

## *Public Transportation Embracing Open Data*

Public transportation agencies across the country are recognizing the value of making their data available for public consumption. The Transit Cooperative Research Project (TCRP) recently published a synthesis on this topic entitled *Open Data: Challenges and Opportunities for Transit Agencies* (<http://www.trb.org/Publications/Blurbs/172202.aspx>), which this paper draws from. Sharing information and data is part of the culture of technology, and can lead to a wide range of new ideas and creations. In the era of big data, public transportation agencies are bringing their data into the public domain and generating value from that.

### **Public Transportation Agencies Produce Lots of Data**

Public transit agencies have been relying on internal systems to collect and analyze data for many years. Scheduling software produces timetables for internal use and the schedules passengers see on their buses. GIS software helps agencies produce maps of routes, station areas, and regions transit agencies serve. Computer-aided dispatch/automatic vehicle location (CAD/AVL) systems manage transit operations and track the locations of vehicles in real-time. Automatic passenger counters on buses and rail vehicles count boardings and alightings and measure how long vehicles stop at stations and stops. Real-time arrival prediction software takes data from AVL and scheduling systems to provide predictions on when transit vehicles will arrive at a station or stop.

All of these technologies are used to produce data for public transportation agency consumption in the past. They have helped agencies to improve their internal management and operations. These data can also be released for public consumption as part of an open data strategy.

### **Open Data Overview**

What are “open data”? The basic principle behind open data is that the data released are free to use, reuse, and redistribute. The Open Data Institute has a Frequently Asked Questions (FAQ) page on open data (<http://theodi.org/guides/what-open-data>) that simply states: “Open data is data that anyone can access, use and share.” “Good” open data according to the Open Data Institute,

- can be linked to, so that it can be easily shared and talked about
- is available in a standard, structured format, so that it can be easily processed
- has guaranteed availability and consistency over time, so that others can rely on it

- is traceable, through any processing, right back to where it originates, so others can work out whether to trust it

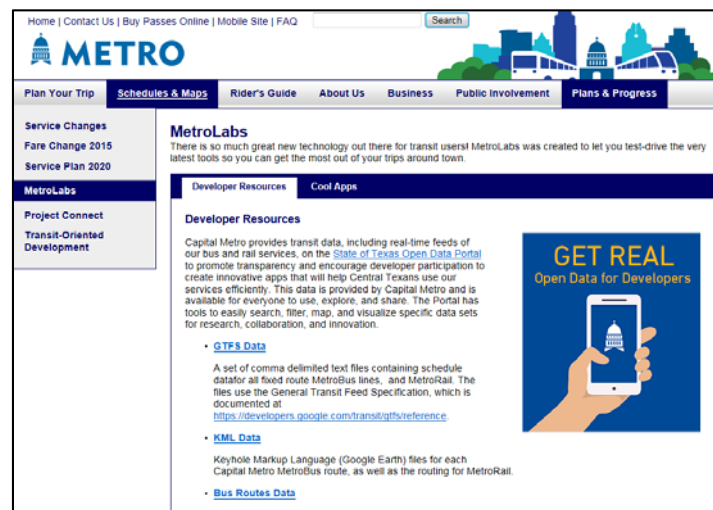
All of these characteristics combine to create a data source that can be trusted by the public and widely used for analysis. Many public transportation agencies are opening up their data sources to the public, and are finding value in doing so.

States, counties, and municipalities are also developing their own open data policies to guide the release of government data. The Sunlight Foundation, a nonprofit dedicated to increasing accountability and transparency in government, keeps track of [the landscape](#) of these open data policies. The policies outline what kinds of data can be shared and in what formats, how to provide confidentiality in government data sets, and who in the organization should make decisions about what data sources to open. See what governments in your area are saying about open data!

## How it's Done

Providing open data starts with creating a page on the public transit agency's website where the public can access open data resources. The page can be as simple as a list of links to various files. Many agencies call this a "developer portal" or something similar. Some examples:

- [MBTA](#)
- [San Joaquin RTD](#)
- [LA County MTA](#)
- [TriMet](#)
- [Port Authority of Allegheny County](#)
- [Capital Metro](#)
- [Utah Transit Authority](#)
- [York Region Transit](#)
- [Yuma County](#)



*Capital Metro (Austin, TX) [Developer Website](#)*

These pages usually have information about the different types of data provided, licensing information, contact information where users can ask questions, and links to interesting projects created using the data.

