PROFESSIONAL SERVICES AGREEMENT
[Traffic Engineering Services – RFP 20-21.40]

THIS PROFESSIONAL SERVICES AGREEMENT (the "Agreement") is made at Orange, California, on this _____ day of _____, 2021 (the "Effective Date") by and between the CITY OF ORANGE, a municipal corporation ("City"), and ITERIS, INC., a Delaware corporation ("Contractor"), who agree as follows:

1. Services. Subject to the terms and conditions set forth in this Agreement, Contractor shall provide to the reasonable satisfaction of City the services set forth in Exhibit "A," which is attached hereto and incorporated herein by reference. As a material inducement to City to enter into this Agreement, Contractor represents and warrants that it has thoroughly investigated and considered the scope of services and fully understands the difficulties and restrictions in performing the work. The services which are the subject of this Agreement are not in the usual course of City's business and City relies on Contractor's representation that it is independently engaged in the business of providing such services and is experienced in performing the work. Contractor shall perform all services in a manner reasonably satisfactory to City and in a manner in conformance with the standards of quality normally observed by an entity provided such services to a municipal agency. All services provided shall conform to all federal, state and local laws, rules and regulations and to the best professional standards and practices. The terms and conditions set forth in this Agreement shall control over any terms and conditions in Exhibit "A" to the contrary.

Larry Tay, City Traffic Engineer ("City's Project Manager"), shall be the person to whom Contractor will report for the performance of services hereunder. It is understood that Contractor's performance hereunder shall be under the supervision of City's Project Manager (or his/her designee), that Contractor shall coordinate its services hereunder with City's Project Manager to the extent required by City's Project Manager, and that all performances required hereunder by Contractor shall be performed to the satisfaction of City's Project Manager and the City Manager.

2. Compensation and Fees.

a. Contractor's total compensation for all services performed under this Agreement, shall not exceed ONE MILLION SEVENTY-SIX THOUSAND THREE HUNDRED FORTY-ONE DOLLARS and 00/100 ($1,076,341.00) without the prior written authorization of City.

b. The above compensation shall include all costs, including, but not limited to, all clerical, administrative, overhead, insurance, reproduction, telephone, travel, auto rental, subsistence and all related expenses.

c. In addition to the scheduled services to be performed by the Contractor, the parties recognize that additional, unforeseen work and services may be required by City's Project Manager. In anticipation of such contingencies, the sum of ONE HUNDRED SEVEN THOUSAND SIX HUNDRED THIRTY-FOUR DOLLARS and 10/100 ($107,634.10) has been

added to the total compensation of this Agreement. City's Project Manager may approve the additional work and the actual costs incurred by the Contractor in performance of additional work or services in accordance with such amount as City's Project Manager and the Contractor may agree upon in advance. Said additional work or services and the amount of compensation therefor, up to the amount of the authorized contingency, shall be memorialized in the form of an Amendment to Agreement approved by the City Manager on a form acceptable to the City Attorney. The Contractor agrees to perform only that work or those services that are specifically requested by the City's Project Manager. Any and all additional work and services performed under this Agreement shall be completed in such sequence as to assure their completion as expeditiously as is consistent with professional skill and care in accordance with a cost estimate or proposal submitted to and approved by City's Project Manager prior to the commencement of such services.

d. The total amount of compensation under this Agreement, including contingencies, shall not exceed ONE MILLION ONE HUNDRED EIGHTY-THREE THOUSAND NINE HUNDRED SEVENTY-FIVE DOLLARS and 10/100 ($1,183,975.10).

3. Payment.

a. As scheduled services are completed, Contractor shall submit to City an invoice for the services completed, authorized expenses and authorized extra work actually performed or incurred as set forth in Exhibit "A."

b. All such invoices shall state the basis for the amount invoiced, including services completed, the number of hours spent and any extra work performed.

c. City will pay Contractor the amount invoiced within thirty (30) days after the approval of the invoice.

d. Payment shall constitute payment in full for all services, authorized costs and authorized extra work covered by that invoice.

4. Change Orders. No payment for extra services caused by a change in the scope or complexity of work, or for any other reason, shall be made unless and until such extra services and a price therefor have been previously authorized in writing and approved by City as an amendment to this Agreement. City's Project Manager is authorized to approve a reduction in the services to be performed and compensation therefor. All amendments shall set forth the changes of work, extension of time, and/or adjustment of the compensation to be paid by City to Contractor and shall be signed by the City's Project Manager, City Manager or City Council, as applicable.

5. Licenses. Contractor represents that it and any subcontractors it may engage, possess any and all licenses which are required under state or federal law to perform the work contemplated by this Agreement and that Contractor and its subcontractors shall maintain all appropriate licenses, including a City of Orange business license, at its cost, during the performance of this Agreement.

6. **Independent Contractor**. At all times during the term of this Agreement, Contractor shall be an independent contractor and not an employee of City. City shall have the right to control Contractor only insofar as the result of Contractor's services rendered pursuant to this Agreement. City shall not have the right to control the means by which Contractor accomplishes services rendered pursuant to this Agreement. Contractor shall, at its sole cost and expense, furnish all facilities, materials and equipment which may be required for furnishing services pursuant to this Agreement. Contractor shall be solely responsible for, and shall indemnify, defend and save City harmless from all matters relating to the payment of its subcontractors, agents and employees, including compliance with social security withholding and all other wages, salaries, benefits, taxes, exactions, and regulations of any nature whatsoever. Contractor acknowledges that it and any subcontractors, agents or employees employed by Contractor shall not, under any circumstances, be considered employees of City, and that they shall not be entitled to any of the benefits or rights afforded employees of City, including, but not limited to, sick leave, vacation leave, holiday pay, Public Employees Retirement System benefits, or health, life, dental, long-term disability or workers' compensation insurance benefits.

7. **Contractor Not Agent**. Except as City may specify in writing, Contractor shall have no authority, express or implied, to act on behalf of City in any capacity whatsoever as an agent. Contractor shall have no authority, express or implied, to bind City to any obligation whatsoever.

8. **Designated Persons**. Only those qualified persons authorized by City's Project Manager, or as designated in Exhibit "A," shall perform work provided for under this Agreement. It is understood by the parties that clerical and other nonprofessional work may be performed by persons other than those designated.

9. **Assignment or Subcontracting**. No assignment or subcontracting by Contractor of any part of this Agreement or of funds to be received under this Agreement shall be of any force or effect unless the assignment has the prior written approval of City. City may terminate this Agreement rather than accept any proposed assignment or subcontracting. Such assignment or subcontracting may be approved by the City Manager or his/her designee.

10. **Time of Completion**. Except as otherwise specified in Exhibit "A," Contractor shall commence the work provided for in this Agreement within five (5) days of the Effective Date of this Agreement and diligently prosecute completion of the work as agreed to by and between the representatives of the parties.

11. **Time Is of the Essence**. Time is of the essence in this Agreement. Contractor shall do all things necessary and incidental to the prosecution of Contractor's work.

12. **[Reserved]**

13. **Delays and Extensions of Time.** Contractor's sole remedy for delays outside its control, other than those delays caused by City, shall be an extension of time. No matter what the cause of the delay, Contractor must document any delay and request an extension of time in writing at the time of the delay to the satisfaction of City. Any extensions granted shall be limited to the

length of the delay outside Contractor's control. If Contractor believes that delays caused by City will cause it to incur additional costs, it must specify, in writing, why the delay has caused additional costs to be incurred and the exact amount of such cost at the time the delay occurs. No additional costs can be paid that exceed the not to exceed amount stated in Section 2.a, above, absent a written amendment to this Agreement.

14. Products of Contractor. The documents, studies, evaluations, assessments, reports, plans, citations, materials, manuals, technical data, logs, files, designs and other products produced or provided by Contractor for this Agreement shall become the property of City upon receipt. Contractor shall deliver all such products to City prior to payment for same. City may use, reuse or otherwise utilize such products without restriction.

15. Equal Employment Opportunity. During the performance of this Agreement, Contractor agrees as follows:

a. Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, mental or physical disability, or any other basis prohibited by applicable law. Contractor shall ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, national origin, mental or physical disability, or any other basis prohibited by applicable law. Such actions shall include, but not be limited to the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation and selection for training, including apprenticeship. Contractor agrees to post in conspicuous places, available to employees and applicants for employment, a notice setting forth provisions of this non-discrimination clause.

b. Contractor shall, in all solicitations and advertisements for employees placed by, or on behalf of Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, mental or physical disability, or any other basis prohibited by applicable law.

c. Contractor shall cause the foregoing paragraphs (a) and (b) to be inserted in all subcontracts for any work covered by this Agreement, provided that the foregoing provisions shall not apply to subcontracts for standard commercial supplies or raw materials.

16. Conflicts of Interest. Contractor agrees that it shall not make, participate in the making, or in any way attempt to use its position as a consultant to influence any decision of City in which Contractor knows or has reason to know that Contractor, its officers, partners, or employees have a financial interest as defined in Section 87103 of the Government Code. Contractor further agrees that it shall not be eligible to work as the design/build firm for the project that is the subject of this Agreement.

17. Indemnity.

a. To the fullest extent permitted by law, Contractor agrees to indemnify, defend and hold City, its City Council and each member thereof, and the officers, officials, agents

and employees of City (collectively the "Indemnitees") entirely harmless from all liability arising out of:

(1) Any and all claims under workers' compensation acts and other employee benefit acts with respect to Contractor's employees or Contractor's subcontractor's employees arising out of Contractor's work under this Agreement, including any and all claims under any law pertaining to Contractor or its employees' status as an independent contractor and any and all claims under Labor Code section 1720 related to the payment of prevailing wages for public works projects; and

(2) Any claim, loss, injury to or death of persons or damage to property caused by any act, neglect, default, or omission other than a professional act or omission of Contractor, or person, firm or corporation employed by Contractor, either directly or by independent contract, including all damages due to loss or theft sustained by any person, firm or corporation including the Indemnitees, or any of them, arising out of, or in any way connected with the work or services which are the subject of this Agreement, including injury or damage either on or off City's property; but not for any loss, injury, death or damage caused by the active negligence or willful misconduct of City. Contractor, at its own expense, cost and risk, shall indemnify any and all claims, actions, suits or other proceedings that may be brought or instituted against the Indemnitees on any such claim or liability covered by this subparagraph, and shall pay or satisfy any judgment that may be rendered against the Indemnitees, or any of them, in any action, suit or other proceedings as a result of coverage under this subparagraph.

b. To the fullest extent permitted by law, and as limited by California Civil Code 2782.8, Contractor agrees to indemnify and hold Indemnitees harmless from all liability arising out of any claim, loss, injury to or death of persons or damage to property to the extent caused by its negligent professional act or omission in the performance of professional services pursuant to this Agreement.

c. Except for the Indemnitees, the indemnifications provided in this Agreement shall not be construed to extend any third party indemnification rights of any kind to any person or entity which is not a signatory to this Agreement.

d. The indemnities set forth in this section shall survive any closing, rescission, or termination of this Agreement, and shall continue to be binding and in full force and effect in perpetuity with respect to Contractor and its successors.

18. <u>Insurance</u>.

a. Contractor shall carry workers' compensation insurance as required by law for the protection of its employees during the progress of the work. Contractor understands that it is an independent contractor and not entitled to any workers' compensation benefits under any City program.

b. Contractor shall maintain during the life of this Agreement the following minimum amount of comprehensive general liability insurance or commercial general liability

insurance: the greater of (1) One Million Dollars ($1,000,000) per occurrence with a Two Million Dollar ($2,000,000) aggregate; or (2) all the insurance coverage and/or limits carried by or available to Contractor. Said insurance shall cover bodily injury, death and property damage and be written on an occurrence basis.

c. Contractor shall maintain during the life of this Agreement, the following minimum amount of automotive liability insurance: the greater of (1) a combined single limit of One Million Dollars ($1,000,000); or (2) all the insurance coverage and/or limits carried by or available to Contractor. Said insurance shall cover bodily injury, death and property damage for all owned, non-owned and hired vehicles and be written on an occurrence basis.

d. Any insurance proceeds in excess of or broader than the minimum required coverage and/or minimum required limits which are applicable to a given loss shall be available to City and its partner cities for the Tustin Avenue/Rose Drive Corridor Traffic Signal Synchronization Project (Cities of Anaheim, Placentia, Santa Ana, Tustin and Yorba Linda, collectively "Partner Cities"). No representation is made that the minimum insurance requirements of this Agreement are sufficient to cover the obligations of Contractor under this Agreement.

e. Each policy of general liability and automotive liability shall provide that City and Partner Cities, their officers, officials, agents, and employees are declared to be additional insureds under the terms of the policy, but only with respect to the work performed by Contractor under this Agreement. A policy endorsement to that effect shall be provided to City along with the certificate of insurance. In lieu of an endorsement, City will accept a copy of the policy(ies) which evidences that City and Partner Cities are additional insureds. The minimum coverage required by Subsection 18.b and c, above, shall apply to City and Partner Cities as additional insureds. Any umbrella liability insurance that is provided as part of the general or automobile liability minimums set forth herein shall be maintained for the duration of the Agreement.

f. Contractor shall maintain during the life of this Agreement professional liability insurance covering errors and omissions arising out of the performance of this Agreement with a minimum limit of One Million Dollars ($1,000,000) per claim. Contractor agrees to keep such policy in force and effect for at least five (5) years from the date of completion of this Agreement.

g. The insurance policies maintained by Contractor shall be primary insurance and no insurance held or owned by City and Partner Cities shall be called upon to cover any loss under the policy. Contractor will determine its own needs in procurement of insurance to cover liabilities other than as stated above.

h. Before Contractor performs any work or prepares or delivers any materials, Contractor shall furnish certificates of insurance and endorsements, as required by City, evidencing the aforementioned minimum insurance coverages on forms acceptable to City, which shall provide that the insurance in force will not be canceled or allowed to lapse without at least ten (10) days' prior written notice to City.

i. Except for professional liability insurance coverage that may be required by this Agreement, all insurance maintained by Contractor shall be issued by companies admitted to conduct the pertinent line of insurance business in California and having a rating of Grade A or better and Class VII or better by the latest edition of Best Key Rating Guide. In the case of professional liability insurance coverage, such coverage shall be issued by companies either licensed or admitted to conduct business in California so long as such insurer possesses the aforementioned Best rating.

j Contractor shall immediately notify City if any required insurance lapses or is otherwise modified and cease performance of this Agreement unless otherwise directed by City. In such a case, City may procure insurance or self-insure the risk and charge Contractor for such costs and any and all damages resulting therefrom, by way of set-off from any sums owed Contractor.

k. Contractor agrees that in the event of loss due to any of the perils for which it has agreed to provide insurance, Contractor shall look solely to its insurance for recovery. Contractor hereby grants to City, on behalf of any insurer providing insurance to either Contractor or City with respect to the services of Contractor herein, a waiver of any right to subrogation which any such insurer may acquire against City by virtue of the payment of any loss under such insurance.

l. Contractor shall include all subcontractors, if any, as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor to City for review and approval. All coverages for subcontractors shall be subject to all of the requirements stated herein.

19. **Termination**. City may for any reason terminate this Agreement by giving Contractor not less than five (5) days' written notice of intent to terminate. Upon receipt of such notice, Contractor shall immediately cease work, unless the notice from City provides otherwise. Upon the termination of this Agreement, City shall pay Contractor for services satisfactorily provided and all allowable reimbursements incurred to the date of termination in compliance with this Agreement, unless termination by City shall be for cause, in which event City may withhold any disputed compensation. City shall not be liable for any claim of lost profits.

20. **Maintenance and Inspection of Records**. In accordance with generally accepted accounting principles, Contractor and its subcontractors shall maintain reasonably full and complete books, documents, papers, accounting records, and other information (collectively, the "records") pertaining to the costs of and completion of services performed under this Agreement. City and its authorized representatives shall have access to and the right to audit and reproduce any of Contractor's records regarding the services provided under this Agreement. Contractor shall maintain all such records for a period of at least three (3) years after termination or completion of this Agreement. Contractor agrees to make available all such records for inspection or audit at its offices during normal business hours and upon three (3) days' notice from City, and copies thereof shall be furnished if requested.

21. Compliance with all Laws/Immigration Laws.

a. Contractor shall be knowledgeable of and comply with all local, state and federal laws which may apply to the performance of this Agreement.

b. If the work provided for in this Agreement constitutes a "public works," as that term is defined in Section 1720 of the California Labor Code, for which prevailing wages must be paid, to the extent Contractor's employees will perform any work that falls within any of the classifications for which the Department of Labor Relations of the State of California promulgates prevailing wage determinations, Contractor hereby agrees that it, and any subcontractor under it, shall pay not less than the specified prevailing rates of wages to all such workers. The general prevailing wage determinations for crafts can be located on the website of the Department of Industrial Relations (www.dir.ca.gov/DLSR). Additionally, to perform work under this Agreement, Contractor must meet all State registration requirements and criteria, including project compliance monitoring.

c. Contractor represents and warrants that Contractor:

(1) Has complied and shall at all times during the term of this Agreement comply, in all respects, with all immigration laws, regulations, statutes, rules, codes, and orders, including, without limitation, the Immigration Reform and Control Act of 1986 (IRCA); and

(2) Has not and will not knowingly employ any individual to perform services under this Agreement who is ineligible to work in the United States or under the terms of this Agreement; and

(3) Has properly maintained, and shall at all times during the term of this Agreement properly maintain, all related employment documentation records including, without limitation, the completion and maintenance of the Form I-9 for each of Contractor's employees; and

(4) Has responded, and shall at all times during the term of this Agreement respond, in a timely fashion to any government inspection requests relating to immigration law compliance and/or Form I-9 compliance and/or worksite enforcement by the Department of Homeland Security, the Department of Labor, or the Social Security Administration.

d. Contractor shall require all subcontractors or subconsultants to make the same representations and warranties as set forth in Subsection 21.c.

e. Contractor shall, upon request of City, provide a list of all employees working under this Agreement and shall provide, to the reasonable satisfaction of City, verification that all such employees are eligible to work in the United States. All costs associated with such verification shall be borne by Contractor. Once such request has been made, Contractor may not

change employees working under this Agreement without written notice to City, accompanied by the verification required herein for such employees.

f. Contractor shall require all subcontractors or sub-consultants to make the same verification as set forth in Subsection 21.e.

g. If Contractor or subcontractor knowingly employs an employee providing work under this Agreement who is not authorized to work in the United States, and/or fails to follow federal laws to determine the status of such employee, that shall constitute a material breach of this Agreement and may be cause for immediate termination of this Agreement by City.

h. Contractor agrees to indemnify and hold City, its officers, officials, agents and employees harmless for, of and from any loss, including but not limited to fines, penalties and corrective measures City may sustain by reason of Contractor's failure to comply with said laws, rules and regulations in connection with the performance of this Agreement.

22. **Governing Law and Venue**. This Agreement shall be construed in accordance with and governed by the laws of the State of California and Contractor agrees to submit to the jurisdiction of California courts. Venue for any dispute arising under this Agreement shall be in Orange County, California.

23. **Integration**. This Agreement constitutes the entire agreement of the parties. No other agreement, oral or written, pertaining to the work to be performed under this Agreement shall be of any force or effect unless it is in writing and signed by both parties. Any work performed which is inconsistent with or in violation of the provisions of this Agreement shall not be compensated.

24. **Notice**. Except as otherwise provided herein, all notices required under this Agreement shall be in writing and delivered personally, by e-mail, or by first class U.S. mail, postage prepaid, to each party at the address listed below. Either party may change the notice address by notifying the other party in writing. Notices shall be deemed received upon receipt of same or within three (3) days of deposit in the U.S. Mail, whichever is earlier. Notices sent by e-mail shall be deemed received on the date of the e-mail transmission.

"CONTRACTOR"	"CITY"
Iteris, Inc. 1700 Carnegie Avenue, Suite 100 Santa Ana, CA 92705 Attn.: Braulio Ramirez Project Manager	City of Orange 300 E. Chapman Avenue Orange, CA 92866-1591 Attn: Larry Tay, City Traffic Engineer
Telephone: 949-270-9663 E-Mail: bxr@iteris.com	Telephone: 714-744-5534 E-Mail: ltay@cityoforange.org

25. **Counterparts**. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Signatures transmitted via facsimile and electronic mail shall have the same effect as original signatures.

IN WITNESS of this Agreement, the parties have entered into this Agreement as of the year and day first above written.

"CONTRACTOR"	**"CITY"**
ITERIS INC., a Delaware corporation	CITY OF ORANGE, a municipal corporation
*By:_____ Printed Name:_____ Title:_____	By: _____ Mark A. Murphy, Mayor
*By:_____ Printed Name:_____ Title:_____	ATTEST: _____ Pamela Coleman, City Clerk

APPROVED AS TO FORM:

_____
Mary E. Binning
Senior Assistant City Attorney

***NOTE: City requires the following signature(s) on behalf of the Contractor:**

-- **(1) the Chairman of the Board, the President or a Vice-President, AND (2) the Secretary, the Chief Financial Officer, the Treasurer, an Assistant Secretary or an Assistant Treasurer. If only one corporate officer exists or one corporate officer holds more than one corporate office, please so indicate. OR**

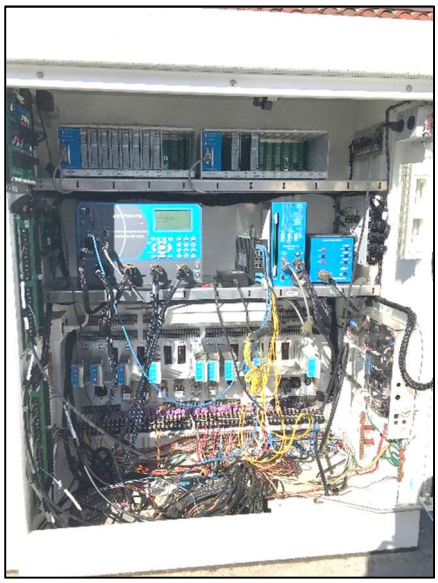
-- **The corporate officer named in a corporate resolution as authorized to enter into this Agreement. A copy of the corporate resolution, certified by the Secretary close in time to the execution of the Agreement, must be provided to City.**

EXHIBIT "A"

SCOPE OF SERVICES

[Beneath this sheet.]

REQUEST FOR PROPOSAL
for
TRAFFIC ENGINEERING SERVICES



Regional Traffic Signal Synchronization Program Project for Tustin Avenue – Rose Drive

from First Street, Tustin to Wabash Avenue, Yorba Linda

CIP No. 20425

RFP 20-21.40

Request for Clarifications Due: May 13, 2021 by 2:00 P.M.
Proposal Due: May 27, 2021 by 2:00 P.M.

ADDENDUM 1: Issued May 19, 2021

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REQUEST FOR PROPOSAL FOR TRAFFIC ENGINEERING SERVICES

1. INTRODUCTION:

The Orange County Transportation Authority (OCTA) has awarded the City of Orange (City) and other participating agencies with Regional Traffic Signal Synchronization Program (RTSSP) Project P funding under the Measure M2 competitive program. This funding will provide improvements along the Tustin Avenue (known as Tustin Street in the City) – Rose Drive corridor from First Street in the City of Tustin to Wabash Avenue in the City of Yorba Linda (Project). The Project includes 54 signals over 11.4 miles.

The City of Orange will be the lead and implementing agency for the design and implementation of traffic signal and communication improvements and optimized traffic signal synchronization timing through the Project corridor. Other Partner Agencies on this Project include the cities of Tustin, Santa Ana, Anaheim, Placentia, and Yorba Linda. The California Department of Transportation (Caltrans) is not a fiscal participant but has offered support of the Project. A map and list of all intersections included in this Project is included in Appendix A.

The Project will consist of the Primary Implementation Phase and the Ongoing Monitoring and Maintenance Phase. The Primary Implementation Phase is anticipated to be completed within a period of one year and will consist of signal synchronization, signal infrastructure improvements, and a "Before" and "After" study report. The Ongoing Operation and Maintenance Phase is anticipated to be completed within a period of two years and will consist of monitoring, improving signal timing, addressing resident concerns, providing communications and detection support, and preparing a final Project report.

The City is requesting proposals for consulting services to develop and manage implementation of signal synchronization timing along the Project corridor. The professional services include any and all services required, to successfully deliver this Project in accordance with OCTA requirements. Related services include but are not limited to: Project management and coordination, traffic engineering design, traffic signal operations, traffic signal timing and coordination, "Before" and "After" studies, construction management, and providing ongoing monitoring and maintenance support services.

CIP No. 20425 – Tustin Avenue - Rose Drive Traffic Signal Synchronization Project

Prospective consultants are requested to read all sections of this proposal carefully. Proposers should note critical items such as minimum requirements, scope of services, proposal submittal dates and formats, and submittal instructions. Only the Request for Proposal document (RFP) received directly from the City shall be considered official, as the City must track RFP holders in the event an addendum is issued. To be eligible to submit for proposal, prospective consultants must email Ms. Gabrielle Hayes, ghayes@cityoforange.org, Senior Civil Engineer at the City of Orange, requesting to be added to the Proposer List. Any addendum issued will be provided to prospective consultants on the Proposer List. All proposers must acknowledge receipt of any addenda in the Cover Letter of their proposal. Failure to submit a Proposer List request to the City and/or acknowledge receipt of addenda in the submitted proposal will result in disqualification of the proposal. Hard copies are not available.

2. PROJECT BACKGROUND:

The Tustin Avenue – Rose Drive RTSSP Project is a rejuvenated project originally performed and funded by Measure M2 RTSSP in 2011. Since then, land uses along the corridor have changed, new developments have

sprouted and the original timing has decayed. The original project limits has been expanded, resulting in a total of six partnering agencies, plus the cooperation and support of Caltrans.

The Project limits follows the length of the Tustin Avenue to Rose Drive corridor, starting at the intersection of First Street in Tustin and ending at the intersection of Wabash Avenue in Yorba Linda. There are two intersections in the City of Tustin, six intersections within the City of Santa Ana, twenty intersections within the City of Orange, five intersections within the City of Anaheim, seven intersections within the City of Placentia, four intersections in the City of Yorba Linda and ten intersections maintained and operated by Caltrans.

SCOPE OF SERVICES

Consultant will perform budget analysis and scope refinement, as appropriate, over the course of the Project. The City developed conservative cost estimates for this Project, therefore, the expectation is there are opportunities for Project scope enhancement. The Consultant, in concurrence with all Participating Agencies, will identify opportunities for scope enhancement to maximize features and benefits the Project can deliver. This includes looking for Project cost savings and converting those savings to additional Project features.

3. PRIMARY IMPLEMENTATION SERVICES:

Task 1: Project Management

Project management will be ongoing throughout the duration of the Project in both the Primary Implementation Phase (Task 1A) and Ongoing Monitoring and Maintenance Phase (Task 1B). This task includes day-to-day Project management, such as meetings, progress reports, tracking of schedules, invoicing and overall administration of the Project. The Project management team will be comprised of City personnel, Partner Agency representatives and the selected Proposer.

Project management costs shall be split between the two Project phases. Project management for the Primary Implementation Phase is Task 1A and for Ongoing Monitoring and Maintenance Phase is Task 1B.

The following lists a minimum of what is required of Project management:

1. The selected Consultant for the Project shall prepare a detailed budget, schedule and estimates for all tasks, providing specific Project milestones for review and approval by the City. These items shall be detailed and include expected meetings, activities (by work task, whether performed by Consultant team or by others), start dates, activity durations, product submittal dates, relationships among work tasks (including critical path items), and a detailed Gantt chart for the Project tasks, and float time.
2. Consultant shall lead two Project Kick-Off Meetings with all applicable parties.
    a. The first meeting will be to kick-off the Project with the City: establish communication channels and protocols, discuss the scope of work, schedule, and budget, gather available information, and obtain a thorough understanding of the goals for the Project. Specific topics to discuss include data collection needs, Traffic Signal Timing Optimization software programs, and construction considerations and required/optional procurement methodologies, intent of the original application and allowances or variants in design engineering, and Project schedule. Administrative items to be discussed will include contact persons and secondary contacts for different functions of the Project. Invoicing and reporting with explanations on how to provide monthly information on prime, sub-consultant, and vendor expenses on the invoice submittal will be discussed.
    b. The second meeting will be with the Consultant, City, and Partner Agencies that have signalized intersections along the Project. The focus of this meeting shall be to identify specific goals and develop effective strategy to accomplish them. Consultant shall prepare an agenda to discuss critical tasks and schedule of work and a memorandum to document the Project goals and strategy. Data collection needs and requirements shall be outlined to the Partner Agencies. Consultant shall notify each agency of the type of work, and when the work is to be performed within that agency. Consultant shall notify each Partner Agency of any and all documents that need to be produced pertaining to the construction of the facilities and the coordination, including but not limited to: as-built drawings, new Plans, Specifications and Estimates (PS&E) for new construction related to this Project, intersection timing charts, existing Synchro models, aerial photos, Average Daily Traffic (ADT) and Turning Movement Counts (TMC) data, etc.

3. Consultant shall organize and lead Project meetings as directed by City to include Consultant staff, City, Partner Agencies and other Project-related participants. The purpose of these meetings will be to ensure that proper input is being received and included in the work effort by Consultant and City.
    a. Consultant shall prepare agendas, provide status updates, discuss the progress and direction of the work, and provide notes of these meetings as directed by City to all relevant parties. These meetings will also serve to provide regarding specific issues of the effort, including facilitating the development of measures of effectiveness, and constructability reviews.
    b. At a minimum, one meeting per month for the Primary Implementation Phase (Task 1A) should be scheduled and budgeted. Consultant shall evaluate Project needs and propose the appropriate discussion sessions to properly facilitate the Project. During the Ongoing Monitoring and Maintenance Phase (Task 1B), meetings shall be on an as-needed basis. Consultant shall anticipate at least one kick-off meeting for the Ongoing Monitoring and Maintenance phase to discuss scope and schedule.
    c. Consultant will be responsible for documentation of all Project meetings with the City. Meeting minutes with action items shall be distributed within five (5) working days to all attendees.
4. Consultant shall attend and be an active presenter, as requested, at the OCTA-led OCTA Traffic Forum, updating the group on the effort, and its status. The Traffic Forum is a semi–annual forum envisioned to further communication and information exchange between OCTA and the local agencies regarding traffic signal synchronization and intelligent traffic system.
5. Consultant may be requested to prepare and present the Project at two public forum meetings for the City of Orange: City Council and/or Traffic Commission.
6. Consultant shall create and maintain a file-sharing portal that shall be used for all Project correspondence, file transfer, and schedule management. Platform shall be approved by the City prior to implementation. All email correspondence shall include the City as a recipient.
7. Consultant shall keep a running record of Project cost broken down by task and sub-task. Project costs attributed to each Partner Agency shall be identified, tracked and included in this cost record. This information may be requested by the City at any time. The Project cost record shall be actively maintained on the file-sharing portal for Project files.
8. Consultant shall also keep a running record of all scope changes and/or any deviations from awarded contract. This information will be used by the City to request for Scope Changes at the Semi-Annual Review (SAR). This information may be requested by the City at any time. The record of Project changes shall be actively maintained on the file-sharing portal for Project files.
9. Consultant shall submit monthly invoices in an acceptable format. Each invoice shall include a detailed progress report for the reporting month, all third-party invoices, schedule, and other backup documentation as requested by the City. Each invoice shall clearly identify the tasks worked on and percent complete. All costs accrued shall be broken down by task. All supporting documents for costs accrued shall be submitted as back-up. When applicable, the task, associated progress and costs shall be broken out and tracked by Partner Agency.
10. Consultant shall be familiar with all relevant OCTA Project delivery and documentation requirements, including, but not limited to Comprehensive Transportation Funding Programs (CTFP) Guidelines, Project P, and Measure M2. Consultant shall develop Project schedule to ensure satisfying Project delivery timelines; and advise City of all applicable OCTA requirements. Consultant shall prepare, coordinate, and submit all necessary reporting and close-out documentations in compliance with OCTA requirements on behalf of the City. The Consultant shall manage the Project to ensure the CTFP Guidelines and funding deadlines are met.

11. Consultant shall perform required coordination, including between Project team, lead agency, participating agencies, Caltrans and OCTA.

12. Consultant shall coordinate with Caltrans for execution of cooperative agreements with Partner Agencies for implementation of Project improvements and signal synchronization at Caltrans operated intersections. Consultant shall refine scope and responsibility and coordinate Project efforts in the Caltrans operated intersections. Caltrans cooperative agreement fees will be paid by the City with proper documentation.

13. Consultant shall coordinate with City and Partner Agencies to verify all software preferences being used in the various tasks and deliverables, including software versions and compatibility for each agency.

