

**FY 2024 Call for Projects****Regional Traffic Signal Synchronization Program****Project P****Supplemental Application****Kraemer Boulevard/ Glassell Street/ Grand Avenue Corridor****10/26/2023**

Application Deadline

**Project Overview**

Length of Corridor (mi): 15.1  
Number of signals: 61  
Total Project Cost: \$5,710,657.50  
M2 funds requested: \$4,568,526.00  
Total Match: \$1,142,131.50  
*Cash Match: \$1,112,131.50*  
*In-kind Match: \$30,000.00*  
Participating Agencies: Santa Ana  
Brea  
Placentia  
Anaheim  
Orange  
Caltrans

**Applicant Agency:** City of

Santa Ana

**Contact Name:** Cesar Rodriguez**Contact Number:** 714-647-54626**Contact Email:** [crodriguez5@santa-ana.org](mailto:crodriguez5@santa-ana.org)

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**SECTION 1: KEY TECHNICAL INFORMATION**

a. Project **Corridor**  
**Kraemer Boulevard/ Glassell Street/ Grand Avenue Corridor**

b. Project Limits:  
 from **Lambert Road** to **Dyer Road**

c. Project Length (miles):  
**15.14**

d. Number of signalized intersections along the corridor (include all Caltrans intersections):  
**61** number of signals on project corridor(s) **3** number of offset signals included in this project

- e. Participating agencies / Traffic Forum Members (including applicant agency):
- |  |   |  |   |   |
|--|---|--|---|---|
| <input type="checkbox"/> Aliso Viejo         | <input type="checkbox"/> Cypress          | <input type="checkbox"/> La Habra      | <input type="checkbox"/> Los Alamitos           | <input type="checkbox"/> San Juan Capistrano  |
| <input checked="" type="checkbox"/> Anaheim  | <input type="checkbox"/> Dana Point       | <input type="checkbox"/> La Palma      | <input type="checkbox"/> Mission Viejo          | <input checked="" type="checkbox"/> Santa Ana |
| <input checked="" type="checkbox"/> Brea     | <input type="checkbox"/> Fountain Valley  | <input type="checkbox"/> Laguna Beach  | <input type="checkbox"/> Newport Beach          | <input type="checkbox"/> Seal Beach           |
| <input type="checkbox"/> Buena Park          | <input type="checkbox"/> Fullerton        | <input type="checkbox"/> Laguna Hills  | <input checked="" type="checkbox"/> Orange      | <input type="checkbox"/> Stanton              |
| <input checked="" type="checkbox"/> Caltrans | <input type="checkbox"/> Garden Grove     | <input type="checkbox"/> Laguna Niguel | <input checked="" type="checkbox"/> Placentia   | <input type="checkbox"/> Tustin               |
| <input type="checkbox"/> Costa Mesa          | <input type="checkbox"/> Huntington Beach | <input type="checkbox"/> Laguna Woods  | <input type="checkbox"/> Rancho Santa Margarita | <input type="checkbox"/> Villa Park           |
| <input type="checkbox"/> County of Orange    | <input type="checkbox"/> Irvine           | <input type="checkbox"/> Lake Forest   | <input type="checkbox"/> San Clemente           | <input type="checkbox"/> Westminster          |
|  |   |  |   | <input type="checkbox"/> Yorba Linda          |

f. Lead Agency  **Santa Ana**

g. Designation of the corridor to synchronize:  
 Signal Synchronization Network Corridor / Priority Corridor  Master Plan of Arterial Highways Corridor

h. Project Start Date: **January 1, 2025** Project End Date: **December 31, 2027**

- i. Select any that apply:  
 Re-timing at least 75% of previous project  Timing at least 75% of new eligible project  None  
 All participating agencies are participating in the Countywide Baseline Project

j. Contact Information (Include name, title, agency, phone, email, and address)

Cesar Rodriguez, Senior Civil Engineer City of Santa Ana, 714-647-5626 crodriguez5@santa-ana.org 20 Civic Center Plaza Santa Ana, CA 92701	Albert Espinoza, City Engineer City of Brea, 714-990-7657 alberte@ci.brea.ca.us 1 Civic Center Circle Brea, CA 92821
Kyra Tao, Transportation Manager City of Placentia, 714-993-8121 ktao@placentia.org 401 E. Chapman Ave. Placentia, CA 92870	John Thai, Principal Traffic Engineer City of Anaheim, 714-765-5294 jthai@anaheim.net 200 S. Anaheim Blvd, Suite 276 Anaheim, CA 92805
Gabrielle Hayes, Senior Civil Engineer City of Orange, 714-744-5561 ghayes@cityoforange.org 300 E. Chapman Avenue Orange, CA 92866	Pauline Nguyen, Branch Chief, Traffic Signals/Ramp Metering/ Census Caltrans District 12, 949-279-9168 6681 Marine Way Irvine, CA 92618

k. Signalized intersections that are part of the project:

	Main Corridor	Cross Street
1	Kraemer Boulevard	Lambert Road
2	Kraemer Boulevard	Birch Street
3	Kraemer Boulevard	Orbiter Street
4	Kraemer Boulevard	Birch Hills Mall
5	Kraemer Boulevard	Imperial Highway (SR-90) *
6	Kraemer Boulevard	Buttonwood Drive/ Saturn Street
7	Kraemer Boulevard	Golden Avenue
8	Kraemer Boulevard	Patrician Lane
9	Kraemer Boulevard	Bastanchury Road
10	Kraemer Boulevard	Yorba Linda Boulevard
11	Kraemer Boulevard	Sheffield Street/Morse Avenue
12	Kraemer Boulevard	Madison Avenue
13	Kraemer Boulevard	Alta Vista Street
14	Kraemer Boulevard	Chapman Avenue (North)
15	Kraemer Boulevard	Hawaii Way
16	Kraemer Boulevard	Crowther Avenue
17	Kraemer Boulevard	Orangethorpe Avenue
18	Kraemer Boulevard	La Jolla Street
19	Kraemer Boulevard	Miraloma Avenue
20	Kraemer Boulevard	Coronado Street
21	Kraemer Boulevard	Fire Signal
22	Kraemer Boulevard	La Palma Avenue
23	Kraemer Boulevard	SR-91 Westbound Off-Ramp *
24	Kraemer Boulevard	Frontera Street
25	Glassell Street	Riverdale Avenue
26	Glassell Street	Riverbend Parkway/Richland Avenue
27	Glassell Street	Lincoln Avenue
28	Glassell Street	Fletcher Avenue
29	Glassell Street	Meats Avenue
30	Glassell Street	Grove Avenue
31	Glassell Street	Orange Olive Road
32	Glassell Street	Taft Avenue
33	Glassell Street	Katella Avenue
34	Glassell Street	Wilson Avenue/Adams Avenue
35	Glassell Street	Collins Avenue
36	Glassell Street	Walnut Avenue
37	Glassell Street	Sycamore Avenue/University Drive
38	Glassell Street	Palm Avenue
39	Glassell Street	La Veta Avenue

	Main Corridor	Cross Street
40	Glassell Street	SR-22 Westbound Ramp *
41	Glassell Street	SR-22 Eastbound Ramp *
42	Grand Avenue	Fairhaven Avenue
43	Grand Avenue	Santa Clara Avenue
44	Grand Avenue	21st Street
45	Grand Avenue	17th Street
46	Grand Avenue	I-5 Northbound Ramp
47	Grand Avenue	Santa Ana Blvd/I-5 Southbound Ramp
48	Grand Avenue	Fruit Street
49	Grand Avenue	OC Register
50	Grand Avenue	4th Street
51	Grand Avenue	1st Street
52	Grand Avenue	Chestnut Avenue
53	Grand Avenue	McFadden Avenue
54	Grand Avenue	Century High School
55	Grand Avenue	Edinger Avenue
56	Grand Avenue	St Andrew Place
57	Grand Avenue	St Gertrude Place
58	Grand Avenue	Warner Avenue
59	Grand Avenue	Hotel Terrace Drive/Brookhollow Dr
60	Grand Avenue	SR-55 Southbound Off-Ramp
61	Grand Avenue	Dyer Road

Legend

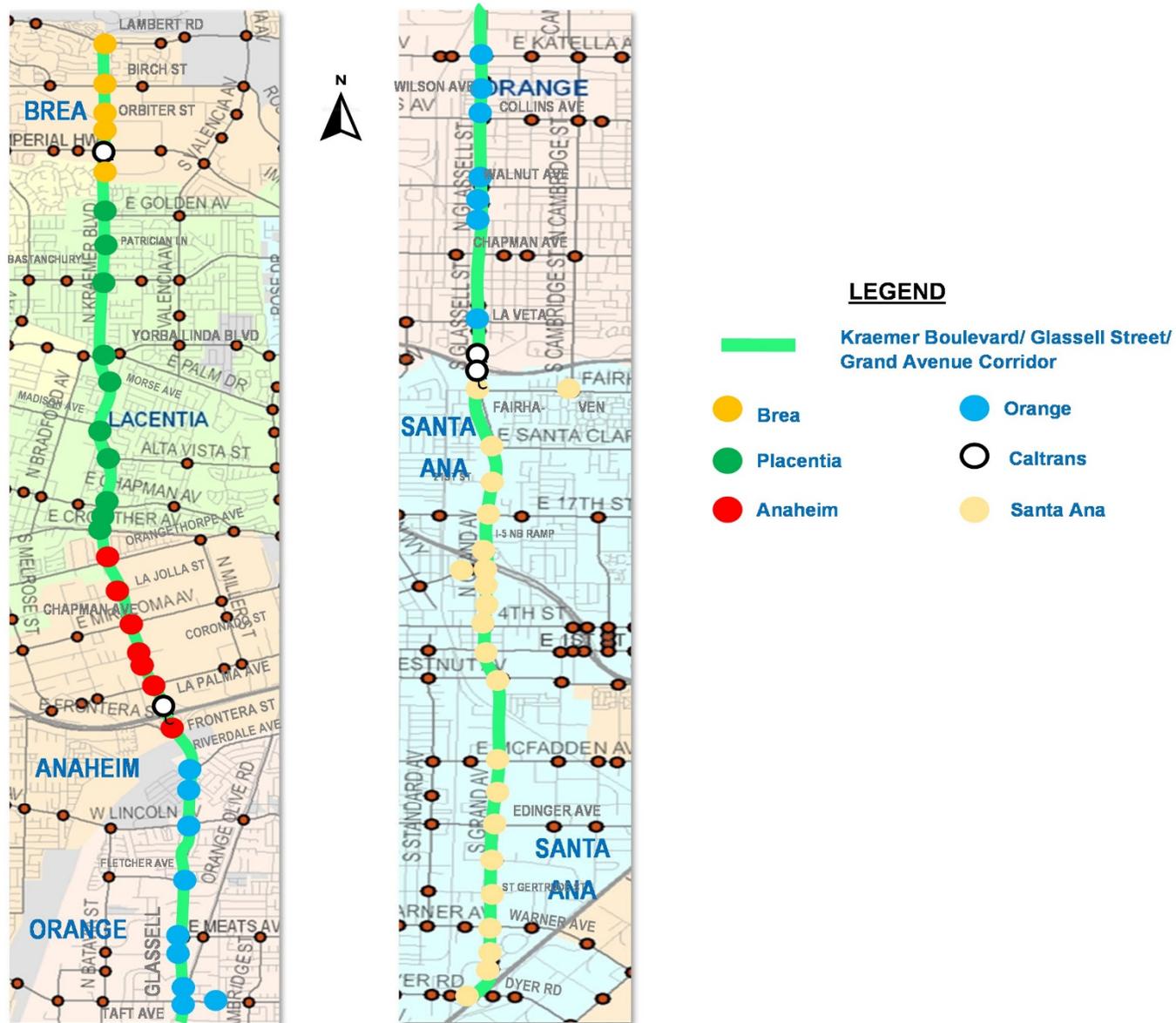
<span style="background-color: #ffffcc; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Brea
<span style="background-color: #c6e0b4; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Placentia
<span style="background-color: #f4cccc; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Anaheim
<span style="background-color: #cce5ff; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Orange
<span style="background-color: #fff2cc; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span>	Santa Ana
	* Caltrans

