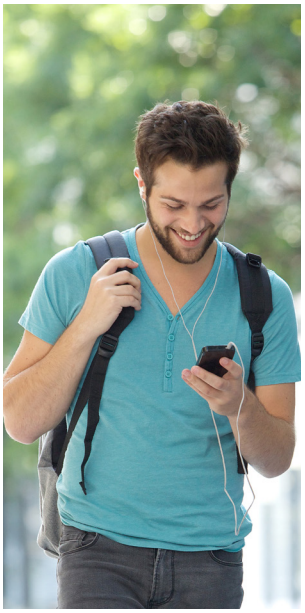

Passenger Information Systems:

What Transit Agencies Need to Know

TripSpark

www.tripspark.com

As transit service continues to evolve, passenger information systems are quickly becoming a mainstay in today's public transit domain. Integrated systems that keep passengers informed along their journey are increasingly in demand, and transit agencies must find a way to keep up with this need.

A passenger information system is the key communications link between a transit agency and their riders. Passenger information technology lets a transit agency communicate with its passengers to provide them with real-time bus location and status updates, schedule data and timely announcements. It vastly improves the transit experience for riders and streamlines work for agency employees.

THE BENEFITS

The goal of any transit agency is to provide efficient, reliable service to their riders. For this to occur, information about an agency's service must be effectively distributed to the public. Implementing a passenger information system means:

- **Reduced Perceived Wait Time:** The negative impact of transit delays is minimized, leading to increased ridership numbers and the perception of better customer service.
- **Increased Dispatch Efficiency:** Dispatchers and call-takers won't have to deal with as many 'where's my bus?' calls, which means more time for everything else.
- **No More Guesswork:** Passengers won't have to guess when their bus will arrive—they'll know

Here are a few Return on Investment (ROI) figures[1] that demonstrate the impact that passenger information technology has made on transit operations.

- **65%** of passengers felt they 'waited for a shorter period of time'
- **64%** thought service had improved (it had actually decreased)
- Generated greater than **1.5%** new revenue
- **5%** increase in bus riders
- Benefit: cost ratio in excess of **2:1**

THE TECHNOLOGY

There are a number of fundamental elements that go into building a passenger information system. Here are the required technology pieces:

1. An integrated GPS device on each bus to collect real-time bus location data as it relates to the schedule, and send it to the office.

2. A wireless network to send the data from the buses over to the office.

3. Computer-Aided Dispatch/Automatic Vehicle Location (CAD/AVL) software in the office to make sense of all the data and output it in a user/developer friendly format.

KEEPING PASSENGERS INFORMED: THE METHODS

With these elements in place, passenger information system technologies work to distribute bus status and location information to riders. Transit agencies can decide which combination of methods would best serve their riders and fit within their budget.

1. Wayside and Transfer Station Signs

A common way of getting information to passengers is through the use of wayside signs. Wayside signs stand at bus stops or terminals and inform passengers of the estimated time of departure of upcoming vehicles. They are a useful way for transit agencies to dynamically manage and distribute their information. In addition to providing passengers upcoming bus departure times, they can also provide information such as time, temperature and news updates.

Wayside signs use the real-time data generated by the CAD/AVL software to tell riders when buses are expected. It is important for transit agencies to look at the pros and cons of installing wayside signs to get a better idea if it is a right fit for their operation.

Pros:

- Wayside signs are a big benefit for passengers—they're not waiting and wondering when the next bus will be by.
- They are an added communication device, which helps transit riders identify the locations of their desired buses/routes at-a-glance.
- Wayside signs can be linked to an RSS feed that provides extra information for passengers, such as temperature, time, weather and transit notifications.

Cons:

- Wayside signs are expensive, and may not fit within every agency's budget. It's not just the signs themselves that are expensive; the up-front costs of installing wayside signs, like construction and power, are high as well.
- Due to the cost, wayside signs are not usually put up at all bus stops. They are usually installed at main terminals or bus centers instead.
- Some argue that since most people these days use mobile phones, wayside signs aren't necessary. Passengers can just as easily get schedule and bus information with a web-enabled mobile or smart phone, or via SMS.

2. Website

Most transit agencies already post their static schedules on their websites. This is an effective way for passengers to get transit information, but this doesn't let passengers know if or when the service is disrupted, in real-time.
With a passenger information system, an agency's website can offer passengers much more than just a place to look up schedule information. It can give passengers a comprehensive picture of their service, and provide passengers with tools to enhance how they use public transit. Here are a few points to consider.

