On-demand public transport

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Part of the Tranzinfo Hot Topics series, this issue offers a selection of recent material on on-demand, or demand-responsive, public transport. On-demand services are a growth area in public transport. According to Griffith University research here have been 36 on-demand trials across Australia since October 2017, providing over 1 million rides. Vehicles are often small buses or vans, and don't follow fixed routes or timetables.
Under the on-demand/demand-responsive model, passengers can use their smartphone to request a trip from a specific place at a specific time, and bus operators can analyse the demand for travel and provide the buses as needed. Benefits for passengers include less overcrowding and more flexibility in trip planning. Benefits for the system operators are increased efficiency and time and cost savings. This model of transport service has been useful in regions that are underserved by conventional public transport, and as a first mile/last mile connection to conventional public transport services.

Contents:

Research & case studies

1 million rides and counting: on-demand services bring public transport to the suburbs
The Conversation, March 2020
Researchers at Griffith University are examining the social equity impacts of on-demand public transport services.

Resurgence of demand responsive transit services – Insights from BRIDJ trials in Inner West of Sydney, Australia
Perera, S et al., Research in Transportation Economics, 2020, Article ID100904.
This paper outlines the key insights gained from the Demand Responsive Transit (DRT) operations in Inner West Sydney, since its commencement in July 2018. In the context of

Inner West Sydney, DRT plays the role of a feeder service during the morning and evening peak periods, where commuters use these services to directly access train stations serving high frequency train services.

Transport industry adapting to change: an Australian case study
Lowe, C & Stanley, J, Research in Transportation Economics, vol. 83, 2020, Article ID 100940.
Growing governmental reluctance to fund local bus services is leading to increased interest in demand responsive transport (DRT). At the same time, the use of technology to facilitate access to DRT is creating circumstances for significant disruption of the way bus services are planned, contracted, delivered and regulated. This disruption creates uncertainty for bus operators but also presents an opportunity for operators to proactively adapt to better meet passenger needs and capture more of the market.

Public transport ride-sharing coming to Gold Coast, but will it help cut congestion?
ABC News, 5 November 2020
The Queensland Government will launch a trial of demand responsive transport (DRT) on the Gold Coast next year.

Consumer preferences for on-demand transport in Australia
Vij, A et al. Transportation Research Part A, vol. 132, 2020, pp. 823-39
This study surveyed 3,985 geographically and demographically representative Australians nationwide, to understand consumer demand and willingness to pay for ODT in Australia. Overall, our analysis indicates that ODT services have the ability to both increase public transport use among existing public transport customers, and to draw new customers to public transport services.

On-demand and shared mobility roadmap
Auckland Transport, 2020
The purpose of this Roadmap is to describe the approach that Auckland Transport (AT) plans to take to shape Auckland's future transport network by expanding access to travel options such as bike share, e-scooter share, car share, on-demand shuttles, dynamic car-pooling and ride-hailing. AT recognises that these new travel options could help to connect people to existing public transport services and address the first and last leg gap ie the distance between an individual's home or final destination and the nearest bus, rail or ferry service

On-demand public transport sounds like a luxury - but it can actually save cities money
The Next Web, 2020
Evidence shows that when on-demand networks are implemented in a smart way, communities can actually save money compared to their previous fixed-route services, unlocking broader benefits that pay back the initial investment many times over.

Cities struggle to boost ridership with 'uber for transit' schemes
Wired, 1 February 2020
Helsinki, Los Angeles, Shanghai, Singapore, and other metros have been experimenting with on-demand buses—and not seeing a lot of success.

The future of bus travel in on-demand
The Big Smoke, Jan 2020
Because of technological advances, the conditions are ripe for a more agile and personalised approach to running bus services. The public bus system can now connect supply with demand. As an emerging model, this can ensure that a passenger's needs are met by buses at the right location, at the right time. This is good value for money for the passengers, even if the fare does in fact rise.

When the bus ride to your destination is just a click away
The Guardian, 19 Febuary 2020
With bus routes severely curtailed outside big cities, is demand-responsive transport the answer?

