

REQUEST FOR PROPOSALS (RFP) 10-01
SR 237/I-880 EXPRESS CONNECTORS PROJECT



**ALL INQUIRIES REGARDING THIS RFP
SHALL BE DIRECTED TO:**

Trish Kane, Contracts Program Manager
Phone: (408) 321-7130

Key RFP Dates

Issued	February 12, 2010
Pre-Proposal Conference	March 2, 2010
Submit Questions	March 4, 2010
Submit Proposals	March 19, 2010
Oral Interviews	April 22, 2010



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KEY SR 237/I-880 EXPRESS CONNECTORS REQUEST FOR PROPOSAL DATES

RFP Issued	February 12, 2010	
Pre-Proposal Conference*	March 2, 2010	9:00 am PDT
Deadline for Submitting Questions	March 4, 2010	4:00 pm PDT
Deadline for Proposal Submittal	March 19, 2010	5:00 pm PDT
Interviews	April 22, 2010	

* Attendance at Pre-Proposal Conference is Mandatory.



1. ACRONYMS AND GLOSSARY OF TERMS

ASTM	American Society for Testing and Materials
AVI	Automatic Vehicle Identification
AVC	Automatic Vehicle Classification
BAFO	Best and Final Offer
BATA	Bay Area Toll Authority
Bidder	Any firm or company which submits a written technical and cost proposal in response to this RFP.
Caltrans	California Department of Transportation
CASE	Computer Aided Software Engineering
CCTV	Closed Circuit Television
CCR	Camera Control Receiver
CHP	California Highway Patrol
CMP	Configuration Management Plan
Contract	The contract to be signed by the successful Bidder under this RFP
COTS	Commercial off-the-shelf
CSC	Customer Service Center
CSR	Customer Service Representative
CTOC	California Toll Operators Committee
Customer	Person, company, or entity that applies and subscribes to the Bay Area Toll Authority for a FasTrak [®] Transponder for use in the Express Lanes.
DBE	Disadvantaged Business Enterprises
DDD	Detailed Design Documentation
DMS	Dynamic Message Sign
DRDS	Dynamic Rate Display Sign
DSRC	Dedicated Short Range Communications
EC	SR 237/I-880 Express Connector
ED	Executive Director
ETC	Electronic Toll Collection



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ETS	Electronic Toll System - The electronic collection of tolls utilizing an antenna and reader in the EC Lanes and a transponder located on or in the vehicle. The antenna reads the transponder and the reader determines the ETC account number for toll payment purposes.
Express Carpool Lane	Another name for Express Lanes
Evaluation Committee	The people that will be selected by the <i>VTA</i> to review and evaluate each proposal and provide selection recommendations to the Committee.
FasTrak [®]	FasTrak [®] is the Electronic Tolling System that is utilized in California
FAT	Factory Acceptance Test
FCC	Federal Communications Commission
FIFO	First In First Out
FMAS	Facility Management and Accounting System
GP	General Purpose
GUI	Graphic User Interface
Express Connector	High Occupancy Toll Lane is a freeway or Expressway lane which is open to HOVs without a toll charge and also open to SOVs that pay a specified toll (also referred to in this RFP and other attached documents as the SR 237/I-880 Express Connector or the Express Connector).
Express Connector System	The Express Connector System is all of the hardware and software that is required to effectively operate the EC.
HOV	High Occupancy Vehicle
HOV Lane	High Occupancy Vehicle Lane
ITS	Intelligent Transportation System
LED	Light Emitting Diode
LOS	Level of Service
MF	Mixed Flow
MOMS	Maintenance Online Management System
MOT	Maintenance of Traffic
MTBF	Mean Time Between Failures - the mean calculated time, based on life cycle experience, between failures of an item or component.
MTTR	Mean Time To Repair - the mean time required to repair or replace an item; normally based on testing or actual field experience.



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Non-Revenue Vehicle	Non-HOV authorized vehicles that are allowed to travel on <i>VTA</i> facilities free of charge.
NTCIP	National Transportation Communications for ITS Protocol
NTP	Notice to Proceed
PDA	Personal Digital Assistant
PDD	Preliminary Design Documentation
PTC	Permission to Commence
RCSC	Regional Customer Service Center, which is operated by BATA.
RTMS	Remote Traffic Microwave Sensor
RFID	Radio Frequency Identification
RF	Radio Frequency
RFP	Request for Proposal
SNMP	Simple Network Management Protocol
Software	Software means any Source Code, Object Code, computer databases and any associated html and graphics files (other than Third Party Software that is separately licensed by the <i>VTA</i>) that are supplied to the <i>VTA</i> by the Systems Integrator under the Contract.
SOV	Single Occupancy Vehicle
Special Hardware	Special Hardware means any mechanical part and any piece of electrical or digital equipment that the Systems Integrator designs, develops or modifies for the Project, including, without limitation, lane controllers, hand-held reader devices, together with the written instructions necessary or appropriate to install and operate the Special Hardware.
Systems Integrator (SI)	The company who contracts with the <i>VTA</i> to provide the fully integrated ETS (excluding individual transponders) and all required services consistent with this RFP.
Systems Manager	The Systems Manager is the consultant that will, working closely with <i>VTA</i> staff, oversee the ETS design, development, integration, test, installation, operation and maintenance.
Tag	In-vehicle FasTrak [®] Transponder
TCP/IP	Transmission Control Protocol/Internet Protocol
Title 21	The Caltrans standard for Automatic Vehicle Identification Equipment, set forth in Title 21 of the California Code of Regulations, which must be followed by every electronic toll system deployed in California



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TDC	Toll Data Center - subsystem that will collect all roadside subsystem generated data and supports the dynamic pricing process.
Tolling Zone	The Tolling Zone is the area at which the EC Lanes FasTrak [®] roadside equipment is to be installed.
Transponder	A small in-vehicle electronic device, used for the payment of tolls, which contains a unique identification number.
TMC	Traffic Management Center
TZC	Tolling Zone Controller
RZC	Read Zone Controller
UDBE	Underutilized Disadvantaged Business Enterprises
UPS	Uninterruptible Power Supply
VDS	Vehicle Detection System
Violation	When an SOV not equipped with a FasTrak [®] transponder in good standing passes through a toll zone or is in violation of the California Vehicle Code.
VPN	Virtual Private Network
<i>VTA</i>	Santa Clara Valley Transportation Authority
WAN	Wide Area Network



2. INTRODUCTION AND PROCUREMENT OBJECTIVE

2.1 INTRODUCTION

The Santa Clara Valley Transportation Authority, also known as *VTA*, is the result of a 1995 merger between two previously separate entities: the Santa Clara County Transit District and the Congestion Management Agency for Santa Clara County. *VTA* is an independent special district responsible for bus and light rail operations, congestion management, specific highway improvement projects and countywide transportation planning. As such, *VTA* is both an accessible transit provider and multi-modal transportation planning organization involved with transit, highways, roadways, bikeways, and pedestrian facilities. Working under the direction of a 12 member Board of Directors, *VTA*'s annual operating budget is approximately \$372 million, and its currently approved capital program is approximately \$1 billion. *VTA*'s bus fleet of 450 buses serves a 326 square mile urbanized service area and operates approximately 19 million miles annually. The 42.2-mile light rail system is served by 100 rail cars and 5 historic trolley cars and operates approximately 2.2 million miles annually. *VTA* employs approximately 2,081 people, of whom 719 are administrative, clerical and professional positions and 1362 are operators and maintenance positions. There are four operating/maintenance facilities located within Santa Clara County. The administrative headquarters is located separately from these four facilities.

For more information about *VTA*, log on to www.vta.org.

VTA has received legislative authority to proceed with an environmental study, preliminary engineering, system design, system construction and the operation of a HOT lane facility that will replace the existing HOV facility on US 101 and SR 85 in Santa Clara County. *VTA* will first convert the existing HOV express connector lanes of the SR 237/I-880 interchange to HOT lanes. *VTA* seeks proposals from qualified firms to perform the design and installation of the HOT lanes which for the initial phase will be referred subsequently in this RFP as the SR 237/I-880 Express Connector (EC) Lanes.

2.2 GENERAL DESCRIPTION OF THE PROJECT

The EC will have a single express lane in each direction connecting eastbound SR 237 to northbound I-880 and southbound I-880 to westbound SR 237. The initial EC project will permit a better understanding of HOT lane operation and will allow for the evaluation of system performance before a full scale conversion of all HOV facilities in Santa Clara County. In addition, the EC program will provide immediate congestion relief to drivers within the EC project limits. The initial EC project will have only one entry and one exit point with a toll and read zone in between for each direction of the EC. The System will be configured so each toll zone is installed upstream of each read zone which will be used to read transponders only for verification in an effort to eliminate cross lane transponder reads from the GP lane nearest to the EC lane, provide redundancy, and provide a reliable source of traffic data. Although the intent is to ultimately require HOV users to have a switchable transponder, allowing such users to change their declared status based on occupancy, the initial implementation will require only single occupants to have a valid transponder located in their vehicle. HOV users will be required to



remove any transponder and place it in a mylar bag to avoid being charged a toll. A group of transaction indicator lights will be located at the toll and read zones and will illuminate based initially on the presence and validity of a SOV transponder. These lights are intended to assist CHP in the enforcement of the EC. Users who have standard FasTrak[®] transponder obtained from any California toll agency part of the CTOC exchange will be permitted to use the EC and will be processed as a single occupant vehicle (SOV) and be charged a toll. Although trip building is not a requirement of this Project, future conversion of other HOV lanes will require an upgrade to this EC project to accommodate trip processing.

This segment of HOV was selected for the EC implementation because it is expected to provide congestion relief during the morning and evening rush hours in which the EC will be opened to traffic. Conversion of the HOV segment to the EC will be accomplished using proven technology, traffic engineering expertise, and dynamic pricing to more efficiently use existing roadway capacity to improve traffic flow and travel times in the corridor as well as optimize revenue for future transportation improvements, including transit, in the corridor.

Currently, the EC allows continuous access for eligible vehicles to and from the general purpose (GP) lanes. Under the EC configuration, all eligible users (i.e., HOVs, motorcycles, ILEVs, buses and toll-paying SOVs) will be able to access the EC at the designated locations during the hours of operation. HOV users will continue to use the EC for free.

Solo drivers who want a more convenient and reliable trip can choose to use the EC for a fee. The fee will vary depending on the traffic operating conditions in the EC. Two-axle, delivery-type trucks will also be allowed to use the new converted facility for a fee, but trucks with three or more axles will not be allowed to use the EC.

2.3 PROJECT DEPLOYMENT

The EC Project will be executed under four (4) sequential phases. Each phase of the project will require successful completion in order to proceed to the next.

- **Phase I – Design, Development, Procurement, and Factory Test**
- **Phase II - Installation, Testing, and Approval**
- **Phase III – System Performance Evaluation**
- **Phase IV - Warranty Period**

The project phases are defined in greater detail in Section 7 – Project Milestones.



2.4 SOLE POINT OF CONTACT

The point of contact of all purposes of this procurement shall be as follows:

Trish Kane, Contracts Program Manager
Santa Clara Valley Transportation Authority
3331 N. First Street, Building A
San Jose, CA 95134
Phone: (408) 321-7130
Email: trish.kane@vta.org

2.5 MANDATORY PRE-PROPOSAL CONFERENCE

Attendance at the pre-proposal conference is mandatory for all prospective proposers and will consist of two parts: Part One – Conference and Part Two – Site Tour.

Part One – Conference

The pre-proposal conference will be held:

9:00 a.m. - March 2, 2010
Santa Clara Valley Transportation Authority
3331 N. First Street, Building A - Auditorium
San Jose, CA 95134

The pre-proposal conference will allow prospective Proposers to learn more about the project and to ask questions pertaining to the SR 237/I880 Express Connectors Project, the RFP, procurement process, and the project schedule.

Part Two – Site Tour

Immediately following the conference in the Auditorium, attendees must participate in the Site Tour. This portion of the Pre-Proposal Conference is mandatory and will consist of two site visits:

Site #1 – **VTA** Computer Room
3331 N. First Street, Building C
San Jose, CA 95134

Site #2 – Cerone Division (**VTA** Bus Facility)
3990 Zanker Road
San Jose, CA 95134



2.6 EXAMINATION OF PROPOSAL DOCUMENTS

By submitting a proposal, the Proposer represents that it has thoroughly examined and become familiar with the work required under this RFP, and that is capable of performing quality work to achieve *VTA*'s objectives.

2.7 ADDENDA / CLARIFICATIONS

Questions or comments regarding this RFP must be put in writing and must be received by *VTA* no later than 4:00 p.m., March 4, 2010. Correspondence shall be addressed to Trish Kane, Contract Program Manager, Santa Clara Valley Transportation Authority, 3331 North First Street, Building A, San Jose, CA 95134. Questions may be submitted in email to trish.kane@vta.org or via a facsimile machine. *VTA*'s facsimile number is (408) 955-9729. All forms of submittals must be received by *VTA* by the date and time stated above. Please use "RFP 10-01 Questions" in the subject field for email submittals. Responses from *VTA* will be communicated in writing to all recipients of this RFP. Inquiries received after the date and time stated above will not be accepted and will be returned to the senders without response.

2.8 QUESTIONS AND INQUIRES

During the pre-proposal conference verbal questions will be accepted from prospective Proposers attending the conference. Any questions that cannot be answered fully during the pre-proposal conference will also be addressed and provided to prospective Proposers via the *VTA* website. Any prospective Proposers finding a discrepancy in or omission from the RFP, or in doubt as to the meaning of any provision in the RFP, must raise the issue(s) at the pre-proposal conference.

Other questions, inquiries, discrepancies or omissions, including those arising subsequent to the pre-proposal conference, must be submitted in writing and received by the Contracts Program Manager by 5:00 p.m. (local time) on March 4, 2010 at the address referenced in Section 2.5, with the phrase "RFP10-01 SR 237/I-880 Express Connectors Project" prominently typed on the face of the envelope. Questions may also be transmitted via email to the Contracts Program Manager. All such emails must include the subject line "RFP10-01 SR 237/I-800 Express Connectors Project" and then the stated question in the body of the email. It is up to the Proposers to confirm that the email was received by the Contracts Program Manager by the above-referenced deadline. *VTA* is not obligated to change the RFP in any way, but questions affecting the content of the RFP in a material way, or clarifying the intent, will be answered by means of an addendum to the RFP, which will be made available on the *VTA* website. *VTA* will not be responsible for any communications concerning this RFP which are not in writing or are not made at the pre-proposal meeting. Acknowledgement of the receipt of any and all addenda will be required of Proposers and shall accompany the Proposer's Technical Proposal.

2.9 SUBMISSION OF PROPOSALS

Proposals must be received by the *VTA* Contracts Department at the address below **no later than 5:00 p.m. PST on March 19, 2010**. Proposers who submit their proposals by mail should allow sufficient mailing and internal delivery time to ensure timely receipt by *VTA*. Proposals or



Request for Proposals RFP 10-01 SR 237/I-880 Express Connectors Project

unsolicited amendments to proposals arriving after the closing date and time will be rejected and returned unopened.

Santa Clara Valley Transportation Authority
Attention: Trish Kane, Contracts Program Manager
3331 North First Street, Building A
San Jose, CA 95134

“RFP10-01 SR 237/I-880 Express Connectors Project”

Proposers shall complete and submit their proposals on the forms furnished with the RFP. All proposal forms are to be signed by an individual authorized to bind the Proposers and placed in the appropriate envelope or package, and directed to the *VTA* Contracts Program Manager at the address referenced above.

Technical Proposals and Cost Proposals must be submitted in separate sealed envelopes or packages, addressed to the *VTA* Contracts Program Manager and clearly marked as to their contents, (e.g., "RFP10-01 Technical Proposal, SR237/I-880 Express Connectors Project" or "RFP10-01 Cost Proposal, SR237/I-880 Express Connectors Project"), and received by *VTA* at the address referenced in this section no later than the time and date referenced above. If the separate Technical Proposal and Cost Proposal envelopes or packages are mailed or delivered in one larger envelope or package, the words “RFP10-01 SR237/I-880 Express Connectors Project” must be prominently typed on the face thereof. Failure to submit the proposals in the manner requested may result in the proposal being rejected as unacceptable.

Proposals shall not be opened publicly, and the identity of a Proposer shall not be disclosed prior to contract award.

2.10 WITHDRAWAL OF PROPOSALS

A Proposer may withdraw its proposal at any time before the expiration of the time for submission of proposals as provided in this RFP by delivering to the Contracts Office a written request for withdrawal signed by, or on behalf of, the Proposer.

2.11 RIGHTS OF VTA

This RFP does not commit *VTA* to enter into a Contract, nor does it obligate *VTA* to pay for any costs incurred in preparation and submission of proposals or in anticipation of a contract.

VTA may investigate the qualifications of any Proposer under consideration, require confirmation of information furnished by the Proposer, and require additional evidence or qualifications to perform the Services described in this RFP.



VTA reserves the right to:

1. Reject any or all proposals.
2. Issue subsequent Requests for Proposal.
3. Postpone opening for its own convenience.
4. Remedy technical errors in the Request for Proposal process.
5. Approve or disapprove the use of particular subcontractors.
6. Negotiate with any, all, or none of the Proposers.
7. Solicit best and final offers from all or some of the Proposers.
8. Award a contract to one or more Proposers.
9. Accept other than the lowest offer.
10. Waive informalities and irregularities in proposals.

2.12 CONTRACT TYPE

It is anticipated that the agreement resulting from this solicitation, if awarded, will be a will be a Firm Fixed Price Contract.

2.13 INCORPORATION OF RFP

All terms and conditions of the RFP and amendments thereto; all provisions of the Proposer's proposal and submittals in response to the RFP, and amendments thereto; all applicable state and federal laws, statutory and regulatory provisions and orders, are incorporated by reference and made a part of the Contract to be entered into as a result of this RFP.

2.14 EXCEPTIONS TO THE AGREEMENT

Proposers shall be prepared to accept the requirements of this RFP and Draft Agreement, including the Insurance & Indemnification Requirements. If a Proposer desires to take exception to the RFP and/or Draft Agreement, Proposer shall provide the following information as a section of the Proposal identified as "Attachment H" entitled "Exceptions to the RFP/Agreement Requirements":

1. Proposer shall clearly identify each proposed change to the requirements, including all relevant Attachments.
2. Proposer shall furnish the reasons therefore as well as specific recommendations for alternative language.

The above factors will be taken into account in evaluating proposals. Proposals that take substantial exceptions to the Agreement or proposed compensation terms may be determined by VTA, at its sole discretion, to be unacceptable and no longer considered for award.

2.15 COLLUSION

By submitting a proposal, each Proposer represents and warrants that its proposal is genuine and not a sham or collusive or made in the interest of or on behalf of any person not named therein;



that the Proposer has not directly or indirectly, induced or solicited any other person to submit a sham proposal or any other person to refrain from submitting a proposal; and that the Proposer has not in any manner sought collusion to secure any improper advantage over any other person submitting a proposal.

2.16 AUDIT REQUIREMENTS

The Cost Proposal is subject to a **POST AWARD AUDIT**. After any post award audit recommendations are received, the Cost Proposal shall be adjusted by the Consultant and approved by the *VTA* Contract Program Manager to conform to the audit recommendations. The Consultant agrees that individual items of cost identified in the audit report may be incorporated into the Agreement at *VTA*'s sole discretion. Refusal by the Consultant to incorporate the interim audit or post award recommendations will be considered a breach of the Agreement terms and cause for termination of the Agreement.

Proposers must agree to cooperate with the requirements in Paragraph 10 of FTA Circular 4220.1E. Every Proposer that has been the subject of any audit report by any government or public agency or qualified independent CPA must attach with its proposal, the latest such audit report, including direct labor, materials, fringe benefits and general overhead.

Proposers must also agree to submit cost or pricing data in accordance with 48 CFR Part (FAR) 15.408 Table 15-2.

2.17 LEVINE ACT

The Levine Act (Government Code Section 84308) is part of the Fair Political Practices Act. The Levine Act prohibits any *VTA* Board Member from participating in or influencing the decision on awarding a contract with *VTA* to anyone who has contributed more than \$250 to the Board Member within the previous twelve months. The Levine Act also requires a member of the *VTA* Board who has received such a contribution to disclose the contribution on the record of the proceeding. In addition, *VTA* Board Members are prohibited from soliciting or accepting a contribution of more than \$250 from a party applying for a contract while the matter of awarding the contract is pending before *VTA* and for three months following the date a final decision concerning the contract has been made. A Proposer is prohibited from making a campaign contribution of more than \$250 to a *VTA* Board Member while its Proposal is pending before *VTA* and for three months following the date a final decision concerning the Proposal has been made.

Proposers must disclose on the record any contribution of more than \$250 that they have made to any *VTA* Board Member within the twelve-month period preceding submission of its Proposal. This duty applies to your company, any member of your team, any agents for you or other team members and to the major shareholders of any closed corporation that is part of your team. If you have made a contribution that needs to be disclosed, you must include this information with your Proposal, specifying the date, amount and recipient of the contribution.



2.18 DURATION OF OFFER

Proposals and, if required, Best and Final Offers (BAFOs) submitted in response to this solicitation are irrevocable for a period of 60 days following the closing date for the receipt of proposals and/or the BAFO(s). This period may be extended if requested by the Contracts Program Manager and agreed to by a Proposer, in writing.

2.19 BOND REQUIREMENTS

The successful Proposer (Systems Integrator) shall be required to furnish, at the time of award of the Contract, a Performance Bond in the full amount of the Contract. Acceptable security for the performance bond shall be limited to:

- A Bond in a form satisfactory to *VTA*, underwritten by an admitted surety company authorized to do business in the State of California. Complete “Attachment I”, entitled “Performance Bond” and include in proposal.

2.20 MINIMUM QUALIFICATIONS

The Proposer shall have a Project Manager or Deputy Project Manager who possesses comprehensive knowledge of and is able to demonstrate specific experience leading the development of a roadway pricing, value pricing, toll revenue collection systems and/or a high occupancy toll (HOT) lane project for public agency clients.

The Proposer shall have sufficient experience in and comprehensive knowledge of State of California highway project development. The Proposer shall possess knowledge of regulations and codes regarding State of California highway project development.

The Proposer shall possess knowledge of the accepted systems engineering practices for transportation projects in the State of California as described by the California Department of Transportation’s (Caltrans) Local Assistance Program Guidelines (LAPG) for Intelligent Transportation Systems (ITS) and the Caltrans’ Systems Engineering Guidebook for ITS.

The Proposer shall possess knowledge of the stipulations of Assembly Bill No. 2032 that provide *VTA* with the authority to conduct, administer, and operate a demonstration HOT lane project.

The Proposer shall comply with applicable federal, state and local regulations concerning equal employment opportunity requirements and take affirmative action to ensure equal employment opportunity.

The Proposer shall have at least five years demonstrated experience providing system design and integration engineering services for transportation projects to public agency clients.

The Proposer shall include Professional Engineers licensed by the State of California in key project staff roles.



2.21 DISADVANTAGED BUSINESS ENTERPRISE POLICY

This project is subject to Title 49 CFR 26.13(b):

The contractor, sub recipient 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 DOT-assisted contracts. Failure by the contractor 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 recipient deems appropriate.

The UDBE Contract goal for this contract is 2.0 percent. The SI shall take necessary and reasonable steps to ensure that DBEs have opportunity to participate in the contract (49 CFR 26).

To ensure there is equal participation of the DBE groups specified in 49 CFR 26.5, the Agency specifies a goal for Underutilized Disadvantaged Business Enterprises (UDBEs). UDBE is a firm that meets the definition of DBE and is a member of one of the following groups:

1. Black Americans
2. Native Americans
3. Asian-Pacific Americans
4. Women

References to DBEs include UDBEs, but references to UDBEs do not include all DBEs.

Make work available to UDBEs and select work parts consistent with available UDBE subcontractors and suppliers.

Meet the UDBE goal shown in the Notice to Proposers or demonstrate that you made adequate good faith efforts to meet this goal.

It is your responsibility to verify that the UDBE firm is certified as DBE at date of bid opening. For a list of DBEs certified by the California Unified Certification Program, go to:

http://www.dot.ca.gov/hq/bep/find_certified.htm

In connection with the performance of this Agreement, the Proposer shall fully comply with *VTA* policy and procedures pertaining to utilization of Underutilized Disadvantaged Business Enterprises (UDBEs). The policy and procedures of *VTA* regarding the utilization of UDBEs are available from *VTA*'s Office of Small and Disadvantaged Businesses, and are incorporated herein by this reference. CONTRACTOR shall submit a DBE Utilization Report quarterly to the following address:



Request for Proposals RFP 10-01 SR 237/I-880 Express Connectors Project

Santa Clara Valley Transportation Authority
Office of Small and Disadvantaged Businesses
3331 North First Street, Building A
San Jose, CA 95134
Attn: Hayden Lee

Forms available: <http://www.vta.org/inside/downloads/index.html#dbe>

CONTRACTOR shall submit a UDDBE Final Utilization Report at the conclusion of the contract to the above address indicating any UDDBE utilization during the course of this Agreement. Contractor further agrees to submit any and all required reports to the Office of Small and Disadvantaged Businesses.

The Proposer must ensure that UDDBE subcontractors are *certified at the time of submittal of proposals*. Proposers are also encouraged to have their firms and/or potential subcontractors certified prior to the time of proposal. When submitting an application for this proposal, the Proposer or its potential subcontractors should request the application to be expedited for this RFP. A list UDDBE by expertise will be available to Proposers as a reference for identifying and contacting UDDBEs with the desired contracting capabilities.

The UDDBE application for certification can be obtained by contacting the OSDB at (408) 321-5962 or by visiting our website at the above URL.

Credit for materials or supplies you purchase from UDDBEs counts towards the goal in the following manner:

1. 100 percent counts if the materials or supplies are obtained from a UDDBE manufacturer.
2. 60 percent counts if the materials or supplies are obtained from a UDDBE regular dealer.
3. Only fees, commissions, and charges for assistance in the procurement and delivery of materials or supplies count if obtained from a UDDBE that is neither a manufacturer nor regular dealer. 49 CFR 26.55 defines "manufacturer" and "regular dealer."

You receive credit towards the goal if you employ a UDDBE trucking company that performs a commercially useful function as defined in 49 CFR 26.55.

For reference, the following is *VTA's* good faith efforts required to meet individual UDDBE contract goals:

2.21.1 Good Faith Efforts Guidelines

If the UDDBE participation goal for this project is attained, the Proposer need not submit any documentation on the efforts made to achieve the goal.



However, if the UDBE goal is not attained, the Proposer must demonstrate that “Good-Faith Effort” was made to attain the goal.

A Proposer not achieving the UDBE goal must submit a report documenting that it made sufficient efforts to meet the UDBE goal in accordance with the good faith efforts provisions below:

1. Attendance at any pre-proposal conference as may be scheduled by *VTA* to inform prospective contractors and UDBEs of subcontracting opportunities;
2. Written notice to a reasonable number of specific UDBE subcontractors indicating that their interest in the contract is being solicited, and giving sufficient time to allow the UDBEs to participate effectively;
3. Follow up telephone calls to UDBEs who did not respond to written notice to determine if they will be responding, and encourage their participation;
4. Selection of portions of work to be performed by UDBEs in a manner to increase the likelihood of meeting UDBE goals (including, where appropriate, breaking down contracts into economically feasible units to facilitate UDBE participation;
5. Providing interested UDBEs with adequate information about the plans, specifications and requirements of the contract;
6. Negotiating in good faith with interested UDBE subcontractors, not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities;
7. Assist interested UDBEs in obtaining required bonding, lines of credit, or insurance; and Proposers who fail to achieve the specified UDBE goal shall, within 2 days of receiving a request from *VTA*, submit documentation demonstrating that good-faith efforts were exerted in an attempt to achieve the goal. Documentation shall be addressed to the Contract Administrator as follows: Santa Clara Valley Transportation Authority, Contracts Office, 3331 North First Street, Building A, San Jose, CA 95134.

In evaluating good faith efforts by a proposer, *VTA* may take into account the performance of meeting the UDBE goal by other proposers. *VTA* will advise, by letter, the Proposer of the results of its Good Faith Efforts evaluation.

2.21.2 Frauds and Fronts

Proposers are cautioned against knowingly and willfully using “fronts” to meet the UDBE goal of this contract. The use of “fronts” or “pass through” subcontracts to non-disadvantaged firms constitutes criminal violation.



3. SPECIAL CONTRACT PROVISIONS

3.1 PURPOSE

The purpose of this section is to provide information pertaining to special contract provisions to Proposers interested in preparing and submitting proposals to provide the SR237/I-880 Express Lanes System including design, development, integration, implementation, and maintenance in accordance with the requirements set forth in this document and its references.

3.2 SOFTWARE AND HARDWARE DEFINITIONS

The definitions below are to be used with the license, confidential information and escrow provisions in Sections 3.10 through 3.13 of this RFP.

3.2.1 Confidential Information

Confidential Information with respect to a person or entity means information, knowledge or data, whether in written, oral, visual, machine recognizable or electronic form, which provides independent economic value to such person or entity from (i) not being generally known in the relevant trade or industry or (ii) not being generally known to, or readily accessible by proper means by, competitors of such person or entity and other persons who can obtain economic value from them, including, without limitation, information about the dynamic pricing algorithms and information from third parties and all other information which a person or entity has a reasonable basis to know was created, modified or used and held secret by another party or that was accepted by such other person or entity from any third party under an obligation of confidentiality. Notwithstanding the foregoing, Confidential Information shall not include: (i) information which a party (the “Recipient”) can demonstrate by its files was already in its possession prior to receipt of such information from the other party (the “Disclosing Party”) (provided that access to such information was gained by the Recipient from a third party which had the right to disclose such information without restriction), (ii) information which is in the public domain prior to the date of the Contract, (iii) information which, not as a result of the disclosure by the Recipient, becomes part of the public domain after disclosure, and (iv) information which is hereafter lawfully disclosed to Recipient by a third party (other than any employees or agents of either party) who is not under an obligation to maintain the confidentiality of the information.

3.2.2 Development Documents

Development Documents mean those documents that are delivered to *VTA* by the SI during the system design, development and implementation processes.

3.2.3 Intellectual Property Rights

Intellectual property rights means any and all legal rights regarding intangible property existing from time to time under domestic and international patent law, copyright law, moral rights law, trade secret law, trademark law, unfair competition law or other similar rights.



3.2.4 Express Lanes Development

Express Lanes Development means: (i) those portions of the Software and the Special Hardware that were developed under the Contract to satisfy the specifications or requirements of the Express Lanes project; (ii) those modifications of pre-existing software and hardware that were made to satisfy the specifications or requirements of the SR 237/I-880 Express Connectors Project, and (iii) any changes to the foregoing that are made in response to requests by *VTA* or to address the changing needs of the SR237/I-880 Express Connectors Project.

3.2.5 Object Code

Object Code means: (i) the machine readable code version of the Software, which is substantially or entirely in binary form and is intended to be executable by a computer after suitable processing or linking but without intervening steps of compilation or assembly; and (ii) the written instructions necessary or appropriate for *VTA* to install and use the Object Code form of the Software for the SR 237/I-880 Express Connectors Project.

3.2.6 Personal Information

Personal Information means information that identifies individual 237/I-880 Express Connectors Project users, such as the user's name, address, telephone number, email address, credit card number, FasTrak[®] account number, and expiration date and license plate number.

3.2.7 Release Event

Release Event has the meanings specified in Sections 3.13.2 and 3.13.3.

3.2.8 Software

Software for the purposes of this document means any Source Code, Object Code, and web pages of programs developed by the SI, computer databases and any associated html and graphics files (other than Third Party Software that is separately licensed by *VTA*) that are supplied to *VTA* by the SI under the Contract, together with all enhancements, improvements and modification to the foregoing.

3.2.9 Software Documentation

Software Documentation means the Source Code on industry standard media and source code listings in human readable form of all Software including logic equations for programmable array logic integrated circuits (as well as the compiler or assembler and associated software tools for the Source Code); all design documents, specifications, flow charts, data flow diagrams, Computer Aided Software Engineering (CASE) and development tools, and other materials or documents which explain the performance, function or operation of individual software programs and the interaction of programs within the Express Lanes System; all control files and scripts used to compile, link, load and/or make the applications and systems, test scripts, test plans and test data; all password security codes and any other information and documents necessary to operate and maintain the Software.



3.2.10 Source Code

Source Code is any collection of statements or declarations written in any human readable computer programming language. Source code allows the programmer to communicate with the computer using a reserved number of instructions.

3.2.11 Special Hardware

Special Hardware means any mechanical part and any piece of electrical or electronic equipment that SI designs, develops or modifies for the Project including, without limitation, lane controllers, hand-held reader devices, together with manuals and written instructions necessary or appropriate to install and operate the Special Hardware. The SI shall not infringe on any Intellectual Property Rights with respect to any Special Hardware.

3.2.12 Special Hardware Documentation

Special Hardware Documentation means the documents that contain the necessary drawings/diagrams and specifications for fabricating and manufacturing the Special Hardware. This includes, the following: art work and electronic components necessary to fabricate circuit boards; license(s) to all applicable Intellectual Property Rights, if any; all drawings from equipment housing, ports and connectors and mounting, through assembly, sub-assembly, and fabricated piece parts drawings necessary to manufacture the equipment; all schematics and wiring diagrams and cable harness drawings; all installation, configuration, and layout drawings; all block diagrams and family trees; all assembly instructions and drawings; all test specifications for top-level equipment and for all assemblies to the lowest testable level of assembly; all test procedures for all tests; all maintenance manuals and procedures; all operator manuals; all flow charts relevant to the manufacture, assembly, programming, and operation of the equipment; part lists containing sufficient information to procure all parts and material required to manufacture the equipment from its primary source, except software products available commercially; documentation for the source code if not provided otherwise; all password security codes and any other information and documents necessary to manufacture and maintain the Special Hardware. Notwithstanding the foregoing, the Special Hardware Documentation does not have to include the information necessary to manufacture any Special Hardware part that is generally commercially available from at least two suppliers.

3.2.13 System Information

System Information means the Software Documentation and the Special Hardware Documentation.

3.2.14 Third Party Software

Third Party Software means commercial-off-the-shelf (COTS) computer programs/applications including computer databases, CASE and software development tools, operating systems, drivers and utilities as well as any firmware not developed by the SI but is necessary for the proper functioning of the SR 237/I-880 Express Connectors Project.



3.3 LICENSES

The provisions below substantially set forth the terms of the licenses that must be granted to *VTA*.

3.3.1 Object Code License

The SI shall grant *VTA* a fully-paid, perpetual, non-exclusive, irrevocable royalty-free right and license to use, copy, perform and sublicense the Software in Object Code form in connection with the installation, maintenance and improvement of the Express Lanes System.

3.3.2 Source Code and Software Documentation License

The SI shall grant *VTA* a fully-paid, perpetual, non-exclusive, irrevocable royalty-free right and license to use, copy, perform, modify and sublicense, and create derivative works of, the Software in Source Code form (including, without limitation, the right and license to assemble or compile the foregoing into Object Code form) and the Software Documentation, as deemed necessary or appropriate by *VTA* to operate, maintain and improve the Express Lanes System. Included in this license are the rights to decompile, disassemble or reverse engineer the Software. The license rights granted in this Section 3.10.2 may not be exercised until a Release Event has occurred, at which time they may be exercised automatically without the requirement of further action by *VTA* or the SI.

3.3.3 Special Hardware Documentation License

The SI shall grant *VTA* a full-paid, perpetual, non-exclusive, irrevocable right and license to use, copy, perform, modify and sublicense, and create derivative works of the Special Hardware Documentation, as deemed necessary or appropriate by *VTA* to operate, maintain, manufacture and procure the Special Hardware.

3.3.4 Express Lanes Developments License

Notwithstanding the non-exclusivity provisions of Sections 3.10.1, 3.10.2 and 3.10.3, the SI shall grant *VTA* a fully-paid, perpetual, exclusive, irrevocable royalty-free right and license to use, copy, perform, modify and sublicense, and create derivative works of the Express lanes facility developments in connection with the installation, maintenance and improvement of the Express Lanes System.

3.3.5 License Limitations

In exercising its rights under Section 3.10.1 through Section 3.10.4, *VTA* shall not license, sublicense, sell, resell, transfer, assign, distribute or modify the Software for use with any highway or transportation entity other than those under the jurisdiction of *VTA*.

3.3.6 Other License Terms

1. All modifications, improvements and enhancements to the Software shall be licensed to *VTA* without any additional charge to *VTA*.



2. *VTA* shall have the right, in its discretion, either to contract with the SI for maintenance services and customer services; to provide its own maintenance services and customer services; or, to contract with others for the maintenance services and/or customer services after expiration of the maintenance period described in the Contract.
3. The SI shall deposit in escrow pursuant to the Escrow Agreement (See Section 3.13) all Source Code, Software Documentation and Special Hardware Documentation for the Software and the Special Hardware and for all subsequent modifications, improvements and enhancements to the Software and the Special Hardware.
4. After a Release Event, *VTA* shall be entitled to make its own modifications, improvements and enhancements to the Software or to contract with others to make such modifications or improvements, which modifications, improvements and enhancements *VTA* may use in connection with the system and the systems of its member organizations.
5. The SI shall indemnify *VTA* against any infringement by the software of any Intellectual Property Rights of any other party.
6. The SI shall provide maintenance services and other services for the period described in the Contract.
7. The SI shall supply to *VTA* any new software products which may be useful in the operation of the Express Lanes System on a most favored customer basis during the term of the Contract, including any optional maintenance periods, if exercised.
8. The SI shall represent and warranty that the Software, the Special Hardware and the System Documentation comply with all requirements of the Contract, do not infringe the Intellectual Property Rights of any third party, do not, in the case of the Software, contain any “virus,” illicit code or defect and the documentation is clear, concise, accurate, thorough and exceeds the minimum industry standards. The SI shall also make other standard representations and warranties customary in a contract of this nature and scope.

