The Australia Institute
Research that matters.

The Australia Institute
Research that matters.

# The role of ridesharing in addressing Canberra's transport challenges

July 2015

Dan Gilchrist

Richard Denniss

TAI

Policy Brief

The Australia Institute
Research that matters.

## About TAI

The Australia Institute is an independent public policy think tank based in Canberra. It is funded by donations from philanthropic trusts and individuals and commissioned research. Since its launch in 1994, the Institute has carried out highly influential research on a broad range of economic, social and environmental issues.

## Our philosophy

As we begin the 21st century, new dilemmas confront our society and our planet. Unprecedented levels of consumption co-exist with extreme poverty. Through new technology we are more connected than we have ever been, yet civic engagement is declining. Environmental neglect continues despite heightened ecological awareness. A better balance is urgently needed.

The Australia Institute's directors, staff and supporters represent a broad range of views and priorities. What unites us is a belief that through a combination of research and creativity we can promote new solutions and ways of thinking.

## Our purpose—'Research that matters'

The Institute aims to foster informed debate about our culture, our economy and our environment and bring greater accountability to the democratic process. Our goal is to gather, interpret and communicate evidence in order to both diagnose the problems we face and propose new solutions to tackle them.

The Institute is wholly independent and not affiliated with any other organisation. As an Approved Research Institute, donations to its Research Fund are tax deductible for the donor. Anyone wishing to donate can do so via the website at https://www.tai.org.au or by calling the Institute on 02 6130 0530. Our secure and user-friendly website allows donors to make either one-off or regular monthly donations and we encourage everyone who can to donate in this way as it assists our research in the most significant manner.

Level 5, 131 City Walk
Canberra, ACT 2601
Tel: (02) 61300530
Email: mail@tai.org.au
Website: www.tai.org.au

TAI

**Policy Brief**

The Australia Institute
Research that matters.

## Acknowledgement

This report was commissioned by ridesharing company, Uber.

TAI

Policy Brief

The Australia Institute

Research that matters.

## Summary

The emergence of ridesharing services like Uber and Lyft offer a potentially useful addition to Canberra's urban transport options.

Canberra faces unique transport challenges. Car ownership rates are higher in the ACT than in most states, despite almost all of the population living in the Canberra urban area. But with population predicted to almost double by 2061 other transport is required. At current rates of ownership Canberra's future population would have an additional 124,000 cars by 2040, enough fill a parking lot the size of the entire Parliamentary Triangle.

Public transport usage has stagnated compared to the rest of the country. While Sydney's public transport passenger numbers have tripled since the 1980s, Canberra's numbers have barely changed. The capital's public transport works well between particular hubs, such as Woden and Civic, but performs poorly in the low-density suburbs, where it suffers from the 'last mile problem' – how to connect passengers to the well-serviced transport hub.

Furthermore, Canberra's transport system faces the most variable demand conditions in the country. Visitor numbers to Canberra vary more than any other Australian city because of Federal Parliament. During parliamentary sitting periods, more than 1,000 politicians, staffers and lobbyists arrive and are heavy transport users. Domestic tourism is also highly seasonal with visitors avoiding cold winters and hot summers and flocking to events such as Floriade.

Parliamentary staff are heavy users of taxis. Their peaks of taxi demand place enormous strain on the taxi industry – Canberra has among the lowest numbers of taxis per capita in Australia, 30 per cent less than Sydney. Despite this, the taxi industry claims there is an oversupply of taxis.

Ridesharing has the potential to assist with many of these transport challenges.

In peak hours and peak months, more drivers can make themselves available for those seeking transport. Drivers can work around other commitments to come online when it is convenient or more profitable to do so. The ability of ridesharing apps to match an increase in transport capacity to a surge in consumer demand means it could significantly increase the efficiency of the transport system.

The flexibility of ridesharing can complement Canberra's public transport system by overcoming the 'last mile' problem. Data from Sydney ridesharing shows that 64.4 per cent of trips in the last year began or ended in an area with minimal public transport. More established data from the US shows that ridesharing is supplementing other forms of transport. With affordable ridesharing options at Canberra's transport hubs, these services are likely to significantly increase the utilisation of public transport and increase the efficiency of the wider transport network.

As Canberra moves to a future with more people and a different transport mix, ridesharing will be a useful addition to the city.

