EVIDENCE OF THE RELATIVE EFFECTIVENESS FOR URBAN "CONGESTION BUSTING" MEASURES IN GLEN EIRA

PREPARED FOR

Glen Eira City Council

CONFIDENTIAL

Glen Eira Park and Ride Assessment

PROJECT NO. 21-52

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1.0 Introduction

The City of Glen Eira is seeking advice on the effectiveness of commuter car parks and measures such as bus and improved cycling infrastructure to reduce congestion and enhance liveability.

1.1 Project context

The City of Glen Eira is located in Melbourne's south-east suburbs, approximately 10 kilometres from Melbourne's central business district. Glen Eira includes the suburbs of Bentleigh, Bentleigh East, Carnegie, Caulfield, Caulfield East, Caulfield North, Caulfield South, Elsternwick, Gardenvale, Glen Huntly, McKinnon, Murrumbeena, Ormond and part of the suburbs of Brighton East and St Kilda East.

During the 2019 Federal Government election, the Australian Government made funding commitments—under the $500 million Commuter Car Park Fund established as part of the Urban Congestion Fund—for two commuter car parking projects in Glen Eira, adjacent to Bentleigh and Elsternwick railway stations. Glen Eira City Council has been offered $20.6 million by the federal government to deliver these projects.

Both the Bentleigh and Elsternwick Structure plans identify Council-owned at-grade car parks for future capacity increases in the form of multi-deck car parks. Bentleigh station is on the Frankston line and commuter parking is currently served by 205 spaces immediately to the west of the station, on the opposite side of the station to the Bentleigh activity centre, while Elsternwick station is on the Sandringham line and is served by a multi-deck car park with 156 spaces to the south west of the station.

Council has sought advice to assess the effectiveness of providing additional commuter car parks at Elsternwick and Bentleigh stations on congestion, as well as advice about the potential for other "congestion busting" interventions and how they might compare to park and ride.

Proposed location of the new Bentleigh commuter car park - 1-5 Bent Street, BENTLEIGH VIC 3204

Proposed location of the new Elsternwick commuter car park - 26 Stanley Street ELSTERNWICK VIC 3185

Because of the limited time available for this report, the analysis and findings are necessarily at a high level. It is understood that, should Council intend to proceed with construction of the two park and ride facilities a detailed feasibility study and design would be undertaken which will build on further, more detailed analysis.

1.2 Structure of this report

This report examines the questions of who the potential commuter car parks will serve; the impact of park and ride on congestion; the broader benefits of park and ride; and an overview of potential alternative measures. The next section (Section 2) of the report has been prepared using a spatial analysis of the users of the current PTV commuter car parks, while Sections 3 and 4 present a summary of an international literature review, focussing on Australia and New Zealand examples. Section 5 provides an overview of other potential interventions that could reduce congestion and an analysis of their potential use within Glen Eira.

2.0 Who will benefit from additional commuter car parking?

To determine who will benefit from additional commuter car parking at Elsternwick and Bentleigh rail stations, we have undertaken a spatial analysis reviewing the origins of users of the existing PTV-owned commuter car parks

2.1 Methodology

To better understand who is likely to benefit from any additional commuter car parking at the stations, we have drawn on Location Based Service (LBS) data from mobile phone users as it has a high degree of locational accuracy (using GPS data) and can be aggregated over time. This provides evidence of where the people using the existing park and ride have come from, and in particular what suburb they started their journey.

VLC analysed data for the PTV commuter carparks at Elsternwick and Bentleigh rail stations for an average weekday across the entirety of 2018 and 2019. Although more recent data is available, the impact of COVID on travel during 2020 and 2021 mean 2018 and 2019 will be more representative of "normal" travel.

- For Elsternwick, a resulting 641 trips from 421 unique devices were found that passed through the carparks. These were then weighted to de-emphasise repetitive devices that make the same trip over and over, leaving 549 weighted trips
- For Bentleigh, a resulting 1185 trips from 770 unique devices were found that passed through the carparks. These were then weighted to de-emphasise repetitive devices that make the same trip over and over, leaving 1032 weighted trips.

While LBS data can be used to determine origins and destinations of users of the two commuter car parks, it cannot be used to determine mode of access to the stations. However, where the destinations of car park users are along a train line, we can infer that these travellers travelled by train after parking their cars.

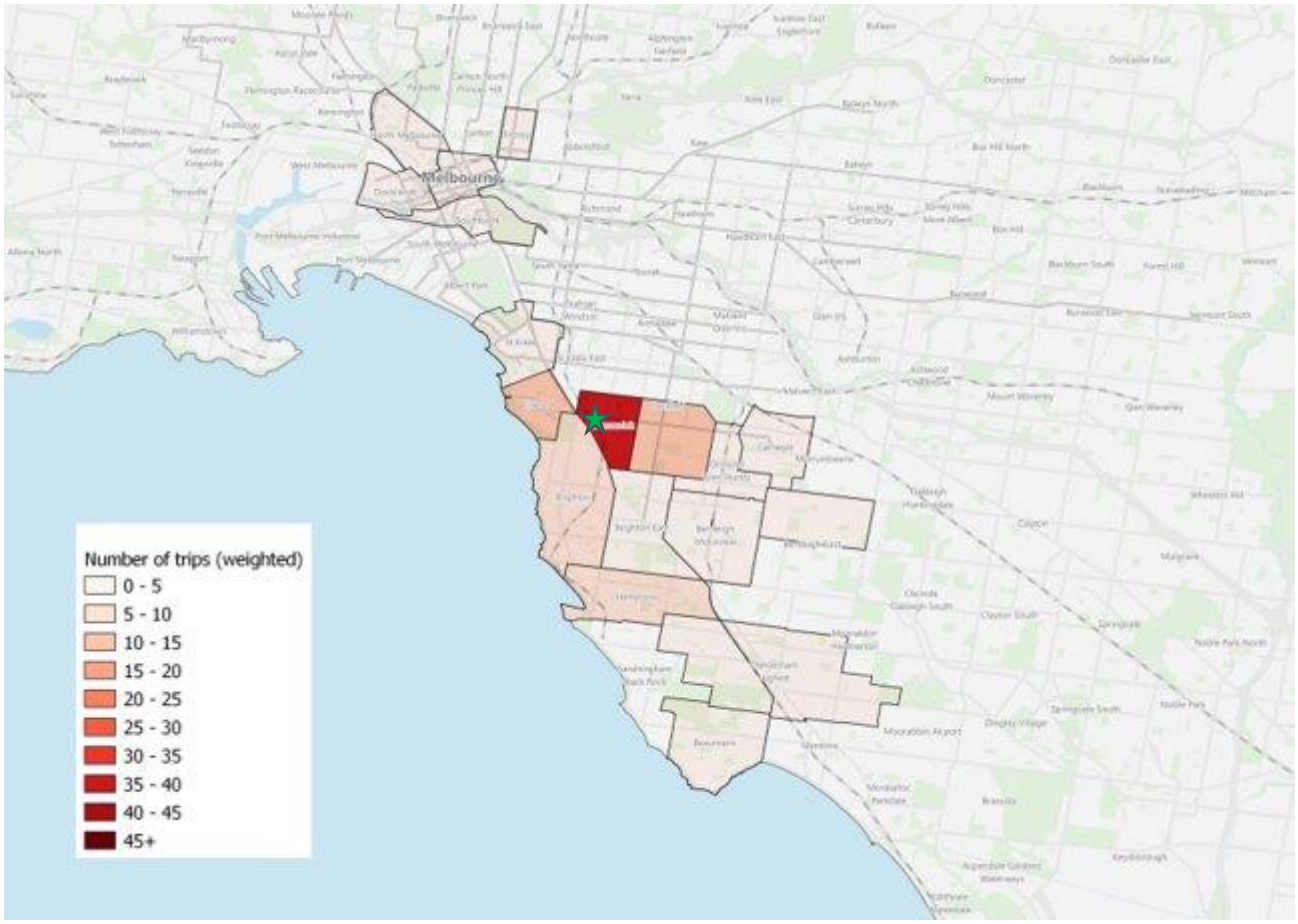
Origin data for people parking at the respective station car parks for the AM peak was used to determine where people parking at the stations came from. Destination data for people parking at the respective station car parks in the AM peak is used to determine where people went after they parked their car. This destination data is used to infer what happened after they parked at the commuter car park, ie did they catch the train or did they, say, stay at the local activity centre.

What is Mobile Phone App (or Location-based services) data?

- High precision geo-location data from a number of mobile apps, collected by a third party, and which includes time stamps and locations
- Data is collected from around 3 million monthly active user and is available looking back for three years.
- All data is de-personalised, has appropriate permissions for data analysis and all analysis takes places in a secure, controlled platform.
- Data is biased towards smartphone users with a likely bias towards regular mobile phone users.

