Submission to the inquiry into the administration and expenditure of funding under the Urban Congestion Fund

PUBLIC TRANSPORT USERS ASSOCIATION

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1. Introduction

The Public Transport Users Association (PTUA) welcomes the opportunity to contribute to the inquiry into the administration and expenditure of funding under the Urban Congestion Fund (UCF).

The PTUA is an independent, non-profit consumer organisation representing passengers of all forms of public transport in Victoria. Our submission outlines evidence on the effectiveness of different approaches to meeting the objectives of the UCF; the implications of this for the National Commuter Car Park Fund and the wider UCF; and makes some high-level recommendations to boost the Fund's performance.

2. Objective of UCF

The objective of the UCF is an important reference point for any inquiry into its administration and funding, consistent with item (e) of the Inquiry's Terms of Reference. According to the 2018-19 Budget Papers[1], the UCF is intended to "support projects to remediate pinch points, improve traffic safety and increase network efficiency for commuter and freight movements in urban areas". The Department of Infrastructure, Transport, Regional Development and Communications puts it more simply by stating on its website[2] that the Government is providing funding through the UCF to "reduce congestion in urban areas" and, through the Commuter Car Park Fund established within the UCF, to “encourage greater use of public transport”.

3. Evidence on reducing congestion

3.1. Road capacity expansion

A wide body of academic research and government reports show that attempting to reduce congestion by expanding road capacity is often ineffective at best and at worst costly and counter-productive. This is due to the encouragement of additional traffic by the new road space (Beck & Bliemer 2015). Litman (2017) lists a number of studies that quantify the amount of additional traffic that is encouraged by expanding road capacity. For example:

- Hymel (2019) found that traffic increases in direct proportion to increased road capacity so that any relief from congestion disappears within five years.
- Graham, McCoy and Stephens (2014) concluded that "even major capacity increases can actually lead to little or no reduction in network traffic densities".

[1] https://archive.budget.gov.au/2018-19/bp2/bp2.pdf, p.142
[2] https://investment.infrastructure.gov.au/key_projects/initiatives/urban_congestion_fund.aspx, accessed 25/08/2021

- Tennøy, Tønnesen and Gundersen (2019) not only found that congestion relief from highway expansion was short-lived, but also that total traffic growth increased due to sprawled development.
- Odgers (2009) found that travel times were longer after the construction of Citylink in Melbourne than were predicted in the absence of the new motorway.
- The Standing Advisory Committee on Trunk Road Assessment (SACTRA) in the UK was one of the first major government reports to publicly acknowledge that new roads create additional traffic that counters the supposed rationale of reducing congestion (Wood 1994). SACTRA found that road projects are not inherently of net benefit and that robust appraisal of costs and benefits should be made.

Despite long-standing recognition of induced traffic among researchers, public figures have continued to tout the supposed congestion-busting benefits of road building, and transport funding has continued to chase elusive congestion reduction benefits from road expansion without sound assessment of likely congestion impacts (VAGO 2013; Volker et al 2020).

3.2. Public transport

Real world evidence shows greater potential for limiting congestion through provision of high quality public transport services and active transport facilities. An analysis of over 500 European cities by Garcia-López et al (2020) found that increasing road capacity did not solve urban congestion but that congestion decreases with the expansion of public transport. Examination of travel times during a public transport shutdown in Rotterdam showed substantial increases in travel times on inner city roads, particularly during peak times, which demonstrated the contribution of public transport to normal transport network efficiency (Adler & Ommeren 2016).

Even if high quality public transport does not totally eliminate congestion, it does support more efficient commuter movements by providing access that neither exacerbates nor suffers from road congestion in the way that travel by private motor vehicles would. Litman (2005) outlines a number of studies showing that per capita congestion costs are lower in cities with extensive rail public transport systems that allow people to access jobs and education without adding to road traffic. This shows that congestion does not impede economic activity as severely where commuters can avoid it by using public transport.

For a public transport system to be able to serve a significant share of journeys, it must form an integrated network that allows people to transfer to services that reach their destination. Mees (2000) demonstrated this with the hypothetical example of "Squaresville".