TAI

Policy Brief

## What is ridesharing?

In this report we define ridesharing as an app-based, on-demand service in which a driver uses the spare capacity of a private vehicle to supply transport to a passenger.

## Canberra's emerging transport task

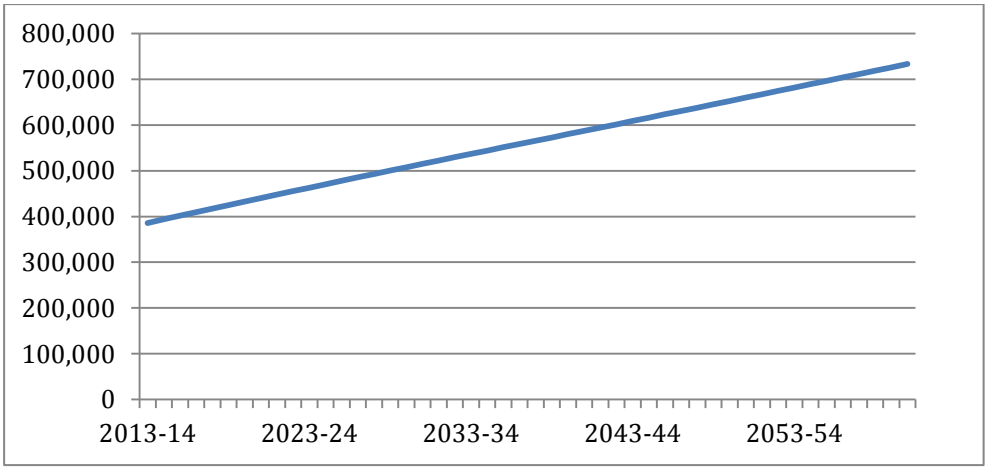
> *"Cities change slowly. We (Australia) are going to almost double the urban capacity of our cities in the next 40 years. Our ability to achieve that is not going to be done by following the same mechanisms that we have followed in the past. We cannot build the same capacity as we have built in the whole of civilisation in 40 years, so there needs to be a new way of addressing these problems."*
>
> - Professor Rob Adams, Director of City Design, City of Melbourne, 2014

Population growth, low population density, and Canberra's unique attributes as a capital city all place significant pressure on the city's transport system. In order to address some of these problems, the ACT government is currently making a significant investment in light rail.

The Capital Metro project is a 12 kilometre, 13-stop link between Gungahlin and the city centre, connecting two of the city's major transport hubs. The $610 million rail investment is expected to serve nearly 14,000 passengers in 2021, growing to 21,000 by 2031.[1] As Stage One of the project, this link is seen as a test case for wider adoption of light rail in the city.

Investment in light rail, combined with an increase in housing density along the rail corridor, has the potential to take significant pressure off the existing road infrastructure in Canberra's north. As Figure 1 shows, Canberra's population is forecast to rise from 375,000 in 2012 to 586,000 by 2040 and 733,000 in 2061.

**Figure 1 – Projected population, Australian Capital Territory**




Source: ABS 3222.0 - Population Projections, Australia, 2012 (base) to 2101 (series B used)

[1] http://www.capitalmetro.act.gov.au/the-case-for-light-rail/capital-metro-in-focus

However, the ability to connect Canberra's sprawling population to the new light rail stops will be a central determinant of both the financial success of the light rail project and the extent to which it relieves traffic congestion.

At current rates of car ownership, the population growth expected by the ABS will result in an additional 124,000 cars on Canberra's roads by 2040.[2] **If these cars were all used to drive to work, they would require parking space of more than 3.5km$^2$ – an area the size of the entire parliamentary triangle.** And at current rates of car use, those extra vehicles would be driving an additional 1.3 billion kilometres on Canberra roads each year – more than the distance from Earth to Saturn.[3]

This would require significant investment in additional road and parking infrastructure.

## Canberra's unique transport challenge

Canberra's transport planners, and ultimately Canberra's citizens, face a number of unique challenges. Uneven population concentrations with a low overall density, the regular influx of temporary workers when Federal Parliament is sitting, and major drawcard events such as Floriade all serve to make the provision of traditional forms of flexible, low-cost and high-convenience transport options difficult.

