

LIVERMORE AMADOR VALLEY TRANSIT AUTHORITY  
(LAVTA)

REQUEST FOR PROPOSALS

FOR

ADAPTIVE SIGNAL CONTROL TECHNOLOGY  
SERVICES #2016-05

LIVERMORE AMADOR VALLEY TRANSIT AUTHORITY  
1362 Rutan Court, Suite 100  
Livermore, CA 94551

March 31, 2016

Key RFP Dates

<b>Date of Issuance:</b>	<b>March 31, 2016</b>
<b>Pre-Proposal Conference (Optional):</b>	<b>April 7, 2016 at 10:00 a.m.</b>
<b>Written Questions/Requests Due:</b>	<b>April 14, 2016 at 4:00 p.m.</b>
<b>Responses to Questions/Requests:</b>	<b>April 21, 2016</b>
<b>Proposals Due:</b>	<b>April 28, 2016 at 2:00 p.m.</b>
<b>Demonstrations and Presentations (estimated):</b>	<b>May 20, 2016</b>
<b>Contract Award (estimated):</b>	<b>July 11, 2016</b>
<b>Contract Execution (estimated):</b>	<b>July 18, 2016</b>

Contact Information:  
Beverly Adamo, Director of Administrative Services  
(925) 455-7555  
[procurements@lavta.org](mailto:procurements@lavta.org)

March 31, 2016

**SUBJECT: NOTICE OF REQUEST FOR PROPOSALS  
ADAPTIVE SIGNAL CONTROL TECHNOLOGY SERVICES 2016-05**

The Livermore Amador Valley Transit Authority (LAVTA), operator of the Wheels bus system, is soliciting proposals from qualified firms to implement the strategies of adaptive signal control and replace the existing coordinated traffic signal system, to provide real time changes to the signal timing parameters in response to changes in the traffic conditions along a portion of Dublin Boulevard in the City of Dublin.

A Pre-Proposal Conference will be held at LAVTA, 1362 Rutan Court, Suite 100, Livermore, CA, on April 7, 2016 at 10 a.m. Prospective Proposers are highly encouraged to attend this meeting, but attendance is not required.

All Questions and Requests for Clarification must be submitted in writing by April 14, 2016 at 4:00 p.m. Proposals must be received in the LAVTA Administrative Offices by 2:00 p.m. on April 28, 2016. **No proposals will be accepted after this time and date.** Any proposal or amendment to proposal received after the closing time will be returned unopened to the sender. Submission of a proposal shall constitute a firm offer to LAVTA. No Proposer may withdraw its proposal for a period of one hundred twenty (120) days after the opening of proposals. Each Proposer will be notified of award of contract, if award is made. LAVTA reserves the right to reject any and all proposals, or to waive any irregularities or informalities in any proposal or in the proposal procedure, or to postpone the proposal opening for good cause. LAVTA specifically reserves the right to not award a contract after the submittal of Proposals.

Following the initial review and screening of timely-submitted proposals, one or more firms may be invited to attend an interview and give a presentation of their proposal to LAVTA during the week of May 20, 2016. Engagement staff will be present at the interview/presentation. LAVTA's request for an interview/presentation shall not constitute acceptance of a proposal.

Proposals shall be submitted to the following:

**Livermore Amador Valley Transit Authority  
1362 Rutan Court, Suite 100  
Livermore, CA 94551  
Attention: Beverly Adamo, Director of Administrative Services**

The contract awarded under this Request for Proposals (RFP) may be funded in whole or in part by the Federal Transit Administration (FTA). Full compliance with all Safety and Health Standards, Equal Employment Opportunity, and Americans with Disabilities Act laws and regulations will be required of the successful Proposer.

LAVTA hereby notifies all Offerors that it is the policy of LAVTA to ensure non-discrimination on the basis of race, color, sex or national origin in the award and administration of contracts that it awards. It is the intention of LAVTA to create a level playing field on which Disadvantaged Business Enterprises (DBEs) can compete fairly for contracts and subcontracts relating to LAVTA's construction, procurement and professional services activities. Offerors are urged to obtain DBE participation on this project, although there is no specific DBE contract goal. Offerors are encouraged to attend the pre-Proposal conference to better understand the applicable DBE requirements.

LAVTA intends for this procurement to be primarily conducted electronically via distribution on the procurement page of [www.wheelsbus.com](http://www.wheelsbus.com); however, upon request, copies of the RFP may be obtained by contacting LAVTA at (925) 455-7555.

*/s/ /BEVERLY ADAMO*

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Beverly Adamo  
Director of Administrative Services  
Livermore Amador Valley Transit Authority

March 31, 2016  
Date

SECTION I

INSTRUCTIONS TO PROPOSERS

## **1.0 INSTRUCTIONS TO PROPOSERS**

### **1.1 Request for Proposals**

The Livermore Amador Valley Transit Authority (“LAVTA” or “Authority”) seeks the services of a qualified firm to implement the strategies of adaptive signal control and replace the existing coordinated traffic signal system, to provide real time changes to the signal timing parameters in response to changes in the traffic conditions along Dublin Boulevard in the City of Dublin. LAVTA will utilize the “Best Value” method of procurement, in conformance with applicable procurement guidelines. Respondents to this RFP should demonstrate an understanding of the work to be performed.

### **1.2 Examination of Proposal Documents**

The work to be performed under this contract consists of the furnishing of all labor, insurance, materials, and equipment necessary to perform the requirements specified in the Scope of Work. By submitting a proposal, Proposer (herein after also referred to as the “System Vendor”) represents that it has thoroughly examined and become familiar with the work required under this RFP and that it is capable of performing quality work to achieve the Livermore Amador Valley Transit Authority’s (“Authority” or “LAVTA”) objectives.

### **1.3 Addenda**

Any Authority changes to the requirements will be made by written addendum to this RFP. Any written addenda issued pertaining to this RFP shall be incorporated into the terms and conditions of any resulting Agreement. The Authority will not be bound to any modifications to or deviations from the requirements set forth in this RFP as the result of oral instructions. Proposers shall acknowledge receipt of addenda in their proposals.

### **1.4 Authority Contact**

All questions and/or contacts with LAVTA staff regarding this RFP are to be directed to the Procurement Officer:

Beverly Adamo, Director of Administrative Services  
Livermore Amador Valley Transit Authority  
1362 Rutan Court, Suite 100  
Livermore, CA 94551  
Phone: (925) 455-7563

### **1.5 Pre-Proposal Conference**

Proposers are invited to participate in a pre-proposal conference to be held at LAVTA, 1362 Rutan Court, Suite 100, Livermore, CA, at 10:00 a.m. on April 7, 2016. LAVTA staff and a representative from a consulting firm will be on hand to discuss the project scope and answer any questions Proposers may have.

Attendance at this conference is not mandatory; however Proposers are highly encouraged to attend.

## **1.6 Questions and Requests for Clarification**

Should a Proposer have questions concerning or require clarifications of this RFP, the Proposer shall notify the Authority in writing. Should it be found that the point in question is not clearly and fully set forth, the Authority will issue a written addendum clarifying the matter, which will be posted on the agency's interactive website; [www.wheelsbus.com](http://www.wheelsbus.com).

### **Submitting Request**

- (a) All questions and/or requests for clarification must be put in writing and must be received by the Authority no later than 4:00 p.m. on April 14, 2016.
- (b) Requests for clarification, questions and comments must be clearly labeled, "Written Questions." The Authority is not responsible for failure to respond to a request that has not been labeled as such.
- (c) Any of the following methods of delivering written questions are acceptable as long as the questions are received no later than the date and time specified above:
  - (1) U.S. Mail: Livermore Amador Valley Transit Authority, 1362 Rutan Court, Suite 100, Livermore, CA 94551.
  - (2) Personal Courier: Director of Administrative Services, 1362 Rutan Court, Suite 100, Livermore, CA 94551.
  - (3) Facsimile: The Authority's fax number is (925) 443-1375.
  - (4) E-Mail: [procurements@lavta.org](mailto:procurements@lavta.org).

## **1.7 Authority Responses**

Responses from the Authority will be posted on the Authority's website, [www.wheelsbus.com](http://www.wheelsbus.com) by April 21, 2016. LAVTA reserves the right to postpone this deadline for its own convenience.

## **1.8 Submission of Proposals**

- (a) Date and Time - Proposals must be received in the LAVTA Administrative Offices at or before 2:00 p.m. on April 28, 2016. Proposals received after the above-specified date and time will be returned to Proposers unopened.

- (b) Address - Proposals shall be submitted to the following:

**Livermore Amador Valley Transit Authority  
1362 Rutan Court, Suite 100  
Livermore, CA 94551  
Attn: Beverly Adamo, Director of Administrative Services**

## **1.9 Identification of Proposals**

Proposers shall submit one (1) original and four (4) hard copies AND one (1) electronic version of its proposal on a CD or USB drive, addressed as shown above, bearing the Proposer's name and address, and clearly marked as follows:

**“LAVTA Adaptive Signal Control Technology Services– RFP #2016-05”**

In case of any discrepancies, the original will be considered by the Authority in evaluating the Proposal and the electronic version is provided for the Authority's administrative convenience only.

## **1.10 Acceptance of Proposals**

- (a) The Authority reserves the right to accept or reject any and all proposals, or any item or part thereof, or to waive any informalities or irregularities in proposals or proposal procedures.
- (b) The Authority reserves the right to withdraw or cancel this RFP at any time without prior notice and the Authority makes no representations that any contract will be awarded to any Proposer responding to this RFP.
- (c) The Authority reserves the right to postpone proposal openings for its own convenience.
- (d) The Authority reserves the right to request additional information to clarify any proposal.

## **1.11 Pre-Contractual Expenses**

The Authority shall not, in any event, be liable for any pre-contractual expenses incurred by Proposer in the preparation of its proposal. Proposer shall not include any such expenses as part of its proposal.

Pre-contractual expenses are defined as expenses incurred by Proposer in:

1. Preparing its proposal in response to this RFP;
2. Submitting that proposal to the Authority;
3. Negotiating with the Authority on any matter related to this proposal; or
4. Any other expenses incurred by Proposer prior to date of award, if any of the Agreement.

### **1.12 Joint Offers**

Where two or more firms desire to submit a single proposal in response to this RFP, they should do so on a prime-subcontractor basis rather than as a joint venture. The Authority intends to contract with a single firm rather than with multiple firms doing business as a joint venture.

### **1.13 Protest Procedures**

Protests based upon the content of this Request for Proposals shall be filed in writing with Michael Tree, LAVTA Executive Director, within ten (10) calendar days after the Request for Proposals is first advertised. The protest must clearly specify in writing the grounds and evidence on which the protest is based. LAVTA shall issue a written decision on the protest prior to the opening of proposals. A protest may be renewed by refiling the protest within fifteen (15) calendar days after the mailing of the notice of the recommended award.

Any proposer may protest the recommended award on any ground not based upon the content of the Request for Proposals by filing a protest with Michael Tree, LAVTA Executive Director, within fifteen (15) calendar days after the mailing of the notice of the recommended award. The protest must clearly specify in writing the grounds and evidence on which the protest is based. Protesters shall have an opportunity to appear and be heard before the Authority Board prior to final award of the contract.

Because this contract is federally funded, the Authority's final determination of protests may also be appealed to the Federal Transit Administration (FTA) in accordance with the procedures set forth in FTA Circular 4220.1F, as may be periodically updated. FTA's review will be limited to protests alleging that the Authority failed to have or follow its written protest procedures, failed to review a complaint or protest, or violated a federal law or regulation. The protest must be received by the FTA within five working days of the date the protester learned or should have learned of an adverse decision by the Authority.

Copies of the complete proposal protest procedure are available at the office of the Authority.

### **1.14 Contract Type**

Following the completion of all contractual requirements, the Contractor shall provide the services within the approved scope, schedule and price as set forth in the Agreement. (see Attachment E - Sample Agreement).

### **1.15 Ex-Parte Communications Prohibited**

Proposers shall not contact, lobby or communicate with any member of the Board of Directors, or employees or agents of LAVTA, regarding the RFP or the selection process.



### **1.16 Federal Transit Administration Requirements**

This project will be financed in part by the Federal Transit Administration (“FTA”). Accordingly, the federal contract provisions, as required by the FTA, must be complied with in the performance of this contract. To the extent the contract provisions required by the FTA, and State law are inconsistent, the Contractor is responsible for complying with the more comprehensive or stricter requirements.

### **1.17 Energy Conservation**

The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Federal Energy Policy and Conservation Act (42 U.S.C. 6321 et seq.).

### **1.18 Environmental Requirements**

The Contractor and any subcontractor or third party contractor under this Contract shall comply with all applicable environmental requirements and regulations, including any amendments, as follows:

- A. **Air Quality.** The Contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 et seq. The Contractor agrees to report each violation to LAVTA, to FTA and the appropriate EPA Regional Office. The Contractor shall include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with Federal assistance provided by FTA.
- B. **Clean Water.** The Contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§ 1251 et seq. The Contractor agrees to report each violation to LAVTA, to FTA and the appropriate EPA Regional Office. The Contractor shall include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with Federal assistance provided by FTA.

### **1.19 Lobbying**

Contractor shall file the certification required by 49 CFR part 20, “New Restrictions on Lobbying.” Contractor shall certify that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Contractor shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-Federal funds with respect to that Federal contract, grant or award covered by 31 U.S.C. 1352. Such disclosures shall be forwarded to LAVTA. Contractor shall ensure that all of its Subcontractors under this Contract shall certify the same. Prior to execution of this Agreement, Contractor shall submit the “Certification for Contracts Grants, Loans & Coop Agreements,” included in

the contract documents. LAVTA is responsible for keeping the certification of the Contractor, who is in turn responsible for keeping the certification forms of subcontractors.

### **1.20 Access To Records And Reports**

Contractor shall provide all authorized representatives of LAVTA, the FTA, and the Comptroller General of the United States access to any books, documents, papers and records of the Contractor which are directly pertinent to this Contract for the purposes of making audits, copies, examinations, excerpts and transcriptions. Contractor also agrees to maintain all books, records, accounts and reports required under this Contract for a period of not less than three years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case Contractor agrees to maintain the same until LAVTA, the FTA, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto.

### **1.21 Federal Changes**

Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Agreement (Form FTA MA (21) dated October 2014) between LAVTA and the FTA, as they may be amended or promulgated from time to time during the term of this Contract. Contractor's failure to so comply shall constitute a material breach of this Contract.

### **1.22 No Government Obligation To Third Parties**

- A. LAVTA and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this Contract and shall not be subject to any obligations or liabilities to LAVTA, Contractor, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.
- B. The Contractor agrees to include this clause in any subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

### **1.23 Program Fraud And False Or Fraudulent Statements And Related Acts**

- A. The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. § 3801 et seq. and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract or the FTA assisted

project for which this Contract work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the Federal Government deems appropriate.

- B. The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. § 5307, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307(n)(1) on the Contractor, to the extent the Federal Government deems appropriate.
- C. The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the subcontractor who will be subject to the provisions.

#### **1.24 Civil Rights Requirements**

A. Nondiscrimination

In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

B. Equal Employment Opportunity

The following equal employment opportunity requirements apply to this Contract:

- 1. Race, Color, Creed, National Origin, Sex - In accordance with Title VII of the Civil Rights Act; as amended, 42 U.S.C. § 2000e, and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. Parts 60 et seq., (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 113 75, "Amending Executive Order 11246 Relating to Equal

Employment Opportunity,” 42 U.S.C. § 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project.

During the performance of this contract, the contractor agrees as follows:

- (a) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action 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. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- (b) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.
- (c) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notices in conspicuous places available to employees and applicants for employment.
- (d) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (e) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

- (f) In the event of the contractor’s noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
  
- (g) The contractor will include the portion of the sentence immediately preceding paragraph (a) and the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempt by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

2. Age

In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § 623 and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

3. Disabilities

In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, “Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act,” 29 C.F.R. Part 1630, pertaining to employment of persons with

disabilities. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

4. Access Requirements for Individuals with Disabilities

The Contractor agrees to comply with the requirements of 49 U.S.C. § 5301(d) which expresses the Federal policy that the elderly and persons with disabilities have the same right as other persons to use mass transportation service and facilities, and that special efforts shall be made in planning and designing those services and facilities to implement those policies. Contractor also agrees to comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA), 42 U.S.C. §§ 12101, et seq., and 49 U.S.C. § 322; § 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794; § 16 of the Federal Transit Act, as amended; 49 U.S.C. App. § 612; and the following federal regulations, including any amendments thereto:

- (a) U.S. DOT regulations, "Transportation Services for Individuals with Disabilities (ADA)," 49 C.F.R. Part 37;
- (b) U.S. DOT regulations, "Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance," 49 C.F.R. Part 27;
- (c) Joint U.S. Architectural and Transportation Barriers Compliance Board/U.S. DOT regulations, "Americans with Disabilities (ADA) Accessibility Specifications for Transportation Vehicles," 36 C.F.R. Part 1192 and 49 C.F.R. Part 38;
- (d) U.S. DOJ regulations, "Nondiscrimination on the Basis of Disability in State and Local Government Services," 28 C.F.R. Part 35;
- (e) U.S. DOJ regulations, "Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities," 28 C.F.R. Part 36;
- (f) U.S. GSA regulations, "Accommodations for the Physically Handicapped," 41 C.F.R. Subpart 101-19;
- (g) U.S. Equal Employment Opportunity Commission, "Regulations in Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630;
- (h) U.S. Federal Communications Commission regulations, "Telecommunications Relay Services and Related

Customer Premises Equipment for the Hearing and Speech Disabled,” 47 C.F.R. Part 64, Subpart F;

- (i) FTA regulations, “Transportation for Elderly and Handicapped Persons,” 49 C.F.R. Part 609; and
- (j) Any other implementing federal regulations and requirements.

- 5. The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

### **1.25 Debarment And Suspension**

This contract is a covered transaction for purposes of 49 CFR Part 29. As such, the contractor is required to verify that none of the contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as defined at 49 CFR 29.940 and 29.945.

The contractor is required to comply with 49 CFR 29, Subpart C and must include the requirement to comply with 49 CFR 29, Subpart C in any lower tier covered transaction it enters into.

By signing and submitting its bid or Proposal, the bidder or proposer certifies as follows:

The certification in this clause is a material representation of fact relied upon by LAVTA. If it is later determined that the bidder or proposer knowingly rendered an erroneous certification, in addition to remedies available to LAVTA, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment. The bidder or proposer agrees to comply with the requirements of 49 CFR 29, Subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

### **1.26 Incorporation of Federal Transit Administration (FTA) Terms**

The preceding provisions include, in part, certain Standard Terms and Conditions required by U.S. DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by the U.S. DOT, as set forth in FTA Circular 4220.1F, are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any LAVTA requests which would cause LAVTA to be in violation of the FTA terms and conditions.

### **1.27 Disadvantaged Business Enterprise Program**

The Authority, a recipient of federal financial assistance from the Federal Transit Administration (FTA), is committed to and has adopted a Disadvantaged Business Enterprise Program for contracts in accordance with federal regulations 49 CFR Part 26, issued by the U. S. Department of Transportation (U.S. DOT).

It is the policy of the Authority to ensure nondiscrimination in the award and administration of all contracts and to create a level playing field on which Disadvantaged Business Enterprises (DBEs) can compete fairly for contracts and subcontracts relating to the Authority's construction, procurement and professional services activities. To this end, the Authority has developed procedures to remove barriers to DBE participation in the bidding and award process and to assist DBEs to develop and compete successfully outside of the DBE Program.

Pursuant to 49 CFR §26.13, and as a material term of any agreement with the Authority, the Contractor hereby makes the following assurance and agrees to include this assurance in any agreements it makes with Subcontractors in the performance of this contract:

The Contractor or Subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of U.S. DOT-assisted contracts. Failure by the Contractor or Subcontractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Authority deems appropriate.

The Contractor shall cooperate with the Authority in meeting its commitments and objectives with regards to insuring non-discrimination in the award and administration of Authority contracts and shall use its best efforts to insure that barriers to participation of Disadvantaged Business Enterprises (DBE) do not exist. To better help the Authority record and encourage DBE participation, all Bidders must complete, sign, and submit with their Bid the DBE/Subcontractor forms included in the Bid Forms in Appendix A.

By submitting a Proposal, a Proposer is deemed to have made the foregoing assurance and to be bound by its terms.

### **1.28 Buy America Requirements**

Contractor agrees to comply with 49 U.S.C. 5323(j) and 49 CFR Part 661, which provide that Federal Funds may not be obligated unless steel, iron, and manufactured products used in FTA-funded projects are produced in the United States unless a waiver has been granted by FTA, or unless the product is subject to a general waiver. General waivers are listed in 49 CFR 661.7.

Attention is directed to the FTA's Dear Colleague Letter dated February, 17, 2011, available at: [http://www.fta.dot.gov/12358\\_12450.html](http://www.fta.dot.gov/12358_12450.html). In light of the FTA's advice restricting the granting of Buy America waivers and the need to proceed with this project without delay, the Authority will not award a contract to a Proposer that does not certify compliance with the Buy America requirements on the Buy America Certificate, as such



a submission will be considered non-responsive to the requirements of this specification. Proposers should notify the Authority during the request for clarifications period if they have questions regarding the Buy America requirements. All Proposers must complete, sign and submit to the authority, Buy America certification forms included in Attachment A, with their proposals. Proposals that are not accompanied by a completed Buy America certification must be rejected as nonresponsive. This requirement does not apply to lower tier subcontractors.

SECTION II

SCOPE OF WORK

## SCOPE OF WORK

### ADAPTIVE SIGNAL CONTROL TECHNOLOGY SERVICES

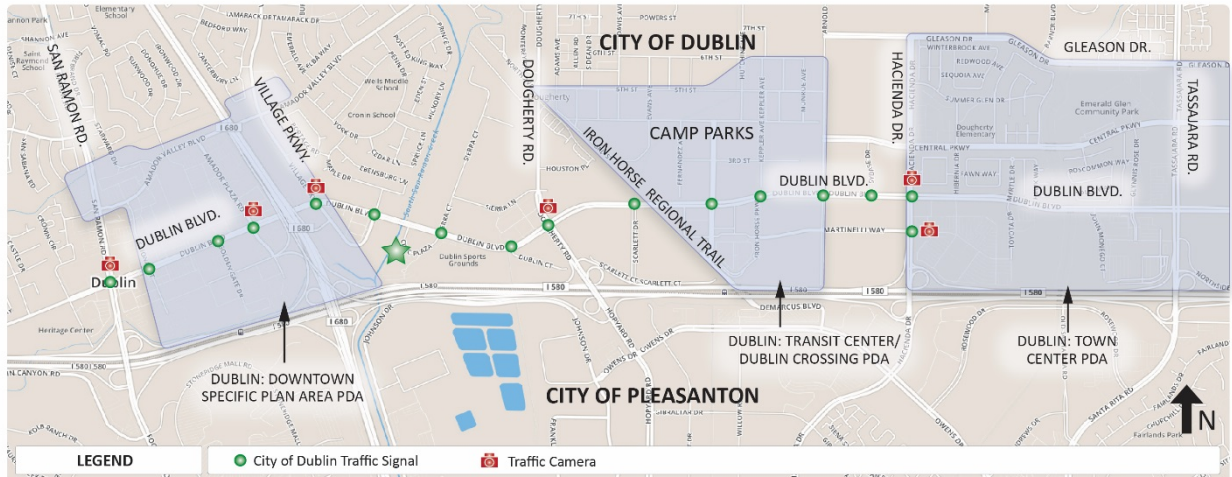
#### 1. INTRODUCTION

##### 1.1. Request for Proposals

The Livermore Amador Valley Transit Authority (LAVTA) seeks the services of a qualified firm able to implement the strategies of adaptive signal control, and replace the existing coordinated traffic signal system, to provide real time changes to the signal timing parameters in response to changes in the traffic conditions in the City of Dublin. The purpose of providing adaptive control along this corridor is to minimize delay and manage queues due to periodic traffic volume fluctuations. The project location is along a 2.87 mile stretch of Dublin Boulevard from San Ramon Road to Hacienda Drive, consisting of sixteen (16) traffic signals shown in the figure below. This initial deployment will form the basis for future deployment(s) and expansion of the adaptive system as additional funding becomes available.

For additional details regarding the existing system, operation, and infrastructure for this project corridor, please refer to the Final Concept of Operations report attached to this RFP as **Attachment B**.

#### Project Map



Respondents to this RFP must be able to provide all of the desired services for each of the items listed in the scope of work. LAVTA intends to award the contract to one firm, but reserves the right to award to multiple firms.

The contract awarded under this RFP may be funded in whole or in part by the Federal Transit Administration (FTA). The successful Proposer shall cooperate with the Authority to ensure the full conformance with its funding agreements with the FTA and shall comply with all terms and conditions prescribed for third party contracts by the FTA.

## 1.2. Scope of Work

The System Vendor shall furnish, install, integrate, and test all necessary software and hardware, and make operational an Adaptive Signal Control Technology (ASCT) system comprised of a system capable of implementing real-time centralized control and monitoring of traffic signals as outlined in the System Requirements found in **Attachment C**. The System Vendor shall be responsible for all items necessary to furnish, install, configure, implement, test, and provide training and documentation on the proposed system. The System Vendor shall also be responsible for successfully utilizing the City of Dublin's existing Ethernet communication system along the project limits to implement the ASCT system.

The System Vendor shall be fully responsible for the maintenance and care of all hardware, equipment, and software furnished by the System Vendor until the time of final acceptance of the ASCT system by LAVTA and the City of Dublin. The responsibility of operating and maintaining the ASCT system shall be transferred to the City of Dublin from LAVTA upon completion of the project.

The City of Dublin will be responsible for providing the System Vendor access to the existing Ethernet communications between the proposed ASCT system server and all traffic signal controllers at each project intersection. The System Vendor will not be responsible for providing these items, other than the need to integrate these items into the System Vendor's proposed ASCT system.

### A. Project Management

The System Vendor shall designate a dedicated System Vendor Project Manager that will be committed to this project through the duration of the contract. The System Vendor Project Manager's responsibilities shall include, but not limited to:

- Coordinate the work of this contract with other concurrent work as necessary.
- Maintain communication between key contract personnel, LAVTA staff and City of Dublin staff.
- Maintain an adequate staff of qualified support personnel to perform the work necessary to complete the project as per the project schedule.
- Establish and maintain contract administration procedures, which may include supplemental agreements, time-extensions, subcontracts, and tracking and maintaining the budget.
- Inform the LAVTA's Project Manager of any changes to the key personnel assigned to the project. The work shall be performed and directed by the key personnel identified in the proposal. Any changes in the designated key personnel or the proposed Project Manager in charge of the work, as indicated in the proposal, shall be subject to review and approval by LAVTA. The proposed staff assigned to perform any task shall be qualified individuals with closely related experience in that field.
- Keep LAVTA's Project Manager informed of all the pertinent decisions related to the project.

**B. Project Schedule**

The System Vendor Project Manager shall develop and maintain a project schedule for the duration of the project. Within one week after the notice to proceed (NTP), the System Vendor shall submit a detailed schedule indicating all milestone dates and deliverables. The system is expected to be deployed approximately four (4) months after Notice to Proceed is given to the System Vendor. LAVTA's Project Manager will review and approve the Project Schedule for content and format.

**1) Bi-Weekly Progress Meetings**

The System Vendor Project Manager shall arrange and attend regular progress meetings every other week as needed at LAVTA's designated facility to report the progress and provide data to LAVTA's Project Manager. The data shall generally include the following information:

- Detailed project schedule and critical path work from initial plans as work progresses.
- Progress against schedule for each identified work item.
- Forecast the completion dates from current progress.
- Rescheduled work in any area, which is out of the required sequence.
- Respond to any inquiry concerning the status of any work element in terms of schedule, staff, and cost.

