COMPANY NAME:_____

OVERVIEW

Background

The City of Guelph operates both conventional and mobility transit services through Guelph Transit. Guelph Transit was established in 1929 by the City and has since grown to serve approximately 28 conventional service routes using 75 buses. Recently, Guelph Transit replaced their conventional fleet with wheelchair-accessible low-floor buses. Mobility services are also offered to riders with disabilities limiting access to conventional service.

EXISTING OPERATION

The following technologies are already in place at Guelph Transit:

- Fixed route scheduling software, to be replaced under this project;
- In-house developed conventional daily operations management application based on Microsoft Office Excel and Visual Basic for Applications (VBA), to be replaced under this project;
- In-house developed mobility daily schedule and operations management applications based on Microsoft Office Access and VBA, to be replaced under this project;
- Microwave Radio Communications (MRC) open channel voice radio communications system. The current radio system will be replaced by a closed radio voice communications system under a different project. This project will integrate the closed voice radio system with a Computer Aided Dispatch / Automatic Vehicle Location (CAD/AVL) system to provide additional functionality, such as request to talk (RTT), priority request to talk (PRTT), and covert microphone audio monitoring during emergency alarm.
- Seon Design on-board cameras and Digital Video Recorder (DVR) system for both the conventional and mobility fleet, to be integrated with the CAD/AVL system.
- GFI fareboxes system, to be integrated with the CAD/AVL system.
- NextBus CAD/AVL system from WebTech Wireless. This system comprises onboard location monitoring equipment, wayside arrival time prediction displays, and Interactive Voice Response (IVR) automated telephone information system. The new CAD/AVL system will replace and expand on the capabilities of this existing CAD/AVL system.

EXISTING IT ENVIRONMENT

The following provides background information about the City of Guelph Information Technology environment:

- Guelph Transit intends to install any new local servers and workstations for the system at their Guelph Transit Operations at 170 Watson Road South, Guelph, Ontario, N1L 1C1 or at the City of Guelph Server Room located at 1 Carden Street, Guelph, Ontario, N1H 3A1.
- Guelph Transit currently does not have dispatcher workstations at their main facility on Watson Road South.

- Guelph Transit Operations is connected via the City wide area network to the Guelph Transit Terminal (Downtown Guelph) through City Hall (1 Carden Street). The Guelph Transit to City Hall connection is through a 100 Mbps Single Mode (SM) Fibre connection using a Rogers IP-VPN. City Hall is then linked to the Guelph Transit Terminal through a 1 Gbps 2xSM Fibre (see Appendix A for a diagram illustrating this existing network connectivity).

PROJECT GOALS

The following are key project goals:

- Enhance staff operational efficiency
- Improve safety by continuously monitoring the real time position of buses, including during incidents
- Enhance schedule reliability and adherence through monitoring operations and gathering enhanced data for planning on actual running times
- Enable rapid service management response to changing conditions
- Improve the availability of real-time information to customers
- Improve accuracy of reporting and data availability
- Meet AODA requirements
- Minimize the manual data entry required by Guelph Transit staff
- Improve the integration of current corporate systems with newly deployed systems
- Maximize the opportunities for integration with future Guelph Transit systems

System Concept and Project Scope

The City of Guelph envisions that transit technology deployment for Guelph Transit will incorporate a number of central, vehicle based, and communications equipment and software hereinafter referred to collectively as the "system."

Exhibit 1: System Concept of Operations represents a graphical overview of the system concept to be deployed for Guelph Transit with information flows based on the Intelligent Transportation Systems (ITS) Architecture for Canada. This represents the complete system. The requirements defined herein are to enable this system concept.

The proposed onboard technology solution incorporates CAD/AVL based on the use of Global Positioning Systems (GPS), Mobile Data Terminals (MDT), and (specifically for conventional transit) Automated Next Stop Announcements (ASA), and Automatic Passenger Counters (APC) functionality. These onboard capabilities will be coordinated by an On-Board Computer (OBC) that both integrates onboard equipment and communicates with the central software during operations. The system will provide messaging between the mobile and central systems, real-time and historical reporting of vehicle location and schedule adherence to the central system, and passenger boarding/alighting data. This data is provided to the central system to help facilitate performance monitoring and operations optimization, support traveler advisories and route planning/analysis activities. In addition, the proposed solution includes conventional scheduling software, mobility scheduling and operations software and conventional transit pullout management software.

COMPANY NAME:_____

The central system servers shall be located at Guelph Transit Operations, or at the City Hall server room. Vehicle storage areas will provide for WLAN data transmission between the vehicles and the central system while vehicles are there.

The system shall track the Guelph Transit conventional and mobility fleets, supervisor, and maintenance vehicles. The table below summarizes the number and types of vehicles to be communicated with by the central system under this project:

Vehicle Type	Number of Vehicles
Mobility buses	10
Conventional buses:	75
Supervisor vehicles	2
Maintenance vehicles	2
Relief Transportation Vehicles	2

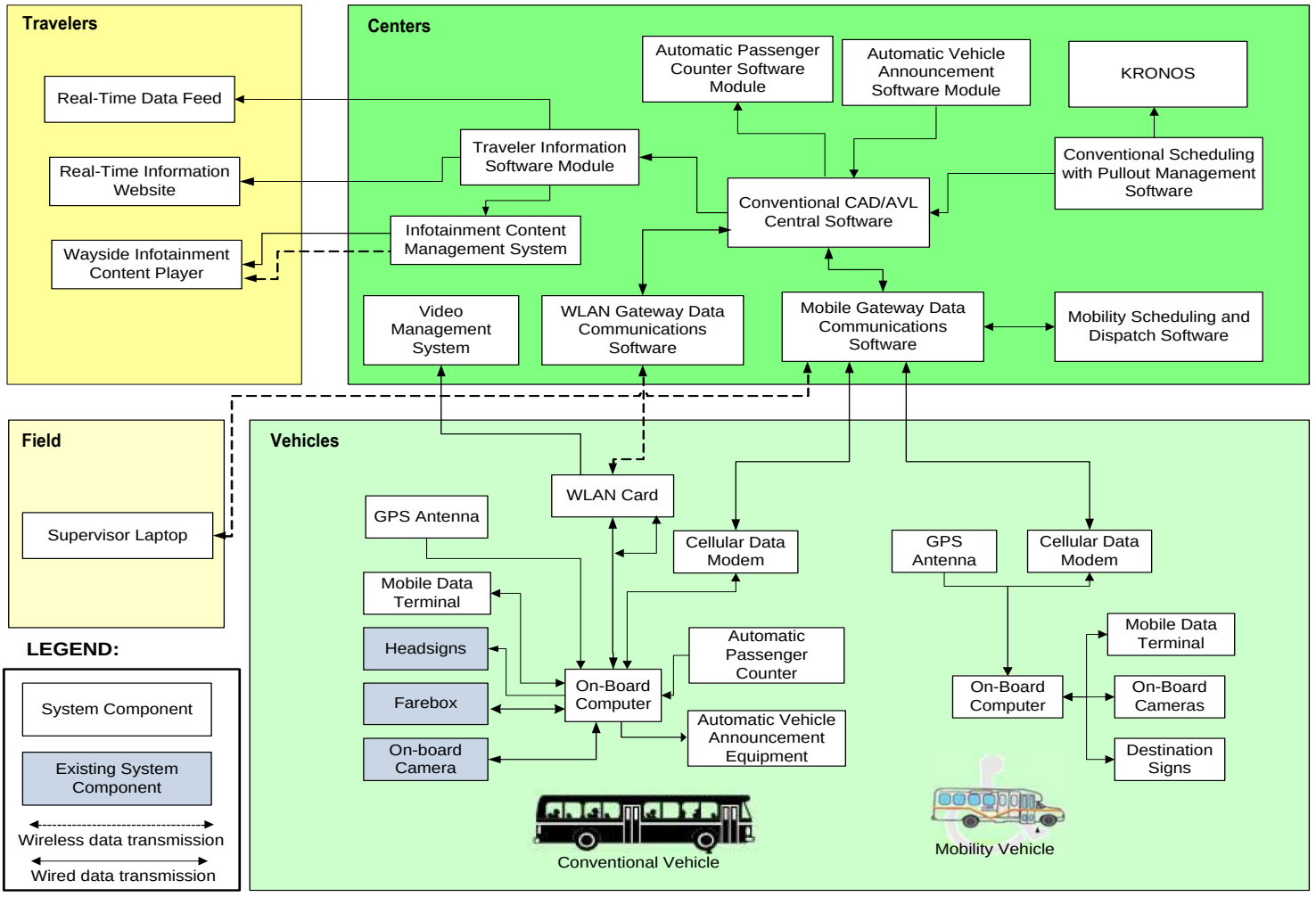
A complete fleet list of the vehicles to be equipped is provided in the document “13-032 Vehicle List”.

All conventional vehicles will be equipped with OBCs, GPS, MDTs, APCs, Cellular Data Communications, Voice Radio Communications, WLAN Communications and ASA equipment. All mobility vehicles as well as service (i.e. maintenance, relief transportation and supervisor) vehicle will be equipped with OBCs, GPS, MDTs, and cellular data communications. Supervisor personnel (vehicles) will also be equipped with mobile computing equipment and mobile data communications for remote access to central system functionality. This remote access will be through a laptop computer, or alternate approved mobile computing hardware.

COMPANY NAME:_____

The system shall use the real-time data from vehicles to maintain next bus arrival time predictions for all stops, making these predictions available through an interactive website. The system will also include a real-time predictions data feed that will help enable wayside signs, interaction with an IVR system, and third party development for access through personal mobile devices.

Exhibit 1: System Concept of Operations



Contractor Responsibilities

The Contractor shall be responsible for providing a complete system that incorporates all specification requirements, including but not limited to:

- Existing Conditions Survey
- Design Review Documentation
- Modify and customize software for Guelph Transit
- Installation
- Acceptance Testing
- Training

- Project and System Documentation
- Troubleshooting
- Warranty and Support

Guelph Transit Responsibilities

Guelph Transit and its designated representatives shall:

- Assign a project manager to coordinate on its behalf;
- Provide basic infrastructure (power, space, access) at each facility for installations;
- Witness all testing stages;
- Provide prompt review comments on all documentation submissions;
- Participate in all scheduled project activities, attend scheduled meetings and promptly respond to new meeting requests, requests for information, technical support or other necessary communication activities;
- Provide GIS base maps, as well as information on bus stop locations/bus stop inventory and bus route data as GIS data layers;
- Provide access to vehicles for equipment installation and testing;
- Procure and provide central system and mobile access hardware, including servers, workstations and associated Uninterruptible Power Supplies, addressing minimum hardware requirements set by the Contractor.
- Guelph Transit will help the Contractor obtain information, services and facilities access including:
    - Select the wireless data communication service provider;
    - Help obtain necessary permits or permissions for activities requiring outside authorization;
    - Help coordinate logistics for receiving project related equipment into project facilities;
    - Help obtain any new, changed or updated operational information needed for to the Contractor to configure and initialize the system;
    - Schedule and coordinate staff participation in training sessions as per the agreed training schedule;

COMPANY NAME:_____

Instructions to Proposers

Future Migration Path

Guelph Transit understands that some elements of the contractor product line may not be required to meet the specifications set forth in this RFP. Proposers shall include a section in their proposal highlighting the a future potential migration path for Guelph Transit, discussing features of such additional available systems and products as well as whether/how they could be added to the system in the future.

Submission Checklist

- Signed forms
- Completed Mandatory Requirements Matrix
- Completed Preferred Requirements Matrix
- Technical Proposal
    - Team Qualifications
    - Reference Projects
    - Project Staffing
    - Project Management Plan
    - Schedule
    - System Design and Functionality Details
    - Future Migration Path
    - Design Review, Installation and Acceptance Testing Plan
    - Training and Documentation Plan
    - Operations Support and Warranty Plan
- Completed Price Proposal Form

COMPANY NAME:_____

Implementation Schedule

The Contractor shall complete the system according to the following proposed implementation schedule:

Reference Number	Reference Requirements	Proposed Schedule
Notice to Proceed		N/A
Master Schedule of Work	7.1	
Project Binder	7.3	
Preliminary Design/System Design Document Completed	8.1	
Final Design/System Design Document Completed	8.4	
Factory Acceptance Test (FAT) Procedures	9.2	
Factory Acceptance Test (FAT)	9.2	
Training Materials	10	
O&M Documentation	11.1	
Mini-Fleet Testing Procedure	9.3	
Mini-Fleet Testing	9.3	
Installation Test Procedures	9.4	
Training	10	
Completion of Installations and Installation Tests	9.4	
System Acceptance Test (SAT) Procedures	9.5	
As-built System Design Document	11.4	
Final O&M Documentation (if updated)	11.1	
System Acceptance Test (SAT)	9.5	
Warranty	12	

COMPANY NAME:_____

MANDATORY REQUIREMENTS

Please note that proponents are required to complete both the Mandatory Requirements Matrix and the Preferred Requirements Matrix as provided within the document. Proponents must respond to all tabular items using one of the response codes listed below. Note that only F (Fully Compliant) and N (Does Not Comply) are valid responses for the Mandatory Requirements Matrix. A response other than F for any of these requirements shall immediately remove a bid from consideration by the City of Guelph.

Response Code	Definition
F	**Fully Compliant** – Function or feature fully complies with Guelph Transit requirements. Responses that are qualified by exceptions or limitations, etc. in the Matrix shall be considered the equivalent of "N" (does not comply).
N	**Does Not Comply** – Proposer does not comply with the Guelph Transit requirement. Accompanying comments are discouraged.

Requirement Number	Description	Code	Proposal Section Reference
1.01	The contractor shall provide contact information for an individual at a minimum of three reference projects for which they were also the contractor. Reference projects shall have been completed within the previous five years, and have deployed a system corresponding to at least the complete scope of these specifications and for a transit agency of at least as large a fleet size as currently operated by Guelph Transit.		
1.02	Each subcontractor or supplier shall provide contact information for an individual at a minimum of three reference projects for which they completed work within the previous five years corresponding to what would be provided in the Guelph Transit solution.		
1.03	The contractor shall implement a system that includes all line items indicated in the price proposal.		
1.04	The contractor shall if requested provide to Guelph Transit a demonstration of system functionality corresponding to the entire scope of these specifications as part of the tender assessment process.		
1.05	All maps used in the central system shall be Geographic Information System (GIS)-based and able to incorporate periodically imported layers from Guelph Transit, City of Guelph or local county GIS maps. The central system shall include any import utilities necessary to import and update the base GIS maps and add layers.		
1.06	Guelph Transit specific software parameters shall be configurable by City of Guelph staff after system acceptance.		

COMPANY NAME:_____

Requirement Number	Description	Code	Proposal Section Reference
1.07	Application software (both user and system) shall be able to be reinstalled by City of Guelph staff after system acceptance to other computers using similar hardware and the same operating system without need for any modifications or use of hardware keys.		
1.08	The system shall be integrated so as to ensure that any configuration or data changes made in one subsystem are automatically also recognized in other applicable subsystems.		
1.09	The system shall maintain data integrity, including use of error checking.		
1.10	All database software shall be Open Database Connectivity (ODBC) compliant. All data shall be owned by Guelph Transit, with rights to access the data, export it to other applications, and allow access to third parties for integration purposes on a perpetual royalty-free basis.		
1.11	The system documentation shall include a database Data Dictionary and Entity Relationship Diagram (ERD), and all required Application Programming Interfaces (APIs).		
1.12	All customer facing equipment shall be able to display or announce information in English and French.		
1.13	The system shall provide access control based on establishing groups. User assignments to groups and group access rights shall both be configurable by the system administrator.		
1.14	The system shall allow operators to sign-in using workstations provided in the operator sign-in areas. The system shall also generate a notification whenever operator assignment run, or pull-out/pull-in time has changed from the scheduled assignment.		
1.17	The contractor shall complete an interface through which the KRONOS software shall ingest schedule information as well as this actual sign-in and pull-out/pull-in times data. Guelph Transit will assist the selected contractor in negotiating a reasonable subcontract with KRONOS for its support services.		

COMPANY NAME:_____

Preferred Requirements

Please note that proponents are required to complete both the Mandatory Requirements Matrix and the Preferred Requirements Matrix as provided within the document. Proponents must respond to all tabular items using one of the response codes below.

Response Code	Definition
E	**Exceeds Requirements** – Function or feature provided is both fully compliant, and exceeds Guelph Transit requirements. The Proposer shall provide alternate requirement language to the Guelph Transit requirement, to which they commit to fully comply. Guelph Transit can opt to use either the alternate requirement language or the original language – in both cases the Proposer will be understood to be fully compliant ("F").
F	**Fully Compliant** – Function or feature fully complies with Guelph Transit requirements. Responses that are qualified by exceptions or limitations, etc. in the Matrix shall be considered the equivalent of "N" (does not comply).
CM	**Complies with Modified Requirement** – Proposers shall provide suggested alternate requirement language in the comments column of the Matrix. The "CM" will be equivalent to a response of "F" if Guelph Transit opts to change the requirement as proposed, or to a response of "N" if Guelph Transit opts to not change the requirement. If alternate requirement wording is not proposed in conjunction with a "CM" response, the response shall be considered "N" (does not comply).
N	**Does Not Comply** – Proposer does not comply with the Guelph Transit requirement. Accompanying comments are discouraged.

Comments may be provided in the table to support the Proposal as necessary, but the requirement language to which the proposer offers to commit shall govern for system acceptance purposes.

