Metro

Board Report

File #: 2017-0469, **File Type:** Informational Report   **Agenda Number:** 38

<u>**REVISED**</u>
EXECUTIVE MANAGEMENT COMMITTEE
JULY 20, 2017

SUBJECT: CUSTOMER EXPERIENCE TECHNOLOGY IMPROVEMENT

ACTION: RECEIVE AND FILE STATUS REPORT

RECOMMENDATION

RECEIVE AND FILE status report on efforts underway to use technology and innovation to transform the customer experience of Metro's Bus and Rail system, and mobility in the region in general.

ISSUE

This report provides key accomplishments and technological activities since the last update in the April 2017 to further the goal of improving the customer experience as well as a look-ahead to the next update in October 2017.

DISCUSSION

The following is a summary of progress on customer focused activities for the referenced period.

1. *Connected Buses - project initiated*

The Connected Buses project is an enterprise scale project to provide cellular-Wi-Fi communications to Metro's entire 2200+ bus fleet. The potential benefits of the project are long term and far reaching lay the foundation for the implementation of many new innovative and state-of-art technologies including but not limited to:

- Public Wi-Fi for passengers

- Real-time data improvements

- Predictive and proactive vehicle maintenance

- Safer travel

- Better on-time performance

- Real-time TAP transactions

- Real-time vehicle monitoring

- Service efficiencies

- Marketing/advertising opportunities

The project is planned to ultimately expand to include rail services as well.

Currently, there are 150 cellular-Wi-Fi equipped buses. An RFP to retrofit and additional 150+ contract service buses is in progress with the goal of completion by the end of 2017. All new vehicles will be Wi-Fi-equipped. Several of the projects listed below, will exploit the benefits of the Connected Bus project.

A program to implement buses fleet-wide with cellular Wi-Fi was unanimously approved by the IT Governance Board and included in the FY2018 budget.

2. *Digital Countdown Displays and Real-time Accuracy Improvements - on-going*

There are currently two real-time predictive algorithms in use by NextBus, the contractor which presently provides real-time predictions used by Metro to support nearly 900 countdown displays at stations and stops throughout the county.

- Bus algorithm - uses a data feed supplied my Metro which is created on-the-fly using GPS coordinates from buses. As NextBus was the first company to provide real-time predictions, this process is mature and generally accurate. Accuracy is however, limited by Metro's older polling rate of 3 minutes for most buses. The new cellular-Wi-Fi equipped buses poll every 5 seconds for improved accuracy. A new data feed has been created which injects this more accurate data to the NextBus prediction engine for cellular-Wi-Fi equipped buses.

- Rail algorithm - uses a data feed supplied by Metro which is created on-the-fly using location information from the rail supervisory control and data acquisition (SCADA) system which relies on periodic sensor crossings as opposed to continuous GPS satellite reception. This algorithm is not as mature as the GPS approach, as NextBus has only recently begun providing rail predictions. That notwithstanding, IT technical staff has been working with SCADA engineers and with NextBus engineering to identify and remediate several instances where the original algorithm had significant difficulties. Additional work is required but the current approach is already much improved.

3. *Orange Line Speed and Safety Improvement Project - early design phase*

This pilot project, initiated by Metro Corporate Safety, proposes to reduce travel time for the Orange Line by implementing software to communicate with operators on a dynamic basis to direct them to adjust their speed such that they can receive a green light at the upcoming intersection. The goal is to keep individual buses in green time bands. The potential for speed improvement is nearly 10%.

The prime safety benefit would arise from smoother operation and, fewer on-board falls.

There are also potential benefits for reduced fuel use and less maintenance.

The buses for the demonstration will be cellular-Wi-Fi equipped under the Connected Buses project with 5-second polling rates for GPS data needed to make the speed/timing predictions for sending to the operator's digital display.

If successful, this technology could be applied to other lines for enterprise-wide saving and benefits as more and more buses become equipped with cellular-Wi-Fi.

4.   Shake Alert System Expansion - new project

The Metro Risk Management and ITS departments are coordinating their efforts to extend the earlier Shake Alert pilot project initiated by Rail Engineering to all Metro facilities. Earthquake early warning systems are increasingly relevant for Metro as it rapidly expands operational facilities and rail infrastructure countywide in support of measure M.

In addition to rail operator early warning, this implementation will provide early warning alerts to the Gateway Bus Operations Center (BOC) for real-time dissemination to bus operators via the Connected Bus cellular-Wi-Fi project to signal slowdown and pull over while avoiding bridges/overpasses.

Installation at Metro divisions and facilities will assist in protecting maintenance personnel working around vehicles and industrial or heavy equipment.