Pros:

- Passengers have access to transit service information in real-time.
- Transit agencies can update not only static schedule information, but dynamic transit information as well. Dynamic transit information can include next bus departure times, real-time bus locations, service delays, emergency information; weather updates or any other changing information the agency wishes its customers to know.
- A website can integrate with Google™ Maps, increasing versatility as well as giving passengers a place to plan their trip from beginning to end, without needing to call the agency for this information.
- Personalized rider accounts can be set up, allowing passengers to get updates specific to the routes and buses they take.

Cons:

- Integrating the real-time data feed with the website requires skilled developers and can be expensive.
- Having a website that offers real-time transit information can require a greater time investment to ensure data is up-to-date.

3. Mobile Website

A mobile website offers many of the same features as a standard website, but it is different from a normal website in that it is formatted for use with a web-enabled cell phone or smart phone, like an iPhone or BlackBerry. A mobile website provides information in a straightforward and easy-to-use manner. Here are some reasons why transit agencies may or may not want to make use of a mobile website.

Pros:

- A mobile website is different from a mobile application (or app) in that apps can only work with specific smart phone devices. Having a mobile website means that real-time transit information can be accessed using any web-enabled cell or smart phone, offering greater flexibility for riders.
- Gives passengers a way to quickly access real-time transit information, or check the status of their bus at any time, no matter their location.
- A mobile website contains most of the pertinent information passengers will likely want to view.

Cons:

- Requires development costs on the part of the transit agency.
- Not all passengers use cell phones or smart phones and this technology may not be useful for elderly riders.

4. Real-Time SMS

Recent statistics estimate that 82% of adults in the United States use a cell phone or other mobile device, and 72% of these adults use their phones to send and receive text messages[2]. As a result, being able to get real-time bus information using SMS is a very useful option for passengers. Passengers waiting at a bus stop can text message the agency using a designated phone number and the bus stop code found on the bus stop sign they are at. The system will automatically return the departure times of the next few buses leaving that stop in real-time.

Pros:

- Having SMS options at bus stops is a great way to communicate with riders.
- Passengers can stay informed on-the-go.

Cons:

SMS can be expensive and complicated to implement. There are two ways a transit agency can set itself up to offer SMS messaging:

Method #1: One method is for transit agencies to set everything up themselves. This is usually done by large agencies. The first step is for the transit agency to set up a short code. A short code is a five or six digit number that a rider would have to text to get information. They are used to address SMS messages from mobile phones. Short codes can be obtained from websites that manage them, such as **www.usshortcodes.com** for example.

The next step is to take the number (short code) and go to an aggregator. An aggregator is a conglomerate that has agreements in place with various wireless carriers. A small aggregator might only have a deal with one carrier, whereas large aggregators have deals with all the carriers. All of these aggregators charge agencies a fee per message to use the system.

The downside to this method is that it can have a variable cost which is hard to plan for. This stems from the fact that if a transit agency chooses this method, they have to pay for every inbound and outbound message. Therefore, if the agency has a month where there are many service disruptions due to bad weather, for example, it is likely that many more text messages would be received. The agency will have to pay a fee for every one of these messages, making costs unpredictable and higher than normal.

Method #2: The other method is for transit agencies to use a third-party provider. These providers have bought a short code and have gone through the process discussed above. A transit agency that uses a third-party provider has to tag a keyword at the beginning of a message. That keyword is what gets sent to the agency. The messages

containing this keyword are re-routed to their servers and disseminated.

The upside to this method is that third-party providers will typically charge agencies a flat fee per month instead of the agency having to absorb the cost of every outbound and inbound message. Also, transit agencies don't have to negotiate contracts with the larger aggregators, which is an attractive option for smaller agencies.

5. MOBILE APPLICATIONS

Mobile applications are yet another option for getting real-time transit information to riders. There are a number of compelling reasons to consider offering mobile applications, as well as a few things to take into account before going down this path.

Pros:

- Releasing transit data allows developers to create useful mobile applications of immense everyday value for riders without the agency needing to contribute time or money towards development.
- For those riders who use smart phones, there certainly is a demand for transit-specific apps.
- Software developers can take initiative and create applications that offer a range of unique capabilities, many of which use the data in ways transit agencies hadn't considered.
- Mobile applications make transit more accessible for new riders, and can encourage more people to use public transit.
- Opening transit data is a great way to connect with and engage riders.
- If transit data is released online, time spent filling requests for data can be saved because everyone can access the data from a single location.
- Agencies that release and update their transit information know for certain that the public always has the most current information regarding their service.