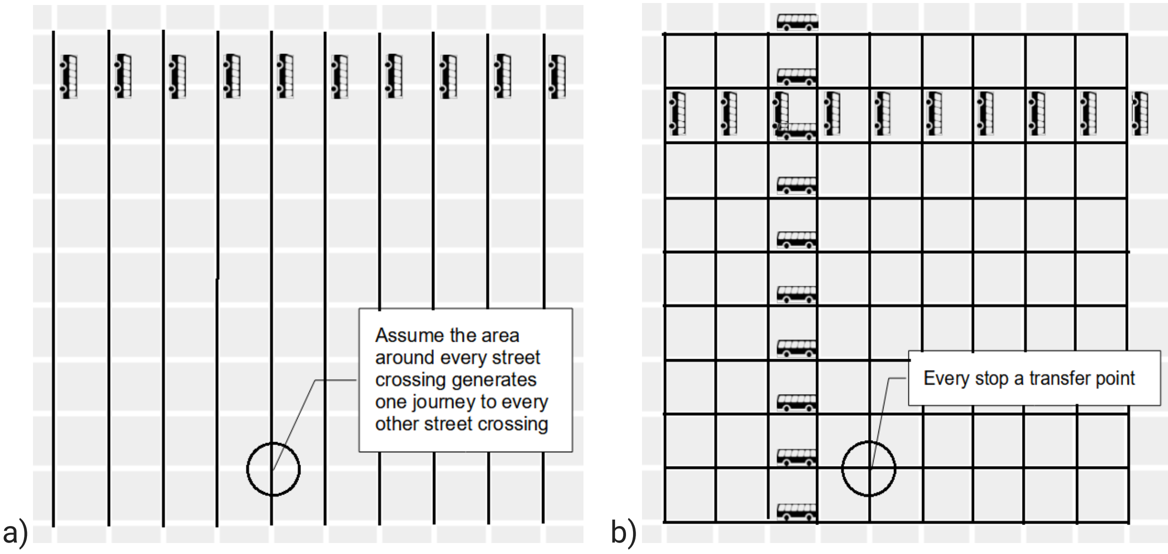

Figure 1: “Squaresville” offering only north-south routes with no opportunity to transfer (a); and “Squaresville” with intersecting routes creating a network effect (b). Based on Mees (2000, p.140).

In the city of Squaresville (Figure 1), 100 journeys start from each crossing - one to each of the 100 crossings shown, giving a total of 10,000 journeys, with 100 of those within walking distance of the same crossing. If buses run along each north-south road (Fig. 1, panel a), nine of the other 99 crossings can be reached by public transport. If public transport attracts one third of the trips it can theoretically serve, an absolute maximum of 3% of journeys would be made by public transport. This low share of journeys comprehensively fails to deliver good network efficiency for commuter movements. With such a low ceiling on possible mode share, public transport would be unable to make a meaningful contribution to reducing congestion. However if transfers are possible where north-south routes intersect with east-west routes (Fig. 1, panel b), suddenly 100% of journeys are theoretically possible by public transport. The enormous increase in the value of public transport when transfers become possible is known as the network effect and is a fundamental feature of all successful public transport systems the world over (Nielsen et al 2005).

In the real world, transfers are only a realistic option if service frequencies keep waiting times to a minimum. If commuters have to wait a long time for a connecting service then the public transport system is acting more like Squareville without transfers than an efficient network. Nielsen et al (2005) show that the need for good frequencies applies to all links in the network such as feeder buses - not just the high capacity trunk routes (Figure 2).

Low frequency network
A collection of lines that function separately if you are willing to plan your journey in detail. The area you can reach by a simple journey is restricted to those places that are within walking distance from the line that passes the place where you are. Change of lines where they cross each other is not very attractive. Waiting times will often be long, and you will need detailed information about more than one line. Transfering is perceived as a large barrier, and these crossing points are seen as being of little value. In reality, it is misleading to call this collection of lines a network.

Network with some high frequency lines or sections
The service is good along the lines or sections with high frequency. Transfer is more attractive at places with such a service, but only in one direction, towards the high frequency section. The total number of origin-destination combinations that are given a better service is limited. Even very high frequencies on the best sections will not change this general picture.