5.   Metro Open Trip Planner - recent updates

Metro Communications recently updated the new Trip Planner with nearly 2.9 million addresses from the latest LA County Census data which also includes additional landmarks and intersections. This new data, combined with program improvements to the search engine is largely responsible for a recent 25% increase in usage.

The Communications web and mobile team continues to innovate with the latest web and mobile technologies in support of Metro Customers. A new updated version of the Metro mobile app is slated for implementation in early summer.

6.   *Metro Route Management System - completed*

A new Route Management System used by Customer Relations supervisory staff to maintain route, stop, schedule, map, and fare data for 70 regional transit carriers has been completed and tested. The new system will replace a much older version used for over a decade but no longer supported.

The system provides point and click - drag and drop functionality for rapid complex dataset updating while minimizing the need for advanced technical knowledge by system users. Datasets created support Trip Planning, GIS mapping, 3rd party web-services and real-time API support for driving digital displays. Additionally, datasets can be exported in General Transit Feed Specification (GTFS) format for other downstream systems needing a consistent source of accurate and timely data.

The system provides a map server for supporting GIS overlays of point, linear features and polygons. Metro Real Estate is evaluating its use to satisfy their property management needs as is Metro Security for use in monitoring the performance of the new security contract among the Los Angeles Police Department, Los Angeles County Sherriff and the Long Beach Police Department.

7.		*Subway Metro Rail System Cellular project - Purple Line is operational for Verizon, Sprint and T-Mobile devices.*

Additional milestones were reached this period in Metro's effort to provide wireless cellular coverage in our subway system. The entire Purple Line is now covered by Verizon, Sprint and T-Mobile.

AT&T, which recently completed an agreement to provide service for the Phase One, is projecting to have service available for that Phase later this fall.

The Redline segment between Vermont/Beverly and Vermont/Sunset should provide cell service by late this summer. This is dependent on the construction of another communication room.

The final installation phase between Hollywood/Western and North Hollywood Stations is anticipated to be complete by the end of 2017.

*Phase One stations include Union Station, Civic Center, Pershing Square and 7th Metro.

8.	*NextTrip Bus Arrival Electronic Signage Project - project status*

The NexTrip e-signage project will implement approximately 300 real-time digital displays at existing shelters throughout the Metro service area. These signs display stop-specific information: real-time arrival information for Metro and other municipal operators that operate at these stops, date/ time information, and stop/ route/ system-wide messages. The new signs will also have Push-to-Talk (PTT) technology, allowing the arrival times to be audibly played over a nearby speaker; making this information ADA accessible for the visually impaired.

Approximately one-third of the e-sign installations will be solar powered to help expand Metro's sustainability footprint and provide a lower cost installation solution where access to commercial power is limited.

Currently, programming changes required for supporting the latest model e-signs and PTT devices are being completed and readied for testing at the first three test sites in mid-August 2017. The sites chosen (Spring/Cesar Chavez, 6th/Hope, and Broadway/Venice) are representative of the three site types required by the project:

- Hardwired adjacent 24/7 power

- Solar powered

- Rapid Bus Line Shelter installations

A special ADA braille faceplate has been designed and approved to assist the visually impaired in the use of the PTT units.

The first group of 75 e-sign locations is scheduled for activation by the end of October 2017. The project contractor, Syncromatics, continues to seek ways to expedite the project. To this end, they are reaching out to the City of Los Angeles in an attempt to create a master installation agreement for updating the shelters in order to avoid the need for re-permitting every location individually.

The remaining 225 e-signs will be implemented at a rate of approximately 25 per month for completion by early summer of 2018.

NEXT STEPS

Staff will develop and implement customer experience related initiatives as well as continue to evaluate other technology applications that will benefit Metro's customers.
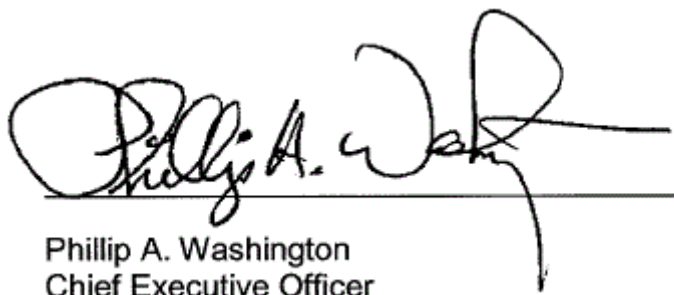
Look-Ahead for Next Period

Staff will report back in October 2017 with a progress update on a variety of customer related technology initiatives, including:

    A. Enterprise GIS efforts

    B. Connected Buses - Public Wi-Fi / Cellular service 'pilot'

    C. Electronic Digital Management System (EDMS)

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