3.4 THIRD PARTY LICENSES

The SI shall provide *VTA* with fully-paid, non-exclusive, perpetual, irrevocable, royalty-free licenses to use the Third Party Software, as necessary or appropriate, for *VTA* to operate, maintain and modify/improve the Express Lanes System.

3.5 OWNERSHIP AND PROTECTION OF CONFIDENTIAL INFORMATION

The following provisions show how Confidential Property should be addressed.

3.5.1 Ownership

VTA shall retain all right, title and interest, including, without limitation, all Intellectual Property Rights, in the Confidential Information furnished by *VTA* to the SI. The SI shall retain all right, title and interest, including, without limitation, all Intellectual Property Rights, in the Confidential Information furnished by the SI to *VTA*.

3.5.2 Confidential Information in Proposal and Development Documents

The SI shall specify what information in its Proposal it considers its Confidential Information. *VTA* expects that the designation of Confidential Information will be kept to a minimum and will



be limited to pricing. The SI shall also specify what information in the Development Documents it considers to be Confidential Information.

3.5.3 Protection

Except as necessary to carry out its obligations under the Contract, each party (a “Recipient”) shall not, at any time during or after the term of the Contract disclose the Confidential Information of the other party (a “Disclosing Party”) to any person whatsoever, examine or make copies of any reports or other documents, papers, memoranda or extracts embodying the Confidential Information for other use, or utilize for the Disclosing Party's own benefit or for the benefit of any other party any such Confidential Information. Each party shall at all times exercise the same degree of care which it regularly uses to protect its own proprietary information to maintain the confidential, secret or proprietary character of all Confidential Information, provided that each party shall use at least a reasonable degree of care. Notwithstanding the foregoing, either party may disclose Confidential Information of the other party: (i) to its employees and professional advisors to the extent necessary to allow the party to carry out its obligations under the Contract; provided that such persons are advised of the confidential nature of the information and are under an obligation to maintain its confidentiality; and (ii) as may be required by the California Public Records Act. Upon the completion of its obligations to be performed hereunder, the SI shall promptly return to *VTA* all *VTA* Confidential Information.

3.5.4 Exception from Non-Disclosure

The non-disclosure obligations shall not apply to disclosures made by a party in response to any deposition, interrogatory, request for documents, subpoena, civil investigative demand or similar legal process ("legally compelled disclosure") provided that the conditions of Section 3.12.3 are complied with by the disclosing party. In the event that the disclosing party or any of its representatives are requested or become subject to make a legally compelled disclosure of any of the Confidential Information of the other party, the disclosing party shall first provide the other party with prompt prior written notice of such requirement so that the other party may seek a protective order or other appropriate remedy and/or waive compliance with the terms of the Contract.

3.5.5 Personal Information

Personal Information may be subject to special procedures established by *VTA* to maintain its confidential nature. The SI shall agree to abide by any such special procedures and to allow *VTA* to review its implementation of these special procedures.

3.5.6 Injunctive Relief

The parties shall acknowledge that the unauthorized disclosure or misuse by a party of the Confidential Information of the other party could irreparably damage the other party and/or third parties dealing with the other party, and that monetary damage would not be an adequate remedy for any such breach. In the event of a breach or threatened breach by a party of any of the provisions of the Contract, the non-breaching party shall be entitled to injunctive relief in any



court of competent jurisdiction restraining the breaching party from breaching the terms hereof or from disclosing any Confidential Information of the non-breaching party to any person. Nothing contained herein shall be construed as prohibiting any party from pursuing any other remedies available to it, either at law or in equity, for such breach or threatened breach, including specific performance and recovery of monetary damages. In addition, the party breaching or threatening breach shall indemnify the other party for its attorneys' fees and court expenses incurred in enforcing the Contract.

3.6 ESCROW

The Proposal shall provide for the Software Documentation to be escrowed substantially as follows:

3.6.1 Escrow Agreement

Within ninety (90) days after the execution of the Contract, the SI shall enter into an escrow agreement (the “Escrow Agreement”) with *VTA* on the terms and conditions provided in this Section 3.13 and such other terms and conditions as are customary and reasonably acceptable to SI and *VTA*, including but not limited to a provision that California law will govern any dispute related to the Escrow, and a further provision that any action related to or arising out of the Escrow Agreement shall be venued in Santa Clara County, California. Pursuant to the terms of the Escrow Agreement, the SI shall deposit with an Escrow Agent located in the continental United States and satisfactory to *VTA*, without charge to *VTA*, the Software Documentation. If the SI revises or supplements any of the System Information deposited, or creates additional Software Information, the SI shall deposit a complete set of such revised, supplemented or additional Software Information with the Escrow Agent within thirty (30) days of such revision, supplementation or creation, and the SI shall indicate with each deposit which documents and which pages have been revised, supplemented or added to the last deposit. The Escrow Agreement shall continue until there is a Release Event or the Software is no longer in use by *VTA*. The SI shall be responsible for the payment of all costs arising in connection with the maintenance of the escrow referred to in this section throughout the entire term of the Escrow Agreement.

3.6.2 Release Events

Release event means that one or more of the following have occurred:

- SI has filed a voluntary petition in bankruptcy or for a reorganization or to effect a plan or other arrangement with its creditors, files an answer to a creditor’s petition or other petition against it for an adjudication in bankruptcy or for a reorganization admitting the material allegations thereof, or applied for or permitted the appointment of a receiver, trustee or custodian for any substantial portion of its properties or assets, and such petition or proceeding is not dismissed within sixty (60) days of the filing or initiation thereof;
- SI has ceased its ongoing business operations;
- SI has substantially ceased the sale, licensing, maintenance or other support of the Software;



- SI breaches any material provision of the Contract and fails to cure the breach within fifteen (15) days of notice thereof by *VTA*; provided that upon the third material breach of the Contract by SI, SI shall have no opportunity to cure the breach and a Release Event shall be deemed to occur; or
- *VTA* has exercised its right to maintain or engage a third party to maintain the Software, whether such right is exercised at the end of the Warranty Period or at any other time.

3.6.3 Release

Upon the occurrence of any Release Event, *VTA* may direct the release of the Software Documentation from the Escrow and exercise its license rights under Sections 3.10.2, 3.10.3, and 3.10.4.

3.7 LIQUIDATED DAMAGES

Time is of the essence under the Contract. In the event certain work under the Contract is not satisfactorily completed in a timely manner, *VTA* will sustain substantial financial and other damages. Accordingly, the Contract shall provide for liquidated damages in the event of certain delays by the SI, as described below.

3.7.1 Liquidated Damages for Completion Delay

In the event the ETS (including the interface to the Bay Area Toll Authority (BATA) Regional Customer Service Center (RCSC) and the Caltrans Traffic Management Center (TMC)) is not satisfactorily completed and ready for full use and revenue service by the time of the scheduled SR237/I880 Express Lanes System opening to traffic (“Completion Delay”), *VTA* will sustain substantial financial and other damages. *VTA* has attempted to estimate the damages which would result from Completion Delay. Given the fact that the Project has a dual role in facilitating transportation and generating revenue, the impact of any such Competition Delay is greater than most public works projects.

Based on the foregoing, in the event of any Completion Delay, **the SI shall pay to *VTA* as liquidated damages the amount of \$4,900 for each calendar day of Completion Delay.** The parties acknowledge that this amount represents *VTA*’s reasonable estimate of the damages from Completion Delay, and does not constitute a penalty.

3.7.2 Performance Damages

Once System Acceptance has been achieved (Phase II completion), the SI shall be subject to liquidated damages for any failure to meet the performance requirements as specified in Section 6 – Project Requirements.

These liquidated damages shall be paid to *VTA* as compensation for lost toll revenues. The amount of compensation shall be derived based on a comparison of toll revenues collected for the same time period which is comparable to a historically similar time period. For example if



\$X was collected during the period of the failure and the historical comparison indicated \$Y was collected, VTA would be due as compensation equal to that of Y – X. In the event that there is not enough historical or no comparative data available to complete the determination (within the first 12 months of operation) the traffic and revenue study shall be used for that period of time in question.

3.7.3 Maintenance Delay

Liquidated damages for maintenance performed during the Warranty Period and the Maintenance option periods shall be assessed for failure of the SI to meet the combined response and repair times specified in Table 1 below.

The repair of any spare component shall not relieve the SI of the responsibility to repair any in-service components that malfunctioned or were malfunctioning while such repairs were being conducted. Such failure to repair the in-service components within the time specified in Table 1 may result in the assessment of liquidated damages. Liquidated damages shall be applied at the rates indicated in Table 1, for each hour or fraction thereof in excess of the repair time shown, until the failure or malfunction is resolved, restoring the System to the state it was in prior to failure or malfunction.

Equipment/Item	Combined Response and Repair Time (in hours)	Hourly Liquidated Damages (\$US)
Tolling Zone Controllers	4	\$150
Electronic Toll Collection Reader/Antenna	4	150
Vehicle Detectors	4	100
RTMS Equipment	4	100
Hand Held Enforcement Devices	4	50
Tolling Zone Transaction Indicator Beacon (single light gantry mounted)	4	50
Tolling Zone Transaction Indicator Beacon (dual lights pole mounted)	4	50
VES Lane Equipment	4	50
Local Area Network	4	50
Wide Area Network	4	50
All Supplied Standard Workstations	4	50
TDC Computer System	4	150
Dynamic Pricing Subsystem	4	350

Table 1 – Repair/Response Times and Maintenance Liquidated Damages

3.7.4 Maintenance of Traffic Damages

Any malfunction or performance degradation which requires a lane closure in either the EC or the GP lanes, and adversely affects the collection of tolls, the ability to audit or enforce the EC lanes between the hours of 5:00 AM and 9:00 AM, or between 3:00 PM and 7:00 PM, shall be



subject to additional liquidated damages of \$250 per hour, per lane, in the event that the SI fails to repair or replace the malfunctioning component within the time limits set forth in Table 1.

3.7.5 Collection and Effect of Liquidated Damages

At its option, *VTA* may deduct any such liquidated damages owed by the SI from amounts otherwise payable to the SI, or may bill the SI as a separate item.

The assessment of liquidated damages by *VTA* against the SI does not supersede the right of *VTA* to impose other remedies available to it including, but not limited to, retention or withholding of payments otherwise due to the SI until the SI remedies the situation which has led to the imposition of liquidated damages.

In addition to any other remedies available to it in law or under the Contract, in the event that the SI fails to provide the services, equipment, or other items required for performance of the Contract within the prescribed time limits, *VTA* may elect to provide or obtain services, equipment, or other items necessary to perform under the Contract. In that event, the SI shall pay the total cost incurred by *VTA* for obtaining replacement services, equipment and other items necessary to a fully functional SR237/I880 Express Lanes System. *VTA* shall have the unilateral right of source selection when the SI is unable to perform. In addition to the replacement costs described above, the SI shall also be required to pay the liquidated damages set forth above for any delay in performance as well as other damages sustained by *VTA*.

3.8 CONTINUITY OF SERVICES

The SI recognizes that the services under the Contract must be continued without interruption and that, upon Contract expiration or termination, a successor, either *VTA* or another contractor, may continue them. The SI agrees to exercise its best efforts and cooperation to effect an orderly and efficient transition to a successor.

The SI shall, upon written notice from *VTA*:

- (a) Furnish phase-in, phase-out services for up to 90 days after the Contract expires; and
- (b) Negotiate in good faith an agreement and plan with *VTA* to determine the nature and extent of phase-in, phase-out services required. The scope of such negotiated agreement will be in addition to the scope of the Contract.

The plan shall specify a training program and a date for transferring responsibilities for each division of work described in the plan, and shall be subject to *VTA*'s approval. The SI shall provide sufficient experienced personnel during the phase-in, phase-out period to ensure that the services called for by the Contract are maintained at the required level of proficiency.

The SI shall allow as many personnel as practicable to remain on the job to help the successor maintain the continuity and consistency of the services required by the Contract. The SI also shall disclose necessary personnel records and allow the successor to conduct on site interviews with these employees. If selected employees are agreeable to the change, the SI shall release



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them at a mutually agreeable date and negotiate transfer of their earned fringe benefits to the successor.



4. PROPOSAL REQUIREMENTS

4.1 TECHNICAL PROPOSAL

Presented below are the various requirements that need to be adhered to as Proposers develop their Technical Proposal.

4.1.1 Format

Proposals should be prepared simply and economically, providing a straightforward and clear description of the Proposer's proposal for meeting the requirements of this procurement. Proposals shall meet all of the requirements that are presented in Section 6 of this RFP.

One original, fifteen (15) type-written copies, and one (1) CD copy of the Proposer's proposal shall be received by the *VTA* Contracts Program Manager at the time and on the date as previously stated in this RFP in Section 2.8. The proposal of each Proposer shall be developed using 12-font size text and shall be signed by a corporate officer, partner, proprietor, or other person authorized to legally bind the Proposer.

4.1.2 Content of Technical Proposal

Presented below are the various requirements that need to be adhered to as Proposers develop their Technical Proposal

4.1.3 Letter of Transmittal

A letter of transmittal on the Proposer's official letterhead, not to exceed three (3) typed pages in length, shall be included at the front of the Proposal. The letter of transmittal shall be signed in ink by a duly authorized representative of the Proposer and shall include the Proposer's contact person and their address, office phone number, cellular phone number and email address.

The letter should briefly introduce the proposed project team. The letter shall provide the name, title, address, phone number, facsimile number and email address of the person designated by the Proposer to serve as a contact during the selection process.

A statement shall be provided that reflects that the Proposer fully comprehends the nature of the tasks involved in the Scope of Work, and accepts full responsibility, if selected for the award of a contract, for the completion of all of the work required, within the proposed schedule.

4.1.4 Qualifications of Firm

The Proposer shall furnish documentation of its own, and its subcontractors', experience in the planning, design, construction, installation, integration, implementation, maintenance and operation of Express Lanes and conventional Electronic Toll Collection (ETC) systems, as well as its experience pertaining to the integration with other ETC back office service center operations. The experience statement shall include the Proposer's past experience and present



contracts, and provide details on system hardware and software utilized, facilities management, system operations, system maintenance, customer relations, fiscal management and any other appropriate information related to the development, implementation and operation of the programs.

The descriptions should indicate any significant similarities and differences to those system(s) and the technical services that are described in this RFP. Information must be provided as to whether the contracts were completed on time and within budget or, if the contracts are ongoing, whether the contracts are on schedule and within budget. The Proposer shall also furnish the name, title, address, phone number and email address of persons who may be contacted by **VTA** for verification of the information provided. Information for up to seven (7) relevant Express Lanes and tolling system related projects shall be included. Each project description should be no more than 1 page in length.

4.1.4.1 Profile of Firm

The Proposer shall provide a general description of the corporate organization, the management structure, and the capabilities of the Proposer itself including each joint venture participant, if any, and of all subcontractors. This shall include, for each firm, an overview of the organization, its history, general business purpose, parent company if appropriate, major divisions or subsidiaries, locations of offices, number of employees, etc

4.1.4.2 Personnel

The Proposer shall identify each firm and the key persons that will be involved in and committed to the planning, design, construction, installation, integration, and implementation of the SR237/I-880 Express Connectors System to be provided under the Contract. Personnel shall be listed by position, education, experience, the role they will play and the percentage of their time that will be devoted to the Contract. Resumes shall be provided with sufficient information to permit **VTA** to evaluate each person's ability to contribute to the overall effort. The Proposer shall also identify its proposed Project Manager (PM).

Resumes shall list directly related and general experience of all key personnel who are anticipated to be most responsible for performance of work on the project. All key personnel shall be identified on a proposed organizational chart. Each resume should not be more than two (2) pages in length.

4.1.4.3 Project Understanding

The Proposer shall set forth his understanding of what work is to be accomplished. Specific reference must be made to the project requirements, the specifications applicable to the SR237/I-880 Express Connectors Project, and all other required criteria. The general system requirements should be summarized sufficiently to demonstrate the Proposer's understanding of the products expected. However, a recopying of the project requirements, as described in this RFP, is not necessary or desirable. Special requirements of the project should be discussed and any unique circumstances should be presented



4.1.4.4 Project Experience and Ability

The Proposer shall furnish documentation of its own, and its subcontractors', experience in the planning, design, construction, installation, integration, implementation, maintenance and operation of Express Lanes and conventional Electronic Toll Collection (ETC) systems, as well as its experience pertaining to the integration with other ETC back office service center operations. The experience statement shall include the Proposer's past experience and present contracts, and provide details on system hardware and software utilized, facilities management, system operations, system maintenance, customer relations, fiscal management and any other appropriate information related to the development, implementation and operation of the programs.

The descriptions should indicate any significant similarities and differences to those system(s) and the technical services that are described in this RFP. Information must be provided as to whether the contracts were completed on time and within budget or, if the contracts are ongoing, whether the contracts are on schedule and within budget. The Proposer shall also furnish the name, title, address, phone number and email address of persons who may be contacted by **VTA** for verification of the information provided. Information for up to seven (7) relevant Express Lanes and toll system related projects shall be included. Each project description should be no more than 1 page in length.

4.1.4.5 Financial Capability

The Proposer shall provide evidence of the firm's financial condition, sufficient in detail to demonstrate its ability to perform all the proposed services. The submission must include audited financial statements, including all schedules, notes and the opinion of an independent accounting firm, for the three most recently completed fiscal years. The statements must represent the entity submitting the proposal which will be responsible for the performance of all services, not a subsidiary or parent of the Proposer, except that a Proposer may submit audited documentation of the financial viability of a parent company along with a guarantee from said parent company in lieu of the same from the Proposer itself. The Proposer shall include evidence of their ability to provide the required bonding and insurance. Proposers may provide interim financial information, with a statement attesting to the accuracy of the information signed by the Chief Financial Officer (CFO) of the firm, if such interim information is necessary to provide all of the information required by **VTA**.

4.1.5 Work Plan

4.1.5.1 General Description

A detailed overall description of the proposed ETS, including any drawings, sketches, charts, graphs and written narrative required illustrating the system design, development, construction, implementation, and maintenance, to support the logic and methodology used by the Proposer to arrive at the proposed design shall be provided. Presented to Proposers, in Appendix 9.1 to this RFP, is a SR 237/I-880 Express Connectors Concept of Operations document that conveys **VTA**'s understanding of existing conditions, opportunities, alternatives and the proposed concept for project operations.



4.1.5.2 Organizational Chart

An organizational chart for the project showing the PM and key personnel, the firm they work for and their project responsibilities shall be provided. The chart shall be accompanied with explanatory text. The particular advantages of the structure chosen should also be described.

The PM will not be required to reside locally to the project area. However, the key personnel in charge of installation (e.g. Installation Manager) will be required to be on-site during the period of installation and during transition to the warranty period. The Maintenance Manager will also be required to reside locally to the project area during the Warranty Period and any subsequent maintenance periods.

4.1.5.3 Management and Work Plan

A proposed management and work plan, including, but not limited to, details for overall and day-to-day project management; management controls and procedures for all tasks of the project; staffing progress reporting, budget tracking, etc. shall be provided by the Proposer. An overview of the various work tasks and how they are to be accomplished, descriptions of the tasks that will be subcontract, and to whom they will be subcontracted shall also be provided in the Work Plan.

4.1.5.4 Accomplishment of Project Requirements

The Proposer shall individually address the requirements of Section 6 - Project Requirements, which sets forth subsystem requirements, equipment specifications, proposed methodology, techniques and processes required to accomplish project objectives.

In addressing Sections 6.2 through 6.8 of the Project Requirements, product information that would assist in review and evaluation of the proposal shall be included in the proposal as an appendix.

Proposed Quality Assurance and Quality Control (QA/QC), Reliability, and Testing Programs shall be described in sufficient detail in the Work Plan. The Reliability Program shall include Mean Time Between Failure (MTBF) commitments for the primary system components included in Sections 6.2 Express Connectors Operations and Equipment and 6.7 Communications Network.

An ETS Project Schedule including all of the milestones that are presented in this RFP shall be included in the work plan. The proposed project schedule shall be one that the Proposer believes to be realistic and attainable. A Critical Path Method (CPM) or similar type chart shall be prepared with supporting text.

A description of the proposed Maintainability Program shall be included in the work plan for maintenance and warranty requirements.

No cost information shall be included in the technical proposal. Inclusion of cost information in the technical proposal may result in disqualification of a proposal from consideration for award.



4.1.6 Technical Alternatives

In response to this section, the Proposer may present a technical description of alternatives that it wishes to present to *VTA* for inclusion in, to supplement or to replace elements of its basic proposal. This opportunity is open only if the Proposer has made an acceptable basic proposal that is fully responsive and in compliance with the requirements of the RFP.

If the Proposer elects to propose technical alternatives, the Proposer shall present the proposed alternative approach in response to this section in a clear and concise manner and identify why the alternative is being proposed and why *VTA* would benefit from such an alternate solution.

VTA reserves the right to either accept or reject any and all technical alternatives that are proposed.

4.1.7 Product Information

Product information such as brochures and product specifications that would assist *VTA* in review of the Proposer's proposal shall be included in the proposal as an appendix. Extraneous or advertising information that is not helpful in understanding the Proposer's proposal is not desired. The Appendix should preferably be bound in a separate volume and be limited in size.

4.2 COST PROPOSAL (SEALED)

Each Proposer shall submit one (1) original, fifteen (15) copies and one (1) electronic copy (in PDF format on a CD) of the Cost Proposal on the forms provided subsequently in this document. *VTA* reserves the right to reject in whole or in part offers containing unbalanced or unreasonable cost proposals for any item(s). The Proposers shall clearly state in their Cost Proposal that the presented program costs are valid for a period for not less than 60 days. *VTA* reserves the right to request that Proposers extend their proposed costs for 30-day periods, if necessary. Items on the cost proposal labeled as "OPTION" may be exercised at *VTA*'s sole discretion.

4.2.1 Project Cost Alternatives

The Proposer may present pricing options that it wishes to present to *VTA* for inclusion in, to supplement or to replace pricing elements of its basic proposal. This opportunity is open only if the Proposer has made an acceptable basic pricing proposal that is fully responsive and in compliance with the RFP.

If the Proposer elects to propose pricing alternatives, the Proposer shall present the proposed alternative pricing approach in response to this section in a clear and concise manner and identify why the alternative is being proposed and why *VTA* would benefit from such an alternate solution.

VTA reserves the right to either accept or reject any and all pricing alternatives that are proposed.



4.2.2 Required Attachments

Attachment A – Cost Proposal

Attachment B - General Information

Attachment C - Designation of Subcontractors

Attachment D - Listing of UDBE Prime and Subcontractors

Attachment E - Certification of Restriction on Lobbying

Attachment F - Certification of Nonconstruction Employee Protection

Attachment G – Certification of Consultant

Attachment H – Exceptions to the RFP and Draft Contract

Attachment I – Performance Bond Form



5. PROPOSAL REVIEW, EVALUATION AND SELECTION PROCESS

5.1 PROPOSAL EVALUATION AND SELECTION COMMITTEE

A Review Board, generally made up of *VTA* staff, will review the proposals submitted, establish a list of finalists based on pre-established evaluation criteria, interview the finalist firms, and determine the successful Proposer based on the evaluation criteria and oral interview. The Review Board may request member participation from other agencies or cities. The names of the Review Board members are not revealed prior to the interviews. The individual or composite rating and evaluation forms prepared by individual Review Board members are not retained by *VTA* and will not be revealed.

5.2 EVALUATION CRITERIA

The criteria that will be used by the Review Board for its evaluation of each qualifying technical proposal are listed below. Factor number 1 is the most important. Factors numbered 2 through 5 are slightly less important, and are approximately equal to each other in value.

1. The qualifications of the Proposer to perform the work required under the contract, including the following factors.
 - The overall management background and experience and the technical competence of the Proposer to plan, design, manufacture, construct, install, integrate and implement an Express Lanes system of the type required by this RFP.
 - The qualifications of the principal persons that are proposed to be involved in the planning, design, development, manufacturing, equipping, construction, installation, integration and implementation of the SR 237/I-880 Express Connectors Project covered by this RFP.
 - The direct experience of the Proposer's management and technical staff in the successful planning, design, development, manufacturing, equipping, construction, installation, integration and implementation of SR 237/I-880 Express Connectors Project systems.
 - The financial capacity and capability to perform all the work required under the Contract, and the ability to provide the required bonding, insurance and indemnification to *VTA*.
 - The perceived ability of the SI and its subcontractors to complete all of the required work in full accordance with the requirements of the RFP and in the time schedule offered in the proposal.



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2. The ability of the SR 237/I-880 Express Connectors Project proposed by the Proposer to perform in accordance with the design objectives specified in this RFP, and to the satisfaction of *VTA*.
3. The proposed design of the system, with emphasis on quality, durability, efficiency, safety, appearance, ease and economy of maintenance, suitability for the intended use, and overall conformance with the requirements of the RFP will be taken into account by the Committee.
4. The quality, durability and capability of the equipment, software and systems proposed; the methods proposed to minimize downtime and to maintain satisfactory results over the life of the contract.
5. The overall quality of the Proposer's proposal for the project, including but not limited to the Proposer's comprehension of *VTA*'s requirements; the completeness, depth and clarity of the information provided; the Proposer's approach to the various aspects of the development and installation of the system; and its commitment to delivery of the project in accordance with the requirements of the RFP.
6. The evaluation of the Proposer's technical proposal may be affected by the Proposer's oral presentation and response to various questions that are posed by the Committee. However, oral presentations may not be required by the Committee in order to make its determinations and recommendations.

Presented in Figure 1 is a preliminary Technical Proposal evaluation matrix. An evaluation matrix similar to this one will be completed for each Technical Proposal that is received from Proposers.



TECHNICAL PROPOSAL		Weight	<Firm #1>		<Firm #2>		<Firm #3>	
			Grade	Product	Grade	Product	Grade	Product
1.a	Overall Qualifications of the Firm to implement the ETS	5		0.000		0.000		0.000
1.b	Qualifications of Key Personnel	10		0.000		0.000		0.000
1.c	Project Manager's Experience	15		0.000		0.000		0.000
1.d	Financial Capability - Satisfy Bonding, Insurance and Indemnification Requirements	5		0.000		0.000		0.000
1.e	Ability to Complete the Work on schedule	5		0.000		0.000		0.000
2	Conformance with the Design Objectives	10		0.000		0.000		0.000
3	Quality, Robustness, and Suitability of Proposed System Design	20		0.000		0.000		0.000
4	Features and Procedures to Maximize Reliability of Hardware, Software and Equipment	10		0.000		0.000		0.000
5	Overall Quality and Clarity of Proposal	5		0.000		0.000		0.000
6	Strength, Clarity, and Soundness for Express Lanes Project Implementation	15		0.000		0.000		0.000
	TECHNICAL SCORE	100		0.000		0.000		0.000

Figure 1 – Preliminary Technical Proposal Evaluation Matrix



5.3 QUALIFYING PROPOSALS

The Contracts Program Manager will initially review each Technical Proposal for compliance with the instructions contained in this RFP, any addendum, and with any other procedures required in conducting this procurement. Failure to comply with any requirement may disqualify a Proposer's Proposal from consideration by the Committee. Each Proposer must assume full responsibility for meeting the requirements of the procurement.

5.4 TECHNICAL EVALUATION

After the Contracts Program Manager selects the qualifying proposals, the Committee will conduct an evaluation of the technical merit of each qualifying proposal. This evaluation will be made on the basis of the evaluation criteria as set forth above in Section 6.2 above. This step of the overall Proposal evaluation may include verification of credentials and stated experience, and the Bidder authorizes *VTA* to so inquire as *VTA* sees fit.

Proposals which have been found by the Committee to be non-responsive to the technical requirements of the RFP may be considered ineligible for further consideration at and from this point in the evaluation process.

As part of the technical evaluation, the Committee may require those Proposers whose proposals are initially classified as reasonably considered for being selected for award to appear before the Committee to make oral presentations, to answer questions and/or to provide clarification on their proposals. The individual identified as the PM in the Proposer's Proposal will be expected to play the primary role in the Proposer's interview and presentation.

The Committee will also conduct reference checks of Proposer's at this time. The purpose of the reference checks will be to determine the level of satisfaction and quality of service provided to Proposer's present and/or past clients in the areas of general system performance; technical integration; compliance with implementation plans and budgets; general responsiveness; customer satisfaction; and contract compliance.

5.5 ORAL PRESENTATION

Approximately 90 minutes will be allowed for the oral presentation, questions and answers, and proposal clarification. The Project Manager must lead the presentation before the Review Board. Oral Presentations will be conducted on **April 22, 2010**. Each Proposer is asked to keep this date open. No other oral presentation dates will be provided. *VTA* reserves the right to interview at its discretion. Additional information regarding the oral presentation will be provided following the technical evaluations.

5.6 COST PROPOSAL EVALUATION

Separately, and after completion of the Technical Proposal evaluation, the Contracts Administrator will unseal the Cost Proposal of each qualifying Proposer. The Committee shall



then perform a thorough evaluation and tabulation of the cost information contained in each Proposer's Cost Proposal.

5.7 COMBINED EVALUATION

The Committee will then rank the Proposers based on the combination of their Technical and Cost Proposals. In determining the final ranking of proposals, technical merit might be given more weight than the proposal cost. The Review Board will evaluate proposals and choose the preferred Proposer not necessarily based upon the lowest cost, but based upon the determined best value to the agency.

5.8 BAFO EVALUATION

VTA reserves the right to request Best and Final Offers (BAFOs) from any or all of the Proposers. If the BAFO process is utilized, *VTA* may enter into discussions with one or more Proposers and request a BAFO document from such Proposers, or *VTA* may request BAFO(s) without first discussing any issues with the selected Proposer(s). All Proposers that are selected to participate in discussions with *VTA* may be advised of any deficiencies in their proposals, and *VTA* may issue a change in the scope of the work or to other provisions of the Contract documents. The selected Proposer shall be offered a reasonable opportunity to correct or resolve any deficiencies for which *VTA* provides notification and to submit such cost and/or other technical revisions to their proposals that may result from the discussions. At the conclusion of the discussions, a final common cut-off date which allows a reasonable opportunity for submission of written final revisions shall be established, and those Proposers that are selected to remain in contention for the Contract will be notified, in writing, to submit proposal revisions. *VTA* will consider the revised cost and/or technical information and re-evaluate and possibly revise the proposal ratings as might be appropriate.

5.9 AWARD

When the Review Board has completed its work, negotiations will be conducted for the extent of services to be rendered. Because *VTA* may award without conducting negotiations, the proposal submitted shall contain the Proposer's most favorable terms and conditions.

5.10 PROTEST POLICY

Prior to the closing date for submittal of proposals, Proposer may submit to *VTA* protests regarding the procurement process, or alleged improprieties in specifications or alleged restrictive specifications. Any such protests shall be filed no later than 10 working days prior to the scheduled closing date. If necessary, the closing date of the solicitation may be extended pending a resolution of the protest. Protests dealing with alleged improprieties in the procurement or the procurement process that can only be apparent after the closing date for receipt of proposals shall be filed within 5 working days of issuance of the Notice of Recommended Award. Protests shall contain a statement of the grounds for protests and supporting documentation. Protestor will be notified of *VTA*'s final decision prior to issuance of Award.



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A Proposer may discuss the Procurement Documents with *VTA*. Such discussions, however, do not relieve proposers from the responsibility of submitting written protests as required by *VTA* Policy No. 36 – Bid Protests.

Proposer's requests and protests shall be addressed to: Santa Clara Valley Transportation Authority, Attention: Thomas B. Smith, Purchasing and Materials Manager, 3331 N. First Street, Bldg. A., San Jose, CA 95134.

The full text of *VTA*'s Policy No. 36 may be obtained by contacting Tom Smith, Purchasing and Materials Manager, at (408) 321-7190.

A Proposer may appeal *VTA*'s determination of the protest to the Federal Transit Administration. All appeals submitted to the FTA shall be filed and will be handled in accordance with FTA Circular 4220.1E.



6. PROJECT REQUIREMENTS

6.1 GENERAL REQUIREMENTS

Presented in the Appendix of this RFP is a copy of the ETS System Requirements document. If there are any differences between the requirements presented in this RFP and the System Requirements document, the RFP shall govern.

6.1.1 Life, Reliability, and Availability

The ETS, with appropriate maintenance, shall be sized and designed for a minimum ten-year usable life. Each major part of the ETS shall meet or exceed the specific Mean-Time-Between-Failure (MTBF) and Mean-Time-To-Repair (MTTR) criteria that are listed below in Table 2.

Equipment	Minimum Mean Time Between Failures	Maximum Mean Time To Repair
Tolling/Read Zone Controllers	12,000 hours	2 hours
ETC Reader/Antenna	20,000 hours	2 hours
Vehicle Detector System (VDSs)	10,000 hours	2 hours
Image Processor		2 hours
CCTV Camera		2 hours
CCRV PTZ Assembly		2 hours
Hand Held Enforcement Devices	15,000 hours	2 hours
Tolling/Read Zone Transaction Indicator Light (single light gantry mounted)	15,000 hours	2 hours
Tolling/Read Zone Transaction Indicator Light (dual lights gantry mounted)	15,000 hours	2 hours
License Plate Image Capture Subsystem Cameras/Light Assembly	15,000 hours	2 hours
Laser Communication System	30,000 hours	2 hours
Standard Workstations	10,000 hours	2 hours
TDC Computer System	10,000 hours	2 hours
Pricing Sign Display Modules & Controller		2 hours
Blank-out Sign & Controller		2 hours

Table 2 – Equipment MTBF and MTTR

MTTR is based on average repair times for typical system failures.

6.1.2 Hardware Requirements

System Life- The System shall have a minimum ten (10) year design life. *VTA* approval is required for the procurement of any equipment or component with planned



obsolescence/discontinuation within ten years. No equipment shall be designed and fabricated using components with planned obsolescence/discontinuation within ten years known at the time of proposal submittal. Expendable and consumable materials and supplies will not be included in this requirement.

New Equipment- All equipment, supplies, and materials for this system shall be new and unused, when installed. Materials and products which have been previously used for development work, leased systems, or any other type of used equipment, will not be permitted.

Modular Design- Modular design principles shall be used throughout the system, and shall be defined as the packaging of components together in replaceable units according to the function they perform and by using standardized hardware and components to achieve flexibility of use and to facilitate maintenance. Replaceable and repairable modules shall be used whenever possible to simplify troubleshooting, reduce downtime, and reduce operational and maintenance costs.

Accessibility- All assemblies, subassemblies, and modules shall be readily accessible for removal, testing or replacement without extensive removal of other modules or assemblies. Components shall be located so that there is visibility and access for the use of hand tools and standard test probes where maintenance is required.

Circuit Protection- In addition to UPS protection provided to controllers, processors and servers, components and devices which are susceptible to damage upon failure of the regulating element within an electrical distribution system shall be protected by means of an over-voltage protective circuit. All fuses shall be mounted with retention devices at both ends. All fuse types shall contain visual indicators to indicate a blown fuse. The System Integrator's design and recommendations shall conform to the applicable lightning protection, surge, and transient protection standards, such as NFPA-78, IEEE Std 587, and UL-1447, as they apply to each area of protection.

Housings and Cabinets- The material and finish for new housings and cabinets shall be environmentally resistant to the extremes of outdoor, indigenous northern California highway environments. Aluminum panels are required unless otherwise specified. All cabinets and housings shall be fitted with required gaskets, grommets, and filters to prevent dust, dirt, smoke, moisture or other contaminants from entering the enclosures in accordance with the application in which the equipment is employed. All cabinets shall have a NEMA rating of 3R or better. VDS equipment, zone controllers, image processors, communication devices and all associated electronics shall be installed in Caltrans and FHWA standard 334 controller cabinets furnished and installed by others at the location shown on the construction drawings. These free standing roadside cabinets will include separate hand holes for electrical and communication cables as well as conduit stubs out in the cabinet foundation slab as shown on the construction drawings. If requested, a 334 controller cabinet will be made available for the purpose of laying out equipment and devices to fit inside the cabinet, which results in sufficient clearance space for operation and maintenance. The Agency will coordinate a mutually agreeable arrangement with the parties involved to affect this time limited cabinet transfer. The System Integrator shall



inspect all installed cabinets, hand holes and conduit prior to equipment and cable installation and prepare a condition report signed by the Project Manager that identifies any damage or deficiency with the items installed by others. After any documented problems are confirmed and corrected, the System Integrator shall submit a letter to the designated Agency representative accepting responsibility for all cabinets furnished and installed by others.

Hardware- All mounting hardware, bolts, nuts, studs, washers, brackets, screws, hinges, and others shall be new and shall be constructed of non-corrosive material, and of a design to perform their respective purpose and function for the specified ten (10) year system life.

