



Multi-Modal Transportation and the Future of Paratransit

White Paper

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Introduction

We are on the cusp of a transportation revolution. Led by a move away from personally-owned vehicles, and an influx of new mobility providers, the transit industry as a whole is shifting towards an integrated, single mobility service. Rideshare giants like Uber, Lyft and ZipCar have already forced us to change how we think about transportation and caused longstanding transportation providers—such as taxi companies—to reconsider their business models in order to stay competitive.

All signs point to continued changes in the space: global revenues from on-demand multi-modal transportation services are [forecasted to exceed \\$1 trillion¹](#) by 2030. It is no longer enough to provide consumers with a single option; commuters want to be in control of their own trips, with the freedom to choose the most cost-effective and convenient option for their individual needs.

To meet these consumer demands, we need systems that can incorporate multiple modes of transportation into single trips. A multi-modal transportation system connects all major providers, allowing commuters to book all parts of a journey—from taxis to ferries to buses— through a single interface.

What does this mean for the future of paratransit? First and foremost, new software and streamlined fleet management will be necessary to respond to increased ridership and meet legislative and social demands for better transit options. This means key players—from governments to paratransit operators to app creators—will have to work together to find innovative ways to transport riders to their destinations.

Who Relies on Paratransit?

Paratransit transportation services are for people with disabilities and other mobility conditions that prohibit them from using public transit services. They are often provided on-demand as a supplement to fixed-route bus and rail systems by public transit agencies. Eligible paratransit riders, as defined by [The U.S. Department of Transportation's ADA regulations](#), fall under three categories:

¹ <https://www.abiresearch.com/press/abi-research-forecasts-global-mobility-service-rev/>

1. **People who can't travel on the bus or train, even if it's physically accessible, because of a disability.** This includes people with cognitive challenges and visual impairments.
2. **People who need an accessible bus or train.** This includes people in wheelchairs or with other physical challenges who are capable of using accessible vehicles, but who want to travel on a route where a vehicle is not accessible.
3. **People who have a specific disability-related condition.** This includes people who may not be able to board or disembark available transit options, or those who can only travel to their transit options during certain times of year (for example, an elderly person who cannot walk to their bus stop when the conditions are icy).

How are Paratransit Operations Regulated?

The [Americans with Disabilities Act](#) of 1990 is a law that prohibits discrimination based on disability. In the U.S., public transit agencies are required to provide transportation services that meet ADA guidelines. Under the ADA, people with disabilities must be able to:

- Receive reasonable access to fixed-route transportation
- Receive accommodation for wheelchairs, service animals and/or attendants
- Receive the same standard of service from person to person

There are several current obstacles in implementing adequate paratransit service. Government regulation requires that paratransit drivers receive sufficient training, which makes it difficult to outsource vehicles to drivers working for transportation network companies who don't have similar training.

According to John Matthews, VP of Customer Service at DDS:

“The idea of using taxis and non-traditional services has been around for years—the issue holding us back is legislative. It has to do with requirements for the operator of any vehicle providing paratransit service.”

Compliance Setbacks

Unlike paratransit drivers, Transportation Network Company (TNC) drivers don't undergo the same levels of training or thorough background checks. This oversight by the Federal Transportation Administration (FTA) will have to change if paratransit unions take agencies to task.

Another striking problem with government compliance is the issue of wait times. Although the law stipulates that paratransit service must not vary in quality from person to person, in reality this is very difficult to provide on a consistent basis. For instance, someone in a wheelchair may have to wait 25 minutes for a ride, whereas another rider with a cognitive disability might be able to use a TNC and only have to wait five minutes. The FTA would consider this a disparity in service, and dictate that these wait times need to be on par.

Rather than demand that transit operators provide comparable service to all riders regardless of their disability, we need to look at all available transit methods and provide the best service based on the specific context.

An International Need

Research and testing conducted across Europe supports a multi-modal transportation movement.