**C. Advise on ASCT System Detection Requirements**

The System Vendor shall review the existing detection configuration at each project intersection and then advise LAVTA's Project Manager on the need for either a modification to the existing detection and/or the need for additional detection required in order to satisfy the detection requirements of the ASCT system. The City of Dublin will provide the System Vendor with traffic signal as-built drawings to conduct this review. It may be necessary for the System Vendor to perform a portion of this review in the field if the System Vendor deems that the provided as-built plans are not adequate to provide the System Vendor with the information needed to make an accurate assessment of the existing detection.

Based on the System Vendor's input on the need to modify or add detection at each intersection, LAVTA will be responsible for preparing design plans and procuring a construction contractor to build the improvements.

**D. Furnish ASCT Software and Hardware**

The System Vendor shall furnish the ASCT software per the system requirements contained in **Attachment C**. This shall include any additional 3<sup>rd</sup> party software, operating system(s), application(s), and/or utilities necessary for the operation of the ASCT system.

The System Vendor shall furnish the required number of servers and workstation necessary to host the ASCT software and provide the functionality as specified in the system requirements. At a minimum, the following shall be provided:

- The main server and a backup main server, with appropriate slide out mounting rails for a 19" equipment rack, shall be located at the City of Dublin's Traffic Operation Center (TOC) located at Dublin City Hall.
- A computer workstation, to run the ASCT client software application, shall be located at the City of Dublin TOC.

The System Vendor has the option of installing their firmware on the existing Naztec 2070 controller hardware or supplying an Ethernet capable Model 2070 controller that supports the proposed firmware, provided the different controller's functionality is approved by the City of Dublin. If new controller hardware is provided then a total of 18 units will be required. This includes one per intersection plus two spare.

For all hardware supplied by the System Vendor, the System Vendor shall provide LAVTA's Project Manager with hardware submittals for review and approval prior to delivery. It shall be the Vendor's responsibility to provide any ancillary equipment such as cables, mounting rails, etc. with the provided hardware.

#### **E. Installation, Integration and Deployment**

The System Vendor shall install, configure, and integrate the ASCT software on servers, workstations, and laptops.

The System Vendor shall install the main server and the backup main server at the City's TOC within Dublin's City Hall. The City of Dublin will provide the necessary rack space (19" rack) to mount the provided servers, the necessary power source, and the communications network infrastructure to connect the servers to the City's existing network. The System Vendor shall coordinate with LAVTA's Project Manager and City of Dublin staff to integrate the main server and the backup server onto the City's existing LAN. The System Vendor shall install the ASCT software on the main server and the backup main server. The System Vendor shall configure the main server as the primary server for the ASCT responsible for day-to-day operation.

The System Vendor shall configure the backup main server as a clone of the main server. A routine shall be established to clone the main server onto the backup main server on a daily basis such that backup main server is never more than 24 hours behind the main server. In the event of a failure of the main server, the backup main server shall take over as the server for day to day operation until such time the main server is repaired and brought back on-line.

The System Vendor shall install and configure the ASCT client software onto the existing workstations and laptops of City staff. It is anticipated that there will be up to 5 client installations of this type.

The System Vendor shall integrate all the traffic signal controllers under this project with the ASCT system. If necessary, a separate contractor will be procured to install the System Vendor's provided traffic signal controller in the field and any additional intersection detection as advised by the System Vendor outlined in Task 4.0. The System Vendor shall make appropriate personnel available to assist in the controller installation and ensure its proper and intended function, if needed.

The System Vendor shall set up and configure the ASCT system including entering all timings into the central system and field controllers and configuring all system parameters in the central system. The System Vendor shall then activate and deploy the system for field operation and fine-tune all required timings and parameters to satisfy the system requirements.

#### **F. System Testing and Acceptance**

The System Vendor shall develop Verification and Acceptance Test Procedures for LAVTA's review and approval based on the Verification Plan in **Attachment D**. The System Vendor shall provide a proposed acceptance test procedure to LAVTA for approval at least 30 days before the acceptance test is to begin. LAVTA shall review the System Vendor's initial Acceptance Test Procedure and provide review comments within 14 days of receipt. The Acceptance Test Procedures shall not be final until accepted by LAVTA and the City of Dublin.

The Acceptance Test Procedures will serve as a guide to operationally test system hardware, software, and integration. The procedures must include a detailed description of the tests to be conducted and the purpose of each test. Each test should be mapped to at least one of the system requirements. At a minimum, the Acceptance Test Procedure shall define testing stages, methods, procedures, tools and data to verify that the system is working as designed under the planned and maximum conditions.

Final acceptance testing shall include tests for the ASCT software, any additional software implemented, and communications between field traffic signal controllers and the ASCT software. The test period for final acceptance will be a period of 30 days of error free operation. LAVTA and/or the City of Dublin may choose to pause the testing period on days spent correcting minor errors and will notify the System Vendor if they pause the testing period. LAVTA and/or the City of Dublin may choose to restart the 30-day acceptance test if errors are found to be significant. Final acceptance tests will be conducted to:

- Verify requirements are satisfied;
- Verify user interface is implemented correctly;
- Verify error-free linkage of field controllers and the ASCT server and software;
- Verify storage and throughput capacity requirements;
- Verify real time performance requirements are met;
- Verify security measures;

- Verify diagnostic and logging features;
- Verify ability to recover from errors, improper input and hardware failures; and
- Ensure hardware performs correctly.

All tests will be conducted by the System Vendor in the presence of LAVTA's Project Manager or designated representative, and the City of Dublin's designated staff. The System Vendor shall document and record all test results. A variance report shall be prepared by the System Vendor each time a test results in the ASCT system not meeting a functional requirement. The System Vendor shall document actions to be taken to correct the variance.

LAVTA's Project Manager and the City of Dublin will provide final acceptance of the ASCT system software, hardware, integration, and other services following the System Vendor's completion of work in accordance with the contract and after successful completion of the 30-day acceptance test. The acceptance date will mark the beginning of the System Vendor's warranty period. The ASCT system will be owned, managed and operated by the City of Dublin. Therefore all warranties and associated ASCT system documentation must indicate the City of Dublin as the final owner of the ASCT system.

#### **G. Training and Documentation**

The System Vendor shall develop training courses and conduct training classes for the purpose of training City of Dublin staff in the operation, administration and maintenance of the ASCT system. The System Vendor shall submit a detailed and comprehensive training plan for each course to LAVTA for review and approval 30 days prior to the scheduled start of any training. The training plan(s) shall include a lesson plan for each course detailing the literature, standard operating procedures, manuals, and test materials that will be used.

The training plan(s) shall describe the System Vendor management role and responsibilities for each course. The training plan(s) shall include a training schedule listing each period of instruction and the time required for each period. The number of training persons per course will vary depending on the course subject.

The System Vendor shall provide a total of 40 hours of training by qualified personnel. Also, the System Vendor shall provide 20 hours of follow-up training at the end of the warranty period.

The training courses are classified into three general categories:

- System Operations
- System Administration
- System Maintenance

The System Vendor shall be responsible for ensuring the operating and technical support staff for the City of Dublin is adequately trained to provide all



operational, maintenance, and support functions on the system. The degree of technical support to be provided shall be contingent upon the category of training provided, but as a minimum, must be to the degree that all normal and daily operations and maintenance activities can be achieved without any support of the System Vendor. Formalized training shall be provided as defined below to acquaint large numbers of staff to the functionality and support of the particular application. Unless otherwise stated, class size shall be assumed to be no more than 10 persons.

The training sessions shall consist of both formal classroom presentation and hands-on workshops. All training shall be conducted during the normal business hours of the City of Dublin.

**1.) System Operations**

Courses in this category shall be designed to train City of Dublin staff and other end users in the use of the ASCT system. Courses in this category shall include all necessary materials to acquaint this audience with the application operations.

The purpose of this training is to provide intended users of the system with sufficient expertise to use and manipulate all of the key features and applications provided with the system.

**2.) System Features and Functionalities**

Courses in this category shall be designed to train a smaller group of City of Dublin staff that will have system administrative responsibilities of the ASCT system. Courses in this category shall include all necessary materials to train this audience with the administration features and functionalities of the ASCT system. The purpose of this training is to provide intended users of the system with sufficient expertise to use and manipulate all system features (i.e., configuration files, threshold parameters, passwords, backup procedures, etc.).

**3.) System Maintenance**

Courses in this category shall be designed to train City of Dublin staff in the maintenance of the ASCT system. Courses in this category shall include all necessary materials to acquaint this audience with the ASCT maintenance procedures. The purpose of this training is to provide intended users of the system with sufficient expertise to utilize System Vendor provided diagnostic and maintenance utilities, and to diagnose, maintain, and repair all supplied ASCT elements.

**4.) Training Location and Schedule**

All training courses shall be primarily conducted at a space to be provided by the City of Dublin or as otherwise designated. The System Vendor shall develop a training schedule acceptable to LAVTA and the City of Dublin with all training completed before final acceptance of the ASCT system.

**5.) Training Equipment Requirements**

All training shall be performed using actual equipment to be installed as part of the ASCT system. This shall include servers, workstations, field devices, test equipment, etc. Standard classroom type materials such as white boards, slide and overhead projectors, screens, and so forth will be provided by the City of Dublin as requested by the System Vendor. These standard materials shall be restricted to normal supplies typically owned by the City.

The System Vendor shall be responsible for all labor costs, transportation, per diem, course material and reproduction costs, and all miscellaneous material and supply costs not identified but required, to conduct all classroom training.

The System Vendor shall develop training manuals for all phases of the system training effort. The System Vendor shall deliver and update a minimum of ten (10) copies of the training manual(s) to the City of Dublin. All training aids including slides, charts, graphs, support documentation and other media shall become the property of the City of Dublin upon completion of the training programs.

LAVTA and the City of Dublin reserve the right to film any and all training courses provided and organized by the System Vendor.

**6.) Documentation**

The System Vendor shall provide a complete systems documentation package. The documentation package in general shall include all drawings (electrical, mechanical, assembly, flow and block diagrams, interconnection diagrams, power distribution, wiring, etc.), schematics, software and hardware submittals, detailed functional and interface descriptions, user/operator manuals, software programming manuals and procedures and all other required documentation related to the completed ASCT system. The documentation package shall address all hardware and software provided under this contract, and shall be subject to review and approval by LAVTA and the City of Dublin before final system acceptance.

The System Vendor shall submit all documentation for review and approval by LAVTA and the City of Dublin. Following approval, a minimum of ten (10) copies of the documentation shall be provided to the City of Dublin.

**H. System License, Warranty and Support**

**1.) Licensing Terms**

The System Vendor shall provide all necessary licenses, including for database, operating systems, third-party software applications, etc., used for the project including installations of such software in servers, workstations, laptops, and other computing devices to LAVTA with the City of Dublin listed as the final owner of the ASCT system. All software license terms shall be perpetual with no recurring fees. The terms and conditions of software license will be incorporated into the final contract.

Prior to finalizing the contract, LAVTA reserves the right to negotiate terms of the software license.

**2.) Warranty and Support Terms**

The System Vendor shall provide all necessary on- and off-site support as appropriate during the course of implementation of the ASCT system. Following completion and final acceptance of the ASCT system, the System Vendor shall warrant and support the installed ASCT for the duration as proposed by the System Vendor, or as negotiated, but for a period of no less than three years following final system acceptance. The final terms and conditions of this warranty will be incorporated into the final contract.

During the warranty period, the System Vendor shall provide the following support services at no additional cost:

- a. Technical Support – The System Vendor shall provide technical support to assist City of Dublin staff with routine questions about the use, configuration, management, and troubleshooting of the system. The System Vendor shall propose the technical support terms and include methods of communication, hours of availability, and response times.
- b. Software Upgrades – The System Vendor shall provide all released upgrades to the City of Dublin. Software upgrades include those to address errors, defects, security flaws, etc. and those that provide enhancements, new features, new functions, etc. The ASCT system must retain all system, user configuration, and preferences when applying software upgrades. If requested by the City of Dublin, the System Vendor shall provide technical support to install software upgrades.

**2.0 ADDITIONAL REQUIREMENTS**

**2.1 Insurance**

The insurance requirements specified in this section shall apply to System Vendor and any subcontractors, suppliers, temporary workers, independent contractors, leased employees, or any other persons, firms or corporations that System Vendor authorizes to work under this Agreement (hereinafter collectively referred to as “Agents”). System Vendor and all Agents are required to procure and maintain at their sole cost and expense the insurance coverages subject to all of the requirements set forth below. Such insurance shall remain in full force and effect throughout the term of this Agreement. To the extent that any Agent does not procure and maintain such insurance coverage, System Vendor shall be responsible for said coverage and assume any and all costs and expenses that may be incurred in securing said coverage or in fulfilling System Vendor’s indemnity obligation as to itself or any of its Agents in the absence of coverage. In the event System Vendor or its Agents procure

excess or umbrella coverage to maintain certain requirements outlined below, these policies shall also satisfy all specified endorsements and stipulations, including provisions that the System Vendor's insurance be primary without any right of contribution from the Authority. Prior to beginning work under this contract, System Vendor shall provide the Authority with satisfactory evidence of compliance with the insurance requirements of this section.

**A. Minimum Types and Scope of Insurance**

**1.) Workers' Compensation and Employers' Liability Insurance**

- a. Workers' Compensation with Statutory Limits, as required by Section 3700 et seq of the California Labor Code, or any subsequent amendments or successor acts thereto governing the liability of employers to their employees.
- b. Employers' Liability coverage with minimum limits of \$1 million.
- c. Such insurance shall include the following endorsement as further detailed in the Endorsements Section below:
  - Waiver of Subrogation.

**2.) Commercial General Liability Insurance**

Commercial General Liability insurance for bodily injury and property damage coverage with a combined single limit for bodily injury and property damage of at least \$1 million per occurrence or claim and a general aggregate limit of at least \$2 million. Such insurance shall cover all of System Vendor's operations both at and away from the project site.

- a. This insurance shall include coverage for, but not be limited to:
  - Premises and operations.
  - Products and completed operations.
  - Contractual liability.
  - Personal injury.
  - Advertising injury.
  - Explosion, collapse, and underground coverage (xcu).
  - Broad form property damage.
- b. Such insurance shall include the following endorsements as further detailed in the Endorsements Section below:
  - Additional Insured.
  - Cross Liability or Severability of Interests Clause.
  - Primary and Non-Contributory wording.
  - Waiver of Subrogation.

Products and completed operations insurance shall be maintained for three (3) years following termination of this Agreement.

**3.) Business Automobile Liability Insurance**

Business Automobile Liability insurance providing bodily injury and property damage with a combined single limit of at least \$1 million per occurrence.

a. This insurance shall include coverage for, but not be limited to:

- All Owned vehicles.
- Non-owned vehicles.
- Hired or rental vehicles.

b. Such insurance shall include the following endorsements as further detailed in the Endorsements Section below:

- Additional Insured.
- Primary and Non-Contributory wording.
- Waiver of Subrogation.

**4.) Professional Liability Insurance**

The System Vendor, at its own cost and expense, shall maintain professional liability insurance for the period covered by the Agreement, and two years following completion of the contract in an amount not less than \$1,000,000 covering errors and omissions in the services of the System Vendor performs under the Agreement. The policy limits of this professional liability insurance policy shall apply separately to the Agreement.

**B. Endorsements**

**1.) Additional Insured**

The referenced policies and any Excess or Umbrella policies shall include as Additional Insureds the Livermore Amador Valley Transit Authority and its directors, officers, employees, volunteers and agents while acting in such capacity, and their successors or assignees, as they now, or as they may hereafter be constituted, singly, jointly or severally.

**2.) Waiver of Subrogation**

The referenced policies and any Excess or Umbrella policies shall contain a waiver of subrogation in favor of the Livermore Amador Valley Transit Authority and its officers, directors, employees, volunteers and agents while acting in such capacity, and their successors and assignees, as they now, or as they may hereafter be constituted, singly, jointly or severally.

**3.) Primary Insurance**

The referenced policies and any Excess and Umbrella policies shall indicate that they are primary to any other insurance and the insurance company(ies) providing such policy(ies) shall be liable thereunder for the full amount of any loss or claim, up to and including the total limit of liability, without right of contribution from any of the insurance effected or

which may be effected by the Livermore Amador Valley Transit Authority.

**4.) Severability of Interests or Cross Liability**

The referenced policies and any Excess or Umbrella policies shall contain either a Cross Liability endorsement or Severability of Interests Clause and stipulate that inclusion of the Livermore Amador Valley Transit Authority as an Additional Insured shall not in any way affect Authority's rights either as respects any claim, demand, suit or judgment made, brought or recovered against the System Vendor. Said policy shall protect System Vendor and the Livermore Amador Valley Transit Authority in the same manner as though a separate policy had been issued to each, but nothing in said policy shall operate to increase the insurance company's liability as set forth in its policy beyond the amount or amounts shown or to which the insurance company would have been liable if only one interest had been named as an insured.

**C. Evidence of Insurance**

**1.) All Coverages**

Prior to commencing work or entering onto the Property, System Vendor shall provide the Director, Contracts and Procurement of the Authority with a certificate evidencing coverage, and upon request, a certified duplicate original of the policy. The certificate shall also show that the System Vendor's policy(ies) will not be cancelled or coverage altered without 30 days prior written notice to the Authority's Executive Director.

**D. General Provisions**

**1.) Notice of Cancellation**

The policies shall provide that the System Vendor's policies will not be cancelled or have limits reduced or coverage altered without 30 days prior written notice to the Authority's Executive Director.

**2.) Acceptable Insurers**

All policies will be issued by insurers acceptable to the Authority (generally with a Best's Rating of A- 10 or better).

**3.) Self-insurance**

Upon evidence of financial capacity satisfactory to the Authority and System Vendor's agreement to waive subrogation against the Authority respecting any and all claims that may arise, System Vendor's obligation hereunder may be satisfied in whole or in part by adequately funded self-insurance.

**4.) Failure to Maintain Insurance**

All insurance specified above shall remain in force until all work to be performed is satisfactorily completed, all of System Vendor's personnel and equipment have been removed from the Authority property, and the work has been formally accepted. The failure to procure or maintain required insurance and/or an adequately funded self-insurance program

will constitute a material breach of this Agreement.

**5.) Claims Made Coverage**

If any insurance specified above shall be provided on a claim-made basis, then in addition to coverage requirements above, such policy shall provide that:

- a. Policy retroactive date coincides with or precedes the System Vendor's start of work (including subsequent policies purchased as renewals or replacements).
- b. System Vendor shall make every effort to maintain similar insurance for at least three (3) years following project completion, including the requirement of adding all named insureds.
- c. If insurance is terminated for any reason, System Vendor agrees to purchase an extended reporting provision of at least three (3) years to report claims arising from work performed in connection with this Agreement.
- d. Policy allows for reporting of circumstances or incidents that might give rise to future claims.

**6.) Deductibles and Retentions**

System Vendor shall be responsible for payment of any deductible or retention on System Vendor's policies without right of contribution from the Authority.

In the event that the policy of the System Vendor or any subcontractor contains a deductible or self-insured retention, and in the event that LAVTA seeks coverage under such policy as an additional insured, System Vendor shall satisfy such deductible or self-insured retention to the extent of loss covered by such policy for a lawsuit arising from or connected with any alleged act or omission of System Vendor, subcontractor, or any of their officers, directors, employees, agents, or suppliers, even if System Vendor or subcontractor is not a named defendant in the lawsuit.

**2.2 Conflict of Interest**

Proposer represents and warrants that it presently has no interest and agrees that it will not acquire any interest which would present a conflict of interest under California Government Code §§ 1090 et seq. or §§ 87100 et seq. during the performance of services under the Agreement. Proposer shall promptly disclose any actual or potential conflict of interest to Authority as soon as proposer becomes aware of such conflict. Proposer further covenants that it will not knowingly employ any person having such an interest in the performance of the Agreement. Violation of this provision may result in the Agreement being deemed void and unenforceable.

No member, officer or employee of the Authority or of any of its member jurisdictions during his/her tenure of office, or for one year thereafter, shall have any interest, direct or indirect, in this contract or the proceeds therefrom.



SECTION III

PROPOSAL CONTENT

## **1.0 PROPOSAL CONTENT - TECHNICAL PROPOSAL**

### **1.1 Format**

The intent of this RFP is to encourage responses that clearly communicate the proposer's understanding of the scope of work and the proposer's planned approach to meet LAVTA's requirement for adaptive signal control technology services.

Proposals should be limited to specific discussion of the elements outlined in this RFP. Responders are encouraged to avoid submissions that are poorly organized or in which important information is obscured by unnecessary promotional material. Short, succinct, and clear submittals are less likely to be marked down due to uncertainty as to meaning or misinterpretation. The Evaluation Committee will assume the most unfavorable interpretation when information is unclear, ambiguous, or missing. Responders are encouraged to submit proposals that best address the evaluation criteria outlined in Section IV, Evaluation and Award, subsection 1.1.

The organization of the proposal should follow the general outline below. Proposals should not exceed twenty (20) pages in length excluding any appendices. Page limit applies to Proposer's Qualifications, Experience and References and Technical Proposal section.

Respondent's proposal shall include the following items in the following sequence:

### **1.2 Cover Form**

The signed cover form, provided in Attachment A, contains the following:

- a) Date submitted and complete name and address of person who will receive correspondence and who is authorized to make decisions or represent the Proposer and contractually bind the firm. This person shall also sign the Price Proposal Form. Identification shall include legal name of company, corporate address, telephone and fax number and contact person during period of proposal evaluation.
- b) An understanding of the conditions under which the proposal is offered.
- c) Acknowledgement of receipt of all RFP addenda, if any.
- d) A statement to the effect that the proposal shall remain valid for a period of not less than one hundred twenty (120) days from the date of submittal.
- e) An understanding that LAVTA reserves the right to reject any or all Proposals or to waive any informality or technicality in any proposal in the interest of LAVTA.

- f) A statement that Proposer is prepared to sign the Sample Agreement without alterations or exceptions or whether it is requesting modifications to the Sample Agreement and/or any requirements of this RFP.
- g) A statement confirming the commitment of adequate resources to meet LAVTA's quality and schedule expectations.
- h) Signature of a person authorized to bind Proposer to the terms of the proposal.

### **1.3 Evidence of Ability to Provide Insurance**

Provide evidence in the form of a certificate of insurance or letter from Proposer's broker/agent that verifies the firm is able to meet the minimum insurance requirements as detailed in Section II – Scope of Work, including, workers' compensation insurance, commercial general liability insurance, automobile liability insurance and professional liability insurance.

### **1.4 Proposer's Qualifications, Experience and References**

The following information shall be included:

- a) Summary - A brief description of the Proposer's qualifications furnish, install, integrate, and test all necessary software and hardware, and make operational an Adaptive Signal Control Technology (ASCT) system comprised of a system capable of implementing real-time centralized control and monitoring of traffic signals as outlined in the System Requirements found in **Attachment C**, including the organization name, size and years in business.
- b) Firm Experience – This section should contain a concise description of the proposer's background and experience in furnishing, installing, integrating, and testing software and hardware to make operational an Adaptive Signal Control Technology (ASCT) system comprised of a system capable of implementing real-time centralized control and monitoring of traffic signals similar to those outlined in the Scope of Work. List at least three projects within the last three years (not including any projects completed for LAVTA). The information submitted should include:
  - Name, address, and telephone number of the responsible official of the organization
  - Cost of the contract
  - Dates services encompass
  - Services provided
  - The status of the contract

This section should provide examples of work on similar projects, including project scope, objectives and success or failure to achieve those goals.

- c) Experience of Key Personnel - Identify your proposed Project Manager, and other key personnel who will provide direct services to LAVTA, including such

person's relevant job histories, professional credentials, if any, and related experience, especially in, but not limited to, working with public sector clients.

- d) Financial stability and history of the Proposer - Provide a statement of your firm's financial strength, stability, capacity, and resources. Company official reports and other similar materials (balance sheet and income statements, with 3-year summary history) should be provided. Provide information about the history of the firm, demonstrating viability of the firm.
  - o Identify any past (within last 3 years) or pending litigation against the Proposer alleging failure to perform in accordance with contractual obligations, and describe present status. If there is no such litigation, this must be explicitly stated.
  - o List any projects, which have resulted in time extensions and/or the assessment of liquidated damages against any member of the project team during the last five (5) years.

### **1.5 Approach to Scope of Work**

Adaptive Signal Control Technology Services - The following shall be included as a description of the proposed services to be provided by the Proposer under this contract in conformance Section II, Scope of Work:

- a) Demonstrate the Firm's approach to meet the mandatory system requirements described in Section II, Scope of Work.
- b) Project approach and methodology that includes at minimum systems design approach, training program, quality control, project management and product delivery. The System Vendor shall propose the technical support terms and include methods of communication, hours of availability, and response times for the warranty period.
- c) Conformance to the terms of the requirements of the RFP – The Proposer should describe if they can meet all the requirements of the RFP. Any deviation with the RFP requirements should be clearly identified and described. Failure to specify any exceptions or objection to the requirements, and terms and conditions of this RFP will constitute acceptance of LAVTA's requirements.
- d) Identification of any parts of the proposal the proposer considers proprietary and a written justification for the claim.

### **1.6 Supporting Documentation**

Proposals may include other material that may assist in evaluating the Proposal. Supporting documentation should be relevant and brief.

### **1.7 Completed Required Forms (Provided in Attachment A)**

- o Certification Regarding Worker Compensation

- Fair Employment Practice Certification
- Certification Concerning Control of Employee
- Lobbying Certification
- Buy America Form

### 1.8 Price Proposal

The Proposer shall use the Price Proposal Forms provided in Attachment A to provide the complete price for the Advanced Signal Control Technology hardware, software, Services, training, and maintenance.

The Initial Project Total and Future Expansion Total Cost shall include everything necessary for the completion and fulfillment of all services being contemplated by the Authority, as identified in Section II – Scope of Work, including, but not limited to, hardware, software licenses, training, maintenance, labor, services, materials, equipment, storage, delivery, transportation, profit, insurance, overhead, associated costs for LAVTA and City of Dublin staff training, and customer service/support, and all applicable federal, state, and local taxes.

### 1.9 Confidentiality

The California Public Records Act (California Government Code Sections 6250 et seq.) mandates public access to government records. Therefore, unless the information is exempt from disclosure by law, the content of any request for explanation, exception or substitution, response to these specifications, protest or any other written communication between Authority and the proposer shall be available to the public.

If the proposer believes any communication contains trade secrets or other proprietary information that the proposer believes would cause substantial injury to the proposer's competitive position if disclosed, the proposer shall request that Authority withhold from disclosure the proprietary information by marking each page containing such proprietary information as confidential. **The proposer may not designate its entire proposal or bid as confidential. Additionally, proposer may not designate its cost proposal or any required bid forms or certifications as confidential.**

If proposer requests that Authority withhold from disclosure information identified as confidential, and Authority complies with the proposer's request, proposer shall assume all responsibility for any challenges resulting from the non-disclosure, indemnify and hold harmless Authority from and against all damages (including but not limited to attorneys' fees that may be awarded to the party requesting the proposer information), and pay any and all costs and expenses related to the withholding of proposer information.

Proposer shall not make a claim, sue or maintain any legal action against Authority or its directors, officers, employees or agents in connection with the withholding from disclosure of proposer information.

If proposer does not request that Authority withhold from disclosure information identified as confidential, Authority shall have no obligation to withhold the

information from disclosure and may release the information sought without any liability to Authority.

