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1. Introduction

1.1 Background

An Advisory Committee (the Committee) has been appointed by the Minister for Planning to consider the Punt Road Public Acquisition Overlay (PAO), between Alexandra Avenue in South Yarra and Union Street in Windsor.

The Committee is seeking to review the future of the PAO affecting properties within the City of Stonnington on the east side of Punt Road and to determine whether or not to retain, modify or remove the overlay.

I have been instructed by Norton Rose Fulbright Australia in December 2015 to consider and address the traffic and transport matters associated with the terms of reference of the PAO, the strategic benefit of retaining the PAO having regard for the Concept Options 5, 6 and 7 in the Arup Options report, and provide and prepare an expert evidence report on those issues for presentation at the upcoming hearing.

In preparing this report, I have relied upon information prepared by VicRoads, Public Transport Victoria (PTV) and Arup in forming my position. It is important to note that my report is an independent traffic and transport evidence report and is not a peer review of the previous work undertaken by others.

1.2 Instructions & Scope of Report

I have been engaged to prepare and present expert traffic and transport evidence as part of the Advisory committee to consider the Punt Road Public Acquisition Overlay. Prior to preparing this evidence I was briefed by Norton Rose Fulbright regarding the proposal via written instructions.

This evidence has been prepared having consideration of the following matters:

i. A review of the relevant background material

ii. The strategic traffic and transport context of the Punt Road Corridor in the local and wider network

iii. Relevant traffic and transport matters set out in the Advisory Committee Terms of Reference dated 10th December 2015

iv. The vehicular and public transport benefits of retaining the PAO as they specifically relate to the relevant Terms of Reference for the hearing

v. The strategic benefit in retaining the PAO, particularly having regard to Concept Options 5, 6 and 7 in the Arup Options Report.
1.3 Expert Witness Details

Reece Humphreys BE (Civil)
Director - GTA Consultants (Vic) Pty Ltd
L25, 55 Collins Street, Melbourne

Areas of Expertise: Traffic Engineering & Transport Planning

I have a Bachelor of Engineering degree and over eleven years’ experience spanning transport modelling, major event planning, traffic engineering design, land use development and traffic and parking impact assessments. This experience covers a mixture of tasks ranging from microsimulation modelling of large scale projects in Melbourne and Sydney to traffic engineering analysis and advice on projects around Australia. I have had active roles in managing and delivering the transport planning a variety of large major event planning projects for the Australian Open (tennis), Commonwealth Games and Herald Sun/CityLink Run for the Kids Fun Run. I have also completed a number of projects for VicRoads and the NSW RTA including a series of large regional transport and microsimulation models, strategic corridor modelling, SCATSIM modelling and independent model auditing. I have also recently assisted with planning approval for a number of high profile rezoning and development applications for large retail and residential uses in Melbourne.

In 2012 I was a finalist for the Engineers Australia Young Engineer of the Year Award. Currently I serve as a committee member on the AITPM and as a member of the National AITPM Transport Modellers Network.

Further details of my experience are provided in Appendix A.

1.4 References

In preparing this evidence, reference has been made to the following:

- Stonnington and Melbourne Planning Scheme
- Arup Options Report for Vic Roads dated 14th October 2015
- Concept Layout plans prepared by Arup as part of the Options Report
- Vic Roads Options Report August 2012
- Vic Roads and PTV submission to the Committee, Part A, dated 24th December 2015
- Plan Melbourne, May 2014
- Various technical data as referenced in this report
- An inspection of the site and its surrounds.
2. Punt Road Public Acquisition Overlay

2.1 Background

The Punt Road Public Acquisition Overlay (the “PAO”) has been in place since 1954 which reserves the land to the east side of Punt Road (between Alexander Avenue in South Yarra and Union Street in Windsor) for use by the government to undertake infrastructure works deemed important to the strategic growth of Melbourne.

Work completed by VicRoads and other consultants have established that the corridor is heavily congested during the transport network peaks as well as inter-peak and weekend periods, and that its high casualty rates\(^1\) need to be reduced. Investigations into improvement works for optimising and improving the operation of the Punt Road corridor are already warranted. It is the only major north south arterial route in the eastern side of an expanded Central City making it vital to Melbourne’s liveability and access as well as supporting economic growth.

Since the PAO has been implemented, VicRoads have either compensated or purchased all except three properties affected by the amendment. The Committee has been requested to review all relevant information on the current status of planning and the PAO, and recommend whether to retain, modify or remove the overlay.

2.2 The PAO

The PAO reserves the land adjacent Punt Road protecting its use for potential improvements to Punt Road in the future. The location of the Punt Road PAO has been reproduced in Figure 2.1.

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\(^1\) Refer to Trafficworks Background Conditions Report dated 21/4/2015
The PAO consists of approximately 20 metre wide strip of land on the east side of the current Punt Road alignment. All properties affected by the PAO are located in the City of Stonnington, except for a small strip of land on the southern end of Punt Road which is located within the City of Port Phillip. It is also noted that properties located on the west side of Punt Road are located within the City of Melbourne.

Punt Road is nominated as a Road Zone Category 1 (RZ1) in the Victorian Planning Scheme and is managed and controlled by VicRoads.

2.3 Arup Options Report

VicRoads engaged Arup Consultants to develop a series of improvement concepts for the corridor and assess their relative merit, which were presented in their report dated 14th October 2015. Seven concepts were developed which are all at-grade configurations, noting that grade separated solutions and major new transit corridors were not considered as part of the Arup engagement.

The various concepts require different use of the PAO land, noting that concept Options 1, 2 and 3 do not require use of the PAO. Briefly, the Concept Options are discussed as follows:
1. **Concept 1 - 24 hour Clearways**
   - Concept 1 can be implemented without using PAO land and involves the removal of kerbside parking along the length of Punt Road (on both sides) and 100m on east-west arterials that intersect Punt Road. It is noted that clearways currently operate along Punt Road during the peak AM and PM periods and therefore benefits would only be realised outside of these times.
   - Further, it is noted that all concept options propose 24-hour/7-day clearways and the conversion of PAO properties, owned by VicRoads, into public off-street parking areas.
   - State government announced on 31 January 2016 that 24 hour clearways will be introduced by the middle of 2016.

2. **Concept 2 - 4 Lane: Central Right Turn Lane**
   - Concept 2 extends on the clearways described in Concept 1 by incorporating a linemarked central right turning lane which provides continuous opportunities for right turns into frontage properties and local streets. Additionally, this option would include improved tram priority lanes for east-west routes, upgrades to stops and simplified traffic signal operations.
   - This option can also be implemented without using PAO land, however the concept, as well as Concepts 3 to 7, potentially requires acquisition of a small parcel of park land (Fawkner Park) outside the PAO. Further discussion on the Fawkner Park land is provided in Section 5.2.

3. **Concept 3 - 4 Lane: Narrow Central Median**
   - Concept 3 adopts the same arrangement as Concept 2, however the central lane would be a solid median (instead of a right turn lane) preventing right turns at minor midblock locations. All right turns would be required to take place at signalised intersections.

4. **Concept 4 - 5 Lane: Reversible Lane**
   - Concept 4 provides five lanes with a reversible central lane, however this concept has since been deemed unacceptable by VicRoads as a result of safety and space implications and is not being considered any further.

5. **Concept 5 - 4 Lane/6 Lane: Widening Intersections**
   - Concept 5 builds on Concept 2 by providing additional capacity at major signalised intersections. The approach and departure sides of intersections would be flared (or widened) to increase capacity for vehicular throughput, whilst the option also provides an opportunity to allocate an additional lane to public transport.
   - Approximately 65 of 140 properties within the PAO would be impacted by this arrangement.

6. **Concept 6 - 6 Lane: Dual Carriageway**
   - Concept 6 proposes three continuous traffic lanes in each direction (plus additional lanes at key intersections), whilst maintaining the modification to right turn movements in Concepts 2 and 3 to
simplify the traffic signal operations. In addition, existing footpaths are proposed to be widened and a dedicated bicycle path constructed to the east of Punt Road.

According to the plans prepared by Arup, this option would require full use of the PAO and approximately 130 properties.

**Concept 7 - 4 Lane/6 Lane: Bus Lanes**

Concept 7 is a combination of options 5 and 6. As an alternative to providing three continuous traffic lanes at midblock locations, one of the lanes in each direction would be allocated to buses. As with concept 6 this option would require full use of the PAO. It would include the same simplified traffic signal operations and would alter the proposed cycle path in Option 6 (due to the bus lanes) and narrowing of roadside verges at major intersections.

