



DDS 
WIRELESS

Take Advantage of Change

The Next Era of Paratransit

White Paper

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Responsive Technology and the Next Era of Paratransit

A new transit challenge is emerging: demand for paratransit service is at risk of outstripping supply. The number of people aged 65 and older in the U.S. is set to double between now and 2050¹, and around 25% of Europe's population will be above 65 by 2030². Moreover, bolstered by a growing familiarity with on-demand services, younger paratransit travellers are making more use of existing paratransit networks when planning their routes. This all means that paratransit providers are going to be forced to improve service and efficiency significantly over the coming years, all while keeping costs down and doing more with less.

While paratransit faces an uphill battle in responding to customer demand, technological advancements in the transit space are already bringing solutions within reach. From boosted convenience via mobile apps and big data to fully on-demand transit options, many positive changes are emerging that can make life easier for paratransit providers and their customers. This paper will explore these recent trends with a focus on the innovative dispatch service solutions that are poised to usher in a new era of paratransit.

¹ <https://www.prb.org/americas-aging-population/>

² <https://www.prb.org/europespopulationagingwillacceleratesaysdatasheet/>



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Challenges Loom for Paratransit Providers

With demand growing, paratransit agencies across the world face a number of challenges unique to the field. Funding in particular is a major issue for paratransit providers. Providing paratransit is significantly more expensive than providing traditional transit services: in the U.S., trips provided under the Americans with Disabilities Act cost around \$45 per trip, more than 10 times the cost of an individual trip on traditional transit. In addition, paratransit trips make up only about 2% of total ridership, but account for at least 9% of total agency operating costs³. These challenges, combined with the anticipated increased demand for paratransit services, will continue to drive costs up.

While paratransit is tasked with providing convenient, effective service to its customers that is equal to the level of service provided by traditional transit, many paratransit providers today are struggling to meet customer expectations. With antiquated booking procedures that often requires a request to be phoned in well in advance of actual travel, it is no surprise that customer satisfaction presents a hurdle. Add in unforeseen traffic accidents and road closures that disrupt a set schedule, and delays and inefficiencies for both the provider and the customer are the result.

³ <http://www.masstransitmag.com/blog/12370500/the-c-suite-unplugged-what-you-have-to-do-to-provide-excellent-paratransit-service>



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Taking a New Approach: How the Latest Transit Technology Can Shape Paratransit

The question remains: how can paratransit providers keep costs down while simultaneously providing a better service to an ever-growing customer base? This is no easy task, but technology offers a possible solution.

New and innovative technologies have been making waves in the transit space for the past several years now. The rise of autonomous vehicles, mobile booking systems, ridesharing solutions and on-demand services have changed the landscape. The good news is that there are several available technologies emerging in the general transit space that the paratransit industry can take advantage of to meet growing challenges.



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A Shift to the Cloud: Mobility-as-a-Service

The use of cloud-based technology is critical to enabling the integration of top-of-the-line tools and services into paratransit dispatch systems. At present, many providers are still making use of legacy systems that are siloed and incapable of integrating with modern cloud-based applications. Dispatch solutions built using modern solutions like Amazon Cloud Services (AWS) are set to change the face of paratransit. With a cloud-based approach comes the ability to “plug and play” when it comes to resources, allowing paratransit providers to scale as needed and experiment with new cloud-based tools and technologies.

DDS Wireless’ ADEPT IQ is one example of a service built from the ground up using innovative cloud technology on the AWS platform. Modular and API-based, ADEPT IQ is a next-generation dispatch and fleet management solution, and its architecture integrates easily with other tools, including real-time data providers (such as traffic information), transportation service providers, passenger tools and more.

Another example of a service using an integrated, cloud-based approach is the Whim

app, recently introduced in Helsinki, Finland and since rolled out to other cities. Whim connects multiple services into a one-stop platform for travelling from point A to B, depending on the needs of the particular user. The app provides a multi-modal transportation portal by integrating public transit, taxi, car share, bike share and walking data into one service⁴. Whim also allows users to book and pay for their complete trip without having to open a wallet or fumble for change. While this is obviously not an app aimed at paratransit, it does show what is ultimately achievable. With new cloud solutions and real-time data, it can become possible to plan paratransit trips in much greater detail and respond effectively to unexpected changes.