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1 Central System				
2.1.1 GENERAL				
2.1.01	All software shall be the current version in production at the time of installation (software versions to be approved by the Guelph Transit Project Manager).			
2.1.02	All software shall contain version control numbers.			
2.1.03	Features shall be provided to identify the software version on each device, and verify that it is the correct or most recent version for that device.			
2.1.04	The system shall contain supporting software as required to operate and maintain all elements of the software Graphical User Interface (GUI). This shall include means to configure priority of alarms with GUI parameters.			
2.1.05	Passwords shall only be displayed in encrypted form.			
2.1.06	The GUI shall incorporate a context sensitive online help system.			
2.1.07	Only metric units shall be displayed in the GUI.			
2.1.08	The central system date and time shall be automatically corrected whenever the deviation from the Guelph Transit- approved internet time source exceeds one second, with corrections occurring at least every 24 hours. The system date and time shall automatically adjust for the start and end of daylight savings time (DST) as well as leap years. The start and end dates for (DST) shall be Guelph Transit configurable.			
2.1.09	The system date and time shall provide the same date for service times associated with a complete transit operational day, where number of hours for the day is based on start and end of service regardless of service starting on the prior calendar date or extending into the following calendar date.			
2.1.10	Data transferred between devices or software shall not be purged or written over until a successful transfer has been confirmed.			
2.1.11	The system shall ensure that all created files are uniquely identified, and that no files are lost or missed during data transfer.			
2.1.12	The system shall confirm that no data is lost during processing.			
2.1.13	The system shall automatically detect and prevent the propagation of invalid or erroneous data.			
2.1.14	The system shall allow authorized users to manually correct any data.			
2.1.15	The system shall incorporate a comprehensive data backup, archiving, and recovery capabilities.			
2.1.16	The GUI shall enable scheduling of data archiving and batch processing.			
2.1.17	Under primary data storage failure, users shall be able to recover data files through a secondary standardized PC interface such as a USB or RJ45 port.			
2.1.18	Under primary or backup data storage failure, the system shall alert a configurable list of staff members.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.19	Additional alternate processes for initiating data extraction and/or alternate means of removing data records may be provided, subject to Guelph Transit Project Manager review and approval.			
2.1.20	Central system and mobile access computer hardware (e.g. workstations) shall be procured by Guelph Transit, conforming to Contractor-identified minimum requirements.			
2.1.21	The system software can be provided as an installed solution at the Guelph Transit facility.			
2.1.22	The system shall be configurable to display an AM/PM or 24 hour clock based on user preference.			
2.1.23	The existing voice radio recording systems shall be reconfigured to record and make available for playback all voice radio communications.			
2.1.24	Guelph Transit shall be able to provide different access rights to users accessing the system via thin client access compared to when they are accessing the system via a workstation client application. Active Directory shall provide the security integration of users and groups. Active Directory integration shall be via LDAP or direct integration with Microsoft Windows. As a minimum, the following three groups shall be initially configured (System Administrator, Dispatcher, and View Only).			
2.1.2 Conventional Scheduling Software				
2.1.2.1 Route Definition				
2.1.2.1.01	The system shall allow any number of trip patterns to be defined as distinct bus stop sequences, including the ability to designate selected stops in each trip pattern as schedule timepoints and whether a trip pattern is inbound or outbound.			
2.1.2.1.02	The system shall display all trip patterns or fixed portions of flexible trip patterns during a user-specified date and time range on a map for visual display.			
2.1.2.1.03	The system shall calculate distances and display deadhead route segments, entire trip patterns, and selected trip pattern segments defined by the user.			
2.1.2.1.04	The system shall be capable of generating a list of turning movements for an entire trip pattern.			
2.1.2.1.05	The system shall allow routes to be defined as a sequence of trips using selected trip patterns during defined time periods.			
2.1.2.2 Bus Stop Definition				
2.1.2.2.01	The system shall allow an unlimited number of bus stops and nodes to be defined.			
2.1.2.2.02	The system shall permit the user to define bus stops using a variety of methods, including direct entry of GPS-determined coordinates, and setting the stop location with a mouse click.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.2.2.03	The system shall allow stops to be properly positioned along road segments.			
2.1.2.3 Creating Timetables				
2.1.2.3.01	The system shall use historical running time data to suggest average running speeds, for various days and time periods, for deadhead segments and between each pair of stops along each trip pattern. Guelph Transit shall be able to manually designate average running speeds for any of the above, which shall supersede system suggestions.			
2.1.2.3.02	The system shall enable both automatic and manual trip building for each route, using the designated sequence of trip patterns. The system shall build trips based on user-specified headways or user-specified trip start/end times. The system shall allow for defining exceptions to the daily operating schedules.			
2.1.2.3.03	The system shall permit users to automatically or manually assign trip numbers.			
2.1.2.3.04	The system shall allow modifying built trips, based on modifying a single trip pattern, all trips in a single direction or a combination of the above.			
2.1.2.3.05	The system shall permit authorized users to assign specific vehicle types to trips.			
2.1.2.3.06	The system shall compute deadhead time, including the effect of varying running speeds in various time periods.			
2.1.2.3.07	The system shall provide summary data on trips and running times, including total trip length, total deadhead time, number of stops and service start/end times.			
2.1.2.4 GTFS Interface				
2.1.2.4.01	The system shall include a utility to create a set of files compliant with the General Transit Feed Specification (GTFS), intended to allow for the export of files to enable (among other potential uses) Guelph Transit itinerary trip planning to be made available via the Google Transit web service.			
2.1.2.5 Blocking / Vehicle Assignment				
2.1.2.5.01	The system shall enable both automatic and manual vehicle block development based on user-defined variables, with checks to ensure that all trips have been assigned and notifications provided about a missing assignment. The system shall enable blocking trips based on an assigned bus type.			
2.1.2.5.02	The system shall enable users to both automatically and manually assign block numbers.			
2.1.2.5.03	The system shall allow developing potential interline relationships both for the entire service and based on the user selecting specific routes or trips.			
2.1.2.5.04	The system shall perform blocking to minimize the number of vehicles required, deadhead time and/or the total vehicle hours.			
2.1.2.6 Runcutting				