Task 1 Deliverables:

1. Organize and lead Project Kick-off Meetings and prepare agendas and meeting materials.
2. Draft and Final Detailed budget and schedule.
3. Monthly progress reports, including detailed status of the work effort, outlook, issues/ solutions, and updated schedule shall be e-mailed to the City and Partner Agencies.
4. Attend all coordination meetings and prepare meeting materials, including agenda, action items, graphics, presentation aides, and notes/minutes.
5. Attend OCTA Traffic Forum meetings (as requested) and prepare meeting materials, graphics, presentation aides, and notes.
6. Retain and provide electronic versions of all data files as directed by the City.
7. Prepare graphics and presentation aides required for all meetings.
8. All documents provided in electronic form should be those currently used by the City: Microsoft Office and PDF files.
9. All electronic data produced for the Project shall be provided on a flash drive.
10. Monthly invoices in a format acceptable to the City, shall include all third-party invoices and other supporting documentation as requested by the City.
11. All reporting and close-out documentations in compliance with OCTA requirements and any applicable regulatory agency.

Task 2: Data Collection

Consultant will collect data necessary to thoroughly understand existing traffic conditions in the study area, develop a concept of operations and develop optimal time-of-day traffic signal coordination plans for specific zones and traffic generators as applicable. At a minimum, Consultant shall collect the following data:

1. Consultant shall collect any existing timing charts/sheets, existing coordination plans, as-built/record drawings, aerial photos, maps, traffic collision data, and collision diagrams for the study intersections, if available. Consultant shall be responsible for any and all documentation reproduction, as necessary.
2. Consultant shall consult with the City and Partner Agencies on signal timing and signal priority preferences, including, but not limited to, those related to pedestrian and bicycle timing, phase sequence modifications and preferences, and special operations such as conditional service, change in clearance intervals, coordination preferred phase re-service, and ring-barrier logic, as well as the timing optimization software preference.
3. Consultant shall conduct seven-day 24-hour Average Daily Traffic (ADT) counts with vehicle classification

counts to determine heavy vehicle (Buses and Trucks) percentage information. The vehicle classification categories shall correspond to the latest Federal Highway Administration (FHWA) vehicle class categories. Include proposed peak period and durations for AM peak, mid-day peak, PM peak, and weekend peak. All count locations will be approved by the City and Partner Agencies prior to collection.

4. Consultant shall conduct weekday and weekend peak period intersection turning movement (ITM) counts at each and every one of the Project signalized intersections, including pedestrian and bicycle counts. ITM counts shall be conducted, with approval of City and Partner Agencies for week day and weekend peak periods. Peak periods can be estimated to last for two hours of each weekday peak period (AM, mid-day, and PM) and a single four-hour Saturday mid-day peak period. Consultant shall consult with Project team to determine if additional ITMs are necessary to account for special events and/or special generators.
5. All counts shall be summarized in Microsoft Excel format. Counts shall also be summarized in a Comma Separated Values (CSV) file in the Universal Traffic Data Format (UTDF) for direct volume import into Synchro (latest version) by peak period. Copies of the raw data count sheets shall also be provided.
6. Consultant shall field measure all advanced loops to the stop bar and compare to the latest California Manual of Uniform Traffic Control Devices (MUTCD) guidelines to calculate appropriate extension time. Submit all measurements and calculations in Microsoft Excel format to the City and Partner Agencies for review.
7. Consultant shall use the latest California MUTCD guidelines to field measure all crosswalks for all intersections. Submit all measurements and calculations in Microsoft Excel format to the City and Partner Agencies for review.
8. Consultant shall use the latest California MUTCD guidelines to measure and calculate bicycle timing for all movements. Submit all measurements in AutoCAD format and calculations in Microsoft Excel format to City and Partner Agencies for review.
9. Consultant shall also include an identification of all planned and programmed improvements (widening projects, intersection improvements, etc.) on the Project corridor or on intersecting corridors or streets that might affect the Project. The identification of these projects should be at minimum a list summarizing all improvements.
10. Consultant shall also investigate factors that are expected to affect signal progression including, but not limited to: intersections with high pedestrian or bicyclist volumes; over-saturated intersections; uneven lane distribution; high volumes of trucks and buses; high-volume un-signalized intersections, including interchanges; parking maneuvers; presence and location of bus stops; differing signal timing patterns; etc.

Task 2 Deliverables:

1. Prepare a report summarizing the findings of the data collection completed in Task 2. This report is to be incorporated in the Primary Implementation Project Report (Task 8).
2. Electronic versions of all data files, organized and compiled in a logical manner.

Task 3: Field Review and Plans, Specification and Estimates

Consultant shall identify and attribute Task 3 costs to each Partner Agency. For duration of Task 3, all costs shall be tracked accordingly. ~~City of Anaheim cost and scope for Task 3 are deletable.~~ **City of Anaheim Sub-Task 3.1 Field Review cost and scope shall be split between A) all field review tasks necessary to develop signal timing and B) all field review tasks necessary to design and implement equipment or infrastructure upgrades and improvements. Sub-Task 3.1B and Sub-Task 3.2 Plans, Specification and Estimates are deletable scope and costs. Sub-Task 3.1A will be required of Consultant in the event that Sub-Tasks 3.1B and 3.2 are deleted.** See cost proposal instructions in Section 9 for more information.

ADD. 1

Sub-Task 3.1 Field Review

Consultant will review any and all relevant information related to traffic signal operations and equipment, including the geometric layout, existing traffic signal equipment, and signal synchronization related infrastructure to identify any deficiencies for each intersection and along the Project corridor. The review shall include an assessment of the existing intersection geometry, traffic conditions, traffic signal control equipment, and telemetry/interconnect facilities along the corridor and of each intersection using observation, available as-built plans, consultation with the local agencies, and supplied aerial photos. Based on the initial assessment by the Partner Agencies and with their respective permission, Consultant shall inspect the interior of each traffic control cabinet, inspect the telemetry systems and determine their respective condition and make recommendations for equipment upgrades. Key components of the Project corridor review shall include, at a minimum, the following:

1. Corridor lane configurations;
2. Existing street and lane geometries, curbs, bus turnouts, and medians;
3. Existing signal operation characteristics – signal phasing, cycle lengths, phase sequence alteration, protective-permissive, etc.;
4. Crossing arterial coordination operations;
5. Crossing arterial or street with adjacent intersections;
6. All traffic control devices related to traffic signal operations at all Project intersections, approaches to cross streets, and along the Project corridor;
7. Traffic signal control device information, such as type of device, brand and make, and condition of equipment. Open each controller cabinet and take digital photos of all existing equipment. Intersection photographic documentation log of existing equipment condition shall be required;
8. Necessary configuration and parameters, such as advanced loop distances and detector channel assignments, for Automated Traffic Signal Performance Measures (ATSPM);
9. Existing controller and telemetry/interconnect equipment, if any. Note if to be reused;
10. Existing time-referencing setup, if any;
11. Existing Central Master Equipment;
12. Existing Field Master equipment or peer-to-peer operation, if any. Note if to be reused and modified, salvaged and/or new;
13. Note any deficiencies of traffic control equipment at each intersection; and
14. Note the maintenance condition or existence of the traffic signal equipment, controllers and synchronization related infrastructure.

With the view of assisting, enhancing, and improving the traffic operations along this corridor, Consultant shall identify any deficiencies of the existing traffic signal control and telemetry infrastructure and geometric layout, and provide recommendations towards solutions that may be implemented to correct such deficiencies.

Sub-Task 3.1 Deliverables:

1. Prepare a report summarizing the findings and recommendations of the field review completed in Sub-Task 3.1. This report is to be incorporated in the Primary Implementation Project Report (Task 8).
2. Electronic versions of all data files, organized and compiled in a logical manner.

Sub-Task 3.2 Plans, Specification and Estimate

Consultant shall prepare a set of plans, specification and estimate (PS&E) for the implementation of Project improvements to be accomplished through a competitive bid process. The specific improvements required as a part of this Project are outlined in the Project application to OCTA (Attachment B). The improvements include but are

not limited to: traffic signal controllers, controller cabinets, traffic signal improvements, communication equipment, Traffic Management Center (TMC) upgrades, Closed Circuit Television Cameras (CCTV) and Intelligent Transportation System (ITS) equipment and elements.

Consultant shall prepare one PS&E package, containing improvements for all Partner Agencies. The bid package shall be organized such that each agency's requirements, standards and specifications are incorporated. The bid package will be advertised by the City for construction. Consultant will ensure timely coordination and preparation of PS&E package to ensure City and Partner Agency review. A proposed construction timeline is provided in the next section, Tentative Project Schedule.

The Final Design PS&E package shall be completed on or before December 10, 2021.

As described in Task 7, Synchronization System Construction, Consultant shall provide Bid Support and Construction Engineering and Management services for the Project. Consultant shall produce final As-Built record drawings.

At a minimum, Consultant shall:

- Conduct all required utility research and coordination for Project, including ownership, information requests, preliminary notices and final notices. Consultant shall identify any required relocations.
- Survey existing conditions to locate existing improvements. Survey data collection should extend outside Project limits sufficiently to plot joins to existing improvements, verification of unimpeded intersection sight distance triangles, and others. All survey data shall be located in the California state plane horizontal coordinate system, North American Datum 1983 and North American Vertical Datum 1988 and their latest adjustments/epochs.
- Existing right-of-way limits and easements shall be identified and shown. Any required temporary construction easements shall be identified.
- Prepare and submit permit applications to each regulatory agency required for plan approvals. Permit application fees will be paid by the City with proper documentation.
  Anticipated permits:
  - Encroachment permit from Caltrans
  - No-fee encroachment permits for work within each Partner Agency's right-of-way.
- Coordinate with Southern California Edison (SCE) for design of new or upgraded services. SCE design and installation fees shall be paid **by the Consultant and reimbursed** by the City with proper documentation. Consultant shall coordinate to ensure any required fees have been paid in time for relevant construction activities to begin.

ADD. 1

- Prepare PS&E package for 60%, 90% and Final level of design.
- Plans shall be prepared using owning Agency CAD standards and in the latest version of AutoCAD and Microstation software.
- Coordinate review of PS&E with each Partner Agency, within jurisdiction, at each level of design. All comments shall be tracked and addressed at each subsequent level of design.
- Comply with all laws, rules and regulations concerning environmental permitting.

Sub-Task 3.2 Deliverables

1. Utility coordination documents and records, including all letters of requests, responses, as-built drawings, utility logs, Preliminary and Final Notices.
2. All permit application submittals and final issued permits.
3. Plans, specifications and estimates for 60% and 90% level design, in both hard copy and electronic copy format. Copies of each level of design shall be provided to each Partner Agency.

4. SCE approved final plans for new or upgraded services and relevant invoices.
5. Review Comment and Resolution tracking log, in Excel format.
6. Original files of the PS&E for each level of design (60%, 90% and Final), including AutoCAD and Microstation files, Word and Excel files.
7. Any design and quantity calculations.
8. Final PS&E package, signed and stamped by a California Licensed Professional Engineer. Final PS&E package shall be in both electronic and hard copy. Electronic file shall be in PDF format. Hard copy shall include one full size (36"x24") set of plans, on mylar for City records. Hard copy specifications shall be GBC bound. Copies of Final design shall be provided to each Partner Agency.

Task 4: Corridor "Before" Study

Consultant shall conduct "Before" floating car travel runs prior to timing implementation. Between three (3) to five (5) runs shall be completed in each direction for each of the peak periods. For weekday timing plans, this includes AM, mid-day, and PM peak periods. For weekend timing plan, this includes Saturday mid-day peak period. The number of runs shall be consistent for both directions and time periods. Consultant shall notify and receive approval from City and Partner Agencies on number of runs to be accomplished prior to commencement of data collection.

Consultant will prepare a "Before" field study report representative of the times and days for which synchronization plans will be developed. The report shall identify Measures of Effectiveness (MOE) to evaluate the effects of the synchronization plans. MOEs shall include traffic flow, travel time, average speed, number of stops per mile, number of intersections traversed on green vs. stopped by red (Greens per Red) per the OCTA MOE, Corridor Synchronization Performance Index (CSPI). Other MOEs shall include fuel consumption reduction, pollution reduction, and other pertinent items. Consultant shall collect data or analytics from Partner Agencies with Automated Traffic Signal Performance Measures (ATSPM) as part of the "Before" study.

Consultant shall prepare two (2) synchronized videos of "Before" and "After" (Task 6) condition, one for AM peak and one for PM peak. The videos shall be synchronized to show side by side of the "Before" and "After" run. The videos are to be used by City and Partner Agencies for presentation purposes.

Task 4 Deliverables:

1. "Before" Study report. This report is to be incorporated in the Primary Implementation Project Report (Task 8).
2. Electronic versions of all data files, organized and compiled in a logical manner.

Task 5: Signal Timing Optimization and Implementation

Consultant shall develop synchronized timing for the AM peak, PM peak, mid-day peak, and weekend peak periods. Special generators such as schools and businesses along with cross street traffic, will be considered. Crossing arterial projects that have recently been timed shall be considered as part of the Project.

Sub-Task 5.1: Proposed Network Modeling

Consultant shall develop signal timing based on field observation of existing conditions and the data obtained from previous tasks. Synchro will be utilized to perform timing analysis and generate the network model. Existing coordination parameters will also be observed in network modeling to provide smooth progression at crossing arterial intersections.

Consultant shall develop network modeling timing plans for each period – AM peak period, midday peak period, PM peak period, and weekend peak period for City of Orange and Partner Agencies intersections. Evaluate the possibility of partitioning network into sub- systems. Provide cycle evaluation analysis for each time period and sub-system. Attempt to minimize impact to progression across sub-systems. Pedestrian and bicycle timings should be included in the optimized model. Consultant shall implement appropriate Macro/Micro search optimization steps based on the practices of each Participating Agency.

Consultant shall evaluate the signal timing and coordination parameters to optimize coordination timing using:

- Modified Phase Sequence Rotation
    - Lead/Lead
    - Lead/Lag
    - Leading and lagging the same phase within a given cycle (re-servicing)
- Harmonic cycling – double or half
- Other innovative techniques upon approval of the owning agency

The submittal will include electronic version for the City's and Partner Agencies' review and approval. Submit Draft Network Model and Cycle Evaluation three weeks after turning counts are approved by the relevant Partner Agency. Cycle Evaluation should be presented in table format for each peak period and sub-system. A re-submittal will be required within two weeks of the receipt of the relevant Partner Agency comments. Each Partner Agency will provide existing phasing configuration and timing parameters. For City of Orange and Partner Agencies locations, all time-space diagrams shall be optimized using Tru-Traffic.

Upon final approval of the network model, the timing plans shall be converted and organized in tables in accordance with NEMA phase and sequence. Submit two weeks after each Partner Agency approves the optimal cycle. A re-submittal with corrections will be required within two weeks of the receipt of Partner Agency's comments.

Consultant shall determine the versions of Synchro and Tru-Traffic that is compatible with all Partner Agencies.

Sub-Task 5.1 Deliverables:

1. Proposed Synchro with optimized timing parameters.
2. Proposed Tru-Traffic with optimized timing parameters.
3. Draft Network Modeling Technical Memorandum.
4. Final Network Modeling Technical Memorandum.

Sub-Task 5.2: New Timing Implementation

Consultant shall implement signal timing plans to coordinate the traffic signals on the Project corridor.

For all Project intersections, Consultant shall coordinate with each owning agency in the development and implementation of new timing plans.

For Caltrans locations, Consultant shall coordinate with Caltrans in the implementation of optimized timing plans.

Consultant shall implement approved timing plans at each Partner Agency's Traffic Management Center or at the local controller. Timing plan development should consider optimization of delay, progression saturation flow rate and lost time.

Consultant will contact and work with other Partner Agencies affected by the Project and will coordinate efforts with concurrent cross street projects to achieve mutually acceptable results.

Sub-Task 5.2 Deliverables:

1. Implementation-ready timing sheets summarizing optimized timing parameters and plans.

Sub-Task 5.3: Optimize Signal Timing

Consultant shall implement and fine-tune the timing plans. Consultant shall verify the implemented timing plans by performing field checks and keep City and Partner Agency staff informed in writing of the implementation progress.

Upon completion of Implementation Phase, Consultant shall incorporate all changes and re- submit Synchro files, Tru-Traffic files, timing plans and tables with final implemented data.

Sub-Task 5.3 Deliverables:

1. Final optimized Synchro files
2. Final optimized Tru-Traffic files

Task 6: Corridor "After" Study

Consultant shall conduct "After" floating car travel runs after timing implementation. Between three (3) to five (5) runs shall be completed in each direction for each of the peak periods. For weekday timing plans, this includes AM, mid-day, and PM peak periods. For weekend timing plan, this includes Saturday mid-day peak period. The number of runs shall be consistent for both directions and time periods. Consultant shall notify and receive approval from City and Partner Agencies on number of runs to be accomplished prior to commencement of data collection.

Consultant will conduct an "After" field study representative of the times and days for which synchronization plans will be developed. The "After" study must be conducted in the same manner and contain the same MOEs as the "Before" study described in Task 4 in order to evaluate the improvements of the synchronization plans. MOEs should be compiled for the optimized corridor using the floating car method. Consultant shall collect data or analytics from Partner Agencies with Automated Traffic Signal Performance Measures to complement both the before and after studies.

Consultant shall prepare two synchronized videos of "Before" (Task 4) and "After" condition, one for AM peak and one for PM peak. The videos shall be synchronized to show side by side of the "Before" and "After" run. The videos are to be used by City and Partner agencies for presentation purposes.

Task 6 Deliverables:

1. "After" Study report. This report is to be incorporated in the Primary Implementation Project Report (Task 8).
2. Electronic versions of all data files, organized and compiled in a logical manner.
3. Two (2) synchronized videos showing "Before" and "After" runs for AM and PM peaks.

Task 7: Synchronization System Construction

The timeline for Project construction is outlined in the following section, Tentative Project Schedule. Consultant is expected to provide bidding and construction management services. Such services include, but are not limited to, responding to Contractor questions and requests for information, redesign of Project plans due to unforeseen conditions, traffic control plans that may be required, and system integration support services. Task 7 costs shall be attributed to each Partner Agency and tracked accordingly. City of Anaheim cost and scope for Task 7 are deletable. See cost proposal instructions in Section 9 for more information.

Sub-Task 7.1: Bid Support

The Consultant shall provide assistance during the bidding phase, including, but not limited to, pre-proposal meetings, responding to requests for clarifications (RFCs), issuing addenda, and bid analyses.

Sub-Task 7.2: Construction Engineering and Management

Consultant shall provide professional construction management services, including inspection coordination, quality control, Critical Path Method (CPM) schedule management, utility coordination, and administration services during construction. Work shall be performed in accordance with City of Orange standards of practice.

Consultant shall respond to all requests for information (RFIs), review shop drawing and material submittals, plans, and any other Project related documents. Consultant shall assist the City with reviewing and negotiating proposed Construction Change Orders.

Consultant is expected to support the Project Construction Contractor with system integration (including, but not limited to installing/implementing and integrating all hardware and software) during the construction phase of the Project. Consultant is expected to coordinate with the Construction Contractor for installing and/or integrating new traffic signal controllers and cabinets, communication hardware, communication equipment, ITS equipment, etc.

During construction, each Partner Agency will provide construction inspection services for those components subject to that agency's inspection. Construction management services, at a minimum, include the following:

Construction Phase:

1. Arrange and conduct Pre-Construction meeting, inviting the Project Manager, Inspector, public utilities, private entities, general contractor and other Project stakeholders. Prepare minutes of Pre-Construction meeting for distribution to all attendees.
2. Provide and maintain sufficient field personnel to administer and manage construction contract.
3. Review construction schedule, including activity sequences and duration, schedule of submittals and delivery schedule of long lead materials and equipment. Review contractor's update and revisions as may be required to reflect actual progress of work.
4. Schedule and conduct progress meetings to discuss contract issues, procedures, progress, problems, change orders, submittals, request for information (RFIs), deficiencies and schedules. Prepare minutes of progress meetings for distribution to all attendees.
5. Coordinate construction inspection.
6. Investigate field problems affecting property owners and contractors.
7. Process, review and coordinate with City and Partner Agencies to approve contractor's submittals
8. Process, review and track RFIs, submittals, shop drawings, proposed change orders and revisions.
9. Review and evaluate proposed change orders. Review estimates for reasonableness and cost effectiveness and render recommendations to City. Conduct negotiations with contractors and resolve problems.
10. Maintain cost accounting records on authorized work performed under contract unit costs and additional work performed based on actual costs of time (labor) and materials (T&M).
11. Review contractor submittals for extra or unforeseen work. Review potential Construction Change Orders (CCO) for accuracy and provide recommendation(s) to City staff for proper course of action and processing of CCOs.
12. Develop a reasonable cost control system, including regular monitoring of actual costs for activities in progress and estimates for uncompleted tasks and proposed changes.
13. Assist City in coordinating services of other consultants that may be hired or selected for the Project.
14. Respond to contractor's requests for interpretation or clarification of meaning and intent of Project plans and specifications.

15. Establish and implement job safety procedures in compliance with CAL-OSHA requirements. Monitor contractor's compliance with established safety program, respond to deficiencies and hazards, and investigate and report on accidents.
16. Track quantities of work completed for progress payments. Develop and implement procedures for review and processing of progress payment applications. Assist City with review and certification for payment.
17. Establish procedures and monitor contractor compliance with state prevailing wage regulations and requirements.
18. Assist City in preparing and processing reimbursements.
19. Maintain a complete Project filing system, including records of all changes and field notes. Filing system shall be in accordance with City procedures.

Post-Construction Phase:

1. Evaluate completion of work and recommend to City and Partner Agencies when work is ready for final inspection.
2. Conduct final inspection/walk through with agency staff.
3. Coordinate with Inspector final punch list, including schedule for punch list completion. Monitor and follow through with contractor until completion of all punch list items.
4. Secure and transmit required guarantees, certifications, affidavits, leases, easement deeds, operating & maintenance manuals, warranties and other documents as stipulated in contract documents.
5. Secure and provide neat and orderly material sheets, inspection reports,
6. Review and process contractor's request for final payment and release of retention.

Sub-Task 7.3: As-Built Records

At the conclusion of construction contract, produce As-Built record drawings in both electronic and hard copy format of all improvements. The electronic copy shall include both original file format (AutoCAD) and PDF. Hard copy shall include one full size (36"x24") set of plans, on mylar for City records and one set on bond paper. A copy of both formats (electronic and hard copy) shall be provided to each Partner Agency.

Task 7 Deliverables:

1. Response to RFCs, Addenda and Bid Analyses as a result of Bid Support.
2. Construction engineering and management records and files, including, but not limited to:
    a. Pre-Construction meeting agenda and notes
    b. Construction progress meeting minutes and notes
    c. Submitted shop drawings and materials submittals and subsequent reviews and responses
    d. Contractor correspondence
    e. Contract change order requests, calculations, estimates and documentation
    f. Compilation of all relevant inspection reports and photos
    g. Tracking of quantities of work completed and progress payments records and calculations
    h. Guarantees, certifications, affidavits, leases, easement deeds, operating & maintenance manuals, warranties and other documents as stipulated in contract documents
    i. Electronic versions of all files, organized and compiled in a logical manner.
3. Final As-Built record drawings in both hard copy and electronic format; provided to each Partner Agency.

Task 8: Primary Implementation Project Report

Using the data, information and analyses gathered in the previous tasks, Consultant will develop a Primary Implementation Project Report. This report will provide an analysis of the "Before" and "After" studies for the

Project identifying signal coordination benefits. The report will be completed after the Primary Implementation is completed and will include the following:

- **Introduction/Project description:** a summary of the Project including the purpose, background, and objectives of the Project.
- **Data collection:** a summary of the data collected as part of the effort including the traffic counts, phasing, lane configurations, etc.
- **Traffic signal systems improvements:** a summary of the implemented traffic signal systems improvements by the Project.
- **Signal timing optimization:** a summary of the development and implementation of updated signal timing including the models, selected cycle lengths, intersection groupings, etc.
- **Results:** the study will contain directional morning, mid-day, evening, and weekend peak periods using travel times, average speeds, green lights to red lights, stops per mile, and the derived Corridor Synchronization Performance Index (CSPI) metric. This information shall be collected both before and after any signal timing changes have been made. Additional details based on the Final Report Template will also be included.
- **Benefits to cost analysis:** Project benefits resulting from signal synchronization will be evaluated based on the "Before" and "After" study results. Savings will be calculated for travel time, fuel consumptions, vehicle maintenance, Greenhouse Gas (GHG) reduction, and a final benefit cost ratio.
- **Future signal corridor improvements:** recommendations for system and equipment enhancements to improve traffic flow and signal synchronization will be provided.
- **Conclusion:** a summary of the "Before" and "After" study and its findings.

Task 8 Deliverables:

1. Primary Implementation Project Report.

4. ONGOING MONITORING AND MAINTENANCE SERVICES:

Task 1B: Ongoing Monitoring and Maintenance Project Management

Consultant shall provide continuous Project management for the duration of the Ongoing Monitoring and Maintenance Phase. Project management during this Phase, at a minimum, includes monthly status reports, tracking of schedules, invoicing, coordination between agencies and overall administration of the Project. Consultant shall provide Project close-out documentation, as needed, for completion of the project. See Task 1 Project Management in Section 3 of this RFP for additional description of Project management activities.

Task 9: Ongoing Monitoring and Maintenance

Consultant shall provide "on-call" signal timing support services for a period of 24 months following the complete closeout and all payments made for the Primary Implementation phase, to address any future adjustments that may be needed during this period. During this 24-month period, Consultant will be prepared to review any Project intersection requested within 24 hours of written notice, including observing and fine-tuning the signal timing. Consultant will also assist with resolving communications and detection issues along the corridor.

Sub-Task 9.1: Monitoring and Improving Optimized Signal Timing

Consultant will drive the length of the Project arterial during all designated corridor synchronization timing plan hours of operation on a monthly basis in order to verify that the synchronization timing is working as designed, and complete any necessary adjustments. Monthly driving times will consist of a full 12-hour weekday and a 4-hour Saturday. All drives shall be documented. Consultant shall collect data or analytics from Partner Agencies with ATSPM as part of monitoring and improving optimized signal timing.

Sub-Task 9.2: Communication and Detection Support

Consultant will coordinate with respective agencies to monitor, maintain, and repair communication and detection along for 54 signals for 24 months after signal timing is implemented along Project corridor.

Sub-Task 9.3: Ongoing Monitoring and Maintenance Memo

Consultant will prepare an Ongoing Monitoring and Maintenance (OMM) memorandum to summarize the Ongoing Monitoring and Maintenance phase, including details on when travel runs were conducted; issues and solutions throughout the phase; and recommendations for future improvements.

Task 9 Deliverables

1. Summary of drives completed and ATSPM data collected in Sub-Task 9.1 and resulting findings and adjustments on a monthly basis. A copy, limited to jurisdictional boundaries, shall also be sent to each Partner Agency.
2. Draft and final OMM memorandum.
3. Electronic versions of all files, organized and compiled in a logical manner.

5. MISCELLANEOUS

Selected Consultant shall provide insurance documents per the attached checklist prior to contract award. Consultant shall ensure insurance companies used are admitted to conduct insurance business along the lines of insurance supplied in the State of California and have a Best Guide rating of Grade A or better and Class VII or better.

The City shall coordinate, prepare and execute a cooperative agreement with Caltrans for the ten Caltrans operated signals along the Project corridor. Consultant shall **assist the City with execution of Caltrans cooperative agreement, including but not limited to coordination and scope refinement.**

ADD. 1

The City recognizes that the Consultant in their preparation of a response to this RFP may have other ideas to improve the efficiency, safety, cost effectiveness or resiliency of the project beyond what is outlined in this RFP. Based on the Project understanding and goals, the Consultant may provide optional tasks that will enhance the performance and delivery of the project in the most efficient and effective manner. Optional tasks presented by the Consultant shall be cognizant of the overall project schedule and budget. For every optional task, the Consultant shall provide an explanation of additional enhancement, efficiency or cost savings to the Project along with a detailed scope of work, timeline, estimated not-to-exceed cost for each item, and deliverables.

Additional work items are not required, and thus a Consultant will not be penalized for not proposing any optional tasks.

TENTATIVE PROJECT SCHEDULE

Project Start Date: August 16, 2021

Project End Date: December 31, 2024

Primary Implementation*

Task	Start Date	End Date
Task 1: Project Administration	August 16, 2021	December 31, 2024
Task 2: Data Collection	September 1, 2021	October 31, 2021
Task 3: Field Review and Plans, Specifications, and Estimates	August 16, 2021	December 10, 2021
Task 7: Synchronization System Construction	January 1, 2022	September 30, 2022
Task 4: Corridor "Before" Study	October 1, 2022	October 14, 2022
Task 5: Signal Timing Optimization and Implementation	October 14, 2021	November 14, 2022
Task 6: Corridor "After" Study	November 14, 2022	November 30, 2022
Task 8: Primary Implementation Project Report	December 16, 2022	December 16, 2022

*Primary Implementation schedule accounts for a six month administrative delay.

Task 7: Synchronization System Construction Schedule

Task	Date
Council Authorize Bid	January 11 2022
City Advertise Project (3 Weeks)	January 13, 2022
Bid Opening	February 3, 2022
Contract Award and Execution	March 8, 2022
Pre-Construction Meeting	March 28, 2022
Construction Completion	September 30, 2022

Ongoing Monitoring and Maintenance

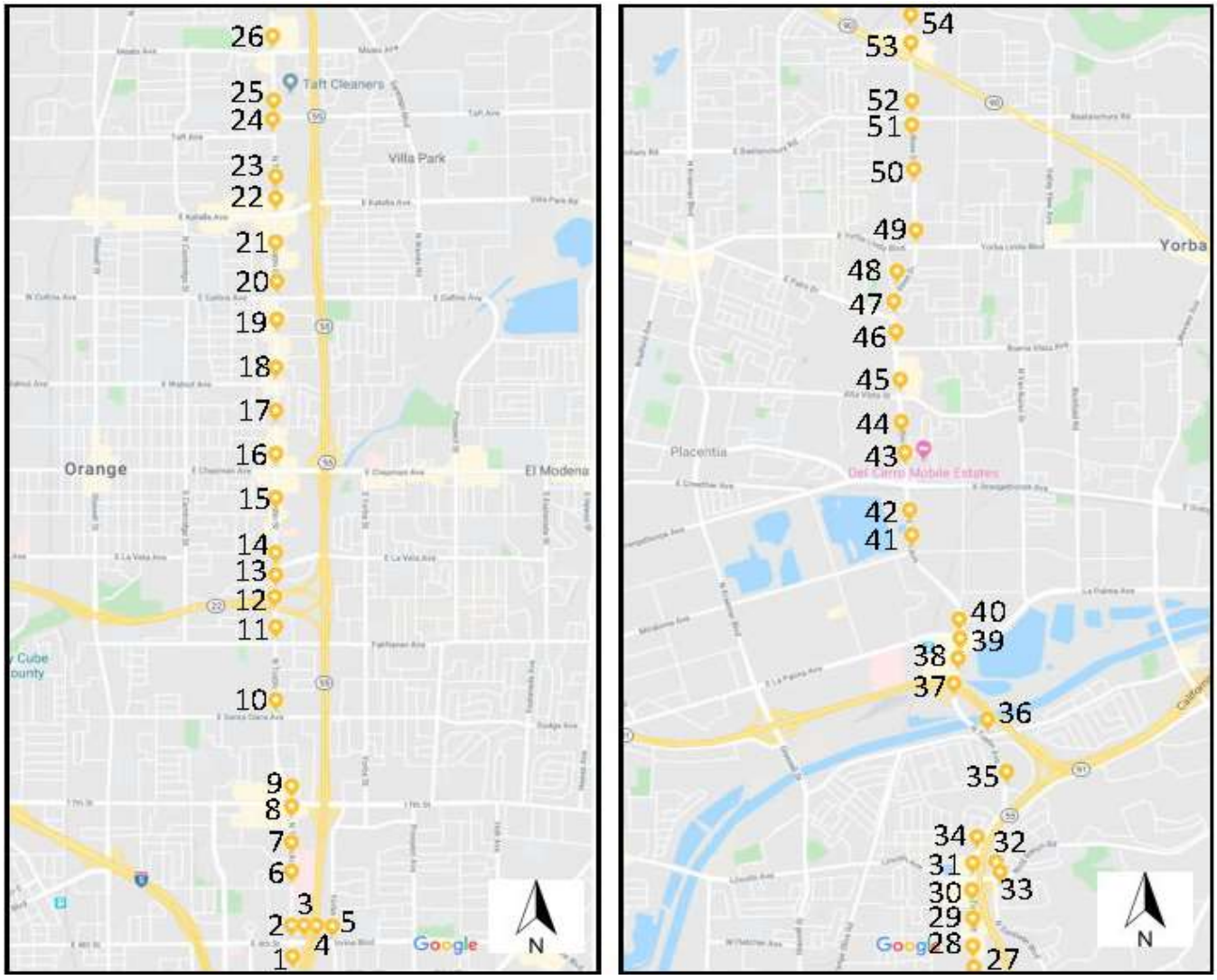
Task	Start Date	End Date
Sub-Task 9.1: Monitoring and Improving Optimized Signal Timing	January 1, 2023	December 31, 2024
Sub-Task 9.2: Communications and Detection Support	January 1, 2023	December 31, 2024
Sub-Task 9.3: OMM Memo	January 1, 2023	December 31, 2024

APPENDIX A

Map and List of Signalized Intersections included in the
Tustin Avenue – Rose Drive Traffic Signal Synchronization Project

Map of Project Corridor

The proposed Project will synchronize Tustin Avenue/Rose Drive corridor from First Street in Santa Ana to Wabash Avenue in Yorba Linda. The Project includes 54 signals over 11.4 miles.



