

OPAL FARES
2020-2024

INVESTIGATING FARE-FREE PUBLIC TRANSPORT



Information paper

February 2020

What would happen if public transport was fare-free?

Sydney public transport currently covers around a quarter of its costs from passengers through the fares they pay to use it. This sharing of costs between passengers and taxpayers is common in public transport systems across the world. However, in some parts of the world public transport is free to use and is fully funded by the community through taxation revenue. We explored what might happen if Sydney public transport was free by considering the experience of the cities where fare-free public transport has been introduced.

Based on experience elsewhere, and our own analysis of the Sydney public transport network, we consider that Sydney could see the following outcomes from making public transport free to use:

- ▼ An immediate increase in public transport ridership of around 40%, leading to substantial crowding on the public transport network.
- ▼ Minimal impact on the level of road congestion (even in peak hours). Experience elsewhere suggests a reduction in avoided road congestion of around 2% to 5%.
- ▼ More people using public transport for short trips when they would have otherwise walked or cycled - reducing the health benefits of public transport.
- ▼ An increase in public transport use by low income earners which improves their participation in society.
- ▼ A loss of \$1.6 billion per year in fare revenue that would need to be funded through taxation revenue, which represents about \$530 per NSW household (last year each NSW household contributed about \$4,900 in taxation revenue to fund public transport services)¹.
- ▼ Significant infrastructure investment to cater for increased demand on public transport services.

We are not recommending free fares as we consider that the benefits of doing this do not justify the costs involved. We consider that some key benefits of fare-free public transport, such as greater accessibility for low income earners, can be achieved at lower cost through targeted programs.

Fare-free public transport would result in substantial costs to taxpayers relative to its benefits

Benefits of increased social mobility could be specifically targeted rather than providing free travel to the whole community at significant cost.



¹ NSW Government recurrent and capital spending per NSW household for 2018-19.

What would happen to public transport use in Sydney?

Overall ridership could increase by around 40% resulting in substantial crowding

Using our elasticity estimates (see *Technical Paper – Demand and elasticity*) we estimate that free fares could increase overall ridership by around 40%. However, as our elasticities were derived from much smaller fare changes (within $\pm 20\%$) we examined a range of different experiences with free fares, including:

- ▼ what has occurred on specific routes in NSW, and
- ▼ the impact on ridership observed/estimated from other jurisdictions.

We also considered modelling that was recently undertaken for Paris where fare-free transport was considered but not implemented.

Some examples of NSW routes that have implemented/trialled fare-free services include:

- ▼ A fare-free zone for buses in Newcastle that was implemented in 2006, mainly in the CBD area. This was removed in 2019 with the introduction of the light rail.
- ▼ Certain bus services in Parramatta and Wollongong that currently provide free travel around popular destinations (such as shopping, business precincts, university campuses and hospitals).
- ▼ A number of fare-free services that were trialled in the Sydney region but were discontinued due to low patronage.²

However, there is not a lot of information on what the impact on patronage has been on these routes as in many cases passenger trips were not recorded. As these services are specific, they may not provide a good guide for what would occur if fares were made free across the board. Therefore, we have used the overseas examples in Box 1 as guidance on what the impacts might be for Sydney.

When free fares have been introduced overseas the increase in ridership has varied widely – from 14% in Tallinn, and 60-100% in Dunkirk, within the first year. When free fares were proposed for Paris, studies estimated a patronage increase of 6% to 48%. However, we note that increased ridership following free fares is largely impacted by the quality of the public transport services provided, prior fare prices and the cost and feasibility of alternative modes (such as driving). Thus, the results vary considerably between cities.

Given the observed outcomes and estimates from other jurisdictions we consider that increases of around 40% in ridership could be possible on the Sydney public transport network.

² Free bus shuttle services at Blacktown, Cabramatta, Campbelltown, Liverpool and Penrith were discontinued due to low patronage. These services had less than 4.5 passengers per kilometre (the Liverpool service had 0.6 passengers per kilometre) compared with 7.4 passengers per kilometre for Wollongong, and 8.8 and 21.1 for Sydney and Parramatta. <https://www.illawarramercury.com.au/story/1589190/gong-bus-safe-as-brakes-go-on-free-shuttles/> [accessed 3 November 2019].

