CITY OF
PORT PHILLIP

Melbourne Metro Rail Project Environment Effects Statement
Joint Inquiry and Advisory Committee
Council Presentation by
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7 September 2016

Madam Chair, Inquiry Members, thank you for the opportunity to present to the Inquiry.

The City of Port Phillip is very pleased the Victorian Government is committed to the delivery of the Melbourne Metro Rail Project, which, although it will have significant impacts during construction, will greatly influence and contribute to the future liveability of our city.

I have structured my presentation into 3 parts:

- A brief overview of our City, growth and transport choices
- An update on matters that have been agreed since our submission
- Key points where Council is of the view that more work needs to be done

Part 1: Overview

The City of Port Phillip is a Growth Council and the 2nd smallest municipality in Victoria of 20.6 square kilometres – a high density place with a diverse community.

With our population forecast to double to around 200,000 residents by 2050, along with significant growth in jobs and visitors, we are already experiencing rapid development activity, giving rise to significant amenity concerns, parking pressures and increased demand and visitation to our public spaces and places.

As well as experiencing rapid growth across the entire municipality, redevelopment of the Fishermans Bend Urban Renewal Area is a key focus for growth, both now and over the next 30 years.

Council seeks to provide a wide range of safe travel choices for our community to ensure the City of Port Phillip will continue to be an engaged, vibrant, resilient and healthy city to live, work and visit.

Council's vision is:

'for a connected and liveable city where residents, visitors and workers can live and travel car free by improving the convenience, safety, accessibility and range of travel choices across our City.'

Rapid population growth comes with a demand for services – core city public infrastructure, including community facilities, libraries, child care, aged care services, parks, affordable housing and transport.

Transport is catalytic city infrastructure. Experience has shown that with the commitment and delivery of new or upgraded transport connections, adjacent land use changes to a higher value.

As a high density inner metro Council we need to improve the range, convenience and safety to walk, ride a bike or catch public transport, or we can expect greater traffic and public transport congestion at peak times across the day and week, together with increasing demands for the limited supply of on-street parking. We are currently developed an Integrated Transport Strategy to understand and respond to this challenge.

Council's priority is on the parts of the transport network and places that we control and can influence, with a focus on an integrated approach to investment in our places, villages and foreshore, travel behaviour change and infrastructure for bicycles and walking. We look to partner with the State and Federal Government to invest in state-significant walking, bicycle and public transport infrastructure.

As our city grows, we welcome Metro Rail as a key project for improving the range, capacity and convenience of travel choices. Without this and other investments in our transport network we can expect greater traffic and public transport congestion at peak times across the day and week, together with increasing demands for the limited supply of on-street parking.

Part 2 – An update on matters that have agreed since our submission

You would be familiar with Council's submission to the Inquiry, which was endorsed by our Council in June this year. We are pleased to inform you that since this time, we have continued working with the Melbourne Metro Rail Authority (MMRA) to resolve a number of the issues and recommendations from our submission. I would like to take this opportunity to briefly note the cooperation and genuine engagement with Council that has been displayed by MMRA throughout the project to date.

We would be pleased to provide the Inquiry with a list of those recommendations from our Submission that we have resolved through consultation with MMRA as a separate document. We are currently working through this list to finalise it but expect it could be provided to you within a week.

In light of this, today is an opportunity to update you on those matters where we have not aligned our views, as well as to reinforce the importance of getting the legacy design right to ensure this project benefits our community for generations to come.

Part 3 – Key points where Council is of the view that more work needs to be done

There are 8 matters that I would like to draw to the attention of the Panel:

1. Trees
2. Domain Station Precinct – Design and Scope
3. South African Soldiers Memorial
4. Transport connections
5. Bicycle Parking
6. Construction Methodology
7. Chiller/Mechanical Plant
8. Planning

1 Trees

The first issue that I would like to touch upon is the impact of the project to trees in the precinct. The loss of trees as part of this project is of great concern to our community. **We consider the impact that has been assessed on the basis of the Reference Design (i.e. 223 trees lost in the precinct, across both City of Melbourne and Port Phillip) is unacceptable**. Notwithstanding that this is a conservative assessment, we have been assured that it is unlikely that this number will actually be lost. We note that a number of the elm trees in the Albert Road Reserve are likely to date from the late nineteenth century, and are still healthy and viable.

Given the ongoing detailed design and planning work that MMRA is undertaking to reduce the number of trees impacted in the precinct – and this is very welcome – we would like the Inquiry to fully consider more up to date information in assessing the tree removals as part of the project. In particular, we note that recent work by MMRA indicates that the culturally significant Windsor Oak and the majority of the mature elms on the North West side of Albert Road Reserve may be able to be retained. We fully support this, and question whether, in light of this more detailed information, if the extent of trees assessed for removal through this Inquiry process can be consequently reduced. This will remove a level of ambiguity about an acceptable level of tree loss as the project proceeds to procurement and a contractor is appointed.

We are generally in agreement with MMRA on the strategy for reinstating trees in the precinct, notwithstanding some technical and contractual details still to be worked through. It is important to note that we agree every effort should be made to replant trees as early as possible, and subject to appropriate specialist arborist advice, that advanced and super-advanced stock should be used to minimise the period of time during which the precinct is without canopy cover. Within the context of this project, I think we can agree that it is not appropriate to economise on any aspect of tree reinstatement, given the relatively trivial sums of money involved in getting it right, compared to the overall budget.

2 Domain Station Precinct – Design & Scope

While Council acknowledges the benefits of the project in the legacy state, it's very clear there will be a significant impact on residents, businesses and visitors of Domain precinct, particularly during construction, but also for an extended period while trees develop to maturity. The impacts will include congestion, access restrictions, dust and noise, construction hoardings and truck traffic, and loss of publicly accessible open space and amenity. These are impacts that will be borne by our community and local businesses over an extended timeframe.

The Domain precinct presents a unique and transformational opportunity to deliver a new community-led vibrant and activated public space for our city.

In a highly dense city, our public space is the 'living lounge rooms' of our centre, places for people where our community connect and spend time together. Public space is much more than the space between buildings.

In the City of Port Phillip our public space is our most prized asset, the jewels of our city. We talk about trees as the lungs of our city, and but **we should also talk about public spaces as the hearts of our community – our meeting places, our gathering places.**

When thinking about redevelopment of any our public spaces, we put people at the top of the hierarchy, with the movement of people a key part of understanding how places and spaces work. The 'place and movement' approach.

The challenges we face as a city are great and fundamental to planning and delivering place outcomes is 'how we work together'. The Acland Street Upgrade project is a leading example of how the State Government (Public Transport Victoria and Yarra Trams) and Council can work together in a collaborative partnership to showcase the planning, design and delivery of a new integrated community-led public place which also has the highest quality safe and fully accessible public transport service embedded into its design. **This project will deliver more to our community that any single agency could have achieved by itself.**

Council has the same, if not higher, expectations for the planning and delivery of a new integrated community-led public place in the Domain precinct, in which a new metro station is embedded into the precinct design.

The design and extent of the returned works in the Domain precinct is of central importance to Council, and is an area where we do not yet have adequate certainty on the extent and scope of what the contractor will deliver. The Urban Design Strategy and EPRs provide a good starting point for the process (including engagement with Council). However we hold a real concern that opportunities to create a broader station precinct befitting the importance of the project will be lost. We do not yet have a clear idea that the extent of works or available budget will be sufficient to deliver what is needed in the wider precinct.

Council has undertaken wider precinct planning for the St Kilda Rd North area and consider there is a significant opportunity to deliver greater landscape amenity for this densifying precinct by more comprehensively re-imagining and redesigning Albert Rd Reserve and Albert Rd to Kings Way.

Currently this is beyond the scope of the proposed Domain Station – however **this is the opportunity to create a long lasting place legacy for our community, a city-shaping outcome with significant amenity uplift as a result of the project.**

Council believes the opportunities are to:

- Extend the project scope to Kings Way to create a high quality public realm precinct anchored by the station and South African Soldiers Memorial with improved links to the Shrine and Albert Park
- Enhance the sight lines and the prominence of the memorial
- Deliver a high quality design for station entrances and integrated tram infrastructure that complements the precinct and does not detract from the amenity as well as the heritage character of St Kilda Road and the memorial
- Deliver improved bicycle and pedestrian connections between Albert Park and St Kilda Rd, and beyond
- Integrate new tree canopy with the existing St Kilda Rd boulevard
- Reconfigure existing road space & potential realignment of Kings Way intersection to improve motor vehicle, pedestrian and bicycle flow

Council believes extensive engagement with the community is critical, and encourages MMRA to ensure it and the preferred proponents form a collaborative partnership with the City of Port Phillip to engage early and often throughout the project with local residents, workers and visitors to the precinct.

3 South African Soldiers Memorial

The South African Soldiers Memorial is a key landmark on St Kilda Rd. Council has recently commissioned a Conservation Management Plan for the Memorial, which notes that 'The site was regarded favourably because it was on a busy thoroughfare, with the Unveiling Ceremony pamphlet noting in 1924 that:

'scores of thousands of citizens daily pass this site'. The site was also in close proximity to Victoria Barracks and directly opposite the Domain. The functions of both these places were elevated to national importance between 1901 and 1927 when Melbourne, as the seat of Federal Parliament, was the interim capital city of the newly federated Australian nation'.

Council is the custodian of the South African Soldiers Memorial. As such we are responsible for ensuring the integrity and prominence of the memorial is preserved through the design and development of the Metro Rail project, which will require the memorial to be dismantled, stored and reinstated. Council acknowledges the significance of the memorial to a number of groups, including the descendants of those who fought in South Africa, as a significant part of Australia's wider military heritage, and as an important landmark and monument for those who identify with the Domain Precinct.

Council would like to specifically acknowledge the range of views on the most appropriate location for the memorial following the development of the Metro Rail project. Council has considered these views in forming its view that the significance of the memorial is best served if it is retained at its current location, or very close to it, in the legacy design. The visual prominence and physical connection of the memorial to St Kilda Road are critical aspects of its significance. Maintaining this connection will require further design work to be undertaken on the station entries and how they relate to the memorial. The current reference design is not supported by any of the parties, as already been noted to this Inquiry. The significance of the memorial and the provision of appropriate contemplative spaces further reinforces the need for meaningful community engagement to be undertaken on the configuration and programming of this space.

Finally, given that the memorial will likely be in storage for a number of years, we support the inclusion of appropriate interpretive material during construction, so the significance of the space is not forgotten. Early reinstatement of the memorial, along with a useable public space, is preferable but should be balanced against any risk of damage to the memorial due to ongoing construction works.

4 Transport Connections

As noted earlier, Port Phillip is a growth council, and we expect the delivery of the Metro Rail project will be a key enabler of more sustainable growth, and will impact positively on the city's liveability by providing people with improved travel choices, and access to a wider range of quality jobs, services and recreation.

It is therefore vitally important the project is supported by appropriate transport connections, both during construction as well as in the legacy state.

Council supports the proposed reduction of St Kilda Rd to a single traffic lane, tram lanes and bicycle lanes during main construction stages. We understand this is likely to be the most expedient and appropriate configuration regardless of whether a 'cut and cover' or 'cavern' style construction methodology is chosen (more on this later). We accept the advice of MMRA that this will have significant program benefits compared to retaining two traffic lanes during construction, and we

agree that the transport network impacts, while significant, can generally be appropriately managed through the Travel Demand Management (TDM) actions proposed by MMRA.

We support the overall rationale of the TDM Strategy which relies on the 'four Rs' – re-routing travel, re-moding trips, re-timing trips to outside peak hour, and reducing the need for travel overall. However, given the very limited capacity for additional vehicle traffic on alternative routes during peak times (e.g. Kings Way and Punt Road), **we support a greater priority be given to re-moding trips to more sustainable or efficient forms of transport.**

As such, our Council strongly supports the early delivery of the Park Street Tram Link (which MMRA has committed to deliver as part of the project, but not as early works), in order to improve travel choices and support mode shift, increase network resilience, and boost capacity to the western part of the CBD in the short term. We have not seen evidence that the delivery of this project would have an unacceptable impact on Kings Way, and consider the benefits of providing additional tram connectivity and capacity through South Melbourne and the west of the CBD will have a greater contribution to the execution of the TDM strategy than the marginal gains to vehicle capacity on Kings Way.