l. Offset signalized intersections that are part of the project:

	Main Street	Cross Street	
1	Taft Avenue	Shaffer Street	13
2	Fairhaven Avenue	Cambridge Street	14
3	Santa Ana Boulevard	I-5 SB On/Off Ramp	15
4			16
5			17
6			18
7			19
8			20
9			
10			
11			
12			

Main Street Cross Street

m. Project Map Depicting the Project Limits and Offset Signals



**SECTION 2: REGIONAL SIGNIFICANCE**

Explain why this project is regionally significant:

The Kraemer Boulevard/ Glassell Street/ Grand Avenue corridor is a reinvigorated project originally performed and funded by M2 RTSSP in FY 2013/2014. The Kraemer Boulevard/ Glassell Street/ Grand Avenue corridor extends 15.14 miles from Lambert Road in the City of Brea to Dyer Road in the City of Santa Ana. The corridor encompasses 61 signalized intersections controlled by the Cities of Brea, Placentia, Anaheim, Orange, Santa Ana and the California Department of Transportation (Caltrans). Caltrans is a participating agency in the project and the participating Cities are committed to executing a cooperative agreement with Caltrans for the implementation of optimized signal timing at the Caltrans intersections.

Kraemer Boulevard/ Glassell Street/ Grand Avenue corridor is currently classified as a Major Arterial in the Cities of Brea, Placentia, Anaheim and Santa Ana and as a Primary Arterial in the City of Orange. The corridor is also designated as part of a Priority Corridor Network by the Traffic Signal Synchronization Master Plan. The corridor carries traffic volumes ranging from 13,000 to 21,000 in Cities of Brea and Placentia; up to approximately 46,000 in City of Anaheim, down to approximately 8,000 in Old Towne Orange, to over 40,000 vehicles daily in Santa Ana.

Kraemer Boulevard/ Glassell Street/ Grand Avenue corridor stretches from the northern County limits to the center of Orange County encompassing a wide range of land uses. At the northern limit in City of Brea, the arterial primarily serves a mix of residential, retail and large commercial including Birch Hills Mall and biomedical manufacturing company Beckman Coulter. This area experiences high morning and evening peak traffic volumes that require a well-synchronized network to meet the peak demand. In City of Placentia, the corridor primarily serves residential, small retail and schools including Tri-City Park and nearby Valencia High School. This area experiences moderately high morning and evening peak traffic volumes and requires a well balanced traffic signal system that serves both daily vehicle commuters and local pedestrian and bike users. In City of Anaheim, the corridor primarily serves large industrial and commercial businesses and cuts through the Anaheim Canyon Business District. This area is being reimagined by the City of Anaheim and looks to create a business environment attractive to a wide variety of industries while encouraging sustainable development. This area sees the highest traffic volume of the corridor and is adjacent to the Caltrans SR-91 Freeway which requires a well synchronized traffic signal system that accounts for high volume of vehicle and large trucks traffic. In the City of Orange, the corridor serves a mix of residential, small business, schools and historic landmarks including Chapman University and Old Towne Orange. This area experiences lower traffic volume but requires special signal timing and active transportation elements to efficiently accommodate the mix of vehicle, pedestrians and bicycles. At the southern limit in City of Santa Ana, the corridor serves a mix of residential, schools, and large manufacturing and commercial businesses including Behr Paint Company and several Orange County government facilities. This area sees some of the highest traffic volumes and demands a well-synchronized network to meet the directional and oversaturated traffic demand.

The original signal timing and improvements on Kraemer Boulevard/ Glassell Street/ Grand Avenue corridor has decayed and needs to be revisited. Therefore, it is imperative that this very important corridor be considered for the 2024 Call for Projects from OCTA.

**SECTION 3: ACKNOWLEDGEMENT OF REQUIRED TASKS**a. **PROJECT TASKS**

- By checking this box, the Applicant Agency, on behalf of all the participating agencies, agree to the following tasks:**

**Primary Implementation (PI) Phase, lasting approximately one year shall include the following:**

## Task 1: Project Management - PI Phase

*This task is ongoing throughout the duration of the PI Phase of the project. It includes day-to-day project management, such as meetings, progress reports, tracking of schedules, tracking of cost by agency, invoicing, and overall administration of the PROJECT.*

*The following list is a minimum of what is required of this task:*

- *A running record of project cost broken down by Participating Agency shall be part of this task. This information will be used by the Lead Agency to bill Participating Agencies for their respective project match.*
- *A running record of all scope changes and/or any deviations from the final approved application. This information will be used by the Lead Agency to request for Scope Changes at the Semi-Annual Review (SAR).*

## Task 2: Data Collection and Field Review

*All agencies on this application will opt out of the Data Collection portion of Task 2 due to participation in the Countywide Baseline Project. A Before/After study will be completed. However, Data Collection will be conducted at the four (4) Caltrans intersections and utilized to develop Signal Timing Optimization and Implementation. These efforts will be closely coordinated with the Countywide Baseline Project. Cities of Brea, Anaheim and Orange are committed to executing a Cooperative Agreement with Caltrans for the Data Collection efforts. Funding for Data Collection at the Caltrans intersection is included in the respective Agency Task 2.*

*This task shall include collecting seven-day, 24-hour machine counts, including vehicle and bike classifications, along each 1-mile segment of the corridor(s). The project shall also produce weekday and weekend peak period intersection turning movement (ITM) counts at every signalized intersection, including pedestrian and bicycle counts. ITM counts shall be conducted for two hours of each weekday peak period (AM, mid-day, and PM) and a single four-hour Saturday mid-day peak period. All counts shall be summarized in Microsoft Excel format. All data shall adhere to the CTFP Guidelines for data compatibility.*

*Data collection also includes field review of before and after conditions. The floating car method shall be utilized with software and GPS for the 'Before' Study to fine-tune the corridor operation and verify integrity of system intersection clocks. Synchronized Video shall be used to compare actual conditions to anticipated conditions dictated by the time-space diagram so that any anomalies may be corrected prior to the 'After' studies task.*

*Field review conducted as part of this task will document the existing conditions for all signal timing, infrastructure, and system improvements on the project. This includes pre-construction pictures for comparison during the post-construction walkthrough, should there be any questions or discrepancies noted by any parties. Data Collection and Field Review Memos shall be provided to all participating agencies.*

- Check this box to indicate all agencies on this application will opt out of the data collection portion of Task 2 due to participation in the Countywide Baseline Project. A Before/After study is still required. A memorandum shall be submitted to indicate completion of this task.**

**SECTION 3: ACKNOWLEDGEMENT OF REQUIRED TASKS****Task 3: System Design and Construction**

*The Lead Agency will hire a consultant(s), licensed contractor(s), and/or use city staff, or extension of staff, to design, procure, install, construct, and implement all desired components of the project as described in this application in accordance with the CTFP Guidelines.*

*All work and equipment supplied for the project shall comply and be done in accordance with the latest standards and provisions of each Participating Agency or latest approved California Department of Transportation (Caltrans) Standard Plans and Standard Specifications.*

*As-built plans shall be provided to match the improvements. This task is not complete until all participating agencies approve the improvements implemented in their jurisdiction.*

**Task 4: Signal Timing Optimization and Implementation**

*All agencies on this application will opt out of the Signal Timing Optimization and Implementation portion of Task 4 due to participation in the Countywide Baseline Project. However, Signal Timing Optimization and Implementation will be conducted at the four (4) Caltrans intersections and coordinated with the Countywide Baseline Project. Cities of Brea, Anaheim and Orange are committed to executing a Cooperative Agreement with Caltrans for the Signal Timing Optimization and Implementation efforts. Funding for Signal Timing Optimization and Implementation at the Caltrans intersection is included in the respective Agency Task 4.*

*Synchronization will be inter-jurisdictional in nature. All existing traffic patterns, flows, and conditions will be taken into account. At a minimum, synchronized timing plans will be developed for a weekday AM, Mid-day, PM, and a Weekend peak period. Special generators such as schools and businesses along with cross street traffic will be considered as part of the project. Timing plans that will be developed will assist traffic in getting to its destination without regard to physical or jurisdictional boundaries.*

*The following list is a minimum of what is required of this task:*

- *A review of the basic timing parameters*
- *Concept of Operations documenting the recommended coordination strategies (e.g. segments, cycle lengths, etc.) based on existing data collection and simulations*
- *Existing and Optimized simulation networks in Synchro (version 10) that is also shared with OCTA using the OCTA designated ID numbers*
- *Implementation and fine-tuning of proposed timing plans*

*This task will not be complete until all participating agencies approve the new timing plans implemented.*



**Check this box to indicate all agencies on this application will opt out of the Signal Timing Optimization and Implementation task (Task 4) due to participation in the Countywide Baseline Project. The Final PI Report shall still include a section on timing optimization and implementation from the Baseline Project.**

**Task 5: Final PI Report**

*A Final PI Report, with an executive summary, shall provide complete documentation of the project, including, but not limited to:*