It is clear that a shift to the cloud is the way forward for paratransit. Paratransit agencies should be taking advantage of cloud services to connect multiple data sources and create an integrated service. Leveraging modern solutions, paratransit providers will be able to provide their customers with a real-time scheduling and dispatch system, including automatic vehicle locations monitoring (AVLM) systems. This will empower paratransit providers to unify driver services, data collection, route optimization and vehicle positioning into one cloud-based solution.

⁴ <https://www.economist.com/international/2016/09/29/it-starts-with-a-single-app>



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Opening New Doors With Artificial Intelligence

Automation is already underway in the transit space. While autonomous vehicles represent the apex of automation, there are many different ways that automation can make life easier for paratransit users.

Autonomous vehicles (AVs) are already being tested as a public transportation alternative in cities throughout the world. Europe is leading the way by testing cost-effective, autonomous minibuses in numerous cities⁵. In North America, the City of Toronto has also kicked off a pilot project in which driverless shuttles are providing rides to and from major transit stations⁶. While these options may seem futuristic, the implications for paratransit are profound. Imagine a person living with disability having complete freedom to travel where they want without having to rely on someone else. Indeed, such trials are already being conducted: Waymo is currently testing autonomous vehicles with blind operators⁷, paving the way for a future that would provide a level of freedom and self-reliance previously unknown to many.

Beyond AVs, other forms of computer autonomy and machine learning can play an

5 <https://www.nytimes.com/2017/05/28/technology/the-future-of-european-transit-driverless-and-utilitarian.html>

6 <https://www.thestar.com/news/gta/2018/07/03/toronto-plans-to-test-driverless-vehicles-for-trips-to-and-from-transit-stations.html>

7 <https://www.bloomberg.com/news/articles/2017-07-19/blind-drivers-step-up-to-shape-u-s-push-for-driverless-cars>

important role in the future of paratransit. Microsoft's "Seeing AI" app is harnessing the powers of AI to narrate the world for users with visual impairments⁸. Users can point their phone at a person or product and receive a verbal description of people, text and objects. This type of AI could provide significant benefits to the paratransit industry by improving customer experience: vehicles equipped with similar AI systems could describe vehicle locations, clarify wait times, even narrate what is going on outside a window.

Managing service changes through AI route planning and response would also significantly improve the paratransit experience. For example, ADEPT IQ employs different algorithms for different use cases. Some of its algorithms manage same-day changes, like trip cancellations or add-ins, while others are focused on trip optimization and cost savings. ADEPT IQ's automated system is also capable of raising early warnings when routes are in danger of running late, and can provide recommendations to remedy the situation based on available resources. It could even take automated actions if an agency's system allows.

8 <https://www.microsoft.com/en-us/seeing-ai>



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Taking Demand-Responsive Transit to the Next Level With Real-Time Data

The ability of demand-responsive transit (DRT) to provide flexible, as-requested service to its passengers is hugely beneficial to many. However, its dependence on advance booking and its low responsiveness to same-day changes can leave many customers wanting more.

With the rise of smart cities and the wide availability of big data, agencies have increasing amounts of information at their fingertips to take DRT to the next level. What is needed, though, is a way to compile and analyze this data. ADEPT IQ takes data and uses it in real time: its route tracking module receives traffic updates and can optimize routes already underway. The software is able to schedule 23,000 trips in under four minutes.

Paratransit providers are also looking to alternative services to manage the high cost of individual trips and provide even greater flexibility for paratransit travellers. Studies estimate that the U.S. could save up to \$2.2 billion dollars annually by integrating ridesharing into paratransit⁹. Both Uber and Lyft, for instance, have vehicles and

⁹ <https://www.brookings.edu/research/how-lyft-and-uber-can-improve-transit-agency-budgets/>

drivers in certain cities that can meet the transportation needs of passengers with disabilities¹⁰. Many agencies are starting to look at these alternatives as viable additions to traditional paratransit services. The Boston Transit Authority has partnered with Uber to provide paratransit services as a pilot project. So far, Uber has typically been 70% cheaper than existing paratransit services¹¹. Integrating alternative services can both offset costs and enable providers to better meet customer needs for flexibility and responsiveness.