Some agencies are also sharing their open data on city and state open data portals. Capital Metro in Austin, TX shares its real-time feeds and GIS files not only on its website, but also on the [City of Austin Open Data Portal](#)

and the [State of Texas Open Data Portal](#). The Chicago Transit Authority shares its real-time feeds, along with extensive ridership information by station and GIS files on the City of Chicago Open Data Portal.

Public transportation agencies also engage their open data users through a variety of tools and events. Simple email lists help agencies keep data users informed of updates and changes to the data. Some public transit agencies have set up Google Groups where users can discuss the agency's data and how they are using it, and interact with the data contacts at the agency. Public events can foster face-to-face contact between data users, developers, and public transportation agency staff. Some agencies have held app contests to generate interest and excitement around the initial release of open data, to get several apps off the ground at once. Hackathons can create excitement around using agency open data for a single event, and meetup events establish a schedule of monthly or quarterly gatherings of programmers and others using public transit agency data.

Public transportation agencies of all sizes have hosted app contests to generate interest around their open data and to help jumpstart a stable of public transit apps. Champaign-Urbana Mass Transit District held an [app contest](#) after the release of version 2.0 of their open data API (application programming interface). The New York MTA has hosted a series of [App Quests](#) to encourage the development of new tools.

## **What About Licensing?**

Many agencies provide short and simple license agreements. Data users usually do not have to sign an agreement or provide anything to the agency – downloading the data is confirmation of agreement with the license. Removing barriers to the data download process helps attract even more data users.

The TCRP report identifies (page 22) some common elements of public transit agency data licensing agreements:

- The agency reserves the rights to its logo and all trademarks. These marks are an indicator used for official information from the agency only.
- The data are provided without warranties.
- No availability guarantees are expressed or implied.
- The agency retains full rights to the data.
- The license is free of charge and is made between the [agency] and a licensee.
- The licensee may freely copy and deliver; modify and use (e.g., for a commercial purposes); and combine and use as part of an application or service.
- It is not mandatory, but we highly recommend, that the name of the licensor (e.g., Finnish Transport Agency) is shown.

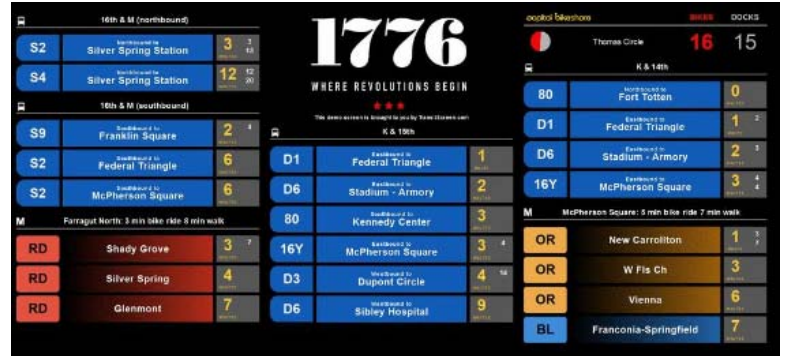
By using these elements, public transportation agencies are protected from harm, get credit for releasing their data, and the public is easily able to reuse and reproduce the data.

## **What is Transit Open Data Used For?**

Public transportation open data helps to advance the culture of innovation in the tech sector. App developers, researchers, transit fans, and others are constantly finding new ways to use the data public transit agencies provide. The products created using public transit open data inform transit users about service and empower them to make better decisions about which public transit services to use and when. Visualization tools created

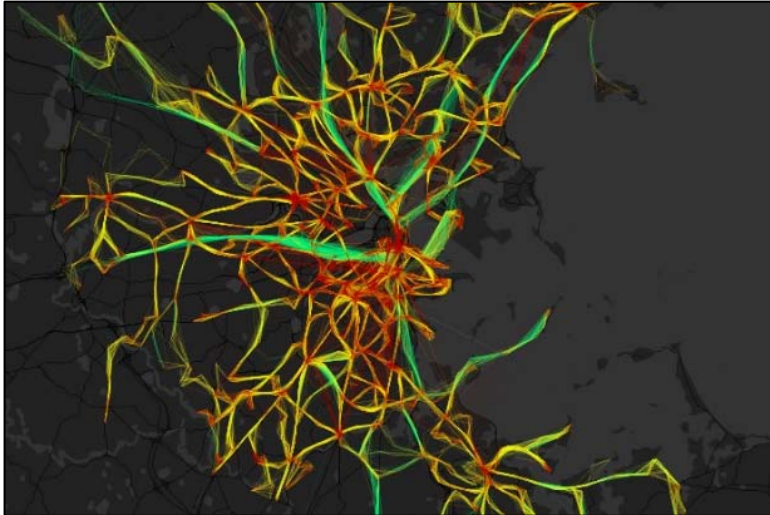
by the public using open data can increase the visibility and knowledge of existing public transit service. The experience of the MBTA in the Boston area shows that apps created using open data can even increase public transit ridership.