List of Signalized Intersections included in Project

No.	Agency	Intersection on Tustin Avenue@
1	Tustin	First Street
2	Santa Ana	Fourth Street
3	Caltrans	Fourth Street SR-55 S/B Ramps
4	Caltrans	Fourth Street SR-55 N/B Ramps
5	Tustin	Irvine Boulevard @ Yorba Street
6	Santa Ana	Fruit Street
7	Santa Ana	Wellington Avenue
8	Santa Ana	entre on Seventeenth/Tustin Centr
9	Santa Ana	Seventeenth Street
10	Santa Ana	Santa Clara Avenue
11	Orange	Fairhaven Avenue
12	Caltrans	SR-22 E/B Ramp - Seba Avenue
13	Caltrans	SR-22 W/B Ramp
14	Orange	La Veta Avenue/Rock Creek
15	Orange	Palmyra Avenue
16	Orange	Chapman Avenue
17	Orange	Palm Avenue
18	Orange	Walnut Avenue
19	Orange	Mayfair Avenue
20	Orange	Collins Avenue
21	Orange	Quincy Avenue
22	Orange	Katella Avenue
23	Orange	Van Owen Avenue/Toyota Way
24	Orange	Taft Avenue
25	Orange	Taft Avenue/Briardale
26	Orange	Meats Avenue
27	Orange	East Village Way
28	Orange	Village Town Center
29	Orange	Heim Avenue

No.	Agency	Intersection on Tustin Avenue@	
30	Orange	SR-55 S/B On Ramp	
31	Orange	Lincoln Avenue/Nohl Ranch Road	
32	Caltrans	Nohl Ranch Road @ Santiago Blvd	
33	Caltrans	Santiago Blvd @ N/B SR-55 Ramp Vista Park	
No.	**Agency**	**Intersection on Tustin Avenue@**	
34	Caltrans	SR-55 S/B Off Ramp	
35	Orange	Santa Ana Canyon Road	
36	Anaheim	Riverdale Avenue	
37	Anaheim	SR-91 E/B Ramps	*
38	Anaheim	SR-91 W/B Ramps	*
39	Anaheim	Pacificenter Drive	
40	Anaheim	La Palma Avenue	
41	Anaheim	Mira Loma Avenue	
42	Anaheim	Auto Exchange	
No.	**Agency**	**Intersection on Rose Drive @**	
43	Placentia	Del Cerro (Orangethorpe Grade Sep)	
44	Placentia	Castner Drive	
45	Placentia	Alta Vista Street	
46	Placentia	Buena Vista Avenue	
47	Placentia	Palm Drive	
48	Placentia	Linda Vista Street/Valpariso Way	
49	Placentia	Yorba Linda Boulevard	
50	Yorba Linda	School Ped Signal	
51	Yorba Linda	Equestrian Signal/Ped Signal	
52	Yorba Linda	Bastanchury Road	
53	Caltrans	Imperial Highway	
54	Yorba Linda	Wabash Avenue	

*SR-91 ramp intersections in Anaheim maintained and operated by Caltrans

APPENDIX B

OCTA's Fiscal Year 2020 Call for Projects: Regional Traffic Signal Synchronization Program/Project P for Tustin Avenue – Rose Drive Corridor Application

FY 2020 Call for Projects

Regional Traffic Signal Synchronization Program

Project P

Supplemental Application

Tustin Avenue/Rose Drive

10/27/2019
Revision 2: 4/15/2021

Project Overview

Length of Corridor (mi):	11.4
Number of signals:	54
Total Project Cost:	**$3,452,950.00**
M2 funds requested:	**$2,762,360.00**
Total Match:	**$690,590.00**
Cash Match:	***$656,400.00***
In-kind Match:	*$34,190.00*
Participating agencies:	Anaheim, Orange (City), Placentia, Santa Ana, Tustin, Yorba Linda

Applicant Agency: City of Orange

Contact Name: Larry Tay

Contact Number: 714-744-5534

Contact Email: ltay@cityoforange.org

Project P Regional Traffic Signal Synchronization Program Application Checklist

Project P Application Checklist	Page	Rev2 Page:
RTSSP Online Application – submitted through OCFundTracker		
1. Vehicle Miles Traveled		
2. Benefic Cost Ratio		
3. Project Characteristics		
4. Transportation Significance	Online	
5. Maintenance of Effort		
6. Project Scale		
7. Number of Jurisdictions		
8. Current Project Readiness		
9. Funding Over-Match		
10. Cabinet photos, equipment specifications, as-built drawings, cabinet drawings, etc. (if OCTA-Led)	Flashdrive	
Section 1: Key Technical Information		
a. Project Corridor Limits	1	1
b. Designation of the corridor to synchronize: Signal Synchronization Network corridor or Master Plan of Arterial Highways corridor	1	2
c. Project start date and end date, including any commitment to operate signal synchronization beyond the three year grant period	1	2
d. Signalized intersections that are part of the project	1	2
e. Traffic Forum members	1	2
Section 2: Lead agency	2	3
Section 3: Resolutions of support from the project's Traffic Forum members	3	4
Section 4: Preliminary plans for the proposed project by task (detail below)		
The plans shall include details about both phases of the project: Primary Implementation (PI) and the Ongoing Maintenance and Operations (O & M). The plan should be organized using the following setup.		
Primary Implementation shall include details about the following:		
Task 1: Project Administration (required)	Pg. 4-5	5-6
Task 2: Data Collection (required)		
Task 3: Field Review and Plans Specifications and Estimates (required)		
Task 4: Corridor "Before" Study (required)		
Task 5: Signal Timing Optimization and Implementation (required)		
Task 6: Corridor "After" Study (required)		
Task 7: Sychronization System Construction (required)		
Task 8: Project Report (required)		
Task 9: On-going Operations and Maintenance (required)		
Ongoing Maintenance and Operations (O&M) will begin after the Primary Implementation of the project is completed. It shall include details about the following:	Pg. 6	6
a. Monitoring and improving optimized signal timing (required)		
b. Communications and detection support (optional)		
c. O&M Final Memorandum (required)		
Section 5: Funding Needs/Costs for Proposed Project by Task	Pg. 6	7-8
a. Table I: Summary of Improvements	Pg. 7	9
b. Table II: Detailed Improvement Breakdown	Pg. 8	10-15
Section 6: Project schedule for the 3 year grant period by task	Pg. 9	16
Section 7: Matching funds	Pg. 10	17-18
Section 8: Environmental clearances and other permits	Pg. 11	19
Section 9: Calculations used to develop selection criteria inputs	Pg. 11-12	19-20
Section 10: Any additional information deemed relevant by the applicant	Pg. 13	21-23
Appendices	Pg. 14	

SECTION 1: KEY TECHNICAL INFORMATION

a. The proposed project will synchronize Tustin Avenue/Rose Drive corridor from First Street in Santa Ana to Wabash Avenue in Yorba Linda. The project includes fifty-four (54) signals over eleven and four tenths (11.4) miles. **Figure 1** shows a map of the project area.

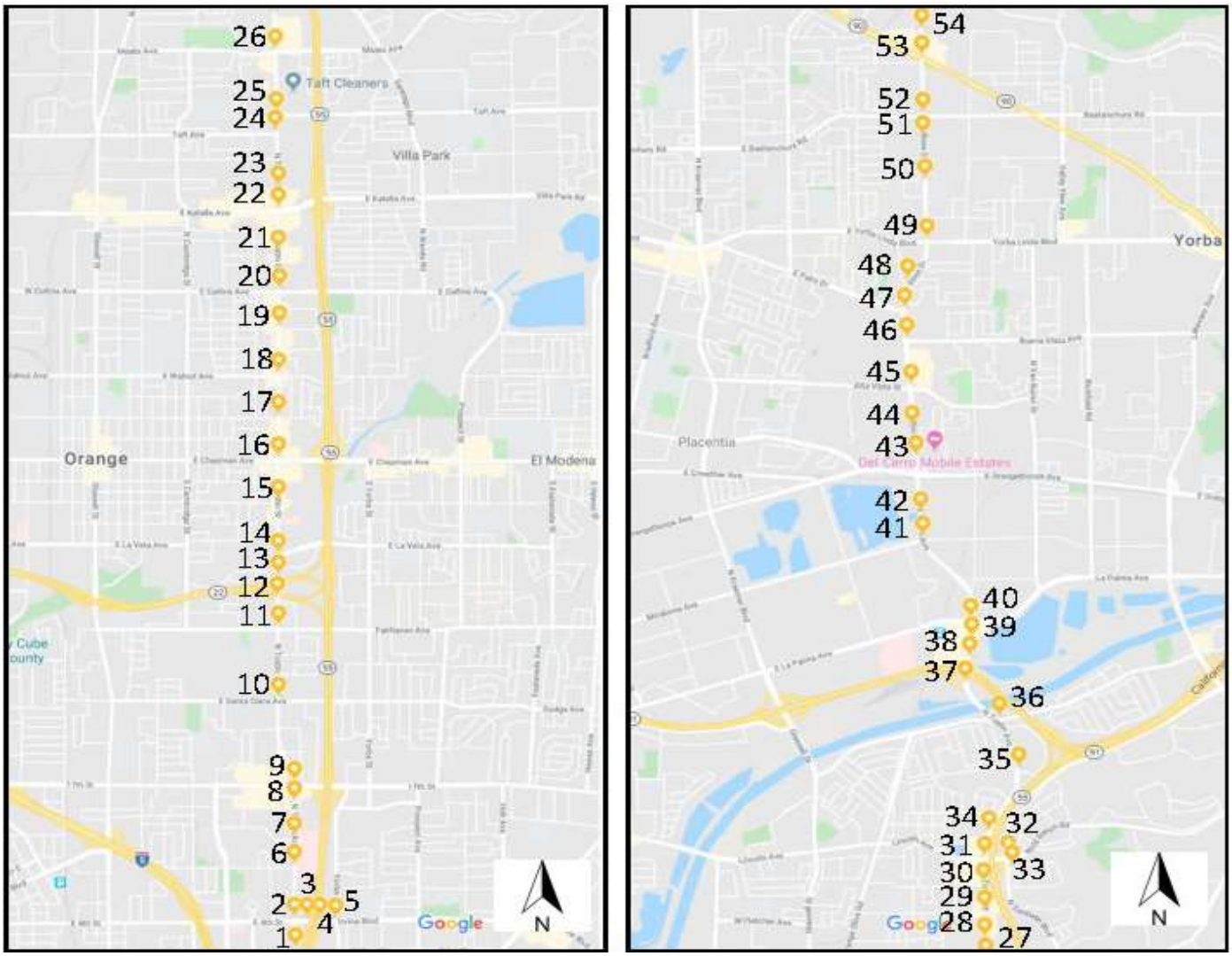


Figure 1: Signalized intersection and proposed project limits.

b. Designation of the corridor to synchronize:

- ☑ Master Plan of Arterial Highways Corridor
- ☑ Signal Synchronization Network Corridor

c. Project Start Date: August 1, 2020 Project End Date: July 31, 2023

All agencies commit to operate signal synchronization **BEYOND** the three year grant period for:

☑ Zero Years ☐ One Year ☐ Two Years ☐ Three Years ☐ Other

d. Signalized intersections that are part of the project:

No.	Agency	Intersection on Tustin Avenue@	No.	Agency	Intersection on Tustin Avenue@
1	Tustin	First Street	30	Orange	SR-55 S/B On Ramp
2	Santa Ana	Fourth Street	31	Orange	Lincoln Avenue/Nohl Ranch Road
3	Caltrans	Fourth Street SR-55 S/B Ramps	32	Caltrans	Nohl Ranch Road @ Santiago Blvd
4	Caltrans	Fourth Street SR-55 N/B Ramps	33	Caltrans	Santiago Blvd @ N/B SR-55 Ramp Vista Park
5	Tustin	Irvine Boulevard @ Yorba Street	**No.**	**Agency**	**Intersection on Tustin Avenue@**
6	Santa Ana	Fruit Street	34	Caltrans	SR-55 S/B Off Ramp
7	Santa Ana	Wellington Avenue	35	Orange	Santa Ana Canyon Road
8	Santa Ana	entre on Seventeenth/Tustin Centr	36	Anaheim	Riverdale Avenue
9	Santa Ana	Seventeenth Street	37	Anaheim	SR-91 E/B Ramps
10	Santa Ana	Santa Clara Avenue	38	Anaheim	SR-91 W/B Ramps
11	Orange	Fairhaven Avenue	39	Anaheim	Pacificenter Drive
12	Caltrans	SR-22 E/B Ramp - Seba Avenue	40	Anaheim	La Palma Avenue
13	Caltrans	SR-22 W/B Ramp	41	Anaheim	Mira Loma Avenue
14	Orange	La Veta Avenue/Rock Creek	42	Anaheim	Auto Exchange
15	Orange	Palmyra Avenue	**No.**	**Agency**	**Intersection on Rose Drive @**
16	Orange	Chapman Avenue	43	Placentia	Del Cerro (Orangethorpe Grade Sep)
17	Orange	Palm Avenue	44	Placentia	Castner Drive
18	Orange	Walnut Avenue	45	Placentia	Alta Vista Street
19	Orange	Mayfair Avenue	46	Placentia	Buena Vista Avenue
20	Orange	Collins Avenue	47	Placentia	Palm Drive
21	Orange	Quincy Avenue	48	Placentia	Linda Vista Street/Valpariso Way
22	Orange	Katella Avenue	49	Placentia	Yorba Linda Boulevard
23	Orange	Van Owen Avenue/Toyota Way	50	Yorba Linda	School Ped Signal
24	Orange	Taft Avenue	51	Yorba Linda	Equestrian Signal/Ped Signal
25	Orange	Taft Avenue/Briardale	52	Yorba Linda	Bastanchury Road
26	Orange	Meats Avenue	53	Caltrans	Imperial Highway
27	Orange	East Village Way	54	Yorba Linda	Wabash Avenue
28	Orange	Village Town Center			
29	Orange	Heim Avenue			

e. Traffic Forum members:

Anaheim
Orange
Placentia
Santa Ana
Tustin
Yorba Linda

SECTION 2: LEAD AGENCY

[X] City of Orange will be the lead agency

[ ] County of Orange will be the lead agency

Please note OCTA will not be leading projects for this Call for Projects.

The Tustin Avenue Rose Drive RTSSP corridor is a rejuvenated project originally performed and funded by M2 RTSSP in 2011 and was from the original Call for Projects. The project for FY 20/21 has been expanded to include the City of Yorba Linda making the total number of participating agencies now 6 plus Caltrans. The corridor length is close to 12 miles in length and will have 54 intersections retimed including some crossing arterial segments and interfacing abutting agency intersections to two crossing corridors with the SR-55 Freeway. All signal and ITS equipment need to be updated to the latest ATC standards to promote Automated Traffic Signal Performance Measures and to embrace Connected Vehicle technologies.

Land uses along the corridor have changed over the course of time. The Mall of Orange is now changed over to an individually owned small retail store situation with many fast food restaurants, etc. Major brick and mortar anchor stores have all left this type of development because of on line purchasing applications. Other types of entertainment and retail development has increased all across the length of the Tustin Avenue area. The Pacificenter complex in Anaheim has also recently developed and is influencing operations on both Tustin Avenue and La Palma Avenue. The Orangethorpe Grade Separation project has eliminated a full eight phase intersection impacted by the BNSF rail crossing. All conflicts and queueing issues have been resolved.

The original timing has decayed and needs to be revisited. Therefore, it is imperative that this very important corridor be considered for the 2020 Call for Projects from OCTA

SECTION 3: RESOLUTIONS OF SUPPORT

Draft resolutions and letters of support from the partnering Traffic Forum members are provided in the Appendix A to E.

1. City of Yorba Linda Resolution will be approved at the City Council Meeting on November 5, 2019.
2. A letter of support from Caltrans District 12 was sent to the City of Orange on October 19, 2019
3. A letter of intent from the City of Orange was sent to OCTA on October 16, 2019. A Resolution will be approved by the City Council on November 12, 2019
4. A Letter of support from the City of Placentia was sent to the City of Orange on October 16, 2019. A Resolution
5. A letter of intent from the City of Tustin was sent to the City of Orange on October 19, 2019.
A Resolution will be approved by the City Council on November 19, 2019
6. A letter of intent from the City of Santa Ana was sent to the City of Orange on October 16, 2019.
A Resolution will be approved by the City Council on November 19, 2019
7. A letter of intent from the City of Anaheim was sent to the City of Orange on October 23, 2019.
A Resolution will be approved by the City Council in December of 2019
8. A sample Resolution is supplied for the City of Anaheim. A full resolution will be approved by the City Council in December of 2019

SECTION 4: PRELIMINARY PLANS FOR THE PROJECT

Primary Implementation (PI)

The Primary Implementation phase will last approximately one year and include the following elements:

Task 1: Project Administration

The City of Orange will lead the project using contracted consultant staff to optimize signal synchronization timing along the Tustin Avenue/Rose Drive corridor. Orange shall perform normal day to day project administration duties. Local agency staff will perform local project administration duties. Project budget shall include time and funding for agency outreach and coordination. Orange will be responsible for all fiduciary elements of the project including dissemination of any funds and/or collection of funds from the partnering agencies. Project Administration services by Orange will include but not be limited to administration, engineering and design, coordination, presentation and other related responsibilities to ensure a timely project delivery. The budget shall include time and funding for outreach and cooperative agreement development and matching funds required by the partners.

Task 2: Data Collection

The Consultant contracted by the City of Orange will collect data necessary to thoroughly understand existing traffic conditions in the study area, develop a concept of operations, and be able to develop optimal time-of-day traffic signal coordination plans for specific zones and traffic generators as applicable.

Task 3: Field Review and Plans Specifications, and Estimates

The City of Orange's contracted consultant shall be a qualified traffic engineering consultant with the ability to complete the engineering design of the fiber upgrade and communications for the project. The Consultant will review the geometric layout, existing traffic signal equipment, and signal synchronization related infrastructure to identify any deficiencies for each intersection and along the whole corridor/route. The review shall include an assessment of the existing intersection geometry, traffic conditions, traffic signal control equipment, and telemetry/interconnect facilities along the corridor and of each intersection using observation, available as-built plans, consultation with the local AGENCIES, and Party supplied aerial photos. Based on the initial assessment by the partnering agencies and with their respective permission, the CONSULTANT shall inspect the interior of each traffic control cabinet, inspect the telemetry systems and determine their respective condition and make recommendations for equipment upgrades. The project scope shall encourage innovative solutions and also account for unforeseen conditions.

Task 4: Corridor "Before" Study

The City of Orange's contracted consultant shall be a qualified traffic engineering consultant with the ability to conduct "before" floating car travel runs prior to timing implementation. The Consultant will conduct a 'Before' field study report representative of the times and days for which synchronization plans will be developed. The report shall identify Measures of Effectiveness (MOE) to evaluate the effects of the synchronization plans. MOE's will likely include traffic flow, travel time, average speed, number of stops per mile, number of intersections traversed on green vs. stopped by red (Greens per Red) (note: Average Speed, Stops per Mile, and Greens per Red are the new OCTA MOE, Corridor Synchronization Performance Index (CSPI)), fuel consumption reduction, pollution reduction, and other pertinent items. Agencies with Automated Signal Performance Measures should provide any data or analytics as part of the Before Study.

Task 5: Signal Timing Optimization and Implementation

Synchronization or coordination will be inter-jurisdictional in nature. All existing special generators such as schools or attractive businesses, traffic patterns, flows, and conditions will be taken into account. Synchronized timing will be developed for the AM Peak, PM Peak, Mid-day Peak and Weekend Peak. Crossing Arterial projects that have recently been timed will be considered as part of the project. Timing plans will be developed that assist traffic in getting to its destination without regard to physical or jurisdictional boundaries.

Task 6: Corridor "After" Study

The City of Orange's contracted consultant shall be a qualified traffic engineering consultant with the ability to conduct "after" floating car travel runs after timing implementation. The Consultant will

conduct an 'After' field study representative of the times and days for which synchronization plans will be developed. The 'After' study must be conducted in the same manner and contain the same MOE's as the 'Before' study in order to evaluate the improvements of the synchronization plans. MOE's should be compiled for the optimized corridor using the floating car method. Agencies with ATSPM shall provide any data and analytics to complement both the before and after studies.

Task 7: Synchronization System Construction

The City of Orange will use qualified traffic engineering consultants to design all infrastructure and equipment upgrades based on Section 5. All installations and upgrades will be per the owning agencies' standards. Details of equipment upgrades are tabulated in Tables I and II. Since the agencies have requested Orange to be the lead on this project, Orange will enlist a qualified contractor on a standard procurement basis to construct the facilities based on State and local agencies standards, specifications, and special provisions as developed by the consultant.

Task 8: Primary Implementation Project Report

The contracted consultant will develop a before and after study for the project. This report will be completed after the Primary Implementation is completed and will include the following:

- Introduction/project description: a summary of the project including the purpose, background, and objectives of the project.
- Data collection: a summary of the data collected as part of the effort including the traffic counts, phasing, lane configurations, etc.
- Traffic signal systems improvements: a summary of the implemented traffic signal systems improvements by city.
- Signal timing optimization: a summary of the development and implementation of updated signal timing including the models, selected cycle lengths, intersection groupings, etc.
- Results: the study will contain directional morning, mid-day, evening, and weekend peak periods using travel times, average speeds, green lights to red lights, stops per mile, and the derived corridor synchronization performance index (CSPI) metric. This information shall be collected both before and after any signal timing changes have been made. Additional details based on the Final Report Template will also be included.
- Benefits to cost analysis: project benefits resulting from signal synchronization will be evaluated based on the before and after study results. Savings will be calculated for travel time, fuel consumptions, vehicle maintenance, Greenhouse Gas (GHG) reduction, and a final benefit cost ratio.
- Future signal corridor improvements: recommendations for system and equipment enhancements to improve traffic flow and signal synchronization will be provided.
- Conclusion: a summary of the before and after study and its findings.

The City of Orange shall be responsible for submission of this document along with relevant backup information to OCTA Programs for close out of the PI Phase.

Task 9: On-going Maintenance & Operations

The City of Orange's contracted consultant shall provide "on-call" signal timing support services for a period of two years or 24 months following the complete closeout and all payments made for the Primary Implementation phase, to address any future adjustments that may be needed during this period. Depending on the nature of the adjustment, the Consultant may accomplish the fine-tuning adjustments remotely from the office through the traffic management systems. During this 24-month period the Consultant will be prepared to review any project intersection requested within (24) hours of written notice, including observing and fine-tuning the signal timing. The Consultant will also assist with resolving communications and detection issues along the corridor.

The Consultant will drive the length of the project arterial during all designated corridor synchronization timing plan hours of operation on a monthly basis in order to verify that the synchronization timing is working as designed, and complete any necessary adjustments. Monthly driving times will consist of a full 12-hour weekday and a 4-hour Saturday. All drives shall be documented. A copy, limited to jurisdictional boundaries, shall also be sent to each agency.

At the end of the 2-year O&M phase, the Consultant shall prepare a memorandum to summarize the O&M phase. It should, at the minimum, include when travel runs were conducted, issues and solutions throughout the phase, and recommendations for future improvements.

SECTION 5: FUNDING NEEDS / COSTS FOR PROPOSED PROJECT BY TASK

Primary Implementation

The Primary Implementation will last one year and include the following elements (**See Table I and Table II**).

Project Tasks	Cost / Int	Total Cost	*Match*	
			Cash	*In-Kind*
Task 1: Project Administration	$ 2,000.00	$ 108,000.00	*$ 20,600.00*	*$ 1,000.00*
Task 2: Data Collection	$ 850.00	$ 45,900.00	*$ 9,180.00*	*$ -*
Task 3: Field Review and Plans Specifications, and Estimates	$ 7,350.00	$ 396,900.00	*$ 72,440.00*	*$ 6,940.00*
Task 4: Corridor "Before" Study	$ 600.00	$ 32,400.00	*$ 6,480.00*	*$ -*
Task 5: Signal Timing Optimization and Implementation	$ 5,150.00	$ 278,100.00	*$ 51,620.00*	*$ 4,000.00*
Task 6: Corridor "After" Study	$ 600.00	$ 32,400.00	*$ 6,480.00*	*$ -*
Task 7: Synchronization System Construction (*See Table II*)	-	**$2,375,650.00**	***$ 457,240.00***	*$ 17,890.00*
Task 8: Primary Implementation Project Report	$ 1,000.00	$ 54,000.00	*$ 10,800.00*	*$ -*
Task 9: Ongoing Operations & Maintenance *(See Task 9 Details)*	$ 2,400.00	$ 129,600.00	*$ 21,560.00*	*$ 4,360.00*
	Total Project Cost:	**$ 3,452,950.00**	*$ 656,400.00*	*$ 34,190.00*

Ongoing Operations & Maintenance

Ongoing Operations and Maintenance will last two years and include the following elements. (See ***Task 9 Details***):

Task 9 Details:

Task	Description of Work	Unit Price / Intersection	# of signals	Cost
Project Administration	Day to day administrative duties during O&M			included
Monitoring and improving optimized signal timing	Drive monthly and improve timing parameters along 54 signals for 24 months after signal timing and implemented along Tustin Avenue/Rose Drive from 1st Street to Wabash Avenue (@$70/signal/month)	$1,680.00	54	$90,720
Communications and detection support	Monitor, maintain, and repair communication and detection along for 54 signals for 24 months after signal timing is implemented along Tustin Avenue/Rose Drive. (@ $30/signal/month)	$720.00	54	$38,880
OMM Memorandum	A memorandum to summarize the O&M phase, including details on when travel runs were conducted; issues and solutions throughout the phase; and recommendations for future improvements.			included
			Proposed Ongoing Operations & Maintenance:	**$129,600**

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

	Total
Total M2 Request:	*$2,762,360.00*
Total Agency Match:	*$690,590.00*
Total Project Cost:	**$3,452,950.00**

TABLE I: SUMMARY OF IMPROVEMENTS

Location	Agency	Project Intersections at:	Description of Work																								
			INTERSECTION						CONTROLLERS		CONTROLLER CABINET					COMMUNICATION UPGRADE									ADVANCED TRAFFIC MANAGEMENT SYSTEM (ATMS)		
			EVP (all directions)	Video Detection System	UPS	ATSPM including O& M At Applied Cell Site	ADA Pushbutton Assembly	Pedestrian Countdown Heads	New Controller	SDLC Cable	New Cabinet with New Foundation	New Cabinet (Reuse existing foundation)	System Detector (DLC)	Advance Detection Loop with New Conduit	Bluetooth Travel Time Unit	CCTV Camera	6E Pull box and Splice Enclosure	Fiber in New Conduit	Fiber in Existing Conduit	Fiber Distribution Unit (FDU)	Fiber Switch/Ethernet Switch	Patch Panel and Fiber Splicing	Ethernet Switch and/or Cell Modem	CENTRACS Integration + System Graphics	CENTRACS System License or CENTRACS System Modules	TMC Workstation
Rose Drive @																											
1	Yorba Linda	Wabash Avenue				x			x	x		x				x	x	x		x	x	x	x	x	x		
2	Caltrans	Imperial Highway															x	x		x	x	x	x				
3	Yorba Linda	Bastanchury Road				x			x	x		x				x	x	x		x	x	x	x	x	x		
4	Yorba Linda	Equestrian/Ped Signal				x			x	x		x				x	x	x		x	x	x	x	x	x		
5	Yorba Linda	School Ped Signal				x			x	x		x				x	x	x		x	x	x	x	x	x		
6	Placentia	Yorba Linda Boulevard				x	x	x	x	x						x				x	x	x	x				
7	Placentia	Linda Vista Street/Valpariso Way				x			x	x						x				x	x	x	x		x		
8	Placentia	Palm Drive				x			x	x						x				x	x	x	x		x		
9	Placentia	Buena Vista Avenue				x	x	x	x	x						x				x	x	x	x		x		
10	Placentia	Alta Vista Street				x	x	x	x	x						x				x	x	x	x		x		
11	Placentia	Castner Avenue				x			x	x						x				x	x	x	x		x		
12	Placentia	Del Cerro (Orange Thorpe Grade Separation							x	x															x		
Tustin Avenue @																											
13	Anaheim	Auto Exchange	x	x			x	x	x	x					x					x	x	x					
14	Anaheim	Mira Loma Avenue	x	x			x	x	x	x					x	x				x	x	x					
15	Anaheim	La Palma Avenue	x	x			x	x	x	x	x				x	x				x	x	x					
16	Anaheim	Pacificenter Drive																									
17	Caltrans	SR-91 W/B Ramps																									
18	Caltrans	SR-91 E/B Ramps																									
19	Anaheim	Riverdale Avenue	x	x			x	x	x	x						x					x						
20	Orange	Santa Ana Canyon Road	x		x	x			x	x		x											x				
21	Caltrans	SR-55 S/B Off Ramp																									
22	Caltrans	Santiago Boulevard @ SR-55 N/B - Vista Park																									
23	Caltrans	Nohl Ranch Road at Santiago Boulevard																									
24	Orange	Lincoln Avenue/Nohl Ranch Road				x			x																		
25	Orange	SR-55 S/B On Ramp	x	x		x			x	x																	
26	Orange	Heim Avenue	x		x	x			x																		
27	Orange	Village Town Center	x						x							x											
28	Orange	East Village Way	x		x	x			x		x																
29	Orange	Meats Avenue	x		x	x			x		x																
30	Orange	Taft Avenue/Briardale	x			x			x																		
31	Orange	Taft Avenue	x			x			x			x				x											
32	Orange	Van Owen Avenue/Toyota Way				x			x	x																	
33	Orange	Katella Avenue	x	x		x			x																		
34	Orange	Quincy Avenue	x	x		x			x																		
35	Orange	Collins Avenue	x	x		x			x																		
36	Orange	Mayfair Avenue				x			x																		
37	Orange	Walnut Avenue	x			x			x			x				x											
38	Orange	Palm Avenue				x			x																		
39	Orange	Chapman Avenue		x		x																					
40	Orange	Palmyra Avenue	x			x			x	x						x											
41	Orange	La Veta./Rock Creek				x																					
42	Caltrans	SR-22 W/B																									
43	Caltrans	SR-22 E/B - Seba																									
44	Orange	Fairhaven	x	x		x			x																		
45	Santa Ana	Santa Clara Avenue							x							x	x		x		x	x	x				
46	Santa Ana	Seventeenth Street																			x	x	x				
47	Santa Ana	Centre on Seventeenth/Tustin Centre							x																		
48	Santa Ana	Wellington Avenue							x																		
49	Santa Ana	Fruit Street							x		x																
50	Caltrans	SR-55 N/B																									
51	Caltrans	SR-55 S/B																									
52	Santa Ana	Fourth Street			x	x			x			x					x	x	x	x	x	x	x		x	x	
53	Tustin	Irvine Boulevard at Yorba				x			x	x																	
54	Tustin	First Street				x	x		x																		

