

# Requisition for Hosting and Maintenance of a web-based Software as a Service (SaaS)

The City Transit Authority is seeking requisition for Hosting and Maintenance of a web-based Software as a Service (SaaS) containing modeled data on origin-destination pairs, transfers, and vehicle loads by synthesizing data from sources for three years with two one-year options.

The solicitation will require the firm awarded with the contract (Contractor) to assist with the implementation of the SaaS including configuration, customization, testing, training, deployment, and post-go-live support.

Requirements include:

- Client Server applications should use Server 2016/2019 or the latest for the network operating system whenever possible;
- Client computers should utilize Microsoft Windows 10 as client application architecture;
- Microsoft Office 365 is the standard for common office applications; and
- Microsoft Edge is the standard browser.

## **Scope of Services**

### **Synthesized Ridership Data**

The City Transit Authority is interested in acquiring a SaaS that would provide modeled data on origin-destination pairs, paid and unpaid transfers, and vehicle loads by synthesizing data from sources including:

Automatic Vehicle Location (AVL) for bus  
Supervisory Control and Data Acquisition (SCADA) for rail  
General Transit Feed Specification (GTFS)  
Automatic Passenger Counter (APC) for bus  
Automated Fare Collection (AFC)  
Geographic Information System (GIS)

The system would apply algorithms or other logic to infer and validate the details of each anonymized passenger's movements, including the location and time of origin, transfer(s) (if applicable), and destination. The system would have a reasonable method for scaling up data to account for uninferred origins and destinations, as well as passengers who did not interact with the AFC system or other missing data. The system would process data nightly.

## **Detailed Specifications**

### **Network and Schedule Unification:**

The Contractor would derive a system-wide, multi-modal network and schedule to cover all the City Transit Authority bus and "L" services and fare-collection equipment and facilities, and to reflect the state of the transit system on any dates being analyzed.

**Vehicle History Synthesis:**

The Contractor would configure its SaaS to clean, correct, and reconstruct each of the City Transit Authority vehicle's stop-level history in space and time, including the handling of misidentified trains and the correction of GPS errors. This entails a robust analysis of AVL, SCADA, GTFS-static, APC, schedule, GIS, and possibly other data.

**Origin inference:**

The SaaS would attempt to infer the time and stop of each passenger boarding. This includes boardings associated with fare transactions (such as at fareboxes) as well as those that occur within gated stations. In cases where a definite boarding location cannot be inferred, it would be approached probabilistically.

**Destination inference:**

The SaaS would attempt to infer the alighting stop and time of each ride. In cases where a definite alighting location cannot be inferred, it would be approached probabilistically.

**Transfer and journey inference:**

The SaaS would attempt to infer whether each ride was linked to the next or ended in a trip-generating activity. Rides would then be grouped into journeys.

**Train assignment:**

Riders who interact with the fare system at gated "L" stations would be associated with one or more trains, leading to the estimation of train loads and platform occupancy.

**Disaggregate ride records:**

The Contractor would make available or otherwise provide nightly (or otherwise as mutually agreed to in a processing schedule) sets of ride records, including inferred origin, destination, transfer, and journey information.

**Stop-level vehicle data:**

The Contractor would make available or otherwise provide nightly (or otherwise as mutually agreed to in a processing schedule) sets of vehicle visit records, where each is an instance of a vehicle serving a stop. These records would include scaled boarding, alighting, and load counts from the inferred passenger ride data.

**Aggregate Ridership data:**

The Contractor would make available or otherwise provide nightly (or otherwise as mutually agreed to in a processing schedule) scaled Ridership data at additional levels of

aggregation beyond the stop-level data mentioned above. This would account for rides that weren't successfully recorded or associated with a vehicle visit.

**Historical data:**

The Contractor would process data from 2019 and beyond to make available or otherwise, provide corresponding generated data.

**Performance and Ridership analytics tools:**

The accumulated generated data will power the Contractor's analytics platform, where the City Transit Authority would have full access to a suite of Ridership, performance, and other tools, including total estimated Ridership counts, vehicle loads and crowding, origin-destination flows, on-time performance, unfilled service trips and other fully scaled passenger-flow information.

**Daily data processing:**

The Contractor would perform a nightly (or otherwise as set forth in a processing schedule) extract-transform-load (ETL) process to obtain data from the City Transit Authority's Ventra, Genfare, Clever, SCADA, Hastus, and BusTools systems. Dates would be reprocessed to capture any late reporting data.