As discussed below, Canberra residents rely heavily on private cars for their transport needs. Both public transport use and the number of taxis per capita are below the national average. This pattern of transport choice means that the public transport options available to non-resident visitors to the ACT are fewer than they might be which, in turn, places significant pressure on the transport system at times of high demand.

## Population density and dispersion

Canberra's population density is significant lower than that of the major capital cities in Australia. Most areas in Canberra support a population of between 1,000 and 2,000 people per square kilometre, while large parts of Sydney and Melbourne reach 4,000 to 5,000 people per square kilometre.

Canberra also eschews the standard pyramid profile of population density, where, for most cities, population density increases fairly smoothly towards the city centre. As a consequence of its decentralised plan, by comparison, Canberra's population density is distributed unevenly.

[2] ABS 2013: 4102.0 - Australian Social Trends, July 2013
[3] ABS 2013: 9208.0 Survey of Motor Vehicle Use, Australia, 12 months ended 30 June 2012

**Figure 2 – Population density in Canberra**


Source: Nenad Petrovic, .id Consulting

Low population density tends to increase the cost, and reduce the convenience, of public transport services. It is difficult to provide sufficient services to more sparsely populated suburbs.

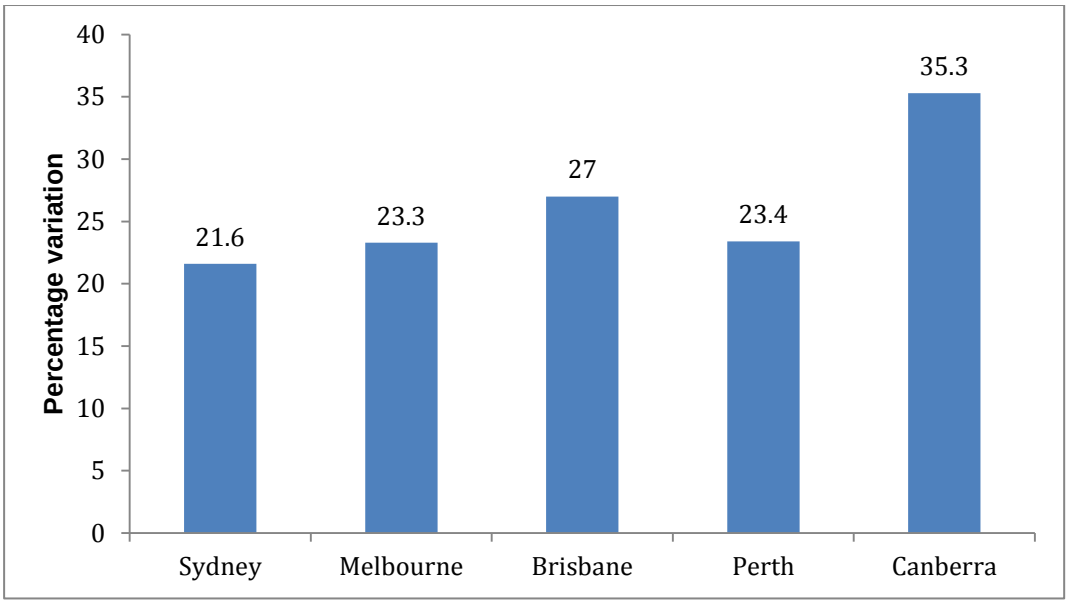
Canberra provides good transport services between hubs such as Civic and Woden – with direct transport corridors and relatively light traffic – but the low density of areas outside the hubs means that connecting services have further to travel, and fewer people to pick up. In such areas ridesharing could be a useful addition to the existing transport services.

## Variable population

Domestic visitor numbers to Canberra vary more than any other Australian city because of Federal Parliament. During parliamentary sitting periods, more than 1,000 politicians, staffers and lobbyists arrive in Canberra. These visitors are heavy taxi users, which further stresses Canberra's already low taxi coverage.

Canberra's unique nature in this regard is well demonstrated by examining the difference in domestic air passenger arrivals. Canberra's arrivals vary more from month to month than other cities, reflecting both parliament and Canberra's strong seasonal variation in tourism and business activity. As shown in Figure 3 below, Canberra's domestic arrivals vary between its lowest and highest months by over 35 per cent, compared with Sydney, which varies by only 22 per cent.