Many of these extra trips are likely to be new trips or to replace walking/cycling trips

A 40% increase in ridership is a substantial increase. Based on observations in other jurisdictions (Box 1), the increase in public transport ridership is likely to come from people who would have otherwise walked or cycled, those who choose to ride for leisure (eg, increased ferry rides for enjoyment) and from increased social mobility, rather than reducing cars on roads. This is also supported by the experience in Melbourne, which introduced a fare-free zone for trams. In Melbourne, short walking trips have been substituted by tram rides resulting in increased congestion on trams.³

The extra trips could exacerbate crowding on public transport

A large increase in public transport use in Sydney would place substantial pressure on the already congested public transport network, particularly the train network during peak hours. For example, maximum capacity can already exceed 180% (as a percentage of seating capacity) during the weekday peak hours on busy services on the T1 Western/North Shore lines and the T4 Illawarra lines. Hence, free fares could exacerbate crowding on these services and there is limited capacity to increase services on these already congested routes without making large new capital investments (we discuss potential crowding issues further below).

Off-peak fares for train services are currently lower and provide a financial incentive to passengers to shift their travel out of the peak if they can. One of the key reasons for doing this is to spread demand out across the day as this lowers the overall costs of providing services. Thus, free fares are likely to further exacerbate crowding during peak periods.

We have also considered the impact on ridership if free fares were to be only introduced during off-peak periods. Some passengers may switch from peak to off-peak travel which would alleviate some pressure on congested services during peak periods. However, the impact on all services may not be significant (there is already a 30% fare discount for off-peak train travel). There may not be a significant number of additional people that switch their travel to off-peak times, as there are other considerations that can determine when people choose to travel (eg, when they commence and finish work).⁴

³ City of Melbourne, *Draft transport strategy 2030*, May 2019, p 100.

⁴ Melbourne currently has free train travel if you touch on and off with your Myki before 7:15am on weekdays. However, still experiences significant crowding on its rail system which is highest during the morning peak. Infrastructure Australia, *Urban Transport Crowding and Congestion – the Australia Infrastructure Audit 2019 supplementary report*, June 2019 <https://www.ptv.vic.gov.au/tickets/myki/travel-with-myki/travel-benefits/> [accessed 4 November 2019], <https://www.infrastructureaustralia.gov.au/sites/default/files/2019-08/Urban%20Transport%20Crowding%20and%20Congestion%20%28Lower%20Resolution%29.pdf> p 59 [accessed 8 November 2019]

Box 1 Free fares in other parts of the world

Talinn, Estonia

Free fares for residents were first introduced in Talinn (which operates a tram and bus system) in 2013 before being extended across Estonia under an opt-in system (for each county).

- ▼ Cost recovery from farebox was around 30% prior to introducing free fares.
- ▼ Free fares are only available to people who are registered as residents in Talinn, and not available for tourists and other non-residents. If someone registers as a resident in Talinn then the county receives an additional portion of national taxes paid by each resident (from the national budget allocated for county public transport). This additional revenue has been reported as having offset more than the loss in fare revenue.
- ▼ In 2016, a study into the scheme found that by 2014, the use of public transport had increased by 14%, but car use had only declined by 5%. It also found that the number of trips done by walking had dropped by 40% as more people used buses. It also found that public transport use increased dramatically among the old and the young, those on very low income (as well as those out of employment) but there was no indication that employment opportunities had improved as a result.

Dunkirk, France

France has free public transport schemes across a number of different networks. It also has a history of low public transport prices and strong social policies. Dunkirk, with a population of about 90,000 introduced free fares in September 2018. One of its aims was to revitalise its town that had an aging and dwindling population.

- ▼ Cost recovery from farebox revenue was previously about 10%. The fare shortfall is funded from an increase in company taxes and additional funding from the city's budget.
- ▼ The town revamped its bus system prior to introducing the scheme and included an extension of bus routes, better connections to neighbouring towns (five express lanes running every 10 minutes throughout the day) and an increase in the bus fleet from 100 to 140.
- ▼ After the introduction, initial findings have found that ridership has more than doubled on weekends and increased by 60% during the week. The impact on reduced car usage is unclear, however, of 2000 passengers surveyed by researchers, about half of them stated that they use the fare-free bus service regularly instead of their cars. Previously only 5% of trips were made by bus, 65% of trips were made by car, 29% by walking and 1% by bicycle.