Fabrication- All chassis, attachments, and hardware shall be fabricated from corrosion and rust resistant materials, or properly plated to achieve corrosion and rust resistance. For those housings and cabinets requiring locked covers, there shall be no exposed hardware visible or accessible from the outside. The covers shall fit flush with the main body of the housing with no exposed gaskets or seals visible when the cover is closed.

Stainless Steel Materials- The provision and fabrication of all stainless steel materials used in the system shall conform to current American Society for Testing and Materials (ASTM) requirements. Austenitic grade stainless steel (e.g., Type 301 and 304) shall be used when welding is involved. All welds shall be thoroughly cleaned to remove all oxide scale and ground smooth. Discoloration resulting from the welding process shall be removed from all external surfaces. All grinding, polishing and buffing shall be in accordance with the requirements of the material used.

Equipment Diagnostic and Self-Test Requirements- Diagnostic software/firmware shall be loaded and embedded in the toll and read zone controllers as well as image processors and be interactive during operation and invoked at the time the equipment is powered on. Diagnostics shall operate automatically to detect malfunctions and failures and to report any failures and degradations to the Maintenance On-Line Management System (MOMS) system at the time of occurrence. Diagnostic software shall be provided to evaluate all connected components of the TZC and RZC operation, including communication devices. The MOMS module shall function as the SNMP management station for the pricing sign controllers and all intelligent communication equipment that are SNMP agents. The management station and agents shall include a MIB database where state changes of identified managed objects are stored and accessible by the management station.

System operation shall not be adversely affected or result in a missed FasTrak[®] transponder read by the presence of active transponders mounted to a vehicle that are both compliant and non-compliant with Title 21.

The System Integrator shall conduct an inter-modulation study at each roadside site prior to installation to ascertain the existence of any electromagnetic interference in the radio frequency (RF) spectrum that would effect the operation of the ETS subsystem. This includes interference with existing radio equipment of the CHP and Caltrans operations and roadway maintenance staff. Should any such interference be identified, the System Integrator shall take the required



actions to eliminate or mitigate the interference affecting equipment operation, to the complete satisfaction of the designated *VTA* representative and at no additional cost to the Contract.

Caltrans is fully responsible for operations and maintenance of the State Highway System (SHS), including the civil and structural elements (excluding the pricing signs and ETS equipment and associated structures) of the EC upon completion of construction. Caltrans is also responsible for providing for the authorized expansion of the system and for assessing the impact of improvements proposed by others to the existing system.

To ensure that projects on the SHS are well designed, safe, and properly constructed, all project planning, design, and construction shall be reviewed and approved by Caltrans in accordance with Caltrans standards and practices and according to the Caltrans project development process.

For this reason, the installation of “T” structures, CCTV and communication poles, equipment, electrical and communication conduit, wires and cables, cabinets and all ancillaries within the State’s Right of Way requires the *VTA* to secure an Encroachment Permit based upon the Final System Design and to then secure a Rider authorizing the System Integrator and its subcontractors access to perform the approved installation. The System Integrator is expected to assist the *VTA* in securing the Encroachment Permit and Rider and adhering to the requirements set forth in the Caltrans Encroachment Permit Manual, which is available online at:

<http://www.dot.ca.gov/manuals.htm>

The System Integrator shall be responsible for coordination with PG&E, and other local utility companies as needed to identify available service connection points during the design phase. The *VTA* IT department will be responsible for the arranging leased lines from the local exchange carrier for communication from the Cerone facility to the *VTA* Data Center and from the TDC to the BATA RCSC and Caltrans TMC. *VTA* IT will also negotiate the rate and service level for WiMax service. The System Integrator shall coordinate with *VTA* to arrange point to point T-1 type data circuit installation(s) and WiMax service. The System Integrator shall be responsible for preparing the necessary applications and payment of the applicable fees. The Agency will pay the equipment and installation costs charged by the utility to deliver service after confirming the proposed design results in the most cost effective approach. The System Integrator shall cooperate by providing information that may be requested to justify a proposed utility service design.

The nature of the ETS is such that it will be considered a Locally Funded Project in excess of \$1,000,000 within the State’s Right of Way for purposes of the Manual. The Cooperative Agreement, the Project Report and the Environmental Clearance have been or will be completed by the *VTA*. The System Integrator is expected to develop the necessary documents to satisfy the Encroachment Permit Application Submittal Requirements and assist with the actual submittal to Caltrans.

Working drawings, catalog information, or shop plans for all equipment in the system and all work to be permanently installed shall comply with the State of California Department of



Transportation Standard Specifications April 2006 and Standard Plans May 2006 and their subsequent updates, as applicable, when submitted for approval. The System Integrator shall also be responsible to adhere to all other jurisdictional requirements.

6.1.3 Electrical Work Requirements

The System Integrator shall develop as-built Project electrical and communication plans, which shall detail connections, conduit, junction boxes, hand holes, disconnects, and wire and to ETS devices listed in this RFP. The System Integrator shall furnish and install power, conduit and cables to all ETS devices described in this RFP and required by the System Integrator's approved design. The electrical work shall be successfully completed when all ETS components are properly connected and powered up. The System Integrator will not install conduit and hand holes for roadside cabinets furnished and installed by others and shown on the construction drawings.

The required electrical service will be as specified by the System Integrator after preparing and submitting a load analysis associated with each utility service drop location. The System Integrator shall be responsible for connecting to a utility transformer or other service connection drop and for furnishing and installing direct burial cables, cables (in existing conduit), or uniduct to bring electrical service to the toll and read zones, pricing sign locations and CCTV and communication poles. The System integrator shall also be responsible for furnishing and installing wires, cables, conduit, junction boxes and panels to distribute electrical service to the various equipment and devices within a toll and read zone, unless shown otherwise on the construction plans. Wherever electrical conduit is installed below ground, an additional 2" diameter conduit or duct shall be installed in the same trench approximately 12 inches above the installed electrical conduit for future communication needs. A nylon chord shall be placed inside this conduit for its full length.

The System Integrator shall provide equipment for filtering, conditioning, and distribution of line power to all necessary Tolling Zone and Read Zone equipment as well as the pricing signs. The System Integrator shall provide an Uninterruptible Power Supply (UPS) for each toll and read zone and for the video server cabinet located in the Cerone facility. The System Integrator shall provide appropriate switching gear to provide for continued uninterrupted operation of the zone controllers and pricing signs until either an interruption of utility power is restored or UPS runtime is exceeded.

The UPS shall supply sufficient power so that no data is lost or altered due to a power outage for a minimum of thirty (30) minutes when fully loaded and shall allow regular operation of all system equipment as required keeping the following functional capabilities fully operational during the power failure:

- 1) Vehicle detection, ETC tag read capability and zone controller validation ,
- 2) Future license plate image capture subsystem; and
- 3) Communications within the toll and read zones as well as communication to the Cerone facility..



The UPS shall be self-monitoring and shall provide operational status, such as fully charged, charging, discharging, depleted, and system failure messages to the MOMS system. A UPS smart module shall support SNMP protocol for communications with the MOMS.

The pricing sign controller shall include a UPS to filter and condition electrical service to the pricing sign. A minimum runtime of thirty (30) minutes shall be provided by this UPS. In addition to an electrical service disconnect at each pricing sign, an outlet and transfer switch for connecting a portable generator shall be provided.

Complete status reporting of each UPS shall be available via the maintenance monitoring function of the ETS.

6.1.4 Applicable Codes and Contractor Requirements

All work for the Contract shall be in conformity with the latest published requirements, as and when applicable to a particular element of the System, of the following:

- 1) State of California Department of Transportation Standard Specifications;
- 2) State of California Department of Transportation Standard Plans;
- 3) National Electrical Contractors Association (NECA);
- 4) Occupational Safety and Health Act (OSHA);
- 5) National Fire Protection Association (NFPA);
- 6) NFPA 70: National Electric Code (NEC);
- 7) National Electrical Manufacturers Association (NEMA);
- 8) American Society for Testing and Materials (ASTM);
- 9) National Television System Committee (NTSC) video transmission Standards;
- 10) Institute of Electrical and Electronic Engineers (IEEE);
- 11) IEEE C62.36-2000 Standard Test Methods for Surge Protectors Used in Low-Voltage Data, Communications, and Signaling Circuits;
- 12) International Organization for Standardization (ISO);
- 13) American National Standards Institute (ANSI);
- 14) International Electrotechnical Commission (IEC);
- 15) Manual on Uniform Traffic Control Devices (MUTCD);
- 16) Applicable Electronic Industries Association (EIA) Standards for Interface and Intercommunication;
- 17) Underwriters Laboratories (UL); and
- 18) ANSI/UL 1449-2006 Standard for Surge Protection Devices

6.1.5 Environmental Requirements

The ETS equipment shall be installed either outside or in a building. The assembled equipment shall be rated to perform under those environmental conditions at the two (2) toll zone and two (2) read zone sites. The System Integrator shall thoroughly investigate all environmental factors that may affect the operation, reliability, and life of the System delivered under the Contract and



shall select equipment that is appropriate for operation in the environment or shall take adequate steps to protect the equipment from the environment.

For each environmental area, the equipment installed or operated within that area, the System Integrator shall provide certified test results from a testing laboratory satisfactory to the **VTA** certifying the equipment meets the environmental specifications as indicated below in Table 3.

Area	Exterior	Building
Min operating temp	-20°F	50°F
Max operating temp	145°F	85°F
Min operating humidity (Non-condensing)	15%	15%
Max operating humidity (Non-condensing)	98%	80%
Shock	98% MIL-STD-810E Method 516.4 procedures IV	MIL-STD-810E Method 516.4 procedures IV
Vibration	±1g from 15Hz through 500 Hz for a period of 15 minutes in three planes.	None
Corrosion	IEC 68-2-11 and NEMA 4	None
Electrostatic Discharge	Survives while booth testing	None
Rain	IEC-529 (4), MIL-STD-810F-506.4 and NEMA 4 enclosure	None
Sand and Dust	IEC-529(4), MIL STD-810F-510.4 and NEMA 4	None

Table 3 – Summary of Environmental Requirements

Certified results from prior testing by the manufacturer or an approved independent test lab may be used to satisfy the environmental qualification requirement.



6.2 EXPRESS CONNECTORS EQUIPMENT

6.2.1 Lane Operations

Figure 2A provides an overview of the general Express Connectors operations requiring transponders for just SOV users that conveys the necessary “user-machine” interactions of the subsystems specified in this document.. Figure 2B provides an overview of the general Express Connectors operations requiring transponders for HOV and SOV users that conveys the necessary “user-machine” interactions of the subsystems specified in this document. This later operational flow diagram pertains to when switchable transponders are readily available for distribution. The proposed solution shall blend manual and system elements meeting the specified requirements to achieve the Agency’s objectives..

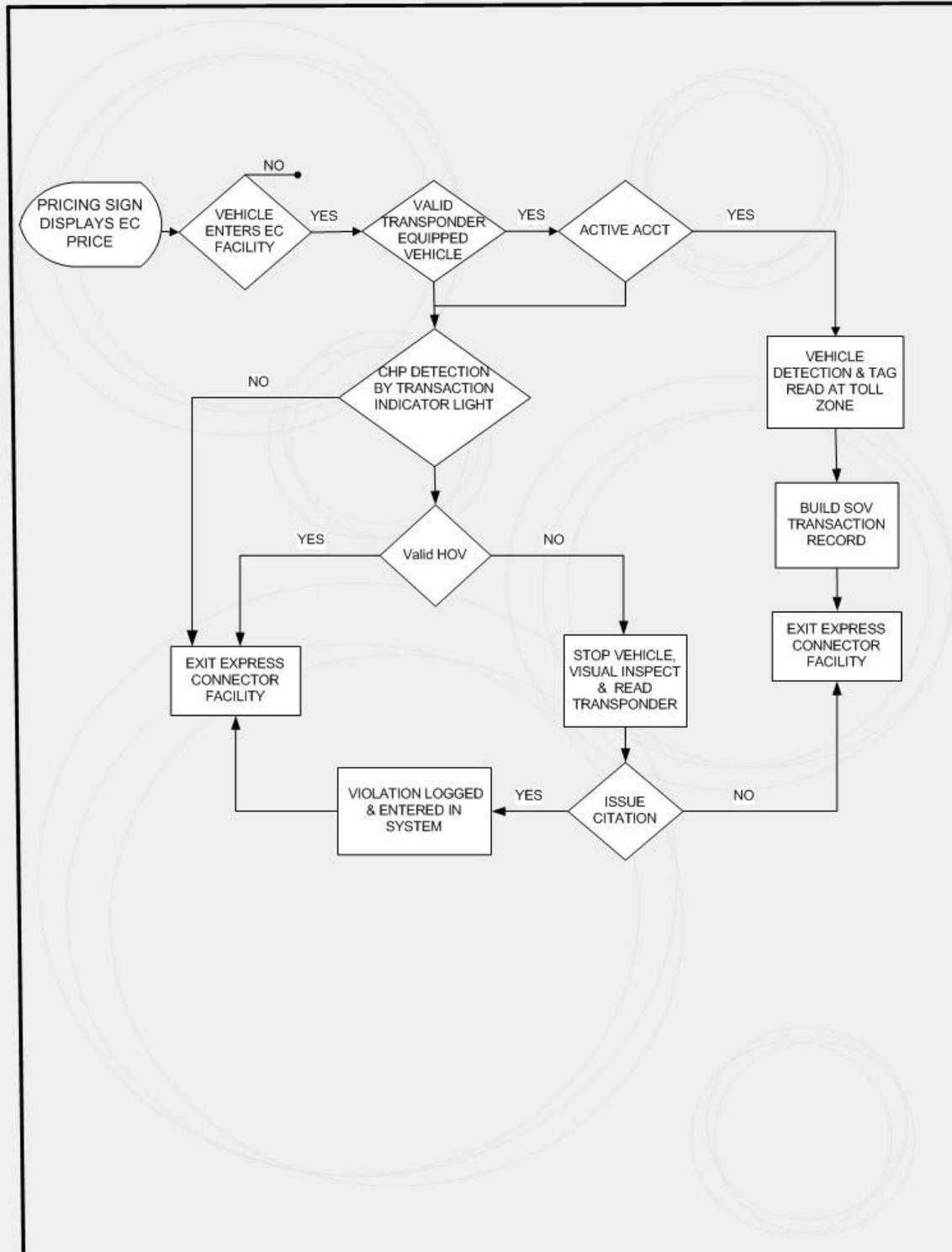


Figure 2A – Express Connector Operations Identifying SOV Users Only

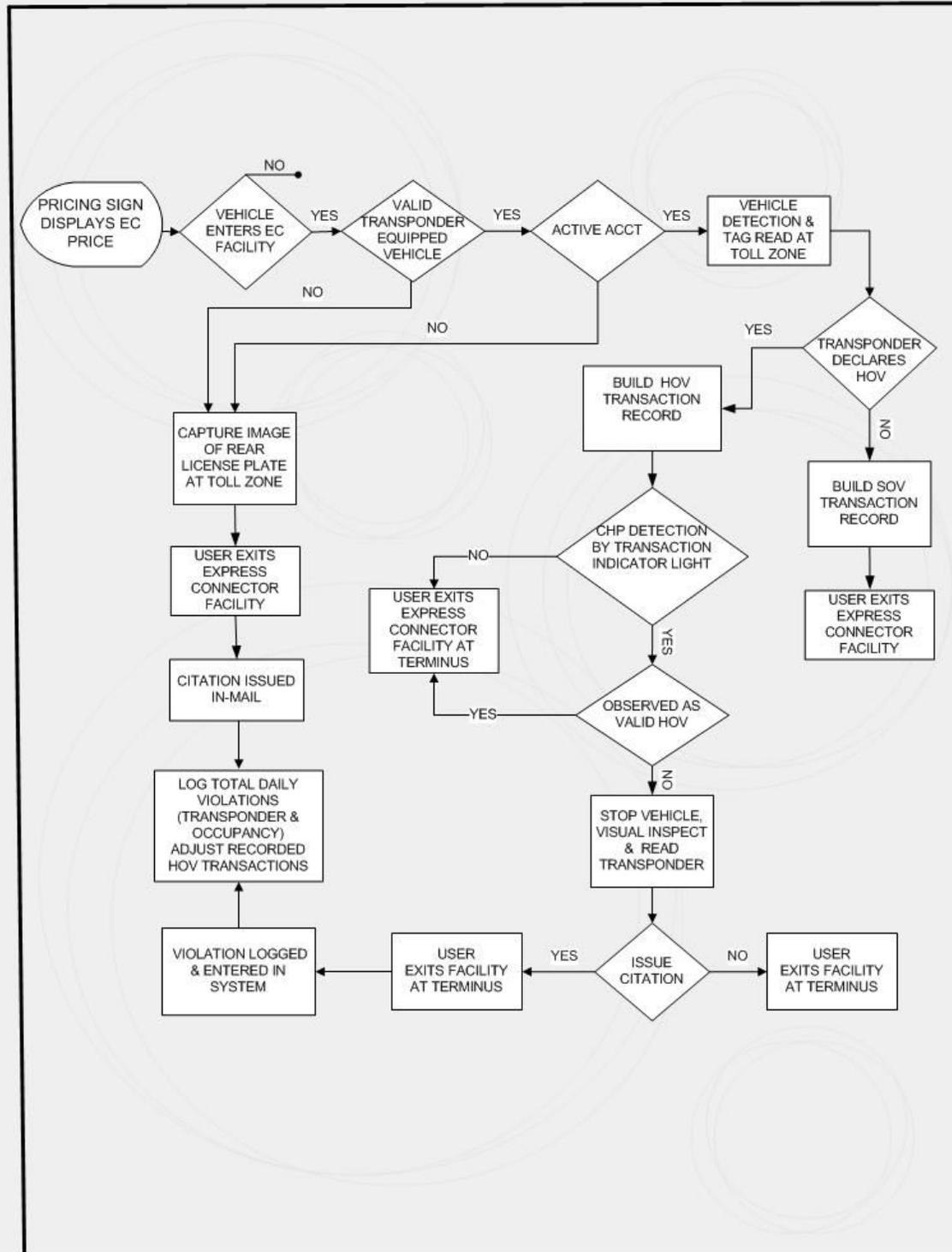


Figure 2B – Express Connector Operations Identifying All Users



6.2.2 FasTrak® ETC Subsystem

The ETC subsystem, including the reader, transceiver and antenna, deployed for the EC System shall meet all California Title 21 requirements and standards that are in place in the Bay Area at time of deployment of the EC System. The System Integrator shall design the ETS to be upwards compatible and seamlessly support the operation of switchable FasTrak® transponders. The switchable FasTrak® transponder shall allow the patron to switch between SOV operation and HOV operation depending on the number of persons traveling in the vehicle. Users with standard FasTrak® transponders will be permitted to use the EC but shall only be recorded as an SOV transponder type and charged a toll even if user qualifies as an HOV. For the initial System implementation, prospective HOV users having a transponder mounted to their vehicle will be required to remove the transponder and place it in a mylar bag supplied by the BATA RCSC.

Prospective EC HOV users will be issued a switchable FasTrak® transponder through the BATA RCSC, which is located in San Francisco, after completing an application and making the required account deposit. Switchable transponders procured under this Contract, if any, shall comply with all California Title 21 requirements and accurately read by all compliant California tolling agencies that do not require a switchable transponder. Switchable transponders shall meet the following:

- 1) Securely attach to the windshield equal or exceeding to the current FasTrak® transponder restraint;
- 2) User installable/removable;
- 3) Provide distinguishable audible tones when the transponder is successfully read corresponding to a SOV or HOV mode (i.e., switch position); and
- 4) Support the write-back of the time, date, location code, and transponder type code to the switchable FasTrak® transponder's internal buffer for latest three transactions that is accessible by a portable reader.

The System Integrator shall be responsible to assist *VTA*, the operating agency, in obtaining an economic area (EA) Part 90 (90.353 (i) Non-multilateration LMS system) Federal Communications Commission (FCC) license, and a temporary license if required to meet the Project schedule. *VTA* will provide elevation, latitude, longitude, and the county for the two sites requiring this license to operate.

6.2.3 Zone Controllers

The toll zone controllers (TZC) shall control and monitor vehicle identification and user type at each toll zone and be primarily responsible for gathering FasTrak® transaction data and transmitting that information to the Toll Data Center (TDC), in a secure environment without duplication. The transaction data shall flag degraded or failed components. The TZC shall also interface with the TDC to receive daily FasTrak® tag status files and updates on at least a daily basis.



The System Integrator shall review the selected location of the proposed “T” structures used to support the license plate image capture cameras and light and antenna/transceiver equipment. Comments shall be submitted to identify any condition that will affect ETS equipment installation and performance. The System Integrator shall install six (6) transaction indicator lights on the toll zone “T” structure provided by others (i.e., three (3) in each direction), controllers in the Caltrans 334 standard cabinet provided by others, wires and cables in conduit provided by others (from structure to cabinet only), electrical conduit, wires and cables between the utility source and cabinet, communication wires and cables from the “T” structure to the cabinet, and all necessary miscellaneous items to provide operational toll zones including maintenance of traffic plans.

6.2.3.1 Toll Zone Controller Primary Functions

The primary functions of the TZC shall be to:

- 1) Build and transmit authorized vehicle transaction records and summary traffic counts;
- 2) Provide stationary CHP officers parked downstream of the toll zone visual feedback on the declared status of SOV and HOV users based on the FasTrak® switchable transponder position through the use of transaction indicator lights mounted to the “T” at a height that complies with Caltrans standards and is in clear view;
- 3) Monitor its peripheral toll zone equipment (i.e. FasTrak® reader, vehicle detector, equipment, license plate image capture image processor and camera/light assemblies) and report on the status of this equipment;
- 4) Receive configuration files and time synchronization data;
- 5) Receive daily tag account status list and update files from the TDC;
- 6) Trigger the license plate image capture subsystem when no transponder ID is read;
- 7) Build violation transaction record in conjunction with capturing license plate image(s) of all unauthorized vehicles; and
- 8) Notify users of the current setting of their transponder switch, as applicable, based on an audible transponder tone corresponding to its state so the user can expect a toll when the sound indicates a SOV switch setting.

The TZC shall accommodate a system administration and maintenance interface. This interface shall support operations including modification of system configuration files, time synchronization, uploading messages and alarms, invoking on-site diagnostics, and performing preventive maintenance tasks.

The TZC shall be capable of storing no less than 30 days of traffic, maintenance message, event and FasTrak® and violation transaction data. The TZCs shall be capable of storing no less than 10 million FasTrak® tag status list entries.

All TZC messages (i.e. traffic, event, FasTrak® transaction, violation, maintenance, and configuration/administration) shall contain a unique sequence number.

The TZCs shall include at least the following information in each transaction record:



- 1) Transponder number;
- 2) Transponder account status;
- 3) Transponder type;
- 4) Last recorded switch position;
- 5) Last recorded switch position date;
- 6) FasTrak® transaction date;
- 7) FasTrak® transaction time;
- 8) Transponder handshake count;
- 9) Agency ID/Code; and
- 10) Equipment status code.

The TZC's vehicle sequencing logic shall be self-correcting and correlated with the read zone sequencing logic. The TZC shall record all transponders ID numbers that are read by the ETC subsystem.

The TZC shall be able to operate normally without network communications, albeit a stale tag status list, storing current records, messages, events and traffic summaries for later transmission to the TDC. TZC shall include a portable hard drive to manually transfer data to and from the TDC.

6.2.3.2 Read Zone Controller Primary Functions

The primary functions of the RZC shall be to:

- 1) Backup transponder read and transaction building functions of the toll zone;
- 2) Build and transmit authorized vehicle transaction records and summary traffic counts;
- 3) Monitor its peripheral read zone equipment (i.e. FasTrak® reader, and vehicle detector equipment) and report on the status of this equipment;
- 4) Provide stationary CHP officers parked downstream of the read zone (SB I-880 to WB SR 237 only) visual feedback on the declared status of SOV and HOV users based on the FasTrak® switchable transponder position through the use of transaction indicator lights mounted to the "T" at a height that complies with Caltrans standards and is in clear view;
- 5) Receive configuration files and time synchronization data;
- 6) Receive daily tag account status list and update files from the TDC;
- 7) Build violation transaction record of all unauthorized vehicles; and
- 8) Notify users of the current setting of their transponder switch, as applicable, based on an audible transponder tone corresponding to its state prior to passing through the toll zone. (Note: function is based on logically designating the first zone encountered the "read zone" although physically both zones located on SR 237 are referred to in this document as a read zone).

The RZC shall accommodate a system administration and maintenance interface. This interface shall support operations including modification of system configuration files, time synchronization, uploading messages and alarms, invoking on-site diagnostics, and performing preventive maintenance tasks.



The RZC shall be capable of storing no less than 30 days of traffic, maintenance message, event and FasTrak® and violation transaction data. The RZCs shall be capable of storing no less than 10 million FasTrak® tag status list entries.

All RZC messages (i.e. traffic, event, FasTrak® transaction, violation, maintenance, and configuration/administration) shall contain a unique sequence number.

The RZCs shall include at least the following information in each transaction record:

- 1) Transponder number;
- 2) Transponder account status;
- 3) Transponder type;
- 4) Last recorded switch position;
- 5) Last recorded switch position date;
- 6) FasTrak® transaction date;
- 7) FasTrak® transaction time;
- 8) Transponder handshake count;
- 9) Agency ID/Code; and
- 10) Equipment status code.

The RZC's vehicle sequencing logic shall be self-correcting and correlated with the toll zone sequencing logic. The RZC shall record all transponders ID numbers that are read by the ETC subsystem.

The RZC shall be able to operate normally without network communications, albeit a stale tag status list, storing current records, messages, events and summaries for later transmission to the TDC. RZC shall include a portable hard drive to manually transfer data to and from the TDC.

6.2.3.2.1 Equipment Monitoring and Control

The TZC and RZC shall monitor the following peripheral equipment through real-time digital I/O or serial data connections:

- 1) Vehicle detector equipment;
- 2) FasTrak® ETC reader;
- 3) Transaction indicator lights;
- 4) Image Processor (TZC only);and
- 5) UPS.

The system monitoring functionality shall include the ability to receive maintenance status messages from ETC and license plate image capture subsystems, as applicable, and it shall incorporate logical processes, local to the toll and read zone controllers, which evaluate operations and create maintenance codes and alarms based upon sets of rules and expected results.



The maintenance codes that are generated by the toll and read zone controllers shall be sent to MOMS which executes on the TDC.

MOMS shall be responsible for compiling raw maintenance data into a database and building maintenance alarms and detailed work orders that translates codes to actual maintenance events that are dispatched via text messaging to technicians. Technicians shall be able to remotely access the System to retrieve assigned work orders.

Communication equipment installed at each zone shall support SNMP protocol and execute MIB script needed to function as an agent.

6.2.3.3 Zone Controller Data and File Transmission

The TZC and RZC shall be connected to the TDC through a combination of wireless communication and a local exchange carrier (e.g. T1) connection and transmit files to the TDC server in near real-time.

The TZC and RZC shall transmit traffic summaries, FasTrak[®] and violation transaction records and maintenance data.

The TZC and RZC shall receive, at a minimum, daily FasTrak[®] tag status list and update files as well as system configuration files and time synchronization periodically.

The TZC and RZC serial ports shall support RS-232 and RS-422. Serial communications interfaces shall provide for error detection protocols.

6.2.4 Zone Controller Equipment Requirements

Under normal conditions, the TZC and RZC shall operate continuously in an automated fashion without intervention from operational personnel.

All ETS functions, including but not limited to, transponder ID and location validation, transaction assembly, equipment status monitoring and file transmission shall be designed to function independent of human interaction.

The TZC and RZC shall consist of environmentally hardened components and installed in a Caltrans 334 standard cabinet (by others), which provides an environmentally protected and controlled enclosure to operate under the weather conditions found in the Bay Area.

The TZC and RZC electronics design shall support discrete input and output signal lines and use optical isolation circuitry for protection.

The TZC and RZC shall store data redundantly.



The TZC and RZC shall support a local user interface for maintenance and system administration purposes.

The TZC and RZC data storage process shall be based on First in First out (FIFO) technology. The TZC and RZC performance shall be capable of fully processing 2,500 vehicles per lane per hour, resulting in transmission of a complete transaction record to the TDC with 99% of these vehicles having an active FasTrak[®] transponder.

For any 10 second period, the TZC and RZC shall be capable of handling all EC processes for transponder vehicle passage rates of 3,200 vehicles per lane per hour, assuming that all vehicles have transponders.

The TZC and RZC shall capture transponder reads for 99.95% of the vehicles with properly mounted Title 21 compliant transponders passing through the toll and read zone.

6.2.4.1 Zone Controller Operating System

The TZC and RZC Operating System (OS) shall support all of the operations of the toll and read zone subsystems while meeting the requirements stated in this RFP.

The TZC and RZC OS shall function in such a way that it allows for the real-time collection and transmission of data across a combined wireless communication and local exchange carrier network that shall also supports remote, real-time user connections (for maintenance purposes).

The TZC and RZC shall support TCP/IP network protocol and TCP utilities such as Simple Network Management Protocol (SNMP), telnet, and ping.

The OS memory management shall support downloading and scanning a tag status file containing 5 million transponders.

6.2.4.2 Zone Controller Interface to the Toll Data Center

Each TZC and RZC shall maintain a real-time interface with the TDC. This interface shall allow for the transmission and reception, in near real-time, of any data collected and assembled at a zone controller and any data compiled at the TDC which is necessary for toll and read zone subsystem operations.

The TZC and RZC to TDC interface shall be fully automated and not require human intervention.

The TZC and RZC shall broadcast lane events in near real-time to the TDC to support the monitoring activities carried out by operations or maintenance personnel.

The TZC and RZC shall transmit a periodic heartbeat, or the zone controllers shall execute a watchdog timer process with the TDC to quickly identify failed communications.



If communication between a toll and read zone controller and the TDC fails, the TZC and RZC shall periodically and automatically attempt to re-establish the connection until a connection is made.

The TZC and RZC shall periodically (at least daily) receive tag status files from the TDC. The TDC shall receive the tag status files from the BATA RCSC. Upon receiving tag status files from the TDC, the TZC and RZC software shall subject the file to various sanity checks to ensure that the file is valid prior to writing the new data file into its static memory. Typical sanity checks would include checking the file type, the file size, the file header and footer data, etc.

The TZC and RZC shall acknowledge TDC-initiated command execution.

6.2.4.3 Toll Zone Controller License Plate Image Capture Subsystem Interface

TZC interface to the license plate image capture processor shall include a means of detecting equipment (e.g., processor, camera, light) status changes affecting image quality and the capture and processing of license plate images for unauthorized vehicles.

6.2.4.4 Zone Controller Interface to the Vehicle Detection Systems

A standard compliant device meeting the requirements stated in this RFP shall convert opto-isolated digital I/O connections of the zone controller vehicle detectors to a serial data input to the zone controllers.

The vehicle detector data input to the zone controllers shall consist of raw vehicle speed, occupancy and volume collected in the EC by means of in-pavement detectors.

Vehicle presence data provided by the RZC and TCZ vehicle detectors may be used to trigger the license plate image capture subsystem for each unauthorized vehicle passing through the lane.

6.2.4.5 Zone Controller Interface to the FasTrak[®] Reader

The interface between the TZC and RZC and the FasTrak[®] reader shall be in real-time and not encumbered by latency.

A full duplex interface shall allow for the exchange of toll and read zone controller commands and FasTrak[®] system transponder data. The necessity of the accurate and timely exchange of data between the two subsystems is essential to successful ETS operations, including timely notification of a user's declared status to on-site CHP officers. The "personality" of the reader shall be configurable from the TDC, a local portable computer and remotely by authorized user using secure encrypted data.



6.2.4.6 Zone Controller Connection to the Transaction Indicator Lights

The toll and read zone controller shall send a digital I/O signal to the toll zone transaction indicator lights based on the position of the FasTrak[®] transponder' (SOV/HOV) switch at the time a vehicle is detected and processed. Amber lights shall be illuminated when an HOV patron is confirmed by the zone controller. A green light shall be illuminated when a SOV patron is confirmed by the zone controller. Patrons using a standard FasTrak[®] transponder will always be recorded as an SOV transaction and a green light will illuminate. No lights will be illuminated for vehicles for which the following applies 1) improperly mounted transponder, 2) an invalid transponder, or 3) no transponder when traversing the toll and read zone.

6.2.4.7 Uninterruptible Power Supply

The UPS shall support an intelligent interface for monitoring battery status and sending alarms when utility service is automatically or manually converted to battery power. The TZC and RZC shall interface directly to an Uninterruptible Power Supply's (UPS) smart module to monitor the status of the battery back-up, particularly during a utility electrical service outage.

The use of UPS equipment shall ensure that the TZC and RZC software is shut down in an orderly fashion if utility electrical service is not restored prior to expiration of the UPS run time.

In addition, the UPS smart module communication with MOMS shall support SNMP and traps to function as a MIB agent to identify different state changes.

6.2.5 Vehicle Detection Subsystem

The primary functions of EC VDS equipment shall be to accurately, and in near real-time, detect vehicles in the EC and a very limited portion of the GP Lanes to calculate traffic volume, occupancy and speed for use by the TDC in a dynamic pricing module.

The System Integrator shall be responsible for the design, procurement and installation of VDS controller, vehicle detector units (i.e., amplifier) and associated equipment in a Caltrans 334 standard cabinet. This cabinet along with its foundation, 2" diameter conduit to the pole or structure supporting wireless communication and pull boxes and stub-ups at both ends of the conduit will be furnished and installed by others. The System Integrator shall review the civil package construction drawings and identify anything that could affect the installation and performance of the VDS equipment. The System Integrator shall furnish and install conduit, wires and cables, electrical supply terminations, circuit protection and distribution, connections to both the utility company's electrical source and the wireless communications system, and all necessary miscellaneous items to provide a fully operational vehicle detection subsystem at the locations shown on the civil package construction drawings.

A total of ten (10) VDS subsystems with dual wireless magnetic sensors shall be installed along the EC and two (2) subsystems shall be installed in the adjacent GP lane between the pricing sign and EC ingress (for each direction of travel) as shown on the drawings. The intent of the VDS subsystem layout is for VDS serving traffic in opposite directions to share wireless



communication equipment mounted to new structure or pole installed by others in proximity to both VDS cabinets.

6.2.5.1 Vehicle Detectors

Wireless magnetic sensors using an advanced packet radio technology shall be installed in the EC Lanes at the locations identified on the civil package construction drawings, which shall be converted to as-built drawings by the System Integrator. Final location of each sensor will be subject to the approval of the designated *VTA* representative and the Engineer. Installation of the vehicle detection sensors shall comply with Caltrans standard specifications and plans.

Wireless magnetic sensors shall be capable of automatically detecting and measuring the speed and density of vehicles traveling at speeds ranging between 5 and 100 mph. These sensors shall have an operating life of at least 10 years. Detector accuracy shall comply with Caltrans requirements and equal or exceed the performance of a Caltrans standard compliant loop detector.

Each VDS controller shall communicate with the dual wireless sensors via the manufacturer's access module and provide near real-time traffic data to the TDC for input to the dynamic pricing module.

6.2.6 Pricing Signs

6.2.6.1 Pricing Sign Functions

A pricing sign shall be located approximately 1/4-mile upstream of the SR 237 entry point and 1/2-mile upstream of the I-880 entry point to the EC. The pricing sign shall be the primary method of informing the public of the current Single Occupant Vehicle (SOV) price to use the EC.

A pricing sign controller shall energize the Light Emitting Diodes (LEDs) module(s), comprising a full matrix display panel installed in a pricing sign cutout. The pricing sign consists of a static, fixed panel sign with display modules inserted in the cutout. The energized LEDs shall display either a price or a message and the controller shall acknowledge all TDC commands that the requested message was received and properly displayed.

The pricing sign controller shall be polled by the TDC at regular intervals (at least every 60 seconds) to monitor the operating state of the display panel electronics and return a status message. The pricing sign controller shall be capable of reporting to the TDC the displayed message by interrogating the display module sign pixels.

In addition to the display panel inserted in a pricing sign cutout, a full matrix display panel matching the width of the fixed panel sign shall be installed below and abut the fixed panel sign. This display panel shall display messages related to the current operation of the EC.

All full matrix display panels shall be sized to display a single line of 18 inch characters.



6.2.6.2 Pricing Sign Equipment

The static fixed panel portion of the pricing sign shall be consistent with the Caltrans approved signage program.

The pricing sign shall include both static and dynamic portions.

The EC pricing sign shall combine a static sign information panel using 3M reflective sheeting or an approved equal with LED modules used to primarily display variable prices. The display panel inserted into the static sign panel cutout shall be capable of forming at least 8 alpha numeric characters 18 inches in height.

The static portion of the pricing sign, which will be provided by others, shall show permanent information (i.e. the facility type, downstream destination, and allowed vehicles). The display panel mounted below the static sign shall display information such as HOV eligibility requirements, FasTrak[®] not needed, HOV only, Closed, remaining time before opening and closing and facility operating hours,. The System Integrator shall be responsible for furnishing and installing a LED display panel in the static sign cutout and a LED display panel mounted below and abutting the static sign.

Each display panel shall include at least two photocells to measure ambient light and adjust the intensity of the LEDs to maximize visibility and clarity under all light conditions (full sun to full dark). The LED color shall be amber.

Each pricing sign display panel shall include a sign controller which will be mounted to the sign.