**Figure 3 – Percentage variation in domestic airport arrivals from lowest to highest month, 2014**




Source: BITRE Airport Traffic Data: http://bitre.gov.au/publications/ongoing/airport_traffic_data.aspx

## How technological change shifts the cost-convenience trade-off

The cheapest solution to a problem is rarely the most convenient. Consider the following:

- The total cost of car ownership is expensive but, for those who do not live near public transport hubs, it is often considered to be the most convenient transport choice.
- Taxis provide a more convenient 'door to door' transport solution than buses, but they do so at higher cost.
- Bikes provide a very low cost transport solution but they are a relatively inconvenient transport mode with little capacity for passengers or cargo.

Technological change has the capacity to fundamentally affect the trade-off between cost and convenience for some products.

Just as Airbnb has made it much easier for people with spare rooms to find people who want rooms, ridesharing apps have made it much easier for people with spare car seats and spare time to find people who want a ride.

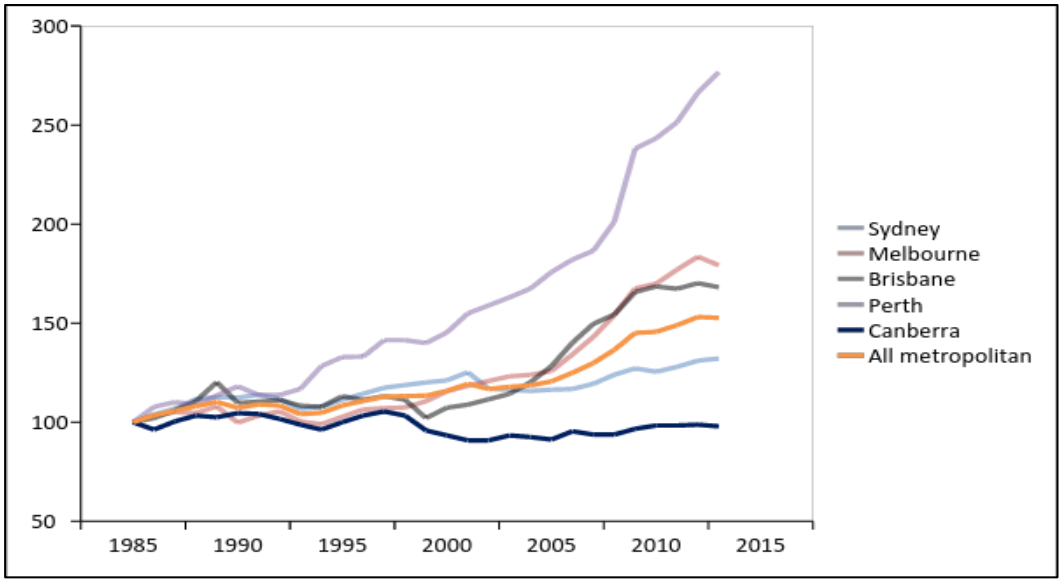
By using existing private cars and generating real-time trip request data via an app, the supply of ridesharing vehicles closely tracks demand for rides. Ridesharing drivers do not need to drive around searching for a rider, and they have the flexibility to log-on or off the system in response to undersupply or oversupply. This efficiency is reflected in improved availability and lower prices.

A recent survey of Sydney residents found that low cost was the main reason for choosing transport options such as ridesharing.[4]

The per kilometre cost of ridesharing services means that it is unlikely to act as a substitute for cars or public transport for long journeys, but the flexibility of the service means that it has the capacity to significantly complement Canberra's public transport system by overcoming the 'first and last mile' problem – how connect passengers to the well-serviced transport hub.

Ordinarily, high housing density means that a greater number of people can live in easy walking distance from a public transport mode. However, low housing density means that relatively few residents enjoy that convenience. Canberra's low population density means that the 'first and last mile' problem is a significant barrier to the widespread use of public transport, and makes transport infrastructure projects uneconomical. As shown in Figure 4, public transport usage in Canberra has stagnated since the 1980s, despite a widespread trend towards increasing public transport usage nationally.

**Figure 4 – Public transport passengers per year, relative to 1985 levels (per cent)**




Source: BITRE 2014: 'Long term trends in Australian public transport', Table 5. Note: 1985 levels set at 100.

Low cost and flexible transport systems from homes and businesses to public transport stops will be essential to the use and viability of reliable public transport. In this sense, ridesharing services are likely to boost public transport use.