Cons:

- Mobile applications aren't universally compatible with every type of smart phone. This means an app developed for an iPhone won't work with a BlackBerry, and vice versa.
- If third-party developers are creating apps, transit agencies have no control over what they build.
- Unless a transit agency takes full control to develop mobile applications for every smart phone platform, which can be costly, there is always a chance that a percentage of the smart phone-using rider base will be left out.

WEB SERVICES

If a transit agency does decide to allow developers access to their data as part of a passenger information system, it is important to understand what web services are and how they work.

The data that a CAD/AVL system gathers can be transmitted over the Internet. This data is what's known as a web service, and agencies can use it to provide route, schedule, bus location, and departure information to passengers in real-time. Web services are the foundation that nearly all passenger information technologies are built on.

Web services have a set of programming tools that let developers access transit data from a database. They include a set of function calls, such as 'get schedules,' for example. A developer can send that call to a specified IP address and the server recognizes the call and responds with the required data.

The transit agency provides developers with a document that instructs them how to get the information they want, and the information is returned in a standardized developer-friendly language, XML. Web services give agencies a controlled way to let developers and the public access data on their servers.

CONCLUSION

Passenger information systems are becoming indispensable in today's public transit realm. They are evolving to respond to the demand by riders to have transit information provided clearly, quickly, and in real-time.

Implementing a passenger information system benefits both passengers and the transit agency itself. The system benefits passengers by providing accurate, real-time information about a bus's location, status, and its estimated time of departure.

A passenger information system offers transit agencies numerous options for providing real-time information. Any combination of the methods discussed can be used effectively. If an agency already has CAD/AVL technology in place that outputs web services, a passenger information system is well within reach.

A passenger information system is a way for transit agencies to improve their communication systems in a way that will not only generate revenue, but improve customer service and satisfaction as well.

TRIPSPARK MYRIDE

Easy to implement and deploy, TripSpark MyRide is a comprehensive passenger information system that allows riders to access accurate, real-time transit information on a user-friendly website, cell phone or smart phone.

Bus Locations

Passengers can log onto MyRide and see the real-time location and capacity of all buses on an easy-to-view map and find out the times of the next buses passing through their stop.

Real-Time Departures

Passengers enter a specific stop and route into the MyRide website and it will respond with the real-time departures of the next few buses. The MyRide website can be accessed using a desktop computer or smart phone.

Real-Time SMS

Passengers can text message their agency using a designated phone number and the bus stop code from the bus stop where they are waiting. The system will automatically return the departure times of the next few buses leaving that stop. This gives passengers without web-enabled cell phones a way to get accurate transit information on-the-go.

Configurable Alerts and Notifications

Passengers who sign up for a rider information account on the website will receive automatic alerts for their most traveled routes and stops, when they want them. Alerts are sent out via SMS text message or email.

Trip Planning

The Trip Planner is helpful for new or infrequent riders, allowing them to easily plan trips using the Google™ Transit Maps integration on the MyRide website.

RELEASING TRANSIT DATA

Transit agencies that make their web services accessible to the public are releasing, or opening, their transit data. Releasing transit data can further enhance passenger information and ridership buy-in, in addition to the other technology options, such as wayside signs or SMS messaging. If an agency wishes to release their data, they need to follow these steps:

Step 1:

Provide an IP address where the data can be accessed (Create either a developer page on an agency site or provide an URL from a third-party that is authorized to host the data)

Step 2:

Create a License Agreement or Terms of Use (A license agreement, or terms of use, will outline how the data can be used by developers)

Step 3:

Create and provide a document that outlines the web service function calls and commands to access the data

Step 4:

Keep developers aware of if and when changes happen to the web services (A simple RSS feed can alert developers when changes have been made to an agency's web services so they can update their applications and ensure they are accurate)

Sources

1. Passenger Information Systems website: http://www.dft.gov.uk/itstoolkit/Tools/T20.php.
2. Lenhart, Amanda. Cell phones and American adults. Pew Internet & American Life Project, September 2, 2010, http://www.pewinternet.org Reports/2010/Cell-Phones-and-American-Adults/Overview.aspx, accessed on February 8, 2011.