Apart from providing additional tram network capacity and connectivity, there is a key opportunity to improve travel options by bicycle during construction. There are a number of exciting bike network improvements currently in the planning stage, which together have the potential to start to create a continuous, safe network that could enable a much wider take up of cycling as a mode of choice for short trips, and allow people to avoid the likely increased congestion that will arise due to the works on St Kilda Road.

The City of Port Phillip is a city of short trips' with 50% of all trips in the city less than 2kms, and 70% of all trips less than 5km. All of these trips could easily be made on a bicycle if a network of safe protected bike lanes is provided.

We note the ongoing work with MMRA to scope a range of Network Enhancement Projects to assist with the TDM Strategy, including bike facilities on Moray Street, part of Dorcas Street, and the intersection of Kerferd and Canterbury Roads. We also want the St Kilda Road Safety Corridor Study progressed as a matter of urgency, which the Metro Rail project will need to integrate with. While some of these projects are relatively minor (with the exception of St Kilda Rd), they will have a big impact on the overall connectivity of the bike network and improved travel choices, and will provide a significant legacy benefit from the project.

The project presents a unique opportunity to provide a new focus at the Domain Precinct, and we expect the project will drive a range of longer term development across the broader precinct. In this regard, it is important that we plan now for the levels of activity and access the station will generate. The legacy configuration of St Kilda Road is a key opportunity to provide a public space that prioritises people first - pedestrians, bikes and of course public transport users over cars – which currently dominate the precinct. **The reduction of St Kilda Road to a single lane during construction clearly begs the question as to why it would be returned to a six lane cross section** – albeit with part time parking on the outer lanes. Council supports a four lane cross section in the legacy state, in order to provide priority for pedestrians including shorter crossing distances and the opportunity for wider footpaths (or improved landscaping). **This should be supported by the adoption of a full time 40km/h speed limit in the precinct,** which is particularly appropriate given the proximity of Melbourne Grammar School and MacRobertson High School, and high level of pedestrian traffic projected in the precinct.

The City of Port Phillip currently has 70% of all local roads with a 40 km/hr speed limit, with a target of 100% of all local roads by 2020. We are on-track to achieve the 100% goal.

In addition to this, we would encourage the project – and the State Government more broadly – to consider more fully the legacy opportunities for walking and bike network improvements to support the operation of Domain Station, to further fill in the gaps in the bike network. The delivery of key connections such as:

- the Dorcas Street link to the Fishermans Bend Urban Renewal Area; and
- the Albert Road / Kerferd Road link to the bay – Domain to the Bay

Both these links deserve further investigation for delivery to coincide with the opening of the Metro station. **These links are our future grand city boulevards for the next generation.**

5 Bicycle Parking

Melbourne is a great city – in fact the world's most liveable city

…and the proposal for 25 bicycle hoops at the Domain metro station is embarrassing.

This is clearly a policy gap at the state level.

We do note there is a difficulty in forecasting demand, and the lack of clear policy guidance in this area, but consider that Domain Station is extremely well placed to have a high bicycle mode share, due to its location on St Kilda Road as well as the future connections on Albert Road/Kerferd Road and Dorcas Street.

MMRA has undertaken a high level assessment of bicycle parking demand at existing stations. This notes that there is relatively little evidence of demand or existing standards / policy for the provision of bicycle parking at stations in CBD / central city locations.

The approach of predicting future demand to be low and then responding by providing a few bike hoops ('predict and provide') is not appropriate for Domain Station, where the quality of infrastructure is likely to be the main limiting factor to a wider take up of cycling. In this regard, provision of sufficient space or contingency to accommodate longer term demand is critical for Domain Station.

Apart from policy imperatives, there are a number of characteristics of Domain Station that mean it will be a desirable location for cyclists to access the rail network:

- It will be the closest or most convenient place to access the rail network for a large proportion of Port Phillip's population, particularly as further development and intensification occurs in South Melbourne and Port Melbourne (including Fishermans Bend).
- Fishermans Bend is planned to have a very high active travel mode share, and will be within a short cycling distance (less than 5 km) and may not have direct public transport links to Domain Station.
- Domain Station will be well integrated with Port Phillip's bicycle network, with high capacity, mainly separated and / or protected bike lanes including St Kilda Rd, Albert Rd, Kerferd Rd, Dorcas St and Park St. The majority of these facilities are likely to be in place and operational by the time the station opens in 2026.
- Domain Station will provide access to a wide range of employment and educational opportunities, including the CBD, Parkville and Monash National Innovation and

Employment Clusters, as well as Monash, RMIT, Melbourne and Victoria Universities. For many residents of Port Phillip, the station will be a highly attractive point to access the rail network.

At Domain Station, the main modes of access will be by foot, tram or cycling. While trams are expected to play a major role for access from the wider catchment, they are likely to be operating at capacity. In addition there will be many Domain Station users for whom bicycle is the most convenient option.

Council has undertaken a high level analysis of bicycle mode share for a range of stations based on PTV 2013-14 entry data shows that for non-CBD stations that could be considered broadly comparable with Domain Station, cycle trips generally account for approximately 1-2% of those accessing the station, for example:

- South Yarra – 2.1%
- Richmond – 1.8%
- Footscray – 0.9%
- North Melbourne – 1.0%
- Caulfield – 0.8%

A proportion of people using bicycles to access stations will prefer take their bicycle on the train, however the provision of secure and easily accessible parking has the potential to capture large share of all people accessing the station by bike. Anecdotal evidence suggests that providing 'Parkiteer' cages has attracted latent demand for people wanting to cycle to stations and store their bike during the day.

Overall, cycling in the City of Port Phillip experienced a 22% increase on weekdays between 2012 and 2014 based on counts on key routes. While this rate of increase may not continue in the longer term, it suggests that by 2026 cycling will have a higher mode share. This is particularly likely for St Kilda Rd and the Port Phillip catchment due to the proposed implementation of protected bicycle lanes, which are likely to attract new people to ride a bike.

St Kilda Road is experiencing a 5.4% p.a. increase for cyclist volumes, and there is forecast to be a 'step change' (25% increase) once protected bike lanes are implemented.

Based on previous considerations, a conservative estimate of potential cycling mode share for Domain Station is in the order of 1 to 2% of patronage. However, it is likely to be higher in 2026 when the station opens given the background increase in cycling, as well as the provision of separated bike lanes accessing the station.

In 2026, we understand that week day patronage for Domain Station is estimated to be in excess of 40,000 entries. If it is conservatively assumed that 1% of patrons accessing the station would potentially wish to store their bike at the station, this equates to demand for in the order of 400 spaces. This is not a particularly scientific assessment, but we consider that it is represents a better approach than that undertaken by MMRA to date.

In recent years I was part of an Australian delegation, invited by the government of the Netherlands to study and better understand their bicycle culture and their approach to policy, planning and infrastructure over the past 40 years.

In the Netherlands their public space is highly valued. Their greatest issue today is the volume of bicycle parking cluttering their valuable public spaces and places.

In the city of Utrecht, I visited a recently opened underground bicycle parking facility for 2,500 bikes. And over the next 5 years, the City of Utrecht is building 12,000 undercover bicycle parks within the metro rail precinct.

10-30% of all rail station users in European Cities travel to the station by bicycle.

The Melbourne Metro Rail project is the opportunity for us to learn from others and plan for the future.

Great cities require great thinking.

We need to be futurists so that we plan for and build in opportunities for the future.

In the long term, it is feasible that up to 5% (or more) of station users could access Domain Station by bike. This would equate to over 2,000 bike parking spaces being required. Innovative storage solutions with potential for adaption or expansion should be planned for as part of the station precinct design, to avoid ad hoc or piecemeal expansion in future. **A parkiteer will not do**. This is an opportunity for the State to demonstrate commitment to improving transport choice by providing for the interchange between cycling and the metro through provision of high quality facilities.

We strongly encourage MMRA to take a strategic view of this important aspect of station design and properly account for future bicycle mode share, **with 400 undercover secure bicycle parking spaces open on Day 1, and with provision for an expansion to at least 2,00 bicycle spaces.**

6 Cosntruction Methodology

We note there has been some interest by members of our community, and in the media, regarding the potential for a 'cavern' style construction methodology to be adopted at Domain Station, rather than the proposed 'cut and cover' method.

We note that MMRA has recently presented to our Council on this matter, and we are satisfied on the basis of the evidence presented that on balance, a cut and cover approach is the best solution. While we are not technical experts in this regard, we understand that a cavern approach would result in more spoil being removed (and therefore more truck traffic), longer construction timeframe, similar surface impacts (noting a minor reduction in the number of trees lost), and perhaps most significantly a worse customer experience in the legacy state as passengers would need to travel much further underground to access the trains.

Council does hold concerns regarding the construction of the diaphragm walls for the station box and access shafts. While we understand that this will be required to an extent regardless of the methodology adopted (as they will be required in any case for construction and TBM launch shafts), the duration of these very noisy works is a key concern. We share a number of concerns with the City of Melbourne in this regard, and given the large number of elevated dwellings in the Domain precinct that will look directly down into the work site, this will require a comprehensive response from MMRA and the contractor, including a range of physical mitigation, respite and relocation where required, and of course ongoing transparent communication with all parties who are affected.

We remain open to further analysis on this issue and simply note that any changes to construction methodology that reduce the overall impact on the community and people travelling through the precinct would be looked at favourably.

7 Chiller / Mechanical Plant

The location of the large mechanical plant to serve the Domain Station continues to be vague and relies on the assumption by MMRA that it is simply acceptable to place it within the Albert Road median. This is an unacceptable outcome for Council.

As mentioned earlier our public places and spaces are our most prized assets in the municipality. **The public space is not a dumping ground for utilities like mechanical plant and infrastructure** that hasn't been appropriately accommodated in the early design and planning stages.

The size and scale of such a large structure has significant visual and amenity impacts that counter any positive benefits gained from a broader redesign of the precinct. Council strongly recommends co-location with an existing building or new development. These options have not been explored to our satisfaction.

The Metro project and subsequent tram interchange at Domain require the future installation of an electrical substation to support tram operations. Currently this is not identified as within the scope of the Metro project. While Council understands that this will be delivered post implementation of Domain Station by another authority, and hence MMRA is not responsible for that, Council believes that MMRA has a responsibility to lead the integrated planning regarding the future location and design of this substation.

This is to ensure that the public realm legacy around Domain Station is not negatively eroded by the cumulative impact of other service providers undertaking mechanical plant upgrades triggered by the Metro project. This integrated planning would provide greater certainty to the community and Council, for a less cluttered public realm as well as certainty to PTV/Yarra Trams that their needs can be accommodated.

8 Planning

I note that a new version of the Incorporated Document was tabled yesterday that we are yet to review. From an initial overview this morning we note that this new version addresses some of our concerns about changes/amendments to the Development Plans, but we need to consider the changes further to more fully understand if all our concerns have been addressed.

The EES and proposed planning scheme amendment provides the basis for project design and planning approvals. It is critical that sufficient accountability is included and that any changes over the life of the project are properly managed to ensure that community confidence is maintained. Council's submission recommends a number of clarifications and changes to the planning approach to ensure that community interests are safeguarded and the benefits of the project are not eroded over time.

In terms of the planning approach, as stated in our submission, Council supports the use of the Design and Development Overlay and Incorporated Document as the mechanisms to implement the project through the planning scheme.

Council acknowledges that while flexibility is required for the project to enable the MMRP to respond to changing circumstances over time, the planning approval process should also ensure that changes to the project and how they are assessed is clear and transparent for the community and provides an opportunity for community feedback.

We draw the Inquiry's attention to the two major planning issues highlighted in our submission:

- Process for managing change
- Creating certainty around the criteria used to assess changes to the project.

Process for managing change

Council notes that the plans for the MMRP are conceptual and the detailed designs are still being worked through.

Council values the thorough and collaborative process that has taken place in to date with the MMRA and other agencies and wishes to ensure it continues to be consulted and actively engaged in the detailed design phase.

The Incorporated Plan relies on Development Plans, Environmental Management Framework and Urban Design Strategy and/or Early Works Plan to resolve the details of the project.
Council notes that the Incorporated Document specifically requires consultation with Council and other agencies on the preparation of:

- Development Plans
- Environmental Management Framework.
- Urban Design Strategy.

