects		$32,369			$32,369						
Del Obispo widening	M1	$6,419	$3,740								$2,679
I-5 at La Paz interchange improvements	M1	$8,942	$2,800						$1,792		$4,350
Imperial Highway Smart Streets	M1	$1,900						$200	$200		$1,500
Traffic Light Synchronization Program (TLSP), countywide - Proposition 1B	M1	$8,000						$4,000	$4,000		
		$840,715	**$223,243**		**$76,218**			**$268,544**	**$6,492**	**$156,141**	**$110,077**

Local Road Project Completed Totals	
Federal Funding Total	$299,461
State Funding Total	$268,544
Local Funding Total	$272,710
Total Funding (000's)	$840,715

Acronyms:

ARRA - American Recovery and Reinvestment Act of 2009 Board - Board of Directors
Call - Call for Projects
CMAQ - Congestion Mitigation Air Quality Improvement Program
FTA - Federal Transit Administration
FY - Fiscal Year
I-5 - Interstate 5
M Code - Project Codes in Measure M1 and M2
M1 - Measure M1
M2 - Measure M2
OCTA - Orange County Transportation Authority
SB 1 - SB 1 (Chapter 5, Statutes of 2017)
SCAG - Southern California Association of Governments
SCCP - Solutions for Congested Corridors SHA - State Highway Account
SR-57 - State Route 57
STBG - Surface Transportation Block Grant
STIP - State Transportation Improvement Program

Capital Programming Update

Background

- Board-approved project delivery continues to progress
  - M2 freeway projects
  - Transit capital projects
- Project funding adjustments needed
  - Fund subsequent phases
  - Align with updated estimates
  - Adjust funding sources
  - Maximize use of external funds
- Board approval necessary for programming

Board – Board of Directors
M2 – Measure M2

Overview

- M2 freeway improvement projects recommended for construction and prior phase funding:
  - SR-55 Improvement Project (I-5 to SR-91)
  - SR-91 Improvement Project (La Palma Avenue to SR-55)
- M2 freeway improvement projects recommended for supplemental funding due to updated project estimates:
  - I-5 Improvement Project (I-405 to Yale Avenue)
  - SR-91 Improvement Project (SR-55 to Lakeview Avenue)
  - SR-91 Improvement Project (Acacia Street to La Palma Avenue)
  - I-605 and Katella Avenue Interchange
- Two transit projects recommended for funding
  - Inland Slope Rehabilitation Phase II – Funding for construction phase
  - Future Zero-Emission Bus – Funding for additional buses

SR-55 – State Route 55
I-5 – Interstate 5
SR-91 – State Route 91
I-405 – Interstate 405
I-605 – Interstate 605

Funding Recommendations ($762.801 Million)

Funding for Construction and Prior Phases for Freeway Projects

Funding Need (000s)	91 EL	M2	LPP-F	CPF/CDS	Total	Existing Funding	Total Project Cost
SR-55, I-5 to SR-91	-	$180,584	-	-	**$180,584**	$22,045	$202,135*
SR-91, La Palma to SR-55 (Seg 2)	$323,726	-	$6,641	$4,000	**$334,367**	$46,314	$380,681
Total Phase	$323,726	$180,584	$6,641	$4,000	**$514,951**	$68,359	$582,816

Additional Funding for Freeway Projects

Funding Need (000s)	91 EL	M2	Total additional	Existing Funding	Total Project Cost
I-5, I-405 to Yale (Seg 1)	-	$132,149	**$132,149**	$205,794	$337,943
SR-91, SR-55 to Lakeview Ave (Seg 1)	$22,260	-	**$22,260**	$110,517	$132,777
SR-91, Acacia to La Palma Ave (Seg 3)	$57,912	-	**$57,912**	$164,492	$222,404
I-605 / Katella Ave Interchange	-	$14,699	**$14,699**	$38,315	$53,014
Total additional need	$80,172	$146,848	**$227,020**	$519,118	$746,138

Funding for New and Existing Transit Projects

Funding Need (000s)	CMAQ	M2	LPP-F	Total	Existing Funding	Total Funding	Estimated Project Cost
Inland Slope Rehabilitation Phase II	-	$5,600	$2,400	**$8,000**	$170	$8,170	$8,170
Future Zero Emission Bus **	$12,830	-	-	**$12,830**	$21,254	$34,084	$120,000
Total	$12,830	$5,600	$2,400	**$20,830**	$21,424	$42,254	$128,170





* Funding recommendation F regarding SHOPP funding not included
** SR-55, I-5 to SR-91 total project cost includes a deprogramming of $494,000 in federal STBG, therefore total and existing funding do not equal total project cost.
*** Estimated project cost is the incremental difference between the cost for replacing the CNG buses versus transitioning to zero-emission buses.

91 EL – 91 Express Lane Excess Revenue
Ave – Avenue
CMAQ – Congestion Mitigation and Air Quality Improvement Program
CNG - Compressed natural gas
CPF/CDS – Community Project Funding/Congressionally Directed Spending
CON - Construction
I-5 – Interstate 5
I-405 – Interstate 405
I-605 – Interstate 605
LPP-F – Local Partnership Program Formulaic
M2 – Measure M2
SR-55 – State Route 55
SR-91 – State Route 91
Seg – Segment
STBG – Surface Transportation Block Grant
SHOPP – State Highway Operations and Protection Program

Updates from March Regional Transportation Planning Committee

- I-605/Katella Avenue interchange funding recommendation increased from $1.760 million to $14.699 million
  - New recommendation includes updating all prior phases to reflect actual costs for environmental, design, and right-of-way
  - Updated construction cost estimate reflects all of OCTA's internal costs, such as additional contingency, public awareness and outreach
- Additionally, prior phases for all projects were updated per actual costs and updated estimates
- Recommendations revised to separate individual projects

Recommendations

A. Authorize the use of up to $180.584 million to fund the construction phase and adjust costs associated with prior phases for the SR-55 Improvement Project from I-5 to SR-91 (Project F) using Measure M2 funding.

B. Authorize the use of up to $334.367 million to fund the construction phase and adjust costs associated with prior phases for the SR-91 Improvement Project from La Palma Avenue to SR-55 (Segment 2) (Project I), using the following funding sources:

- 91 Express Lanes Excess Revenue ($323.726 million)
- Local Partnership Program – Formulaic ($6.641 million)
- Community Project Funding/Congressionally Directed Spending ($4.000 million)

C. Authorize the use of up to an additional $132.149 million to supplement the construction funding and prior phase funding for the I-5 Improvement Project from I-405 to Yale Avenue (Segment 1) (Project B) using Measure M2 funding.

D. Authorize the use of up to an additional $80.172 million to supplement the construction funding and prior phase funding for the SR-91 (Segments 1 and 3) (Project I) using 91 Express Lanes Excess Revenue.

E. Authorize the use of up to an additional $14.699 million to supplement the construction funding and prior phase funding for the I-605/Katella Avenue Interchange Project (Project M) using Measure M2 funding.