Impacts of replacing a fixed public transport line by a demand responsive transport system: case study of a rural area in Amsterdam
Coutinho, FM et al., Research in Transportation Economics, vol. 83, 2020
This paper provides a historical overview of DRT experiences, understanding their pros and cons. In addition, it presents the case study of Mokumflex, a 12-month DRT pilot program that replaced the regular bus service in low-density areas of Amsterdam, the Netherlands.

Flexible mobility on-demand: an environmental scan
Liyanage, S et al., Sustainability, vol. 11, no. 5, 2019
On-demand shared mobility is increasingly being promoted as an influential strategy to address urban transport challenges in large and fast-growing cities. The appeal of this form of transport is largely attributed to its convenience, ease of use, and affordability made possible through digital platforms and innovations. The convergence of the shared economy with a number of established and emerging technologies—such as artificial intelligence (AI), Internet of Things (IoT), and Cloud and Fog computing—is helping to expedite their deployment as a new form of public transport. Recently, this has manifested itself in the form of Flexible Mobility on Demand (FMoD) solutions, aimed at meeting personal travel demands through flexible routing and scheduling. Increasingly, these shared mobility solutions are blurring the boundaries with existing forms of public transport, particularly bus operations. This paper presents an environmental scan and analysis of the technological, social, and economic impacts surrounding disruptive technology-driven shared mobility trends.

Exploring the performance of different on-demand transit services provided by a fleet of shared automated vehicles: an agent-based model
Wang, S et al., Journal of Advanced Transportation, ID 7878042, 2019
Automated vehicles used as public transport show a great promise of revolutionizing current transportation systems. Still, there are many questions as to how these systems should be organized and operated in cities to bring the best out of future services. In this study, an agent-based model (ABM) is developed to simulate the on-demand operations of shared automated vehicles (SAVs) in a parallel transit service (PTS) and a tailored time-varying transit service (TVTS).

[An international review of experiences from on-demand public transport services]
The Swedish Knowledge Centre for Public Transport, 2019
The aim of this report is to contribute to develop knowledge about what the developments in positioning and smartphone technology bring to the table for the public transport sector. The overarching question in the report is: can new technology improve demand-responsive transport (DRT)?

[On-demand public transport – key learnings from global pilots]
LEK Consulting, 2019
Many jurisdictions around the world are asking whether it is possible to use on-demand technologies to complement or replace some conventional public transport services. Authorities and operators have been conducting on-demand public transport pilots to test and learn. This report summarises emerging insights from some of these pilots and provides a blueprint for execution for public transport authorities and operators.

[On-demand transit can unlock urban mobility]
Boston Consulting Group, 7 November 2019
We studied services in four locations: Arlington, Texas, a city snuggled between Dallas and Fort Worth; Berlin; Seattle; and West Sacramento, California. Via, a New York–based unicorn founded by Israeli entrepreneurs, which develops and operates public mobility systems around the world, operates all four services under contracts with public authorities and local transport agencies.

[Comparison between ad-hoc demand responsive and conventional transit: a simulation study]
Navidi, Z et al., Public Transport, vol. 10, 2018
Considering the sprawl of cities, conventional public transport with fixed route and fixed schedule becomes less efficient and desirable every day. However, emerging technologies in computation and communication are facilitating more adaptive types of public transport systems, such as demand responsive transport that operates according to real-time demand. It is crucial to study the feasibility and advantages of these novel systems before implementation to prevent failure and financial loss. In this work, an extensive comparison of demand responsive transport and conventional public transport is provided by incorporating a dynamic routing algorithm into an agent-based traffic simulation.

[UpRouted: exploring microtransit in the United States]
Westerveldt, M et al., Eno Center for Transportation, Washington, USA, 2018
In the United States, public transportation agencies are experimenting with on-demand, shared, and dynamic models to augment traditional fixed-route bus and train services. These services—referred to as microtransit— are enabled by technology similar to the mobile smartphone applications pioneered by privately operated transportation network companies.

[Community transport meets mobility as a service: on the road to a new a flexible future]
Mulley, C et al., Research in Transportation Economics, 2018
The growth of ridesharing and other “new mobility services (NMS)” poses challenges for traditional public transport operators because they create an environment where consumers

can demand an “integrated mobility” from different transport modes and improved accessibility (information, booking, payment systems etc).The paper's principal consideration is on how MaaS is relevant to public transport.