- *Project scope, objectives, locations, findings, and recommendations*
- *Data collected: counts, travel time studies, and project benefits achieved in terms of fuel savings, travel time, and other measurable parameters*
- *For each intersection: lane configurations, signal phasing, turning movement data, and cycle lengths for existing and proposed timings for all peak periods*

**SECTION 3: ACKNOWLEDGEMENT OF REQUIRED TASKS**

- *All work performed for system construction and signal timing optimization*
- *Implementation schedule and improvements accomplished, including dates*
- *Procedures for continuing maintenance, surveillance, and evaluation of the coordinated signal system*

*The report shall document all planned and programmed improvements on the study corridor as well as recommendations based on PI tasks for further infrastructure improvements that would likely improve the corridor signal coordination project results. The report shall be completed in accordance with the current CTFP Guidelines.*

*Finally, the report shall provide recommendations with cost and benefit estimates for future improvements to traffic signal infrastructure (signal controllers, vehicle detection, communications, etc.), intersection capacity (appropriate signal phasing, lane geometrics, and alleviation of physical bottlenecks that curtail arterial capacity), and traffic management strategies. These proposed improvements should be useful in determining future enhancements to the corridor.*

*A Project Summary Sheet, one sheet front and back, that describes the project and improvements gained shall be provided to OCTA. This sheet will be used by OCTA and Participating Agencies to present to the Board and elected officials.*

**By checking this box, the following additional PI task(s) and/or exceptions will be made:**

*All agencies on this application will opt out of the Data Collection portion of Task 2 and Signal Timing Optimization and Implementation portion of Task 4 due to participation in the Countywide Baseline Project. However, Data Collection and Signal Timing Optimization and Implementation will be conducted at the four (4) Caltrans intersections. These efforts will be closely coordinated with the Countywide Baseline Project. Cities of Brea, Anaheim and Orange are committed to executing a Cooperative Agreement with Caltrans for the Data Collection and Signal Timing Optimization/ Implementation efforts. A Before/After study will be completed for the entire corridor including the Caltrans locations. No system construction is proposed at the Caltrans locations. Funding for Data Collection and Signal Timing Optimization/ Implementation at the Caltrans intersection is included in the respective Agency Task 2 and 4.*

**ONGOING OPERATIONS AND MAINTENANCE (O&M) PHASE, lasting approximately two (2) years, shall include the following:**

Task 6: Project Management - O&M Phase

*This task includes day-to-day project management, such as meetings, tracking of schedules, invoicing, and overall administration of the project. This task shall continue in full force as specified in the Primary Implementation Phase.*

Task 7: Continuing Support

*During this 24-month period, the signal timing along the corridor/route/grid shall be observed and fine-tuned. This task shall also include the monitoring, maintaining, and repair of detection and communication implemented as part of this project. Monthly drives shall be conducted along the length of the project during all designated corridor synchronization timing plan hours of operation in order to verify that the synchronization timing is working as designed and complete any necessary adjustments. This is followed by a monthly memorandum summarizing the status and trends of the corridor based on the runs conducted. Trip logs for the month shall be provided to the Participating Agencies. The memorandum shall include all additional tasks requested and completed during that month. Performance metrics comparisons from ATSPM, where available, shall also be included in the memorandum.*

Task 8: Final O&M Report

**SECTION 3: ACKNOWLEDGEMENT OF REQUIRED TASKS**

*At the end of the O&M Phase, a Final O&M Report documenting the Ongoing Operations and Maintenance efforts and procedures for continuing maintenance shall be prepared. At the minimum, the memorandum shall include when travel runs were conducted and issues and solutions throughout the phase. The memorandum shall document all planned and programmed improvements on the study corridor as well as recommendations for further infrastructure improvements that would likely improve the corridor signal coordination project results.*

**By checking this box, the following additional O&M task(s) and/or exceptions will be made:**  
<Insert Text>

b. **ENVIRONMENTAL CLEARANCE AND OTHER PERMITS**

By checking this box, the Applicant Agency, on behalf of all the participating agencies, agree to obtain environmental clearance and other permits (if needed) for this project

c. **ACKNOWLEDGMENT OF MEETING CTFP GUIDELINES**

By checking this box, the Applicant Agency, on behalf of all the participating agencies, certify that all current CTFP guidelines were met for this project.

**SECTION 4: FUNDING NEEDS / COSTS FOR PROPOSED PROJECT BY TASK**

**a. Summary of Project Cost**

<b>Project Tasks</b>	<b>Total Cost</b>
Task 1: Project Management - PI Phase	\$ 140,800.00
Task 2: Data Collection	\$ 70,200.00
Task 3: System Design and Construction	\$ 5,236,457.50
Task 4: Signal Timing Optimization and Implementation	\$ 20,000.00
Task 5: Project Report	\$ 64,000.00
Task 6: Project Management - O&M Phase	\$ 25,600.00
Task 7: Continuing Support	\$ 134,400.00
Task 8: Final Technical Memorandum	\$ 19,200.00
<b>Total Project Cost:</b>	<b>\$ 5,710,657.50</b>

**Match Commitment:**  (minimum 20%)

**Total Project Cost (PI and O&M for a total of 3 years):**

	<b>Project Total</b>
<i>Total M2 Request:</i>	\$ 4,568,526.00
<i>Total Agency Match:</i>	\$ 1,142,131.50
<b>Total Project Cost:</b>	<b>\$ 5,710,657.50</b>

	<b>PI Total</b>
<i>Total M2 Request for PI Phase:</i>	\$ 4,425,166.00
<i>Total Agency Match for PI Phase:</i>	\$ 1,106,291.50
<b>Total PI Cost:</b>	<b>\$ 5,531,457.50</b>

	<b>O&amp;M Total</b>
<i>Total M2 Request for O&amp;M Phase:</i>	\$ 143,360.00
<i>Total Agency Match for O&amp;M Phase:</i>	\$ 35,840.00
<b>Total O&amp;M Cost:</b>	<b>\$ 179,200.00</b>

**SECTION 4: FUNDING NEEDS / COSTS FOR PROPOSED PROJECT BY TASK****b. Summary of Cost by Agency****Brea**

		Agency	Caltrans	Offset	Total	
Number of Signals:		5	1		6	
<b>Project Tasks (Brea)</b>					<b>Cost / Int</b>	<b>Total Cost</b>
Task 1: Project Management - PI Phase					\$ 2,200.00	\$ 13,200.00
Task 2: Data Collection					\$ 1,200.00	\$ 7,200.00
Task 3: System Design and Construction					-	\$ 549,200.00
Task 4: Signal Timing Optimization and Implementation					\$ 5,000.00	\$ 5,000.00
Task 5: Project Report					\$ 1,000.00	\$ 6,000.00
Task 6: Project Management - O&M Phase					\$ 400.00	\$ 2,400.00
Task 7: Continuing Support					\$ 2,100.00	\$ 12,600.00
Task 8: Final Technical Memorandum					\$ 300.00	\$ 1,800.00
		<b>M2 Requested</b>	<b>Match</b>	<b>Total Cost</b>		
<b>PI</b>	\$	<b>464,480.00</b>	\$ <b>116,120.00</b>	\$	<b>580,600.00</b>	
<b>O&amp;M</b>	\$	<b>13,440.00</b>	\$ <b>3,360.00</b>	\$	<b>16,800.00</b>	

**Placentia**

		Agency	Caltrans	Offset	Total	
Number of Signals:		11	0		11	
<b>Project Tasks (Placentia)</b>					<b>Cost / Int</b>	<b>Total Cost</b>
Task 1: Project Management - PI Phase					\$ 2,200.00	\$ 24,200.00
Task 2: Data Collection					\$ 1,000.00	\$ 11,000.00
Task 3: System Design and Construction					-	\$ 882,750.00
Task 4: Signal Timing Optimization and Implementation					\$ -	\$ -
Task 5: Project Report					\$ 1,000.00	\$ 11,000.00
Task 6: Project Management - O&M Phase					\$ 400.00	\$ 4,400.00
Task 7: Continuing Support					\$ 2,100.00	\$ 23,100.00
Task 8: Final Technical Memorandum					\$ 300.00	\$ 3,300.00
		<b>M2 Requested</b>	<b>Match</b>	<b>Total Cost</b>		
<b>PI</b>	\$	<b>743,160.00</b>	\$ <b>185,790.00</b>	\$	<b>928,950.00</b>	
<b>O&amp;M</b>	\$	<b>24,640.00</b>	\$ <b>6,160.00</b>	\$	<b>30,800.00</b>	

**Anaheim**

		Agency	Caltrans	Offset	Total	
Number of Signals:		6	1		7	
<b>Project Tasks (Anaheim)</b>					<b>Cost / Int</b>	<b>Total Cost</b>
Task 1: Project Management - PI Phase					\$ 2,200.00	\$ 15,400.00
Task 2: Data Collection					\$ 1,200.00	\$ 8,400.00
Task 3: System Design and Construction					-	\$ 597,875.00
Task 4: Signal Timing Optimization and Implementation					\$ 5,000.00	\$ 5,000.00
Task 5: Project Report					\$ 1,000.00	\$ 7,000.00
Task 6: Project Management - O&M Phase					\$ 400.00	\$ 2,800.00
Task 7: Continuing Support					\$ 2,100.00	\$ 14,700.00
Task 8: Final Technical Memorandum					\$ 300.00	\$ 2,100.00
		<b>M2 Requested</b>	<b>Match</b>	<b>Total Cost</b>		
<b>PI</b>	\$	<b>506,940.00</b>	\$ <b>126,735.00</b>	\$	<b>633,675.00</b>	
<b>O&amp;M</b>	\$	<b>15,680.00</b>	\$ <b>3,920.00</b>	\$	<b>19,600.00</b>	

**SECTION 4: FUNDING NEEDS / COSTS FOR PROPOSED PROJECT BY TASK**

**Orange**

	Agency	Caltrans	Offset	Total
Number of Signals:	15	2	1	18

<b>Project Tasks (Orange)</b>		<b>Cost / Int</b>	<b>Total Cost</b>
Task 1: Project Management - PI Phase		\$ 2,200.00	\$ 39,600.00
Task 2: Data Collection		\$ 1,200.00	\$ 21,600.00
Task 3: System Design and Construction		-	\$ 1,454,250.00
Task 4: Signal Timing Optimization and Implementation		\$ 5,000.00	\$ 10,000.00
Task 5: Project Report		\$ 1,000.00	\$ 18,000.00
Task 6: Project Management - O&M Phase		\$ 400.00	\$ 7,200.00
Task 7: Continuing Support		\$ 2,100.00	\$ 37,800.00
Task 8: Final Technical Memorandum		\$ 300.00	\$ 5,400.00
	<b>M2 Requested</b>	<b>Match</b>	<b>Total Cost</b>
<b>PI</b>	<b>\$ 1,234,760.00</b>	<b>\$ 308,690.00</b>	<b>\$ 1,543,450.00</b>
<b>O&amp;M</b>	<b>\$ 40,320.00</b>	<b>\$ 10,080.00</b>	<b>\$ 50,400.00</b>