Recommendations (Continued)



F. Authorize the inclusion of $39.251 million in committed State Highway Operations and Protection Program funds and an additional $22.769 million in uncommitted future state funds to integrate the California Department of Transportation Multi-Asset Project into the Capital Funding Program report for:

- I-5 Improvement Project between I-405 and Yale Avenue (Segment 1) (Project B) ($36.400 million in committed State Highway Operations and Protection Program funds and $13.744 million in uncommitted future state funds)
- SR-91 Improvement Project from Acacia Street to La Palma Avenue (Segment 3) (Project I) ($2.851 million in committed State Highway Operations and Protection Program funds and $9.025 million in uncommitted future state funds)

G. Authorize the use of up to $8.000 million for the Inland Slope Rehabilitation Phase II Project from the following fund sources:

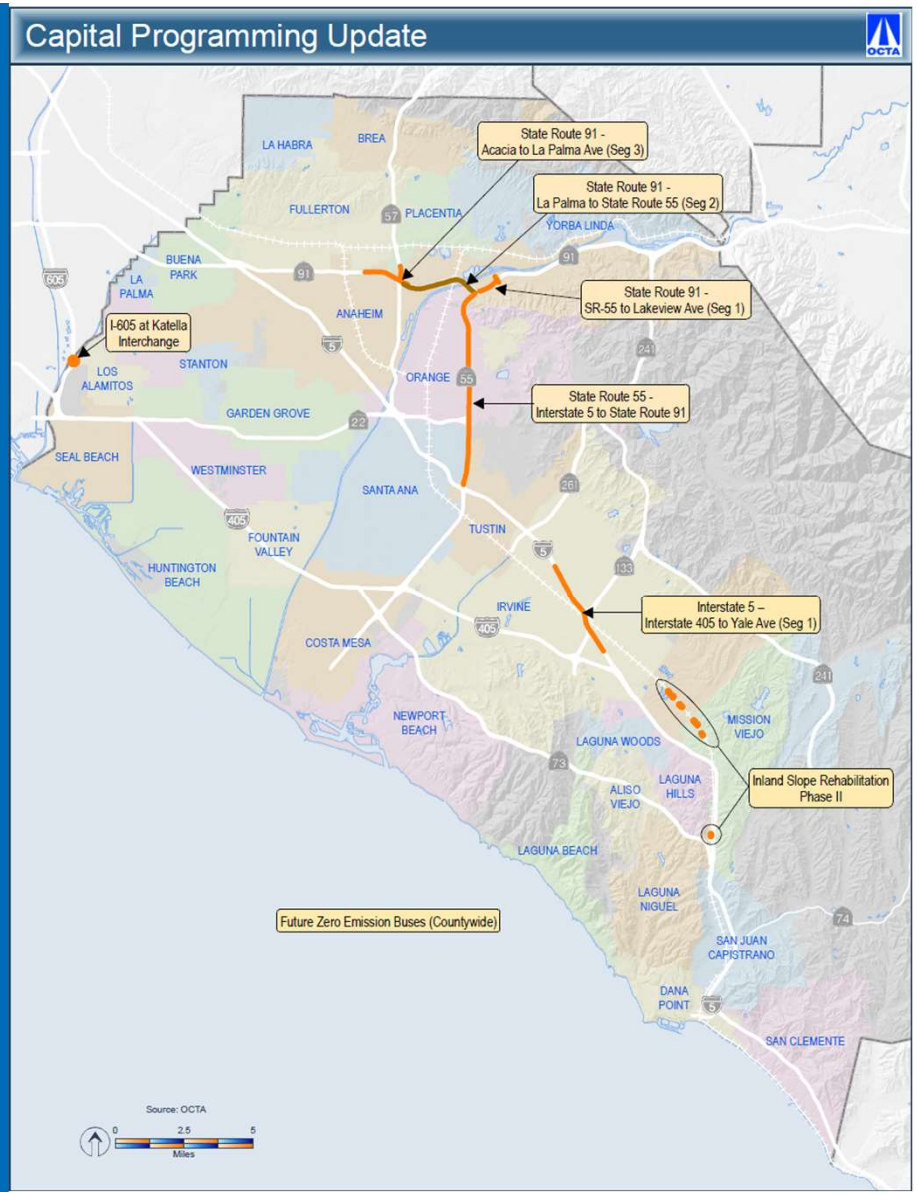
- Measure M2 ($5.600 million)
- Local Partnership Program – Formulaic ($2.400 million)

H. Authorize the use of up to $12.830 million in Congestion Mitigation and Air Quality Improvement funds for the Future Zero-Emission Bus Project.

I. Authorize staff to process all necessary amendments to the Federal Transportation Improvement Program and execute or amend all necessary agreements to facilitate the above actions.



Questions


Capital Programming Update
State Route 91 - Acacia to La Palma Ave (Seg 3)
State Route 91 - La Palma to State Route 55 (Seg 2)
State Route 91 - SR-55 to Lakeview Ave (Seg 1)
I-605 at Katella Interchange
State Route 55 - Interstate 5 to State Route 91
Interstate 5 – Interstate 405 to Yale Ave (Seg 1)
Inland Slope Rehabilitation Phase II
Future Zero Emission Buses (Countywide)
LA HABRA
BREA
FULLERTON
PLACENTIA
YORBA LINDA
BUENA PARK
LA PALMA
ANAHEIM
LOS ALAMITOS
STANTON
ORANGE
GARDEN GROVE
SEAL BEACH
WESTMINSTER
SANTA ANA
TUSTIN
FOUNTAIN VALLEY
HUNTINGTON BEACH
IRVINE
COSTA MESA
NEWPORT BEACH
MISSION VIEJO
LAGUNA WOODS
ALISO VIEJO
LAGUNA HILLS
LAGUNA BEACH
LAGUNA NIGUEL
SAN JUAN CAPISTRANO
DANA POINT
SAN CLEMENTE
Source: OCTA
0
2.5
5
Miles

April 7, 2025

To: Regional Transportation Planning Committee

From: Darrell E. Johnson, Chief Executive Officer

Subject: Comprehensive Transportation Funding Programs – 2025 Call for Projects Programming Recommendations

Overview

The Orange County Transportation Authority issued the 2025 Measure M2 Comprehensive Transportation Funding Programs Regional Capacity Program and Regional Traffic Signal Synchronization Program call for projects in August 2024. Project applications were due in October 2024. A list of projects recommended for funding is presented for Board of Directors' review and approval.

Recommendations

A. Approve the award of $25.72 million in 2025 Regional Capacity Program (Project O) funds to nine local jurisdiction projects.

B. Approve the award of $11.99 million in 2025 Regional Traffic Signal Synchronization Program (Project P) funds to six local jurisdiction projects.

Background

The Regional Capacity Program (RCP), Project O, is the Measure M2 (M2) competitive funding program through which the Orange County Transportation Authority (OCTA) supports street and road improvement projects. The Regional Traffic Signal Synchronization Program (RTSSP), Project P, is the M2 competitive program that provides funding for regional signal synchronization projects.

Both programs are included in the Comprehensive Transportation Funding Programs (CTFP), which includes all the competitive M2 programs that provide grants to local agencies for transit, streets and roads, and environmental cleanup. These programs are subject to an annual call for projects (call) which is guided by the Board of Directors (Board)-approved CTFP guidelines. The CTFP guidelines are updated before each call and include scoring criteria that are developed in collaboration with the OCTA Technical Advisory Committee (TAC), which is comprised of representatives from the 35 local jurisdictions.

The CTFP guidelines for the 2025 call were approved by the Board on August 12, 2024. At that meeting, the Board also authorized the issuance of the current call. On average, OCTA awards approximately $40 million annually through these funding programs. The deadline to submit projects for consideration for the 2025 CTFP call was October 24, 2024.

Discussion

RCP

OCTA received ten applications for RCP funding, requesting a total of $33.21 million in funding as further detailed in Attachment A. The applications were reviewed for eligibility, consistency, adherence to the guidelines, and overall M2 program objectives aimed at completing a balanced regional network. Applications were evaluated and ranked based on the scoring criteria identified in the guidelines. During the review process, staff worked with local jurisdictions to address technical issues such as application scoring corrections, scope of work clarifications, and refinement of final project funding requests. One project from the County of Orange could not advance for funding consideration, as it did not meet the basic level of service criteria required.

Based upon these reviews and project consistency with the guidelines, staff recommends funding for nine projects, totaling $25.72 million (inflationary adjustments would be added, as appropriate). The recommended amount differs from what was originally requested by each local jurisdiction due to OCTA's detailed review of costs as listed in the applications. The revised recommended grant amount reflects only the project scope components and costs that appear to be eligible per the guidelines. Attachment B provides more detail on the programming recommendations.

