



TOPEKA METRO

REQUEST FOR BIDS
Technology for Buses
TM-24-01

Appendix 2
Functionality and Quantities

REQUIRED

QUANTITY

Equipment will be installed on twenty-six (26) fixed route buses. Please refer to Appendix 1 for existing equipment on the buses.

AUTOMATED VEHICLE LOCATION/COMPUTER AIDED DISPATCH (AVL/CAD)

- Integrate with existing headsigns (all existing equipment is detailed in Appendix 1)
- Integrate with or replace existing automated passenger counters
- Provide real-time location of buses
- Provide location updates every 15 seconds or less
- At least 4G LTE cellular connectivity
- Ability to easily import initial route and stop information
- Ability to easily and intuitively update routes and stop information from a desktop interface, including the input of temporary stops and detours
- Ability to schedule detours and route deviations which are reflected in all internal and customer-facing real-time maps
- Ability to add or modify bus annunciator announcements from the desktop
- Ability to update inside and outside headsigns messages from the desktop including upcoming stops and PR messaging
- Ability to define the geofence to trigger annunciators and head signs from the desktop
- Ability to define approach heading into geofences to trigger events for annunciator and headsign output
- Provide data feed using an industry-standard data format for real-time signage at stations/stops including, but not necessarily limited to, next 5 arriving buses with arrival times, and routes served
- Provide open API feed to customer-facing transit apps, e.g. Transit App, including the ability to export GTFS and GTFS-RT feeds at no additional cost.
- Provide GTFS-RT feed continuously from day one of operations.
- Provide real-time updates to GTFS static and RT feeds when a detour occurs and routing must be modified.
- Guarantee GFTS-RT feed will not be broken or inoperable due to updates in GTFS static feed.
- Provide backend support for dispatch and other bus operations
 - Route performance analytics
 - Real-time vehicle location mapping with ability to monitor speed, buses departing from defined routes, adherence to on-time performance (OTP)
 - Ability to playback historic bus movement, speed, etc.
 - Run-time, dwell time, OTP, and headway dashboards and/or reports
 - National Transit Database (NTD) certified bus operating reports

- View a summary of network-wide on-time performance for all routes, including daily, weekly, and monthly trends
 - Investigate on-time performance issues as well as passenger ridership by:
 - route
 - stop along a route
 - distribution of how early and how late
 - time of day
 - tabular heatmap format organized by schedule
 - Users can:
 - Edit how they define “on-time”
 - Adjust the dates/times over which the reports are run
 - Reports include information about service changes that impact on-time performance
 - Reports include all scheduled stops with, as well as without, an observed departure time (including missed data and missing service)
 - Download reports in CSV and Excel formats
- Map-based historic playback of vehicle locations by route or a specified vehicle by date/time range with playback functionality
 - Users can investigate vehicles by:
 - route
 - destination
 - trip or block being operated
 - on-time performance or headway adherence
 - date and time range
 - operator
 - bus
- For internal real-time mapping, the ability to display the following information on mouse-over or click on vehicle/stop icon:
 - Bus
 - Speed
 - Bus number/Operator designator
 - Route designator
 - Upcoming stop arrival times
 - Stop
 - Stop name and designator
 - Routes served
 - List of next arriving buses and arrival times
- Ability to predict arrival times based on both timepoints only and all stops
- Headsigns on buses running interlined routes or buses changing routes on next trip will update automatically upon approach to the station or other interlining location
- Ability to run reports without vendor intervention or additional cost
- Support for custom report creation with no additional cost
- Provide reporting tool for system performance including, but not limited to: downtime, apps/website usage, number of customer support requests

