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Date:

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Subject:

Review of Transit Visualization System (TVS) provided by TransLoc

This memo reviews the Transit Visualization System (TVS) developed by TransLoc and discusses the applicability of TVS in meeting CCTA's current and longer- term needs. Further, the memo includes an assessment of its scalability in meeting CCTA's long-term needs.

I. Introduction

The TVS is a visualization system that uses automatic vehicle location (AVL) data obtained from vehicles at a predefined interval over a cellular data network to display real-time vehicle location information. Vehicle tracking information is displayed on a custom-built web-based interface using Flash and Google Maps, and can be accessed via any Flash-supported browser.

Vehicles are equipped with global positioning system (GPS) receivers and cellular data modems to enable mobile data communication between the vehicle and the central system, which is hosted on the TransLoc server. TransLoc provides the required infrastructure (server hardware and software) and ongoing maintenance service for the central system. Thus, because of the underlying technology architecture, this system will have a low capital cost but a relatively high operations and maintenance cost as compared to other AVL products on the market today. Also, since this system is intended to only provide real-time vehicle location information, this solution will not serve CCTA's needs as discussed later in this memo.

Figure 1 shows an example of the vehicle tracking display using TVS for the ShuttleTracker system operated by Harvard University in Cambridge, MA.

II. Current TVS Implementations

TransLoc's clients are mainly small shuttle bus systems operated by universities across the country. Some of these school systems include: TigerTransit at Auburn University, ShuttleTracker at Harvard University, BC Shuttle at Boston College and The WolfLine at NC State University. These systems are much smaller than CCTA. Our opinion is that the TVS has not really been proven in a traditional fixed-route transit environment comparable to that of CCTA. Further concerns related to TransLoc's experience in transit industry are discussed in Section III.

III. Ability to Meet CCTA's Needs

Since the TVS has been designed primarily for shuttle bus systems it will have the following limitations in servicing CCTA needs:

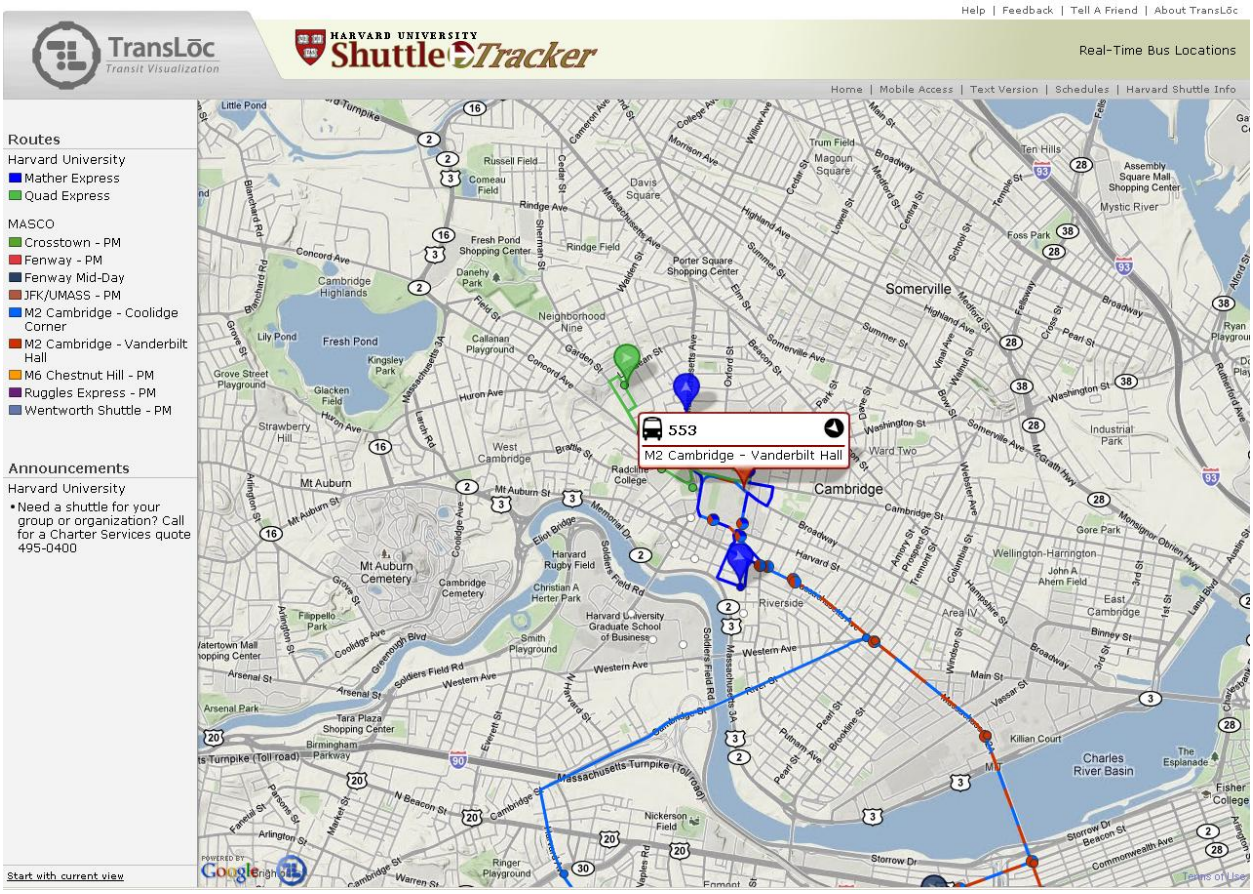

Figure 1. A Snapshot of TVS for Shuttle Tracker (at Harvard University)

A. Operational Differences between CCTA and Existing TransLoc Clients

University systems generally operate headway-based service using a short number of routes. Riders on these systems typically do not require transfers between buses and hence routes are not interlined. Also, a vehicle operator typically runs the same route during the course of the day. However, CCTA operates a complex series of routes that span a wide geographic area with schedules that vary substantially based on the time of day and day of the week. Thus, unlike shuttle drivers, CCTA drivers may have to run more than one route during a service day per their assignment which is prepared using the existing HASTUS scheduling system.