The recommended RCP funding will support projects in the cities of Anaheim, Irvine, Mission Viejo, Newport Beach, Santa Ana, and Yorba Linda, and the County of Orange. Of the nine recommended projects, six will provide arterial capacity improvement benefits and three will provide intersection capacity

enhancements. Implementation of these projects in aggregate is anticipated to produce notable congestion-reducing benefits in Orange County, while enhancing the arterial system overall.

It should also be noted that the applications submitted by the cities of Irvine and Newport Beach received additional points for providing further details on how the proposed bicycle facilities identified in their projects will help reduce congestion and improve street operations. As such, OCTA is interested in these projects, and they will be evaluated after they are delivered for potential benefits of complementary bicycle improvements to the Master Plan of Arterial Highways network.

RTSSP

OCTA received six applications for RTSSP funding, requesting a total of $12.03 million in RTSSP funding. Staff worked with the local jurisdictions to address technical issues related to equipment cost refinements as well as project scope of work clarifications. Attachment A has more detail on the submitted projects.

Staff recommends the award of $11.99 million to fund all six RTSSP projects. The revised recommended grant amount is a result of cost refinements and scope of work clarifications. The local jurisdictions have indicated that they anticipate implementing these projects in fiscal year 2025-26. Together, these projects will improve throughput on six arterial roadways in the cities of Aliso Viejo, Anaheim, Brea, Costa Mesa, Fullerton, Irvine, Laguna Hills, Laguna Niguel, Mission Viejo, Newport Beach, Orange, and Santa Ana. Additional details on the recommended signal synchronization projects and the recommended awards are provided in Attachment C.

The table below provides an overall summary of the funding recommendations:

2025 CTFP Call Summary ($ in millions)			
	RCP	**RTSSP**	**Total**
Number of Applications Recommended for Approval	9	6	15
Amount Recommended for Approval (Escalated)	$25.72	$11.99	$37.71

Staff recommends the award of $37.71 million for 15 projects under the RCP and RTSSP. With the addition of these awards, the total amount of RCP and RTSSP M2 grants provided by OCTA to local agencies, since 2011, is more than $604 million. These grants support the development of a safe, efficient, and modern roadway system. The RCP applications for the recommended projects

demonstrate a future funding need of approximately $254 million to support right-of-way and construction phases, with $24 million likely needed within the next three call cycles. A map displaying the 2025 RCP and RTSSP recommended project awards is provided in Attachment D.

The OCTA Technical Steering Committee and TAC reviewed and recommended the RCP and RTSSP awards for Board approval at their meetings in March 2025.

Next Steps

With Board approval of these recommendations, staff will initiate letter agreements between OCTA and the appropriate local jurisdictions. As these projects advance, staff will continue to monitor their status and project delivery through the semi-annual review process.

Summary

Programming recommendations to award $37.71 million to 15 projects in M2 2025 RCP and RTSSP funds are presented for Board approval.

Attachments

A. 2025 Measure M2 Call for Projects – Applications Received
B. 2025 M2 Regional Capacity Program (Project O) Call for Projects – Programming Recommendations
C. 2025 M2 Regional Traffic Signal Synchronization Program (Project P) Call for Projects – Programming Recommendations
D. 2025 Recommended Project O and P Awards Map

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ATTACHMENT A

2025 Measure M2 Call for Projects – Applications Received

Regional Capacity Program (Project O) Applications

Agency	Project	Fund	Phase	Match Rate	Total M2 Request	Match	Total Cost
Anaheim	Lincoln Avenue and Harbor Intersection Improvements	ICE	ROW	25%	$ 940,812	$ 313,604	$ 1,254,416
Anaheim	Lincoln Avenue Improvements (Evergreen Street to State College Boulevard)	ACE	ENG	10%	$ 432,000	$ 48,000	$ 480,000
County of Orange	Los Patrones Parkway Extension – Final Design	ACE	ENG	50%	$ 5,000,000	$ 5,000,000	$ 10,000,000
County of Orange	Ranch Canyon, Bucker Way, and Bucker Way Bridge - Design	ACE	ENG	50%	$ 7,000,000	$ 7,000,000	$ 14,000,000
Irvine	Campus Drive Arterial Capacity Enhancements (Carlson Avenue to University Drive)	ACE	ENG	25%	$ 383,250	$ 127,750	$ 511,000
Mission Viejo	Alicia Parkway and Olympiad Road Intersection Capacity Enhancement Project	ICE	ENG, CON	25%	$ 723,577	$ 241,192	$ 964,769
Newport Beach	West Coast Highway Improvements at Old Newport Boulevard	ACE	ROW, CON	25%	$ 4,111,458	$ 1,370,486	$ 5,481,944
Santa Ana	Fairview Street Improvements (Monte Carlo Drive to Trask Street)	ACE	ROW	25%	$ 5,148,290	$ 1,716,097	$ 6,864,387
Yorba Linda	Lakeview Avenue Improvements (Bastanchury Road to Oriente Drive)	ACE	CON	25%	$ 2,567,831	$ 855,944	$ 3,423,775
Yorba Linda	Yorba Linda Boulevard/Savi Ranch Parkway Improvements - Construction (Phase 1)	ICE	CON	29%	$ 6,904,350	$ 2,873,850	$ 9,778,200
			PROJECT O REQUESTED TOTALS		**$ 33,211,568**	**$ 19,546,923**	**$ 52,758,491**

Regional Traffic Signal Synchronization Program (Project P) Applications

Agency	Project	Fund	Signals	Match Rate	Total M2 Request	Match	Total Cost
Anaheim	State College Boulevard Corridor (Cliffwood Avenue to Garden Grove Boulevard)	RTSSP	58	20%	$ 3,750,147	$ 937,537	$ 4,687,684
Irvine	Sand Canyon Avenue Corridor (Portola Parkway to I-405 SB ramp)	RTSSP	21	20%	$ 1,558,806	$ 389,702	$ 1,948,508
Laguna Hills	Avenida de Carlota Corridor (Lake Forest Drive to Los Alisos Boulevard)	RTSSP	8	20%	$ 599,996	$ 149,999	$ 749,995
Laguna Niguel	Cabot Road Corridor (La Paz Road to Paseo de Colinas)	RTSSP	12	20%	$ 881,002	$ 220,251	$ 1,101,253
Laguna Niguel	La Paz Road Corridor (Olympiad Road/Felipe Road to Crown Valley Parkway)	RTSSP	23	20%	$ 1,861,644	$ 465,411	$ 2,327,055
Santa Ana	Bristol Street Corridor (SR-22 EB ramp to Jamboree Road)	RTSSP	45	20%	$ 3,374,926	$ 843,731	$ 4,218,657
			PROJECT P REQUESTED TOTALS		**$ 12,026,521**	**$ 3,006,631**	**$ 15,033,152**

Acronyms:
ACE - Arterial Capacity Enhancements
CON - Construction
EB - Eastbound
ENG - Engineering
I-405 - Interstate 405
ICE - Intersection Capacity Enhancements
M2 - Measure M2
OCTA - Orange County Transportation Authority
ROW - Right-of-Way
RTSSP - Regional Traffic Signal Synchronization Program
SB - Southbound
SR-22 - State Route 22