2.2 Elsternwick Station

2.2.1 ELSTERNWICK COMMUTER CAR PARK ORIGINS



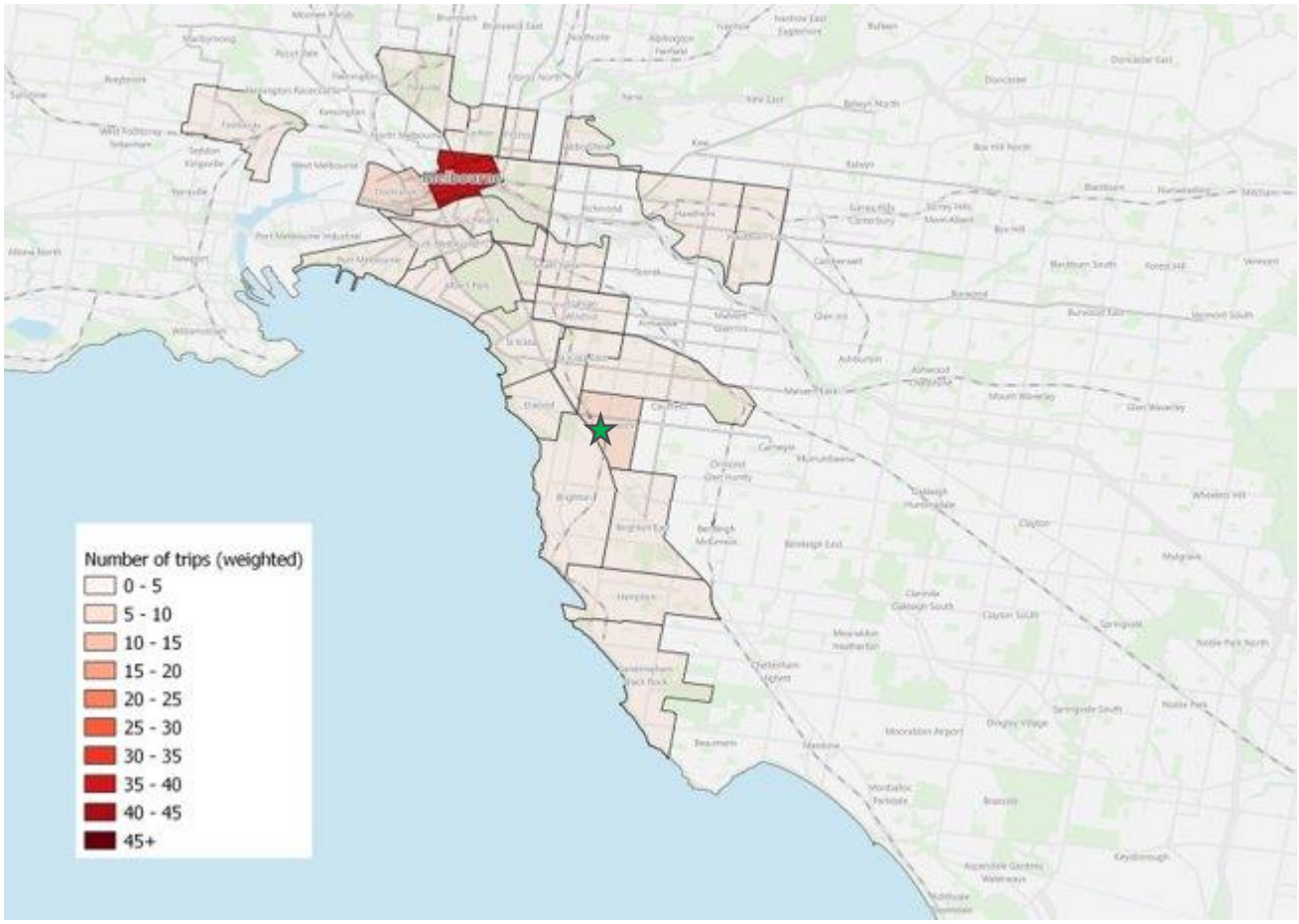
Origins of trips to the Elsternwick Station car park – AM Peak ★ *- Elsternwick Station*

The largest number of users of the Elsternwick station commuter car park come from the Elsternwick area, with decreasing numbers of users from Brighton, Elwood and Hampton and with fewer users coming from as far as Cheltenham, Highett and Beaumaris. A small number of car park users from the CBD and surrounding areas have Elsternwick as their destination and are likely to be taking advantage of the free commuter parking at the station.

Within Elsternwick, the longest distance that can be travelled from a residence to Elsternwick station is 1.8km, meaning driving trips are relatively short. There are several potential explanations for the number of short trips:

- Journeys may combine multiple trip-legs (eg 'home-childcare-station' or 'station-supermarket-home'), rather than being simple 'home-station' journeys.
- Commuters are time-sensitive and place a high value on the time saved
- Some commuters may have physical disabilities or are otherwise unable to walk to the station
- Active transport may be unattractive for other reasons, eg traffic volumes and the lack of separated cycling infrastructure
- Commuter parking is currently free

2.2.2 ELSTERNWICK COMMUTER CAR PARK DESTINATIONS

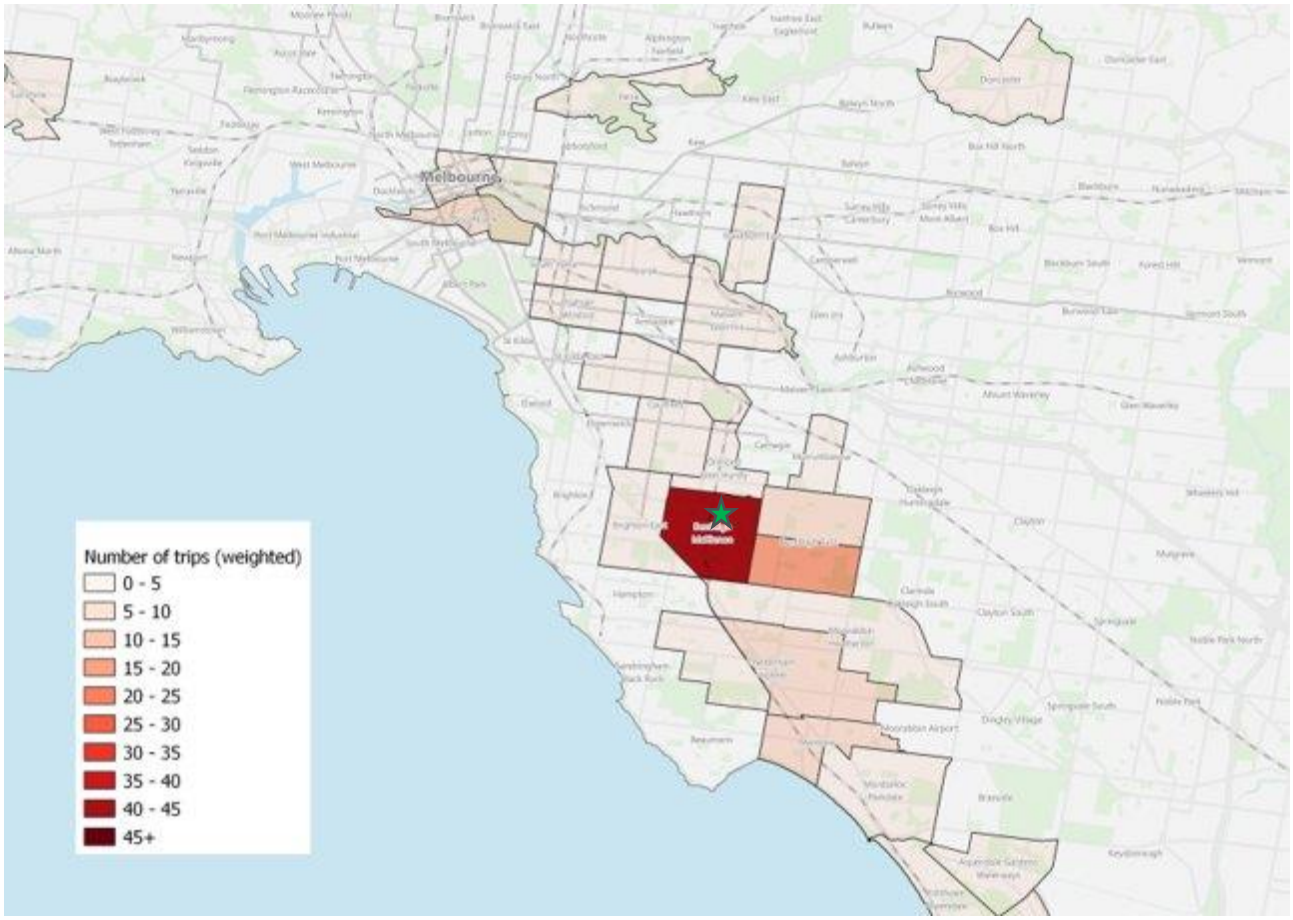


Destinations of trips from the Elsternwick Station car park – AM Peak ★ *- Elsternwick Station*

Unsurprisingly, the greatest number of users of the Elsternwick commuter car park have destinations in the CBD and surrounds, and almost all users have destinations along the Sandringham line, including a small number of users travelling in the counter-peak direction towards Sandringham and Black Rock. A small number of users have destinations as far away as Hawthorn, Hawthorn East and Footscray. A small number also have Elsternwick as their destination, which suggests some use of the commuter car park for local, non-commuting purposes.

