REQUEST FOR INFORMATION

June 19, 2014

Dear Contractors, Manufacturers, Agency Staffs:

AC Transit is gathering information that will facilitate a formal procurement process and invites your firm to provide input associated with this Request for Information (RFI). Any suggestions received through this inquiry may be incorporated into a final work scope that will provide the basis of a possible Request for Proposal (RFP). Draft solicitation data/documents are attached for your review. Response to this RFI does not guarantee an award during the subsequent solicitation process nor will the District be responsible for any preparation costs associated with the submission of any data submitted in response to this RFI. Responses to this RFI will also help the District identify a short list of vendors that have products that will match the District’s unique needs. It will be to this short list of vendors that the RFP will be distributed.

Introduction and Background

Agency Description and Background

The Alameda-Contra Costa Transit District is an Oakland-based public transit agency serving the western portions of Alameda and Contra Costa Counties in the East Bay portion of the San Francisco Bay Area. The service area consists of 175 routes, serving 6,500 stops, and has a daily ridership of 236,000. AC Transit operates two Bus Rapid Transit (BRT) lines, the 1R and the 72R, connecting Downtown Oakland to the BART system, and connecting Contra Costa College to Downtown Oakland, respectively.

Fleet/Facility Description

AC Transit has a fleet of approximately 560 buses that operate out of three divisions: Emeryville, Oakland, and Hayward. The fleet consists of various models of Van Hool and Gillig buses, including 12 hydrogen fuel-cell powered buses. Older vehicles in the fleet include buses by NABI, MCI, and New Flyer.

A new BRT line is currently planned that will extend from Downtown Oakland to San Leandro.

AC Transit Goals

Introduction of the Project

The purpose of this project is to replace the existing computer-aided dispatch/automatic vehicle location (CAD/AVL) system, advancing AC Transit’s ability to make safer, more reliable, and more timely transit service decisions. Ultimately, the objectives of the project are to provide better service
management, better asset performance, better customer information, and better operational plans and schedules through a set of integrated technologies.

The technologies to be procured as part of this project include:

- Central system, including CAD/AVL system and Automatic Vehicle Announcements (AVA) management software
- WLAN Access Points infrastructure at garages
- Onboard systems
  - Mobile Data Terminals
  - Vehicle Logic Units, including GPS Receiver
  - Antennas for Voice radio, GPS, Cellular data, and WLAN
  - Mobile Access Router, including cellular data and WLAN communications cards
  - Voice Radio
  - Emergency Alarm switch
  - Real Time Passenger Information System

**Integration with various existing central and onboard systems, including:**

- Onboard VLU integration
- Onboard powertrain J1708/J1939 gateway
- Transit Signal Priority emitter
- Destination Signs
- Digital Video Recorder
- Farebox
- Interior display and PA amplifier, for AVA
- Onboard MAR integration
- Existing APC equipment

**Existing Systems and Operations**

**AC Transit IT Environment**

The current central system feeds into many other applications that rely on the data provided by the CAD/AVL system, including customer information (currently provided to NextBus, a Real Time Passenger Information system). Information from the CAD/AVL system is also downloaded into the AC Transit Enterprise Database, along with other data from various District applications.
Existing AC Transit Onboard Systems
The primary components of the existing onboard systems that are integrated to the current VLU include: a Mobile Data Terminal (MDT), a voice and data radio system, automatic vehicle announcements (AVA), Onboard Readerboards, an Emergency Alarm switch, as well as J1708/1939 and discrete signal connections for lift, ignition state, door open/close, and odometer readings.

Current equipment that is not currently interfaced with the VLU include: Automatic passenger counters, Apollo security system (video), transit signal priority, vehicle destination signs, smart media reader, farebox, and other onboard equipment.

Existing AC Transit Communications Systems
At central and field locations, AC Transit staff maintains ongoing radio and telephone communication with each other in order to carry out their duties. The current radio system is a Motorola “Transit Trunked” system with eight frequencies (six voice, two data). Controllers currently have access to eight Motorola Centracom Elite consoles with a single Elite server. There is no backup dispatch capability.

The onboard communications setup includes a Motorola voice radio, and an onboard covert alarm switch and microphone that cannot be deactivated remotely from the Operations Control Center (OCC). All voice and data interactions are recorded, and the system supports a request to talk (RTT) function. The system is limited to a one minute polling rate.

Other Existing AC Transit Applications
AC Transit’s current system pushes vehicle location information to the NextBus system, which provides off-board information about next arrival time predictions to customers based on these locations via dynamic message signs, via the AC Transit website, and through interactive phone applications.