ATTACHMENT B

2025 M2 Regional Capacity Program (Project O) Call for Projects - Programming Recommendations

RECOMMENDED FOR FUNDING

No	Agency	Fiscal Year	Project	Fund	Phase	M2 Funding Engineering	M2 Funding Right-of-Way	M2 Funding Construction	Total M2 Grant*	Estimated Local Match**	Match Rate	Total Programming
1	Anaheim	25/26	Lincoln Avenue and Harbor Intersection Improvements [1]	ICE	ROW		$ 886,699		**$ 886,699**	$ 295,566	25%	$ 1,182,265
2	Anaheim	25/26	Lincoln Avenue Improvements (Evergreen Street to State College Boulevard) [2]	ACE	ENG	$ 360,000			**$ 360,000**	$ 120,000	25%	$ 480,000
3	County of Orange	25/26	Los Patrones Parkway Extension – Final Design	ACE	ENG	$ 5,000,000			**$ 5,000,000**	$ 5,000,000	50%	$ 10,000,000
4	Irvine	25/26	Campus Drive Arterial Capacity Enhancements (Carlson Avenue to University Drive)	ACE	ENG	$ 383,250			**$ 383,250**	$ 127,750	25%	$ 511,000
5	Mission Viejo	25/26†	Alicia Parkway and Olympiad Road Intersection Capacity Enhancement Project [3]	ICE	ENG	$ 52,500			**$ 52,500**	$ 17,500	25%	$ 70,000
		26/27			CON			$ 615,627	**$ 615,627**	$ 205,209		$ 820,836
6	Newport Beach	25/26†	West Coast Highway Improvements at Old Newport Boulevard [4]	ACE	ROW		$ 2,598,759		**$ 2,598,759**	$ 866,254	25%	$ 3,465,013
		26/27			CON			$ 1,761,975	**$ 1,761,975**	$ 587,324		$ 2,349,299
7	Santa Ana	25/26†	Fairview Street Improvements (Monte Carlo Drive to Trask Street) [5]	ACE	ROW		$ 4,914,769		**$ 4,914,769**	$ 1,638,256	25%	$ 6,553,025
8	Yorba Linda	25/26	Lakeview Avenue Improvements (Bastanchury Road to Oriente Drive) [6]	ACE	CON			$ 2,238,155	**$ 2,238,155**	$ 746,052	25%	$ 2,984,207
9	Yorba Linda	25/26	Yorba Linda Boulevard/Savi Ranch Parkway Improvements - Construction (Phase 1) [7]	ICE	CON			$ 6,904,350	**$ 6,904,350**	$ 2,301,450	25%	$ 9,205,800
			PROJECT O PROGRAMMING TOTALS			$ 5,795,750	$ 8,400,227	$ 11,520,107	**$ 25,716,084**	$ 11,905,361		$ 37,621,445

**Includes escalation of 1.9% for all construction phases programmed for fiscal year 2026/27.*

***Actual match amount is determined by the match rate percentage. Dollar amount is listed for estimate purposes.*

† *Pre-award authority requested.*

NOT RECOMMENDED FOR FUNDING (Ineligible - Does Not Meet Project O Eligibility Requirements Based Upon Current Traffic Counts)

1	County of Orange	25/26	Ranch Canyon, Bucker Way, and Bucker Way Bridge - Design^	ACE	ENG	$ 7,000,000			**$ 7,000,000**	$ 7,000,000	50%	$ 14,000,000

^Project is not recommended for programming due to not complying with CTFP guidelines requirement, specifically with respect to current traffic volumes meeting a minimum LOS "C" (0.71v/c).

1. Applicant requested additional funding but award is reduced to reflect eligibility of items within project scope and correct match reduction. Total project cost is $1.25 million. The M2 grant plus local match is listed as $1.18 million; an additional $72k to come from local sources.
2. Applicants original request provided only 10 percent match but 25 percent match is required. Award amount was reduced and match increased to fully fund the project and to reflect local match requirement of 25 percent. Total project cost is $480k.
3. Applicant requested additional funding but award is reduced to reflect eligibility of items within project scope and correct match reduction. Total project cost is $965k for ENG and CON. The M2 grant plus local match is listed as $890k for ENG and CON; an additional $75k to come from local sources.
4. Applicant initially requested less funding but award is increased to reflect eligibility of items within project scope. Total project cost is $5.77 million for ROW and CON, which is equivalent to the M2 grant plus local match.
5. Applicant requested additional funding but award is reduced to reflect eligibilty of items within project scope. Total project cost is $6.86 million. The M2 grant plus local match is $6.55 million; an additional $311k to come from local sources. The recommended grant includes an administrative exception to the CTFP guidelines that would accept the project's categorical CEQA exemption after the October 24, 2024 call for projects application deadline. The notice of exemption was in progress at the time of application submittal and approved by the applicant's city council on February 6, 2025.
6. Applicant requested additional funding but award is reduced to reflect eligibility of items within project scope. Total project cost is $3.42 million. The M2 grant plus local match is $2.98 million; an additional $440k to come from local sources. The recommended grant is a reapplication from prior cycles.
7. The recommended grant includes a minor exception to the CTFP guidelines to allow work within a 600 feet from intersection for the benefit of the MPAH to reach a logical terminus on Mirage Street. This excludes sidewalk improvements on Mirage Street beyond the beginning curb return.

Acronyms:

ACE - Arterial Capacity Enhancements
CEQA - Califonria Environmental Quality Act
CON - Construction
CTFP - Comprehensive Transportation Funding Programs
ENG - Engineering
ICE - Intersection Capacity Enhancements
LOS - Level of Service
M2 - Measure M2
MPAH - Master Plan of Arterial Highways
ROW - Right-of-Way
v/c - Volume/Capacity

ATTACHMENT C

2025 M2 Regional Traffic Signal Synchronization Program (Project P) Call for Projects - Programming Recommendations

No	Agency	Fiscal Year	Project	M2 Funding Primary Implementation	M2 Funding Operations & Maintenance	Total M2 Grant	Estimated Local Match*	Match Rate	Total Programming
1	Anaheim	25/26	State College Boulevard Corridor (Cliffwood Avenue to Garden Grove Boulevard) [1]	$ 3,493,171	$ 269,120	**$ 3,762,291**	$ 940,573	20%	$ 4,702,864
2	Irvine	25/26	Sand Canyon Avenue Corridor (Portola Parkway to I-405 SB ramp) [2]	$ 1,398,259	$ 96,800	**$ 1,495,059**	$ 373,765	20%	$ 1,868,824
3	Laguna Hills	25/26	Avenida de Carlota Corridor (Lake Forest Drive to Los Alisos Boulevard)	$ 580,412	$ 19,584	**$ 599,996**	$ 149,999	20%	$ 749,995
4	Laguna Niguel	25/26	Cabot Road Corridor (La Paz Road to Paseo de Colinas)[3]	$ 761,346	$ 67,680	**$ 829,026**	$ 207,256	20%	$ 1,036,282
5	Laguna Niguel	25/26	La Paz Road Corridor (Olympiad Road/Felipe Road to Crown Valley Parkway)[4]	$ 1,809,061	$ 124,080	**$ 1,933,141**	$ 483,285	20%	$ 2,416,426
6	Santa Ana	25/26†	Bristol Street Corridor (SR-22 EB Ramp to Jamboree Road)	$ 3,262,926	$ 112,000	**$ 3,374,926**	$ 843,731	20%	$ 4,218,657
			PROJECT P PROGRAMMING TOTALS	$ 11,305,175	$ 689,264	**$ 11,994,439**	$ 2,998,609		$ 14,993,048

