There's an App for That

Apps Help Mobility Management Professionals Empower Their Customers

One of mobility managers' essential contributions to the lives of the customers they serve is their active role in connecting them to the transportation options that are most responsive to their needs. Whether their "customer" is an entire community, a specific agency customer, a particular target population, or individuals seeking assistance, mobility management practitioners excel at

- Staying informed about the range of existing community transportation services,
- Sharing that knowledge with customers, and
- Helping people connect the dots so they have mobility throughout their entire trip.

Although mobility managers will continue to provide value through delivering information, referral, and assistance services using paper-based and web-based products and services, the presence of and evolution of smartphone and computer applications ("apps"[1]) can transform the way in which they empower their customers.

The popularity of apps has grown apace with the burgeoning growth in smartphone ownership and geographic coverage. Overall, 56% of American adults now own smartphones, and by 2015, the number of mobile Internet users is expected to reach 788 million. Having limited income does not seem to deter individuals in purchasing smart phones: 77% of 18–29 year olds with annual incomes less than $33,000 own one, although this number drops to 22% among 50–64 year olds in the same income bracket.[2] Smartphone ownership is not limited to younger generations either: 18% of Americans age 65 or older own a smartphone and 34% own tablets;[3] 91% of people with a disability own or use a wireless device.[4]

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[1] App: a self-contained program or piece of software designed to fulfill a particular purpose; an application, especially as downloaded by a user to a mobile device (Oxford Dictionary).

[2] Smith A. "Smartphone Ownership in 2013." http://www.pewinternet.org/2013/06/05/smartphone-ownership-2013/ (accessed 8/26/14).

[3] Ibid.

[4] Wireless Rehabilitation Engineering Research Center. "Use of Wireless Devices by Adults with Disabilities." Volume 2013, No. 3. http://www.wirelessrerc.org/sites/default/files/publications/SUNspot_2013-03_Wireless_Devices_and_Adults_with_Disabilities_2013-07-12%5B1%5D.pdf. (accessed 8/26/14)

This brief explores current smartphone transportation apps, with a particular focus on apps that support the travel of people with disabilities, older adults, and people with limited income. The brief concludes with a look at trending developments in future transportation apps.

Early Apps for Urban Transit Agencies

Access to GPS data, open data from publicly funded transit agencies, and crowd-sourced data, along with a more refined understanding of how these data can be applied to transportation, has led to the rapid development of transportation applications. And most of these apps are being developed not with public transportation dollars, but with funds from nonprofit and for-profit companies. For example, it was recently noted that there are 55 apps using data from TriMet, the Portland, Oregon transit agency, none of which were created by the agency itself.[5]

Smartphone transportation apps were first developed for the traveling public in urban areas, giving transit customers access to bus schedules and real-time bus arrival information, and progressed from there into

ridesharing, carsharing, bikesharing, and taxi apps. The big change that enabled the development of these apps was an initiative by Google to incorporate fixed-route transit data into its Google Maps program. Any transit agency wishing to post its data to Google Maps had to translate that data into General Transit Feed Specification (GTFS; originally known as Google Transit Feed Specification).[6] Once transit agencies had geo-coded their routes and schedules for Google Maps, taking the next step of using these data in real-time transit technologies for mobile devices, such as smartphones, was easy. Apps developed by using these technologies allowed the creation of data streams that revealed the exact location at any given time of the bus/train and the passenger as well as lines not operating or experiencing delays. Thus, an app could locate a user's current position, find the closest local fixed-route transit stop, and show the user in real-time when the
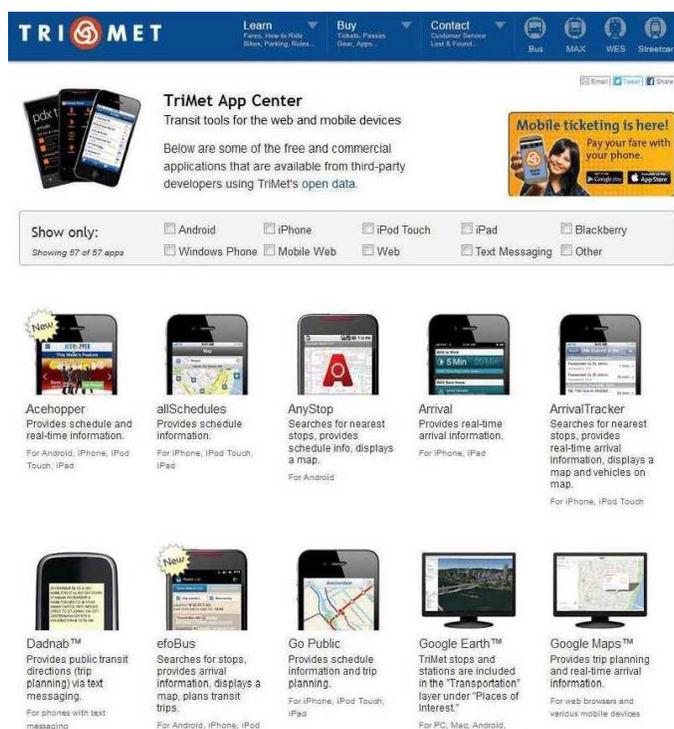
Screen shot from http://trimet.org/apps/ showing multiple apps using TriMet data.

