

Examining innovation in Australia's urban transport systems



Based on AHURI Final Report No 360: Innovative responses to urban transportation: current practice in Australian cities

What this research is about

This research explores how Australian urban transport programs and policies are responding to changes in transport technology, travel patterns, environmental imperatives and spatial development dynamics in order to offer guidance about future policy directions and options for Australia's cities policy arrangements.

The context of this research

The growing demand in Australia's major cities has placed pressure on transport infrastructure and services which, in turn, raises public and policy concern about the plans, services and infrastructure needed to respond to these changes. Australia's transport systems are in a period of change with new configurations of technology, infrastructure and spatial organisation emerging, while at the same time existing arrangements persist, giving rise to questions of obsolescence or dysfunctionality.

For passengers or users, the value includes increased usefulness; increased accessibility; increased inclusivity; increased comfort; increased convenience; increased safety; and reduced price.

A multiplicity of drivers of innovation were identified, including technology; social and environmental imperatives; demand behaviour—of markets or individuals; resource constraints—land, public and private capital; regulatory gaps; and political imperatives. In addition, what is seen as innovative in one place may not be seen the same way in another place.

The key findings

Critically, the value of innovation is not only about newness and novelty as such, but the creation of new value propositions for regulators, providers and travellers.

In this report innovation is defined as 'the conception and application of new technical, social, organisational, institutional or economic practices that respond to societal demands or needs'.

The value of innovation in transport

For regulators this value includes enhanced ability to meet overarching policy goals such as reduced emissions and congestion; increased efficiency or productivity; and greater accessibility and social equity. For transport providers, the value includes greater efficiency, greater capacity and greater market share.

Transport service platforms

There is a great deal of diversity in transport service platforms, whether they are operating systems, large conglomerate information systems, or specific applications (such as Uber). Digital platforms have become prominent as mechanisms for coordinating service delivery, including integrated mobility services, car-sharing, ride-hailing and micro-mobility vehicles (i.e. ebikes and e-scooters). In some jurisdictions, multimodal platforms known as 'Mobility as a Service' (MaaS) are being deployed.

MaaS business models treat the whole transport sector as a cooperative, interconnected sustainable mobility ecosystem, providing services tailored to the needs of customers and available through a single digital platform (typically a smartphone app) with point of payment at use, either through membership subscription or one-off payments.

Autonomous vehicles

There is considerable uncertainty as to the technological viability of autonomous (or driverless) vehicles (AVs), their operation within urban transport systems, their effects on travel behaviour and the institutional arrangements that should accompany their adoption. There are mixed views regarding their benefits and drawbacks for car dependency, increased distances travelled, urban expansion, reduced mass public transport use and their compatibility with complex urban environments with high levels of pedestrian activity. The timing of driverless car availability and rollout remains unclear.

Ride-hailing and car sharing

Ride-hailing offers a useful case study of disruptive innovation generating a regulatory response, with four ways that cities internationally have regulated ride-hailing:

- Singapore established a register records system to manage ride-hailing, without setting an entry threshold.
- California created a regulatory middle ground, allowing ride-hailing to operate with government regulatory oversight.
- London classified ride-hailing services under the private hire vehicles regulation system and set up a lower entry threshold—however, London has since tightly regulated Uber.
- France saw Uber as a traditional taxi operation subject to orthodox taxi regulation, which prevented the firm from entering the market.

Influencing travel behaviour

Many innovations seek to influence travel behaviour, typically to reduce reliance on private cars. One of the largest of such efforts was the TravelSmart program that operated in major Australian cities during the late-1990s and 2000s. The program sought to modify travel behaviour through direct consultations with households, providing guidance and information about car use and sustainable alternatives. The results were often ambivalent; a small proportion of households altered their travel behaviour away from the car, but there wasn't an accompanying gain in sustainable travel.

The TravelSmart experience suggests that efforts to reduce car dependence that focus on behaviour alone and do not involve wider policy frames that reduce the convenience or raise the cost of car use relative to other modes are unlikely to be successful.

Increasing public transport

Good quality public-transport network planning can improve the quality of service experienced by users and, in turn, support patronage growth.

The relative density of population, as determined by dwelling density, can determine the potential level of ridership of public transport. If a city is dispersed, then public transport cannot operate to high service levels and remain viable under prevailing financing arrangements.

Another view is that public transport patronage is independent of urban form, and that service quality—in terms of convenience of access to destinations via public transport networks—is the determining factor. To improve public transport patronage, policies should focus on improving the quality of service provided, measured by variables such as:

- directness and speed of routes
- comfort
- safety and reliability of services
- convenient transfers among highly connected networks
- legibility of services in terms of wayfinding, maps and schedules.

There remain many opportunities for innovation in the provision of public transport in Australian cities that do not depend on technological innovations—rather, they involve institutional innovation.

“The TravelSmart experience suggests that efforts to reduce car dependence that focus on behaviour alone and do not involve wider policy frames that reduce the convenience or raise the cost of car use relative to other modes are unlikely to be successful.”