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TABLE II: DETAILED IMPROVEMENTS BREAKDOWN

Item No.	Rose Drive @	Item Description	Unit	Qty	*Labor to Install*	*Equipment Cost*	Total	*Cash Match*	*In-Kind Match*	Agency
1	Wabash Avenue	Furnish and Install TS2 Cabinet Type "P", Cobalt ATC Controller & Appurtenances on Existing Foundation	EA	1	*$ 4,000.00*	*$ 23,000.00*	**$ 27,000.00**	*$ 5,400.00*		Yorba Linda
2		Furnish and Install BBS System and Cabinet on New Type "P" cabinet	EA	1	*$ 1,000.00*	*$ 6,500.00*	**$ 7,500.00**	*$ 1,500.00*		Yorba Linda
3		Re-establish Existing Type II service	EA	1	*$ 800.00*		**$ 800.00**	*$ 160.00*		Yorba Linda
4		Furnish and Install Video Surveillance Camera & Appurtenances	EA	1	*$ 1,000.00*	*$ 8,000.00*	**$ 9,000.00**	*$ 1,800.00*		Yorba Linda
5		Furnish and Install 2" Conduit with 72 SFO I/C South to Imperial Hwy. (900-ft)	LF	900	*$ 35.00*	*$ 10.00*	**$ 40,500.00**	*$ 8,100.00*		Yorba Linda
6		Furnish and Install 6E Fiber Drop Pull box & Appurtenances	EA	4	*$ 2,500.00*	*$ 1,000.00*	**$ 14,000.00**	*$ 2,800.00*		Yorba Linda
7		Furnish and Install Fiber Ethernet Switch and Power Supply	EA	1	*$ 500.00*	*$ 3,000.00*	**$ 3,500.00**	*$ 700.00*		Yorba Linda
8	Imperial Highway	Furnish and Install 2" Conduit with 72 SFO I/C South to Bastanchury Rd. (1,900-ft)	LF	1900	*$ 35.00*	*$ 10.00*	**$ 85,500.00**	*$ 17,100.00*		Yorba Linda
9		Furnish and Install 6E Fiber Drop Pull box & Appurtenances	EA	4	*$ 2,500.00*	*$ 1,000.00*	**$ 14,000.00**	*$ 2,800.00*		Yorba Linda
10	Bastanchury Road	Supply and Install Cobalt ATC Controller & Appurtenances in Existing Cabinet	EA	1	*$ 1,000.00*	*$ 4,000.00*	**$ 5,000.00**	*$ 1,000.00*		Yorba Linda
11		Furnish and Install Video Surveillance Camera & Appurtenances	EA	1	*$ 1,000.00*	*$ 8,000.00*	**$ 9,000.00**	*$ 1,800.00*		Yorba Linda
12		Furnish and Install Duplex Power Outlet	EA	1	*$ 150.00*	*$ 50.00*	**$ 200.00**	*$ 40.00*		Yorba Linda
13		Furnish and Install 2" Conduit with 72 SFO I/C South to Equestrian Xing. (850-ft)	LF	850	*$ 35.00*	*$ 10.00*	**$ 38,250.00**	*$ 7,650.00*		Yorba Linda
14		Furnish and Install 6E Fiber Drop Pull box & Appurtenances	EA	3	*$ 2,500.00*	*$ 1,000.00*	**$ 10,500.00**	*$ 2,100.00*		Yorba Linda
15		Furnish and Install Fiber Ethernet Switch and Power Supply	EA	1	*$ 500.00*	*$ 3,000.00*	**$ 3,500.00**	*$ 700.00*		Yorba Linda
16		Remove Twisted Pair Copper and Furnish and Install 72 SFO East to Grey Rock (550-ft)	LF	550	*$ 5.00*	*$ -*	**$ 2,750.00**	*$ 550.00*		Yorba Linda
17	Equestrian Xing	Supply and Install Cobalt ATC Controller & Appurtenances in Existing Cabinet	EA	1	*$ 1,000.00*	*$ 4,000.00*	**$ 5,000.00**	*$ 1,000.00*		Yorba Linda
18		Furnish and Install Video Surveillance Camera & Appurtenances	EA	1	*$ 1,000.00*	*$ 8,000.00*	**$ 9,000.00**	*$ 1,800.00*		Yorba Linda
19		Furnish and Install Duplex Power Outlet	EA	1	*$ 150.00*	*$ 50.00*	**$ 200.00**	*$ 40.00*		Yorba Linda
20		Furnish and Install 2" Conduit with 72 SFO I/C South to Pedestrian Xing. (1,500-ft)	LF	1500	*$ 35.00*	*$ 10.00*	**$ 67,500.00**	*$ 13,500.00*		Yorba Linda
21		Furnish and Install 6E Fiber Drop Pull box & Appurtenances	EA	5	*$ 2,500.00*	*$ 1,000.00*	**$ 17,500.00**	*$ 3,500.00*		Yorba Linda
22		Furnish and Install Fiber Ethernet Switch and Power Supply	EA	1	*$ 500.00*	*$ 3,000.00*	**$ 3,500.00**	*$ 700.00*		Yorba Linda
23	Pedestrian Xing (SCHOOL)	Supply and Install Cobalt ATC Controller & Appurtenances in Existing Cabinet	EA	1	*$ 1,000.00*	*$ 4,000.00*	**$ 5,000.00**	*$ 1,000.00*		Yorba Linda
24		Furnish and Install Video Surveillance Camera & Appurtenances	EA	1	*$ 1,000.00*	*$ 8,000.00*	**$ 9,000.00**	*$ 1,800.00*		Yorba Linda
25		Furnish and Install duplex Power Outlet	EA	1	*$ 150.00*	*$ 50.00*	**$ 200.00**	*$ 40.00*		Yorba Linda
26		Furnish and Install 6E Fiber Drop Pull box & Appurtenances	EA	1	*$ 2,500.00*	*$ 1,000.00*	**$ 3,500.00**	*$ 700.00*		Yorba Linda
27		Furnish and Install Fiber Ethernet Switch and Power Supply	EA	1	*$ 500.00*	*$ 3,000.00*	**$ 3,500.00**	*$ 700.00*		Yorba Linda
28	Yorba Liinda TMC Upgrades	F&I Server to Server Module to Centracs ATMS	EA	1	*$ 500.00*	*$ 20,000.00*	**$ 20,500.00**	*$ 4,100.00*		Yorba Linda
29		Develop Graphics and Integrate intersections to Centracs ATMS	EA	5	*$ 1,000.00*	*$ -*	**$ 5,000.00**	*$ 1,000.00*		Yorba Linda
30	Yorba Linda On Call Consultant Services	Various items involved with Construction Engineering, Design Review, etc. See various tables for expansion.	LS	1	*$ 14,490.00*		**$ -**	*$ -*	***$ 14,490.00***	Yorba Linda
31	Yorba Linda Blvd.	Furnish & install Cobalt ATC controller unit	EA	1	*$ 750.00*	*$ 4,150.00*	**$ 4,900.00**	*$ 980.00*		Placentia
32		Furnish & install Actelis ML684D Ethernet Fiber and VDSL Switch	EA	1	*$ 400.00*	*$ 2,000.00*	**$ 2,400.00**	*$ 480.00*		Placentia
33		Furnish & install Fiber Termination Unit	EA	1	*$ 400.00*	*$ 1,200.00*	**$ 1,600.00**	*$ 320.00*		Placentia
34		Furnish & install CCTV System	EA	1	*$ 1,000.00*	*$ 7,000.00*	**$ 8,000.00**	*$ 1,600.00*		Placentia
35		Furnish & install Active Pedestrian Safety System and Audio Push Buttons (4-ways) Includes Cabinet System Module	LS	1	*$ 2,160.00*	*$ 6,100.00*	**$ 8,260.00**	*$ 1,652.00*		Placentia
36		Furnish & install Countdown Ped Head System	EA	8	*$ 75.00*	*$ 250.00*	**$ 2,600.00**	*$ 520.00*		Placentia

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37	Linda Vista St.	Furnish & install Cobalt ATC controller unit	EA	1	$ 750.00	$ 4,150.00	$ 4,900.00	$ 980.00		Placentia
38		Furnish & install Actelis ML684D Ethernet Fiber and VDSL Switch	EA	1	$ 400.00	$ 2,000.00	$ 2,400.00	$ 480.00		Placentia
39		Furnish & install Fiber Termination Unit	EA	1	$ 400.00	$ 1,200.00	$ 1,600.00	$ 320.00		Placentia
40		Furnish & install CCTV System	EA	1	$ 1,000.00	$ 7,000.00	$ 8,000.00	$ 1,600.00		Placentia
41	Palm Dr.	Furnish & install Cobalt ATC controller unit	EA	1	$ 750.00	$ 4,150.00	$ 4,900.00	$ 980.00		Placentia
42		Furnish & install Actelis ML684D Ethernet Fiber and VDSL Switch	EA	1	$ 400.00	$ 2,000.00	$ 2,400.00	$ 480.00		Placentia
43		Furnish & install Fiber Termination Unit	EA	1	$ 400.00	$ 1,200.00	$ 1,600.00	$ 320.00		Placentia
44		Furnish & install CCTV System	EA	1	$ 1,000.00	$ 7,000.00	$ 8,000.00	$ 1,600.00		Placentia
45	Buena Vista Ave.	Furnish & install Cobalt ATC controller unit	EA	1	$ 750.00	$ 4,150.00	$ 4,900.00	$ 980.00		Placentia
46		Furnish & install Actelis ML684D Ethernet Fiber and VDSL Switch	EA	1	$ 400.00	$ 2,000.00	$ 2,400.00	$ 480.00		Placentia
47		Furnish & install Fiber Termination Unit	EA	1	$ 400.00	$ 1,200.00	$ 1,600.00	$ 320.00		Placentia
48		Furnish & install CCTV System	EA	1	$ 1,000.00	$ 7,000.00	$ 8,000.00	$ 1,600.00		Placentia
49		Furnish & install Active Pedestrian Safety System and Audio Push Buttons (3-ways) Includes Cabinet System Module	LS	1	$ 1,420.00	$ 5,200.00	$ 6,620.00	$ 1,324.00		Placentia
50		Furnish & install Countdown Ped Head System	EA	6	$ 75.00	$ 250.00	$ 1,950.00	$ 390.00		Placentia
51	Alta Vista St.	Furnish & install Cobalt ATC controller unit	EA	1	$ 750.00	$ 4,150.00	$ 4,900.00	$ 980.00		Placentia
52		Furnish & install Actelis ML684D Ethernet Fiber and VDSL Switch	EA	1	$ 400.00	$ 2,000.00	$ 2,400.00	$ 480.00		Placentia
53		Furnish & install Fiber Termination Unit	EA	1	$ 400.00	$ 1,200.00	$ 1,600.00	$ 320.00		Placentia
54		Furnish & install CCTV System	EA	1	$ 1,000.00	$ 7,000.00	$ 8,000.00	$ 1,600.00		Placentia
55		Furnish & install Active Pedestrian Safety System and Audio Push Buttons (4-ways) Includes Cabinet System Module	LS	1	$ 2,160.00	$ 6,100.00	$ 8,260.00	$ 1,652.00		Placentia
56		Furnish & install Countdown Ped Head System	EA	8	$ 75.00	$ 250.00	$ 2,600.00	$ 520.00		Placentia
57	Castner Dr.	Furnish & install Cobalt ATC controller unit	EA	1	$ 750.00	$ 4,150.00	$ 4,900.00	$ 980.00		Placentia
58		Furnish & install Actelis ML684D Ethernet Fiber and VDSL Switch	EA	1	$ 400.00	$ 2,000.00	$ 2,400.00	$ 480.00		Placentia
59		Furnish & install Fiber Termination Unit	EA	1	$ 400.00	$ 1,200.00	$ 1,600.00	$ 320.00		Placentia
60	Del Cerro Dr.	Furnish & install Cobalt ATC controller unit	EA	1	$ 750.00	$ 4,150.00	$ 4,900.00	$ 980.00		Placentia
61		Furnish & install Actelis ML684D Ethernet Fiber and VDSL Switch	EA	1	$ 400.00	$ 2,000.00	$ 2,400.00	$ 480.00		Placentia
62		Furnish & install Fiber Termination Unit	EA	1	$ 400.00	$ 1,200.00	$ 1,600.00	$ 320.00		Placentia
63		Furnish & install CCTV System	EA	1	$ 1,000.00	$ 7,000.00	$ 8,000.00	$ 1,600.00		Placentia
64	From Rose/Yorba Linda to Orangethorpe/Del Cerro	Furnish & install 72 SMFO Trunk Cable in existing conduit (Rose/Yorba Linda to Orangethorpe/Del Cerro)	LF	8400	$ 3.00	$ 2.00	$ 42,000.00	$ 8,400.00		Placentia
65		Furnish & install 12 SMFO Drop Cable in existing conduit at each intersection	LF	800	$ 6.00	$ 10.00	$ 12,800.00	$ 2,560.00		Placentia
66		Furnish & install 2" Sch. 80 PVC conduit between Rose/Del Cerro and Orangethorpe/Del Cerro	LF	700	$ 25.00	$ 10.00	$ 24,500.00	$ 4,900.00		Placentia
67		Furnish & install Fiber Splice Enclosure. Splice proposed 72 SFMO fiber to existing 72 SMFO Fiber at Orangethorpe/Del Cerro	LS	1	$ 3,000.00	$ 1,500.00	$ 4,500.00	$ 900.00		Placentia
68		Add intersections to Centracs with graphics	LS	6	$ 1,500.00		$ 9,000.00	$ 1,800.00		Placentia

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69	Auto Exchange	Furnish and install controller	EA	1	$ 150.00	$ 3,200.00	**$ 3,350.00**	$ 670.00		Anaheim
70		Furnish and install Ethernet switch	EA	1	$ 2,500.00	$ 2,500.00	**$ 5,000.00**	$ 1,000.00		Anaheim
71		Furnish and install armored 120 SMFO cable	LF	1000	$ 6.00	$ -	**$ 6,000.00**	$ 1,200.00		Anaheim
72		Furnish and install fiber tray, terminate SMFO cable to cabinet	EA	LS	$ 3,000.00	$ 600.00	**$ 3,600.00**	$ 720.00		Anaheim
73		Furnish and install loops, video detection	EA	LS	$ 720.00	$ 18,000.00	**$ 18,720.00**	$ 3,744.00		Anaheim
74		Furnish & install countdown ped head system	EA	8	$ 135.00	$ 150.00	**$ 2,280.00**	$ 456.00		Anaheim
75	Mira Loma	Furnish and install controller	EA	1	$ 150.00	$ 3,200.00	**$ 3,350.00**	$ 670.00		Anaheim
76		Furnish and install Ethernet switch	EA	1	$ 2,500.00	$ 2,500.00	**$ 5,000.00**	$ 1,000.00		Anaheim
77		Furnish and install armored 120 SMFO cable	LF	3200	$ 6.00	$ -	**$ 19,200.00**	$ 3,840.00		Anaheim
78		Furnish and install fiber tray, terminate SMFO cable to cabinet	EA	LS	$ 3,000.00	$ 600.00	**$ 3,600.00**	$ 720.00		Anaheim
79		Furnish and install CCTV	EA	1	$ 400.00	$ 10,000.00	**$ 10,400.00**	$ 2,080.00		Anaheim
80		Furnish and install loops, video detection	EA	LS	$ 720.00	$ 18,000.00	**$ 18,720.00**	$ 3,744.00		Anaheim
81		Furnish and install performance measure equipment	EA	1	$ 500.00	$ 8,000.00	**$ 8,500.00**	$ 1,700.00		Anaheim
82		Furnish & install accessible ped pushbutton	EA	8	$ 100.00	$ 1,000.00	**$ 8,800.00**	$ 1,760.00		Anaheim
83		Furnish & install countdown ped head system	EA	8	$ 135.00	$ 150.00	**$ 2,280.00**	$ 456.00		Anaheim
84	La Palma	Furnish and install cabinet	EA	1	$ 550.00	$ 20,000.00	**$ 20,550.00**	$ 4,110.00		Anaheim
85		Furnish and install controller	EA	1	$ 150.00	$ 3,200.00	**$ 3,350.00**	$ 670.00		Anaheim
86		Furnish and install Ethernet switch	EA	1	$ 2,500.00	$ 2,500.00	**$ 5,000.00**	$ 1,000.00		Anaheim
87		Furnish and install armored 120 SMFO cable	LF	610	$ 7.00	$ -	**$ 4,270.00**	$ 854.00		Anaheim
88		Furnish and install fiber tray, terminate SMFO cable to cabinet	EA	LS	$ 3,000.00	$ 600.00	**$ 3,600.00**	$ 720.00		Anaheim
89		Furnish and install CCTV	EA	1	$ 400.00	$ 10,000.00	**$ 10,400.00**	$ 2,080.00		Anaheim
90		Furnish and install loops, video detection	EA	LS	$ 720.00	$ 18,000.00	**$ 18,720.00**	$ 3,744.00		Anaheim
91		Furnish and install performance measure equipment	EA	1	$ 500.00	$ 8,000.00	**$ 8,500.00**	$ 1,700.00		Anaheim
92		Furnish & install accessible ped pushbutton	EA	8	$ 100.00	$ 1,000.00	**$ 8,800.00**	$ 1,760.00		Anaheim
93		Furnish & install countdown ped head system	EA	8	$ 135.00	$ 150.00	**$ 2,280.00**	$ 456.00		Anaheim
94	Pacificenter	Furnish and install controller	EA	1	$ 150.00	$ 3,200.00	**$ 3,350.00**	$ 670.00		Anaheim
95		Furnish and install Ethernet switch	EA	1	$ 2,500.00	$ 2,500.00	**$ 5,000.00**	$ 1,000.00		Anaheim
96		Furnish and install armored 120 SMFO cable	LF	800	$ 6.00	$ -	**$ 4,800.00**	$ 960.00		Anaheim
97		Furnish and install fiber tray, terminate SMFO cable to cabinet	EA	LS	$ 3,000.00	$ 600.00	**$ 3,600.00**	$ 720.00		Anaheim
98		Furnish and install CCTV	EA	1	$ 400.00	$ 10,000.00	**$ 10,400.00**	$ 2,080.00		Anaheim
99		Furnish and install loops, video detection	EA	LS	$ 720.00	$ 18,000.00	**$ 18,720.00**	$ 3,744.00		Anaheim
100		Furnish and install performance measure equipment	EA	1	$ 500.00	$ 8,000.00	**$ 8,500.00**	$ 1,700.00		Anaheim
101		Furnish & install accessible ped pushbutton	EA	8	$ 100.00	$ 1,000.00	**$ 8,800.00**	$ 1,760.00		Anaheim
102		Furnish & install countdown ped head system	EA	8	$ 135.00	$ 150.00	**$ 2,280.00**	$ 456.00		Anaheim
103	Caltrans Ramps SR-91	Caltrans Encroachment Permit (Synchronize with SR-91 Ramp E)	LS	1	$ 2,500.00	$ -	**$ 2,500.00**	$ 500.00		Anaheim
104		Caltrans Encroachment Permit (Synchronize with SR-91 Ramp W)	LS	1	$ 2,500.00	$ -	**$ 2,500.00**	$ 500.00		Anaheim
105	Riverdale	Furnish and install controller	EA	1	$ 150.00	$ 3,200.00	**$ 3,350.00**	$ 670.00		Anaheim
106		Furnish and install Ethernet switch	EA	1	$ 2,500.00	$ 2,500.00	**$ 5,000.00**	$ 1,000.00		Anaheim
107		Furnish and install fiber tray, terminate SMFO cable to cabinet	EA	1	$ 3,000.00	$ 600.00	**$ 3,600.00**	$ 720.00		Anaheim
108		Furnish and install CCTV	EA	1	$ 400.00	$ 10,000.00	**$ 10,400.00**	$ 2,080.00		Anaheim
109		Furnish and install loops, video detection	EA	LS	$ 720.00	$ 18,000.00	**$ 18,720.00**	$ 3,744.00		Anaheim
110		Furnish and install performance measure equipment	EA	1	$ 500.00	$ 8,000.00	**$ 8,500.00**	$ 1,700.00		Anaheim
111		Furnish & install accessible ped pushbutton	EA	8	$ 100.00	$ 1,000.00	**$ 8,800.00**	$ 1,760.00		Anaheim
112		Furnish & install countdown ped head system	EA	8	$ 135.00	$ 150.00	**$ 2,280.00**	$ 456.00		Anaheim
112A	TMC Improvements	Software and Hardware Additions and/or Upgrades to TMC	LS	1	$ 2,000.00	$ 38,000.00	**$ 40,000.00**	$ 8,000.00		Anaheim
113	Santa Ana Cyn Road	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	**$ 4,050.00**	$ 810.00		Orange City
114		Furnish & install P44 Cabinet on existing foundation	EA	1	$ 3,200.00	$ 19,400.00	**$ 22,600.00**	$ 4,520.00		Orange City
115		Furnish & install Myers UPS/BBS W/4 Batteries	EA	1	$ 1,100.00	$ 6,000.00	**$ 7,100.00**	$ 1,420.00		Orange City
116		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	**$ 8,100.00**	$ 1,620.00		Orange City
117		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	**$ 1,000.00**	$ 200.00		Orange City
118		SPM O & M per year	EA	3	$ 800.00		**$ 2,400.00**	$ 480.00		Orange City
119		Furnish & install AI Applied Cell Site	EA	1	$ 1,100.00	$ 5,000.00	**$ 6,100.00**	$ 1,220.00		Orange City
120	Caltrans Ramps SR-55	S/B SR-55 Off Ramp	LS	1	$ 2,500.00	$ -	**$ 2,500.00**	$ 500.00		Orange City
121		Nohl Ranch Road at Santiago Boulevard	LS	1	$ 2,500.00	$ -	**$ 2,500.00**	$ 500.00		Orange City
122		N/B SR-55 Ramp at Santiago Boulevard	LS	1	$ 2,500.00	$ -	**$ 2,500.00**	$ 500.00		Orange City

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123	Lincoln Avenue	Furnish and install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
124		SPM O & M per year for 3 years	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
125		Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
126	SR-55 FRWY S/B On Ramp	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
127		Furnish & install Gridsmart Video Detection	EA	1	$ 1,100.00	$ 20,000.00	$ 21,100.00	$ 4,220.00		Orange City
128		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
129		SPM O & M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
130		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
131	Heim Avenue	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
132		Furnish & install Myers UPS/BBS W/4 Batteries	EA	1	$ 1,100.00	$ 6,000.00	$ 7,100.00	$ 1,420.00		Orange City
133		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
134		SPM O & M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
135		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
136	Village Town Center	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
137		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
138		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
139		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
140		Furnish & install Cohu Rise CCTV	EA	1	$ 1,100.00	$ 3,500.00	$ 4,600.00	$ 920.00		Orange City
141	East Village Way	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
142		Furnish & install P44 Cabinet on New Foundation	EA	1	$ 6,000.00	$ 19,400.00	$ 25,400.00	$ 5,080.00		Orange City
143		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
144		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
145		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
146		Furnish & install Myers UPS/BBS W/4 Batteries	EA	1	$ 1,100.00	$ 6,000.00	$ 7,100.00	$ 1,420.00		Orange City
147	Meats Avenue	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,400.00	$ 3,950.00	$ 790.00		Orange City
148		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
149		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
150		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
151		Furnish & install Gridsmart Video Detection	EA	1	$ 1,100.00	$ 20,000.00	$ 21,100.00	$ 4,220.00		Orange City
152	Briardale Avenue	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
153		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
154		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
155		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
156	Taft Avenue	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
157		Furnish & install P44 Cabinet on existing foundation	EA	1	$ 3,200.00	$ 19,400.00	$ 22,600.00	$ 4,520.00		Orange City
158		Furnish & install Cohu Rise CCTV	EA	1	$ 1,100.00	$ 3,500.00	$ 4,600.00	$ 920.00		Orange City
159		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
160		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
161		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
162	Van Owen Avenue	Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
163		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
164		Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
165	Katella Avenue	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
166		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
167		Furnish & install Iteris SPM	EA	1	$ 199.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
168		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
169		Furnish & install Gridsmart Video Detection	EA	1	$ 1,100.00	$ 20,000.00	$ 21,100.00	$ 4,220.00		Orange City
170	Quincy Avenue	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
171		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
172		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
173		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
174		Furnish & install P44 Cabinet on existing foundation	EA	1	$ 3,200.00	$ 19,400.00	$ 22,600.00	$ 4,520.00		Orange City

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175	Collins Avenue	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
176		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
177		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
178		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
179		Furnish & install Gridsmart Video Detection	EA	1	$ 1,100.00	$ 20,000.00	$ 21,100.00	$ 4,220.00		Orange City
180	Mayfair Avenue	Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
181		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
182		Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
183	Walnut Avenue	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
184		Furnish & install P44 Cabinet on existing foundation	EA	1	$ 3,200.00	$ 19,400.00	$ 22,600.00	$ 4,520.00		Orange City
185		Furnish & install GTT EVP System	EA	1	$ 135.00	$ 145.00	$ 280.00	$ 56.00		Orange City
186		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
187		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
188		Furnish & install Cohu Rise CCTV	EA	1	$ 1,100.00	$ 3,500.00	$ 4,600.00	$ 920.00		Orange City
189	Palm Avenue	Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
190		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
191		Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
192	Chapman Avenue	Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
193		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
194		Furnish & install Gridsmart Video Detection	EA	1	$ 1,100.00	$ 20,000.00	$ 21,100.00	$ 4,220.00		Orange City
195	Palmyra Avenue	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
196		Furnish & install Cohu Rise CCTV	EA	1	$ 1,100.00	$ 3,500.00	$ 4,600.00	$ 920.00		Orange City
197		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
198		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
199		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
200	LaVeta Avenue	Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
201		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
202	Caltrans Ramps SR-22	W/B On Ramp	LS	1	$ 2,500.00	$ -	$ 2,500.00	$ 500.00		Orange City
203		E/B Off Ramp/Seba	LS	1	$ 2,500.00	$ -	$ 2,500.00	$ 500.00		Orange City
204	Fairhaven Drive	Furnish & install Cobalt ATC controller unit (No touchscreen)	EA	1	$ 550.00	$ 3,500.00	$ 4,050.00	$ 810.00		Orange City
205		Furnish & install GTT EVP System	EA	1	$ 1,100.00	$ 7,000.00	$ 8,100.00	$ 1,620.00		Orange City
206		Furnish & install Iteris SPM	EA	1	$ 100.00	$ 900.00	$ 1,000.00	$ 200.00		Orange City
207		SPM O&M per year	EA	3	$ 800.00		$ 2,400.00	$ 480.00		Orange City
208		Furnish & install Gridsmart Video Detection	EA	1	$ 1,100.00	$ 20,000.00	$ 21,100.00	$ 4,220.00		Orange City
209	Santa Clara Avenue	Econolite 2070-1C CPU w/ latest Econolite software	EA	1	$ 1,000.00	$ 2,000.00	$ 3,000.00	$ 600.00		Santa Ana
210		CCTV Camera System (Axis Q6055-E)	EA	1	$ 2,000.00	$ 6,000.00	$ 8,000.00	$ 1,600.00		Santa Ana
211		Install 144-SMFO from Santa Clara to 17th (in existing conduit)	LF	4000	$ 1.00	$ 4.00	$ 20,000.00	$ 4,000.00	$ 600.00	Santa Ana
212		Etherwan Fiber Optic Ethernet Switch (EX78921-0VB)	EA	1	$ 1,000.00	$ 3,000.00	$ 4,000.00	$ 800.00		Santa Ana
213		Fiber Splicing (including Fiber Distribution Unit)	LS	1	$ 2,000.00	$ 3,000.00	$ 5,000.00	$ 1,000.00		Santa Ana
214		Econolite Autoscope Vision or Iteris Vantage Edge2 Video Detection System	LS	1	$ 30,000.00	$ 5,000.00	$ 35,000.00	$ 7,000.00		Santa Ana
215	17th Street	Fiber Splicing (including Fiber Distribution Unit)	LS	1	$ 1,000.00	$ 1,000.00	$ 2,000.00	$ 400.00	$ 400.00	Santa Ana
216	Tustin Center	Econolite 2070-1C CPU w/ latest Econolite software	LS	1	$ 1,000.00	$ 2,000.00	$ 3,000.00	$ 600.00	$ 600.00	Santa Ana
217	Wellington Avenue	Econolite 2070-1C CPU w/ latest Econolite software	LS	1	$ 1,000.00	$ 2,000.00	$ 3,000.00	$ 600.00	$ 600.00	Santa Ana
218	Fruit Street	Replace existing cabinet w/ Type 332L cabinet, Type II Dual Service, Foundation, Conduits and Pull Boxes	LS	1	$ 10,000.00	$ 30,000.00	$ 40,000.00	$ 8,000.00	$ 600.00	Santa Ana
219		Econolite ATC 2070C controller w/ latest Econolite software	LS	1	$ 2,000.00	$ 6,000.00	$ 8,000.00	$ 1,600.00		Santa Ana
220		Southern California Edison New Service Fee	LS	1	$ 7,000.00	$ -	$ 7,000.00	$ 1,400.00		Santa Ana
221		Southern California Edison Conduit and Pull Box	LS	1	$ 5,000.00	$ 10,000.00	$ 15,000.00	$ 3,000.00		Santa Ana
222	Caltrans Ramps SR-55	4th Street On-Off ramp N/B SR-55	LS	1	$ 2,500.00	$ -	$ 2,500.00	$ 500.00		Tustin
223		4th Street On-Off ramp S/B SR-55	LS	1	$ 2,500.00	$ -	$ 2,500.00	$ 500.00		Santa Ana

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224	4th Street	Replace existing cabinet w/ Type 332L cabinet, Type II Dual Service, Foundation, Conduits and Pull Boxes	LS	1	$ 10,000.00	$ 30,000.00	**$ 40,000.00**	$ 8,000.00	$ 600.00	Santa Ana
225		Econolite ATC 2070C controller w/ latest Econolite software	LS	1	$ 2,000.00	$ 6,000.00	**$ 8,000.00**	$ 1,600.00		Santa Ana
226		Southern California Edison New Service Fee	LS	1	$ 7,000.00	$ -	**$ 7,000.00**	$ 1,400.00		Santa Ana
227		Southern California Edison Conduit and Pull Box	LS	1	$ 5,000.00	$ 10,000.00	**$ 15,000.00**	$ 3,000.00		Santa Ana
228		Caltrans Encroachment Permit (Synchronize with SR-55 Ramps)	LS	1	$ 20,000.00	$ -	**$ 20,000.00**	$ 4,000.00		Santa Ana
229	Tustin Ave/First St	Cobalt ATC TS2 Type 2 Controller & Appurtenances	EA	1	$ 500.00	$ 5,000.00	**$ 5,500.00**	$ 1,100.00		Tustin
230		Polara Navigator iN2 APS W/ 5x7 R10-3B Braille Signs	EA	6	$ 170.00	$ 450.00	**$ 3,720.00**	$ 744.00		Tustin
231		Polara Navigator iN2 APS Controller Assembly	EA	1	$ 800.00	$ 2,000.00	**$ 2,800.00**	$ 560.00		Tustin
232		Radar Detection	LS	1	$ 5,000.00	$ 18,000.00	**$ 23,000.00**	$ 4,600.00		Tustin
232A		Integration	LS	1	$ 2,500.00	$ -	**$ 2,500.00**	$ 500.00		Tustin
233	Yorba St/Irvine Blvd	Cobalt ATC TS2 Type 2 Controller & Appurtenances	EA	1	$ 500.00	$ 5,000.00	**$ 5,500.00**	$ 1,100.00		Tustin
234		Polara Navigator iN2 APS W/ 5x7 R10-3B Braille Signs	EA	8	$ 170.00	$ 450.00	**$ 4,960.00**	$ 992.00		Tustin
235		Polara Navigator iN2 APS Controller Assembly	EA	1	$ 800.00	$ 2,000.00	**$ 2,800.00**	$ 560.00		Tustin
236		Radar Detection	LS	1	$ 5,000.00	$ 18,000.00	**$ 23,000.00**	$ 4,600.00		Tustin
236A		Integration	LS	1	$ 2,500.00	$ -	**$ 2,500.00**	$ 500.00		Tustin
						Subtotal:	**$ 1,900,520.00**	**$ 380,104.00**	**$ 17,890.00**	
						Contingency (10%):	**$ 190,052.00**	**$ 38,010.40**	**$ -**	
						Construction Management (15%):	**$ 285,078.00**	**$ 57,015.60**	**$ -**	
						In-Kind Match	**$ -**	**$ (17,890.00)**		
						SYSTEM IMPROVEMENT TOTAL:	**$ 2,375,650.00**	**$ 457,240.00**	**$ 17,890.00**	

SECTION 6: PROJECT SCHEDULE BY TASK

Project start date: August 1, 2020

Project end date: July 31, 2023

Primary Implementation

Task	Starting Date	Ending Date
Task 1: Project Administration	August 1, 2020	June 30, 2023
Task 2: Data Collection	August 1, 2020	September 30, 2020
Task 3: Field Review and Plans Specifications, and Estimates	August 1, 2020	October 31, 2020
Task 4: Corridor "Before" Study	November 1, 2020	November 7, 2020
Task 5: Signal Timing Optimization and Implementation	August 1, 2020	May 1, 2021
Task 6: Corridor "After" Study	May 5, 2021	May 12, 2021
Task 7: Synchronization System Construction	December 1,2020	May 31, 2021
Task 8: Primary Implementation Project Report	June 15, 2021	June 15, 2021
Task 9: Ongoing Operations & Maintenance	August 1, 2021	June 30, 2023

Ongoing Monitoring and Maintenance

Task	Starting Date	Ending Date
a. Monitoring and improving optimized signal timing	August 1, 2021	June 30, 2023
b. Communications and detection support	August 1, 2021	June 30, 2023
c. OMM Memo	August 1, 2021	June 30, 2023

SECTION 7: DETAILED LOCAL MATCH COMMITMENT

Input Only
Auto-Fill

PART 1: AGENCY TOTAL MATCH SUMMARY

Agency	CASH		IN-KIND		TOTAL MATCH	
	PI	OMM	PI	OMM	PI	OMM
City of Anaheim	*118,412.50*	*0.00*	*0.00*	*3,360.00*	*118,412.50*	*3,360.00*
	118,412.50		***3,360.00***		***121,772.50***	
City of Orange	*224,520.00*	*12,000.00*	*0.00*	*0.00*	*224,520.00*	*12,000.00*
	236,520.00		***0.00***		***236,520.00***	
City of Placentia	*82,917.50*	*3,360.00*	*0.00*	*0.00*	*82,917.50*	*3,360.00*
	86,277.50		***0.00***		***86,277.50***	
City of Santa Ana	*73,545.00*	*2,360.00*	*12,400.00*	*1,000.00*	*85,945.00*	*3,360.00*
	75,905.00		***13,400.00***		***89,305.00***	
City of Tustin	*30,225.00*	*1,440.00*	*0.00*	*0.00*	*30,225.00*	*1,440.00*
	31,665.00		***0.00***		***31,665.00***	
City of Yorba Linda	*105,220.00*	*2,400.00*	*17,430.00*	*0.00*	*122,650.00*	*2,400.00*
	107,620.00		***17,430.00***		***125,050.00***	
TOTAL MATCH	***634,840.00***	***21,560.00***	***29,830.00***	***4,360.00***	***664,670.00***	***25,920.00***
	656,400.00		***34,190.00***		***690,590.00***	

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

A. Cash Match

Agency	Funding Source	Amount of Cash Contribution
City of Anaheim	Local Funds	$118,412.50
City of Orange	Local Funds	$236,520.00
City of Placentia	Road Funds	$86,277.50
City of Tustin	Local Funds	$31,665.00
City of Santa Ana	Local Funds	$75,905.00
City of Yorba Linda	Local Funds	$107,620.00
TOTAL CASH MATCH:		$656,400.00

B. In-Kind Services

i. Specific Improvements (List items and Cost):

Agency	Description	Expenditure
Total Specific Improvements (i):		$0.00

ii. Staffing Commitment:

Agency	Staff Position	Type of Service to Project	No. of Hours	Fully Burdened Hourly Rate	Total*
City of Santa Ana	Senior Civil Engineer	Project Administration, Quality Assurance & Signal Timing	50.0	$86.93	$4,346.50
	Assistant Engineer	Design PS&E	58.0	$76.41	$4,431.78
	Construction Inspector	Construction Inspection	60.0	$58.21	$3,492.60
	Engineering Intern	Design PS&E	61.70	$18.30	$1,129.12
				Total for City of Santa Ana :	*$13,400.00*
	Project Manager	PS&E, Traffic Signal Timing, Timing Implimintation and Ststem integration Review, QA	18	$165.00	$2,970.00

City of Yorba Linda	Senior Engineer	PS&E, Traffic Signal Timing, Timing Implimintation and Ststem integration Review, QA	22	$150.00	$3,300.00
	Traffic Signal System Supervisor	PS&E, Traffic Signal Timing, Timing Implimintation and Ststem integration Review, QA	33	$135.00	$4,455.00
	Traffic Signal System Specialist	Construction Observation	54	$125.00	$6,705.00
				Total for City of Yorba Linda :	*$17,430.00*
City of Anaheim	Engineering Intern	Drive Corridor and reports	168	$20.00	$3,360.00
				Total for City of Anaheim:	*$3,360.00*
				Total Staffing Commitment (ii):	*$34,190.00*

TOTAL IN-KIND MATCH* (i + ii):	$34,190.00

*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 is expected to be included with the final submittal. Records will be subject to auditing.