Similar to Option 6, this option would require full use of the PAO and approximately 130 properties.

2.4 Anticipated Demographic Growth in Punt Road Corridor

I have extracted some of the inputs from the Victorian Integrated Transport Model (VITM) Reference Case to understand in more detail the predicted changes in land use within 800m of the Punt Road Corridor. The land use forecasts within VITM are ratified by the Department of Economic Development, Jobs, Transport and Resources (DEDJTER) and were most recently updated in 2014.

My review was to seek to understand the projected land use change abutting Punt Road in both a local and Melbourne wide Context and how this applies to transport integration.

A summary of the existing (2011) and forecast future land uses is provide in Table 2.1. The analysis includes the land use forecasts for zones located within an 800m wide strip of land along each side of Punt Road.

<table>
<thead>
<tr>
<th>Design Year</th>
<th>Population (no. of residents)</th>
<th>Employment (no. of jobs)</th>
<th>Education (no. of enrolments)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punt Road Corridor 1</td>
<td>2011 (Existing)</td>
<td>16,564</td>
<td>34,960</td>
</tr>
<tr>
<td>2021</td>
<td>25,079</td>
<td>40,607</td>
<td>11,661</td>
</tr>
<tr>
<td>2031</td>
<td>28,275</td>
<td>50,266</td>
<td>13,781</td>
</tr>
<tr>
<td>2046</td>
<td>36,149</td>
<td>59,937</td>
<td>16,698</td>
</tr>
<tr>
<td>Net Change (2011-2031)</td>
<td>+11,711 (+171%)</td>
<td>+15,306 (+144%)</td>
<td>+3,009 (+128%)</td>
</tr>
<tr>
<td>Net Change (2011-2046)</td>
<td>+19,585 (+218%)</td>
<td>+24,977 (+171%)</td>
<td>+5,926 (+159%)</td>
</tr>
<tr>
<td>Net Change (Metropolitan Melbourne 2011-2031)</td>
<td>+1,763,000 (+143%)</td>
<td>+920,000 (+143%)</td>
<td>+475,000 (+139%)</td>
</tr>
<tr>
<td>Net Change (Metropolitan Melbourne 2011-2046)</td>
<td>+3,103,000 (+176%)</td>
<td>+1,735,000 (+180%)</td>
<td>+794,000 (+166%)</td>
</tr>
</tbody>
</table>

[1] Includes VITM Zones Located within 800m of Punt Road between St Kilda Junction and Alexander Avenue

The outputs show that population and employment growth within the corridor is forecast to be generally at or above that of Melbourne’s rate to 2031 with the exception of enrolments. The forecast growth in the corridor and resultant activity will place additional demand on the transport system, in particular for public transport (and access thereto and from), walking and cycling and their level of accessibility.

I also note that the 2046 forecasts highlight the forecast growth of Melbourne’s population is expected to reach 7.2 million.
3. Strategic Transport Planning Evaluation

3.1 Preamble

There are a number of key policy and best practice planning documents which provide guidance on matters relating to traffic and transport planning for Punt Road.

Those considered most important to any evaluation of the strategic need for the PAO are set out in the following sections together with a brief summary of their application. Further to these documents, detail is also provided on case studies and investigations which further explain the significant of the Punt Corridor and broader road network transport planning issues for inner Melbourne.

3.2 Statutory & Other Key Legislative Controls

3.2.1 Road Management Act (2010)

The Road Management Act (RMA) is the overarching form of governance for the road network, its management and performance. It is a statutory framework that provides a set of principles for the management of the road system. There are a number of components within the RMA that are of relevance to this hearing which I draw attention to, most notably, Section 20 Part 1A of the Act notes the following:

“In giving effect to the principal object of road management consistent with the transport system objectives under the Transport Integration Act 2010, the road network is to be managed to reflect the priorities of different modes of transport having regard to the intended function or functions of different parts of the road network.”

This overarching statement sits well with not only the current role but any future role that Punt Road as a transport corridor will play. The need to provide a transport system that accommodates the movement of people relates to not only Punt Road itself but the wider network. Future population growth in Melbourne lead to the necessity that parts of the road network will require some form of capacity improvement over time to ensure that the objectives of the act are met.

3.2.2 Transport Integration Act (2004)

The Transport Integration Act (TIA) is the primary transport statute for Victoria, and has caused significant change to the way transport decisions are undertaken. The TIA requires that all transport agencies work together to achieve an integrated and sustainable transport system. The TIA is designed to consider all users and modes against a set of objectives and principles.

The TIA:
- unifies all elements of the transport portfolio to ensure that transport agencies work together towards the common goal of an integrated transport system
- provides a framework for integrated and sustainable transport policy and operations
- recognises that the transport system should be conceived and planned as a single system performing multiple tasks rather than separate transport modes
- integrates land use and transport planning and decision-making by extending the framework to land use agencies whose decisions can significantly impact on transport (“Interface bodies”)
- re-constitutes transport agencies and aligns their charters to make them consistent with the framework.
The TIA forms an overarching legislative framework for transport related state planning policies and has been integrated within the Victoria Planning Provisions (VPP).

The transport system as defined in Section 3 of the Act comprises of all components which make up the system for the movement of persons and goods. The first three definitions for the management of components are:

- strategic planning including plans for building the network, acquiring vehicles, reserving land for future development and business continuity;
- operations planning including business plans, corporate plans, operations plans and contingency plans;
- operational matters required to operate the transport system including schedules, timetables and ticketing systems;

The PAO sits comfortably within each of these components in particular the right to reserve land for future development and business continuity. The information provided by both VicRoads and PTV as part of this process has identified both an immediate and contingent need for use of the PAO that would benefit the transport network.

In terms of decision making, the TIA provides a framework being a triple bottom line assessment approach. Decision makers must have regard to the following objectives and principles:

- social and economic inclusion
- economic prosperity
- environmental sustainability.

The relevance of each of these objectives to the PAO are explored in more detail in Section 6 of my evidence.

3.2.3 Clause 18 of the Victorian Planning Provisions

Clause 18 of the Planning Scheme is designed to reflect the intent of State Government guidance and contains objectives and strategies in relation to Transport which are relevant to the Punt Road PAO, including, but not limited to:

- Create a safe and sustainable transport system by integrating land-use and transport.
- Coordinate development of all transport modes to provide a comprehensive transport system.
- Reserve land for strategic transport infrastructure.
- Upgrade and develop the Principal Transport Network and local public transport network in Metropolitan Melbourne.
- Provide a Principal Public Transport Network that allows for circumferential, in addition to radial movements.
- Manage the road system to achieve integration, choice and balance by developing an efficient and safe network and making the most of existing infrastructure.
- Facilitate and safeguard pedestrian and cyclists’ access to public.
- Promote the use of sustainable personal transport.
- Integrate planning for cycling with land use and development planning and encourage alternative modes of travel.
- Achieve greater use of public transport by increasing densities, maximising the use of existing infrastructure and improving the viability of the public transport operation.

This clause sets out a range of objectives and strategies which seek to support population and employment growth together with a need to manage the by-product of that growth in the form of increased demand on the transport system.
Transport choice is one the desirable outcomes of planning for growth whereby real alternatives exist for people to travel by private car, in-road, public transport, as well as walking and cycling.

3.2.4 Clause 45.1 Stonnington Planning Scheme – Public Acquisition Overlay

The Stonnington Planning Scheme identifies the purpose of a PAO as the following:

“To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies.

To identify land which is proposed to be acquired by a Minister, public authority or municipal council.

To reserve land for a public purpose and to ensure that changes to the use or development of the land do not prejudice the purpose for which the land is to be acquired.

To designate a Minister, public authority or municipal council as an acquiring authority for land reserved for a public purpose.”

The scheme identifies and reinforces the original purpose of the PAO which is to safeguard it against development, with the responsible authority being VicRoads.

3.2.5 VicRoads SmartRoads

SmartRoads is a VicRoads policy which sets ‘modal’ priorities on the road network and underpins many of the strategies for public transport prioritisation. The policy is reproduced as follows:

“SmartRoads is an approach that manages competing interests for limited road space by giving priority use of the road to different transport modes at particular times of the day. All road users will continue to have access to all roads. However, certain routes will be managed to work better for cars while others will be managed for public transport, cyclists and pedestrians.”