Respondent is expected to examine this RFP carefully, understand the terms and conditions for providing the products herein and respond completely. **FAILURE TO COMPLETE AND PROVIDE ANY OF THE ABOVE ITEMS MAY RESULT IN THE RESPONDENT'S PROPOSAL BEING DEEMED NON-RESPONSIVE.**

SECTION IV  
EVALUATION AND AWARD

## 1.0 EVALUATION AND AWARD

### 1.1 Evaluation Criteria

The Authority intends to award a Contract to the most qualified, responsible firm submitting a responsive proposal. The Authority will evaluate the Proposals received based on the following criteria:

Evaluation Criteria - % Weight (100% Best)	Scoring
<b>System Requirements.</b> Ability of firm to meet the mandatory system requirements outlined in the Technical Scope.	40 points
<b>Understanding of Project.</b> Firm's ability to demonstrate an understanding of the project objectives and work requirements based upon clarity of proposal and responsiveness to the RFP.	15 points
<b>Company Qualifications and Experience:</b> Strengths, experience and qualifications of key personnel, in completing projects of similar type, size and complexity, and client references.	15 points
<b>Proposed Cost:</b> The most cost effective proposal will receive full points. The 2 <sup>nd</sup> lowest cost proposal will receive 10 points and the third lowest cost proposal will receive 5 points. All other proposals will receive 0 points.	15 points
<b>Ability to meet desirable system requirements:</b> Proposer understands LAVTA's requirements as demonstrated by a comprehensive response to this RFP.	10 points
<b>Project Approach.</b> Proposer provides a logical and efficient approach to the project and offers a clear methodology to the approach.	5 points
Total Points	100 points

### 1.2 Evaluation Procedure

To be considered for evaluation, all proposals must be responsive to this Request for Proposals with respect to required submissions and must be compliant with all provisions as documented. LAVTA may reject as nonresponsive any proposal not meeting the requirements of this RFP. An Evaluation Committee shall be comprised of Authority staff and may include outside personnel. The Committee members will evaluate the written proposals using the criteria identified in Section 1.1 above.

Firms submitting a proposal to this RFP may be required to give a demonstration and presentation of their proposal and/or system to LAVTA as noted in the Consultant Notice. This presentation may provide an opportunity for the firms to



clarify or elaborate on the proposal but will in no way change the original submission.

Engagement staff shall be present at the oral presentation. LAVTA's request for an oral presentation shall not constitute acceptance of a proposal.

The Authority reserves the right to request additional information to clarify any Proposal. Upon completion of the review of written submittals and interview, if any, the Authority shall rank each firm in accordance with the criteria above.

### **1.3 Award**

The Authority reserves the right to accept or reject any or all Proposals received as a result of this solicitation, to negotiate with any qualified firm, to modify or cancel in part or in its entirety the RFP or to request revised Proposals if it is in the best interest of the Authority to do so. The Authority, however, may award a contract without negotiation, so System Vendors are encouraged to submit their best offers and proposals.

### **1.4 Notification of Award**

Proposers who submit a proposal in response to this RFP shall be notified by mail regarding LAVTA's intent to award the contract.

## Attachment A – Proposal Forms

**PROPOSAL COVER FORM**  
**for**  
**Adaptive Signal Control Technology Services**  
**RFP # 2016-05**

Livermore Amador Valley Transit Authority (LAVTA)  
Livermore, CA

DATE SUBMITTED:

NAME OF INDIVIDUAL SUBMITTING PROPOSAL:

CONTACT PERSON:

NAME UNDER WHICH BUSINESS IS CONDUCTED:

STREET ADDRESS:

MAILING ADDRESS, IF DIFFERENT:

TELEPHONE:

FAX:

BUSINESS LICENSE NUMBER:

CONDITIONS:

1. The undersigned understands that he/she will be bound by the Proposal as expressed by these forms if an award is made by LAVTA. The Contract will be in accordance with this Proposal.
2. The Request for Proposals, Required Forms, and Addenda, if any, are made a part of this Proposal.
3. The undersigned understands that any clarification made to the Proposal Form or any new and different conditions or information submitted in or with the Proposal Form, other than that requested, may render the Proposer unresponsive.
4. The undersigned acknowledges the receipt of the following Addenda:

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5. The undersigned understands that all proposals shall remain in effect for one hundred twenty (120) days from the date of the submittal.
6. The undersigned understands that LAVTA reserves the right to reject any or all Proposals or to waive any informality or technicality in any proposal in the interest of LAVTA.
7. The undersigned certifies that the Proposal includes all costs for labor, materials, taxes, insurance, overhead, profits, and all other costs necessary to perform the work in accordance with the Contract Documents.
8. The undersigned will submit five sets of their proposal package (one original and four copies) and one electronic copy of the proposal on a CD or USB drive. The five sets of the proposal package and one electronic copy shall be placed in a sealed box (marked "Adaptive Signal Control Technology Services Proposal"). The five sets of a proposer's proposal must be submitted as follows:

One original proposal with required signatures in ink by an officer of the proposer with the authority to bind the proposer to the terms of the RFP submitted in a separate securely sealed envelope marked as follows:

ORIGINAL: ADAPTIVE SIGNAL CONTROL TECHNOLOGY SERVICES PROPOSAL

Proposers are warned against making erasures or alterations of any kind without initialing each and every change.

Four sets of copies of the proposal submitted in a separate securely sealed envelope marked as follows:

COPY: ADAPTIVE SIGNAL CONTROL TECHNOLOGY SERVICES PROPOSAL

One electronic copy of the PROPOSAL on CD or USB drive.

The sealed box shall, prior to 2:00 pm Pacific Time on April 28, 2016, be delivered to:

Beverly Adamo  
Director of Administrative Services  
Livermore Amador Valley Transit Authority  
1362 Rutan Court, Suite 100  
Livermore, CA 94551

9. The undersigned is prepared to sign the Sample Agreement without alterations or exceptions or if it is requesting modifications to the Sample Agreement and/or any requirements of this RFP, shall include such requested modifications in its proposal.
10. The undersigned confirms the commitment of adequate resources to meet LAVTA's quality and schedule expectations.

**SIGNED:**

The undersigned certify that we sign this Proposal Form with full and proper authorization to do so.

\_\_\_\_\_  
Signature, Printed Name, and Title

\_\_\_\_\_  
Signature, Printed Name, and Title

**IF CORPORATION:**

This Corporation is incorporated under the laws of the State of:

\_\_\_\_\_

\*If Contractor is a corporation, two corporate officers must sign on behalf of the corporation as follows: (1) Chairman of the Board, President, or Vice President; and (2) Secretary, Assistant Secretary, Chief Financial Officer, or Assistant Financial Officer. In the alternative, this Contract may be executed by a single officer or a person other than an officer provided that evidence satisfactory to LAVTA is provided, demonstrating that such individual is authorized to bind the corporation (e.g., a copy of a certified resolution from the corporation's board or a copy of the corporation's by laws).

## Price Proposal Form Request for Proposal #2016-05

<b>PROPOSAL PRICING FORM</b>
------------------------------

Task	Units Needed	Unit	Unit Price	Cost
1. Project Management	1	LS		
2. Advise on Detection Requirements	1	LS		
3. Furnish and Install ASCT Software (license for minimum initial 16 intersections)	1	LS		
4. Furnish and Install ASCT Server	2	EA		
5. Furnish and Install ASCT Client on Existing City of Dublin Computers	5	EA		
6. Furnish Traffic Signal Controllers	18	EA		
7. System Testing	1	LS		
8. Training and Documentation	1	LS		
9. Warranty, Maintenance and Support (initial minimum 3 year period)	1	LS		
<b>INITIAL PROJECT TOTAL:</b>				
<b>Expansion Options</b>				
10. ASCT Maintenance and Support (Year 4)	1	LS		
11. ASCT Maintenance and Support (Year 5)	1	LS		
12. ASCT Maintenance and Support (Year 6)	1	LS		
<b>FUTURE EXPANSION TOTAL COST:</b>				

LS = Lump Sum

**CERTIFICATION REGARDING WORKER COMPENSATION**

Contract with the LIVERMORE AMADOR VALLEY TRANSIT AUTHORITY, 1362 Rutan Court, Livermore, California 94551, for On-Call Engineering Consulting Services.

RFP # 2010-16

Labor Code Section 3700:

"Every employer, except the State, and all political subdivisions or institutions thereof, shall secure the payment of compensation in one or more of the following ways:

- (a) By being insured against liability to pay compensation by one or more insurers, duly authorized to write compensation insurance in this State.
- (b) By securing from the Director of Industrial Relations a certificate of consent to self-insure, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to employees."

I am aware of the provisions of Section 3700 of the Labor Code, which require every employer to be insured against liability for worker's compensation or to undertake self-insurance. In accordance with the provisions of that code, I will comply with such provisions before commencing the performance of the work of this contract.

Dated: \_\_\_\_\_, 201\_\_  
(Proposer)

By \_\_\_\_\_  
\_\_\_\_\_  
(Official Title)

(SEAL)

(Labor Code Section 1861, provides that the above certificate must be signed and filed by the Proposer with the Authority prior to performing any work under this contract.)

## FAIR EMPLOYMENT PRACTICES CERTIFICATION

In connection with the performance of work under this contract, the Proposer agrees as follows:

1. The Proposer will not willfully discriminate against any employee or applicant for employment because of race, color, religious creed, ancestry, national origin, age, sex, physical disability, mental disabilities, marital status, or medical condition as defined in Government Code §12926. The Proposer will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religious creed, ancestry, national origin, age, sex, physical disability, mental disability, marital status, or medical condition as defined in Government Code §12926. Such action 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. The Proposer agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this Fair Employment Practices section.
2. The Proposer will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, advising the said labor union or workers' representative of the Proposer's commitments under this section; and the Proposer shall post copies of the notice in conspicuous places available to employees and applicants for employment.
3. The Proposer will permit access to its records of employment, employment advertisements, application forms, and other pertinent data and records by the Fair Employment Practices Commission, LAVTA, or any other appropriate agency of the State of California designated by LAVTA for the purposes of investigation to ascertain compliance with the Fair Employment Practices section of this contract.
4. A finding of willful violation of the Fair Employment Practices section of this contract or of the Fair Employment Practices Act shall be regarded by LAVTA as a basis for determining the Proposer to be not a "responsible Proposer" as to future contracts for which such Proposer may submit Proposals, for revoking the Proposer's pre-qualification rating, if any, and for refusing to establish, re-establish, or renew a pre-qualification rating for the Proposer.  
  
LAVTA shall deem a finding of willful violation of the Fair Employment Practices Act to have occurred upon receipt of written notice from the Fair Employment Practices Commission that it has investigated and determined that the Proposer has violated the Fair Employment Practices Act and has issued an order under Government Code §12970 or obtained a court order under Government Code §12973.  
  
Upon receipt of such written notice from the Fair Employment Practices Commission, LAVTA shall notify the Proposer that, unless it demonstrates to the satisfaction of LAVTA within a stated period that the violation has been corrected, the Proposer's pre-qualification rating will be revoked.
5. The Proposer agrees that should LAVTA determine that the Proposer has not complied with the Fair Employment Practices section of this contract then, pursuant to Labor Code Sections 1735 and 1775, the Proposer shall, as a penalty to LAVTA, forfeit, for each calendar day, or portion thereof, for each person who was denied employment as a result of such noncompliance, the penalties provided in the labor code for violation of prevailing wage rates. Such monies may be recovered from the Proposer. LAVTA may deduct any such damages from any monies due the Proposer.
6. Nothing contained in this Fair Employment Practices section shall be construed in any manner of fashion so as to prevent LAVTA from pursuing any other remedies that may be available at law.
7. Prior to award of the contract, the Proposer shall certify to LAVTA that it has or will meet the following standards for affirmative compliance, which shall be evaluated in each case by LAVTA:



- a. The Proposer shall provide evidence, as required by LAVTA, that it has notified all supervisors, foremen and other personnel officers, in writing, of the content of the anti-discrimination clause and their responsibilities under it.
  - b. The Proposer shall provide evidence, as required by LAVTA, that it has notified all sources of employee's referral (including unions, employment agencies, advertisements, Employment Development Department) of the content of the anti-discrimination clause.
  - c. The Proposer shall file a basic compliance report as required by LAVTA. Willfully false statements made in such reports shall be punishable as provided by law. The compliance report shall also spell out the sources of the work force and who has the responsibility for determining whom to hire or whether or not to hire.
  - d. Personally, or through its representatives, the Proposer shall, through negotiations with the unions with whom it has agreements, attempt to develop an agreement which will:
    - (1) Spell out responsibilities for nondiscrimination in hiring, referral, upgrading, and training.
    - (2) Otherwise implement an affirmative anti-discrimination program in terms of the unions' specific areas of skill and geography to the end that qualified minority workers will be available and given an equal opportunity for employment.
  - e. The Proposer shall notify LAVTA of opposition to the anti-discrimination clause by individuals, firms, or organizations during the period of its pre-qualification.
8. The Proposer will include the provisions of the foregoing Paragraphs 1 through 7 in every first-tier subcontract so that such provisions will be binding upon each subconsultant.
9. Statements and Payrolls. The Proposer shall maintain its records in conformance with the requirements included in the Information to Proposers and the following Special Conditions:
- a. The submission by the Proposer of payrolls or copies thereof, is not required. However, each Proposer and sub-contractor shall preserve their weekly payroll records for a period of three (3) years from the date of completion of this contract.
  - b. The payroll records shall contain the name, address and social security number of each employee, his/her correct classification, rate of pay, daily and weekly number of hours worked, itemized deductions made, and actual wages paid.
  - c. The Proposer shall make its payroll records available at the project site for inspection by LAVTA and shall permit LAVTA to interview employees during working hours on the job.

The following certification is to be executed by every Proposer and enclosed and forwarded in a sealed envelope containing the Proposal. The person signing the certification shall state his/her address and official capacity.

### Fair Employment Practice Certification

The undersigned, in submitting a Proposal for performing work as specified in the Scope of Work hereby certifies that the Proposer will meet the above standards of affirmative compliance with the Fair Employment Practices Act.

---

PROPOSER

---

SIGNATURE

---

PRINTED NAME OF SIGNER

---

TITLE

---

MAILING ADDRESS

---

CITY	STATE	ZIP CODE
------	-------	----------

---

TELEPHONE NUMBER

---

DATE

**LIVERMORE AMADOR VALLEY TRANSIT AUTHORITY  
A CERTIFICATION CONCERNING CONTROL OF EMPLOYEE  
OF CONTRACTOR**

The contractor, by entering into this Agreement with LAVTA to perform or provide work, services or materials to LAVTA, does hereby certify and assure that in performing the services under this Agreement, the Contractor shall act as an independent contractor and shall have full control of the work and Contractor's employees. Contractor and its employees, under no circumstances whatsoever, shall imply or be considered as an agent(s) or employee(s) of LAVTA. Contractor employees, under no circumstances, shall be entitled to part of any pension plan, insurance, bonus, or any similar benefits which LAVTA provides its own employees.

Any infraction of this Certification shall be cause for termination of this agreement.

Authorized Representative of Proposer

---

Signed

---

Title

---

Date

**LOBBYING CERTIFICATION FOR CONTRACTS GRANTS, LOANS AND COOPERATIVE AGREEMENTS  
(Pursuant to 49 CFR Part 20, Appendix A)**

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal Contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal Contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal Contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions and as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96).
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and Contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Bidder, \_\_\_\_\_, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Bidder understands and agrees that the provisions of 31 U.S.C. A 3801, et. seq. apply to this certification and disclosure, if any.

\_\_\_\_\_ Signature of Authorized Official

\_\_\_\_\_ Name and Title of Authorized Official

\_\_\_\_\_ Date



**DISCLOSURE OF LOBBYING ACTIVITIES**  
CONTINUATION SHEET

Reporting Entity: \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

Authorized for Local Reproduction  
Standard Form – LLL-A  
BILLING CODES 3410-01-C; 6450-01-C; 6690-01-C;  
8025-01C; 7510-01-C; 3510-FE-C; 8120-01-C; 4710-24-  
C; 6116-01-C; 6051-01-C; 8230-01-C; 3210-01-C; 4210-  
32-C; 4410-18-C; 4510-23-C; 4810-25-C; 3001-01-C;  
4000-01-C; 3820-01-C; 6560-50-C; 6820-61-C; 4310-RF-  
C; 6718-01-C; 4150-04-C; 7555-01-C; 7537-01-C; 7536-  
01-C; 6050-28-C; 4910-62-C

### INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Use the SF-LLL-A Continuation Sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a follow-up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, state and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee", then enter the full name, address, city, state and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, state and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.  
(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a).  
Enter Last Name, First Name, and Middle Initial(MI).
11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.
14. Provide a specific and detailed description of the services that the lobbyist has performed, or will be expected to perform, and the date(s) of any services rendered. Include all preparatory and related activity, not just time spent in actual contact with Federal officials. Identify the Federal official(s) or employee(s) contacted or the officer(s), employee(s), or Member(s) of Congress that were contacted.
15. Check whether or not a SF-LLL-A Continuation Sheet(s) is attached.
16. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, D.C. 20503.

**BUY AMERICA CERTIFICATE  
(Steel, Iron or Manufactured Products)**

SELECT AND COMPLETE ONLY ONE OF THE FOLLOWING CERTIFICATIONS:

*Certificate of Compliance with 49 U.S.C. 5323(j)(1)*

The bidder or offeror hereby certifies that it will meet the requirements of 49 U.S.C. 5323(j)(1), and the applicable regulations in 49 CFR Part 661.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Company \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

*Certificate of Non-Compliance with 49 U.S.C. 5323(j)(1)*

The bidder or offeror hereby certifies that it cannot comply with the requirements of 49 U.S.C. 5323(j)(1) and 49 CFR Part 661.5, but it may qualify for an exception pursuant to 49 U.S.C. 5323(j)(2)(A), 5323(j)(2)(B), or 5325(j)(2)(D), and 49 CFR 661.7.

Date \_\_\_\_\_

Signature \_\_\_\_\_

Company \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_



Attachment B – NGAOP Dublin LAVTA ConOps

# Next Generation Arterial Operations Program LAVTA/ City of Dublin – Dublin Boulevard Final Concept of Operations (CONOPS) | *Deliverable 4.4b*



Project Sponsors:



October 27, 2015

Innovation for better mobility





## DOCUMENT VERSION CONTROL

DOCUMENT NAME	SUBMITTAL DATE	VERSION NO.
Draft Concept of Operations (internal review release)	8/13/2015	V1
Draft Concept of Operations (internal review release)	8/17/2015	V2
Draft Concept of Operations (release to MTC for review)	8/18/2015	V3
Draft Concept of Operations (release to Dublin for review)	8/20/2015	V4
Final Concept of Operations (internal review release)	9/15/2015	V5
Final Concept of Operations (release to MTC and Dublin)	9/21/2015	V6
Final Concept of Operations (revised based on System Requirements)	10/27/2015	V7



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## 1 SCOPE

### 1.1 Document Purpose and Scope

As part of the Metropolitan Transportation Commission's (MTC) Transit Performance Initiative (TPI) Program Next Generation Arterial Operations (NextGen AOP) Program, the City of Dublin and Livermore Amador Valley Transit Authority (LAVTA) was selected as one of four program sponsored projects to implement advanced technologies to better manage and operate arterial roadways. The NextGen AOP seeks to deploy and evaluate next generation arterial management solutions to improve user travel experience by improving travel time and travel time reliability for autos and transit vehicles and improve safety of motorists, transit users, pedestrians, and bicyclists. The technologies include adaptive signal control systems, transit signal priority, real-time traffic monitoring, and other innovative operating strategies.

The scope of this document covers the consideration of adaptive signal control technology (ASCT) for use along a portion of Dublin Boulevard within the City of Dublin, CA. This document describes and provides a rationale for the expected operations of the proposed adaptive system. It documents the outcome of stakeholder discussions and consensus building that has been undertaken to ensure that the system that is implemented is operationally feasible and has the support of stakeholders. The intended audience of this document includes: system operators, administrators, decision-makers, nontechnical readers and other stakeholders who will share the operation of the system or be affected by it.

### 1.2 Project Purpose and Scope

This project will deploy Adaptive Signal Control Technology along a 2.87 mile portion of Dublin Boulevard, as shown in **Figure 1**, to improve Transit Signal Priority performance, corresponding intersection upgrades, and bus stop enhancements. These improvements are estimated to result in:

- 20% bus travel time reduction in peak periods (2 to 3 minutes)
- 25% bus travel time reduction in non-peak periods (2 to 3 minutes)
- Elimination of one coach per day, with same frequency and schedule, due to time savings - \$373,000 annual operating cost savings.
- 10-15% increase in ridership due to time savings and passenger information systems.



Figure 1: Project Area and Intersections

## Project Map

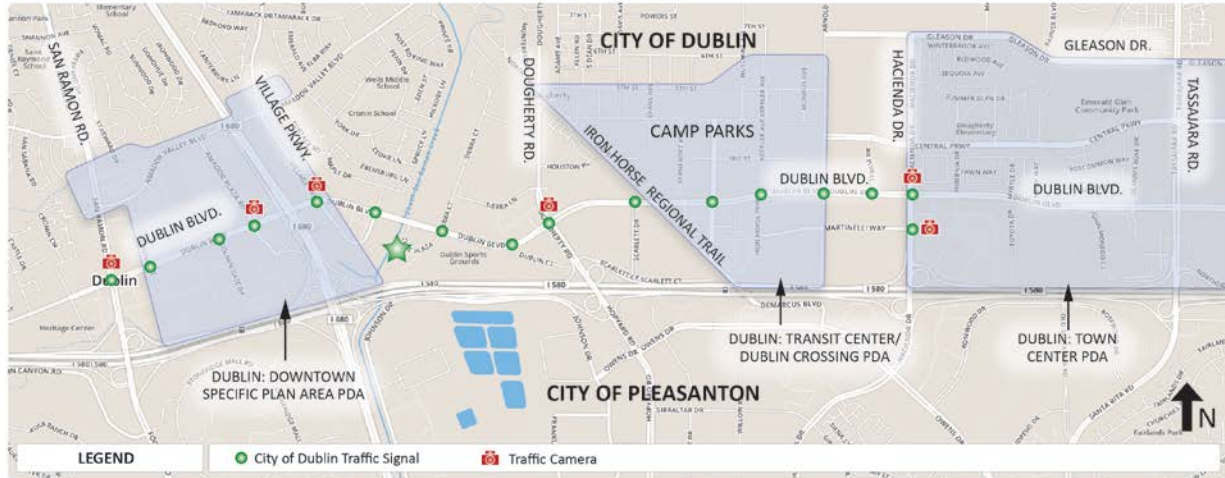


Table 1: Project Intersections

INT. NO	Owner & Operating Agency	INTERSECTION
1	City of Dublin	Dublin Boulevard at San Ramon Road
2	City of Dublin	Dublin Boulevard at Regional Street
3	City of Dublin	Dublin Boulevard at Golden Gate Drive
4	City of Dublin	Dublin Boulevard at Amador Plaza Road
5	City of Dublin	Dublin Boulevard at Village Parkway
6	City of Dublin	Dublin Boulevard at Clark Avenue
7	City of Dublin	Dublin Boulevard at Sierra Court – Civic Plaza
8	City of Dublin	Dublin Boulevard at Dublin Court
9	City of Dublin	Dublin Boulevard at Dougherty Road
10	City of Dublin	Dublin Boulevard at Scarlett Drive
11	City of Dublin	Dublin Boulevard at Demarcus Boulevard
12	City of Dublin	Dublin Boulevard at Iron Horse Parkway
13	City of Dublin	Dublin Boulevard at Arnold Road
14	City of Dublin	Dublin Boulevard at Persimmon Place
15	City of Dublin	Dublin Boulevard at Hacienda Drive
16	City of Dublin	Hacienda Drive at Martinelli Way

### 1.3 Procurement

This project will be completed in a phased approach. Phase I consists of the Systems Engineering Analysis that includes preparation of a SEMP, CONOPS, System Requirements, Verification Plan/Acceptance Plan and Adaptive System Procurement Specification documents. Phase I is led by MTC/Iteris. Phase II will consist of detailed design and construction and is separated into Phase IIA covering intersection improvements and Phase IIB covering transit improvements. The City of Dublin will



lead Phase IIA and LAVTA will lead Phase IIB. Finally Phase III will be led MTC and another Program for Arterial System Synchronization (PASS) consultant and focus on evaluating the effectiveness of the project.

## 2 REFERENCED DOCUMENTS

The following documents have been used in the preparation of this Concept of Operations and stakeholder discussions. Some of these documents provide policy guidance for traffic signal operations in this area, some are standards with which the system must comply, while others report the conclusions of discussions, workshops and other research used to define the needs of the project and subsequently identify project requirements.

- “Systems Engineering Guidebook for ITS”, California Department of Transportation, Division of Research & Innovation, Version 3.0, November 2009.
- “Model Systems Engineering Documents for Adaptive Signal Control Technology (ASCT) Systems”, U.S. Department of Transportation, Federal Highway Administration, FHWA-HOP-11-027, August 2012.
- “Systems Engineering for Intelligent Transportation Systems, An Introduction for Transportation Professionals”, U.S. Department of Transportation, Federal Highway Administration, January 2007.
- “Systems Engineering Processes for Developing Traffic Signal Systems”, National Cooperative Highway Research Program (NCHRP) Synthesis 307, Transportation Research Board, 2003.
- “Adaptive Traffic Control Systems: Domestic and Foreign State of Practice”, National Cooperative Highway Research (NCHRP) Synthesis 403, Transportation Research Board, 2010.
- “Intelligent Transportation System Architecture and Standards; Final Rule, 23 CFR Parts 655 and 940”, Department of Transportation, Federal Highway Administration, Federal Register, Vol. 66, No. 5, Monday, January 8, 2001.
- “Bay Area ITS Architecture, 2011 Update”, Metropolitan Transportation Commission, April 23, 2012.





### 3 USER-ORIENTED OPERATIONAL DESCRIPTION

This section describes the existing signal system infrastructure and operations along the project corridor, limitations of the existing system, and goals and objectives for the new ASCT system.

#### 3.1 Existing Situation

##### 3.1.1 Network Characteristics

Dublin Boulevard is the major east-west arterial in the City of Dublin that spans the entire length of the city. The project corridor is a 2.8 mile long segment with 16 traffic signals where adaptive control is being considered and is shown in **Figure 1** and **Table 2**. Along the project corridor, Dublin Boulevard is a multi-lane divided arterial with a mix of 4-lane to 6-lane cross sections connecting Dublin’s downtown area to the west and Eastern Dublin. I-580 runs parallel to this roadway to the south and access to the freeway is provided by on and off ramps along the north-south oriented roadways that bisect Dublin Boulevard. These north-south oriented roadways provide access to the City of San Ramon and/or Contra Costa County to the north and the City of Pleasanton to the south. The corridor has relatively even spacing between traffic signals with most signals spaced between 690’ and 1585’ apart.