**Actual match amount is determined by the match rate percentage. Dollar amount is listed for estimate purposes.*

† *Pre-award authority requested.*

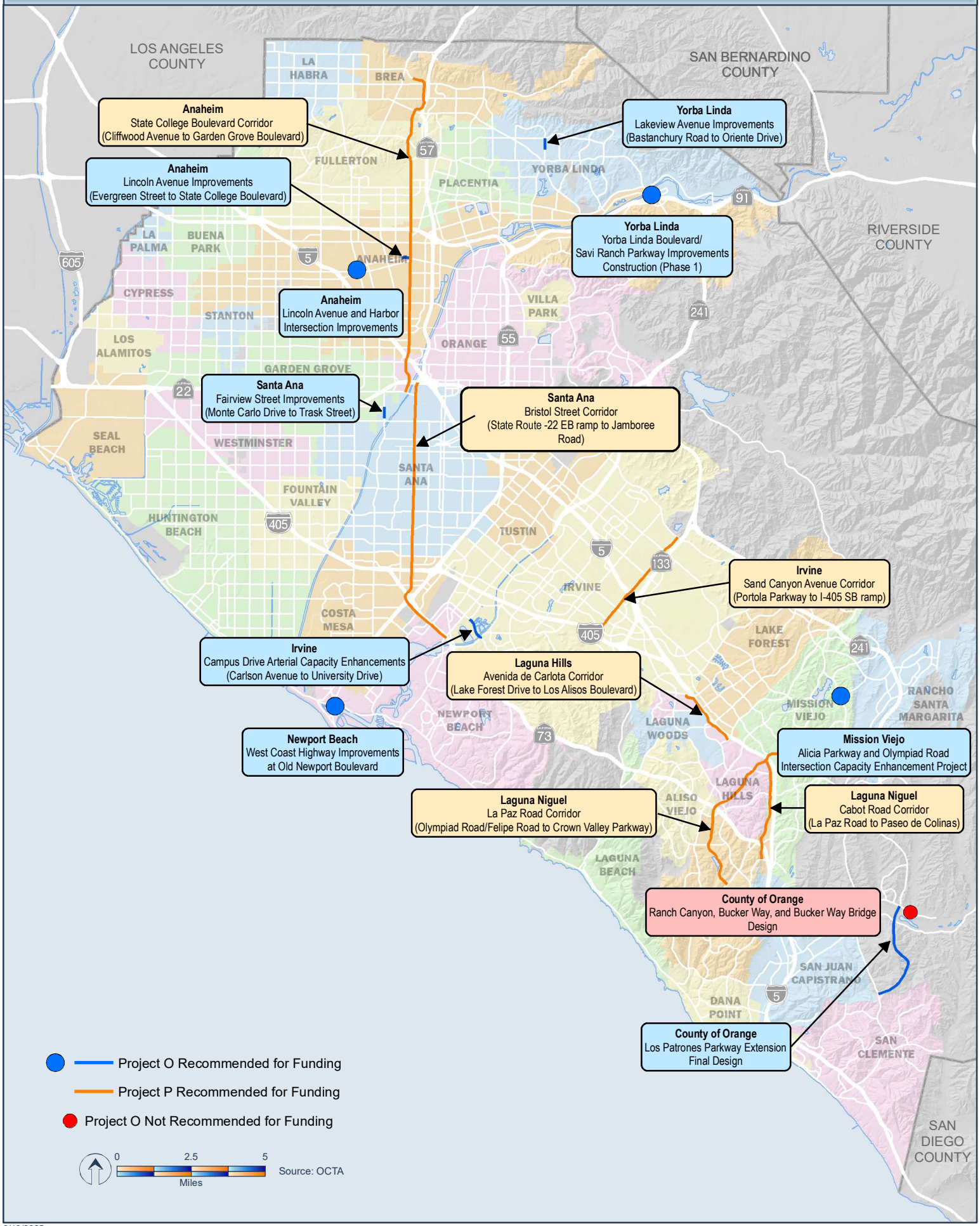
1. Applicant initially requested less funding but award is increased to reflect consistent equipment unit costs. Total project cost is $4.70 million for IMP and O&M, which is equivalent to the M2 grant plus local match.
2. Applicant requested additional funding but award is reduced to reflect updated cost estimate for Task 2. Total project cost is $1.56 million. The M2 grant plus local match is listed as $1.87 million; an additional $64k to come from local sources.
3. Applicant requested additional funding but award is reduced to reflect revised budget. Total project cost is $881k. The M2 grant plus local match is listed as $1.03 million; an additional $52k to come from local sources.
4. Applicant initially requested less funding but award is increased to reflect one contract with design and CON. Total project cost is $2.42 million for one contract, which is equivalent to the M2 grant plus local match.

Acronyms:

CON - Construction
EB - Eastbound
IMP - Implementation
I-405 - Interstate 405
M2 - Measure M2
O&M - Operations and Maintenance
RTSSP - Regional Traffic Signal Synchronization Program
SB - Southbound
SR-22 - State Route 22

2025 Recommended Project O and P Awards

ATTACHMENT D



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Comprehensive Transportation Funding Programs - 2025 Call for Projects Programming Recommendations

Background

Program	Project O	Project P
Goals and Objective	Project O provides funding to complete the MPAH. In addition, the program provides for intersection improvements and other projects to help improve street operations and reduce congestion.	Project P targets to coordinate over 2,000 signalized intersections in the County across jurisdictional boundaries including cities, County of Orange, and Caltrans.
Percent of M2 Allocation	Ten percent of M2 Net Revenues	Four percent of M2 Net Revenues.
Call Amount (on average)	Approximately $29 million awarded per call.	Approximately $10.7 million awarded per call.
Impact	Through 14 calls, 186 projects awarded, more than $406 million (includes leveraged external funds).	Through 14 calls, 132 projects awarded, more than $160 million (includes leveraged external funds).

Call – Call for projects
Caltrans – California Department of Transportation
MPAH - Master Plan of Arterial Highways
M2 – Measure M2

Regional Capacity Program

- Closes gaps in the local road network
- Improves intersections to enhance street operations
- Provides better interfaces with the highway system
- Project O funds awarded to date: $382.1 million

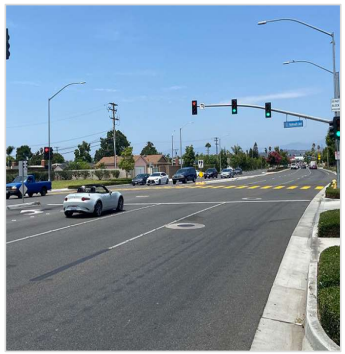
Project O Examples



Del Obispo Improvements
City of San Juan Capistrano



Grand Avenue Improvements
City of Santa Ana



Brookhurst Street Improvements
City of Anaheim



Newport Boulevard Improvements
City of Newport Beach

Regional Traffic Signal Synchronization

- Reduces travel times, stops, and delays
- Invests in future-proofing the system
- Improves traffic flow and makes the system more efficient
- Project P funds awarded to date: $142.3 million