In a case study of their operations in Chicago, Uber found that 75 percent of trips were one-way.[5] That is, the passenger's next trip through Uber was at least 2 miles away from, or 2 days after, their last. This means that the majority of Uber traffic is supplementing other forms of transport.

[4] Taverner Research - Report on Survey of Taxi Use - December 2014
[5] Uber – 'Chicago An Uber Case Study'

Data from Sydney is similar. Over a third of Sydney's population lives in transport 'deserts': areas more than 800m from medium frequency public transport. Data shows that 64.4 per cent of trips facilitated by Uber in the last year began or ended in a transport desert.[6]

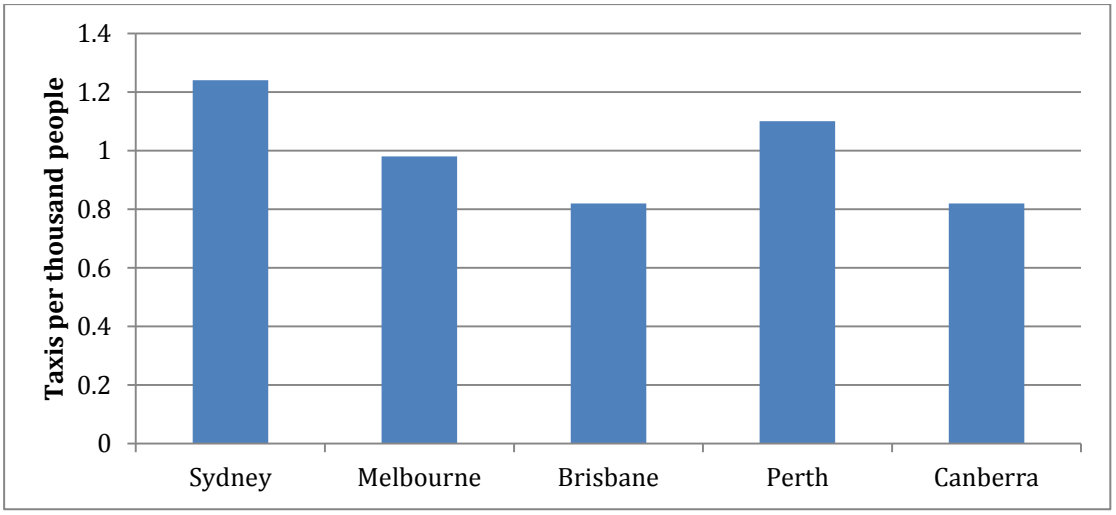
## The role of ridesharing in providing flexible supply

A unique attribute of ridesharing services is that they use existing capital (privately-owned cars) at short notice to provide a publicly valuable service. While decisions about the number of buses, trains and taxis on the road by necessity must be made in advance by regulators based on imperfect demand projections, this is not the case for ridesharing services. Ridesharing drivers may log-on and off at will in response to undersupply or oversupply.

In peak hours and peak months, more drivers make themselves available for those seeking transport as they can work around other commitments to come online when it is convenient or more profitable to do so. That is, ridesharing apps create a surge capacity pool by making work viable for those drivers who only want to operate during peak periods, perhaps to supplement other income or to work around other responsibilities.

As shown in Figure 5, Canberra has significantly fewer taxis per head of population than most other cities, with around 0.8 taxis per thousand people, compared with Sydney, which has over 1.2:

**Figure 5 – Taxi density in Australian cities**




Source: taxi regulator in each state / territory

Despite having 30 per cent fewer taxis per person than Sydney, Canberra's taxi industry has claimed that there are already too many taxis on the roads in Canberra.[7] With industry claims of oversupply, it is unlikely to provide a solution to the surge in demand for short trips