However it does not provide the same opportunity for consultation on amendments to any of these documents. The concern for Council is that the Minister for Planning could approve amendments to the project and these documents (that could have potential environmental / urban design impacts for our community) without consultation with Council or any authority / agency.

Council considers that a major amendment to any of these elements should go through the same consultation process as its preparation as the impact could be significant.

As an option, Council suggests that an independent panel or forum could also be set up to assess major changes to the project. We note that Mr Smyth in his evidence for RMIT suggests the establishment of a Standing Advisory Committee.

Council also notes that other submitters (such as RMIT) have noted that the process excludes third parties from the planning approvals process. Mr Milner in his evidence on behalf of the MMRA has suggested an addition to the Incorporated Document which would require consultation on any Development Plans for 14 days.

While this concept has not been presented to our Councillors, officers support the idea as it will enable Council and the wider community to have a say on the development plan.

However we maintain our position that the incorporated document should provide for consultation on amendments to the project, plans and the criteria used to assess any changes to the project.

We also note that the EMF should include a mechanism to report back / monitor compliance with the requirements.

Creating certainty around the criteria used to assess changes to the project

A further aspect that would assist in creating further certainty, is ensuring that there is clarity in the Incorporated Document about how the project (and any changes to the project) will be assessed. The Incorporated Document outlines that the project needs to be assessed against:

- Environmental Performance Requirements (in 5.2 - Environmental Management Framework)
- Urban Design Strategy (in 5.3 - Urban Design Strategy).

The Incorporated Document includes a list of the titles of the EPRs but not the requirements themselves. Council considers that maintaining a current version of the EPRs on the Metro Melbourne website does not provide an adequate level of certainty for the community.

The performance requirements should be included in the Incorporated Document for transparency. Ideally the EPRs should be included as an appendix to the Incorporated Document to elevate their status and embed them as requirements (noting this approach was used in the East West Link Incorporated Document.) However, alternatively the Incorporated Document could reference a specific version of the EPRs (eg approved on specific date).

Council strongly supports the inclusion of the reference to the Urban Design Strategy and its equal prominence with the Environmental Management Framework. The Incorporated Document includes a condition that the project must be consistent with the Urban Design Strategy. However, it does not specify whether this is with the objectives, principles or guidelines. All three should be referenced. Or as noted above, the alternative could be to reference a specific version of the document.

Council appreciates that including the EPRs (or specific reference to a version and date) as well as the objectives and principles from the Urban Design Strategy, a planning scheme amendment would be required to amend the incorporated document should any changes be made to the EPRs or UDS. However this is not considered unreasonable especially if other changes to the project are being considered.

I don't wish to go into a great detail on other issues raised in our submission, however two issues which I believe have not been raised by other submitters include:

- Clarifying the requirements for Development Plans in the Incorporated Document
  - *Section 5.1 - Development plans* of the Incorporated Document requires Development Plans for above ground and underground components from the station entrances to the ticket gate. Development Plans must provide for a site layout plan, architectural, landscape and public realm plans and elevations as well as a response to the Urban Design Strategy.
  - However the Development Plan doesn't need to respond to other issues that are included in the EPRs such as traffic, heritage etc. The Incorporated Document should be expanded to include those matters required in any case through the EPRs, e.g. a Traffic Management Plan, Heritage Management Plan and Construction Management Plan.

- Pre-application process for the proposed Design and Development Overlay (DDO30)
    - In relation to the DDO, Council supports the use of a DDO, however we recommend the MMRA develop a clear pre-application process as the Design and Development Overlay (DDO) triggers a referral and does not include the actual parameters for sub-surface development.
    - It is recommended the Department establish a clear pre-application process to advise property owners on the potential impacts of the DDO on their property or development.
    - For example, before a property is purchased or developed, Melbourne Water offers the opportunity to submit plans for pre-development advice about development requirements. This enables property owners to be clear about the development potential / impacts on their site.

Conclusion

In conclusion, I'd like to thank the Inquiry for the opportunity to present today, and for your consideration of our submission.

We look forward to continuing to work constructively with MMRA in the delivery of this project, and trust that our submission has assisted the Inquiry in their consideration of the project.

CITY OF
PORT PHILLIP

Melbourne Metro Rail Project EES Inquiry / Advisory Committee

Updated Recommendations

September 2016

Not resolved **Subject to ongoing discussions (Note - awaiting written confirmation on some issues)**

#	Council Recommendation from Submission	Submission Reference	Updated Status
	Recommendations – Project Approvals		
1	Establish a clear pre-application process to advise property owners on the potential impacts of the Design and Development Overlay on their property or development.	5.1	Subject to ongoing discussion. MMRA verbally confirmed at a meeting (on 13 September 2016), they are preparing a Planning Practice Note and Technical Notes to assist applicants. Document is yet to be cited.
2	Clarify whether a retrospective planning permit is required where an existing approval has not yet been acted on and the proposal includes sub-surface works that would affect the Melbourne Metro.	5.1	Subject to ongoing discussion. At a meeting (dated 13 September 2016), MMRA verbally confirmed the DDO would not be retrospective.
3	Amend Clause 61.01 “Responsible Authority for administering and enforcing the Scheme” to clarify the physical and legal extent of the Metro Melbourne Project.	5.2	Not resolved
4	Provide guidance on land uses associated with the station eg cafes, newspaper stands and any other retail uses.	5.4	Not resolved Incorporated document provides for ‘retail uses’. MMRA in Technical Note 56 (dated 5 September 2016) clarifies that consultation would be undertaken on uses as part of the Development Plan consultation process. However no guidance is provided on the

#	Council Recommendation from Submission	Submission Reference	Updated Status
			scale / location of retail or that the retail use is ancillary to the station use.
5	Expand the requirements for Development Plans to include additional plans, such as Traffic Management Plans, Heritage Management Plans and Construction Management Plans.	5.5	Not resolved Technical Note 56 (dated 5 September 2016) clarifies that plans are required through EPRs. Council officers consider that the Incorporated Document should note this.
6	Require the inclusion of the Environmental Performance Requirements in an appendix to the Incorporated Document.	5.6	Not resolved.
7	Require that "Use and development for the project must be carried out generally in accordance with the Objectives and Principles of the endorsed Urban Design Strategy."	5.6	Resolved. Revised Incorporated Document (provided with Technical Note 56 dated 5 September 2016) addressed this issue.
8	Include the principles and objectives from the Urban Design Strategy in an appendix to the Incorporated Document for transparency.	5.6	Not resolved.
9	Amend the wording in 5.1 Development Plans to read: *An approved Development Plan may be prepared and approved in stages and may be amended from time to time to the satisfaction of the Minister for Planning (or delegate) following consultation with the Office of the Victorian Government Architect, relevant Council/s and where relevant, the Roads Corporation, Melbourne Water and Heritage Victoria.*	5.7	Not resolved Revised Incorporated Document (provided with Technical Note 56 dated 5 September) partially addresses this issue. However it does not define what a 'material amendment' entails.
10	Amend the wording in 5.2 Environmental Management Framework and 5.3 Urban Design Strategy in line with Recommendation 9 to require consultation on major / significant amendments.	5.7	Not resolved.

#	Council Recommendation from Submission	Submission Reference	Updated Status
11	Directly involve relevant statutory authorities in monitoring compliance with EPRs and other relevant standards and guidelines during construction.	5.8	Resolved
12	Commit to regular public reporting on compliance with EPRs and other relevant standards.	5.8	Not resolved It is expected that reporting on key measures of compliance would be undertaken in a timely and transparent way to meet community needs and expectations – this is likely to go beyond the requirements of 23.8.2
	Mitigating the impacts of construction on the Port Phillip community and business		
13	Further explore the 'cavern' construction method so that the relative benefits and costs / impacts can be assessed against the 'cut and cover' method.	6.3	Resolved
14	Prioritise the monitoring of water discharge during construction and devise strategies to prevent ground water from being discharged into the stormwater system.	6.4	Resolved
15	Provide further information about the planned discharge from the water treatment plant and proposed standards for recycling water during construction.	6.4	Not resolved
16	Provide information regarding the expected daily use of water and the source (potable/ recycled) during construction. Develop a detailed plan to demonstrate best practice in the reduction of potable water consumption.	6.4	Resolved
17	Clarify the responsibility for engineering requirements around the footings of the South African Soldiers Memorial and any maintenance subsequent to the reinstallation that may be required as a result of the relocation.	6.5	Subject to ongoing discussion Verbal discussions positive
18	Provide the City of Port Phillip with the authority to give final approval of the storage site for the South African Soldiers Memorial and provide access as needed, for conservation treatment or inspections of the memorial and fountain. Put in place contingency measures in case there is damage to the memorial/ fountain while in storage or	6.5	Subject to ongoing discussion Verbal discussions positive

#	Council Recommendation from Submission	Submission Reference	Updated Status
	reconstruction.		
19	During the removal and storage of the memorial, which may be for several years, MMRA should design and implement appropriate interpretive material in the precinct, and in particular on the site of the memorial, during construction to communicate the significance of the precinct and the memorial. This may include interpretive material on construction hoardings, interpretive panels and could even include a printed image of the memorial on a scaffold over its current location so that a continuity of presence is maintained. (this practice is common in Europe)	6.5	Not resolved. Outcomes are specific due to the complexity of this process, timeframe and community expectations in this precinct. Request that EPR is modified to include consultation with Council on this specific location. (could be in CH7) and to be specified in the PSTR.
20	Make every effort to plan and stage the construction activities to enable the early reinstatement of the memorial so long as this does not put the memorial at risk of damage. Any early reinstatement should allow for access to the memorial and should be accompanied with the return of some of the proposed open space.	6.5	Subject to ongoing discussion Verbal discussions positive
21	Develop clear processes, protocols and governance arrangements in consultation with Council to manage construction impacts in the precinct, including provision for temporary relocation of residents in certain circumstances.	6.6	Subject to ongoing discussion Verbal discussions positive
22	Deliver the Park Street Tram Link and bicycle network connections prior to main construction commencing at Domain, in order to improve travel choices and support the TDM Strategy for the project.	6.7	Not resolved. Council requires a written agreement stating the construction and delivery time
23	Resource the Transport Demand Management (TDM) strategy appropriately to ensure construction impacts on the transport network are well managed, and that TDM projects provide a lasting benefit of mode shift and better travel choices for the community.	6.7	Subject to ongoing discussion Verbal discussions positive
24	Ensure ongoing Council involvement in TDM strategy planning, monitoring and implementation throughout the construction period.	6.7	Subject to ongoing discussion Verbal discussions positive
25	Work with Council to proactively plan for and manage impacts to the transport network at key locations such as St Kilda Junction and Canterbury Road	6.7	Subject to ongoing discussion Verbal discussions positive
26	Maintain the St Kilda Rd cross section through the construction site with a bicycle lane of	6.7	Not resolved.