Project P Examples



Irvine Center Drive/ Edinger Avenue
City of Irvine



Seal Beach Boulevard/ Bolsa Avenue
City of Seal Beach



Edinger Avenue
City of Fountain Valley

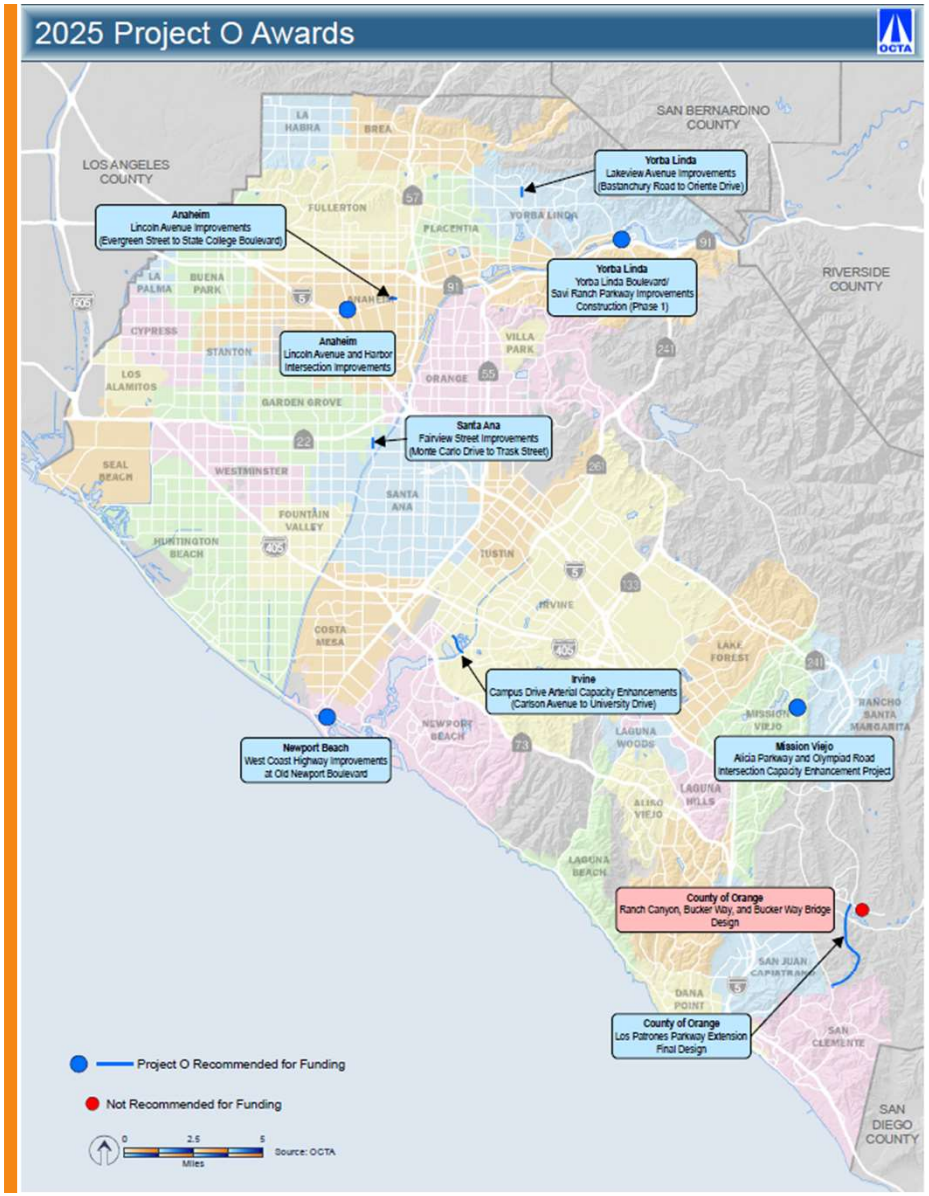


Marguerite Parkway
City of Mission Viejo

Staff Recommendations

- Approve the 2025 RCP to fund **nine projects**, totaling **$25.72 million**
- Approve the 2025 RTSSP to fund **six projects**, totaling **$11.99 million**

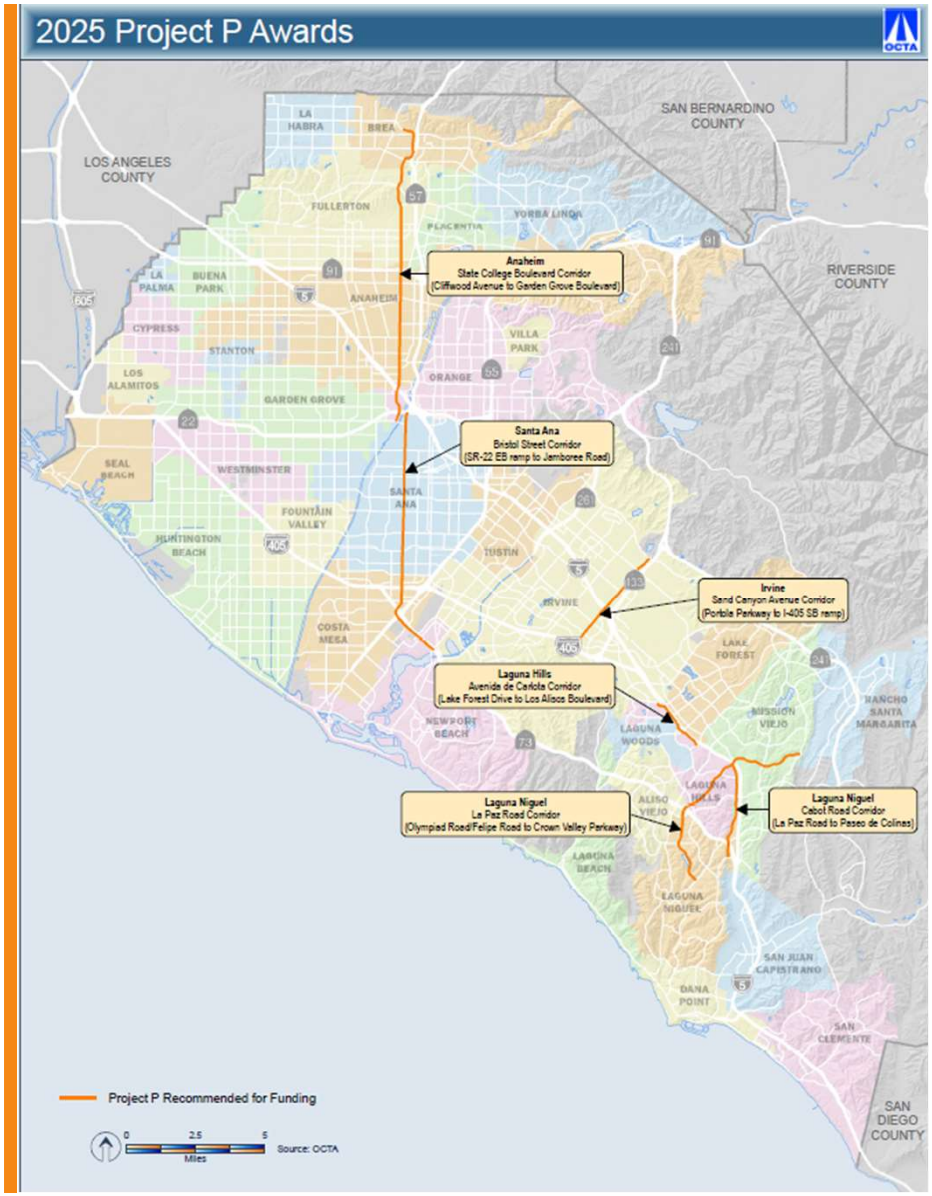
RCP - Regional Capacity Program
RTSSP - Regional Traffic Signal Synchronization Program



Project O Recommendations

Approve nine projects totaling $25.72 million in RCP funds

- $17.25 million for roadway improvements
- $8.46 million for intersection enhancements



Project P Recommendations

Approve six projects totaling $12.03 million in RTSSP funds

- Improvements to 194 signals along 50 miles of streets
- Coordination of traffic flow across 15 local jurisdictions

2025 Call Timeline and Milestones

- March 26, 2025 – Technical Advisory Committee
- April 7, 2025 – Regional Transportation Planning Committee
- April 14, 2025 – OCTA Board Final Approval
- July 1, 2025 – Programming of 2025 Project O & Project P Grants
  (Subject to Board Approval)

Board – Board of Directors
OCTA – Orange County Transportation Authority

OCTA

April 7, 2025

To: Regional Transportation Planning Committee

From: Darrell E. Johnson, Chief Executive Officer

Subject: Active Transportation Program Biannual Update

Overview

The Orange County Transportation Authority coordinates regional active transportation efforts with local jurisdictions, key stakeholders, and the public. An update on recent and upcoming activities is provided.

Recommendation

Receive and file as an information item.

Background

The Orange County Transportation Authority (OCTA) is engaged in regional active transportation projects and programs in Orange County (OC). These efforts support OCTA's vision for a balanced multimodal transportation system. To realize this vision, OCTA works with local jurisdictions, stakeholders, and the public to advance the development of safe, accessible, and connected bicycling and walking networks. Updates on these projects and a summary of additional active transportation efforts are discussed below.

Discussion

Electronic Bicycles (E-Bikes) Safety Action Plan

In December 2024, OCTA completed the E-Bike Safety Action Plan (Plan) to address gaps in e-bike safety resources at regional, state, and local levels. The Plan proposes strategies to address these gaps and identifies potential funding sources to facilitate future e-bike initiatives.

The project team conducted an inventory of available e-bike data and non-infrastructure e-bike resources, including crash and count data, injury data, ongoing local safety efforts, regional initiatives, and statewide initiatives and legislation. The project team then conducted a gap analysis of these resources and initiatives, identifying areas where resources were both available and not available. The project team also engaged with OC's local jurisdictions, law enforcement agencies, regional agencies such as Orange County Healthcare Agency (OCHCA), hospitals such as Providence Mission Hospital, retailers, and other stakeholders involved in e-bike safety efforts, as well as the broader OC community.

