Real-time Transit Passenger Information

A Case Study in Standards Development

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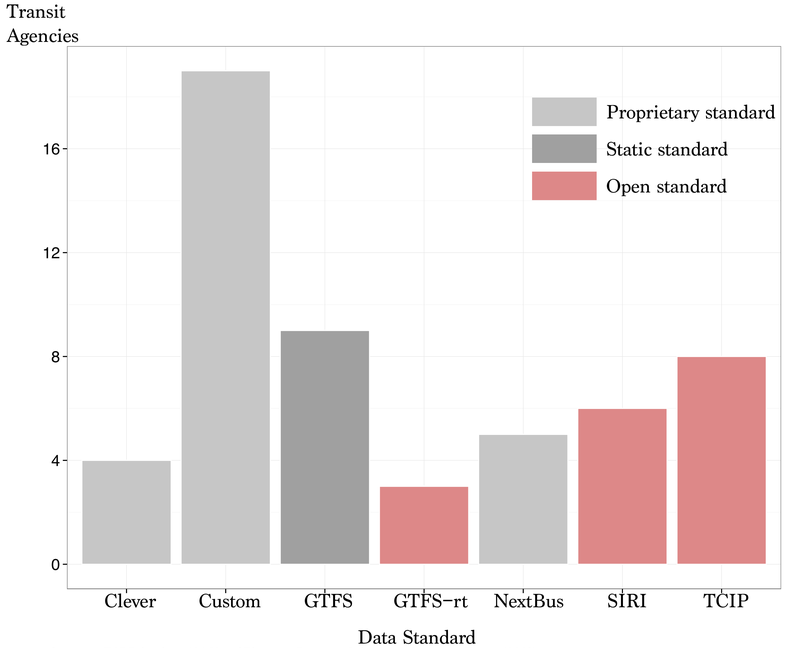
Background

As the transportation sector evolves with the integration of information technology, organizations face decisions that will expose them to new technologies, relationships, and risks. Accompanying a rise in transit-related web and mobile applications, a set of competing data standards from both public and private organizations have emerged.

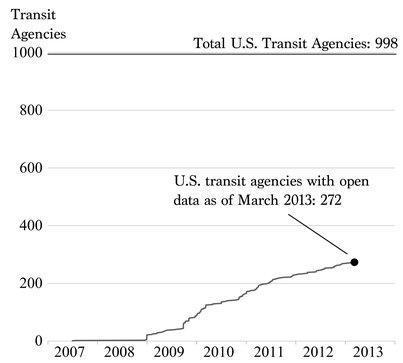
The purpose of this research is to understand the forces that move the transit industry towards the widespread adoption of a data standard. This project will review and assess the development and evolution of real-time transit passenger information standards including:

- the **General Transit Feed Specification for realtime** (GTFS-rt),
- the **Service Interface for Realtime Information** (SIRI), and
- **Transit Communications Interface Profiles** (TCIP).

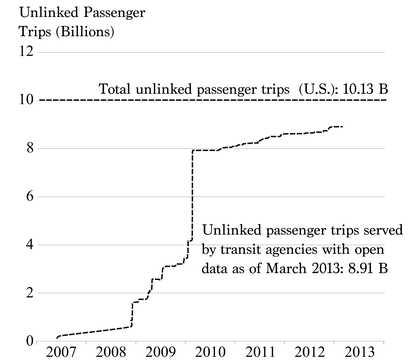


Sources: *TCRP Synthesis 104 Use of Electronic Passenger Information Signage in Transit* (2013)

The above chart shows the number of U.S. transit agencies using respective transit passenger information data standards for information display as reported in TCRP Synthesis 104. Light grey indicates proprietary or closed standards, which are typically not viable for industry adoption. Dark grey indicates static, schedule data standard. Salmon indicates open standards under examination



(a) U.S. transit agencies with open data



(b) Unlinked passenger trips served by agencies with open data

Note: Data indexed using 2011 NTD ridership. and agency statistics
Data Source: National Transit Database 2011, City-go-Round (http://citygoround.org)

Charts (Wong, 2013) showing the explosive growth of transit agencies openly providing GTFS by (a) number of agencies and (b) unlinked passenger trips served, both of which serve as proxies for the adoption of this standard.

GTFS was developed by Google under a proprietary model; however, the company moved towards an open model early on. Although the above show trends for adoption of a static data standard, the recent importance of open data suggests that real-time standards that cater to open data and open source communities will achieve similar adoption rates.

Methodology

The research will be conducted through three major components: (1) a literature review for both standards setting in general and the state of transit passenger information standards; (2) a comparative analysis which will consider real-time data standards in the context of other IT standards war; and (3) a series of interviews with standards development organizations (SDOs) to better understand the standards development process (especially openness), history, and evolution.

Expected Findings

The expected outcome of this research is an analysis of federal stances on standards policy as well as an assessment of current and future trends in this sector--both technical and instititutional. Results will inform the transit policy and action in standards setting and intelligent transportation systems (ITS) requirements, identifying the potential catalysts that will increase the effectiveness of federal- and agency-level programs.

Openness Analysis

The primary method of analysis is based on Krechmer's open standards framework. The framework measures a standard's "openness" in the ten dimensions described below. The researcher suspects these measures to correlate to successful adoption for a standard, especially as open data continues to be a priority of the Executive Branch of the Federal Government and local agencies.

1. **Open Meetings** -- Meetings/discussion (either in-person or electronic) for the standard development should be open to public.

2. **Consensus** -- General (not necessarily absolute) agreement should govern decisions. Stakeholders should be well represented and one group of stakeholders should not outweigh the others.

3. **Due Process** -- Appropriate comment and appeal mechanisms should be in place.

4. **Open World** -- The standard should apply globally to like systems, i.e., it should not be bound by political or social boundaries.

5. **Open IPR** -- Implementation of the standard should be available on resaonable and non-discriminatory (RAND) terms.

6. **Open Change** -- Changes to the standard ought to be made in an open manner, i.e., adhering to the first three requirements.

7. **Open Documents** -- Final and in-progress documentation should be openly published at reasonable or no cost.

8. **Open Interface** -- Backwards and forwards compatibility should be maintained over the life of the standard.

9. **Open Access** -- Conformance verification ought to be generally available.

10. **On-going Support** -- Technical support should be available over the life of the standard.

Sources:
Krechmer, Ken (2006). Open standards requirements. *Journal of IT Standards and Standardization.* 50:6.
Schweiger, Carol (2013). *TCRP Synthesis 104 Use of Electronic Passenger Information Signage in Transit*. Transportation Research Board.
Wong, James. (2013). Leveraging the General Transit Feed Specification (GTFS) for Efficient Transit Analysis. *Proceedings of the 2013 Transportation Research Board Annual Meeting*.