2.3 Bentleigh Station

2.3.1 BENTLEIGH COMMUTER CAR PARK ORIGINS



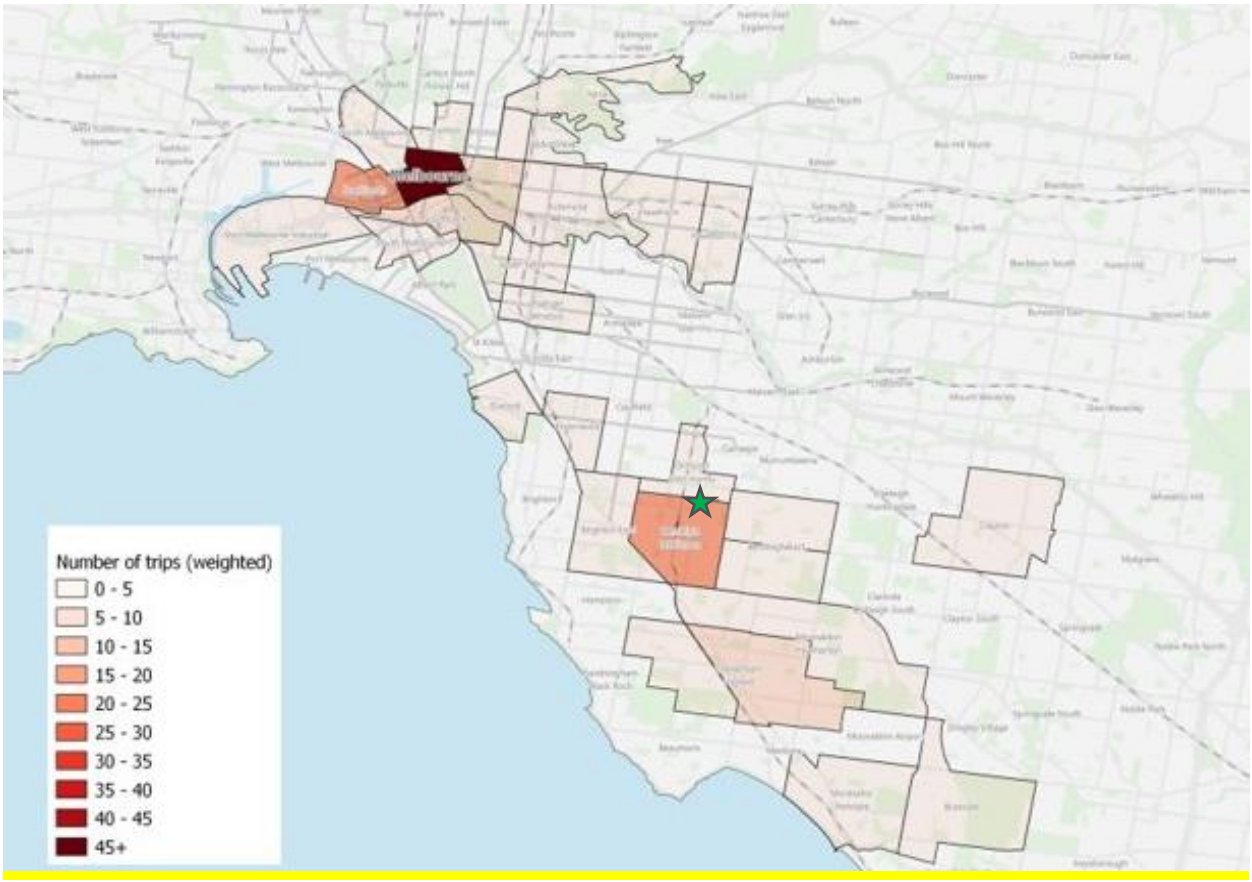
Origins of trips to the Bentleigh Station car park – AM Peak ★ *- Bentleigh Station*

The largest number of users of the Bentleigh station commuter car park have origins within Bentleigh and Bentleigh East, with smaller numbers from along the Frankston line, from both inbound and outbound sides. Compared to Elsternwick, the catchment for commuter car parking for Bentleigh is larger, which is likely a function of poorer public transport access to Bentleigh station compared to Elsternwick, and higher frequencies on the Frankston line compared to the Sandringham line.

Again, a very small number of users drive from considerable distances (Clifton Hill, Sunshine, Doncaster), presumably to use the free car parking for purposes other than commuting.

Within the suburb of Bentleigh, the longest distance from a residential area to Bentleigh station is less than 2.2km. The reasons for commuters to park and ride rather than use active transport are likely to be the same as for Elsternwick.

2.3.2 BENTLEIGH COMMUTER CAR PARK DESTINATIONS



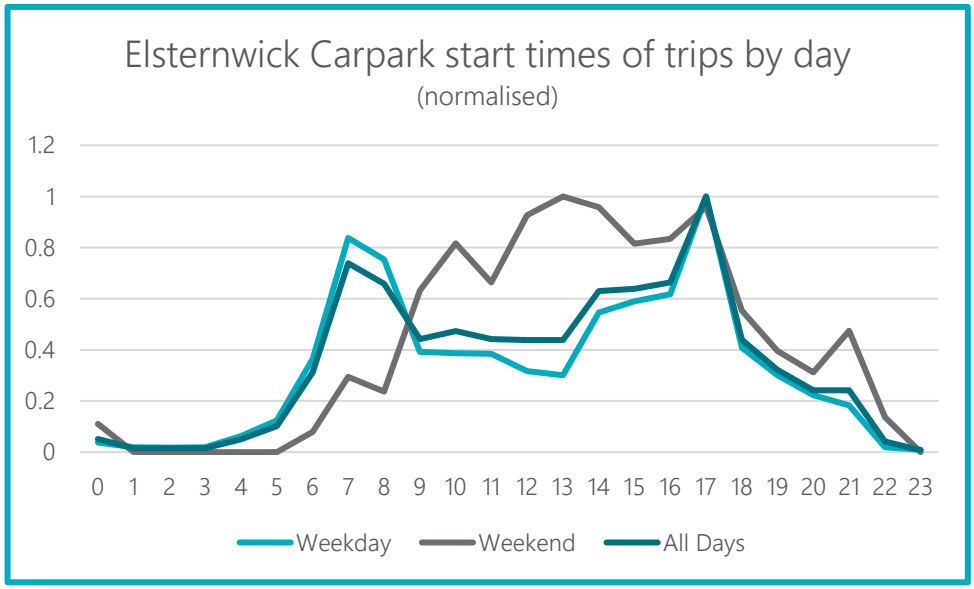
Destinations of trips to the Bentleigh Station car park – AM Peak ★ *- Bentleigh Station*

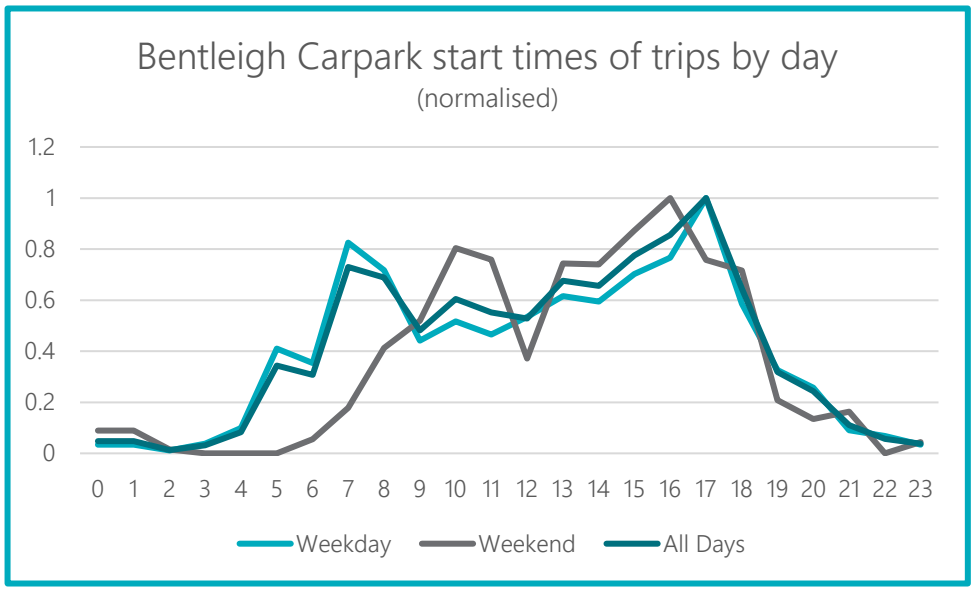
As for Elsternwick station, most users of the Bentleigh commuter car park have destinations in the CBD, Docklands and surrounding areas. There are also users with destinations along the Frankston line, including some counter-peak travel to Cheltenham, Highett and Mordialloc. There are also a small number of users whose destination is Bentleigh, suggesting use of the commuter car park for local purposes (eg shopping) rather than commuting.

2.4 When do people make their trips to the existing park and ride facilities?

While the analysis in Sections 2.2 and 2.3 in the report show that the origins and destinations of people currently using the existing park and ride facilities, the potential impact on local congestion, ie around the Elsternwick and Bentleigh activity centres, will also be affected by the time of day that people access the car parks and how that access is spread over time. In other words, if people are arriving at broadly the same time in the AM peak, that will have a greater impact on local congestion than if their arrival times are spread over several hours.