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[5] http://trimet.org/apps. Noted by Kevin Chambers in his presentation during the "Harnessing Technology for Expanded Communication with Customers, Caregivers, and Health Care and Employment Providers" panel, National Mobility Management Conference, June 9–10, 2014, St. Paul, Minnesota. http://nationalcenterformobilitymanagement.org/2014mmconference/ (accessed 9/10/14)

[6] The GTFS Data Exchange maintains a listing of transit agencies providing GTFS data. Agencies that do not currently have data in GTFS format can program it to create a data exchange and then develop an app in house or purchase a program to create to create one.

next bus or train would arrive at that stop. This type of data allowed for the creation of maps, routes, schedules, and interactive sites for trip planning, and, eventually, specific transit apps.

In many ways, transit apps have swiftly moved through their own evolution to meet ever more demanding users and to take advantage of more sophisticated data streams and phones. Today, transportation apps can suggest alternative routes and modes based on real-time traffic and service information; they can pay system fares with a tap or swipe; they can calculate calories burned and or fitness levels achieved while traversing a transportation system; and, in some cases, they are the means by which a user summons a ride. San Francisco's Bay Area Rapid Transit even has an app that indicates how crowded its trains are, allowing users to avoid peak ridership periods.

All of these transportation apps are good news for travelers, giving them access to real-time travel data that can help them plan and use community transportation options more effectively. Knowledge of these new technologies can eliminate the barriers that previously prevented many human service customers from taking public transit or sharing rides and vehicles. They also provide mobility managers with a new set of resources as they improve customer awareness of and access to mobility options within their communities.

Apps for Ridesharing

The use and capability of smartphones is also expanding ridesharing options for many people through apps developed by transportation network companies (TNCs) such as Uber, Lyft, and Sidecar; ridesharing companies such as Carma; and the taxicab industry.[7] The result for riders is increased access to a host of transportation options on demand, including a black sedan, taxi, or privately driven vehicle. Some TNCs are launching specialized services for people with disabilities. Uber has UberAssist, an app that assists riders in finding an UberX driver trained in accessibility and whose vehicle can accommodate folding wheelchairs. A follow-up app, UberAccess, lets passengers order a vehicle with a wheelchair-friendly ramp.[8] Driver training for some Uber drivers is delivered in partnership with the Open Doors Organization, whose mission is to improve the quality of life for people with disabilities.[9] Similarly, Lyft is expanding into the disability market with its LyftAccess service, which recruits drivers with wheelchair accessible vehicles.

Transportation Information Apps Help Low-Wage Workers

Knowing real-time arrival and travel time information for transit vehicles can help hourly-wage workers plan their trip more accurately and coordinating multiple stops (to child care or other locations) within their trip. Being able to more efficiently plan travel on public transit can help workers avoid being docked pay for late arrivals to their job and missed work. For example, a mother who missed her connecting bus after dropping her child off at child care can search a transportation app to determine if other nearby bus routes can also get her to work. Apps can also facilitate connections with other, low-cost modes of travel, including shared bicycles and pathways, hourly rental cars, community shuttles, carpools or shared rides,

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[7] Learn more about existing app-based transportation services. Gilpin L. "10 ridesharing companies that can make your work trip more efficient." Nov. 18, 2014. http://tek.io/1wT2nC7 (accessed 11/18/14)

[8] Fingas J. "Uber's new services bring ridesharing to wheelchair users." http://www.engadget.com/2014/09/03/uberassist-and-uberaccess/ (accessed 9/9/14)

[9] Mallory. "UberACCESS: Expanding Transportation Options." http://blog.uber.com/UberACCESSHou (accessed 9/9/14)

and pedestrian walkways. For workers traveling to/from late-night work shifts or during extreme weather conditions, apps allow them to time their arrival at the bus stop to just before the bus arrives.