- Unlimited internal users, or other authorized users, to access the CAD/AVL system at the same time
- 99.9% uptime or greater, with over-the-air updates and upgrades included in the license for no additional cost
- Ability to combine multiple vehicle position feeds, in real-time, with the intent of producing a higher level of data accuracy and data redundancy in case one feed goes down
- Tools to automatically monitor data feed uptime and health
- Automatic processing of GTFS schedule data, up to every hour if changes have occurred. No human input should be required.
- Predictions support GTFS-rt, including:
 - GTFS-rt Vehicle Positions,
 - GTFS-rt Trip Updates
 - GTFS-rt ServiceChanges v3.1
- Predictions factor in real-time service adjustments including:
 - Canceled trips
 - Added trips
 - Detours
 - Skipped stops
 - Modified departure times
- Proof of successful outcomes in GTFS-RT and other elements at a transit agency of similar size around passenger
- Can automatically populate a service alert based on real-time changes to service
- Create and edit real-time service alerts at the system, route, or stop level
- Approved staff can create the following service changes:
 - Add trip
 - Cancel trip
 - Create detour
 - Close stop
 - Modify departure times
- Approved staff can change the assignment of a vehicle, shifting it from one route/trip/block to another
- See real-time changes to service through the real-time vehicle monitoring functionality
- Passenger facing data reflects service changes through GTFS-rt data feeds and continues to provide real-time information and predictions for detoured routes
- Historical data reports include information about changes to service

CUSTOMER-FACING APP/WEBSITE

- Ability to view on both desktop computers and iOS and Android smartphones with dedicated smartphone app or automatic resizing optimized for mobile screens
- Display of bus locations in real-time
- Display location of nearest bus stops based on customer smartphone GPS location

- For a defined stop, display list of routes served and upcoming bus arrivals with predicted arrival times based on real-time bus performance
- Display full route map with ability to display select individual routes
- Provide link to route data on Topeka Metro website
- Ability for Topeka Metro staff, from the desktop, to post and display system-wide notifications and service alerts to the customer-facing app/website on a scheduled or ad hoc basis
- App will offer trip planning options with single modes, or combination of modes to complete a trip example: walking/transit, bike/transit
- App will currently offer the ability to pay with electronic fare payment. Topeka Metro may not opt to use this feature now, but wants it to be available in the app's current design, rather than having to be designed at a later date.

PASSENGER CUSTOMER SERVICE SUPPORT

- Automated (SMS) text response service which delivers information about upcoming bus stop arrivals based on customer location or selected bus stop as well as service alerts.
- Automated voice response service (IVR) which delivers information about upcoming bus stop arrivals based on selected bus stop as well as service alerts.
- Vendor will maintain IVR phone number "785-333-1113" for use in IVR operations as a part of this RFP and contract.
- Vendor will integrate use of 2 and 3 digits numbers currently in use by Topeka Metro as identifying numbers for bus stops in IVR and texts that customers seek bus stop arrival estimates. In other words, Topeka Metro can continue using the same numbers to identify each bus stop via IVR and texting etc.

AUTOMATED PASSENGER COUNTERS (APCs)

- Integrate with (or replace) 26 currently installed APC systems (front and rear doors) (all existing equipment is detailed in Appendix 1)
 - We have 3 remaining sets from recently retired buses for a total of 26 sets
- Ability to use GPS data to provide boarding/alighting counts for specific locations
- Ability to transmit APC data in real-time via cellular or mobile data connection
- Ability to store and wirelessly transmit data without loss of data upon return to garage if cellular data service is lost
- Ability to produce passenger reports, including average trip length in support of NTD required reporting
- The vendor will be able to produce data reports from this APC data to provide to Metro or a 3rd party vendor to certify a certification process with the FTA to replace the NTD passenger data validation process.

Vendor will provide all needed services to attain NTD certification of passenger counts, average trip length, and all other NTD required passenger reports at no additional charge.

HARDWARE

- All equipment will be available off-the-shelf, non-proprietary, designed for transit use (please provide references and dates in service for other transit properties)
- All equipment will be warranted for 3 years from date of installation
- Will support onboard or remote login of operators
- Informs vehicle operators of changes to service/ detours
- All equipment will provide for battery backup and internal storage to retain data in case of an interruption in power or cellular communications
- Operating temperature range: -40° – 120° F
- All software related troubleshooting matters will be able to be accessed remotely without interface or participation of Topeka Metro.
- Tablet device will have the ability to count passengers in real-time for reporting of passengers per stop if APCs aren't functioning.
- Ability for tablet to be stowed and not require operator confirmation or touch. Transit agency prefers operators not to engage with it once the bus is in service (after the operator signs in)