The SmartRoads approach is used by VicRoads as a decision making tool in relation to any projects that impact on the network. The SmartRoads network in the vicinity of Punt Road is shown in Figure 3.1.

Figure 3.1 indicates that in the vicinity of the corridor, Punt Road is identified as a Preferred Traffic Route and Bus Priority Route, Toorak Road as a Pedestrian Priority Area and Tram Priority Route and Commercial Road and High Street as Tram, Bicycle and Bus Priority Routes. Overall, Punt Road exhibits a range of competing demands moving along or across it. In relation to north south traffic, Punt Road is one of two identified traffic routes that cross the Yarra River for an 8km (approx.) stretch between Richmond and CityLink.

SmartRoads supports the notion of a need to manage competing demands on Punt Road and its intersecting arterials, and any improvements to Punt Road must have regard for the competing routes.
3.3 Plan Melbourne

The Victorian Government released the Metropolitan Planning Strategy, Plan Melbourne (The Plan) in May 2014. The Plan is intended to guide Melbourne’s housing, commercial and industrial development through to 2050. It is noted that the plan is currently going through a ‘refresh’, and will build on the work already undertaken – the plan refresh is due for release as ‘Plan Melbourne 2016’, it will continue to be reviewed and updated every 5 years.

A refresh discussion paper was released in 2015 that provided documentation on options to be included in the 2016 update that resulted from the 2015 ministerial advisory committee review. Notwithstanding, the 2014 Plan identifies the role that transport plays in underpinning the liveability, efficiency and productivity of Melbourne. “A More Connected Melbourne” identifies the need for commuter capacity on public transport and road systems, such as those in inner Melbourne. Further, it identifies the need to invest in improving road efficiency and public transport services.

The Plan Melbourne strategy is underpinned by six major objectives for Melbourne:

i. Delivering jobs and investment – create a city structure that drives productivity, supports investment through certainty and creates more jobs.

ii. Housing choice and affordability – provide a diversity of housing in defined locations that cater for different households and are close to jobs and services.

iii. A more connected Melbourne – provide an integrated transport system connecting people to jobs and services and goods to market.

iv. Liveable communities and neighbourhoods – create healthy and active neighbourhoods and maintain Melbourne’s identity as one of the world’s most liveable cities.

v. Environment and Energy – protect our natural assets and better plan our water, energy and waste management to create a sustainable city.

vi. Implementation: delivering better governance – achieve clear results through better governance, planning regulation and funding options.

Punt Road has the potential to provide for a transport system that aligns with the objectives presented above and in doing so can be a more efficient use of existing infrastructure as well as encouraging more desirable future travel behaviour.

Further, Plan Melbourne (2014) identifies a number of short-term priorities under Initiative 3.1.3, including:

“Prepare a road-use strategy to ensure trams and buses can operate efficiently alongside other vehicles, particularly as land use changes”

The subsequent discussion paper from the 2015 ministerial advisory committee recommended that this priority be maintained as part of the refresh.

In the case of Punt Road, this priority means that planning for the corridor must have regard for an outcome that enables it to co-mingle buses with other on road vehicles. The current cross section of Punt Road which is discussed in Section 4 of my report outlines deficiencies in the ability for buses and vehicles to operate efficiently and meet this objective.

The Plan also strives to improve bus services in initiative 3.1.4 as follows:

“Support growing areas of the central city by strengthening bus services to and around Central Melbourne”

Buses are shifting to performance based systems that seek to improve both reliability and patronage.

It is also worth noting that Direction 3.5 of Plan Melbourne relates to “Improve the efficiency of freight networks while protecting urban amenity”. The direction discusses the importance of Freight to the
states’ economy as documented in the report entitled ‘Victoria - The Freight State’ with a long term objective to:

“Ensure investment in the arterial road network in metropolitan Melbourne improves the level of service for freight, to reduce pressure for the diversion of freight transport onto local roads”

Map 23 in Plan Melbourne identifies Punt Road as a principal link in the 2050 freight network. Whilst it is highlighted that limited planning for Punt Road as a Freight Route has been undertaken, it currently performs an important role for local freight and commercial deliveries.

3.4 PTV Bus Network Development Plan

I have requested from PTV the status of their PTV Bus Network Development Plan which is similar to the heavy rail network development plan document released by PTV. The Bus Network Development Plan document will provide direction and guidance on the future planning of Melbourne’s bus network, and it is identified in Plan Melbourne as an action item for its delivery.

PTV have provided the following comment in relation to the plan:

“In 2012 PTV completed the first of these Network Development Plans for the Metropolitan Rail Network. This plan provided the government with a comprehensive plan for the development of Melbourne’s rail system over a 40 year time frame for its consideration. The Regional Network Development Plan is currently under development. Following the completion of the regional plan, PTV will then seek to complete the Tram and Bus (On Road) Network Development Plan.

Notwithstanding this, as Route 246 is currently the ninth most popular bus service in Victoria, a major bus route operating along the Punt Road corridor into the future will be part of the On Road NDP. Punt Road is also a key link on the Principal Public Transport Network.”

3.5 VAGO Reports

The Victorian Auditor-General’s Office is a public sector audit organisation providing auditing services to the Victorian Parliament and Victorian public sector agencies and authorities.

The office assists the Auditor-General, who is an independent officer of Parliament, appointed under legislation to examine and report to Parliament and the community on the efficient and effective management of public sector resources, and provide assurance on the financial integrity of Victoria’s system of government.3

Managing Traffic Congestion (April 2013)

The Victorian Auditor General released its audit report on Managing Traffic Congestion (April 2013). The study highlights the primary trip generators in peak periods as those associated with employment and education. Most importantly, the report notes that in recent times:

“….congestion management strategies remain heavily weighted towards the supply side with little attention to demand management. Continuing this approach poses a significant risk for achieving any congestion reduction benefits attached to the MPS’ preferred vision for Melbourne’s future growth.”4

A key outcome of the VAGO report is the need to plan the road network to ensure that it has the ability to operate and function for vehicles and public transport services.

The report also makes a number of recommendations relating to the Department of Transport (as they were known at the time), Public Transport Victoria and VicRoads insofar as developing a

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4 Source: Victorian Auditor General’s Report on Managing Congestion, Page xiii
balanced approach to delivering network upgrades under the regulatory framework established under the Transport Integration Act (2010).

### 3.6 International Policy Example

Safeguarding and protecting land is increasingly difficult as cities around the world are experiencing growth and the pressures of maintaining a functioning transport network increases. This is an issue that is not confined to Melbourne and is something that interstate and international cities are addressing by safeguarding land for transport. One such example that I have sourced is the Policy for the City of London\(^5\). The London ‘Land for Transport’ Policy highlights the economic and social viability for land retention:

It is recognised in the Mayor’s London Plan that transport plays an essential part in keeping the city prosperous economically and socially. Ensuring that land is available for transport functions close to the market it serves helps reduce the cost of provision, improve reliability and reduce transport’s energy consumption. It may also help ensure operational staff can access their place of work more easily.

Further reading of the document in relation to road congestion highlights a requirement for schemes that have the impact of reducing road capacity for the urban realm, walking and cycling must ‘take into account the impact on congestion and reliability for all road users, and on the bus network in particular’.

### 3.7 Summary of Legislative, Best Practice and Policy Review

My review of policy, strategic and best practice literature documents as part of this study raises a number of key transport themes which have relevance to the PAO.

It is evident that the Committee has access to a raft of planning tools and reference documents which will assist it in determining the acceptability of transport planning outcomes. These tools at the highest level deliver a strong strategic platform in support of a state wide transport system which is “sustainable” but also “deliverable”.

It is also conceivable through this documentation that policy supports the need to deliver improvements to both private vehicle and on road public transport. VicRoads has identified Punt Road as both a traffic and public transport priority route and as such the development of transport system improvements must have regard for the ability to deliver across all modes.

The themes identified in the policy and best practice documents identified are all contained under the umbrella of the Transport Integration Act. The TIA defines and guides the way transport decisions are undertaken in order to achieve an integrated and sustainable transport system. This is more evident now given the forecast growth in both the immediate and wider areas.

Overall, there is strong strategic justification within both state and local policy identifying at the very least a need to protect assets such as the Punt Road PAO for the future legacy of the transport network.