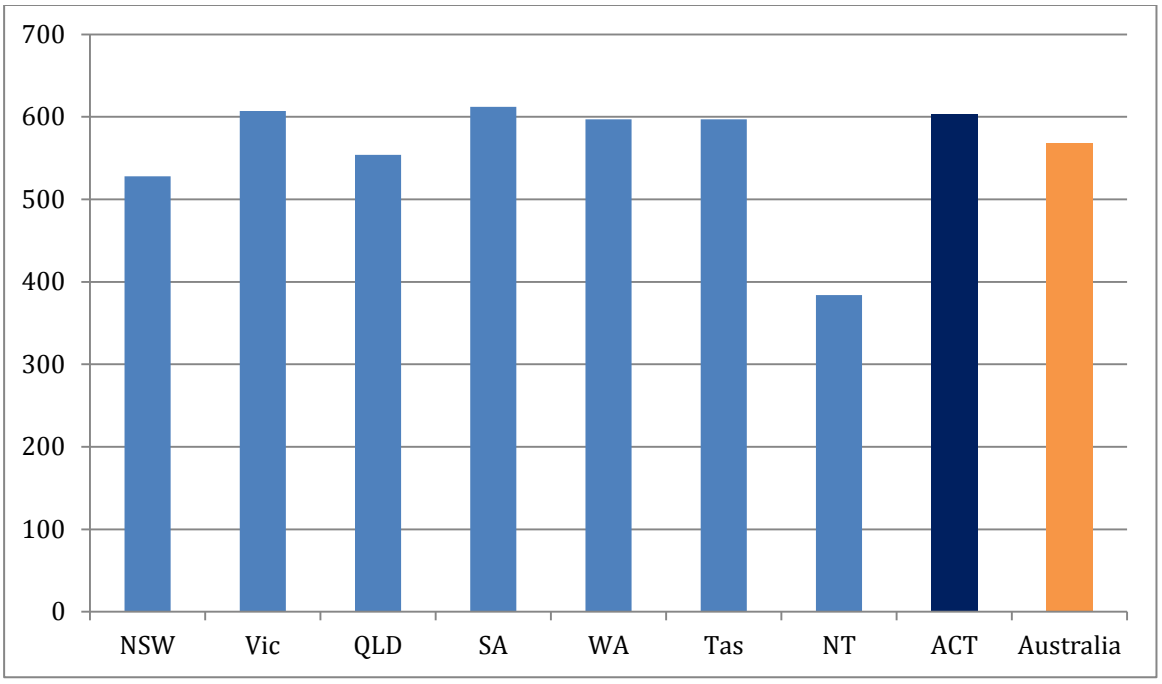
[6] http://newsroom.uber.com/sydney/2015/05/connecting-sydneys-villages/

[7] http://www.canberratimes.com.au/act-news/taxi-drivers-ask-act-government-to-keep-canberra-cab-licences-off-road-20141129-11um8c.html

experienced during peak times, likely to increase with population growth and the introduction of Capital Metro.

Significantly, when the public transport and taxi systems are unable to meet demand, it is likely that residents will choose to purchase a car to reliably access transport. For example, if an individual chose to rely on a combination of buses and taxis to meet their transport needs, but became unable to rely on taxis during parliamentary sitting weeks, then they may decide to switch to a private car instead. As shown in Figure 6 below, ACT residents own significantly more cars per thousand people than the national average, despite living almost entirely in an urban environment.

**Figure 6 – Cars per 1000 population, 2013**




Source: ABS 2014. '4102.0 - Australian Social Trends, July 2013'.

Across Australia, city-based vehicles are far more frequently used within their capital city than in interstate trips. ABS figures show that for every 105 km driven by vehicles within capital cities, only two km are driven between capitals.[8] This indicates that cars are most commonly used for journeys that could be undertaken by intra-city transport services such as ridesharing.

[8] ABS 2013. 'Survey of Motor Vehicle Use, Australia, 12 months ended 30 June 2012', Table 21. Note that numbers used were for all vehicle types as, for passenger vehicles only, the inter-capital trip statistic has a relative standard error of over 50 per cent. Those numbers do broadly agree with the overall vehicle statistics (that is for passenger vehicles, 82 km in-city to 0.55 km between cities).

Given that the largest cost of private car transport is car ownership, once someone has decided to buy a car to ensure reliable access to transport they are likely to drive that car even on journeys for which they were once willing to rely on public transport.

A study of the City CarShare scheme in the San Francisco Bay area found that with access to an affordable alternative to car ownership, 29 per cent of CarShare members subsequently owned one or more fewer cars.[9] Ridesharing is one such alternative, and will play a valuable role in reducing Canberra's dependency on cars. Although not a direct comparison with ridesharing, the potential for reducing car use is clear.