**Table 2: Project Intersections**

INT. NO	AGENCY	INTERSECTION	DISTANCE TO NEXT
1	City of Dublin	Dublin Boulevard at San Ramon Road	0’ (Begin)
2	City of Dublin	Dublin Boulevard at Regional Street	690’
3	City of Dublin	Dublin Boulevard at Golden Gate Drive	1,320’
4	City of Dublin	Dublin Boulevard at Amador Plaza Road	630’
5	City of Dublin	Dublin Boulevard at Village Parkway	1,215’
6	City of Dublin	Dublin Boulevard at Clark Avenue	1,000’
7	City of Dublin	Dublin Boulevard at Sierra Court – Civic Plaza	1,160’
8	City of Dublin	Dublin Boulevard at Dublin Court	1,270’
9	City of Dublin	Dublin Boulevard at Dougherty Road	850’
10	City of Dublin	Dublin Boulevard at Scarlett Drive	1,585’
11	City of Dublin	Dublin Boulevard at Demarcus Boulevard	1,375’
12	City of Dublin	Dublin Boulevard at Iron Horse Parkway	740’
13	City of Dublin	Dublin Boulevard at Arnold Road	1,160’
14	City of Dublin	Dublin Boulevard at Persimmon Place	790’
15	City of Dublin	Dublin Boulevard at Hacienda Drive	690’
16	City of Dublin	Hacienda Drive at Martinelli Way	690’ (End)
<b>Total Corridor Length:</b>			<b>15,165’ (2.87 miles)</b>

The posted speed limit along the project corridor varies between 35 to 45 mph. Along the eastern portion, the posted speed limit is 45 mph between Hacienda Drive and Scarlett Drive. The posted limit decreases to 35 mph between Scarlett Drive and San Ramon Road. Average travel speed along the project corridor varies by direction and time of day based on the peak travel direction. Floating car travel time studies were conducted along the project corridor in 2013 with the following results: AM EB (24.80 mph), AM WB



(28.05 mph), Midday EB (31.9 mph), Midday WB (21.38 mph), PM EB (22.26 mph), and PM WB (24.04 mph).

The 16 signals designated as City of Dublin in **Table 1** are owned and operated by the City of Dublin and maintained by Alameda County under a maintenance contract.

### 3.1.2 Traffic Characteristics

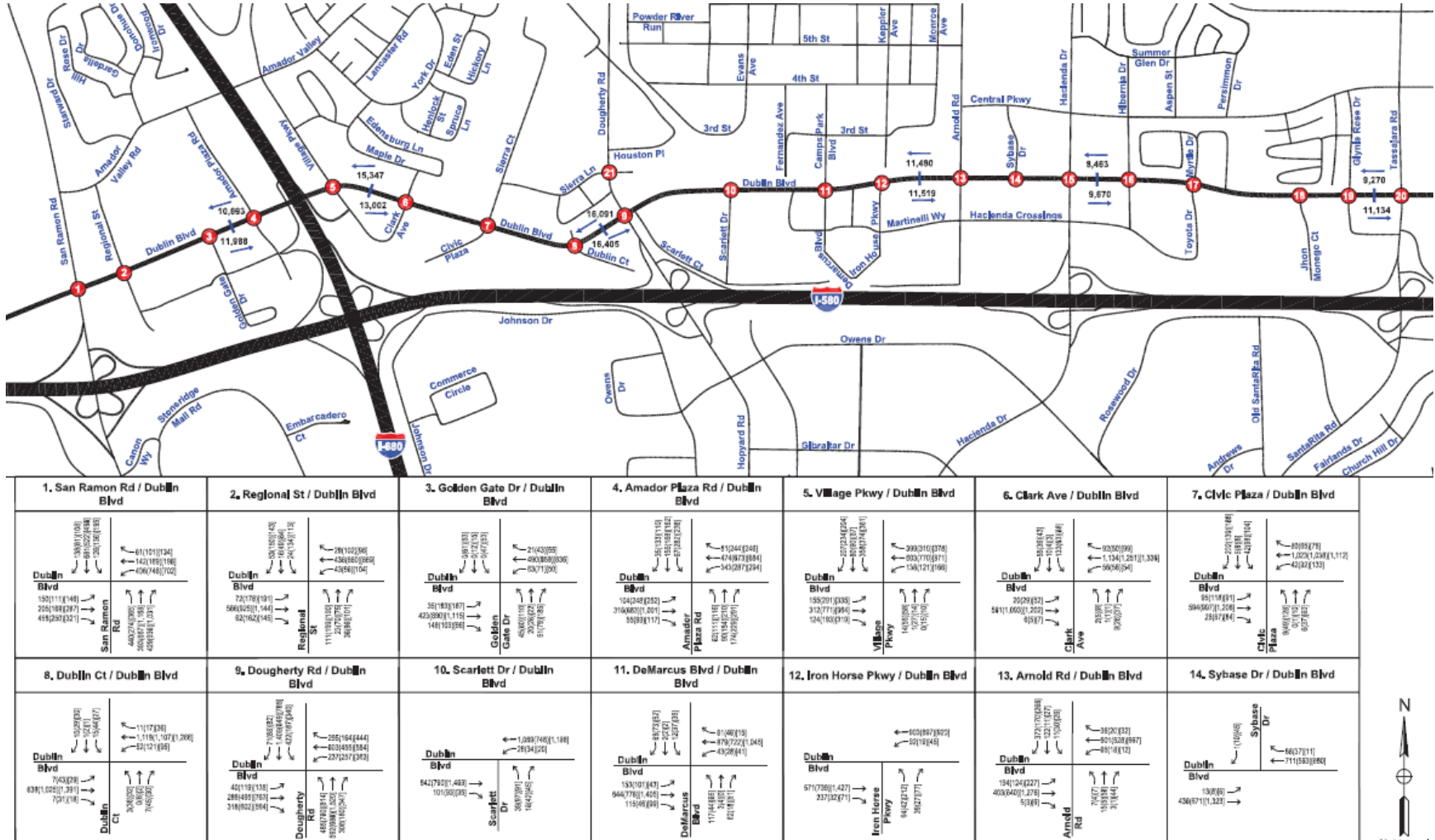
Dublin Boulevard is a major east-west arterial through the City of Dublin and is considered a route of regional significance. Dublin Boulevard parallels the I-580 freeway and is often used as an alternate route to the freeway when congested. The corridor also provides direct access to the I-680 freeway. Currently, Dublin Boulevard carries approximately 24,135 vehicles per day (vpd) during the weekdays and 21,404 vpd during the weekend. **Figures 2 and 3** show Peak Hour Turning Volumes for AM, mid-day and PM along Dublin Boulevard and were taken from the 2012-13 PASS Final Report for Dublin Boulevard.

During the weekday AM peak, the peak travel direction is westbound along the project corridor with traffic volumes higher in the westbound direction compared to the eastbound direction. During the weekday midday period, there is no pronounced peak travel direction and traffic flow tends to be evenly distributed between the eastbound and westbound directions. Midday traffic volumes are also significantly lower compared to the AM or PM peaks. During the weekday PM peak, the peak travel direction is eastbound along the project corridor with traffic volumes higher in the eastbound direction compared to the westbound direction. There are two intersections that do not conform to these trends. Both Dublin Boulevard/San Ramon Road and Dublin Boulevard/Dougherty Road experience significant southbound traffic volumes in the AM and northbound traffic volumes in the PM. This is largely attributed to commute traffic traveling to and from Pleasanton's Hacienda Business Park.



# Draft Concept of Operations (CONOPS) Deliverable 4.4a

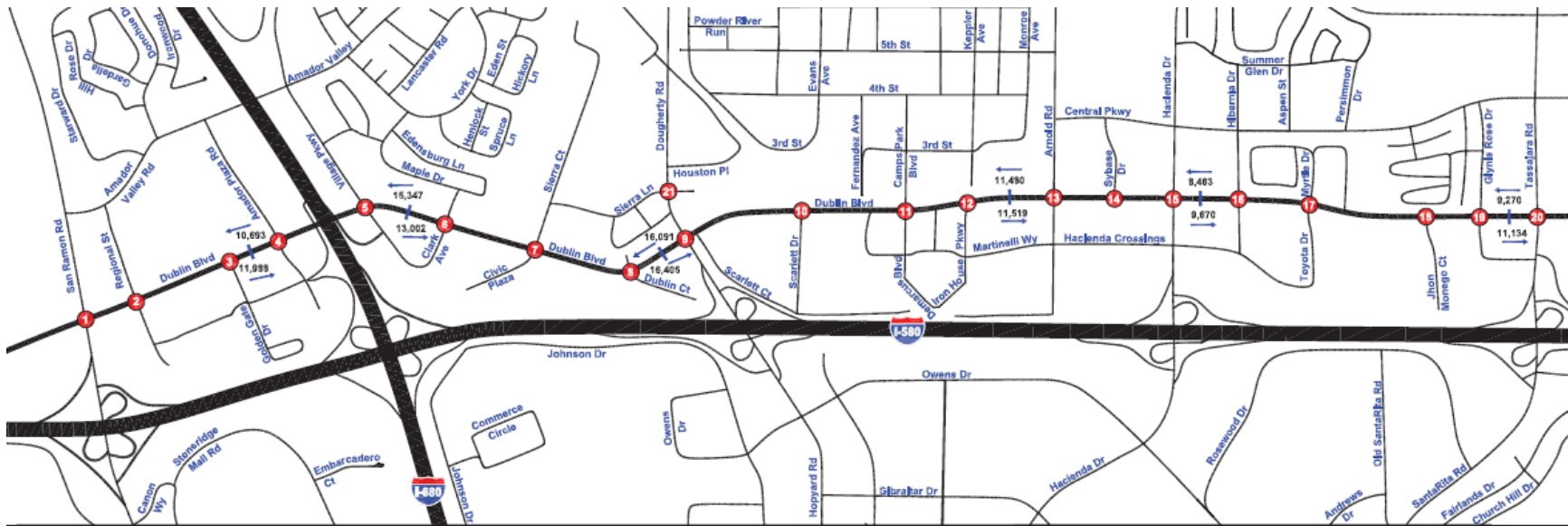
Figure 2: Dublin Boulevard Existing Peak Hour Turning Volumes (San Ramon Road to Sybase Drive)





# Draft Concept of Operations (CONOPS) Deliverable 4.4a

Figure 3: Dublin Boulevard Existing Peak Hour Turning Volumes (Hacienda Drive to Sierra Lane)



15. Hacienda Dr / Dublin Blvd	16. Hibernia Dr / Dublin Blvd	17. Myrtle Dr / Dublin Blvd	18. John Monego Ct / Dublin Blvd	19. Glynnis Rose Dr / Dublin Blvd	20. Tassajara Dr / Dublin Blvd	21. Sierra Ln / Dublin Blvd

**Legend**

- Study Intersections
- XX(XX)(XX) = AM(MD)/PM Volumes
- XX,XXX = Average Daily Traffic for Weekdays
- Location of Average Daily Traffic for Weekdays





### 3.1.3 Signal Grouping

The location of signals to be operated under adaptive control are shown in **Figure 1** and **Table 1**. All the traffic signals are on one route and currently operate in coordinated mode by time-of-day (TOD) in multiple groups.

**Table 3: Existing Signal Coordination**

INT. NO	INTERSECTION	AM (1)		MD		PM	
		Cycle	Time	Cycle	Time	Cycle	Time
1	Dublin Blvd /San Ramon Rd	120	7:15-9:30	120	11:00-2:15	120	3:30-7:00
2	Dublin Blvd / Regional St	120	7:15-9:30	120	11:00-2:15	120	3:30-7:00
3	Dublin Blvd/ Golden Gate Dr	120	7:15-9:30	120	11:00-2:15	120	3:30-7:00
4	Dublin Blvd/ Amador Plaza Rd	120	7:15-9:30	120	11:00-2:15	120	3:30-7:00
5	Dublin Blvd/ Village Pkwy	120	7:15-9:30	120	11:00-2:15	120	3:30-7:00
6	Dublin Blvd/ Clark Ave	90	7:15-9:30	90	11:00-2:15	90	3:30-7:00
7	Dublin Blvd/ Sierra Ct – Civic Plaza	90	7:15-9:30	90	11:00-2:15	90	3:30-7:00
8	Dublin Blvd/ Dublin Ct	90	7:15-9:30	90	11:00-2:15	90	3:30-7:00
9	Dublin Blvd/ Dougherty Rd	Free	7:15-9:30	Free	11:00-2:15	Free	3:30-7:00
10	Dublin Blvd/ Scarlett Dr	130	7:15-9:30	120	11:00-2:15	120	3:30-7:00
11	Dublin Blvd/ Demarcus Blvd	130	7:15-9:30	120	11:00-2:15	120	3:30-7:00
12	Dublin Blvd/ Iron Horse Pkwy	130	7:15-9:30	120	11:00-2:15	120	3:30-7:00
13	Dublin Blvd/ Arnold Rd	130	7:15-9:30	120	11:00-2:15	120	3:30-7:00
14	Dublin Boulevard at Persimmon Place	65	7:15-9:30	60	11:00-2:15	60	3:30-7:00
15	Dublin Boulevard at Hacienda Drive	Free	7:15-9:30	Free	11:00-2:15	130	3:30-7:00
16	Hacienda Drive at Martinelli Way	130	7:15-9:30	Free	11:00-2:15	130	3:30-7:00

### 3.1.4 Land Use Characteristics

This corridor is identified as a route of regional significance given its location in relation to I-580 and I-680. The project corridor also serves as a vital link for regional transit service. Dublin Boulevard traverses through three (3) PDA’s (Priority Development Area) and various residential, commercial, and office uses. Two of the PDA’s are located at the two Tri-Valley BART stations, namely; West Dublin/Pleasanton BART Station and (East) Dublin/Pleasanton BART Station. Dublin Boulevard is the western anchor of LAVTA’s service in the Tri-Valley. Serving two BART stations, shopping centers, major employers, and multiple housing developments, this corridor is both a key origin and destination for LAVTA’s passengers. As of March 2014, LAVTA operated a total of seven routes on this alignment, with corridor level frequencies from 5 to 15 minutes, depending on time of day.

### 3.1.5 Existing System Architecture

The City of Dublin currently uses a central signal system (TrafficWare ATMS.now) for day-to-day operations and management of the City’s traffic signals. All traffic signals are connected to their central signal system. The signal system is housed in the City’s Traffic Management Center (TMC) located within City Hall. Transportation staff have access to the ATMS system either on the client workstations inside the TMC, client workstations at their desks or mobile devices in the field. Traffic signal control cabinets are primarily Type P44 TS2. All traffic signal controllers are Naztec 2070 with the exception of the cabinet at Dublin Blvd./Dougherty Rd. which is a Naztec 900. **Table 5** shows the cabinet, controller, communications type, and



presence of preemption at the sixteen traffic signals along the project corridor. Of the sixteen signals on the corridor, exactly half utilize copper twisted pair cable while the other half utilizes fiber optic cable.

**Table 4: Existing Signal Infrastructure**

INT. NO	INTERSECTION	CABINET	CONTROLLER	COMM.	DETECTION	PREEMPT
1	Dublin Blvd /San Ramon Rd	Type P44	Naztec 2070	Ethernet over Copper (Actelis ML688)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
2	Dublin Blvd / Regional St	Type P44	Naztec 2070	Ethernet over Copper (Actelis ML688)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
3	Dublin Blvd/ Golden Gate Dr	Type P44	Naztec 2070	Ethernet over Copper (Actelis ML688)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
4	Dublin Blvd/ Amador Plaza Rd	Type P44	Naztec 2070	Ethernet over Copper (Actelis ML688)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
5	Dublin Blvd/ Village Pkwy	Type P44	Naztec 2070	Ethernet over Copper (Actelis ML688)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
6	Dublin Blvd/ Clark Ave	Type P44	Naztec 2070	Ethernet over Copper (Actelis ML688)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
7	Dublin Blvd/ Sierra Ct – Civic Plaza	Type P44	Naztec 2070	Ethernet over Copper (Actelis ML688)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
8	Dublin Blvd/ Dublin Ct	Type P44	Naztec 2070	Ethernet over Fiber (Actelis ML530)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
9	Dublin Blvd/ Dougherty Rd	Type P44	Naztec Series 900 TS2	Ethernet over Fiber (Actelis ML688)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
10	Dublin Blvd/ Scarlett Dr	Type P44	Naztec 2070	Ethernet over Copper (Actelis ML688)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
11	Dublin Blvd/ Demarcus Blvd	Type P44	Naztec 2070	Ethernet over Fiber (Actelis ML530)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
12	Dublin Blvd/ Iron Horse Pkwy	Type P44	Naztec 2070	Ethernet over Fiber (Actelis ML530)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
13	Dublin Blvd/ Arnold Rd	Type P44	Naztec 2070	Ethernet over Fiber (Actelis ML630)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
14	Dublin Boulevard/ Persimmon Place	Type P44	Naztec 2070	Ethernet over Fiber (Actelis ML530)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)



15	Dublin Boulevard/ Hacienda Drive	Type P44	Naztec 2070	Ethernet over Fiber (Actelis ML688)	Loops (All); Advance Detection (All)	EVP (3M 752, GTT 752)
16	Hacienda Drive/ Martinelli Way	Type P44	Naztec 2070	Ethernet over Fiber (Actelis ML688)	Loops (All); Advance Detection (All)	EVP (3M 752)

All sixteen traffic signals use pavement loops. The City standardizes on the use of pavement loops for detection but will consider the use of other detection technologies (i.e., video, radar) in limited situations where the installation of pavement loops is not feasible. There are typically four 6'x6' loops per lane placed at the stop bar, with advance loops per lane on the major street approaches. All traffic signals have pedestrian push buttons for pedestrian detection.

### 3.2 Limitations of the Existing System

The following statements illustrate the limitations of the existing system that is not capable of managing the existing traffic conditions on the project corridor.

- The existing system cannot detect the sudden changes in traffic demand. The existing system also cannot react to the resulting change in travel patterns (increase in left and right turns) and surge in pedestrian crossing activity.
- Traffic conditions can vary along different portions of the corridor with certain segments experiencing higher traffic volumes compared to other segments. The system cannot react to this condition by operating certain group(s) of signals at different cycle lengths to suit prevailing traffic demand.
- The existing system cannot recognize the onset or dissipation of the peak periods, so the time-based control coordination times are conservatively set to ensure that the variability of peak onset/dissipation times are covered. As a result, inefficiencies result during the shoulders of the peak periods.
- The coordinated signal operation is often disrupted by transit vehicle priority. An adaptive system would be expected to recover faster from these disruptions than the existing system which typically takes three to five cycles to transition back to coordination.
- The existing system allows Transit Signal Priority (TSP) calls at intervals of not less than 10 minutes.

### 3.3 Proposed Improvements to the Existing System

The following statements generally describe the improvements that are desired to address the limitations of the existing system. The City seeks a system that will:

- Recognize changes in traffic conditions and react quickly and automatically to accommodate those changes.
- More efficiently accommodate transit signal priority operations.
- Improve the management of queues within the network.
- Recognize the existence of differing traffic conditions in various parts of the project corridor and react in each section appropriately.



- Keep signal timing current rather than letting its efficiency deteriorate between signal re-timing efforts.

### 3.4 Vision, Goals and Objectives for the Proposed System

The vision of the adaptive system is to provide an advanced traffic control system that responds to changing traffic conditions in order to reduce delays, stops, and travel time, improve air quality by reducing emissions, improve transit operation and reliability, and improve safety while balancing the needs of all roadway users. The goal of the adaptive system is to support vehicle, pedestrian, and transit safety and mobility. To support the vision and goal to be achieved by the adaptive system, the following objectives for the adaptive system are identified as follows:

- The system needs to be able to implement time-of-day (TOD) signal coordination during when adaptive is not in use;
- The system needs to be able to run adaptively all day;
- The system needs to provide operational preference to minimize delay for side-streets and protected left turns;
- The system needs to be able to provide cross-coordination along intersecting corridors, especially at the intersection of two major arterials where cross-coordination is currently provided by TOD signal coordination however priority will be given to Dublin Boulevard;
- Minimize impact caused by transit signal priority and pedestrian calls; and
- Improve air quality through reduced emissions.

### 3.5 Strategies Applied by the Improved System

The adaptive coordination and control strategies that may be used to achieve the operational objectives include:

- Providing a pipeline along a coordinated route to maximize the throughput in both directions during peak periods;
- Distributing time in a way that equitably shares the green time between various movements; and
- Managing queues so they do not exceed the available storage capacity and minimize phase failures.

### 3.6 Alternative Non-Adaptive Strategies Considered

The City of Dublin currently employs time-of-day signal coordination. The alternative non-adaptive strategy available would be Traffic Responsive Pattern Selection (TRPS). The City has not utilized TRPS because they do not believe this strategy can efficiently handle the traffic fluctuations experienced along this project corridor. TRPS tends to be slow to react to changing traffic conditions, as it makes decisions based on traffic data that can be as old as 15 minutes and then takes another three to five cycles to transition from the current coordinated plan to a new plan.

## 4 OPERATIONAL NEEDS





This chapter describes the user needs identified by the stakeholders related to the operations of the adaptive system. Each section below describes something that the system user needs to be able to accomplish. Each of these needs, preceded with a Concept of Operations reference number as shown, will be satisfied by compliance to a set of system requirements that will be developed in a subsequent document.

## 4.1 Adaptive Strategies

The system operator needs the ability to implement different strategies individually or in combination to suit different prevailing traffic conditions. These strategies are:

[4.1-01] The system needs to be able to identify changing traffic conditions and be able to automatically adjust operation, to include cycle, offsets, splits, phases, and signal grouping, based on the prevailing traffic conditions.

[4.1-02] The system needs to provide operational preference for bi-directional corridor progression during certain periods of the day as currently provided by time-of-day (TOD) signal coordination and allow the City of Dublin to determine when adaptive operations begin and end.

[4.1-03] During peak period (high demand), the system needs to provide operational preference focused on queue management, especially at intersections with geometric limitations that include turn pocket lengths.

[4.1-04] During shoulders of the peak, the system needs to provide operational preference to minimize delay for side street and protected left turn.

[4.1-05] The system needs to accommodate increase demand for new homes and retail that will be built within the next three years.

[4.1-06] The system needs to be able to dynamically alter signal groupings in response to demand fluctuations in traffic.

[4.1-07] The system needs to automatically switch to a TOD or flush plan under certain situations (e.g. volume surge) and provide controls that allow users to manually override system control to provide another form of operation including Free, TOD coordination, or a user-selected timing plan (e.g. flush) based on a schedule.

[4.1-08] In the absence of adaptive control, the system coordination should be based on a fixed cycle length with some form of coordination at selected intersections.

[4.1-09] The system needs to be able to maintain continuity on crossing arterials by responding to the operation of the crossing arterials, but operating them as separate systems. As a secondary priority, the adaptive system needs to be responsive to the crossing arterials operations.



## 4.2 Network Characteristics

[4.2-01] With this initial project, adaptive operation needs to be implemented for sixteen (16) signalized intersections up to two miles away from the City's TMC.

[4.2-02] The system needs to be able to eventually implement adaptive operation for up to 200 signalized intersections up to seven miles away from the City's TMC.

## 4.3 Coordination across Jurisdictional Boundaries

[4.3-01] The system needs to be able to incorporate the neighboring system operation, and allow for stratified levels of authority and control should the system ever expand to the freeway ramp signals.

## 4.4 Security

[4.4-01] The system needs to have a security management and administrative system that allows access and system modifications to be assigned, monitored, and controlled by an administrator, and conforms to any access and network infrastructure security policies the City may have.

## 4.5 Queuing Interactions

A key component of the system's operational goal is queue management.

[4.5-01] The system needs to detect the formation of rapidly building queues and modify the adaptive operation to manage and clear the queues.

[4.5-02] The system needs to detect the presence and formation of long standing queues and modify the adaptive operation to manage queue dissipation and dispersal.

## 4.6 Pedestrians

[4.6-01] The system needs to accommodate pedestrian and bike movements that prioritizes safety, especially at critical locations including the West Dublin/Pleasanton BART Station near Dublin Boulevard at Golden Gate Drive and Dublin/Pleasanton BART Station Dublin Boulevard at DeMarcus Boulevard. In addition at the San Ramon and Hacienda interchanges. Additionally bicycle and pedestrian access is important at San Ramon Road and Hacienda Drive interchanges due to the access needs for north/south corridors in the region.

[4.6-02] The system needs to accommodate increased pedestrian demand that will accompany the new developments especially near BART stations. Pedestrian and bicycle safety is a primary objective at these crossing locations.



## 4.7 Non-Adaptive Situations

[4.7-01] The system needs to provide controls (both manual and time based control) that allow users to override system control to provide another form of operation including Free, TOD coordination, or a user-selected timing plan.

## 4.8 System Responsiveness

[4.8-01] The system needs to be to accommodate a wide magnitude of demand variation within a 15 minute window.

[4.8-02] The system needs to be able to accommodate variable cycle lengths that are automatically calculated within a 15% to 20% range of change.

## 4.9 Complex Coordination and Controller Features

The system needs to provide the following controller features as part of the adaptive operation:

[4.9-01] The system needs to be able to dynamically alter the signal phase sequence from fixed for peak period recurring congestion to an alternative sequence for non - recurring congestion.

[4.9-02] The system needs to be able to provide dynamic directional offset adjustments that have the ability for a user defined maximum delta range.

[4.9-03] The system needs to be able to provide variable phase green splits adjustments that has the ability for a user defined maximum delta range.

[4.9-04] The system needs to be able to accommodate operation beyond the standard 8-phase operation including: 16-phase operation and flashing yellow operation.

[4.9-05] The system needs to be able to support flashing yellow arrow operations.

[4.9-06] The system needs to be able to support bicycle detection and green extensions in left-turn lanes.

## 4.10 Monitoring and Control

The following system monitoring and control are needed:

[4.10-01] System monitoring needs to be provided via interface centrally (such as a central server), distributed to multiple client workstations on a local area network (LAN), and remote client outside the LAN via mobile equipment.

[4.10-02] System monitoring needs to be provided to multiple users on multiple client workstations simultaneously and also have the ability for remote access from a mobile device.



[4.10-03] System monitoring information provided to the user needs to be similar or better than that provided by a modern day advanced traffic signal system. This generally includes information related to all pertinent system health information such as system status, communications status, detector status, intersection status, mode of operation, active phase, duration, ramp status and signal equipment, like batteries, BBU, conflict monitors, etc.

[4.10-04] System monitoring needs to allow the user to access all local controller settings and parameters from a central server, client workstation, or remote client workstation. Access includes the ability to upload (controller to system), download (system to controller), and compare (controller vs. system) a user-selected portion of the controller database or the entire controller database.

[4.10-05] System monitoring needs to allow the user to view, edit, and save changes to all systems level settings and configurations and all individual controller settings and parameters via the central server, client workstation, and remote client workstation.

[4.10-06] For the purpose of recording but not manipulation, the adaptive system's parameters and algorithms need to be accessible by the operator.

## 4.11 Performance Reporting

The following system performance reporting are needed:

[4.11-01] The system needs to be able to provide and store real-time logs of all system status, events, and operation.

[4.11-02] As part of the system, the local controllers needs to be able to log and store real-time status, events, and alarms for the individual controller.

[4.11-03] The system needs to generate, store, and provide historic and real-time performance measures and decisions that effectively support operation, maintenance, and analysis. The City of Dublin prefers logs to be maintained for 72 hours.

[4.11-04] The system needs to provide user manuals for system set-up, configuration, and maintenance.

[4.12-05] The system needs to generate reports that are currently sent to LAVTA on a daily basis on the TSP operations on the corridor.

## 4.12 Failure Notification

The following system failure notifications are needed:

[4.12-01] The system needs to immediately notify operations staff of any alarms and alerts.

[4.12-02] The system needs to provide and store real-time logs of all alarms, alerts, and failure events.



[4.12-03] Bi-weekly reporting generated by operators noting system operations that all system components are functioning normally, including verification of two-way communications, system software and hardware, local controller, and detection health. The report shall develop a list of action items, if needed, to address and repair all deficiencies and failures.

[4.12-04] Bi-weekly review by the system vendor of system event logs, alarms, notifications, etc. on health of system and preparation of action items, if needed, to address any system deficiencies or component failures to return the system to a state of good operation for the first year of system deployment.