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4. Assessment of Options

4.1 Introduction

As part of my brief I have been requested to investigate the merits of options 5, 6 and 7 of the Arup Report, and in particular whether or not the PAO should be retained. Whilst these options are the primary focus of my evidence, I have had some regard for Options 1-3 as these also demonstrate the maximum level of operation possible without the PAO.

This section looks at key traffic and transport components of the corridor being the network demands, intersection performance, public transport and pedestrian movement. It also focuses (where possible) on formulating responses to the key traffic and transport matters that have been stated as part of the terms of reference and/or submissions.

I note that each of the options that activate the use of the PAO also require improvements to Hoddle Street (including Yarra Bridge) and the St Kilda Road-Punt Road intersection. I have not undertaken a critical review of these improvements as they do not impact directly on the PAO.

4.2 Network Performance

4.2.1 Victorian Integrated Transport Model (VITM) Outputs

Through the process of preparing my report I have reviewed the available VITM outputs provided from Arup as they directly relate to traffic movement in and around the areas south of the Yarra River. Link Volumes on four key roads that relate to north-south flow south of Toorak Road are reproduced in Table 4.1.

<table>
<thead>
<tr>
<th>Location</th>
<th>2013</th>
<th>Do Nothing</th>
<th>Options 1-3</th>
<th>Option 5 &amp; 6</th>
<th>Option 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punt Road – South of Toorak Road</td>
<td>32,000</td>
<td>34,000</td>
<td>30%</td>
<td>65%</td>
<td>64%</td>
</tr>
<tr>
<td>St Kilda Road – South of Toorak Road</td>
<td>44,000</td>
<td>47,000</td>
<td>1%</td>
<td>-3%</td>
<td>-2%</td>
</tr>
<tr>
<td>Chapel Street – South of Toorak Road</td>
<td>17,000</td>
<td>19,000</td>
<td>-5%</td>
<td>-9%</td>
<td>-8%</td>
</tr>
<tr>
<td>Williams Road – South of Toorak Road</td>
<td>23,000</td>
<td>25,000</td>
<td>-6%</td>
<td>-10%</td>
<td>-10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>116,000</td>
<td>125,000</td>
<td>7%</td>
<td>13%</td>
<td>13%</td>
</tr>
</tbody>
</table>

* VITM outputs reproduced from Table 3 of Arup Options Report
* Option increases are those increases or decreases against the ‘Do Nothing’ Option
* Total is the percentage of total of each link calculated from individual percentages

Interrogation of the volumes identifies that with the expected population and employment growth, and maintaining the Punt Road corridor as it currently stands (i.e. do nothing scenario), the north-south routes are anticipated to increase by approximately eight percent. The growth is expected to vary across each of the four corridors of between two and three thousand additional vehicles per day.

It is sensible that Options 5 and 6 from a strategic (VITM) perspective have been modelled as similar options given that the throughput at each of the intersections would be generally similar to a degree. I would expect Option 6 may have a marginal higher level of throughput given the reduced levels of merging and diverging upstream and downstream of the intersections.

The capacity improvements provided with Options 5, 6 and 7 show a large uplift in throughput as a result of the additional capacity. In broad terms, an additional lane on Punt Road would be...
expected to provide more than 50% additional throughput in each direction. This higher level of throughput in the options highlights that demand in the network exists regardless of the level of capacity improvement provided. Whilst the strategic model does not include the local street network, the higher level of demand increase in Options 5, 6 and 7 suggests that there will also be increased pressure on the local road network. This is on the basis that the forecast population, employment and educational increases in the immediate vicinity of the corridor (refer to Table 2.1 earlier in this report) will create additional demand on the local road network with residents and workers trying to access jobs and housing.

The increased capacity of Punt Road in Options 5, 6 and 7 makes this an attractive route for north south movements and results in a net decrease on the three competing routes. There are a number of reason for this in my view with the key reasons being the higher speeds on Punt Road with the increased capacity as well as the connectivity that the corridor plays both north and south of its extents (i.e. it is a continuous corridor as opposed to the other three routes).

4.2.2 Victorian Mesoscopic Model (VMM) Outputs

The performance of the corridor was also completed by Arup using mesoscopic modelling. Mesoscopic models are operational models that are able to assess the performance of the network (using demands from the strategic model) under the operational conditions such as signal control, lane controls and closures, speed changes and localised turns and movements.

Traditionally these models also provide outputs by vehicle type (i.e. on road and public transport) which I was advised have not been refined to this level of detail. This would have been beneficial for this process in identifying the level of throughput and operational performance for public transport. Notwithstanding, the outputs do provide an indication of the benefits of the corridor under each of the options.

Of note, the outputs reported show that with options 5, 6 and 7, the throughput growth is higher than that forecast in VITM, being between 70% improvements in throughput realised in the morning peak, 140% improvements in throughput in the midday peak, and 65% improvement in throughput in the afternoon peak.

The section of Punt Road between Toorak Road and Commercial Road highlight that in each of Options 5, 6 and 7 the average speeds on this link will be marginally higher than that of the current conditions. It is not surprising as the level of throughput and demand is significantly higher in each of the options with increased capacity. It is also highlighted that the options with lower capacity (and demand) are expected to operate at higher speeds. What is not shown is whether or not the remainder of the route as well as parallel and competing east west routes benefit from the increased throughput on these roads, although the VITM outputs do consider the broader network implications.

Notwithstanding, I am satisfied that based on the level of throughput achieved Options 5, 6 and 7 provide benefits to both the immediate corridor and the wider north south movements.

4.2.3 East West Traffic

VITM outputs provided in the Arup Options Report indicate that the three key roads crossing Punt Road (Toorak Road, Commercial Road and High Street) are anticipated to experience varying degrees of growth both to 2031 and for each of the options. The two southern routes of Commercial Road and High Street experience increases whilst Toorak Road is expected to experience marginal decreases when compared to both 2013 and 2031 demands. The low growth on Toorak Road highlights the deficiencies in its capacity, as well as the role that Commercial Road and High Street provide in feeding other routes to get to Punt Road.
The predicted marginal increase in throughput on the east west routes make sense given the relative catchments (when compared to the wider metropolitan network) for each of the east west roads crossing Punt Road and the high level of public transport options available. A more detailed interrogation of the east west routes is provided in the intersection and public transport assessments in the following sections.

4.3 Intersection Operation

4.3.1 North South

The proposed approach to provide improved throughput in each of the options is fundamentally driven by improving the operating characteristics at each of the signalised intersections. Each of the options aim at removing or relocating key right turn movements on the majority of approaches which has the benefit of providing more green time allocation to the through movements both north to south and east to west. Cycle times for each intersection would be reduced from approximately 130 seconds to 110 seconds for each intersection meaning that the wait time between the start and finish of a green phase is lower. Reducing the cycle time is becoming more common place for corridor demand management in congested environments, and also provides a better outcome for pedestrian and cycle accessibility.

As stated previously, a limitation of the Victorian Mesoscopic Model, which was the model used to understand the operational performance of the corridor, is that it did not separate public transport vehicles in its reporting. In order to understand in more detail the benefits that the options would provide both passenger vehicles and public transport I have obtained the SIDRA outputs from Arup. It is important to recognise that a limitation of SIDRA is that it is not able to model upstream and downstream flow as an isolated intersection tool, and its application in this instance should be to compare options against one another rather than as a combined outcome. I also note that this does not represent travel time or delay, as whilst they are comparable, they should be looked at as a system rather than individually.

A summary of Arup the northbound and southbound SIDRA 95%ile queue lengths anticipated on Punt Road for key intersections is provided in Figures 4.1 and 4.2.
It is assumed that results for Options 5 and 6 would be the same as each other as the intersection treatments are identical. Further, public transport queues in all options excluding 7 would be the same as the general traffic queues due to the fact that they share the same road space as one another.

By undertaking a comparison between the queues presented in Figures 4.1 and 4.2, the ‘bus lanes’ and ‘general traffic lanes’ indicated that Option 7 buses will experience substantially lower queuing. In some instances, the introduction on bus lanes will mean that buses would sit in total queues up to 1.2km less than if they were not introduced. By virtue of their own lane, the resultant lower travel
time and delays are and will be substantial when considering the role that the bus lanes will play on the movement of people.

It is also noted that overall queuing for general traffic will generally be comparable or better than the ‘2031 Do Nothing’ scenario. Whilst queueing would be similar, the level of throughput on the corridor is substantially more (approximately 50% increase) in Options 5, 6 and 7.