**Santa Ana**

	Agency	Caltrans	Offset	Total
Number of Signals:	20		2	22

<b>Project Tasks (Santa Ana)</b>		<b>Cost / Int</b>	<b>Total Cost</b>
Task 1: Project Management - PI Phase		\$ 2,200.00	\$ 48,400.00
Task 2: Data Collection		\$ 1,000.00	\$ 22,000.00
Task 3: System Design and Construction		-	\$ 1,752,382.50
Task 4: Signal Timing Optimization and Implementation		-	-
Task 5: Project Report		\$ 1,000.00	\$ 22,000.00
Task 6: Project Management - O&M Phase		\$ 400.00	\$ 8,800.00
Task 7: Continuing Support		\$ 2,100.00	\$ 46,200.00
Task 8: Final Technical Memorandum		\$ 300.00	\$ 6,600.00
	<b>M2 Requested</b>	<b>Match</b>	<b>Total Cost</b>
<b>PI</b>	<b>\$ 1,475,826.00</b>	<b>\$ 368,956.50</b>	<b>\$ 1,844,782.50</b>
<b>O&amp;M</b>	<b>\$ 49,280.00</b>	<b>\$ 12,320.00</b>	<b>\$ 61,600.00</b>

**SECTION 4: FUNDING NEEDS / COSTS FOR PROPOSED PROJECT BY TASK**

**c. Summary of Intersection Improvement Costs**

LOC.	AGENCY	PROJECT CROSS STREETS	TASK 3 IMPROVEMENT TOTALS			
			Design	Construction	TOTAL	Average Score
1	Brea	Lambert Road	\$ 7,000.00	\$ 89,250.00	\$ 96,250.00	31.3
2	Brea	Birch Street	\$ 7,000.00	\$ 89,250.00	\$ 96,250.00	31.3
3	Brea	Orbiter Street	\$ 6,000.00	\$ 76,500.00	\$ 82,500.00	31.7
4	Brea	Birch Hills Mall	\$ 10,000.00	\$ 127,500.00	\$ 137,500.00	31.3
5	Brea	Imperial Highway (SR-90) *	\$ -	\$ 2,500.00	\$ 2,500.00	50.0
6	Brea	Buttonwood Drive/ Saturn Street	\$ 7,000.00	\$ 89,250.00	\$ 96,250.00	31.3
7	Placentia	Golden Avenue	\$ 6,200.00	\$ 79,050.00	\$ 85,250.00	27.5
8	Placentia	Patrician Lane	\$ 7,200.00	\$ 91,800.00	\$ 99,000.00	31.3
9	Placentia	Bastanchury Road	\$ 9,400.00	\$ 119,850.00	\$ 129,250.00	35.0
10	Placentia	Yorba Linda Boulevard	\$ 2,800.00	\$ 35,700.00	\$ 38,500.00	32.5
11	Placentia	Sheffield Street/Morse Avenue	\$ 1,000.00	\$ 12,750.00	\$ 13,750.00	15.0
12	Placentia	Madison Avenue	\$ 2,000.00	\$ 25,500.00	\$ 27,500.00	22.5
13	Placentia	Alta Vista Street	\$ 11,400.00	\$ 145,350.00	\$ 156,750.00	32.0
14	Placentia	Chapman Avenue (North)	\$ 6,800.00	\$ 86,700.00	\$ 93,500.00	31.3
15	Placentia	Hawaii Way	\$ 1,000.00	\$ 12,750.00	\$ 13,750.00	15.0
16	Placentia	Crowther Avenue	\$ 1,000.00	\$ 12,750.00	\$ 13,750.00	15.0
17	Placentia	Orangethorpe Avenue	\$ 6,200.00	\$ 79,050.00	\$ 85,250.00	26.7
18	Anaheim	La Jolla Street	\$ 6,850.00	\$ 87,337.50	\$ 94,187.50	31.0
19	Anaheim	Miraloma Avenue	\$ 7,850.00	\$ 100,087.50	\$ 107,937.50	32.5
20	Anaheim	Coronado Street	\$ 5,850.00	\$ 74,587.50	\$ 80,437.50	31.3
21	Anaheim	Fire Signal	\$ 1,550.00	\$ 19,762.50	\$ 21,312.50	45.0
22	Anaheim	La Palma Avenue	\$ 6,450.00	\$ 82,237.50	\$ 88,687.50	33.0
23	Anaheim	SR-91 Westbound Off-Ramp *	\$ -	\$ 2,500.00	\$ 2,500.00	50.0
24	Anaheim	Frontera Street	\$ 7,850.00	\$ 100,087.50	\$ 107,937.50	32.5
25	Orange	Riverdale Avenue	\$ 5,300.00	\$ 67,575.00	\$ 72,875.00	27.0
26	Orange	Riverbend Parkway/Richland Avenue	\$ 5,300.00	\$ 67,575.00	\$ 72,875.00	27.0
27	Orange	Lincoln Avenue	\$ 6,600.00	\$ 84,150.00	\$ 90,750.00	36.7
28	Orange	Fletcher Avenue	\$ 6,600.00	\$ 84,150.00	\$ 90,750.00	36.7
29	Orange	Meats Avenue	\$ 11,600.00	\$ 147,900.00	\$ 159,500.00	31.7
30	Orange	Grove Avenue	\$ 13,500.00	\$ 172,125.00	\$ 185,625.00	31.7
31	Orange	Orange Olive Road	\$ -	\$ -	\$ -	
32	Orange	Taft Avenue	\$ 2,600.00	\$ 33,150.00	\$ 35,750.00	40.0
33	Orange	Katella Avenue	\$ 1,900.00	\$ 24,225.00	\$ 26,125.00	30.0
34	Orange	Wilson Avenue/Adams Avenue	\$ 2,600.00	\$ 33,150.00	\$ 35,750.00	40.0
35	Orange	Collins Avenue	\$ 2,600.00	\$ 33,150.00	\$ 35,750.00	40.0
36	Orange	Walnut Avenue	\$ 6,600.00	\$ 84,150.00	\$ 90,750.00	36.7
37	Orange	Sycamore Avenue/University Drive	\$ 6,600.00	\$ 84,150.00	\$ 90,750.00	36.7
38	Orange	Palm Avenue	\$ 6,600.00	\$ 84,150.00	\$ 90,750.00	40.0
39	Orange	La Veta Avenue	\$ 7,700.00	\$ 98,175.00	\$ 105,875.00	35.0
40	Orange	SR-22 Westbound Ramp *	\$ -	\$ 2,500.00	\$ 2,500.00	50.0
41	Orange	SR-22 Eastbound Ramp *	\$ -	\$ 2,500.00	\$ 2,500.00	50.0
42	Santa Ana	Fairhaven Avenue	\$ 16,200.00	\$ 208,447.50	\$ 224,647.50	32.9
43	Santa Ana	Santa Clara Avenue	\$ 2,700.00	\$ 36,322.50	\$ 39,022.50	35.0
44	Santa Ana	21st Street	\$ 8,900.00	\$ 115,372.50	\$ 124,272.50	37.0
45	Santa Ana	17th Street	\$ 8,900.00	\$ 115,372.50	\$ 124,272.50	37.0
46	Santa Ana	I-5 Northbound Ramp	\$ 2,700.00	\$ 36,322.50	\$ 39,022.50	35.0
47	Santa Ana	Santa Ana Blvd/I-5 Southbound Ramp	\$ 4,000.00	\$ 52,897.50	\$ 56,897.50	33.8
48	Santa Ana	Fruit Street	\$ 8,700.00	\$ 112,822.50	\$ 121,522.50	30.0
49	Santa Ana	OC Register	\$ 2,100.00	\$ 28,672.50	\$ 30,772.50	40.0
50	Santa Ana	4th Street	\$ 7,800.00	\$ 101,347.50	\$ 109,147.50	40.0

**SECTION 4: FUNDING NEEDS / COSTS FOR PROPOSED PROJECT BY TASK**

**c. Summary of Intersection Improvement Costs**

LOC.	AGENCY	PROJECT CROSS STREETS	TASK 3 IMPROVEMENT TOTALS			
			Design	Construction	TOTAL	Average Score
51	Santa Ana	1st Street	\$ 8,100.00	\$ 103,275.00	\$ 111,375.00	31.7
52	Santa Ana	Chestnut Avenue	\$ 1,900.00	\$ 26,122.50	\$ 28,022.50	27.5
53	Santa Ana	McFadden Avenue	\$ 14,900.00	\$ 191,872.50	\$ 206,772.50	33.3
54	Santa Ana	Century High School	\$ 3,900.00	\$ 51,622.50	\$ 55,522.50	38.8
55	Santa Ana	Edinger Avenue	\$ 2,700.00	\$ 34,425.00	\$ 37,125.00	22.5
56	Santa Ana	St Andrew Place	\$ 3,500.00	\$ 46,522.50	\$ 50,022.50	33.8
57	Santa Ana	St Gertrude Place	\$ 2,700.00	\$ 36,322.50	\$ 39,022.50	35.0
58	Santa Ana	Warner Avenue	\$ 8,700.00	\$ 110,925.00	\$ 119,625.00	20.0
59	Santa Ana	Hotel Terrace Drive/Brookhollow Dr	\$ 2,700.00	\$ 36,322.50	\$ 39,022.50	35.0
60	Santa Ana	SR-55 Southbound Off-Ramp	\$ 2,700.00	\$ 36,322.50	\$ 39,022.50	35.0
61	Santa Ana	Dyer Road	\$ 1,900.00	\$ 26,122.50	\$ 28,022.50	27.5
-	-	-	\$ -	\$ -	\$ -	
1	Orange	Taft Avenue & Shaffer Street	\$ 12,800.00	\$ 163,200.00	\$ 176,000.00	22.5
2	Santa Ana	Fairhaven Avenue & Cambridge Street	\$ 2,100.00	\$ 26,775.00	\$ 28,875.00	40.0
3	Santa Ana	Santa Ana Boulevard & I-5 SB Ramp	\$ 2,700.00	\$ 34,425.00	\$ 37,125.00	32.5
-	Santa Ana	TMC Improvements	\$ -	\$ 63,250.00	\$ 63,250.00	40.0
-	Placentia	TMC Improvements	\$ -	\$ 126,500.00	\$ 126,500.00	40.0
-	Orange	TMC Improvements	\$ 1,900.00	\$ 87,475.00	\$ 89,375.00	35.0
-	Anaheim	TMC Improvements	\$ -	\$ 94,875.00	\$ 94,875.00	40.0
-	Brea	TMC Improvements	\$ -	\$ 37,950.00	\$ 37,950.00	40.0
<b>SIGNAL IMPROVEMENT TOTAL =</b>					<b>\$ 5,236,457.50</b>	<b>33.6</b>