SECTION 8: ENVIRONMENTAL CLEARANCE AND OTHER PERMITS

Environmental clearance and other permits (if needed) will be obtained for this project.

SECTION 9: SELECTION CRITERIA CALCULATIONS

Vehicle Miles Traveled (VMT):

	Segment	ADTs	Distance	VMT
1	1st to 4th Street	18,033	0.17	3,066
2	4th Street to Fruit Street	25,521	0.32	8,167
3	Fruit Street to Wellington Avenue	24,518	0.17	4,168
4	Wellington Avenue to Centre on Seventeenth	24,518	0.21	5,149
5	Centre on Seventeenth to 17th Street	24,518	0.12	2,942
6	17th Street to Santa Clara Avenue	35,618	0.52	18,521
7	Santa Clara Avenue to Fairhaven Avenue	33,810	0.42	14,200
8	Fairhaven Avenue to SR-22 E/B Ramps at Seba	35,700	0.18	6,426
9	SR-22 E/B Ramps at Seba to SR-22 W/B Ramps	35,700	0.13	4,641
10	SR-22 W/B Ramps to La Veta/Rock Creek	35,700	0.13	4,641
11	La Veta Rock Creek to Palmyra Avenue	32100	0.32	10,272
12	Palmyra Avenue to Chapman Avenue	32,100	0.25	8,025
13	Chapman Avenue to Palm Avenue	38,800	0.25	9,700
14	Palm Avenue to Walnut Avenue	38,800	0.25	9,700
15	Walnut Avenue to Mayfair Avenue	33,900	0.28	9,492
16	Mayfair Avenue to Collins Avenue	33,900	0.22	7,458
17	Collins Avenue to Katella Avenue	33,800	0.48	16,224
18	Katella Avenue to Van Owen Avenue/Toyota Way	41,000	0.13	5,330
19	Van Owen Avenue/Toyota Way to Taft Avenue	41,000	0.33	13,530
20	Taft Avenue to Taft Avenue/Briardale	41,000	0.11	4,510
21	Taft Avenue/Briardale to Meats Avenue	43,300	0.38	16,454
22	Meats Avenue to Lincoln Avenue/Nohl Ranch Road	31,400	0.83	26,062
23	Lincoln Avenue/Nohl Ranch Road to Santa Ana Canyon Roac	27,400	0.58	15,892
24	Santa Ana Canyon Road to Riverdale Avenue	27,400	0.32	8,768
25	Riverdale Avenue to SR-91 E/B Ramps	17,630	0.28	4,936
26	SR-91 E/B Ramps to SR-91 W/B Ramps	63,258	0.12	7,591
27	SR-91 W/B Ramps to Pacificenter Drive	62,501	0.15	9,375

29	Pacificenter Drive to La Palma Avenue	61,791	0.12	7,415
30	La Palma Avenue to Mira Loma Avenue	25,484	0.59	15,036
31	Miraloma Avenue to Auto Exchange	23,000	0.19	4,370
32	Auto Exchange to Del Cerro	26,399	0.29	7,656
33	Del Cerro to Castner Drive	29,291	0.19	5,565
34	Castner Drive to Alta Vista Street	29,291	0.25	7,323
35	Alta Vista Street to Buena Vista Avenue	27,290	0.28	7,641
36	Buena Vista Avenue to Palm Drive	27,290	0.18	4,912
37	Palm Drive to Linda Vista Street/Valpariso Way	22,484	0.18	4,047
38	Linda Vista Street/Valpariso Way to Yorba Linda Boulevard	22,484	0.27	6,071
39	Yorba Linda Boulevard to School Ped Xing	18,200	0.35	6,370
40	School Ped Xing to Equestrian Signal/Ped Signal	18,200	0.27	4,914
41	Equestrian Signal/Ped Signal to Bastanchury Road	18,200	0.14	2,548
42	Bastanchury Road to Imperial Highway	16,700	0.35	5,845
43	Imperial Highway to Wabash Avenue	22,800	0.16	3,648

Total Project VMT:	**11.46**	**348,601**

Source: 2016 - 2019 All Agency ADT Counts

SECTION 10: DETAILED BREAKDOWN OF COSTS BY AGENCIES

City of Tustin

Number of Signals: 2 3

Project Tasks (Tustin)	Total Cost	Match	
		Cash	*In-Kind*
Task 1: Project Administration	$ 6,000.00	*$ 1,200.00*	*$ -*
Task 2: Data Collection	$ 2,550.00	*$ 510.00*	*$ -*
Task 3: Field Review and Plans Specifications, and Estimates	$ 22,050.00	*$ 4,410.00*	*$ -*
Task 4: Corridor "Before" Study	$ 1,800.00	*$ 360.00*	*$ -*
Task 5: Signal Timing Optimization and Implementation	$ 15,450.00	*$ 3,090.00*	*$ -*
Task 6: Corridor "After" Study	$ 1,800.00	*$ 360.00*	*$ -*
Task 7: Synchronization System Construction (*See Table II*)	$ 98,475.00	$ 19,695.00	*$ -*
Task 8: Primary Implementation Project Report	$ 3,000.00	*$ 600.00*	*$ -*
Task 9: Ongoing Operations & Maintenance *(See Task 9 Details)*	$ 7,200.00	*$ 1,440.00*	*$ -*
Total Project Cost:	**$ 158,325.00**	*$ 31,665.00*	*$ -*

City of Santa Ana

Number of Signals: 6 7

Project Tasks (Santa Ana)	Total Cost	Match	
		Cash	*In-Kind*
Task 1: Project Administration	$ 14,000.00	*$ 1,800.00*	*$ 1,000.00*
Task 2: Data Collection	$ 5,950.00	*$ 1,190.00*	*$ -*
Task 3: Field Review and Plans Specifications, and Estimates	$ 51,450.00	*$ 6,290.00*	*$ 4,000.00*
Task 4: Corridor "Before" Study	$ 4,200.00	*$ 840.00*	*$ -*
Task 5: Signal Timing Optimization and Implementation	$ 36,050.00	*$ 3,210.00*	*$ 4,000.00*
Task 6: Corridor "After" Study	$ 4,200.00	*$ 840.00*	*$ -*
Task 7: Synchronization System Construction (*See Table II*)	$ 306,875.00	$ 57,975.00	*$ 3,400.00*
Task 8: Primary Implementation Project Report	$ 7,000.00	*$ 1,400.00*	*$ -*
Task 9: Ongoing Operations & Maintenance *(See Task 9 Details)*	$ 16,800.00	*$ 2,360.00*	*$ 1,000.00*
Total Project Cost:	**$ 446,525.00**	*$ 75,905.00*	*$ 13,400.00*

City of Anaheim

Number of Signals: 5 7

Project Tasks (Anaheim)	Total Cost	Match	
		Cash	*In-Kind*
Task 1: Project Administration	$ 14,000.00	*$ 2,800.00*	*$ -*
Task 2: Data Collection	$ 5,950.00	*$ 1,190.00*	*$ -*
Task 3: Field Review and Plans Specifications, and Estimates	$ 51,450.00	*$ 10,290.00*	*$ -*
Task 4: Corridor "Before" Study	$ 4,200.00	*$ 840.00*	*$ -*
Task 5: Signal Timing Optimization and Implementation	$ 36,050.00	*$ 7,210.00*	*$ -*
Task 6: Corridor "After" Study	$ 4,200.00	*$ 840.00*	*$ -*
Task 7: Synchronization System Construction (*See Table II*)	$ 469,212.50	$ 93,842.50	*$ -*
Task 8: Primary Implementation Project Report	$ 7,000.00	*$ 1,400.00*	*$ -*
Task 9: Ongoing Operations & Maintenance *(See Task 9 Details)*	$ 16,800.00	*$ -*	*$ 3,360.00*
Total Project Cost:	**$ 608,862.50**	*$ 118,412.50*	*$ 3,360.00*

City of Orange

Number of Signals: 20 25

Project Tasks (Orange)	Total Cost	Match	
		Cash	*In-Kind*
Task 1: Project Administration	$ 50,000.00	*$ 10,000.00*	*$ -*
Task 2: Data Collection	$ 21,250.00	*$ 4,250.00*	*$ -*
Task 3: Field Review and Plans Specifications, and Estimates	$ 183,750.00	*$ 36,750.00*	*$ -*
Task 4: Corridor "Before" Study	$ 15,000.00	*$ 3,000.00*	*$ -*
Task 5: Signal Timing Optimization and Implementation	$ 128,750.00	*$ 25,750.00*	*$ -*
Task 6: Corridor "After" Study	$ 15,000.00	*$ 3,000.00*	*$ -*
Task 7: Synchronization System Construction (*See Table II*)	$ 683,850.00	$ 136,770.00	*$ -*
Task 8: Primary Implementation Project Report	$ 25,000.00	*$ 5,000.00*	*$ -*
Task 9: Ongoing Operations & Maintenance *(See Task 9 Details)*	$ 60,000.00	*$ 12,000.00*	*$ -*
Total Project Cost:	**$ 1,182,600.00**	*$ 236,520.00*	*$ -*

City of Placentia

Number of Signals: 7 7

Project Tasks (Placentia)	Total Cost	Match	
		Cash	*In-Kind*
Task 1: Project Administration	$ 14,000.00	*$ 2,800.00*	*$ -*
Task 2: Data Collection	$ 5,950.00	*$ 1,190.00*	*$ -*
Task 3: Field Review and Plans Specifications, and Estimates	$ 51,450.00	*$ 10,290.00*	*$ -*
Task 4: Corridor "Before" Study	$ 4,200.00	*$ 840.00*	*$ -*
Task 5: Signal Timing Optimization and Implementation	$ 36,050.00	*$ 7,210.00*	*$ -*
Task 6: Corridor "After" Study	$ 4,200.00	*$ 840.00*	*$ -*
Task 7: Synchronization System Construction (*See Table II*)	$ 291,737.50	$ 58,347.50	*$ -*
Task 8: Primary Implementation Project Report	$ 7,000.00	*$ 1,400.00*	*$ -*
Task 9: Ongoing Operations & Maintenance *(See Task 9 Details)*	$ 16,800.00	*$ 3,360.00*	*$ -*
Total Project Cost:	**$ 431,387.50**	*$ 86,277.50*	*$ -*

City of Yorba Linda

Number of Signals: 4 5

Project Tasks (Yorba Linda)	Total Cost	Match	
		Cash	*In-Kind*
Task 1: Project Administration	$ 10,000.00	*$ 2,000.00*	*$ -*
Task 2: Data Collection	$ 4,250.00	*$ 850.00*	*$ -*
Task 3: Field Review and Plans Specifications, and Estimates	$ 36,750.00	*$ 4,410.00*	*$ 2,940.00*
Task 4: Corridor "Before" Study	$ 3,000.00	*$ 600.00*	*$ -*
Task 5: Signal Timing Optimization and Implementation	$ 25,750.00	*$ 5,150.00*	*$ -*
Task 6: Corridor "After" Study	$ 3,000.00	*$ 600.00*	*$ -*
Task 7: Synchronization System Construction (*See Table II*)	$ 525,500.00	$ 90,610.00	$ 14,490.00
Task 8: Primary Implementation Project Report	$ 5,000.00	*$ 1,000.00*	*$ -*
Task 9: Ongoing Operations & Maintenance *(See Task 9 Details)*	$ 12,000.00	*$ 2,400.00*	*$ -*
Total Project Cost:	**$ 625,250.00**	$ 107,620.00	*$ 17,430.00*

Note: Rose Drive at Imperial Highway is in PI on another project.

Note: Cities with Caltrans intersections are included within their totals

Project Summary

X All guidelines were met for this project.

LIST OF CONTACTS

Agency	Phone	Email	Street Address
City of Orange Larry Tay Traffic Engineer	714-744-5534	ltay@cityoforange.org	City of Orange 300 E. Chapman Avenue Orange, CA 92866
City of Anaheim John Thai Principal Traffic Engineer	714-765-5202	jthai@anaheim.net	City of Anaheim Traffic Management Center 200 South Anaheim Boulevard Anaheim, CA 92805
City of Placentia Luis Estevez Director of Public Works	714-993-8120	lestevez@placentia.org	City of Placentia 401 E. Chapman Avenue Placentia, CA 92870
City of Santa Ana Cesar Rodriguez Senior Civil Engineer	714-647-5626	crodriguez5@santa-ana.org	City of Santa Ana 20 Civic Center Plaza Traffic Engineering Section/M-43 Santa Ana, CA 92702
City of Tustin Krys Saldivar Public Works Manager- Traffic/Transportation	714-573-3172	ksaldivar@tustinca.org	City of Tustin 300 Centennial Way Tustin, CA 92780
City of Yorba Linda Tony Wang Traffic Engineering Manager	714-961-7184	twang@yorba-linda.org	City of Yorba Linda 4845 Casa Loma Avenue Yorba Linda, CA 92885-8714
Caltrans District 12 Shivinderjit Singh Branch Chief Electrical	949-936-3464	shivinderjit.singh@dot.ca.gov	Caltrans District 12 - TMC 6681 Marine Way Irvine, CA 92618

iteris®

Proposal for

RFP 20-21.40
TUSTIN -ROSE TSSP

Public Works - Traffic

ELECTRONIC COPY
May 27, 2021

Submitted to:

CITY OF ORANGE
INCORPORATED
APRIL 6, 1888
ORANGE COUNTY CALIFORNIA

08063 - 119.22

iteris®

949.270.9400
iteris.com

1700 Carnegie Avenue, Suite 100
Santa Ana, CA 92705

1) COVER LETTER

May 27, 2021

Ms. Gabrielle Hayes
Senior Civil Engineer
Public Works – Traffic
City of Orange
300 E. Chapman Ave.
Orange CA 92866

Re: Proposal for RFP 20-21.40 Regional Traffic Signal Synchronization Program Project (RTSSP) for Tustin Avenue – Rose Drive

08063-119.22

Dear Ms. Hayes:

The **City of Orange** (City) has built a modern and robust traffic system throughout the City and continues the process making good use of the Orange County Transportation Authority (OCTA) Traffic Signal Synchronization (TSS) program for the benefit of the community. This approach has allowed the City to maximize budgets by utilizing industry leaders to provide the City with best practices and solutions on arterial corridors throughout the City. It is important that the City's consultants deliver up-to-date solutions to ensure the implementations satisfy the current needs of the City while ensuring the City is ready for future technologies and the advantages these can bring.

This contract provides the perfect opportunity for the City to build on the past success by modernizing processes to take advantage of technology and improved communications to result in efficient and cost-effective delivery of traffic operations services for Tustin Avenue-Rose Drive.

Iteris, Inc. (Iteris) is pleased to submit this proposal to the City of Orange to provide services for the Regional Traffic Signal Synchronization Program Project for Tustin Avenue – Rose Drive project. Iteris is confident that we are the right firm to successfully manage this regional traffic signal synchronization project to design and integrate traffic system upgrades and update traffic signal timing in the Cities of Orange, Tustin, Santa Ana, Anaheim, Placentia, and Yorba Linda. Iteris staff know the corridor firsthand being residents of the City of Orange and drive the corridor nearly daily to and from work as well as for daily errands. **This constant use of the corridor directly benefits the project because this will result in nearly daily surveillance of the corridor by experienced traffic operation engineers during primary implementation as well as during the operation and maintenance period.**

Iteris has helped more cities in Orange County modernize their traffic signal systems than any other firm over the past 30 years. These Orange County cities, with expertise provided by Iteris, are now well-positioned to leverage the latest technologies, including connected vehicles and autonomous mobility, in an environment that also requires increased cybersecurity. Iteris is committed to helping the project stakeholders on this project achieve these same successes in traffic management to improve mobility and safety on this regional arterial.

Iteris' keys to working with the City to achieve its goals include:

EXPERTISE: The success of any project begins with the expertise of the people. Iteris staff are leaders in the industry at all levels of our organization. Our executive team coordinates with industry leaders from all over the world to help define and promote best practices in transportation. This interaction can vary from vendors that are developing connected vehicle technologies to access to Congressional bills being drafted **(including one bill currently being drafted by Senator Romney related to Smart Signals)** that could aid our clients in the pursuit of Federal Funding.

Our project delivery team, such as the staff in Orange County, delivers on some of the most demanding projects, including the I-405 Design-Build job and over 20 traffic signal synchronization projects for every city in Orange County.

FOCUS ON SAFETY AND MOBILITY: Iteris' mission is to help our clients improve safety and mobility for the smart transport of people, goods, and services. While technology and cloud solutions are providing agencies with more tools to achieve a Vision Zero roadway network, it is the expertise of firms like Iteris who implement the benefits of technology for agencies to achieve the goals of safer and more efficient mobility. Iteris is unique in the industry by offering a combination of transportation planners, traffic engineers, data scientists, software engineers, signal technicians, and traffic sensor developers, all with a focus on smart transportation. Iteris' ability to apply all these resources to aid the City of Orange and the project stakeholders to modernize and manage its traffic signal system makes Iteris the best choice to help the City achieve its project goals.

LEADERS IN TECHNOLOGY-BASED SOLUTIONS THAT IMPROVE AGENCY EFFICIENCY: The past few years have seen a shift in the industry away from labor-intensive activities to leveraging data and technology to work smarter and more efficiently. Gone are the days of having to wait for a public complaint to know there is an issue with signal timing. Gone are the days of having to drive to the field to inventory hardware to determine what needs to be replaced. Iteris' ClearMobility™ platform includes software solutions that offer SPM and Asset Management in a cloud environment that can be accessed in the office on a PC or in the field on a phone.

For the City, the results are safer intersections for the public, fewer trips to the field to troubleshoot, and a team of experts from Iteris who can develop the optimal solutions and leverage technology so that advanced system features are employed, such as traffic responsive, so that optimal timing is operating during surges in traffic or in the middle of a pandemic.

TRAVEL PATTERN SHIFTS BEYOND COVID-19 AND ECONOMIC CHANGES: Unprecedented changes due to COVID-19 have affected our communities and traffic patterns. Iteris has utilized our ClearGuide™ corridor performance measurement and traffic monitoring system to understand changes in travel behavior in Orange County and along the Tustin Avenue - Rose Drive corridor. This data driven, dynamic approach will be an input in the proposal for any new timing patterns during the life of this project.

Iteris acknowledges receipt of Addendum No. 1 (5/19/21). Iteris has review the Insurance requirements outlined within checklist and find them acceptable. This proposal is submitted subject to the successful negotiation of a mutually agreeable contract between Iteris and the City of Orange. This proposal and cost/rate schedule are valid for 90 days from date of submission.

I, Scott Carlson, PE, have the authority to bind and negotiate on behalf of firm. Thank you for the opportunity to submit our proposal. Iteris looks forward to assisting the City on this important project. Please contact me at (714) 724-7089 or sec@iteris.com, or the designated Project Manager (PM), Mr. Braulio Ramirez at (949) 270-9663 or BRamirez@iteris.com, should you have any questions.

Sincerely,
Iteris, Inc.

Scott Carlson, PE
Regional Vice President, Consulting Solutions

2) TABLE OF CONTENTS

Tables

Figures

3) PROJECT TEAM

Iteris strives to help clients solve the problems that are the focus of the project by providing solutions that work, solutions that innovate, and solutions that are smart. These are reasons why clients know Iteris as a firm that goes above and beyond expectations to make client projects successful. One method to achieve these goals is by offering solutions and quality control (QA/QC). **Leading the Iteris Team as Project Manager (PM) is Mr. Braulio Ramirez** and **Mr. Gabriel Murillo as Principal-In-Charge**. Braulio will oversee the project development process, meetings of all the client's needs, and making any presentations as necessary. Gabriel will support quality assurance/ quality control (QA/QC) and will work with the team to ensure the areas of the corridor that need extra attention are administered. This includes in North Orange the Lincoln Avenue intersection which is split phase east and west which results in delay for Tustin Avenue. Also, the driveways for In-n-Out Burger and Chick-Fil-A near Lincoln Avenue as well as the Car Wash driveway which all experience overflow onto Tustin Avenue blocking the curb lane essentially reducing the capacity of Tustin Avenue during peak high business demand. La Veta Avenue and the SR-22 freeway ramps also pose a challenge and experience significant delay that will be another focus area for QA/QC.

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Iteris has helped more cities in Orange County modernize their traffic signal systems than any other firm over the past 30 years.

Iteris has identified **7 task leaders and 6 project engineers** who will provide innovative engineering solutions on this **Regional Traffic Signal Synchronization Program** (RTSSP) project. These experts are the right team with the knowledge and engineering creativity to not only analyze the current conditions, but also to prepare this critical corridor for the traffic growth that is being experienced weekly as the County is opening more capacity to businesses as the Covid shutdowns are curtailing. Experience summaries for key staff are provided below. With the offices in Santa Ana (headquarters) and Los Angeles, Iteris has the resources of over **125 staff members** in California dedicated to Traffic Engineering & Operations, ITS and Transportation Engineering, available to meet all the needs of the City. Iteris' staffing plan is represented in the staff identified in the Iteris organization chart (**Figure 1**) for each of the categories in accordance with the RFP. Based upon the specific task order to be issued, Iteris has the experienced local staff as required to meet the scope and schedule.

Project Management and Team Organization

Braulio has over **16 years of experience** in providing professional services in planning, design and implementation of traffic engineering and ITS. He has served as PM and Deputy PM for OCTA and various agencies in Southern California on numerous outstanding ITS Design and Traffic Engineering experience. He will utilize this experience and the lessons learned from these past projects to ensure this project runs smoothly meeting all the project objectives. Some of his **relevant** projects include:

- City of Santa Ana, Harbor Blvd Traffic Signal Synchronization (TSS)
- OCTA, Brookhurst Regional Traffic Signal Synchronization (RTSSP)
- OCTA, Bristol Street Traffic Signal Synchronization Project (TSSP)
    - Iteris has provided a letter of reference for Iteris project team as proof of our success in delivery projects on time and on schedule in **Appendix A**.
- City of Corona, ATMS Master Plan Update, Grant Services, Engineering Design Services and Project Management Services
- City of Rancho Cucamonga, Professional Design and Construction Support for the TSS for ATMS

His expertise includes Intelligent Transportation Systems (ITS) Design and Traffic Engineering. He has served as Project Lead Engineer on numerous ITS, Transit Signal Priority (TSP), and traffic engineering projects. Additionally, Mr. Ramirez has had developed effective work relationship with the Cities of Orange, Laguna Niguel, Anaheim, Irvine and Buena Park by providing on-call traffic engineering services.

Braulio Ramirez, PE
Project Manager

Availability 60%

Current Position
Senior Engineer

Education & Registrations
BS, Civil Engineering
PE, CA #85189

Years with Iteris 14 years

AimTD LLC
Aim Traffic Data

To support the Traffic Counts task, Iteris is pleased to offer the services of AimTD LLC (AimTD). Iteris has teamed with AimTD on numerous projects in southern California and has always been pleased with their work. AimTD has over ten years of experience providing accurate traffic data collection and is both a certified Women Business Enterprise (WBE), and a certified Small Business Enterprise (SBE) Micro by the State of California. AimTD has experience and resources to perform all tasks under this contract within the required time frame professionally and accurately. They are known for reliable and cost-effective services and a high level of customer support.

Iteris' proposed team organization is provided in **Figure 1**. Resumes are included in **Appendix B.**

Figure 1 – Project Team Organization

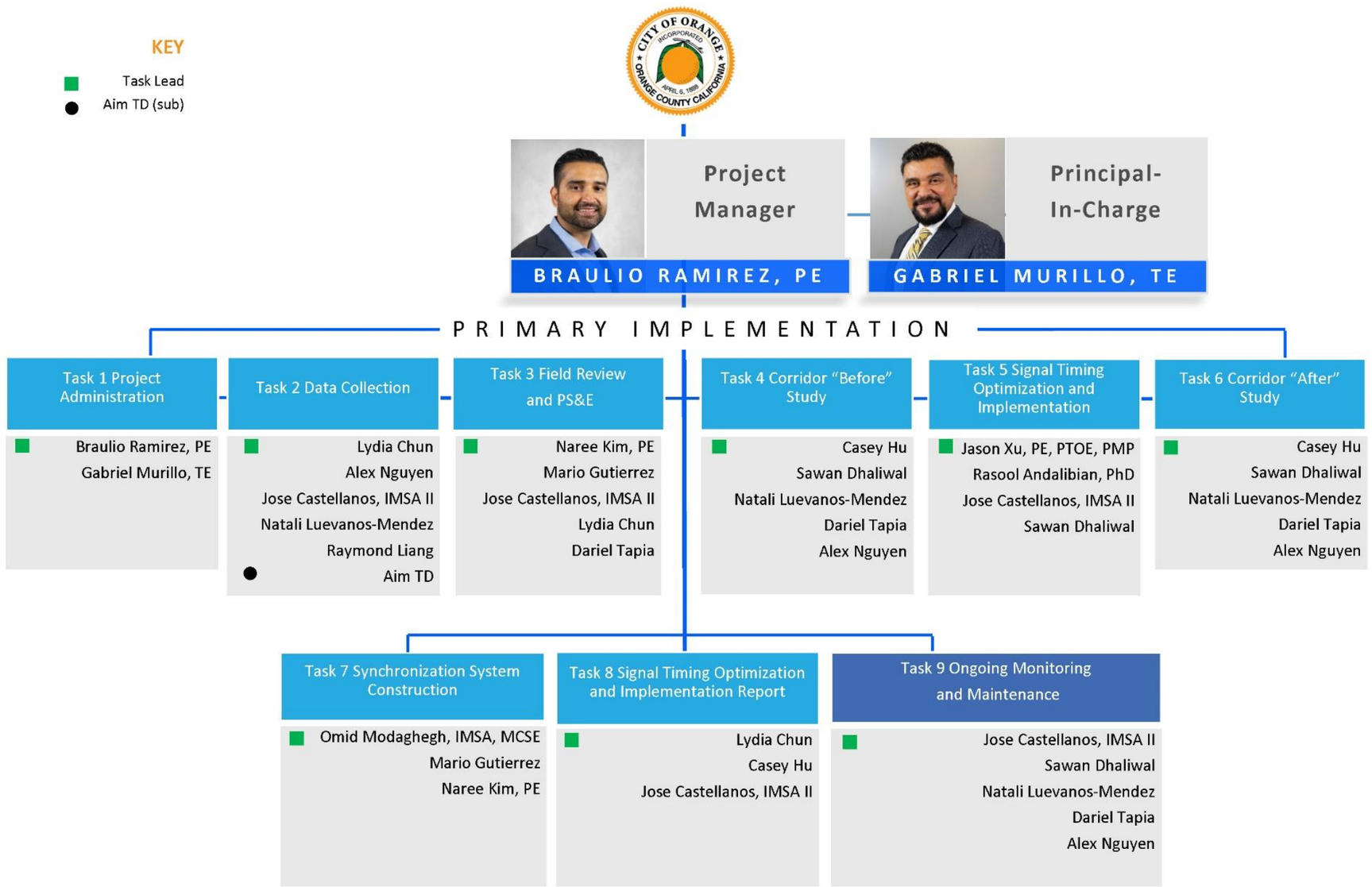


Table 1 summarizes the Iteris Team's key staff member roles, relevant qualifications and availability.

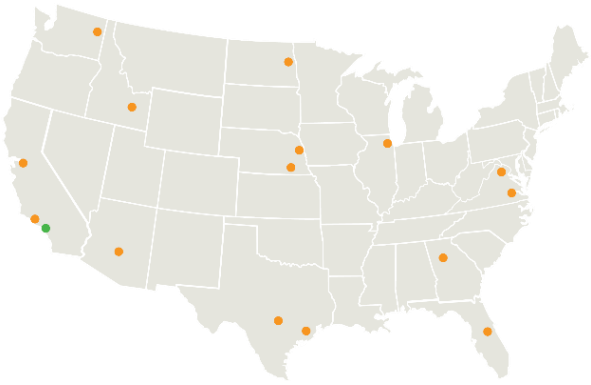
Table 1 –Staff Roles, TSS Experience and Availability

STAFF	ROLE	TRAFFIC SIGNAL SYNCHRONIZATION EXPERIENCE	AVAILABILITY
Iteris			
Braulio Ramirez, PE	Project Manager	• Santa Ana, Harbor Blvd RTSSP • OCTA, Bristol St RTSSP • OCTA, Main St RTSSP	60%
Gabriel Murillo, TE	Principal-In-Charge	• Lincoln Blvd RTSSP • OCTA, Pacific Coast Highway RTSSP • Anaheim, Orangewood RTSSP Project	40%
Naree Kim, PE	Task Leader - Field Review / PS&E	• Irvine, Irvine Center Drive-Edinger Avenue RTSSP • Irvine, MacArthur Ave RTSSP • OCTA, Katella Ave RTSSP	40%
Jason Xu, PE, PTOE, PMP	Task Leader – Signal Timing	• OCTA, Brookhurst RTSSP • SBCTA, San Bernardino Valley Coordinated TSS • Ventura Main St. TSS	40%
Jose Castellanos, IMSA II	Task Leader – O&M	• OCTA, Katella Ave RTSSP • OCTA, Pacific Coast Highway RTSSP • SBCTA, San Bernardino Valley Coordinated TSS	40%
Lydia Chun	Task Leader - Data Collection/Project Report	• Laguna Woods, El Toro Road TSS and O&M • Irvine, MacArthur Ave RTSSP • Irvine, Irvine Center Drive-Edinger Ave RTSSP • SBCTA, San Bernardino Valley Coordinated TSS	40%
Omid Modaghegh, MCSE, IMSA	Task Leader - Synchronization System Construction	• SBCTA, San Bernardino Valley Coordinated TSS • Anaheim, Orangewood TSS Project • OCTA, Pacific Coast Highway RTSSP	40%
Casey Hu	Task Leader - Before & After Studies	• SBCTA, San Bernardino Valley Coordinated TSS • Irvine, MacArthur Boulevard RTSSP • Irvine, Von Karmen RTSSP	60%
Rasool Andalibian, PhD	Project Engineer	• OCTA, Brookhurst RTSSP • SBCTA, San Bernardino Valley Coordinated TSS • OCTA, Pacific Coast Highway RTSSP	50%
Mario Gutierrez	Project Engineer	• OCTA, Brookhurst RTSSP • Irvine, MacArthur Ave RTSS • South Gate, Tweedy Blvd Signal Synchronization	50%
Sawanpreet Dhaliwal	Project Engineer	• OCTA, Main Street RTSSP • Irvine, MacArthur Boulevard RTSSP • OCTA, Katella Ave RTSSP	50%
Alex Nguyen	Project Engineer	• Irvine, Walnut Avenue/The Mall Traffic Signal Improvements • Irvine, Irvine Center Drive/Edinger Avenue RTSSP • LADOT, East San Fernando Valley Transit Corridor Project	50%
Natali Luevanos-Mendez	Project Engineer	• Irvine, Irvine Center Drive-Edinger Ave RTSSP • OCTA, Main St RTSSP • Laguna Woods, Moulton Parkway TSS	60%
Raymond Liang	Project Engineer	• OCTA, Katella Ave RTSSP • Rancho Cucamonga, Professional Design and Construction Support for the TSS for ATMS	60%

STAFF	ROLE	TRAFFIC SIGNAL SYNCHRONIZATION EXPERIENCE	AVAILABILITY
		• OCTA, Main St RTSSP	
Dariel Tapia	Project Engineer	• OCTA, Main Street RTSSP • Garden Grove, Traffic Signal Modifications for various intersections	70%
AimTD			
Edward Polunin	Traffic Data Collection - Project Manager	• Port of Long • City of Pasadena • LADOT • City of Santa Monica	40%
Olga Polunin, MBA	Traffic Data Collection - Project Director	• LADOT • City of Santa Monica • City of Pasadena • City of Torrance	30%
Manuel Espinoza	Traffic Data Collection - Field Technician	• City of Santa Monica • Port of Long Beach • City of Pasadena • LADOT	45%

4) EXPERIENCE AND QUALIFICATIONS

Iteris Background



Iteris is the market leader in smart mobility infrastructure management solutions to the transportation industry since 1987. Iteris' 425 staff have decades of expertise in traffic management, along with superior services and patented products that help detect, measure, and manage traffic and vehicular performance; minimize traffic congestion and improve safety; and empower Iteris clients with solutions to better manage their transportation networks. The firm is headquartered in Santa Ana, CA with nationwide coverage.