Communication between a pricing sign controller and the TDC shall comply with the National Transportation Communications for ITS Protocol (NTCIP) standard sets over the combined wireless communication network, local exchange carrier leased lines and *VTA* fiber backbone.

Each pricing sign controller shall have a unique IP address that identifies its location.

Cantilever sign structures and foundations will be furnished and installed by others at the locations described in this RFP and shown on the civil package construction drawings.

6.2.7 Fixed Message Blank Out Sign

A fixed message blank out sign shall be furnished and installed to inform SOV users to exit the EC facility during the operating hours of the interconnecting HOV lanes on SR 237 and I-880.

The blank out sign shall comply with the following:

1. Support activation and deactivation by contact closure or serial communication with embedded controller,
2. Aluminum sign enclosure,
3. Manufactured with non-corrosive exposed components,
4. Display a single message when activated,



5. Character height of 18 inches,
6. Message visibility of at least 700 feet under all ambient lighting and weather conditions,
7. Compliant with MUTCD – 2009
8. Capable of operating in temperatures ranging from 20°F to 120 °F and humidity ranging from 5% to 95%, non-condensing
9. Maximum power consumption of 100 watts a 120 VAC.

The fixed message blank out sign shall be installed to the mast arm on the back side of an overhead cantilever sign structure installed by others and shown on the civil package construction drawings. Corrosion-protected mounting brackets or other structural members shall be furnished and installed to mount the sign to the mast arm. Sign fastening shall allow the sign to be removed and replaced within 30 minutes by two technicians. Electrical service (i.e., 120 VAC) will be provided by others and be available at the base of each designated structure. The sign shall be hardwired to the pricing sign serving the opposite direction of travel. A minimum 1” diameter PVC schedule 40 conduit shall be pulled, trenched or bored, as required, to interconnect the fixed message blank out sign and the pricing sign controller. An activation signal shall be sent to the fixed message blank out sign when the pricing display module receives a command to display any price other than \$0.00. The sign shall remain activated until a deactivation signal is sent to the fixed message blank out sign when the pricing display module receives a command to display \$0.00.

The fixed message blank out sign shall be sized to display the preliminary message, “NON-HOV MUST EXIT AHEAD”, which shall be finalized during the design phase.

6.2.8 Closed Circuit TV Subsystem

Closed Circuit Television (CCTV) camera systems shall be deployed approximately 60 feet from each pricing sign, in the direction away from the SR 237/I-880 Interchange, to confirm the displayed price and monitor traffic conditions along the EC, CCTV cameras shall also be used to assist Caltrans staff in detecting incidents and lane blockage and to track the progress of incident response and vehicle clearance. Video from the CCTV cameras shall be sent via the wireless communication network to the Cerone facility for recording and playback as needed.

VTA staff located at the Cerone facility shall have control over the pan, tilt and zoom camera features for the two cameras installed within the Project Limits.

The System Integrator shall be responsible for the design, procurement and installation of the CCTV equipment, pole mounted enclosures and, conduit (interior or exterior to the pole only), wires and cables, grounding, electrical and communication source connections, and all the necessary miscellaneous items to provide two fully operational CCTV systems, including maintenance of traffic plans.

6.2.9 CCTV Camera Locations

The CCTV cameras shall be installed at the locations shown on the civil package construction drawings.



6.2.9.1 CCTV Subsystem Requirements

The CCTV subsystems shall include the following components:

- 1) CCTV camera, in a dome configuration;
- 2) Pole-mounted enclosure;
- 3) Grounding and lightning protection devices; and
- 4) Video, electrical and communication components, conduit, wires and cables.

The CCTV camera shall support Ethernet-based communications and TCP/IP and SNMP protocols and include a RJ-45 port.

6.2.9.2 Camera Assembly

Each camera assembly shall be an Axis Q6032-E PTZ Dome consisting of the following fully integrated components:

- 1) Solid state progressive scan camera;
- 2) Electronic image stabilization;
- 3) Multiple, individually configurable H.264(MPEG-4) and Motion JPEG video streams;
- 4) Local storage with a built-in SD/SDHC memory card slot;
- 5) High power over Ethernet (PoE), max. 50 W;
- 6) Temperature operating range of -40°C to 50°C (-40°F to 122°F);
- 7) Weatherproof camera housing; and
- 8) Pan and tilt assembly;

The camera assemblies shall be assembled and tested to verify compliance with these specifications prior to delivery to the *VTA*. Factory testing documentation shall be furnished to the *VTA*. Camera assemblies shall be furnished as a complete unit.

Individual components of the camera assembly shall conform to the specifications in the following sections.

6.2.9.3 Solid State Color Camera

Solid state charged-coupled device (CCD) progressive scan cameras shall be provided, which shall meet or exceed the requirements presented in Table 4 below.

Color System/Signal Format	Phase Alteration Line (PAL) standard
Image Sensor	1/4" ExView HAD Progressive Scan CCD
Resolution	NTSC: 704x480 to 176x120,
Minimum Illumination	Color: 0.5 lux at 30 IRE; Mono: 0.008 lux at 30 IRE
Day/Night Switchover	Day (color) / night (mono), Selectable manual /auto
On-screen ID	Presets, Sectors and programmable alarms



	(enable/disable)
Memory	128 MB RAM, 128 MB Flash

Table 4 – Solid State Color Camera Requirements

The camera shall be specifically designed to operate under low light conditions and shall function satisfactorily over a wide range of dynamic lighting conditions ranging from low light to full sunlight. To improve sensitivity under low light conditions, the camera may switch from full color to monochrome operation.

6.2.9.4 Zoom Lens

The camera lens shall be a motorized zoom lens that meets or exceeds the requirements that are presented below in Table 5.

Optical Zoom Range	Integral 35X optical
Digital Zoom range	1X through 12X digital
Auto focus	Selectable Auto/Manual

Table 5 – Camera Lens Requirements

6.2.9.5 Waterproof Camera Enclosure

The cameras shall be furnished in waterproof enclosures. The enclosures shall be designed to ensure that the complete CCTV camera assembly operates satisfactorily and in compliance with the specifications in the meteorological and ambient conditions prevailing in the San Francisco Bay Area in general and the East Bay in particular.

The enclosure shall be weatherproofed and sealed. The enclosure shall protect against water, grime, dirt, sand and moisture.

6.2.9.6 Pan and Tilt

The camera assembly shall include remote controlled pan and tilt functions that, at a minimum, meet the minimum requirements as stated below in Table 6.



Pan	360 degrees, continuous pan
Tilt	0 –220 degrees, Auto flip (E-flip) at 90 degrees
Presets	64
Preset speed	0.05° – 450°/second (pan and tilt)
Tours	8, each of 32 presets with dwell time per preset per tour
Sectors	16
Privacy Zones	8 programmable zones can be set for video blanking
Digital position feedback	Yes

Table 6 – Camera Assembly Requirements

6.2.9.7 Camera Mounting Assembly

The cameras shall be installed on poles furnished and installed by others. The System Integrator shall furnish and install all necessary manufacturer recommended components and fittings for mounting the camera assembly onto the CCTV poles. The mounting shall support the weight of the camera assembly and be capable of withstanding winds with no appreciable movement for Caltrans specified wind design speed for pole mounted CCTV camera domes.

6.2.9.8 Pole Mounting Brackets

Axis T91A67 pole mount brackets shall be used to mount the specified Axis dome cameras to the CCTV poles. Stainless steel straps shall be used to attach the bracket to the pole using a strapping tool specifically designed and manufactured for this purpose.

6.2.9.9 Camera Cable

The Axis PTZ Dome Camera communication and power cable shall be connectorized using Axis part number 35899-0906 for the model Q6032 camera. This connector shall allow insertion of a RJ-45 connector supporting Ethernet communication and power over Ethernet (PoE). A hole shall be bored in the CCTV pole, fitted with a grommet, and the cable routed down the pole to a pole mounted enclosure. A hole shall be bored in the CCTV pole and enclosure wall, the openings fitted with grommets, and the cable routed inside the enclosure for connection to a switch after separating power from the communication link. .

6.2.9.10 CCTV Enclosure

A CCTV enclosure shall be mounted to the pole to house a switch, CCTV power on Ethernet adapter/converter, data surge suppressor, transformer, copper bus and ground bar, electrical terminal block, and line circuit protection. This aluminum enclosure shall have a NEMA 3R



rating, include a mounting backplane, and installed at a height that is accessible from ground level.

6.2.9.11 CCTV Communications Equipment

The System Integrator shall furnish and install a minimum 6 port environmentally hardened switch supporting 10/100BASE-T Ethernet communications in the CCTV enclosure. The CCTV camera will connect to the EC wireless communication system through this switch. A wireless communication transceiver shall be installed on each CCTV pole at a height and location that achieves line-of-sight and maximizes the reliability of the communication system. The switch shall uplink to this wireless transceiver to send video to the Cerone Facility where it shall be processed and stored by a network video server/recorder.

6.2.9.12 CCTV Video Processing and Storage

A network video server/recorder shall be furnished and installed at a designated location within the Cerone facility to store the CCTV video from the two (2) CCTV cameras installed under this contract. This server/recorder shall be a HP ProLiant ML370 G6 E5502 2.66GHz Quad Core SFF High Performance Tower Server (Part Number 483879-B21). This server shall be furnished with 2 TB of video storage, expandable to 8 TB. A 22" flat screen monitor, keyboard, and mouse shall be furnished to select, control and monitor real time video and retrieve and view stored video based on user selectable retrieval parameters. A video splitter shall be furnished and installed to allow viewing video from the two EC cameras simultaneously. The server /recorder shall be capable to storing either full motion or time lapse video based on a user selectable parameter. The video server shall include a titling capability to overwrite incoming video with time, date and location before storing the digital video data. Configurable camera features and parameters described in these technical requirements shall be settable from this server. This server shall be accessible from authorized *VTA* workstations to review stored video based on a selectable location, date and specific time periods. Access to the video server shall be limited to authorized users identified by user ID and password. The System shall be able to limit access to functions, such as setting and changing selectable parameters, video retrieval and other functions based on both individually assigned privileges and privileges tied to a job position.

A UPS shall be furnished and installed to condition and filter incoming 120/240 VAC utility electrical service and provide a 30 minute runtime with all components of the video server/recorder operating at full load. The UPS shall include a smart module that communicates all UPS status changes (e.g., electric service to battery backup) and status conditions periodically, such as percent battery capacity remaining and disconnected battery backup, to the MOMS.

6.2.9.13 CCTV Testing

The System Integrator shall locally test and demonstrate user control, performance and image quality of video from the installed cameras. CCTV camera system components shall be set and configured by the System Integrator using the network video server/recorder software and expected change in functionality, performance or operations shall be verified by demonstration. All testing shall be coordinated with the Agency Engineer or representative.



The System Integrator shall prepare and submit test procedures at least three weeks prior to the scheduled field testing. Proposed testing shall include the following:

- 1) Inspect the continuity and resistance of ground and surge suppression devices;
- 2) Measure power supply voltages and connected loads at camera cabinet;
- 3) Confirm continuity across connections and inspect all terminations;
- 4) Measure and compare digital video output to specified output. Verify quality of video image and compliance with NTSC standards at the camera site;
- 5) Demonstrate camera sensitivity at low light levels to meet the manufacturer's related performance specifications;
- 6) Demonstrate the camera's image stabilization capability by viewing video output under high winds or a large, loaded tractor trailer passing adjacent to the camera at a speed exceeding the posted speed limit.
- 7) Confirm and certify the operation of heater and fan for the installed dome camera system whenever temperature and condensation would affect the operation or performance of the dome camera system output.
- 8) Using a portable computer loaded with camera control software, demonstrate pan, tilt, zoom, focus, iris opening, manual iris control selection and operation, preset positioning, and power on/off functions;
- 9) Demonstrate the pan/tilt speed and full range of movement to meet the manufacturer's applicable specifications;

Results of the field test shall be documented and include in a detailed report submitted to the Engineer or representative. Any equipment or component found to be defective or degraded during testing shall be replaced and retested. This shall be repeated until the specified performance is demonstrated.

The System Integrator shall submit a detailed system acceptance test plan to the Engineer or representative for review and approval two weeks before the proposed start of testing. Video quality will be accepted by the Agency as viewed from the Caltrans TMC and the TDC prior to final acceptance.

The System Integrator acceptance test plan shall at a minimum consider the following:

- 1) System Acceptance will be based on the clarity and resolution of the video output at the Cerone facility under sunny, overcast and low light conditions by locating test vehicles at



pre-established distances from the camera. Video quality shall at least be equal to the clarity and resolution provided by existing cameras at the Caltrans TMC of the same type under the same lighting and distance when viewed side by side at the TMC using recorded video.

- 2) A minimum of ten (10) presets shall be configured and demonstrated from the network video server/recorder. The optimum view of each pricing sign from the nearest CCTV camera shall be established during testing and assigned the first preset position.
- 3) Control of a full range of pan, tilt and zoom camera movements from the network video server/recorder shall be demonstrated with video displayed on a monitor.
- 4) Control of all other non-PTZ camera changeable functions as stated herein or contained in the manufacturer's product literature for the required dome PTZ camera from the network video server/recorder shall be verified by demonstration and inspection.

6.3 ENFORCEMENT EQUIPMENT REQUIREMENTS

In order to manage the traffic in the EC using dynamic pricing, careful and efficient system enforcement is essential. Uncontrolled use of the EC by unauthorized vehicles will cause overcrowding, disproportionately burdening paying SOV users with higher prices, and jeopardizing the success of the project.

The EC enforcement process will include visual monitoring to determine how many occupants are in the vehicles that are traveling in the EC. Visual enforcement will primarily be performed by CHP officers watching for an amber transaction indicator light indicating the user is either an HOV or a violator and then observing vehicle occupancy as the user passes to confirm HOV eligibility. If CHP officer observes the vehicle occupancy to be ineligible for HOV status, the officer will pursue these vehicles from the observation area. Designated observation areas shown on the civil package construction drawings will be used by the CHP officers to observe passing vehicles for occupancy violations,.

Access to the EC will be prohibited by means of a buffer consisting of triple painted lines (one solid white line and double solid yellow lines) wherever access from the adjacent GP lane is possible. On-site CHP officers will pursue vehicles that enter the EC facility by crossing the buffer instead of accessing the facility at locations designated by broken or skip line striping. All other traffic violations will be enforced by the CHP in the EC corridor, including speeding, seat belt violations, erratic and reckless driving,

6.3.1 On-site CHP Enforcement Tools

The CHP will make use of the following two (2) enforcement tools, which will be provided to them and be maintained by the System Integrator pursuant to the Contract:

- 1) Portable Reader; and
- 2) Toll and Read Zone Transaction Indicator Lights.



6.3.1.1 Portable Reader

A portable reader shall be provided for use by CHP officers patrolling in a cruiser or motorcycle to confirm, after stopping a prospective violator, the transponder status. For future switchable transponders only, the portable reader shall display information for the last three transactions recorded and written to the transponder. The officer will also be able to verify the transponder audible beep is functioning, thereby confirming the user was given the opportunity to set the transponder switch to the correct position based on occupancy prior to passing the toll zone. (Note: Assumes an EC configuration with the read zone preceding the toll zone in both directions).

6.3.1.2 Portable Reader Primary Functions

The portable reader shall provide the following functions:

- 1) Capable of downloading a tag status list and updates along with an exception list of lost and stolen transponders;
- 2) Capable of reading a FasTrak® transponder ID number, validating the ID number on the current stored tag status list and its current status, and displaying the result;
- 3) For future switchable transponders only, capable of reading and displaying the current transponder type that results in an audible sound from the transponder corresponding to the displayed transponder type;
- 4) For future switchable transponders only, capable of querying and displaying the agency ID, time, date and reader location code for up to three of the last EC transactions written to reserved fields in the transponder's internal memory for use in determining if an occupancy violation was committed based on the transponder type recorded on previous reads; and
- 5) Portable reader's interface with FasTrak® transponders shall comply with the original Title-21 protocol and modifications related to a future switchable transponder, to the extent this information is available prior to when the portable reader is procured..

6.3.1.3 Portable Reader Requirements

The portable reader shall meet the following requirements:

- 1) Read and display the transponder ID number from all FasTrak® transponders and the transponder type (i.e., SOV, HOV) from all switchable transponders within a distance of 10' when manually triggered when this transponder is available from the BATA RCSC,
- 2) Contain an integrated processor, reader, antenna and a communication transceiver that allows it to operate as a wireless device under Part 15 of the FCC,
- 3) Once a transponder ID number, and transponder type as and when applicable, is read the software resident on the reader shall cross reference the ID number with a stored tag status file to determine if there is a match and display the account status (e.g., active, inactive, good, bad),
- 4) Capable of downloading the current tag status file by wireless communication (e.g., WiMax, cellular) and by placing the device on a communication shelf or connecting to a docking station,



- 5) Weatherproof, ruggedized to withstand the environmental conditions indigenous to northern California, and of a size consistent with handheld operation and carrying on a motorcycle.
- 6) Manufactured using a non-corrosive housing material, and
- 7) Include a built-in LCD display measuring at least three and one-half (3.5) inches diagonally and visible under direct sunlight.

6.3.1.4 Toll and Read Zone Transaction Indicator Light

Transaction indicator lights shall be furnished and installed at the toll and read zones to provide a visual indication to CHP officers parked in a designated observation area downstream of the lights of the declared status of each EC users. LED lights adjustable in both horizontal and vertical planes shall be provided. Configuration of lights at each designated location shall be two adjacent lights, one with green LEDs for indicating a SOV transaction and another with amber LEDs for indicating HOV and violation transactions installed at a height not exceeding 10 feet and a single amber light mounted to the mast arm of the zone structure. The two adjacent lights shall be mounted to a short horizontal structural member attached to the zone “T” structure. Each light shall be controlled from the zone controller. For authorized SOV users, the single green LED light will be activated depending on the status of transponder read by the zone controller. The two adjacent LED lights shall be clearly visible in a parked CHP officer’s rear view mirror when stationed approximately 100 to 200 feet downstream from this structure. The zone controller software shall include a configurable parameter that establishes whether the amber light activates based on a transaction record without a transponder ID number or a declared HOV status based on the position of a future switch on the transponder. The System implementation contemplated by this RFP requires the parameter to be set to the former state.

The duration of a light activation shall be configurable with a default value of 1.5 seconds. Under normal operating conditions, the intent is for a CHP officer to monitor the amber light color corresponding to a HOV or violator and carefully inspect the number of occupants in the passing vehicle to confirm compliance with the occupancy requirement. SOV user violations (i.e., no valid FasTrak[®] transponder or improperly mounted transponder) can be monitored by the transaction indicator light and pursued to confirm a violation.,

Transaction indicator lights will be mounted to both northbound and south bound sides of the toll zone “T” structure on I-880 to service on-site CHP enforcement in both directions of travel. Transaction indicator lights will only be installed to monitor westbound traffic on SR 237. An observation area is planned to be installed in the gore area formed by the WB on-ramp at McCarthy Blvd and the SR 237 mainline. The amber LED transaction indicator light mounted to the “T” structure mast arm shall be oriented to be clearly visible from this gore observation area.

Figure 3 depicts a conceptual configuration/layout of the transaction indicator lights at the Toll zone.

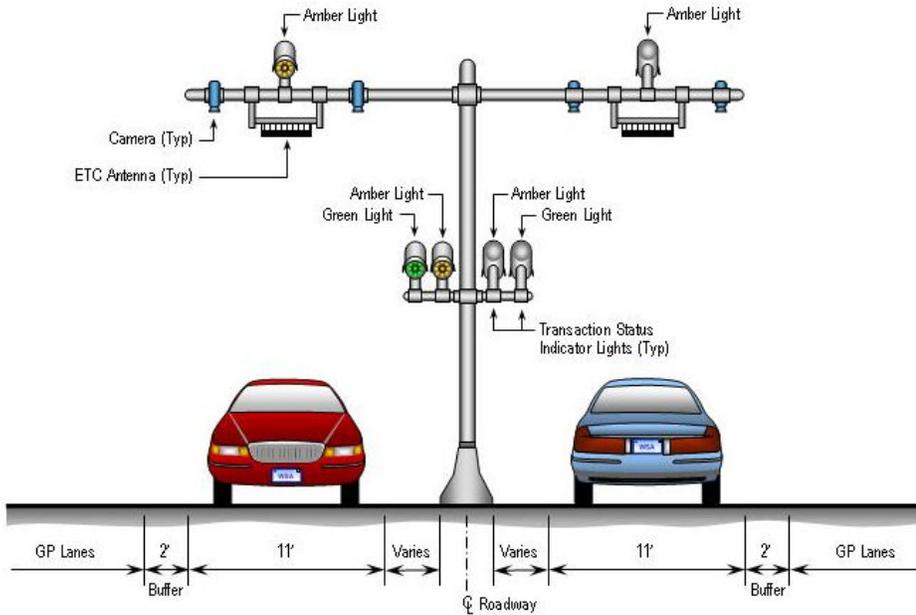


Figure 3 – Toll Zone Transaction Indicator Light Configuration

6.3.2 Automated Enforcement Equipment

Although it is the intent of *VTA* to implement a System that requires HOV users to obtain a switchable transponder to declare either a HOV and SOV status, unresolved policy issues necessitates deferral of the procurement of automated enforcement equipment. The zone controllers and portable reader shall include the functionality to support the future implementation of a license plate image capture subsystem meeting the requirements specified herein. The license plate image capture subsystem shall be offered and priced as an option under the terms and conditions of the Contract documents.

The System Integrator shall furnish and install all components of a license plate image capture subsystem at the toll zone located on I-880 for automated enforcement of both directions of travel. All equipment, supplies, and materials for this license plate image capture subsystem shall be new, unused, COTS, field proven items, of the latest model and technology when installed.

The work under this section shall include all labor, materials, licenses, and support services to complete the design, development, documentation, installation, integration, testing, and acceptance of the hardware and software for the license plate image capture subsystem. The license plate image capture subsystem shall process all violation transaction records in real-time.



6.3.3 License Plate Image Capture Subsystem

The license plate image capture subsystem shall include, but not be limited to, cameras and associated optical devices, supplemental lighting, trigger detectors, interfaces, enclosures, wires, conduits, mounting hardware, lightning protection, and grounding, necessary to detect the vehicle position, capture image(s) of the vehicle's rear license plate when triggered, and transmit it to the TDC for storage. The trigger detector can share the output from the vehicle detector installed to frame the transaction and collect traffic data. Stored images shall be periodically transmitted to BATA RCSC for processing based on the *VTA* established business rules. The license plate image(s) associated with a particular vehicle shall be linked to the violation transaction record built when a transponder ID is not read at the toll zone. This link will be used by the existing RCSC violation processing subsystem to convert it to a SOV or HOV transaction record if the extracted license plate matches an existing FasTrak[®] account holder. In the case of a switchable transponder, the BATA RCSC will use the same transponder type recorded for the last transaction posted to the account. The System Integrator shall coordinate with the BATA RCSC Service Provider to modify an existing Interface Control Document (ICD) to eliminate or minimize the need for any new data element required to implant the EC ETS.

The license plate image capture subsystem shall require no operator intervention after initial configuration and performance tests (e.g., camera field of view and shutter speed). Continuous supplement lighting shall be used by this subsystem to assure consistent license plate image quality needed to achieve maximum OCR extraction.

6.3.3.1 Image Capture Equipment

License plate image capture subsystem components shall be installed to capture rear license plate image(s) for vehicles traveling in a toll zone lane and at least two feet onto the shoulders or buffer. The license plate image capture subsystem components shall include high resolution cameras with an environmentally protected enclosure, surge suppressors, grounding, trigger, supplemental lighting, wires, cables and connectors, communication transmission equipment, transformer, image processing software and hardware, mounting hardware, and components. The license plate image capture subsystem shall capture, store and forward digital images of vehicle rear license plates. The Subsystem shall capture the quantity of images needed to meet the specified performance requirements. The System Integrator shall design this subsystem to minimize bandwidth demand using techniques such as compression of images with successful OCR and transmission scheduling, subject to meeting the performance requirements.

An image processor shall provide an automatic license plate reading (ALPR) capability that processes images to extract the plate number and jurisdiction and writes the plate number to the violation file.

A maintenance code shall be written to all violation transaction records for lanes operating with defective, degraded or failed equipment. This code shall be recognized by MOMS and used to generate a work order and dispatch a technician to resolve the problem.

The license plate image capture subsystem shall include the equipment described below.



1) **Image Processor**

- a. An image processor shall be provided to receive, process, and store data and images sent from connected cameras or from the toll zone controllers. It may be an component of the toll zone controller or a separate standalone controller.
- b. The image processor shall include an OCR software application to extract characters from captured images and write to a file before storing and forwarding to the TDC.
- c. The image processor shall be located within the roadside cabinet at the I-880 toll zone and share the zone controller UPS.
- d. The image processor shall include lightning protection consistent with its exposed risk (e.g., copper vs. fiber optic cable)
- e. The OCR process shall produce both plate number and jurisdiction of issue for all types of license plates, including motorcycle, light truck and bus plates.
- f. The image processor shall communicate directly with the zone controller and receive all or a portion of the violation transaction record for writing to the header of the license plate image(s) associated with the violation.
- g. The image processor shall execute a watchdog timer to monitor the status of the zone controller that uses a real-time clock alarm function capable of automatically triggering a hardware reset process on the image processor to identify failed communications.
- h. The image processor shall support a configurable parameter that enables default rear license plate image capture of all triggered vehicles when communication with the zone controller is lost.
- i. The image processor shall be capable of monitoring the status of connected cameras and report failures to the TDC MOMS functionality in a timely manner.
- j. The image processor shall be capable of detecting degraded image quality due to a loss of supplemental lighting and reporting this degradation to the TDC MOMS functionality in a timely manner.
- k. The image processor shall be capable of a graceful/safe shutdown and re-start process under all failure conditions.
- l. The image processor shall be capable of error logging and shall contain diagnostic software to report errors and failures to the TDC MOMS functionality in a timely manner.
- m. The TDC shall synchronize the image processor's real time clock.
- n. The image processor shall be capable of storing (buffer) an average of 48 hours of violation data at each toll zone (license plate images and associated transaction data) in the event that the communication link with the TDC fails;
- o. The image processor shall be capable of accurately extracting all license plate characters from 85% of all legible, undamaged and non-blocked rear license plates using OCR.
- p. The image processor shall be capable of capturing a human readable rear license plate image for 95% of all legible, undamaged and non-blocked plates.
- q. Exceptions for out-of-plane plate mounting will be limited to a maximum of 2% of any given EC sample size of live traffic.



- r. The OCR process shall be capable of reading plate fonts for plates issued by California and by its contiguous neighbor states.

2) Cameras

The quantity of cameras provided, camera orientation, and camera resolution shall be sufficient to support a 15 foot wide by 4 foot high field of view at the image capture focal point with the pixelation needed to meet the OCR performance requirements. Camera enclosure and cabling shall be designed to meet Caltrans environmental requirements for roadway surveillance cameras. Camera enclosure shall be designed for quick removal and replacement from/to the mounting hardware and shall include a quick disconnect for both power and communication connections. Surge suppressor shall be installed at both ends of all copper wires and cables routed between the camera and the image processor. Each camera shall be a high resolution, progressive scan digital camera that is installed to capture license plate images for at least one operating U.S. agency in a tolling environment. This camera shall include optical components (e.g., lens, filter) necessary to meet the specified performance requirements. The camera shutter speed shall be optimized for vehicle speeds of 50 – 75 mph. The camera shall be capable of autofocus, pixel isolation/control and include anti-blooming technology.

For implementations involving multiple cameras per zone, full-plate image for each violation shall be maximized by sufficiently overlapping adjacent camera field of view and that image sets from both of two adjacent cameras are captured whenever the vehicle position is significantly within each field of view. The toll zone captured rear license plate images for which OCR is not successful shall be processed, stored and forwarded by the image processor in an uncompressed digital or “lossless” compression format. All other captured digital license plate images may be compressed prior to sending to the TDC.

3) Trigger

A reliable and accurate means of triggering the capture of vehicle rear license plate images shall be provided. Although the preferred image capture trigger is a wireless magnetic sensor to minimize Project spare parts and maximize technician familiarity, the System Integrator shall furnish and install a trigger that in conjunction with other components of the license plate image capture subsystem, achieves the specified capture accuracy and OCR extraction performance requirements. The trigger shall be available and operating accurately 99% of the time. The selected trigger detector shall be capable of supporting the capture of license plate images for vehicles traveling at speed ranging from 0 to 100 mph. This detector shall trigger for all vehicles traveling within the EC lane and at least two feet into the shoulder or buffer. The trigger shall connect directly to the toll zone controller and image processor. This trigger may be shared by the zone controller in framing transaction records and collecting traffic data.

4) Supplemental Lighting



Supplemental lighting shall be provided to assure uniform image quality that is proven to result in a very high probability of successful OCR of extracted license plate characters. The license plate image capture subsystem shall meet performance requirements operating 24 hours a day, 7 days a week. The lighting source may share an enclosure with the camera or housed separately. Either an infrared or white light source shall be used to maximize the consistent quality of each image. Power consumption of supplemental lighting for each camera shall not exceed 150 watts. Consistent with this requirement and the preferred solution is pulsed or flashed light energized only when image capture is triggered and for only the duration needed to capture images. Each camera shall have an independent light focused on an area where license plate images are captured.

Supplemental lighting shall avoid impairing the vision of the motorists when traveling through a toll zone or an adjacent GP lane in either direction under any ambient lighting condition. Intensity of this lighting may be capable of automatic adjustment based on ambient light levels to assure uniform quality of captured images and a very high probability of successful OCR processing.

6.3.3.2 Image Capture Software Functionality

The license plate image capture subsystem software shall include, but it is not limited to, the following functionality:

- 1) Scheduling and control of subsystem resources;
- 2) Periodic performance of a self-configuration and diagnostic test;
- 3) Interface with the zone controller and TDC to process, store and forward license plate image files that can subsequently be linked to a violation transaction record built by a zone controller.
- 4) Transfer maintenance messages and synchronize date and time with the TDC.

6.4 TOLL DATA CENTER SYSTEM REQUIREMENTS

The TDC shall function as the central and primary logical unit for the EC System and support all central processing functions.

The TDC shall interface with the following ETS equipment and external entities:

- 1) Toll and read zone controllers;
- 2) Pricing sign controllers;
- 3) License plate image capture subsystem image processor (future subsystem);
- 4) Portable reader;
- 5) Vehicle detector station (VDS) controllers;
- 6) The Caltrans Traffic Management Center (TMC); and
- 7) The BATA Regional Customer Service Center (RCSC).

Figure 4 shows the known context of the data elements needed for each interface, which shall be revised and expanded based on the design and the requirements specified herein.



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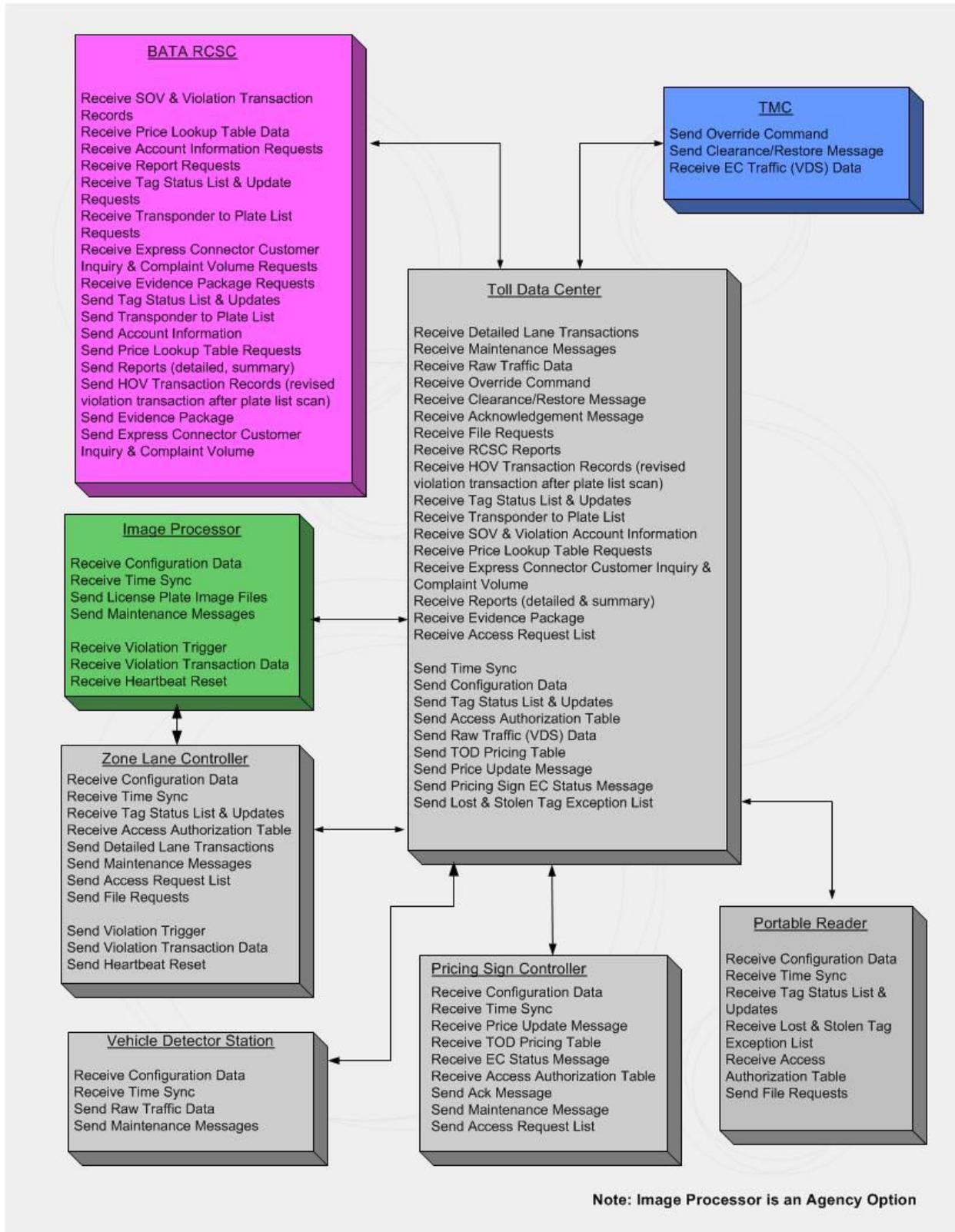




Figure 4 – System Interface Diagram

6.4.1 Primary Functions of the TDC

6.4.1.1 Traffic Demand Pricing Calculation

The TDC shall continuously and dynamically calculate the facility usage price based upon EC lane traffic speed, volume and density information. The primary objective of toll-rate setting is to maximize facility revenues while striving to maintain free flow conditions. EC pricing shall result in an average speed of no less than 50 mph for 90% of a measured time period without an incident or lane blockage.

Traffic data shall be collected from the EC lane via Caltrans approved wireless magnetic sensors embedded in the pavement that will be installed in the EC spaced approximately at 1/2 mile intervals along the EC facility, as shown on the construction drawings.

The TDC shall collect traffic volume, occupancy and speed data at a minimum interval of every 15 seconds (configurable parameter). The actual time interval of collection of this vehicle data by the TDC shall be determined by the System Integrator during the system design process.

The System shall strive to optimize tolls for each price update interval so as to achieve the objective of maximizing facility revenues subject to the following general constraints:

- 1) The toll shall not be less than the agency-specified minimum toll amount.
- 2) The toll shall not be more than the agency-specified maximum toll amount.
- 3) The toll amount shall remain constant for at least the agency approved minimum toll interval to avoid driver confusion.
- 4) The toll amount shall be recalculated at every scheduled toll interval, which may not require an update to the current price.
- 5) The toll amount shall not change by more than the Agency-specified maximum change increment from any one toll interval to the next, based on an exponential change function of average travel speed to the toll change delta.
- 6) The toll shall be sufficient to ensure that the EC lane maintains a speed above the minimum specified for 90% of the measured time period.
- 7) The specified minimum speed incorporates a built-in buffer to account for unmanageable volume of HOV and violators, particularly relevant during peak periods that shall be confirmed or adjusted during System testing to assure the speed does not drop below the maximum EC throughput speed 100% of the time
- 8) The System shall be capable of smoothing temporary fluctuations or spikes in collected traffic data based on a moving average of historical pricing for the same time period;
- 9) The System shall track the ratio of price to average speed against historical values for the same time period to detect software anomalies or traffic data input errors in the pricing process and provide a configurable parameter to automatically convert to an historical table-driven toll schedule in conjunction with sending a maintenance alert to MOMS.



Agency constraints will be finalized during the ETS design phase of the Project and will specifically relate to the proposed solution. Pricing calculation shall incorporate configurable parameters that can be modified by authorized, non-technical *VTA* staff, or its designees, to account for policy or facility changes and to improve performance.

Although the System includes toll and read zones, the initial implementation shall build a single toll transaction based on single segment pricing scheme in each direction.

The dynamic pricing item of the TDC software architecture shall be configured as a separate module with a clearly and completely documented API that describes all interactions with other TDC configuration items with sufficient specificity that the dynamic pricing module can be modified or replaced in the future.

The dynamic pricing method and calculation shall be formulated by the Systems Integrator during the ETS design phase of the project (Phase II) subject to required algorithm constraints and parameters and within allowed tolerances as specified in this RFP.