Some apps, like the one recently launched by Commuter Connections in the Washington, D.C. area, make it easier to directly download carpool information, which can be a cost-effective means of travel. Using the app, commuters can search for carpool partners by entering their home and work locations and work hours and receive contact information for commuters with similar schedules. Information on the location of park-and-ride lots where commuters can meet carpools or vanpools is also provided. The app even allows access to the guaranteed ride-home program as well as carpool rewards.
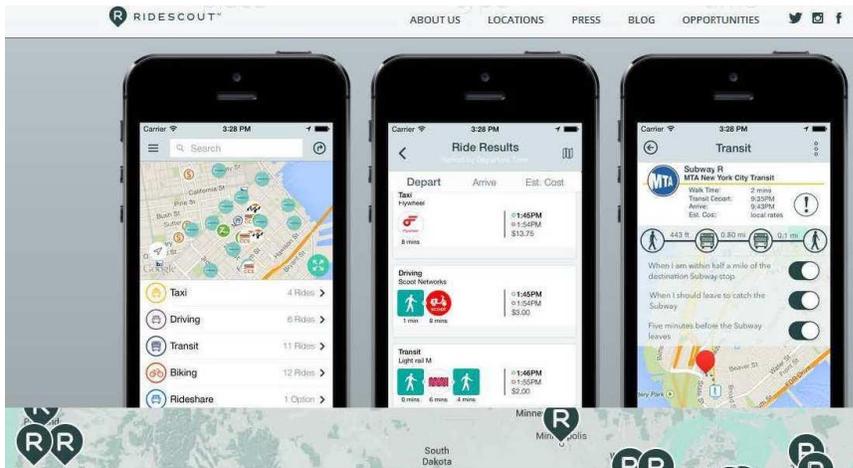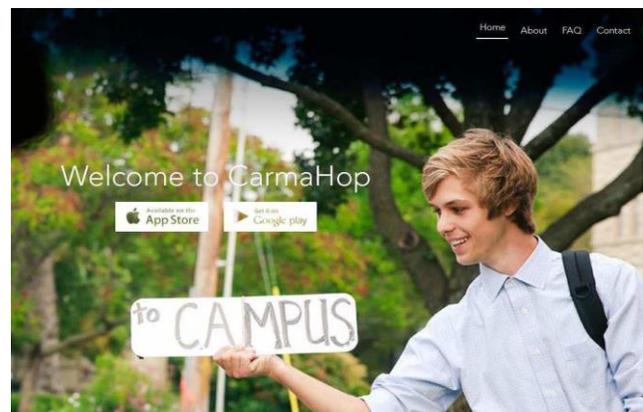

Screen shot from http://www.ridescoutapp.com/ showing sample screens from the app

RideScout's app aggregates multiple ground transportation ride options, allowing users to compare the travel time and costs in real time. The app integrates transit information, carsharing and bikesharing options, taxis, and peer-to-peer ridesharing, and allows users to search for and book rides. Travelers who prefer to walk can use HopStop, which, in addition to providing information about transit, cycling, or taxis, provides point-to-point walking directions. The app also links to restaurants, shopping, and other nearby destinations.

The use of apps is also increasing in rural communities. An individual transportation advocate in Lawrence, Kansas and the ridesharing company Carma developed the new CarmaHop app, a smartphone-based entrée into community hitchhiking. The app, currently operational only in Lawrence, allows pre-registered riders and drivers to connect along major routes in the community. Users are provided with a map of good locations to get a ride, the ability to log trips in real-time, and access to a driver/rider ratings system. There is no cost to ride using this app.

Screen shot from https://carmacarpool.com/hop/ website introducing the CarmaHop app

When designing apps that facilitate long-distance commuting, we can look to other countries for inspiration. Paris-based BlaBlaCar now operates in 12 countries throughout Europe and the

Mediterranean. The app suggests pricing to cover the cost of gas, tolls, and other expenses so passengers and drivers don't have to spend time haggling.[10] The average length of trips booked via BlaBlaCar is 200 miles, with drivers offering seats for the equivalent of $25 or less.

Transportation Apps for People with Disabilities

In the past, front-line case managers assisting people with disabilities relied on published schedules to help them plan their trips. While these are still available resources that can provide general time-frame information about specific transit routes, real-time apps provide up-to-the minute information directly to the customer. Case managers can now introduce customers to relevant transportation apps that will help them plan trips more accurately and reduce wait times for buses, shuttles, and other public vehicles. In addition to these general purpose transportation apps, a multitude of apps designed to specifically assist people with disabilities in traveling throughout their communities has been developed. The impact of such apps on the lives of passengers with disabilities can be life-changing, giving them the confidence to visit new destinations and use once unfamiliar transportation modes.