Service planning and scheduling processes are supported by field data from on- and off-board systems, both within AC Transit and externally. Scheduling compares route adherence, schedule adherence, and incident data generated from the CAD/AVL system plus APC data to improve schedules.

Concept of Operations
The following represents a high level summary of the concept of operations for the replacement system. The full document (including operational scenarios) can be found in Attachment C.

Systems Concept
The replacement of AC Transit’s CAD/AVL system will consist of the Central CAD/AVL system, onboard MDTs and VLUs, GPS receiver, Voice radio, cellular data and Wi-Fi equipment, antennas, Mobile Access Routers, PA systems and microphones, and Emergency Alarms. The deployment will also consist of interfaces with the onboard vehicle components monitoring system, existing transit signal priority system, headsigns, security video, farebox, and automated vehicle announcements system. Schedule and rostering data shall be provided to
the CAD/AVL system through interfaces with Giro’s HASTUS2012 scheduling and runcutting system, and the CAD/AVL shall interface with the existing District enterprise database. Both run on Microsoft SQL Server, the District’s standard RDBMS.

General

Summary of Existing Systems Operational Environment

AC Transit’s existing computer aided dispatching and automated vehicle location (CAD/AVL) system is an ACS/Xerox (previously Orbital TMS) system titled OrbCad 2000. The Agency’s existing voice and data radio communications system is a Motorola “Transit Trunked” system that provides integrated voice and data radio communications. The OrbCad 2000 CAD/AVL central software interfaces with the Motorola Centracom Elite voice radio consoles. This enables Controllers to manage voice and data radio communication via radio base stations between revenue vehicles and the Operations Control Center (OCC) located in Emeryville, California.

Proposed Systems Operational Concept

The proposed system will be used by Controllers, field supervisors, and operators to employ dynamic real-time management of transit operations, and provide a more efficient means to perform daily duties. The monitoring of active service will undergo a paradigm shift from responsive monitoring to proactive monitoring by automating the data collection and reporting of service restoration tools, incident management tools, and vehicle components monitoring tools.

Additionally, the Operations Control Center will relocate to our Central Maintenance Facility at 10626 International Blvd, Oakland. New CAD/AVL servers and consoles will be installed there. Our leased-line and microwave connections to the EBRCSA P.25 voice radio system will also be located there.

Figure 1: System Concept Figure 1 below shows that the proposed system will consist of a single direct workstation interface for the System Administrator to the CAD/AVL system, which will include a direct interface with the HASTUS scheduling system for the provision of daily operational data. Additionally, real-time vehicle location data will be sent directly to the region’s 511 information systems for providing stop arrival predictions. Accumulated real-time data stored in the CAD/AVL system will be available through database views, which AC Transit will copy into their Enterprise Database.
Summary of Anticipated Operational Impacts

Division Yard/Garage

With the upgrade of the CAD/AVL system, it is not anticipated that the overall responsibilities and roles in the yard will change.

Window Dispatch

With the new HASTUS upgrade project, Window Dispatch will enter changes to Operator/vehicle assignments in real time to the new HASTUS system. This information will be used to help facilitate log on to the new CAD/AVL system using only the Operator ID. Window dispatchers may also find the new CAD/AVL system a helpful tool in locating vehicles remotely.

Maintenance

With the new system it is envisioned that additional vehicle monitoring data will be available to the maintenance department remotely. This includes ECM performed over the J1708/1939 connections that will be recorded and logged by the VLU in accordance with filtering parameters. If one of the specific configured mechanical messages is triggered on the vehicle (e.g. Stop Engine Warning), that message will be immediately forwarded to the OCC and Maintenance. Each maintenance department will include a workstation with limited CAD/AVL access,
either directly from the CAD/AVL vendor or via an in-house developed application, to pull information from the agency’s Enterprise Database.

**Road Supervisors**
The new system will help Controllers easily locate Road Supervisors to facilitate incident response. Laptops will provide Road Supervisors with information to assist with responding to incidents and to improve coordination with the OCC.

**Operators**
Deploying new onboard equipment will create a more efficient means to perform daily duties. Operators will have a single point of log-on to streamline start of day and relief duties and improve success for capturing end of day reporting data. Better accuracy in locations and improved voice and data communications will provide the Operator with the necessary information to improve schedule adherence and assist with planned and ad hoc service changes/corrections that may be required throughout the day. The new system should be easier to use, more accurate, and more efficient.