SECTION 5: DETAILED LOCAL MATCH COMMITMENT

**PART 1: AGENCY TOTAL MATCH SUMMARY**

Agency	CASH		IN-KIND		TOTAL MATCH	
	PI	OMM	PI	OMM	PI	OMM
Brea	\$116,120.00	\$3,360.00	\$0.00	\$0.00	\$116,120.00	\$3,360.00
	<b>\$119,480.00</b>		<b>\$0.00</b>		<b>\$119,480.00</b>	
Placentia	\$185,790.00	\$6,160.00	\$0.00	\$0.00	\$185,790.00	\$6,160.00
	<b>\$191,950.00</b>		<b>\$0.00</b>		<b>\$191,950.00</b>	
Anaheim	\$126,735.00	\$3,920.00	\$0.00	\$0.00	\$126,735.00	\$3,920.00
	<b>\$130,655.00</b>		<b>\$0.00</b>		<b>\$130,655.00</b>	
Orange	\$308,690.00	\$10,080.00	\$0.00	\$0.00	\$308,690.00	\$10,080.00
	<b>\$318,770.00</b>		<b>\$0.00</b>		<b>\$318,770.00</b>	
Santa Ana	\$338,956.50	\$12,320.00	\$30,000.00	\$0.00	\$368,956.50	\$12,320.00
	<b>\$351,276.50</b>		<b>\$30,000.00</b>		<b>\$381,276.50</b>	
<b>TOTAL MATCH</b>	<b>\$1,076,291.50</b>	<b>\$35,840.00</b>	<b>\$30,000.00</b>	<b>\$0.00</b>	<b>\$1,106,291.50</b>	<b>\$35,840.00</b>
	<b>\$1,112,131.50</b>		<b>\$30,000.00</b>		<b>\$1,142,131.50</b>	

**PART 2: MATCH BREAKDOWN (CASH vs IN-KIND SERVICES)**

**A. Cash Match**

Agency	Funding Source	Amount of Cash Contribution
Brea	Gas Tax/ M2 Fairshare	\$119,480.00
Placentia	Gas Tax/ AB2766	\$191,950.00
Anaheim	Gas Tax/ M2 Fairshare	\$130,655.00
Orange	Gas Tax/ M2 Fairshare	\$318,770.00
Santa Ana	M2 Fairshare	\$351,276.50
<b>TOTAL CASH MATCH:</b>		<b>\$1,112,131.50</b>

**B. In-Kind Services**

*i. Specific Improvements (List items and Cost):*

Agency	Description	Expenditure
Select a City		
<b>Total Specific Improvements (i):</b>		<b>\$0.00</b>

*ii. Staffing Commitment:*

Agency	Staff Position	Type of Service to Project	No. of Hours	Fully Burdened Hourly Rate	Total*
Santa Ana	Sr. Civil Engineer	Project Oversight, Construction Engineering	60	\$170.00	\$10,200.00
	Assistant Signal Operations Engineer	Equipment configuration, installation and integration/ Construction Engineering	120	\$140.00	\$16,800.00
	Assistant Engineer	Equipment configuration, installation and integration/ Construction Engineering	30	\$100.00	\$3,000.00
					\$0.00
<i>Total for City of Santa Ana:</i>					<b>\$30,000.00</b>
<b>Total Staffing Commitment (ii):</b>					<b>\$30,000.00</b>

<b>TOTAL IN-KIND MATCH* (i + ii):</b>					<b>\$30,000.00</b>
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\*Total amount is the required participation by the identified agency. The number of hours and hourly rate will be based on each agency's actual fully burdened billing rates, which must collectively equal the same value of the assigned "Total" dollars. Each agency will be responsible for keeping detailed records of hours worked and description of work. An accounting record of personnel, hours at fully burdened rate shall be included with the in-kind report submittals. Records will be subject to auditing. In-kind match can be converted to Cash Match, but Cash Match cannot be converted to in-kind match.

**SECTION 6: PROJECT SCHEDULE BY TASK**

a. Projected Start and End Dates:

**Project start date:** January 1, 2025

**Project end date:** December 31, 2027

b. Projected Schedule by Task

Task	Starting Date	Ending Date
Task 1: Project Management - PI Phase	January 1, 2025	December 31, 2025
Task 2: Data Collection	January 1, 2025	April 30, 2025
Task 3: System Design and Construction	January 1, 2025	December 31, 2025
Task 4: Signal Timing Optimization and Implementation	January 1, 2025	December 31, 2025
Task 5: Project Report	October 1, 2025	December 31, 2025
Task 6: Project Management - O&M Phase	January 1, 2026	December 31, 2027
Task 7: Continuing Support	January 1, 2026	December 31, 2027
Task 8: Final Technical Memorandum	October 1, 2027	December 31, 2027

By checking this box, the Applicant Agency, on behalf of all the participating agencies, agree to implement this project within 12 months. ***(This means the project will be ineligible for delays and timely use funds extensions. This is not applicable to projects requesting OCTA to lead and Baseline Project participants.)***

# **Appendix A**

## **CALCULATIONS AND ESTIMATED POINTS**

**APPENDIX A: CALCULATIONS AND ESTIMATED POINTS**

Criteria (Max Points)	Estimated Points
<p>1. Transportation Significance (25 points)</p> <p><u>Yes.</u> All agencies are participating in the Countywide Baseline Project</p> <p>Inclusion of offset signals w/in 2,700'</p> <p><u># of offset signals on project / total # of offset signals:</u>    <u>3</u>    /    <u>115</u>    =    <u>100.0%</u></p> <p style="text-align: right;">=    10</p> <p style="text-align: right;"><u>Vehicle Miles Traveled (VMT):</u>    <u>367,503</u>    =    15</p>	25
<p>2. Economic Effectiveness (Cost to Benefit Ratio): (10 points)</p> <p>Calculation for Total Project Cost / VMT =    <u>\$5,710,658</u>    /    <u>367,503</u>    =    <u>15.54</u></p>	5
<p>3. Project Characteristics: (20 points)</p> <p style="text-align: right;"><u>Average project improvement score</u> =    <u>33.6</u></p>	10
<p>4. Project Scale: (20 points)</p> <p style="text-align: right;"><u># of signals along entire length of corridor:</u>    <u>61</u>    =    10</p> <p><u># of signals being synched / total # of corridor signals:</u>    <u>61</u>    /    <u>61</u>    =    <u>100.0%</u></p> <p style="text-align: right;">=    10</p>	20
<p>5. Number of Jurisdictions: (10 points)</p> <p style="text-align: center;"><u>6</u> Participating Jurisdiction(s)</p>	10
<p>6. Current Project Status (10 points)</p> <p><u>Yes.</u> Retiming 75% of previous project    =    5</p> <p><u>Not</u> Timing 75% of new eligible project    =    0</p> <p><u>Not</u> Implementing within 12 months    =    0</p>	5
<p>7. Funding Match: (5 points)</p> <p style="text-align: right;"><u>\$1,142,131.50</u>    /    <u>\$5,710,657.50</u>    =    <u>20.00%</u></p>	0
<b>Total Estimated Points:</b>	<b>75</b>