LBS analysis for the two station car parks shows the period of time over which people start their trips to either Bentleigh or Elsternwick differs. The following two charts show the start times of trips of people using the two existing park and ride facilities, compared with total car park volumes over the day. Travel behaviour in the morning peak differ somewhat between the two stations.





In summary, users of the existing Elsternwick park and ride facility start their journeys in a narrower band of time, with most users in the AM peak arriving between 6.00AM and 8.00AM. Users of the Bentleigh park and ride leave their origins over a longer period of time, between 5.00AM and 8.00AM. While Bentleigh has more spaces than Elsternwick (205 compared to 156 respectively), trips to Bentleigh are spread over a longer period of time and are less likely to contribute to local congestion than in the AM peak at Elsternwick. While it is possible that additional park and ride facilities will create different behaviours, if current behaviours are carried over to additional car parks, it is likely that the risk of local congestion at the Elsternwick activity is greater than that at Bentleigh.

2.5 Conclusion

From the LBS analysis we see that the greatest number of users of Bentleigh and Elsternwick stations are the residents of Bentleigh and Elsternwick respectively. In addition, there are a smaller number of people accessing the station commuter car parks from further south-east. Bentleigh has a larger geographic catchment than Elsternwick and commuters are prepared to drive longer distances to access more frequent train services.

Almost 30% of the people using the Elsternwick commuter car park in the AM peak are from Glen Eira, while approximately 25% of those using the Bentleigh commuter car park in the AM peak are from Glen Eira. Glen Eira

accounts for more origins than any other local government area. It is likely that any additional car parking will provide a greater benefit to Glen Eira residents than residents in any other LGA, although possibly not at the same rate of users at the moment as the availability of more commuter car parks, particularly if they are fee-free, will attract users from further afield in the south east, particularly for Bentleigh.

The proportion of car trips that are relatively short in distance has several possible explanations: commuters' trips are more complex than simple 'home-station' trips; commuters have a particularly high value of time; possible physical limitations; and barriers to active transport, such as network quality.

3.0 Commuter car parks and congestion

3.1 What impact does Park and Ride have on congestion?

The effects of park and ride on congestion depend on local conditions for two reasons. First, the effects depend on the transport choices that people make in the absence of park and ride. Second, the effects depend on the prevailing road network conditions, when and where people would otherwise drive.

For example, if a park and ride facility attract passengers to public transport that would have otherwise driven to their destination, then vehicle kilometres travelled (VKT) and congestion may be reduced. If however, a park and ride facility attract passengers that would otherwise access the station by non-car modes—like bus, tram, walking or cycling—then this could serve to increase VKT and worsen congestion.

Similarly, even in situations where *total* VKT is reduced, park and ride can increase localised congestion—for example, by attracting vehicle trips into local centres that might have otherwise been taken by feeder bus services or active transport. As noted in Section 2.4 above, given the differences in the time that people arrive at Elsternwick and Bentleigh stations in the morning, this is more likely to be an issue for Elsternwick than Bentleigh, as Bentleigh is currently displaying a greater spread of start times in the AM peak.

Put simply, the effects of park and ride on congestion are influenced by local conditions because they depend on (1) people's transport choices and (2) prevailing road network conditions. For this reason, the best way to understand the effects of park and ride on congestion is to gather local data, such as the LBS data presented in Section 2.0. That said, the latter only tells us what people *currently do*, not what they *would do* in the absence of park and ride—or, more specifically in this case, in the absence of an expanded park and ride facility.

To gain insight into the latter, we would ideally undertake local surveys of existing park and ride users. The responses to such surveys can then be used to determine the different transport choices that people would have been likely to make, such as[1]:

- Divert to driving to destination
- Divert to accessing PT by kiss-and-ride
- Divert to accessing PT by non-car mode
- Divert to accessing PT by parking in local area
- Divert to accessing PT via another park and ride
- Divert to parking in local area[2]
- Trip avoidance

Beyond the benefits to users of park and ride, most of the benefits of park and ride are associated with changing the behaviour of people who would otherwise drive to their destination. In contrast, the other five behaviours listed above are typically either desirable, e.g. diverting drivers to kiss-and-ride or non-car modes, or can be managed via other policies, e.g. diversion to parking in local area—whether to access PT or other destinations—or another park and ride. The other behaviour often seen is "trip avoidance", which are alternatives to travel such as work from home and online shopping.

In the absence of such surveys, we must instead rely on case studies of the effects of park and ride in other locations. As travel choices are context dependent, we have selected case studies that are broadly representative of Glen Eira. In doing so, we have considered relevant local factors such as general urban form; the quality of public transport and active transport networks; the capacity and use of the road network; and relative costs of car travel. For this reason, our case studies focus on three similar cities (and where possible, locations within these cities) where data is available: Melbourne, Auckland and Wellington.

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[1] Stated preference surveys of hypothetical alternative situations, such as the absence of park and ride, need to be carefully designed to elicit reasonable and representative responses.

[2] This category captures the percentage of users who use park and ride not to access PT but instead to access local destinations.

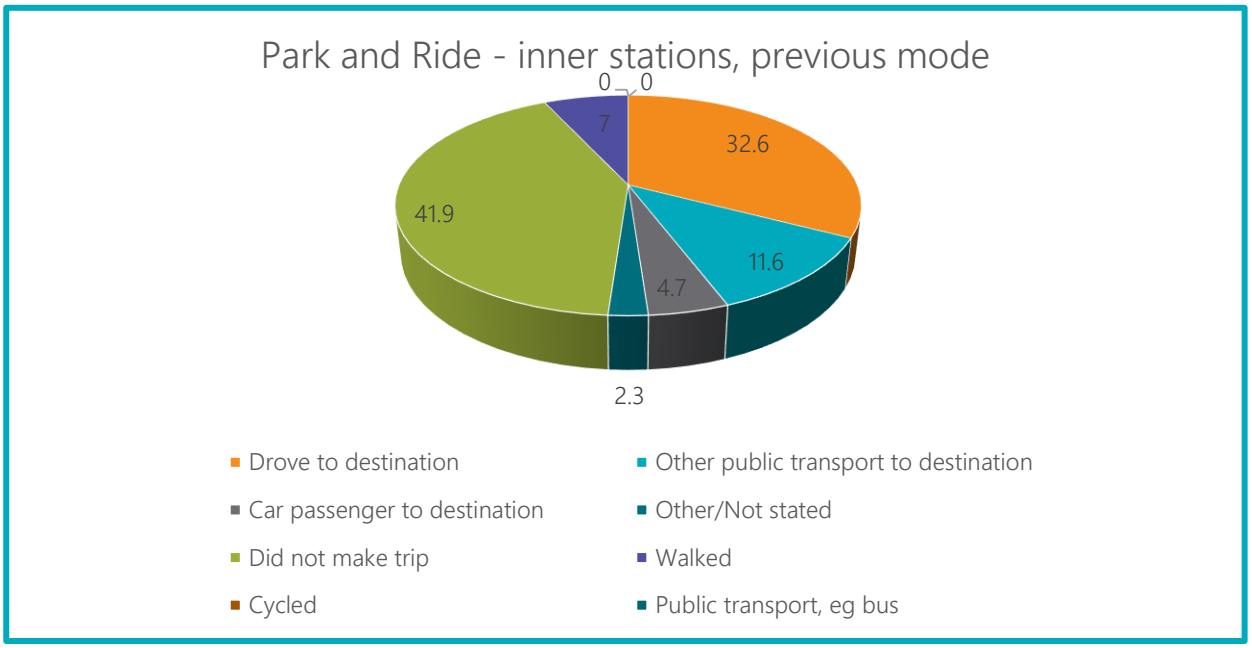
In doing so, we emphasise that these case studies are not exhaustive, and—with more time and resources—further case studies could be developed, if necessary.

3.1.1 MELBOURNE

In *Analysing the Effectiveness of Park and Ride as a Generator of Public Transport Mode Shift* (2007), Hamer examines the impact of expanded park and ride facilities at several Melbourne stations following increases in car park size. In 2006, the State Government committed $90 million to deliver additional park and ride spaces in and around Melbourne, and by 2008 approximately 580 additional spaces at seven different rail stations had been delivered.

Two of these stations were categorised as "inner Melbourne" – Holmesglen and Tottenham – and these are similar distances from the CBD as Bentleigh and Elsternwick respectively

The following chart shows what modes park and ride users had used prior to using one of the additional car parks. In other words, these were people who now use park and ride, but previously used one of these options.



In summary, prior to using park and ride, approximately one third of users had driven to their destination. The research notes that this is broadly consistent with the international literature[3] that suggests the about one third of new users of a park and ride previously drove to their destination. Note that in general, this can be higher the further from the city centre a station is, ie, park and ride in outer metropolitan and regional centres will attract a higher proportion of people who would have otherwise driven to their destination.

The Melbourne research does suggest only a small shift from walking to driving to the station (7%), which is important given the so many commuters driving to the existing park and ride facilities at Elsternwick and Bentleigh are from the surrounding suburb. Nor were there any cycling trips diverted to people using park and ride.

3.1.2 WELLINGTON

In 2015, Wallis et al[4] conducted surveys in Wellington and Auckland where users of park and ride facilities were interviewed to determine how they had changed their travel since the introduction of park and ride. The results are somewhat different, as is the transport context for each city, so they are presented separately.