During Detailed Design Review, the Systems Integrator shall produce a development model of the dynamic pricing engine that demonstrates the capability of the algorithm(s) to set pricing that complies with the required objectives and functions subject to the constraints. The development model shall simulate the price-setting process by accepting simulated traffic data consisting average speed and traffic-counts for discrete time intervals (e.g., 15-seconds) from multiple data streams representing each EC VDS. The development model will output prices for a particular time interval and simulated display of the user price. The development model shall emulate the operation of the production model, to the maximum practical extent. The development model shall incorporate a computer-screen or window that emulates the “dashboard” of the actual implementation. Such a dashboard should display current settings of agency-set parameters, manual override tools, indicators of system operating state, and measures of current system performance vis-à-vis, for example, comparisons of current versus prior period performance by plotting the output price relative to input of simulated volume, occupancy and speed data input.

A separate application inputting existing HOV lane traffic data provided by *VTA* shall be used to generate simulation data based on a reasonable assumption of SOV and violator traffic during peak and off-peak periods. This application will generate volume, occupancy and speed data that simulates traffic conditions in the EC based on assumed volumes of SOV and violators in the EC during peak, off-peak and shoulder periods that are validated by a resulting speed greater than 50 mph. The System Integrator shall produce multiple plots of speed versus price to discern a consistent and repeatable speed response for different facility entry prices.

The System Integrator’s proposed solution shall include descriptions and justifications of contemplated price-setting rules and procedures related to resolving each of the following:

- 1) the rate change function and frequency of price display updates that achieve facility objectives;



- 2) how collected vehicle detector and transponder probe data is used in the price-setting process;
- 3) identifying any price setting process involving manual control or input in either a primary or backup operations mode;
- 4) means of validating pricing sign execution time of a price display command and the subsequent price display command to establish display interval boundary times of a price prior to writing this information to a price lookup table;
- 5) structure, content and format of a price lookup table and method of minimizing storage space requirements of online data needed for easy retrieval of historical pricing information by customer service representatives;
- 6) weight assigned to data input from each EC vehicle detector by the pricing process, if unequal;
- 7) suitability of the quantity and location of proposed vehicle detectors shown on the construction drawings;
- 8) timeliness of identification and response to unusual events (e.g., incidents, lane blockage) in the EC lanes;
- 9) latency of logical processes used to identify failed and degraded/intermittent conditions affecting the accuracy and reliability of the pricing process;
- 10) backup procedure when pricing algorithm(s) fail to function properly;
- 11) expected EC 15-minute time interval speeds during operating hours under varying percentages of user volume to capacity (i.e., v/c ratio) consumed by HOV and violators for the same time intervals; and
- 12) all proposed user configurable parameters incorporated into the pricing process.

The Systems Integrator shall provide, at a minimum, the following:

- 1) A dynamic, real-time, parameter or heuristic-driven price calculation program that successfully achieves the stated operational objectives subject to the constraints;
- 2) A price calculation process that inputs traffic data obtained from both vehicle detectors and transponder probe measurements at read and toll zones to maximize the accuracy of assessing prevailing EC conditions;
- 3) A price calculation program that accounts for disparities in traffic densities and speed occurring simultaneously at the measured time interval at various locations over the length of the EC corridor;
- 4) A recommended pricing reset interval (e.g., 5 minutes) demonstrated to be the most effective in maintaining free flow conditions when HOV and violator demand alone does not preclude operating under these conditions;
- 5) A variable automatic price increment demonstrated to manage EC demand and maximize revenue by not pricing out prospective users too early, which is common under constant rate of price increases that need to start the ascent in price earlier to be able to reach the maximum price in as timely a manner as the constraints allow; and
- 6) A user settable minimum and maximum price.



6.4.1.2 Price Safeguards

When a vehicle enters the EC lane, the price may change between the time at which the driver views the price on the pricing sign and the time at which the driver passes through the toll and read zone. Based upon 1) calculated average speed along the EC prior to encountering the first zone, 2) known travel time between zones, and 3) the average speed in the nearest GP lane from pricing sign to EC ingress, the expected time and date the user last viewed the pricing sign can be determined. A time adjustment shall be independently calculated for the read and toll zones to mitigate the impact of losing communication with a zone controller. Under this scenario, the travel time between zones shall be calculated using the average EC speed determined using input from the vehicle detectors. After the System calculates the total travel time adjustment, the price lookup table shall be scanned to obtain the two time intervals closest to the adjusted user view time. The lowest price associated with one of the two closest time intervals shall be written to the transaction record. Any proposed refinements to this process shall not change the *VTA* premise a user will never pay more than the price displayed when viewed approximately 50 feet upstream of the pricing sign.

6.4.1.3 Lane Discrimination

To eliminate cross lane reads of FasTrak[®] transponders mounted to a vehicle traveling in the adjacent GP, the TDC shall cross reference transactions built in the toll and read zone within a defined window of time and separate transaction records with matching transponder ID numbers. This process shall assure less than 0.01% of transponder ID read at either zone is from a vehicle traveling in a general purpose (GP) lane. The TDC shall support a configurable parameter to establish default processing when a particular zone is not communicating with the TDC. A *VTA* business rule will define how this condition is handled. Depending on the parameter setting, SOV and violation transactions may or may not be forwarded to BATA for processing and posting to an account.

6.4.1.4 Transaction Redundancy

The TDC shall receive, process and store a transaction record for each vehicle using the EC from both the toll and read zones. Transaction record data shall include the Agency ID, transponder ID number, date, time, and a zone location code where the transponder was read, position of switch (SOV or HOV), and any maintenance code. The configured toll zone shall be the primary source of transactions records that are parsed to separate out HOV transactions prior to forwarding to BATA for processing. If communication with the toll zone is lost the TDC shall automatically and seamlessly use the transaction records downloaded from the read zone as the primary source of transactions records. A maintenance message shall alert *VTA* staff to this change in operating conditions.

6.4.1.5 Transaction Audit and Reconciliation

The TDC shall support EC transaction audit and reconciliation functionality. It shall provide a secure user interface which shall allow *VTA* staff or a designated third party to view and reconcile all TDC processed EC transactions against RCSC posted account transactions, returned transactions converted to HOV, and violation transactions that could not be processed. All SOV



transactions, excluding violation transactions subsequently converted to SOV by “V-toll” processing, shall be reconciled within 24 hours of the close of each business day against RCSC transaction posted to active FasTrak[®] accounts, thereby recognizing revenue by a debit to the account balance. Violation transactions occurring on the date when the number of days allowed to make payment are added to it results in the current date shall be audited daily using RCSC data to identify any significant variation in collected and uncollected revenue. At a configurable time period after this initial audit, the TDC shall execute another audit using RCSC data to again identify any significant variation in collected and uncollected revenue. On a daily basis the TDC shall audit the RCSC disposition of violation transactions for which OCR was unsuccessful and were recorded on the date 72 hours earlier. This audit shall calculate the quantity of violation transactions for each approved resolution code and compare to the established trend to identify anything unusual. At the completion of each business day, the TDC shall calculate the hourly percent of HOV users and compare to a moving average for the past three months for the same time period, distinguishing week day from weekend. The TDC shall audit the disposition of a violation transaction as HOV or SOV based on a match after scanning the captured license plate against the current transponder ID to plate list. The daily quantity of new HOV and SOV transactions resulting from this “V-toll” process shall be compared to a three month moving average of these quantities to identify significant variations. The TDC shall generate a report that details and summarizes the results of the reconciliation and audits described here as well as those identified during the design phase.

Authorized users shall be able to make adjustments to the transaction data to correct data entry and processing errors. Authorized users shall be able to adjust individual transactions or bulk sets of transactions if it is determined that a equipment malfunction or failure caused unusual average condition or trend variation.

The TDC database shall store configurable audit parameters, and provide a permanent audit record, or trail, of any adjustments that are made to summary or detail information.

6.4.1.6 Toll and Read Zone Operation Monitoring

The TDC shall support a secure, browser based Graphical User Interface (GUI) allowing authorized users to view processed detail and summary transaction and maintenance/event data, as it occurs in near real-time, at each toll and read zone.

The TZC and RZC shall transmit data in near real-time to the TDC and this data shall be compiled and displayed in a logical, easily understood, graphical manner that allows a user to drill down to more detail from higher levels of information.

Presented below is typical example data:

- 1) Last 10 transponder reads;
- 2) Traffic summary volumes during the last 15 minutes, last 30 minutes, last hour, since 6:00 a.m., etc;



- 3) Discrete messages and events comprising a record from the roadside equipment,(i.e., TZC, RZC, VDS and pricing sign controllers) including
 1. Transponder Identification (ID);
 2. Transponder read time;
 3. Transponder handshakes (the number of times during vehicle passage through a toll zone that the transponder and the antenna communicate with one another);
 4. Vehicle speed;
 5. Position of transponder switch (SOV/HOV) (future);
 6. Speed and LOS variation along the EC and adjacent GP lanes;
 7. Zone controller events (e.g., failure code message, UPS status);
 8. VDS equipment events;
 9. Image processor events (future);
 10. Pricing sign events.

User interface security authentication process shall support *VTA* defined user roles, which includes providing different sets of data to different user categories. This user interface is intended for use by operations and maintenance personnel.

The user interface shall protect customer information and operate under the requirements of California State privacy legislation.

6.4.1.7 TDC Reporting

The TDC shall provide a fully integrated reporting module to support transaction reconciliation, EC operations, BATA record posting and reconciliation and *VTA* managerial system monitoring requirements.

The module shall include predefined traffic and revenue reports as well as support for ad hoc reporting needs.

The reporting system shall allow users to browse, choose, and run reports through a clearly displayed and user-friendly Graphical User Interface (GUI).

The reporting interface shall allow users to schedule reports to be run in the future.

The reporting interface shall allow reports to be output, saved, or printed in at least the following formats:

- 1) On-screen;
- 2) PDF;
- 3) HTML; and
- 4) Excel.

When accessing or running reports, the execute-to-display or execute-to-print time shall be less than one minute for each request.



The TDC report server shall be operational and available 24 hours per day, seven days a week.

Presented below is a list, at a minimum, of the required sample TDC reports:

- 1) Express Connector Revenue Report;
- 2) Express Connector Traffic Report (by segment and entire facility);
- 3) Express Connector Trip Posting (to BATA) Report;
- 4) BATA Express Connector Reconciliation Report;
- 5) Transaction Adjustment Report;
- 6) Tolling/Read Zone History Report;
- 7) Detailed FasTrak® Transaction Report;
- 8) Price Change Tables by Tolling Zone;
- 9) Express Connector Travel Time Report (by direction);
- 10) Equipment Maintenance Reports; etc.

6.4.1.8 Data Transmission

For the following equipment installed along the EC facility, a 10/100BASE-T Ethernet protocol shall be used for all wireless data communications to and from a Cisco Catalyst switch (WS-C3560E-48PD-S) installed in the MPOE of the Cerone facility:

- 1) Zone Controllers,
- 2) Image Processor,
- 3) Pricing Sign Controller,
- 4) VDS Controller,
- 5) CCTV camera.

A configured 10BASE-T port on this switch shall be connected to the existing backbone and then a router to convert to a T-1 signal. The *VTA* furnished router will be connected to the local exchange carrier's existing T-1 interconnect for transmission to the *VTA* Data Center. At the *VTA* Data Center the T-1 line will be converted back to 10BASE-T using *VTA* furnished equipment and connected by *VTA* IT staff to a designated port on an existing core switch. A second Cisco Catalyst switch (WS-C3560E-48PD-S) shall be installed in the TDC server and data storage cabinet to interconnect the installed hardware and accommodate future expansion. The System Integrator shall furnish four (4) Cisco Catalyst Gigabit Ethernet small form-factor protocol (SFP), transceivers (GLC-SX-MM) with LC connectors for the *VTA* IT staff's use in interconnecting the new cabinet switch with the existing core switch, including the connectorized multi-mode fiber optic cable furnished by *VTA*.

The *VTA* IT department will be responsible for the arranging leased lines from the local exchange carrier for communication from the TDC to the BATA RCSC and Caltrans TMC. The System Integrator shall coordinate with *VTA* IT staff regarding the bandwidth needed from the T-1 circuits.



The video server installed at the Cerone facility shall be connected to a Cisco Catalyst switch to communicate with the TDC and the CCTV camera assemblies using an Ethernet protocol.

All transmissions originating from the TDC shall occur automatically and use a guaranteed delivery protocol.

The System Integrator's EC design shall limit the bandwidth needed between the *VTA* owned Cerone facility and the *VTA* Data Center to a single T-1 leased line.

The System Integrator shall design, implement and successfully test a seamless failover from a primary laser communications solution to a backup WiMax communication system. *VTA* plans to execute an agreement with a local Service Provider that can provide the coverage needed for use as a backup to the primary free space optics (i.e., laser) communication system. The failover and switchback processes to the restored laser communication system shall not disrupt operations or result in the loss of any data or functionality.

6.4.1.9 TDC Security

The TDC shall securely maintain EC data through a standard login and password-based security system.

Secure user accounts shall be administered through a system administration interface.

The system shall operate under the provisions of all California State privacy laws. For example, customer contact and profile information that is accessible from anywhere in the *VTA* River Oaks and Cerone facilities or remotely shall be masked to maintain customer privacy.

The database shall use security service enterprise authentication for user access to distributed databases. This will centralize database security in one location.

All users shall have their own user name and password that is the same across all databases.

Users shall have individual resource usage limits set for them to prevent unauthorized or excessive utilization of system resources.

Profiles shall be used to define resource usage limits by work activity or job type.

Users shall be granted access profiles according to their job needs.

The database shall be able to restrict data access down to the row level.

6.4.1.10 Receipt and Downloading of Tag Status Files

The TDC will receive, at least once per day, the current version of the tag status file from the BATA RCSC.



The file acquisition process shall adhere to the BATA Interface Control Document (ICD), a copy of which shall be presented in the appendices of the RFP.

The TDC shall automatically, upon receipt of a tag status file from BATA and integrating this file into the TDC database, upload either the full or incremental tag status file updates to each of the two toll and read zone controllers. The incremental tag status file upload shall include new FasTrak[®] accounts or changes to the status of existing accounts.

The method of file download shall be according to the BATA RCSC ICD.

6.4.1.11 Portable Reader Data Transmission

The TDC shall send tag status data and updates and lost & stolen exception lists through either a communication shelf or docking station or a wireless link to a handheld portable reader to enable the CHP officers to enforce the EC. The System Integrator shall perform an alternative analysis to identify and justify the most cost effective wireless communication method based on a 10 year life cycle analysis.

Hosted applications accessed over a wireless network using secure encrypted data communications shall enable enforcement vehicles to obtain the tag status file and lost & stolen exception list files on a real-time basis.

6.4.1.12 System Data and Software Backups

All TDC data shall be properly backed up to ensure a continuous operation and virtually no loss of data or accounting information.

Activity logs shall be saved weekly on tape backup for 90 days.

Daily partial and weekly full backups of all data shall be conducted and properly logged.

EC transaction records shall be stored on-line for at least 12 months. Transaction logs and records shall be retained off-line for five years.

6.4.2 TDC Standby System Design

The need for a TDC system with high availability has been identified as a key element to the success of this project. In order to ensure that transaction records, events and messages are never lost or delayed, the TDC shall have to perform all of its functions in a highly reliable failover environment. An automatic failover design shall be incorporated into the ETS to ensure that the TDC offers the required high operating availability. The proposed failover solution shall provide at least the fault tolerance afforded by the approach shown below.

Running a database server on virtual machines has the same characteristics as running on physical machines. However in a virtual environment all servers automatically become highly available. This approach using third party virtual machine software protects against application outages by automatically starting virtual servers, applications and services on different hardware,

just like other cluster configurations, but protection automatically applies to all servers in the same environment. Provided below in Figure 5 is a configuration of the TDC hot standby operating approach. In this example, the EC TDC subsystem would be the same as the “TCS-Host”.

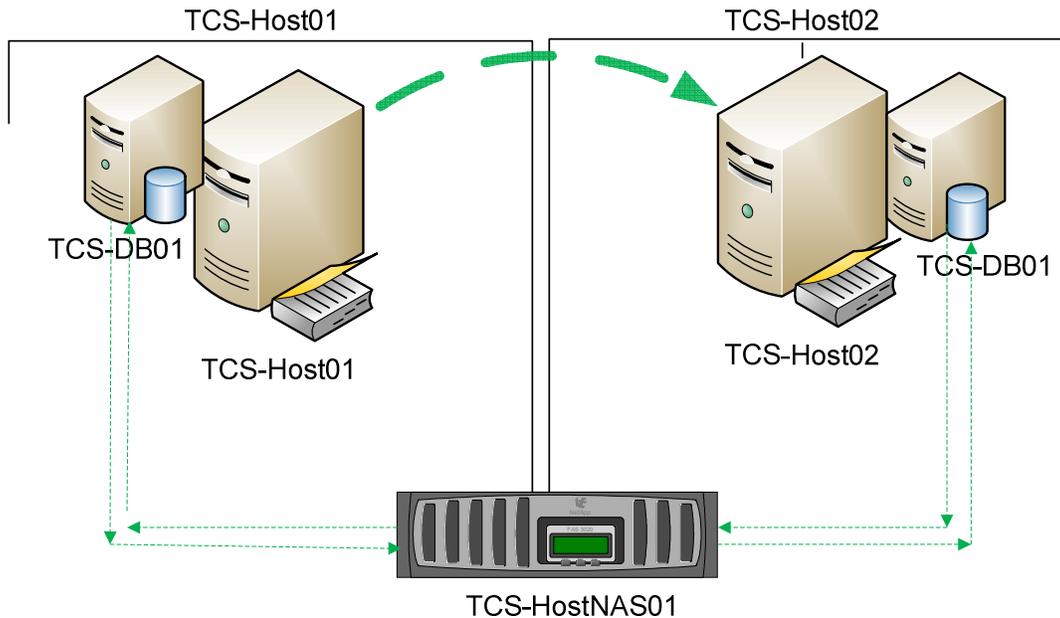


Figure 5 – TDC Hot Standby Configuration

Under this TDC Hot Standby configuration, the following would occur:

- 1) The database files and database logs would reside on the NAS;
- 2) The NAS would be configured with the appropriate RAID level for performance and redundancy;
- 3) The virtual machine application shall monitor and detect virtual machines for failures and will automatically restart the machines;
- 4) The virtual machine application shall detect server failures automatically, using a “heartbeat” on the servers;
- 5) The virtual machine application shall detect server failures and initiates restarts of virtual machines almost instantly without human intervention;
- 6) The virtual machine application shall ensure that capacity is always available in order to restart all virtual machines affected by server failure; and
- 7) If an entire server goes down (TCS-Host01) the virtual machine application would automatically start a failover of the other virtual machine (TCS-Host02).



The virtual machine cluster shall provide continuous service availability in unplanned system downtime situations such as server failures. In the event of a TDC failure in the cluster, the virtual machine application shall be designed to automate the restarting of the virtual machine on the other TDC. This virtual machine software shall protect the infrastructure from multiple sources of failures and will offer pervasive failover protection; automatically without human interaction.

6.5 REGIONAL CUSTOMER SERVICE CENTER INTEGRATION

6.5.1 BATA ICD

The System Integrator shall design and develop TDC applications and functions to eliminate or minimize the need for any modifications to the existing BATA Interface Control Document (ICD). A copy of the most current ICD is presented in the Appendix **Error! Reference source not found.** The System Integrator shall be responsible for configuration management of the TDC/BATA RCSC interface, in strict coordination with the RCSC Service Provider, to ensure that the TDC is properly interfaced to the RCSC when any ICD updates are approved and implemented throughout the EC ETS Contract.

6.6 SYSTEM INTEGRATION REQUIREMENTS

6.6.1 External System Interfaces

The TDC shall be required to interface with three other systems to obtain data required for the contemplated EC operations.

EC SOV and violation transaction records shall be transmitted to the BATA RCSC for processing and posting to the respective accounts based on transponder ID number and license plate number, respectively. The TDC shall be capable of receiving and processing full California Toll Operators Committee (CTOC) tag status files and updates from the RCSC on at least a daily basis. The TDC shall also be capable of receiving and processing data from the RCSC needed for the following purposes:

- 1) Reconciliation and audit(as described herein),
- 2) Data needed for complaint handling,
- 3) Evidence package information (defined during design phase) for violation citation hearings and DMV hold on vehicle registration pending payment of outstanding violations, and
- 4) Reports.

The TDC shall be capable of processing and sending EC lane raw traffic volume, density and speed data to the designated Caltrans TMC over a leased T-1 arranged by *VTA*.

The incident detection process shall be the responsibility of Caltrans. The TDC shall be capable of temporarily suspending SOV tolls and automatic violation citations and/or EC closing, based on *VTA* business rules, and receiving a command from a TMC Operator to open the EC lanes to



all traffic or to close the EC facility to all traffic. The TDC shall translate the TMC command to a corresponding command to each pricing sign. Conversely, the TMC Operator shall send a message informing *VTA* operations staff the incident or lane blockage was cleared and normal operations can resume. This message shall be immediately displayed on the *VTA* monitoring workstation and sent to MOMS, resulting in a text message being sent to designated maintenance staff.

All commands and messages received from TMC personnel shall be logged into a TDC system database accessible to system administration and *VTA* operations staff for viewing and generating a report that will be established during the define phase. The ETS shall only allow authorized *VTA* staff to commence operations after an unscheduled closure. A detailed procedure for handling incidents and lane blockage in either the EC or adjacent GP lanes will be finalized during the System design phase.

6.6.2 Internal System Interfaces

6.6.2.1 Toll and Read Zone Controller

The TDC shall interface to each toll and read zone controller in near real-time via combined wireless and leased line communication.

The interface will support the download of detailed and summary traffic data transaction records (i.e., SOV, HOV and violation), maintenance messages, event data, and access request list. The interface shall support the upload of a tag status file and incremental updates, configuration data, time synchronization, access authorization table, and file requests.

This interface shall be automatic and not require human intervention.

An interface control document shall be developed by the System Integrator during Phase II of the project.

6.6.2.2 Pricing Sign Display

The TDC shall interface with each pricing sign controller in near real-time via combined wireless and leased line communication. This interface shall be NTCIP compliant and support a very limited set of standard objects that will be established during the design phase.

The interface shall support the download of maintenance messages, access request list and command execution acknowledgements. The interface will support the upload of configuration files, time synchronization, price updates, facility use messages, status requests, access authorization table and TOD pricing schedule.

An interface control document shall be submitted by the System Integrator during Phase II of the Project that is developed by and/or in close coordination with the display module vendor.



6.7 COMMUNICATIONS NETWORK

The System Integrator shall design, develop, test, implement and maintain a wireless communication system to support the transmission of data between the intelligent System equipment installed along the EC and the *VTA* Cerone facility. *VTA* will make arrangements for T-1 and fractional T-1 leased line(s) to transmit data from Cerone to the *VTA* Data Center at their River Oaks facility. The System Integrator shall strive to minimize the bandwidth required for transmission between the Cerone and River Oaks facilities. The System Integrator shall calculate this required bandwidth and submit it to *VTA* during the design phase.

The preferred wireless communication system is free space optics (FSO) requiring the installation of overhead laser transceivers along the the facility at a height and combined vertical and horizontal angle to achieve line-of-sight between consecutive transceivers. The System Integrator shall confirm the proposed FSO design meets the performance requirements and propose an alternative microwave system if needed to meet the performance requirements. The laser transceiver shall be a Sonabeam model E-52 manufactured by FSONA Systems Corporation or approved equal meeting the requirements contained in the Table 7 below.

Performance Measurement	Operating Range/Characteristic
Transmission Rate	10 – 68 Mbps
Transmission Standard	10Base-T (Ethernet)
Range: Clear air (3 dB/km)	50 m -3850 m (160 ft. – 2.3 mi.)
Exteme rain (10 dB/km)	50 m – 1820 m (160 ft. – 1.1 mi.)
Laser Output Power	100 mW peak (2 X 50 mW)
Fiber xmtr output power	-15 dBm (min) -8 dBm (max)
Fiber recr input power	-31 dBm (min) -8 dBm (max)
Receiver aperture	10 cm (4 inch) diameter
3R Control & Data Recovery	User selectable, by-pass for rate-transparency or mux
Fiber Optic Interface	Single mode, SC connector
Fiber xmtr wavelength	1310 nm nominal
Fiber recr wavelength	1310 nm nominal
Operating Temperatures	-40 °C to 60 °C (-40 °F to 140 °F)
Solar filers	2 spatial, 2 spectral
Pointing Stability	120 km/h operating ; > 160 km/h survivability (75 mph > 100 mph)
Environmental Rating	NEMA 4; IP66
Weight	Head 10 kg (22 lbs); PCA: 8 kg (17 lbs); Yoke 8 kg (17 lbs)
Input Voltage	22 to 57 VDC; 100 – 240 VAC (nominal; VAC 120 VAC, 60 Hz)
Power Consumption	Transceiver & heater 30 watts, max;

Table 7 – Communications Network Requirements



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The transceiver shall have two redundant transmitters with independent lasers and drives. The transceiver window shall be heated to preventing fogging. The transceiver housing shall be manufactured from cast aluminum. The transceiver shall include an embedded agent for supporting SNMP. MOMS shall use this protocol to monitoring the status of each installed transceiver.

The installed wireless communication system, including the proposed primary FSO solution and secondary WiMax solution, shall have a combined availability of 99.99%. A system analysis shall be prepared and submitted at the conclusion of the design phase to confirm the proposed solution meets the required availability.

Figure 6 provides a schematic layout of the Communication System as currently contemplated. The System Integrator shall use this layout for guidance in preparing a design that satisfies all requirements contained herein.

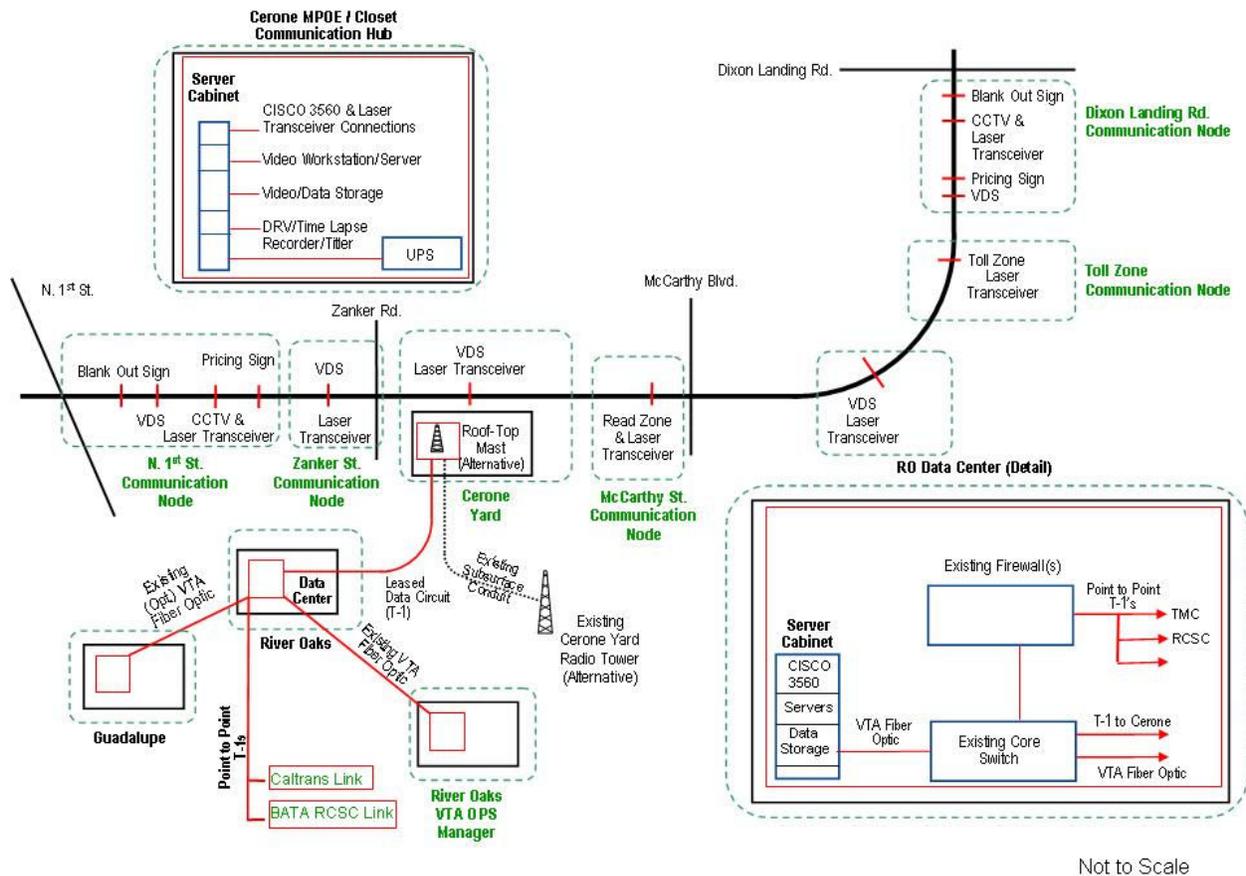


Figure 6 – Communication System Layout



6.7.1 Toll and Read Zone to Cerone

Toll and read zone to Cerone communication can be accomplished, depending on line-of-sight and range limitations, by direct transmission to and from Cerone or by configuring a repeater at the read zone by increasing the height of the structure (by others) or at a communication pole installed (by others) in the NW quadrant of the SR237/I-880 interchange. A Cisco Catalyst 2955T-12 switch shall be furnished and installed at the toll and read zone locations to interconnect the two (2) zone controllers and future image processors for both directions as well as other remote equipment using a read or toll zone as a repeater. The System Integrator has the option of one of the following:

- 1) Furnishing and installing a corrosion protected mast of a height determined by a line-of-sight survey to the roof of the Cerone facility at a location specified by the designated *VTA* representative. A structural analysis shall be performed by a registered CA structural engineer and submitted for approval. Conduit, junction boxes, connectors and single mode fiber optic cable shall be routed from the transceivers mounted to the roof mast to the MPOE in the Cerone facility. Grounding and lightning protection complying with the applicable standards listed in Subsection 6.1.4. shall be provided for the roof mast. Conduit, junction boxes, fittings, connectors and electrical wires and cable shall be routed from the transceivers to a furnished and installed electrical panel with circuit breakers fed from a designated existing distribution panel in Cerone. A TVSS shall be installed at the electrical panel.
- 2) Mounting the laser transceivers to the existing radio tower owned by *VTA* and located in the Cerone yard. Existing buried conduit between the radio tower and Cerone facility may be used to route fiber optic cable into the building. Conduits, junction boxes, connectors and single mode fiber optic cable shall be furnished and installed from the laser transceivers mounted to the radio tower to an existing fiber distribution panel in the Cerone facility used for terminating radio tower cable and then to the Cisco Catalyst switch installed in the MPOE. Conduit, junction boxes, fittings, connectors and electrical wires and cable shall be routed from the transceivers to a furnished and installed electrical panel with circuit breakers fed from a designated existing distribution panel in Cerone. A TVSS shall be installed at the electrical panel.

VDS controller to Cerone communication shall be accomplished by furnishing and mounting a laser transceiver to a new pole or cantilever sign structure as shown on the civil package construction drawings and either establishing a direct line-of-sight communication link to Cerone or configuring an intermediate pole or structure as a repeater site. Electrical and communication conduits, junction boxes, fittings and connectors will be furnished and installed from the existing VDS handhole to the nearby pole or structure by others. The System Integrator shall route fiber optic cable and electrical wires and cable from the VDS cabinet to the pole/structure mounted laser transceiver.

CCTV camera to Cerone communication shall be accomplished by furnishing and mounting a laser transceiver to the CCTV pole at least four (4) feet below the CCTV camera assembly and



establishing a direct line-of-sight communication link with Cerone or configuring an intermediate pole or structure as a repeater site. Fiber shall be used to connect the camera to a minimum 6-port switch that shall also connect the pricing sign and possibly the zone controller (depending on the System Integrator's design). Fiber optic cable shall also be used to connect this switch to the laser transceiver. Electrical and communication conduits, junction boxes, fittings, connectors and a pole mounted enclosure shall be furnished and installed for the CCTV camera subsystem. The interior of the CCTV pole may be used to route fiber optic cable from the switch to the CCTV camera.

6.7.2 Cerone to TDC

This required communication link shall use leased line(s) from the local exchange carrier. *VTA* will make the necessary arrangements to obtain the leased line bandwidth capacity calculated, certified and submitted to *VTA* by the System Integrator prior to completion of the design phase.

6.7.3 TDC to RCSC

The network communication between the TDC and BATA RCSC shall use a T-1 or fractional T-1 leased line from the local exchange carrier. The System Integrator shall perform a detailed analysis to determine the bandwidth required for this communication link. This analysis shall be submitted to *VTA* prior to completion of the design phase. *VTA* will investigate the applicability and availability of frame relay technology as a viable alternative.

Data communication between the TDC and the BATA RCSC shall be via FTP for EC SOV and violation transaction records to and from a pre-configured drop box. SSL and appropriate encryption shall be incorporated into this communication link.

6.7.4 TDC to Caltrans Traffic Management Center

The network communication between the TDC and the Caltrans TMC shall use a T-1 or fractional T-1 leased line from the local exchange carrier. The System Integrator shall perform a detailed analysis to determine the bandwidth required for this communication link. This analysis shall be submitted to *VTA* prior to completion of the design phase. *VTA* will investigate the applicability and availability of frame relay technology as a viable alternative.

6.7.5 TDC to System Enforcement Equipment

Communications between the TDC and portable reader shall use a secure, encrypted, high-speed data communication connection over a wireless network.

- 1) The cellular data communications network shall provide uninterrupted coverage over the entire length of the project.
- 2) The cellular data communication network shall provide a minimum data rate of 128kbps.
- 3) The communication link between the enforcement device and the TDC shall utilize Virtual Private Network (VPN) tunneling to establish a secure and encrypted connection.



6.8 VTA WEBSITE REVIEW AND SUPPORT

The *VTA* EC Web site will be developed by others. However, the System Integrator shall be responsible to provide Web site development and support to the developer as appropriate and required by *VTA*. The primary purpose of the Web site will be to provide EC information to the public.



7. PROJECT MILESTONES

This part of the RFP provides an overall summary of the SR 237/I-880 EC Lanes project phasing, scheduling, and testing requirements.

7.1 PROJECT PHASES

As previously discussed the EC system deployment under this Contract will be completed under four (4) sequential project phases.

Phase I – Design, Manufacturing, and Factory Test – This phase includes the design, development, fabrication and pretest of components of the entire ETS up to and including civil engineering designs and successful conduct of a full and detailed Factory Acceptance Test (FAT) of all equipment, software and subsystems in accordance with a pre-approved test plan, which shall be developed by the SI. This test shall be performed by the System Integrator under the supervision of the *VTA* ED and the Systems Manager;

Phase II - Installation, Testing, and Approval - Field equipment, conduits and cables, gantries, barrier rail systems, CCTV poles, VDS, and software installation, including on-site System Integrator testing and debugging, conduct of a detailed Field Acceptance Test and approval for use of the ETS with all components and interfaces fully integrated for Express Lanes operation;

Phase III – System Performance Evaluation - Performance evaluation period of 90 days under actual Express Connectors operation during which time any outstanding problems shall be immediately corrected by the SI. This phase also includes full ETS support and maintenance by the SI, culminating in Final System Approval; and

Phase IV - Warranty Period - Provision of full ETS maintenance, operations and system support during a Warranty Period that shall extend 270 days after issuance of Final System Approval. During this phase the System Integrator shall correct any outstanding problems and transfer the maintenance program over to others if the maintenance options are not selected by the *VTA*. Successful completion of Phase IV shall culminate in Final System Acceptance, which effectively closes the System Integrator Contract.

A written NTP will be submitted by the *VTA* to the System Integrator which shall indicate the official commencement/date of Phase I. Each of the three (3) subsequent phases shall not begin until successful completion of the previous phase and such successful completion has been granted by the *VTA*.

Presented below in Table 8 are the contractual completion deadlines that are required for each phase of the work program.



PROJECT PHASE	COMPLETION DEADLINE (Calendar Days From NTP)
Phase I – Design, Manufacturing, and Factory Test Approval	300
Phase II – Installation, Testing, and Approval	450
Phase III – System Performance Evaluation Approval	540
Phase IV – Warranty Period Completion	810

Table 8 – Project Phases

The ETS shall be ready for full use and revenue service no later than the time of EC opening to traffic, which is tentatively planned for July 11, 2011 or the date cited in the latest approved Program Schedule at time of award. If ETS equipment and/or software problems are detected during the system performance evaluation period, and the equipment and/or software is not operating at an acceptable level of performance as defined in the Contract, the System Integrator shall be notified in writing. All problems or defects shall be promptly resolved by the System Integrator. Final System Acceptance shall not be granted by the *VTA* until the ETS performs satisfactorily. It should also be noted that within each overall Project phase there are several interim deliverable deadlines, as outlined in this document.

7.2 PROJECT SCHEDULING

Once a Contract has been executed between the System Integrator and the *VTA* a NTP will be issued, in writing, to the System Integrator to begin work. The System Integrator shall not begin any work until NTP has been issued. In the event the System Integrator proceeds with any work effort prior to issuance of NTP it shall be at the sole risk of the System Integrator.