**Data Storage and Access:**

The service includes a Contractor-hosted data warehouse that can be accessed and queried by power users at the transit agency. Output data could be transferred to the City Transit Authority for internal use.

**Documentation, support, and maintenance:**

The Contractor would provide online documentation detailing the usage and theory of all UI tools, an output data dictionary, and user-friendly explanations of the models and algorithms applied to the data. The Contractor would also provide onsite training and/or meetings for up to three (3) consecutive business days per year as requested by the City Transit Authority, and up to one hundred and twenty (120) hours of remote support, meetings, and training per year. The Contractor would provide unlimited maintenance for any issues with its Services for which the Contractor is responsible.

**Additional Features:**

The Contractor would add new features and improvements to the SaaS and make them available to the City Transit Authority as they are developed and become generally available to the City Transit Authority.

**Implementation and Integration**

The Contractor must provide the software solution and perform the installation, implementation and integration of data. The Contractor will work closely with the Technology and Planning Departments.

## **Processing Environment**

The Contractor must define the target environment including any hardware/cloud computing required to properly run a Ridership SaaS and to meet the performance criteria of the the City Transit Authority. The Contractor shall provide the infrastructure required for the Ridership SaaS, including a test and production platform. The Contractor will provide testing and production environment during the implementation.

## **System Performance**

The SaaS application must meet the minimum required performance as listed below:

- 1) handle large volumes of data and interface with other systems utilizing the City Transit Authority network, without degrading the system response or performance. The proposed SaaS application will be used 24 hours, 7 days a week, and 365 days a year;
- 2) acknowledge all user requests within one second and provide results within 5 seconds. A longer response time should be indicated via a percentage status bar or change in User Interface (UI) appearance; and
- 3) support and provide dynamic failover capabilities of application data and functionality. The Contractor is expected to assist the City Transit Authority in defining, configuring and establishing the infrastructure and failover mechanism for the system.

## **System Architecture**

### **1. Data Security**

Security is critical. The Ridership SaaS is required to secure information and systems against the full spectrum of threats; use multiple, overlapping protection approaches; and address the people, technology, and operational aspects of information systems. Attributes to secure system data should include:

- Application level security to integrate/interface/co-exist with the OS level security, database level security, and network security that is in use at the City Transit Authority.
- Comprehensive security mechanisms to safeguard access to the applications and integrated database.
- Comprehensive auditing capability to trace activity to an individual user level – record updates, deletion, creation and edits.
- Control access privileges to software functionality, data attributes, and software screens and prevent unauthorized use of data.
- the City Transit Authority requires the Contractor to provide all the data security and vulnerability assessment information upon request during the project implementation and during the contract period.

### **2. Reporting Services**

The system must have standard reporting capabilities with the option for customization. The Ridership SaaS is required to generate and export pre-determined reports in a variety of formats, run queries on demand, export query results as .xml or .xls, Excel files or other common industry formats, and save queries for future use where appropriate. The Ridership SaaS must have the ability to interface data with various systems and services within the City Transit Authority. The reporting tool must have the ability to select/configure output columns, filter the results, group the results, graph the results, sort the results, or drill down to the required granularity by input parameters.

### **3. Terminology**

The UI screens, controls and reports must use language and terminology acceptable to the City Transit Authority and have the ability to customize the software screen, all captions, messages, and reports to meet the City Transit Authority industry and business-specific terminology wherever requested.

### **Ownership**

The database and the contained data of the Ridership SaaS are owned by the City Transit Authority. Any access to the actual data for updates will be provided upon authorization from the City Transit Authority. The Contractor shall not reveal any confidential or non-confidential information without prior authorization from the City Transit Authority.

### **Project Management**

#### **1. General Requirements**

The Contractor is required to demonstrate the planned project management processes including, but not limited to, project requirements, schedule, cost, risk management, communication management, quality management, contract management, and administration.

#### **2. Communications**

The Contractor shall be responsible for ensuring all project milestones and dates are met for the Ridership SaaS. The Contractor must develop a realistic schedule, a comprehensive work plan, and a project management and communications approach. The Contractor must work with the the City Transit Authority's project manager at regular project meetings and must document project status reports, risk mitigation plans, open and closed issues, accomplishments, milestones, quality control, and meeting notes. The Contractor shall also coordinate and work with a change management team for approvals in baseline changes of scope, cost, schedule and quality.