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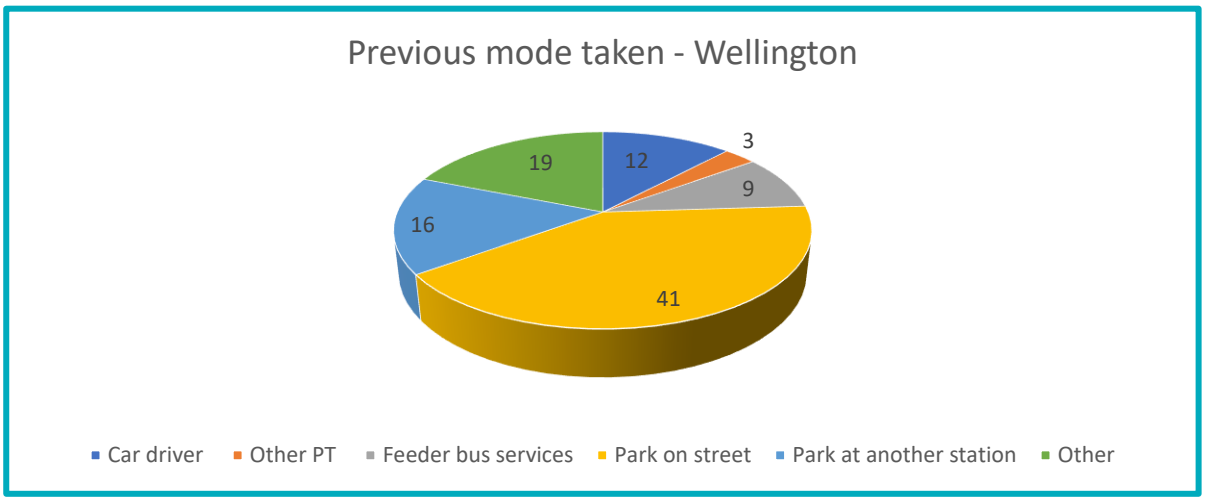
[3] Barton-Aschman 1995, Bowler 1986, Foote, 2000

[4] Ian Wallis, Julie Ballantyne, Adam Lawrence, David Lupton, Doug Weir, *Economic benefits of park and ride*, Australasian Transport Research Forum 2015 Proceedings, 2015

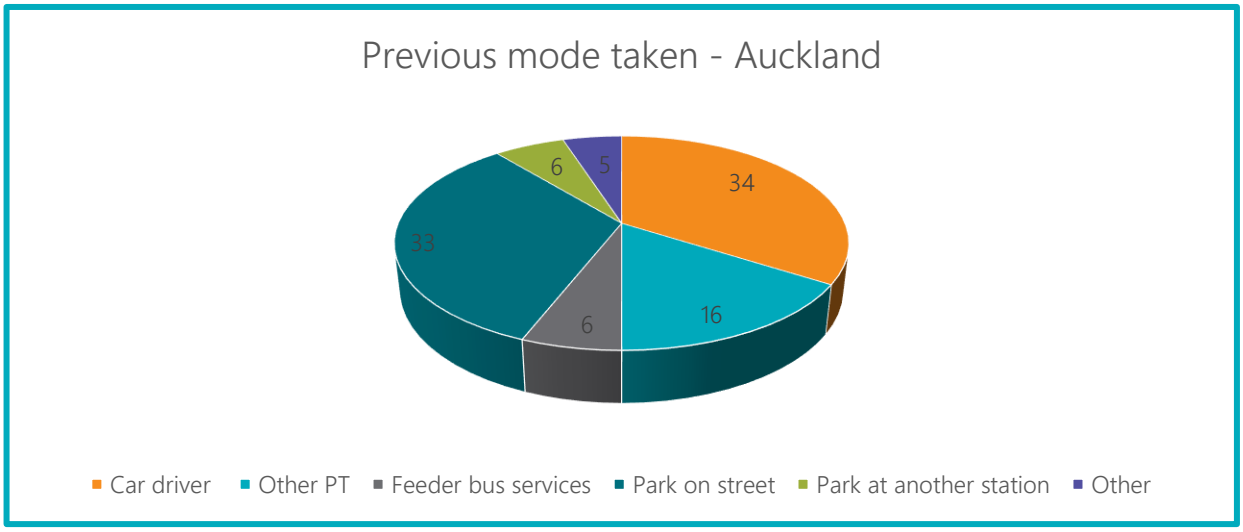
The research noted that at the Wellington sites, direct bus services towards the Wellington CBD do not offer a comparative advantage over private vehicle and that the rapid transit system was well established



Again, this graph shows what people were doing before they started using park and ride when the facilities were improved. These results suggest fewer people were previously driving to their destination (12%) than in the Melbourne examples and the international literature suggests. There is also a significant shift away from on-street parking to park and ride (41% of users) as well as shift from parking at other stations to the new car parks (16%). 9% of users of the park and ride previously accessed the station using a feeder bus and 3% of new users used to use other forms of public transport (eg bus) to access the station.

3.1.3 AUCKLAND

The same research for Auckland shows a more familiar picture and the results are similar to those found inner Melbourne by Hamer. Auckland differs from Wellington in that direct services do offer a competitive alternative in a way that Wellington services did not. In addition, at the time of the research Auckland's rapid transit system was relatively under-developed.



Here we see that 34% of new users of the park and ride used to drive to their ultimate destination, which is both similar to the Melbourne result and broadly in line with international expectations, unlike the Wellington results. Like Wellington however, there is a considerable number of people using the park and ride who previously used on-street parking (33%) to access the station. There is also a shift away from other public transport modes or routes (16%), in addition to a small shift away from feeder bus services (6%) and from parking at another station

(6%). Adding these together, we see that 28% of new users of the park and ride were already public transport users.

3.1.4 DISCUSSION & CONCLUSIONS

Ideally to better understand the likely impact of new park and ride facilities, we would undertake primary research such as surveys, but the impact of COVID on current travel patterns means that even if surveys could be conducted, they would not be representative of long-term trends. Given the range of outcomes found in each of the examples above and in the absence of contemporary local research, we can however draw some broad conclusions.

- The rate at which new users of the expanded park and ride used to drive to their final destination in both Inner Melbourne and Auckland were of a similar order (34-37%) when Inner Melbourne numbers include both car drivers and passengers, and is broadly in line with other international research.
- Across the three cities there is a shift away from people accessing the station via bus, or using other public transport routes, to park and ride.
- Both Wellington and Auckland demonstrate a considerable shift away from on-street parking to park and ride. Given on-street parking controls in both Bentleigh and Elsternwick centres this is unlikely to be an issue for Glen Eira but may have an impact on surrounding residential streets.
- Only small numbers of people are driving to the park and ride that previously walked or cycled.

In summary, this suggests that the increase in capacity park and ride at Bentleigh and Elsternwick can be expected to reduce the rate of car trips towards the CBD by about one third of all new users of the car parks, or in other words, every three new car parks will mean one less longer distance car trip towards the CBD. There is likely to be a small shift to park and ride from local bus services, and potentially number of people using park and ride who previously walked to the station.

As noted in Section 3.1, while introducing further park and ride facilities is likely to have a positive impact to reduce congestion between Bentleigh and Elsternwick and destinations towards the CBD, this is likely to come at the expense of increased peak congestion within the Bentleigh and Elsternwick precincts as more cars access the increased park and ride facilities. As noted in Section 2.4, this is more likely to impact on Elsternwick.

4.0 Broader benefits of commuter car parking

Do commuter car parks provide any benefits other than parking for the local communities?

4.1 Overview

Many of the benefits of commuter car parking in park and ride facilities in Melbourne are clear. By providing access to the Principal Public Transport Network, park and ride facilities offer a means of accessing high quality public transport services with the convenience and flexibility of car travel for the first and last mile travel.

The potential transport benefits of park and ride facilities include:

- Encouraging public transport patronage growth
- Reducing congestion
- Providing easy access to public transport for people with mobility limitations
- Reducing parking requirements in locations closer towards the CBD (ie in the direction of peak AM travel)

Beyond the commuter benefits, there are also other potential benefits to making commuter car parking more broadly available at a local centre when it is not being used for commuting purposes.

- Encouraging late night and weekend visits to the commercial and retail centres around stations.
- Use as community spaces in off-peak periods
- Benefits to local residents by minimising the parking overspill onto local streets, although this is generally better managed by local parking policies

4.2 Transport Benefits of park and ride

Park and ride facilities can increase public transport patronage by expanding the station catchment, for example to cater for journeys that are ill-suited to access by active transport or bus. As per the case studies above, we can expect approximately one-third of park and ride users to divert to public transport rather than driving to their destination. This can be expected to generate congestion reduction benefits.

This diversion of drivers to park and ride will have a small effect on congestion between the station and the CBD and surrounds as the likely destination, although potentially there will be a small increase in local traffic around the park and ride facilities.

Providing access to the rail network for people with mobility limitations is an important social imperative and is reflected in the Australian Disability Parking Scheme and similar schemes internationally, as well as Glen Eira parking policies.