Within 15 days of NTP the System Integrator shall submit a detailed Project Schedule, using Microsoft® Project, outlining the order in which the work shall be performed.

The schedule shall be developed in a CPM format identifying the critical elements and efforts of the project, task dependencies, required resources, and predecessor and successor tasks.

The specific milestone completion dates and installation deadlines set forth in the Contract shall be clearly identified in the Project Schedule.

The schedule shall be used as a basis for progress tracking throughout the course of all work on the Contract.

If a delay in the Project Schedule arises due to circumstances beyond the System Integrator's control, the System Integrator shall first notify the *VTA* in writing. Within five (5) working days a revised schedule shall be submitted for review and approval by the *VTA*. Any failure or delinquency in submission of the Schedule, standard updates or revised, shall be treated as default on the part of the System Integrator and may be subject to possible actions by *VTA*, including withholding of any payments due on the Contract.



7.3 WORK PROGRESS

The System Integrator shall use all practical means to make the progress of the work conform fully to the Project Schedule. If the System Integrator fails to meet the dates that are presented in the Project Schedule, the Systems Manager may require the System Integrator to take any or all of the following remedial actions, at no additional cost to the *VTA*:

- Perform overtime work;
- Increase the number of personnel assigned to the project; and
- Increase plant or machine capacity.

The System Integrator shall prepare and submit to the Systems Manager monthly progress reports on the status of all major project items and activities. The monthly progress reports shall include an updated Project Schedule.

Progress meetings shall be conducted monthly by the System Integrator PM, at the offices of the *VTA*, at a schedule to be proposed by the System Integrator and approved by the *VTA* and the Systems Manager. The purpose of these meetings will be to monitor progress, discuss design issues, plan for system installation, prepare for and conduct testing activities, start up of operations, etc.

During more intensive periods of the Project more routine meetings and/or calls may be required as requested by the *VTA*.

7.4 PHASE I – DESIGN, MANUFACTURING, AND FACTORY TEST

Upon issuance of NTP and submittal of the Project Schedule, a kick-off meeting shall be held within 30 days of NTP. At the kick-off meeting all appropriate lines of communication for both oral and written correspondence shall be established. Appropriate methods for documenting meetings, telephone conversations and other communications shall also be defined. The System Integrator's Project Schedule shall be reviewed in detail and refined, as may be necessary. The Systems Manager shall submit, in writing, to the System Integrator any required modification to the Project Schedule. A mark-up of preliminary and final civil engineering construction drawings, focusing on accommodation for toll and read zone equipment, VDS, CCTV poles, sign structures supporting System equipment, and the need for additional conduit not required in this RFP shall be submitted to the Systems Manager within the time period specified herein..

Work during this phase shall include all ETS design, software development, hardware procurement and/or fabrication, shop testing, software testing, integration testing, software documentation and System design documentation culminating in a full and complete FAT. Periodically throughout this phase, the Systems Manager may visit the System Integrator's development facility in order to inspect work in progress and might, from time-to-time, request reasonable demonstrations of ETS equipment, software, interfaces and subsystem operations. The Systems Manager will give reasonable advance notice to the System Integrator prior to any factory visits. At such time that the System Integrator has completed all development, fabrication and integration of the ETS, including detailed internal testing, the System Integrator



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shall provide written notice to the Systems Manager requesting the scheduling of a full and complete FAT. The System Integrator shall provide test scripts for the review and approval of the Systems Manager no later than 60 days prior to the scheduled date of the FAT.

Table 9 below presents the submittal date, based upon number of days from NTP, for all of the documentation that is required under the Contract.

ITEM NO.	DOCUMENT SUBMITTAL	PROJECT PHASE	DUE DATE (CALENDAR DAYS)
1	Project Schedule (re-submittal within 10 days if requested)	I	30 Days from NTP
2	Project Management Plan	I	30 Days from NTP
3	Preliminary Test Plan	I	60 Days from NTP
4	Software Development Plan	I	60 Days from NTP
5	Sepias and Shop Drawing Documents	I	90 Days from NTP
6	Sample of all On-Demand and Automatically Generated Reports	I	90 Days from NTP
7	Preliminary Installation Plan	I	90 Days from NTP
8	Quality Assurance Plan	I	90 Days from NTP
9	Software Specification	I	90 Days from NTP
11	Roadway Contractor (s) Gantries, CCTV Poles, Conduit and Cable Design Plan Review/Comments	I	90 Days from NTP
12	Preliminary Design Document	I	120 Days from NTP
13	Factory Acceptance Test Plan	I	120 Days from NTP
14	Detailed Design Document	I	150 Days from NTP
15	Field Test Plan	I	180 Days from NTP
16	Final Civil and Electrical Engineering Plans	I	180 Days from NTP
17	Final Installation Plan	I	180 Days from NTP
18	Wiring Diagrams	I	180 Days from NTP
19	Training Plan	I	270 Days from NTP
20	Maintenance Plan	I	270 Days from NTP
21	TDC Systems Operator Manual (Final)	I	30 Days before Phase II Approval
22	System Auditor Manual (Final)	I	30 Days before Phase II Approval
23	Customer Service Representative Manual (Final)	I	30 Days before Phase II Approval
24	CHP Enforcement Manual (Final)	I	30 Days before Phase II Approval
25	Maintenance Service Manual (Final)	I	30 Days before Phase II Approval
26	Draft Software Documentation	II	30 Days after Phase I Approval
27	Preliminary Maintenance Service Manual	II	60 Days after Phase I Approval
28	Bill of Materials	II	60 Days after Phase I Approval
29	Schedule of Preventive Maintenance	II	60 Days after Phase I Approval



30	Final Draft Software Documentation	II	30 Days after Phase II Approval
31	Final Software Documentation	II	30 Days before Phase III Approval
32	Final As-Built Drawings	II	30 Days before Phase III Approval

Table 9 – Documentation Submittal Schedule

The System Integrator shall provide written results and evidence of pre-internal testing prior to the FAT. If the proposed test scripts have been approved and, if after reviewing evidence of satisfactory System Integrator internal testing of the ETS and all of its’ interfaces, the Systems Manager will send a letter to the System Integrator indicating that they are allowed to proceed with the FAT.

The FAT shall involve testing of all subsystems to be installed as part of the EC ETS. All components shall be fully fabricated and integrated and ready for installation at the time of the FAT. At least one complete subsystem of each category shall be installed at the System Integrator’s site for the purpose of this FAT, including:

- One toll zone subsystem, including the lane controller, a complete FasTrak[®] subsystem (reader, antenna and transponders), a wireless magnetic sensor and VDS, , a pricing sign and blankout sign plus all necessary communication equipment;
- A CCTV subsystem, including all necessary communications equipment;
- Enforcement subsystem, including use of the toll and read zone transaction indicator lights, the hand-held portable reader, plus all necessary communication equipment;
- The TDC subsystem with a fully configured computer system including all software, a dynamic pricing algorithm, TDC workstation, and any necessary communication equipment; and
- All of the TDC interfaces, including the toll and read zone subsystems, pricing sign and VDS equipment, the BATA RCSC, the Caltrans TMC, and the portable reader subsystem.

Any ETS functions defined in the Contract, as well as any Contract amendments, shall be subject to detailed testing and verification by the *VTA* during FAT. If, in the judgment of the *VTA*, the FAT indicates that the ETS equipment and software appear to be functioning satisfactorily in accordance with a predefined test plan and all functional and technical requirements of the Contract, the Systems Manager shall issue written approval of the FAT and subsequently indicate the System Integrator approval to begin Phase II.

Approval of the FAT shall in no way reduce or eliminate the System Integrator’s full responsibility to resolve any problems and make the ETS operate in full conformance with the



requirements of the Contract. Nor shall it limit the rights of the *VTA* or the Systems Manager, to bring ETS related problems to the attention of the System Integrator at a later time.

7.5 PHASE II – INSTALLATION, TESTING, AND APPROVAL

With the issuance of FAT approval by the Systems Manager, the System Integrator may be authorized to immediately commence shipment of the ETS equipment to the site to begin the installation phase. No actual equipment installation activity shall take place on site until FAT approval and an Encroachment Permit from Caltrans have been obtained and the Caltrans Resident Engineer approves the access to the State's Right-of-Way (ROW) as called for by the Encroachment Permit. However, if any conduit installation or other minor physical modifications at the toll zone sites are required, these may be performed prior to approval of the FAT, provided the Encroachment Permit is in hand and the Caltrans Resident Engineer approves the access to the State's Right of Way. Any pre-FAT approval installation activity shall be approved, in writing, by the Systems Manager.

The System Integrator's Installation Manager (or Project Manager if the same) shall be on-site throughout the entire installation period. The installation and site testing shall begin at the toll zone that is identified in the Installation Plan and when successfully completed, installation may begin at the read zone site. The System Integrator may present a proposal to partially overlap installation at the toll and read zone sites for the consideration and approval of the Systems Manager. If an overlap in installation is proposed, it shall be clearly identified in the Project Schedule.

An Installation Plan of required electrical and communication conduit and cabling, grounding, and lightning protection shall be submitted by the System Integrator to the Systems Manager and Caltrans for review and approval. Actual installation will be inspected by, and subject to the approval of the *VTA* and Caltrans designated representative. Installation of the ETS equipment shall be performed by trained personnel who are familiar with all aspects of the equipment. During the installation phase of the project, the System Integrator shall provide a resident Installation Manager (if different than the Project Manager) conveniently located and accessible to the Systems Manager from a local office. During phases other than the installation phases, the System Integrator's Project Manager shall be readily accessible via telephone and/or pager. In addition, the System Integrator's Project Manager shall report to the site within 24 hour notification from the *VTA* or the Systems Manager.

In the event that any structure is damaged due to the System Integrator's activities, such damage shall be repaired immediately at the System Integrator's expense and to the satisfaction of the *VTA* and the Systems Manager, or to the satisfaction of Caltrans with respect to any Caltrans-owned facilities.

The System Integrator shall make its own arrangement for the supply of electrical service to all of the ETS equipment. The System Integrator shall also make its own arrangement for temporary electrical service, as needed, water and waste at the work site.



The System Integrator, under the supervision of the Systems Manager, shall perform the Site Acceptance Test. This testing shall include individual lane equipment, subsystem testing, testing of the dynamic pricing algorithm, TDC testing, wireless communication system, and any other reasonable test that may be required to verify proper functioning of the ETS.

Phase II field testing shall include full end-to-end simulated system load testing. Software simulators shall be used to generate realistic data at the toll zone site. The simulated data shall pass through the entire ETS including the communications network and the TDC, and ultimately to simulated account postings at the RCSC, output reports, etc. Testing shall include a minimum of five (5) full days of real time simulated operations.

The conclusion of Phase II shall be signified by the successful completion of installation and testing of the new ETS and the successful completion of site verification tests at the toll and read zone sites and at the TDC.

It is anticipated that work by other contractors may be in progress adjacent to or within the limits of this project during progress of the work on this contract.

The System Integrator and their contractor(s) must attend joint weekly meetings, at a time and location determined by the Systems Manager and/or Engineer, to coordinate work and traffic control with the contractor(s) for the above listed projects. The System Integrator shall bring to the meeting a detailed 3-week look ahead schedule that includes all work that may affect the public through traffic, noise or vibration, work that affects the operations of contracts listed above and work that requires ramp, HOV and GP lane closures. The System Integrator shall accommodate and coordinate with other project contractors when preparing operations and work schedule.

7.6 PHASE III – SYSTEM PERFORMANCE EVALUATION

Phase III will begin after the successful conclusion of Phase II and with the opening of the EC to traffic. If the System Integrator is informed that the project is not ready to open to traffic at the completion of Phase II, the System Integrator's work will be suspended until the roadway is ready to open to traffic. During Phase III of the Contract, a 90-day period of observation and evaluation of the new ETS public use shall take place. The System Integrator shall be required to fully support and maintain the ETS, in accordance with provisions set forth in the Maintenance Provisions of this document. Any problems detected during the monitoring of the ETS during Phase III shall be immediately brought to the attention of the System Integrator for resolution. At the conclusion of this evaluation period, if the ETS is considered to be operating fully in compliance with the RFP and the Contract requirements, the Systems Manager will provide the System Integrator with written notice of Final System Approval.

The System Integrator shall be responsible for TDC operational support during Phase III and through the initial Warranty Period. Starting at the beginning of Phase II and continuing through the end of Phase III, the System Integrator shall provide technical and operational support to advise and assist the *VTA* in start-up and initial operation of the ETS. It will be necessary for



this staff position to be knowledgeable in all aspects of the ETS and shall be particularly familiar with the TDC operations.

7.7 PHASE IV – WARRANTY PERIOD

The final phase of the Contract, Phase IV, shall include continued ETS maintenance through the 270-day Warranty Period. The Warranty Period shall commence with the granting of Final System Approval to the System Integrator by the Systems Manager.

All provisions set forth in this RFP and the other Contract documents shall be in effect throughout the Warranty Period. During this Period the System Integrator shall supply adequate maintenance personnel, spare parts, and factory support to ensure the ETS remains fully operational in full accordance with system performance requirements and that problems are corrected within the repair/replacement times as indicated in the maintenance section of this RFP.

If through and at the conclusion of the 270-day Warranty Period the system is operating in full accordance with the RFP and the Contract documents the *VTA* shall grant written Final System Acceptance.

The *VTA* shall advise the System Integrator as to whether or not the Maintenance Option(s) will be exercised at least 90 days prior to the scheduled completion of Phase IV (initial Warranty Period).

7.8 PROJECT MILESTONES

The following section shall define the project milestones and payment provisions for the Contract. Presented in Table 10 below is a chart that shows the major project milestones and the number of calendar days from NTP each of the milestones shall be completed by the SI. The System Integrator shall successfully complete each milestone prior to proceeding with the next milestone activity.

Upon completion of each milestone, the *VTA*'s Systems Manager will issue a letter of certification indicating that the System Integrator has successfully completed the milestone.

PROJECT MILESTONE	PROJECT PHASE	CALENDAR DAYS FROM NTP
Detail Design Review	I	270
Factory Acceptance Test	I	300
Equipment Installation	II	390
System Acceptance Test	II	450
Final System Approval	III	540



Final System Acceptance	IV	810
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Table 10 – Project Milestones

7.8.1 Detail Design Review

Successful completion of the Detail Design Review milestone shall be achieved when the *VTA*, Caltrans and the Systems Manager have reviewed and approved the Detail Design and accompanying documents submitted by the SI.

7.8.2 Factory Acceptance Test

Successful completion of the FAT milestone shall be achieved when the System Integrator has demonstrated that the ETS, as demonstrated during the FAT, has met all of the functional and performance requirements set forth in this RFP, in the Project Contract documents, and in accordance with the FAT Plan and procedures. This determination will be made by *VTA* and the Systems Manager.

7.8.3 Equipment Installation

Successful completion of the ETS equipment installation, including all of the roadside FasTrak[®] equipment, the TZC and RZC, the VDS equipment, pricing signs, communications hardware/software, TDC equipment and devices that are used to interface to external systems (BATA RCSC, Caltrans TMC).

7.8.4 System Acceptance Test

Successful completion of the System Acceptance Test milestone shall be achieved when the System Integrator has demonstrated, to the satisfaction of *VTA* and the Systems Manager, that the installed Express Connector System equipment has met all of the functional and performance requirements set forth in this RFP, in the Contract documents, and in accordance with the System Acceptance Test Procedures as documented in the System Integrator’s Requirements Traceability Matrix (RTM) .

7.8.5 Final System Approval

Successful completion of the 90-Day Operational Test shall be achieved when, as judged by *VTA* and the Systems Manager, the ETS has operated without equipment failure and in accordance with the functional and performance requirements for a continuous period of 30 days without major equipment or functional failure. The 90-Day Operational Test might need to be extended in order to achieve a full 30-day period of continuous operation without any major equipment or functional failure. The determination of whether a subsystem or equipment failure should be categorized as major or not will be made by *VTA* and the Systems Manager prior to the commencement of the 90-Day Operational Test.



7.8.6 Final System Acceptance

Final System Acceptance shall be considered achieved when the *VTA* and the Systems Manager has certified that the 90-Day Operational Test has been completed and that all other project documentation and activities required of the System Integrator have been provided.

Issuance of Final System Acceptance shall also indicate the beginning of the 270-day Warranty Period.

7.9 OPTIONAL MAINTENANCE PERIODS

VTA reserves the right to extend the Contract for up to three consecutive one-year maintenance periods. The *VTA* will inform the System Integrator in writing, at least 90 days prior to the conclusion of the Warranty Period or current one-year maintenance period, whether or not the *VTA* elects to extend the contract for the next one-year period. During any one-year maintenance period covered by such extended Contract, the System Integrator shall maintain the ETS according to the requirements presented in this RFP and in the Contract documents. If the *VTA* extends the contract for any one-year maintenance period, the System Integrator shall obtain a performance bond covering the System Integrator's maintenance obligations during the entirety of such period in form and protection satisfactory to the *VTA* in its sole discretion, prior to the commencement of such maintenance period. Bidders shall submit a cost for each of the three possible one-year maintenance periods as part of the Cost Proposal.

7.10 QUALITY ASSURANCE

7.10.1 Quality Control Program

The System Integrator shall establish and maintain an effective quality assurance and quality control (QA/QC) program to assure compliance with the requirements of the Contract. The program and procedures used shall be developed by the System Integrator and carefully tailored to meet Contract requirements.

The System Integrator's QA/QC program shall address all aspects of the ETS from design through manufacture, installation, system acceptance, and final acceptance. Software as well as hardware shall be under the control of the System Integrator's quality program.

The System Integrator shall describe its QA/QC program in the technical proposal. At a minimum, the proposal response shall describe the following elements of the System Integrator's QA/QC program as it shall apply to the ETS.

- Management Responsibility including QA/QC organization staff, and job description
- Documented Quality Management System
- Design Control
- Document Control and Submittal Management
- Subcontractor and Supplier Control
- Receiving, Handling, Storage and Control of Materials and Equipment
- Process Control and Control of special processes i.e. welding, coating, etc.



General Inspection and Testing Plan
Control of Measuring and Testing Equipment
Inspection and Test Status
Identification, Control and Correction of Non-conforming Conditions
Corrective Actions
Documentation of Quality Records
Contractor internal Surveillance and Audit
Training (QA/QC)

The System Integrator shall assign to the Project an engineer whose sole responsibilities shall be the quality and reliability of the ETS. This engineer shall be in place within 30 days of Contract award and shall remain assigned to the ETS throughout the Contract until final acceptance of the system.

The System Integrator's quality program shall include those internal inspections by an independent inspector or verifications necessary to ensure that the ETS being provided meets the requirements of these specifications and the highest standards of quality.

Inspections and/or verifications shall be used by the System Integrator for all appropriate steps related to the Contract and the ETS. Inspections/verifications shall be appropriate for design, incoming materials, fabrication, in-process inspection, final assembly, unit and system testing, and at any other point in the development process at which quality must be assured.

Inspections or verifications for function or performance shall be accomplished in accordance with written procedures. Such procedures shall define the objectives to be met as well as the step-by-step inspection/verification to be accomplished. Accept/reject criteria shall be included within the written procedures. Inspections or verifications for trade workmanship may or may not require written procedures, as determined by the System Integrator.

When inspections require *VTA* witnessing, those inspection procedures shall require *VTA* approval before scheduling the inspection.

Inspections/verifications for function or performance conducted by the System Integrator shall require the generation of records that shall include the legible signature of the System Integrator employee performing the inspection or verification. The *VTA* shall retain the right to review and audit such records either at the System Integrator's place of business or after submission by the System Integrator to the *VTA*.

System plans, drawings, work procedures, and inspection documents shall identify the inspections or verifications to be carried out. (Conventional QA terminology identifies inspection points as "I" and verification points as "V" on documentation.)

Status records of inspections/verifications shall be maintained by the System Integrator to preclude the issue or use of material, equipment, or components that have not passed



inspection/verification successfully. Non-compliant materials or products of any type shall be tagged and separated from acceptable product.

At a minimum, the final assembly inspection (which may be combined with the inspection at source) shall confirm that all applicable prior in-process or assembly inspections/verifications have been successfully completed before performance of the final assembly or source inspection. The System Integrator shall not ship to the site any ETS equipment, components, or software that have not completed all prior inspections or verifications required by the Contract and/or the System Integrator's own QA/QC program.

The System Integrator is advised that the *VTA* shall require not less than 30 working days for review and comment on inspection or test procedures submitted for approval unless longer periods are indicated within these specifications. The resubmission of inspection or test procedures should be anticipated on documents that generate numerous *VTA* comments or questions. The 30 working day period shall commence upon receipt of the document at the *VTA* office (date stamps shall be used).

Inspection and test procedures that require *VTA* approval shall have a format and content that, at a minimum, generally conform to the following:

- test or inspection methodology (step-by-step instructions for conducting the test or inspection),
- identify the items to be inspected, examined and tested,
- identify the characteristics to be inspected, examined, and tested,
- specify at which point or activity the inspection, examination, and testing are to be conducted,
- specify materials, equipment, and documentation to be used,
- specify inspection, examination and testing requirements/condition and acceptance criteria to be used,
- identify the individual or organization performing the inspection and or testing, and
- include inspection, examination and testing checklists and reports.

7.11 DESIGN AND IMPLEMENTATION

Presented in the Appendices to this RFP is a copy of the Systems Engineering Management Plan (SEMP) that was developed for the EC Project. This document includes a description of the various SEMF guidelines that the System Integrator should use during the ETS design, development, integration, testing and implementation phases of the Contract. It is important to note that the System Integrator is fully responsible to develop a series of system design, development, integration, testing and implementation plans as part of the Contract and, therefore, the SEMF is being provided for informational purposes only.



Also presented in the Appendices to this RFP is a copy of the Systems Integration Document Control Process document that the System Integrator shall adhere to during the conduct of work on the Project. This document describes the various roles and responsibilities all of Project team members and the method in which the document control process shall be conducted.

7.11.1 Documentation Requirements

The System Integrator shall submit all documentation and plans in the English language.

The System Integrator shall submit documentation and Plans for *VTA* review and approval in sufficient time for a minimum of two iterations of review. *VTA* will endeavor to expeditiously review submitted documents but the System Integrator should plan for a minimum *VTA* review time of ten (10) business days (excluding holidays). Multiple simultaneous submittals may extend *VTA*'s review times. Approval of documents shall not relieve or limit the System Integrator's responsibility to provide systems in full compliance with the technical provisions in the RFP and in the Contract file. If corrections or improvements are requested, the System Integrator shall resubmit the Documentation and Plans until such time as it is fully acceptable. Any need for re-submittal shall not be seen as a cause for delay in completing the project in accordance with the schedule requirements.

Deviations from the technical requirements that may be contained within the System Integrator submitted documents, even though the document may be approved by *VTA*, shall not have the effect of modifying Contract requirements. Only specific requests to *VTA* from the System Integrator for waivers or specification change that are formally approved by *VTA* shall void or change requirements in the Contract.

The development documentation to be provided shall include, at a minimum, the documents listed below:

- Project Management Plan;
- Software Development Plan;
- Software Specifications;
- Configuration Management Plan;
- Preliminary Design Document;
- Detailed Design Document; and
- Various Test Plans.

7.11.1.1 Project Management Plan

The System Integrator shall be responsible to prepare a Project Management Plan (PMP), as well as developing, implementing, maintaining, and adhering to the Project management organization and system contained in the PMP. The PMP shall describe the organization, authority, reporting relationships, and procedures to be implemented to manage and control the Work. The System Integrator shall provide the personnel, equipment, and tools necessary to plan, design, construct,



and perform all Work. The management organization must manage the Work in a manner that ensures safety, quality, and environmental sensitivity.

7.11.1.2 Software Development Plan

A detailed Software Development Plan (SDP) shall be prepared by the System Integrator and submitted to *VTA* for review and approval. This plan shall indicate all elements of the software development process and shall include, but not be limited to, the following:

- Software Development Schedules;
- Software Development Tools;
- Assignments to Sub-contractors;
- Programming Languages;
- Software Development Quality Control and Quality Assurance;
- Software Testing Plan;
- Software Documentation Plan; and
- Software Management Plan.

A complete program of software testing shall be defined as part of the SDP Plan. The Integrator's testing plan shall include a summary of test procedures, dates and equipment to be used for each particular test. The SDP shall include a description of documentation to be provided for application programs, as well as incorporating standards to be followed and sample documentation, where available.

7.11.1.3 Software Specification

The System Integrator shall prepare a detailed Software Specification (SS) that includes a description of all programs and subroutines satisfying all functional requirements, as set forth in the Contract documents. Flow diagrams shall be included in the software specification for programs used in all subsystems to clearly identify data flow through the system and to illustrate the relationship between individual programs and/or subroutines.

A preliminary data dictionary and file/record document shall also be included in the software specification. This document shall define all data messages, records and files accessed by more than one program in the ETS.

7.11.1.4 Configuration Management Plan

The System Integrator shall develop and provide a Configuration Management Plan (CMP) for the review and approval by *VTA* to be adhered to throughout the duration of this project. A method of configuration management shall be utilized in order to efficiently and accurately track and monitor the progress and changes that occur in all areas of this project.

At a minimum, the CMP shall address the following areas:

- Configuration Control;



1. Requirements Management.
 2. Deviation and specification change requests.
 3. Data Management.
 4. Configuration Audits;
 - a) Functional.
 - b) Physical.
 5. Approval Requirements for installed systems.
 6. Testing Requirements for installed systems.
- Configuration Status Accounting;
 1. Document Control and the Library Function.
 2. Approved Documents.
 3. Revision History for Documents.
 4. Physical Item Content.
 5. Physical Item Where Used.
 6. Status of Changes.
 7. Changes by Product/Serial Number.
 8. Results of Configuration Audits.
 9. Configuration Management Accounting (As Designed, As Built, As Delivered).
 10. Mod Status of Installed Systems.

7.11.1.5 Back-Up and Disaster Recovery Plan

The System Integrator shall develop and submit a backup and disaster recovery plan for the ETS in accordance with the relevant guidelines of the State of California. The plan submittal and the ETS design shall support the approved plan. During the operations phase of the Contract the System Integrator shall conduct the plan testing described in the above referenced disaster recovery guidelines.

The ETS data storage system shall provide built-in redundancy using a technique such as data mirroring.

A new image copy of the entire ETS shall be created after any application and/or operating system upgrade performed by the System Integrator. The monthly backup shall include all files, data, and software to completely restore the system to an operational state.

7.11.1.6 Preliminary Design Documentation

The Preliminary Design Documentation (PDD) shall include detailed information on schedule, organization, technical approach, methodology, risk mitigation and other issues related to a complete plan for software development. The topics for the PDD shall include, but shall not necessarily be limited to, the following:

- Schedule;
- Organization;
- Methodology;
- Overall System Architecture;



- Requirements for each System or Subsystem;
- Project Management Plan;
- Quality Assurance Plan;
- Software Development Plan;
- System Integrator Organization and Schedule Configuration Management Plan;
- Civil Work Plan;
- Examine and Assess Alternatives, where appropriate, for Each Subsystem or Component;
- Assess Design Issues and Associated Risk;
- Risk Mitigation;
- Assess Design Alternatives; and
- Status of environmental testing for system components.

In addition, the System Integrator shall address and show compliance with quality assurance, reliability, maintainability, software development, and other system requirements. Hardware concept drawings and preliminary level engineering specifications shall be submitted during this review. The PDD will be reviewed by *VTA* and Systems Manager staff and comments will be submitted to the SI. A meeting will be convened to discuss the *VTA*'s comments and the System Integrator shall then submit a revised version of the document. This process will repeat until *VTA* and the Systems Manager determine that the PDD is at an acceptable level. Once *VTA* and Systems Manager decide that the PDD is complete, a PDD approval letter will be sent to the SI.

7.11.1.7 Detailed Design Documentation

The System Integrator shall provide a functional narrative text, system and subsystem block diagrams, data flow diagrams, data structure diagrams, schematics, and any other graphic illustrations to demonstrate the technical adequacy of the system design approach and compliance for system hardware and software with quality assurance, reliability, maintainability, software development, and other requirements of these specifications.

The Detailed Design Documentation (DDD) shall be an extension of the approved PDD document. It shall include such detail as block diagrams, software design, testing procedures, operational procedures, etc. A list of equipment for each function along with a description of its role shall be provided.

The DDD shall be an extension of both the Contract documents and the System Integrator's Proposal. It shall include such detail as block diagrams, screen layouts, report formats, software design, testing procedures, operational procedures, and other pertinent design documentation. A list of equipment for each function along with a description of its role shall be provided. Any equipment listed in the DDD that has not been listed in the Cost Proposal or supplemental cost sheets shall be accompanied by the equipment specifications. Such equipment shall be provided at no increased cost to *VTA*.

The topics to be discussed in the DDD shall include, at a minimum, the following:

- Scope of Project;



- Master Schedule;
- Compliance Review Matrix;
- Document Requirements and Explanation, including for:
 - Roadside Equipment and Tolling Zone Design
 - Functionality
 - System Function Flow Chart
 - Hardware, Specifications and Integration
 - VDS Subsystem
 - TDC Host Server
 - Network Communications
 - Maintenance Functionality
 - MOMS
 - MOMS Messages
 - Maintenance Service and User Interface
 - Spare Parts complement to be provided
 - Hardware, Specifications and Integration
 - Network Communications
 - Maintenance Functionality
 - MOMS
 - Maintenance Service and User Interface
 - Software / Database Design
 - Software Specification
 - Operating System (OS)
 - Programming Language
 - Version Management
 - Reports
 - Performance Standards
 - Capacities
 - Degraded Modes of Operations
 - Speed
 - System availability calculations
 - Environmental Requirements and Specifications
 - Network Communications
 - Environmental Testing Results

The DDD will be reviewed by *VTA* and Systems Manager staff and comments and suggested changes will be submitted to the SI. A meeting will be held to discuss the *VTA*/Systems Manager comments and the System Integrator shall then submit a revised version of the document. This process will repeat until *VTA* and the Systems Manager determine that the DDD is at an acceptable level. Once the decision is made that the DDD is complete, an approval letter of the DDD will be sent to the SI.



7.11.2 Testing Requirements

7.11.2.1 Test Plan

The System Integrator shall prepare a detailed plan for testing all components of the ETS. This plan shall include environmental certification, functional tests, performance tests, operational tests and all other ad-hoc tests that might be required as deemed appropriate by *VTA* and/or the Systems Manager. The System Integrator shall submit a written report documenting the results for all tests performed and comparing them to the expected results.

Tentative dates for conducting the various tests shall be included in the Test Plan, as submitted by the SI. Reasonable modifications to these dates may be permitted during the course of the Work provided a written request for such changes is made at least two (2) weeks prior to the revised test date.

The Test Plan shall define the following:

Environmental Certification - The process for certifying that each item of toll zone equipment satisfies the environmental requirements is presented above in Section 6.1.3. This is to be accomplished either by providing documentation for tests previously performed or conducting environmental testing to certify the equipment item.

Factory Acceptance Testing – The Integrator shall perform factory acceptance tests, which shall include testing of the hardware, software and various subsystems that will be provided by the Integrator. These tests shall be conducted at the Integrator's facility using their test facility. The purpose of the FAT is to internally verify as many of the system requirements prior to the on-site ETS Approval Test as practical. To minimize the risk of later discovery of problems, the FAT tests will, as much as possible, be performed as an integrated system rather than as independent subsystems, using a representative system slice of the toll hardware and integrated software that is assembled and connected using the WAN and LAN configured for the actual production system. *VTA*, and/or its representatives, reserve the right to witness and participate in the FAT.

Operational Testing- The Test Plan shall define procedures for evaluating the ETS in a real world environment. The operational testing, which includes testing during the installation period and testing subsequent to the ETS being open to traffic (90-Day Operational Test) is to be conducted and evaluated by the SI. The operational testing procedures shall include but not limited to the following:

- Review of recorded transaction data to identify any patterns that suggest erratic or faulty system behavior. Such indications may prompt further analysis or investigation.
- Review of MOMS and other maintenance data to identify reliability problems.
- Controlled testing through the insertion of test vehicles into real traffic.



Performance Audit - The Test Plan shall define controlled test procedures for evaluating the Express Connector System on an annual basis to ensure that system reliability and accuracy have not degraded over time and the ETS continues to satisfy the functional and performance requirements. Procedures should be similar to those defined for Operational Testing. The System Integrator shall also incorporate selected *VTA* ad hoc tests into the Performance Audit test procedures.

Test plans shall include details on the test environment including the hardware, software and test items and dependencies comprising the test environment, and the overall flow of the test activities. The Test Plan shall provide a requirements traceability matrix listing each RFP requirement and how that requirement is to be tested/demonstrated, inspected,, or analyzed For those requirements that are to be verified through testing, the matrix shall reference the particular test procedure number which provides the conditions/scenario of the test and the number of test runs planned in addition to the scripts written to verify satisfaction of the requirement. Each condition or scenario detailed by a test procedure shall also include the types of data to be recorded, the expected results and the acceptance criteria for the test.

Scenarios should include tests that require the toll zone to be able to process a specific rate of transactions and successfully transfer those transactions to the TDC in both normal operational modes and various degraded modes of operation.

Conditions and scenarios of the tests should include items such as type of vehicle, and the speed and movement of the vehicles through the Tolling Zone (left to right, straddling buffer and EC lane, vehicle speed, and mix of vehicles with and without tags). The ETS Acceptance and 90-Day Operational Tests shall include correlation testing where platoons of closely spaced vehicles, some with and some without tags, are used as test vehicles. These tests shall also include significant variation in pricing to ensure that the software algorithms are working properly.

7.11.3 Factory Acceptance Test, Procedures and Reporting

The tests to be performed shall be according to internal plans and procedures of the System Integrator and shall be witnessed by the System Integrator's Quality Control staff. It is the responsibility of the System Integrator to ensure best practices are being utilized to test with perceptiveness and thoroughness. Issues and problems uncovered during the FAT which result in a design or process change shall be reported to *VTA*. While intended as an internal test, *VTA* reserves the right to review all plans, procedures and data generated from the internal FAT. Special focus of the FAT should be on the operations of the dynamic pricing algorithms and how the change in pricing affects the LOS in the Express Lanes. The System Integrator shall clearly describe how this process will be tested at the factory level.

7.11.4 Express Connectors System Acceptance Test

The tests to be performed shall be defined in the Express Lanes System Acceptance Test procedures which the System Integrator shall prepare and submit to *VTA*. Prior to conducting



the System Acceptance Test all test scripts and scenarios shall be approved by *VTA* and the Systems Manager.

Tentative dates for conducting the various tests shall be included with the ETS Test Plan. Reasonable modifications to these dates without delaying the overall schedule may be permitted by *VTA* during the course of the project work, provided a written request for such changes is made at least two (2) weeks prior to the revised test date.

If there are any failures or anomalies in conducting any test step, the System Integrator shall take the necessary corrective action and the test shall be repeated. In the case that corrective action is undertaken by the SI, it shall perform any necessary regression testing to ensure that such corrective action has not adversely affected the system's ability to pass previously conducted test steps. If necessary this process shall continue until success is achieved.

If a System Acceptance Test indicates that the system and its components are satisfactory, *VTA* will issue written approval of the test for the configuration. If the results are not satisfactory, according to the *VTA* and the Systems Manager, the System Integrator shall request the scheduling of a subsequent test re-run to occur after corrective action is completed.

Components used in the System Acceptance Test shall be production models, which would be suitable for installation at toll zones, in the Express and GP lanes, at the TDC and at the TMC.

The System Acceptance Test shall be performed by the System Integrator under the supervision of, and with the participation of, *VTA* staff and the Systems Manager. *VTA* staff and the Systems Manager shall be permitted to conduct ad hoc testing that they deem appropriate during or after the formal tests. Any observed repeatable deficiencies shall be brought to the attention of System Integrator and these shall be incorporated in the test review and evaluation. Each installed piece of ETS and TDC equipment and subsystem shall be subjected to testing during the System Acceptance Test. Once *VTA* and Systems Manager staff determine that the FAT is successful, a FAT approval letter will be submitted to the SI.

7.11.5 ETS Acceptance Test Procedures

The System Integrator shall prepare detailed ETS Acceptance Test procedures or scripts for the ETS Acceptance Test. The Test procedures shall cover test set-up, step by step procedures for controlled tests, and the expected results for each step. Tests shall be "end-to-end" so that results are tracked through the system, whenever possible. For example, the impact of parameters set by and communicated from the *VTA* TDC to outside systems shall be closely observed in the behavior of the lane systems or results of tests that are conducted in the lanes at the toll zones are tracked at the TDC. *VTA* will arrange for reports of the transmitted test transactions and to be processed by the BATA RCSC and the posting information to be provided to the SI.

The following are illustrative of the aspects of the ETS that are, at a minimum, to be demonstrated during conduct of the System Acceptance Test:



- Power up tests;
- Verify initialization;
- Verify data integrity (no loss of data);
- Verify diagnostic messages;
- Introduce failures;
- Verify diagnostic messages;
- MOMS Reporting;
- Normal FasTrak[®] Transaction Tests;
- Lane operational tests;
- Functioning of the TDC;
- TDC interface to the TZCs/RZCs;
- TDC interface and data processing to and from the BATA RCSC;
- TDC interface to and the operation of the Caltrans TMC;
- TDC interface and data transfers to and from the CHP portable reader;
- System enforcement equipment operation and processing;
- Transponder detection by vehicles at speeds from 5mph to 100mph through the toll zones;
- Transponder detection during a platoon of vehicles;
- Proper association of vehicles and transponders;
- ETC transaction tests;
- Tag status file download and upload tests;
- Production of various TDC traffic, revenue and audit reports;
- Tolling zone and TDC stand-alone operation tests; and more.