4.3.2 East West

By virtue of the lower cycle times, east west routes would be expected to improve as they also have the benefit of less wait time between cycles. In addition, the removal of some of the right turn movements have resulted in minimal obstructions to trams which are often delayed by right turning vehicles.

The approach delays for the tram lanes have also been extracted from the SIDRA results provided to represent in more detail the benefits expected to east west public transport services. Figure 4.3 and Figure 4.4 show the total delay experienced for westbound and eastbound tram lanes, noting that Option 5 results are the same as Option 6 from a SIDRA perspective.

Figure 4.3: Arup SIDRA Assessment: Delays for Westbound through Movements (AM and PM peak)
The results show that for Options 2, 5 and 7, improvements in delays for both eastbound and westbound movements will be realised when compared to both the existing situation and the ‘Do Nothing’ in 2031. These outcomes indicate that trams on the east west routes would benefit from the introductions of the options and the resultant outcome would be a more reliable and attractive services.

Further discussion on these benefits is provided in the following section.

4.4 Public Transport

4.4.1 Current Usage of Punt Road Public Transport

Route 246 is a bus service which operates on Punt Road which is part of a strategic and important service connecting Elsternwick Station to Clifton Hill bus and tram interchange. Its context in relation to Punt Road and the wider network is shown in Appendix B. Information provided from PTV indicate that there were just over 1.5 million passenger boarding’s in the last financial year (2014/15), making it the ninth busiest bus route in Victoria. Surveys obtained from PTV in relation to customer trip purpose have indicated that 57% of trips are work related and 23% educational, as reproduced in Figure 4.5.
The service provides connections to 10 train lines at Clifton Hill, Richmond and Elsternwick stations as well as 15 crossing tram routes and 27 bus routes. In addition to the journey purpose, the connections from and to other modes has been provided by PTV, which is also reproduced in Figure 4.6.

26% of Route 246 users transferred from or onto another form of public transport as part of completing their journey highlighting the importance of the connections that the route provides to other models.

As it relates to Punt Road, 72% of patrons accessing the route do so by the walking. This suggests that the catchment of the bus route is that of a walk up function whether it be from a person’s home or to a place of employment, further highlighting its role in serving the local community.

**4.4.2 Forecast Patronage Growth**

Public Transport Victoria and ARUP have provided information on the patronage forecasts for the corridor based on outputs from strategic modelling undertaken in VITM. I have assessed the expectant growth by taking a screenline of north south movement immediately south of Toorak Road and a screenline of east west movement immediately west of Punt Road, which is summarised in Table 4.2 and Table 4.3.
Table 4.2: Arup VITM Estimated PT Demands by Link (North-South Movements)

<table>
<thead>
<tr>
<th>Location</th>
<th>2013</th>
<th>Arup Options (2031)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do Nothing</td>
<td>Options 1-3</td>
</tr>
<tr>
<td>Bus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punt Road – South of Toorak Road</td>
<td>3680</td>
<td>5080</td>
</tr>
<tr>
<td>St Kilda Road – South of Toorak Road</td>
<td>2250</td>
<td>2130</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>5930</td>
<td>7210</td>
</tr>
<tr>
<td>Tram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>St Kilda Road – South of Toorak Road</td>
<td>16420</td>
<td>34130</td>
</tr>
<tr>
<td>Chapel Street – South of Toorak Road</td>
<td>3180</td>
<td>5480</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>19600</td>
<td>39610</td>
</tr>
<tr>
<td>Total</td>
<td>25530</td>
<td>46820</td>
</tr>
</tbody>
</table>

* Based on VITM outputs provided by PTV/Arup
* Option increases are those increases or decreases against the 'Do Nothing' Option

The outputs show that bus patronage is expected to increase by almost 22% and that tram patronage on St Kilda Road is anticipated to more than double the current patronage. It is noted that the bus patronage is the resultant of one bus route whereas the tram patronage is a multiple of three tram routes, all operating at high frequencies than existing.

Extrapolated annually, the forecasts suggest that patronage on Route 246 would carry between 2.1 and 2.5 million passengers by 2031.

Table 4.3: Arup VITM Estimated PT Demands by Link (East-West Movements)

<table>
<thead>
<tr>
<th>Location</th>
<th>2013</th>
<th>Arup Options (2031)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do Nothing</td>
<td>Options 1-3</td>
</tr>
<tr>
<td>Bus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial Road, west of Punt Road</td>
<td>2040</td>
<td>1500</td>
</tr>
<tr>
<td>Tram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toorak Road, west of Punt</td>
<td>6580</td>
<td>11580</td>
</tr>
<tr>
<td>Commercial Road, west of Punt</td>
<td>5840</td>
<td>10670</td>
</tr>
<tr>
<td>High Street, west of Punt</td>
<td>5520</td>
<td>10920</td>
</tr>
<tr>
<td>Sub-Total</td>
<td>17940</td>
<td>33170</td>
</tr>
<tr>
<td>Total</td>
<td>19980</td>
<td>34670</td>
</tr>
</tbody>
</table>

* Based on VITM outputs provided by PTV/Arup
* Option increases are those increases or decreases against the 'Do Nothing' Option

The east-west tram routes crossing Punt Road show patronage increases of almost 80% when compared to 2013. The modelled patronage forecasts show a decrease in usage of Commercial Road buses, which can be attributed to some passengers switching to tram (as reflected in the growth in tram usage) from bus and assumed modelled changes in service levels of Route 220, 219 and 216. In all options the east west demands demonstrate little variation from one another, suggesting that the patronage is an outcome of more of a localised growth and demand, rather than network capacity.

The larger increase in tram versus bus is expected due to a range of reasons, including the current preference to use tram when users are faced with a choice and that road priority treatments assumed in the model are focussed on tram and as such are not subject to their low speed environments, as well as the increased congestion on the road network. This connotation is supported by recent information obtained from PTV in relation to the patronage response to corridors within Melbourne that have been implemented with improved on road priority amongst other initiatives which is reproduced in Figure 4.7.
These real examples demonstrate that increases of up to 70 per cent were achieved within two years after the introduction of bus lanes and resultant reliability. These figures suggest that higher increases in public transport patronage would be likely with the introduction of dedicated bus lanes and reliability on Punt Road.

4.4.3 Headway / Frequency

Headway is defined as the time from one vehicle to next, is often considered as the frequency of the service, and in this instance it is expressed in minutes. A “shorter” headway signifies a more frequent service. Modelled headways were also provided from PTV and Arup which are the headways input into the state operated version of VITM. The 2011 headways are representative of current conditions whilst the 2031 headways are those used in the Do Nothing and Option runs. These are reproduced in Table 4.4.
All of the tram services within the model used for the analysis are expected to operate at lower frequencies in 2031. Headways on Route 246 are expected to halve to five minute frequencies, however PTV have advised that it is possible that lower frequencies could be provided should an increase in capacity be warranted (in addition to larger vehicle sizes).

**Commentary on Public Transport**

Regardless of the outcome of the preferred and constructed option of Punt Road, the information suggest that public transport patronage will increase substantially by 2031. This outcome is not uncommon with forecasts for the remainder of Melbourne as population is forecast to exceed 6 million by 2031 and 8 million by 2050. Punt Road itself will experience an increase in patronage and its importance in providing connections to places of work and connections to other transport modes will be critical.

As it stands, travel times are variable and long delays occur, as buses are required to share road space with other vehicles. Travel times on Punt Road will continue to decrease without improvements adding further delays to the bus travel times.

Studies have shown that improvements to delays by as little as 3.5 minutes\(^6\) provide an improved attractiveness and response to patronage. Options 2, 5 and 6 provide increased throughput and better reliability for travel times, whilst dedicated bus lanes in Option 7 provide superior outcome for public transport and its patrons.

Similarly to reduced delay, increasing travel speed and reliability lead to increase patronage. Recent studies have identified that a 10% travel time savings typically increases patronage by 4-6%. This suggests that typical bus lanes that reduce total door-to-door travel times will by themselves increase peak patronage. Larger gains are possible if bus lanes are implemented in conjunction with other policies. Currie and Sarvi (2012) also used Melbourne data to model the patronage increases and car travel reductions provided by public transport travel time savings. The study found significant vehicle on road travel reductions as a result of modest time savings to public transport.

The benefits to east west movement and public transport cannot be understated. With patronage demands anticipated to increase by up to 80% an improved level of service must be provided than the current situation. Each of the options show improvements for east and westbound travel across Punt Road, providing not only a better level of service but increases in reliability.