4.3 Wider Benefits of park and ride

While park and ride predominately attract a weekday commuter market, additional parking spaces are available to cater for other purposes at other times, such as on evenings and weekends. Greater benefits can be leveraged from investment in the infrastructure if it can be designed to effectively serve multiple purposes for different markets.

Activities, such as dining, in Elsternwick may benefit from increased car parking capacity in the evening and on weekends, as could Bentleigh's role as an important retail centre in the inner southeast. If pricing was introduced for commuter car parking during the day, differential pricing (including zero fee) would be an important option to retain for the evenings and weekends.

As the research in Wellington and Auckland suggest, the introduction of park and ride facilities can have the benefit of reducing on-street parking around stations.

5.0 Alternative "congestion busting" measures

5.1 Context

Around the world communities and governments have grappled with how to best manage vehicle congestion and there are wide range of approaches that can be taken. In very broad terms, these can be summarised under two broad headings: supply measures and demand measures.

Supply measures

At their most basic, supply measures are focussed on increasing the capacity of the road network to allow for more vehicles. This includes obvious measures such as increasing the number of road lanes and building new routes, but also includes measures to increase the throughput of the existing road network, such as optimising traffic signal phases and actively managing freeways (e.g. with ramp metering to improve traffic flow).

Demand measures

Demand measures can be designed to either reduce the total amount of travel required, such as the promotion of working from home, or to shift demand to other modes, generally public transport, active transport and more recently micromobility (e.g. electric scooters). It also includes measures to increase vehicle occupancy such as carpooling, so fewer cars are carrying the same number of people.

Demand management is often driven using positive incentives ("carrots"), such as improvements to public transport and active transport facilities, attractive public transport fares and high occupancy vehicle lanes to support carpooling. Demand management can also be delivered using disincentives ("sticks") though measures such as congestion charges and taxes.

5.1.1 OPTIONS FOR MANAGING CONGESTION IN GLEN EIRA

While there are a wide range of tools available to manage congestion, some only make sense at a scale that is out of scope of this report, and many are not appropriate to the Glen Eira context. Tools such as ramp metering and active lane management are appropriate for freeways but not for the arterial road network in Glen Eira. Others such as congestion charging and taxes are more efficiently applied at the national or at least the state level.

The following sections outline a number of measures that could feasibly manage congestion at the local government area level, or are measures that Council could influence. Importantly, however, the Commonwealth Urban Congestion Fund is intended to improve congestion across the metropolitan area, not just within Glen Eira.

The following analysis focuses on options for improving the attractiveness of alternatives to private vehicle travel; the potential to increase the capacity of the road network; and measures that encourage people to change their travel behaviour.

5.2 Travel in Glen Eira

5.2.1 ROAD NETWORK AND TRAFFIC VOLUMES

Glen Eira is loosely bounded by two major roads – Dandenong Road to the north and the Nepean Highway to the south. Both are significant routes connecting south east Melbourne with inner Melbourne and carry relatively high traffic volumes, with both carrying in excess of 5,000 vehicles between 7.00AM and 9.00AM on a typical weekday morning peak.

Glen Eira's arterial road network is largely mature, and while traffic volumes are largely typical given its urban form and proximity to central Melbourne, the network generally performs reasonably.

We have illustrated modelled speeds on the arterial road network in AM peak in Appendix 2 – with both Glen Eira and the broader south east of Melbourne shown for comparison. Figure 1, focussing on Glen Eira, shows that average vehicle speeds in the AM peak are largely as would be expected given posted speeds, however there are several places operating at lower speeds, particularly in Caulfield South and the southern parts of Murrumbeena. Figure 2, which shows Glen Eira in the broader context of Melbourne's south east, shows broadly similar performance across the inner suburbs, although Glen Eira performance is better than that of the inner northern suburbs.

5.2.2 HOW ARE PEOPLE TRAVELLING?

Travel behaviour across Glen Eira varies by suburb but most work trips are taken by private vehicle. This varies from Carnegie and Elsternwick with a private vehicle mode share of 60.2% and 61.6% respectively, to Bentleigh East, where private vehicle mode share is between 77.7% (North) and 80.2% (South). Public transport mode share for work trips vary from Bentleigh East (South) with 16.7% to Carnegie with a high of 35.1%. This broadly reflects the suburbs' different urban forms and access to public transport services. Active transport rates also reflect the different urban forms, with Elsternwick seeing 7.4% of trips made by active transport, while Bentleigh East (South) has the smallest proportion of people walking and cycling to work, at 2.6%

Suburb of origin	Vehicle (%)	Public%	Active (%)	Other (%)
Caulfield North	67.7	25.7	5.8	0.8
Elsternwick	61.6	30.2	7.4	0.8
Ormond -Glen Huntley	74.7	21.2	3.5	0.5
Carnegie	60.2	35.1	4.2	0.4
Bentleigh - McKinnon	71.8	22.7	4.7	0.7
Murrumbeena	65.4	30.2	4.0	0.4
Bentleigh East (North)	77.7	18.4	3.4	0.5
Bentleigh East (South)	80.2	16.7	2.6	0.4

Mode of transport by which people travelled to work from the suburbs of Glen Eira. Journey to Work, ABS, 2016

Understanding how people are travelling in Glen Eira, and how it differs across the suburbs is useful context in understanding what impact alternative "congestion busting" measures might have, in the absence of a more detailed analysis. While the analysis draws on local data, it is of necessity a high-level overview of what broad options are available to manage congestion.

5.3 Alternative measures

5.3.1 IMPROVED CYCLING FACILITIES

A significant proportion of Australians (in the order of 40% in 2006[9]) of Australians have a commute of less than 10 kilometres to work or study. In the capital cities 15.3% of commuters travel less than 5 kilometres, and in the rest of the nation 28.6%. Despite this, less than 3 out of 50 commuters walk or cycle to work (1.6% cycle / 4.2% walk). Of those commuters who travel less than 5 kilometres, 3.5% ride and 18.7% walk. Of those travelling between 5 and 10 kilometres, 2.3% ride and 0.1% walk.

As pointed out in Sections 2.2 and 2.3 above, a large number of the people using the park and ride facilities at Elsternwick and Bentleigh stations are from within those respective suburbs and most are driving less than 2km. In Infrastructure Australia's words:

[9] ABS 2006, Environmental Issues, table 4.9, quoted *in Cycling Infrastructure for Australian Cities Background Paper* Infrastructure Australia, 2009

> "A modal shift to walking or cycling, particularly for short journeys, reduces reliance on private car use and public transport. Traffic congestion in urban areas, and the consequent loss of productivity, is the central basis for productivity assessments of cycling measured against other modes of transport. Some critics argue that increasing the numbers of cyclists on roads increases traffic congestion due to their slower pace. This argument underscores the need to appropriately integrate and design cycling infrastructure (such as separated paths, speed restrictions) to minimise adverse impacts on traffic congestion and improve safety."[10]

This highlights the role of the design of cycling infrastructure to do two things – to positively enhance the cycling experience by improving safety and perceptions of safety through separation, and to minimise the impact on traffic congestion.

The role of infrastructure in promoting cycling

Recent research in New Zealand by the New Zealand Transport Agency[11] suggests that perceptions of safety are an important deterrent to people taking up cycling for commuting, and that perceptions of safety are influenced in particular by the degree of separation between cyclists and moving vehicles. In particular the research shows that "those who ride more frequently are more satisfied with the current cycling infrastructure, while recreational riders have lower satisfaction. The continuity and connectivity of cycle lanes and paths should be a focus area for improvement."

International research[12] generally supports the finding that improved cycling infrastructure with greater separation from traffic is important in encouraging cycling as a commuter mode. In addition, safer, separated cycle lanes will do more to encourage women to take up cycling. The recent experience with pop-up bike lanes in Heidelberg Road in Fairfield suggests providing greater separation from vehicles led to both a significant increase in the number of people cycling on Heidelberg Road (from 5,000 per week in January 2021 to 6,000 per week in March 2021)[13], but also a significant increase in the number of women riding along the route (from 16% of riders to 30%).

Cycling facilities in Glen Eira

Glen Eira has limited safe and convenient cycling facilities to encourage more people to take up commuter cycling, either to people's final destinations or to train stations. While Bentleigh has a well-utilised Parkiteer bike cage at Bentleigh, there is no cage at Elsternwick station and cycle parking facilities are limited. For longer cycling commutes the bicycle network in Glen Eira is limited.

The Victorian Department of Transport has established the Principal Bicycle Network (PBN) as "a network of existing and proposed cycle routes identified to help people ride to major destinations around metropolitan Melbourne. (its focuses)… on getting people into activity centres and to make more use of local roads and off-road paths"[14].

As the following map shows, the existing PBN coverage in Glen Eira is limited with little east-west connectivity towards inner Melbourne, save for on road paths on Neerim Road and Glen Eira Road, and north-south connectivity largely limited to the north eastern end of Glen Eira, with on-road paths on Orrong Road, Kooyong Road and Bambra Road. Importantly, much of the network is not continuous. At the southern end of Glen Eira around Bentleigh and Bentleigh East there is almost no existing PBN network, other than the on-road lanes along East Boundary Road.

