The Time Has Come: Adopting a Common Data Language to Enhance Mobility

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For millions of people, especially those who do not drive or have access to public transit, getting where you need to go can be a challenge. Yet the technology exists to address this problem, making life better for anyone who needs a ride to a particular place at a particular time.

The key is for providers of flexible, demand responsive transportation to communicate with one another through a common digital language. With such a language—which already is central to other transportation sectors—service would become more available. Passengers could get from point A to point B without worrying about the details. Providers would coordinate smooth travel across different service areas, saving their riders time and trouble.

Until now, such readily organized and available travel has been the exception in the fragmented industry of demand responsive transportation. Comprised of services ranging from senior shuttles to ride-hailing companies (see sidebar, "What is Demand Responsive Transportation?"), demand responsive transportation is characterized by a diverse assortment of providers spread over many overlapping service areas. The result has been obstacles to availability for those who depend on these services the most, notably older adults, people with disabilities, rural residents, and Medicaid recipients.

Fortunately, that all can now change. For the first time, a new (and freely available) specification for data exchange among service providers is poised to enable demand responsive transportation providers, both public and private, to interoperate and thus speak to one another in the same digital language. If transportation services adopt it, riders can become empowered to go where they need and when they wish, with convenience that once would have seemed like a dream. This new specification is a giant step in the right direction.

THE OPPORTUNITY

A data specification now available can lead to one-stop shopping and easier travel for everyone who depends on demand responsive transportation, including nondrivers, many of whom are older, have a disability, or live in remote areas with limited transportation options. The promise of universal mobility will extend to groups that have been long underserved. But achieving this goal will require leadership from varied stakeholders, including leaders in the human services, transportation, health care, and technology sectors.
CONNECTING TO THE FUTURE

“Public transit’s new mobility era and demand responsive transportation require a common data language, allowing different software systems to provide unified mobility service to our communities. The Transit Cooperative Research Program (TCRP) has developed such a language for the industry, in the new TCRP Draft-Report 210.”

* American Public Transportation Association, November 1, 2019.

WHAT IS DEMAND RESPONSIVE TRANSPORTATION?

In demand responsive transportation, a rider requests a trip at a certain time to a certain place. Unlike city buses or trains, demand-responsive services do not follow fixed routes or schedules. Dial-a-rides, taxis, ride hailing, ride sharing, car sharing, bike sharing, and other technology-enabled transportation are examples.

For people who are unable to drive or use regular public transportation, demand responsive transportation can be a lifeline—the only way to get to crucial destinations, such as jobs, medical appointments, or the grocery store. That is why the option is so important for people with disabilities, older nondrivers, and residents of rural areas.

Data Can Promote a Better Transit Experience

An exciting change is occurring right now. Technology-enabled transportation services and new data-sharing capabilities are creating opportunities to modernize responsive transportation and better serve those who rely on it.

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Today’s Reality: Mobility Options Are Limited and Problematic

Most human services agencies and nonprofits that offer rides on demand rely on technology and business models from the pre-Uber past. Many are small and have very limited service areas. They may still depend on Excel spreadsheets and even pens and pencils to schedule rides. Communication between providers is often ad hoc and old tech, based on phone calls and e-mails.

Moreover, the lack of coordination adds to headaches, confusion, and inconvenience for passengers. While community transportation providers may wish to provide better and more seamless service, their limited ability to connect with one another stands in the way.

In the United States today, even more technologically oriented providers of demand responsive transportation typically operate in their own silos using a single software package that is incompatible with that of other transportation providers or brokers in the region. Providers typically serve limited areas and many must abide by rules restricting the type of trip or funding source. For example, a service may have to stop at the county line, or it may not be allowed to take a passenger to the pharmacy on the way home from the doctor.

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1 Kevin Chambers of Full Path Transit Technology defines community transportation as a wide range of mobility services that lean toward the small and are provided by a public agency, nonprofit, or other community group (such as a faith-based organization). Conventionally, the term has been used to describe volunteer driver programs and transportation targeted to serve veterans, older adults, people with disabilities, people in rural or small communities, and people who need medical transportation. Community transportation often takes the form of demand responsive transportation. It does not include fixed-route transit provided in a city by a full-size bus or a train.
The Transportation Research Board of the National Academies of Sciences, Engineering, and Medicine, in response to the challenges of coordinating demand responsive transportation, has developed a data specification that can pave the way for better customer service and potential cost savings, as providers integrate them with their existing software. The specification will enable multiple organizations to manage a passenger’s entire trip cycle, from trip request to trip delivery, with all necessary data—assuring access to all the details that successful coordination among organizations depends on. For this to work, the notion of operational coordination needs to be reframed with a customer-centered focus on ease of transactions—routine delivery of needed services in a “business as usual” manner.