# **Appendix B**

## **AGENCY IMPROVEMENT CALCULATIONS**

TABLE I: AGENCY IMPROVEMENT PREFERENCES

Yes  No

CATEGORIES	ID	ITEM DESCRIPTION	UNIT PRICE (MATERIAL + LABOR)					APPLICABLE DESIGN COST PER UNIT					VENDOR/BRAND & ADDITIONAL NOTES					
			Brea	Placentia	Anaheim	Orange	Santa Ana	Brea	Placentia	Anaheim	Orange	Santa Ana	Brea	Placentia	Anaheim	Orange	Santa Ana	
Comm	1	Above ground (e.g. wireless, cellular, etc.)				\$19,000	\$13,000				\$1,900	\$1,300				Encom Radio, Fiber Switch & power supply, SFPs	Encom Wireless Radio and Etherwan Ethernet Switch w/ SFPs	
	2	Fiber Optic underground	\$10,000	\$10,000	\$5,000	\$90,000	\$19,000	\$1,000	\$1,000	\$500	\$9,000	\$1,900	Fiber Optic Ethernet Switch w/ SFPs and Power Supply, Layer 3 HUB Switch w/ SFPs and Power Supply	Reterminate Fiber Optic Cable, Fiber Optic Ethernet Switch w/ SFPs and Power Supply, Layer 3 HUB Switch w/ SFPs and Power Supply	Ethernet Switch	120 SMFO, conduit, Fiber Drop Cable, Splice enclosure, FPP/FDU, Fiber Switch, SFPs, Fiber Switch & power supply	120 SMFO Fiber Optic Cable In Existing Conduit, Fiber Splicing (FDU and Splice Enclosure), Etherwan Switch w/ SFPs, Drop Cable, No 6E Pullbox	
	3	All other (e.g. copper, aerial fiber, GPS, etc.)				\$8,000					\$800					Fiber Switch & power supply, SFPs, Fiber Patch Panel		
Field Elements	4	ATC signal controller	\$10,000	\$8,000	\$5,500	\$7,000	\$8,000	\$1,000	\$800	\$550	\$700	\$800	Qubic Commander w/ Scout Software	Econolite Cobalt w/ EOS Software	Econolite 2070 TS2 Type 1 w/ 1C board w/ EOS software	Econolite Cobalt w/ ASC3 Software	Econolite Cobalt w/ EOS Software	
	5	Signal cabinet on existing foundation	\$40,000	\$24,000	\$24,000	\$38,000		\$4,000	\$2,400	\$2,400	\$3,800		Type P44 Cubic Trafficware Cabinet	Western Systems Type P+	Western Systems Type P+	Modify/extend existing foundation or use existing foundation as is, Econolite TS Type II P Cabinet		
	6	Signal cabinet on new foundation		\$44,000			\$60,000		\$4,400			\$6,000		Western Systems Type P+ w/ Service and SCE Design Fee			Econolite ATCC w/ Service and SCE Design Fee	
	7	BBS/USP (attached)																
	8	BBS/UPS on existing foundation		\$11,000					\$1,100							Myers / Clary		
	9	BBS/UPS on new foundation														Myers / Clary		
	10	CCTV	\$10,000	\$10,000	\$10,000	\$11,000	\$8,000	\$1,000	\$1,000	\$1,000	\$1,100	\$800	Axis Q6000 + PTZ Camera	Bosch / COHU	Axis	Cohu Rise	Axis	
	11	Vehicle detection (ATSPM inputs + counts)																
	12	Vehicle detection (ATSPM inputs)																
	13	Vehicle detection + bicycle detection	\$40,000	\$40,000	\$24,000		\$50,000	\$4,000	\$4,000	\$2,400		\$5,000	Iteris Next	Iteris Next	Econolite		Econolite Vision or Iteris Apex	
	14	Vehicle detection				\$40,000					\$4,000			Iteris Next		Gridsmart w/ mounting brackets		
	15	Bicycle detection																
	16	Pedestrian detection (audible)		\$12,000		\$23,000	\$12,000		\$1,200		\$2,300	\$1,200			Polara (IN2S APS System)		Campbell APS	Polara (IN2S APS System)
	17	Pedestrian detection																
	18	Active transportation/pedestrian safety																
	19	Transit Signal Priority																
	20	EVP (hybrid or GPS)	\$15,000		\$12,000			\$1,500		\$1,200			GTT Opticam GPS System		GPS EVP			
	21	EVP (infrared)																
	22	Speed feedback signs (existing post)																
	23	Speed feedback signs (new post)																
	24	Signal Performance Monitoring			\$10,000		\$1,500			\$1,000						Software, Licensing and Server		Centracs SPM
	Minor Signal Op Improve	25	Channelization															
		26	Signal phasing improvement															
	TMC/TOC	27	Central System (server, licenses, workstations)	\$30,000	\$100,000	\$75,000	\$50,000	\$50,000						Synchro Green Central System Licenses, Etherwan Layer 3 Switch w/ SFPs and Power Supply, Dell Workstation	Etherwan Layer 3 w/ SFPs and Power Supply, Digital Watchdog VMS Server/ Licensing, Dell Server (Video/ Traff Mgt), Dell Workstations, Synchro License, IP Schematic, Server Rack	Econolite Centracs Software and Server	Workstations (w/ monitors), Touchpanel, TMC Console, Switches	Dell Server, Milestone VMS Licenses, Dell Workstations
28		Display (video wall, VMS, etc.)																
29		UPS for TMC		\$10,000					\$1,000						Rack Mount UPS			
Signal Timing Only	30	Timing Only																
	31	Timing + Traffic Responsive (license only)																
	32	Timing + Peer-to-Peer (configuration only)																
	33	Timing + Traffic Adaptive (license only)																
Caltrans	34	Caltrans Cooperative Agreement	\$2,500		\$2,500	\$2,500						Cooperative Agreement and Data Collection		Cooperative Agreement and Data Collection	Cooperative Agreement			

APPENDIX B: AGENCY IMPROVEMENT CALCULATIONS

TABLE II: DESCRIPTION OF WORK BY INTERSECTION

LOCATION	IMPLEMENTING AGENCY	PROJECT CROSS STREETS	DESCRIPTION OF WORK														
			1 Above ground (e.g. wireless, cellular, etc.)	2 Fiber Optic underground	3 All other (e.g. copper, aerial fiber, GPS, etc.)	4 ATC signal controller	5 Signal cabinet on existing foundation	6 Signal cabinet on new foundation	10 CCTV	13 Vehicle detection + bicycle detection	14 Vehicle detection	16 Pedestrian detection (audible)	17 Pedestrian detection	24 Signal Performance Monitoring	27 Central System (server, licenses, workstations)	34 Caltrans Cooperative Agreement	
1	Brea	Lambert Road		1		1			1	1							
2	Brea	Birch Street		1		1			1	1							
3	Brea	Orbiter Street		1		1				1							
4	Brea	Birch Hills Mall		1		1	1			1							
5	Brea	Imperial Highway (SR-90) *															1
6	Brea	Buttonwood Drive/ Saturn Street		1		1			1	1							
7	Placentia	Golden Avenue		1		1		1					1				
8	Placentia	Patrician Lane		1					1	1			1				
9	Placentia	Bastanchury Road		1		1	1			1			1				
10	Placentia	Yorba Linda Boulevard		2		1											
11	Placentia	Sheffield Street/Morse Avenue		1													
12	Placentia	Madison Avenue		1					1								
13	Placentia	Alta Vista Street		1		1		1		1			1				
14	Placentia	Chapman Avenue (North)		2		1				1			1				
15	Placentia	Hawaii Way		1													
16	Placentia	Crowther Avenue		1													
17	Placentia	Orangethorpe Avenue		1		1		1									
18	Anaheim	La Jolla Street		1		1	1		1	1							
19	Anaheim	Miraloma Avenue		1		1	1		1	1				1			
20	Anaheim	Coronado Street		1		1	1			1							
21	Anaheim	Fire Signal				1								1			
22	Anaheim	La Palma Avenue		1		1			2	1				1			
23	Anaheim	SR-91 Westbound Off-Ramp *															1
24	Anaheim	Frontera Street		1		1	1		1	1				1			
25	Orange	Riverdale Avenue			1	1	1										
26	Orange	Riverbend Parkway/Richland Avenue			1	1	1										
27	Orange	Lincoln Avenue	1			1						1					
28	Orange	Fletcher Avenue	1			1						1					
29	Orange	Meats Avenue	1	1		1											
30	Orange	Grove Avenue		1		1	1										
31	Orange	Orange Olive Road															
32	Orange	Taft Avenue	1			1											
33	Orange	Katella Avenue	1														
34	Orange	Wilson Avenue/Adams Avenue	1			1											
35	Orange	Collins Avenue	1			1											
36	Orange	Walnut Avenue	1			1						1					
37	Orange	Sycamore Avenue/University Drive	1			1						1					
38	Orange	Palm Avenue	1			1						1					
39	Orange	La Veta Avenue	1			1			1			1					
40	Orange	SR-22 Westbound Ramp *															1
41	Orange	SR-22 Eastbound Ramp *															1
42	Santa Ana	Fairhaven Avenue	1	1		1		1		1		1		1			

APPENDIX B: AGENCY IMPROVEMENT CALCULATIONS

TABLE II: DESCRIPTION OF WORK BY INTERSECTION

LOCATION	IMPLEMENTING AGENCY	PROJECT CROSS STREETS	DESCRIPTION OF WORK													
			1 Above ground (e.g. wireless, cellular, etc.)	2 Fiber Optic underground	3 All other (e.g. copper, aerial fiber, GPS, etc.)	4 ATC signal controller	5 Signal cabinet on existing foundation	6 Signal cabinet on new foundation	10 CCTV	13 Vehicle detection + bicycle detection	14 Vehicle detection	16 Pedestrian detection (audible)	17 Pedestrian detection	24 Signal Performance Monitoring	27 Central System (server, licenses, workstations)	34 Caltrans Cooperative Agreement
43	Santa Ana	Santa Clara Avenue		1		1								1		
44	Santa Ana	21st Street		1		1				1		1		1		
45	Santa Ana	17th Street		1		1				1		1		1		
46	Santa Ana	I-5 Northbound Ramp		1		1								1		
47	Santa Ana	Santa Ana Blvd/I-5 Southbound Ramp	1	1		1								1		
48	Santa Ana	Fruit Street		1		1		1						1		
49	Santa Ana	OC Register	1			1								1		
50	Santa Ana	4th Street				1			1	1		1		1		
51	Santa Ana	1st Street		1						1		1				
52	Santa Ana	Chestnut Avenue		1										1		
53	Santa Ana	McFadden Avenue		1		1		1		1		1		1		
54	Santa Ana	Century High School		1		1						1		1		
55	Santa Ana	Edinger Avenue		1					1							
56	Santa Ana	St Andrew Place		1		1			1					1		
57	Santa Ana	St Gertrude Place		1		1								1		
58	Santa Ana	Warner Avenue		1				1	1							
59	Santa Ana	Hotel Terrace Drive/Brookhollow Dr		1		1								1		
60	Santa Ana	SR-55 Southbound Off-Ramp		1		1								1		
61	Santa Ana	Dyer Road		1										1		
		-														
1	Orange	Taft Avenue & Shaffer Street		1			1									
2	Santa Ana	Fairhaven Avenue & Cambridge Street	1			1										
3	Santa Ana	Santa Ana Boulevard & I-5 SB Ramp		1		1										
-	Santa Ana	TMC Improvements													1	
-	Placentia	TMC Improvements													1	
-	Orange	TMC Improvements	1												1	
-	Anaheim	TMC Improvements													1	
-	Brea	TMC Improvements													1	
<b>QUANTITY TOTAL =</b>			<b>16</b>	<b>45</b>	<b>2</b>	<b>47</b>	<b>10</b>	<b>7</b>	<b>15</b>	<b>20</b>	<b>6</b>	<b>10</b>	<b>2</b>	<b>21</b>	<b>5</b>	<b>4</b>