High frequency network: Network effect
When all or many of the lines or sections have high frequency, the network effect is created. The network can be used by the public transport passengers in a similar manner to motorists' use of the road network. You may travel everywhere in the network, almost at the time of your own choice. Instead of being barriers to travel, transfers open up a large number of new travel opportunities. All lines and all modes of transport "feed" each other with traffic and increase each other's market share.

Figure 2: The network effect for the users of public transport (Nielsen et al 2005, p.85)

3.3. Park and Ride

3.3.1. Traffic impacts

Just like expanding road capacity can draw commuters away from public transport services and result in worsening congestion over time (see above), railway station car parking can draw commuters away from feeder bus services and undermine their viability. If bus patronage is reduced from the levels it would otherwise be, frequencies are likely to be lower and the network effect likely to be weakened. In such cases train commuters will be more likely to drive to the station rather than catch the bus - further worsening local parking pressures - and journeys requiring transfers may become unviable by public transport - further worsening broader congestion issues and accessibility challenges for people who cannot drive.

Even if station parking intercepts commuters who would otherwise have driven all the way to their destination, this is generally a minority of car park users which indicates that most users would have walked, cycled or used public transport to reach the station rather than drive to their destination (Mingardo 2013; Tennøy et al 2020; Wiseman et al 2012). Some drivers may also bypass other stations on their way to the car park which blunts any traffic reduction benefits of using park and ride (Tennøy et al 2020). Furthermore, the car park may serve as destination parking itself if located near an activity centre[3] , thereby encouraging car journeys and crowding out train users (Mingardo 2013). The lack of charging for station parking or effective means of

3 https://www.gleneira.vic.gov.au/about-council/news/latest-news/new-car-parks-to-reduce-parking-pressure-in-bentleigh-and-elsternwick

restricting the car parks to PT passengers (with barriers integrated with the ticketing system) is likely to exacerbate non-PT usage.

More fundamentally, car parking fails to scale adequately to the task of large commuter flows. For example, the total railway station parking capacity on the Frankston and Sandringham lines in southern Melbourne is dwarfed by the total daily passenger capacity of those lines. For example, station parking would need to be expanded by an order of magnitude to accommodate the total passenger capacity of train services currently provided on these lines each morning.

Parking capacity is similarly dwarfed by the daily traffic volume on Nepean Highway, which would be considered a key target market for mode shift onto those two railway lines. The task of providing parking capacity for this number of road trips would require four times current parking capacity to be added to existing capacity. This would clearly be monumentally expensive and hugely disruptive to the local areas around railway stations. Importantly it would also fail to provide station access for the many people who are unable to drive.

In contrast, a similar number of journeys to railway stations as currently accommodated by station parking on the Sandringham and Frankston lines could be provided by around 180 bus arrivals - equivalent to less than five bus arrivals per station per day. These could protect land and amenity in station precincts as well as provide access for non-drivers and enhance the network effect which is crucial to successful congestion management (see Section 3.2). Crucially for dealing with limited parking capacity at railway stations, buses could continue to deliver passengers to train services all day, long after car parks would have filled to capacity. Providing sufficient bus capacity to fill all citybound trains on the Frankston and Sandringham lines each weekday morning would require an average of 40 bus arrivals per station. This would allow a more significant mode shift from road to public transport than reliance on car access would permit.

3.3.2. Direct and opportunity costs of parking

Land around railway stations is often well-suited to commercial, residential or community uses such as Transit Oriented Development (TOD). This pattern of development is likely to contribute to “transit leverage” that results in public transport use replacing more than an equivalent amount of private motor vehicle use (Neff 2013). That is, by co-locating shops and services with major transport interchanges, each kilometre of public transport use can replace between 5 to 7 kilometres of private car use which would have clear congestion and environmental benefits. These advantages are undermined if the station is alienated from surrounding land uses by extensive car parking.