#	Council Recommendation from Submission	Submission Reference	Updated Status
	minimum width 1.5m plus buffer, one traffic lane and one tram lane in each direction. Maintain pedestrian access throughout the precinct at all times.		Request the PSTR to provide a minimum width for bicycle lanes. If deviation of bike lane onto footpath is required (e.g. to preserve trees) then a segregated path is required – any shared arrangement is considered by Council to be unacceptable.
27	Minimise closures of St Kilda Rd and access restrictions for pedestrians during construction. When closures or restrictions are unavoidable, ensure they are communicated well in advance to the widest possible audience as part of the Transport Demand Management strategy.	6.7	Resolved
28	Commit to delivering complementary bicycle network improvements on parallel routes to St Kilda Rd prior to main construction commencing (including Moray Street and improved connections through Southbank to the CBD).	6.7	Not resolved
29	Require that the successful contractor work with Council to resolve and minimise the overall construction footprint, in order to clarify and minimise car parking impacts in the precinct.	6.8	Not resolved T1 to be modified to include requirement that contractor work to minimise impact to car parking provision and public realm during various stages of construction, in consultation with Council
30	Provide further information relating to the specific targets and strategies for each category under the ISCA and Green Star rating tools.	6.9	Resolved
31	Aim for a zero net emissions target through a public tender process for renewable energy, along with proscribed targets for each potential source of emissions.	6.9	Not resolved
32	Ensure that the final approved plan and construction schedule retains as many trees as possible. Every effort should be made to retain all trees, but in particular the English	6.10	Subject to ongoing discussion Verbal discussions positive

#	Council Recommendation from Submission	Submission Reference	Updated Status
	Elms located on the Northern edge of the South African Soldiers Memorial, along Albert Street (PH057-PH068) are of great significance.		
33	Make every effort to retain the Windsor Oak or conserve it off site during construction. In the event that this is not possible, propagate replacement plantings.	6.10	Subject to ongoing discussion Verbal discussions positive
	Ensuring the Melbourne Metro provides a high quality city-shaping legacy		
34	Ensure that the final design and positioning of the South African Soldiers Memorial: • Retains the formal and visual prominence of the Memorial to St Kilda Road • Is visually prominent from Kings Way and Albert Road looking towards the Shrine • Provides ease of access from Albert Road and St Kilda Road • Provides a congregation area surrounding the Memorial that is DDA compliant • Is well integrated into the design of Domain Station	7.1	Not resolved First dot point to be updated to 'retain the formal, **physical** and visual prominence'. This section to be copied directly into the public realm brief and PSTR.
35	Return the Cockbill Fountain, Windsor Oak and plaques to the site post construction. In the event that the Windsor Oak is unable to be conserved, plant a new tree propagated from the original in its place.	7.1	Subject to ongoing discussion Verbal discussions positive
36	Include the following design guidelines in the Urban Design Strategy: • Enhance the pedestrian links from St Kilda Road to the Park Street Tram route. • Design the Park Street tram stop (at Wells Street) as a high quality public space that complements its setting and preserves views to the Shrine. • Within Albert Road Reserve, minimise the size and visual prominence of the station entrance so it does not detract from the South African War Memorial. • Ensure the design of the station entrance provides an appropriate setting for and minimises impacts on the South African War Memorial. • In Guideline 6, which currently focusses on the design and location of ventilation shafts, include a reference to the need for the careful design and location of the chiller plant and the Yarra Trams sub-station (see also Recommendations 42 and 43).	7.4	Not resolved Council preference is to co-locate mechanical chiller plant in a building.
37	Fully explore opportunities to integrate water harvesting as part of the project. Incorporate best practice water management and reuse into the project by contributing	7.5	Not resolved

#	Council Recommendation from Submission	Submission Reference	Updated Status
	to the Albert Park Lake Scheme that is currently being planned by Port Phillip and Melbourne Councils, and Parks Victoria.		
38	Treat runoff prior to it entering the stormwater system at strategic locations around the interchange.	7.5	Subject to ongoing discussion Verbal discussions positive
39	Design streetscape planting to take advantage of passive irrigation technologies including consideration of structural soils combined with kerb inlets. This will provide real benefits to trees with compromised soil volumes as a result of the station box and provide for positive legacy design outcomes.	7.5	Subject to ongoing discussion (expected to be resolved in PSTR)
40	Put in place strategies to ensure effective irrigation and water security to protect trees and minimise wastage.	7.6	Subject to ongoing discussion (expected to be resolved in PSTR)
41	Undertake the propagation of the Windsor Oak as a matter of priority to maintain the option of an appropriate replacement in the event that the original tree is unable to be saved.	7.6	Subject to ongoing discussion Verbal discussions positive
42	Continue to investigate a number of strategic bicycle routes (including the St Kilda Rd Safety Corridor Project), in partnership with the City of Port Phillip and VicRoads, to ensure that these integrate with the new station in terms of timing and physical infrastructure.	7.7	Not resolved
43	Provide an initial allocation of approximately 200 bicycle parking spaces (half secure and sheltered, half short term hoops). Design bicycle parking so it can be expanded in future as demand grows.	7.7	Not resolved. Recommendation updated as per Council presentation to Inquiry panel on 07/09/16
44	Resolve an alternative location and / or treatment for the mechanical chiller plant such as co-location with an existing building or new development, or underground	7.8	Not resolved
45	Resolve location and design of the new Yarra Trams substation in consultation with Councils and other affected parties.	7.9	Not resolved
46	Provide for legacy transport network outcomes in the construction of Domain Station including: • Introduction of safer speeds: 40km/h through the precinct is suitable given the high numbers of pedestrians (including school children), as well as bike riders	7.10	Not resolved

#	Council Recommendation from Submission	Submission Reference	Updated Status
	• Support for the 'two lane' cross section for St Kilda Rd. This cross section will allow for greater pedestrian amenity, safety and priority, with reduced crossing distances and more generous footpaths. Given that people will adapt to having one lane through the precinct during construction, returning two lanes as legacy is appropriate. • Protected bicycle lanes consistent with the St Kilda Rd Safety Corridor Project should be included (noting some flexibility is required as this project progresses, but a minimum 2.5m protected lane should be allowed for) • Minimising kerbs and other barriers to pedestrian movement throughout the precinct to create a seamless public realm where pedestrians and bike riders have priority • Converting on-street parking in the Precinct to other uses, commensurate with its new role as a major transport interchange (noting that some car parking will need to be retained to support local businesses)		
47	Clearly outline the ownership and management of above ground assets. Assign to relevant parties to allow for appropriate access, operation, maintenance and renewal upon the completion of Domain Station construction.	7.11	Subject to ongoing discussion
	Commitment to Legacy Projects		
48	Commitment to the following outcomes as part of the MMRP to ensure that the overall legacy outcome for the project supports the precinct and wider community in the best way: • Early delivery of the Park Street Tram Link, including provision for level access tram stops and signalisation of the Wells St / Park St intersection • An upgrade to the new Domain – Spencer St tram route (including Clarendon St) to provide tram priority and level access tram stops, given the much higher frequency and capacity tram connection that will be provided from Domain to the western part of the CBD • Delivery of supporting bicycle network projects to improve access to the precinct	8.1	Not resolved

#	Council Recommendation from Submission	Submission Reference	Updated Status
	such as the St Kilda Rd Safety Corridor Project, Albert Road / Kerferd Road and Dorcas Street • Delivery of a high standard, sheltered, secure bicycle facility as part of the station, with room to expand in future as demand grows • Delivery of improved public realm in the wider area, to take account of the full extents of the project (including Albert Road between St Kilda Road and Kings Way, Bowen Crescent, Kings Way and St Kilda Road).		

Port Phillip City Council

Separated Bike Lanes – St Kilda Road

Cost Benefit Analysis

Final Report

April 2014

Executive summary

Project context

St Kilda Road is one of the main access routes from the suburbs south of Melbourne to the CBD. The road provides a direct connection from residential and commercial areas, to the business hubs along St Kilda Road and in the city. The road also provides convenient access to social infrastructure (e.g. The Alfred Hospital, Albert Park and MSAC) and tourist attractions (e.g. Shrine of Remembrance), whilst connecting to major arterial roads such as Queens Road, Kings Way and the Princes Highway.

St Kilda Road is the busiest commuter bike route within the Port Phillip area. Between 2008 and 2012 there have been approximately 117 bike crashes along the route. As the number of vehicles and bike riders sharing the road has increased, so too has the number of crashes. The increase in collision rates and the increasing severity of collisions has prompted the consideration of measures to increase the safety and desirability of bike use on St Kilda Road.

Research into the effectiveness of separated bike lanes has been emphasised by studies undertaken internationally. Research from New York City, where kerbside bike lanes were introduced, recorded a 27% reduction in injuries to all street users after the first year of operation and a 29% increase in bike rider patronage[1]. The introduction of bike lanes in Copenhagen, Denmark, saw a marked increase in bike riders however the safety of bike riders actually declined in the locations in which the study was undertaken, despite an increase in perceived safety[2]. It is interesting to note that this was considered to be primarily due to incidents at intersections. This research highlights the importance of constructing simple and safe bike lane intersections, which would support the preference for Copenhagen style (one-way) bike lanes over two way bike lanes.

Forecast bike numbers

Future bike numbers have been forecast based on an assumed growth rate of 5.4% p.a. in 2015[3]. The growth rate decreases logarithmically to 2.6% p.a. from 2016 through until 2035. GHD considers that it is realistic to decrease the growth rate logarithmically as exponential or constant growth would likely overestimate bike volume growth over the 20 year period, due to capacity being reached within this period. This growth will be the result of systematic growth along bike routes that connect to St Kilda Road, as well as an increase in general bike numbers as people transition to active transport for health benefits, reduced operating costs and/ or convenience.

If Copenhagen style lanes are installed, GHD predicts a 25% increase in bike riding volumes along St Kilda Road in the first year after construction is completed. This is consistent with the increase in riders in New York City, where bike rider volumes increased by 29% in the first year after separated bike lanes were introduced.

GHD has assumed that the majority of potential mode shift towards bike riding will come from public transport patronage and pedestrians.

[1] ALTA Planning and Design (2010) A Guide to the Use of Kerbside Running Bike Lanes
[2] Jensen (2007) Bicycle Tracks and Lanes: A before and after study
[3] Based on cyclist volumes on St Kilda Road over the past decade

Impact on health benefits

GHD expects that an increase in bike rider volumes due to separated bike lanes would result in an increase in the health benefits attributable to active transport and bike riding, improving the wellbeing of those riders from within the community.

Impact on crash rates

St Kilda Road was the most frequent location for car doorings (an incident that occurs when a vehicle passenger opens the vehicle door into the path of a bike) in inner Melbourne over the period 2006 – 2010[4]. GHD expects that separated bike lanes will significantly reduce the incidence of side swipes and doorings; however acknowledges that there may be an increase in other crash types, such as those incurred at driveways or intersections. The crash rates experienced in the past have been applied to forecast traffic numbers to determine the number of crashes to be expected in the future.

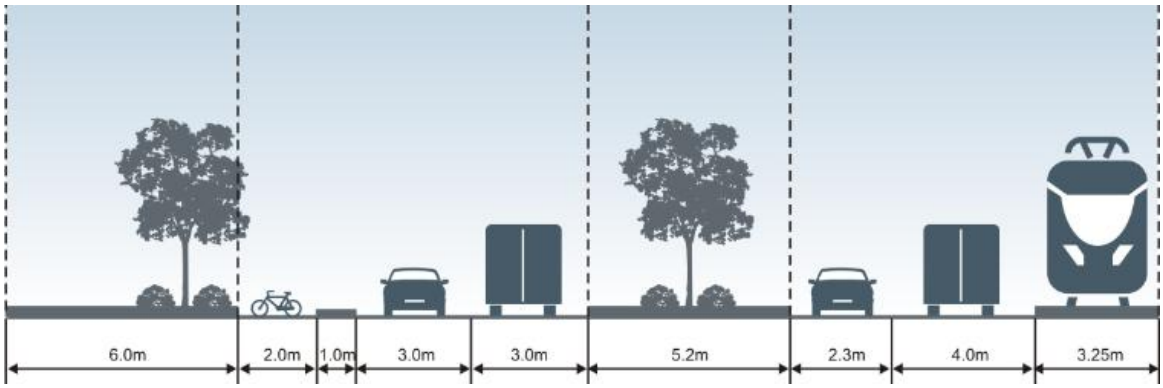
Infrastructure requirements

GHD has proposed a change to the current lane configuration along St Kilda Road in order to accommodate the Copenhagen style bike lanes.

The proposed lane configuration between Linlithgow Avenue and St Kilda Junction adds a 2 m Copenhagen style bike lane to the outer carriageway, as well as a 1 m wide raised concrete separator island. It is proposed that one traffic lane would alternate between an off peak parking lane and a traffic lane during peak periods. There would be no changes to infrastructure along the main carriageway.

Figure 1 illustrates GHD's proposed changes to the lane configuration along the majority of the route, between Linlithgow Avenue and St Kilda Junction.

Figure 1: Proposed lane configuration sketch – Linlithgow Avenue to St Kilda Junction



The proposed lane configuration between St Kilda Junction and Carlisle Street replaces the dedicated parking lane with the continuation of a 2 m Copenhagen style bike lane and a 1 m wide raised concrete separator island. One of the traffic lanes is converted to an alternating off peak parking lane, and a traffic lane during peak periods.

Capital and operational expenditure requirements

Cost estimates for proposed future infrastructure CAPEX assume:

- Construction of a 2 m wide bike lane running along 750 m (northern segment) and 4,540 m (southern segment) of St Kilda Road
- Bike lanes will be constructed in both the north bound and south bound service lanes

[4] *Bicycle Rider Collisions with Car Doors*, Road Safety Action Group Inner Melbourne, 13 July 2012

- The bike lane will be separated from traffic lanes by a 1 m concrete divider
- Construction will take place during the 2016/17 financial year.