APPENDIX B: AGENCY IMPROVEMENT CALCULATIONS

TABLE II: DESCRIPTION OF WORK BY INTERSECTION

LOCATION	IMPLEMENTING AGENCY	PROJECT CROSS STREETS	SIGNAL IMPROVEMENT COSTS					NOTES
			Design	Construction	Construction Management & Inspection	Contingency	TOTAL	
					15%	10%		
1	Brea	Lambert Road	\$ 7,000.00	\$ 70,000.00	\$ 10,500.00	\$ 8,750.00	\$ 96,250.00	
2	Brea	Birch Street	\$ 7,000.00	\$ 70,000.00	\$ 10,500.00	\$ 8,750.00	\$ 96,250.00	
3	Brea	Orbiter Street	\$ 6,000.00	\$ 60,000.00	\$ 9,000.00	\$ 7,500.00	\$ 82,500.00	
4	Brea	Birch Hills Mall	\$ 10,000.00	\$ 100,000.00	\$ 15,000.00	\$ 12,500.00	\$ 137,500.00	
5	Brea	Imperial Highway (SR-90) *	\$ -	\$ 2,500.00	\$ -	\$ -	\$ 2,500.00	
6	Brea	Buttonwood Drive/ Saturn Street	\$ 7,000.00	\$ 70,000.00	\$ 10,500.00	\$ 8,750.00	\$ 96,250.00	
7	Placentia	Golden Avenue	\$ 6,200.00	\$ 62,000.00	\$ 9,300.00	\$ 7,750.00	\$ 85,250.00	
8	Placentia	Patrician Lane	\$ 7,200.00	\$ 72,000.00	\$ 10,800.00	\$ 9,000.00	\$ 99,000.00	
9	Placentia	Bastanchury Road	\$ 9,400.00	\$ 94,000.00	\$ 14,100.00	\$ 11,750.00	\$ 129,250.00	
10	Placentia	Yorba Linda Boulevard	\$ 2,800.00	\$ 28,000.00	\$ 4,200.00	\$ 3,500.00	\$ 38,500.00	
11	Placentia	Sheffield Street/Morse Avenue	\$ 1,000.00	\$ 10,000.00	\$ 1,500.00	\$ 1,250.00	\$ 13,750.00	
12	Placentia	Madison Avenue	\$ 2,000.00	\$ 20,000.00	\$ 3,000.00	\$ 2,500.00	\$ 27,500.00	
13	Placentia	Alta Vista Street	\$ 11,400.00	\$ 114,000.00	\$ 17,100.00	\$ 14,250.00	\$ 156,750.00	
14	Placentia	Chapman Avenue (North)	\$ 6,800.00	\$ 68,000.00	\$ 10,200.00	\$ 8,500.00	\$ 93,500.00	
15	Placentia	Hawaii Way	\$ 1,000.00	\$ 10,000.00	\$ 1,500.00	\$ 1,250.00	\$ 13,750.00	
16	Placentia	Crowther Avenue	\$ 1,000.00	\$ 10,000.00	\$ 1,500.00	\$ 1,250.00	\$ 13,750.00	
17	Placentia	Orangethorpe Avenue	\$ 6,200.00	\$ 62,000.00	\$ 9,300.00	\$ 7,750.00	\$ 85,250.00	
18	Anaheim	La Jolla Street	\$ 6,850.00	\$ 68,500.00	\$ 10,275.00	\$ 8,562.50	\$ 94,187.50	
19	Anaheim	Miraloma Avenue	\$ 7,850.00	\$ 78,500.00	\$ 11,775.00	\$ 9,812.50	\$ 107,937.50	
20	Anaheim	Coronado Street	\$ 5,850.00	\$ 58,500.00	\$ 8,775.00	\$ 7,312.50	\$ 80,437.50	
21	Anaheim	Fire Signal	\$ 1,550.00	\$ 15,500.00	\$ 2,325.00	\$ 1,937.50	\$ 21,312.50	
22	Anaheim	La Palma Avenue	\$ 6,450.00	\$ 64,500.00	\$ 9,675.00	\$ 8,062.50	\$ 88,687.50	
23	Anaheim	SR-91 Westbound Off-Ramp *	\$ -	\$ 2,500.00	\$ -	\$ -	\$ 2,500.00	
24	Anaheim	Frontera Street	\$ 7,850.00	\$ 78,500.00	\$ 11,775.00	\$ 9,812.50	\$ 107,937.50	
25	Orange	Riverdale Avenue	\$ 5,300.00	\$ 53,000.00	\$ 7,950.00	\$ 6,625.00	\$ 72,875.00	
26	Orange	Riverbend Parkway/Richland Avenue	\$ 5,300.00	\$ 53,000.00	\$ 7,950.00	\$ 6,625.00	\$ 72,875.00	
27	Orange	Lincoln Avenue	\$ 6,600.00	\$ 66,000.00	\$ 9,900.00	\$ 8,250.00	\$ 90,750.00	
28	Orange	Fletcher Avenue	\$ 6,600.00	\$ 66,000.00	\$ 9,900.00	\$ 8,250.00	\$ 90,750.00	
29	Orange	Meats Avenue	\$ 11,600.00	\$ 116,000.00	\$ 17,400.00	\$ 14,500.00	\$ 159,500.00	
30	Orange	Grove Avenue	\$ 13,500.00	\$ 135,000.00	\$ 20,250.00	\$ 16,875.00	\$ 185,625.00	
31	Orange	Orange Olive Road	\$ -	\$ -	\$ -	\$ -	\$ -	
32	Orange	Taft Avenue	\$ 2,600.00	\$ 26,000.00	\$ 3,900.00	\$ 3,250.00	\$ 35,750.00	
33	Orange	Katella Avenue	\$ 1,900.00	\$ 19,000.00	\$ 2,850.00	\$ 2,375.00	\$ 26,125.00	
34	Orange	Wilson Avenue/Adams Avenue	\$ 2,600.00	\$ 26,000.00	\$ 3,900.00	\$ 3,250.00	\$ 35,750.00	
35	Orange	Collins Avenue	\$ 2,600.00	\$ 26,000.00	\$ 3,900.00	\$ 3,250.00	\$ 35,750.00	
36	Orange	Walnut Avenue	\$ 6,600.00	\$ 66,000.00	\$ 9,900.00	\$ 8,250.00	\$ 90,750.00	
37	Orange	Sycamore Avenue/University Drive	\$ 6,600.00	\$ 66,000.00	\$ 9,900.00	\$ 8,250.00	\$ 90,750.00	
38	Orange	Palm Avenue	\$ 6,600.00	\$ 66,000.00	\$ 9,900.00	\$ 8,250.00	\$ 90,750.00	
39	Orange	La Veta Avenue	\$ 7,700.00	\$ 77,000.00	\$ 11,550.00	\$ 9,625.00	\$ 105,875.00	
40	Orange	SR-22 Westbound Ramp *	\$ -	\$ 2,500.00	\$ -	\$ -	\$ 2,500.00	
41	Orange	SR-22 Eastbound Ramp *	\$ -	\$ 2,500.00	\$ -	\$ -	\$ 2,500.00	
42	Santa Ana	Fairhaven Avenue	\$ 16,200.00	\$ 163,500.00	\$ 24,525.00	\$ 20,422.50	\$ 224,647.50	

APPENDIX B: AGENCY IMPROVEMENT CALCULATIONS

TABLE II: DESCRIPTION OF WORK BY INTERSECTION

LOCATION	IMPLEMENTING AGENCY	PROJECT CROSS STREETS	SIGNAL IMPROVEMENT COSTS					NOTES
			Design	Construction	Construction Management & Inspection	Contingency	TOTAL	
					15%	10%		
43	Santa Ana	Santa Clara Avenue	\$ 2,700.00	\$ 28,500.00	\$ 4,275.00	\$ 3,547.50	\$ 39,022.50	
44	Santa Ana	21st Street	\$ 8,900.00	\$ 90,500.00	\$ 13,575.00	\$ 11,297.50	\$ 124,272.50	
45	Santa Ana	17th Street	\$ 8,900.00	\$ 90,500.00	\$ 13,575.00	\$ 11,297.50	\$ 124,272.50	
46	Santa Ana	I-5 Northbound Ramp	\$ 2,700.00	\$ 28,500.00	\$ 4,275.00	\$ 3,547.50	\$ 39,022.50	
47	Santa Ana	Santa Ana Blvd/I-5 Southbound Ramp	\$ 4,000.00	\$ 41,500.00	\$ 6,225.00	\$ 5,172.50	\$ 56,897.50	
48	Santa Ana	Fruit Street	\$ 8,700.00	\$ 88,500.00	\$ 13,275.00	\$ 11,047.50	\$ 121,522.50	
49	Santa Ana	OC Register	\$ 2,100.00	\$ 22,500.00	\$ 3,375.00	\$ 2,797.50	\$ 30,772.50	
50	Santa Ana	4th Street	\$ 7,800.00	\$ 79,500.00	\$ 11,925.00	\$ 9,922.50	\$ 109,147.50	
51	Santa Ana	1st Street	\$ 8,100.00	\$ 81,000.00	\$ 12,150.00	\$ 10,125.00	\$ 111,375.00	
52	Santa Ana	Chestnut Avenue	\$ 1,900.00	\$ 20,500.00	\$ 3,075.00	\$ 2,547.50	\$ 28,022.50	
53	Santa Ana	McFadden Avenue	\$ 14,900.00	\$ 150,500.00	\$ 22,575.00	\$ 18,797.50	\$ 206,772.50	
54	Santa Ana	Century High School	\$ 3,900.00	\$ 40,500.00	\$ 6,075.00	\$ 5,047.50	\$ 55,522.50	
55	Santa Ana	Edinger Avenue	\$ 2,700.00	\$ 27,000.00	\$ 4,050.00	\$ 3,375.00	\$ 37,125.00	
56	Santa Ana	St Andrew Place	\$ 3,500.00	\$ 36,500.00	\$ 5,475.00	\$ 4,547.50	\$ 50,022.50	
57	Santa Ana	St Gertrude Place	\$ 2,700.00	\$ 28,500.00	\$ 4,275.00	\$ 3,547.50	\$ 39,022.50	
58	Santa Ana	Warner Avenue	\$ 8,700.00	\$ 87,000.00	\$ 13,050.00	\$ 10,875.00	\$ 119,625.00	
59	Santa Ana	Hotel Terrace Drive/Brookhollow Dr	\$ 2,700.00	\$ 28,500.00	\$ 4,275.00	\$ 3,547.50	\$ 39,022.50	
60	Santa Ana	SR-55 Southbound Off-Ramp	\$ 2,700.00	\$ 28,500.00	\$ 4,275.00	\$ 3,547.50	\$ 39,022.50	
61	Santa Ana	Dyer Road	\$ 1,900.00	\$ 20,500.00	\$ 3,075.00	\$ 2,547.50	\$ 28,022.50	
		-	\$ -	\$ -	\$ -	\$ -	\$ -	
1	Orange	Taft Avenue & Shaffer Street	\$ 12,800.00	\$ 128,000.00	\$ 19,200.00	\$ 16,000.00	\$ 176,000.00	
2	Santa Ana	Fairhaven Avenue & Cambridge Street	\$ 2,100.00	\$ 21,000.00	\$ 3,150.00	\$ 2,625.00	\$ 28,875.00	
3	Santa Ana	Santa Ana Boulevard & I-5 SB Ramp	\$ 2,700.00	\$ 27,000.00	\$ 4,050.00	\$ 3,375.00	\$ 37,125.00	
-	Santa Ana	TMC Improvements	\$ -	\$ 50,000.00	\$ 7,500.00	\$ 5,750.00	\$ 63,250.00	
-	Placentia	TMC Improvements	\$ -	\$ 100,000.00	\$ 15,000.00	\$ 11,500.00	\$ 126,500.00	
-	Orange	TMC Improvements	\$ 1,900.00	\$ 69,000.00	\$ 10,350.00	\$ 8,125.00	\$ 89,375.00	
-	Anaheim	TMC Improvements	\$ -	\$ 75,000.00	\$ 11,250.00	\$ 8,625.00	\$ 94,875.00	
-	Brea	TMC Improvements	\$ -	\$ 30,000.00	\$ 4,500.00	\$ 3,450.00	\$ 37,950.00	
<b>QUANTITY TOTAL =</b>			<b>SIGNAL IMPROVEMENT TOTAL =</b>				<b>\$ 5,236,457.50</b>	