Telecommuting

Telecommuting involves workers using information and communications technology (ICT) to avoid travelling to a workplace. With improvements to ICT over recent decades, telecommuting has been viewed as a potential mechanism for reducing vehicle kilometres travelled, as well as reducing road and public transport network congestion.

There is substantial evidence that the COVID-19 experience resulted in large proportions of employees and employers experiencing telecommuting, with significant proportions keen to utilise it for a much greater proportion of work practices. The extent and durability of such shifts is difficult to predict.

Urban structures

Efforts to manage urban structure often involve coordination of transport and land-use planning around key nodes within metropolitan areas. These efforts may be considered innovative in relation to prevailing patterns, but they face impediments such as:

- the complications associated with ongoing car-dependent travel
- the task of coordinating and regulating land-use activities
- institutional and political support.

The expansion of metropolitan areas typically requires consideration of infrastructure servicing, but less effort is often dedicated to public transport provision. A stable viable model of urban fringe and ex-urban demand-responsive transit is not yet confirmed as established, apart from very specialist tasks such as disability mobility.

Climate change and pricing

Innovation to cope with the negative costs of transport infrastructure as experienced through various forms of pollution, including greenhouse gas emissions, includes electric vehicle uptake; road pricing; and improved parking-pricing regimes and regulation.

Road pricing is open to innovation, not only in relation to technologies that provide for less intrusive road-use recording but also to institutional models and the potential to advocate for the wider benefits that would accrue from price signals that reduce road use at the same time as raise funds for broader environmental and transport objectives.

There is potential for innovation in car parking pricing in terms of technologies, regulations and institutional models. However, this needs to be understood within the generalised framework of support for automobile travel, as parking is a consequence of wider settings.

Infrastructure procurement

Infrastructure procurement focusses on value capture and public-private partnerships (PPPs). If implemented carefully, value-capture models can be a robust financing alternative that could effectively support sustainable urban development and generate revenue for transport schemes. They have been successfully deployed in international jurisdictions.

“Road pricing is open to innovation, not only in relation to technologies that provide for less intrusive road-use recording but also to institutional models and the potential to advocate for the wider benefits that would accrue from price signals that reduce road use at the same time as raise funds for broader environmental and transport objectives.”

What this research means for policy makers

Policy discussion about transport innovation in Australia is focussed predominantly on current transport modes—rather than emerging modes—and on land-use planning to facilitate sustainable transport. Other innovation domains are covered—but not consistently across states—and include a focus on encouraging telecommuting and on emerging transport modes: MaaS, ride-hailing, car-sharing options and AVs. NSW also includes a focus on micro-mobility.

A key conclusion is that the Australian urban transport sector lacks a coherent overarching framework for an innovation system, despite regular references to innovation in policies. The principal approach is of market-initiated innovation with regulatory anticipation and oversight at adoption.

Establishing an innovation framing of Australian urban transport policy that uses contemporary theories of innovation—including innovation systems, cross-sectoral collaboration, sustainability transitions and public sector innovation—would be an advance on the current limited policy approach.

Urban transport innovation framework

An Australian urban transport innovation framework would undertake an inventory of the current institutional landscape for technical and policy innovation within the transport sector. This would involve mapping private and public capability at local, state and national scales, as well as any international linkages.

A visioning effort could be undertaken to frame national goals in urban transport. These would need to reflect major societal challenges, including productivity and environmental imperatives, plus urban demands such as livability and accessibility.

“Establishing an innovation framing of Australian urban transport policy that uses contemporary theories of innovation—including innovation systems, cross-sectoral collaboration, sustainability transitions and public sector innovation—would be an advance on the current limited policy approach.”

There would be a need to identify cross-sectoral institutional arrangements that could respond to the vision and performance challenges. This would include how suitable arrangements might be devised at the level of particular cities, and the mix of institutions present in such contexts that should be involved in the innovation framework.

Reform would likely be needed to reset the agendas for existing transport agencies at both state and federal levels so that innovation can be embedded within their activity.

Policy gaps and opportunities

This study has identified innovation domains where there are knowledge gaps:

- technology development and adoption—such as AVs or EVs
- institutional questions—such as settings necessary to establish generalised road pricing, implement effective multimodal public transport networks or strengthen activity centre planning in major metropolitan areas.

Methodology

This research is a desk-based review of the international literature on innovation, transport innovations and on Australian state planning and transport policy, focussing on New South Wales, Victoria and Western Australia. It also conducted two workshops with transport planning experts from state and local government and the private sector in Victoria and Western Australia.

To cite the AHURI research, please refer to:

Dodson, J., Curtis, C., Ashmore, D., Woodcock, I. and Kovacs, S. (2021) *Innovative responses to urban transportation: current practice in Australian cities*, AHURI Final Report No. 360, Australian Housing and Urban Research Institute Limited, Melbourne.

Available from the AHURI website at ahuri.edu.au/research/final-reports/360