High quality public transport will likely result in other benefits, such as a larger reduction in localised car travel. This outcome has a direct benefit to create more amenable, walkable, transit-oriented neighbourhoods where residents tend to own fewer cars, drive less and rely more on alternative modes, reducing car trips on the route. This outcome is already noticeable in areas in Melbourne with high public transport accessibility.

4.5 Pedestrians

My review of the submissions have highlighted that there is a view that the options that widen Punt Road provide a poorer outcome for pedestrians. This view is due to the introduction of the additional lanes in Options 5, 6 and 7 result in increased crossing distances and times.

Whilst this view is correct in terms of total crossing distance time, I have reviewed the pedestrian delays from the SIDRA outputs at the intersections for the signalised crossing points at the key intersections on Punt Road.

Table 4.5: Arup SIDRA Assessment: Average Delay at Toorak Road Intersection Pedestrian Crossings (seconds)

<table>
<thead>
<tr>
<th>Approach</th>
<th>2013</th>
<th>Arup Options (2031)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Do Nothing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AM Peak</td>
</tr>
<tr>
<td>South Full Crossing</td>
<td>39.2</td>
<td>35.4</td>
</tr>
<tr>
<td>East Full Crossing</td>
<td>33.5</td>
<td>34.2</td>
</tr>
<tr>
<td>North Full Crossing</td>
<td>56.1</td>
<td>51.6</td>
</tr>
<tr>
<td>West Full Crossing</td>
<td>33.5</td>
<td>34.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM Peak</td>
</tr>
<tr>
<td>South Full Crossing</td>
<td>35.4</td>
<td>36.9</td>
</tr>
<tr>
<td>East Full Crossing</td>
<td>29</td>
<td>27.7</td>
</tr>
<tr>
<td>North Full Crossing</td>
<td>35.7</td>
<td>37.2</td>
</tr>
<tr>
<td>West Full Crossing</td>
<td>20.1</td>
<td>27.7</td>
</tr>
</tbody>
</table>

A review of the data shows that when compared to the ‘Do Nothing’ scenario, the lower cycle time results in reductions to average delay for Option 2 and 5 in the AM peak and Option 2 in the PM peak, with increases observed on Punt Road in the remainder of options. A review of the remaining intersections on the route show that the varying levels of increases and decreases in pedestrian delays will occur with introduction of the six lanes in Options 5, 6 and 7, when compared to the do nothing scenario. Notwithstanding, these do not represent significant or unwarranted wait times for pedestrians in my view.

I note that the delays are calculated by SIDRA having regard for the pedestrian demand as well as available crossing time. On a practical level, the lower cycle times in the options will result in an improved level of service for pedestrians due to the reduced wait time between walk phases in successive cycles.

4.6 Summary of Option Assessment

The strategic objectives for the Hoddle Street – Punt Road corridor (as detailed in the Arup Report) include the movement of people along and across the corridor, improving travel times and reliability for bus services as well as the local amenity and priority of sustainable transport. The options reviewed allow for a staged approach (if required) to progressively construct capacity improvements at the key intersections (Option 5), followed by midblock improvements (Option 6) and the introduction of high capacity lanes or public transport lanes (Option 7).
Without improvements to the corridor, increased congestion will have an impact on both car travel and public transport with travel times making the services unreliable and unattractive. Further, the current congestion and provision of north-south priority along punt road also impacts on intermodal connectivity between buses, train and trams.

The information provided by VicRoads, PTV and Arup have confirmed that from a traffic and transport perspective each of the options provide benefit to the Punt Road corridor as well as the wider and localised transport network.

The VicRoads and PTV position that the corridor should have a focus on both passenger vehicle throughput as well as public transport is supported and should be planned for. In the short term, Option 5 and 6 provide outcomes for traffic that will benefit all modes and the network up to 2031. Beyond 2031, transport solutions will be required so that more people can be moved efficiently, as such I am satisfied that Option 7 will provide the best outcome for the transport network.
5. Response to Submissions

5.1 Terms of Reference

As part of my evidence preparation, I have been requested to respond to the public transport requirements of the terms of reference, which I have obtained through consultation with PTV and VicRoads as detailed within this report.

To assist the Committee with the response to these terms, I have summarised these in Table 5.1.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Term</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>The Committee would like an understanding of the impacts of each option on the broader public transport network. The Committee can see the local treatments proposed for each option, but would like to understand the flow-on benefits and any disadvantages for the operation of the broader network.</td>
<td>Refer to Section 4.4 of this evidence</td>
</tr>
<tr>
<td>16</td>
<td>The Committee requests current and projected information for the bus service along Punt Road. This should include trip times; traffic congestion related delays to scheduled services; patronage levels at various times of the day; origins and destinations of patrons; any broader analysis of customer displacement caused by current service constraints; and other relevant information about the route.</td>
<td>Refer to Section 4 of this evidence</td>
</tr>
</tbody>
</table>

5.2 City of Melbourne – Council Report

The City of Melbourne prepared a submission to the Committee outlining their position on the PAO. A number of key themes of the submission that relate to traffic and transport have been identified and are summarised below in italics along with my commentary on each of these provided thereafter.

SAFETY

The report suggests that if Option 2 is implemented that a 40km speed limit is recommended. The rationale of lower speeds is that pedestrians will be closer to traffic lanes thus increasing the risk.

- I note that pedestrian treatments currently exist on Punt Road at high pedestrian areas, such as around Toorak Road, with a 40kph limit during school times.
- My initial thoughts are that a 40kph speed limit for the entire stretch of Punt Road is excessive particularly given the objective of increasing throughput. Notwithstanding, this could be something that should be investigated further to understand the request from the City of Melbourne and its impacts.
- Notwithstanding, this is a design detail matter and does not impact on the question of whether or not the PAO should be retained.

TRANSPORT STRATEGY

The 2012 statement supports the intent of Punt Road as a preferred traffic route and provides priority to high capacity public transport.

- The statement supports all options and more importantly Option 7 as the preferred.
- Balancing priorities such as the east west public transport connections is an issue that is common across metropolitan Melbourne and should be balanced to best serve the network.
- The options that use the PAO will not only have the ability to improve operating conditions for Punt Road (increased throughput and less delays) but will also provide increased benefits to East-West movements due to reduced delays and lower cycle times.
WALKING

Walking is a key mode of transport in the immediate area of Punt Road. Walking journeys are small in length and cross Punt Road rather than navigate its length.

- Indeed the distance crossing Punt Road will increase, however the discussion in Section 4.5 of this report which indicates that the majority of improvement options will generally exhibit lower delays and walking times as a result of the changes to the signal cycle times.
- An added benefit of Options that use the PAO are that pedestrian facilities on both sides of Punt Road will improve, with increased path widths.

INTERSECTION DESIGN

The report states that the increased lane widths are supported however the C.O.M. report suggests that the option with widening would increase cycle time.

- I note the increase lane widths are supported.
- Indeed the distance crossing Punt Road will increase, however the discussion in Section 4.5 of this report which indicates that all of the improvement options will generally exhibit lower delays and walking times as a result of the changes to the signal cycle times.

FAWKNER PARK

I note the C.O.M. report identifies the loss of park land on Fawkner Park on Toorak Road is not supported.

- I note that the concept design has been prepared to provide demonstrate an opportunity to provide increased priority to Trams on Toorak Road.
- My review of the design suggests that an alternate design is possible and achievable, which could result in Fawkner Park land not being required.
- This would be achieved by compromising on some design parameters as well as providing a shared tram and traffic environment for turning vehicles.
- This will require further assessment, however I believe that whilst some delays to trams may occur, it should not be too detrimental to the travel times due to the distance between Punt Road and the location of the turnaround facility on Fawkner Park.
- This is a detailed design matter and does not impact on the question as to whether or not the PAO should be retained.

5.3 City of Stonnington- Ratio Report

Ratio Consultants prepared a report on behalf of the City of Stonnington on the Arup Options Report. A number of key themes of the submission that relate to traffic and transport have been identified and are summarised below in italics along with my commentary on each of these provided thereafter.

Parking

The report identifies the loss of parking as a result of the introduction of clearways and is not supported.