## 4.13 Preemption and Priority

The system needs to accommodate preemption and priority operations as follows:

[4.13-01] The system needs to accommodate existing transit priority operations and queue jump at Dublin Boulevard/Dougherty Road that incorporate both green extensions and early green. The system needs to accommodate several parameters to provide for more responsive transit signal priority operations. City of Dublin – buses currently have a lock to not receive priority calls if a bus shows up within 10 minutes of the previous bus and the City would like to see if this restriction can be removed.

[4.13-02] The system needs to accommodate emergency vehicle preemption operation at all intersections for fire and police.

## 4.14 Failure and Fallback Modes

The following system response are needed in the case of system or system component failures:

[4.14-01] When a system failure (i.e., central server failure) occurs, controllers under system control needs to revert to the local controller scheduled TOD operation that include Free operation, coordination plan, and any special functions. The City of Dublin would like to use Historical data.

[4.14-02] When a system wide communication failure occurs, controllers under system control needs to revert to the local TOD operation that include Free operation, coordination plan, and any special function. The City of Dublin would like to use Historical data.

[4.14-03] When a localized detection failure occurs, the system needs to determine the mode of operation based upon a pre-defined set of conditions. The City of Dublin would prefer a detector failure rate of no more than 10%.

[4.14-04] When a failure of the adaptive processor occurs the system will run coordinated with central control, which is preferred by the City of Dublin.

[4.14-05] When a failure of adaptive components occurs, the system needs to be able to pass alarms and alerts through an alternative parallel system.



## 4.15 Constraints

The system is constrained to the following needs:

[4.15-01] The system needs to be able to support bicycle detection in left-turn lanes.

[4.15-02] The system needs to work with existing Type 332, NEMA TS2, and NEMA TS1 type traffic signal controller cabinets.

[4.15-03] The system needs to fully function in a computer network environment with various system devices and components potentially residing on different networks, different virtual local area networks (VLANs), and between network security devices (i.e., fire wall).

[4.15-04] The system will be operated and monitored at the City of Dublin TMC, at the workstation of City staff, and on any mobile computing device connected to the City of Dublin's computer network.

[4.15-05] The system needs to allow monitoring access by authorized users via secured VPN.

[4.15-06] The system needs to use a standard database that allows access and assign rights to multiple levels of user access (i.e., admin, user, guest).

[4.15-07] The system needs to be capable of utilizing the existing detection (stop bar and advanced) based on currently installed configuration.

[4.15-08] The system needs to work with the City's existing ATMS.now central system.

## 4.16 Training and Support

The City will need the following training and support to be provided by the system vendor:

[4.16-01] The system vendor needs to provide user manuals for system set-up, configuration, and maintenance.

[4.16-02] Comprehensive training needs to be provided to engineering staff on system (hardware and software) set-up, configuration, and maintenance.

[4.16-03] Comprehensive training needs to be provided to engineering staff and signal maintenance staff on local controller hardware and firmware programming, operation, and configuration.

## 4.17 External Interfaces

[4.17-01] The system needs to have a standards-based interface for sharing of information between the system and other signal systems or ATMS systems utilizing the Traffic Management Data Dictionary



(TMDD) Standard for Center to Center Communications. In particular, the sharing of traffic signal control and status needs to be provided.

## 4.18 Maintenance

[4.18-01] The City needs to have spare parts for critical components as part of on-going maintenance of the system.

[4.18-02] The provided system will need to include on-going warranty and maintenance of a minimum of three years from the date of system acceptance.



## 5 ENVISIONED ADAPTIVE SYSTEM OVERVIEW

This chapter describes the envisioned adaptive system to be deployed by the City of Dublin. Key elements include system size and grouping, operational objective, fallback operation, crossing routes and adjacent systems, operator access, coordination and controller operation, and organizations involved will be discussed.

### 5.1 Size and Grouping

The City of Dublin plans to implement adaptive control at sixteen signalized intersections as part of this project. The system will implement adaptive operation for groups of traffic signals that will be defined by the operator. Groups of signals may range from a single signal up to any number of signals defined by the operator that may include all traffic signals in the corridor. Under day-to-day operation there are three groups of signals. Group definitions will be flexible and allow for individual signals to belong to one or more groups. This will provide the operator with flexibility to define signal groups by either time-of-day or day-of-week to suit the varying traffic characteristics or conditions along any specific route or area.

### 5.2 Operational Objective

The first objective of the adaptive system will be to provide for smooth flow along an arterial, minimizing the number of stops and delay experienced by users along the coordinated route. This objective includes providing progression along both travel directions. Simply progressing traffic in the peak direction, at the expense of the opposite travel direction, would not be acceptable. Part of this coordination objective will be to maximize the throughput along the coordinated route with a reasonable tradeoff of increasing delay for side streets and protected left turns, such that delays experienced by traffic on the coordinated route will be balanced with delays experienced by side-street and protected left turn traffic.

The second objective of the adaptive system will be to manage the lengths of queues at specific locations within the signal group, so that long queues do not block upstream intersections or otherwise reduce the capacity available to adjacent movements. During this objective, the goal of managing queues and clearing queues, especially for protected left-turn movements, may override the first objective of maximizing the throughput along the coordinated route. This may require controlling phase durations so that the size of platoons entering a downstream block does not exceed the storage length if the platoon will be stopped. This objective applies for specific situations, events, or areas of the city where queue management and minimizing the delay experienced by turning movements outweigh the need to provide progression along the main coordinate route. In particular, this objective would apply to signalized locations near schools during the school start/dismissal periods, near transit hubs during boarding/alighting events, and in areas where there is a concentration of retail land use during peak shopping times.

The system or the operator will be able to select the appropriate objective depending on the current traffic conditions. For example, during commute peaks, the primary objective may be to maximize throughput and provide smooth flow on the coordinate route. Then during other periods, the objective





may be to manage queues, prioritize pedestrian service, and balance delay for side-street and left turn traffic compared to the main street movements. The operator will be able to define for each group of signals, the appropriate operational objective. For example, near a concentrated retail area with heavy turning movements, the queue management strategy may be specified, while on an arterial with long signal spacing, the strategy to smooth flow and maximize throughput may be specified.

Within these operational objectives, the adaptive system will change its operation to accommodate the rise and fall of traffic volumes throughout the day and the changing patterns of flow throughout the day and week.

### 5.3 Fallback Operation

The system will have a fallback state that allows coordination using a common cycle length for all signals within a coordinated group, similar to existing TOD coordinated operation when a complete system failure occurs, such as failure of the adaptive system server or a complete loss of communications between the adaptive server and all signals in a group.

In the event that failures are limited or isolated (i.e., detection failure for a specific movement at one or more location, communications failure at one particular location, etc.), the operator will have the option to continue running adaptive control based on historical data. If the isolated failure is at a location at the end or edge of a signal group, the system will have the option to remove (manually by the operator or automatically by the system) the isolated signal from the group and to operate in a backup mode (i.e., Free, TOD, etc.), while the remainder of the group continues to operate normally under adaptive control.

### 5.4 Crossing Routes and Adjacent Systems

The system will provide for coordination to occur on more than one coordinate route, such as two crossing arterials or a grid network of signals. At locations where coordination is to occur along two crossing arterials, the system will be able to maintain coordination along both routes in both directions by designating multiple phases as the coordinated phase. There are no adjacent systems that the proposed adaptive system needs to interact with at this time.

### 5.5 Operator Access

City of Dublin transportation engineering and support staff will be assigned different levels of authority and access to equipment for which they are authorized, based on their roles and responsibilities. This will allow them to control, view, monitor, and analyze the operation of the system as appropriate. The system will reside on the City's existing ITS network. The system will allow limited access by authorized users (i.e. the system vendor for support/maintenance) outside of the City.



## 5.6 Complex Coordination and Controller Operation

The City will use the following coordination and controller features:

- The ability to repeat a phase, such as running a left turn phase before and after its opposing through movement;
- The ability to operate different phase sequences based on different traffic conditions or by time-of-day;
- The ability to omit a phase based on user input;
- The ability to allow the coordinated phase to terminate early if the coordinated phase gaps-out;
- The ability to designate a phase split shorter than the minimum time required to serve a pedestrian movement (i.e., stop-in-walk); and
- The ability to display the walk indication for a variable duration of time up until the flashing don't walk must be initiate to coincide with the force off point (i.e., rest-in-walk).

## 5.7 Organizations Involved

LAVTA will transfer ownership of the adaptive system to the City of Dublin to own, operate, and maintain once all work has been accepted. In the event the system is expanded to the freeway ramps, Caltrans will own and maintain State-owned signals and have the ability to monitor adaptive signal operations at locations where the City of Pleasanton operates the State-owned signals.



## 6 ADAPTIVE OPERATIONAL ENVIRONMENT

The system will be operated and monitored from the City of Dublin's TMC, on the workstations at the desks of transportation and support staff, on mobile computing devices in various City buildings, in the field, and from remote locations. The central server equipment will be housed on an existing 19" equipment rack in the City's TMC alongside other computing and networking devices. The central server will be a stand-alone commercial-off-the-shelf standard platform rack mount server and be able to be replaced independently from the adaptive software. City Transportation staff will have the ability to log in to the system from remote locations via secured VPN over the Internet and have full functionality consistent with their access rights.

The City has standardized on the use of Naztec 900 and 2070 ATC controllers. The City prefers to continue the use of the existing controllers but will accept Model 2070 controllers as part of the adaptive system if necessary. The City also uses inductive pavement loops and prefers to use the same for the adaptive system. The City will consider the use of other detection technology, to supplement the use of existing pavement loops, if appropriate.

The City's transportation engineering staff are experienced in setting up, operating, and managing their existing central signal system. Day-to-day operations and management of the adaptive system will be the responsibility of the City's transportation staff. They will require training specific to the adaptive system to set-up, fine-tune, and operate all aspects of the system. Maintenance of any field equipment deployed as part of the adaptive system, along with all other existing traffic signal infrastructure, will be performed by the City's signal maintenance contractor.

The City expects to operate the adaptive system with the latest software for a period of ten years assuming system performance continues to meet the City's needs. The City will seek technical support from the system vendor in using the adaptive software for three years in which the vendor will provide support via a combination of phone, on-site visits, and remote log-in to the adaptive server. The City expects warranty and maintenance of any vendor-supplied software, parts, and equipment for a minimum of three years will be included in the purchase price. Software maintenance will include any updates (software patches, iterative revisions, and new versions) to be included in the purchase price for a minimum of five years.



## 7 ADAPTIVE SUPPORT ENVIRONMENT

This chapter describes the support environment for the adaptive system. Key elements include identifying institutions and stakeholders, facilities, system architecture constraints, utilities, equipment, computing hardware and software, personnel, and other support needs will be discussed.

Existing stakeholders of the adaptive system include the City of Dublin and the Metropolitan Transportation Commission (MTC). The City of Dublin will be the owner of the adaptive system to be deployed and will be responsible for operation, management, and maintenance of the system. MTC is the funding agency and program manager of this initiative and is responsible for overall program oversight to ensure project delivery and success.

The City of Dublin has an existing TMC at City Hall where transportation staff are located. The existing TMC currently houses the existing central signal system and is fully equipped with equipment racks, servers, networking equipment, workstations, consoles, and video equipment. The TMC is a secured facility that is currently managed and maintained by the transportation staff. The adaptive system will be housed in the TMC alongside and supported by the existing equipment.

The adaptive server will reside within the Tri-Valley Smart Corridor network. This will be the same network in which the existing central signal system currently resides along with all other communications and equipment associated with the City's signal infrastructure. The City of Dublin's transportation staff will provide support and system management so that the adaptive server will be integrated into this subnet so that operator will have appropriate access to the system locally, from within the City's LAN, and externally outside the City's LAN. The communications media available for use by the adaptive system will be the same currently used by the existing signal system to communicate with existing controllers and other field devices as detailed in Section 3.1.5 of this report.

The City has all required equipment and resources to support the existing traffic signal system. Any additional test equipment required to support the adaptive system will be determined by the system vendor. The vendor will specify any needed hardware and software to support the adaptive system as well as any needed field modifications (i.e., detection). The vendor will be responsible for identifying and providing any hardware needed to support the adaptive system, such as servers and data storage. It is anticipated that other existing equipment in the City's TMC will be utilized to support the adaptive system (i.e., network switch, workstations, monitors, printers, equipment racks, and power supply). Maintenance and repair of the computing equipment is the responsibility of transportation staff. Software maintenance is the responsibility of transportation staff. Transportation staff are responsible for software maintenance for standard software packages (i.e., computer operating system, business applications, etc.) and transportation staff is responsible for department specific software applications (i.e., signal system).

The adaptive system will be operated by existing transportation staff that currently operate the existing central signal system. There are two transportation engineers dedicated to signal operations and no additional staff is anticipated to be required to operate the adaptive system. The operators are available during normal business hours with after-hours support provided by the City's signal maintenance contractor. Training of transportation engineering staff and staff from the City's signal maintenance



contractor will be required to be provided by the system vendor during and after the installation of the adaptive system. Backup of the adaptive system database will be incorporated into the work flow and follow the same existing routine of backing up the signal system database.

To ensure optimal operation of the system, the system vendor will provide transportation staff with bi-weekly confirmation noting system operations confirming all system components are properly functioning, including verification of two-way communications, system software and hardware, local controller, and detection health. The system vendor will also monitor system event logs, alarms, notifications, etc. on the health of system. The system vendor will prepare a list of action items, if needed, to address any system deficiencies or component failures to return the system to a state of good operation. Transportation staff will also continuously monitor the performance of the corridor to collect various measures of effectiveness (MOE's) of corridor operation such as travel time and average speed. The collected MOE's will allow for a continuous and on-going assessment of the effectiveness of the adaptive system.



## 8 OPERATIONAL SCENARIOS

### 8.1 Overview

This chapter presents a number operational scenarios to describe how the adaptive system is expected to operate to meet user needs. The envisioned adaptive system is expected to be able to manage the following operational scenarios for both the current project corridor and potential future expansion of the system to other corridors in the City of Dublin:

- Peak Period Operation
- Midday Operation
- Priority and Preemption
- Queue Jump
- Fault Condition

### 8.2 Peak Period Operation

During the morning peak period, the peak travel direction is westbound along Dublin Boulevard. Traffic is heaviest at the intersection of Dublin Boulevard/Dougherty Road. During the evening peak period, the peak travel direction is eastbound along Dublin Boulevard. Similar to the morning peak, the critical intersection is Dublin Boulevard/Dougherty Road.

The adaptive system will provide smooth flow and maximize the progression bandwidth in the peak direction, while at the same time provide progression for the non-peak direction, though the degree of progression provided may be to a lesser extent (i.e., smaller bandwidth, one or more stops) compared to the peak direction. The system will achieve this at the expense of increased delay for side-street and protected left turn traffic, but not to the extent that phase failures occur or an unreasonable delay is experienced. The adaptive system will operate at a cycle length optimized for the prevailing traffic conditions, and increase the cycle length as the peak period builds and decrease the cycle length as the peak period dissipates. The system would utilize the following signal timing strategies:

- At all intersections, select phase times that equitably serve all movements and eliminate phase failures;
- At the critical intersections of Dublin/Dougherty, Dublin/Hacienda and Dublin/San Ramon for the westbound left turn, select phase times that eliminates queue overflow in left turn pockets;
- For intersections where the left turn demand is high, the system will allow for the left turn phase to be served twice per cycle to avoid queue build up;
- At all intersections, provide green times on the coordinated phases to minimize stops for travel along Dublin Boulevard; and
- Provide the ability to operate the entire corridor as one single group, or be broken up into two or more groups, based on prevailing traffic conditions and the required cycle lengths required on certain portions of the corridor compared to another.

### 8.3 Midday Operation



During the midday period, traffic volumes are much lighter compared to the peak periods with directional flow more balanced. During this time, the system will operate at the lowest cycle length possible, subject to prevailing traffic conditions, to ensure equitable distribution of green time to all phases while providing coordination. Unlike the peak periods, where the primary objective is to provide smooth flow and maximize throughput on Dublin Boulevard, the primary objective during the midday will be to ensure that all movements at all intersections have equitable distribution of green time, while still providing a reasonable progression along Dublin Boulevard in both directions. As a result, it would be acceptable to provide smaller progression bandwidths with potentially the need to stop once or twice when traveling through the project corridor.

## 8.4 Priority and Preemption

All of the traffic signals along the corridor are equipped with TSP and Emergency Vehicle Preemption (EVP). When an intersection responds to a TSP or EVP request, other signals within the adaptive control group will continue to operate adaptively. The preempted signal will run the preempt routine for the duration of the preemption request and return to adaptive operation once the preemption call ends.

Thus, the system will continue to have the capability to implement a TSP request routine and be able to extend the existing green or introduce an early green in order to serve a transit priority request. The decision to provide priority and the extent in which priority is provided will be determined by the signal controller of the adaptive system based on a set of parameters defined by the user.

## 8.5 Queue Jump

Queue jump is a method to minimize bus delay by giving buses exclusive lanes and signal phases at intersections. The intersection of Dublin Boulevard and Dougherty Road is equipped with a queue jump along Dublin Boulevard. Buses are positioned in the far-side lane, which is designated for buses and right-turning vehicles. An advance green, for a dedicated transit signal phase, lasting up to 10 seconds allows buses in these lanes to move through the intersection before the green phase for the adjacent lanes. For other vehicles in the lane, queue jump serves as a protected overlap, allowing vehicles queued ahead of the bus to pass through the intersection.

Thus, the system will continue to have the capability to support queue jump operations and be able to provide an advance green to serve transit vehicles.

## 8.6 Fault Conditions

If a communication failure prevents the adaptive system from continuing to control one or more intersections within a defined group, all signals within the group will revert to a pre-defined mode of operation based on a time-of-day (TOD) table residing in each signal controller. This may include either time-based coordination or free operation depending on the time-of-day and/or day-of-week in which the communication failure occurs. However, if the communication failure occurs at the endpoint of a corridor or at the edge of a network, the system will allow the user to remove the failed intersection (either manually or automatically through a predefined set of parameters) from the adaptive control group and continue to operate the remainder of the group under adaptive control.



The system will recognize a detector failure and take appropriate action to accommodate the missing data. For a detector that influences adaptive operation, the system will use data from an alternate detector (such as an adjacent lane detector or another upstream/downstream detector) or use historical data from an archive of historical detector data. If the number of detector failures within an adaptive control group exceeds a user-specified threshold, the system will automatically cease adaptive operation and revert to a pre-defined mode of operation based on a TOD table similar to that described for a communications failure. Detector failures not only occur when a detector is broken and ceases to function, but it may also fail by reporting erroneous information (i.e., excessively high or low occupancy and count data), which would affect the operation of the adaptive system. The system will allow a user to set thresholds for individual detectors that will designate a detector as failed when erroneous data is reported by the detector.

In the event that the adaptive system fails (i.e., server fails), all signals under adaptive control will revert to a pre-defined mode of operation based on a TOD table similar to that described for a communications failure.



Attachment C – NGAOP Dublin LAVTA Requirements  
Checklist

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
<b>1</b>	<b>Network Characteristics</b>	
1.0-1	The ASCT shall control a minimum of 16 signals concurrently.	M
1.0-1.0-1	The ASCT will control up to 200 signals concurrently.	D
1.0-2.0-5.0-1	The boundaries surrounding signal controllers that operate in a coordinated fashion shall be altered by the system according to a time of day schedule.	M
1.0-2.0-5.0-4	The ASCT shall not interfere with the City of Dublin's ability to exchange traffic data with Caltrans District 4, City of Livermore and City of Pleasanton which was established through the Tri-Valley Smart Corridor program in 2002.	M
<b>2</b>	<b>Type of Operation</b>	
2.1.1.0-1	The ASCT shall operate non-adaptively during the presence of a defined condition.	M
2.1.1.0-2.0-4	The ASCT shall operate non-adaptively when a user-defined communications link fails.	M
2.1.1.0-3	The ASCT shall operate non-adaptively when a user manually commands the ASCT to cease adaptively controlling a group of signals.	M
2.1.1.0-4	The ASCT shall operate non-adaptively when a user manually commands the ASCT to cease adaptive operation.	M
2.1.1.0-5	The ASCT shall operate non-adaptively in accordance with a user-defined time-of-day schedule.	M
2.1.1.0-7	The ASCT shall alter the adaptive operation to achieve required objectives in user-specified conditions as defined in 2.1.1.0-7.0-1 to 2.1.1.0-7.0-4.	M
2.1.1.0-7.0-1	When current measured traffic conditions meet user-specified criteria, the ASCT shall alter the state of the signal controllers, maximizing the throughput of the coordinated route.	M
2.1.1.0-7.0-4	When current measured traffic conditions meet user-defined criteria, the ASCT shall alter the state of signal controllers providing two-way progression on a coordinated route.	M
2.1.1.0-8	The ASCT shall provide maximum and minimum phase times.	M

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
2.1.1.0-12	The ASCT shall not prevent the use of phase timings in the local controller set by agency policy.	M
2.1.2.0-1	The ASCT shall not prevent protected/permissive left turn phase operation.	M
2.1.3.0-1	The ASCT shall detect the presence of queues at pre-configured locations.	M
2.1.3.0-2	When queues are detected at user-specified locations, the ASCT shall execute user-specified timing plan/operational mode.	M
2.1.3.0-3	When queues are detected at user-specified locations, the ASCT shall execute user-specified adaptive operation strategy.	M
2.1.3.0-4	When queues are detected at user-specified locations, the ASCT will omit a user-specified phase at a user-specified signal controller.	M
2.1.3.0-5	The ASCT shall meter traffic into user-specified bottlenecks by storing queues at user-specified locations.	M
2.1.3.0-6	The ASCT shall store queues at user-specified locations.	M
2.1.3.0-7	The ASCT shall maintain capacity flow through user-specified bottlenecks.	M
2.2.0-4	The ASCT shall calculate offsets to suit the current coordination strategy for the user-specified reference point for each signal controller along a coordinated route within a group.	M
2.2.0-4.0-1	The ASCT shall apply offsets for the user-specified reference point of each signal controller along a coordinated route.	M
2.2.0-6	The ASCT shall limit changes in offset adjustment to not exceed a user-specified range.	M
2.3.0-3	At non-critical intersections within a group, the ASCT shall calculate the time at which a user-specified phase shall be green, relative to a reference point at the critical intersection, to suit the current coordination strategy.	M
2.3.0-4	When demand is present, the ASCT shall implement a user-specified maximum time between successive displays of each phase at each intersection.	M

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
2.6.0-1	The ASCT shall limit the change in consecutive cycle lengths to be less than or equal to a user-specified value.	M
2.6.0-2	The ASCT shall limit the change in phase times between consecutive cycles to be less than or equal to a user-specified value. This does not apply to early gap-out or actuated phase skipping.	M
2.6.0-3	The ASCT shall limit the changes in the direction of primary coordination to a user-specified frequency.	M
2.6.0-4	When a large change in traffic demand is detected, the ASCT shall respond more quickly than normal operation, subject to user-specified limits (i.e., 2 cycles).	M
2.6.0-5	The ASCT shall select cycle length from a list of user-defined cycle lengths.	M
<b>3</b>	<b>External/Internal Interfaces</b>	
3.0-2	The ASCT will be in compliance with the mandatory requirements in the Institute of Traffic Engineers (ITE) Traffic Management Data Dictionary (TMDD) Standard for the Center to Center Communications, v03.03c.	D
<b>4</b>	<b>Crossing Arterials and Boundaries</b>	
	None	
<b>5</b>	<b>Access and Security</b>	
5.0-1	The ASCT shall be implemented with a security policy that addresses the following selected elements:	M
5.0-1.0-1	· Local access to the ASCT.	M
5.0-1.0-2	· Remote access to the ASCT.	M
5.0-1.0-3	· System monitoring.	M
5.0-1.0-4	· System manual override.	M
5.0-1.0-5	· Development	M
5.0-1.0-6	· Operations	M
5.0-1.0-7	· User login	M
5.0-1.0-8	· User password	M
5.0-1.0-9	· Administration of the system	M
5.0-1.0-10	· Signal controller group access	M
5.0-1.0-11	· Access to classes of equipment	M
5.0-1.0-12	· Access to equipment by jurisdiction	M
5.0-1.0-13	· Output activation	M

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
5.0-1.0-14	· System parameters	M
5.0-1.0-15	· Report generation	M
5.0-1.0-16	· Configuration	M
5.0-1.0-17	· Security alerts	M
5.0-1.0-18	· Security logging	M
5.0-1.0-19	· Security reporting	M
5.0-1.0-20	· Database	M
5.0-1.0-21	· Signal controller	M
5.0-3	The ASCT shall comply with the City of Dublin's IT security policies.	M
<b>6</b>	<b>Data Log</b>	
6.0-1	The ASCT shall log the following events:	M
6.0-1.0-1	Time-stamped vehicle phase calls	M
6.0-1.0-2	Time-stamped pedestrian phase calls	M
6.0-1.0-3	Time-stamped emergency vehicle preemption calls	M
6.0-1.0-4	Time-stamped transit priority and queue jump calls	M
6.0-1.0-5	Time-stamped railroad preemption calls	M
6.0-1.0-6	Time-stamped start and end of each phase	M
6.0-1.0-7	Time-stamped controller interval changes	M
6.0-1.0-8	Time-stamped start and end of each transition to a new timing plan.	M
6.0-2	The ASCT shall export its systems log in the following formats: - MS Excel, - Text, - CSV, - Open Source SQL database	M
6.0-3	The ASCT shall store the event log for a minimum of 365 days.	M
6.0-4	The ASCT shall store results of all signal timing parameter calculations for a minimum of 365 days.	M
6.0-5	The ASCT shall store the following measured data in the form used as input to the adaptive algorithm for a minimum of 365 days: - volume, - occupancy, -queue length, - phase utilization, - arrivals in green, - green band efficiency	M

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
6.0-7	The ASCT shall provide data storage for a system size of at least 200 signal controllers. The data to be stored shall include the following: <ul style="list-style-type: none"> <li>- controller state data</li> <li>- reports,</li> <li>- log data,</li> <li>- security data,</li> <li>- ASCT parameters,</li> <li>- detector status data</li> </ul>	M
6.0-8	The ASCT shall calculate and report relative data quality including: <ul style="list-style-type: none"> <li>- The extent data is affected by detector faults,</li> <li>- other applicable items</li> </ul>	M
6.0-9	The ASCT shall report comparisons of logged data when requested by the user: <ul style="list-style-type: none"> <li>- day to day,</li> <li>- hour to hour,</li> <li>- hour of day to hour of day,</li> <li>- hour of week to hour of week,</li> <li>- day of week to day of week,</li> <li>- day of year to day of year.</li> </ul>	M
6.0-10	The ASCT shall store data logs in a standard database (Microsoft SQL).	M
6.0-12	The ASCT shall store the following data in user-specified time increments: <ul style="list-style-type: none"> <li>- volume,</li> <li>- occupancy,</li> <li>- queue length.</li> </ul>	M