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.2.6.01	The system shall enable both cutting single-piece and multi-piece work assignment runs, with each piece being a sequence of route trips from a particular block.			
2.1.2.6.02	The system shall enable ensuring that runs have identical start/finish locations and that specific run types are available at given periods of the day.			
2.1.2.6.03	The system shall enable users to both automatically and manually assign run numbers.			
2.1.2.6.04	The system shall enable users to customize so that generated runs incorporate all applicable Guelph Transit labour agreement provisions.			
2.1.2.6.05	The system shall enable users to customize so that generated runs incorporate all Guelph Transit management rules.			
2.1.2.6.06	The system shall flag when a manual or automatically generated runcut violates a management rule or labour agreement provision.			
2.1.2.6.07	The system shall allow developing alternative runcut scenarios, allowing Guelph Transit to compare resulting costs for each scenario. Results shall be at least as cost effective as those currently produced manually for an equivalent scenario.			
2.1.2.6.08	The system shall allow shifting trip relief times (as stated in block tables) to optimize runcuts.			
2.1.2.6.09	The system shall enable use of compressed work weeks (e.g., 4 day work weeks, 10 hour days).			
2.1.2.6.10	The system shall enable manually cutting some or all blocks.			
2.1.2.7 Rostering and Bid Management				
2.1.2.7.01	The system shall automatically build rosters (i.e., sets of daily operator assignments combined over multiple days).			
2.1.2.7.02	The system shall enable users to both automatically and manually assign roster numbers.			
2.1.2.7.03	The system shall take into account special service levels in effect for selected and recurring dates (e.g., holidays).			
2.1.2.7.04	The system shall allow Guelph Transit staff to establish rules on which the rostering suggested by the system will be based.			
2.1.2.7 Rostering and Bid Management				
2.1.2.7.05	The system shall create separate rosters for various groups of operators (e.g., part-time rosters).			
2.1.2.7.06	The system shall validate the transitions between rosters for two consecutive rostering periods.			
2.1.2.7.07	The system shall support both roster and cafeteria style bids.			
2.1.2.7.08	The system shall automatically generate both one roster at a time and all rosters simultaneously.			
2.1.2.7.09	The system shall allow Guelph Transit staff to access human resource information for any bus operator imported into the system.			
2.1.2.7.10	The system shall use on-site workstations to allow operators to select their roster choices			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.2.7.11	The system shall validate operator roster selections to determine whether each operator meets minimum rest time requirements between runs and alert Guelph Transit if these requirements are not being met.			
2.1.2.7.12	The system shall validate operator roster selections to determine whether each operator meets requirements for minimum/maximum assigned work load.			
2.1.2.8 Reporting				
2.1.2.8.01	Reports shall be filterable by user-selectable fields.			
2.1.2.8.02	The system shall generate a report for each trip pattern, listing the distances and running times between timepoints.			
2.1.2.8.03	The system shall generate a bus stop report identifying bus stop location, amenities, conditions, and other fields that are part of the bus stop definition.			
2.1.2.8.04	The system shall generate detailed timetables for each route and for each service day type.			
2.1.2.8.05	The system shall generate route timetable with map schematic brochures suitable for providing schedule information to customers (e.g., pocket timetables). These brochures shall be able to be produced using both AM/PM clock and 24 hour clock based schedules.			
2.1.2.8.06	The system shall generate a report listing the block numbers and detailing the sequence of trips for each.			
2.1.2.8.07	The system shall generate a report detailing the block and trip sequence for the work pieces comprising each run.			
2.1.2.8.08	The system shall generate a report listing the set of runs in each roster, in a suitable format for operator signup.			
2.1.2.8.09	The report files shall be easily exported to formats that can be opened and edited in the latest versions of Microsoft Word and Excel			
2.1.3 Conventional Pullout Management Software 2.1.3.1 General				
2.1.3.1.01	The pullout management software shall enable and track the assignment of vehicles to blocks and operators to runs, the latter starting with the assignments from the operator signup.			
2.1.3.1.02	The pullout management software shall track actual pullout and pull-in times for each block.			
2.1.3.1.03	The pullout management software shall track all vehicle and operator assignments, and changes to the vehicle and operator assignments throughout the operational day, including: • Details of each change • The name of the person who made the change • The date and time each change was made			
2.1.3.2 Accommodations				
2.1.3.2.01	Administrators shall have the ability to enter and associate accommodations to each operator. (e.g. an operator is unable to drive a particular bus type).			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.3.2.02	Any time a vehicle is assigned to an operator (in most cases indirectly via the combination of the operator run assignment and the vehicle block assignment) the system shall ensure the operator is able to drive the vehicle based on their accommodations. If an operator is assigned to a bus they are unable to drive the system shall provide a warning that the assignment is incompatible with operator accommodations.			
2.1.3.3 Interfaces				
2.1.3.3.01	The system shall interface with the conventional scheduling software to get baseline operator assignments.			
2.1.3.3.01	The system shall interface with the conventional CAD/AVL software to track the time each vehicle exits and enters the garage.			
2.1.3.4 Employee Details				
2.1.3.4.01	The pullout management software shall store employee information to which direct access is needed to enable operator assignments, including: • Identification and contact information (such as name, ID number and contact information including at least 4 phone and 2 email address fields, each with customizable labels) • Status and eligibility information (such as full/part time status, active/inactive status, overtime preferences, seniority level and license information including type, class and expiry date) • Leave time information (such as days off and weekly vacations) and leave time balance • Accommodations (such as which bus types an operator is authorized to drive) • Free-form comments related to the employees • Guelph Transit customizable and filtered fields			
2.1.3.4.02	The pullout management software shall allow Guelph Transit to search employees based on any fields in the employee data.			
2.1.3.4.03	The pullout management software shall allow Guelph Transit to define employee groups based on any fields in the employee data.			
2.1.3.4.04	The pullout management software shall allow Guelph Transit to filter the employee list by group when looking to assign work.			
2.1.3.4.05	The pullout management software shall enable the import and export of employee information to/from standard flat file formats (such as comma separated value files), as well as the direct input of any employee information via manual entry.			
2.1.3.5 Vehicle Assignment				
2.1.3.5.01	The pullout management software shall show vehicle assignments and allow easy identification of unassigned vehicles and vehicles unavailable due to maintenance.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.3.5.02	The pullout management software shall allow Guelph Transit to reassign vehicles between blocks, and assign vehicles to unassigned blocks. Any unassigned blocks with no vehicle assigned shall be brought to the attention of the software user (e.g., through the use of highlights, alerts, or other means). Vehicles shall not be assigned to more than one block at a time, with the software alerting a user that tries to do so.			
2.1.3.5.03	The pullout management software shall display the current number of vehicles in revenue service.			
2.1.3.5.04	The pullout management software shall record the time when vehicles enter and exit from each garage and go in or out of service.			
2.1.3.5.05	The pullout management software shall assist with block assignment to vehicles, by suggesting assignments based on the vehicle parking locations in the garage. (I.e. the block assigned to each vehicle should result in those vehicles parked ahead in its line pulling out earlier). The vehicle parking locations shall be able to be manually entered into the system by Guelph Transit employees.			
2.1.3.6 Operator Assignment				
2.1.3.6.01	The pullout management software shall show operator assignments and allow easy identification of unassigned operators.			
2.1.3.6.02	The pullout management software shall allow Guelph Transit to reassign operators between runs, and assign operators to unassigned runs. Any unassigned runs with no operator assigned shall be brought to the attention of the software user (e.g., through the use of highlights, alerts, or other means). Operators shall not be allowed to be assigned to more than one run at one time.			
2.1.3.6.03	When an operator is removed from a run, the pullout management software shall provide a mechanism for entering the reason for removal.			
2.1.3.6.04	When changes are made to operator assignments, the system shall automatically validate the assignments to ensure that they conform to Guelph Transit-defined rules.			
2.1.3.6.05	The pullout management software shall automatically display a list of operators (including contact information) available to fill unassigned runs. The software shall note which operators can be utilized without violating Guelph Transit-defined rules. The software shall also indicate which operator selections will result in overtime being paid, and the overtime preferences for these operators.			
2.1.3.6.06	The pullout management software shall allow the entry of operator availability (e.g., leave time, training, jury duty) and shall automatically identify runs for which the assigned operator has become unavailable.			
2.1.3.6.07	The pullout management software shall allow the user to assign/re-assign an operator to future runs and off days. It shall be possible to enter this information for any future date up to the end of the baseline schedule (i.e., the end of the scheduling period for the schedule created in the conventional scheduling software).			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.3.6.08	The pullout management software shall allow the user to view employee run assignments and hours for the current week (on a weekly and day-by-day basis) to review the amount of work assigned and determine availability for additional run assignments			
2.1.3.6.09	If an operator does not sign-in within a configurable time prior to the scheduled pullout time for their currently assigned run, dispatch shall be notified and the software shall enable immediate changes to cover the open run with an available operator.			
2.1.3.6.10	Operator sign-in workstations shall also display current operator run assignments as a source of operator information.			
2.1.3.7 Reports				
2.1.3.7.01	The system shall provide reports that are quick and easy to generate and evaluate. Statistical reports generated by the system must be "user friendly" and shall not require support from a technician or system administrator to obtain and analyze data. Reports shall be easy to print, export for use in a standard spreadsheet application, or convert to PDF for emailing. The system shall be capable of establishing automatic hourly, daily, weekly, monthly, quarterly routines to automatically produce and email standard reports to defined user groups.			
2.1.3.7.01	Standard reports to be provided shall be developed in coordination with Guelph Transit, and the set of standard reports to be provided shall be listed in the proposal, to include at a minimum: • Operator and vehicle assignments • Leave time information • Employee runs sheet (including hours worked/overtime) • Vehicle usage summary • Vehicle circle check summary			
2.1.3.7.03	The unit cost shall be indicated in the price proposal for creating additional customized reports Guelph Transit decides to purchase beyond the set of standard reports listed in the proposal.			
2.1.3.7.04	The pullout management software shall provide a user friendly ad-hoc report generating utility.			
2.1.3.7.05	The contractor shall provide Guelph Transit with a database dictionary allowing them access to the database to create reports using Crystal Reports if desired.			
2.1.3.7.06	Database transactions shall be completed within one second of user data entry.			
2.1.3.7.07	All reports shall have the capability to export information into a common analysis and text editing software such as Microsoft Excel and Word.			
2.1.4 CAD/AVL Software **2.1.4.1 General**				
2.1.4.1.01	The central system shall have a map-based Graphical User Interface (GUI). The GUI shall support various map views, with mouse clickable full zoom, pan and auto-centering capability. Users shall also have the option to use a tabular user interface and schematic display for a given route as alternatives for tracking buses.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.4.1.02	All communications and CAD/AVL data shall be stored in a manner that allows direct software access for at least 90 days. Utilities shall be provided to support archive and restore functions for older data.			
2.1.4.1.03	The system shall store time data in a manner that enables display to users with a resolution of seconds.			
2.1.4.1.04	The priority ordering for display of the vehicle event list (e.g., logon, logoff) shall be configurable by Guelph Transit.			
2.1.4.1.05	The displayed vehicle status list (e.g., schedule adherence, route adherence) shall be capable of being sorted on any data field by the individual dispatcher.			
2.1.4.1.06	All windows with non-paging data shall open and populate with data within 3 seconds.			
2.1.4.1.07	All windows with paging data shall open and populate with the initial data within 3 seconds and thereafter page updates shall be retrieved within 1 second.			
2.1.4.1.08	Dragging of the cursor bar for a scrollable list shall cause instantaneous redisplay of the list in time with the movement of the cursor bar, with no noticeable lag.			
2.1.4.1.09	A “thin client” program or approved alternate method shall be provided to allow remote access to the central software via internet connection.			
2.1.4.1.10	Supervisors shall be provided with a laptop or alternate approved mobile hardware that shall use the remote access method to the central software, to enable an assigned dispatcher to access the system after-hours when needed. The mobile devices will be provided by Guelph Transit.			
2.1.4.1.11	Guelph Transit personnel accessing the system remotely shall have access to the full capabilities of the system allowed by their authorization.			
2.1.4.1.12	Software functions and views accessible via the remote access method shall be configurable in the central software by a systems administrator.			
2.1.4.1.13	System access shall be provided and configured for Guelph Transit desktop computers at the satellite office location. Any hardware, software and communications required in addition to standard internet access shall be provided.			
2.1.4.2 OBC Log-on and Route Verification				
2.1.4.2.01	The system shall receive and validate a logon request from an OBC, if the operator ID is valid and the operator is not already logged in on another OBC (and otherwise respond that it is an invalid login attempt).			
2.1.4.2.02	The system shall use the operator ID to automatically logon the OBC to the current route assigned to the operator in the pullout management software.			
2.1.4.2.03	The system shall log the vehicle (inspection) circle check information entered by the operator as part of the logon.			
2.1.4.2.04	The system shall receive and immediately process a logoff message from an OBC.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.4.2.05	In addition to logon requests and logoff messages, the system shall receive various other incoming message types from OBCs including location reports, schedule/route adherence reports and text messages.			
2.1.4.2.06	The system shall log all outgoing and received data in a historical database, including date/time, vehicle number, operator number, dispatcher number, route number, trip number, GPS location latitude/longitude, schedule adherence, message type, and message content. The historical database shall be read-only. Historical data shall be available in a format that is directly accessible by or importable into common database management and analysis tools.			
2.1.4.2.07	The system shall include a log-over feature to allow a new operator to login directly as the replacement operator for the current block.			
2.1.4.3 Location Tracking				
2.1.4.3.01	The GUI shall use colour-keyed icons to distinctly represent buses on schedule, ahead of, or behind schedule, based on Guelph Transit-configurable threshold parameters. The icon locations shall be updated to always indicate based on the most recent location report received from the vehicle. The GUI should provide an easy and intuitive means (e.g., popup window) to quickly retrieve all current data about the vehicle including its painted identifier, operator number, route number and trip number. The GUI should allow an intuitive way of selecting one or more vehicles to perform data transactions/send messages operations. The dispatcher shall have the capability to manually request a current location report response from any given vehicle.			
2.1.4.3.02	The system shall receive and store latitude and longitude information stamped with date, time, vehicle, operator, block, run, route, and trip from OBCs.			
2.1.4.3.03	The system shall provide the individual choice for each workstation user of whether to display the vehicle, route or operator ID as the icon labels.			
2.1.4.3.04	The icon shall provide a conspicuous indication if the most recently reported location being displayed is older than the reporting interval.			
2.1.4.3.05	The time intervals for location reporting shall be configurable by Guelph Transit. The system shall record detailed information using the OBC (e.g., speed, heading, latitude, longitude) once per second, which can be uploaded to the central system when the vehicle returns to its storage depot (i.e., in case some reports are not received at central).			
2.1.4.3.06	The system shall store the vehicle last known location as received from that vehicle, even after an OBC has been shutdown.			
2.1.4.4 Route and Schedule Adherence Tracking				
2.1.4.4.01	The central system shall provide both automatic and operator-requested “connection protection.” The system shall attempt, within reasonable configurable parameters, to guarantee a designated bus connection even if one or more buses are not on schedule. Operators would receive hold instructions via the OBC should they be required to wait for the connecting bus. The central system shall have the capability to override the protection and release the vehicle with appropriate notification provided to all involved vehicles.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.4.4.02	The system shall at a configurable interval receive and store schedule and route adherence information stamped with date, time, stop, vehicle, block, operator, run, route, trip, latitude, and longitude from OBCs. The timestamps for this information shall be stored with a resolution of seconds.			
2.1.4.4.03	Based on configurable thresholds, the system shall use the reported schedule adherence data to designate when vehicles are “early,” “late” or “on time.”			
2.1.4.4.04	The system shall conspicuously highlight to the dispatcher those vehicles operating early, late or off-route, using tabular and map displays to indicate their current schedule and route adherence status. The tabular display entries and the map display symbols for these vehicles shall use distinct and configurable colour codes for early, late and off-route status.			
2.1.4.4.05	The system shall provide a real-time output of the current location and schedule/route adherence for all fleet vehicles, for use by the next stop arrival/departure prediction software. The Contractor shall document and provide to Guelph Transit the communications protocols, command sets and message formats used in this interface.			
2.1.4.4.06	The system shall include relevant functions to program and modify transit routes, with stops/terminals and other necessary locations entered in the form of geo-fenced coordinates.			
2.1.4.4.07	The time intervals for schedule/route adherence reporting shall be configurable by Guelph Transit. The system shall record detailed information using the OBC (e.g., speed, heading, latitude, longitude), which can be uploaded to the central system when the vehicle returns to its storage depot ((i.e., in case some reports are not received at central).			
2.1.4.5 Text Messaging				
2.1.4.5.01	The GUI (both map and tabular) shall support text-messaging functionality to communicate with operators. Dispatch shall be able to send pre-set or custom messages to one, all, or a set of vehicles. Maximum message length shall be at least 255 characters and shall include letters, numbers and all other symbols available on a standard QWERTY keyboard. The messaging function shall include the feature to identify when/if a message is received and read (i.e., read receipt).			
2.1.4.5.02	The system shall allow the dispatcher to view received text messages in a tabular display that also indicates the sending vehicle ID and the times the message was sent and received.			
2.1.4.5.03	The system shall allow the dispatcher to send a text message to a single OBC, a selected group of OBCs, a predefined group of OBCs, all OBCs within an area selected on the map display or all OBCs operating on the same route.			
2.1.4.5.04	The system shall allow Guelph Transit staff to add, edit, delete, or reorder the listing of canned messages on MDTs.			
2.1.4.5.05	The system shall support creating a least 50 canned messages on the MDTs.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.4.5.06	The system shall allow any message sent by dispatch to be flagged as requiring vehicle operator acknowledgement or a Y/N response, and shall allow the dispatcher to view a list of such messages for which the acknowledgement or response has not yet been received.			
2.1.4.5.07	Messages shall be transferred between a dispatcher workstation and the cellular data gateway within one second.			
2.1.4.6 Voice Communications				
2.1.4.6.01	The CAD system shall support Request To Talk (RTT)_and Priority Request To Talk (PRTT) methods for operators to request using the MDT that dispatch contacts the vehicle using voice radio communications.			
2.1.4.6.02	Voice communications requests shall be separately highlighted and displayed in the communications queue.			
2.1.4.6.03	Only one (1) RTT or PRTT shall be displayed in the queue for each vehicle attempting to make a call. A PRTT will replace a RTT should the vehicle change from RTT to PRTT, whereas repeated presses of RTT or PRTT will simply update the receive time indicated in the communications queue.			
2.1.4.6.04	Dispatchers shall be able to initiate voice radio calls by double-clicking RTT or PRTT messages			
2.1.4.6.05	Once connected, the message will display as being handled by the connecting dispatcher on all workstations displaying that message			
2.1.4.6.06	RTT and PRTT shall not disappear from the communications queue until responded to or deleted by a dispatcher			
2.1.4.6.07	PRTTs shall be displayed as the highest priority in the communications queue with the exception of emergency alarms.			
2.1.4.6.08	All queue priority levels shall be configurable by the Guelph Transit system administrator.			
2.1.4.6.09	Dispatcher workstations shall be assigned a default talkgroup, with voice communications on that talkgroup played on dispatcher audio until the dispatcher generates a voice call or emergency alarm covert audio monitoring at which time the selected vehicle(s) and the dispatcher workstation will be assigned to a common talkgroup only for the duration of that call.			
2.1.4.6.10	Dispatchers shall be able to initiate voice communications to one or more vehicles by pressing the appropriate hot key or a function specific icon on the CAD display and: 1. Selecting a vehicle in the map display, vehicle, block, run, or operator list 2. Dragging a box to surround (“rubber-banding”) multiple vehicles on the map display 4. Selecting all vehicles on one or more routes, within one or more yards/terminals, based out of one or more yards, or fleetwide 5. Selecting from a list of specific vehicle Ids			
2.1.4.6.11	The system shall notify the dispatcher when the call cannot be setup within a brief time and present the dispatcher with a choice to either cancel or continue trying to set up the call.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.4.6.12	The system shall notify the dispatcher visually and by tone when a call has connected and the dispatcher may begin speaking.			
2.1.4.6.13	Dispatchers shall be able to conduct the following type of voice calls: a. Two-way voice call between dispatcher and a single vehicle, directed to the handset or hailing speaker b. One-way "broadcast" calls between the dispatcher and one or more selected vehicles, where all vehicles hear the dispatcher but cannot respond, with the audio directed by dispatch to the hailing speaker or Public Address speaker: c. Conference calls between dispatch and selected vehicles, where dispatcher and vehicle can all hear and respond to each other, , directed to the handset or hailing speaker			
2.1.4.6.14	System shall automatically and immediately locate and update vehicle information (e.g., route, trip, location, schedule/route adherence status) when the voice call is setup.			
2.1.4.6.15	The system shall automatically notify dispatchers after a Guelph Transit configurable amount of time has passed, that an RTT/PRTT has not been addressed.			
2.1.4.7 Emergency Alarm				
2.1.4.7.01	After receiving an emergency alarm signal from a vehicle, the system shall zoom and center the map display on that vehicle. The scale of the zoom shall be configurable by Guelph Transit.			
2.1.4.7.02	In the emergency state, location and status updates shall be received from that vehicle at a rate configurable by Guelph Transit.			
2.1.4.7.03	There shall be a continuous audible alert to all central system users from when an emergency alarm was received until a dispatcher accepts the alarm.			
2.1.4.7.04	The dispatcher that accepts the alarm shall have the option to activate/deactivate covert microphone audio monitoring until the alarm state has been terminated.			
2.1.4.7.05	The emergency alarm state shall remain in place until this state has been terminated by the dispatcher that selected the alarm.			
2.1.4.8 Location Playback				
2.1.4.8.01	The dispatcher shall be able to review on the map display the chronological sequence of reported locations for a specified vehicle over a specified past time period.			
2.1.4.8.02	The software shall provide controls to view the entire sequence of reported locations from the beginning of the time period or to step through the sequence incrementally forwards or backwards.			
2.1.4.8.03	The system shall allow replay for a single vehicle, selected set of vehicles or all vehicles on the selected map view at any time during the selected time period.			
2.1.4.8.04	The system shall allow selection of any time period for viewing the historical data.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.4.8.05	The replay data shall include location reports, schedule adherence data and on-route status.			
2.1.4.8.06	All users accessing the CAD/AVL software shall be able to access the playback function.			
2.1.4.8.07	The system shall allow use of playback without exiting from the current CAD/AVL operational view.			
2.1.4.8.08	The system shall be able to store a playback in a video file format that can be exported for viewing on a different computer equipped to view such files using a standard video file format such as .avi or .mpg.			
2.1.4.9 Data Logging and Retrieval				
2.1.4.9.01	All incoming and outgoing data shall be stored for retrieval, analysis, display and printing. The system shall allow all such data to be retrieved for these purposes when needed, even if it has been previously archived.			
2.1.4.9.02	This historical information shall include all data transmitted from vehicles to dispatch (e.g., location data, route/schedule adherence data, logon/logoff data), and all central software user logons and logoffs.			
2.1.4.9.03	The online data storage system shall ensure data integrity in the event of a computer disk drive failure.			
2.1.4.9.04	In addition, the system shall include a means of archiving transaction data, or restoring data from an archive, while the system is in operation. It shall not be necessary to shut down the database to perform a successful backup operation.			
2.1.4.9.05	The stored data shall be time and date stamped, and shall contain sufficient information to enable selective sorting and retrieval based on user-specified selection criteria. At a minimum, the following sorting and selection criteria shall be supported for accessing the historical data from both the online and archived storage: date and time, GPS latitude/longitude, vehicle number, block number, run number, operator number, dispatcher number, route number, trip number, and incident type (where this applies).			
2.1.4.9.06	Historical data shall be read-only with modification only permitted to individual pre-defined fields.			
2.1.4.9.07	At a minimum, the system shall provide the following alarms, which can be sent to a Guelph Transit configurable list of persons through multiple configurable methods (e.g., emails, texts, popup windows),in the event an alarm is triggered: • Detection of invalid or erroneous data (i.e., data corruption), including data import errors from external systems. • Detection of a device or system fault. All alarms shall be recorded and stored in a database, along with a history of corrective actions.			
2.1.4.9.08	Features shall be provided to ensure that all system-created files are uniquely identified, and that no files are lost or missed during data transfer.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.4.10 Reporting				
2.1.4.10.01	The system shall provide reports that are quick and easy to generate and evaluate. Statistical reports generated by the system must be "user friendly" and shall not require support from a technician or system administrator to obtain and analyze data. Reports shall be easy to print, export for use in a standard spreadsheet application, or convert to PDF for emailing. The system shall be capable of establishing automatic hourly, daily, weekly, monthly, quarterly routines to automatically produce and email standard reports to defined user groups.			
2.1.4.10.02	Standard reports to be provided shall be developed in coordination with Guelph Transit, and the set of standard reports to be provided shall be listed in the proposal, to include at a minimum: • Missed Trips Reports; • Stop Time Analysis Reports; • Layover/Recovery Reports; • In-Service Hours Reports; • Actual-Hours and Actual-Kilometres Reports; • Route Deviation Reports; • Travel Time and Average Speeds Reports; • Maintenance Reports; • Schedule Adherence; and • Canadian Urban Transit Association Reports.			
2.1.4.10.03	The unit cost shall be indicated in the price proposal for creating additional customized reports Guelph Transit decides to purchase beyond the set of standard reports listed in the proposal.			
2.1.4.10.04	The system shall provide an easy to use utility to create ad hoc custom reports using any data stored within the system database.			
2.1.4.10.05	Database transactions shall be completed within one second of user data entry.			
2.1.4.10.06	All reports shall have the capability to export information into a common analysis and text editing software such as Microsoft Excel and Word.			
2.1.4.10.07	The contractor shall provide Guelph Transit with a database dictionary allowing them access to the database to create reports using Crystal Reports if desired.			
2.1.5 Mobility Scheduling and Dispatch Software **2.1.5.1 Mobility Client Registration**				
2.1.5.1.01	The system shall allow entry of first name, last name and middle initial. When entering data, the system shall utilize search, pop-ups or other appropriate techniques to detect and alert the user if there may already be a client database entry under this name.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.5.1.02	The system shall import all current client information from Guelph Transit's database without assigning new Ids to current clients. Guelph Transit shall provide this data in an Excel spreadsheet or Access database.			
2.1.5.1.03	The system shall assign a unique client identification number for each entry in the Guelph Transit client database.			