TABLE III: PROJECT AVERAGE IMPROVEMENT SCORES

LOCATION	IMPLEMENTING AGENCY	PROJECT CROSS STREETS	Timing Only	Timing + Traffic Responsive (license only)	Timing + Peer-to-Peer (configuration only)	Timing + Traffic Adaptive (license only)	Caltrans Cooperative Agreement	AVERAGE IMPROVEMENT SCORE	NOTES
			Online or Offline			Y/N			
1	Brea	Lambert Road						31.3	
2	Brea	Birch Street						31.3	
3	Brea	Orbiter Street						31.7	
4	Brea	Birch Hills Mall						31.3	
5	Brea	Imperial Highway (SR-90) *					50	50.0	
6	Brea	Buttonwood Drive/ Saturn Street						31.3	
7	Placentia	Golden Avenue						27.5	
8	Placentia	Patrician Lane						31.3	
9	Placentia	Bastanchury Road						35.0	
10	Placentia	Yorba Linda Boulevard						32.5	
11	Placentia	Sheffield Street/Morse Avenue						15.0	
12	Placentia	Madison Avenue						22.5	
13	Placentia	Alta Vista Street						32.0	
14	Placentia	Chapman Avenue (North)						31.3	
15	Placentia	Hawaii Way						15.0	
16	Placentia	Crowther Avenue						15.0	
17	Placentia	Orangethorpe Avenue						26.7	
18	Anaheim	La Jolla Street						31.0	
19	Anaheim	Miraloma Avenue						32.5	
20	Anaheim	Coronado Street						31.3	
21	Anaheim	Fire Signal						45.0	
22	Anaheim	La Palma Avenue						33.0	
23	Anaheim	SR-91 Westbound Off-Ramp *					50	50.0	
24	Anaheim	Frontera Street						32.5	
25	Orange	Riverdale Avenue						27.0	
26	Orange	Riverbend Parkway/Richland Avenue						27.0	
27	Orange	Lincoln Avenue						36.7	
28	Orange	Fletcher Avenue						36.7	
29	Orange	Meats Avenue						31.7	
30	Orange	Grove Avenue						31.7	
31	Orange	Orange Olive Road							
32	Orange	Taft Avenue						40.0	
33	Orange	Katella Avenue						30.0	
34	Orange	Wilson Avenue/Adams Avenue						40.0	
35	Orange	Collins Avenue						40.0	
36	Orange	Walnut Avenue						36.7	
37	Orange	Sycamore Avenue/University Drive						36.7	
38	Orange	Palm Avenue						40.0	
39	Orange	La Veta Avenue						35.0	
40	Orange	SR-22 Westbound Ramp *					50	50.0	
41	Orange	SR-22 Eastbound Ramp *					50	50.0	
42	Santa Ana	Fairhaven Avenue						32.9	

TABLE III: PROJECT AVERAGE IMPROVEMENT SCORES

LOCATION	IMPLEMENTING AGENCY	PROJECT CROSS STREETS	Timing Only	Timing + Traffic Responsive (license only)	Timing + Peer-to-Peer (configuration only)	Timing + Traffic Adaptive (license only)	Caltrans Cooperative Agreement	AVERAGE IMPROVEMENT SCORE	NOTES
			Online or Offline	Y/N					
43	Santa Ana	Santa Clara Avenue						35.0	
44	Santa Ana	21st Street						37.0	
45	Santa Ana	17th Street						37.0	
46	Santa Ana	I-5 Northbound Ramp						35.0	
47	Santa Ana	Santa Ana Blvd/I-5 Southbound Ramp						33.8	
48	Santa Ana	Fruit Street						30.0	
49	Santa Ana	OC Register						40.0	
50	Santa Ana	4th Street						40.0	
51	Santa Ana	1st Street						31.7	
52	Santa Ana	Chestnut Avenue						27.5	
53	Santa Ana	McFadden Avenue						33.3	
54	Santa Ana	Century High School						38.8	
55	Santa Ana	Edinger Avenue						22.5	
56	Santa Ana	St Andrew Place						33.8	
57	Santa Ana	St Gertrude Place						35.0	
58	Santa Ana	Warner Avenue						20.0	
59	Santa Ana	Hotel Terrace Drive/Brookhollow Dr						35.0	
60	Santa Ana	SR-55 Southbound Off-Ramp						35.0	
61	Santa Ana	Dyer Road						27.5	
0	0	-							
1	Orange	Taft Avenue & Shaffer Street						22.5	
2	Santa Ana	Fairhaven Avenue & Cambridge Street						40.0	
3	Santa Ana	Santa Ana Boulevard & I-5 SB Ramp						32.5	
-	Santa Ana	TMC Improvements						40.0	
-	Placentia	TMC Improvements						40.0	
-	Orange	TMC Improvements						35.0	
-	Anaheim	TMC Improvements						40.0	
-	Brea	TMC Improvements						40.0	
<b>AVERAGE SCORE =</b>								<b>33.6</b>	

# Appendix C

## VEHICLE MILES TRAVELED (VMT)

**APPENDIX C: VEHICLE MILES TRAVELED (VMT)**

	Segment	ADTs	Distance	VMT
<b>Brea</b>	Lambert Rd - Birch St	13,036	0.40	5,214
	Birch St - Imperial Hwy (SR-90)	16,463	0.50	8,232
	Imperial Hwy (SR-90) - Golden Ave	16,397	0.50	8,199
<b>Placentia</b>	Golden Ave - Bastanchury Rd	16,052	0.50	8,026
	Bastanchury Rd - Yorba Linda Blvd	18,362	0.60	11,017
	Yorba Linda Blvd - Alta Vista St	20,952	0.80	16,762
	Alta Vista St - Chapman Ave (North)	18,905	0.40	7,562
	Chapman Ave (North) - Orangethorpe Ave	18,932	0.42	7,951
<b>Anaheim</b>	Orangethorpe Ave - Riverdale Ave	45,665	1.70	77,631
<b>Orange</b>	Riverdale Ave - Lincoln Ave	20,900	0.45	9,405
	Lincoln Ave - Fletcher Ave	16,200	0.46	7,452
	Fletcher Ave - Taft Ave	16,500	0.94	15,510
	Taft Ave - Katella Ave	21,900	0.46	10,074
	Katella Ave - Collins Ave	15,500	0.46	7,130
	Collins Ave - Walnut Ave	8,900	0.50	4,450
	Walnut Ave - Chapman Ave (South)	7,900	0.50	3,950
	Chapman Ave (South) - La Veta Ave	13,200	0.50	6,600
	La Veta Ave - SR-22 Fwy	29,100	0.34	9,894
	SR-22 Fwy - Fairhaven Ave	29,300	0.16	4,688
<b>Santa Ana</b>	Fairhaven Ave - Santa Clara Ave	27,641	0.43	11,886
	Santa Clara Ave - 17th St	24,397	0.50	12,199
	17th St - Santa Ana Blvd/ I-5 Fwy	28,732	0.39	11,205
	I-5 Fwy - 1st St	44,763	0.61	27,305
	1st St - McFadden Ave	37,067	0.84	31,136
	McFadden Ave - Edinger Ave	28,319	0.48	13,593
	Edinger Ave - Warner Ave	24,644	0.75	18,483
	Warner Ave - Dyer Rd	21,727	0.55	11,950
<b>Total Project VMT:</b>			<b>15.14</b>	<b>367,503</b>

Source: 2023 - Brea, Placentia, Anaheim 2022 - Santa Ana, Orange

# **Appendix D**

## **AGENCY RESOLUTIONS AND LETTERS OF SUPPORT**

# **Appendix E**

**Cabinet photos and As-built drawings (Uploaded to OCFundTracker and included in Electronic Submittal Only)**

<b>ELIGIBLE IMPROVEMENTS</b>	<b>SCORE BASED ON STATUS</b>	
<b>Signal Timing (No Capital)</b>	<b>Online</b>	<b>Offline</b>
Timing Only	50	30
Timing + Traffic Responsive (license only)	50	15
Timing + Peer-to-Peer (configuration only)	50	40
Timing + Traffic Adaptive (license only)	40	1
<b>Signal Communication</b>	<b>No Time Source</b>	<b>Time Source</b>
Above ground (e.g. wireless, cellular, etc.)	50	30
Fiber Optic underground	25	15
All other (e.g. copper, aerial fiber, GPS, etc.)	5	1
<b>Field Elements</b>	<b>None/5+ Years</b>	<b>Within 5 Years</b>
ATC signal controller	50	10
Signal cabinet on existing foundation	30	10
Signal cabinet on new foundation	15	5
BBS/USP (attached)	20	10
BBS/UPS on existing foundation	10	5
BBS/UPS on new foundation	5	1
CCTV	30	10
Vehicle detection (ATSPM inputs + counts)	50	30
Vehicle detection (ATSPM inputs)	40	20
Vehicle detection + bicycle detection	30	15
Vehicle detection	30	15
Bicycle detection	30	15
Pedestrian detection (audible)	50	30
Pedestrian detection	30	15
Active transportation/pedestrian safety	50	30
Transit Signal Priority	50	25
EVP (hybrid or GPS)	40	10
EVP (infrared)	30	10
Speed feedback signs (existing post)	40	10
Speed feedback signs (new post)	20	10
Signal Performance Monitoring	40	10
<b>Minor Signal Operational Improvements</b>	<b>None/5+ Years</b>	<b>Within 5 Years</b>
Channelization	40	20
Signal phasing improvement	50	25
<b>TMC/TOC</b>	<b>None/10+ Years</b>	<b>Within 10 Years</b>
Central System (server, licenses, workstations)	40	20
Display (video wall, VMS, etc.)	30	10
UPS for TMC	20	5
<b>Caltrans Participation</b>	<b>With Coop</b>	<b>Without Coop</b>
Caltrans Cooperative Agreement	50	25