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
6.0-13	The ASCT local controller shall log, with time-stamp, the following events at a minimum: - controller power on/off, - controller on-line, - conflict flash, - local flash, - command flash, - coordination status, - coordination error, - preempt events, - priority events, - local free, - communications status, - BBU status -detector status.	M
6.0-14	The ASCT controller shall be able to store on the local controller memory at least 1000 of the controller's most recent events.	M
6.0-15	The ASCT shall make the system parameters and algorithm available to the operators on a read-only basis.	M
6.0-16	The ASCT shall generate a daily report for LAVTA recording the time savings due to TSP and queue jump operations.	M
<b>7</b>	<b>Advanced Controller Operation</b>	
7.0-2	The ASCT shall provide a minimum of 8 phase overlaps.	M
7.0-3	The ASCT shall accommodate a minimum of 16 phases at each signal	M
7.0-4	The ASCT shall accommodate a minimum of 4 rings at each signal.	M
7.0-5	The ASCT shall accommodate a minimum of 4 phases per ring.	M
7.0-6	The ASCT shall provide a minimum of 16 different user-defined phase sequences for each signal.	M
7.0-6.0-1	Each permissible phase sequence shall be user-assignable to any signal timing plan.	M
7.0-6.0-2	Each permissible phase sequence shall be executable by a time of day schedule.	M
7.0-6.0-3	Each permissible phase sequence shall be executable based on measured traffic conditions.	D

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
7.0-7	The ASCT shall not prevent a phase/overlap output by time-of-day.	M
7.0-8	The ASCT shall not prevent a phase/overlap output based on an external input.	M
7.0-9	The ASCT shall not prevent any phase to be designated as coordinated phases.	M
7.0-11	The ASCT shall not prevent the controller from displaying flashing yellow arrow left turn.	M
7.0-13	When adaptive operation is used in conjunction with normal TOD coordination, the ASCT shall not prevent a controller serving a cycle length different from the cycles used at adjacent intersections.	M
<b>8</b>	<b>Pedestrians</b>	
8.0-2	When a pedestrian phase is called, the ASCT shall accommodate pedestrian crossing times during adaptive operations.	M
<b>9</b>	<b>Special Functions</b>	
	None	
<b>10</b>	<b>Detection</b>	
10.0-1	The ASCT shall be compatible with bicycle and pedestrian detection technologies	M
<b>11</b>	<b>Railroad and Emergency Preemption</b>	
11.0-2	The ASCT shall maintain adaptive operation at non-preempted intersections during emergency vehicle preemption.	M
11.0-4	The ASCT shall resume adaptive control of signal controllers when preemptions are released.	M
11.0-7	The ASCT shall release user-specified signal controllers to local control when one signal in a group is preempted.	M
11.0-8	The ASCT shall not prevent the local signal controller from operating in normally detected limited-service actuated mode during preemption.	M
<b>12</b>	<b>Transit Priority</b>	
12.0-1	The ASCT shall continue adaptive operations of a group when one of its signal controllers receives a transit priority request.	D
12.0-2	The ASCT shall advance the start of a user-specified green phase in response to serving a transit priority request.	D



Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
12.0-2.0-1	The advance of start of green phase shall be user-defined.	D
12.0-2.0-2	Adaptive operations shall continue during the advance of the start of green phase.	D
12.0-3	The ASCT shall delay the end of a green phase, in response to serving a priority request.	D
12.0-3.0-1	The delay of end of green phase shall be user-defined.	D
12.0-3.0-2	Adaptive operations shall continue during the delay of the end of green phase.	D
12.0-9	The ASCT shall continue adaptive operations of a group when one of its signal controllers has a queue jump call.	M
12.0-10	The ASCT shall advance the start of a user-specified green phase in response to a queue jump call.	M
12.0-11	The ASCT shall delay the end of a green phase, in response to a queue jump call.	M
12.0-12	The delay of end of green phase shall be user-defined.	M
<b>13</b>	<b>Failure Events and Fallback</b>	
13.1.0-3	In the event of a detector failure, the ASCT shall issue an alarm to user-specified recipients. This requirement may be fulfilled by sending the alarm to a designated list of recipients by a designated means, or by using an external maintenance management system.	M
13.1.0-4	In the event of a failure, the ASCT shall log details of the failure in a permanent log.	M
13.1.0-5	The permanent failure log shall be searchable, archivable and exportable.	M
13.2-1	The ASCT shall execute user-specified actions when communications to one or more signal controllers fails within a group.	M
13.2-1.0-1	In the event of loss of communication to a user-specified signal controller, the ASCT shall release control of all signal controllers within a user-specified group to local control.	M
13.2-1.0-2	The ASCT shall switch to the alternate operation in real time without operator intervention.	M

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
13.2-1.0-3	In the event of loss of communication to a user-specified signal controller, the ASCT will be configurable to release control of only that signal controller within a user-specified group to local control. The remaining signals in the group shall continue under ASCT control.	D
13.2-2	In the event of communications failure, the ASCT shall issue an alarm to user-specified recipients. (This requirement may be fulfilled by sending the alarm to a designated list of recipients by a designated means, or by using an external maintenance management system.	M
13.2-3	The ASCT shall issue an alarm within 5 minutes of detection of a failure.	M
13.2-4	In the event of a communications failure, the ASCT shall log details of the failure in a permanent log.	M
13.2-5	The permanent failure log shall be searchable, archivable and exportable.	M
13.3-1	The ASCT shall execute user-specified actions when adaptive control fails:	M
13.3-1.0-1	The ASCT shall release control to central system control.	M
13.3-1.0-2	The ASCT shall release control to local operations to operate under its own time-of-day schedule.	M
13.3-2	In the event of an adaptive processor failure, the ASCT shall issue an alarm to user-specified recipients. This requirement may be fulfilled by sending the alarm to a designated list of recipients by a designated means, or by using an external maintenance management system.	M
13.3-4	During adaptive processor failure, the ASCT shall provide all local detector inputs to the local controller.	M
<b>14</b>	<b>Software</b>	
14.0-1	The vendor's adaptive software shall be fully operational within the following platform:	M
14.0-1.0-1	Windows-PC	M
14.0-1.0-2	Mobile Operating System (i.e., iOS, Android, and/or Windows)	D

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
14.0-3	The ASCT shall fully satisfy all requirements when the ASCT local firmware is installed on a 2070 ATC controller.	M
14.0-4	The ASCT shall provide the full capabilities of the system to users based on configured credentials and security privileges located at: - The City's TMC - Workstations at City's transportation staff desk - Workstations at any City facility with access to the City's LAN - Workstations anywhere with access to the City's wireless LAN - Workstations and mobile devices located outside of the City's LAN via secured VPN	M
14.0-5	The ASCT shall allow at least 10 simultaneous users to have full and complete control and access to the ASCT system regardless of the user's location (as defined in Requirement 14.0-4).	M
14.0-6	The ASCT shall display, with the user interface, a list of users that are currently logged into the ASCT that shall be available to be viewed by a user-defined set of users and/or administrator.	M
14.0-7	The ASCT GUI shall incorporate a system map that covers the entire limits of the controlled area. This map can be aerial imagery, GIS based maps or jpg/bitmap imagery	M
14.0-7.0-1	Within the ASCT, graphical views (when maximized) will return to the scale at which they were displayed immediately prior to being minimized.	D
14.0-7.0-2	The ASCT will provide the capability to create maps and graphic displays (corridor and intersection).	M
14.0-7.0-3	The ASCT will provide the capability to create maps by importing map displays from a Geographic Information System (GIS).	D
14.0-7.0-4	The ASCT will provide the capability to create graphical displays by importing graphics in the following formats: .bmp, .wmf, .jpg, .png, .tiff.	D

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
14.0-7.0-5	The ASCT's mapping will incorporate full pan/zoom capability on system and area maps.	D
14.0-7.0-6	The ASCT will provide the ability to set up both dynamic and static informational layers that are displayed at different view scale levels by defining the view scale levels in a zoom level set-up configuration database table.	D
14.0-7.0-7	Within the ASCT, different layers will be enabled as a default at different zoom levels.	D
14.0-7.0-8	By setting the zoom scale range and appropriately enabled/disabled layers, the ASCT will provide the ability to control which layers display at different zoom scales. For example, at the city-wide scale level the user can enable roadway centerlines (static information) as well as a communication status indication (dynamic information) for each intersection controller in the system.	D
14.0-7.0-9	The ASCT will support multiple base maps, where Users may select the map to be displayed.	D
14.0-7.0-10	ASCT map elements (i.e., streets, device icons, etc.) will be scalable between zoom levels, such that they are resized appropriately at each zoom level.	D
14.0-7.0-11	The ASCT will assign and display with a unique color, the status off all intersections on the map.	D
14.0-7.0-12	The ASCT's map display will be able to be run on multiple workstations so that each workstation will be able to display data from the same or different intersections simultaneously.	D
14.0-7.0-13	Within the ASCT, objects on the map will be capable of being programmed to turn on or off at different zoom levels. Text labels will be comparable in size between different zoom levels.	D

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
14.0-8	The ASCT will allow Users to view real-time intersection status and detector status overlaid on maps and graphic displays showing the layout of the intersection. The ASCT will provide a minimum refresh rates of once-per-second for all dynamic display data elements at the intersection level.	D
14.0-8.0-1	The ASCT will provide the ability to define unique names and ID numbers to an intersection.	D
14.0-8.0-2	The ASCT will display details of live count-up/down of the following controller parameters at the intersection: cycle length, offset, and phase splits.	D
14.0-8.0-3	The ASCT will display the status pedestrian calls at the intersection.	D
14.0-8.0-4	The ASCT will display the color status of each vehicle (Red, Yellow, Green) and pedestrian (Walk, FDW) phase indication at the intersection.	D
14.0-8.0-5	The ASCT will display the status of the controller operational mode (e.g., adaptive, local TBC, Manual, Free, Flash, etc.).	D
14.0-8.0-6	The ASCT will display controller status at the intersection (e.g., in-plan, pre-empted, type of preemption, conflict flash, priority, etc.).	D
14.0-8.0-7	The ASCT will display the status of communications at the controller (e.g., on-line, no communication, etc.).	D
14.0-8.0-8	The ASCT will display the status of the actuation status of all detectors associated with the intersection.	D
14.0-9	The ASCT shall allow for the download on a system-wide, section, or intersection basis from the ASCT server to the local controller.	M
14.0-10	The ASCT shall allow for the upload on a system-wide, section, or intersection basis from the local controller to the ASCT server.	M
14.0-11	Upload/download commands shall be executed within 3 seconds upon command between the ASCT and the field controller.	M

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
14.0-12	The ASCT shall be capable of uploading and downloading all values (timing parameters, data, logs, configuration) within the controller.	M
14.0-13	The ASCT shall be capable of uploading and downloading a user-defined sub-set of all the values within the controller. For example, the ability to upload/download only the pre-empt timing parameters within a controller.	M
14.0-14	The ASCT shall perform a data check and highlight errors or missing data in timing parameters prior to permitting a download action to a controller.	M
14.0-15	The ASCT shall generate a comparison report listing all data discrepancies between the database and controller.	M
14.0-16	The ASCT database shall time stamp (date and time) all upload and download to and from each signalized intersection.	M
14.0-17	The ASCT shall provide the ability to schedule downloads, uploads, and compares using a scheduler.	M
14.0-18	The results of the auto-compare will be logged and made available to the ATMS User for review.	M
14.0-19	It shall be possible to request a download from a field controller to the ASCT without the need for ASCT user support (remote download request).	M
14.0-20	The ASCT user interface shall be graphics-based, and follow Microsoft GUI standards. All ASCT user accessible software shall use a graphical user interface (GUI).	M
14.0-21	The ASCT user interface shall provide a complete searchable list of intersections showing at least the intersection name, number, type of control, description, and communications status.	M
14.0-22	The ASCT GUI Software shall provide the User with a graphical operating environment of the type commonly found on today's computers operating systems.	M
14.0-23	The ASCT GUI shall allow the User to select objects on the screen by point-and-click manipulation with a menu-driven structure, thereby minimizing the need to memorize typed commands.	M

Requirements Reference Number	Requirement Statement	Mandatory(M)/ Desirable(D)
14.0-24	The ASCT shall allow the ability to add or delete an intersection from a section through point-and-click manipulation of the intersection on the ASCT GUI.	M
14.0-25	The ASCT GUI shall be a fully operational multi-tasking environment. It shall be Windows™ GUI-based, and support the use of standard Windows™ OS features and interface standards, such as multi-tasking, scalable windows, minimization, clipboard, etc.	M
14.0-26	Within the ASCT GUI, several windows may be active at the same time and may overlap on the screen with the User interacting with one (1) window at a time.	M
14.0-27	Within the ASCT GUI, the User shall be able to move any window on the screen, to change window size, and to collapse a window to an icon.	M
14.0-28	The ASCT workstation client shall be able to operate normally with additional software programs operating concurrently on the workstation. This includes such functions as productivity applications, Internet browsers, and other third-party programs.	M
14.0-29	Pull down or pop-up menus shall provide access to the entire functionality of the ASCT.	M
14.0-30	The ASCT shall provide full GUI display of database tables.	M
14.0-31	The ASCT database configuration shall allow for an operator to select lines of data for "cut", "copy", "paste" functions.	M
14.0-32	Through the ASCT, Users with defined privileges shall have operational control (e.g., monitor, control, check equipment status, etc.) of every traffic signal connected to the system.	M
14.0-33	The ASCT shall provide functions allowing the Administrator to control the system security (i.e., Users will be able to adjust who has what type of access to system security features).	M

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
14.0-34	ASCT Users shall be able to log in from a remote location and be able to monitor, control, upload and download signal plans, etc. to the intersection controllers.	M
14.0-35	ASCT clients (i.e., workstation PC's) shall connect to the system server automatically upon initiation of the client software program at the workstation. In like fashion, the system server shall also connect to all system devices and to the database(s) automatically upon initiation of the server.	M
14.0-36	The ATMS shall provide for local area network (LAN) capability so that several workstations can simultaneously access the ASCT database(s).	M
14.0-37	The ASCT shall fully satisfy all requirements when the ASCT local controller is installed in a Type 332, NEMA TS1, and NEMA TS-2 controller cabinet environment.	M
14.0-38	The ASCT software shall operate in a PC-based servers and clients.	M
14.0-39	The ASCT shall communicate to field controllers over an Ethernet network in a Layer 2 and 3 environment.	M
14.0-40	The ASCT shall communicate with field controllers, computer workstations, and servers that reside on various different VLANs within the network.	M
14.0-41	The ASCT shall support remote workstation access over a wired and wireless network.	M
14.0-42	The ASCT shall support remote workstation access over the Internet or private network via secured VPN connection.	M
14.0-43	The ASCT shall utilize a standard database platform to establish user access, rights, and privileges to the ASCT software.	M
14.0-44	The ASCT shall be capable of being installed on a standalone Windows-based server and in a virtual server environment.	M
14.0-45	The ASCT shall be capable of utilizing the existing detection (stop bar and advanced) based on currently installed configuration.	D



Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
14.0-46	The ASCT and existing ATMS.now central system shall share a single user signal map. This can be accomplished through a data exchange between the two systems or creation of common map.	M
<b>15</b>	<b>Training</b>	
15.0-1	The vendor shall provide the following training:	M
15.0-1.0-1	The vendor shall provide training on the operations of the adaptive system.	M
15.0-1.0-2	The vendor shall provide training on troubleshooting the system.	M
15.0-1.0-3	The vendor shall provide training on preventive maintenance and repair of equipment.	M
15.0-1.0-4	The vendor shall provide training on system configuration.	M
15.0-1.0-5	The vendor shall provide training on administration of the system.	M
15.0-1.0-6	The vendor shall provide training on system calibration.	M
15.0-1.0-7	The vendor's training delivery shall include: printed course materials and references, electronic copies of presentations and references.	M
15.0-1.0-8	The vendor's training shall be delivered on-site at City of Dublin's TMC.	M
15.0-1.0-9	The vendor shall provide a minimum of 5 days training to a minimum of 10 staff.	M
15.0-1.0-10	The vendor shall provide a minimum of 5, 1-day training sessions.	M
<b>16</b>	<b>Maintenance, Support and Warranty</b>	
16.0-4	The System Vendor shall provide bi-weekly confirmation noting system operations confirming all system components are properly functioning including verification of two-way communications, system software and hardware, local controller, and detection health. Prepare a list of action items, if needed, to address and repair all deficiencies and failures.	M
16.0-5	The System Vendor shall conduct a bi-weekly review of system event logs, alarms, notifications, etc. on health of system and preparation of action items, if needed, to address any system deficiencies or component failures to return the system to a state of good operation. This review shall be conducted throughout the length of the contract and warranty period.	M

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)
16.0-6	As part of the ASCT procurement document, the City shall provide a list of spare parts, equipment, and/or software to be provided by the ASCT vendor.	M
<b>17</b>	<b>Schedule</b>	
	None	
<b>18</b>	<b>Performance Measurement, Monitoring and Reporting</b>	
18.0-1	The ASCT shall report measures of current traffic conditions on which it bases signal state alterations.	M
18.0-2	The ASCT shall report all intermediate calculated values that are affected by calibration parameters.	M
18.0-3	The ASCT shall maintain a log of all signal state alterations directed by the ASCT.	M
18.0-4	The ASCT shall produce a daily report on corridor TSP operations that is consistent with the current report generated by the City of Dublin's TrafficWare ATMS.now system	M

Attachment D – NGAOP Dublin LAVTA Final  
Verification

# Next Generation Arterial Operations Program LAVTA/ City of Dublin – Dublin Boulevard Final Verification Plan | *Deliverable 6.4b*



Project Sponsors:



November 11, 2015

Innovation for better mobility





## DOCUMENT VERSION CONTROL

DOCUMENT NAME	SUBMITTAL DATE	VERSION NO.
Draft Verification Plan (Internal Review Release)	10/27/2015	V1
Draft Verification Plan (Released to MTC)	10/28/2015	V2
Draft Verification Plan (Released to MTC and City of Dublin)	10/29/2015	V3
Final Verification Plan (Released to MTC and City of Dublin)	11/11/2015	V4



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## 1 PURPOSE OF DOCUMENT

The scope of this document covers the consideration of adaptive signal control technology (ASCT) for use along a portion of Dublin Boulevard within the City of Dublin. Following the Systems Engineering Management Plan (SEMP), the Concept of Operations (ConOps), and Requirements document, this Verification Plan document is the fourth in a series of systems engineering documents being developed for the implementation of the ASCT system.

The purpose of this document is to present the proposed verification plan for the ASCT system that will be implemented in the City. This document describes the scope of the project, the referenced documents that are used to prepare the verification plan, details on the conduct of verification, and lists the verifications cases and corresponding system requirements to be tested.

The intended audience of this document includes: technical staff, system operators, system designers, and vendors. Project stakeholders include:

- Metropolitan Transportation Commission (MTC)
- City of Dublin, CA
- Livermore Amador Valley Transit Authority (LAVTA)

This document will be used to guide the City of Dublin staff and the System Vendor during the deployment with the understanding that the project requirements and verification plan will guide the installation, integration, and testing of the ASCT system.

## 2 SCOPE OF PROJECT

As part of the Metropolitan Transportation Commission's (MTC) Transit Performance Initiative (TPI) Program and Next Generation Arterial Operations (NextGen AOP) Program, the City of Dublin and Livermore Amador Valley Transit Authority (LAVTA) was selected as one of four program sponsored projects to implement advanced technologies to better manage and operate arterial roadways. The NextGen AOP seeks to deploy and evaluate next generation arterial management solutions to improve user travel experience by improving travel time and travel time reliability for autos and transit vehicles and improve safety of motorists, transit users, pedestrians, and bicyclists. The technologies include adaptive signal control systems, transit signal priority, real-time traffic monitoring, and other innovative operating strategies.

The scope of this document covers the consideration of adaptive signal control technology (ASCT) for use along a portion of Dublin Boulevard within the City of Dublin. Following the Systems Engineering Management Plan (SEMP), the Concept of Operations (ConOps) documents, and Requirements document, this Verification Plan document is the fourth in a series of systems engineering documents being developed for the implementation of the adaptive signal control technology (ASCT) system. The ASCT system will initially be deployed along a 2.9-mile segment of Dublin Boulevard. This document defines the technical scope of the system to be deployed and is the foundation for system verification after the system is deployed and operational. The Model Systems Engineering Documents for ASCT Systems (see Chapter 2 References, for reference details) was referenced in the preparation of this



Verification Plan document. The intended audience of this document includes: technical staff, system operators, system designers, and vendors.

Project stakeholders include:

- Metropolitan Transportation Commission (MTC)
- City of Dublin, CA
- Livermore Amador Valley Transit Authority (LAVTA)

These stakeholders represent those who will evaluate, plan, design, fund, implement, operate, use, and maintain the system. The primary agency responsible for the acquisition is LAVTA while the City of Dublin will operate and maintain the ASCT system.

## 3 REFERENCED DOCUMENTS

The following documents have been used in the preparation of this Requirements document. Some of these documents provide policy guidance for traffic signal operations in this area, some are standards with which the system must comply, while others report the conclusions of discussions, workshops and other research used to define the needs of the project and subsequently identify project requirements.

- “Next Generation Arterial Operations Program, City of Dublin, Final System Requirements”, Iteris, October 27, 2015.
- “Next Generation Arterial Operations Program, City of Dublin, Final Concept of Operations”, Iteris, September 21, 2015.
- “Systems Engineering Guidebook for ITS”, California Department of Transportation, Division of Research & Innovation, Version 3.0, November 2009.
- “Model Systems Engineering Documents for Adaptive Signal Control Technology (ASCT) Systems”, U.S. Department of Transportation, Federal Highway Administration, FHWA-HOP-11-027, August 2012.
- “Systems Engineering for Intelligent Transportation Systems, An Introduction for Transportation Professionals”, U.S. Department of Transportation, Federal Highway Administration, January 2007.
- “Systems Engineering Processes for Developing Traffic Signal Systems”, National Cooperative Highway Research Program (NCHRP) Synthesis 307, Transportation Research Board, 2003.
- “Adaptive Traffic Control Systems: Domestic and Foreign State of Practice”, National Cooperative Highway Research (NCHRP) Synthesis 403, Transportation Research Board, 2010.
- “Intelligent Transportation System Architecture and Standards; Final Rule, 23 CFR Parts 655 and 940”, Department of Transportation, Federal Highway Administration, Federal Register, Vol. 66, No. 5, Monday, January 8, 2001.
- “Bay Area ITS Architecture, 2011 Update”, Metropolitan Transportation Commission, April 23, 2012.





## 4 CONDUCTING VERIFICATION

The verification will be conducted by the ASCT System Vendor in the presence of the City of Dublin system operator and the System Engineer. Prior to conducting the verification test, the System Vendor will develop the verification procedures to be reviewed and approved by the City of Dublin. All verification shall be conducted in the presence of the City of Dublin's Project Manager. Oversight of the verification process and system acceptance will be supported by the System Engineer. Final verification and formal system acceptance will be provided by the City of Dublin's Project Manager. The Project Manager will control the plan and tests, but will also work with the System Engineer to clarify the verification procedure and acceptance tests.

The ASCT System Vendor will be responsible for providing all materials, equipment and staff to complete the testing. A list of all hardware, software and special equipment utilized in the testing shall be provided at a future date. The proposed date and time of all acceptance testing will be planned in advance and coordinated with the City's Project Manager. The ASCT System Vendor shall produce and maintain a schedule for the City's Project Manager that details all proposed dates and time of all acceptance testing activities. The City's Project Manager, in coordination with the System Engineer, will review and approve the schedule.

The ASCT System Vendor shall conduct the verification tests in two steps. In the first step, the Vendor shall bench test the system against the system requirements at the City's Transportation Management Center (TMC), or another location to be determined by the City. This "bench test" shall serve to test conditions that would otherwise be unsafe or unwanted in the field with actual traffic conditions. These include the testing of failed conditions such as "Flash" conditions or "Power Fail" conditions, etc. In the second step, the System Vendor shall conduct the verification tests with field deployed hardware and software. The verification table indicates where the test should be conducted. The Vendor shall coordinate with the City's Project Manager to schedule the testing time periods consistent with the test schedule. All hardware components are to be tested for a minimum of seven (7) calendar days prior to deployment in the field.

Acceptance testing will be a critical part of implementation. The acceptance test is expected to consist of a multiple day test of the field components. This testing will take place in the field at selected locations and at the City's TMC for complete end-to-end system verification. If there are verification tests that result in failure, then the verification could take longer. A 30-day reliability test for each component installed as part of the project will also be documented. The 30-day test is expected to document the verification of daily operation.

Any failure or lack of performance to meet the stated system requirements shall be immediately recorded as a system variance and the System Vendor shall prepare a report stating why the system requirement was not met. It will be the responsibility of the System Vendor to complete, track, and resolve each variance to the satisfaction of the City's Project Manager. The variance form shall include a proposed solution to resolve the deficiency and shall be submitted to the Project Manager within seven days of the failure if discovered. Upon any failed verification, the City's Project Manager, in consultation with the System Engineer, will decide if all testing should stop until the correction is made. A failure with a select system requirement such as upload/download data to the controller will likely cause all testing to halt.



Other functional requirement failure such as a report layout may not necessitate a halt to system verification.

If the ASCT System Vendor is not able to meet a system requirement that was included in the contract, the System Vendor shall prepare a report documenting the failure and develop a plan to provide similar performance operation or correction to the failure. It is not anticipated that any software revisions will be required to satisfy the fulfillment of all identified mandatory requirements. Upon completion of all required verification testing, the System Vendor shall prepare a final Verification Report which will contain all critical information regarding testing conducted including both failures and successes. Resolution of the cause of failures will also be detailed.

## 5 VERIFICATION IDENTIFICATION

This section identifies specific verification cases to be performed. A verification case is a logical grouping of functions and performance criteria that are to be verified together. Each case should contain the following:

- Name and reference number
- Objective (from Requirements)
- List of requirements to be verified or traced
- Data to be recorded or noted during verification, such as expected results
- Statement of requirements met, partially met, or not met.
- Comments on how requirements are met, and proposed action if only partially met or not met.

The following test cases have been identified to correspond with the primary verification methods as outlined in the verification and test case matrix in **Appendix A**. More specific test case instructions will be developed in conjunction with the ASCT System Vendor, after a specific system has been procured so that all necessary software demonstration procedures are adjusted accordingly.

### Test Case 1: Product Submittal Review

As the System Vendor selects final system components for procurement, the System Vendor will provide the City's Project Manager with product specifications and/or engineering drawings for requirements verification and acceptance. Once accepted, the Vendor may complete procurement of components for installation and integration.

### Test Case 2: Product Demonstration

After the System Vendor has procured the system hardware and integrated an initial group of intersections with the system, a series of detailed software demonstration tests will be conducted. The demonstration will take place on-site at the designated City of Dublin facility. The system shall be activated and observed for requirements verification and acceptance.

### Test Case 3: Field Observations



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After the System Vendor has integrated the system components and completed the software demonstration test case, a visual inspection of system performance and/or functionality in the field will be conducted. This visual confirmation will document how the system satisfies requirements associated with field-observed operations and/or functions.