How to ensure an on-demand transport trial will lead to a financially sustainable service
Cooper, T. et al., ITS World Congress, 25th, Copenhagen, Denmark, 2018
If an organisation is considering doing a Demand Responsive Transport (DRT) trial, (also known as On-Demand Transport or taxi-buses/shared taxis), then they will be very interested to know how to determine what geographic areas/corridors and pricing points will lead to a financially self-sustaining service. The large number of failures in this area highlight the need for a realistic simulation before $m’s are blown on an unviable market design.

Which service is better on a linear travel corridor: Park & ride or on-demand public bus?
Zhang, J et al., Transportation Research Part A, Policy and Practice, vol. 118, 2018
This paper develops an analytical model to support the decision-making for selection of a public transport service (PTS) provision between park & ride and on-demand public bus (ODPB). The objective of the model is to maximise the total social welfare, which includes consumer surplus and operator’s net profit.

New shared mobility study on Helsinki confirms ground-breaking Lisbon results
International Transport Forum, 2017
Replacing private car trips with shared on-demand mobility services would reduce carbon emissions and congestion and free up public parking space for other uses, according to a study of the Helsinki Metropolitan Area released by the International Transport Forum.

Shaping the relationship between public transport and innovative mobility
International Transport Forum, 2017
This report investigates the convergence of public transport and innovative mobility solutions, such as ride services, car- and bicycle-sharing, app-enabled on-demand micro-bus services, and platforms that connect app-using travelers and drivers. It examines the role of public authorities in ensuring this convergence supports commercial innovation as well as public policy objectives and identifies principles to guide partnerships between innovative mobility services and public transport operators.

On-demand mobility in NSW, Australia: focusing on a great customer experience
Orr, K., ITS World Congress, 24th, Montreal, Canada, 2017
On-demand mobility has gained increasing popularity in highly populated urban areas, remote areas with low demand do not benefit from the same advantages. As an example, improving public transport services in the low patronage areas using an on-demand strategy seems a true challenge to tackle. Told through an innovative startups involvement, this report focuses on presenting innovative methods used by Transport for NSW to encourage ideas, concepts and case studies from experts in the domain of on-demand mobility. Recognising that by embracing and leveraging private partnerships, unique and innovative projects can be created to perhaps better compete with the fast-changes in our ever-increasing urban infrastructures.

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Trials in Australia/NZ

NSW

There are On Demand services currently operating in Sydney and surrounds, and regional and rural NSW, as part of a trial.

On-demand pilots – patronage
NSW Government
Monthly patronage data for the NSW On Demand bus and electric bike pilots.

Shuttle bus trial between Lilli Pilli and Caringbah to end and be replaced by more frequent regular services
The Leader, 19 November 2020
The frequency of regular bus services between Lilli Pilli Point and Caringbah will be greatly increased as a result of Opal data and feedback from passengers gathered during the trial of a Turn Up and Go minibus shuttle.

SA

South Australian On-Demand bus services are available in Gawler, and now also on trial in Mt Barker and the Barossa Valley.

Barossa 'uber-style' buses four times more expensive than Mount Barker
Barossa Herald, January 15, 2020
Barossans will be paying four times more for the on-demand public transport bus trials that began this week exclusively in Mount Barker and the Barossa.

On-Demand bus services in massive demand
SA Government media release, 16 Feb 2020
In Mount Barker over there are now over 1,000 trips per week, which is four times more than the initial target, with passengers rating the service 4.8 out of 5.

QLD

The Queensland Government is currently partnering with 13cabs to deliver a trial of DRT in selected Logan suburbs.

Public transport ride-sharing coming to Gold Coast, but will it help cut congestion?
ABC News, 5 November 2020
The Queensland Government will launch a trial of demand responsive transport (DRT) on the Gold Coast next year.

NZ

Timaru's on-demand bus service eclipses traditional public transport
Stuff.co.nz, Jun 21, 2020

A trial of on-demand public transport in Timaru, NZ, has surpassed the services it replaces by nearly 40 per cent since the beginning of June. MyWay by Metro's 12-month trial will be officially launched in Timaru after the service was quickly brought out of its pilot period to aid those needing public transport for essential travel when the Covid-19 lockdown began, a statement from Environment Canterbury says.

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