2.1.5.1.04	The system shall allow entry of data from the client's health care practitioner that includes (this list shall be customizable by Guelph Transit), but not limited to: • Whether the client is physically unable to climb/descend the steps of a conventional vehicle; • Whether the client is unable to walk a distance of 175 metres; • Whether the client has challenges waiting for a bus; • Whether the client has challenges riding a conventional transit vehicle and recognizing landmarks and his/her destination; • Whether the client is able to function independently in the community • Whether the client is able to use conventional transit service on a seasonal basis; • Whether the need is due to temporary disability; and • The nature of the client's functional limitation			
2.1.5.1.05	The system shall allow for entry of other types of client information including but not limited to: • Whether the client is travelling with a service animal; • Whether the client is eligible to travel with a Personal Care Attendant (PCA).			
2.1.5.1.06	The system shall allow entry of multiple categories of eligibility including unconditional, conditional and temporary.			
2.1.5.1.07	The system shall allow entry of the client date of birth using a pop-up interactive calendar interface. A second field should display an automatically calculated client age, expressed in years, based on the current date and the date of birth.			
2.1.5.1.08	The system shall allow entry of client gender, using a pop-up window or list box to enable easy selection.			
2.1.5.1.09	The system shall allow multiple address entries for common client pick-up locations, and require at least one pick-up address entry. The system shall require that one address be flagged as the default. The system shall provide a separate field for the client street address in case the client uses a non-street mailing address.			
2.1.5.1.10	The system shall identify and automatically geocode the location associated with each entered address. If the automatic geocoding fails, the system shall provide alternative methods of establishing x- and y- map coordinates for the address. One alternative methods supported shall be clicking on a map location with the mouse.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.5.1.11	The system shall allow entry of a text field for special instructions (for subsequent printing on manifests) to assist in locating the client address.			
2.1.5.1.12	The system shall allow entry of a certification date defining when the client is authorized to begin receiving service. As some clients have temporary eligibility, the system shall also allow entry of a certification expiration date. Certification and expiration dates must be capable of being specified separately for specific funding sources. Dates shall be entered using a pop-up interactive calendar interface.			
2.1.5.1.13	The system shall allow entry in a field indicating whether a client uses a mobility aid. The system shall provide a pop-up window or list box to permit selection from among a list of pre-defined mobility aids.			
2.1.5.1.14	The system shall require entry in a field specifying disability status. The system shall provide a pop-up window or list box to permit selection from among a list of pre-defined disability definitions.			
2.1.5.1.15	The system shall allow entry of one or more billing codes for each client, indicating a third party to be billed for certain trip types. The system shall provide pop-up windows or list boxes to permit multiple selections from among a list of pre-defined trip types and selection of a billing code for each selected trip type. The contractor shall provide implementation/integration support to export billing data into the Guelph Transit accounting system.			
2.1.5.1.16	The system shall allow entry of the name, address and phone number of a care-giver or other contact to be used in the event of an emergency.			
2.1.5.1.17	The system shall allow entry to the client registration record of additional comments or information of importance. Information on this field shall appear on any manifest trip entry for that client.			
2.1.5.1.18	The system shall be capable of linking attachments to the client registration record (e.g., scanned forms, doctor notes).			
2.1.5.2 Mobility Client Booking				
2.1.5.2.01	The system shall permit trip booking while the booking clerk is on the phone with the client. The system shall be capable of booking both subscription (standing-order) and demand response trips in this manner. The system shall be capable of booking same day trip requests. .			
2.1.5.2.02	The system shall permit trip booking times within prescribed scheduling windows.			
2.1.5.2.03	The system shall permit demand response trip bookings from 24 hours and up to 30 days in advance of trip request.			
2.1.5.2.04	The system shall permit the Guelph Transit booking clerk to retrieve the client record by entering the client ID number, client last name, or telephone number. For client retrieval by last name, a pop-up window or list box shall be used to list all clients with last name beginning with the characters entered. Once selected, a trip booking data entry screen shall be presented to the booking clerk pre-populated with all data for that client which remains constant (e.g., ID numbers, mobility limitations).			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.5.2.05	The system shall initially automatically present the default pick-up address in the trip booking screen. The system shall allow entry of an alternative pick-up address using keystroke entry or through use of a list box showing the alternative pick-up addresses associated with that client.			
2.1.5.2.06	The system shall allow selection of the drop-off address, through a pop-up window or list box, from among several frequently and/or recently used drop-off addresses for that client. The system shall allow entry of an alternative drop-off address using keystroke entry.			
2.1.5.2.07	The trip date shall be entered using a pop-up interactive calendar interface. The system shall be capable of accepting trip bookings up to 180 days in advance of the requested trip date for subscription trips, and up to 14 days in advance of the requested trip date for regular trips. These limits shall be configurable.			
2.1.5.2.08	The system shall require entry of a requested pick-up time and allow entry of a negotiated pick-up time.			
2.1.5.2.09	The system shall allow defining standing order trip bookings, with flexible options to specify recurring travel dates. At minimum, the system shall support selection of a recurring weekly day (e.g., every Tuesday), a recurring monthly day (e.g., every 2nd Wednesday), a recurring monthly date (e.g., the 4th of every month), recurring weekly days (e.g., every Tuesday and Friday), or recurring monthly days (e.g., 1st and 14th of every month)			
2.1.5.2.10	The system shall allow the booking clerk to temporarily suspend a particular standing order, with entry of both start and end dates for the suspension time period. These dates shall be entered using a pop-up interactive calendar interface.			
2.1.5.2.11	The system shall automatically suspend standing orders on holidays when Guelph Transit services are not in operation (e.g., Thanksgiving and Christmas, based on the specific holidays approved by Council). The system shall allow the booking clerk to enter or adjust such holidays. Standing orders shall be flagged (i.e., system shall provide an alert) when in conflict with Guelph Transit holidays.			
2.1.5.2.12	The system shall allow the booking clerk to designate any completed trip booking as a group booking (e.g., a trip for a group of two or more individuals traveling between a common origin and destination that will be scheduled, as a matter of system policy, to the same run), and then add or delete individual clients from the group booking.			
2.1.5.2.13	The system shall allow the booking clerk to access existing trip bookings to edit the pick-up address, drop-off address, trip date, and/or pick-up time upon client request. The system shall assign a unique identification number to each trip booking record to facilitate trip editing.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.5.2.14	The system shall alert the booking clerk during a trip booking when the certification expiration date for the funding source will have passed by the trip date. The system shall allow the booking clerk to book the trip nonetheless by overriding this feature. The system shall flag all trip bookings for which this override was applied.			
2.1.5.2.15	The system shall permit cancellation of any trip booking, when consistent with Guelph Transit policies. The system shall retain the trip booking and flag it with the date and time when it was cancelled to facilitate Guelph Transit management of its cancellation policies.			
2.1.5.2.16	The system shall alert the booking clerk if the client has previously booked a trip with a trip time period in conflict with the selected booking pick-up time. The system shall allow the booking clerk to book the trip nonetheless by overriding this feature. The system shall flag all trip bookings for which this override was applied.			
2.1.5.2.17	During each trip booking, the system shall display the map locations for the pick-up and drop-off.			
2.1.5.2.18	The system shall allow entry of a start and end date for the time period when a client's ridership privileges are suspended. If the selected trip date is within this suspended service time period, the system shall alert the booking clerk.. These dates shall be entered using a pop-up interactive calendar interface. The clerk shall have the capabilities to override the suspension on a case by case basis.			
2.1.5.2.19	The system shall allow entry, during the trip booking process, of the names of any Personal Care Attendants (PCAs) or other companions (e.g., children) that will accompany the client on the trip. The system shall provide an alert if the client is not eligible to travel with a PCA.			
2.1.5.2.20	Once all other trip booking information has been entered, the system shall indicate to the booking clerk any applicable fare(s) to be paid by the client and any companions.			
2.1.5.2.21	The system shall, at the conclusion of the trip booking process, confirm to the booking clerk that the booking was successfully entered into the system.			
2.1.5.2.22	The system shall use the Guelph Transit IVR system interface to provide an automatic reminder call to customers with booked trips. This reminder call shall be made at a Guelph Transit configurable time ahead of the scheduled pickup time			
2.1.5.3 Mobility Scheduling				
2.1.5.3.01	The system shall be capable of scheduling, in batch mode, all bookings for the next travel day. Scheduling should be based on the actual street network in the Guelph Transit service area, using user defined parameters associated with street network segments as established in the GIS system (e.g., physical barriers, running speed by time of day, and appropriate dwell times for the boarding and alighting of passengers). Additional GIS layers required for system operation shall be the responsibility of the contractor to acquire.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.5.3.02	The system shall be capable of recognizing absolute arrival times (i.e., appointment start time) or departure times (i.e., end of work) and schedule trip request accordingly, within prescribed scheduling window..			
2.1.5.3.03	The system shall allow Guelph Transit to designate which trips are to be assigned to a third party contractor such as a taxi service.			
2.1.5.3.04	The system shall enable developing subscription run templates, based on standing orders. The system shall optimize the templates for least distance and/or travel time, based on the street network segment parameters stored in the system.			
2.1.5.3.05	The system shall have the ability to lock a particular trip to a specific manifest (i.e. cannot be subsequently moved by the scheduling algorithm).			
2.1.5.3.06	The system shall suggest manifest assignments for new trip bookings based on service standards defined by Guelph Transit (e.g., maximum travel time, average load time, acceptable pick-up/drop-off windows, vehicle capacity, vehicle type, operating hours, as well as vehicle availability location based on trips already scheduled).			
2.1.5.4 Manifest Transmission and Changes				
2.1.5.4.01	The system shall store employee information needed to enable operator assignments, including: • Identification and contact information (e.g., name, ID number and contact information including at least 4 phone and 2 email address fields, each with customizable labels) • Status and eligibility information (e.g., full/part time status, active/inactive status, overtime preferences, seniority level and license information including type, class and expiry date) • Leave time information (e.g., days off and weekly vacations) and leave time balance • Free-form comments related to the employees • Guelph Transit customizable and filtered fields			
2.1.5.4.02	The system shall allow Guelph Transit to search employees based on any fields in the employee data.			
2.1.5.4.03	The system shall allow Guelph Transit to define employee groups based on any fields in the employee data.			
2.1.5.4.04	The system shall allow Guelph Transit to filter the employee list by group when looking to assign work.			
2.1.5.4.05	The system shall enable import and export of employee information to/from standard flat file formats (e.g., comma separated value files), as well as manual entry for any employee information.			
2.1.5.4.06	The system shall produce a daily manifest for each run, indicating in chronological order the pull-in and pull-out times, and projected vehicle arrival time at each pick-up and drop-off location.			
2.1.5.4.07	The system shall allow driver breaks to be scheduled and locked (i.e., cannot be changed by the scheduling algorithm). The system shall still allow breaks to be rescheduled manually.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.5.4.08	The system shall display all manifests for a given day. The system shall provide tools to allow manual adjustments to manifests, including manually moving trips between runs with projected trip event times automatically adjusted accordingly.			
2.1.5.4.09	The system shall use internal validation checks to ensure that manifests do not violate work and labour rules (e.g., driver work hours and breaks). The system shall also perform validation checks to ensure that policies limiting travel times for individual passengers are not violated.			
2.1.5.4.10	The system shall assign each run to a vehicle, recognizing the accessibility needs of the scheduled clients (including PCAs and companions) and vehicle capacity constraints. The user shall be able to adjust the vehicle assignments.			
2.1.5.4.11	The vehicle manifest shall be transmitted to its assigned vehicle using the mobile data communications system, once an operator has logged in to that vehicle.			
2.1.5.4.12	Manifest adjustments capability shall be available to authorized dispatchers (i.e., for insertions, changes, cancellations, or no-shows) during vehicle operation and such adjustments shall be immediately transmitted to and from vehicles using the mobile data communications system.			
2.1.5.4.13	The system administrator shall be able to configure which portions of the upcoming manifest entries shall be sent to the OBC (e.g., the next X trips, all trips in the next Y minutes).			
2.1.5.4.14	The dispatcher shall be able to resend trip information if concerned that trip information may be missing from the OBC.			
2.1.5.4.15	Additional portions of the manifest shall be automatically sent to the OBC on an ongoing basis as trip events are completed, in accordance with the Guelph Transit-configured manifest transmission parameters.			
2.1.5.4.16	The system shall automatically display any same day manifest changes (e.g., trip additions, no shows, cancellations), to the dispatcher and transmit these manifest changes to the OBC in the vehicle assigned to that manifest. Manifest changes that meet the Guelph Transit configured parameters for requiring operator notification shall be resent periodically until operator acknowledgement via the MDT has been received.			
2.1.5.4.17	The system shall be capable of transmitting manifests for overflow trips assigned to a third party provider (e.g., taxi) to a configured email address.			
2.1.5.5 Trip Events Logging				
2.1.5.5.01	The system shall receive trip pull-in, pull-out, pickup, no-show request and drop-off event reports from OBCs, and use this data to update the time and reported location for each trip event.			
2.1.5.5.02	The system shall acknowledge receipt of trip event messages to the OBC.			
2.1.5.5.03	The system shall receive trip completion data from OBCs over the mobile data communications system and immediately update the dispatcher manifests status display using that information.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.5.5.04	Based on the logged trip event data, the system shall update the estimated time of arrival for the remaining manifest trip events and display this information to the dispatcher alerting them if the run is operating "late." The designation of a vehicle as "late" shall be based on a Guelph Transit-configurable threshold.			
2.1.5.5.05	The system shall receive no-show requests from OBCs, allow dispatchers to decide whether to authorize the no-show, record when the no-show was authorized, mark the pickup and drop-off in the manifest as a no-show, and transmit the cancellation of the pickup and drop-off as manifest changes to the OBC in the vehicle assigned to that manifest.			
2.1.5.6 Dispatch Support				
2.1.5.6.01	The central system shall have a map-based GUI. The GUI shall support various map views, with mouse-clickable full zoom, pan and auto-centering capability.			
2.1.5.6.02	All communications and system data shall be stored in a manner that allows direct access by the software for at least 90 days. Utilities shall be provided to support archive and restore functions for older data. This number of days shall be configurable by Guelph Transit.			
2.1.5.6.03	The system shall store time data in a manner that enables display to users with a resolution of seconds.			
2.1.5.6.04	All windows with non-paging data shall open and populate with data within 3 seconds.			
2.1.5.6.05	All windows with paging data shall open and populate with the initial data within 3 seconds and thereafter page updates shall be retrieved within 1 second.			
2.1.5.6.06	Dragging the cursor bar for a scrollable list shall cause instantaneous redisplay of the list in time with the movement of the cursor bar, with no noticeable lag.			
2.1.5.6.07	A "thin client" program or approved alternate method shall be provided to allow remote access to the central software via internet.			
2.1.5.6.08	Supervisors shall be provided with laptops, or alternate approved mobile access device, that use the central software remote access method, to enable remote access for assigned personnel. The mobile access devices will be provided by Guelph Transit.			
2.1.5.6.09	Software functions and views accessible via the remote access method shall be configurable in the central software by a systems administrator.			
2.1.5.6.10	System access to the shall be available for designated Guelph Transit desktop computers on the City of Guelph network (to be identified during the design review).. Any hardware, software and communications required in addition to standard internet access shall be provided by the Contractor.			
2.1.5.6.11	The system shall receive and validate a logon request from an OBC, if the operator ID is valid and not already logged in on another OBC (and otherwise respond that it is an invalid login attempt).			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.5.6.12	The system shall receive and immediately process a logoff message from an OBC.			
2.1.5.6.13	In addition to logon requests and logoff messages, the system shall receive various other incoming message types from OBCs including location reports, trip event reports and text messages.			
2.1.5.6.14	The system shall receive and store location messages from OBCs stamped with date, time, vehicle, operator, run, latitude/longitude, and odometer.			
2.1.5.6.15	The system shall allow each workstation user to choose whether to display for icon labels the vehicle, run, or operator.			
2.1.5.6.16	The icon shall provide a conspicuous indication if the most recently reported location being displayed is older than the reporting interval.			
2.1.5.6.17	The GUI (both map and tabular) shall support text-messaging functionality to communicate with operators. Dispatch shall be able to send pre-set or custom messages to one, all, or a set of vehicles. Maximum message length shall be at least 256 characters and shall include letters, numbers and all symbols available on a standard QWERTY keyboard. The messaging function shall include the feature to respond to the central software when/if a message is received and read (i.e., read receipt).			
2.1.5.6.18	The system shall allow the dispatcher to view received text messages in a tabular display that also indicates the sending vehicle ID and when the message was received.			
2.1.5.6.19	The system shall allow the dispatcher to send a text message to a single vehicle, a selected group of vehicles, a predefined group of vehicles, or all vehicles within an area selected on the map display.			
2.1.5.6.20	The system shall allow Guelph Transit's staff to add, edit, delete, or reorder the listing of canned messages on MDTs.			
2.1.5.6.21	The system shall support the creation of a minimum of 50 canned messages on the MDTs.			
2.1.5.6.22	The system shall allow any message sent by dispatch to be flagged as requiring vehicle operator acknowledgement or a Y/N response, and shall allow the dispatcher to view a list of such messages for which the acknowledgement or response has not yet been received.			
2.1.5.6.23	Messages shall be transferred between a dispatcher workstation and the cellular data gateway within one second.			
2.1.5.7 Data Logging and Retrieval				
2.1.5.7.01	All incoming and outgoing system data shall be logged in a relational database.			
2.1.5.7.02	The system shall log all outgoing and received data in a historical database, including date/time, vehicle number, operator number, dispatcher number, run number, odometer reading, GPS location latitude/longitude, message type, and message content. The historical database shall be read-only. Historical data shall be available in a format directly accessible by or importable into common database management and analysis tools.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.5.7.03	The system shall allow all such data to be retrieved, even if it has been archived.			
2.1.5.7.04	The online data storage system shall ensure data integrity in the event of a computer disk drive failure.			
2.1.5.7.05	The software shall provide controls to view the entire sequence of reported locations from the beginning of the time period or to step through the sequence incrementally forwards or backwards.			
2.1.5.7.06	The system shall allow replay for a single vehicle, selected set of vehicles or all vehicles on the selected map view for selected time period.			
2.1.5.7.07	The system shall allow selection of any time period for the historical data.			
2.1.5.7.08	The replay data shall include location reports.			
2.1.5.7.09	All software users including workstation and remote access users shall be able to access the playback function.			
2.1.5.7.10	The system shall allow use of playback without exiting from the current operational view.			
2.1.5.7.11	The system shall be able to store a playback in a video file format that can be exported for viewing on a different computer equipped to view such files using a standard video file format such as .avi or .mpg.			
2.1.5.8 Reporting				
2.1.5.8.01	The system shall provide reports that are quick and easy to generate and evaluate. Statistical reports generated by the system must be “user friendly” and shall not require support from a technician or system administrator to obtain and analyze data. Reports shall be easy to print, export for use in a standard spreadsheet application, or convert to PDF for emailing. The system shall be capable of establishing automatic hourly, daily, weekly, monthly, quarterly routines to automatically produce and email standard reports to defined user groups.			
2.1.5.8.02	Standard reports to be provided shall be developed in coordination with Guelph Transit, and the set of standard reports to be provided shall be listed in the proposal, to include at a minimum: • Trips provided by trip type • Trips provided by mode type • Passenger type • Passenger travel time, by run or user group • Number of cancellations • Number of no-shows • Number of vehicle (service) hours/kilometres • Number of billable (revenue) hours/kilometres • Fare Due • Actual Fare received • Canadian Urban Transit Association reports The system shall automatically send reports to a configurable set of emails.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.5.8.03	The unit cost shall be indicated in the price proposal for creating additional customized reports Guelph Transit decides to purchase beyond the set of standard reports listed in the proposal.			
2.1.5.8.04	The software shall have the capability to generate reports based on exceptions as per thresholds set by the Guelph Transit staff.			
2.1.5.8.05	The Contractor shall provide user-friendly tools to generate ad-hoc reports on stored data.			
2.1.5.8.06	All reports shall have the capability to export information into a common analysis and text editing software such as Microsoft Excel and Word.			
2.1.5.8.07	The contractor shall provide Guelph Transit with a database dictionary allowing them access to the database to create reports using Crystal Reports if desired.			
2.1.5.8.08	Database transactions shall be completed within one second of user data entry.			
2.1.6 Real-Time Information Software				
2.1.6.1 Next Arrival Predictions				
2.1.6.1.01	The system shall use the conventional real time location, schedule adherence data, and predicted remaining route travel time to create a continuously updated table of next arrival and departure predictions for all stops.			
2.1.6.1.02	Predicting remaining route travel time to a stop shall be based on the current vehicle location, route distance to the stop, and average speed for individual route segments. This functionality shall operate using the same GIS base map data as the rest of the system. Route segment average speeds shall be configurable by Guelph Transit.			
2.1.6.1.03	The information required by the algorithm(s) shall be in a prediction support parameters database that allows users with appropriate access rights to configure these database parameter values.			
2.1.6.1.04	The system shall log data on the accuracy of the predictions relative to the actual arrival time on a minute by minute basis for at least 30 minutes prior to every vehicle arrival (i.e., the accuracy for the prediction made 30 minutes in advance, 29 minutes in advance, and so on down to 1 minute in advance, relative to the actual arrival time).			
2.1.6.1.05	Based on this data, the Contractor shall calibrate the prediction algorithm and assist Guelph Transit with adjusting conventional schedule times, timepoints, segment running distances/times and stop locations to maximize the accuracy of the arrival predictions.			
2.1.6.1.06	A system report providing accuracy of predictions shall be provided, stratified by the number of minutes in advance of stop arrival, filtered on a stop and for a selected time period basis. The percent error for next vehicle arrival time predictions at a given stop for a given minute in advance of arrival shall be calculated as: absolute value of (predicted time to next arrival minus observed time to next arrival) divided by (observed time to next arrival). For example, if the observed time to next arrival was 7 minutes relative to a predicted time to next arrival of 8 minutes, the percent error would be 1/7 (i.e., 14%).			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
	The Contractor shall be required to assist with efforts to use the report data to make schedule data and prediction algorithm parameter adjustments to maximize the accuracy of the predictions.			
2.1.6.2 Website				
2.1.6.2.01	The Contractor shall develop a website to be seamlessly integrated with the existing Guelph Transit web presence. The site shall incorporate real time information indicating the predicted arrival/departure times for vehicles at all stops.			
2.1.6.2.02	A website user shall be able to enter the stop ID, select the stop ID using a sequence of menu selections for route and direction, or select the stop using a map. The system shall default to displaying the predicted time until arrival of the next bus in minutes (or the predicted time until departure for stops that follow a layover). The number of predicted bus arrival/departure times displayed for a selected stop in the customer screen should be configurable by Guelph Transit. The system shall also allow the user to specify a future day of week and time period to view the scheduled arrival/departure times (the default shall display current predictions).			
2.1.6.2.03	Stop IDs used shall be consistent with Guelph Transit current stop IDs. This information will be made available by Guelph Transit on an excel spreadsheet.			
2.1.6.2.04	The website GUI shall be consistent with the existing Guelph Transit website and allow for the graphical presentation of vehicle locations on GIS-based maps. The Contractor shall build the new website pages with appropriate Guelph Transit input (e.g., branding, graphics, colours). Screen layouts, menu and screen information shall be provided for review, comment and approval during the implementation process.			
2.1.6.2.05	The Contractor shall design and develop the website, including all required HTML, scripting, and integration, with relevant systems of the overall transit technology system being implemented by the Contractor.			
2.1.6.2.06	The Contractor shall integrate and setup the website.			
2.1.6.2.07	The Contractor shall ensure that the website, as developed, is W3C compliant and works within the Guelph Transit IT environment. Ease of future Guelph Transit management is a high priority.			
2.1.6.2.08	The website shall comply with the all requirements specified in the Accessibility for Ontarians with Disabilities Act (AODA) and must follow the latest version of the Web Content Accessibility Guidelines (WCAG).			
2.1.6.2.09	The website shall render correctly and run smoothly with at minimum the following browsers/versions: • Internet Explorer Version 7 and higher • Chrome Version 19 and higher • Firefox 10 and higher • Safari Version 5.1 and higher			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.6.2.10	The system shall include a mobile website compatible in the IOS, Android, Widows Phone and Blackberry environments. This application shall provide next stop information to riders, the GPS information from mobile device using the website shall be used to determine the closest stop. This closest stop shall be the default information page for the customer.			
2.1.6.2.11	The system shall allow a person using a web-based personal mobile device to visit a publicly-accessible web address to select a route, direction and stop, and in response receive the current predicted arrival time from the prediction software at the initiating device.			
2.1.6.2.12	The mobile website shall render correctly and run smoothly with common versions of mobile/tablet internet browsers in use at the time of deployment, including: • iOS 5.0 or higher • Android Browser 4.0 or higher • Opera Mini 5.0 or higher • Symbian (Nokia Browser 7.0) • Blackberry OS 5.0 or higher • Windows Phone 7.0 or higher			
2.1.6.2.13	The website shall, upon receiving a request from a browser that is not fully supported (either not supported or an older version than what is fully supported), indicate to the user those browsers and versions fully supported for improved website response.			
2.1.6.2.14	The system shall support stop identification by QR code. Riders scanning this code with their mobile device shall be taken to the mobile website displaying the next arrival predictions for that stop.			
2.1.6.3 Mobile Application (Option)				
2.1.6.3.01	The contractor shall provide a mobile application in the iOS, Android, Windows Phone, and BlackBerry environments.			
2.1.6.3.02	The application shall provide upcoming arrival times information for a user-selected stop, from those displayed that are close to the device location based on its GPS co-ordinates, for all arrivals predicted within the next hour – indicating both the route and the current predicted arrival time.			
2.1.6.3.03	The application shall allow users to define a stop in a “favourites list” and easily select a stop from this list to view its current associated predicted arrival times.			
2.1.6.3.04	The application shall be able to display the associated predicted arrival times based on a stop code manually entered by the user.			
2.1.6.3.05	The associated predicted arrival times shall be displayed for a stop after the user scans an associated QR code using a generic QR code scanning mobile application utility.			
2.1.6.4 Data Feeds				