## Appendix A: Verification Test Case Matrix

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
<b>1</b>	<b>Network Characteristics</b>								
1.0-1	The ASCT shall control a minimum of 16 signals concurrently.	M	2	Demonstration of software	Bench				
1.0-1.0-1	The ASCT will control up to 200 signals concurrently.	D	1	Review product cut sheet/shop drawing	Bench				
1.0-2.0-5.0-1	The boundaries surrounding signal controllers that operate in a coordinated fashion shall be altered by the system according to a time of day schedule.	M	2	Demonstration of software	Bench				
1.0-2.0-5.0-4	The ASCT shall not interfere with the City of Dublin's ability to exchange traffic data with Caltrans District 4, City of Livermore and City of Pleasanton which was established through the Tri-Valley Smart Corridor program in 2002.	M	2	Demonstration of software	Bench				
<b>2</b>	<b>Type of Operation</b>								
2.1.1.0-1	The ASCT shall operate non-adaptively during the presence of a defined condition.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.1.0-2.0-4	The ASCT shall operate non-adaptively when a user-defined communications link fails.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.1.0-3	The ASCT shall operate non-adaptively when a user manually commands the ASCT to cease adaptively controlling a group of signals.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.1.0-4	The ASCT shall operate non-adaptively when a user manually commands the ASCT to cease adaptive operation.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.1.0-5	The ASCT shall operate non-adaptively in accordance with a user-defined time-of-day schedule.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.1.0-7	The ASCT shall alter the adaptive operation to achieve required objectives in user-specified conditions as defined in 2.1.1.0-7.0-1 to 2.1.1.0-7.0-4.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.1.0-7.0-1	When current measured traffic conditions meet user-specified criteria, the ASCT shall alter the state of the signal controllers, maximizing the throughput of the coordinated route.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.1.0-7.0-4	When current measured traffic conditions meet user-defined criteria, the ASCT shall alter the state of signal controllers providing two-way progression on a coordinated route.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.1.0-8	The ASCT shall provide maximum and minimum phase times.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.1.0-12	The ASCT shall not prevent the use of phase timings in the local controller set by agency policy.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.2.0-1	The ASCT shall not prevent protected/permissive left turn phase operation.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.3.0-1	The ASCT shall detect the presence of queues at pre-configured locations.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.3.0-2	When queues are detected at user-specified locations, the ASCT shall execute user-specified timing plan/operational mode.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.3.0-3	When queues are detected at user-specified locations, the ASCT shall execute user-specified adaptive operation strategy.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
2.1.3.0-4	When queues are detected at user-specified locations, the ASCT will omit a user-specified phase at a user-specified signal controller.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.1.3.0-5	The ASCT shall meter traffic into user-specified bottlenecks by storing queues at user-specified locations.	M	3	Visual Inspection	Field				
2.1.3.0-6	The ASCT shall store queues at user-specified locations.	M	3	Visual Inspection	Field				
2.1.3.0-7	The ASCT shall maintain capacity flow through user-specified bottlenecks.	M	3	Visual inspection	Field				
2.2.0-4	The ASCT shall calculate offsets to suit the current coordination strategy for the user-specified reference point for each signal controller along a coordinated route within a group.	M	2	Demonstration of software	Bench				
2.2.0-4.0-1	The ASCT shall apply offsets for the user-specified reference point of each signal controller along a coordinated route.	M	2	Demonstration of software	Bench				
2.2.0-6	The ASCT shall limit changes in offset adjustment to not exceed a user-specified range.	M	2	Demonstration of software	Bench				
2.3.0-3	At non-critical intersections within a group, the ASCT shall calculate the time at which a user-specified phase shall be green, relative to a reference point at the critical intersection, to suit the current coordination strategy.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.3.0-4	When demand is present, the ASCT shall implement a user-specified maximum time between successive displays of each phase at each intersection.	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
2.6.0-1	The ASCT shall limit the change in consecutive cycle lengths to be less than or equal to a user-specified value.	M	2	Demonstration of software	Bench				
2.6.0-2	The ASCT shall limit the change in phase times between consecutive cycles to be less than or equal to than a user-specified value. This does not apply to early gap-out or actuated phase skipping.	M	2	Demonstration of software	Bench				
2.6.0-3	The ASCT shall limit the changes in the direction of primary coordination to a user-specified frequency.	M	2	Demonstration of software	Bench				
2.6.0-4	When a large change in traffic demand is detected, the ASCT shall respond more quickly than normal operation, subject to user-specified limits (i.e., 2 cycles).	M	2	Demonstration of software	Bench				
2.6.0-5	The ASCT shall select cycle length from a list of user-defined cycle lengths.	M	2	Demonstration of software	Bench				
<b>3</b>	<b>External/Internal Interfaces</b>								
3.0-2	The ASCT will be in compliance with the mandatory requirements in the Institute of Traffic Engineers (ITE) Traffic Management Data Dictionary (TMDD) Standard for the Center to Center Communications, v03.03c.	D	2	Demonstration of software	Bench				
<b>4</b>	<b>Crossing Arterials and Boundaries</b>								
	None								
<b>5</b>	<b>Access and Security</b>								
5.0-1	The ASCT shall be implemented with a security policy that addresses the following selected elements:	M	2	Demonstration of software	Bench				
5.0-1.0-1	Local access to the ASCT.	M	2	Demonstration of software	Bench				

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
5.0-1.0-2	· Remote access to the ASCT.	M	2	Demonstration of software	Bench				
5.0-1.0-3	· System monitoring.	M	2	Demonstration of software	Bench				
5.0-1.0-4	· System manual override.	M	2	Demonstration of software	Bench				
5.0-1.0-5	· Development	M	2	Demonstration of software	Bench				
5.0-1.0-6	· Operations	M	2	Demonstration of software	Bench				
5.0-1.0-7	· User login	M	2	Demonstration of software	Bench				
5.0-1.0-8	· User password	M	2	Demonstration of software	Bench				
5.0-1.0-9	· Administration of the system	M	2	Demonstration of software	Bench				
5.0-1.0-10	· Signal controller group access	M	2	Demonstration of software	Bench				
5.0-1.0-11	· Access to classes of equipment	M	2	Demonstration of software	Bench				
5.0-1.0-12	· Access to equipment by jurisdiction	M	2	Demonstration of software	Bench				
5.0-1.0-13	· Output activation	M	2	Demonstration of software	Bench				
5.0-1.0-14	· System parameters	M	2	Demonstration of software	Bench				
5.0-1.0-15	· Report generation	M	2	Demonstration of software	Bench				
5.0-1.0-16	· Configuration	M	2	Demonstration of software	Bench				
5.0-1.0-17	· Security alerts	M	2	Demonstration of software	Bench				
5.0-1.0-18	· Security logging	M	2	Demonstration of software	Bench				
5.0-1.0-19	· Security reporting	M	2	Demonstration of software	Bench				
5.0-1.0-20	· Database	M	2	Demonstration of software	Bench				
5.0-1.0-21	· Signal controller	M	2	Demonstration of software	Bench				
5.0-3	The ASCT shall comply with the City of Dublin's IT security policies.	M	2	Demonstration of software	Bench				
<b>6</b>	<b>Data Log</b>								
6.0-1	The ASCT shall log the following events:	M	2	Demonstration of software	Bench				
6.0-1.0-1	Time-stamped vehicle phase calls	M	2	Demonstration of software	Bench				
6.0-1.0-2	Time-stamped pedestrian phase calls	M	2	Demonstration of software	Bench				
6.0-1.0-3	Time-stamped emergency vehicle preemption calls	M	2	Demonstration of software	Bench				
6.0-1.0-4	Time-stamped transit priority and queue jump calls	M	2	Demonstration of software	Bench				
6.0-1.0-5	Time-stamped railroad preemption calls	M	2	Demonstration of software	Bench				
6.0-1.0-6	Time-stamped start and end of each phase	M	2	Demonstration of software	Bench				
6.0-1.0-7	Time-stamped controller interval changes	M	2	Demonstration of software	Bench				
6.0-1.0-8	Time-stamped start and end of each transition to a new timing plan.	M	2	Demonstration of software	Bench				
6.0-2	The ASCT shall export its systems log in the following formats: - MS Excel, - Text, - CSV, - Open Source SQL database	M	2	Demonstration of software	Bench				
6.0-3	The ASCT shall store the event log for a minimum of 365 days.	M	2	Demonstration of software	Bench				
6.0-4	The ASCT shall store results of all signal timing parameter calculations for a minimum of 365 days.	M	2	Demonstration of software	Bench				
6.0-5	The ASCT shall store the following measured data in the form used as input to the adaptive algorithm for a minimum of 365 days: - volume, - occupancy, - queue length, - phase utilization, - arrivals in green, - green band efficiency	M	2	Demonstration of software	Bench				

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
6.0-7	The ASCT shall provide data storage for a system size of at least 200 signal controllers. The data to be stored shall include the following: - controller state data - reports, - log data, - security data, - ASCT parameters, - detector status data	M	2	Demonstration of software	Bench				
6.0-8	The ASCT shall calculate and report relative data quality including: - The extent data is affected by detector faults, - other applicable items	M	2	Demonstration of software	Bench				
6.0-9	The ASCT shall report comparisons of logged data when requested by the user: - day to day, - hour to hour, - hour of day to hour of day, - hour of week to hour of week, - day of week to day of week, - day of year to day of year.	M	2	Demonstration of software	Bench				
6.0-10	The ASCT shall store data logs in a standard database (Microsoft SQL).	M	2	Demonstration of software	Bench				
6.0-12	The ASCT shall store the following data in user-specified time increments: - volume, - occupancy, - queue length.	M	2	Demonstration of software	Bench				
6.0-13	The ASCT local controller shall log, with time-stamp, the following events at a minimum: - controller power on/off, - controller on-line, - conflict flash, - local flash, - command flash, - coordination status, - coordination error, - preempt events, - priority events, - local free, - communications status, - BBU status -detector status.	M	2	Demonstration of software	Bench				
6.0-14	The ASCT controller shall be able to store on the local controller memory at least 1000 of the controller's most recent events.	M	2	Demonstration of software	Bench				
6.0-15	The ASCT shall make the system parameters and algorithm available to the operators on a read-only basis.	M	2	Demonstration of software	Bench				



Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
6.0-16	The ASCT shall generate a daily report for LAVTA recording the time savings due to TSP and queue jump operations.	M		Demonstration of software	Bench				
<b>7</b>	<b>Advanced Controller Operation</b>								
7.0-2	The ASCT shall provide a minimum of 8 phase overlaps.	M	2	Demonstration of software	Bench				
7.0-3	The ASCT shall accommodate a minimum of 16 phases at each signal	M	2	Demonstration of software	Bench				
7.0-4	The ASCT shall accommodate a minimum of 4 rings at each signal.	M	2	Demonstration of software	Bench				
7.0-5	The ASCT shall accommodate a minimum of 4 phases per ring.	M	2	Demonstration of software	Bench				
7.0-6	The ASCT shall provide a minimum of 16 different user-defined phase sequences for each signal.	M	2	Demonstration of software	Bench				
7.0-6.0-1	Each permissible phase sequence shall be user-assignable to any signal timing plan.	M	2	Demonstration of software	Bench				
7.0-6.0-2	Each permissible phase sequence shall be executable by a time of day schedule.	M	2	Demonstration of software	Bench				
7.0-6.0-3	Each permissible phase sequence shall be executable based on measured traffic conditions.	D	2	Demonstration of software	Bench				
7.0-7	The ASCT shall not prevent a phase/overlap output by time-of-day.	M	2	Demonstration of software	Bench				
7.0-8	The ASCT shall not prevent a phase/overlap output based on an external input.	M	2	Demonstration of software	Bench				
7.0-9	The ASCT shall not prevent any phase to be designated as coordinated phases.	M	2	Demonstration of software	Bench				
7.0-11	The ASCT shall not prevent the controller from displaying flashing yellow arrow left turn.	M	2	Demonstration of software	Bench				
7.0-13	When adaptive operation is used in conjunction with normal TOD coordination, the ASCT shall not prevent a controller serving a cycle length different from the cycles used at adjacent intersections.	M	2	Demonstration of software	Bench				
<b>8</b>	<b>Pedestrians</b>								
8.0-2	When a pedestrian phase is called, the ASCT shall accommodate pedestrian crossing times during adaptive operations.	M	2	Demonstration of software	Bench				
<b>9</b>	<b>Special Functions</b>								
	None								
<b>10</b>	<b>Detection</b>								
10.0-1	The ASCT shall be compatible with bicycle and pedestrian detection technologies	M	2, 3	Demonstration of software / Visual Inspection	Bench / Field				
<b>11</b>	<b>Railroad and Emergency Preemption</b>								
11.0-2	The ASCT shall maintain adaptive operation at non-preempted intersections during emergency vehicle preemption.	M	2,3	Demonstration of software / Visual Inspection	Bench / Field				
11.0-4	The ASCT shall resume adaptive control of signal controllers when preemptions are released.	M	2,3	Demonstration of software / Visual Inspection	Bench / Field				
11.0-7	The ASCT shall release user-specified signal controllers to local control when one signal in a group is preempted.	M	2,3	Demonstration of software / Visual Inspection	Bench / Field				
11.0-8	The ASCT shall not prevent the local signal controller from operating in normally detected limited-service actuated mode during preemption.	M	2,3	Demonstration of software / Visual Inspection	Bench / Field				

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
<b>12</b>	<b>Transit Priority</b>								
12.0-1	The ASCT shall continue adaptive operations of a group when one of its signal controllers receives a transit priority request.	D	1	Review product cut sheet/shop drawing	Bench				
12.0-2	The ASCT shall advance the start of a user-specified green phase in response to serving a transit priority request.	D	1	Review product cut sheet/shop drawing	Bench				
12.0-2.0-1	The advance of start of green phase shall be user-defined.	D	1	Review product cut sheet/shop drawing	Bench				
12.0-2.0-2	Adaptive operations shall continue during the advance of the start of green phase.	D	1	Review product cut sheet/shop drawing	Bench				
12.0-3	The ASCT shall delay the end of a green phase, in response to serving a priority request.	D	1	Review product cut sheet/shop drawing	Bench				
12.0-3.0-1	The delay of end of green phase shall be user-defined.	D	1	Review product cut sheet/shop drawing	Bench				
12.0-3.0-2	Adaptive operations shall continue during the delay of the end of green phase.	D	1	Review product cut sheet/shop drawing	Bench				
12.0-9	The ASCT shall continue adaptive operations of a group when one of its signal controllers has a queue jump call.	M	1	Review product cut sheet/shop drawing	Bench				
12.0-10	The ASCT shall advance the start of a user-specified green phase in response to a queue jump call.	M	1	Review product cut sheet/shop drawing	Bench				
12.0-11	The ASCT shall delay the end of a green phase, in response to a queue jump call.	M	1	Review product cut sheet/shop drawing	Bench				
12.0-12	The delay of end of green phase shall be user-defined.	M	1	Review product cut sheet/shop drawing	Bench				
<b>13</b>	<b>Failure Events and Fallback</b>								
13.1.0-3	In the event of a detector failure, the ASCT shall issue an alarm to user-specified recipients. This requirement may be fulfilled by sending the alarm to a designated list of recipients by a designated means, or by using an external maintenance management system.	M	2	Demonstration of software	Bench				
13.1.0-4	In the event of a failure, the ASCT shall log details of the failure in a permanent log.	M	2	Demonstration of software	Bench				
13.1.0-5	The permanent failure log shall be searchable, archivable and exportable.	M	2	Demonstration of software	Bench				
13.2-1	The ASCT shall execute user-specified actions when communications to one or more signal controllers fails within a group.	M	2	Demonstration of software	Bench				
13.2-1.0-1	In the event of loss of communication to a user-specified signal controller, the ASCT shall release control of all signal controllers within a user-specified group to local control.	M	2	Demonstration of software	Bench				
13.2-1.0-2	The ASCT shall switch to the alternate operation in real time without operator intervention.	M	2	Demonstration of software	Bench				
13.2-1.0-3	In the event of loss of communication to a user-specified signal controller, the ASCT will be configurable to release control of only that signal controller within a user-specified group to local control. The remaining signals in the group shall continue under ASCT control.	D	2	Demonstration of software	Bench				

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
13.2-2	In the event of communications failure, the ASCT shall issue an alarm to user-specified recipients. (This requirement may be fulfilled by sending the alarm to a designated list of recipients by a designated means, or by using an external maintenance management system.	M	2	Demonstration of software	Bench				
13.2-3	The ASCT shall issue an alarm within 5 minutes of detection of a failure.	M	2	Demonstration of software	Bench				
13.2-4	In the event of a communications failure, the ASCT shall log details of the failure in a permanent log.	M	2	Demonstration of software	Bench				
13.2-5	The permanent failure log shall be searchable, archivable and exportable.	M	2	Demonstration of software	Bench				
13.3-1	The ASCT shall execute user-specified actions when adaptive control fails	M	2	Demonstration of software	Bench				
13.3-1.0-1	The ASCT shall release control to central system control.	M	2	Demonstration of software	Bench				
13.3-1.0-2	The ASCT shall release control to local operations to operate under its own time-of-day schedule.	M	2	Demonstration of software	Bench				
13.3-2	In the event of an adaptive processor failure, the ASCT shall issue an alarm to user-specified recipients. This requirement may be fulfilled by sending the alarm to a designated list of recipients by a designated means, or by using an external maintenance management system.	M	2	Demonstration of software	Bench				
13.3-4	During adaptive processor failure, the ASCT shall provide all local detector inputs to the local controller.	M	2	Demonstration of software	Bench				
<b>14</b>	<b>Software</b>								
14.0-1	The vendor's adaptive software shall be fully operational within the following platform:	M	2	Demonstration of software	Bench				
14.0-1.0-1	Windows-PC	M	2	Demonstration of software	Bench				
14.0-1.0-2	Mobile Operating System (i.e., iOS, Android, and/or Windows)	D	2	Demonstration of software	Bench				
14.0-3	The ASCT shall fully satisfy all requirements when the ASCT local firmware is installed on a 2070 ATC controller.	M	2	Demonstration of software	Bench				
14.0-4	The ASCT shall provide the full capabilities of the system to users based on configured credentials and security privileges located at: - The City's TMC - Workstations at City's transportation staff desk - Workstations at any City facility with access to the City's LAN - Workstations anywhere with access to the City's wireless LAN - Workstations and mobile devices located outside of the City's LAN via secured VPN	M	2	Demonstration of software	Bench				
14.0-5	The ASCT shall allow at least 10 simultaneous users to have full and complete control and access to the ASCT system regardless of the user's location (as defined in Requirement 14.0-4).	M	2	Demonstration of software	Bench				

Requirements Reference Number	Requirement Statement	Mandatory(M)/De-sirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
14.0-6	The ASCT shall display, with the user interface, a list of users that are currently logged into the ASCT that shall be available to be viewed by a user-defined set of users and/or administrator.	M	2	Demonstration of software	Bench				
14.0-7	The ASCT GUI shall incorporate a system map that covers the entire limits of the controlled area. This map can be aerial imagery, GIS based maps or jpg/bitmap imagery	M	2	Demonstration of software	Bench				
14.0-7.0-1	Within the ASCT, graphical views (when maximized) will return to the scale at which they were displayed immediately prior to being minimized.	D	2	Demonstration of software	Bench				
14.0-7.0-2	The ASCT will provide the capability to create maps and graphic displays (corridor and intersection).	M	2	Demonstration of software	Bench				
14.0-7.0-3	The ASCT will provide the capability to create maps by importing map displays from a Geographic Information System (GIS).	D	2	Demonstration of software	Bench				
14.0-7.0-4	The ASCT will provide the capability to create graphical displays by importing graphics in the following formats: .bmp, .wmf, .jpg, .png, .tiff.	D	2	Demonstration of software	Bench				
14.0-7.0-5	The ASCT's mapping will incorporate full pan/zoom capability on system and area maps.	D	2	Demonstration of software	Bench				
14.0-7.0-6	The ASCT will provide the ability to set up both dynamic and static informational layers that are displayed at different view scale levels by defining the view scale levels in a zoom level set-up configuration database table.	D	2	Demonstration of software	Bench				
14.0-7.0-7	Within the ASCT, different layers will be enabled as a default at different zoom levels.	D	2	Demonstration of software	Bench				
14.0-7.0-8	By setting the zoom scale range and appropriately enabled/disabled layers, the ASCT will provide the ability to control which layers display at different zoom scales. For example, at the city-wide scale level the user can enable roadway centerlines (static information) as well as a communication status indication (dynamic information) for each intersection controller in the system.	D	2	Demonstration of software	Bench				
14.0-7.0-9	The ASCT will support multiple base maps, where Users may select the map to be displayed.	D	2	Demonstration of software	Bench				
14.0-7.0-10	ASCT map elements (i.e., streets, device icons, etc.) will be scalable between zoom levels, such that they are resized appropriately at each zoom level.	D	2	Demonstration of software	Bench				
14.0-7.0-11	The ASCT will assign and display with a unique color, the status off all intersections on the map.	D	2	Demonstration of software	Bench				

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
14.0-7.0-12	The ASCT's map display will be able to be run on multiple workstations so that each workstation will be able to display data from the same or different intersections simultaneously.	D	2	Demonstration of software	Bench				
14.0-7.0-13	Within the ASCT, objects on the map will be capable of being programmed to turn on or off at different zoom levels. Text labels will be comparable in size between different zoom levels.	D	2	Demonstration of software	Bench				
14.0-8	The ASCT will allow Users to view real-time intersection status and detector status overlaid on maps and graphic displays showing the layout of the intersection. The ASCT will provide a minimum refresh rates of once-per-second for all dynamic display data elements at the intersection level.	D	2	Demonstration of software	Bench				
14.0-8.0-1	The ASCT will provide the ability to define unique names and ID numbers to an intersection.	D	2	Demonstration of software	Bench				
14.0-8.0-2	The ASCT will display details of live count-up/down of the following controller parameters at the intersection: cycle length, offset, and phase splits.	D	2	Demonstration of software	Bench				
14.0-8.0-3	The ASCT will display the status pedestrian calls at the intersection.	D	2	Demonstration of software	Bench				
14.0-8.0-4	The ASCT will display the color status of each vehicle (Red, Yellow, Green) and pedestrian (Walk, FDW) phase indication at the intersection.	D	2	Demonstration of software	Bench				
14.0-8.0-5	The ASCT will display the status of the controller operational mode (e.g., adaptive, local TBC, Manual, Free, Flash, etc.).	D	2	Demonstration of software	Bench				
14.0-8.0-6	The ASCT will display controller status at the intersection (e.g., in-plan, pre-empted, type of preemption, conflict flash, priority, etc.).	D	2	Demonstration of software	Bench				
14.0-8.0-7	The ASCT will display the status of communications at the controller (e.g., on-line, no communication, etc.).	D	2	Demonstration of software	Bench				
14.0-8.0-8	The ASCT will display the status of the actuation status of all detectors associated with the intersection.	D	2	Demonstration of software	Bench				
14.0-9	The ASCT shall allow for the download on a system-wide, section, or intersection basis from the ASCT server to the local controller.	M	2	Demonstration of software	Bench				
14.0-10	The ASCT shall allow for the upload on a system-wide, section, or intersection basis from the local controller to the ASCT server.	M	2	Demonstration of software	Bench				
14.0-11	Upload/download commands shall be executed within 3 seconds upon command between the ASCT and the field controller.	M	2	Demonstration of software	Bench				

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
14.0-12	The ASCT shall be capable of uploading and downloading all values (timing parameters, data, logs, configuration) within the controller.	M	2	Demonstration of software	Bench				
14.0-13	The ASCT shall be capable of uploading and downloading a user-defined sub-set of all the values within the controller. For example, the ability to upload/download only the pre-empt timing parameters within a controller.	M	2	Demonstration of software	Bench				
14.0-14	The ASCT shall perform a data check and highlight errors or missing data in timing parameters prior to permitting a download action to a controller.	M	2	Demonstration of software	Bench				
14.0-15	The ASCT shall generate a comparison report listing all data discrepancies between the database and controller.	M	2	Demonstration of software	Bench				
14.0-16	The ASCT database shall time stamp (date and time) all upload and download to and from each signalized intersection.	M	2	Demonstration of software	Bench				
14.0-17	The ASCT shall provide the ability to schedule downloads, uploads, and compares using a scheduler.	M	2	Demonstration of software	Bench				
14.0-18	The results of the auto-compare will be logged and made available to the ATMS User for review.	M	2	Demonstration of software	Bench				
14.0-19	It shall be possible to request a download from a field controller to the ASCT without the need for ASCT user support (remote download request).	M	2	Demonstration of software	Bench				
14.0-20	The ASCT user interface shall be graphics-based, and follow Microsoft GUI standards. All ASCT user accessible software shall use a graphical user interface (GUI).	M	2	Demonstration of software	Bench				
14.0-21	The ASCT user interface shall provide a complete searchable list of intersections showing at least the intersection name, number, type of control, description, and communications status.	M	2	Demonstration of software	Bench				
14.0-22	The ASCT GUI Software shall provide the User with a graphical operating environment of the type commonly found on today's computers operating systems.	M	2	Demonstration of software	Bench				
14.0-23	The ASCT GUI shall allow the User to select objects on the screen by point-and-click manipulation with a menu-driven structure, thereby minimizing the need to memorize typed commands.	M	2	Demonstration of software	Bench				
14.0-24	The ASCT shall allow the ability to add or delete an intersection from a section through point-and-click manipulation of the intersection on the ASCT GUI.	M	2	Demonstration of software	Bench				
14.0-25	The ASCT GUI shall be a fully operational multi-tasking environment. It shall be Windows™ GUI-based, and support the use of standard Windows™ OS features and interface standards, such as multi-tasking, scalable windows, minimization, clipboard, etc.	M	2	Demonstration of software	Bench				
14.0-26	Within the ASCT GUI, several windows may be active at the same time and may overlap on the screen with the User interacting with one (1) window at a time.	M	2	Demonstration of software	Bench				
14.0-27	Within the ASCT GUI, the User shall be able to move any window on the screen, to change window size, and to collapse a window to an icon.	M	2	Demonstration of software	Bench				

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
14.0-28	The ASCT workstation client shall be able to operate normally with additional software programs operating concurrently on the workstation. This includes such functions as productivity applications, Internet browsers, and other third-party programs.	M	2	Demonstration of software	Bench				
14.0-29	Pull down or pop-up menus shall provide access to the entire functionality of the ASCT.	M	2	Demonstration of software	Bench				
14.0-30	The ASCT shall provide full GUI display of database tables.	M	2	Demonstration of software	Bench				
14.0-31	The ASCT database configuration shall allow for an operator to select lines of data for "cut", "copy", "paste" functions.	M	2	Demonstration of software	Bench				
14.0-32	Through the ASCT, Users with defined privileges shall have operational control (e.g., monitor, control, check equipment status, etc.) of every traffic signal connected to the system.	M	2	Demonstration of software	Bench				
14.0-33	The ASCT shall provide functions allowing the Administrator to control the system security (i.e., Users will be able to adjust who has what type of access to system security features).	M	2	Demonstration of software	Bench				
14.0-34	ASCT Users shall be able to log in from a remote location and be able to monitor, control, upload and download signal plans, etc. to the intersection controllers.	M	2	Demonstration of software	Bench				
14.0-35	ASCT clients (i.e., workstation PC's) shall connect to the system server automatically upon initiation of the client software program at the workstation. In like fashion, the system server shall also connect to all system devices and to the database(s) automatically upon initiation of the server.	M	2	Demonstration of software	Bench				
14.0-36	The ATMS shall provide for local area network (LAN) capability so that several workstations can simultaneously access the ASCT database(s).	M	2	Demonstration of software	Bench				
14.0-37	The ASCT shall fully satisfy all requirements when the ASCT local controller is installed in a Type 332, NEMA TS1, and NEMA TS-2 controller cabinet environment.	M	2	Demonstration of software	Bench				
14.0-38	The ASCT software shall operate in a PC-based servers and clients.	M	2	Demonstration of software	Bench				
14.0-39	The ASCT shall communicate to field controllers over an Ethernet network in a Layer 2 and 3 environment.	M	2	Demonstration of software	Bench				
14.0-40	The ASCT shall communicate with field controllers, computer workstations, and servers that reside on various different VLANs within the network.	M	2	Demonstration of software	Bench				
14.0-41	The ASCT shall support remote workstation access over a wired and wireless network.	M	2	Demonstration of software	Bench				
14.0-42	The ASCT shall support remote workstation access over the Internet or private network via secured VPN connection.	M	2	Demonstration of software	Bench				
14.0-43	The ASCT shall utilize a standard database platform to establish user access, rights, and privileges to the ASCT software.	M	2	Demonstration of software	Bench				
14.0-44	The ASCT shall be capable of being installed on a standalone Windows-based server and in a virtual server environment.	M	2	Demonstration of software	Bench				

Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
14.0-45	The ASCT shall be capable of utilizing the existing detection (stop bar and advanced) based on currently installed configuration.	D	2	Demonstration of software	Bench				
14.0-46	The ASCT and existing ATMS.now central system shall share a single user signal map. This can be accomplished through a data exchange between the two systems or creation of common map.	M	2	Demonstration of software	Bench				
<b>15</b>	<b>Training</b>								
15.0-1	The vendor shall provide the following training:	M	N/A	Staff training					
15.0-1.0-1	The vendor shall provide training on the operations of the adaptive system.	M	N/A	Staff training					
15.0-1.0-2	The vendor shall provide training on troubleshooting the system.	M	N/A	Staff training					
15.0-1.0-3	The vendor shall provide training on preventive maintenance and repair of equipment.	M	N/A	Staff training					
15.0-1.0-4	The vendor shall provide training on system configuration.	M	N/A	Staff training					
15.0-1.0-5	The vendor shall provide training on administration of the system.	M	N/A	Staff training					
15.0-1.0-6	The vendor shall provide training on system calibration.	M	N/A	Staff training					
15.0-1.0-7	The vendor's training delivery shall include: printed course materials and references, electronic copies of presentations and references.	M	N/A	Staff training					
15.0-1.0-8	The vendor's training shall be delivered on-site at City of Dublin's TMC.	M	N/A	Staff training					
15.0-1.0-9	The vendor shall provide a minimum of 5 days training to a minimum of 10 staff.	M	N/A	Staff training					
15.0-1.0-10	The vendor shall provide a minimum of 5, 1-day training sessions.	M	N/A	Staff training					
<b>16</b>	<b>Maintenance, Support and Warranty</b>								
16.0-4	The System Vendor shall provide bi-weekly confirmation noting system operations confirming all system components are properly functioning including verification of two-way communications, system software and hardware, local controller, and detection health. Prepare a list of action items, if needed, to address and repair all deficiencies and failures.	M	N/A	Contract requirement					
16.0-5	The System Vendor shall conduct a bi-weekly review of system event logs, alarms, notifications, etc. on health of system and preparation of action items, if needed, to address any system deficiencies or component failures to return the system to a state of good operation. This review shall be conducted throughout the length of the contract and warranty period.	M	N/A	Contract requirement					
16.0-6	As part of the ASCT procurement document, the City shall provide a list of spare parts, equipment, and/or software to be provided by the ASCT vendor.	M	N/A	Contract requirement					
<b>17</b>	<b>Schedule</b>								
	None	N/A	N/A						
<b>18</b>	<b>Performance Measurement, Monitoring and Reporting</b>								



Requirements Reference Number	Requirement Statement	Mandatory(M)/Desirable(D)	Test Case	Verification Method	Test Location	Met	Partially Met	Not Met	Describe how requirements are met and proposed action if not met or only partially met.
18.0-1	The ASCT shall report measures of current traffic conditions on which it bases signal state alterations.	M	2	Demonstration of software	Bench				
18.0-2	The ASCT shall report all intermediate calculated values that are affected by calibration parameters.	M	2	Demonstration of software	Bench				
18.0-3	The ASCT shall maintain a log of all signal state alterations directed by the ASCT.	M	2	Demonstration of software	Bench				
18.0-4	The ASCT shall produce a daily report on corridor TSP operations that is consistent with the current report generated by the City of Dublin's TrafficWare ATMS.now system	M	2	Demonstration of software	Bench				

Attachment E – Sample ASCT Services Agreement

EXHIBIT 1

PROPOSED LAVTA AGREEMENT

SAMPLE

THIS AGREEMENT, ("Agreement") made and entered into this \_\_\_ day of \_\_\_, 2016 by and between the **Livermore Amador Valley Transit Authority** ("Authority" or "LAVTA"), and \_\_\_\_\_ (Consultant).