Widespread adoption of this specification would define how and when different providers’ computer systems will share the data. Specifically, it would do the following:

- Create a shared data format for the entire cycle of a trip, including each rider’s origin and destination, time traveled, whether the rider qualifies for a subsidy, trip distance, and the portion of the trip shared with other passengers.
- Specify the steps and order in which data sharing will take place, details that are required for effectively sharing information between systems.

The specification, developed under a project of the Transit Cooperative Research Program (TCRP) as sponsored by the Federal Transit Administration, is available at no cost and can be put in place today by local transportation providers as a step toward coordinated, regional transportation systems. The specification can be refined over time through a process of standard setting, such as that used to establish consistency in electrical outlets and Bluetooth connectivity with smartphones. Further, its broad adoption can promote competition and innovation, because coordination will no longer be dependent on all providers purchasing the same scheduling software package. Instead, transportation providers can tailor their purchases to their individual needs. The code can be integrated with software as commonplace as Google Sheets or sophisticated as Ecolane, Routematch, or Trapeze.

**The Trip Cycle is Supported by the Data Specification**
Benefits to riders include the following:

- More flexible services, such as same-day rides
- Convenience—a more efficient system that is more reliable and punctual
- Easier ability to travel across jurisdictional boundaries
- More service availability—trips become possible even across a network of community transportation providers

Benefits to transportation providers include the following:

- Potential availability of other providers to handle trips that exceed their own service capacity
- Easier data sharing—less staff time dedicated to coordination and scheduling of trips among different providers
- Fewer empty seats and lower cost per passenger
- Greater choice in scheduling software
- Accurate billing-related data for trips that involve another provider
- Financial savings arising from greater efficiency and productivity

A Common Data Format Has Flourished in Scandinavia
FlexDanmark is a nationwide system that coordinates more than 500 different transportation providers that operate nearly 2,000 vehicles. All data communication between the ordering systems, scheduling systems, and providers’ computer systems is based on a standard data format that is used throughout Scandinavia. These data standards help guarantee that the software systems of transportation companies work in a smooth and complementary manner throughout the country, and a thriving network of service sponsors and providers depends on them.

The Link to Better Health
Universal Mobility envisions tapping the tremendous innovation happening in the transportation sector today for the benefit of those who rely on demand responsive services. Passengers would have access to a menu of services through user-friendly platforms that provide the information they seek in real time to plan and complete a trip. Back-end data exchange supports everyone: a student going to after-school activities, an adult who plans to stay out late, a babysitter who wants to go home—anyone who calls on a demand responsive transportation service to reach a destination.
For people who lack other ways to get around, such flexible transportation is critical. It may be the only way they can reach the doctor, physical therapist, grocery store, or other vital service.

Access to such transportation combats social isolation and promotes engagement, which leads to better health and quality of life. It is a vital ingredient of livable communities and the ability to age in place.

Yet the inconvenience of on-demand transportation creates challenges for individuals and the agencies that support their needs. For this reason, modernizing the system could be of great value to those who do not drive and their advocates, and service providers need to be aware of this potential.

Creating a Digital Language for Universal Mobility

Widespread adoption is needed to fully realize the benefits of a new specification for demand responsive transportation. But such a change will require a determined push.

Stakeholders in the transportation, aging services, and disability sectors may not yet recognize the benefits made possible by data standardization. Informed technology companies are generally open to the idea but may be wary of the cost of developing the software code to make their products specification compliant, or they may fear losing market share if all software products speak the same “language” so that they can inter-operate within a market segment.

Yet it is now possible to envision a path forward.

Community transportation providers can begin to implement the specification today. While data specifications for demand responsive transportation are not new, their broad adoption in the United States would represent a significant change in longtime practices. Such change will require leadership. Professionals in health and human services can play a vital role, as can innovative companies, transportation agencies and associations, entrepreneurs, policy makers, and advocates of livable communities.

The specification now available from the Transportation Research Board provides a building block toward that system. For success to become a reality, stakeholders must embrace the promise of this technology and contribute their insights on how to implement it. Pilot locations are needed to demonstrate its efficacy. Doing nothing ensures that marginalized passengers will remain on the sidelines.

A national movement toward automated, coordinated, and flexible transportation could usher in a time when all users enjoy mobility options, regardless of their health, age, ability, or place of residence. This would mean that passengers with different needs would be equitably served, and transit agencies could evolve into full-service “mobility managers” that enable all users to live more rewarding lives. The new specification offers the opportunity to greatly enhance service for customers while increasing efficiency and transparency for providers and payors.

With that vision clearly achievable, interested professionals should work together to address the remaining obstacles to a more modern and seamless network of demand responsive transportation. The benefits are too vast to ignore.

To read the full TCRP Research Report 210: Development of Transactional Data Specification for Demand-Responsive Transportation, see http://www.trb.org/Main/Blurbs/179848.aspx.