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.6.4.01	The central system shall output traveller information using open standards based feeds. The types of feeds used shall be approved by Guelph Transit, but shall at minimum include an XML-based feed and a second feed compliant with the General Transit Feed Specification – real-time (GTFS-real-time) standard. This GTFS real time implementation shall include the service alerts feed.			
2.1.6.4.02	Documentation shall be provided identifying the format of all data provided in the traveller information feeds. The documentation shall describe all fields and request parameters, and shall be sufficient to allow the development of real-time third party applications using the data.			
2.1.6.4.03	The output data shall include real-time traveller information including: • Real-time bus locations • Predicted arrival/departure times at stops • List of known service alerts in effect It shall be possible to query the XML based feed to receive information on a specific bus, stop, direction, or route and receive relevant output data as a response.			
2.1.6.4.04	The real-time data feed shall use the same IDs and cross references provided in the General Transit Feed Specification files.			
2.1.6.4.05	The Contractor shall provide public access to the XML based feed. Guelph Transit shall be able to configure the access to this feed, based on parameters including frequency of access and data volumes requested.			
2.1.7 Cellular Data Gateway				
2.1.7.01	The Contractor shall implement mobile data communications between all conventional and mobility on-board computers and the central system, using commercial cellular data carrier service subscriber plans as selected by Guelph Transit.			
2.1.7.02	The system shall be compatible with the data transmission using the Bell cellular network. Guelph Transit shall be at any time able to change the cellular data provider at their discretion.			
2.1.7.03	Cellular mobile data communications shall be via a cellular data gateway interfaced with the central system using a firewall and enabling secured communications between the central system and the head end system of the cellular data carrier selected by Guelph Transit.			
2.1.8 WLAN Bulk Data Transfer Gateway				
2.1.8.01	The Contractor shall implement WLAN bulk data transfer between all conventional and mobility on-board computers and the central system, when in range of the WLAN access points infrastructure being installed by Guelph Transit.			
2.1.8.02	WLAN communications shall be via a WLAN bulk data transfer gateway interfacing with the central system with the WLAN access-points infrastructure using a firewall and enabling secured communications between the central system and the OBCs.			
2.1.8.03	The WLAN Transfer Gateway shall support two way communications.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.9 Automated Passenger Counter (APC) Software				
2.1.9.1 Unprocessed Data				
2.1.9.1.01	Unprocessed APC data received from vehicles shall be stored without alteration in database tables. The system shall retain unprocessed APC data after post-processed APC data has been developed.			
2.1.9.2 Post-Processed Data				
2.1.9.2.01	The system shall associate each unprocessed APC record with the correct nearest stop, based on an algorithm that uses the recorded GPS latitude and longitude, the route, and the stops assigned to preceding and following data records.			
2.1.9.2.02	If the latitude and longitude recorded for a stop are not within a configurable distance of a stop on the current route/trip, a stop ID shall not be added to the data record.			
2.1.9.2.03	The system shall initially flag in the unprocessed data (1) any "outlying" data; (2) instances where the calculated vehicle occupancy becomes negative; and (3) instances where the total number of boardings and alightings over the course of a trip are not equal.			
2.1.9.2.04	The software shall allow the user to set and adjust parameters controlling the automatic flagging of "outlying" data.			
2.1.9.2.05	The system shall allow the user to review the flagged data and offer post-processing options. At a minimum, these options will include (1) eliminating or adjusting "outlying" data; (2) proportionally adjusting boarding and alighting counts data to avoid a negative occupancy condition; and (3) proportionally weighting boarding and alighting counts to equalize the total number of boardings and alightings.			
2.1.9.2.06	The system shall store the post-processed version of the APC data received from vehicles in a database table.			
2.1.9.3 Reporting				
2.1.9.3.01	The system shall be capable of importing/exporting ridership data from/to standard spreadsheet/database files such as Excel and Access.			
2.1.9.3.02	The system shall allow users to manually enter ridership data.			
2.1.9.3.03	Common transit management questions for which the system shall be capable of providing information support include, but are not limited to, ridership by route, run, segment and bus stop.			
2.1.9.3.04	The system shall provide ridership analysis results in both tabular and graphical formats.			
2.1.9.3.05	The system shall provide ridership analysis results in a map-based visualization, where boardings and alightings are shown beside the corresponding stops/stations along the specific route.			
2.1.9.3.06	The system shall generate APC data reports, offering both tabular and graphical formats.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.9.3.07	The user shall be able to select between unprocessed and post-processed data. The user shall be able to apply a filter comprising any combination of route, pattern, direction, stops, date/time period and day-of-week. The user shall be able to select to view data including boardings by stop, boardings not assigned to a stop, alightings by stop, alightings not assigned to a stop, onboard passenger load by stop, and stops for which boardings/alightings were not recorded.			
2.1.9.3.08	All database tables shall be made available in an Open Database Connectivity (ODBC)-compliant format, with the data dictionary and Entity Relationship Diagram (ERD) provided to Guelph Transit, so that Guelph Transit can import this data for analysis and reporting purposes into common database management and analysis tools.			
2.1.10 Automated Vehicle Announcements (AVA) Software				
2.1.10.1 General				
2.1.10.1.01	The system shall provide an integrated software package for preparing all information to be downloaded to the fleet, including the internal and external announcements, interior Dynamic Message Sign (DMS) text messages, announcement trigger locations, and headsign trigger locations.			
2.1.10.2 Announcement Preparation				
2.1.10.2.01	The system shall provide a text-to-speech generator for English and French, using a voice engine and voice approved by Guelph Transit.			
2.1.10.2.02	The system shall provide software to create recorded message files in-house.			
2.1.10.2.03	The system shall be able to use professionally-recorded messages that use a designated file format.			
2.1.10.2.04	The system shall provide the ability to create announcement messages that concatenate selected portions of recorded message files with timed pauses and text-to-speech segments.			
2.1.10.2.05	The system shall provide the ability to create the DMS text associated with each announcement message.			
2.1.10.2.06	The system shall provide the ability to prepare both internal and external announcements.			
2.1.10.2.07	There shall be parameters to allow the user to configure the following for external announcements: • Repeat cycle for external announcements (i.e. time interval between announcements) • Number of external announcement repeats External announcements will repeat based on the above parameters as long as the front door is open.			
2.1.10.3 Trigger Location Configuration				
2.1.10.3.01	The system shall allow the announcement message files and associated DMS text files to be linked with individual announcement trigger locations.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.1.10.3.02	An internal announcement trigger location is a user-defined area located prior to a stop location. The system shall provide a utility that allows the user to configure announcement trigger locations on a global basis (e.g., 250 meters before) and to set or adjust announcement trigger locations individually.			
2.1.10.3.03	The user shall be able to associate external announcements to specific stops and these announcements will trigger when the operator opens the front door.			
2.1.11 Interactive VOICE RESPONSE (IVR) Interface				
2.1.11.01	The Contractor shall integrate their system with Guelph Transit's IVR system.			
2.2 In-Vehicle (Conventional)				
2.2.1 On-Board Computer (OBC)				
2.2.1.01	The On-Board Computer (OBC) shall integrate all in-vehicle ITS functions and hardware including the GPS receiver, the Mobile Data Terminal (MDT), APC, internal and external announcements, farebox, and headsigns. The OBC may be physically integrated with the MDT or may be a separate unit.			
2.2.1.02	The OBC shall support the data transfer to/from the central system through the commercial cellular data carrier system for all data that needs to be exchanged in real time.			
2.2.1.03	The OBC shall support the data transfer to/from the central system through the WLAN infrastructure for all data that does not need to be transmitted in real-time, including APC data, schedule data updates, and firmware updates.			
2.2.1.04	The OBC shall be interfaced with the existing vehicle radio to start and end voice calls based on selected a designated talkgroup as commanded via data messages received from the central software. The existing voice radio that the Contractor shall integrate with is expected to be either the Mototrbo 4350 or potentially a radio from the newer XPR 5000 series.			
2.2.1.05	The OBC shall be interfaced with the existing handset, hailing speaker, and interior PA speakers, to control to which of these the incoming audio is routed as indicated in the incoming voice call set up by dispatch.			
2.2.1.06	When dispatch enables a one-way voice call to the vehicle the OBC shall provide a distinct audible alert tone. The audio will be routed through the hailing speaker, and if the operator picks up the handset, audio shall instead be routed through the handset. If the handset is hung up the audio routing will return to the hailing speaker.			
2.2.1.07	When dispatch enables a two-way voice call to the vehicle the OBC shall provide a distinct audible alert tone. The incoming audio will be routed through the handset once the operator picks up the handset, until the end of the timed voice call after which the OBC shall automatically end the voice call. The operator will be able to send audio to dispatch from the handset microphone by pressing the handset Press To Talk button.			
2.2.1.08	When the operator hangs up the handset during a two-way voice call, this shall be detected by the OBC and the voice call ended. The OBC shall send a data message to notify dispatch that the voice call has ended.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.2.1.09	The OBC shall allow the operator to send a text message to the central system by selecting from a set of pre-defined messages. All canned messages to dispatch shall include the date, time, and location.			
2.2.1.10	The OBC shall signal with a distinct audible alert tone when a text message is received from dispatch and available for viewing			
2.2.1.11	The OBC shall store up to ten text messages received from dispatch, indicate to vehicle operators when there are unread text messages, and allow stored text messages to be viewed or deleted. The OBC shall allow the vehicle operator to view received text messages that are longer than that can fit on one line of the display.			
2.2.1.12	The OBC shall also allow the operator to send an acknowledgement or Yes/No response to certain text messages received from the central system.			
2.2.1.13	The OBC shall periodically attempt to send a canned text message or response until it receives an acknowledgement message from the central system.			
2.2.1.14	The OBC shall check with the central system to validate that the entered operator ID is valid and that another vehicle has not already logged on using this operator ID.			
2.2.1.15	The OBC shall store the transit vehicle schedule on-board for all runs. The schedule shall consist of location co-ordinates and passing times for all stops along each trip.			
2.2.1.16	The OBC application software shall automatically be initiated when the vehicle ignition is turned on. The vehicle system shall initiate its shutdown sequence after a configurable time has passed since the vehicle ignition was turned off in order to conserve the vehicle battery.			
2.2.1.17	The OBC shall automatically log the vehicle off once it has been detected as having returned to its storage facility, if the operator has not already completed a manual logoff.			
2.2.1.18	The following input parameters and requests from the central system shall be supported by the vehicle system while the vehicle is in service: • Revise operator, run or block; • Set periodic reporting parameters; and • Reset all settings/thresholds to default.			
2.2.1.19	The OBC shall provide notification if a vehicle has not moved between successive location reports and beyond a Guelph Transit configurable allowable threshold.			
2.2.1.20	The OBC shall include a standard port to connect an external portable computing device for manual data configuration using a provided utility software.			
2.2.1.21	Regardless of the amount of time that power is lost on-board a vehicle, the data inside the OBC shall not be affected. The data shall be stored until power is restored. The OBC shall be equipped with a lithium battery that maintains the system's time for more than 5 years in case of power loss.			
2.2.1.22	A GPS receiver shall be used to continuously gather position, velocity, heading, and time.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.2.1.23	The OBC shall track current vehicle locations within at least 3 meters of the true location at least 95% of the time, using the combined information from the GPS receiver, odometer, and any supplementary dead reckoning sensors used (e.g., gyroscopes). The OBC shall send a location report with date and time, "GPS lock" status, derived location latitude/longitude, heading, vehicle number, and vehicle operator ID number whenever a configurable time has passed since the most recent location report was sent. Location monitoring accuracy will not be affected when vehicles occasionally operate in reverse.			
2.2.1.24	The OBC shall store the most recent location received from the GPS receiver.			
2.2.1.25	The system location and navigation capabilities shall accurately determine and report vehicle position while in the vicinity of objects that can cause multi-path location errors in the reception of GPS signals (e.g., taller buildings).			
2.2.1.26	Block assignment for vehicles shall occur both automatically when an operator logs in through the MDT or when manually assigned by a dispatcher using the central CAD/AVL software.			
2.2.1.27	The system shall compare the schedule for the current trip for the current location with the actual time and on this basis track the current estimated schedule adherence status.			
2.2.1.28	Location and route/schedule adherence data collected by the OBC shall be sent via the commercial cellular data carrier system to the central CAD/AVL system and stored in a central database. This data shall be sent at a customizable frequency and also when configurable events occur (e.g., bus stop, doors open, doors close, schedule/route adherence threshold passed).			
2.2.1.29	The OBC shall automatically reboot to resume normal operations in case of fatal error.			
2.2.1.30	The OBC shall be equipped with a cellular data card or external cellular modem appropriate to achieve integrated cellular data communications using the cellular carrier subscription plan selected by Guelph Transit.			
2.2.1.31	The OBC shall be equipped with a WLAN client card appropriate to achieve integrated bulk data transfer with the central system when in range of the WLAN Guelph Transit access points infrastructure. The bulk data transfer shall use 802.11n and WPA2 encryption.			
2.2.1.32	The Contractor shall provide one or more external roof-mounted antennas for GPS, cellular data, and WLAN. Antennas shall be securely mounted under the carbon-fibre roof of the vehicle. Antennas, mounting and sealants shall be impervious to physical and chemical attack by automatic bus washing equipment.			
2.2.1.33	The OBC shall support the use of an existing covert emergency alarm switch by the operator.			
2.2.1.34	The OBC shall detect if the emergency alarm switch circuit is closed for at least one second and automatically send an alarm message to dispatch and place the OBC into the emergency state			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.2.1.35	Activation of the emergency state using the emergency alarm switch shall cause location and status updates to be received from that vehicle at a rate configurable by Guelph Transit.			
2.2.1.36	The OBC shall allow dispatch to activate audio reception from the covert microphone, but only after the emergency alarm has been activated by the operator.			
2.2.1.37	A covert microphone shall be installed in the vicinity of the operator compartment, with the location, orientation and sensitivity calibrated to enable a dispatcher monitoring this audio to understand words spoken by the operator in a conversational tone within a driving bus.			
2.2.1.38	The OBC shall disable receipt of voice calls or sending/receiving of text messages while in the emergency alarm state, but shall leave the Request To Talk (RTT) and Priority Request To Talk (PRTT) buttons activated.			
2.2.1.39	Only dispatch shall be allowed to terminate the emergency alarm state once activated.			
2.2.1.40	The OBC shall periodically attempt to send the emergency alarm message until it receives an acknowledgement message from the central system.			
2.2.1.41	An automatic self-diagnostic test shall be performed at start-up for the emergency alarm switch to ensure proper operation, which shall not require operator or dispatch interaction.			
2.2.1.42	Based on thresholds configurable by Guelph Transit staff, the system shall reliably designate when vehicles are deemed off-route.			
2.2.1.43	The OBC shall be interfaced with the existing DVR using an Ethernet connection.			
2.2.1.44	The new emergency alarm button shall be wired to the DVR input for the existing flag video button. When either button is pressed the DVR shall receive the same input signal as it currently receives from the flag video button.			
2.2.1.45	The OBC shall upload flagged video data received from the DVR via WLAN bulk data transfer.			
2.2.1.46	The OBC shall provide current latitude/longitude data to the DVR every second.			
2.2.1.47	The OBC shall periodically provide current date/time to the DVR.			
2.2.1.48	The OBC shall log DVR fault codes received from the DVR. The OBC shall store all status messages received from the DVR in a log file, with each log record including the date, time, vehicle ID, GPS location, run, block, route, and trip. These DVR equipment status log files shall be automatically uploaded from the OBC to the central system via the WLAN or using a portable computing device via a USB port. The log files shall be viewable using standard PC utilities (e.g., Word and Excel).			
2.2.2 Mobile Data Terminal (MDT)				
2.2.2.01	The MDT shall allow vehicle operator logon using an alphanumeric operator ID entry.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.2.2.02	If the operator does not log in, no information shall be shown in the MDT. However, in this scenario the OBC shall still provide location reports to the central software.			
2.2.2.03	If the operator does not log in and the vehicle is moving then the OBC shall send an alert to the dispatcher via the central system and the MDT shall emit a loud beeping sound until the operator logs on to the vehicle. Guelph Transit shall be able to disable or adjust the volume for this beep feature.			
2.2.2.04	As part of the logon process the MDT will prompt operators to indicate the result for their completed vehicle circle check. Logon shall not be complete until the circle check form has been completed, and the circle check result shall be sent with the login data and available to dispatch in the CAD/AVL software.			
2.2.2.05	The MDT shall have a “log-over” feature to allow a new operator to logon directly as the replacement driver for the current block.			
2.2.2.06	The MDT shall allow the vehicle operator to logoff by selecting the logoff key.			
2.2.2.07	The MDT shall be designed to support simple and intuitive use. Message selection (including canned messages), variable inputs, and interpretation of received messages shall be from menus that may change based on context and shall be customizable by Guelph Transit.			
2.2.2.08	The MDT shall allow the operator to change the volumes of the internal/external announcements, voice radio volume, and MDT notification tones, within the range of Guelph Transit configurable maximums and minimums.			
2.2.2.09	The MDT shall, at a minimum, display current system-wide transit time, vehicle status (in/out of service), data messages, as well as the name of the next upcoming stop, current schedule adherence status (+/- time indicated in minutes and seconds (with configurable distinct colour codes to indicate if this schedule adherence is a configurable time ahead of or behind schedule, and current route adherence status.			
2.2.2.10	The MDT shall provide configurable distinct audio alerts to operators when they are a configurable time ahead of or behind schedule.			
2.2.2.11	The MDT shall allow for the storage and reconfiguration of at least 50 pre-defined “canned” messages, each of which shall be configurable as to whether an acknowledgement can be requested from dispatch, and relative level of priority.			
2.2.2.12	The MDT shall indicate when there are unviewed messages in the incoming message queue and how many messages are in that queue. The software shall allow the operator to view a message in the queue, delete a message from the queue only after it has been viewed, or send an acknowledgement if required upon viewing the message.			
2.2.2.13	The MDT shall alert the operator with an audible and visual signal when a new message has been received.			
2.2.2.14	The MDT shall be configurable between providing messaging functions to the operator at any time vs. only when the vehicle is below a customizable speed threshold.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.2.2.15	The MDT shall indicate to the operator if a message has not yet been acknowledged as successfully received by the central software after a configurable time has passed.			
2.2.2.16	The operator shall not be able to disconnect the MDT from power, turn off the MDT or shut down the MDT software.			
2.2.2.17	The MDT shall be able to receive and display at least sixty-four characters of a message on a single screen, consisting of any ASCII-coded characters. The MDT shall allow scrolling for viewing all longer messages. The MDT shall be able to display multiple text sizes.			
2.2.2.18	Messages shall be displayed to the user in a large typeface readable by a user with 20/20 eyesight from a distance up to one meter.			
2.2.2.19	The MDT shall have operator-adjustable brightness.			
2.2.2.20	The MDT shall provide Request to Talk (RTT) and Priority Request to Talk (PRTT) soft buttons to allow the operator to request that the dispatcher setup a voice call			
2.2.2.21	The operator shall be notified via a change in the MDT display once an emergency alarm activation has been received by, and once the covert microphone audio is being monitored by, dispatch. The indication shall be identifiable only by a trained operator in a manner approved by Guelph Transit.			
2.2.2.22	The MDT shall notify the operator about the loss of data communication through a distinct symbol on the operator screen.			
2.2.2.23	The MDT shall allow the operator to fill out a defect form at any time during operation. This form shall be auto-populated with all known information. Canned defect codes/descriptions used in this form shall be available and configurable by Guelph Transit. Upon completion, the defect form data shall be sent and displayed to dispatchers in the CAD/AVL software.			
2.2.2.24	The operator shall be able to communicate using the radio when the MDT and/or OBC have failed.			
2.2.3 Automated Passenger Counters (APC)				
2.2.3.01	The APC sub-system shall accurately count the number of passengers boarding and alighting at each stop, separately for each doorway. Counts shall be accurate within +/- 5% of actual observed passenger volumes for both boarding and alighting passengers.			
2.2.3.02	The APC sub-system shall store the boarding and alighting counts on-board, for each stop and doorway, including the latitude, longitude, stop ID number, current date/time, block, route and trip.			
2.2.3.03	The APC sub-system shall transfer the stored counts data to the central system.			
2.2.3.04	The doorway sensors shall be able to separately count successive passengers that are walking as close together as is practical with normal passenger movements and the vehicle configuration, either one behind the other or side-by-side.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.2.3.05	The doorway sensors shall not register as multiple passengers the passage of a single passenger that reaches into or out of the doorway passage, or is swinging the arms, while passing through the sensors.			
2.2.3.06	The APC sub-system shall be interfaced with a wheelchair ramp sensor, such that the number of wheelchair ramp operational cycles at each stop is also recorded.			
2.2.3.07	The APC equipment shall transmit various status messages to the OBC.			
2.2.3.08	The OBC shall store all status messages received from the APC equipment in a log file, with each log record including the date, time, vehicle ID, GPS location, run, block, route, and trip. These APC equipment status log files shall be automatically uploaded from the OBC to the central system via the WLAN or using a portable computing device via a USB port. The log files shall be viewable using standard PC utilities (e.g., Word and Excel).			
2.2.4 Automated Vehicle Announcements (AVA)				
2.2.4.01	The Operator shall be able to select an internal announcement to play at any time from a scrollable list on the MDT. The scrollable list shall only include those announcements applicable to the current trip.			
2.2.4.02	The operator shall be able to test the AVA system, through a selection on the MDT, by playing in succession the test message (external audible and internal audible).			
2.2.4.03	Next stop announcements on vehicles shall play a recording indicating the name of the next bus stop, triggered by arriving at one or more stored location(s) upstream of that stop. These messages shall be activated by the OBC based on the vehicle location. The next stop announcement shall activate at an accuracy of within +/- 1 second of detecting the stored assignment point.			
2.2.4.04	Internal and external announcement volumes shall be automatically set based on the ambient interior and exterior sound levels, respectively, immediately prior to announcement activation (i.e. there shall be independent internal and external volumes). Parameters governing the response of announcement volumes to changes in interior and exterior sound levels shall be configurable by Guelph Transit.			
2.2.4.05	Both the internal and external announcements shall have separate maximum and minimum volume parameters, adjustable by Guelph Transit. The external maximum and minimums shall also be configurable by time of day.			
2.2.4.06	The contractor shall be responsible for ensuring the sound quality on each bus is good enough for clear internal audio messages that can be understood at every location on the bus, and external audio messages that can be understood within 4 metres of the front door, either incorporating or replacing the existing speakers and PA amplifier. External speakers need to be installed in the vicinity of the front doors, for any buses not already equipped with a suitable external front door speaker.			
2.2.4.07	Stop announcement configurations shall be based on the current trip pattern as determined by the block the OBC is logged into			
2.2.4.08	Next stop announcements shall not be activated if the vehicle is off-route or out-of-service.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.2.4.09	All stops shall be announced or only stops selectively identified by Guelph Transit (e.g., major intersections, landmarks, transfer points).			
2.2.4.10	Onboard DMS displays shall indicate the name of the next bus stop for a configurable duration, triggered by arriving at a stored location. These messages shall be activated through an interface of the DMS to the OBC and shall automatically change as required based on the vehicle location. The DMS shall activate at an accuracy of within +/- 1 second of detecting the stored assignment points.			
2.2.4.11	There shall be one DMS per bus near the front of the bus mounted from the ceiling, likely in-line with the center-line of the bus, where it can be viewed from the entire passenger area of the bus.			
2.2.4.12	The DMS shall consist of a 1-line amber LED matrix with a minimum of 16 fixed-width font characters per line. Characters shall be of sufficient size and clarity to allow a legibility distance of at least 12 meters.			
2.2.4.13	The DMS messages shall be legible under the full range of ambient internal illumination conditions.			
2.2.4.14	The DMS shall be able to display a message composed of any combination of ASCII code characters. The typeface and font for the DMS shall be approved by Guelph Transit.			
2.2.4.15	Display characteristics shall include variable and fixed width typefaces, proportional spacing and fully-configurable fonts.			
2.2.4.16	The onboard DMS shall transmit various status messages to the OBC.			
2.2.4.17	The OBC shall store all status messages received from the onboard DMS equipment in a log file, with each log record including the date, time, vehicle ID, GPS location, run, block, route, and trip. These DMS status log files shall be automatically uploaded from the OBC to the central system via the WLAN or using a portable computing device via a USB port. The log files shall be viewable using standard PC utilities (e.g., Word and Excel).			
2.2.5 Farebox integration				
2.2.5.01	The OBC shall be interfaced with the existing GFI fareboxes, using a GFI J1708/J1587 interface based on documentation to be provided by Guelph Transit as the basis for data exchange.			
2.2.5.02	The OBC shall use the interface to enable operator login to the farebox using the MDT, with the OBC transmitting data to the farebox indicating the current operator, block, route, fareset, and trip direction whenever one of these changes.			
2.2.5.03	The OBC shall respond to requests from the farebox for the current location with the latitude/longitude most recently stored when the front door was open.			
2.2.5.04	The OBC shall use the interface to periodically send time/date to the farebox.			
2.2.5.05	The OBC shall use the interface to receive the various status messages transmitted by the farebox.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.2.5.06	The OBC shall store all status messages received from the farebox in a log file, with each log record including the date, time, vehicle ID, GPS location, run, block, route, and trip. These farebox status log files shall be automatically uploaded from the OBC to the central system via the WLAN or using a portable computing device via a USB port. The log files shall be viewable using standard PC utilities (e.g., Word and Excel).			
2.2.6 Headsign integration				
2.2.6.01	The OBC shall be interfaced with the existing Aesys headsigns, using J1708/J1587 interface documentation to be provided by Guelph Transit.			
2.2.6.02	The OBC shall use the interface to command the headsign to show a message indicating the route to be operated on the upcoming trip, at a Guelph Transit-configured location approaching the end of the preceding trip.			
2.2.6.03	The OBC shall allow the operator (using the MDT) or dispatcher to manually override the headsign message, and log such overrides.			
2.2.6.04	The OBC shall use the interface to receive the various status messages transmitted by the headsign.			
2.2.6.05	The OBC shall store all status messages received from the headsign in a log file, with each log record including the date, time, vehicle ID, GPS location, run, block, route, and trip. These headsign status log files shall be automatically uploaded from the OBC to the central system via the WLAN or using a portable computing device via a USB port. The log files shall be viewable using standard PC utilities (e.g., Word and Excel).			
2.3 In-Vehicle (Mobility)				
2.3.1 On-board computer				
2.3.1.01	The OBC shall integrate all in-vehicle ITS functions and hardware including the GPS receiver and the MDT. The OBC may be physically integrated with the MDT or may be a separate unit.			
2.3.1.02	The OBC shall support data transfer to/from the central system using the cellular carrier subscription plan selected by Guelph Transit, for all data that needs to be exchanged in real time.			
2.3.1.03	The OBC shall support data transfer to/from the central system through the WLAN infrastructure for all data that does not need to be transmitted in real-time, including manifest download whenever possible and firmware updates.			
2.3.1.04	The OBC application software shall automatically be initiated when the vehicle ignition is turned on. The vehicle system shall initiate its shutdown sequence after a configurable time has passed since the vehicle ignition was turned off in order to conserve the vehicle battery.			
2.3.1.05	OBCs will send vehicle ID information to the mobility software, which will send to the OBC the manifest data assigned to that vehicle.			
2.3.1.06	The OBC shall automatically log the vehicle off from its assigned run once it has been detected as having returned to its storage facility, if the operator has not already completed a manual logoff.			
2.3.1.07	The OBC shall include a standard port to connect an external portable computing device for manual data configuration using a provided utility software.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.3.1.08	Regardless of the amount of time that power is lost on-board a vehicle, the data inside the OBC shall not be affected. The data shall be stored until power is restored. The OBC shall be equipped with a lithium battery that maintains the system's time for more than 5 years in case of power loss.			
2.3.1.09	A GPS receiver shall be used to continuously gather position, velocity, heading, and time.			