Given the capacity of mobile technology and apps to enhance the lives of people with disabilities of all ages, it is clearly important that as new transportation apps are developed, they remain accessible to people with disabilities, as defined in Section 508 of the Americans with Disabilities Act (ADA). The Bridging Apps site, developed by the Houston, Texas, Easter Seals affiliate, reviews apps of all types for people with disabilities in terms of usability.

Wayfinding apps assist people with physical and intellectual disabilities in navigating streets and pathways between their homes and transit stops and other destinations. Such apps are designed to provide enough information to allow an individual with a disability to travel alone, giving them unprecedented freedom. One study demonstrated, for example, that when guided by a specially designed, cognitively accessible GPS-based WayFinder app, 73% of the individuals with an intellectual disability involved in the study could travel an unfamiliar bus line and exit at the correct stop.[11] Among other wayfinding apps are the following:

- An app developed for Temple University helps wheelchairs users identify accessible pathways across the campus and incorporates functions that assist individuals with visual or hearing impairments.[12]

- Trekker Breeze, a handheld, talking GPS-enabled device, verbally announces names of streets, intersections, and landmarks and can provide step-by-step travel instruction.

- In Germany, an individual using a wheelchair can access Wheelmap.org, an iPhone app and website to view a map of wheelchair-accessible places. The map identifies accessible cafes,

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[10] Chaber K. "BlaBla is Building a Global Transportation Network out of Empty Car Seats." http://qz.com/239163/blablacar-is-building-a-global-transportation-network-out-of-empty-car-seats (accessed 8/27/14)

[11] Davies DK, Stock SE, Holloway S, Wehmeyer ML. "Evaluating a GPS-Based Transportation Device to Support Independent Bus Travel by People With Intellectual Disability." *American Journal on Intellectual and Developmental Disabilities*, Vol 48, No, 6, December 2010. http://www.aaiddjournals.org/doi/pdf/10.1352/1934-9556-48.6.454 (accessed 8/27/14)

[12] Temple University. "Interactive Wayfinding Case Study." http://amandalynnesmith.wordpress.com/tag/wayfinding/ (accessed 8/26/14)

libraries, swimming pools, and other public places with an icon and allows users to color-code locations that are totally accessible, partially accessible, or not accessible. Places that are not yet marked appear in gray and can easily be updated. Most of the locations are in Germany, but users can also search cities in the U.S. and elsewhere.

Transit apps for people with disabilities have been adapted from data used in general public transit apps, and include apps such as the following:

- Tiramisu transit app, developed at Carnegie Mellon University, which helps individuals with disabilities get to and use public transit. In addition to providing real-time bus times, the app also helps wheelchair users identify buses, using aggregated crowd-sourced data, that have capacity for additional wheelchair users.

- New York State's Metropolitan Transit Authority is piloting a mobile app, known as Accessway, that helps blind and visually impaired subway riders navigate the system. By talking to a user's device, the app informs the passenger about surroundings (e.g., platform locations, nearest exits, navigating within stations).

- Also in New York City, wheelchair users can use Wheely to identify subway stations that have accessible elevators and find elevator status (working or not) in real time.

Finding a wheelchair-accessible taxi or rideshare option can sometimes be like locating the proverbial needle in a haystack. However, apps have been developed to help with that too:

- Using New York City's Accessible Dispatch program's app, Wheels on Wheels (WOW), can request wheelchair- and scooter-accessible cabs. The app provides real-time tracking and notification. People can book their trips for immediate dispatch or for travel within a 24-hour period. In its first 1.5 years of service, the program delivered more than 50,000 riders in the city's more than 600 accessible cabs. Riders can also secure rides through telephone, website, or text message.

During a recent national Online Dialogue on Transportation & Assistive Devices and Technologies, many suggestions for useful apps for people with disabilities were posted, including the following:

- Providing information about the accessibility of specific streets and segments of streets that could be directly entered into an app or obtained from other social medial, enabling a subscriber to receive all information regardless of source. Some of these types of technologies already are being developed for daily use, especially for people with visual disabilities.[13]

- Creating a crowd-sourced application on mobile devices that allows someone to relay their locations via GPS when walking to/from a bus stop. After completing the trip, providing a map that enables the user to note/rank the accessibility of the route.