Iteris team members are experts in the fields of transportation planning, traffic engineering and ITS. Knowledge of these practice areas enables Iteris to provide comprehensive services ranging from initial traffic impact studies, transportation modeling, planning, systems engineering, and detailed design, through implementation, performance monitoring and systems management. Iteris combines the knowledge of transportation engineers, systems engineers, system integrators, software engineers and transportation planners to offer an unmatched combination of talent and experience. Iteris develops and deploys innovative solutions that help agencies improve safety, reduce traffic congestion, enhance transit use, monitor and manage transportation networks and provide greater access to reliable traveler information. Iteris was founded based on the principle of providing quality solutions on time and within budget. Committed to the transportation industry, Iteris applies in depth knowledge to solve the most challenging problems associated with the movement of people and goods to enhance a growing economy. Iteris delivers precise solutions that meet customer needs and expectations.

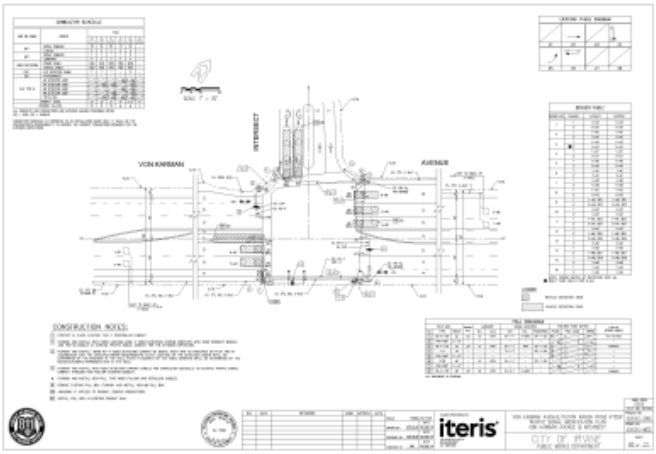
Iteris has extensive, relevant experience in Traffic Engineering, ITS Design and Traffic Signal Synchronization, and has worked with numerous agencies throughout California. Iteris' project experience ranges from planning and design to the implementation of multimodal transportation systems and signal synchronization plans which includes the following highlighted projects.

Technical Expertise and Staff Qualifications

Iteris specializes in the design, evaluation, and operation of intersections and arterials to improve the efficiency and safety of vehicular traffic flow, pedestrian mobility, transit operations, and bicycle traffic. Iteris has co-authored the industry standard **FHWA Traffic Control Systems Handbook** and has assisted multiple agencies throughout the U.S. in the development of signal operation standards.

TRAFFIC SIGNAL DESIGN

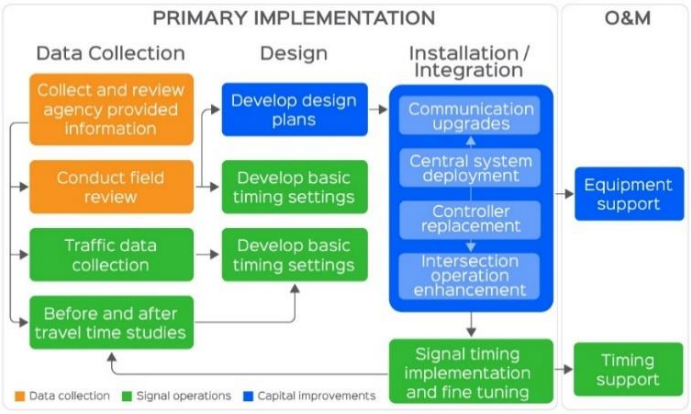
As a leader in traffic engineering, Iteris has extensive experience providing planning and design of traffic signals and associated systems to improve safety and efficiency, extend capital investment life, and modify and improve operations, including for transit and emergency vehicles, pedestrians, and bicyclists**. Iteris has been an integral part of design and deployment of thousands of signals nationwide.** Our approach stems from a comprehensive understanding of traffic operations, and our engineers strive to provide cost-effective and problem-solving solutions within our signal planning and design. Iteris has extensive experiences in all stages of design development from signal system analysis, evaluation, and master planning to detailed Plans, Specifications, and Estimates (PS&E), hardware selection, and integration of hardware in the field. We utilize our extensive equipment knowledge and experience to help municipalities implement the right solution for their needs.



- Traffic signal design and modification
- TSP and EVP implementation
- Signage and striping
- Detection selection and implementation
- Signal Performance Measures (ATSPM) modifications
- Traffic signal phasing
- Standard development
- Construction Assistance
- Testing and training

TRAFFIC SIGNAL TIMING AND SYNCHRONIZATION

Iteris excels in the assessment of existing traffic signal timing operations to improve the efficiency and safety of vehicular traffic flow, pedestrian mobility, transit operations and bicycle traffic. **Iteris has designed, deployed or equipped over 1/3 of the signalized intersections in the United States. This expertise and relevant experience acquired from projects throughout the country and the solutions that are required for unique challenges in various parts of the country will guarantee all signal timing projects have the best solution implemented.** Iteris continues to innovate in developing advanced solutions to complex problems with traffic operations. Iteris has extensive experience successfully completing numerous signal timing optimization projects throughout the country.



- Signal timing/coordination analysis
- Inter-jurisdictional and regional traffic signal coordination optimizations
- Traffic signal phasing
- Development of arterial traffic calming measures
- Transit Signal Priority (TSP) timing
- Before and after studies
- Area-wide street network analysis
- Vehicular and pedestrian safety
- Ongoing Operations and Maintenance (O&M)
- Construction assistance
- Training

TRAFFIC SIGNAL SYSTEM UPGRADE

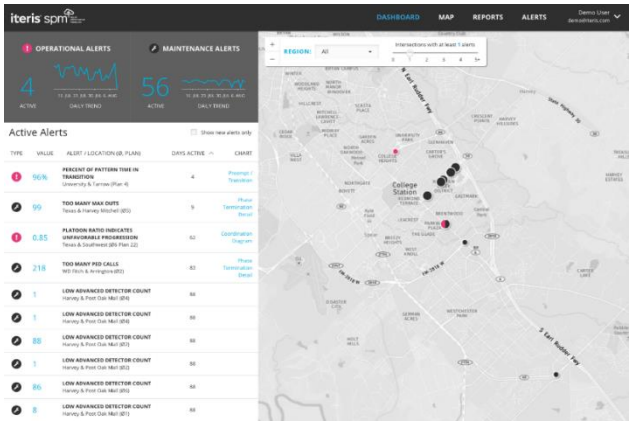
Iteris understands the importance of following the Systems Engineering (SE) approach when selecting a new or upgraded traffic signal system. Recommendations for such upgrades are based on the City's needs, available resources, and desired future growth. Iteris leverages Iteris' extensive experience with every signal controller and central system in the market to best guide Iteris clients when selecting a system. Iteris provides signal O&M support through physical or remote access to many agency central systems throughout Southern California. As users of various systems, from day-to-day operation to special event management, Iteris understands the features that have been, or will be implemented by each vendor/manufacturer. Furthermore, Iteris has provided troubleshooting and beta testing support of central systems that has resulted in numerous improvement modifications to these systems.

- System Evaluation and Selection
- Signal System Upgrade and Migration
- Intersection Configuration
- Intersection Graphics
- Signal System Alerts
- Operations and Maintenance (O&M)
- Special Event Operations
- Training

Proper and detailed documentation has been critical in Iteris' success in traffic signal system upgrades. This begins from identifying a standard, to providing the appropriate training and material to ensure every client is able to operate and maintain his/her specific system.

ADVANCED TRAFFIC SIGNAL PERFORMANCE MEASURES (ATSPM)

SPM is an emerging solution designed by Traffic Engineers for Traffic Engineers that will revolutionize the way agencies manage signal timing and safety at signalized intersections in the coming years. Iteris' SPM solution provides a proactive understanding of your arterial and intersection operations with clearer insights and actionable information, and is used by agencies across the Country to improve mobility and safety.



With Iteris' SPM, you can:

- Evaluate detailed, per movement/phase information at the intersection level, such as volumes, delay, and Level of Service
- Understand causes of intersection congestion/ delay
- Provides a feedback loop to improve real time signal/arterial operations
- Access transportation network effectiveness and system delay
- Before/after studies, including comparison of real-time to historical data
- Volume at the intersection level

ITS INTEGRATION

Integration – Systems integration is a key component of successful multimodal, regional multi-agency, and complex operating environments. Specialized engineering expertise and skillsets are necessary to overcome all institutional challenges, whether deploying a new system, expanding a legacy system, or aggregating subsystems. Iteris utilizes its extensive experience in complex system engineering, design, product development, systems integration, implementation, system acceptance testing and continued operational maintenance, to integrate all necessary aspects of a complete system including but not limited to hardware, software, and the user-interface into a fully-functional, cost-effective, and turnkey solution. Iteris is committed to providing high-quality products, integrated solutions, and around-the-clock support to meet the client's needs during the entire lifecycle of the program and keep them up and running well into the future.

Integration

- Systems Design, Engineering, Management, Installation, Integration, Implementation
- Hardware and Software Development

Iteris understands customer relationships and what it takes to facilitate agreements among stakeholders, as well as implement and operate multi-jurisdictional or intermodal systems. When it comes to understanding the connection between subsystems, program phasing, interagency communications, and integration, Iteris has the experience to deliver superior results time and again. With backgrounds in systems engineering, in-house testing of all customer hardware/software, object-oriented development, and hardware/software development, Iteris provides integrated solutions which solve current and future transportation challenges before they arise. Additionally, Iteris develops and documents system requirements as well as performs system acceptance testing to ensure results meet system requirements. Iteris understands its client's needs and provides cost-effective system solutions to complete the most complex tasks on-time and within budget. At the conclusion of a project, Iteris ensures that the client has a fully-functional system they understand and can utilize for years to come.

CONSTRUCTION SUPPORT/INSPECTION

Iteris keeps traffic moving during project construction. The firm's ITS, traffic engineering, and transportation planning experts provide a dynamic combination of skills to anticipate traffic management challenges, implement traffic control plans, and design during the different phases of development. Iteris has significant experience in building consensus on construction period traffic patterns among public agencies, business owners, and the public. Iteris also designs temporary installations of traffic control devices such as video/radar detectors, Dynamic Message Signs (DMS), and ramp meters that can be relocated during various stages of construction. Traffic Management Plans (TMP) frequently utilize portable DMS and highway advisory radio. Iteris prepares plans for temporary parking, temporary access to adjoining properties, and transit service and mitigation measures on detour routes. Iteris is fully acquainted with many local agency and Department of Transportation guidelines and requirements for TMP. Iteris also provides program and project management assistance during construction by serving as an extension of agency staff, directly interfacing with adjacent cites, Caltrans, utility companies, and third-party contractors. Iteris will ensure projects are deployed according to plans and specifications, on schedule, and within budget. Iteris staff can be available to support the activities listed below:

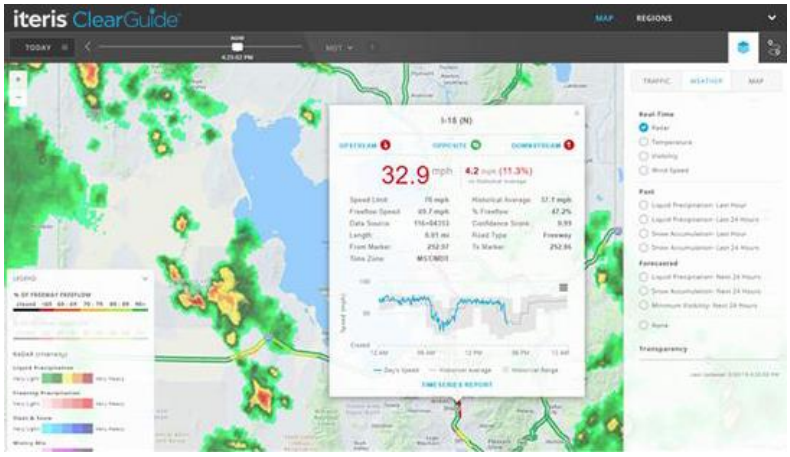
- Communications Infrastructure
- Community Outreach
- Detour Plans
- ITS Surveillance Elements
- Pre-construction Planning
- Signing and Striping Plans
- Staged Construction Analysis
- Traffic Maintenance
- Traffic Management Centers
- Traffic Management Planning
- Traffic Signal Systems

- Attendance at pre-bid meeting
- On-site construction support
- Assistance with bid process, selection and award
- Communicating through agency staff, respond via phone and email to requests for information by contractor or agency staff
- Support approval process of submittals and shop drawings by contractor

CLEARGUIDE™

Iteris' ClearGuide software solution measures and manages transportation networks, providing actionable information to optimize the flow of entire networks and to ensure the effectiveness of signal timing deployments are maintained throughout the project duration.

Moving Ahead for Progress in the 21st Century (MAP-21) emphasizes performance management and monitoring across multiple transportation modes, and in particular identifies reducing congestion and improving reliability of the transportation system among the priority performance goals. Supporting annual traffic management and operations performance reporting by actively identifying key measures to help inform how agencies can better operate the regional systems to improve efficiency.

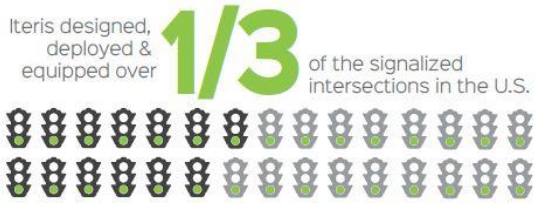


Iteris' ClearGuide provides:

- Reliability measurement of the transportation on network
- Benefit/cost analysis of delay and congestion on to your entire transportation on network
- Project evaluation on using before and after analytics
- Weather visualization in conjunction with traffic
- Predictive and actionable information
- 3rd party traffic data ingestion and processing
- Bottleneck reporting and visualization

Relevant Traffic Signal Synchronization Project Experience

Iteris has extensive, relevant experience in Traffic Engineering, ITS Design and Traffic Signal Synchronization, and has worked with numerous agencies throughout California. Iteris' project experience ranges from planning and design to the implementation of multimodal transportation systems and signal synchronization plans which includes the following highlighted projects.



ITERIS, INC.

OCTA TRAFFIC SIGNAL SYNCHRONIZATION (TSS) PROGRAM

ORANGE COUNTY, CA

Key Staff	Gabriel Murillo, Jason Xu, Jose Castellanos, Braulio Ramirez, Naree Kim
Duration	1/2015 – Ongoing

Project Outcome and Relevance: Cross-jurisdictional signal synchronization involving different TMC central systems and multiple Caltrans intersections.

Iteris has been retained by the Orange County Transportation Authority (OCTA) and local agencies since 2008. As part of the on-call contracts, Iteris has been tasked with providing the following services:

- Design and installation of communication system (Ethernet-over-copper, fiber optics, and/or wireless)
- Traffic signal controller hardware and software implementation
- Central traffic signal system installation and integration
- Traffic Management Center (TMC) upgrade
- Installation of GPS units at State-owned intersections
- Detailed vehicular, pedestrian, and bicycle data collection
- Signal synchronization analysis to provide weekday (AM, MD, PM) and weekend coordination timing plans
- Signal timing implementation at agencies' TMC
- Observations of new timings in the field and fine-tuning of timings at agencies' TMCs
- Operation and maintenance support

Iteris has been re-selected as the highest ranked firm in 2012 and then again in 2015) for a multi-year on-call contract to provide traffic signal engineering and regional synchronization services throughout the County.

To date, Iteris has either completed or is currently working on the following projects as part of our on-call services with OCTA:

- Katella Avenue (9 agencies; 68 signals, 17 miles. Fee= $674,000)
- Warner Avenue (5 agencies; 43 signals, 13 miles. Fee= $703,630)
- Pacific Park / Oso (6 agencies; 32 signals, 8 miles. Fee= $557,770)
- Trabuco Road (2 agencies; 14 signals, 5 miles. Fee=$319,000
- Newport Boulevard (3 agencies; 33 signals, 7 miles. Fee= $1,406,270)
- Bristol Avenue (4 agencies; 42 signals, 8 miles. Fee= $2,160,360)
- Pacific Coast Highway (1 agency, 27 signals, 11 miles, Fee=$2,016,238)
- Brookhurst Avenue (6 agencies, 59 signals, 16.5 miles, Fee= $$3,534,110)
- Main Street (3 agencies, 67 signals, 12 miles, Fee= $3,640,000) SEE FULL PROJECT DESCRIPTION BELOW
- Katella Avenue (7 agencies, 73 signals, 20 miles, Fee= $4,800,000) SEE FULL PROJECT DESCRIPTION BELOW
- Warner Avenue (3 agencies, 42 signals, 14 miles, Fee= $5,000,000)

OCTA MAIN STREET REGIONAL TRAFFIC SIGNAL SYNCHRONIZATION PROJECTS (RTSP) – ORANGE COUNTY, CA

Key Staff	Bernard Li (PM), Braulio Ramirez (PS&E and Integration Lead), Casey Hu, Sawan Singh Dhaliwal, Jose Castellanos, Raymond Liang, Lydia Chun (Project Engineers)
Duration	12/2019 – Ongoing

Project Outcome and Relevance: Signal synchronization along major arterials and synchronization with Caltrans intersections.

Iteris was selected by OCTA for a $3.6 million regional traffic signal synchronization project along 12 miles of the Main Street corridor extending through the Cities of Orange, Santa Ana, and Irvine in Orange County, California. The three-year project includes signal coordination and timing improvements, with the aim of improving traffic flow, enhancing public safety and decreasing stops. Under the project agreement, Iteris will provide services that will upgrade traffic signal electronics and communications equipment, and optimize signal timing along Main Street, a major north-south corridor that comprises 67 major signalized intersections.

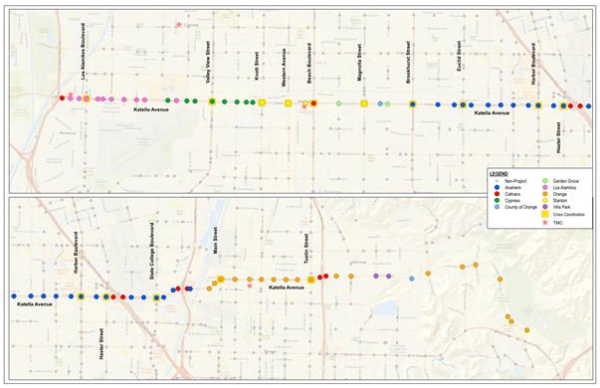
As part of the project, Iteris' Intersection-as-a-Service™ end-to-end solution offering will deliver proactive monitoring of traffic signal operations at all project intersections. The primary goal of this project is to deploy new Intelligent Transportation System (ITS) equipment and communication infrastructure to support the management of the cities' transportation network, implement optimized coordination timing plans to achieve optimal traffic flow, and improve safety for all road users, including vehicles, buses, bicycles and pedestrians.

Iteris is proud to support OCTA's goal of improving the safety and mobility of road users by embarking on this traffic signal synchronization project. This initiative will ultimately help increase the value and effectiveness of the region's existing transportation infrastructure, while improving air quality and reducing fuel consumption.

OCTA KATELLA AVENUE REGIONAL TRAFFIC SIGNAL SYNCHRONIZATION PROJECTS (RTSP) – ORANGE COUNTY, CA

Key Staff	Gabriel Murillo (PM), Jason Xu (Signal Timing Lead), Omid Modaghegh (Integration Lead), Naree Kim (Data Collection Lead), Jose Castellanos, Mario Gutierrez (Project Engineers), Casey Hu, Sawan Singh Dhaliwal, Lydia Chun
Duration	2/2020 – Ongoing

Project Outcome and Relevance: Signal synchronization along major arterials and synchronization with Caltrans intersections.



Iteris was selected by OCTA for a $4.7 million regional traffic signal synchronization project along approximately 20 miles of the Katella Avenue corridor extending through the Cities of Anaheim, Cypress, Garden Grove, Los Alamitos, Orange, Stanton, Villa Park and the County of Orange jurisdictions in Orange County, California. The three-year project includes signal coordination and timing improvements, with the aim of improving traffic flow, enhancing public safety and decreasing stops. Under the project agreement,

Iteris will provide services that will upgrade traffic signal electronics and communications equipment, and optimize signal timing along Katella Avenue / Villa Park Road / Santiago Canyon Road, a major east-west corridor that comprises 73 major signalized intersections.

As part of the project, Iteris' Intersection-as-a-Service™ end-to-end solution offering will deliver proactive monitoring of traffic signal operations at all project intersections. The primary goal of this project is to deploy new Intelligent Transportation System (ITS) equipment and communication infrastructure to support the management of the cities' transportation network, implement optimized coordination timing plans to achieve optimal traffic flow, and improve safety for all road users, including vehicles, buses, bicycles and pedestrians. Iteris is proud to support OCTA's goal of improving the safety and mobility of road users by embarking on this traffic signal synchronization project. This initiative will ultimately help increase the value and effectiveness of the region's existing transportation infrastructure, while improving air quality and reducing fuel consumption.

ON CALL TRAFFIC ENGINEERING/PLAN CHECKING/DESIGN/PUBLIC WORKS INSPECTION SERVICES – CITY OF ORANGE, CA

Key Staff	Gabriel Murillo (PM), Naree Kim (Construction Support/Inspection Task Lead), Braulio Ramirez (Design/Plan Check Task Lead), Jason Xu (Signal Synchronization Task Lead)
Duration	9/2017 – Ongoing

Project Outcome and Relevance: Provided traffic engineering design and planning services per request base including plan checking.

Iteris has been providing traffic engineering and transportation planning services on an on-call basis to the City of Orange for several years. As part of this contract, Iteris staff has executed task orders such as the review of traffic control plans as well as the City's annual pavement plan. Iteris developed new signal timing plans for the new signal at the Santiago Canyon Road/Holy Sepulcher Cemetery Driveway intersection, including generating new basic timing parameters to match the latest state and City standards. In addition, Iteris prepared a peer review of an existing TIA for Sunrise Assisted Living at Lincoln/Oceanview, which included a high level review of an existing TIA and identifying whether implementing a signal would be feasible even if the study showed that no signal was warranted. Other measures to alleviate resident complaints were considered as well. Iteris evaluated the option of implemented a mini-roundabout at Palmyra Avenue and Glassell Street, which included alternatives and potential costs. Iteris also prepared a simulation to identify potential operational issues was also completed along Palm Avenue between Cypress Street and Glassell Street with a pedestrian scramble intersection. Lastly, Iteris' services included preparing traffic control plans per the City's preference (on aerial background) for events in the City, such as the Orange May Parade and an event on July 3rd.

ARTERIAL REHABILITATION PROJECT (TRAFFIC SIGNAL MODIFICATION)

CITY OF PLACENTIA, CA

Key Staff	Naree Kim (PM), Mario Gutierrez (Design Lead), Casey Hu (Project Engineers)
Duration	7/2019 – 1/2021

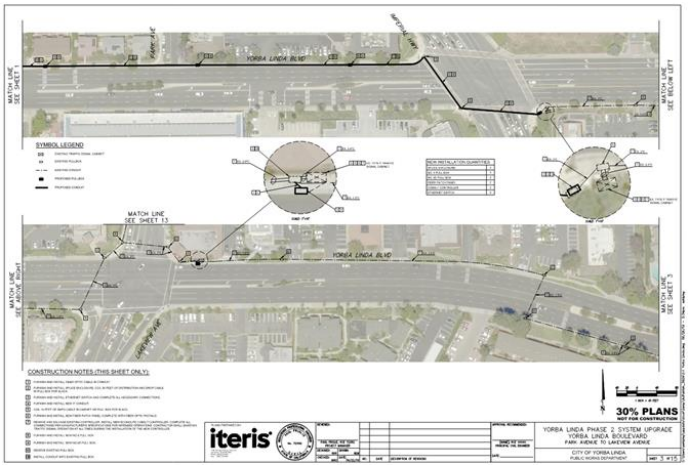
Project Outcome and Relevance: Provide traffic engineering design services for three locations for traffic modification including communication and ITS upgrades and extended the service during construction phase. Iteris is the project traffic engineer on a consultant team that provides full PS&E design and signal timing review services to the City of Placentia for the Arterial Rehabilitation Project. For the PS&E phase, Iteris is responsible for the signal modification design of three (3) project intersections. Iteris was also responsible for updating the basic timing parameters for all project intersections. Two (2) of the project intersections include upgrading the phasing and necessary signal equipment to provide flashing yellow operations. Other key improvements included new poles and mast arms, video detection system installation, full signal re-wiring, and CCTV camera relocation.

ITS PHASE 2 CONCEPTS COMMUNICATION UPGRADE PROJECT

CITY OF YORBA LINDA, CA

Key Staff	Paul Frislie (PM), Naree Kim (Design Lead)
Duration	2/2019 – 12/2019

Project Outcome and Relevance: Provided traffic engineering design and ITS services to develop City-wide ITS phase 2 concept plans and estimates.
Iteris was the lead design firm to provide concept fiber optic design plans for the City of Yorba Linda's ITS Phase 2 program. The concept plans will provide the City with details to pursue funding for detailed design and construction. The project limits are along Yorba Linda Boulevard between Casa Loma Avenue, Casa Loma between Yorba Linda Blvd and City Hall, Lakeview Avenue between Yorba Linda Blvd and Lemon, and Lemon Avenue and Main Street. The project also includes the concept design for a changeable message sign (CMS) along Imperial Highway south of Kellogg. Including the conceptual plans, Iteris provided a baseline construction cost estimate.



AIMTD LLC.

ON-CALL TRAFFIC DATA COLLECTION - YORBA LINDA, CA

Reference	Tony L. Wang, P.E, TE, PTOE, Traffic Engineering Manager, (714) 961-7170, twang@yorbalindaca.gov
Duration	2018 - Ongoing

AimTD was selected to conduct 2018 citywide average daily traffic counts at 147 locations. In 2019, AimTD collected citywide speed study measurements for use in Engineering and Traffic Survey at 125 locations as a sub-consultant to Lin Consulting. Currently, AimTD provides Intersection Turning Movement Counts, Bicycle and Pedestrian Counts, Average Daily Traffic Counts and Speed Surveys on as needed basis and as a part of the On-Call Contract with the City of Yorba Linda.

OCTA CMP TRAFFIC DATA COLLECTION – ORANGE COUNTY, CA

Reference	Archie Tan, TE, OCTA, Senior Transportation Modeling Analyst, (714) 560-5845, atan@octa.net
Duration	2018 - 2019

OCTA is the designated Congestion Management Agency (CMA) for Orange County. To ensure local jurisdictions' continued eligibility for state gas tax funds made available through Proposition 111, local jurisdictions must meet certain roadway Level of Service (LOS) standards. As the CMA, OCTA collects and compiles the traffic data needed to monitor local jurisdiction compliance with the LOS standards. AimTD was selected to collect data that provided traffic data input for the 2019 Congestion Management Program (CMP). The tasks included:

- Intersection Turning Movement Counts, at 101 intersections, 3 days, Tuesday, Wednesday and Thursday, AM and PM peak hours
- 48- hour Pedestrian /Bicycle ADT counts at 20 locations
- 24- hour Mid-Block ADT Counts at 50 locations
- Supplemental Intersection Turning Movement Counts at 13 locations
- Supplemental Travel Time Runs for SR-91 between SR-57 and I-15 for AM Peak period and PM Peak period. (32 runs)

5) PROJECT UNDERSTANDING AND APPROACH

Project Understanding

Tustin Avenue-Rose Drive is one of the primary north-south arterials with a mix of residential, retail business, light industrial, and highway-oriented commercial land uses which is parallel to SR-55. This project will provide ITS upgrades, new traffic signal control equipment, communication improvements, and traffic signal synchronization for 54 signalized intersections along a 11.4-mile segment of Tustin Avenue-Rose Drive in the Cities of Yorba Linda, Placentia, Orange, Anaheim, Santa Ana, Tustin, and Caltrans jurisdictions. We view this project as a critical way to have a high level of integrated signal operation to enhance mobility and safety for all roadway users and to reduce congestion and traffic impacts within local communities.

The main goals of this project are:

- Implementing traffic operations improvements that enhance public safety for all modes of transportation
- Improving traffic progression and operations
- Reducing traffic delays and decreasing stops
- Cultivating proactive traffic management by leveraging technologies like SPM through improved ITS / communication infrastructure

To achieve these goals, Iteris will closely work with project stakeholders to undertake all the activities as summarized in the scope of work of the RFP. To demonstrate Iteris' commitment to delivering the City of Orange and the Stakeholders the best results for safe and efficient mobility along the corridor, our staff has conducted considerable field work along the project corridor in support of our proposal. **Figure 2** provides a map of the corridor, its characteristics and key observations made through our field reconnaissance and per the RFP.

Iteris also understands that we are in an unprecedented time due to the COVID-19 pandemic that changes our lifestyles and traveling behavior, which also presents challenges to transportation that we have never seen before. **Iteris is the only firm that can offer comprehensive analytics provided by ClearGuide™ platform to achieve real-time monitoring of the changing traffic patterns that will contribute to the most suitable signal timing**.