Analyzing the stakeholder and community input, data and non-infrastructure inventory, and gap analysis, the project team developed the final Plan which recommends actions in six key strategy areas: infrastructure, legislation, collisions/injuries, ridership, education/encouragement, and retail collaboration. Each strategy area is accompanied by individual strategies and recommended actions to move towards safer e-bike use in OC.

Recommendations identified in the Plan include:

- Infrastructure: Continue to advance bikeway infrastructure which fosters safe e-bike riding.
- Legislation: Support e-bike use as a sustainable transportation mode and encourage safe adoption of active modes.
- Collisions/injuries: Build understanding of crash and risk factors, especially those that result in severe injury or fatality.
- Ridership: Understand growth trends and hot spots for e-bike use.
- Education/encouragement: Target behavior changes for key groups affected by e-bike safety issues.
- Retailer collaboration: Leverage e-bike retailers for outreach and data collection.

OCTA staff is exploring implementations and partnership strategies to best operationalize the recommendations identified in the plan.

Next Safe Travels Education Program (Next STEP) Project

In June 2024, OCTA, in partnership with OCHCA, launched the Next STEP Project which partners with city staff, schools, and school districts to conduct walking and bicycling education and encouragement activities and assess

infrastructure needs at participating schools. The Project will be implemented at 25 eligible public elementary schools across OC. The $2.1 million Next STEP Project is funded by an $850,000 California Transportation Commission Active Transportation Program (ATP) grant and a $1.25 million Southern California Association of Governments (SCAG) Regional Early Action Planning (REAP) 2.0 grant.

Using eligibility criteria established in the Safe Routes to School Action Plan, the project team has thus far enrolled 14 schools to participate in the infrastructure needs element of the Project (Attachment A). While all cities have been contacted, enrollment in the project remains incomplete as the project team continues working to meet with district and school staff to enroll the remaining schools based on their eligibility and ability to participate in the Project. The project team is conducting walk audits in collaboration with school staff, school districts, city staff, county staff (as appropriate), parents, and the OCHCA. These audits include observing drop-off and/or pick-up activities followed by an evaluation of surrounding roadway, bicycle, and pedestrian facilities. During the walk audits, parents and school staff are encouraged to provide feedback on infrastructure conditions as well as safety and access needs. Traffic data collection efforts and student travel tally surveys are also completed to help analyze the use and movement of vehicles, bicycles, and pedestrians near schools. Recommendations based on the audits will be developed by the project team and reviewed by each city prior to being finalized.

Project staff is soliciting participation from 25 schools to gauge interest in the education programming component. Once recruitment is complete, the project team will begin delivering walking and bicycling education and encouragement activities at participating schools.

Active Transportation Outreach and Engagement Project

The Active Transportation Education and Engagement Project began in summer 2024 and will continue through June 2026. The project team is attending community events, conducting and participating in bicycle rodeos, developing online education modules, and deploying mobile street team ambassadors to distribute safety materials to the public. These efforts aim to empower residents to safely and confidently use bicycling and walking as a viable mode of transportation. The project also strengthens partnerships with community-based organizations in support of active transportation safety to help increase community engagement and participation and further develop OCTA’s active transportation stakeholder group. This project is funded with a $400,000 SCAG REAP 2.0 grant.

The project team is working with local jurisdictions and stakeholders to identify community events where providing active transportation engagement and education can be beneficial to the safety and well-being of the community. Collateral and educational materials were developed and are being distributed to aid in this messaging including:

- Vehicle, pedestrian, and bicycle safety tips flyers
- E-bike safety flyers
- E-bike stickers
- Bicycle stickers

The project team identified and procured walking and bicycle safety equipment. Depending on the focus of the events attended, the project team has been distributing the following:

- Reflective ankle wraps and keychains
- Bicycle lights
- Bicycle bells
- Bicycle helmets

The project team has attended 14 events, engaged 1,840 attendees, and distributed over 2,497 safety items and 1,966 educational materials (Attachment B).

OC Connect Project

OCTA is completing the Project Approval and Environmental Document (PA/ED) phase of the OC Connect Project in cooperation with the cities of Garden Grove and Santa Ana (Cities), the California Department of Transportation (Caltrans) District 12, and Orange County Public Works. This project proposes approximately four miles of Class I shared-use path, connecting the Cities and closing an active transportation gap for the communities around the former Pacific Electric Right-of-Way (PEROW) corridor.

Closing this gap would greatly improve the active transportation connectivity by providing a safe, well-connected active transportation corridor linking the Cities' downtown areas to the surrounding communities as well as the Santa Ana River Trail, multiple transit stops, and the OC Streetcar. In addition to increased connectivity, the project creates a valuable and lasting community greenway that benefits both Cities' downtown areas and the neighborhoods surrounding the corridor. Transformation of the former PEROW corridor into a vibrant community will promote health and wellbeing and create a positive identity using recreation and leisure amenities not currently available in the surrounding areas.

OC Connect PA/ED phase is funded by a $3 million ATP grant, which will complete preliminary design, determine the trail's feasibility, estimate project costs, and complete the requisite environmental documentation. Caltrans, as assigned by the Federal Highway Administration, is the lead agency under the National Environmental Policy Act and OCTA is the lead agency under the California Environmental Quality Act (CEQA). In addition to design and environmental document preparation, OC Connect includes extensive communication with local stakeholders and the surrounding community through a two-phase public outreach and input campaign. These meetings provided opportunities for public comments and discussion regarding the project and the CEQA statutory exemption documentation and process.

OCTA has also secured $6 million in funding to complete the project through the final design or Plans, Specifications, and Estimates (PS&E) phase. After the PA/ED phase concludes in June 2025, OCTA plans to begin the procurement process for PS&E services. Prior to beginning the PS&E phase, OCTA is working with the Cities to secure a commitment to operate and maintain the trail once constructed. Staff will provide the Board with an update in fall 2025 after the completion of the PA/ED phase.

Orange County Bicycle Counts

OCTA is collecting bicycle count data from 450 locations on roads and bicycle paths across the County and updating the OCTA bicycle counts database. This data supports active transportation in the County by providing data for analysis, grant applications, and project development. OCTA is using a web-based platform for local agencies to request counts at specific locations. In January and February 2025, outreach emails were sent to key city and county representatives, including city engineers, public works directors, and active transportation coordinators with the purpose of encouraging jurisdictions to request bicycle count locations within their jurisdiction.

Data collection took place in June 2024 and will take place again in May 2025. Counts are taken at each location for one weekday and one weekend day during the collection period. The count information includes a range of data categories such as direction of travel, sidewalk versus street usage, electric versus non-electric bicycles, and helmet usage. The final 2024 bicycle count data has been added to the database and is available to cities upon request. The 2025 data is expected to be available by the end of summer 2025.

Summary

OCTA supports efforts to improve active transportation throughout OC. This includes ongoing education, encouragement, engineering, and evaluation efforts for active transportation. Coordination and collaboration will continue between regional, state, and local agencies, key stakeholders, and the public to encourage and support safer walking and bicycling in OC.