**WITNESSETH**

WHEREAS, Authority desires to obtain **Adaptive Signal Control Technology (ASCT) Services** (Project) and has issued a Request for Proposals dated \_\_\_\_\_, 2016 (which is attached hereto and incorporated as Attachment 1); and

WHEREAS, Consultant (also referred to as "System Vendor") is qualified and willing to provide said Adaptive Signal Control Technology (ASCT) Services and has submitted a proposal dated \_\_\_\_\_, 2016 (which is attached hereto and incorporated as Attachment 2).

**NOW, THEREFORE**, Authority and Consultant agree as follows:

**1. RENDITION OF SERVICES**

The Consultant agrees to perform services and provide product to Authority in accordance with the terms and conditions of this Agreement.

**2. SCOPE OF SERVICES**

Subject to the terms and conditions set forth in this Agreement, Consultant shall provide the services and products described in Attachment 1, as supplemented by Attachment 2, except when inconsistent with Attachment 1.

**3. SCHEDULE AND TIME OF COMPLETION**

The term of this Agreement will commence upon LAVTA'S issuance of a written Notice to Proceed and will remain in effect until the identified and agreed upon Scope of Work is completed, all work is accepted and in operation, and training completed as specified in this solicitation. The Consultant shall furnish LAVTA with all the materials, equipment and services called for under this Agreement, and perform all other work, if any, described in Attachment 1.

It is further understood that the term of Agreement is subject to LAVTA'S right to terminate the Agreement in accordance with Section 12 of this Agreement.

**4. COMPENSATION AND METHOD OF PAYMENT**

The Consultant agrees to perform all the services included in Section 2, in accordance with the cost information provided in its Cost Proposal included in Attachment 2, which shall include all hardware, software licenses and maintenance, training, labor, materials, taxes, profit, overhead, insurance, delivery costs, subcontractor costs, and other costs and expenses incurred by the Consultant.

Manner of Payment

The Authority will inspect all work prior to payment. The Authority shall make payment for each completed project within 30 days of receipt of proper statements or invoices for the work performed in full conformance with the solicitation requirements, and approved by LAVTA's Director of Administrative Services or Executive Director. The Authority reserves the right to withhold payment to the System Vendor if the Authority determines that the quantity or quality of the work performed is unacceptable. The Authority shall provide written notice to the System Vendor within 10 business days of the Authority's decision to withhold payment and the reasons for non-payment.

Payments for all items shall include hardware, software licensing and maintenance, training, labor, taxes, storage, transportation, delivery, warranty, insurance, materials, profit, subcontractor costs, overhead and all other costs associated with provision of the services.

Invoices shall be made in writing and delivered or mailed to LAVTA as follows:

Accounts Payable  
Livermore Amador Valley Transit Authority  
1362 Rutan Court, Suite 100  
Livermore, CA 94551

Consultant represents that Consultant's taxpayer identification number (TIN) is as evidenced by a completed Federal Form W-9.

**5. CONSULTANT'S KEY PERSONNEL**

It is understood and agreed by the parties that at all times during the term of this Agreement that \_\_\_\_\_ shall serve as the primary staff person of Consultant to undertake, render, and oversee all of the services under this Agreement. Upon written notice by the Consultant and approval by the Authority, which will not be unreasonably withheld, the Consultant may substitute this person with another person, who may possess similar qualifications and experience for this position.

**6 CHANGES**

Authority may, at any time, by written order, make changes within the Scope of Work and services described in this Agreement. If such changes cause an increase in the budgeted cost of or the time required for performance of the agreed upon work, an equitable adjustment as mutually agreed shall be made in the limit on compensation as set forth in Section 4. In the event that the Consultant encounters any unanticipated conditions or contingencies that may affect the scope of work or services, schedule or the amount of compensation specified herein, Consultant shall so advise Authority immediately upon notice of such condition or contingency. The written notice shall explain the circumstances giving rise to the unforeseen condition or contingency and shall set forth the proposed adjustment in schedule or compensation. This notice shall

be given to the Authority prior to the time that Consultant performs work or services related to any proposed adjustment. The pertinent changes shall be expressed in a written supplement to this Agreement prior to implementation of such changes.

**7. CONSULTANT'S STATUS**

Consultant is an independent consultant and not an employee or agent of Authority and has no Authority to contract or enter into any other agreement in the name of Authority. Consultant has, and hereby retains, full control over the employment, direction, compensation and discharge of all persons employed by Consultant who are assisting in the performance of services under this Agreement. Consultant shall be fully responsible for all matters relating to the payment of its employees, including compliance with social security, withholding tax and all other laws and regulations governing such matters. Consultant shall be responsible for its own acts and those of its agents and employees during the term of this Agreement.

**8. INDEMNIFICATION**

To the maximum extent permitted by law, Consultant shall defend, indemnify and hold harmless the City of Dublin, the Authority, their directors, officers, agents and employees from all claims, demands, suits, loss, damages, injury and liability, direct or indirect (including any and all costs and expenses in connection therewith) (collectively "Liability"), that arise out of, pertain to, or relate to the negligence, recklessness, or intentional misconduct of Consultant, its officers, agents, employees and subcontractors/subconsultants or any of them. This obligation shall not apply to Liability that arising from the sole negligence or willful misconduct of Authority. Except as provided above, Consultant will indemnify and defend Authority notwithstanding any alleged or actual passive negligence of Authority which may have contributed to the Liability. In the event any aspect of the foregoing provision is found to be void or unenforceable, a court shall interpret this provision to give the maximum protection available to the Authority under applicable law. This provision will survive termination or expiration of the Agreement.

**9. MAINTENANCE, AUDIT AND INSPECTION OF RECORDS**

All Consultant and subcontractors/subconsultants costs incurred in the performance of this Agreement will be subject to audit. Consultant and its subcontractors/subconsultants shall permit LAVTA, or its authorized representatives to inspect, examine, make excerpts from, transcribe, and copy Consultant's books, work, documents, papers, materials, payrolls records, accounts, and any and all data relevant to the Agreement at any reasonable time, and to audit and verify statements, invoices or bills submitted by the Consultant pursuant to this Agreement. The Consultant shall also provide such assistance as may be required in the course of such audit. Consultant shall retain these records and make them available for inspection hereunder for a period of four (4) years after expiration or termination of the Agreement.

If, as a result of the audit, it is determined by LAVTA's auditor or staff that reimbursement of any costs including profit or fee under this Agreement was in excess of that represented and relied upon during price negotiations or represented as a basis for payment, the Consultant agrees to reimburse LAVTA for those costs within sixty (60) days of written notification by LAVTA.

**10. DATA TO BE FURNISHED BY AUTHORITY--CONFIDENTIALITY**

All data, reports, surveys, studies, drawings and any other documents and materials made available to Consultant by Authority for use by Consultant in the performance of its services under this Agreement shall be made available for information only and shall be returned to Authority at the completion or termination of this Agreement.

Any LAVTA materials to which the Consultant has access or materials prepared by the Consultant during the course of this Agreement ("confidential information") shall be held in confidence by the Consultant, who shall exercise all reasonable precautions to prevent the disclosure of confidential information to anyone except the officers, employees and agents of the Consultant as necessary to accomplish the rendition of services required by this Agreement.

Consultant shall not release any reports, information or promotional materials prepared in connection with this Agreement, whether deemed confidential or not, to any third party without the approval of the LAVTA.

**11. OWNERSHIP OF WORK**

A. All communications and records originated, prepared, and in the process of being prepared, for the services to be performed by Consultant under this Agreement, including, but not limited to, findings, analyses, submittals, conclusions, opinions, engineering drawings, specifications, standards, process sheets, photographs, videos, manuals, technical reports and recommendations with respect to the subject matter of this Agreement and raw and underlying data of such materials, regardless of format or media, including software, reports and other documentation (all of the foregoing, collectively, the "Work Product"), shall be delivered to and become the property of LAVTA. LAVTA shall be entitled to access and to copy the Work Product during the progress of the Work. Any Work Product remaining in the hands of Consultant or in the hands of any subcontractor/subconsultant upon completion or termination of the work shall be immediately delivered to LAVTA and not later than within two (2) weeks of completion or termination of the Work. If any materials are lost, damaged or destroyed before final delivery to LAVTA, Consultant shall replace them at its own expense, and Consultant assumes all risk of loss, damage or destruction of or to such materials.

B. Any specific knowledge of LAVTA proprietary information gained as a result of this Agreement shall be used exclusively to accomplish the Scope of Work outlined above and for no other purpose.

- C. Any and all rights of copyright to Work Product prepared under this Agreement are hereby assigned to LAVTA. Consultant agrees to execute any additional documents that may be necessary to evidence such assignment. Consultant agrees not to assert any rights at common law or equity and not to establish any claim to statutory copyright in such Work Product. Except for its own internal use, Consultant shall not publish or reproduce such Work Product in whole or in part, or in any manner or form, nor authorize others to do so, without the written consent of LAVTA
- D. Notwithstanding anything herein to the contrary, LAVTA acknowledges that as part of Consultant's provision of work hereunder, Consultant may utilize proprietary works of authorship including, without limitation, software, methodologies, tools, specifications, drawings, sketches, models, samples, records and documentation, as well as copyrights, trademarks, service marks, ideas, concepts, know-how, techniques, knowledge or data, that have been originated or developed by Consultant or by third parties under Agreement to, or which have been purchased by, Consultant (all of the foregoing, collectively, "Consultant's Information"). LAVTA agrees that Consultant's Information is and shall remain the sole property of Consultant or such third party. Consultant agrees that LAVTA shall be entitled to use Consultant's Information in connection with this Agreement, and shall grant to LAVTA a perpetual, royalty-free, irrevocable, worldwide, non-exclusive license to use all Consultant's Information and to create and use derivative works of Consultant's Information in connection with this Agreement.
- E. Consultant represents and warrants that it has or will have all appropriate licenses, agreements and/or ownership pertaining to all intellectual property, including but not limited to patents and copyrights, used in connection with the performance of its obligations under this Agreement. Consultant further represents and warrants that it will have all necessary rights to patentable and copyrightable materials, equipment, devices or processes not furnished by LAVTA used on or incorporated in the work and assumes all risks arising from the use of such patentable and copyrightable materials, equipment, devices, or processes.
- F. Consultant shall indemnify, defend and hold harmless LAVTA, its directors, officers, agents and employees to the maximum extent permitted by law from and against any and all claims, liabilities, losses, damages or expenses (including attorneys' fees and related costs, whether or not litigation has commenced), whether direct or indirect, arising out of, relating to, or in connection with the ownership, possession or use of any materials, equipment, devices, or processes that are protected by intellectual property rights, including patent, copyright and trade secret. In case such materials, equipment, devices or processes are held to constitute an infringement and their use enjoined, Consultant, at Consultant's sole cost and expense, shall: (a) secure for LAVTA the right to continue using the materials, equipment, devices or processes by suspension of the injunction or by procuring a royalty-free license or licenses, or (b) replace such materials, equipment, devices, or processes with non-infringing materials, equipment, devices or processes that perform the same functions as the infringing item, or (c) modify them so



that they become non-infringing or remove the enjoined materials, equipment, devices or processes and refund the sums paid therefore, without prejudice to any other rights of LAVTA. If the amount of time necessary to proceed with one of these options is deemed excessive by LAVTA, LAVTA may direct Consultant to select another option or risk default.

**12. TERMINATION**

LAVTA shall have the right to suspend or terminate this Agreement at any time by giving written notice to the Consultant. Upon receipt of such notice, the Consultant shall not commit itself to any further expenditure of time or resources.

If the Agreement is suspended or terminated for any reason other than a default by Consultant, LAVTA shall pay to Consultant all sums actually due and owing from LAVTA for all services performed and all expenses incurred up to the day written notice of effective date of suspension or termination is given, plus any costs LAVTA determines are reasonably and necessarily incurred by Consultant to effect such suspension or termination. If the Agreement is terminated for default, LAVTA shall remit final payment to Consultant in an amount to cover only those services performed and expenses incurred in full accordance with the terms and conditions of this Agreement up to the effective date of termination.

**13. CLAIMS OR DISPUTES**

The Consultant shall be solely responsible for providing timely written notice to LAVTA of any claims for additional compensation and/or time in accordance with the provisions of this Agreement. It is the LAVTA's intent to investigate and attempt to resolve any Consultant claims before the Consultant has performed any disputed work. Therefore, Consultant's failure to provide timely notice shall constitute a waiver of Consultant's claims for additional compensation and/or time.

The Consultant shall not be entitled to the payment of any additional compensation for any cause, including any act, or failure to act, by the LAVTA, or the failure or refusal to issue a modification, or the happening of any event, thing, or occurrence, unless it has given the LAVTA due written notice of a potential claim. The notice of a potential claim shall set forth the reasons for which the Consultant believes additional compensation may be due, the nature of the costs involved, and the amount of the potential claim.

If based on an act or failure to act by the LAVTA, such notice shall be given to the LAVTA prior to the time that the Consultant has started performance of the work giving rise to the potential claim for additional compensation. In all other cases, notice shall be given within 10 days after the happening of the event or occurrence giving rise to the potential claim.

If there is a dispute over any claim, the Consultant shall continue to work during the dispute resolution process in a diligent and timely manner as directed by the LAVTA, and shall be governed by all applicable provisions of this Agreement.

The Consultant shall maintain cost records of all work which is the basis of any dispute.

If an agreement can be reached which resolves the Consultant's claim, the parties will execute a contract change to document the resolution of the claim. If the parties cannot reach an agreement with respect to the Consultant's claim, they may chose to pursue a dispute resolution process.

**14. CONFLICT OF INTEREST**

A. General

Depending on the nature of the work performed, a Consultant of LAVTA may be subject to the same conflict of interest prohibitions established by the Federal Transit Administration (FTA) and California law that govern LAVTA's employees and officials (Cal. Govt. Code Section 1090 et seq. and Cal. Govt. Code Section 87100 et seq.). During the proposal process or the term of the Agreement, Consultant and its employees may be required to disclose financial interests.

The Consultant warrants and represents that it presently has no interest and agrees that it will not acquire any interest that would present a conflict of interest under California Government Code §1090 et seq. or §87100 et seq. during the performance of services under this Agreement. The Consultant further covenants that it will not knowingly employ any person having such an interest in the performance of this Agreement. Violation of this provision may result in this Agreement being deemed void and unenforceable or subject to termination.

Depending on the nature of the work performed, Consultant may be required to publicly disclose financial interests under LAVTA's Conflict of Interest Code. Upon receipt, the Consultant agrees to promptly submit a Statement of Economic Interest on the form provided by LAVTA.

No person previously in the position of director, officer, employee or agent of LAVTA may act as an agent or attorney for, or otherwise represent the Consultant, by making any formal or informal appearance, or any oral or written communication, before LAVTA, or any officer or employee of LAVTA, for a period of twelve months after leaving office or employment with LAVTA if the appearance or communication is made for the purpose of influencing any action involving the issuance, amendment, award or revocation of a permit, license, grant, or contract.

No officer or employee of LAVTA during his or her tenure or for one year after that tenure shall have any interest, direct or indirect, in this Agreement or the proceeds under this Agreement.

B. Organizational Conflicts of Interest

Consultant shall take all reasonable measures to preclude the existence or development of an organizational conflict of interest in connection with work performed under this Agreement and other solicitations. An organizational

conflict of interest occurs when, due to other activities, relationships, or contracts: a firm or person is unable, or potentially unable, to render impartial assistance or advice to LAVTA; a firm or person's objectivity in performing the contract work is or might be impaired; or a firm or person has an unfair competitive advantage in proposing for award of a contract as a result of information gained in performance of this or some other Agreement.

Consultant shall not engage the services of any Subconsultant or independent consultant on any work related to this Agreement if the Subconsultant or independent consultant, or any employee of the Subconsultant or independent consultant, has an actual or apparent organizational conflict of interest related to work or services contemplated under this Agreement.

If at any time during the term of this Agreement Consultant becomes aware of an organizational conflict of interest in connection with the work performed hereunder, Consultant immediately shall provide LAVTA with written notice of the facts and circumstances giving rise to this organizational conflict of interest. Consultant's written notice will also propose alternatives for addressing or eliminating the organizational conflict of interest.

If at any time during the term of this Agreement, LAVTA becomes aware of an organizational conflict of interest in connection with Consultant's performance of the work hereunder, LAVTA shall similarly notify Consultant.

In the event a conflict is presented, whether disclosed by Consultant or discovered by LAVTA, LAVTA will consider the conflict presented and any alternatives proposed and meet with the Consultant to determine an appropriate course of action. LAVTA's determination as to the manner in which to address the conflict shall be final.

During the term of this Agreement, Consultant must maintain lists of its employees, and the Subconsultants and independent consultants used and their employees. Consultant must provide this information to LAVTA upon request. However, submittal of such lists does not relieve the Consultant of its obligation to assure that no organizational conflicts of interest exist. Consultant shall retain this record for five (5) years after LAVTA makes final payment under this Agreement. Such lists may be published as part of future LAVTA solicitations.

Consultant shall maintain written policies prohibiting organizational conflicts of interest and shall ensure that its employees are fully familiar with these policies. Consultant shall monitor and enforce these policies and shall require any subconsultants and affiliates to maintain, monitor and enforce policies prohibiting organizational conflicts of interest.

Failure to comply with this section may subject the Consultant to damages incurred by LAVTA in addressing organizational conflicts that arise out of work performed by Consultant, or to termination of this Agreement for breach

**15. PREVAILING WAGE**

This Agreement may involve the provision of inspection and/or surveying work that may be subject to the California Labor Code. The Consultant shall comply with the following requirements of the California Labor Code to the extent applicable.

Consultant shall comply with California Labor Code Sections 1770 to 1780, inclusive. In accordance with said Section 1775, Consultant shall forfeit as a penalty to the Authority, an amount determined by the Labor Commissioner not to exceed Fifty Dollars (\$50.00), for each calendar day or portion thereof for each worker paid less than stipulated prevailing wage rates for such work or craft in which such worker is employed for any work done under the Agreement by it or by any subconsultant under it in violation of the provisions of the Labor Code and, in particular, Labor Code Sections 1770 to 1780, inclusive. In addition to said penalty and pursuant to said Section 1775, the difference between such stipulated prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by Consultant.

Pursuant to the provisions of Section 1773 of the Labor Code, Consultant shall obtain the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work applicable to the work to be done from the Director of the Department of Industrial Relations. Copies of the prevailing rates will be on file at Consultant's Administrative Office and will be available to any interested party on request. To the extent possible, such wage rates will be prominently posted.

Pursuant to Labor Code 1810, eight hours labor constitutes a legal day's work. Consultant shall comply with the California Labor Code Sections 1810 to 1815, inclusive.

LAVTA's to whom this Agreement is awarded shall sign and file with the Consultant's Contract Officer the following certification prior to performing the work of the Agreement:

"I am aware of the provisions of Section 3700 of the Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance."

**16. WARRANTY OF SERVICES**

- A. Consultant warrants that its professional services will be performed in accordance with the professional standards of practices of comparable system vendor firms at the time the services are rendered. In addition, Consultant shall provide such specific warranties as may be set forth in the individual Task Orders as agreed upon by the parties.

- B. In the event that any services provided by the Consultant hereunder are deficient because of Consultant's or subconsultants failure to perform said services in accordance with the warranty standards set forth above, LAVTA shall report such deficiencies in writing to the Consultant within a reasonable time. LAVTA thereafter shall have:
1. The right to have the Consultant re-perform such services at the Consultant's expense; or
  2. The right to have such services done by others and the costs thereof charged to and collected from the Consultant if within thirty days after written notice to the Consultant requiring such re-performance, Consultant fails to give satisfactory evidence to LAVTA that it has undertaken said re-performance.
  3. The right to terminate the Agreement for default.
- Consultant shall be responsible for all errors and omissions and is expected to pay for all redesign and re-construction work as a result of errors and omissions.

**17. SUBCONTRACTS**

Consultant shall not subcontract all or any portion of its services under this Agreement without the prior written approval of the Authority, and any attempt thereat shall be void and unenforceable. In the event that Consultant enters into one or more subcontracts pursuant to this article, it is understood and agreed that the participating subcontractors shall be solely and directly responsible to Consultant, and Authority shall have no obligation to them.

**18. ASSIGNMENT OF AGREEMENT**

Consultant shall not assign this Agreement or any part thereof without prior express written consent of Authority, and any attempt thereat shall be void and unenforceable.

**20. NOTICES**

Except for invoices submitted by Consultant pursuant to Article 4, all notices or other communications to either party by the other shall be deemed given when made in writing and delivered or mailed to such party at their respective addresses as follows:

To Authority:	Executive Director Livermore/Amador Valley Transit Authority 1362 Rutan Court Suite 100 Livermore, CA 94551
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To Consultant :

**21. LAWS AND REGULATIONS**

Consultant shall comply with its standard of care with regard to any and all laws, statutes, ordinances, rules, regulations and procedural requirements of any national, state or local government and of any agency of such government, including Authority, which relate to or in any manner affect the performance of this Agreement. This Agreement and any related documents supplied hereunder are subject to the California Public Records Act.

**22. CHOICE OF LAW**

All questions pertaining to the validity and interpretation of this Agreement shall be determined in accordance with the laws of California applicable to agreements made and to be performed within the state.

**23. FORCE MAJEURE**

It is expressly agreed that if the Consultant shall be delayed or interrupted in the performance or completion of its work hereunder by any act, neglect or default of the Authority, or of any employee of the owner, or of any other consultant employed by the Authority, or by an embargo, war, fire, flood, earthquake, epidemic or other calamity, act of God or of the public enemy, governmental act (including, but not restricted to, any government priority, preference, requisition, allocation, interference, restraint or seizure, or the necessity of complying with any governmental order, directive, ruling or request) or by any strike or labor dispute involving the Authority, or any manufacturer, supplier or carrier of the machinery, materials or supplies required hereunder, then the time of completion specified herein shall be extended for a period equivalent to the time lost as a result thereof.

**24. ENTIRE AGREEMENT**

This Agreement is the entire agreement of the parties. Consultant represents that in entering into this Agreement, it has not relied on any previous representations, inducements or understandings of any kind or nature.

**25. SEVERABILITY**

If any provision, or any portion of any provision, of any contract resulting from this proposal shall be held invalid, illegal or unenforceable, the remaining provisions or portions of any provisions shall be valid and enforceable to the extent possible.

**26. BENEFIT OF AGREEMENT**

This Agreement shall bind and benefit the parties hereto and their heirs, successors and permitted assigns.

**27. ATTORNEY'S FEES AND OTHER FEES**

Should either party institute any action to enforce this Agreement, or any provision hereof, the prevailing party in any such action or proceeding shall be entitled to receive from the other party all costs and expenses, including reasonable attorney's fees.

IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto as of the day and year first written above.

**THE LIVERMORE AMADOR VALLEY  
TRANSIT AUTHORITY**

\_\_\_\_\_  
Executive Director

Date: \_\_\_\_\_

\_\_\_\_\_  
By\*

\_\_\_\_\_  
Title

\_\_\_\_\_  
By\*

\_\_\_\_\_  
Title

Date: \_\_\_\_\_

**APPROVED AS TO FORM:**

By: \_\_\_\_\_  
Attorney for the Authority

\*If Consultant is a corporation, two corporate officers must sign on behalf of the corporation as follows: (1) Chairman of the Board, President, or Vice President; and (2) Secretary, Assistant Secretary, Chief Financial Officer, or Assistant Financial Officer. In the alternative, this Agreement may be executed by a single officer or a person other than an officer provided that evidence satisfactory to LAVTA is provided, demonstrating that such individual is authorized to bind the corporation (e.g., a copy of a certified resolution from the corporation's board or a copy of the corporation's by laws).

SAMPLE