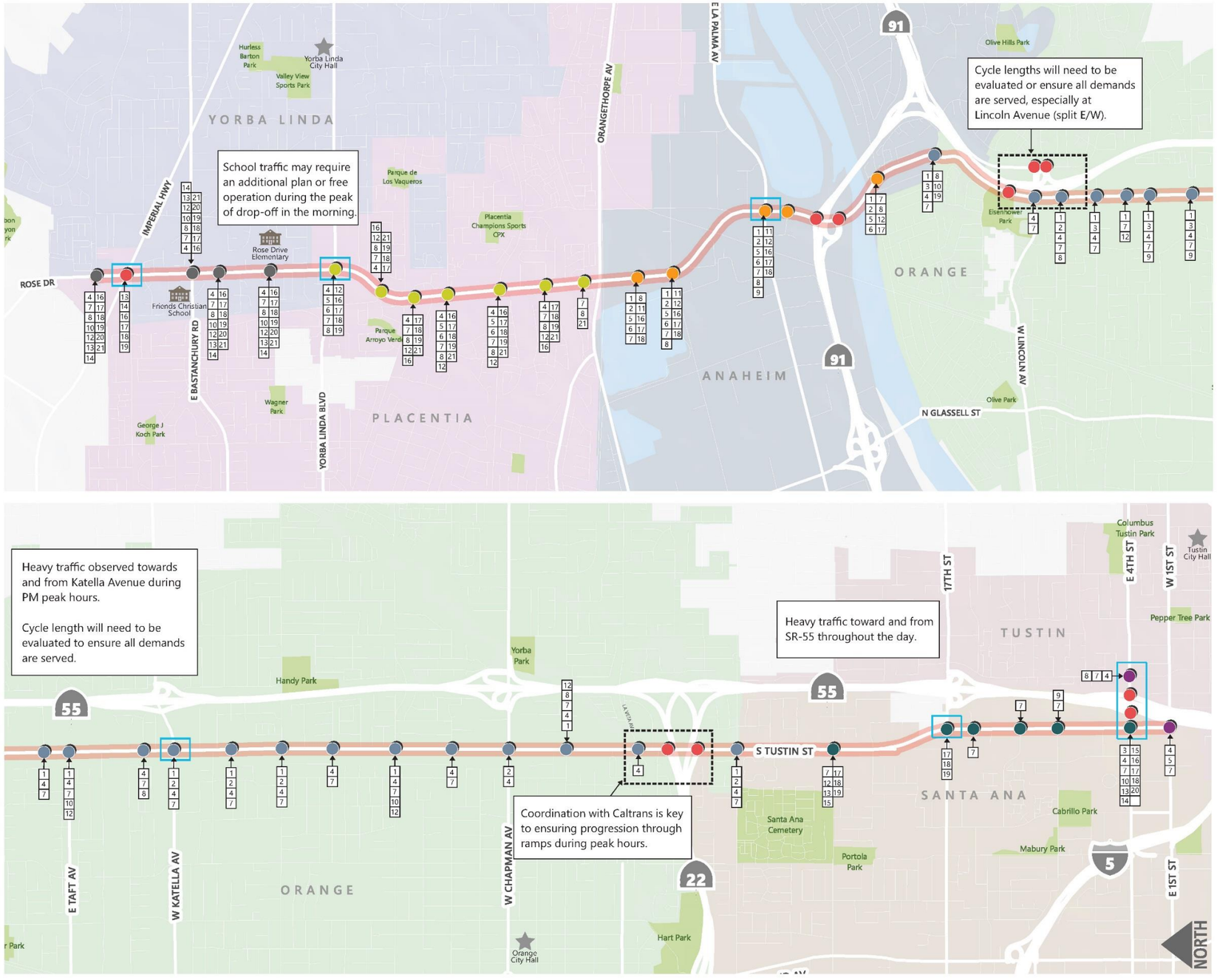
Iteris is aware of the impacts due to COVID-19 which presents challenges to transportation. Iteris will utilize analytics tools to provide real-time monitoring of the changing traffic patterns

Table 2 summarizes the impacts due to COVID-19 and potential changes in traffic patterns in the post COVID-19 era. While these changes significantly reduced traffic levels, the improvements experienced with reduced Covid infections are allowing for more opening of businesses and after a year of "lockdown" people are ready to get out and based on recent traffic levels, Orange County residents are going out. Thus, traffic levels are growing but not quite fully restored to the levels pre-covid.

TRAFFIC SIGNAL SYSTEM UPGRADES AND INTERSECTION ITS IMPROVEMENTS

This project intends to modernize each City's traffic signal system along Tustin Avenue-Rose Drive to take full advantage of the opportunities and benefits offered by new ATC standard controllers and central system software. All participating cities also intend to utilize new smart camera technology, which will provide state of the art detection for traffic signal operation and will be used in conjunction with the City's fiber optic communication network to provide CCTV images and traffic data to a central system user. There are specific needs for each City that the following improvements will address as shown in **Table 3.**

Figure 2 – Project Map Improvements



Legend

Signalized Intersections

- City of Anaheim (5)
- City of Santa Ana (6)
- Caltrans (10)
- City of Tustin (2)
- City of Orange (20)
- City of Yorba Linda (4)
- City of Placentia (7)

Project Corridor
TMC / City Hall
Parks
Schools
Water
Cities

Improvements

= Cross Coordination

1. EVP (All Directions)
2. Video Detection System
3. UPS
4. ATSPM Including O&M AI Applied Cell Site
5. ADA Pushbutton Assembly
6. Pedestrian Countdown Heads
7. New Controller
8. SDLC Cable
9. New Cabinet with New Foundation
10. New Cabinet (Reuse Existing Foundation)
11. Bluetooth Travel Time Unit
12. CCTV Camera
13. 6E Pull box and Splice Enclosure
14. Fiber In New Conduit
15. Fiber in Existing Conduit
16. Fiber Distribution Unit (FDU)
17. Fiber Switch/Ethernet Switch
18. Patch Panel and Fiber Splicing
19. Ethernet Switch and/or Cell Modem
20. CENTRACS Integration + System Graphics
21. CENTRACS System License or CENTRACS System Modules

iteris®

0 0.25 0.5 1 Miles

Table 2 – Land Uses along Tustin Ave – Rose Dr and Potential Traffic Pattern changes due to COVID

EXISTING LAND USE	EXAMPLES	TYPICAL TRAFFIC PATTERNS	POTENTIAL CHANGES DUE TO COVID-19	IMPACTS OF CHANGES ON TRAFFIC PATTERNS	SOURCE OF DATA DRIVEN DECISIONS
SCHOOLS	• Friends Christian School • Rose Drive Elementary School • The Open School • Calvary Christian School	Morning drop-off and afternoon pick-up with some pick up later in the day due to after school day care. High concentration of traffic (vehicle, pedestrian, bike) during a short peak period.	Changing start times, splitting number of students on campus at any one time.	Lower traffic volumes during peak periods and new peaks if school is conducted in shifts or start times are delayed	SPM data to identify new peaks at intersections near schools.
RECREATIONAL/ PARKS	• Eisenhower Park • Carbon Canyon Reginal Park	Demand driven by day of week, time of day and weather. Typically, traffic demand highest on warm weekends and weekday evenings.	Limited accessibility or usage of recreational facilities with sports activities cancelled	More people congregating at parks and public outdoor spaces	ClearGuide probe-based origin-destination data and probe-based volume changes to identify hot spots during different days and seasons
RESIDENTIAL	• Mix of high density • Single family dwellings • Senior/assistant living	Shorter cycle lengths preferred in residential area. Shorter wait time on side streets or left turns is often requested by residents.	Increased numbers of people working from home when possible. Less likely to join carpools or transit. More likely to walk in the neighborhood	Likely to see traffic demand spread through the day, which will flatten the curve of peak hour volumes. Net increase is likely over time due to less transit and carpool trips. More pedestrians.	ClearGuide data to verify traffic volumes changes. SPM data to verify pedestrian push button actuations at intersections.
RETAIL/ SHOPPING/ RESTAURANTS	• Big box stores • Local based smaller retail • Sit-down restaurants • Fast food restaurants	More traffic was observed around lunch hours and weekends, especially around holiday seasons	Smaller groups allowed in shops and restaurants. Big box/ grocery stores expected to continue to see increased volume of customers.	More curbside pickup for restaurants and retail. More drive-thru at fast food restaurants. More traffic at grocery stores.	ClearGuide data to identify traffic volumes fluctuations. SPM data to check turning movements at shopping center signalized intersections
OTHER	• Churches • Office/medical buildings	High concentration of traffic during short peak periods (e.g. Sunday for churches and weekday AM and PM for office buildings)	Changing or staggered start times, smaller turnout for physical distancing	Traffic demand spread through the day with lower traffic volumes during peak periods but potentially more peaks	SPM data to identify new peaks at intersections.

Table 3 - Project Improvements Summary

AGENCY	INTERSECTION				COMMUNICATION		TMC
Tustin (2 signals)	• ADA Push Buttons • Cobalt ATC Controller	(2) (2)	• Radar Detection	(2)	N/A		• ATSPM
Santa Ana (6 signals)	• UPS • ATC Controller	(1) (5)	• Controller Cabinet • VDS	(1) (1)	• Fiber upgrades in existing conduit • Ethernet Switches at 3 intersections	• CCTV camera at one intersection	• ATSPM • Centracs licenses or modules
Orange (20 signals)	• ATC Controller • EVP • UPS	(18) (14) (4)	• Controller Cabinet • VDS	(5) (6)	• Ethernet Switch at one intersection	• CCTV Cameras at 4 intersections	• Iteris SPM
Anaheim (5 signals)	• ATC Controller • Controller Cabinet • VDS	(5) (1) (4)	• Push Button • Pedestrian Head • Blue Tooth	(4) (4) (3)	• CCTV Cameras at 3 intersections	• Fiber upgrades at 4 intersections in existing and/or new conduit	
Placentia (7 signals)	• Push Button • Pedestrian Head	(3) (3)	• ATC Controller	(7)	• CCTV Cameras at 6 intersections • Fiber upgrades in existing and new conduit	• Ethernet Switches at 6 intersections	• ATSPM • Centracs licenses or modules
Yorba Linda (4 signals)	• ATC Controller	(4)	• Controller Cabinet	(4)	• CCTV Cameras at 4 intersections • Fiber upgrades in existing and new conduit	• Ethernet Switches at 4 intersections	• ATSPM • Centracs licenses or modules
Caltrans (10 signals)	• N/A	N/A	• N/A	N/A	• Fiber in new conduit	• Ethernet switch at 1 intersection	• N/A

ITS AND COMMUNICATION UPGRADES

Installation of conduit and fiber optics communication system: The Cities of Yorba Linda, Placentia, Anaheim, and Santa Ana will be installing fiber optic communication along the corridor within their jurisdiction by using existing and new conduit infrastructure. During our field reconnaissance in the City of Yorba Linda, it was noted that there can be potential savings by using existing advance loop detection conduits (~450' of existing conduit, which is about $20k in savings by not installing new conduit) at the Pedestrian Crossing (Equestrian Crossing) and School Crossing to install the fiber. Since new conduit will be installed for most of the corridor within Yorba Linda, construction costs will be very expensive. By using as much existing conduit as possible, the City can potentially apply the savings for something else.

The City of Placentia will use most of the existing conduit infrastructure for the proposed fiber optic cable, except within the limits of Rose Drive/Del Cerro and Del Cerro/Orangethorpe Avenue. The Cities of Anaheim and Santa Ana will be installing fiber optic cable in existing conduit. Tustin Avenue at 17th Street in Santa Ana has fiber optic communication (96 smfo going west), which will be the termination point to bring Santa Clara online via fiber.

Upgrading traffic signal and communication hardware: This activity will include upgrading traffic signal controllers and controller cabinets, pedestrian push buttons, countdown pedestrian heads, emergency vehicle preemption (EVP), video detection systems (VDS), and CCTV cameras. The communication hardware upgrade includes fiber Ethernet switches, splice enclosures, fiber distribution units and pull boxes. For the City of Santa Ana, the RFP calls for replacing the CPU in the existing controllers; however, we recommend that the City install new controllers instead because power supplies and screen displays are more likely to fail in older controllers. Coordination with Caltrans will be necessary to install new conduit, fiber optic cable and communication equipment at Tustin Avenue and Imperial Highway intersection. Iteris is very familiar with the Caltrans encroachment permit process and will apply the permit early on to prevent project delay.

TMC improvements: As part of the Main Street RTSSP project that Iteris is currently working on, the City of Santa Ana is upgrading their ATMS to Centracs with 70 licenses, and upgraded the City of Orange's Centracs System software to a newer version. The Tustin Avenue-Rose Drive RTSSP project will expand the ATMS software capabilities and install Signal Performance Measures (SPM) for various cities within the corridor, which is a great tool to monitor how signalized intersections are performing in real time. As mentioned before, during these unprecedented times with COVID-19, traffic patterns can vary from day-to-day. SPM can provide traffic data on a lane-by-lane basis to help improve efficiency as traffic returns back to normal.

> Iteris will continuously identify cost saving measures during our design and pass the savings back to the agencies for additional equipment

Integration and testing of the system: After construction is completed, all equipment will be tested to ensure it operates as intended. Iteris offers full-service traffic information management systems, bringing clients end-to-end solutions. For all the participating agencies, we will ensure the new communication system will connect all of the field elements to the respective TMCs. Our networking certified staff provide a value-add service by ensuring the system remains operational at all times.

Scope of Work

TASK 1: PROJECT ADMINISTRATION

Iteris strongly believes that excellent project management and continuous project communication are essential in the successful completion of for multi-jurisdictional TSS projects. This is not only true during the implementation phase but also for the O&M phase of the project when any degradation of corridor performance is measured and changes are needed. Thus, at the initiation of the project, **Mr. Braulio Ramirez** will lead a project kick-off meeting with participating agencies, either in-person at the City or virtually as required in these uncertain times. As part of this meeting, communication channels and protocols will be established, the scope of work, schedule, and budget will be discussed, necessary information will be gathered, and a thorough understanding of the goals of the project will be obtained. These procedures will be summarized in a Project Management Plan. Additionally, second kick-off meeting will be followed with the partner agencies to identify specific goals and develop effective strategy to complete the project.

Iteris takes great pride in its proactive methods for staying in contact with project clients. Iteris understands that City staff has other jobs to perform outside of this project and want to be as efficient and effective as possible with their time. Thus, project management techniques will be modified to meet the City's needs as well as catered towards the requirements of OCTA on these types of projects. Iteris also strives to ensure that meeting notes are developed after every meeting, which capture the items covered and decisions made.

Project Management and Contract Administration will be ongoing throughout the duration of the project, including the two-year time period allocated for monitoring and maintaining the system after construction of improvements and implementation of optimized timing plans. Iteris will assist City in preparation and submittal of responses to OCTA and other stakeholders regarding deployment of this project and signal performance.

Mr. Gabriel Murillo, Principal-in-Charge, will also be responsible for the overall Quality Control/Quality Assurance (QC/QA) aspect of this project. Within this role, he will develop an internal QC/QA team to review the products prior to delivery to the City for review and approval.

Task 1 Deliverables

- Project Kick-off Meeting agendas, meeting materials and minutes
- Draft and Final Detail PMP with updated budget and schedule.
- Monthly invoices and progress reports, including detailed status of the work effort, outlook, issues/ solutions
- Detailed project schedule by work tasks with monthly updated as necessary
- Prepare graphics and presentation aides required for all meetings.
- All reporting and close-out documentations in compliance with OCTA requirements and applicable regulatory agency.

TASK 2. DATA COLLECTION

The data collection task includes the gathering of all information needed to deliver the traffic signal improvements for the project and the optimized signal timing and synchronization for the corridor. Iteris has a unique approach to collecting data for both signal timing and PS&E tasks. **Prior to conducting traffic counts, Iteris will use ClearGuide to identify and confirm if traffic patterns have returned to the "new" normal condition.** Once confirmed and with agencies' concurrence, Iteris' subconsultant, AimTD will conduct 7-day 24-hour ADT machine counts at critical locations (at least every 1-mile segment) to identify the peaking characteristics of the corridor and to identify proposed peak periods for the collection of turning movement counts as well as signal synchronization periods. All ADT locations will also include vehicle classification counts to determine heavy vehicle percentage.

AimTD will also conduct weekday and weekend peak period "true demand" turning movement counts at all study intersections along the corridor using video cameras mounted on signal poles.

These recordings can be conducted during the same week(s) as the ADT counts with the appropriate set-up to capture queues. Therefore, once the ADT data is analyzed, the turning movement count videos can be processed immediately without having to schedule another field visit and will also ensure turning movement counts will be representative of the ADT data and provide another layer of quality control. The choice to record the intersection turning movement counts during the same week as the ADT counts will be discussed and approved by the stakeholders prior to collecting.

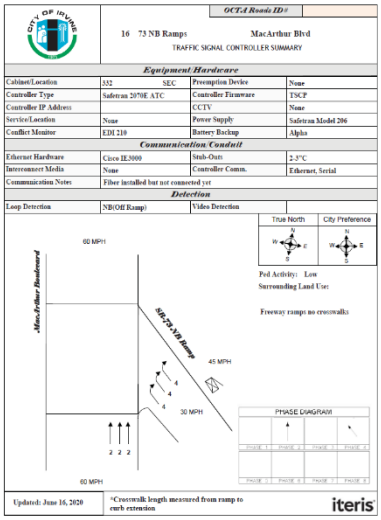
Task 2 Deliverables

- Excel files of pedestrian and vehicle clearance intervals.
- ConOps of Signal Synchronization
- Memorandum documenting the signal timing optimization and implementation.
- All optimized and synchronized traffic signal timing plans, including existing corridor conditions and improved corridor conditions.
- Field implementation of optimized traffic signal timing plans, including all fine-tuning revisions.
- Electronic versions of files from all Traffic Signal Modeling Software programs used.
- Electronic versions of all data files and memorandums.

TASK 3. FIELD REVIEW AND PLANS, SPECIFICATIONS, AND ESTIMATES

SUB-TASK 3.1 FIELD REVIEW

Iteris will also conduct detailed field review of the project area. Our field reviews will note any intersection (including cabinet equipment) and corridor issues. Each study intersection and controller cabinet will be visited and inventoried. In addition, we will open the existing pull boxes to verify conduit sizes and evaluate conduit capacity; document existing utilities or markings that can be captured through visual investigation. To facilitate the field review process, Iteris will use **FastField**, a web- and mobile-based application, during our field review. This application will enable us to input data into mobile devices while in the field and produce high-quality customized reports (shown on left) instantly through the cloud-based system without manual data processing, saving time and money.



Our field review will document the existing detection settings and identify any modification that will be required for deployments of SPM system or signal responsive/adaptive operations. We will identify critical intersections (those with high pedestrian or bicyclist volumes, over-saturated and/or closely spaced intersections), uneven lane distribution, high volume heavy vehicle intersections, and high volume un-signalized intersections along the study corridor to gauge their impact on signal progression.

Information collected as part of this task will be summarized in a report that will detail the findings of the field review, identify planned and programmed improvements, identify equipment and develop costs for work to be performed, identify deficiencies and include, if applicable, simple low-cost solutions. The report will also include a review of the existing signal timing parameters in comparison to the appropriate governing standard timing parameters. Having performed numerous RTSSP projects for OCTA and the local agencies, we have a set format for collection and presentation of the Field Review information collected as part of this subtask, used successfully on several projects.

Task 3.1 Deliverables

- Draft and Final Existing Conditions Memo

SUB-TASK 3.2 PLANS, SPECIFICATION AND ESTIMATE

The system design and construction task will be implemented in two different phases. Iteris will develop plans, specifications and estimates (PS&E) bid packages and support the City during bidding and construction.

Based on City-provided data (e.g. signal plans, street improvement plans, existing signal timing plans etc.) and a thorough field review of the project corridor, design plans, specifications, cost estimates, and bid and contract documents will be prepared for the installation of new and/or upgraded traffic signal control and communication hardware and software as required.

Iteris will work with the participating agencies at the outset of the project to discuss our approach to provide plans that are both biddable and detailed enough to achieve the agency's objectives. After Iteris has verified design requirements with field review and record documentation, Iteris will provide the City with a strategy for final plan production. It is anticipated that traffic signal modification plans will be required for all locations that have installation/upgrades of signal controller/cabinet, smart video detection, signal head upgrades, and fiber installation. These plans will detail the removal and installation of cables in existing conduit as appropriate. For new detection locations, the plans will identify appropriate detection zones and channels in addition to all equipment needs at the traffic signal cabinet.

In addition to these details, the traffic signal modification plans will include all existing equipment including location of all traffic signal elements, pole schedule, conductor schedule, phase diagram, cabinet equipment, and fiber optic cable schematic. For locations where only the controller or GPS clock is being installed, it is anticipated that a full traffic signal modification plan is not necessary. At a minimum, a plan will be provided detailing the work needed in order to update the controller and the location of the cabinet.

Once the details of the project elements have been identified and agreed upon by the Cities, Iteris will begin the detailed design phase, led by **Mrs. Naree Kim, PE**, for the 60%, 90%, and Final submittals. All design drawings prepared will be completed using AutoCAD. Plans will be prepared in standard measure units and based on the level of detail required; design drawings will be developed at 1"=20' for traffic signal modification plans and 1"=40' scale for interconnect plans. Communication schematics will also be provided, which will identify the appropriate splicing details to achieve the desired and intended operation.

Another important data collection task that we will recommend to start early in the project is utility coordination in regard with scheduled signal system upgrade and fiber installation, which will be ongoing and consist of the following:

- Submit utility information requests to all utility companies
- Obtain utility plans showing location and size of all utility lines and appurtenances within the project area to be shown on our design plans
- Prepare a Utility Notification Log to track utility company contacts and responses including contact information and dates of all outgoing and incoming correspondence.

Task 3.2 Deliverables

- Utility request letters and utility notification log
- PS&E at 60%, 90%, and Final submittals Applicable permit applications
- SCE approved final plans
- Full construction bid documents
- All documentation in hard copies and/or electronic copies

TASK 4. CORRIDOR "BEFORE" STUDY

Iteris will conduct a travel time and delay 'before' study along the project corridor using the floating car method and Tru-Traffic Version 10.0 Software. This study will serve the following purposes:

- Serve as a base point of comparison to quantify the improvements of the Measure of Effectiveness (MOE) and Corridor Synchronization Performance Index (CSPI) with the deployment of the new signal timing plans
- Supplement volume and timing analysis in determining congested corridor segments
- Identify operational deficiencies and queuing conditions (in conjunction with field review)

A minimum of five (5) runs will be conducted in each direction to obtain a statistically valid estimation. More runs can be conducted if required by local agencies. Prior to performing travel time runs, we will review the existing time-based coordination schedule and ADT counts to determine appropriate study hours to cover the true peak hour for each peak period. 'Before' studies will be conducted just before new timings are implemented, as preferred by City.

The 'before' data collection task as well as the resulting graphical outputs will provide an easy way to initially identify bottlenecks along the corridor. One draft and one final version of the technical memorandum presenting the MOE results, as well as the results of the CSPI quantification for the 'before' conditions will be submitted. In addition to the floating car data, the report will address optimization strategies for improved signal synchronization including, but not limited to, the flow of traffic along the corridor, coordinated subsystems, and zones and segments. The report will be organized in such a manner as to clearly provide a picture of traffic patterns on the corridor during all identified coordination periods.

In preparation for this proposal, Iteris drove the project corridor during the AM and PM peak periods to collect current travel time, MOEs and identify operational deficiencies. **Table 4** shows the existing MOE results and OCTA CSPI scores generated from Tru-Traffic for the corridor.

Table 4 – Existing MOE Results from Tru-Traffic

	AVG. TRAVEL TIME (MIN)	AVG. DELAY (MIN)	AVG. SPEED (MPH)	# OF STOPS	CSPI SCORE	CSPI TIER
AM PEAK						
NB	30.35	5	23.0	9	62.3	3
SB	24.52	3	29.0	5	84.1	1
PM PEAK						
NB	25.23	3	28.5	6	85.2	1
SB	28.9	5	27.1	8	75.4	2

In addition to the floating car runs, ClearGuide was also used to provide corridor level insights from GPS probe data collected in real-time, every minute. ClearGuide was used to compare the corridor-wide average performance measures between February 2020 (pre-COVID lockdown) and April 2021 (current) to see the impact of the pandemic on traffic conditions.

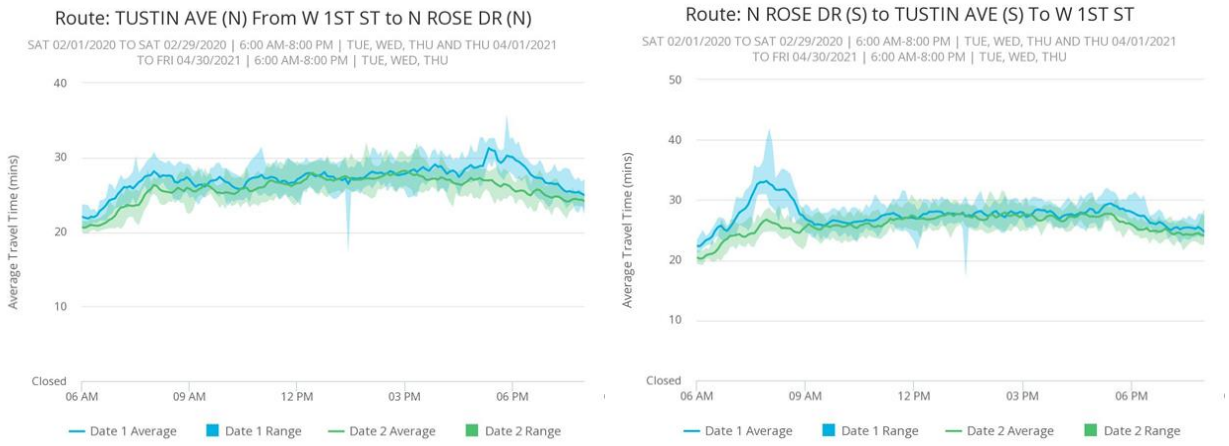
Table 5 shows continuous 5-minute average travel times and speeds gathered within these months for the AM, MD and PM peaks on a typical weekday.

Table 5 – Existing Travel Time and Speed from ClearGuide

	AVG. TRAVEL TIME (MIN)	AVG. DELAY (MIN)
AM PEAK		
NB	24.8	27.8
SB	25.1	27.5
MD PEAK		
NB	26.9	25.7
SB	26.8	25.7
PM PEAK		
NB	26.4	26.1
SB	26.7	25.8

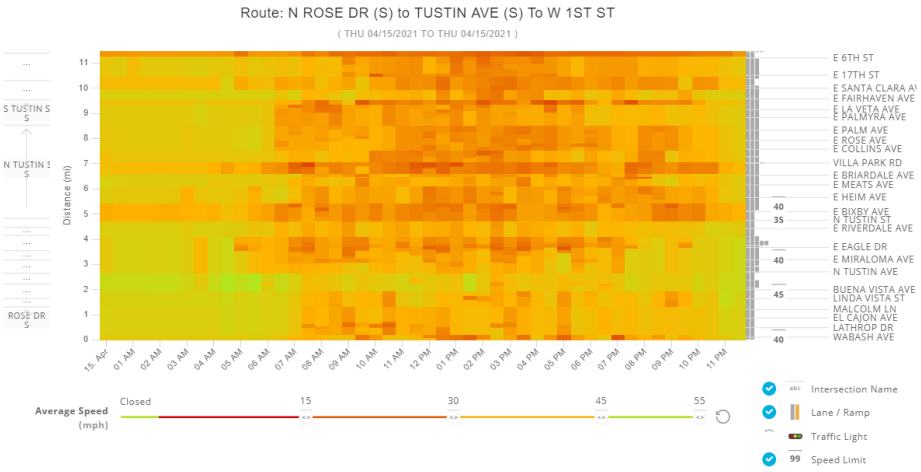
Figure 3 provides the travel time data in graph form to assist in visualization of any fluctuations in travel time throughout the day. Based on the graphs, travel times have generally improved compared to pre-COVID conditions except during the MD peak where it has remained relatively unchanged.

Figure 3 – Average Travel Time Comparison from ClearGuide



ClearGuide also provides precise information on which intersections are causing the most delay along the project corridor. An example corridor speed heat map is shown in **Figure 4** which visualizes speeds for the southbound direction along the corridor during a typical weekday in April 2021. Relevant contextual location information, such as the location of intersections, lane configurations, and speed limit changes, is shown to the right of the heat map.

Figure 4 – Example Corridor Heat Map from ClearGuide



Based on this heat map, the following observations are made:

- The southbound traffic experienced consistent slowdowns from 1st Avenue to Santa Ana Canyon Road from 6:30 AM to 7:30 PM.
- There were major slowdowns (less than 15 mph) from Katella Avenue to Taft Avenue from 11:00 AM to 3:00 PM. This segment of the corridor consists of car dealerships and commercial land use.
- There were major slowdowns between Fairhaven Avenue and La Veta Avenue from 4:30 PM to 6:00 PM, most likely attributed to the SR-22 ramps.
- The intersections of Fairhaven Avenue and La Veta Avenue experienced a sharp peak in slowdowns between 12:30 PM to 1:00 PM.

Because ClearGuide provides continuous performance measures at a high spatial granularity, it can characterize existing conditions and improvements much more comprehensively than floating car runs alone, which provide data from only a single vehicle on a single day during a few slices in time. The use of ClearGuide can be used as a supplement to the 'before' floating car travel time data that will be collected as part of this task.

Task 4 Deliverables

- Draft and Final Project Report
- Documentations for closing the project and release of retention funds.
- Electronic version of all data files for this project

TASK 5. SIGNAL TIMING OPTIMIZATION AND IMPLEMENTATION

Clearly identifying the existing operational issues and signal system improvements is very important. For this proposal purpose, we identified some existing critical locations through preliminary field observations. We will present optimization concept in the kick-off meeting to collect comments from you and other involved agencies. Our team is confident that this corridor's complexities are unique but not overly difficult. Similar issues must be addressed by all inter-jurisdictional signal timing projects and we have an excellent track records for this type of project. We also understand that agencies often have a strong preference regarding using signal timing and synchronization strategies. Our team will strive to meet each agency's preferences, while providing information on the benefits of signal synchronization along the corridor.

SUB-TASK 5.1: PROPOSED NETWORK MODELING

The intersection features and traffic data collected in **Tasks 2** and **3** will be used to prepare and calibrate a traffic model that encompasses Tustin Avenue-Rose Drive project limits and all the signalized intersections on major crossing arterials that are in close proximity to the project corridor The congestion hotspot data and field observations will be used to calibrate and verify the Synchro models, which will serve as the baseline condition for the evaluation and selection of optimization alternatives. The traffic models will be developed and submitted using Synchro version 10 (or 11) and Tru-Traffic 10 using a GIS shapefile as the background to develop the base roadway configuration. The development of the models will be consistent with the City's intersection numbering guideline or the OCTA Countywide Synchro Network as administered by the GIS/ROADS database. Any modification, additions or removal of intersections will be approved by participating cities.

Task 5.1 Deliverables:

- Synchro files for the existing and optimized conditions
- Tru-Traffic files for the existing and optimized conditions
- Draft and final network modeling technical memorandum

SUB-TASK 5.2: NEW TIMING IMPLEMENTATION

Basic Timing Review

Prior to conducting signal coordination optimization, Iteris will perform phase and pedestrian timing analysis for all project intersections identified in the scope. The methodology of basic timing calculation will be consistent with the latest version of California Manual of Uniform Traffic Control Devices (CA MUTCD), industry best practices, and agencies' timing preference. The parameters will be a function of field measurements and speed data collected through City Speed survey's or observed posted speed limits. Iteris will coordinate with agencies' staff for special considerations at turning movement in association with the Institute of Transportation Engineers (ITE) latest Guidelines for Determining Traffic Signal Change and Clearance Intervals. We believe the optimum timing settings require not only the familiarity with timing guidelines but also a thorough understanding of controller firmware and operational features of the existing central systems. The timing parameters to be reviewed include the following, at a minimum, which are critical to safety for vehicle, pedestrian, and bicyclist:

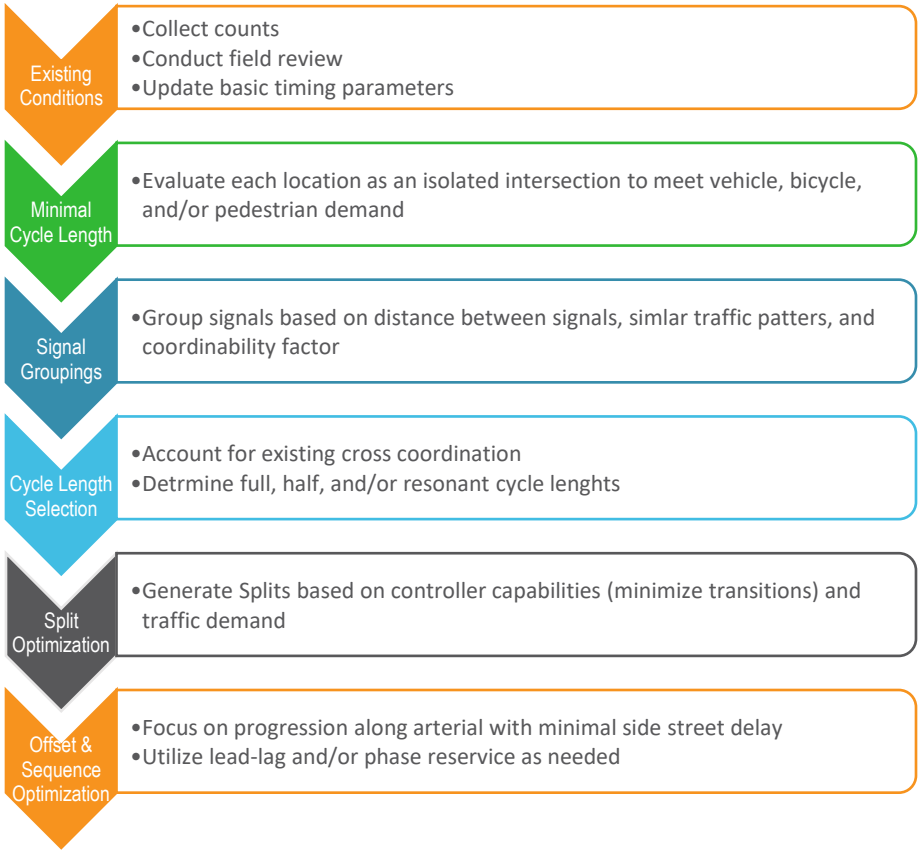
- Minimum Green
- Bicycle Minimum Green
- Yellow Change Interval
- All Red Interval
- Pedestrian Walk Time
- Pedestrian Flashing Don't Walk Time

The Iteris basic timing calculation spreadsheet tool has been used in numerous TSSP projects and well adopted to expedite agencies' review. We will also evaluate the controller parameters and capabilities (density features, dynamic maximums, time of day functions, traffic responsive/adaptive, etc.) to provide participating agencies with additional recommendations for optimum performance during coordinated and free operation.