GHD assumes that there are no separated bike lanes through any of the intersections and that there is no major reconfiguration of intersections required. Based on these assumptions, a CAPEX cost of $2,200,000 / km has been estimated. The estimated per km cost covers construction of lanes in both north and south bound directions.

It is assumed that the proposed infrastructure will require a fixed OPEX cost of $3,000 / lane km, as well as an additional variable OPEX rate of 0.2 % of the assumed CAPEX cost. This additional variable OPEX is assumed to cover the cost of repair and replacement of new signage, clearing of hazards and cleaning.

The total cost of construction is estimated to be $11,638,000, with operational expenditure in the vicinity of $39,146 per annum.

Benefit Cost Analysis modelling

A Benefit Cost Analysis (BCA) was undertaken, based on the assumptions and inputs outlined throughout this report. Details of the methodology and potential costs and benefits have been outlined in section 4. The potential costs and benefits include the following:

- Travel costs or savings
- Savings in crash costs
- Health benefits
- Environmental benefits
- Vehicle operating costs
- Construction costs
- Operational maintenance costs
- Foregone parking revenue.

The results of the BCA are outlined in Table 1.

Table 1: Summary of BCA results

	Demand level		
Sensitivity test	**Low – 15% growth in bike numbers**	**Medium – 25% growth in bike numbers**	**High – 29% growth in bike numbers**
Growth in bike numbers only	1.180	**1.134**	1.122
Crash costs increase by 10%	1.254	**1.191**	1.173
Health benefits ($) increase by 10%	1.225	**1.192**	1.182
CAPEX increases by 10%	1.119	**1.089**	1.080
Variable OPEX rate increases by 0.1%	1.174	**1.130**	1.117

As shown above, sensitivity testing has been undertaken at three levels of perceived future bike demand: high, medium and low. The medium demand level is the case that GHD believes to be most likely in terms of cost estimate, traffic forecast and growth in bike numbers.

The results demonstrate that the move to increase bike riding along St Kilda Road would have significant benefits compared to the base case, or if there was no increase in bike riding due to separated bike lanes. The resultant BCR greater than 1.0 in all instances reflects that there are net economic benefits over the appraisal period at all levels of perceived future bike demand, for each sensitivity test that has been undertaken. This is primarily due to the additional health benefits that are realised and the savings from reduced crash costs given more bike riders.

Further details regarding the results of the sensitivity testing are outlined in section 5.

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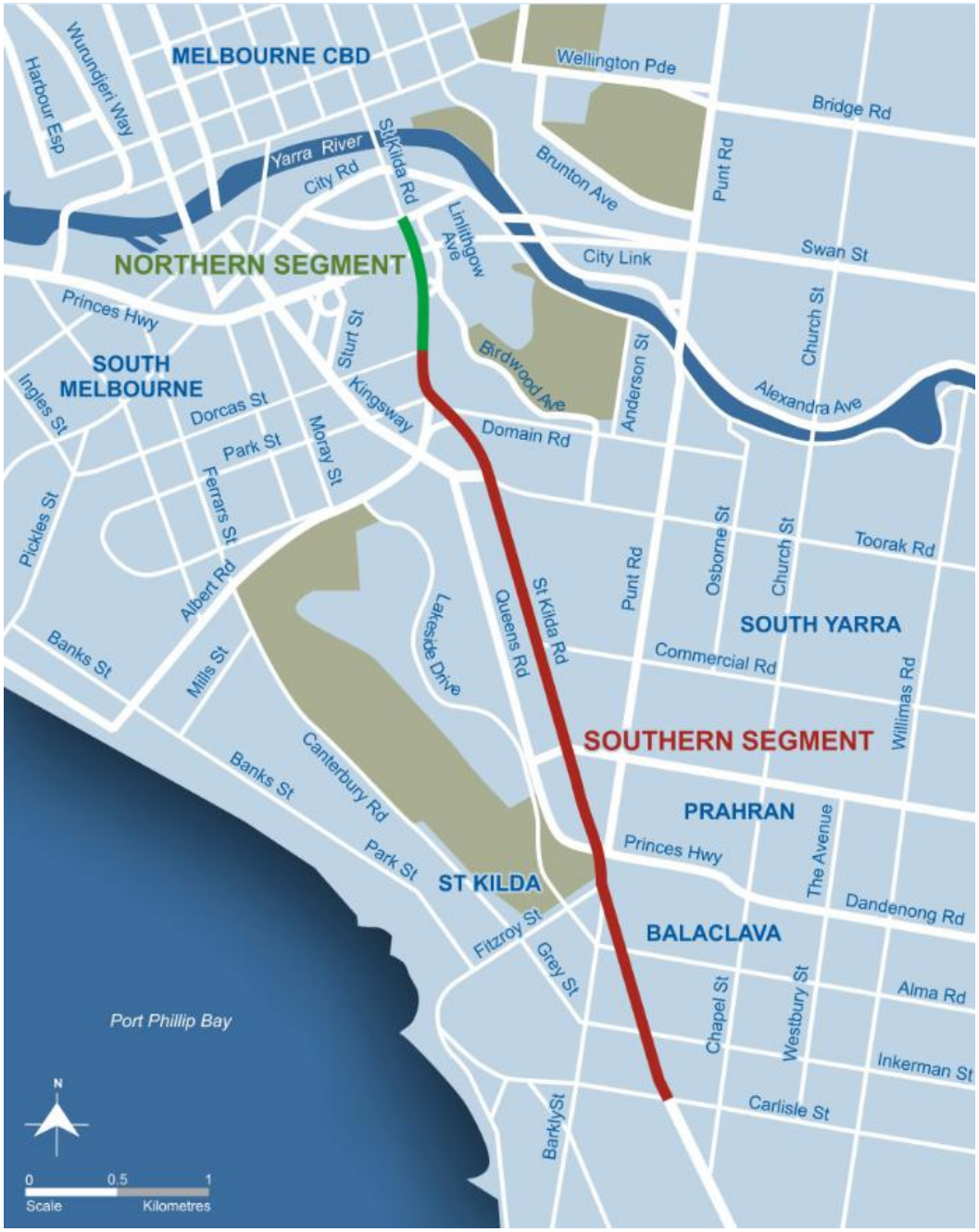
Appendices

1. Introduction and background

1.1 The challenge

St Kilda Road is one of the main access routes from the suburbs south of Melbourne to the CBD. The road provides a direct connection from residential and commercial areas, to the business hubs along St Kilda Road and in the city. The road also provides convenient access to social infrastructure (e.g. The Alfred Hospital, Albert Park and MSAC) and tourist attractions (e.g. Shrine of Remembrance), whilst connecting to major arterial roads such as Queens Road, Kings Way and the Princes Highway. Figure 2 identifies St Kilda Road and the two key segments; the northern segment (Linlithgow Avenue to Dorcas Street) and the southern segment (Dorcas Street to Carlisle Street).

Figure 2: St Kilda Road – northern and southern segments



Source: GHD, 2014

St Kilda Road is a popular bike route for cyclists travelling to and from the CBD given the direct access from numerous places of interest, and the provision of biking facilities such as a green bike lane along the outer lane on each the north and southbound sides of the road. However, the wide, multi-laned road carries significant volumes of traffic along the corridor, with a number of large intersections that break the continuity of the traffic. This results in a low level of bike rider comfort, in terms of both real and perceived safety for all ages and ability of bike rider, who must ride in close proximity to moving and parked vehicles.

St Kilda Road is the busiest commuter bike route within the Port Phillip area. Between 2008 and 2012 there have been approximately 117 bike crashes along the route. As the number of vehicles and bike riders sharing the road has increased, so too has the number of crashes. The increase in collision rates and the increasing severity of collisions has prompted the consideration of measures to increase the safety and desirability of bike use on St Kilda Road.

As the route is a declared road, it falls within the governance of the State Government. City of Port Phillip (Council) has identified that there is a need for improvement to the road, and in particular, the bike lane facilities, however has limited ability to influence and control the delivery of an improved bike route from the suburbs south of Melbourne to the CBD.

1.2 Strategic context

Council has committed to providing a connected and liveable City, where residents, visitors and workers can live and travel car free. In order to achieve this vision, Council plans to achieve reduced private vehicle travel by residents, and an increase in the number of residents that ride bikes[5].

Underpinning this vision is Council's target to reduce the community's Green House Gas (GHG) emissions from transport by 50% by 2020. In order to meet this commitment, Council has committed to helping the community to:

- Reduce private vehicle travel from 78% to 53%
- Increase travel by walking and bike riding from 9% to 20%
- Increase travel by catching public transport from 13% to 28%.[6]

Realistically, this means more local trips being made through active transport modes such as walking and bike riding, and longer trips being increasingly undertaken using public transport.

To deliver this increase in bike riders, Council has developed a bike plan, '*Pedal Power: Making Bike Riding Better 2011 – 2020*'. This plan emphasises the benefits of cycling; in economic terms (for every one dollar invested in bike riding there is a return of $3.88 in net economic benefits over the following 30 years)[7], environmental terms, and health terms.

The strategy looks to:

- Improve bike riding infrastructure (Goal One)
- Better integrate bike riding with public transport and walking networks (Goal Two)
- Instigate behavioural change in regards to bike riding (Goal Three)
- Build a bike riding culture (Goal Four)

In order to achieve these goals Council have developed 11 strategies. One of these strategies looks to 'Improve the network of on-road bike lanes'. The intention is to separate bikes from cars

[5] City of Port Phillip (2011) Sustainable Transport Strategy - A Connected and Liveable City
[6] City of Port Phillip (2011) Sustainable Transport Strategy - A Connected and Liveable City
[7] City of Port Philip (2011) Pedal Power: Making Bike Riding Better 2011 – 2020

to improve safety through projects such as installing formal bike lanes and installing physical separation treatments.

1.3 Separated bike lanes

Research into the effectiveness of separated bike lanes has been emphasised by studies undertaken internationally.

Research from New York City, where kerbside bike lanes were introduced, recorded a 27% reduction in injuries to all street users after the first year of operation and a 29% increase in bike rider patronage[8].

The introduction of bike lanes in Copenhagen, Denmark, saw a marked increase in bike riders however the safety of bike riders actually declined in the locations in which the study was undertaken, despite an increase in perceived safety[9]. It is interesting to note that this was considered to be primarily due to incidents at intersections. The author also noted that although an increase in incidents was seen, the bike lanes increase bike and decrease car use which contribute to other benefits such as more physical activity, less air pollution and less traffic noise. This research highlights the importance of constructing simple and safe bike lane intersections, which would then support the preference for Copenhagen style bike lanes over two way bike lanes.

Table 2 outlines the advantages of each one-way and two-way bike lanes, whilst Table 3 outlines the disadvantages of one-way and two-way bike lanes.

Table 2: Advantages

One – way (Copenhagen)	Two – way
Bike riders are riding where car drivers and other road users expect them to be – this reduces potential crash risks	Space saving – the buffer area is only needed on one side of the carriageway, saving at least 1 m in cross section
The riders are next to destinations on both sides of the road – no need to cross over when accessing destination alongside bike path	Cost saving – only one buffer has to be built on one side of the carriageway
Traditional on-road lanes can be transitioned to separated facilities by establishing the space on the right of the parked cars, moving the space kerbside and providing a buffer	The facility looks similar to a path and can look attractive to the 'maybe' rider who may be averse to non-traditional path styles
The separated facilities connect easily to on-road lanes	The two way on-road routes connect well to off-road paths – no requirement to cross over
	Only one side of the street is changed. This can reduce resistance to the change from bike riders, vehicle users (regarding parking) and the wider community

Source: Bicycle Network Victoria, French vs Danish Separated Lanes, accessed March 2014

[8] ALTA Planning and Design (2010) A Guide to the Use of Kerbside Running Bike Lanes
[9] Jensen (2007) Bicycle Tracks and Lanes: A before and after study

Table 3: Disadvantages

One – way (Copenhagen)	Two – way
The transition from off road paths requires riders to switch to the 'other' side of the road	The intersections can be higher risk as turning motor vehicles are not expecting the rider coming from the 'wrong' way
The space needed can be greater as two sides of the road need additional infrastructure	The transition from on-road lanes will require the riders to switch to the 'other' side of the road at the beginning or end of the facility
The construction cost is likely to be higher as two sides of the road require additional infrastructure	The riders can be on the 'wrong' side of the road when arriving at their destination
	The more crossovers or entryways along a block, the less this type of facility is appropriate

Source: Bicycle Network Victoria, French vs Danish Separated Lanes, accessed March 2014

Copenhagen style bike lanes (one-way bike lanes) appear to have a greater safety advantage, with riders:

- Being where other road users expect them to be – separated lanes with a buffer zone increase visibility of bikes for other road users and provide incentive for bike riders to use these designated paths
- Being closer to destinations – not having to cross over in front of other bike riders and traffic
- Having a safer transition to and from on-road bike lanes.