Paris, France

The city of Paris assessed the feasibility and impact of introducing free fares in 2018. After reviewing the results of two separate commissioned reports and studying Dunkirk's example, it decided to implement other measures such as free travel for children (under 11 years). The commissioned reports found that:

- ▼ There would be minimal impact on reducing car congestion (one report estimated that it would be only around 2%) with potentially a large increase in public transport ridership (one report estimated that it would be around 6%-10% whereas another found increases of up to 36% to 48%) which would have a detrimental impact on service quality across the already congested network

- ▼ One report estimated that the scheme would add around \$814 (€500) a year to household tax bills in the Paris region, and would require additional funding of \$3.6 billion (€2.2 billion) to \$5.4 billion (€3.3 billion).

Hasselt, Belgium

In the city of Hasselt in Belgium, public transport travel was free between 1997 and 2013. Free fares were introduced because of major infrastructure works in the city rings but were subsequently discontinued when it became financially unsustainable.

- ▼ The scheme saw a significant increase in public transport use of 1300%.
- ▼ The financial cost of free public transport increased by about 400% over 1997 to 2007.
- ▼ In terms of the impact to the ridership, riders who reacted most strongly when free fares were removed were occasional users, commuters and students. Stable users remained those in the outer boroughs, leisure riders, seniors and young people (those under 19 years still travel for free).

Source: Cats et al, *Public transport pricing policy – Empirical evidence from a fare-free scheme in Tallinn, Estonia*, January 2014.

Guardian article on Tallinn, Estonia, <https://www.theguardian.com/cities/2016/oct/11/tallinn-experiment-estonia-public-transport-free-cities>, accessed 29 October 2019.

World Economic Forum article on Estonia, <https://www.weforum.org/agenda/2018/06/estonia-is-making-public-transport-free/>, accessed 29 October 2019.

Reuters article on potential free fares in Paris, <https://www.reuters.com/article/us-france-paris-transportation/paris-mulls-free-public-transport-to-reduce-pollution-idUSKBN1GW1KU>, accessed 29 October 2019.

Irish Times article on potential free fares in Dublin, <https://www.irishtimes.com/news/environment/free-public-transport-could-it-work-for-dublin-1.3768146>, accessed 30 October 2019.

France24 article on fare free travel in Dunkirk, <https://www.france24.com/en/20190831-france-dunkirk-free-transportation-bus-success-climate-cities>, accessed 30 October 2019.

Rail Journal article on outcomes of study for free fares in Paris, <https://www.railjournal.com/policy/study-rejects-free-public-transport-for-paris/>, accessed 29 October 2019.

Eltis article on Hasselt cancelling free public transport, <https://www.eltis.org/discover/news/hasselt-cancels-free-public-transport-after-16-years-belgium-0>, accessed 29 October 2019.

How would free fares impact community benefits?

There are a number of benefits for the community when people use public transport. Those benefits primarily occur when public transport trips are taken by people who would otherwise have driven a car. The community wide benefits of public transport use include:

- ▼ Reductions in traffic congestion, air and noise pollution, greenhouse gas emissions and accidents where someone who travels by public transport would otherwise have travelled by car.
- ▼ Lower health costs as a result of physical activity associated with walking and cycling to and from public transport.
- ▼ Faster travel times for existing public transport users when new people use public transport and Government responds by putting on more frequent services (note that this can only occur where there is scope to increase the number of services in response to higher public transport use).

We discuss the impact that free fares might have on community benefits in the sections below. We also discuss the potential impact of free fares on promoting social inclusion.

May have a small impact on reducing road congestion and environmental pollution

In other jurisdictions where free fares have been introduced, private car use has not fallen by anywhere near as much as the increase in public transport trips. The reduction in private car use has been relatively small, around 2% to 5%. There are a number of factors that affect people's decisions to travel by private car instead of public transport. These include convenience (accessibility and frequency of public transport), travel time, personal preference and cost.

Overseas research on the impact of free fares reports that a substantial number of people are unlikely to switch travel modes if they have already chosen the more expensive travel option eg, private car use (which typically faces higher costs compared to public transport which is usually heavily subsidised).⁵

This may also be the case for Sydney, particularly during weekday morning peak periods where traffic congestion is the highest (especially routes into the Sydney CBD) as travelling by car is a more expensive option. For example, if only petrol and parking costs are considered,⁶ then for someone commuting from:⁷

- ▼ Parramatta to the Sydney CBD (a distance of about 25km), the cost of private car travel would be at least \$23 for a return journey compared with \$10.30 to catch the train
- ▼ Chatswood to the Sydney CBD (a distance of about 13km), the cost of private car travel would be at least \$19 for a return journey compared with \$8.96 for the train
- ▼ Hurstville to the Sydney CBD (a distance of about 20km), the cost of private car travel would be at least \$21 for a return journey compared with \$8.96 for the train.