Optimization of Signal Coordination Plans

Our methodology to optimize a study corridor or grid network is shown in **Figure 5**. Cycle length selection is a critical step in developing signal coordination plans. A longer cycle length may provide better progression along the corridors but could increase side street delay and queuing. Alternatively, decreasing the cycle length to reduce the side street delay may increase the overall delay and number of total stops.

Figure 5 – Signal Timing Methodology



We developed a unique iterative methodology to determine ideal cycle lengths for each study intersection. Extensive project studies show this capacity-based methodology provides more accurate results than purely delay-based methodologies adopted by the Highway Capacity Manual and Synchro software. In selecting each intersection's critical cycle lengths, the following factors and conditions were taken into consideration:

- Intersection "true demand" of turning movement counts.
- Each intersection's unique lane geometry and operation.
- Realistic minimum splits for vehicular turning movements.
- Amount of pedestrian and bicyclist activities at each intersection

During the determination of critical cycle lengths, Iteris will treat each intersection as an isolated signal and evaluate the cycle lengths for the following conditions:

- Cycle lengths required to accommodate vehicle turning movement volumes and all pedestrian clearance times – "With All Ped".
- Cycle lengths required to accommodate vehicle turning movement volumes only – "With Vehicle Only"
- Cycle lengths required to accommodate vehicle turning movement volumes and pedestrian crossing demand for the coordinated phases only (i.e., split time was calculated to meet vehicular demand only, which may be lower than the pedestrian clearance times for the side street) – "With Coord Ped".

As mentioned earlier, the traffic demand is experiencing rapid growth as the County has been opening up. It may take some time to get traffic levels back to pre-covid levels. Tustin being a major north / south corridor and serves as an alternate to the adjacent 55 freeway, the freeway congestion levels impact the Tustin corridor during the peak periods. Iteris will utilize the ClearGuide system to understand how the current levels correlate to the pre-covid period. Thus, Iteris proposes developing two sets of timing plans for the AM and PM peak period. One set will be for the current traffic levels condition

and the second set will be for what will be expected after covid openings are complete. Traffic levels will be higher than current but will likely not reach the full level of the pre-covid time as more people will likely be working from home. Iteris will be able to utilize the ClearGuide system to develop a very good estimate for this anticipated future condition. Additionally, Iteris will develop traffic responsive configuration to automate the implementation of the future timing operation. This will provide for improved operation so that during the AM and PM peak period, there will be an allowance for future growth in traffic at which time the lower-level timing can still be utilized at the beginning of the peak period and only the higher-level timing plan utilized during the peak of the peak period. This will provide for improved traffic operations and reduced delay for the crossings to Tustin.

We will use the calculated critical cycle lengths to develop four TSS plans (Weekday AM1, AM2, Midday, PM1 and PM2; and Weekend periods). The Synchro network models will be derived from the base model developed under subtask 5.1. The SimTraffic simulation will then be carefully observed to identify segments of the corridor needing special operational analysis. We will develop time-space diagrams using Tru-Traffic Version 10.0 to augment the Synchro models. Locations noted to have existing cross coordination will be analyzed for split and sequence optimization unless otherwise approved by the respective Agency to evaluate whether a different cycle length is recommended.

Our vast experience in Orange County and working relationships with nearly all the cities allows us to provide value-added services and additional solutions to assigned project corridors. These include the development of school/summer timing plans and traffic operations reviews by in-house traffic responsive/adaptive experts to ensure the optimized plans are completed to serve the project goals and objectives for the project corridor. Experience has shown that multi-jurisdictional projects require continued communication and coordination with the participating agencies and OCTA. **Our relationship and trust with all the local agencies and Caltrans will allow for that communication.**

Task 5.2 Deliverables:

- Basic timing review and existing condition analysis technical memorandum
- Coordination optimization technical memorandum
- Traffic Responsive Configuration
- Implementation-ready timing sheets

SUB-TASK 5.3: OPTIMIZE SIGNAL TIMING

We consider implementation to be the most critical phase of a signal synchronization project and understands each agency has its own requirements for implementation and fine-tuning. Through the existing and completed RTSSP projects, both led by OCTA and the local agencies, Iteris has developed numerous implementation ready timings in agency preferred format (Synchro printouts, marked-up timing sheets in PDF, new Excel files, etc.). Iteris has completed new timing implementation through central systems, and at controllers. We separate the act of implementing new signal timing plans from fine-tuning signal patterns/plans to ensure each intersection is operating as planned prior to any fine-tuning efforts. The implementation team is staffed with qualified specialists fully trained in signal retiming projects.

Immediately after implementation, we will conduct fine-tuning in the field to monitor signal cycling at each intersection as well as actual progression along the corridor. The fine-tuning usually takes at least three weeks, which give the field team plenty of time to observe the new timing plans under varying traffic conditions and make changes as appropriate. Timing fine-tuning will be completed using the Tru-Traffic and Synchro software to provide the participating agencies with historical data during the travel runs and to identify reasoning for any modifications conducted during the fine-tuning task. Iteris also recently adopted TranSync software in the finetuning of an on-going Main Street TSSP project which includes multiple signals in Orange. Iteris will also continue to find opportunities for SPM implementations with each agency, and will utilize the measures provided but such tools when available. SPM coordination, termination and wait time charts will be used to provide a better understanding of intersection performance throughout the implementation and fine-tuning period, especially for periods when we are not able to physically observe conditions. Any adjustments to controller settings will also be made as necessary and documented in an Iteris implementation log. Upon completion of the field implementation and fine-tuning, the Synchro models will be updated to match the field conditions.

Task 5.3 Deliverables:

- Memorandum documenting the signal timing implementation and finetuning.
- Field implementation of optimized traffic signal timing plans, including all required fine-tuning.
- Electronic versions of files from all Traffic Signal Modeling Software programs used.

TASK 6. CORRIDOR "AFTER" STUDY

Similar to the 'before' travel time study, five floating car runs will be conducted four weeks after the fine-tuning and approval of implementation of new timing plans. The 'after' travel time study will be done on the same days of the week, and at the same time of day as the 'before' travel time study. The same MOE and CSPI will be collected to properly evaluate the improvements of the synchronization plans and implementation.

In addition, Iteris will load fine-tuned timing plans into **TranSync-M** mobile app and verify them in field during travel time after study. TranSync files including recorded videos of traffic progression and trajectory of travel time runs will be provided for City's review and presentation purposes.

Upon completion of the 'after' travel time study, Iteris will submit a memorandum specifying the results of the 'before' and 'after' travel time studies with reference to the MOE elements. **Table 6** summarizes the benefits of recently completed RTSSP projects we have performed for OCTA and the local agencies, by listing the Benefit/Cost (B/C) ratios over a three-year period. **All our projects have resulted in significant improvements in travel times, with B/C ratio as high as 23:1.**

Upon completion of the fine-tuning and 'after' studies, a draft timings and evaluation technical report will be developed and provided to the participating agencies. The report will include all the elements identified in the RFP. A separate binder will be provided showing the new traffic signal plan sequences, signal timing plans, and pedestrian timings.

As mentioned in the Task 4, ClearGuide will be utilized in parallel with the travel time studies to compute certain performance metrics along the project corridor. This will provide precise information on which intersections are causing the most delay along the project corridor and will be summarized in the report.

In addition to documenting the processes and results of the timing study, recommendations for future improvements including cost and benefit estimates to further alleviate traffic congestion will be provided. These recommendations may include changes in intersection geometry, infrastructure, and traffic management plans. Time-Space Diagrams showing all pertinent data will be generated from Tru-Traffic or Synchro. When comments are received from stakeholders, the final version of the Project Report will be delivered. An executive summary will identify complete documentation of the project and improvements gained.

Table 6 – Signal Timing Improvements on Recently Completed Projects in Orange County

TSS PROJECT	CITIES/AGENCIES	# SIGNALS	B/C RATIO OVER 3-YEARS
Barranca/Muirlands	Irvine, Lake Forest and Mission Viejo, and Caltrans	44	18:1
Artesia Blvd	Buena Park, Cerritos and La Mirada, and Caltrans	11	23:1
Bristol St	Santa Ana, Costa Mesa and Newport Beach, and Caltrans	45	12:1
Harbor Blvd	Santa Ana, Garden Grove, Fountain Valley, Costa Mesa, Caltrans	46	17:1
Coast Hwy	Newport Beach and Caltrans	27	17:1
Marguerite Pkwy	Mission Viejo	30	18:1
Von Karman Ave	Tustin, Irvine and Newport Beach	30	20:1

Task 6 Deliverables

- Draft and Final Project Report
- Documentations for closing the project and release of retention funds.
- Electronic version of all data files for this project

TASK 7. SYNCHRONIZATION SYSTEM CONSTRUCTION SCHEDULE

After the design has been successfully completed and the construction project awarded to a contractor, our highly skilled engineering team led by **Mr. Braulio Ramirez, PE.**, will manage construction support services for the traffic signal

modifications and communication improvements. Iteris will not only oversee the construction details of the intersection improvements, but will also provide updates and reports to inform the Cities of the construction progress. Fulfilling this task will help ensure that the construction of this project will be completed on time and minimize interruptions to the traffic flow.

SUB-TASKS 7.1 & 7.2: BID SUPPORT & CONSTRUCTION ENGINEERING AND MANAGEMENT

Iteris will provide construction management support to each City's inspection staff. Iteris will help review request for information (RFI's). This will assist in avoiding defects and deficiencies in the work of the contractor. As necessary, Iteris can inspect construction to evaluate the contractor's compliance with the intent of the construction documents. In support of this task, Iteris will conduct the following activities:

- Attend pre-construction meeting
- Review shop drawings submitted by contractor
- Cost management – assist Cities in monitoring the project with respect to the contract amount by keeping track of change orders if any, claims, control of quantities, and other factors affecting project cost
- Quality management – assist Cities in monitoring the contractor's progress with respect to the quality of work specified in the contract for the contract price
- Schedule adherence – assist Cities in review duration of activities, milestones, submittal lead times

TMC Construction and Integration Support

Iteris team will provide overall system integration which includes connections to the TMC. Provide technical oversight and integration support for individual improvement with expertise to realize the overall goal of the project. We will work hand-in-hand with the contractor and system vendor in configuring IP devices and TMC integration. We will test and verify the connectivity from a TMC to field equipment for proper bandwidth and latency requirements for the ITS network. This is essential for a robust and reliable of the network to meet the needs of integration of future integration of projects.

Iteris' in-house experts will expand on existing, or generate new Virtual Local Area Networks (VLANs) for the communications network, and configure switches, controllers, Internet Protocol (IP) cameras, VDS, etc. for deployment. Iteris networking experts evaluate the communication topology and network schema such that the designs are optimal for not only the current project, but also ideal citywide operation for future projects.

Construction Documentation

It is imperative to document the condition of all equipment that is accessed or modified through this project prior to construction starting so that the condition of all equipment is documented and the post construction condition does not negatively impact the existing traffic equipment.
In case equipment stops working or accidently gets damaged, taking pictures will assist to identify existing conditions of equipment prior to construction. Equally important is to document the existing condition of all system and communication components prior to shutting down the existing systems, so the status and expectations of the new system is documented and all operational elements of the new system must be operational when the new system is activated.

SUB-TASK 7.3: AS-BUILT RECORDS

Once the contractor has completed construction, the project will move into the post construction phase. In support of this task, Iteris will conduct the following activities:

- **Punch list** – Iteris will assist City inspectors in the final walk through ensuring compliance with construction requirements and providing a thorough "punch-list" of items that must be corrected and/or completed to satisfy the project requirements.
- **As-builts** – Iteris and the Cities will verify that the contractor maintains an accurate record of all changes in the plans which include change orders, RFIs, any addendums, and additional details. Iteris will compile and re-submit final as-built to both Cities.

Deliverables

- Responses to RFCs
- Field troubleshooting findings and actions memorandums

- Integration and testing reports.
- Negotiate alternative procurements or substitutions as deemed necessary during the course of the Project.
- As-built drawings and photo log of all field implementations.

TASK 8. PRIMARY IMPLEMENTATION PROJECT REPORT

Upon completion of the fine-tuning and 'after' studies, a draft timings and evaluation technical report will be developed and provided to the participating agencies. The report will include all the elements identified in the RFP. A separate binder will be provided showing the new traffic signal plan sequences, signal timing plans, and pedestrian timings.

In addition to documenting the processes and results of the timing study, recommendations for future improvements including cost and benefit estimates to further alleviate traffic congestion will be provided. These recommendations may include changes in intersection geometry, infrastructure, and traffic management plans. Time-Space Diagrams showing all pertinent data will be generated from Tru-Traffic or Synchro. When comments are received from stakeholders, the final version of the Project Report will be delivered. An executive summary will identify complete documentation of the project and improvements gained.

Task 8 Deliverables

- Draft and Final Project Report

TASK 9. ONGOING MONITORING AND MAINTENANCE

Iteris understands the importance of monitoring and maintaining the corridor performance after the primary implementation phase. Therefore, Iteris will continue to provide ongoing support for the Tustin Avenue/Rose Drive corridor for a period of 24 months during the O&M phase, with a goal not only to maintain but also to further enhance the corridor performance. There are two primary tasks for the two-year O&M phase:

SUB-TASK 9.1: MONITORING AND IMPROVING OPTIMIZED SIGNAL TIMING

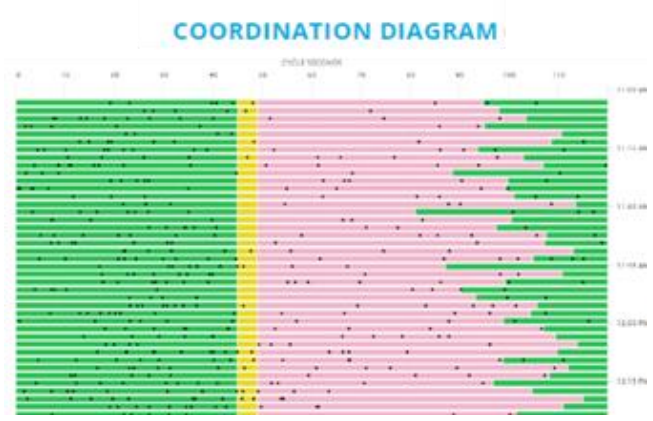
Corridor synchronization monitoring will be achieved by performing monthly travel time floating car surveys during weekday AM, Midday, PM peaks and weekend peak periods. In addition, Iteris will utilize two valuable analytics tools: Agencies' SPM system and Iteris' ClearGuide, a performance measurement software to provide more continuous monitoring of the traffic system which will result in an improved corridor performance throughout the O&M period as any degradations will be identified and remedied right away instead of on the monthly interval when the corridor is driven. Both SPM and ClearGuide provide 24 hours/day, 365 days/year actionable information. Utilizing this continuous stream of data will provide the best maintenance of the traffic system and result in any issues being resolved likely before the City staff receives any complaints. This will relieve City staff of the phone calls that typically arise when timing along a corridor is changed and negatively affected by faulty traffic equipment.

Implementing SPM can be challenging and require proper detector configuration. Iteris staff members are experts in configuring and implementing SPM for agencies. For this project, not only will Iteris configure the system, but will also proactively monitor all the project intersections using SPM to receive alerts and take proper actions to ensure the signal operations are optimal. Iteris will also use ClearGuide, as a value-added service, to monitor and identify any deficiencies (e.g. excessive delays) along any segments of the corridor and conduct further fine-tuning of the signal coordination.

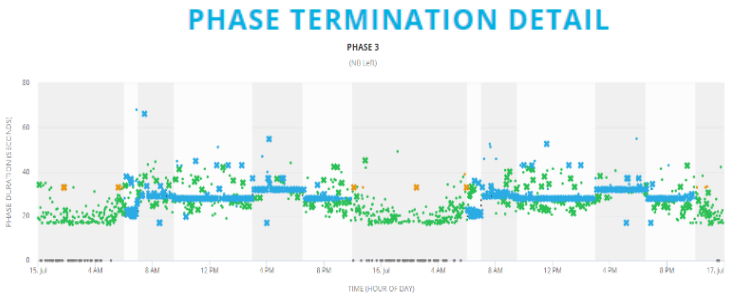
During the O&M phase, Iteris will conduct regular travel time floating car surveys during AM, MD, PM and weekend peak periods monthly using Tru-Traffic software and a GPS unit. The data collected will then be compared to the data gathered from the "after" study to ensure corridor performance is maintained. During our field travel time runs, we will also ensure all side streets and left turns do not experience excessive queues or delays. If any roadway segments are observed to be consistently under-performing after a few months of floating car surveys, and validated by SPM and ClearGuide, Iteris will provide recommendations to the involved agencies to improve the performance and progressions.

Here lists the SPM charts that we routinely use for TSSP O&M to keep track of corridor operational performance and

evaluate how well project signals are performing:

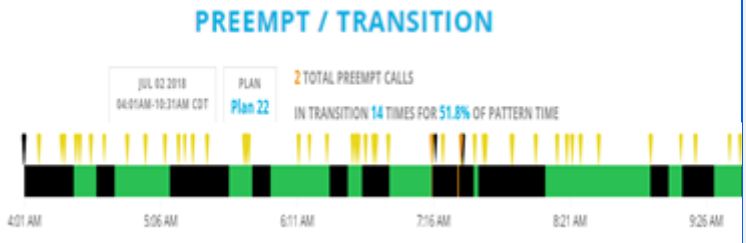


Coordination Diagram provides insights to how good the coordination of the system is performing. The goal of a good coordination plan is to ensure that vehicle platoons are arriving at the intersection during the green. Using the Coordination Diagram, it can be determined if an offset change will allow more vehicles to arrive during green.

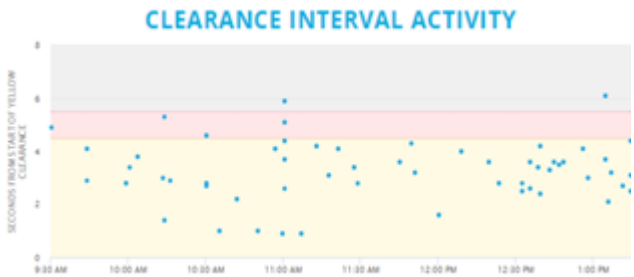


Phase Termination Detail chart plots the duration and type of termination for every cycle, every phase. The data points distinguish whether the approach was cleared during the phase or if vehicles were left at the stop bar at termination. This chart helps traffic engineers identify phases where the vehicle queue is not being adequately served, and appropriate split adjustments can be made.

Wait Time chart in Iteris SPM was developed to help traffic engineers understand how much time the first vehicle to arrive at a red light waited for the green because this is a frequent citizen call that traffic engineers receive. This chart also shows how much of this time that no vehicles were travelling through the intersection.



Preempt/Transition chart shows how much of time the controller spends in preemption or transition in relation to being in step during a coordinated plan. This chart shows the frequency of pedestrian and preemption calls.



Vehicles entering the intersection during and after the yellow and red clearance intervals are shown per phase on the **Clearance Interval Activity** Chart. This feature requires video detection detecting vehicles that have entered the intersection. As such, Clearance interval activity may be considered based on future improvements to traffic signal detection along project corridor.

SUB-TASK 9.2: COMMUNICATION AND DETECTION SUPPORT

Communication and detection maintenance support can be initiated either by project agencies (e.g. check intersection operation, troubleshoot equipment, etc.), or proactively by Iteris to ensure intersection operations are well maintained. Under this task, Iteris will provide "on-call" support for any issues that may arise due to hardware (e.g. detector or communication) as reported by agencies. Iteris will deploy our staff within 48 hours of notification to conduct a field visit for troubleshooting. Upon completion, Iteris will report our findings and any repair work done to the agencies for your records. Iteris prides ourselves in providing this responsive service on all the TSSP projects in a timely manner.

SUB-TASK 9.3: ONGOING MONITORING AND MAINTENANCE MEMO

Iteris will submit the final report for O&M phase to document the data collected in comparison to the initial 'after' study. The report will also include a summary of all the modifications made during the two-year period and any additional recommendations for additional signal system upgrades or low-cost infrastructure improvement along the study corridor. Iteris will also provide the City with the necessary documentation and information and assist City by any means expeditiously in order to close-out the project as per the CTFP guidelines.

Task 9 Deliverables:

- Monthly reports documenting the continual monitoring runs, SPM data analysis, and fine-tuning of timings
- Draft and final reports for OMM phase
- Electronic versions of all travel time and SPM data

6) SCHEDULE

Iteris has provided the proposed project schedule on following page in **Figure 6**.

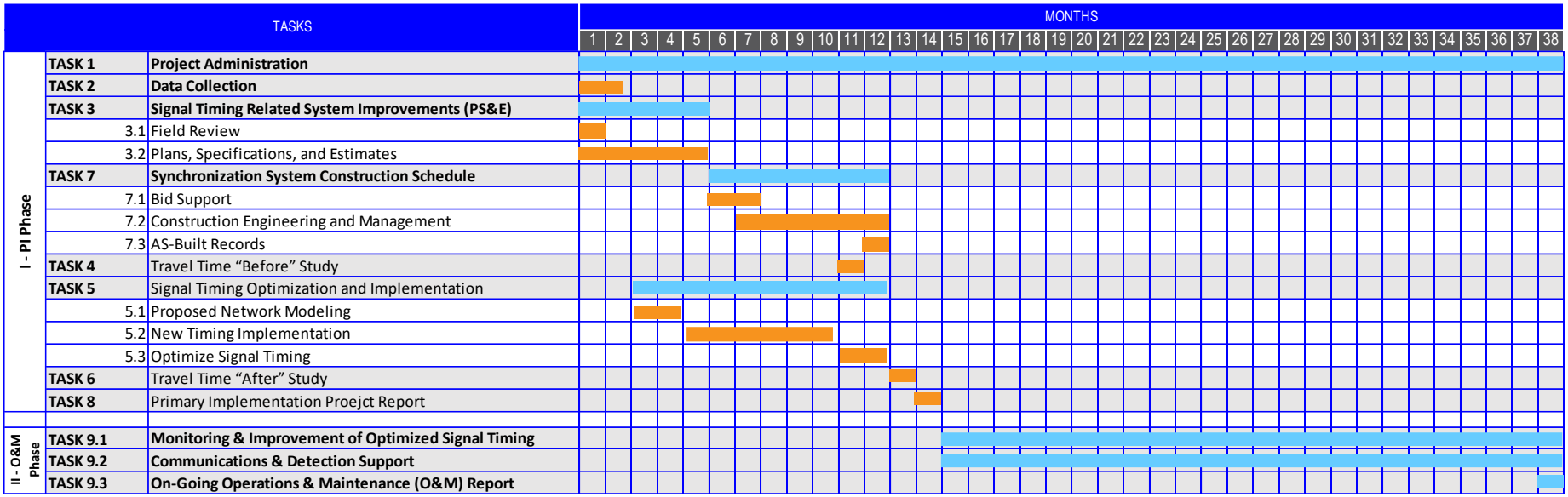
7) REFERENCES

Iteris has provided the following client references as shown in **Table 7**.

Table 7 – References

AGENCY NAME	CLIENT PROJECT MANAGER	DETAILED DESCRIPTION OF SERVICES / DATES OF SERVICES PERFORMED	PROJECT FUNDING SOURCE & PROJECT OUTCOME
Orange County Transportation Authority (OCTA)	**Alicia Yang, PE** Program Manager III (714) 560-5362 ayang@octa.net	▪ OCTA Traffic Signal Synchronization Program ○ Brookhurst St. TSS Project (6/2018 – 6/2021) ○ Main St. TSS Project (12/2019 – Ongoing)	Project was funded through Project P, Signal synchronization along major arterials and synchronization with Caltrans intersections.
City of Santa Ana	**Cesar Rodriguez, PE** Acting Senior Engineer (714) 647-5626 crodriguez5@santa-ana.org	▪ Harbor Blvd. Corridor TSS Project (7/2018 – Ongoing Operations & Management) ▪ Bristol St. TSS Project (6/2015 – 6/2020)	Project was funded through Project P, Cross-jurisdictional signal synchronization involving different TMC central systems and multiple Caltrans intersections.
City of Anaheim	**John Thai** Principal Traffic Engineer (714) 765-5202 jthai@anaheim.net	▪ Harbor Boulevard Regional Traffic Signal Synchronization Project (RTSP) (2/2014 – 3/2018) ▪ Katella RTSSP Project (2/2020 – Ongoing)	Project was funded through Project P, Signal synchronization along major arterials and synchronization with Caltrans intersections.

Figure 6 – Proposed Project Schedule



Proposed Staff Hours Sheet

Iteris has provided the staff hours in **Appendix C.**

8) APPENDICES

Appendix A **Letter of Reference**

Appendix B **Resumes**

Appendix C **Staff Hours**

APPENDIX C STAFF HOURS

Table 6 summarizes the Iteris Team's staff-hours.

Table 6 – Staff Hours by Tasks

	TASK		ITERIS							
			Project Manager	Senior Advisor & QA/QC	Task Lead/ Senior Engineer	Project Engineer	Associate Engineer	Assistant Engineer	Admin Staff	TIME OF COMPLETION FOR EACH TASK
TASK 1A - PI Phase	**Task 1**	**Project Administration**	**252**	**12**	**118**	**96**	**0**	**0**	**0**	**478**
		Kick-Off Meetings	12	4	8					24
		PMP Plan & Project Coordination & Meetings	240	8	110	96				454
	Task 2	**Data Collection**	**6**	**0**	**14**	**8**	**22**	**28**	**0**	**78**
		Data Collection and QC	6		14	8	22	28		78
	Task 3*	**Field Review and Plans, Specifications, and Estimates**	**22**	**0**	**360**	**220**	**330**	**352**	**0**	**1284**
		Subtask 3.1. Field Review	2		40	60	80	92		274
		Subtask 3.2. Plans, Specifications and Estimates	20		320	160	250	260		1010
	Task 4	**Corridor "Before" Study**	**16**	**0**	**0**	**32**	**46**	**80**	**0**	**174**
		Travel Time Studies	16			32	46	80		174
	Task 5	**Signal Timing Optimization and Implementation**	**160**	**16**	**140**	**180**	**300**	**580**	**0**	**1376**
		Subtask 5.1. Proposed Network Modeling	60	8	50	70	120	240		548
		Subtask 5.2. New Timing Implementation	60	8	50	70	120	240		548
		Subtask 5.3. Optimize Signal Timing	40		40	40	60	100		280
	Task 6	**Corridor "After" Study**	**16**	**0**	**0**	**32**	**46**	**80**	**0**	**174**
		Travel Time Studies	16			32	46	80		174
	Task 7*	**Synchronization System Construction**	**110**	**8**	**280**	**400**	**480**	**520**	**0**	**1798**
		Subtask 7.1. Bid Support	40		60					100
		Subtask 7.2. Construction Engineering & Management	50	8	180	400	440	480		1558
		Subtask 7.3. As-Built Records	20		40		40	40		140
	Task 8	**Primary Implementation Project Report**	**8**	**2**	**48**	**56**	**56**	**0**	**0**	**170**
		Draft Report	6	1	32	32	32			103
		Final Report	2	1	16	24	24			67
TASK 1B - O&M Phase	**Task 9**	**Ongoing Monitoring and Maintenance Services**	**16**	**8**	**92**	**156**	**212**	**240**	**2**	**726**
		Subtask 9.1. Monitoring & Improvement of Optimized Signal Timing	8	2	24	64	200	240	2	540
		Subtask 9.2. Communications & Detection Support	4	4	60	80				148
		Subtask 9.3. On-Going Operations & Maintenance (O&M) Memo	4	2	8	12	12			38
		*Subtotal **	***606***	***46***	***1052***	***1180***	***1492***	***1880***	***2***	***6258***
Optional Task 9		*Traffic Responsive Operations up to 15 Signals*	0	16	36	64	64	0	*0*	180

** denotes Tasks 3 and 7 for City of Anaheim are deletable scope and costs*

9) OPTIONAL TASKS

SUB-TASK 9.1. TRAFFIC RESPONSIVE OPERATION

Variable and unpredictable traffic volume changes can pose major challenges for traffic signal operation and traffic control systems, especially with the uncertainties of post-COVID conditions. In addition to standard practice in time-based signal coordination, Iteris will assist the City to evaluate the capacities of City's existing Centracs system to run Traffic Responsive plan selection through the data it collects from the existing detection system in the field. This will enable the system to showcase its potential for selecting desired plan/cycle to respond to changing traffic conditions accordingly. Iteris will utilize the previous Centracs responsive operation experience in other agencies to provide the following services:

- Develop one(1) shoulder plan for each of peak periods (weekday AM and PM peaks)
- Identify system detections and recommend minor detection adjustment if needed
- Recommend K-Value (a factor used to weight the occupancy values within a system detector group), system polling period, and Reference Value (RV) that are calculated using average volume and occupancy from each detector group
- Develop and activate traffic responsive function

SUB-TASK 9.2.CORRIDOR PERFORMANCE MEASURES USING CLEARGUIDE

Signal timing at its core however, can be labor intensive, limited due to manual counts for specific time-periods, and not necessarily proactive. Further, agency budgets only allow for retiming every 3 – 5 years, but timing can be disrupted much more frequently. To combat this issue, Iteris develops solutions that leverage data and technology, with our staff of computer programmers, data scientists and traffic engineers. The key is the traffic engineers who review our solutions with the idea of making their job easier to do and more effective in their deployment.

The solutions are cloud-based and accessible from any computer, allowing users to quickly see the status of their network with the detail that engineers appreciate, to quickly adjust, monitor, or report on their network level of service. More simply, Iteris SPM provides intersection level monitoring and insights, while ClearGuide provides corridor level insights. Iteris' ClearGuide service ingests, analyzes, and visualizes commercial speed data, as well as other safety and sensor data sets, and provides actionable information on real-time problem areas, corridors where performance is degrading, and intersections with the most severe congestion. These analytics provide instant access to corridor before and after studies with much more comprehensive coverage than is possible with floating car runs. They also enable agencies to take a data-driven approach to prioritizing signal synchronization corridors and determining when a particular corridor should be retimed.

SUB-TASK 9.3.COORDINATION OPTIMIZATION AND MONITORING USING TRANSYNC SOFTWARE

Iteris will utilize TranSync software as supplementary tool to augment the signal coordination plans generated by Synchro and to verify coordination progression in the field **without additional cost** to this project. TranSync is a software with similar functions of Synchro or TruTraffic software to optimize signal timing (desktop version) and can be used on mobile devices to collect evaluation measures such as travel time, average speed as well as travel time video (mobile version). A study reported that TranSync offset optimization outperformed Synchro in terms of arterial coordination and fine-tuning efforts required in the field. With signal timings loaded into the mobile app and clocks synced with the controllers, TranSync provide probe car driver a graphic of designed time-space diagram with recorded trajectory of travel time runs and a recorded video that can be used to identify out-of-sync signals, unexpected stops, fine-tuning needs of offsets, and other information that can be used to confirm implementation of new timing plans and perform before-after evaluation.

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About Us

Iteris is the global leader in smart mobility infrastructure management – the foundation for a new era of mobility. We apply cloud computing, artificial intelligence, advanced sensors, advisory services and managed services to achieve safe, efficient and sustainable mobility. Our end-to-end solutions monitor, visualize and optimize mobility infrastructure around the world to help ensure that roads are safe, travel is efficient, and communities thrive.

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PHASE	TASK	COSTS						TOTAL
		Tustin	Santa Ana	Anaheim	Orange	Placentia	Yorba Linda	
PI	Task 1A							$ 99,520
	Task 2							$ 48,170
	Task 3	$ 10,305	$ 30,915	$ 1,547 $ 24,216	$ 103,051	$ 36,068	$ 20,610	$ 226,712
	Task 4							$ 27,996
	Task 5							$ 230,988
	Task 6							$ 27,996
	Task 7	$ 14,036	$ 42,107	$ 35,089	$ 140,356	$ 49,125	$ 28,071	$ 308,784
	Task 8							$ 32,812
	Sub-Total	$ 24,341	$ 73,022	$ 60,852	$ 243,407	$ 85,193	$ 48,681	$ 1,002,978
OMM	Task 1B							$ 9,976
	Task 9							$ 122,692
PROJECT TOTAL								$ 1,135,646
Total for Deletable Anaheim Tasks (Sub-Task 3.1B, Sub-Task 3.2 and Task 7)								$ 59,305
PROJECT TOTAL WITHOUT ANAHEIM TASKS 3.1B, 3.2 AND 7:								$ 1,076,341

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