The [International Transport Forum](#) (ITF) modelled a full-scale implementation of shared mobility systems in the Lisbon metropolitan area. The results included one-third reduction in carbon emissions, 55% fewer total vehicle miles in peak traffic (compared to 2011) and 95% less need for parking space. [The initial findings have since been confirmed in simulations with data from other cities.](#)

As the transportation marketplace matures, legislature and policy will have to support interoperability and ensure that government regulation is helping, not undermining, these business models. The Transport Systems Catapult, the UK's technology and innovation centre for Intelligent Mobility, [published a report](#) outlining several barriers currently prohibiting the success of these structures, such as policies for data sharing between transit operators.²

¹ Figure 9. Mobility as a Service_ Exploring the Opportunity for MaaS in the UK

Contributing Factors to a Reliance on Paratransit

Aging Demographics

Globally, the growing number of seniors and people with disabilities who wish to maintain active lifestyles has put strain on existing paratransit services. Currently, the American Public Transportation Association projected that the 65-74 demographic will rise by [51% by 2020](#).³ The population of the EU on January 1st, 2020 was [estimated at 447.3 million, 20.6%](#) of which were elderly people (aged 65 and over). The number of those aged 80 years or above in the EU is projected to more than double between 2020 and 2100, from 5.9% to 14.6%.³

As this trend continues, regional transit systems will have to accommodate more mobility-challenged individuals.

Vehicle Ownership Is in Decline

As ridesharing becomes more popular, there has been a direct decrease in automotive ownership in younger generations. The past decade has seen a [30% drop in car ownership](#)⁴ among people aged 18 to 34, and the auto industry is projected to reach its [peak point](#)⁵ in the next three years.

The result of this decline is that demand for public transit has increased significantly resulting in over 18% increase in public transport journeys as per [UITP report](#)⁶, the EU has seen the highest demand for public transit since 2000. This growth was mirrored in the U.S., where public transit use in 2013 reached a [record high since 1956](#).⁷

As this demand for better accessibility helps us embrace a multi-modal transportation mindset, riders can hope to see more transportation providers satisfy their evolving needs.

2 American Public Transportation Association Report on Funding the Public Transportation Needs of an Ageing Population

3 http://ec.europa.eu/eurostat/statistics-explained/index.php/Population_structure_and_ageing

4 <https://www.fastcompany.com/3027876/millennials-dont-care-about-owning-cars-and-car-makers-cant-figure-out-why>

5 <https://www.curbed.com/2017/2/6/13428414/car-buying-electric-vehicles-uber-lyft>

6 https://cms.uitp.org/wp/wp-content/uploads/2020/08/UITP_Statistic-Brief-national-PT-stats.pdf

7 https://www.nytimes.com/2014/03/10/us/use-of-public-transit-in-us-reaches-highest-level-since-1956-advocates-report.html?module=Search&mabReward=relbias%3Ar%2C&&_r=0#123;%221%22%3A%22R1%3A5%22}

Cost of Operation

Of course, one of the most difficult challenges lies in the cost of operation. A recent briefing from the [MTA Paratransit Operations](#) in New York revealed that:

- In 1994, Access-A-Ride (AAR) provided 424,239 trips to 25,446 registrants
- In 2015, AAR provided 6,360,165 trips to 144,692 registrants
- By 2030, this number is projected to grow by 35.3 percent to 1.84 million⁹

The staggering costs associated with this growth have led to paratransit services outsourcing the rides to TNCs in recent years, but safety is a concern due to the lack of training and background checks among TNC drivers. The goal is to find a balance between offering a safe environment for the customer—regardless of service provider—and offering equal travel opportunities to all paratransit riders.

Paratransit Solutions: A “One-Size-Fits-All” Model Is Not Enough

Convenient and low-cost ways to move riders from point A to point B benefit both sides of the equation. An ideal service would allow customers to book end-to-end trips, tailoring their trip based on their priorities (cost, convenience, efficiency, etc.) If this a multi-modal system is to fully extend to paratransit services, we need technology that can follow suit.