**Operations Controllers**
Operations Controllers will be provided with new tools and more accurate information to proactively manage system-wide service. Although overall responsibilities will not change, new CAD/AVL system tools and features will automate many manual activities that Controllers actively perform with the current system. Additionally, many actions will now be recorded to provide a more accurate account of the efforts Controllers and other field personnel took to maintain service. Service restoration tools, incident management tools, and other data will automatically collect and store the information such as lost service that the OCC must currently collect and calculate manually.

As part of this project, the Operations Control Center will move from Emeryville California to our Central Maintenance Facility at 10626 E. International Blvd. All new equipment will be installed at the new facility, and go-live and cutover will occur at the new facility.

**Onboard Systems**
AC Transit’s future onboard system will include a mobile access router (MAR) to provide multi-path data communications between the onboard equipment and central systems and the ability to integrate such data communications access for both new and existing devices. The following diagram illustrates the desired replacement system using a MAR.
Figure 2: Onboard Systems Concept

**Voice Radio Communications**

AC Transit will use the regional EBRCISA trunked voice radio system and a cellular mobile data system. It is envisioned that AC Transit will provide the mobile, portable and data radios to the contractor. The EBRCISA P.25 System is a 36 site system consisting of an IP-based P.25 Phase I simulcast subsystem and ASTRO 25 standalone repeater sites. The Motorola ASTRO 25 trunked system incorporates transport, FDMA operation and simulcast frequency efficiency.

To coordinate the implementation of the EBRCISA radio system within AC Transit operations and to ensure appropriate integration with the CAD/AVL system, several parties will have various roles and responsibilities in procuring, configuring, deploying, testing and commissioning the voice radio system components as described in the following section.

**AC Transit will:**

- Negotiate and enter into an agreement with EBRCISA for use of the P.25 radio system;
- Procure and provide:
  - Mobile and portable radios, cables, antennas and other voice radio accessories;
  - Motorola MCC7500 Consoles; and
• Participate in system commissioning activities.

**EBRCSA with the County radio technicians will:**

• Configure, install and warrant consoles;

• Provide and configure appropriate P.25 radio network connectivity and coverage;

• Provide and configure call logging for all AC Transit talk groups; and

• Configure mobile and portable radios.

**The Contractor shall:**

• With EBRCSA, develop the radio system design, detailing talk groups and system operations;

• Install mobile radios, associated hardware and accessories on District non-revenue vehicles;

• Integrate the CAD/AVL system with the voice radio system and its components, including central consoles, mobile radios, and portable radios.

**Communication Consoles**

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**Note:** Although the District currently plans to move forward with a subscription to the EBRCSA, the District is still open to, and investigating alternative voice or combination voice/data communication options.

**Fleet Maintenance**

This deployment shall include an interface to the onboard vehicle components monitoring system via J1708/J1939. The central system shall log all data being reported by the onboard systems, and alert the maintenance department immediately when monitored data exceeds the specified tolerance range (configurable by AC Transit).

**Transit Signal Priority (TSP)**

The current deployment of TSP consists of a basic on-board emitter that operates based on signal control. It is envisioned by AC Transit that the future TSP on regular fixed routes will be configurable to operate based on both a schedule adherence status or in an “always on” mode, to support both schedule adherence based TSP activation on regular fixed routes and in an always-on configuration.
Concurrent Projects

Relevant concurrent projects at AC Transit include:

- East Bay Bus Rapid Transit - Currently, AC Transit is in the planning and design phase for expanding their BRT lines. The new BRT will operate on 10 minute headways and employ TSP functionality. The new BRT line (East Bay BRT) will consist of a 9.5 mile long route starting at the Uptown transit center in Oakland, and ending at the San Leandro BART (Bay Area Rapid Transit) station.

- HASTUS upgrade – In March 2013 AC Transit upgraded their current HASTUS software applications to HASTUS version 2012 which includes: Vehicle, Crew, Crew-Opt, Minibus, GEO, Roster ATP, Rider and Checker. The HASTUS upgrade project also supports a number of internal and external data exchange interfaces. The next stage of this project, HASTUS Daily Integrated Operations (HIOPS) will implement the upgraded HASTUS scheduling modules, install HASTUSBID sign-up and install Operator Timekeeping and vehicle dispatching software. Completion of the HASTUS project should occur spring 2015.