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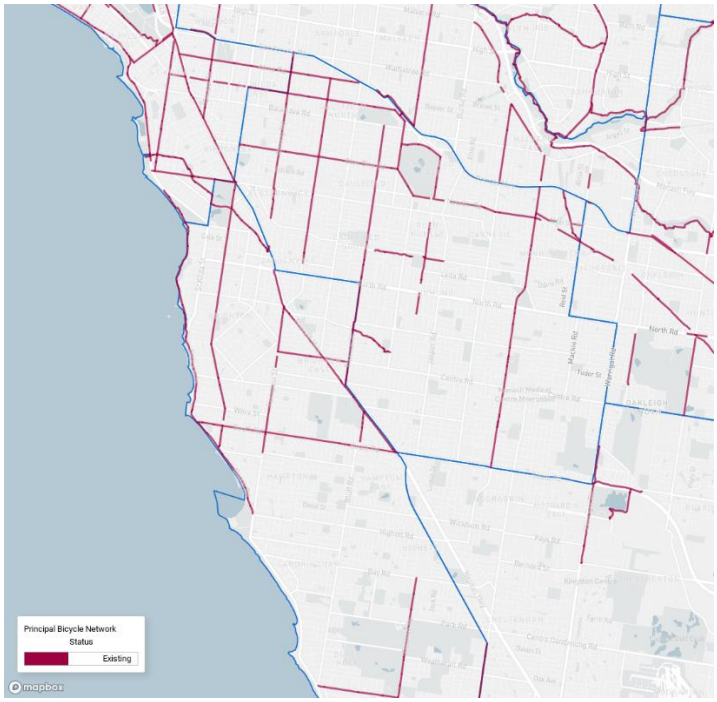
[10] ibid

[11] *Understanding attitudes and perceptions of cycling & walking*, NZ TRA, 2021

[12] See for example, *Role of perception of bicycle infrastructure on the choice of the bicycle as a train feeder mode* Lissy La Paix, Elisabetta Cherchi & Karst Geur, IJST, 2020

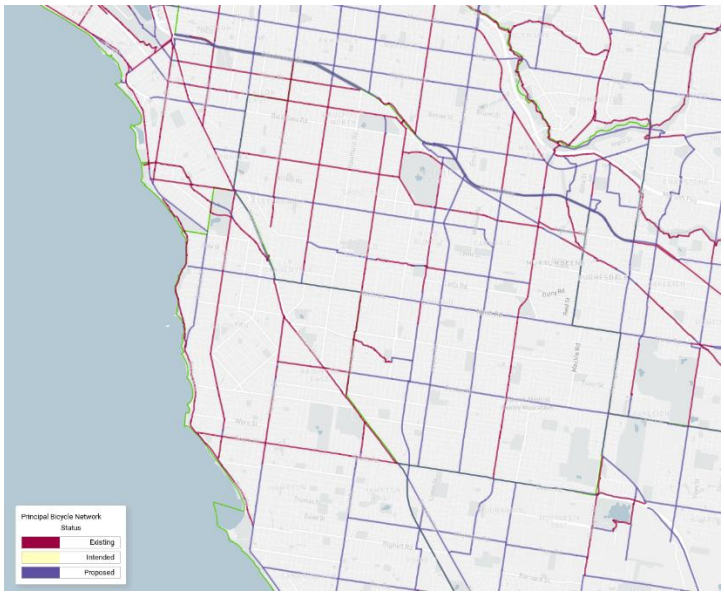
[13] https://www.vicroads.vic.gov.au/traffic-and-road-use/cycling/pop-up-bike-lanes

[14] https://www.vicroads.vic.gov.au/traffic-and-road-use/cycling/bicycle-network-planning



Principal Bicycle Network (Existing) – Glen Eira

The proposed future PBN however, provides significantly more cycling connectivity through Glen Eira, providing additional east-west connections along Glen Huntly Road and more north-south routes, particularly through Ormond and Bentleigh.



Principal Bicycle Network (Proposed) – Glen Eira

The challenge in delivering these paths is that the evidence suggests that simple, line-marked bicycle paths along major arterials is unlikely to provide the degree of separation from vehicle traffic that will encourage many people to take up commuter cycling. As the Heidelberg Road experience suggests, road treatments that provide greater separation will be necessary to make a significant contribution to mode shift. While pop-up facilities are less expensive to deliver, permanent separated facilities are both more costly and are more challenging to deliver in a constrained road environment and are likely to require the removal of on-street parking. While an important medium to long term goal, this will require significant investment and engagement with local communities to successfully deliver.

5.3.2 IMPROVED PEDESTRIAN PATHS

As shown in Sections 2.2 and 2.3, a significant number of the users of the park and ride facilities at Elsternwick and Bentleigh are driving short distances (most less than 2km), trips that could be readily substituted for walking.

Applying a "Walk Score[15]" walkability index to the suburbs of Glen Eira suggests that the desirability of walking across Glen Eira varies by suburb. Under the Walk Score index, scores of 50-69 are rated "Somewhat walkable (some errands can be accomplished on foot)"; scores of 70-89 are "Very walkable" (most errands can be accomplished on foot)"; and scores 90-100 are "Walker's paradise (daily errands do not require a car)". The index takes into account a range of factors but essentially it relates to the distance to a range of amenities. With the exception of Bentleigh East and Caulfield North which are both "somewhat walkable", the suburbs of Glen Eira are rated as "very walkable".

Suburb of origin	Walkability score
Caulfield North	67
Elsternwick	83
Glen Huntley	79
Carnegie	75
Ormond	72
Bentleigh	75
Murrumbeena	71
Bentleigh East	59

This correlates broadly with the rate of journeys to work undertaken by active transport, where Elsternwick was the highest and Bentleigh East the lowest.

Pedestrian facilities in Glen Eira are generally of a good standard, and it is unlikely that path quality is a barrier to more people walking in Glen Eira. What does make a difference (and the Walk Score index numbers support this) is the distance people have to travel to the nearest amenities. This is a function of urban form and planning rather than the quality of pedestrian paths.

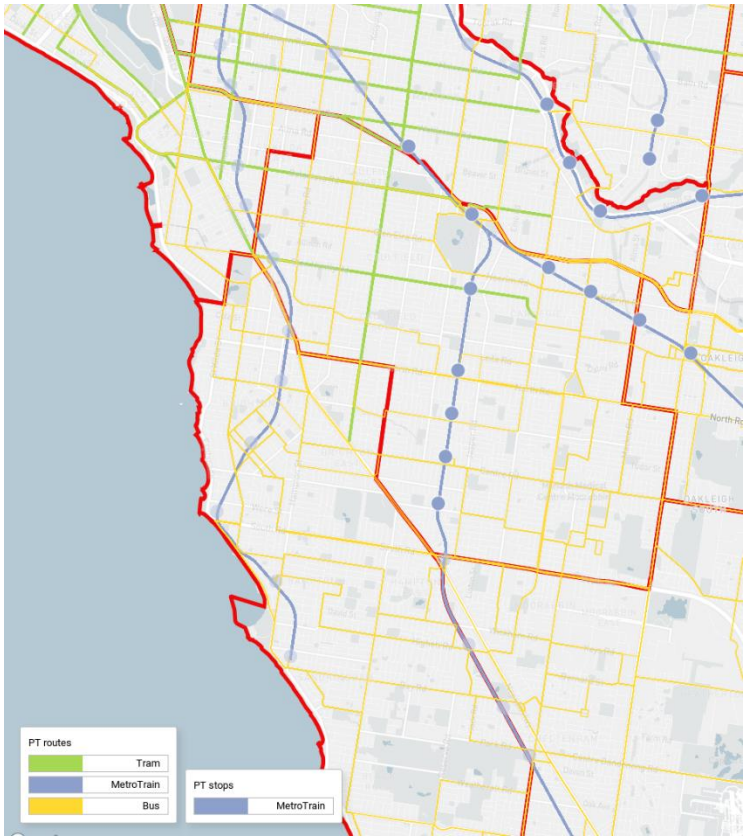
While it is likely there are some locations where paths could be improved, it is unlikely that significant investment in paths to encourage active transport commuter trips will lead to significant mode shift. However, there are other reasons to invest in more walkable neighbourhoods, and this is reflected in the current Glen Eira Integrated Transport Strategy, which has a focus on improving the walking experience along corridors such as Glen Huntley Road, Hawthorn Road etc, as well as around major shopping centres.

While there are many good reasons to invest in an improved pedestrian experience through greater use of shared zones, pedestrian priority, tree canopy coverage and improved traffic signals, these will support local trips and have limited impact on reducing commuter vehicle trips.

5.3.3 IMPROVED PUBLIC TRANSPORT

While much of Glen Eira is relatively well served by public transport, there are differences in coverage across the region. The northern suburbs (Elsternwick, Caulfield North),which are served by buses, trams and multiple train lines, generally have better public transport access than Bentleigh, which is largely served by a bus network and the Frankston line. Public transport access to Elsternwick station is strong with multiple bus routes and tram service, while Bentleigh station is served by bus routes 701 and 979 only. Trips to the CBD and inner Melbourne are catered to by multiple train, tram and bus services.