#### **3. Project Management Tools**

The Contractor is required to use project management tools and technology aligned or compatible with those used by the City Transit Authority (Microsoft Office, Project Management, Visio and SharePoint 2010). The tools

used must be licensed, compatible and versioned similar to the ones used by the City Transit Authority. Ideally, the Contractor should provide an online management tool to record and manage project findings – risks, issues, concerns, change management, and bugs, with the ability to generate extensive reports. Both parties should use the same tool to record and monitor project progress. The Contractor will be responsible to maintain the system throughout the project cycle. Post project implementation of data will be owned by the City Transit Authority.

#### **4. Testing**

The Contractor must create and execute a test plan that verifies all the requirements of the RFP. Success and failures criteria are to be established before the testing occurs. Both the test plan and the success criteria will be subject to the City Transit Authority's approval. The Contractor will provide testing environment to test the City Transit Authority-specific tests. Upon test completion, the Contractor shall provide the City Transit Authority with a report of all results. A final decision on test pass/fail rests with the City Transit Authority project manager.

Testing should cover:

- System Testing: The Contractor must ensure all the components of the systems are working properly and meet business and technical requirements. System testing must also include all reports and imports/exports with other systems. System testing shall be conducted on production systems with artificial data; and
- User Acceptance Test (UAT): the City Transit Authority users test the usability of the application and its reports.

#### **5. End User Training**

The Contractor is required to provide a training plan executed at the City Transit Authority's location or at a location approved by the City Transit Authority. The Contractor will be required to prepare all training materials and provide them in online formats and classroom format.

#### **6. Deployment**

The Contractor is responsible for the final implementation and installation of the Ridership SaaS and must ensure that the system contains all necessary data inputs, ancillary data, configuration settings, and required initial data transfers. The Contractor is required to provide a data readiness checklist for each source and is responsible for compliance before each source is integrated into the system. The Contractor is responsible for the deployment of the final Ridership SaaS system, following approval testing and acceptance by the City Transit Authority. The Contractor should recommend a deployment schedule. The Contractor will provide post-go-live support plans including resources, contact information, available time etc.

## **7. Business Continuity Plans**

The Contractor will provide business continuity and disaster recovery plans in case of system failure for more than 4 hours. The Contractor will provide data archiving files once a year and at the end of the contract.

### **Project Schedule**

Timing is of critical importance to the the City Transit Authority and the program must be developed on an accelerated time schedule. The solution should be tested, fully functional and in operation within twelve months after the City Transit Authority issues the Contractor with a formal Notice to Proceed. Opportunities to condense this timeframe even further should be outlined in the Proposals by the party seeking to become the Contractor (herein known as the "Proposer" or "Your"). Proposers should also list specific risks (and mitigation tactics) that arise from the schedule constraints. Final approval of the project schedule will be at the sole discretion of the the City Transit Authority. Proposers must also provide a milestone deliverables schedule for the system implementation, including proposed earned value of professional services at each milestone. The City Transit Authority will review and approve the requirements modifications and implementation plan. Upon acceptance of each milestone, the Contractor will be authorized to submit invoices for payment.

### **Maintenance and Technical Support**

The Contractor is required to provide ongoing maintenance and technical support to the City Transit Authority throughout the term of the contract. The Contractor's support shall consist of a variety of technical and administrative areas including, but not limited to, installing and configuring the SaaS product, installing and configuring SaaS product updates, providing corrections to identified defects, troubleshooting the system, reviewing the generated log, tracing files, and providing solutions for continuous improvements.

The service level requirements are as follows:

#### **Support Mode:**

Availability of support staff via email, phone or online to provide technical support and assistance to user concerns in a timely fashion. Support staff and technical support staff shall be available during all regular working hours.

#### **Issue Response Time:**

Response time in case of system downtime should be no longer than 2 hours. A high-priority issue should be assigned to technical staff within 2 hours with 24 hours turnaround time to identify a solution. A medium-priority issue should be assigned to technical staff within 24 hours with 72 hours turnaround time to identify a solution. A low-priority issue must have a turnaround time of 5 days to identify a solution. The City Transit Authority will determine the level of priority for each issue and may consider the advice of the Contractor in making this determination.

**Software Management:**

Any corrections, fixes, upgrades, or enhancements to the software revision should include but are not limited to, user training when applicable, accompanied by release documentation – what was changed, what was fixed, test cases, and configuration changes.

**Service Level Agreement (SLA)**

The Contractor must include within its Proposal the service levels to which it will perform, the methodology used to measure and report against service levels, and the remedy the Contractor will provide the City Transit Authority should such service levels not be satisfied.