Public transportation agency open data also helps foster business development. App developers are able to generate income from innovative apps they create using open data. Transit Screen, Inc. created a business developing informational screens for building lobbies and public spaces using open data from public transit agencies and other transportation providers.



*Transit Screen, Inc. Information Display*

Open data efforts also generate interest from the public and help to inform them about public transit service. Many agencies have found that members of the public create fun projects and informational blog pieces using open data. Here are three examples of interesting and engaging presentations of data using public transportation open data releases.

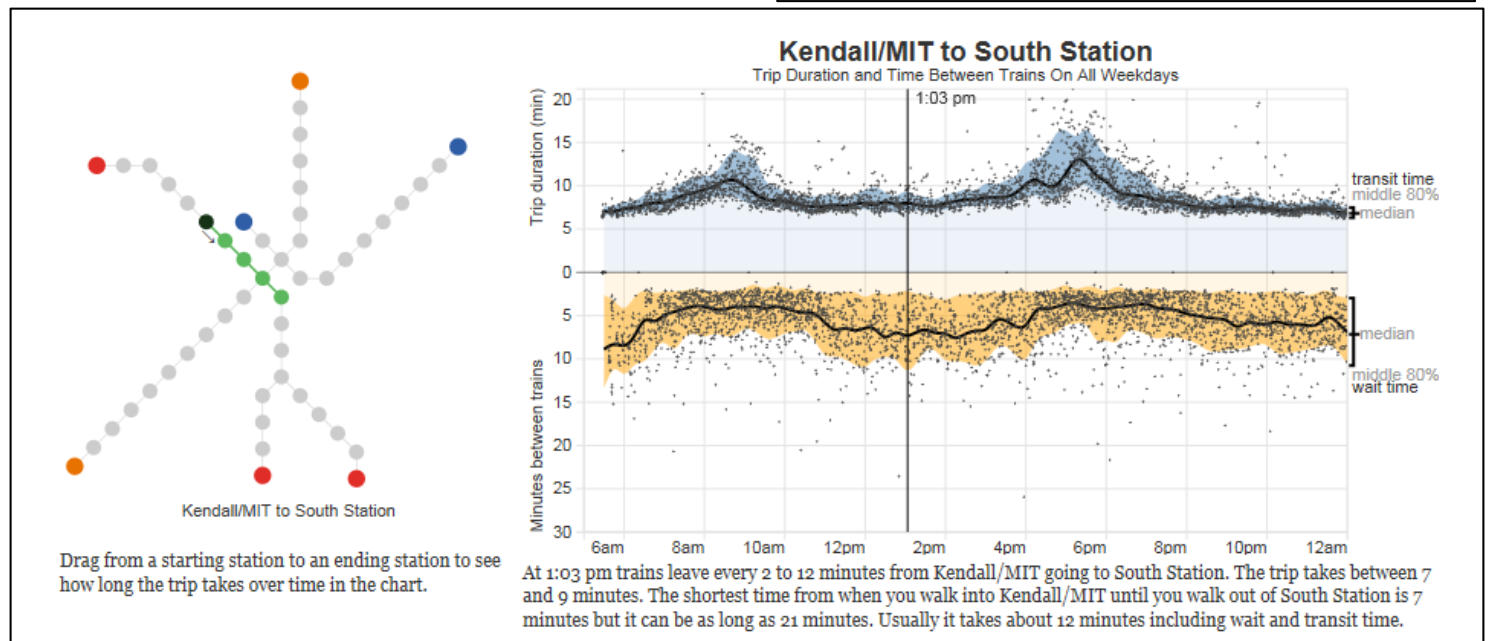
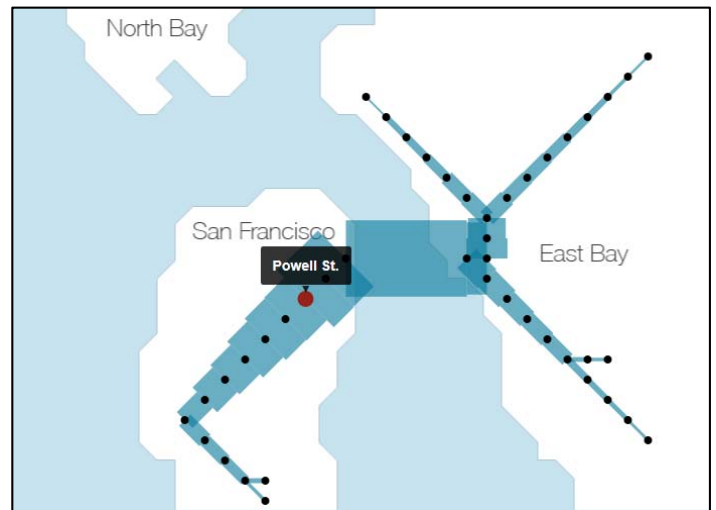