In established suburbs, there is often significant established development using the land around the station.These established land uses can make land acquisition and preparation for parking an expensive and cost-ineffective proposition, as well as disruptive to existing land users. Land scarcity around established stations also increases the likelihood that multilevel parking will be required to provide a significant number of parking spaces. As a result of factors such as these, proposed park and ride facilities can have very high costs per space of up to $200,000 for each car (Rabe 2021) compared to more typical costs in the range of $15,000 to $40,000 per car (PTUA n.d.). Applying benchmark costs (which may be optimistic for developed areas) to the number of additional spaces needed to accommodate current morning train capacity on just the Frankston and Sandringham lines would cost in the region of $1 billion while still failing to serve people who cannot drive or enhancing the network effect (see Section 3.2).

For comparison, the $65 million cost of new car parking at Berwick railway station could instead fund the acquisition of 10 new electric buses and associated charging station, as well as cover driver wages for full-week services for 10 years. This would provide station access for train users well after station parking fills to capacity each morning, as well as mobility around the local area for people who are unable to drive.

4. Project selection

As discussed above, station car parking is generally a poor solution for railway station access in urban areas. However, there may be a valid role for station parking where adequate feeder services are absent and unviable (Evans & Kesper 2021). The adequacy or quality of public transport is a combination or factors such as frequencies, interconnectivity between routes and operating spans. The SNAMUTS Composite Accessibility Index[4] is a useful metric for comparing spatial differences in the quality of current public transport access. For example, this measure shows that areas in the vicinity of Elsternwick and Glenferrie have relatively good public transport access whereas access is relatively poor in many outer areas of Melbourne (Figure 3). This provides an insight into relative need for station parking given current network extent and service levels. However, expansion of network extent and in particular service levels would reduce the need for parking in much of the urban area of Melbourne and would provide access for the large number of people who are unable to drive.