While offering a wider range of options for paratransit travel is important, giving customers control over their trips via a consumer-facing app should be the ultimate goal of all paratransit providers. Such apps obviously exist for traditional transit: Citymapper and Transit offer trip planning for public transit using real-time data, while Uber and Lyft have on-demand ride-hailing apps. Paratransit providers need to take advantage of these existing technologies to both empower users and reduce calls to dispatchers. New York's Metropolitan Transportation Authority, for instance, is currently piloting an on-demand e-hail service for paratransit users under a single, unified app¹². One of the aims of ADEPT IQ is also to provide the functionality and integrations necessary to offer this kind of solution to paratransit providers.

10 <https://mobilitylab.org/2017/07/28/uber-lyft-push-make-paratransit-efficient-affordable/seeing-ai>

11 https://www.washingtonpost.com/news/dr-gridlock/wp/2016/09/16/uber-lyft-partner-with-city-to-offer-paratransit-customers-on-demand-service-in-boston/?noredirect=on&utm_term=.db4a2291e435

12 <http://www.metro-magazine.com/accessibility/news/726331/new-york-mta-to-offer-real-time-on-demand-service-for-paratransit-users>



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The Future of Paratransit

It is clear that paratransit agencies have challenges ahead. It's already a struggle to provide a level of service that meets user needs and remains within operational budgets. But, with a wide range of new and innovative technologies emerging in the transit space, there is a way forward for paratransit. Solutions like ADEPT IQ are set to address the hurdles faced by paratransit agencies. These types of solutions will:

- Facilitate the introduction of paratransit that is more flexible and responsive to the needs of riders
- Improve efficiency and reduce costs by leveraging data
- Improve the user experience through customer-facing apps and real-time data

More important than any one solution is an agency's willingness to accept change. Established paratransit providers—some that have been run the same way for decades—can find it challenging to adapt to the new paratransit landscape. Agencies need to have the foresight to take on new technologies as they become available.

Recommendations

The paratransit agencies who want to be prepared for the future should invest first in pilot programs that provide the opportunity to test solutions in small batches over short windows of time. As a cloud-based system, ADEPT IQ is particularly suited to trial runs; a pilot program can be easily implemented with as few as 10 vehicles. Agencies that create space to see the benefits of new technology in the real world will make adoption a much easier process for their teams and dispatchers.

Paratransit providers should also invest time in identifying agency bottlenecks and investigate how technology can address these shortcomings. For example, if your agency is struggling to stay on schedule because of factors like traffic incidents and road closures, a key technology gap to fill would involve real-time data and automated tools. By leveraging data, paratransit providers can be far more agile and proactive in dealing with unexpected challenges.

Finally, it is important for transit agencies to pay close attention to the dispatch system that is being used by their service providers. Many agencies prefer to simply outsource their dispatch needs and leave it at that. However, agencies need to consider what exactly their dispatch systems are capable of doing and what benefits they are providing, as this is critical to reducing costs. A dispatch system needs to be highly-customized and flexible to meet the exact needs of an agency; this is especially true when it comes to paratransit.

ADEPT IQ and the Future of Paratransit

ADEPT IQ is expected to launch in late 2018 with many features on the horizon specifically geared towards providing benefits to paratransit providers and customers. These features include real-time data integration, utilization of alternate services. Most importantly, DDS will be working with paratransit agencies to learn what pain points should be explored and addressed by ADEPT IQ next. The goal is to provide software that precisely meets the needs of paratransit agencies and prepares them for future challenges.

DDS is committed to helping your agency provide leading-edge service to every customer. [Contact us](#) for a [free demo](#), and learn more about how ADEPT IQ could work for your agency.

About DDS Wireless

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. We also have sales, support and technical personnel employed across the globe in Canada, the U.S. and Europe.

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- 225 Systems Deployed in 11 Countries Globally
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