The key drawbacks are that Copenhagen bike routes have greater space requirements and attract higher construction costs.

A full analysis of the advantages and disadvantages of Copenhagen style bike paths has not been undertaken for the purpose of this report, however GHD consider these lanes to provide a higher degree of safety to bike riders, and make other road users more aware of bike traffic.

1.4 The project

The purpose of this project is to understand the benefits and costs of installing a Copenhagen style bike lane to create a physical separation between bikes and cars, as per *Strategy 1: Improve the network of on-road bike lanes*.

To understand the benefits and costs, GHD has undertaken high level analyses in order to:

- Assess future demand
- Derive an understanding of the site's infrastructure needs from a desktop and site review of current infrastructure
- Identify costs and benefits through economic appraisal.

The intention is for the report to be used as evidence during the funding request process with state and federal governments.

As identified in Figure 2, two segments of St Kilda Road have been defined as 'the study area' for the purpose of this report:

- Northern segment: Linlithgow Avenue to Dorcas Street

- Southern segment: Dorcas Street to Carlisle Street.

1.5 This report

This report documents the research and analysis undertaken to identify the benefits and costs of constructing a Copenhagen style bike lane on St Kilda Road. The report is set out at follows:

- Section 2: Demand analysis
- Section 3: Infrastructure needs
- Section 4: Economic appraisal
- Section 5: Results
- Section 6: Conclusions and recommendations.

2. Demand analysis

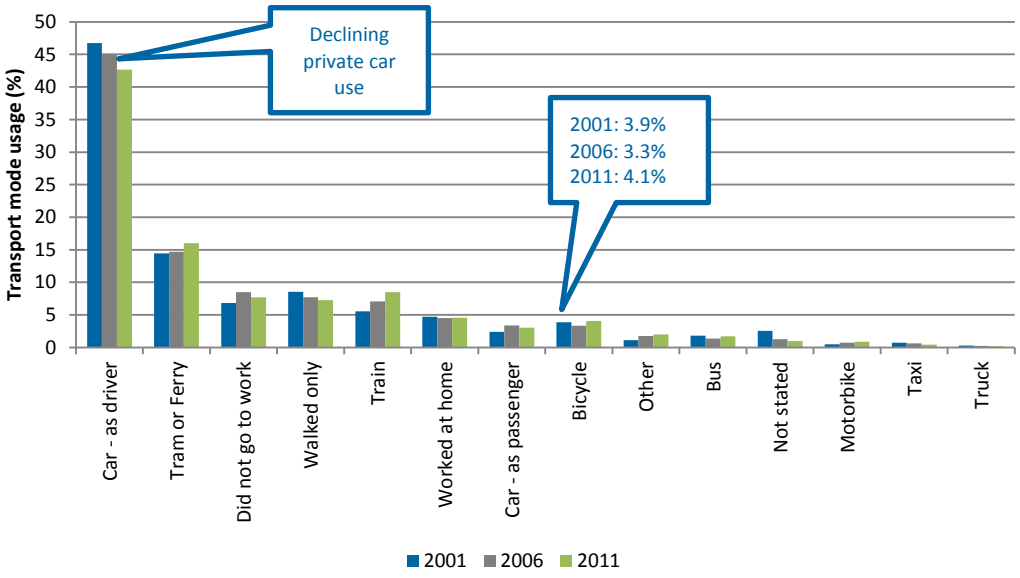
Estimating demand for future bike facilities can be difficult due to idiosyncrasies unique to cycling[10]. However, efforts can be made to understand historic demand and identify trends based on this, providing an indication as to what the demand profile may look like in the future.

This section looks at the overarching historical and current travel patterns and demand within the St Kilda Road area, as well as estimated future demand within the area.

2.1 Current travel patterns

Historical data from between 2001 and 2011 indicates that car travel by a single driver has decreased, while car travel for drivers with a passenger (car sharing) has increased. Patronage of public transport travel has also increased (Figure 3). Accessing work via bike has increased slightly since 2001, increasing from 3.9% to 4.1%.

Figure 3: City of Port Phillip – travel to work (2001 – 2011)



Source: City of Port Phillip, Method of trave to work, profile.id community profile, accessed March 2014

The bike plan '*Pedal Power: Making Bike Riding Better 2011 – 2020*' identifies that just over 5% of bike riders accessing the CBD originate from within the Council area. This indicates that journeys between the Council area and the CBD may be ideal for bikes due to the flat terrain and short distance. Should bike use continue to increase as per the historical trends identified in the figure above, bike riders as a percentage of total traffic will increase over time.

2.1.1 Current demand – bikes

Bike counts are undertaken annually to gain insight into the usage of bike infrastructure in and around the Melbourne CBD. They are undertaken by VicRoads and also by the Bicycle Network on 'Super Tuesday'. Super Tuesday survey data is comprised of the recorded bike volumes at six locations along St Kilda Road between 7 am and 9 am on a selected Tuesday in March. The Super Tuesday data has been compared with VicRoads data to validate the Super Tuesday counts and ensure that demand is not being over or under reported. A comparison of these volumes can be found in Table 4.

[10] AECOM (2010) Inner Sydney Regional Bicycle Network

Table 4: Comparison of VicRoads and Super Tuesday counts

Survey	Daily volume
VicRoads	1102
Super Tuesday – 2013	1108
Super Tuesday – 2014	1105

Source: Bicycle Network Super Tuesday data, 2013 and 2014; VicRoads counts, 2013.

Note: The VicRoads counter is located between Linlithgow Avenue and Domain Road on St Kilda Road – Super Tuesday figures have been calculated using an averaging approach as the Super Tuesday counters are not in the same location as the VicRoads counters.

Table 5 outlines the estimated annual number of bike trips made within the study area.

Table 5: Annual trips – bike (2014)

Road segment	Estimated number of trips (annual average)
St Kilda Road – north	1,219,000
St Kilda Road – south	659,900

Source: Estimate based on Super Tuesday counts and VicRoads data outlined in Table above.

Current annual bike trips (Table 5) have been estimated using Super Tuesday survey data. Although the VicRoads count is closely aligned to the Super Tuesday count in both 2013 and 2014, GHD has selected the Super Tuesday data source for further analysis, due to the greater number of data collection points located within the study area along St Kilda Road.

The Super Tuesday data has been converted to a weekday and weekend 24 hour volume by comparing and validating volumes recorded by a VicRoads bike loop counter on St Kilda Road. The survey data has also been seasonalised based upon average daily volumes per month as reported in the VicRoads Bicycle Data Report[11].

2.1.2 Current demand – traffic

Actual vehicle (defined as motorcycle, car, light commercial vehicle and heavy commercial vehicle) volumes on St Kilda Road within the study area were not provided for this study, however there are a number of comprehensive data sources, that with some manipulation and the application of reasonable assumptions, enabled GHD to estimate vehicle volumes along St Kilda Road. Table 6 outlines the estimated number of vehicle trips on each the northern and southern segments of the road.

Table 6: Annual trips – vehicles (2014)

Road segment	Estimated number of trips (annual average) [12]
St Kilda Road – northern segment	11,315,000
St Kilda Road – southern segment	15,063,405

[11] VicRoads Bicycle Data Report, 2005 – 2013

[12] Note there is no comprehensive data set available for vehicle volumes on St Kilda Road. All figures are estimates and have been derived from AADT estimates by VicRoads and validated using the St Kilda Road North Precinct Plan.

Source: VicRoads estimates and GHD analysis, 2014

VicRoads arterial roads traffic volumes[13] from 2002 to 2012 have been used to estimate the number of trips on the St Kilda Road segments. These traffic volumes have been escalated to 2014 volumes. As the VicRoads volumes are estimates, these estimates have been compared to traffic volumes provided in the St Kilda Road North Sustainable Transport Management Plan and the IMAP Through Traffic Study[14]. The 2014 estimated volumes are generally within plus or minus 10% of the actual surveyed sites.

2.1.3 Current demand – public transport (buses and trams)

Quantifying the current demand for public transport within the study area is challenging due to the lack of publicly available data. Using a combination of limited publicly available data from PTV, assumptions and GHD analysis, annual trips by road segment for tram and bus have been estimated. Table 7 outlines the estimated number of bus and tram trips along the study area.

Table 7: Annual trips – public transport (2014)

Road segment	Estimated number of bus trips (annual average)	Estimated number of tram trips (annual average)
St Kilda Road – north	993,000	16,308,000
St Kilda Road – south	241,000	19,673,000

Source: GHD analysis 2014.

In order for GHD to estimate current public transport demand for both bus and tram patronage, a number of assumptions have been made. These estimates have been calculated based on the following:

- Estimated peak hour tram/ bus volumes per service
- Estimated off-peak tram/ bus volumes per service
- Total number of services per weekday/ weekend.

GHD has used current bus and tram service time tables, correct as at 6 March 2014, to identify the number of daily services and the number of services expected within the morning (7.00 am to 9.00 am) and evening (4.30 pm to 6.30 pm) peak periods. An assumption has been made regarding the number of people that use trams and buses within the peak periods, based on average tram capacity for vehicles servicing the St Kilda Road routes. These usage assumptions have been applied to the peak period volumes to derive weekly and annual patronage. Consideration has been given to public transport vehicles that only travel through a proportion of the study area, and patronage has been amended accordingly.

2.2 Future travel patterns

This section outlines the assumptions and methodology that has been used to estimate the future travel patterns for each mode along St Kilda Road.

2.2.1 Future demand – bikes

Future bike numbers have been forecast based on an assumed growth rate of 5.4% p.a. in 2015[15]. The growth rate decreases logarithmically to 2.6% p.a. from 2016 through until 2035.

[13] VicRoads Traffic Volume Data for Victoria, February 2013
[14] IMAP Through Traffic Study (2013)
[15] Based on cyclist volumes on St Kilda Road over the past decade

GHD considers that it is realistic to decrease the growth rate logarithmically as exponential or constant growth would likely overestimate bike volume growth over the 20 year period, due to capacity being reached within this period. This growth will be the result of systematic growth along bike routes that connect to St Kilda Road, as well as an increase in general bike numbers as people transition to active transport for health benefits, reduced operating costs or convenience.

If Copenhagen style lanes are installed, GHD would predict a 25% increase in bike riding volumes along St Kilda Road in the first year after construction is completed. This is consistent with the increase in riders in New York City, where bike rider volumes increased by 29% in the first year after separated bike lanes were introduced. GHD considers that 29% is high and that 25% is a more reasonable assumption; however will test the 29% increase in sensitivity testing.

GHD has assumed that the majority of potential mode shift towards bike riding will come from public transport patronage and pedestrians. In particular, the additional bike riders are expected from:

- Bike riders changing from using an alternate route to using St Kilda Road, as the level of comfort is improved
- Public transport users that previously used public transport originating outside of the study area and travelling through the study area
- Bus and tram users on St Kilda Road
- Pedestrians along St Kilda Road.

Where there is a transfer of public transport users from bus and trams to bikes, it is assumed that the spare capacity is filled by other users across the network. These users are derived from public transport on other routes, and other modes (e.g. train), as well as car users.

The capacity created by transferring from car driving to bike riding is assumed to be filled with new cars, as drivers will shift to travelling closer to peak periods to utilise the capacity created from the mode shift. For example, a car that experienced congestion at a particular time of the day before the introduction of separated bike lanes may have chosen to travel outside the peak period. After the introduction of separated bike lanes, this car may choose to travel within the peak period, filling a space created by a car driver transferring to bike riding.