[4] http://www.snamuts.com/composite-index1.html

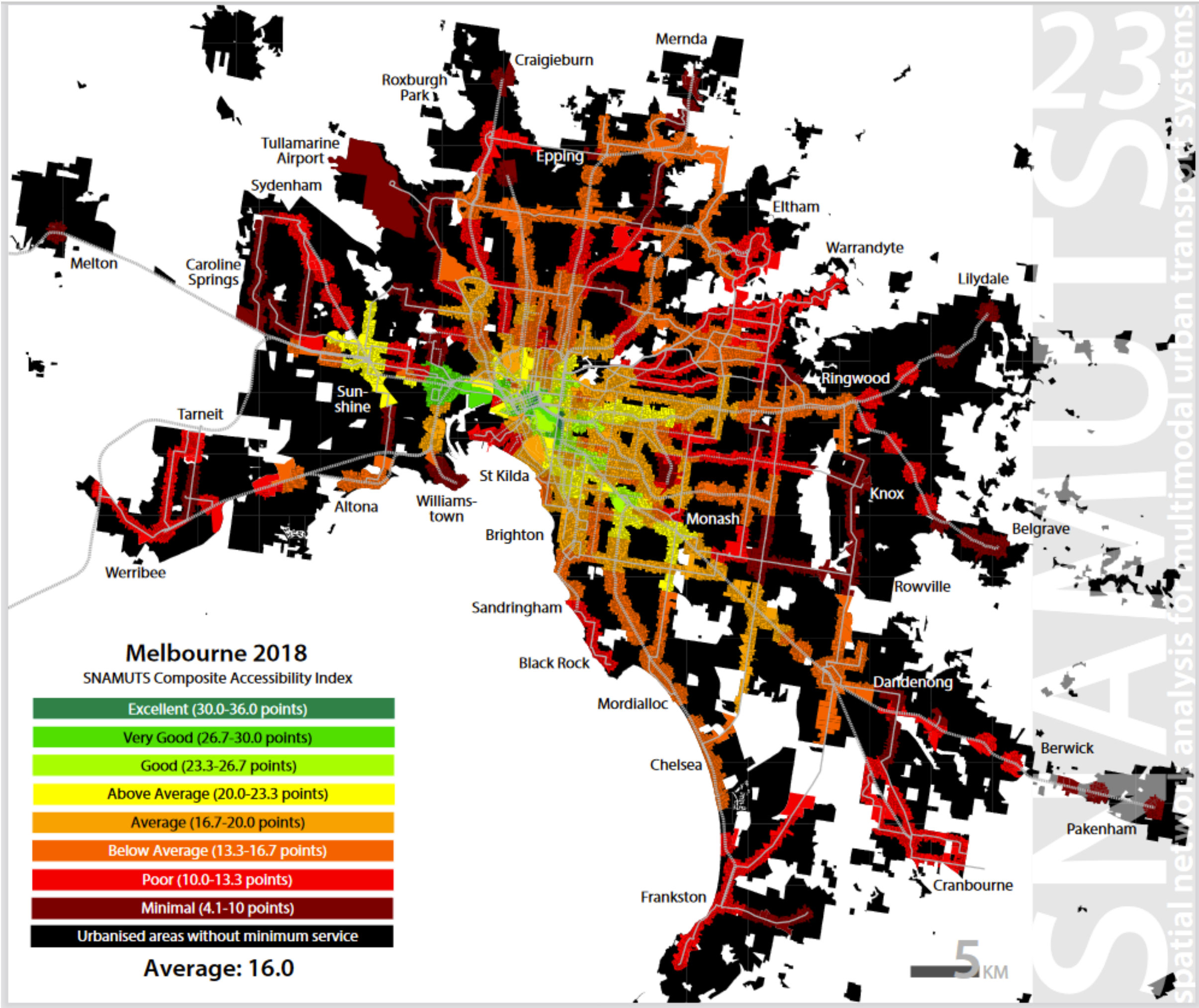

Figure 3: The SNAMUTS Composite Accessibility Index for Melbourne[5].

5. Integration with transport and land use planning

Future need for station parking will be influenced by changes to transport provision and land use decisions at all levels of government. Administration of the UCF should therefore factor these into funding decisions. It appears that relevant transport and land use decisions have not been effectively incorporated into UCF funding decisions. For example, the Commonwealth Budget included funding for a 500 space car park at Surrey Hills station despite state government plans to eliminate this station (Wright et al 2021). Proposed station parking at Elsternwick and Bentleigh face local planning complications as well as questions over the probity of the unsolicited grants (Curtis & Wright 2021).

[5] www.snamuts.com/uploads/2/1/8/1/21813274/melbourne_2018__23r__benchmark_composite.pdf, accessed 09/09/2021

The provision of funding to local government for car parks is somewhat inconsistent with them being station car parks as in Victoria station car parks are generally a state government responsibility, as they are responsible for most passenger railways. It also creates an additional administrative hurdle to the car parks being restricted to public transport users, as the state government is also responsible for the ticketing system, with which the car parks would have to be integrated.

More generally, we understand that the Victorian Government aims to approximately double bus patronage under its recently-released Bus Plan. This implies substantial growth in bus mode share in journeys to railway stations which is unlikely to be consistent with significant expansion of railway station car parking.

Success in managing congestion under the UCF will require integration and consistency with measures being undertaken by other tiers of government to integrate public transport modes and improve service quality. Expansion of car parking will rarely serve this objective.

6. Improving the performance of the UCF

The UCF, and Commonwealth Government investment more broadly, could make important contributions to managing congestion in urban areas by adopting an evidence-based approach to decision making. We make the following recommendations based on evidence outlined in this submission and other relevant literature:

1. Incorporate realistic induced and generated traffic assumptions in estimation of road project congestion impacts (see Section 3.1).
2. Remove the emphasis on private cars for railway station access (see Section 3.3).
3. Strengthen the network effect in Australian public transport systems (see Section 3.2)
4. Engage with state and local governments during the project selection process to ensure projects are consistent with local transport and land use plans (see Section 5).
5. Focus UCF funding on:
    a. expansion of rail networks to areas with low levels of public transport access;
    b. road-based public transport priority treatments;
    c. electric bus and tram fleet expansion;

  d. improving amenity for people transferring between public transport routes and modes, such as weather proofing and convenient access; and

  e. disability accessibility improvements, particularly on the tram network.

6. Not use the UCF to fund:

  a. road capacity expansion projects.

  b. car parks where feeder services are available or easily implemented.

  c. car parks not linked to the ticketing system with barriers

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