Car-pooling itself can be facilitated by ridesharing apps. The uberPOOL trial in New York allows riders with a similar destination to be matched by the app, splitting fare costs and reducing the number of cars on the road.[10]

The ability of ridesharing apps to rapidly match an increase in transport capacity to a surge in consumer demand means it has the capacity to significantly increase the efficiency of the transport market, the benefits to consumers and, potentially, boost economic activity in the territory more generally.

## Additional benefits of ridesharing

In addition to economic advantages, ridesharing has several social benefits.

- Cashless transactions through an app provide a safer environment for drivers who are no longer targets of robbery, and fare evasion is impossible. Conversely, passengers are not susceptible to 'card skimming' which can occur with in-car payment systems.
- The Uber app facilitates ratings for both drivers and passengers at the end of every trip, encouraging positive interactions and resulting in a more pleasant experience for both parties.
- Route selection and pricing is transparent – the route and price can be estimated through the app before the trip commences and, if an inefficient route is taken, riders can report this to the customer support team who can reimburse the cost of the incorrect route.
- Drivers can choose when, where and how much to work, providing supplemental income structured around existing commitments.
- Potential to generate supplemental income when needed, reducing financial stress. Uber contends that their average driver-partner in Australia works 20 hours a week, and earns $2500 a month.[11]

[9] Robert Cervero, Aaron Golub, and Brendan Nee. 2007. "City Carshare: Longer-Term Travel Demand and Car Ownership Impacts,"
[10] https://newsroom.uber.com/nyc/2015/07/taking-1-million-cars-off-the-road-in-new-york-city/
[11] http://newsroom.uber.com/australia/2014/11/ubers-letter-to-the-transport-ministers-of-australia/

- Easy access to ridesharing is associated with reduced drink driving.[12]

## Conclusion

This paper focuses on the potential for ridesharing apps services such as Uber and Lyft to complement Canberra's existing transport options and, in particular, service the 'first and last mile' between public transport stops, homes and workplaces.

Canberra is in a position to benefit greatly from the use of public transport, but is held back by low and scattered population density. There is great potential for ridesharing to supplement inter-hub transport and to meet surges in demand.

A business as usual approach to planning and transport will result in unsustainable strain on the existing transport infrastructure as the population increases. Ridesharing represents an efficient means of improving the public transport network, and giving more Canberrans the means to leave their car at home.

[12]http://www.washingtonpost.com/news/wonkblog/wp/2014/07/10/are-uber-and-lyft-responsible-for-reducing-duis/

## References

Australian Bureau of Statistics (ABS) 3222.0 - Population Projections, Australia, 2012 (base) to 2101

ABS 4102.0. 'Australian Social Trends, July 2013'.

ABS 9208.0. Survey of Motor Vehicle Use, Australia, 12 months ended 30 June 2012

Bureau of Infrastructure, Transport and Regional Economics (BITRE), Airport Traffic Data

BITRE 2014. 'Long term trends in Australian public transport', Table 5

Bureau of Meteorology 2015. Australian Weather Calendar
http://www.bom.gov.au/calendar/annual/climate.shtml

Capital Metro website (accessed 13 July 2015)
http://www.capitalmetro.act.gov.au/the-case-for-light-rail/capital-metro-in-focus
http://www.capitalmetro.act.gov.au/the-case-for-light-rail/benefits-for-our-community

Canberra Times, 2014.
http://www.canberratimes.com.au/act-news/taxi-drivers-ask-act-government-to-keep-canberra-cab-licences-off-road-20141129-11um8c.html

Greenwood, Brad N and Wattal, Sunil, Show Me the Way to Go Home: An Empirical Investigation of Ride Sharing and Alcohol Related Motor Vehicle Homicide (January 29, 2015). Fox School of Business Research Paper No. 15-054

Nenad Petrovic 2015, .id Consulting. Used with permission.

Robert Cervero, Aaron Golub, and Brendan Nee. 2007. "City Carshare: Longer-Term Travel Demand and Car Ownership Impacts,"

Taverner Research - Report on Survey of Taxi Use - December 2014

Uber - http://newsroom.uber.com/australia/2014/11/ubers-letter-to-the-transport-ministers-of-australia/

Uber – 'Chicago An Uber Case Study'

Washington Post 2014. 'Are Uber and Lyft Responsible For Reducing DUIs?'
http://www.washingtonpost.com/news/wonkblog/wp/2014/07/10/are-uber-and-lyft-responsible-for-reducing-duis/