- In January 2016 Traffic Works Pty Ltd completed a Punt Road car parking assessment between Alexandra Avenue to St Kilda Road in South Yarra on behalf of VicRoads. The study was conducted on a typical Wednesday, Friday and Saturday and considered on-street and off-street parking along Punt Road, including 100m on the approach and departure sides of Toorak Road, Commercial Road and High Street. Investigated was the supply and demand of parking in the area, the duration of stay, the reason for parking within the area and behavioural characterises of the motorists who parked within the study area.
The study also investigated the general availability of private off-street car parking to identify where a shortfall in supply may generate on-street demands. In addition, an assessment was undertaken of proposed off-street car parking spaces (by VicRoads) near High Street and Toorak Road, which may be suitable alternative for the car spaces removed as result of the introduction of 24/7 clearways.

Key findings were that the peak Wednesday, Friday and Saturday on-street parking demands were 183, 174 and 157 spaces between 12:30am and 2:00pm. Concept plans for proposed additional off-street parking on VicRoads land suggest 165 Spaces would be available should these car parking areas be developed to offset the removal of current on-street parking, resulting in a shortfall of 18 and 9 spaces on Wednesday and Friday respectively.

I am satisfied that a contingency exists and is available for the introduction of clearways in Options 2 and 3, and the impact would be minimal. I also recognise that the Options that use the PAO (5, 6 and 7) would require further investigation and consultation to determine any broader impacts there may be on Parking.

Clearways

The Ratio Report suggests that the introduction of clearways should be from 6.30am to 6.30pm and is not supported.

Information provided from VicRoads on the weekday and weekend profiles for Punt Road, and reproduced in Figure 5.1 below indicate that volumes on Punt Road are higher outside of these times suggested by Ratio, and that a longer peak is observed.

Further, the weekend data suggests that volumes between 9am and 12 midnight on a Saturday are greater than the weekday inter-peak.

The management of parking could and would be managed suitably (refer to previous comments).

The information suggests that 24/7 clearways would be useful to manage the operation of the road and its implementation is supported.

Figure 5.1: Punt Road Average Weekday Peak hour throughput (source: VicRoads)
Bus Road 246

The Ratio Report suggest that Route 246 is not a greatly valued route

- As per the discussion in Section 4 of this report, Route 246 is the 9th busiest route in Melbourne, carrying some 1.5 million patrons annually.
- The route provides access to places of employment and residence for a number of its users, as well as intermodal connections to train and tram services.
- Reference to studies in Section 4.4.3 of my evidence have shown that services with lower frequencies and improved reliability result in increased patronage and demand. This is also supported by data provided by PTV in relation to existing services in Melbourne that have been altered to operate with separated bus lanes.
6. Retaining the PAO

Having reviewed the available information afforded in preparing this evidence, I regard the key question of note with the Punt Road is not whether to maintain the PAO, rather, what would be the traffic and transport implications for removing it?

Punt Road is a key link in the network and is the only north to south preferred traffic Route crossing the Yarra River between Citylink to the west and Grange Road to the east, a distance of almost 9km. Both VicRoads and Public Transport Victoria have identified Punt Road as a traffic and public transport priority route and the need for improvements to it are overdue.

The strategic benefits of retaining the PAO in my view are quite clear in that it is critical to the management and improvement of the traffic and transport network. This view is supported by local and state policy documentation including Plan Melbourne and VicRoads’ SmartRoads Policy.

The analysis undertaken by Arup on behalf of VicRoads has shown that without improvements to the corridor, congestion will increase and network performance will decrease. This will have resultant impacts on public transport travel times and reliability. The congestion increases will also impact on the movement of east west movements crossing Punt Road. The net outcome to doing nothing will be that it will impact on the way in which people access their jobs and homes.

In order to assist in my position, I have considered the issues associated with removing the PAO against a broad triple bottom line assessment as described in the Transport Integration Act. In terms of decision making, the Transport Integration Act triple bottom line approach must have regard to the following objectives and principles:

- social and economic inclusion
- economic prosperity
- environmental sustainability.

Referring to the research completed in this report, the broad assessment is provided in Table 6.1. This assessment includes items assessed against the Department of Transport’s Paper entitled ‘Transport and the Triple Bottom Line’ dated June 2012.
I am not able to comment on any specific modifications to the PAO at this time

Table 6.1: Transport Integration Act – Triple Bottom Line Assessment of the PAO7 Removal V Retention

<table>
<thead>
<tr>
<th>Measure</th>
<th>Remove the PAO</th>
<th>Retain the PAO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution to economic prosperity</td>
<td>Vehicle throughput along the corridor is likely to reduce due to:</td>
<td>Maintaining the PAO provides the ability to redesign the corridor to cater for a wider range of user requirements while maintaining corridor capacity. Benefits include:</td>
</tr>
<tr>
<td>• Better use of transport assets</td>
<td>• Increased traffic congestion and delays</td>
<td>• Increased throughput.</td>
</tr>
<tr>
<td>• Improve access to work and education</td>
<td>• Reallocation of road space to cater for all users, including sustainable transport and new statutory requirements (e.g. Disability Discrimination Act).</td>
<td>• Providing more people access to employment opportunities.</td>
</tr>
<tr>
<td>• Support business clustering</td>
<td>Could potentially lead to a better use of the transport asset in Option 2, however is a short term solution.</td>
<td>• Efficient access to future major construction projects, known examples include Melbourne Metro Tunnel and Level Crossing removals.</td>
</tr>
<tr>
<td>• Provide value for money infrastructure and services</td>
<td>Does not achieve improved levels of access to work and education with congestion levels predicted to increase.</td>
<td>• Realise freight outcomes identified in the Victorian Freight Network Strategy, including servicing local businesses.</td>
</tr>
<tr>
<td>• Improve business access to markets</td>
<td>Properties owners have already been compensated.</td>
<td>• Facilitate safe access to abutting sites (thereby allowing property values to increase).</td>
</tr>
<tr>
<td>• Keep transport costs down</td>
<td>The PAO is taken into account in the local land values.</td>
<td>Allows the long-term flexibility to efficiently invest in Melbourne’s transport system.</td>
</tr>
<tr>
<td></td>
<td>The cost of safeguarding and protecting land will increase as a result of higher returns from development in the area.</td>
<td>Provides ongoing investment across Melbourne to increase productivity and wider agglomeration benefits.</td>
</tr>
<tr>
<td></td>
<td>The cost of alternatives to stay within the current road reserve (i.e. tunnel or deck) increases by a factor of up to 10.</td>
<td>Promotes local development of population and jobs.</td>
</tr>
</tbody>
</table>

Contribution to social and economic inclusion

<table>
<thead>
<tr>
<th>Measure</th>
<th>Remove the PAO</th>
<th>Retain the PAO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove barriers</td>
<td>The corridor already creates severance between local communities with few crossings and high traffic flows.</td>
<td>The PAO provides road space that can be used to cater for future user requirements along the corridor, including improving conditions for people with access difficulties and disabilities.</td>
</tr>
<tr>
<td>• Respond to user expectations</td>
<td>Resolving corridor issues—such as road safety or new accessibility requirements (e.g. level access)—likely to result in capacity for vehicles to be reduced.</td>
<td>Improved public transport accessibility and reliability, thus making it more affordable. Will require engagement in a wider and broader community to understand true benefits.</td>
</tr>
<tr>
<td>• Make transport more widely available</td>
<td>Reduced level of reliability for all transport users as a result of increased congestion.</td>
<td></td>
</tr>
<tr>
<td>• Improve transport affordability</td>
<td>Does not achieve the best transport outcome.</td>
<td></td>
</tr>
<tr>
<td>Build capacity</td>
<td>The cost of transport affordability is increased. Further engagement with the community is required.</td>
<td>Will not create a positive legacy.</td>
</tr>
<tr>
<td>• Engage and collaborate in planning and delivery</td>
<td>Will not create a positive legacy.</td>
<td></td>
</tr>
<tr>
<td>• Support others to take action on transport challenges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Create a positive legacy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Contribution to resource efficiency and environmental sustainability

<table>
<thead>
<tr>
<th>Measure</th>
<th>Remove the PAO</th>
<th>Retain the PAO</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reduce distances travelled to access people, places and goods</td>
<td>Removes the ability for better Public Transport to be accessed by residents and workers.</td>
<td>The PAO provides opportunity to increase amenity for local residents and promote sustainable travel. This can be achieved through providing wider footpaths, improved on-street public transport provision (e.g. bus stops with shelters) and providing cycling lanes.</td>
</tr>
<tr>
<td>• Make transport activity more resource-efficient and reduce its environmental impacts</td>
<td>Whilst reducing traffic throughput would potentially provide a better local outcome, although increased congestion across the network would likely result in more environmental impacts</td>
<td>Greater reliability of the road network can reduce emissions from traffic.</td>
</tr>
<tr>
<td>• Use environmentally sustainable transport more</td>
<td>Does not promote better use of public transport, thus less environmentally sustainable</td>
<td>Overall less congestion expected on the wider network resulting in lower emissions.</td>
</tr>
<tr>
<td>• Make transport infrastructure more resource-efficient and reduce its environmental impacts</td>
<td></td>
<td>Increased PT accessibility and reliability will result in an uplift in patronage, lower vehicle travel and less emissions.</td>
</tr>
<tr>
<td>• Make transport resilient to climatic extremes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Based on the information provided I have drawn the following conclusions as to the role of the Punt Road corridor in the transport network as follows:

**Strategic Importance and Policy**
- The importance of Punt Road is clearly defined in VicRoads SmartRoads Policy which identifies it as a preferred traffic and public transport route.
- Managing the network to best serve the demands it is presented with is integral to the success of the state’s growth and economy. This responsibility is bestowed upon VicRoads and PTV as part of the Transport Integration Act.