Ultimately there is a net decrease in the total vehicle km travelled; however without local data to support a mode shift, and the development of a strategic model, GHD is not able to quantify the net decline in total car and public transport patronage. The strategic model would take into account the wider network, including traffic volumes on arterial roads, public transport patronage originating and terminating outside of the study area, employment and population growth, and the impact of changes in capacity outside of the study area, as well as changes to bike infrastructure across the network. The development of a strategic model is outside the scope of this report.

The net result is a zero decline in car and public transport users (as spare capacity is filled), and an increase in bike riders.

2.2.2 Future demand – cars

Car use volumes have been assumed to grow at a constant rate of 1.0% p.a. The arterial roads forecasts show that there will be no growth in car travel over the long term and St Kilda Road traffic volumes are near capacity during peak periods; it is not expected that there will be any additional growth in car traffic volumes during the peak times. Instead, it is expected that car travel will increase over the shoulders of peak periods (peak spreading will occur). GHD

considers that a constant growth rate of 1.0% p.a. is reasonable; this is further supported by the assumption that there is no net shift from car travel to bike riding.

2.2.3 Future demand – public transport (buses and trams)

As previously outlined, the lack of publicly available data affects the accuracy of public transport patronage estimates; as a result, public transport patronage figures have been assumed to grow at historical rates of approximately 1.0% p.a.

Whilst the capacities of future trams are unknown, historical growth rates have been limited by tram capacity, as trams have been near or at capacity during peak hour periods. In the future, tram growth is assumed to occur outside the peak period (peak spreading).

2.3 Casualty statistics

Identifying the number of casualties within the project area is of greater use to the analysis than the number of crashes. The number of casualties rather than the number of crashes enables the 'per person' cost to society from crash incidents to be estimated. For example, a crash may occur where no injuries are incurred, or an incident may result in serious or fatal injuries to multiple road users.

2.3.1 Historical and current crash statistics

Table 8 identifies the annual average injury statistics for the five years between 2008 and 2012. Estimated statistics have also been included for 2014. It should be noted that these numbers have not been verified against any statistical data and have been provided for comparison purposes only.

Table 8: Annual crash statistics along study area, 2008 – 2012

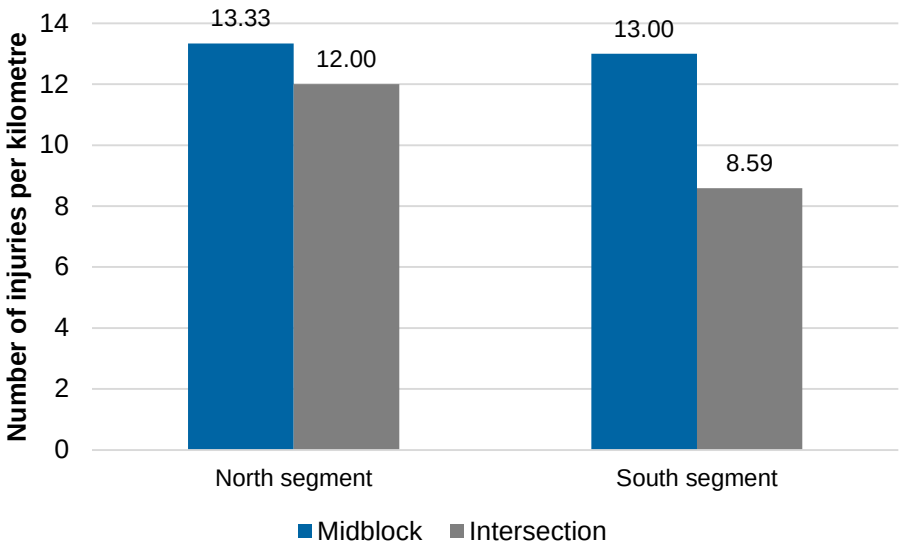
Injury type	Northern segment annual average (2008 – 12)	Southern segment annual average (2008 – 12)	Northern segment annual estimate (2014)	Southern segment annual estimate (2014)
Fatal	0	0	0	0
Hospitalised	0.6	5.2	1	5
Minor injury	3.2	14.4	3	14
Property damage only	0	0	0	0
Total	**3.8**	**19.6**	**4**	**19**

Source: VicRoads CrashStats Database, 2008 – 2012, GHD analysis, 2014.

Figure 4 shows that, historically, a larger proportion (59%) of crashes involving bikes have occurred midblock than have occurred at intersections. Further, the northern segment of the route has a higher rate of crashes (6.5 crashes per million km) than the southern segment of the route (4.2 crashes per million km)[16], likely to be due to the greater number of cyclists on the route, joining at a number of key arterial links.

[16] VicRoads CrashStats Database, 2008 – 2012

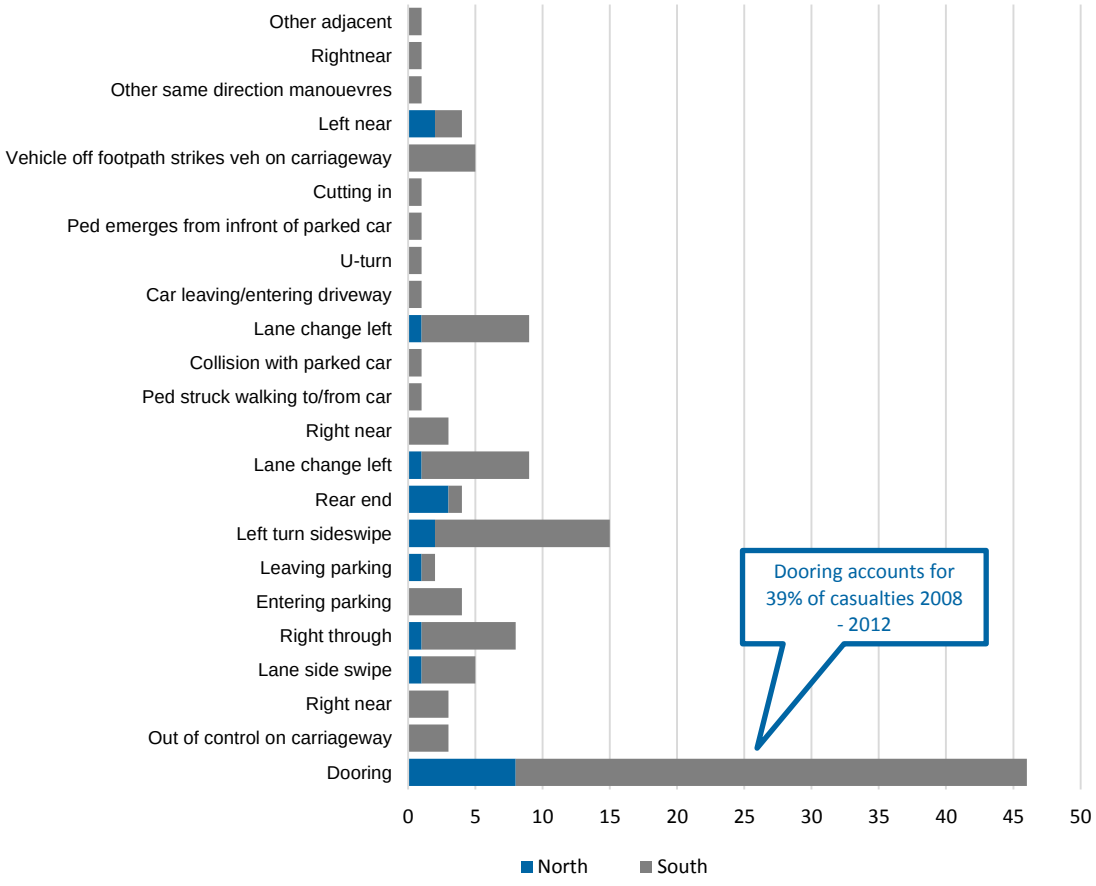
Figure 4: Crash location, 2008 – 2012



Source: VicRoads CrashStats Database, 2008 – 2012

Figure 5 shows that a significant proportion (39%) of injuries along the study area are caused by 'dooring', an incident that occurs when a vehicle passenger opens the vehicle door into the path of a bike, causing the bike to either crash with the vehicle door or swerve, resulting in a crash.

Figure 5: Cause of crash, 2008 – 2012



Source: VicRoads CrashStats Database, 2008 – 2012

St Kilda Road was the most frequent location for car doorings in inner Melbourne over the period 2006 – 2010[17]. As shown above, more recent statistics support that this is likely to still be the case. GHD expects that separated bike lanes would significantly reduce the incidence of side swipes and doorings; however acknowledges that there may be an increase in other crash types, such as those incurred at driveways or intersections. Data supporting a reduction in side swipe and dooring risk is still sparse given that separated bike lanes are relatively new phenomena worldwide.

It should be noted that a number of upgrades have been undertaken along the study area within the last 12 months. The effect of these infrastructure upgrades are unlikely to be captured in the data discussed within this study, as the benefits are likely to manifest in the medium rather than short term.

2.3.2 Future crash statistics

The VicRoads data in the charts and tables presented above demonstrates the high incidence and severity of crashes and injuries sustained by bike riders at locations within the study area.

Based on the historical data, future crash rate forecasts (broken into severity classifications) have been assumed through until the end of the appraisal period. The crash rates experienced have been applied to forecast traffic numbers to determine the number of crashes to be expected in the future.

If there was no increase in other crash types (i.e. those other than doorings and side swipes), crash rates should decrease by approximately 39%. However, as outlined, crashes occurring at driveways and intersections are expected to still occur, thus GHD does not forecast that a reduction of the full 39% of crashes will be realised under the project case. As a result, GHD has assumed a 28% decrease in the incidence of crashes along St Kilda Road.

[17] *Bicycle Rider Collisions with Car Doors*, Road Safety Action Group Inner Melbourne, 13 July 2012

3. Infrastructure needs

3.1 Existing infrastructure

The study area is split into two segments, the northern segment (Linlithgow Avenue to Dorcas Street) and the southern segment (Dorcas Street to Carlisle Street). The southern segment of the road is further split into two sections – Dorcas Street to St Kilda Junction (intersection of Queens Way, St Kilda Road, Punt Road and Fitzroy Street), and St Kilda Junction to Carlisle Street.

Although there is a marked bike lane (painted green with bicycle graphics) along the majority of the length of St Kilda Road, there is no separation of the bike lane from car parking and traffic lanes.

3.1.1 Linlithgow Avenue to St Kilda Junction

The carriageway between Linlithgow Avenue and St Kilda Junction is divided in two: an outer carriageway, or service lane, and the main carriageway.

The configuration of the lanes is outlined in Table 9.

Table 9: Current lane configuration – Linlithgow Avenue to St Kilda Junction

Outer carriageway	Main carriageway
2.0 m dedicated parking lane 1.4 m marked bike lane Two 2.8 m traffic lanes	3.1 m traffic lane, used for parking outside of morning (AM) or evening (PM) peak 3.2 m full time traffic lane * Dedicated tramway running along centre median

* At intersections near tram stops there is a single traffic lane on the main carriageway and no parking lane.

3.1.2 St Kilda Junction to Carlisle Street

The section of road between St Kilda Junction and Carlisle Street is a single carriageway. The configuration of the lanes is outlined in Table 10.

Table 10: Current lane configuration – St Kilda Junction to Carlisle Street

Single carriageway
Single dedicated parking lane Single marked bike lane Four dedicated traffic lanes Dedicated tramway running along centre median

3.1.3 Parking

In preparing this report GHD undertook an onsite review of the parking facilities along St Kilda Road[18]. This inspection was done between 3.30 pm and 6.00 pm to primarily observe traffic and

[18] Site review conducted 24 February 2014, 3.30 pm – 6.00 pm, by GHD staff members. Review was undertaken to observe the PM peak conditions.

cycling conditions during the period. It was also observed that there was excess parking capacity during the 3.30 pm – 6.00 pm time window.

A review of St Kilda Road in the northern and southern segments also indicated that there is excess parking capacity and existing parking facilities are underutilised along both segments of the route.

A detailed study of parking data has not been conducted for the purpose of this report.

3.2 Future infrastructure requirements

GHD has assumed a change to the current lane configuration along St Kilda Road in order to accommodate the Copenhagen style bike lanes. The infrastructure requirement of this change configuration is outlined in this section.

3.2.1 Linlithgow Avenue to St Kilda Junction

The proposed lane configuration between Linlithgow Avenue and St Kilda Junction adds a 2 m Copenhagen style bike lane to the outer carriageway, as well as a 1 m wide raised concrete separator island. It is proposed that one traffic lane would alternate between an off peak parking lane and a traffic lane during peak periods.