- Farebox upgrade – In late 2013 and early 2014 AC Transit issued installed new SPX GENFARE FastFare fareboxes on their entire fleet. Phase II of this project will involve the integration between the farebox with the current CAD/AVL system, and integration between the farebox and the CUBIC Smart Card Driver Console. The entire project is expected to be completed by the end of 2014.

Deployment Summary

Project Scope

Scope of Systems Required

The following technologies shall be deployed as part of this project over the deployment timeframe:

Central Systems

- Computer-Aided Dispatch / Automatic Vehicle Location software
- Automatic Vehicle Announcements software
- WLAN Access Points for garages, and WLAN central system gateway
- Onboard Equipment
- Vehicle Logic Unit (VLU)
  - Automatic Vehicle Location (AVL)
  - Mobile Data Terminal (MDT)
  - Mobile Access Router (MAR)
- Antennas
- Emergency Alarm Covert Switch and Microphone
WLAN Card Integration

- Central System
- Fixed Route Scheduling Software
- Enterprise Database
- Onboard Equipment
- Farebox
- PA Amplifier and Microphone
- Interior AVA Display
- Destination Headsigns
- Transit Signal Priority Emitter
  - Vehicle Components Monitoring, including discrete signals (e.g. kneel)
- Digital Video Recorder
- Automatic Passenger Counters (APC)
- Equipment Cabinets

Voice Radio and Cellular Data System Integration

- Voice Radio
- Voice Radio Console
- VLU integration with Voice Radio and Mobile Access Router
- Central System integration with Voice Radio Console software
- Cellular Data Card
- Cellular Data Gateway

Real Time Passenger Information System

- Next Bus Arrival Predictions and Display
- Passenger information messages
- Scope of Services Required
- Project Management
- System Engineering and Design
- Inspections, Surveys, and Pre-Delivery Testing
- Delivery and Storage of Equipment
- Installation
- Onboard Systems Integration
- Communications Network Integration
Request for Proposals (RFP) Schedule

The tentative date for the anticipated RFP are as follows:

- RFP released – September 2014

Objectives of the RFI

The objectives of this RFI are to identify a short list of vendors that will match AC Transit’s unique system needs. The questions are formed with the intent to understand whether the solution can address not only the required functionality, but also the distinct needs of the District. AC Transit thanks you in advance for your time and look forward to developing an informed opinion about your company and the solutions that they offer.

Content of this RFI

This RFI has three (3) Attachments:

Attachment A - Questions on the current CAD/AVL industry’s capability to design, build, and deliver a CAD/AVL system that meets the District’s specifications. Your responses in Attachment A should be provided under the assumption that all specification and contract term requirements will be achieved unless specifically noted.

Attachment B – Draft Functional and Technical Requirements for the CAD/AVL Procurement. The majority of questions from Attachment A were derived from the draft functional and technical requirements contained in Attachment B. This document is provided to give additional context to the questions only. AC Transit does not guarantee the submission of this document as a part of the formal RFP. Responders are welcome and encouraged to review this document and provide the District with feedback.

Attachment C – Proposed CAD/AVL Concept of Operations. The full Concept of Operations are contained in Attachment C.

Interested parties are requested to review these documents and complete responses to Attachment A and submit to Brian K. Jackson, AC Transit Contract Specialist, via e-mail address bkjackso@actransit.org, no later than 1:00 PM (PST) July 21, 2014. Please format your responses or additional questions with
a reference to the specification sections listed with the questions listed in Attachment A.

**Key RFI Action Dates**

Release of the RFI: June 19, 2014  
RFI Responses Due: July 21, 2014

**RFI Results and Confidentiality**

It is the intention of the District to use information gathered during the RFI process to refine the RFP as appropriate prior to the release of the solicitation. This RFI will also be used by the District to select a short list of vendors in which to distribute the RFP. This RFI will be managed by the District whose members have all signed confidentiality agreements. All material submitted will be held confidentially within the District. Submitters are cautioned to clearly label as proprietary and confidential any specific information or other material that is considered to be confidential.

**RFI Evaluation Process**

All responses to this Request for Information will be reviewed by an evaluation team. From those evaluations a short list of vendors will be selected to receive the CAD/AVL Request for Proposal.

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Should you have any questions about completing the requests or this project’s objectives, please submit your inquiries by email to:

AC Transit Purchasing Department  
Attn: Mr. Brian K. Jackson, Contract Specialist  
1600 Franklin Street, Oakland, CA 94612  
Email: bkjackso@actransit.org; Office: 510-891-5494

Sincerely,  
AC Transit District