Also, as a result of free fares increasing crowding and travel times on public transport, people may be less inclined to switch from private car use.

Given that the impact on reduced road congestion is unlikely to be substantial, there are unlikely to be significant reductions in environmental pollution and accident costs as a result.

In terms of travel time savings, if private car use were to fall by 5% during peak hours, then we estimate that the improvement in travel time would be minimal on average across the Sydney road network (likely to be less than a one minute reduction on average across the Sydney road network during the morning peak period (7am to 9am). However, there may be certain areas that experience greater or lower savings in travel time.

⁵ Private car use may be preferred by those willing to pay more to travel, or public transport may not be readily accessible (services may be infrequent or accessing points of public transport may not be considered as convenient compared with driving, when considering the costs involved).

<https://www.iledefrance-mobilites.fr/wp-content/uploads/2018/10/Rapport-Comit%C3%A9-sur-la-faisabilit%C3%A9-de-la-gratuit%C3%A9-des-transport-en-commun-en-%C3%8Eile-de-France-leur-financement-et-la-politique-de-tarification.pdf>, p 7 [accessed 5 November 2019].

⁶ We note that a share of vehicle operating costs would also need to be considered. Also, there are external costs (eg, environmental pollution, congestion and accident costs) to private care use that are not factored in people's decision to drive, which would otherwise increase the total (private and social) costs of car use.

⁷ Assuming fuel efficiency of 10.5L per 100km petrol costs of \$1.40 per litre and parking costs of \$16 (weekday early bird rates eg, Sydney Opera House). The actual costs per person would be less if carpooling is involved.

May lead to a reduction in overall active health outcomes

The increased ridership may lead to some improvement in active transport benefits from those who now walk or cycle to catch public transport instead of driving. However, the overall active health benefits are likely to reduce as more people catch public transport instead of completely walking or cycling to their destination – particularly for relatively short trips. This has occurred overseas (trips done by walking dropped by 40% in Talinn - see Box 1) and also in Melbourne where short walking trips have been substituted by tram rides in the fare-free tram zone.⁸

Not all new public transport trips replace car trips

Evidence from overseas suggests that a substantial proportion of the increase in ridership is from a replacement in walking/cycling trips and increased social mobility.

May provide some travel time benefits, but may lead to significant crowding on certain peak services where new investment is required

An increase in public transport demand can provide an external benefit to other passengers if service frequency is also increased, as more frequent services mean shorter waiting times in between services. However, if service frequency does not increase, then there would be increased crowding on services.

Bus, light rail and ferry services

For bus, light rail and ferry services, there is likely to be scope to increase the frequency of services across the Sydney network by purchasing new buses, trams and ferries. While there is a cost associated with this expansion, any increases in services would not require significant capital investment. Hence, with the increase in demand, there may be some benefits for these services from lower waiting times for existing public transport passengers.

- ▼ For bus services, we estimate that there would be around a 30% increase in demand during the morning peak period - this is an additional 64,300 passengers and about eight people, on average, per bus service assuming the new passengers were evenly spread across peak services (there are about 7,700 services in the morning peak period across the Sydney bus network). For certain morning peak services, capacity is already at maximum.⁹ New services would need to be added to accommodate any additional passengers on these services otherwise existing passengers would experience increased crowding at bus stops, increased boarding/alighting times, and where new passengers fill up buses, passengers would need to wait for subsequent services.
- ▼ For light rail services, we estimate that there would be around a 5% increase in demand during the morning peak period – this is an additional 500 passengers and about eight people per service on average (there are about 60 services in the morning peak period). Light rail services are close to maximum capacity and passengers may already experience discomfort and crowding at current levels (up to 80% capacity). As with bus services, for many light rail services, even a relatively small increase in demand would require additional services.

⁸ City of Melbourne, *Draft transport strategy 2030*, May 2019, p 100.

