TPB Citizens Advisory Committee: Real-Time Transit Information 101

Eric Randall

TPB Staff

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Structure of Presentation

- Transit Info:
  - Static
  - Real-time
  - Data formats
- What is an API?
- Real-Time Data in US Transit Industry
- Real-Time Data for Region's Transit Providers
- Regional Coordination issues
- Resources / References

Transit Info: Real-Time and Static

What do we use transit data for?

- *Traveler Applications* built for desktop, web and mobile platforms
- *Transit Agency Operations and Planning Applications* that leverage the data to improve safety, efficiency, regulatory compliance, and customer satisfaction of transit operations
  - MWCOG uses for planning and Regional Data Clearinghouse

What transit data is there?

- *Static Data* – most static transit data is now available in electronic form provided in:
  - Trip planners via the web, and
  - In standard formats like GTFS
- *Real-time Information* – larger transit providers are now providing in:
  - Various forms via web tools and applications
  - In various formats

Static Data: Data Visualization

- Static data can be used to produce much information, but is essentially a version of traditional paper schedules.

- Good static information is still valuable, and is the baseline for when real-time data is not available.

http://www.youtube.com/watch?v=J8sjGQV_beo#at=31

Real-Time Data
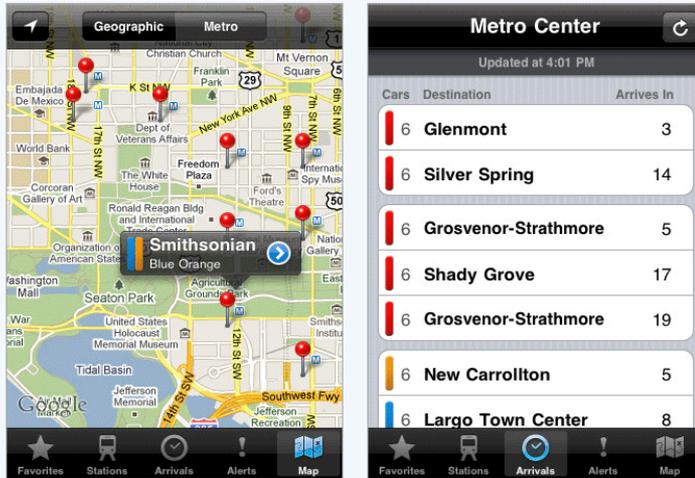
– Time to next bus/train, based on current vehicle location vs. stop location and estimated time to arrive.

- Estimates of arrival time are not always accurate, especially for buses (due to traffic).

– Real-time data is what customers want.

- Smartphones
- Displays

– Also used for operations:

- Dispatching / service control
- Incident response

What data formats are out there?

Static data format

- GTFS – General Transit Feed Specification *(previously G stood for Google)*
  - Common format for public transportation schedules and associated geographic information.
  - Has emerged as a national standard for static information and for the most part is the standard in the region

Real-time data standards have yet to formally emerge:

- GTFS-RT – variation of above for real-time info
  - allows public transportation agencies to provide real-time updates about their fleet to application developers.
- SIRI (Service Interface for Real Time Information)
  - European standard specifically designed for public transport

- APTA Transit Communications Interface Profiles (TCIP) Standard

What is an API?

- Application Programming Interface (API)
  - "Specifies how software components should interact with each other. In practice, most often an API is a library that includes specifications for routines, data structures, object classes, and variables."
  - Formatted data exchange between two computer systems
    - Specific data request (e.g., what time next bus at place X?)
    - Specific data response (e.g., looks at all bus lines that serve X.)
  - Requires common format/standards
    - Not just language or format, but what terms, what order, etc., in a common "vocabulary".
    - Popular formats include: JSON, XML, Protobuf
    - Requires management: WMATA uses Mashery to control data access -> which limits speed at which data can be accessed
  - *These APIs are typically proprietary to the developers*

Using an API

- Two kinds of API: *Everything* and *Transactional*
  - "Everything" – lots of data -> maps, displays, and high-connectivity situations.
  - "Transactional" – limited data -> ask a specific question, useful for smart-phones or low-connectivity situations.

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format of a typical data query

- Mode of Transportation (Bus, Rail)
  - Information Type (Static, Real-time, Support)
    - Data Category (Groups similar information, e.g., Agency Information, Stop Information, Route Information)
      - Data Element (Defines individual data elements available via the API)

Where is the transit industry on real-time data formats?

- New York MTA – modified SIRI (for bus) and GTFS-RT (for rail)
- Los Angeles MTA – internally developed API and Nextbus API
- Chicago (CTA) – Clever Devices BusTime API, separate rail API by QuicTrak
- Philadelphia (SEPTA) – internally developed API
- San Francisco (Muni) – Nextbus API

- The national trend is for transit agencies and others to make static and real-time information openly available to developers at no charge

Where is our region on APIs/real-time data?

- WMATA – originally an internally developed API for bus and rail
  - NextBus Inc. under contract to use this data for bus predictions
  - WMATA has moved to an open API   https://developer.wmata.com/
- DC Circulator uses Nextbus API. Other apps available from DDOT
  http://www.godcgo.com/home/tools-for-getting-around/transit-apps.aspx
- Montgomery County Ride-On – Ride-On Real Time (own API), GTFS-RT
- Arlington ART – Data available in multiple formats (Mobility Lab); contractor Connexionz also provides GTFS-RT
- Prince George's The Bus, Fairfax City CUE – Nextbus API
- Alexandria DASH – Real-time info provided to app developrs
- Fairfax Connector, MTA Commuter Bus, PRTC – real-time info not yet available.

Considerations for Regional Coordination

- Institutional context considerations:
  - Multiple agencies -> multiple data sources
  - Different formats, different uses
  - Liability for data accuracy & integrity
    - Use of data for purposes other than the original intent
  - Relationships with third parties (i.e., NextBus, API developers)
  - Cost of providing information

- Critical questions:
  - What should be the regional standard?
  - Who would build and manage the infrastructure?
  - How would local agencies provide funding and technical support required for support of any regional directory/data hub?
  - What type of governance would be implemented?
    - Ensuring format, regional transit stop identification, periodic updates, etc.
    - Responding to public uses of data, which may alter or use information in unintended ways.

References / Resources

- David Alpert, Greater Greater Washington: Three part series: Jan 16, 18, & 23, 2013
  - http://greatergreaterwashington.org/post/17386/whats-up-with-nextbus-part-1-the-disappearing-app/
  - http://greatergreaterwashington.org/post/17402/whats-up-with-nextbus-part-2-a-pile-of-apis/
  - http://greatergreaterwashington.org/post/17460/whats-up-with-nextbus-part-3-where-ride-on-is-the-leader/

- Kurt Raschke, blogger
  - http://www.kurtraschke.com/

- WMATA PlanIt Metro
  - http://planitmetro.com/2013/02/11/one-day-of-washington-region-transit/
  - http://planitmetro.com/2013/07/19/next-generation-communications/