2.3.1.10	The OBC shall track current vehicle locations within at least 3 meters of the true location at least 95% of the time, using the combined information from the GPS receiver, odometer, and any supplementary dead reckoning sensors used (e.g., gyroscopes). The OBC shall send a location report with date and time, "GPS lock" status, derived location latitude/longitude, heading, vehicle number, and vehicle operator ID number whenever a configurable time has passed since the most recent location report was sent. Location monitoring accuracy will not be affected when vehicles occasionally operate in reverse.			
2.3.1.11	The OBC shall store the most recent location received from the GPS receiver.			
2.3.1.12	The system location and navigation capabilities shall accurately determine and report vehicle position while in the vicinity of objects that can cause multi-path location errors in the reception of GPS signals (e.g., taller buildings).			
2.3.1.13	The OBC shall request manifest data from the mobility software on an ongoing basis, to display at least the next *X* trip events or trip events in next *Y* minutes, with these thresholds being configurable by Guelph Transit.			
2.3.1.14	The OBC shall send a corresponding message to the mobility scheduling and dispatch software when the vehicle operator selects a pull-out, pull-in, pickup, no-show, cancel at door, or drop-off trip event.			
2.3.1.15	The OBC shall not allow a request for no-show until an agency-configurable time interval has passed after the arrive trip event or the start of the customer pickup time window, whichever is later, and shall not allow the arrive event to be selected until the vehicle is stopped and located within a configurable distance of the pickup location.			
2.3.1.16	Once any of these trip events are selected on the MDT, the OBC shall send a message including the date, time, location and odometer value to the mobility software.			
2.3.1.17	Location data collected by the OBC shall be sent via the commercial cell data carrier system to the central system and stored in a central database. Data shall be sent at a customizable frequency and also when configurable events occur.			
2.3.1.18	The OBC shall be interfaced with the existing vehicle radio to start and end voice calls based on selected a designated talkgroup as commanded via data messages received from the central software.			
2.3.1.19	The OBC shall be interfaced with the existing handset and hailing speaker, to control to which of these the incoming audio is routed as indicated in the incoming voice call set up by dispatch			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.3.1.20	When dispatch enables a one-way voice call to the vehicle the OBC shall provide a distinct audible alert tone. The audio will be routed through the hailing speaker, and if the operator picks up the handset, audio shall instead be routed through the handset. If the handset is hung up the audio routing will return to the hailing speaker.			
2.3.1.21	When dispatch enables a two-way voice call to the vehicle the OBC shall provide a distinct audible alert tone. The incoming audio will be routed through the handset once the operator picks up the handset, until the end of the timed voice call after which the OBC shall automatically end the voice call. The operator will be able to send audio to dispatch from the handset microphone by pressing the handset Press To Talk button.			
2.3.1.22	When the operator hangs up the handset during a two-way voice call, this shall be detected by the OBC and the voice call ended. The OBC shall send a data message to notify dispatch that the voice call has ended.			
2.3.1.23	The OBC shall allow the operator to send a text message to the central system by selecting from a set of pre-defined messages. All canned messages to dispatch shall include the date, time, location and odometer value.			
2.3.1.24	The OBC shall signal with a distinct audible alert tone when a text message is received from dispatch and available for viewing			
2.3.1.25	The OBC shall store up to ten text messages received from dispatch, indicate to vehicle operators when there are unread text messages, and allow stored text messages to be viewed or deleted. The OBC shall allow the vehicle operator to view received text messages that are longer than that can fit on one line of the display.			
2.3.1.26	The OBC shall also allow the operator to send an acknowledgement or Yes/No response to certain text messages received from the central system.			
2.3.1.27	The OBC shall periodically attempt to send a canned text message or response until it receives an acknowledgement message from the central system.			
2.3.1.28	The OBC shall be equipped with a cellular data card or external cellular modem appropriate to achieve integrated cellular data communications using the cellular data subscription plan and carrier selected by Guelph Transit.			
2.3.1.29	The OBC shall be equipped with a WLAN client card appropriate to achieve integrated bulk data transfer with the central system when in range of the WLAN Guelph Transit access points infrastructure. The bulk data transfer shall use 802.11n and WPA2 encryption.			
2.3.1.30	The OBC shall automatically reboot to resume normal operations in case of fatal error.			
2.3.1.31	The Contractor shall provide external roof-mounted antennas for GPS, WLAN and cellular data. The antenna shall be securely mounted on the exterior roof of the vehicle, and shall be of an approved low-profile type. The antenna, mounting and sealants shall be impervious to physical and chemical attack by automatic bus washing equipment.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.3.2 Mobile data terminal				
2.3.2.01	The MDT shall allow vehicle operator logon using operator ID alpha-numeric entry.			
2.3.2.02	If the operator does not log in, no information shall be shown in the MDT. However, in this scenario the OBC shall provide location reports to the central software.			
2.3.2.03	The MDT will display the odometer value as of the previous logoff, and provide for the operator to correct this odometer value to match the dashboard odometer (there can be a gradual drift and in some cases the vehicle may have been driven while logged off).			
2.3.2.04	If the operator does not log in and the vehicle is moving then the OBC shall send an alert to the dispatcher via the central system and the MDT shall emit a loud beeping sound until the operator logs on to the vehicle. Guelph Transit shall be able to disable or adjust the volume for this beep feature.			
2.3.2.05	As part of the logon process the MDT will prompt operators to indicate the result for their completed vehicle circle check. The operator shall not be able to complete logon until the circle check form has been completed.			
2.3.2.06	The MDT shall allow the operator to change the voice radio volume, and MDT notification tones, within the range of Guelph Transit configurable maximums and minimums.			
2.3.2.07	The MDT shall allow the vehicle operator to logoff by selecting the logoff key.			
2.3.2.08	The MDT shall be designed to support simple and intuitive use of the MDT. Message selection (including canned messages), variable inputs, and interpretation of received messages shall be from menus that may change based on context and shall be customizable by Guelph Transit.			
2.3.2.09	The MDT shall allow for the storage and reconfiguration of at least 50 pre-defined “canned” messages, each of which shall be configurable as to whether an acknowledgement can be requested from dispatch, and relative level of priority.			
2.3.2.10	The MDT shall indicate when there are unviewed messages in the incoming message queue and how many messages are in that queue. The software shall allow the operator to view a message in the queue, delete a message from the queue only after it has been viewed, or send an acknowledgement if required upon viewing the message.			
2.3.2.11	The MDT shall alert the operator with an audible and visual signal when a new message has been received.			
2.3.2.12	The MDT shall be configurable between providing messaging functions to the operator at any time vs. only when the vehicle is below a customizable speed threshold.			
2.3.2.13	The MDT shall indicate to the operator if a message has not yet been acknowledged as successfully received by the central software after a configurable time has passed.			
2.3.2.14	The operator shall not be able to disconnect the MDT from power, turn off the MDT or shut down the MDT software.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.3.2.15	The MDT shall be able to receive and display at least sixty-four characters of a message on a single screen, consisting of any ASCII-coded characters. The MDT shall allow scrolling for viewing all longer messages. The MDT shall be able to display multiple text sizes.			
2.3.2.16	Messages shall be displayed to the user in a large typeface that is readable by a user with 20/20 eyesight from a distance up to one meter.			
2.3.2.17	The MDT shall have operator-adjustable brightness.			
2.3.2.18	The MDT shall provide Request To Talk (RTT) and Priority Request to Talk (PRTT) soft buttons, to allow the operator to request that the dispatcher set up a voice call.			
2.3.2.19	Manifests and manifest updates sent by a dispatcher shall be displayed on the MDT screen. The screen shall display upcoming pickup or drop-off trip events in summary format including at least event type, event time, client name, gender, event location, fare amount, client comment and location comment.			
2.3.2.20	The MDT shall allow the vehicle operator to select a trip event to view more detail on the pickup or drop-off on a separate screen, which shall include at minimum pickup/drop-off, first and last name, client id, gender, appointment time, event time, window times, location, client comment, location comment, fare type, and space type.			
2.3.2.21	The MDT shall require that the vehicle operator acknowledge the receipt of an insertion, deletion or change to the current manifest (including no-show events). There shall be an audible tone from the MDT when any such manifest change notification is received. All changes in the manifest will be highlighted in distinct colours.			
2.3.2.22	The MDT shall notify the vehicle operator about the loss of data communication through a distinct symbol on the operator screen.			
2.3.2.23	The operator shall use the MDT to select an “arrive” event by pressing a button when first arriving at the location, and then again use the MDT to select a “perform” event when about to depart the location.			
2.3.2.24	In the case of grouped trip events, the vehicle operator shall be able to register a single “arrive” event and “perform” event that applies to all trip events in the group.			
2.3.2.25	The MDT shall be configured to not allow the “arrive” event unless the vehicle reaches within configured radius of the pickup location.			
2.3.2.26	If the customer is not available at the location, the operator shall use an MDT button to request a “no-show”.			
2.3.2.27	The operator shall have the opportunity to update the passenger count, space type and fare received at the time of selecting the perform trip event and send the updated information to the mobility software.			
2.3.2.28	The trip event message shall include the date/time, trip event type, location and odometer value.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.3.2.29	The MDT shall be equipped with a navigation assistance module to provide visual and audible turn-by-turn instruction for operators of mobility vehicles.			
2.3.2.30	The MDT shall display a map showing the current location of the vehicle, the location of the next pickup or drop-off, and a continuously-updated suggested routing between them, at the closest zoom level where this route fits on the display. As the vehicle travels, the map view will automatically pan and zoom to continue to show this entire routing at the closest possible zoom level.			
2.3.2.31	The MDT shall allow operators to override the map zoom level or pan the map display, and to select for the display to return to the default mode that automatically follows the routing.			
2.3.2.32	The driving instructions shall include both the turn directions and the name of the street, and this information shall be provided at an agency-configurable distance in advance of the turn.			
2.3.2.33	The navigation module shall allow the operator to activate and deactivate the navigation map display and/or the audible instructions as desired.			
2.3.2.34	The navigation map shall be stored in the MDT or OBC and be updateable over the WLAN bulk data transfer communications.			
2.3.2.35	If the navigation application is active when a manifest change notification or text message is received, the audible alert tone shall be provided without interrupting the navigation application. This will allow the operator to acknowledge and review the manifest changes or text messages at the next appropriate opportunity without interrupting the navigation support.			
2.3.2.36	The MDT shall allow the operator to fill out a defect form at any time during operation. This form shall be auto-populated with all known information. Canned defect codes/descriptions used in this form shall be available and configurable by Guelph Transit. Upon completion, the defect form data shall be sent and displayed to dispatchers in the CAD/AVL software.			
2.3.2.37	The operator shall be able to communicate using the radio when the MDT and/or OBC have failed.			
2.3.3 Headsign integration				
2.3.3.01	The OBC shall be interfaced with the existing Aesys headsigns, using J1708/J1587 interface documentation to be provided by Guelph Transit.			
2.3.3.02	The OBC shall use the interface to command the headsign to show a message indicating the route to be operated on the upcoming trip, at a Guelph Transit-configured location approaching the end of the preceding trip.			
2.3.3.03	The OBC shall allow the operator (using the MDT) or dispatcher to manually override the headsign message, and log such overrides.			
2.3.3.04	The OBC shall use the interface to receive the various status messages transmitted by the headsign.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.3.3.05	The OBC shall store all status messages received from the headsign in a log file, with each log record including the date, time, vehicle ID, GPS location, run, block, route, and trip. These headsign status log files shall be automatically uploaded from the OBC to the central system via the WLAN or using a portable computing device via a USB port. The log files shall be viewable using standard PC utilities (e.g., Word and Excel).			
2.4 In-Vehicle (Non Revenue/Service Vehicles) **2.4.1 On-board computer**				
2.4.1.01	The On-Board Computer (OBC) shall integrate all in-vehicle ITS functions and hardware including the GPS receiver and the Mobile Data Terminal (MDT). The OBC may be physically integrated with the MDT or may be a separate unit.			
2.4.1.02	The OBC shall support the data transfer to/from the central system through the commercial cellular data carrier system for all data that needs to be exchanged in real time.			
2.4.1.03	The OBC shall support the data transfer to/from the central system through the WLAN infrastructure for all data that does not need to be transmitted in real-time, including firmware updates.			
2.4.1.04	The OBC shall be interfaced with the existing vehicle radio to start and end voice calls based on selected a designated talkgroup as commanded via data messages received from the central software. The existing voice radio that the Contractor shall integrate with is expected to be either the Mototrbo 4350 or potentially a radio from the newer XPR 5000 series.			
2.4.1.05	The OBC shall be interfaced with the existing handset and vehicle speakers, to control to which of these the incoming audio is routed as indicated in the incoming voice call set up by dispatch.			
2.4.1.06	When dispatch enables a one-way voice call to the vehicle the OBC shall provide a distinct audible alert tone. The audio will be routed through the vehicle speaker, and if the operator picks up the handset, audio shall instead be routed through the handset. If the handset is hung up the audio routing will return to the vehicle speaker.			
2.4.1.07	When dispatch enables a two-way voice call to the vehicle the OBC shall provide a distinct audible alert tone. The incoming audio will be routed through the handset once the operator picks up the handset, until the end of the timed voice call after which the OBC shall automatically end the voice call. The operator will be able to send audio to dispatch from the handset microphone by pressing the handset Press To Talk button.			
2.4.1.08	When the operator hangs up the handset during a two-way voice call, this shall be detected by the OBC and the voice call ended. The OBC shall send a data message to notify dispatch that the voice call has ended.			
2.4.1.09	The OBC shall allow the operator to send a text message to the central system by selecting from a set of pre-defined messages. All canned messages to dispatch shall include the date, time, and location.			
2.4.1.10	The OBC shall signal with a distinct audible alert tone when a text message is received from dispatch and available for viewing			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.4.1.11	The OBC shall store up to ten text messages received from dispatch, indicate to vehicle operators when there are unread text messages, and allow stored text messages to be viewed or deleted. The OBC shall allow the vehicle operator to view received text messages that are longer than that can fit on one line of the display.			
2.4.1.12	The OBC shall also allow the operator to send an acknowledgement or Yes/No response to certain text messages received from the central system.			
2.4.1.13	The OBC shall periodically attempt to send a canned text message or response until it receives an acknowledgement message from the central system.			
2.4.1.14	The OBC shall check with the central system to validate that the entered operator ID is valid and that another vehicle has not already logged on using this operator ID.			
2.4.1.15	The OBC application software shall automatically be initiated when the vehicle ignition is turned on. The vehicle system shall initiate its shutdown sequence after a configurable time has passed since the vehicle ignition was turned off in order to conserve the vehicle battery.			
2.4.1.16	The OBC shall automatically log the vehicle off once it has been detected as having returned to its storage facility, if the operator has not already completed a manual logoff.			
2.4.1.17	The following input parameters and requests from the central system shall be supported by the vehicle system while the vehicle is in service: • Revise operator • Set periodic reporting parameters; and • Reset all settings/thresholds to default.			
2.4.1.18	The OBC shall provide notification if a vehicle has not moved between successive location reports and beyond a Guelph Transit configurable allowable threshold.			
2.4.1.19	The OBC shall include a standard port to connect an external portable computing device for manual data configuration using a provided utility software.			
2.4.1.20	Regardless of the amount of time that power is lost on-board a vehicle, the data inside the OBC shall not be affected. The data shall be stored until power is restored. The OBC shall be equipped with a lithium battery that maintains the system's time for more than 5 years in case of power loss.			
2.4.1.21	A GPS receiver shall be used to continuously gather position, velocity, heading, and time.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.4.1.22	The OBC shall track current vehicle locations within at least 3 meters of the true location at least 95% of the time, using the combined information from the GPS receiver, odometer, and any supplementary dead reckoning sensors used (e.g., gyroscopes). The OBC shall send a location report with date and time, "GPS lock" status, derived location latitude/longitude, heading, vehicle number, and vehicle operator ID number whenever a configurable time has passed since the most recent location report was sent. Location monitoring accuracy will not be affected when vehicles occasionally operate in reverse.			
2.4.1.23	The OBC shall store the most recent location received from the GPS receiver.			
2.4.1.24	The system location and navigation capabilities shall accurately determine and report vehicle position while in the vicinity of objects that can cause multi-path location errors in the reception of GPS signals (e.g., taller buildings).			
2.4.1.25	The OBC shall automatically reboot to resume normal operations in case of fatal error.			
2.4.1.26	The OBC shall be equipped with a cellular data card or external cellular modem appropriate to achieve integrated cellular data communications using the cellular carrier subscription plan selected by Guelph Transit.			
2.4.1.27	The OBC shall be equipped with a WLAN client card appropriate to achieve integrated bulk data transfer with the central system when in range of the WLAN Guelph Transit access points infrastructure. The bulk data transfer shall use 802.11n and WPA2 encryption.			
2.4.1.28	The Contractor shall provide one or more external roof-mounted antennas for GPS, cellular data, and WLAN. Antennas shall be securely mounted on the roof of the vehicle. Antennas, mounting and sealants shall be impervious to physical and chemical attack by automatic bus washing equipment.			
2.4.2 Mobile Data Terminal (MDT)				
2.4.2.01	The MDT shall allow vehicle operator logon using an alphanumeric operator ID entry.			
2.4.2.02	If the operator does not log in, no information shall be shown in the MDT. However, in this scenario the OBC shall still provide location reports to the central software.			
2.4.2.03	If the operator does not log in and the vehicle is moving then the OBC shall send an alert to the dispatcher via the central system and the MDT shall emit a loud beeping sound until the operator logs on to the vehicle. Guelph Transit shall be able to disable or adjust the volume for this beep feature.			
2.4.2.04	As part of the logon process the MDT will prompt operators to indicate the result for their completed vehicle circle check. Logon shall not be complete until the circle check form has been completed, and the circle check result shall be sent with the login data and available to dispatch in the CAD/AVL software.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.4.2.05	The MDT shall allow the vehicle operator to logoff by selecting the logoff key.			
2.4.2.06	The MDT shall be designed to support simple and intuitive use. Message selection (including canned messages), variable inputs, and interpretation of received messages shall be from menus that may change based on context and shall be customizable by Guelph Transit.			
2.4.2.07	The MDT shall allow the operator to change the volumes of the voice radio volume, and MDT notification tones, within the range of Guelph Transit configurable maximums and minimums.			
2.4.2.08	The MDT shall, at a minimum, display current system-wide transit time and data messages.			
2.4.2.09	The MDT shall allow for the storage and reconfiguration of at least 50 pre-defined “canned” messages, each of which shall be configurable as to whether an acknowledgement can be requested from dispatch, and relative level of priority.			
2.4.2.10	The MDT shall indicate when there are unviewed messages in the incoming message queue and how many messages are in that queue. The software shall allow the operator to view a message in the queue, delete a message from the queue only after it has been viewed, or send an acknowledgement if required upon viewing the message.			
2.4.2.11	The MDT shall alert the operator with an audible and visual signal when a new message has been received.			
2.4.2.12	The MDT shall be configurable between providing messaging functions to the operator at any time vs. only when the vehicle is below a customizable speed threshold.			
2.4.2.13	The MDT shall indicate to the operator if a message has not yet been acknowledged as successfully received by the central software after a configurable time has passed.			
2.4.2.14	The operator shall not be able to disconnect the MDT from power, turn off the MDT or shut down the MDT software.			
2.4.2.15	The MDT shall be able to receive and display at least sixty-four characters of a message on a single screen, consisting of any ASCII-coded characters. The MDT shall allow scrolling for viewing all longer messages. The MDT shall be able to display multiple text sizes.			
2.4.2.16	Messages shall be displayed to the user in a large typeface readable by a user with 20/20 eyesight from a distance up to one meter.			
2.4.2.17	The MDT shall have operator-adjustable brightness.			
2.4.2.18	The MDT shall provide Request to Talk (RTT) and Priority Request to Talk (PRTT) soft buttons to allow the operator to request that the dispatcher setup a voice call			
2.4.2.19	The MDT shall notify the operator about the loss of data communication through a distinct symbol on the operator screen.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
2.4.2.20	The MDT shall allow the operator to fill out a defect form at any time during operation. This form shall be auto-populated with all known information. Canned defect codes/descriptions used in this form shall be available and configurable by Guelph Transit. Upon completion, the defect form data shall be sent and displayed to dispatchers in the CAD/AVL software.			
2.4.2.21	The operator shall be able to communicate using the radio when the MDT and/or OBC have failed.			
3. Wayside Equipment requirements				
3.1 Bid Management and Sign-In Terminal				
3.1.01	The bid management and sign-in terminals hardware will be provided by Guelph Transit, to meet minimum requirements defined by the Contractor. The Contractor shall be responsible for setting up the bid-management and sign-in software on these terminals. The terminal shall comprise a workstation, display, keyboard, and laser printer.			
3.1.02	The system shall support separate periodic bidding based on seniority order, for vacations and work. Vacation bidding shall allow each operator to select up to their annual allowed vacation weeks until they have selected their vacation allotment, enforcing vacation quotas (maximum allowable number of operators on vacation for individual weeks). Work bidding shall enable each operator to choose for the bid period either a run, extraboard, or vacation coverage (“swing”). If choosing vacation coverage, the system shall show the vacation coverage slots that remain uncovered, so that the operator can choose one for each week of the bid period.			
3.1.03	The sign-in function shall allow an operator to enter their ID. This shall indicate on screen to a conventional operator their run assignment and vehicle assignment, and sign the operator into that run. This shall indicate on screen to a mobility operator their vehicle assignment. The printer shall provide a printout indicating the sign-in date/time and the assignments.			
3.1.04	The bid management function shall allow a conventional operator to review runs and/or rosters on screen in advance of the bid, once these have been posted to the workstation based on the results from the conventional scheduling software.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
3.1.05	The bid management function shall allow a conventional operator to during the bid period select their runs or rosters, days off, and hold downs for the various weeks of the bid period. To enable these selections, the workstation shall for each bid week show the remaining work selections not yet selected by operators earlier in the bid. In addition, the workstation shall automatically notify the bidding operator if a work selection would violate a work rule (e.g., minimum rest hours between end of work in the prior week and start of work in the current week). Until the bidding operator indicates having completed their bid selections, operators shall be able to change any prior work selections. At the conclusion of a successful bid, the workstation shall provide the operator a printout listing the selected work for each week.			
3.1.06	The display shall indicate the current operator bid sequence number to indicate which operator is next eligible to bid based on seniority order. If an operator not yet eligible for bid attempts to do so, the terminal shall indicate this as feedback to the operator.			
3.1.07	The operator bid sequence shall automatically skip over operators that will not be bidding, without altering their actual seniority status (e.g., an operator on Long Term Disability). This feature shall include the capability for Guelph Transit to set whether individual operators will be skipped in the bid sequence.			
3.2 Wayside Infotainment System **3.2.1 Infotainment Software**				
3.2.1.01	The infotainment software shall support Flat Panel Display (FPD) technology using LED-LCD			
3.2.1.02	The software shall support the use of HDMI 1.1 interface connection and be capable of outputting 1080P resolution			
3.2.1.03	The screen aspect ratio supported shall be 16:9.			
3.2.1.04	The diagonal screen size supported shall include the following types at minimum: .1 940mm (37 inches); .2 1120mm (44 inches); and .3 1270mm (50 inches).			
3.2.1.05	The infotainment software shall consist of: .1 Central content management software, used to administer the content to be displayed on various screens at various times, and; .2 Content players at Guelph Transit stations and terminals, used to play the contents on the FPDs.			
3.2.1.06	The software shall allow Guelph Transit to slave one or multiple FPDs to a content player for a given site.			
3.2.1.07	The infotainment software shall support customizable templates (screen layouts) designed with Guelph Transit input. The template configurations shall include at minimum (non-exhaustive list): • Split screen with any number of view areas			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
	• Ability to independently adjust the dimensions of each view area in a split screen configuration			
3.2.1.08	The infotainment software shall have a user friendly template editor to allow Guelph Transit to revise or create template layouts.			
3.2.1.09	The infotainment software shall support playing any of the following content in a given template viewing area, with no restriction on combining different content types within viewing areas within the same template. This list is non exhaustive. • Scrolling text via RSS (weather, service bulletins, CSV) • Real-time arrival/departure information • Scheduled arrival/departure information • Vehicle assignments by bus bay • Still images (TIF, JPEG, PNG, RAW, GIF, BMP) • Video files (AVI, FLV, MPEG, WMV, MOV) • Text (fixed or scrolling display) • Time and date (12 and 24 hour formats) • Audio files			
3.2.1.10	The content management software shall have a drag and drop display to allow Guelph Transit to assign content to each distinct view areas of a template layout.			
3.2.1.11	The content management software shall allow Guelph Transit to create playlists (i.e. independently scheduled sequences for content display) for each view area of a template. These playlist shall have valid to and from dates to allow Guelph Transit to deploy multiple configurations to content players in advance.			
3.2.1.12	The software shall provide user configuration parameters to identify the amount of time (seconds) that static content (e.g. text, images) should be displayed in a viewing area.			
3.2.1.13	The content management software shall provide full preview capabilities to allow Guelph Transit to preview content prior to releasing it to a content player as a playlist.			
3.2.1.14	The content management software shall allow Guelph Transit to tag certain content as either advertisement or campaign material.			
3.2.1.15	The infotainment software shall allow Guelph Transit to track advertisement and campaign content to enable validating proof of display to advertisers.			
3.2.1.16	The content management software shall be able to use multiple forms of content deployment to the content player, that shall at minimum include: • LAN • WLAN • Cellular • SFTP/FTP • USB drive			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
3.2.1.17	The infotainment software shall provide functionality to allow Guelph Transit to make ad-hoc announcements and canned messages (e.g., so in case of detours or service delays, the system could be used to provide immediate alerts).			
3.2.1.18	The infotainment software shall support ad-hoc and pre-programmed messages in multiple languages, including at minimum English and French.			
3.2.2 Infotainment Hardware				
3.2.2.01	The Flat Panel Displays (FPD) and related computer hardware for the content management system and content players (including enclosures) will be provided by Guelph Transit.			
3.2.2.02	The Contractor shall provide Guelph Transit with recommended specifications for the Flat Panel Display and related hardware for the content management system and content players.			
3.2.2.03	The Contractor shall provide Guelph Transit with specifications for vandal and weather proof display enclosures.			
4. Physical Installation Requirement				
4.01	The Contractor shall arrange for access and approval to complete relevant installations, to be granted by Guelph Transit's Project Manager.			
4.02	The Contractor shall obtain approval from Guelph Transit's Project Manager for locations for all on-board equipment for each vehicle style. Contractor shall supply all mounting supplies needed to complete the mount in the approved location for each vehicle style.			
4.03	The Contractor shall provide all labour, materials, parts, cables, software, documentation, instructions, warranty and maintenance in accordance with the intent of these specified system requirements.			
4.04	Guelph Transit will make vehicles available for installations overnight between 6:00 pm and 4:00 am. The May to September time period when the University of Guelph is not in session is the prime opportunity for vehicle installations with high vehicle availability (including availability during daytime hours) because at these times Guelph Transit runs a more limited service schedule; outside of this time period bus availability for vehicle installations will be limited to the overnight period and significantly reduced.			
4.05	One bay will be provided for the Contractor to perform installations at Guelph Transit's main facility.			
4.06	All equipment and components used shall be new.			
4.07	All equipment shall be designed to provide a usable life of not less than fifteen years.			
4.08	All equipment shall be designed for use in urban transit operations, with specific attention to ergonomics, reliability, efficiency, and safety for passengers, operators, maintenance personnel and other system users.			