The TVS may not be able to interface with the existing HASTUS software to automatically import route, stop and schedule data for each schedule change. The schedule data is required to associate vehicle location data with information such as run, block, route and pattern, and direction of vehicle travel to create meaningful reports for planning and operations staff. Currently, the TVS does not have this ability since the shuttle bus systems run by universities do not require runcutting or blocking.

TransLoc is not capable of providing schedule adherence information (early/late) to dispatchers and the public. The primary reason for this is that there is no interface between TVS and scheduling software (in this case, HASTUS). Since the TVS currently does not have the ability to calculate schedule adherence either on-board or in the central system in real-time, CCTA would not be able to provide this information if the TVS was deployed.

B. Real-time Vehicle Information for Dispatchers

The information displayed by the TVS on the web-based map is very limited. The vehicle icons display only the current route, direction and vehicle number when clicked (see Figure 1). Additional operational information such as operator number or trip id cannot be displayed along with the vehicle icon since the TVS does not collect and store that information. Generally, this type of additional information is critical to dispatchers to assist them in monitoring operations. Also, the vehicle icons do not provide any information on the schedule adherence of the vehicles (because of the limitation discussed above) which is extremely useful for both dispatchers and the public.

Further, the TVS does not have a computer-aided dispatch (CAD) interface, which assists dispatchers in communicating with drivers using voice calls and data messages. Also, a CAD interface assists dispatchers in activities such as detour management, incident management, route adherence, and silent alarm monitoring. CCTA may require some of these functions in order to meet their current needs. The TVS would require a major software enhancement to provide these capabilities.

C. Real-time Passenger Information

As stated above, the primary ability of the TVS is to provide a visualization of real-time vehicle location through the agency website and customers' mobile devices. Also, real-time vehicle location information may be displayed on liquid crystal display (LCD) signs using TransLoc's web-based display capability. For CCTA, TVS may be able to provide a data feed for the existing Cherry St. sign. However, it is not clear whether this system will be able to provide a real-time information feed to the new light emitting diode (LED) displays since, currently, TransLoc does not have a proven interface. Please note that this system only displays real-time vehicle location and does not provide predicted arrival information, which has been stated as one of CCTA's current needs.

Since the demographics of service areas of university transit systems are different from that of CCTA, the mode of information dissemination should be different. Student riders are likely to have constant access to web-based information via computers or mobile devices. However, CCTA riders may have more limited access to the internet, meaning that other dissemination media are required to be used. Since the TVS does not support the use of dissemination media, such as LED signs or an interactive voice response (IVR) system, the TVS is not a good solution for CCTA.

IV. Demonstration and Further Contact

During our discussions with a TransLoc representative, it was clear that they are willing to provide a demonstration and further information to CCTA, if desired. The representative's contact information is as follows:

Josh Cohen
Email: josh.cohen@transloc.com
Phone: 919-926-9976

V. Conclusions

The TVS offered by TransLoc is essentially a passenger information system that displays the location of transit vehicles in real-time. This information could be helpful to dispatchers for tracking vehicles in real-time on a map, but the system would not provide other critical information that is used by dispatchers to manage operations. The system generates reports based on automatic vehicle location (AVL) data. However, we learned directly from TransLoc that the reporting capability is very limited. The system only provides basic reports on historical vehicle location, and allows the playback of historic vehicle locations. TransLoc can use additional information from a third-

party AVL system and provide vehicle location information, but their system does not have the ability to capture data on its own and provide standard AVL reports that are typically available from other AVL vendors. For example, AVL vendors typically provide reports on:

- Vehicle pull-in/pull-out;
- Operator logon/logoff;
- Schedule adherence breakdown by vehicle, route, pattern and operator;
- Missed trips;
- Transfers/connections; and
- Incidents/accidents.

Further, the TVS seems to have the ability to serve CCTA's needs in providing real-time location information to the public, but it does not have the ability to provide the information that generally is required by dispatchers. Thus, the system is not scalable to meet CCTA's future needs if CCTA intends to use this system in the future for dispatch activities such as incident management, detour management, and voice call and data messaging management.. After further discussions with TransLoc, they may be willing to customize their system to meet CCTA needs, but it could take considerable effort to enhance the system in order to meet CCTA's short-term and long-term needs. Also, since TransLoc does not serve the traditional fixed-route transit market, the abilities of their staff in understanding fixed-route transit operations may be very limited, which will impact the quality of the customized product. Hence, it is recommended that CCTA reviews other products that are available and proven in the fixed-route transit market and installed at agencies of the size and structure of CCTA.