Towards Multi-Modal Transportation Solutions

One only has to look as far as online aggregator sites like Expedia to see that the travel industry has already adopted solutions that allow customers to book their entire trip including flights, car rental and hotels from a single website. Jaswinder Randhawa, the VP of Product and Marketing at DDS, predicts that a similar model will soon be available for their local transportation needs:

⁸ <https://wagner.nyu.edu/files/rudincenter/2016/12/OlderNYersandAccess-A-Ride.pdf>

“A lot of passengers take multiple modes of transportations every day. They may start with a car-share to the train station, ride the line to work, and may need a taxi to the grocery store on the way back home. Passengers are looking for an easy-to-use solution to book & manage their trips end-to-end. DDS is working hard to make this a reality of its paratransit and taxi customers.”

An overarching platform for paratransit could include all modes of transportation, from taxis and ADA vans to buses and private agencies. For a similar service to exist in the paratransit space, there needs to be cooperation, interoperability, and data transfer between transit providers.

When transit systems are integrated to form a seamless system, there are more viable options for movement within and between cities and countries. Not only can this further the shift from cars to public transit, but it can help drive revenue and promote increased investment in transit infrastructure. This virtuous cycle typically improves congestion and decreases stress on all systems, while promoting economic growth.

For paratransit commutes in particular, multi-modal systems can provide operators with a more holistic view of transportation coverage and help identify gaps in mobility options for certain rider categories. This demand analysis can help justify further infrastructure, that can in turn facilitate better end-to-end transit routes and extend overall transit range.

Technology's Place in the Market Transformation

Current solutions have begun to meet these goals in the paratransit space. High performance demand response systems for paratransit operations allow companies to maximize efficiency and provide quality service to customers through the following benefits:

- Fast scheduling and improved route optimization based on all modes of transportation, organizations, and cost models
- SaaS and cloud deployment models provide reliable data connections to look at a region more holistically, and expandable processing power to provide real-time continuous optimization
- Open software architecture for easier integration with all providers in the ecosystem
- Critical focus on mobile applications to improve user experience, flexibility and responsiveness for passengers, drivers, dispatchers, and administrators

The goal of these platforms is to provide high-performance solutions for paratransit service providers, increasing overall efficiency and quality of service. Current product offerings can handle around 50,000 trips per hour, helping providers streamline the dispatch process. With this type of software, companies can automatically manage resources using parameters and constraints inherent to the dynamic nature of paratransit operations.

Streamlined Process for Drivers and Passengers

Available transportation software makes the process simpler for the customer, drivers, dispatchers, and administrators, from sign-up to pick-up:

1. **Rider management:** Customer information is stored, so the system knows their address and needs, including eligibility, type and frequency of service needed.
2. **Booking trips:** The provider coordinates with paratransit companies to allow customers to contact booking agents who then enter trips into the system.
3. **Scheduling engine:** The algorithm finds the best schedule for drivers and customers and shows optimal routes for the ride.
4. **Dispatch:** On the day of service, the system shows vehicle locations on a map, and provides tools to prevent delays.

The Future of Multi-modal Transportation

Considering the decline of car ownership, a growing reliance on public transit and the rise of autonomous vehicles, transit services must adopt forward-thinking solutions and new technologies. We need a ground transportation system that can support the needs of all riders—typical or disabled, urban or rural—within any demographic. Powerful cloud-based solutions can help make this a reality by scheduling, dispatching, and tracking participating providers within a single ecosystem, paving the way for a true transportation revolution.

The ADEPT IQ software platform will be an entry and management point into the marketplace. With industry-tested tools that streamline your paratransit operations, [DDS Wireless](#) makes life easier at every step of the journey, from booking to arrival.

About DDS

DDS Wireless Inc. is number one in real-time scheduling and dispatch software. As the only fleet management solutions provider in the world that also provides hardware, we're the industry experts in on-demand people movement. DDS has years of experience in operating on a global scale. We are headquartered in Richmond, Canada and have regional offices in Seattle, Sweden, Finland, and the UK.

- 30+ Years of Transportation Leadership
- Industry's best and patented 'routing & scheduling' algorithm
- Used by North America's largest transit authority

Ready to optimize your transportation organization?

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<https://ddswireless.com/book-a-demo/>

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