VENDOR SUPPORT

- Topeka Metro will retain exclusive ownership of all data produced by on-board systems
- Vendor will develop and supply custom reports at no additional cost
- All collected data will be stored for the duration of the service agreement with the ability to transfer data in an openly accessible format at the end of the service agreement for no additional cost
- All collected data will be accessible to Topeka Metro at all times during the duration of the service agreement at no additional cost
- Vendor will supply on-site training for all dispatchers, supervisors, operators, administrators, planners, and maintenance staff at no additional cost
- Vendor will provide additional remote training via webinar and phone as requested at no additional cost for the duration of the service agreement
- Vendor will supply full Users' Manuals for systems and software at no additional cost. The User manuals will cover initial start up tasks, regular daily tasks, rebuilding of blocks, routes, trips etc.
- Vendor will be available via email and phone 24/7 and will respond within 1 hour in a personalized manner, not a automatic reply.
- Vendor will be proactive in development of improvements in the supplied products and will provide the most recent stable updates for software and other systems at no additional expense and provide the necessary support and training to ensure successful deployment
- Vendor will notify Topeka Metro (the Agency) of all software updates and provide training to implement any additional functionality and capabilities
- Vendor will include a maintenance/hosting agreement for the first 5 years along with an annual breakdown of the cost to add up to 5 additional one-year extensions

PREFERRED

CAD/AVL

- Ability to reuse previously defined detours
- For internal Agency real-time mapping, ability to:
 - Customize bus “flags” on real-time map with bus numbers, driver designators, and OTP status, and other bus-specific information
- Display the following information on mouse-over or click on icon:
 - Bus
 - Dwell time
 - Stop
 - Amenities and accessibility
 - Photos
- Ability to set alerts for performance parameters, e.g. OTP parameters, bus speed. These alerts will be sent via email.
- Display available open capacity of bus based on APC data
- Ability to define a speed fence where alerts can be sent if an Agency defined speed is exceeded. These alerts will be sent via email.
- Ability to provide on-bus annunciator announcements in Spanish.

CUSTOMER-FACING APP/WEBSITE

- Display available open capacity of bus based on APC data
- Ability to push notifications about “favorite” stops and routes to app/website users
- Ability to display amenities available at a given stop
- Ability to display a photo of a given stop

HARDWARE

- All equipment will be warrantied for 5 years from date of installation
- All onboard equipment uses wired connections
- Router(s) will be 5G forward-compatible
- Ability to live-stream on-board surveillance (cameras and audio) through secure link to Topeka Metro operations or authorized law enforcement
- Support for LCD displays onboard buses
- Ability to integrate with existing fareboxes (All existing equipment is detailed in Appendix 1)
- Ability to trigger the playback of MP3 audio files based on geofences with files and geofences loaded remotely from the desktop

OPTIONAL

DMS – Real-time Dynamic Message Signs (Existing signs that need a GTFS-RT Arrival Time Estimate)

- Displays will be installed at the main bus station, transfer centers, and selected shelters
- Ability to take a data feed from the CAD/AVL solution specified above to provide:
 - Real-time status update on fixed route buses arriving at a particular stop
 - Service outage alerts
- The signage system should allow users to perform functions from the desktop, including but not limited to, the following:
 - Post emergency and safety alerts to a specific, multiple specific, or all signs
 - Ability to monitor the health of the system and its components
 - Ability to assign routes to signs
 - Ability to configure each sign in terms of update rate, sequencing of estimated times of arrival, messages, current time display, and other similar functions
 - Ability to declare a sign “out of service” and post a message on the sign to that effect
 - Ability to adjust other system operational parameters as required
 - Ability to add authorized users
 - Ability to track changes to notification content and messages dispatched
- Displays
 - Displays will be ADA compliant
 - Ability to display multiple lines of monochrome or color characters
 - Ability to display entire 128 ASCII character set
 - Size/Capabilities, seventeen (17) total
 - Two (2) with a minimum of 12 lines displayed, AC powered
 - Three (3) with a minimum of 4 lines displayed, solar powered
 - Two (2) with a minimum of 3 lines displayed, solar powered
 - Three (3) with a minimum of 2 lines display, solar powered
 - Seven (7) with a minimum of 1 line displayed, solar powered
 - Solar powered signs will have battery backup sufficient to operate 24 hours on full charge
 - Vendor will install signs and assure connectivity and functionality with CAD system and DMS Administration software