**The need to support population growth**
- Plan Melbourne identifies the need to provide a transport network that better serves the needs of public transport and general traffic on road corridors.
- In addition to the broader growth in the wider area north and south of Punt Road, adjacent land use is forecast to intensify. This is something that is currently underway with an increase in medium and high density living and employment being developed.

**Improving Operational Characteristics**
- Vehicle demand on Punt Road is not expected to reduce, and demand will increase as population growth is realised. Punt Road is located within one of the most established localities of Melbourne that provides access to employment and schools, and demographic forecasts strengthen its need to serve the community and wider network.
- Punt Road is a transit corridor that not only serves passenger vehicles, but plays an important role for the public transport network. Route 246 is the 9th highest bus route in terms of public transport patronage.
- The analysis undertaken by Arup on behalf of VicRoads demonstrates that without changes to capacity, network performance will drop on Punt Road as well as the surrounding road network. Managing the network to best serve the demands that will occur due to growth is and must be the responsibility of VicRoads and PTV.

**Benefits to the community**
- The level of demand that the modelling demonstrates in the future networks does not take into account the local road network by the increased level of congestion.
- Whilst localised traffic management treatments are provided in the local road network to deter motorists, demand on these roads will increase. This will be a combination of traffic generated from new developments as well as frustrated motorists trying to avoid an even more congested environment.
- The Punt Road corridor functions to remove traffic from local areas and any upgrade will undoubtedly have boarder network benefits. Capacity improvements are likely to reduce the already apparent use of St Kilda Road and Chapel Street by motorists in an attempt to avoid the congestion along Punt Road and address ‘rat running’ through adjacent local streets.

**Benefits to the economy**
- High quality public transport will create more amenable, walkable and transit-oriented neighbourhoods where residents own fewer automobiles, drive less and rely more on alternative modes, reducing car trips on the Punt Road and the surrounding network.
- Ultimately, the level of congestion on Punt Road will have an impact on the growth and development of the economy, with people unable to adequately access their places of employment.
6.1 Conclusions

On the basis of the information set out within this report I provide the following conclusions in relation to retaining, removing or modifying the PAO:

i  Maintaining the PAO allows for a range of future interventions to accommodate demand growth in a strategically important part of the network. It is consistent with the principles and intention of the Transport Integration Act and I support its retention.

ii Removing the PAO means permanently losing the ability to deal adequately with future growth, or at the very least burdens the community with significantly higher costs and/or lower amenity outcomes through elevated structures or submerged options (i.e. tunnels). This approach cannot be supported from a policy perspective against the TIA framework and nor do I support it.

iii There is no case presented for modifying the PAO at this point in time. However, given the nature of the PAO and potential options, any modifications are likely to be minor in nature and only able to be confirmed after an ultimate treatment is agreed. I do not support modification of the PAO based on the information available to myself.

I note that I have not investigated in great detail as to whether or not the PAO could be modified which is due to the fact that the options are preliminary in nature and would require more detail and documentation prior to finalising on an exact layout and alignment.
7. Summary of Opinion

7.1 Summary of Opinion

On the basis of the information set out within this report, I am confident that retention of the PAO provides the greatest opportunity to implement improvement works for all modes and meet the future needs of the continually growing population and economy. This includes the opportunity to provide high levels of public transport, pedestrian and cyclists' facilities, and improvements to the traffic network for private vehicles and freight.

Declaration

I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance that I regard as relevant have, to my knowledge, been withheld from the tribunal.

Reece Humphreys
Director
02/02/16
Appendix A

Reece Humphreys- Curriculum Vitae
Reece Humphreys
Director

Reece has a Bachelor of Engineering degree and over fourteen years' experience spanning transport modelling, major event planning, traffic engineering design, land use development and traffic and parking impact assessments. This experience covers a mixture of tasks ranging from transport and microsimulation modelling of large scale projects in Melbourne and Sydney to transport planning, engineering analysis, and advice on projects around Australia.

Reece has active roles in industry organisations; being a member of the AITPM Vic Committee, and sitting on the National Council of Transport Modellers Network. He has completed a number of projects for VicRoads and the NSW RMS (formerly RTA) including a series of large regional transport and microsimulation models, strategic corridor modelling, SCATSIM modelling and independent model auditing. Reece has also recently assisted with planning approval for a number of high profile rezoning and development applications for large retail and residential uses in Melbourne.

In 2012 Reece was a finalist for the Engineers Australia Young Engineer of the Year Award, and he is a national committee member for the AITPM Modelling User Group.

Office
Melbourne

Qualifications
BEng (Civil)

Memberships and Affiliations
AITPM
MIEAust Member

Industry Roles
AITPM Committee Member (VIC)
AITPM National Council Transport Modellers Network (TMN)

Project Experience

Transport Modelling
Review of F3-M2 Corridor (NSW-RMS)
Interchange Analysis for East-West Link (VicRoads)
Development of a four-step integrated model of Albury and its surrounds (NSW-RMS)
Transport Modelling for numerous PSPs in the growth areas (Metropolitan Planning Authority)
Paramics Modelling for pinch point corridors (NSW RMS)
Webb Dock Redevelopment (Port of Melbourne Corporation)
SCATS – Sim Paramics Modelling (NSW RMS)
Tamworth Traffic Study (NSW RMS)
Grafton Bridge Traffic Study (NSW RMS)

Transport Planning
Chandler Highway Planning Study (VicRoads)
Central Coburg 2020 Vision Simulation Modelling Station Pier Traffic Management Input and Operations Advice
Coode Road Closure Strategy for the Port of Melbourne
Transport Planning for Essendon Fields and Essendon Airport

Traffic Engineering
Victorian Comprehensive Cancer Centre (Grocon/PCL)
Harvey Norman/IKEA, Springvale (Harvey Norman)
Nelson Place Village (Evolve Developments)
Freshwater Place (Australand)

Expert Evidence
Amendment C130 - Epping Central (City of Whittlesea)
Amendment C149 – Ballarat Road, Sunshine (Onesteel Pty Ltd)
DTF Gateway 2 Review, East West Link Enabling (DTPL/VicRoads)
602-630 Doncaster Road, VCAT (Westfield Pty Ltd)
Summerhill Road, Templestowe (Applicant)
Harvest Home Road, Wollert (Asset1 Pty Ltd)

Professional Background

2004 – Present: GTA Consultants
In his capacity as Director and National Modelling Manager Reece has developed proficiency with a number of software packages, principally VISSIM, AIMSUN and VITM, and has recently been involved in detailed SCATSIM Modelling.

He currently provides technical advice on a number of large land use development projects in Metropolitan Melbourne and across Australia.

2002 – 2004: Hyder Consulting
Reece produced several microsimulation models under Hyders employment, including the Dandenong Town Centre Model for the Department of Infrastructure and the West Gosford traffic model for the NSW RTA. Reece also provided traffic and transportation advice in the development of the Highpoint Shopping Centre and prepared and investigative report for VicRoads into intelligent transportation systems for pedestrians with disabilities.

2000 – 2002: Moorabool Shire Council
As a design engineer, Reece was involved in assisting the Assets Service Unit objectives by the accurate and competent performance of surveying, design, plan preparation, contract specifications, building maintenance, asset management, drafting and other duties.
Appendix B

City of Stonnington Public Transport Map
Melbourne
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