Once *VTA* and Systems Manager staff determine that the System Acceptance Test has been successfully completed, an approval letter indicating so will be submitted to the SI.

7.11.6 ETS Acceptance Test Report

Within 15 days after the ETS Acceptance Test has been successfully completed, the System Integrator shall submit a detailed report of the results. The report shall include, at a minimum, the following:

- An executive summary of the overall test results highlighting the general conclusions of the testing and any problems found and corrected;
- A requirements traceability matrix modified to include any changes to the testing conducted from the initial submission and a verification of the system's conformance to the requirements;
- Results of any *VTA* and Systems Manager requested ad hoc testing that was undertaken and brought to the System Integrator's attention during or after the tests; and
- An appendix containing the detailed results of the performance of the test scripts.



7.11.7 90-Day Operational Test

The ETS shall undergo a 90-day operational evaluation period after the entire ETS has been installed and integration tested successfully completed. The ETS will be closely observed as to its functional and performance characteristics during this 90-day period.

The ETS shall operate reliably and perform in accordance with the specifications and Contract Document requirements during the test. The ETS shall operate without equipment failure and in accordance with the functional and performance requirements for the last 30 days of the evaluation period or the operational test shall be extended until 30 days of operation without major equipment failure is achieved. For this purpose major equipment failure is one that results in the loss of functionality related to system requirements in the RFP and the contract documents. Successful completion of the 90-Day Operational Test is required for the granting of System Acceptance.

7.11.8 90-Day Operational Test Procedures

The System Integrator shall prepare 90-Day Operational Test Procedures defining the procedures and tests to be performed for the installed and operating roadside equipment, toll zones, the TDC, enforcement equipment, and all internal and external interfaces.

7.11.9 90-Day Operational Test Report

Within 15 days after the 90-Day Operational Test has been successfully completed, the System Integrator shall submit a report of the results. The report shall include but shall not be limited to the following:

- A summary of the overall test results highlighting the general conclusions of the testing and any problems found and corrected; and
- An appendix containing the test results and data used in evaluating the system's operational performance.

7.11.10 Performance Audit

On an annual basis, the System Integrator shall conduct a Performance Audit for each operational toll and read zone to verify that system reliability and accuracy has not degraded over time and the ETS continues to satisfy the functional and performance requirements that are presented in the system design documentation and all other Contract documents.

System transaction data and reports plus MOMS data for at least the 30 days preceding the Performance Audit shall be utilized in the analysis. In addition, controlled tests shall be conducted by utilizing test vehicles mixed with real life traffic. *VTA* and Systems Manager staff may choose to perform ad hoc operational testing as part of the Performance Audit. The initial Performance Audit shall be conducted and successfully completed as a condition of Final System



Acceptance. A Performance Audit will be deemed successful by *VTA* and the Systems Manager if it is determined that the audit shows that the system requirements presented herein are met.

7.11.11 Performance Audit Procedures

The System Integrator shall prepare Performance Audit Procedures defining the procedures and tests to be performed for the installed and operating ETS. The procedures shall identify the test vehicles that are to be mixed with real traffic and the results to be obtained from the tests. The Performance Audit Procedures shall also define the operational data to be reviewed and the analysis that will be conducted on that data.

7.11.12 Performance Audit Report

Within 15 days after the Performance Audit has been completed, the System Integrator shall submit a report of the results. The report shall include but shall not be limited to the following:

- A summary of the overall test results highlighting the general conclusions of the testing and any problems found and corrected; and
- An appendix containing the test results and data used in evaluating the system's operational performance.

7.12 WARRANTY PERIOD AND MAINTENANCE REQUIREMENTS

7.12.1 General

The System Integrator shall establish and maintain an effective maintenance program for the new Express Connectors. The System Integrator shall be solely responsible for full maintenance of the ETS, including the roadside and TDC hardware and software, from the time of commissioning through the Warranty Period and for the term of any successive maintenance options that may be exercised by the *VTA*. Maintenance shall be provided through field service, operational testing, remote diagnostics and control, and by maintenance personnel either on-duty or on-call 24 hours a day, seven days a week.

The standards for response time and repair time established herein shall be met by the System Integrator until completion of the Warranty Period and through each of the maintenance periods that might be selected by the *VTA*. Where specific guidance is not provided for response and/or repair times, the total downtime of any component or subsystem shall not exceed four (4) hours.

During the Warranty Period the System Integrator shall replace, at no cost to the *VTA*, any piece of equipment, component or software that is deemed by the *VTA* to not be fully operating within the requirements that are set forth in the Contract documents.

The System Integrator shall provide an Operations Coordinator to coordinate the project operations with the *VTA* during the execution of the Warranty Period.



7.12.2 Maintainability Goals and Objectives of the VTA

The Bidder shall provide with their technical proposal predictions for component and lane maintainability values (MTTR) derived from maintenance records or tests of the System Integrator's product line. The System Integrator proposed equipment and systems shall meet the dictated life, reliability and availability requirements that are presented above in Table 2 (in Section 6.1.1). The System Integrator shall propose only those maintainability values (MTTR) that it can readily defend by engineering data and that it is prepared to be held accountable for during the on-line maintainability demonstration test and duration of the Contract.

The MTTR shall be the total corrective maintenance time divided by the total number of corrective maintenance actions during a given period of time. Corrective maintenance actions shall be those associated with relevant and chargeable failures only.

Response and repair time criteria cited herein shall apply 24 hours a day, seven days a week, for all components of the ETS. The required maintenance analysis and Maintenance Plan shall be used by the System Integrator to show how the criteria shall be met during the maintenance periods.

Response time is defined as the interval of time that transpires between the System Integrator's notification of equipment or system failure and the arrival of the System Integrator's maintenance technician at the failure site to perform the required troubleshoot/repair.

Unless written relief is given by an authorized *VTA* employee at the time of the maintenance call, the response time covered by the Contract shall not exceed two hours. Emergency exceptions shall be handled on a case by case basis.

Repair time is defined as the interval of time that transpires between arrival at the failure site by the System Integrator's maintenance technician and complete resolution of the failed component or subsystem to full operational service. Repair times shall not exceed the specified MTTR values that are presented in Table 2.

7.12.3 Maintenance Analysis Requirements

The System Integrator shall use analytical methods, appropriate models, and a documented study that shall lead to the definition of resources to be used for maintenance of the ETS. This means that the number and types of maintenance service personnel assigned to maintenance of the ETS shall be derived from a careful analysis of System and *VTA* needs. The spare parts required shall also be derived from a careful and documented analysis. In the case of both personnel and spare parts, the System Integrator shall start its analysis from the contractually required response and repair times as set forth herein and provided in the Proposal.

Personnel and spare parts analysis shall carefully consider geographic distribution of the maintenance sites, vehicles available to transport personnel and spares, traffic and driving times, and back-up services available.



The maintenance analysis shall be documented within the appropriate sections of the maintenance plan. Approval of the maintenance plan shall depend in part on the quality and acceptability of the maintenance analysis incorporated into the plan.

7.12.4 Maintenance Personnel Experience Requirements

The Maintenance Plan that is required shall address the requirements for describing the maintenance organization and personnel to be used for maintaining the ETS. This section provides additional requirements for personnel qualifications to be satisfied by the System Integrator while maintaining the System.

The numbers and types of maintenance personnel to be used by the System Integrator for maintaining the System as well as the distribution of personnel shall be the product of maintenance analysis and documented within the maintenance plan.

The Maintenance Manager shall be responsible for the overall maintenance activities for the Project. The individual designated as the Maintenance Manager must have demonstrated and sufficient experience and capabilities in maintenance activities that are similar in scope to what is expected for the Project, including, without limitation, specific experience in electronic toll system design projects, maintenance procedures of toll system equipment and subsystems, and managing field technician personnel. The individual designated as the Maintenance Manager by the System Integrator shall require the approval of the *VTA*.

The System Integrator shall not replace the Maintenance Manager without the prior written approval by the *VTA*. The System Integrator's request to replace the Maintenance Manager shall name a proposed replacement manager, include his/her qualifications and include a statement that he/she will be available within thirty (30) days.

The maintenance service technicians (of any discipline) shall have an appropriate technical education background and at least three years of experience servicing electronic and/or toll system equipment.

Any maintenance subcontracts used by the System Integrator shall be fully described within the Maintenance Plan submitted for the *VTA* approval, and the Subcontract agreements themselves shall be made available for review by the *VTA* upon request.

ETS software maintenance personnel shall have equal or greater education and experience as is required for the maintenance service technicians. The System Integrator shall describe in the Maintenance Plan how ETS software maintenance support shall be provided.

All System Integrator personnel shall be subject to appropriate security checks conducted to the satisfaction of the *VTA*. The System Integrator shall obtain written approval from the *VTA* for all maintenance service personnel.



7.12.5 Maintenance Plan

The System Integrator shall submit a detailed Maintenance Plan. The plan shall include maintenance staffing and administration, dispatch procedures, communication requirements, preventive maintenance techniques, schedules, and support from outside maintenance service (for example, computer manufacturers and COTS vendor suppliers), final maintenance equipment list, and other details as may be appropriate for inclusion in the Maintenance Plan.

If maintenance procedures require any lane closures these shall only be undertaken after the *VTA* and Caltrans has approved the lane closure and the System Integrator shall be responsible for maintenance of traffic (MOT). The System Integrator shall adhere to the MOT plans that are presented as attachments to this RFP.

The Maintenance Plan shall include procedures to be used from the first use of the ETS through completion of the Maintenance/Warranty Period and throughout any of the maintenance options that may be selected by the *VTA*. The Plan shall address, at a minimum, the following:

- Standards and General Procedures;
- Equipment Maintenance;
- Software Maintenance;
- Maintenance Tools;
- Spare Parts and Inventory Control;
- Maintenance On-line Maintenance System (MOMS);
- Emergency/Corrective Maintenance Procedures;
- Preventive Maintenance Procedures and Schedules;
- Support Services:
- Personnel:
- Staff Location;
- Staff Qualifications;
- Training;
- Maintenance Facilities/Workshop(s);
- Maintenance Records;
- Failure Tracking and Corrective Action;
- Lane Closure Procedures (using the attached MOT Plans as the basis for procedures);
- Reliability and Maintainability Analysis and Calculation;
- Spare Parts Inventory Levels; and
- Maintenance Activity Reports.

7.12.6 Preventive Maintenance

The System Integrator shall develop a preventive maintenance schedule designed to cover all electronic toll collection system components and to ensure optimum maintenance of the system to meet the contractually required reliability and maintainability values. The preventive maintenance schedule shall be submitted as part of the Maintenance Plan.



7.12.7 Corrective and Emergency Maintenance

The System Integrator shall maintain a staff of trained personnel of sufficient quantity and quality to ensure that urgent repairs can be performed 24 hours a day, every day of the year. The System Integrator shall be required to respond to a maintenance call and have a technician on-site and ready to fix the reported problem within 2 hours from issuance of the maintenance call that is generated and sent by MOMS. In addition, the System Integrator shall be required to resolve the reported problem within 2 hours from the time in which the technician is physically on-site. The System Integrator maintenance technician shall be responsible to report that they have reached the site of the reported problem by contacting the designated *VTA* representative.

7.12.8 Spare Parts

The System Integrator shall provide and periodically maintain an inventory of all spare parts required to maintain the System according to the requirements presented herein. The initial inventory shall be a complete complement of spare parts. The System Integrator shall maintain adequate reserve stock of spare parts and items of equipment located in proximity to the EC Lanes. Inability to complete repairs due to the lack of timely availability of spare parts shall not relieve the System Integrator of its maintenance obligations.

The System Integrator shall maintain a comprehensive, accurate, and auditable parts and spares inventory at a system level by using the MOMS maintenance data base.

7.12.9 Maintenance Transportation

The System Integrator shall provide all necessary vehicles to effectively maintain the System. All vehicles shall be registered in the State of California. Vehicles shall not carry any special identification unless authorized to do so by the *VTA*. All System Integrator maintenance personnel on duty shall be equipped for rapid two-way communication with the Maintenance Manager's office (e.g., a beeper system).

Each System Integrator vehicle shall be equipped, at the System Integrator's expense, with the test equipment and spare parts that are required to effectively maintain the System. The test equipment and spare parts to be carried in each vehicle shall be documented in the Maintenance Plan.

7.12.10 Maintenance Facilities/Workshop

The System Integrator shall be responsible for the provision of maintenance office and work facilities equipped and capable of supporting the maintenance of hardware and software for the System. The facility shall house spare parts, documentation, communications, and personnel necessary to maintain the System according to the requirements presented herein.

7.12.11 Maintenance On-Line Management System

The System Integrator shall provide a MOMS. The MOMS shall allow for monitoring and reporting of equipment failures within the entire set of toll zones that may be procured under the Contract.



MOMS shall be the focal point for all ETS maintenance activities including routine preventive and corrective maintenance, real-time monitoring, repair calls, report generation, etc.

Access to MOMS information shall require entry of the user's identification and password from which the system shall retrieve the user's assigned role(s). Personnel access levels to MOMS shall be determined by *VTA* staff.

At a minimum, MOMS shall be capable of providing the following information:

- Current Tolling Zone operational status;
- Failure and/or malfunction location;
- Failure and/or malfunction description (w/ priority level);
- Spare parts inventory quantity and control;
- Part and equipment description (including part number and serial number);
- Record of last maintenance activity for a part entered by maintenance staff;
- Record of last preventive and corrective maintenance activity for all parts as entered by maintenance staff; and
- Historical system information/report generation.

The System Integrator shall provide a monthly maintenance summary report to the *VTA*. The *VTA* reserves the right to review the maintenance records and database files for compliance with System performance requirements.

For every monthly maintenance payment period the System Integrator shall prepare a report (Maintenance Report) that tracks malfunctions, the times that malfunctions were recorded, the time the technician responded to the service call and the time the technician completed the repair. The report shall also provide the percent availability figures for the month.

7.12.11.1 Failure Detection and Reporting

One primary purpose of MOMS is to automate the issuance of repair/service calls to maintenance technicians.

MOMS shall be designed with the ability to generate work orders with little or no human intervention. Work order formats and specifications shall be determined during the design process and approved in writing by *VTA*, or their designated representative.

The MOMS shall provide for generating a minimum of four (4) different types of work orders, including ad hoc, preventive, corrective, and emergency maintenance.

The work order shall record the source of the work order, either as automatically triggered by MOMS monitoring, or the person reporting the failure, or both.



The MOMS shall also provide the capability to build ad hoc work orders for unusual maintenance activities. In addition, a work order shall include, but not be limited to, the following information:

- Date/Time of work order generation;
- Date/Time/Location of repair or maintenance call;
- Work order number (sequential); and
- Failure or malfunction description.

MOMS shall also provide the capability to generate blank work orders for repairs or malfunctions not directly reported by MOMS. Blank work orders shall still be generated for the sequential list maintained in MOMS.

MOMS shall allow both automatic and manually activated paging of technicians once a work order has been generated.

MOMS shall be designed to accommodate the assignment of priority levels for each failure type.

MOMS shall assign an initial priority level to each failure but shall provide for manual override to account for aspects that impact severity level and MOMS cannot assess.

The paging process shall check to determine the assigned active technician and update the dispatch grid to include the new service call.

MOMS shall monitor the disposition of service calls and shall generate a page to the maintenance technician and/or the maintenance manager for any work order not responded to or repaired within the required time.

7.12.11.2 System Monitoring

MOMS shall report the status and performance of all levels of ETS equipment in real-time.

The performance monitoring function shall allow the user to select and observe the status and/or performance of several pre-defined portions of the ETS. The following is a breakdown of the various levels, and, at a minimum, the degree of information required to be displayed for each level:

- Toll and Read Zone level components; and
- All equipment statuses for:
 1. Status of all Toll and Read Zone applications;
 2. Toll and Read Zone identification (ID);
 3. Toll and Read Zone location (Tolling Zone ID);
 4. Toll and Read Zone overall operation status (operational/degraded);
 5. Current operational status of each major subsystem; and
 6. Status of Toll and Read Zone communications link.



7.12.11.3 Availability Tracking

MOMS shall track and calculate the availability of each toll zone by function.

The calculations shall be performed automatically whenever an availability report is run.

The availability report shall take into account the number of installed Tolling Zones and the length of outages affecting the particular Tolling Zone function.

7.12.11.4 Remote Access

MOMS shall be designed with the capability to allow technicians and other users to access the MOMS network over the internet.

Technicians or maintenance staff shall typically utilize this function while off-site or to log-in and close out a work order.

The dial-up access shall be designed to utilize simple dial-up connection tools typically found on laptop computers.

Access shall be password protected to prevent unauthorized users from gaining access to MOMS. A single network password shall not be acceptable for dial-up users. Each user shall use a personal password when logging into MOMS.

7.12.11.5 Inventory/Spare Parts Control

The System Integrator shall provide an integrated spare unit and spare parts inventory control as part of MOMS.

This function shall be integrated with the work order generation function which shall automatically update and maintain the system and spare parts inventory based on work orders and technicians recording of parts used during work order closeout.

7.12.12 Force Majeure Repairs

The System Integrator shall repair ETS elements that are damaged by Force Majeure events. After making the repair and presenting acceptable evidence of a Force Majeure repair and documentation of the costs incurred, the System Integrator shall be reimbursed by the *VTA* on a time and materials basis. Maintenance repair response time requirements shall not apply in the case of Force Majeure events.

7.12.13 Maintenance and Service Manual

A Maintenance and Service Manual shall be provided to the *VTA* for review and approval. The schedule for the submittal of the draft and final versions of the Maintenance and Service Manual shall be according to the timelines described previously in Table 5. Five (5) copies of the Final Maintenance and Service Manual shall be submitted by the SI. The Maintenance and Service Manual will be used primarily by the System Integrator's maintenance staff but shall be provided to the *VTA* in the event *VTA* should at some point decide to take over the maintenance responsibility



for the System. This comprehensive document shall provide complete detailed technical descriptions of maintenance operations including, at a minimum:

- Preventive Maintenance Schedule;
- Troubleshooting Techniques;
- Corrective Measures, both temporary and permanent;
- Maintenance Techniques (routine, preventive, and remedial);
- Location and availability of support services for all major components;
- Point-to-point component wiring schematics and logic signal flows; and
- Assembly and disassembly drawings, including exploded view drawings.

The Manual shall be prepared for technical personnel assigned to the maintenance of the ETS. This Manual shall include a general description, theory of operation, operator instructions, detailed electrical/electronic logic circuit analysis, mechanical functions, installation, test and trouble-shooting procedures, and preventive and corrective maintenance procedures. The Manual shall also contain diagrams, schematics, layouts and parts lists required to service each component and circuit board utilized in the System.

Standard service manuals for unmodified commercial products used in the System shall be acceptable if they contain details and accurate information in order to properly service the specific toll equipment supplied under the Contract. Large size diagrams and mechanical assembly diagrams do not have to be reduced or incorporated into the manuals if these drawings are delivered with the manuals.

The final Maintenance and Service Manuals shall be delivered to the *VTA* 90 days prior to Phase IV Approval.

7.12.14 End of Warranty Period and Optional Maintenance Periods

The System Integrator shall be responsible to satisfy the following conditions in order for the *VTA* to declare the end of any optional maintenance period. The System Integrator shall not be released from their maintenance obligations until each of the below described conditions are met to the satisfaction of the *VTA* and this is documented, in writing, by the appropriate *VTA* representative.

- Inspection – A detailed inspection will be performed by *VTA* staff and the System Integrator shall provide reasonable support for the inspection;
- Maintenance Records – The System Integrator shall provide to the *VTA* all current and historical maintenance records, equipment and software support contact information, outstanding equipment and second source software warranty paperwork, service records, and other relevant documentation to the satisfaction of the *VTA*;
- Spare Parts, Components, Tools – The System Integrator shall transfer to the *VTA* all spare parts, components, boards, tools, and other spare parts. The spare parts and components will be cross-referenced with MOMS to ensure that all parts and components are transferred to the *VTA*;



- Passwords – The System Integrator shall provide all system passwords, user names, and other access and system security information to the *VTA*;
- Training – The System Integrator shall provide maintenance training to designated *VTA* staff to the satisfaction of the *VTA*;
- Manuals and Drawings – The System Integrator shall provide revised, fully updated versions of all Maintenance and Service Manuals, current Maintenance Plan, installation drawings, as-built drawings, and other relevant documentation to the satisfaction of the *VTA*; and
- Spare Equipment Repair – The System Integrator shall repair all spare equipment, to the satisfaction of the *VTA*.

The *VTA* will not grant successful completion of any maintenance period until each of the above listed conditions is met, to the satisfaction of the *VTA*.

7.13 TRAINING REQUIREMENTS

The System Integrator shall provide a training schedule for TDC Operators/Auditors, selected CHP officers and maintenance personnel. A separate training course shall be provided, at a location in the Oakland area that is designated by the *VTA*, for each of the following categories of personnel:

- TDC Operators;
- TDC Auditors;
- CHP Enforcement Officers; and
- Maintenance Personnel.

Manuals that describe in detail the various operating parameters shall be developed and submitted by the System Integrator for the TDC Operators, the TDC Auditors, the CHP Enforcement Officers, and the *VTA* maintenance personnel. The documentation delivery dates are presented to Table 5. These manuals will be used as the basis for System Integrator training of the various types of System users. CHP Enforcement Officer and maintenance training shall include both classroom and field training.

System Integrator training of the CHP Enforcement Officers, the TDC Operators, and Auditors shall be successfully completed, as determined by *VTA* and Systems Manager staff, no later than 30 days prior to ETS commissioning. Training by System Integrator staff of the *VTA* maintenance personnel shall be completed, to the satisfaction of the *VTA* and the Systems Manager, at least 30 days prior to the end of any Maintenance Period. Training courses shall be required for not more than five (5) persons.

7.14 PROJECT PAYMENT PROVISIONS

Payment for equipment, software, services and materials provided by the System Integrator under the terms of the Contract shall be made at various intervals based on project milestones being successfully met, as determined by *VTA* and the Systems Manager. The below sections



describe the payment process for each of the payment categories that are listed in the Cost Proposal table, which is provided subsequently in this RFP.

7.14.1 Retainage

Five (5) percent of all payments of any kind required to be made to the System Integrator pursuant to the Contract shall be retained by the *VTA*. Payment of the five (5) percent retainage will be made in full upon *VTA* granting of Final System Acceptance.

7.14.2 System Software

Presented below is the payment process that will be followed for the System Software cost, which is Item “G” of the Cost Proposal table:

- 10% payment upon issuance of NTP to the System Integrator (this represents a project mobilization payment);
- 15% payment upon issuance of DDD approval letter;
- 25% payment upon issuance of FAT approval letter;
- 30% payment upon issuance of Systems Acceptance Test approval letter; and
- 20% payment upon granting of Final System Acceptance to the SI

7.14.3 Project Management

Payment for Program Management, which is Item “L” of the Cost Proposal table, will be made in 18 equal monthly payments. The first monthly payment will be made 30 days after issuance of NTP and the final monthly payment will be upon issuance of Final System Approval.

7.14.4 ETS Hardware

Payment for the ETS Hardware, which includes Items “A”, “B”, “C”, “D”, “E”, “F”, “H” and “I” of the Cost Proposal table, will be made based upon the System Integrator meeting the following milestones:

- 60% payment upon all of the ETS equipment being received on-site (receipt of all ETS equipment on site this will be determined by the Systems Manager);
- 30% payment upon granting of Final System Approval; and
- 10% payment upon granting of Final System Acceptance.

7.14.5 Documentation

Payment for Documentation, which is Item “M” of the Cost Proposal table, will be made as follows:

- 50% payment upon *VTA*/Systems Manager acceptance of the documents listed from item #1 through item #13 on Table 8;



- 30% payment upon *VTA*/Systems Manager acceptance of the documents listed from item #14 through item #23 on Table 8 in conjunction with the granting of Final System Approval; and
- 20% payment upon *VTA*/Systems Manager acceptance of the documents listed from item #24 through item #30 on Table 8 in conjunction with the granting of Final System Acceptance.

7.14.6 Equipment Installation

Payment for Equipment Installation, which is Item “J” of the Cost Proposal table, will be made based upon the following schedule:

- 25% upon delivery of equipment to the work site as verified by the Systems Manager;
- 50% payment upon completion of the equipment and software installation process as determined by the Systems Manager; and
- 25% payment upon granting of Final System Approval.

7.14.7 Training

Payment for Training, which is Item “N” of the Cost Proposal table, will be made in full upon successful completion of the training process. The determination of completion will be made by the Systems Manager.

7.14.8 Warranty Period

Payments for the Warranty Period, which is Item “O” of the Cost Proposal table, will be made in nine (9) equal monthly payments. The first monthly payment will be made 30 days after the commencement of the Warranty Period and the final monthly payment will be upon issuance of Final System Acceptance.

7.14.9 Optional Maintenance Period(s)

Payments for the Optional Maintenance Period(s), which is Item “P” of the Cost Proposal table, will be made in 12 equal monthly payments. The first monthly payment will be made 30 days after the commencement of the Optional Maintenance Period and the final monthly payment will be upon completion of the 12th month of the Period.



8. AGREEMENT AND REQUIRED SUBMITTALS

8.1 AGREEMENT (SEE FOLLOWING PAGE)



AGREEMENT BETWEEN
SANTA CLARA VALLEY TRANSPORTATION AUTHORITY
AND
[CONTRACTOR NAME]
FOR
SR237/I-880 EXPRESS CONNECTORS PROJECT – SYSTEM INTEGRATOR

CONTRACT NO. S10021

THIS AGREEMENT for Professional Services (“Agreement”), effective as of [DATE] (“Effective Date”) is entered into between the Santa Clara Valley Transportation Authority (*VTA*), and [CONTRACTOR NAME – ADDRESS] (CONTRACTOR).

1. **SERVICES TO BE PERFORMED:** CONTRACTOR shall furnish all technical and professional labor, and materials to satisfactorily perform the services and comply with the terms, conditions and requirements stated in RFP10-01 and all addenda thereto; all provisions of the CONTRACTOR’s proposal and submittals and any amendment thereto; which are incorporated by reference and made a part of this Agreement.

2. This Agreement contains the following Exhibits which are attached hereto and incorporated herein:

- Exhibit A entitled “This exhibit reserved for SCOPE, if needed”
- Exhibit B entitled “COMPENSATION, INVOICING and PAYMENT”
- Exhibit C entitled “INDEMNITY AND INSURANCE”
- Exhibit D entitled “FEDERAL REQUIREMENTS”

3. **TERM OF THE AGREEMENT:** The term of the Agreement shall commence upon the Effective Date and continue through completion on or before [DATE].

4. **COMPENSATION:** CONTRACTOR shall be paid for services performed hereunder in accordance with Exhibit B, entitled “COMPENSATION, INVOICING and PAYMENT” which exhibit is attached hereto and incorporated herein by this reference.

Total Compensation for services provided hereunder shall not exceed [\$].

5. **PERFORMANCE OF THE SERVICES:**

5.1 CONTRACTOR represents that it is sufficiently experienced, properly qualified, registered, licensed, equipped, organized and financed to perform the Services under this Agreement.



5.2 CONTRACTOR shall perform the Services under this Agreement with that degree of skill and judgment normally exercised by firms performing services of a similar nature. In addition to other rights and remedies that *VTA* may have, *VTA*, at its option, may require CONTRACTOR at CONTRACTOR's expense to re-perform any Services that fail to meet the above standard.

6. ASSIGNMENT AND SUBCONTRACTS:

6.1 CONTRACTOR shall not assign or transfer this Agreement or any portion thereof without the prior written consent of *VTA*. Additionally, CONTRACTOR shall not subcontract any part of the Services hereunder other than to those subcontractors that may be identified herein. Any assignment, transfer, change or subcontract in violation of this Agreement shall be void.

6.2 CONTRACTOR shall be fully responsible and liable for the services, products and actions of all subcontractors and suppliers of any tier, and shall include in each subcontract any provisions necessary to make all the provisions of this contract fully effective.

7. **CHANGES:** By written notice from *VTA*'s Authorized Representative, *VTA* may, from time to time, make changes within the general scope of this Agreement. If any such changes cause an increase or decrease in the price of this Agreement or in the time required for its performance, CONTRACTOR shall promptly notify *VTA* thereof and assert its claim for adjustment within ten days after the change is ordered, and an equitable adjustment shall be negotiated.

8. **INDEMNIFICATION AND INSURANCE:** Indemnification and Insurance requirements are set forth in Exhibit C, entitled "Indemnification and Insurance" which is attached hereto and incorporated herein by this reference.

9. AUDIT AND RECORDS:

9.1 The cost proposal is subject to a post award audit. After any post award audit recommendations are received, the cost proposal shall be adjusted by the CONTRACTOR and approved by the *VTA* to conform to the audit recommendations. The CONTRACTOR agrees that individual items of cost identified in the audit report may be incorporated into the Agreement at *VTA*'s sole discretion. Refusal by the CONTRACTOR to incorporate the interim audit or post award recommendations will be considered a breach of the Agreement terms and cause for termination of the Agreement.

9.2 CONTRACTOR shall maintain, in accordance with generally accepted accounting principles and practices, complete books, accounts, records and data with respect to actual time devoted and costs incurred for Services under this Agreement. Such documentation shall be supported by properly executed



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payrolls, invoices, contracts and vouchers evidencing in detail the nature and propriety of any charges and sufficient to allow a proper audit of the Services. All checks, payrolls, invoices, contracts and other accounting documents pertaining in whole or in part to the Services shall be clearly identified and readily accessible. All Contractors must keep detailed records of payments to all subcontractors, suppliers of materials, subconsultants and other businesses, including the ethnicity and gender on non-SBE/DBE subcontractors.

- 9.3 For the duration of the Agreement, and for a period of three years thereafter, *VTA*, its representatives and the state auditor shall have the right to examine and audit during CONTRACTOR normal business hours these books, accounts, records, data and other relevant information to the extent required to verify the costs incurred hereunder where such costs are the basis for billings under this Agreement.
- 9.4 When required to report indirect costs, CONTRACTOR shall report indirect costs in accordance with the cost principles contained in 48CFR, Part 31, and follow the uniform administrative requirements set forth in 49 CFR, Part 18.
- 9.5 The provisions of this section shall be included in any subcontracts hereunder.

10. ***DISADVANTAGED BUSINESS ENTERPRISES:*** In connection with the performance of this Agreement, CONTRACTOR shall fully comply with *VTA* policy and procedures pertaining to utilization of Underutilized Disadvantaged Business Enterprises (UDBEs), and with the **2.5% Anticipated UDBE Participation Level** set for this Agreement for dollar amount participation by certified UDBEs for services provided under this Agreement. The policy and procedures of *VTA* regarding the utilization of UDBEs are available from *VTA*'s Office of Small and Disadvantaged Businesses, and are incorporated herein by this reference. CONTRACTOR shall submit a UDBE Utilization Report, available at <http://www.vta.org/inside/downloads/index.html#sbe>, monthly to the following address:

Santa Clara Valley Transportation Authority
Office of Small and Disadvantaged Businesses
3331 North First Street, Building A
San Jose, CA 95134
Attn: Hayden Lee

CONTRACTOR shall submit a UDBE Final Utilization Report at the conclusion of the contract to the above address indicating any UDBE utilization during the course of the Agreement also available at <http://www.vta.org/inside/downloads/index.html#sbe>. Contractor further agrees to submit any and all required reports to the Office of Small & Disadvantaged Businesses.



11. PROHIBITED INTERESTS:

- 11.1 Solicitation: CONTRACTOR warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for CONTRACTOR, to solicit or secure this Agreement and that it has not paid or agreed to pay any company or person, other than a bona fide employee working solely for CONTRACTOR, any fee, commission, percentage, brokerage fee, gift or any other consideration, contingent upon or resulting from the award or making of the Agreement. For breach or violation of this warranty, *VTA* shall have the right to rescind this Agreement without liability.
- 11.2 Interest of Public Officials: No Board Member, officer or employee of the *VTA* during his or her tenure or for two years thereafter shall have any interest, direct or indirect, in this Agreement or the proceeds thereof.
- 11.3 Interest of the CONTRACTOR: The CONTRACTOR covenants that neither it nor its officers, directors or agents, presently has any interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of Services required to be performed under this Agreement. The CONTRACTOR further covenants that in the performance of this Agreement no person having any such interest shall knowingly be employed.

12. TERMINATION AND SUSPENSION:

- 12.1 *VTA* may, by giving at least ten business days' written notice to CONTRACTOR, terminate this Agreement, or suspend performance hereunder, in whole or in part at any time for *VTA*'s convenience. CONTRACTOR shall be compensated in accordance with the terms of the Agreement for Services satisfactorily performed prior to the effective date and time of termination or suspension. CONTRACTOR shall have no right to recover lost profits on the balance of the contract work.
- 12.2 *VTA*, by written notice given to CONTRACTOR, may declare default in CONTRACTOR's performance of any term of this Agreement, specifying with particularity the basis for such default. CONTRACTOR shall deliver a response thereto in writing to *VTA* within two business days of receipt of the notice, setting forth a reasonable proposal to cure the default. If CONTRACTOR fails to deliver the foregoing response on time or fails to cure the default within ten business days after receipt of the notice (or within such additional time the Parties may agree upon in writing), *VTA* may elect to terminate this Agreement for cause by serving written notice thereof to CONTRACTOR.
- 12.3 In the event of such termination for cause, *VTA* shall be relieved of any obligation of further payment to CONTRACTOR and may proceed with the work. The additional cost to *VTA* of completing the Services shall be deducted from any



sum due the CONTRACTOR and the balance, if any, shall be paid the CONTRACTOR upon demand. The foregoing shall be in addition to any other legal or equitable remedies available to VTA.

12.4 If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of VTA.

13. **AUTHORIZED REPRESENTATIVES AND NOTICES:** The Authorized Representatives assigned below have authority to authorize changes to the scope, terms and conditions of this Agreement, as set forth herein.

13.1 For VTA: For CONTRACTOR:

Thomas B. Smith [Name]
Purchasing & Materials Manager [Title]

13.2 Written notification to the other party shall be provided, in advance, of changes in the name or address of the designated Authorized Representatives.

13.3 **NOTICES:** Notices shall be in writing and shall be addressed as follows:

For VTA: For CONTRACTOR:
Trish Kane, Contracts Program Manager [Authorized Representative]
VTA – CONTRACTS OFFICE [ADDRESS]
3331 N. First Street, Building A [ADDRESS]
San Jose, CA 95134-1906 [ADDRESS]
Phone: [PHONE]

14. **GENERAL PROVISIONS**

14.1 **OWNERSHIP OF DATA:** All drawings, specifications, reports and other data developed by CONTRACTOR, its assigned employees or subcontractors pursuant to this Agreement shall become the property of VTA as prepared, whether delivered to VTA or not. Unless otherwise provided herein, all such data shall be delivered to VTA or its designee upon completion of the Agreement or at such other times as VTA or its designee may request.

14.2 **NONDISCRIMINATION AND AFFIRMATIVE ACTION:** During performance of this Agreement CONTRACTOR, its employees and subcontractors shall not unlawfully discriminate against any employee or applicant for employment because of race, religion, creed, color, sex, national origin, ancestry, physical disability, mental disability, medical condition, marital status, age (over 40) or



sexual orientation, and shall take affirmative action to assure that applicants are lawfully employed, and that employees are lawfully treated during their employment, without regard to their race, religion, creed, color, sex, national origin, ancestry, physical disability, mental disability, medical condition, marital status, age (over 40) or sexual orientation.

- 14.3 **CONFIDENTIALITY AND PUBLICITY:** Without the written consent of *VTA*, CONTRACTOR shall not disclose to third parties other than its employees or authorized subcontractors or disclose or use for any purpose other than performance of the Services any information provided to CONTRACTOR by *VTA* in connection with performance of this Agreement, or any information developed or obtained by CONTRACTOR in the performance of this Agreement, unless: (1) the information is known to CONTRACTOR prior to obtaining same from *VTA* or performing Services under this Agreement; (2) the information is at the time of disclosure by CONTRACTOR then in the public domain; or (3) the information is obtained by or from a third party who did not receive it, directly or indirectly, from *VTA* and who has no obligation of confidentiality with respect thereto.
- 14.4 **NONWAIVER:** Failure of *VTA* to insist upon strict performance of any terms or conditions of this Agreement or failure or delay in exercising any rights or remedies provided herein by law or its failure to properly notify CONTRACTOR in the event of breach or its acceptance of or payment for any Services hereunder shall not release CONTRACTOR from the representations or obligations of this Agreement and shall not be deemed a waiver of any right of *VTA* to insist upon strict performance hereof or any of its rights or remedies hereunder.
- 14.5 **SEVERABILITY:** If any of the provisions or portions or applications thereof of this Agreement are held to be unenforceable or invalid by any court of competent jurisdiction, *VTA* and CONTRACTOR shall negotiate an equitable adjustment in the provisions of the Agreement with a view toward affecting the purpose of this Agreement, and the validity and enforceability of the remaining provisions or portions or applications thereof shall not be affected thereby.
- 14.6 **INDEPENDENT CONTRACTOR:** CONTRACTOR is an independent contractor and not the agent or employee of *VTA* in performing its Services under this Agreement.
- 14.7 **ENTIRE AGREEMENT:** This Agreement constitutes the entire agreement between *VTA* and CONTRACTOR relating to the subject matter hereof and supersedes any previous agreements or understandings, oral or written.
- 14.8 **AMENDMENT:** Except as expressly provided herein, the provisions of this Agreement shall not be altered, modified or amended except through the execution of a written amendment executed by *VTA* and CONTRACTOR.