[15] https://www.walkscore.com/how-it-works/



Public transport network, Glen Eira

The state government has committed to significant increases in capacity of the rail network through investments such as Melbourne Metro, and more recently to improvements to the bus network through Victoria's Bus Plan[1]. While the Bus Plan foreshadows the development of a Bus Reform Implementation Plan and a range of route upgrades, these focus on metropolitan development priorities such as FIshermens Bend; high volume routes; the needs of growth areas; and changes as part of the Doncaster Busway. There are no specific changes referred to for Glen Eira.

In the long term, the proposed Suburban Rail Loop will provide an attractive public transport option for people travelling north towards major employment centres such as Clayton/Monash and Box Hill, particularly for residents in south eastern Glen Eira. It is anticipated that buses would complement rail services in connecting Glen Eira residents with the new rail line.

Given Glen Eira already served by a range of public transport options and there are improvements in heavy rail capacity due to come online in the next few years, significant investment in Glen Eira's public transport network in the short term is unlikely. While improvements to bus services and improved tram services are possible, given the levels of services currently in place, significant improvements would be necessary to the bus network in particular to generate mode shift. Changes to routes and the adoption of the hierarchy of bus services spelled out in Victoria's Bus Plan have the potential to increase patronage and Council should work with the Department of Transport to ensure local needs are reflected.

5.3.1 CHANGES TO THE ROAD NETWORK

As noted in Section 5.1, increasing the capacity of the road network can be done through either increasing the amount of road space (eg, constructing more lanes) or through the use of technology to improve the capacity of the existing network.

The road network in Glen Eira is largely mature and there is very limited opportunity to increase the physical road space. Increasing the number of lanes of major arterials would is likely to require the acquisition of properties and is likely to result in a degrading of the urban form to ultimately create a less attractive physical environment and reduce the liveability and walkability of Glen Eira.

In relation to the increased use of technology to manage congestion, the state government has committed to a Smarter Roads[16] program which will involve the use of improved transport technology such as traffic cameras, travel time sensors and live travel signs. This also includes a Traffic Light Network Optimisation program, which will cover much of Melbourne including the east and south east. This creates opportunities to create smoother journeys and potentially reduced travel times. Given VicRoads' responsibility for the arterial road network, Council should work with VicRoads to ensure that local needs are reflected in any changes and that the potential trade-offs are understood.

Changes to the way road space is allocated also have the potential to increase the volume of people travelling along a corridor while not increasing (or reducing) the number of vehicles. This would be achieved though giving priority to on-road public transport (trams and buses). This is already addressed in the Glen Eira Integration Transport Strategy:

> "POTENTIAL IMPROVEMENTS
> To increase the effectiveness of our public transport routes, possible improvements may include:
> - separating the service — for example, a bus-only lane or removal of cars from the tram lane;
> - prioritising the service — for example, creation of clearways in peak hours;
> - programming of traffic signals to prioritise bus movements through intersections;
> - construction of accessible tram stops with high quality shelters and signage;
> - improving connections between train stations and interchange facilities; and/or
> - exploring the reinstatement of lost street parking where appropriate.[17]"

5.4 Conclusions

As noted in Section 1.1, this report provides a rapid, principles-based assessment and a literature review of some of the alternative options for managing congestion in Glen Eira and on the broader network. As noted above, Glen Eira's road network is mature and current public transport options compare well with much of Melbourne.

While some of the measures discussed above have the potential to make modest impacts on congestion – the use of smarter technology on the road network and reallocating road space in particular – these already form part of Council's thinking as demonstrated in the Glen Eira Strategic Transport Plan and require Council to work closely with state government.

Similarly, proposed improvements to enhance the walkability and cycling facilities in Glen Eira, are also discussed in the strategy but are less likely to have a significant impact on shifting people out of their cars, particularly in the south east of Glen Eira where walkability is considered low. There are, however, other reasons such as the liveability of Glen Eira to deliver such improvements over time.

In summary, there is no quick fix to congestion and any individual initiative that can be undertaken within Glen Eira in the short to medium term will have a major impact on congestion. Measures such as the use of smarter technology and providing priority for on-road public transport already form part of Councils plans. Other measures that focus on active transport are desirable from a liveability perspective but are unlikely to have an impact on congestion.

As noted in Section 3.1.4, the impact of enhanced park and ride facilities in Glen Eira are likely to divert car drivers to the train network at a rate of one for every three car parks. This is likely to create a small reduction to traffic volumes between Glen Eira and the CBD, depending on the size of the car parks, but may result in some increases in local traffic volume, particularly around Elsternwick.

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[16] https://www.vicroads.vic.gov.au/traffic-and-road-use/traffic-management/smarter-roads

[17] pg 19, *Glen Eira Integrated Transport Strategy 2018-2031*

Note that this high-level analysis focusses only on the benefits of potential measures and does not address the respective costs. We understand that the costs of any additional park and ride facilities will be assessed as part of any more detailed feasibility study.

Appendices

Appendix A - Bibliography

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Appendix B – Traffic speeds in inner Melbourne & Glen Eira

Figure 1 – Traffic speeds in Glen Eira, AM peak

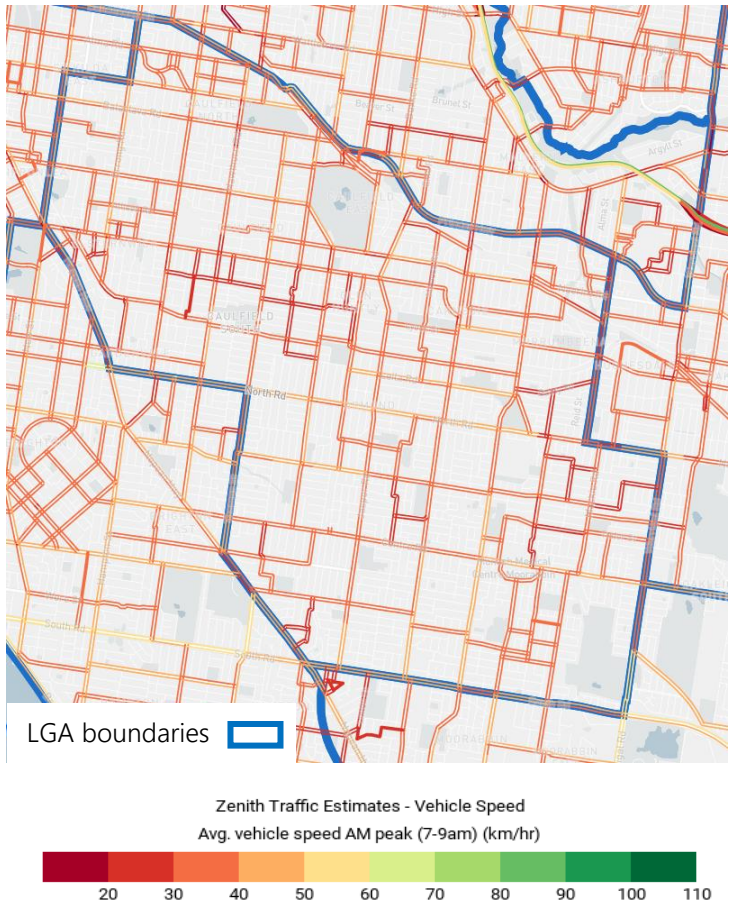
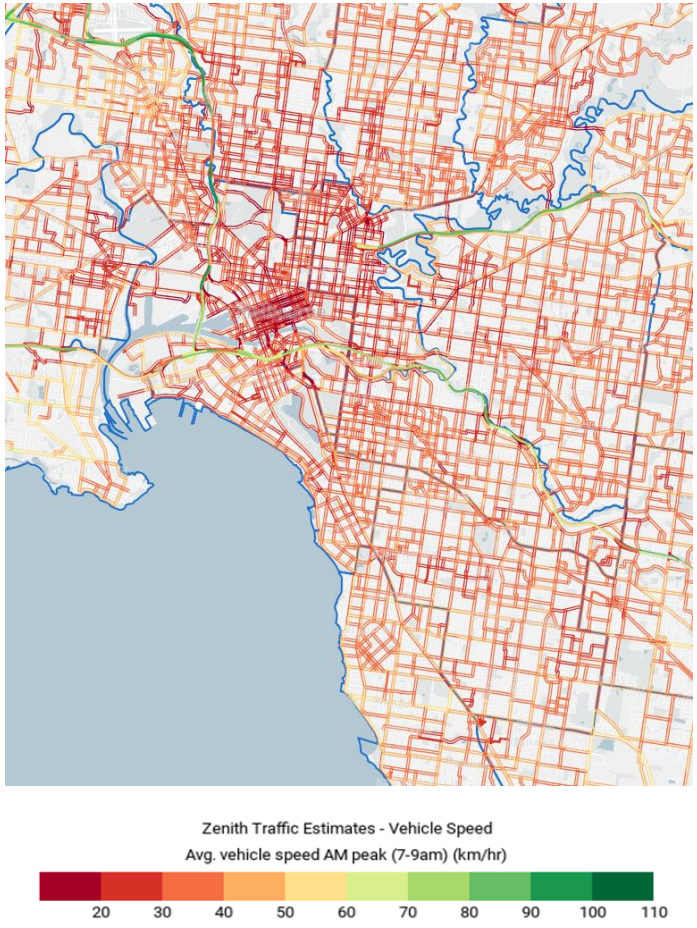


Figure 2– Traffic speeds, SE Melbourne, AM peak

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