PREFRRED REQUIREMENTS

Reference # 13-032

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
4.09	Equipment furnished under these specifications shall be the latest model in current production, as offered to commercial trade, and shall conform to quality workmanship standards and use materials consistent with transit industry requirements.			
4.1	System components shall be built in accordance with best commercial practice. As a minimum, the design and construction shall provide for: • Safe, reliable and stable operation • Minimum maintenance, configuration and calibration required • Minimum number and variety of assemblies and spare parts • Maximum attention to human engineering and • Simplified design and rapid fault isolation to reduce the requirement for highly skilled maintenance personnel			
4.11	The Contractor shall make required improvements and provide all required structures and services for equipment or elements to be installed at all sites and in all vehicles.			
4.12	All external screws, nuts, and locking washers shall be stainless steel or an approved alternate non-corrosive material; no self-tapping screws shall be used unless specifically approved.			
4.13	All parts shall be made of corrosion resistant material, such as UV resistant plastic, stainless steel, anodized aluminum or brass.			
4.14	The Contractor shall utilize modular design throughout.			
4.15	Standard, commercially available components shall be used wherever possible.			
4.16	All functionally identical modules, assemblies and components shall be fully interchangeable between all equipment acquired under this contract.			
4.17	All modules and assemblies shall be connected using standardized durable, positive-locking, indexed quick disconnect connectors. Weatherproof connectors shall be supplied for all connections exposed to the exterior environment.			
4.18	All equipment shall be modularly upgradeable so that it does not need to be replaced in its entirety to increase memory capacity, to upgrade processing performance, upgrade the operating system or application or to reconfigure I/O options.			
4.19	Equipment shall be designed to prevent unauthorized access, and to facilitate only authorized access.			
4.2	Provisions shall be made to protect all equipment and components from vandalism and physical abuse.			
4.21	Equipment and sub-components shall be identified by a part number and/or serial number, permanently and legibly affixed directly to the surface of the unit.			
4.22	Unless otherwise specified in the sub-system specifications, all onboard equipment shall have a minimum 25,000 hours MTBF.			
4.23	Unless otherwise specified in the sub-system specifications, all office equipment shall have a minimum 10,000 hours MTBF.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
4.24	The Contractor shall select system components that have locally available technical support and repair centers wherever possible.			
4.25	The system equipment shall adhere to environmental requirements as per Section 7.			
4.26	It shall be the responsibility of the Contractor to properly locate and install all vehicle equipment. All equipment shall be installed in a manner that allows for simple replacement in the event of failure.			
4.27	Equipment shall allow for easy installation in transit vehicles without major disassembly of the vehicle.			
4.28	In-vehicle system components shall be identical in mounting characteristics and inter-unit cabling across the entire fleet, so that a specific piece of equipment will be installable with minimal modification in any of the vehicles for which it might be used.			
4.29	Equipment shall not pose a hazard to operators or passengers when operated in accordance with manufacturer's recommendations.			
4.3	Individual equipment components to be installed shall be capable of being carried by a single person, and shall not exceed 16kg.			
4.31	Equipment shall be able to be replaced in a vehicle in five minutes or less when the proper tools and a spare unit are available.			
4.32	Equipment shall not pose any hazards to the operators or maintenance personnel, such as sharp edges.			
4.33	All system components shall be waterproof and use Guelph Transit standard connectors and fasteners.			
5. Electrical Requirements				
5.1 General Requirements				
5.1.01	All device enclosures shall contain an accessible master circuit breaker (within a locked enclosure) that will remove power from the equipment when tripped. Circuit breakers shall clearly indicate when they have been tripped.			
5.1.02	All enclosures, chassis, assemblies, panels, switch boxes, terminal boxes, exposed metal equipment shall be grounded.			
5.1.03	Conductors carrying 50 volts or more shall not be bundled with any lower voltage conductors.			
5.1.04	Wire dress shall allow sufficient slack for three additional "re-terminations" without excess tension.			
5.1.05	Wire splices are not permitted.			
5.1.06	Wire and cable ties shall not be so tight as to cause indentation and damage to the insulation.			
5.1.07	Adhesive-mounted bases shall not be used to support wire ties or cable supports.			
5.1.08	All conductors within each enclosure shall be installed free from metal edges, bolt heads, and other sharp or interfering or hazard points.			
5.1.09	All conductors providing connections between components shall be provided with strain-relief, and be clear of moving objects that could damage either the conductor or the object.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
5.1.10	Where wires pass through openings, appropriate bushings shall be provided to protect the integrity of the wiring insulation.			
5.1.11	All terminations and cables shall be clearly indexed, labelled, consistent throughout the vehicle and between vehicles, and schematically identifiable.			
5.1.12	All wire labels shall be non-metallic and shall resist standard lubricants and cleaning solvents.			
5.1.13	When components are connected to each other through individual wires, the wiring shall be incorporated into a wiring harness, where each branch of each circuit can be separated from others for troubleshooting.			
5.1.14	Protection shall be provided against radio frequency and electromagnetic interference (RFI/EMI) emission sources, as well as internal conductive or inductive emissions.			
5.1.15	The Contractor shall be responsible for securing Underwriters Laboratories, Canadian Standards Association (CSA) and other electrical certifications, and shall be responsible for any costs associated with the certification process and/or inspections.			
5.2 Central System				
5.2.01	All equipment installed in Guelph Transit facilities, with the exception of any on-board equipment shall operate from a nominal line voltage of 120 VAC, within voltage tolerances of +10% to –20%, and a frequency range of 57 Hz to 63 Hz without equipment damage.			
5.2.02	Unless otherwise approved or directed by Guelph Transit, all servers and non-desktop computers shall be rack-mounted.			
5.3 In-Vehicle				
5.3.01	Onboard components shall operate at a nominal +12.5 VDC or +24VDC, and be fully functional within operating supply voltage ranges of + 9VDC to +37 VDC. Voltages shall be measured at the power connector to the device.			
5.3.02	The system shall employ low and high voltage protection, as well as reverse polarity protection.			
5.3.03	Contractor shall provide power conditioners/filters for all in-vehicle equipment.			
5.3.04	All roof or exterior mounts shall incorporate a drip loop.			
5.3.05	Wiring/installation diagrams for in-vehicle systems shall be provided by the Contractor for each make/model of vehicle.			
5.3.06	Operation of equipment shall not affect or be affected by vehicle components, such as engine ignition, or other on-board equipment including computers, vehicle power supplies, radios, automatic vehicle identification systems, and on-board data collection and processing equipment.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
5.3.07	Operation of equipment shall not be affected by the electromagnetic fields generated by utility transmission lines, by an overhead catenary, by local power distribution, by bridges, or by infrastructure along city roads that can induce interference.			
5.3.08	The Contractor shall identify the power requirements including start-up and operation of all equipment to be installed on vehicles.			
6. Environmental Requirements				
6.1 Central System				
6.1.01	Office installed equipment shall maintain specified performance while operating in a controlled environment of +3°C to +34°C , and relative humidity (non-condensing) of less than 90%.			
6.2 In-Vehicle				
6.2.01	All exterior mobile equipment including antennas shall be weatherproof.			
6.2.02	In vehicle equipment shall maintain specified performance while operating in exterior ambient temperature between -40°C and +70°C.			
6.2.03	In vehicle equipment shall maintain specified performance while operating in interior ambient temperature between -30°C and +70°C.			
6.2.04	In vehicle equipment shall maintain specified performance while operating in storage temperature between -30°C and +70°C.			
6.2.05	In vehicle equipment shall maintain specified performance while operating in 0-90% relative humidity, non-condensing.			
6.2.06	In vehicle equipment shall maintain specified performance while operating in operating vibration between 1.5G RMS, 5 to 150 Hz.			
6.2.07	In vehicle equipment shall maintain specified performance while operating in sustained shock of 30G for 6 milliseconds and up to 5G sustained indefinitely.			
6.2.08	The equipment shall meet, at a minimum, the IP 54 code for solid object and moisture protection.			
6.2.09	In vehicle equipment shall maintain specified performance while operating in water spray from cleaning floors and walls, industrial solvents, rain, mud, snow and slush, all of which may contain salt that may come in contact with equipment.			
6.3 Wayside Equipment				
6.3.01	All outdoor equipment shall be designed for and suitably protected against exposure to snow, ice, fog, rain, hail, de-icing salt and other environmental conditions prevalent in Southern Ontario.			
6.3.02	Enclosures shall include any provisions necessary to maintain the internal equipment at the manufacturers' specified temperature and humidity			
6.3.03	The equipment shall meet, at a minimum, the IP 54 code for solid object and moisture protection.			
7. Project Management and Documentation				
7.1 Implementation Plan and Schedule				
7.1.01	The Contractor shall provide a detailed implementation plan and schedule approved by Guelph Transit, with sufficient time allocated for Guelph Transit reviews at different stages of the process.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
7.1.02	Guelph Transit desires to begin system acceptance testing for the new system as installed on the entire fleet by October 2014.			
7.2 Documentation Submission Requirements				
7.2.01	The Contractor shall provide detailed documentation that describes the system design, configuration, training, as-built conditions, operation and maintenance. All documentation shall be in English, shall utilize metric measurements, and shall be submitted directly to Guelph Transit electronically as MS Word/ Excel/Project files and also as PDF files.			
7.2.02	The Contractor shall include the necessary time and resources to modify the documentation to incorporate comments from Guelph Transit. The Contractor shall then include additional time for Guelph Transit to review the revised documentation.			
7.2.03	Equipment installation drawings shall be submitted as PDF files. The drawings shall contain sufficient detail including but not limited to equipment dimensions, interfaces, cable details, equipment mounting and fire protection.			
7.2.04	Electrical and electronic drawings shall be supplied to show engineering changes made to any component or module up to the end of the warranty period of the system supplied.			
7.2.05	The manuals shall be complete, accurate, up-to-date, and shall contain only that information that pertains to the system installed.			
7.2.06	All pages of the documentation shall carry a title, version number and issue date, and shall contain a complete subject index. The Contractor shall be responsible for fully co-ordinating and cross-referencing all interfaces and areas associated with interconnecting equipment and systems.			
7.2.07	Documentation shall require re-issuance if any change or modification is made to the equipment proposed to be supplied. The Contractor may re-issue individual sheets or portions of the documentation that are affected by the change or modification. Each re-issue or revision shall carry the same title as the original, with a change in version number and issue date.			
7.3 Project Binder				
7.3.01	The Contractor shall prepare a Project Binder that consists of the following: • Project Management/Work Plan detailing the proposed approach to completing the project, including identification of relevant tasks and an organization/contact chart of personnel; • Quality Plan detailing the successful contractor's Quality Assurance procedures, including change management; • Installation Plan detailing the installation procedure; • Acceptance Test Plan detailing the approach to system testing (as relevant to Section 10); • Training Plan detailing course content, training time requirements, train the trainer program and who should attend (as relevant to Section 11);			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
	• Maintenance & Operations Support Plan that describes routine maintenance measures, response for repairs, communications service, and operations support (as relevant to Section 12.1); and • Statement of Warranty conforming to Section 13.			
8. Design Review				
8.01	The design process for the system shall achieve an approved System Design Document prior to proceeding with installations and testing.			
8.02	The design process shall comprise of two phases: Preliminary Design and Final Design, as described below. Each of the design phases will include submission of the parts or all of the System Design Document (Section 9.4).			
8.03	The Contractor shall attend design meetings with Guelph Transit to discuss the comments and proposed responses. Such meetings shall be scheduled to take place shortly after the Contractor has had a chance to respond to comments. The meeting will be used to reach agreement on any outstanding issues raised through the review process. The Contractor shall be expected to issue notes with agreed upon action items following from the meeting.			
8.1 Preliminary System Design Document				
8.1.01	The Preliminary Design is associated with establishing the necessary information related to Items 1-7 of the System Design Document (SDD) (Final SDD). At the completion of this stage, the Contractor will be expected to submit a preliminary SDD including, at a minimum, the information related to the above referenced items. To do so, it is expected that site visits will be required.			
8.2 Site Surveys				
8.2.01	As part of the Preliminary Design, the Contractor is expected to identify any risks or issues that may arise related to existing conditions at Guelph Transit's or City Hall's facilities. A series of site surveys are anticipated to help the Contractor collect necessary information to complete the task. The Contractor shall visit all relevant locations related to installation of system equipment including but not limited to: • Vehicles • Server rooms • Installation bays • Maintenance and repair facilities • All bus/vehicle types and configurations			
8.2.02	The Contractor shall meet with the Guelph Transit IT representatives to agree to system security measures including wording about firewall, data encryption/privacy, and communication.			
8.3 In-Vehicle Equipment Location				