Attachments

A. Next Safe Travels Education Program Participating Schools (Infrastructure)
B. Active Transportation Outreach Support Summary

Prepared by:



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Approved by:



Rose Casey
Executive Director, Planning
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ATTACHMENT A

Next Safe Travels Education Program Participating Schools (Infrastructure)		
City	**District**	**School**
Aliso Viejo	**Capistrano Unified**	Wood Canyon Elementary
Cypress	**Cypress Elementary**	Clara J. King Elementary
Fountain Valley	**Garden Grove Unified**	James Monroe Elementary
Garden Grove	**Garden Grove Unified**	Sunnyside Elementary
		Ocia A. Peters Elementary
		Earl Warren Elementary
		Patton Elementary
		Garden Park Elementary
		Mitchell Elementary
Lake Forest	**Saddleback Valley Unified**	Rancho Canada Elementary
Orange County Public Works (Unincorporated)	**Capistrano Unified**	Las Flores Elementary
San Juan Capistrano	**Capistrano Unified**	Harold Ambuehl Elementary
Tustin	**Tustin Unified**	Sycamore Magnet Academy
		Benjamin F. Beswick Elementary

ATTACHMENT B

Active Transportation Outreach Support Summary

Event Name	Date	Participation	City
SEPTEMBER - 2024			
Fiestas Patrias	09/14/24	Pop Up	Santa Ana
Community Bike Ride to Raise Prostate Cancer Awareness	09/24/24	Pop Up	Fullerton
OCTOBER - 2024			
Walk to School Day - Washington Elementary	10/09/24	Pop Up	Santa Ana
Trunk or Treat Resource Fair	10/23/24	Pop Up	Santa Ana
NOVEMBER - 2024			
Metrolink Holiday Express Train	11/30/24	Pop Up	Anaheim
DECEMBER - 2024			
Rossmoor Winter Festival	12/14/24	Pop Up	Rossmoor
Holiday Market at Anaheim Garden Walk	12/21/24	Pop Up	Anaheim
JANUARY - 2025			
City of Santa Ana Tet Festival	01/25/25	Pop Up	Santa Ana
First Baptist Church Tet Celebration	01/30/25	Mobile Street Team	Westminster
FEBRUARY - 2025			
2025 Roger Millikan Race	02/09/25	Mobile Street Team	Brea
Cal State Fullerton Bike Safety Check	02/19/25	Pop Up	Fullerton
Oso Fit 5k and Community Health Fair	02/22/25	Pop Up	Mission Viejo
Aliso Viejo Brave Race 5K & 1K Fun Run	02/23/25	Pop Up	Aliso Viejo
Strong Town OC Active Transportation Forum	02/27/25	Pop Up	Fullerton

Active Transportation Program Biannual Update

Overview

- E-Bike Safety Initiatives and Projects
- Next STEP
- Active Outreach and Education
- OC Connect
- Orange County Bicycle Counts

E-Bike - Electric Bicycle
Next STEP - Next Safe Travels Education Program

E-Bike Safety Initiatives and Projects

E-Bike Safety Action Plan

- Completed in winter 2024
- Incorporated input from cities, stakeholders, and public
- Made recommendations and identified potential lead and partner agencies

Six Goal Focus Areas

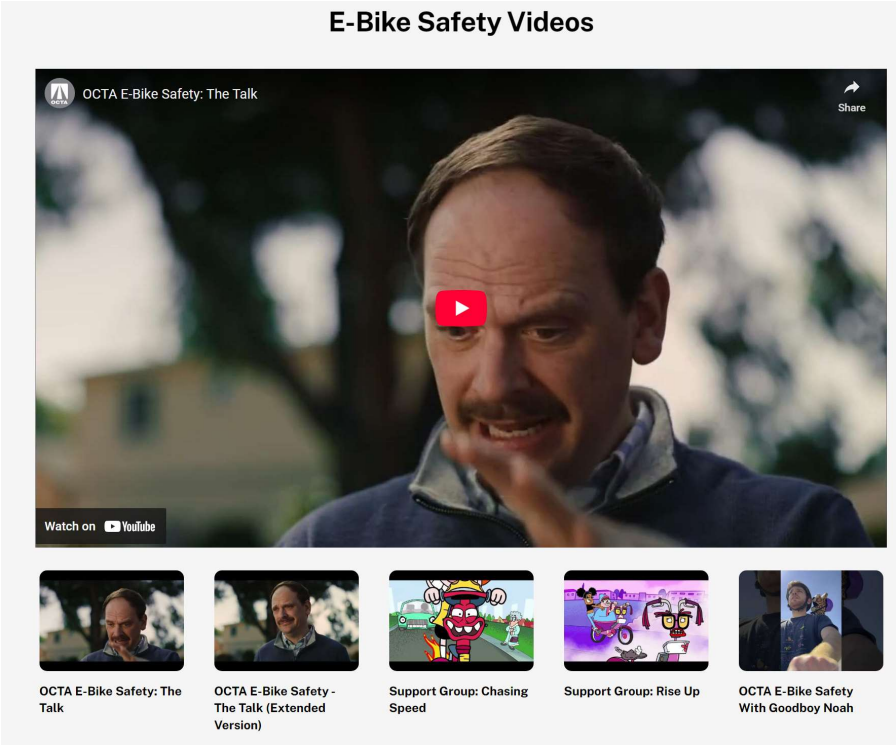
- Infrastructure
- Legislation
- Collisions/injuries
- Ridership
- Education/encouragement
- Retailer collaboration



E-Bike Safety Initiatives and Projects (Cont.)

E-Bike Initiatives

- New safety videos
- Injury collaborative
- Quarterly meeting
- Education and rodeos



E-Bike safety videos on OCTA website

Next Safe Travels Education Program

Project Summary

- 25 schools - eligibility determined by Safe Routes to School Action Plan needs analysis
- Evaluation/concept development
- Educational programming

Current Activities

- School recruitment
- City, schools, and district staff coordination
- Conduct walk audits
- Collect traffic data



Walk Audit at Beswick Elementary in Tustin

SRTS – Safe Routes to School

Active Outreach and Education

Project Overview

- Education and safety engagement
- Community events participation
- Bicycle rodeos
- Online education modules
- Mobile street teams for safety material distribution
- Staff are taking event requests

Distributed Materials

- Educational Materials Distributed: 1905 total
- Safety Equipment Distributed: 2280 total
  - Reflective ankle wraps and keychains, water bottles, bicycle lights, bells, helmets, spoke reflectors



BRAVE Race 1k 5k and 10k for the Joyful Child Foundation event

OC Connect

Project Overview

- 1.5 miles in the City of Garden Grove
- 2.3 miles in the City of Santa Ana
- Preliminary engineering and environmental approval

Project Goals

- Greater connectivity
- Provides low-cost transportation option
- New parks and green space
- Community identity
- Historic preservation

Project Status

- Completed public outreach
- Completed preliminary design
- Finalizing environmental documentation with Caltrans



Caltrans - California Department of Transportation

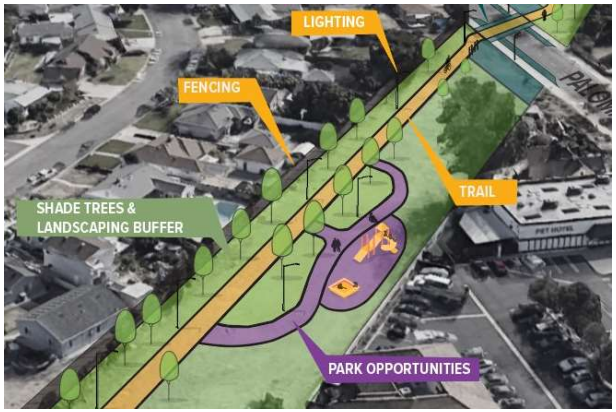
OC Connect

Next Steps

- Complete project approval and environmental document phase (June 2024)
- Secure commitments for maintenance and operations
- Begin final design/plans, specifications and estimate phase



Existing Conditions



Wide Section Trail Side Element Concept



Bridge/Santa Ana River Trail Concept



Example Trail

PE ROW – Pacific Electric Right-of-Way

Orange County Bicycle Counts

Project Overview

- Track bicycle usage across 450 locations
- Various metrics collected
- Data collection will be in May 2025
- Asked for city feedback January – February

Use of Data

- Supports grant applications and project planning
- Available by request for analysis
- Incorporation into OCTA's flow map

Next Steps

- Return to the Board of Directors with updates on active transportation efforts including:
  - OC Connect, e-bike safety efforts, active transportation outreach, upcoming projects
  - Partnering with stakeholders

- Seek funding opportunities to support active transportation initiatives and projects
  - Continue working with local agencies and community groups to advance active transportation measures for all Orange County residents