- 14.9 **PREVAILING WAGE REQUIREMENTS:** Pursuant to appropriate Sections of the Labor Code of the State of California, the Director of the California Department of Industrial Relations has ascertained the general prevailing rate of wages (which rate includes employer payments for health and welfare, vacation, pension, and similar purposes) for those classifications applicable to the services to be performed under this Agreement, for straight time, overtime, Saturday, Sunday and holiday work. Said prevailing wage rates have been adopted by the *VTA* Board of Directors and are incorporated herein by reference. These wage rates are available through the California State Department of Industrial Relations, <http://www.dir.ca.gov>. The CONTRACTOR shall post a copy of the prevailing wage rates at the jobsite or material staging area.

Workmen employed in the work must be paid at the rates at least equal to the prevailing wage rates as adopted. If CONTRACTOR uses a craft or classification not shown on the prevailing wage determinations, CONTRACTOR may be required to pay the wage rate of that craft or classification most closely related to it as shown in the general determinations effective at the time of Contract award.

In the performance of the services specified in this Contract, the CONTRACTOR and all Subconsultants shall be responsible for compliance with California Labor Code Sections 1776 (Payroll records, retention, inspection, noncompliance penalties, rules and regulations) and 1777.5 (Employment of registered apprentices, wages, standards, number, apprenticeable craft or trade, exemptions, contributions).

Contractor and all of its subcontractors of any tier shall maintain all payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the Contract. Such records shall contain the name of all employees, their address, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. These records shall be made available by Contractor or any of its subcontractors of any tier for inspection, copying, or transcription by authorized representatives of DOT, *VTA* or the Department of Labor, and Contractor or any of its subcontractors of any tier shall permit such representatives to interview employees during working hours on the job.

This Contract is also subject to Federal requirements for payment of prevailing wages as determined by the Secretary of Labor. Where there are differences in the rates, the higher rate shall apply.

- 14.10 **COMPLIANCE WITH APPLICABLE LAW:** In the performance of Services hereunder, CONTRACTOR and its subcontractors, shall comply with all applicable requirements of state, federal and local law. The provision of this



paragraph shall be included in any subcontracts hereunder.

14.11 **DOCUMENTS AND WRITTEN REPORTS.** In accordance with Government Code § 7550 *Preparation by nonemployees of state or local agency; content and disclosure requirements*: If CONTRACTOR prepares any documents or written reports pursuant to the scope of work under this Agreement for Services, for which the total cost of preparation exceeds \$5,000, such documents or written reports shall contain a separate section that contains the numbers and dollar amounts of all contracts and subcontracts relating to their preparation.

15. SPECIAL PROVISIONS

15.1 **FEDERAL REQUIREMENTS:** CONTRACTOR, its employees and subcontractors performing the Services hereunder shall comply with the laws and regulations set forth in Exhibit D, entitled “FEDERAL REQUIREMENTS”, which exhibit is attached hereto and incorporated herein by this reference.

[AUTHORIZED SIGNATURES]



EXHIBIT B

**COMPENSATION, INVOICING and PAYMENT
FIRM-FIXED PRICE**

- I. **COMPENSATION.** For CONTRACTOR's full and complete performance of its obligations under this Agreement, *VTA* shall pay CONTRACTOR the firm-fixed sum of [\$], said sum to include CONTRACTOR'S total direct costs, indirect costs, and profit and to be paid in accordance with the following provisions:

[REFERENCE: SECTION 7.14 PROJECT PAYMENT PROVISIONS]

No additional compensation will be paid without a written amendment to this Agreement.

- II. **INVOICING.** CONTRACTOR shall invoice *VTA* based on completed milestones and for services as detailed in Section 7.14 PROJECT PAYMENT PROVISIONS.

A. Each invoice shall cite Agreement No. [TBD] and provide proof of completion of the applicable milestone.

B. A valid and complete invoice shall include all required documentation shall be mailed to the attention of:

Santa Clara Valley Transportation Authority
Accounts Payable
3331 N. First Street, Building A
San Jose, CA 95134-1927.

D. Should *VTA* contest any portion of an invoice, that portion shall be held for resolution, but the uncontested balance shall be processed for payment. *VTA* may, at any time, conduct an audit of any and all records kept by CONTRACTOR for the Services. Any overpayment uncovered in such an audit may be charged against the CONTRACTOR's future invoices and any retention funds.

- III. **PAYMENT.** Payment will be made to CONTRACTOR within 30 days after receipt by *VTA* of a proper invoice. CONTRACTOR shall pay subcontractors for satisfactory performance of Services performed under this Agreement within 15 days of receipt of payment by *VTA* for such services.



EXHIBIT C

INSURANCE AND INDEMNITY REQUIREMENTS

I. INDEMNITY

The Contractor shall indemnify, defend, and hold harmless Santa Clara Valley Transportation Authority (hereinafter “*VTA*”), its officers, agents and employees from any claim, liability, loss, injury or damage arising out of, or in connection with, the negligent performance of this Agreement by Contractor and/or its agents or employees or subcontractors, excepting only loss, injury or damage caused by the negligence or willful misconduct of *VTA* personnel.

II. INSURANCE

Without limiting the Contractor’s indemnification of *VTA*, the Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, its agents, representatives, or employees, or subcontractors. The cost of such insurance shall be included in the Contractor’s bid.

A. Liability and Worker’s Compensation Insurance

1. Minimum Scope of Coverage

Coverage shall be at least as broad as:

- a. Insurance Services Office Commercial General Liability coverage (“occurrence” form CG 0001). Liability insurance written on a “claims made” basis is not acceptable.
- b. Insurance Services Office Business Auto Coverage form number CA 0001 covering Automobile Liability, code 1 “any auto”.
- c. Workers’ Compensation insurance as required by the Labor Code of the State of California, and Employers Liability insurance.
- d. Professional Liability, including limited contractual liability coverage, covering liability arising out of any negligent act, error, mistake or omission in the performance of Contractor’s services under this Agreement. This coverage shall be maintained for a minimum of two (2) years following completion of this Agreement. This coverage may be written on a “claims made” basis, if so, please see special provisions in Section B.



2. Minimum Limits of Insurance

Contractor shall maintain limits no less than:

- a. General Liability \$1,000,000 combined single limit per occurrence and \$5,000,000 for aggregate for bodily injury, personal injury, and \$5,000,000 aggregate for property damage. If a Commercial General Liability or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
- b. Automobile Liability \$1,000,000 combined single limit per accident for bodily injury and property damage.
- c. Workers' Compensation and Employers Liability: Statutory Workers' Compensation limits and Employers Liability limits of \$2,000,000 per accident.
- d. Professional Liability: \$1,000,000 each occurrence/aggregate minimum limit per claim.

3. Self-Insured Retention

Any self-insured retention in excess of \$10,000 must be declared to and approved by *VTA*. To apply for approval for a level of retention in excess of \$10,000 the proposer/bidder must provide a current financial statement documenting the ability to pay claims falling within the self-insured retention. At the option of *VTA*, either: the insurer shall reduce or eliminate such self-insured retention as respects *VTA*, its officers, officials, employees and volunteers; or the propose/bidder shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

B. Claims Made Provisions

If coverage is written on a "claims made" basis, the Certificate of Insurance shall clearly state so. In addition to all other coverage requirements, such policy shall provide that:

1. The policy must be in effect as of the date of this Agreement and the retroactive date shall be no later than the date of this Agreement.
2. If any policy is not renewed or the retroactive date of such policy is to be changed, the Contractor shall obtain or cause to be obtained the broadest extended reporting period



coverage available in the commercial insurance market. This extended reporting provision shall be of at least two (2) years.

3. No prior acts exclusion to which coverage is subject that predates the date of this Agreement.
4. Policy allows for reporting of circumstances or incidents that might give rise to future claims.

C. Other Provisions

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability and Automobile Liability

- a. *VTA*, its officers, officials, employees and volunteers are to be covered as insureds as respects: liability arising out of activities performed by or on behalf of the Contractor, including *VTA*'s general supervision of the Contractor; products and completed operations of the Contractor and its subcontractors; premises owned, occupied or used by the Contractor; or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to *VTA*, its officers, officials, employees, or volunteers.
- b. The Contractor's insurance coverage shall be primary insurance as respects *VTA*, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by *VTA*, its officers, officials, employees, or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.
- c. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to *VTA*, its officers, officials, employees, or volunteers.
- d. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

2. Workers' Compensation and Employers Liability

The insurer shall agree to waive all rights of subrogation against *VTA*, its officers, officials, employees, and volunteers for losses arising from work performed by the Contractor and its subcontractors for *VTA*.

Insurance and bonds are to be placed with insurers with a Best's rating of no less than B+:VIII, unless specific prior written approval has been granted by *VTA*.



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Contractor shall furnish *VTA* with a Certificate of Insurance. The certificates for each insurance policy are to be signed by an authorized representative of that insurer. The certificates will be issued on a standard ACORD Form or something substantially similar thereto.

The certificates will (1) identify the underwriters, the types of insurance, the insurance limits and the policy term, (2) specifically list the provisions enumerated for such insurance in Sections B and C. above, and (3) in the “Certificate Holder” box include:

Santa Clara Valley Transportation Authority
Contracts Department
3331 North First Street
San Jose, CA 95134-1927

All certificates are to be received and approved by *VTA* before work commences. *VTA* reserves the rights to require complete, certified copies of all required insurance policies, at any time.

Each insurance policy required by this Exhibit shall provide that if the policy is canceled or coverage reduced, such cancellation or reduction shall not be effective for 30 days, except for non-payment of premium which shall be 10 days, after receipt by *VTA* of written notice of such cancellation or reduction.

III. MAINTENANCE OF INSURANCE

If Contractor fails to maintain such insurance as is called for herein, *VTA*, at its option, may suspend payment for work performed and/or may order the Contractor to suspend work at Contractor’s expense until a new policy of insurance is in effect.



EXHIBIT D

FEDERAL REQUIREMENTS

- 1. General.** In performance of its obligations pursuant to this Agreement, CONTRACTOR agrees to comply with all applicable provisions of federal, state, and local law, regulations, and Federal Transit Administration (hereinafter called FTA) directives. The terms of the most recent amendment to any federal, state or local law, regulations, FTA directives, and amendments to the grant or cooperative agreement providing funding for this Agreement that may be subsequently adopted, are applicable to this Agreement to the maximum extent feasible, unless FTA provides otherwise in writing.

- 2. Interest of Members of or Delegates to the United States Congress**

In accordance with 41 U.S.C. § 22, CONTRACTOR agrees that it will not admit any member of or delegate to the United States Congress to any share or part of this Agreement or any benefit derived therefrom.

- 3. No Federal Government Obligations to Third Parties**

CONTRACTOR agrees that, absent the Federal Government's express written consent, the Federal Government shall not be subject to any obligations or liabilities to any subrecipient, any third party subcontractor, or any other person not a party to this Agreement, the Grant Agreement or Cooperative Agreement in connection with the performance of the Project. Notwithstanding any concurrence provided by the Federal Government in or approval of any solicitation, subagreement, or third party Agreement, the Federal Government continues to have no obligation or liabilities to any party, including the subrecipient and third party subcontractor.

- 4. Exclusionary or Discriminatory Specifications**

Apart from inconsistent requirements imposed by Federal statute or regulations, CONTRACTOR agrees that it will comply with the requirements of 49 U.S.C. § 5323(h)(2) by refraining from using any Federal assistance awarded by FTA to support procurements using exclusionary or discriminatory specifications.

- 5. Geographic Restrictions**

CONTRACTOR shall not use state or local geographic preferences, except those expressly mandated or encouraged by Federal statute, and as permitted by FTA.

- 6. False or Fraudulent Statements and Claims**

CONTRACTOR acknowledges and agrees as follows:



- a. CONTRACTOR recognizes that the requirements of the Program Fraud Civil Remedies Act of 1986, as amended, 49 U.S.C. §§ 3801 *et seq.* and U.S. Department of Transportation (DOT) regulations, “Program Fraud Civil Remedies,” 49 CFR Part 31, apply to its actions pertaining to this Agreement. Accordingly, by signing this Agreement, CONTRACTOR certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, or it may make pertaining to the matters covered by this Agreement. In addition to other penalties that may be applicable, CONTRACTOR also acknowledges that if it makes 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, as amended, on CONTRACTOR to the extent the Federal Government deems appropriate.
- b. CONTRACTOR also acknowledges that if it makes a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government in connection with an urbanized area formula project financed with Federal assistance authorized by 49 U.S.C. § 5307, the Government reserves the right to impose on CONTRACTOR the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307(n)(1), to the extent the Federal Government deems appropriate.

7. Debarment and Suspension

- a. CONTRACTOR agrees to comply with the requirements of Executive Orders No. 12549 and 12689, “Debarment and Suspension,” 31 U.S.C. § 6101 note; and U.S. DOT regulations on Debarment and Suspension at 49 CFR Part 29.
- b. Unless otherwise permitted by FTA, CONTRACTOR shall not award any third party subagreement of any amount with a party included in the “U.S. General Services Administration’s (U.S. GSA) List of Parties Excluded from Federal Procurement or Nonprocurement Programs,” implementing Executive Orders No. 12549 and 12689, “Debarment and Suspension” and 49 CFR Part 29. The list also includes the names of parties debarred, suspended, or otherwise excluded by agencies, and contractors declared ineligible for Agreement award under statutory or regulatory authority other than Executive Order Nos. 12549 and 12689.
- c. Before entering into any third party subcontract exceeding \$100,000, CONTRACTOR agrees to obtain a debarment and suspension certification from each third party subcontractor (at any tier) containing information about the debarment and suspension status of that third party subcontractor and its “principals,” as defined at 49 CFR § 29.105(p). CONTRACTOR also agrees to require each third party subcontractor to refrain from awarding any third party subcontract of any amount (at any tier) to a debarred or suspended subcontractor, and to obtain a similar certification from any third party subcontractor (at any tier) seeking an Agreement exceeding \$100,000. An example of the appropriate certification is contained in 49 CFR Part 29, Appendix B.



- d. CONTRACTOR shall provide FTA a copy of each conditioned debarment or suspension certification provided by a prospective third party contract at any tier. Until FTA approval is obtained, CONTRACTOR shall not award a third party subcontract with any party that has submitted a conditioned debarment or suspension certification.

8. Reporting, Record Retention and Access.

- a. Reports. At a minimum, CONTRACTOR agrees to provide to FTA those reports required by U.S. Department of Transportation's grant management rules and any other reports the Federal Government may require.
- b. Record Retention. CONTRACTOR agrees that, during the term of this agreement and for three years after final payments are made and all other pending matters are closed, it will maintain intact and readily accessible all data, documents, reports, records, agreements, and supporting materials relating to the Agreement as the Federal Government may require for this Agreement.
- c. Access to Records. Upon request, CONTRACTOR shall permit the Secretary of Transportation and the Comptroller General of the United States, or their authorized representatives, to inspect all Project work, materials, payrolls, and other data, and to audit the books, records, and accounts of CONTRACTOR pertaining to the Project. In accordance with 49 U.S.C. § 5325(a), CONTRACTOR agrees to require each third party subcontractor whose agreement award is not based on competitive bidding procedures as defined by the Secretary of Transportation to permit the Secretary of Transportation and the Comptroller General of the United States, or their duly authorized representatives, to inspect all work, materials, payrolls, and other data and records involving that third party subcontract and to audit the books, records, and accounts involving third party subcontracts as they affect this Agreement.

9. Awards Exceeding \$100,000 - Restrictions on Lobbying.

- a. This Agreement is subject to the requirements of Section 1352, Title 31, United States Code, and Regulations appearing at 49 CFR, Part 20, Lobbying Disclosures Act of 1975. CONTRACTOR shall execute the "Certification Regarding Lobbying" set out in ATTACHEMENTS to those Regulations and shall require that such certification be executed by its subcontractors or subsuppliers receiving an amount in excess of \$100,000 under this Agreement and shall forward such certifications and any disclosure forms to *VTA*.



b. CONTRACTOR agrees as follows:

1. CONTRACTOR will not use Federal assistance funds to support lobbying.

a. In accordance with 31 U.S.C. § 1352 and U.S. DOT regulations, if a new subcontract exceeds \$100,000, FTA will not make any Federal assistance available until FTA has: (a) received the third party contractor or subcontractor's certification that the third party contractor or subcontractor has not and will not use Federal appropriated funds to pay any person or organization to influence or attempt to influence an officer or employee of any Federal department or agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal grant, cooperative agreement, or any other Federal award from which funding for the Project is originally derived, consistent with 31 U.S.C. § 1352, and (b) if applicable, the third party contractor's or subcontractor's statement disclosing any lobbying with non-Federal funds that has taken place in connection with obtaining any Federal financing ultimately supporting the Contract.

b. CONTRACTOR will to provide FTA a copy of each lobbying disclosure statement with the accompanying lobbying certification provided by a prospective third party subcontractor at any tier.

10. Disadvantaged Business Enterprise

a. Policy. It is the policy of the Department of Transportation and *VTA* that Disadvantaged Business Enterprises (DBE), as defined in 49 CFR Part 26 shall have the maximum opportunity to participate in the performance of agreements financed in whole or in part with Federal funds under this Agreement. Consequently, the DBE requirements of 49 CFR Part 26 apply to this Agreement.

It is further the policy of *VTA* to promote the development and to increase the participation of businesses owned and controlled by disadvantaged businesses. DBE involvement in all phases of CONTRACTOR procurement activities is encouraged.

b. DBE obligation. CONTRACTOR and its subcontractors shall ensure that disadvantaged business have the maximum opportunity to participate in the performance of this Agreement and subcontracts issued hereunder. In that regard, all CONTRACTORS and subcontractors shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 as amended, to ensure that minority business enterprises have the maximum opportunity to compete for and perform agreements.



- c. Failure to Carry Out Requirements. Failure to carry out the requirements of 49 CFR Part 26 may, after notification of Department of Transportation, result in the termination of this Agreement or other remedy as appropriate.

11. Civil Rights

- a. Prohibitions Against Discrimination in Federal Programs. CONTRACTOR agrees to comply with, and assure compliance by its third party subcontractors at any tier under this Agreement, with all requirements of Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. § 2000d; 49 U.S.C. § 5332; and DOT regulations, “Nondiscrimination in Federally-Assisted Programs of the Department of Transportation -- Effectuation of Title VI of the Civil Rights Act,” 49 CFR Part 21, and any implementing requirements FTA may issue.
- b. Equal Employment Opportunity.
 - 1. General Requirements. CONTRACTOR agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, sex, disability, age, or national origin. CONTRACTOR agrees to take affirmative action to ensure that applicants are employed and that employees are treated during employment, without regard to their race, color, creed, sex, disability, age, 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. CONTRACTOR also agrees to comply with any implementing requirements FTA may issue.
- c. Access Requirements for Persons with Disabilities. CONTRACTOR agrees to comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA), 42 U.S.C. §§ 12101 *et seq.*; section 504 of the Rehabilitation Act of 1973, as amended, 20 U.S.C. § 794; 49 U.S.C. § 5301(d); and the following federal regulations including any amendments thereto:
 - (1) U.S. DOT regulations, “Transportation Services for Individuals with Disabilities (ADA),” 49 CFR Part 37;
 - (2) U.S. DOT regulations, “Nondiscrimination on the Basis of Handicap in Programs and Activities receiving or Benefiting from Federal Financial Assistance,” 49 CFR Part 27;
 - (3) U.S. DOT regulations, “Americans With Disabilities (ADA) Accessibility Specifications for Transportation Vehicles,” 49 CFR Part 38;
 - (4) U.S. DOJ regulations, “Nondiscrimination on the Basis of Disability in State and Local Government Services,” 28 CFR Part 35;



- (5) U.S. DOJ regulations, “Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities,” 28 CFR Part 36;
- (6) U.S. GSA regulations, “Accommodations for the Physically Handicapped,” 41 CFR Subpart 101-19.

12. Covenant Against Contingent Fees.

CONTRACTOR warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by CONTRACTOR for the purpose of securing business. For breach or violation of this warranty, *VTA* may terminate this Agreement without liability, or at its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage or contingent fee.

13. Covenant Against Gratuities.

CONTRACTOR warrants that it has not offered or given gratuities in the form of entertainment, gifts or otherwise, to any director, officer or employee of *VTA* to secure favorable treatment in the awarding, amending or evaluation performance of this Agreement.

14. Subcontracts.

CONTRACTOR shall include all provisions of this EXHIBIT modified only to show the particular contractual relationship, in all its agreements connected with carrying out this Agreement, except agreements for standard commercial supplies.

15. Incorporation of Federal Transit Administration (FTA) Terms.

The preceding provisions include, in part, certain Standard Terms and Conditions required by Department Of Transportation, whether or not expressly set forth in the preceding agreement provisions. All contractual provisions required by DOT, as set forth in FTA Circular 4220.1D, dated April 15, 1996, are hereby incorporated by reference. Anything relating to this Agreement herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. CONTRACTOR shall not perform any act, fail to perform any act, or refuse to comply with any of *VTA*'s requests which would cause *VTA* to be in violation of the FTA terms and conditions.



16. Non-Construction Employee Protection.

CONTRACTOR agrees to comply with any applicable employee protection requirements for nonconstruction employees of Section 102 of the Contract Work Hours and Safety Standards Act, as amended, 40 USC §§ 327 through 332, and US DOL regulations, “Labor Standards Provisions Applicable to Contracts Governing Federally Financed and Assisted Construction (also Labor Standards Provisions Applicable to Nonconstruction Contracts Subject to Contract Work Hours and Safety Standards Act),” 29 CFR Part 5.



8.2 REQUIRED SUBMITTALS

Required submittals are on the following pages

8.2.1 Attachment A - Cost Proposal Form

8.2.2 Attachment B - General Information Form

**8.2.3 Attachment C - Designation of Subcontractors, Suppliers and Subconsultants
for Data Collection Requirements**

8.2.4 Attachment D - Listing of UDBE Prime and Subcontractors

8.2.5 Attachment E - Certification of Restrictions on Lobbying

8.2.6 Attachment F - Certification of Nonconstruction Employee Protection

8.2.7 Attachment G - Certification of Consultant

8.2.8 Attachment H - Exceptions to the RFP/Agreement Requirements

8.2.9 Attachment I - Performance Bond Form



8.2.1 ATTACHMENT A - COST PROPOSAL FORM

SR237/I-880 Express Connectors Project					
Cost Sheet					
Category	Description	Quantity	Units	Unit Price \$US	Extended Price \$US
A	Zone Equipment				
	Toll Zone and Read Zone Controller	4	EA		
	Vehicle Detector	4	Set		
	Uninterruptible Power Supply (UPS)	4	EA		
		Zone Equip. Sub Total			
B	Express Connectors Equipment				
	CCTV Camera (Dome Assembly)	2	EA		
	CCTV Camera Enclosure & Electronics	2	EA		
	CCTV Communication switch and cabling	2	EA		
	Transaction Indicator Lights, including - adjustable/swivel mounting	9	EA		
		Express Connector Equipment Sub Total			
C	Common Equipment				
	Pricing Signs (including controller & UPS)	2	EA		
	Vehicle Detection Stations in Express Connector Lanes (including dual wireless magnetic vehicle detectors)	10	EA		
	Video Server, Storage and Cabinet	1	EA		
	Video Monitor and Workstation and PTZ controller	1	Set		
	Video =time lapse recorder & titler	1	EA		
	Video Server Cabinet UPS	1	EA		
	Portable Reader	4	EA		
	TDC Hardware (including redundant servers and data storage, 2 workstations, laser printer, communication wiring)	1	LS		
		Common Equipment Sub Total			
D	ETC Equipment				
	ETC Readers	4	EA		



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	ETC Lane Kits (including antenna & transceiver)	4	EA		
	ETC Equipment Tuning and certification	4	EA		
		ETC Equipment Sub Total			
E	Communications System				
	Laser Transceivers (including mounting yokes)	1	LS		
	Cisco Catalyst Switch (WS-C3560E-48PD-S)	2	EA		
	Cisco Transceivers (Core Switch connection)	4	EA		
	Fiber Optic Cabling	1	LS		
	Zone Controller Switch Cisco 2955	2	EA		
		Communications System Sub Total			
F	System Software				
	Tolling Zone and Read Zone Controller Software License	1	LS		
	Video Server Software License	1	LS		
	Toll Data Center System Reports	1	LS		
	TDC Software	1	LS		
		System Software Sub Total			
G	Test Bench Simulator				
	Test Bench Simulator (including software)	1	EA		
	Tolli/Read Zone Controller	1	EA		
	ETC Subsystem	1	EA		
	Toll and Read Zone Transaction indicator lights	2	EA		
	Standard Workstation	1	EA		
		Test Bench Simulator Sub Total			
H	Spare Equipment				
	Toll /Read Zone Controller	1	EA		
	ETC Subsystem (complete lane equipment)	1	Set		
	Standard Workstation	1	EA		
	Vehicle Detector Station controller , detector unit and electronics	2	EA		



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	CCTV Camera	1	EA		
	Transaction Indicator Light (amber & green)	2	EA		
		Spare Equipment Sub Total			
I	Equipment Installation				
	CCTV Installation	2	EA		
	Pricing sign Installation (including LED mounting, brackets)	2	EA		
	Toll and Read Zone Equipment Installation	4	Per Zone		
	TDC Equipment Installation	1	LS		
	Maintenance of Traffic	1	LS		
	VDS Installation	1	LS		
	Cerone Facility Equipment Installation	1	LS		
	Wireless Communication System installation	1	LS		
		Equipment Installation Sub Total			
J	Electrical Work				
	Electrical Plans Development	1	LS		
	Installation of electrical and communication conduits, cables and wires	1	LS		
K	Project Management				
	Project Management	1	LS		
		Project Management Sub Total			
L	Documentation				
	Documentation	1	LS		
		Documentation Sub Total			
M	Training				
	Training	1	LS		
		Training Sub Total			
N	Warranty Period				
	Warranty Period Technical Support (hardware & software)	1	LS		
	Maintenance During the Warranty Period	1	LS		



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		Warranty Period Sub Total			
Category	Subtotal Summary				
A	Express Connector Equipment				
B	Tolling /Read Zone Equipment				
C	Common Equipment				
D	ETC Equipment				
E	Communications System				
F	System Software				
G	Test Bench Simulator				
H	Spare Equipment				
I	Equipment Installation				
J	Electrical Work				
K	Project Management				
L	Documentation				
M	Training				
N	Warranty Period				
		TOTAL SYSTEM COST			
P	Optional Maintenance Periods				
	First 1-Year Period	1	EA		
	Second 1-Year Period	1	EA		
	Third 1-Year Period	1	EA		
		Optional Maintenance Periods			

The Proposer shall price a complete License Plate Image Capture Subsystem Option pursuant to the work breakdown given below:

License Plate Image Capture Subsystem Lane Image Acquisition Module	2	EA
License Plate Image Capture Subsystem Image Processor and Sensing Subsystem	1	EA
License Plate Image Capture Subsystem Camera System	2	EA
Tolling Zone Infrastructure	2	EA
Uninterruptible Power Supply (if required)	2	EA
Image Processor Software License	1	LS
Spare Parts	1	LS
	License Plate Image Capture SubSystem Total	



ATTACHMENT B
GENERAL INFORMATION FORM

Instructions: Please complete this form and include in your proposal. On a separate page, list all Subconsultants; include company name, address, phone number and type of service

Company Name _____

Street Address _____

City/State/Zip _____

Phone No. _____ Fax No. _____

Federal Taxpayer I.D. No. _____

POINT OF CONTACTS

Primary:

Alternate:

Name/Title _____ Name/Title _____

Phone No. _____ Phone No. _____

Cell Phone _____ Cell Phone _____

E-mail on-track@bstreethouse.com _____ E-mail _____

AUTHORIZED SIGNATORIES

Primary:

Name/Title: _____ Signature: _____

Alternate:

Name/Title: _____ Signature: _____



ATTACHMENT C
DESIGNATION OF SUBCONTRACTORS, SUPPLIERS AND SUBCONSULTANTS
FOR DATA COLLECTION REQUIREMENTS

Proposer _____

Proposer shall completely fill in the form below for each proposed subcontract for all subcontractors, suppliers of materials, subconsultants, etc. Include all firms, regardless of ethnicity, gender or SBE/DBE status. Some information, such as ethnicity and gender is for information purposes only. This form is to be completed and submitted with your proposal.

Table with 5 columns: City and State, Portion of Work or Bid Item, Ethnicity*, Gender+, Estimated Dollar Amount of Subcontract. The table contains 9 empty rows for data entry.

*A=Asian, Pacific; AI= Asian Indian; B=Black; C=Caucasian, H=Hispanic; NA=Native American, O=Other
+F=Female; M=Male

Total Proposed Amount: \$ _____ Amount to be Subcontracted: \$ _____

Percent to be Subcontracted: _____ %



ATTACHMENT D
LISTING OF UDBE PRIME AND SUBCONTRACTORS

Firm (Prime): _____ Phone/ Fax: _____

UDBE : ____ Yes ____ No Age of Firm _____

Street Address: _____ Name & Title: _____

City, State, Zip: _____ Signature/ Date: _____

Contract dollar value must exclude work performed by non-DBEs/non-SBEs except materials or equipment purchased and used in this contract.

CREDIT FOR UDBE VENDORS of materials or supplies is limited to 60% of its expenditures for materials and supplies required under this Contract and obtained from a UDBE regular dealer. Credit for UDBE manufacturers is given at 100% toward the UDBE goal only where the UDBE vendor manufactures or substantially alters the material prior to resale.

CREDIT FOR UDBE BROKERS (Distributor or Representative) is limited to the fees and commissions of the amount paid. All other firms receive 100% credit, less work subcontracted by the UDBE to non-DBE firms, towards the UDBE goal.

CREDIT FOR UDBE TRUCKING FIRMS is limited to amount performed by the UDBEs/own trucks and drivers and by UDBE trucking subhaulers. A UDBE trucking firm must itself own and operate at least one fully licensed, insured and operational truck used on the contract.

AU DBE must be certified or accepted as certified by VTA.

Table with 5 columns: Name & Address of Certified UDBE, Certification Number, Agency Certifying, Age of Firm, Dollar Value Of Contract. Rows 1-5.

Table with 1 column: Description of Work. Rows 1-5.

UDBE GOALS ARE DETERMINED ON BASE PROPOSAL AMOUNT:

Total Contract Amount \$ _____

UDBE Contract Amount: \$ _____

UDBE Contract Amount \$ _____ UDBE Goal Achieved: __ UDBE Contract Goal: _____

----- X 100 = _____

Base Contract _____%

IMPORTANT! THIS FORM MUST BE SUBMITTED WITH YOUR PROPOSAL



**ATTACHMENT E
CERTIFICATION OF RESTRICTIONS ON LOBBYING**

Proposer hereby certifies as follows:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of Bidder, to any person 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 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 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 this Federal contract, grant, loan, or cooperative agreement, Bidder shall complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. Proposer 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 is 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 Section 1352, Title 31, U.S. Code. 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.

Proposer _____

By _____

Title _____

Date _____



ATTACHMENT F
CERTIFICATION OF NONCONSTRUCTION EMPLOYEE PROTECTION

Proposer hereby certifies as follows:

1. If awarded a contract pursuant to this Request for Proposals, Proposer agrees to comply, and assures the compliance by any subcontractors, with any applicable employee protection requirements for nonconstruction employees of Section 102 of the Contract Work Hours and Safety Standards Act, as amended, 40 USC §§ 327 through 332, and US DOL regulations, "Labor Standards Provisions Applicable to Contracts Governing Federally Financed and Assisted Construction (also Labor Standards Provisions Applicable to Nonconstruction Contracts Subject to Contract Work Hours and Safety Standards Act)," 29 CFR Part 5.
2. Proposer shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contacts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

Proposer: _____

By: _____

Title: _____

Date: _____



ATTACHMENT G
CERTIFICATION OF CONSULTANT

I HEREBY CERTIFY that I am the _____

and duly authorized representative of the firm of _____

whose address is _____

and that, except as hereby expressly stated, neither I nor the above firm that I represent have:

(a) employed or retained for a commission, percentage, brokerage, contingent fee, or other consideration, any firm or person (other than a bona fide employee working solely for me or the above consultant) to solicit or secure this agreement; nor

(b) agreed, as an express or implied condition for obtaining this contract, to employ or retain the services of any firm or person in connection with carrying out the agreement; nor

(c) paid, or agreed to pay to any firm, organization or person (other than a bona fide employee working solely for me or the above consultant) any fee, contribution, donation, consideration or any kind for, or in connection with procuring or carrying out this agreement.

I acknowledge that this Certificate is to be made available to the California Department of Transportation (Caltrans) in connection with this agreement involving participation of Federal-aid Highway funds, and is subject to applicable State and Federal laws, both criminal and civil.

Date

Signature



**ATTACHMENT H
EXCEPTIONS TO THE RFP/AGREEMENT REQUIREMENTS**

Proposers shall be prepared to accept the terms, conditions and requirements of the RFP and Agreement including the Project Payment Provisions and Insurance and Indemnification requirements.

If a Proposer desires to take exception, Proposer shall provide the following information as a section of the Proposal identified as “Attachment H - Exceptions to the Agreement”:

Proposer shall clearly identify each proposed change to the Agreement, including all relevant Exhibits.

Proposer shall furnish the reasons therefore as well as specific recommendations for alternative language.

The above factors will be taken into account in evaluating proposals. Proposals that take substantial exceptions to the RFP or Agreement or proposed compensation terms may be determined by *VTA*, at its sole discretion, to be unacceptable and no longer considered for award.



**ATTACHMENT I
PERFORMANCE BOND FOR PUBLIC WORKS**

KNOW ALL PEOPLE BY THESE PRESENTS: That

WHEREAS, the Santa Clara Valley Transportation Authority ("VTA") has awarded to

("Principal") a contract described as:

CONTRACT No. S10021

SR 237/I-880 Express Connectors Project

and all of the Contract Documents attached to or forming a part of said Agreement are hereby referred to and made a part hereof; and

WHEREAS, said Principal is required under the terms of said contract to furnish a bond for the faithful performance of said contract,

NOW THEREFORE, we, the Principal and

as Surety, are held and firmly bound unto the Santa Clara Valley Transportation Authority (hereinafter called "VTA"), in the penal sum of \$ _____, lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

The condition of this obligation is such that if the above-bound Principal, its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the said contract and any alteration thereof made as therein provided, on their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless VTA, its officers, agents, and employees, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

And the said Surety for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligations on this bond, and it does hereby waive notice of any change, extension of time, alteration or additions to the terms of the contract or to the work or to the specifications.

In the event suit is brought upon this bond by VTA and judgment is recovered, Surety shall pay all costs incurred by VTA in such suit, including a reasonable attorney's fee to be fixed by the Court.



Request for Proposals RFP 10-01 SR 237/I-880 Express Connectors Project

IN WITNESS WHEREOF this instrument, has been duly executed by Principal and Surety on this _____ day of _____, 20_____.

PRINCIPAL:

SURETY:

(Company)

(Company)

(Signature)

(Signature)

(Name – Please Print)

(Name – Please print)

(Title)

(Title)

NOTE: Signatures of those executing for Surety must be acknowledged by a Notary.

NOTE TO SURETY COMPANY:

The following form of acknowledgement should be used. If any other form of acknowledgement is used, there must be submitted a certified copy of unrevoked resolution of authority for the attorney-in-fact.

SURETY COMPANY ATTORNEY-IN-FACT

State of California)

County of _____)

On _____, before me, the undersigned, a Notary Public in and for

the State, personally appeared _____, known to me to be the duly authorized Attorney-in-Fact of the corporate Surety named in the within instrument, known to me to be authorized to execute that instrument on behalf of said corporation, known to me to be the person whose name is subscribed to such instrument as the Attorney-in-Fact of said corporation, and acknowledged to me that they subscribed the name of said corporation thereto as Surety, and their own name as Attorney-in-Fact and that said corporation executed the same.

WITNESS MY HAND AND OFFICIAL SEAL:

(SEAL)

Notary Public for the State of California

Acknowledgement by Attorney-in-Fact must be attached.
Corporate seals of Principal and Surety must be attached.



9. APPENDICES

9.1 SR 237/I-880 EXPRESS CONNECTORS CONCEPT OF OPERATIONS

9.2 SR 237 EXPRESS CONNECTORS SYSTEMS ENGINEERING MANAGEMENT PLAN (TO BE AVAILABLE ON THE VTA WEBSITE THE WEEK OF FEBRUARY 15)

9.3 BATA RCSC INTERFACE CONTROL DOCUMENT (ICD) (TO BE AVAILABLE ON THE VTA WEBSITE THE WEEK OF FEBRUARY 15)