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[13] Learn more at http://www.mobileye.com

Apps for Older Adult Transportation

As noted above, smartphone usage—and access to apps—among older adults is growing. AARP's website describes smartphone apps that aid seniors wanting to age in place; transportation apps that help them maintain their connectivity to the community support that goal.[14]

Although very few apps dedicated specifically to older adult transportation have been developed, older adults can benefit from many of the apps designed for people with disabilities as well as apps for the general public. Among the most helpful apps are those that provide real-time bus arrival and travel times; these can go a long way toward helping older adults feel they can use public transit safely. Knowing just when the bus will arrive allows them to plan their arrival at the bus stop to reduce waiting time. This is particularly helpful in bad weather or at night. Also, being able to track the bus en route gives them the confidence that the bus will be arriving as promised.

One app crowdsources older adults' experiences to identify "age-friendliness" of different services, including sidewalks and transit services. Users rate locations on things like general accessibility, availability of seating, lighting levels, staff attitudes, and background music levels.[15] The app uses GPS to pinpoint the user's location, and is available for iPhone, iPad, and Android devices. People can simply browse the database to see which locations and services in a neighborhood are considered "age-friendly" and why.

One user-proposed app, noted on the website CollabFinder (a site that facilities partnerships between individuals seeking to develop new projects), is LiftHero, an Uber-like app for seniors. It would allow seniors or their family members to book door-through-door transportation, provided by a cadre of reliable drivers.

Implications of Apps for Transportation Services

The full implications of the increased digitization of transportation information are difficult to predict, but some trends can be noted. All of the apps noted in this brief and similar apps are good news for travelers, giving them access to real-time travel data that can help them plan and use community transportation options more effectively. Using these new technologies can eliminate the barriers that previously prevented many human service agency customers from taking public transit or sharing rides and vehicles. They also provide mobility managers with a new set of resources as they work to improve customer awareness of and access to mobility options within communities.

One rapidly developing trend in apps is API to API connections, where information is transferred directly between computers (and smartphones), substantially reducing the in-person role in the process. (An API is an "application programming interface" or a software intermediary that makes it possible for application programs to interact with each other and share data.) For example, LYNX, the transit agency in Orlando, Florida, is developing a system for scheduling demand-response trips in real-time. Once launched, the

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[14] http://www.aarp.org/technology/innovations/info-06-2011/smartphone-apps-aging-in-place.html
[15] http://www.futurity.org/app-lets-seniors-rate-%E2%80%98age-friendly%E2%80%99-places/ (accessed 9/10/14)

Screen shot from http://www.findmyridepa.com/ showing results of sample transportation search

system will allow customers with a computer or smartphone Internet connection to interact directly with LYNX's scheduling system for general public transportation provided on a demand-response basis. Riders will be able to query the system about the availability of a specific trip or simply ask to be given a seat on the next available trip, which, if the vehicle is already in that location, could mean a very quick response time.

Another trend is the aggregation of transportation information across modes on one app. For example, two companies, RideScout and TransitScreen, give customers data not only on transit options, but also on rideshare, carshare, bikeshare, taxi, parking, and pedestrian options. And although not yet available on a mobile platform, the FindMyRidePA website, developed through a federal Veterans Transportation & Community Living Initiative grant, not only lists available transportation options but also graphs the relevant travel times and lists comparison costs. These one-click (and rapidly becoming "one-tap") transportation information sites will eventually be able to put multimodal transportation information into the hands of every smartphone user, in their own communities and in places they are visiting.

A third trend is the use of open-platform data that multiple transit agencies can access to develop apps. One example is OneBusAway, a multi-region project and a collaborative effort that is enabling the rapid expansion of native mobile transit apps to new metropolitan areas. This system architecture, collaborative design, and development process will allow transit agencies in a multi-state region to provide real-time bus arrival and travel time information for their specific system using a single, regional OneBusAway platform. In this way, when a rider within a region accesses the OneBusAway app, it will automatically detect which transit system serves their current location and display that information. The fundamental

shift from proprietary to open-source software in the transit industry that has made this type of project possible is also examined.[16] A similar app, simply called Transit, is currently available on smartphones.

Changes in the way we learn about and access transportation services appear to be continuing at a rapid pace. Indeed, technology is revolutionizing the transportation world, whether as an app, an advanced scheduling system, a one-click transportation information system, or an autonomously driven vehicle. The National Center for Mobility Management will continue to follow these developments and keep mobility management practitioners informed.

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[16] Center for Urban Transportation, University of South Florida. OneBusAway Multi-region – Rapidly Expanding Mobile Transit Apps to New Cities. Webinar held April 17, 2014. http://www.cutr.usf.edu/2014/04/cutr-webcast-recording-onebusaway-mobile-transit-apps/ (accessed 9/10/14). Also see http://onebusaway.org/.