Cartographer Andy Woodruff created this online tool that visualizes the speed of MBTA bus routes – and generates a new map of the region’s bus speeds every day. These maps have been used to explain how bus speeds and service change with weather and other events. The tool uses MBTA open data on bus positions to calculate speed.

[\(http://bostonography.com/2013/live-mbta-bus-speeds/\)](http://bostonography.com/2013/live-mbta-bus-speeds/)

Robyn Perry, Shubham Goel, and Kayu Chen created this visualization for their Information Visualization and Presentation course at the UC Berkeley School of Information, using openly-available BART ridership data. The visualization shows where riders traveled from a selected station during the month the user selects.

(<http://whatanapp.com/bartviz/>)



This visualization by Mike Barry and Brian Card shows graphs of wait time and travel time throughout the day on a trip the user selects. The visualization helps explain how frequency and trip speed change throughout the day, especially at rush hour. (<http://mbtaviz.github.io/>)

### Benefits to Public Transit Agencies

Public transportation agencies are realizing many benefits from opening their data to public use. In the survey done for the TCRP report, 66% of responding agencies said that providing open data improved the perception of their agency with regards to transparency and openness. Agencies also reported that the public was more aware of public transit services because of open data – 78% of agencies responded that this was the case. According to the survey respondents, public transit users also benefited from access to high-quality information about public transit service, and users were able to access more public transit apps and better public transit apps as a result of open data.

Agencies also saw internal benefits from their open data programs. By developing internal processes as part of an open data effort, several agencies reported that they were able to better use web services and other IT



infrastructure that they already had. This provided better return on investment from those IT services and infrastructure agencies were already paying for. Agencies also reported that their open data programs led to new and better data sources for internal use. Relationships and coordination with regional actors like metropolitan planning organizations, departments of transportation, and other public transit agencies were improved according to the responding agencies.

A [recent article](#) in State Tech Magazine detailed the efforts in Albuquerque, NM to create an open data program. The city learned throughout the process that by providing open data, they could devote less staff time to fulfilling data requests from city partners. Several useful apps were created and updated to use data from the city's public transit agency, ABQ Ride (an APTA member), as a result of the open data initiative. ABQ Ride real-time apps help public transit riders know exactly when their bus is coming using the open data generated by the AVL system on each bus and provided free to the public by the agency.

### **Open Data Benefits Agencies and the Public**

Public transportation agencies around the country are opening their data to public use and generating the benefits discussed here. Open data efforts have led to a more informed public, better access to public transit information for riders, and more streamlined processes and relationships for public transit agencies.

## Acknowledgements

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### For More Information

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## The American Public Transportation Association (APTA)

Michael Melaniphy, President and CEO

The American Public Transportation Association (APTA) is a nonprofit international association of 1,500 public and private sector organizations, engaged in the areas of bus, paratransit, light rail, commuter rail, subways, waterborne services, and intercity and high-speed passenger rail. This includes: transit systems; planning, design, construction, and finance firms; product and service providers; academic institutions; transit associations and state departments of transportation. APTA is the only association in North America that represents all modes of public transportation. APTA members serve the public interest by providing safe, efficient and economical transit services and products. More than 90 percent of the people using public transportation in the United States and Canada ride APTA member systems.

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## APTA Vision Statement

APTA is the leading force in advancing public transportation.