⁹ For example, the B1 Mona Vale to Wynyard, M30 Taronga Zoo to Sydenham, T80 Liverpool to Parramatta, 333 North Bondi to City Circular Quay, B1 Mona Vale to Wynyard, 343 Kingsford to Chatswood, 400 Bondi Junction to Sydney Airport and M52 Parramatta to City Circular Quay services.

- ▼ For ferry services, during weekdays patronage (average of about 20% capacity) is currently lower than other modes of transport and there is capacity for additional passengers (both peak and off-peak periods).¹⁰ However, on Sundays, certain services reach maximum capacity (eg, Manly to Circular Quay). Free fares would increase crowding on these services unless new ferries are purchased. The number of services that can be added without significant new capital investment is limited by the capacity of existing wharfs.

Train services

We estimate that there would be an approximate 30% increase in demand during the morning peak period which is about an additional 82,800 passengers. Given that there are about 1,500 services in the morning peak, this means about 55 additional people per service assuming new passengers are evenly distributed across these services. However, certain services on the T1 Western/North Shore lines and the T4 Illawarra lines transporting passengers to the Sydney CBD are already at capacity. Additional passengers would further increase crowding on platforms, increase boarding/alighting times and force passengers to wait for subsequent services.

Free fares may lead to significant overcrowding on peak train services

There is limited scope to increase the number of train services in the short to medium term

There is currently limited scope to significantly increase the number of train services, except in the longer term,¹¹ and that investment to provide additional services is likely to be expensive. A substantial investment would be required. These investments tend to have relatively long project lead times. As a result, the most likely result would be crowding on rail services in the short to medium term.

May lead to improved social inclusion

Where free fares have been implemented overseas, increased social inclusion – ie, greater transport accessibility for passengers who find it difficult to fully participate in society – has been discussed as a benefit. In Dunkirk, a key aim in providing free fares was to revitalise its town with an aging and dwindling population – bus ridership was previously low but the resulting increase was reported as being successful in increasing social inclusion for the retired, unemployed and those on lower incomes. Similar impacts were also reported for Talinn.¹²

Free fares may improve social inclusion

Those who directly benefit from increased social mobility could be better targeted through discounts or free fares for people who meet certain criteria.

¹⁰ We note that the Manly – Circular Quay route is the most popular route during weekdays and whilst Sydney ferries does not typically reach capacity during the weekday peak periods, the privately operated Manly Fast Ferry Service does.

¹¹ Although, we note that the Metro Stage 2 will help to alleviate some congestion in the medium term.

¹² Susilo & Reimal, *The prospects of fare-free public transport: evidence from Talinn – September 2017*, p 1.

Improving the accessibility of public transport through free fares would assist in increasing social inclusion particularly for those on lower incomes who do not currently have access to Opal Gold¹³ or other concessional fares.

However, we consider that these benefits could be achieved at much lower cost to taxpayers through targeted discounts or free fares for people that meet certain criteria, rather than providing free travel for the whole community.

Would it be financially sustainable?

We estimate the following impacts and hence additional costs to taxpayers if fare-free travel is implemented:

- ▼ About \$1.6 billion loss in fare revenue per year – this is the current amount of Opal fare revenue annually,¹⁴ which represents about \$530 per year for each NSW household¹⁵ and is in addition to the \$4,900 of tax revenue already provided by NSW households in 2018-19 to pay for public transport services.¹⁶
- ▼ Substantial additional financial costs to cater for the additional demand arising from free fares and mainly comprises cost for additional train services in the longer term. There would also be increased operating costs to maintain the additional services.

There would be some administrative savings such as a reduction in ticketing costs and associated staffing. However, they would be significantly less than the loss in Opal fare revenue. If free fares were offered only to residents, then there would be substantially fewer cost savings.

¹³ The Opal Gold card, capped at \$2.50 per day, is available to eligible customers (pensioner concession card holders, NSW seniors, ACT seniors and NSW War Widow/ers) and is a targeted way of providing public transport that is accessible for seniors and pensioners.

¹⁴ Audit Office of NSW, *Financial Audit Transport 2019*, p 20. <https://www.audit.nsw.gov.au/sites/default/files/pdf-downloads/Final%20report-%20Transport%202019.pdf> [accessed 28 November 2019].

¹⁵ There are about 3 million private dwellings in NSW. https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/1?opendocument [accessed 19 November 2019]

¹⁶ NSW Government recurrent and capital spending per NSW household for 2018-19. IPART, *Maximum Opal fares – Issues Paper*, April 2019, p 3.