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
8.3.01	The Contractor shall be responsible for identifying the preferred in-vehicle equipment installation location for all coach types and configurations. Documentation including drawings (dimensioned sketches are acceptable) and photographs illustrating the proposed equipment locations shall be submitted.			
8.3.02	To identify the optimum positioning of the equipment on each bus type, the Contractor is expected to supply and use a mock-up of the equipment. Guelph Transit staff will accompany the Contractor on site visits to help determine the optimal location, and will make available in the yard different coach types and variants. Use of the mock-up will also help to properly assess aspects such as grab rail modifications, and base plate requirements.			
8.3.03	The equipment shall be positioned for ease of passenger movement and driver operation, with maximum consideration for passengers with disabilities. Specifically, placement of equipment on low-floor buses must allow for passage of a wheelchair from front door lift (if so equipped), through the vestibule to the passenger section. Furthermore, the equipment shall be positioned so that it will not interfere with access to any other replaceable equipment on the bus, and will permit complete unrestricted opening of all maintenance lids, doors and other access panels. The equipment shall not interfere with any aspect of the operation of the bus, including the access of the driver to their seat or access to operation of the wheelchair lift (if so equipped). The equipment shall not restrict the operator's view of the steps, any part of the bus windshield or any part of the interior of the bus.			
8.4	**Final System Design Document (SDD)**			
8.4.01	The System Design Document (SDD) shall include, as a minimum, the following information: 1. Overall system schematic and architecture; 2. Detailed description of all subsystems and equipment and hardware, including functional description, interface descriptions, communications loading details, material specifications (e.g., environmental, electrical), all sub-documentation, configuration details and installation details; 3. Detailed description of all software, including functional description, system interface descriptions, Graphical User Interface descriptions, database design documentation, standard reports, report configuration utilities;			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
	4. Detailed description of external interfaces including message structure and protocols, such that third party systems or future enhancements could interface to the CAD/AVL equipment. 5. Detailed description of hardware specifications, availability and reliability figures and configuration details, including but not limited to Central System equipment and server to be procured by the clients. 6. Major assumptions and risks; 7. Standards compliance plan; 8. Detailed placement of all relevant equipment on the bus, at the garage at the Central System location; 9. Detailed and descriptive design and installation drawings for each bus type; 10. Detailed wiring location, size, identification, and clamping; 11. Detailed power pick-up location and circuit breaker locations; 12. Detailed cabling requirements; 13. Location of necessary drilled holes and data feeds; 14. Detailed descriptions of information, materials and timing required by the Contractor by other parties; 15. System Security Plan, describing security features of the Central System including fail-over procedure, firewall, data encryption/privacy, and communication. 16. Detailed description of all RS-232, J1708 or other Architecture interfaces; 17. Maintenance Testing and Repair documentation, as related to Section 12.1. 18. List of Spare Parts and Consumables.			
8.5 Installation Design Documentation (IDD)				
8.5.01	The Contractor shall submit Installation Design Documentation (IDD), for Guelph Transit approval prior to undertaking any installation activities.			
8.5.02	The IDD shall provide text, drawings, illustrations and images using adequate detail to allow for quality installation by a technician without further training in conjunction with other installation instructions provided by the vendors of individual equipment components.			
8.5.03	The IDD shall detail: .1 equipment installation locations/mounting; .2 routing, conductors, colour-coding, labelling, and connectors for power, communications and vehicle ground circuits; .3 connections with, any required modifications to and restoration of existing infrastructure; .4 work area and equipment storage requirements; .5 methods and quality standards; and .6 supervision and quality assurance procedures.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
	9. Acceptance Testing			
	9.1 Test Procedures Review			
9.1.01	The testing process for the system shall achieve approved test plans prior to proceeding with installations and testing.			
9.1.02	The Contractor shall attend design meetings with Guelph Transit to discuss the comments and proposed responses. Such meetings shall be scheduled to take place shortly after the Contractor has had a chance to respond to comments. The meeting will be used to reach agreement on any outstanding issues raised through the review process. The Contractor shall be expected to issue notes with agreed upon action items following from the meeting.			
	9.2 Factory Acceptance Testing (FAT)			
9.2.01	Prior to any installation, the Contractor will provide a Factory Acceptance Test. The FAT will take place in the Contractor's facility. The test shall demonstrate all aspects of system functionality as presented in this RFP. All requirements of this RFP must be tested in order for a compliance certificate to be issued. The Contractor should arrange for any simulation software or hardware that may be required.			
9.2.02	FAT shall also be completed on the software to confirm that the required functionality can be delivered by the software. For commercial off-the-shelf products, the FAT may be replaced by stamped quality testing documents. Each requirement listed in the specification shall be tested where possible; if it cannot be tested, compliance shall be proven by corresponding written documentation or certificates. The central system software FAT shall be completed with the demonstration vehicle.			
9.2.03	FAT shall be witnessed by Guelph Transit representatives (Guelph Transit staff and/or designated support consultants).			
	9.3 Mini-Fleet Testing (MFT)			
9.3.01	The Contractor should provide a prototype Mini Fleet Test. Guelph Transit will provide test vehicles to be equipped with all components as will be installed and interfaced to existing transit hardware. The test shall demonstrate all vehicle-related aspects of system functionality as presented in this RFP.			
9.3.02	MFT shall be witnessed by Guelph Transit representatives (Guelph Transit staff and/or designated support consultants).			
	9.4 Installation Testing			
9.4.01	Installation Testing shall be completed on each device in the field once it has been installed and configured. The Installation Testing shall be completed on the device in isolation to confirm that the installed device meets the required functionality. At a minimum, the installation test for each unit shall include (as applicable): power-up/power-down tests, log-on/log-off tests, verification of major functions, and verification of operational interfaces to other devices.			
	9.5 System Acceptance Testing (SAT)			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
9.5.01	The SAT can only be initiated once all system elements have been installed and configured. The SAT looks at the entire system, and tests are completed to ensure that the overall functional requirements are met. The SAT is typically done from the central system software out to each of the devices. Where software interfaces with other software, this interface shall be tested through the SAT for each piece of software.			
9.5.02	Each requirement listed in the specification shall be tested or, in cases where it may not be feasible to test certain functions in the operational environment, evidence for correct function is to be provided.			
9.5.03	SAT shall be witnessed by Guelph Transit representatives (Guelph Transit staff and/or designated support consultants).			
9.6 Operability Period Test (OPT)				
9.6.01	The OPT is a 30 day performance test that is initiated once the SAT has been completed and operation has commenced. Through the OPT, the system is tested under full operations to ensure that the performance requirements are met, and to measure the system reliability and availability. System failures will result in restart of the OPT.			
9.6.02	Any residual deficiencies shall be rectified, together with any outstanding training and documentation having been provided, before Guelph Transit will grant System Acceptance (SA).			
10. Training **10.1 Training Courses**				
10.1.01	The Contractor shall be responsible to train Guelph Transit designated personnel according to the requirements specified herein.			
10.1.02	Training shall take place at Guelph Transit designated facilities.			
10.1.03	Hands-on practical training with demonstration equipment shall occupy a significant portion of all training classes.			
10.1.04	The training presentations and material shall be in English.			
10.1.05	Instruction shall cover equipment familiarization and systems operation. The minimum training is that which is necessary to bring those employees designated to the level of proficiency required for performing their respective duties.			
10.1.06	The Contractor shall provide experienced and qualified instructors to conduct all training sessions. The Contractor is responsible for ensuring that the instructors teaching these courses are not only familiar with technical information but are able to utilize proper methods of instruction, training aids, audiovisuals and other materials to provide for effective training.			
10.1.07	The Contractor is responsible for providing all training materials, training aids, audiovisual equipment and visual aids for the conduct of these courses.			
10.1.08	Instructional materials consisting of applicable equipment operation and maintenance manuals, and supplemental notebooks consisting of additional drawings, procedures, and descriptive information shall be provided.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
10.1.09	Student guides shall include full topic descriptions, illustrations as needed to enhance content presentation, and common problems with comprehensive solutions given. Student guides shall mirror the instructor guides.			
10.1.10	Short student quick guides shall be provided which can be taken onto the bus by an operator and readily referenced (e.g., pocket reference card), to provide instructions on common tasks and troubleshooting techniques.			
10.1.11	All training materials are to become the property of Guelph Transit at the conclusion of training.			
10.1.12	Maintenance training shall commence during the time when equipment is installed on the buses.			
10.1.13	At the request of Guelph Transit, the Contractor shall provide additional training sessions at the contract price per session.			
10.1.14	The Contractor shall submit the training curricula, presentations, and materials for review and approval by Guelph Transit. No training shall commence until these items have been approved.			
10.1.15	Training curricula shall meet all training requirements and indicate course content, training time requirements, and who should attend.			
10.1.16	Training curricula shall be provided to Guelph Transit for review a minimum sixty days prior to commencement of equipment installation.			
10.1.17	Level of competency required to pass course examinations shall be determined by Guelph Transit.			
10.1.18	At a minimum, training should be provided on the following systems: Conventional • Computer Aided Dispatch Training (3 sessions for each dispatcher); • Scheduling and Pullout Management Software Training (3 sessions for each dispatcher) • In-Vehicle Training “Train the trainer” approach (2 sessions, 5 people each); • In Vehicle Training “Train the Operator” approach. (2 sessions for each Guelph Transit Operator). • Traveller Information/Customer Service Training (1 session, 10 people each); • System Administration Training (3 sessions each admin); and • Maintenance Training (2 sessions, 5 people each). • IT Training (2 sessions, 10 people each)			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
	Mobility • Mobility Scheduling and Dispatch Software Training (3 sessions each dispatcher) • In-Vehicle Training "Train the trainer" approach (1 session, 5 people each); • In Vehicle Training "Train the Operator" approach. (2 sessions for each Guelph Transit Operator) • System Administration Training (1 session, 5 people each); and • Maintenance Training (2 sessions, 5 people each).			
10.2 Training Manuals				
10.2.01	Training manuals shall be provided for each training participant, and an electronic copy shall be provided to Guelph Transit. The manuals shall provide information on all of the topics covered during each of the training sessions and include exercises and screen captures. The Training Manual shall include space for the users to take notes during the training sessions.			
10.2.02	The Training Manuals shall be provided at the initiation of each training session.			
11. Manuals				
11.01	At a minimum, the Contractor shall provide two complete hard copy sets plus an electronic version of manuals.			
11.1 Equipment Operations and Maintenance Manuals				
11.1.01	The Contractor shall provide manuals for each type of unit provided unless specified otherwise. The manuals shall provide sufficient detailed installation and maintenance instructions to allow Guelph Transit or its representative to properly and safely install, connect and commission the equipment supplied and to operate and maintain the system.			
11.1.02	The operation and maintenance documentation will be comprised of the Operation and Maintenance (O&M) manuals, User Manuals and System Administration Manuals.			
11.1.03	The O&M documentation shall be submitted to Guelph Transit or its representative prior to OPT testing.			
11.1.04	The O&M manuals shall be a detailed presentation and shall include illustrations where applicable. For each unit, it shall include, but shall not be limited to: • general description • functional descriptions • functional block diagram • operating instructions • maintenance and repair procedures • test procedures • schematic drawings and circuit diagrams and • parts list			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
11.1.05	Each type of maintenance manual shall contain but not be limited to: • Description of operation including start-up, shut-down and emergency procedures • Installation procedures • Complete parts identification diagram and list • Troubleshooting procedures • Inspection procedures • Preventive maintenance procedures and program • Repair procedures • Diagnostic procedures including criteria for equipment swap-out • Wiring diagrams • Electrical schematics with board and cable identification • Adjustment procedures • Seasonal maintenance requirements • Equipment arrangement and drawings • Names and schedules of all lubricants and cleaners used and • Other consumable materials for the equipment stating where used, quantity, service intervals and annual consumption			
11.1.06	The Contractor shall provide a parts list for each piece of equipment supplied. The parts list shall identify the manufacturer(s), model/part number, address and contact information.			
11.1.07	The Contractor may use manufacturer's data and handbooks for individual items of the equipment that are a sub-component of the overall system. All such documentation shall be contained in similar binders.			
11.1.08	Where an equipment component is of such a nature that local repairs cannot be made and it must be returned to the factory as a unit for overhaul, specific information concerning its repair and breakdown into component parts shall be provided.			
11.2 Software User Manual				
11.2.01	A User Manual shall be provided for each software application. The User Manual shall include screen captures and easy to follow instructions to assist the users through all of the tasks that they may need to complete. The User Manual shall include an index.			
11.2.02	At a minimum, the User Manual shall include all information that is available through the context-sensitive help system.			
11.2.03	Fault procedures shall be described, as well as procedures for dealing with problems.			
11.3 Software Systems Administration Manuals				
11.3.01	A Systems Administration Manual shall be provided for each software application. The Systems Administration Manual shall outline all configuration parameters, details on how to configure the parameters, back-up and recovery process, trouble shooting techniques and technical support information.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
11.3.02	Fault procedures shall be described, as well as procedures for dealing with problems.			
11.4 As-Built Documentation				
11.4.01	The Contractor shall provide sufficient documentation to reflect "as supplied" conditions and to facilitate operation, maintenance, modification and expansion of the equipment or any of its individual components to the satisfaction of Guelph Transit or its representative.			
11.4.02	The SDD shall be updated to include the as-built conditions.			
11.4.03	The as-built documentation shall be provided three weeks after the System Acceptance Test (SAT), and updated documentation will be required at any time the Contractor provides software or hardware upgrades.			
12. Operations support and Warranty **12.1 Spare Parts**				
12.1.01	The Contractor shall propose for consideration a list of spare parts (Spare Parts List) to be provided. This list shall include replacement parts, components or sub-assemblies for all items of equipment provided, in sufficient quantities to meet the estimated need for warranty and maintenance purposes for a period of two years, this shall include a minimum of 10% of the installed quantity for each component. The Spare Parts List shall include complete sets of all necessary replacement parts, including, but not limited to: • OBCs • GPS receivers • Antennas • MDTs • Cell data and WLAN communications cards • APC devices • Onboard DMS			
12.1.02	The Spare Parts List shall contain a set of all specialized tools and equipment necessary to install, calibrate, test and maintain the system. All wiring, cabling and adapters shall also be provided. Each item on the spare parts list shall include all ancillary components (e.g., cables, hardware) needed to complete a rapid onboard replacement for the component.			
12.1.03	The Contractor shall provide spare parts in accordance with the agreed Spare Parts List, the full cost of which shall be included in the Contract Price.			

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
12.1.04	The Spare Parts shall be placed into the spare parts inventory and become the property of Guelph Transit upon handover.			
12.1.05	Guelph Transit shall receive replacement spares within 7 calendar days of notice of shipment of the defective part to the Contractor.			
12.1.06	Guelph Transit shall have the option to purchase additional spare components are the proposed price at any time within the warranty period. Additional purchased spares shall be received within 7 calendar days of order.			
12.2 Warranty Period				
12.2.01	The warranty period shall commence upon System Acceptance (SA), and shall terminate two (2) years following SA. Any extended warranties on specific system components that apply beyond this period shall be transferred to Guelph Transit.			
12.3 Warranty Coverage				
12.3.01	The Contractor shall warrant that it has good title to the system and its components and the right to sell to Guelph Transit, free of any proprietary rights of any manufacturer (if the Contractor is not the manufacturer) or other party, and free of any lien or encumbrance.			
12.3.02	The Contractor shall warrant that it has good title to all system software or that it has the right to license the use of such software, or both, free of any proprietary rights of any other party and free of any other lien or encumbrance.			
12.3.03	The Contractor shall warrant that all installation work and all system hardware furnished by the Contractor, including but not limited to all such work and system hardware provided by Contractors or other suppliers or manufacturers, shall be fit for their intended purpose, shall be new and shall be of good quality and free of any defects or faulty materials and workmanship for the warranty period.			
12.3.04	The Contractor shall warrant that all installation work and system hardware and software shall perform according to the specifications for the warranty period.			
12.3.05	It is recognized that the original manufacturer or supplier warranties may expire before the end of the warranty period. The Contractor must therefore provide extended warranties for all such products or equipment (software, hardware, spare parts) and must assume full responsibility for replacement or repair for the duration of the warranty period, the full cost of which must included in the contract price.			
12.3.06	All warranties and guarantees of Contractors, manufacturers and suppliers with respect to any such work and system hardware shall be obtained by the Contractor for the benefit of Guelph Transit regardless of whether or not such warranties and guarantees have been assigned or transferred to Guelph Transit by separate agreement. On Guelph Transit's behalf, the Contractor shall fully enforce such warranties and guarantees.			

PREFRRED REQUIREMENTS

Reference # 13-032

COMPANY NAME:_____

Reference Number	Description	Code	Alternate Requirement Language for CM/E	Proposal Section Reference
12.3.07	The contractor shall provide a number for Guelph Transit to call 24 hours a day 7 days a week. The time from the placement of calls to this number to the time of problem resolution shall be the contractor's response time to the issues. Issues that substantially affect operations shall be resolved within 4 hours. Other issues shall be resolved within 24 hours.			