There would be no changes to infrastructure along the main carriageway.

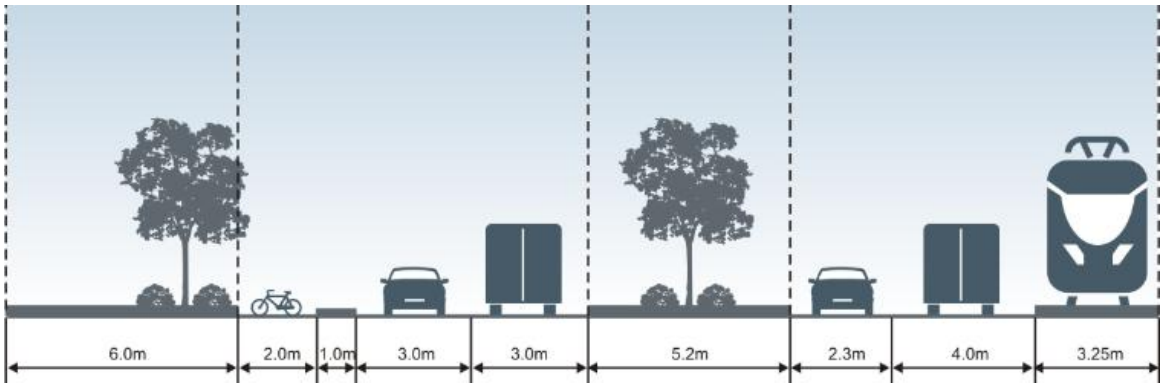
Table 11 outlines the proposed lane configuration between Linlithgow Avenue and St Kilda Junction.

Table 11: Proposed lane configuration – Linlithgow Avenue to St Kilda Junction

Service lane	Main carriageway
2 m bike lane	2.3 m dedicated parking lane
1 m separator island	4 m traffic lane
3 m, used for parking outside of morning (AM) or evening (PM) peak	Dedicated tramway running along centre median
3 m traffic lane	

Figure 6 illustrates GHD's proposed changes to the lane configuration along the majority of the route, between Linlithgow Avenue and St Kilda Junction.

Figure 6: Proposed lane configuration sketch – Linlithgow Avenue to St Kilda Junction



3.2.2 St Kilda Junction to Carlisle Street

The proposed lane configuration between St Kilda Junction and Carlisle Street replaces the dedicated parking lane with the continuation of a 2 m Copenhagen style bike lane and a 1 m wide raised concrete separator island. One of the traffic lanes is converted to an alternating off peak parking lane, and a traffic lane during peak periods.

Table 12 outlines the proposed lane configuration between St Kilda Junction and Carlisle Street.

Table 12: Proposed lane configuration – St Kilda Junction to Carlisle Street

Single carriageway
2 m bike lane
1 m separator island
Single lane, used for parking outside of morning (AM) or evening (PM) peak
Three dedicated traffic lanes
Dedicated tramway running along centre median

3.3 Future infrastructure capital expenditure assumptions

It is assumed that future infrastructure capital expenditure (CAPEX) costs will only be realised in the year that separated bike lanes are constructed. There has been no allowance for escalation of CAPEX costs beyond the current year pricing.

Cost estimates for proposed future infrastructure CAPEX assume:

- Construction of a 2 m wide bike lane running along 750 m (northern segment) and 4,540 m (southern segment) of St Kilda Road
- Bike lanes will be constructed in both the north bound and south bound service lanes
- The bike lane will be separated from traffic lanes by a 1 m concrete divider
- Construction will take place during the 2016/17 financial year.

GHD assumes that there are no separated bike lanes through any of the intersections and that there is no major reconfiguration of intersections required. It should be noted that any such changes would significantly add to the cost.

Based on these assumptions, a CAPEX cost of $2,200,000 / km has been estimated. The estimated per km cost covers construction of lanes in both north and south bound directions. GHD believes that this estimate represents a reasonable cost for the infrastructure required.

The total assumed CAPEX over the length of the road is shown in Table 13

Table 13: CAPEX assumptions ($ / km, construction in both directions)

St Kilda Road segment (length)	CAPEX rate $2,200,000 / km
Northern segment (0.75 km each direction)	$1,650,000
Southern segment (4.54 km each direction)	$9,988,000
TOTAL	**$11,638,000**

The cost estimate outlined above is based on GHD's experience with similar projects and estimated costs of future projects in Australia. The costs estimate has not been broken down

into individual cost components as GHD has not undertaken an assessment of the road conditions e.g. service relocation requirements, footpath excavation, road surface quality.

3.4 Future infrastructure operational expenditure assumptions

It is assumed that annual operational expenditure (OPEX) is required for both the current bike lane configuration, as well as for the proposed future lane configuration.

An annual fixed OPEX cost of $3,000 / lane km is assumed for the current bike lane infrastructure. This fixed OPEX represents a standard 'maintenance crew call out fee', covering road maintenance activities such as repair, clearing of hazards and cleaning. This rate is based on GHD's experience with local government maintenance program costs.

It is assumed that the proposed infrastructure will require a fixed OPEX cost of $3,000 / lane km, as well as an additional variable OPEX rate of 0.2 % of the assumed CAPEX cost. This additional variable OPEX is assumed to cover the cost of repair and replacement of new signage, clearing of hazards and cleaning.

The total assumed annual OPEX over the length of the road is shown in Table 14.

Table 14: OPEX assumptions ($ p.a.)

St Kilda Road segment (length)	Fixed OPEX rate $3,000 / km	Variable OPEX rate 0.2% / km	Total cost per segment
Northern segment (0.75 km), both directions	$2,250	$3,300	$5,550
Southern segment (4.54 km), both directions	$13,620	$19,976	$33,596
TOTAL	**$15,870**	**$23,276**	**$39,146**

The OPEX cost estimates outlined above are based on GHD's experience with similar projects run by councils and road agencies in Victoria and Australia, and estimated costs of future projects in Australia.

4. Economic appraisal

4.1 Approach

The methodology employed in this analysis is a Benefit Cost Analysis (BCA) approach based on the assumptions and inputs outlined in previous sections of this report. A range of costs and benefits have been calculated based on parameters sourced from the following:

- Economic Evaluation for Business Cases Technical Guidelines, Department of Treasury and Finance, August 2013
- Guide to Project Evaluation – Part 4: Project Evaluation Data, Austroads, 2012
- Valuing environmental and other externalities, Austroads, 2003
- Principles and Guidelines for Economic Appraisal of Transport investment initiatives, TfNSW 2013.

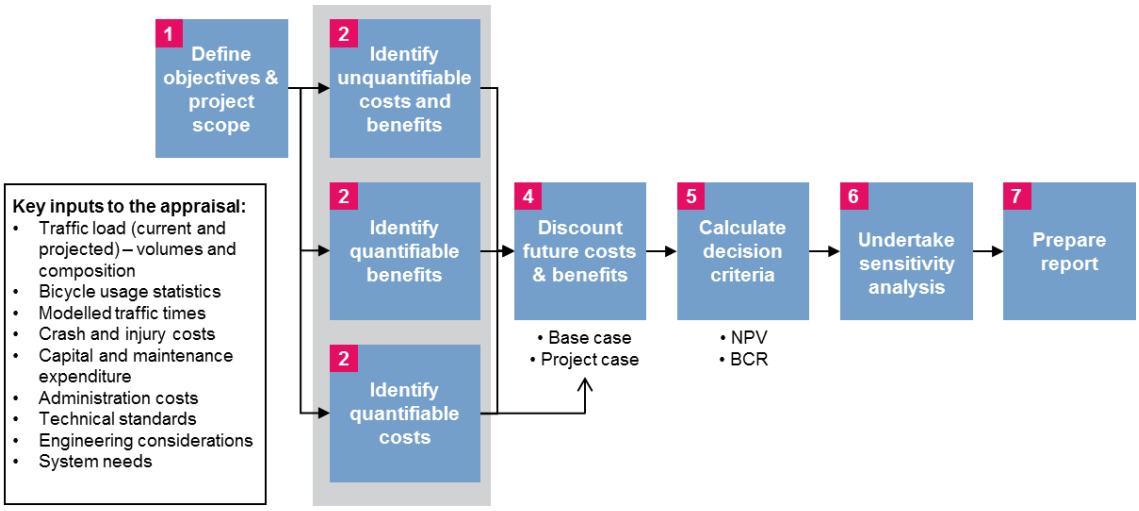
Benefits and costs have been considered based on the demand factors outlined in section 2 of this report, including data and information provided by Council that covers historical and current traffic count data. Additional data has been sought from research and evidence based findings.

4.2 BCA methodology

The BCA undertaken during the preparation of this report is outlined in Figure 7 and is based on the following methodology:

- Definition of the project objectives
- Definition of the base case and project case
- Definition of the alternative project case scenarios and sensitivity tests to be applied to the results
- Identification of the benefits and costs that may be expected under each the base case and the project case
- Quantification of the benefits and costs over the base case and project case appraisal period
- Generation of the net economic worth measures, including Net Present Value (NPV) and Benefit Cost Ratio (BCR)
- Sensitivity analysis on key variables
- Interpretation of results and conclusion.

Figure 7: Benefit cost analysis methodology



Net economic worth has been measured by the following decision criteria:

- Net Present Value (NPV) – the present value of the incremental benefits of the project case minus the present value of the incremental costs of the project case. Projects with a positive NPV have net benefits over the appraisal period.
- Benefit Cost Ratio (BCR) – the ratio of the present value of the incremental benefits of the project case to the present value of the incremental costs of the project case. Projects with a BCR greater than 1.0 have net benefits over the appraisal period.

4.3 Assumptions

A set of general assumptions apply to both the base case and the project case. These assumptions include:

- Years are considered in terms of financial years e.g. 2014 refers to the 2013/ 14 financial year (used interchangeably)
- All benefits/ costs have been estimated in 2014 ($2014) dollars
- Prior year values have been escalated to equivalent $2014, at a rate equal to CPI of 2.5% p.a.[19]
- A real discount rate of 7.0%[20] has been applied
- The appraisal period commences in 2015 and concludes in 2035
- The capital expenditure (CAPEX) is realised in 2017 and transition to the project case commences in 2018
- There have been no allowances for escalation beyond current day pricing
- There is no significant mode change between car usage and bike riding, as outlined in section 2
- The northern segment (Linlithgow Avenue to Dorcas Street) is 750 m in length, while the southern segment of St Kilda Road (Dorcas Street to Carlisle Street) is 4,540 m in length.

[19] *The Monetary Policy Framework*, Reserve Bank of Australia, 2001 – 2013
[20] *Economic Evaluation for Business Cases Technical Guidelines*, Department of Treasury and Finance, August 2013

4.4 Exclusions

Benefits and costs that have not been considered during this BCA include:

- An in-depth traffic demand analysis along intersecting and arterial roads around St Kilda Road e.g. Queens Way, Toorak Road, Commercial Road
- Travel delays due to routine maintenance on St Kilda Road and intersecting roads in years that fall within the appraisal period.

4.5 Base case

4.5.1 Definition

The base case assumes that there is no change to the current bike lane configuration along St Kilda Road. Bike riders and other road users will not be impacted by any changes to parking, lane width and availability or bike lane accessibility.

The base case further assumes that current traffic volumes will increase in line with forecast growth rates.

4.5.2 Assumptions

The base case makes the following assumptions:

- There will be no additional infrastructure works undertaken on St Kilda Road over the appraisal period, thus no CAPEX allowance
- Current operational maintenance activities will continue as per current VicRoads maintenance planning schedules, at the fixed OPEX rate outlined in section 3
- Bike numbers increase over the appraisal period, growing at an assumed rate of 5.4% p.a. in 2015 which decreases logarithmically to a rate of 2.6% p.a. by 2035.

4.6 Project case

4.6.1 Definition

The project case assumes that a 2 m wide bike lane will be constructed kerb side in the service lanes along St Kilda Road. Construction details have been outlined in section 3.3.

The project case assumes that design work will be undertaken during the 2015 /16 financial year, and the necessary infrastructure upgrades commence and are completed during the 2016/ 2017 financial year.

The project case further assumes that the current car, bus and tram patronage levels will grow at the current rate; however there will be an increase in the use of bikes along the route due to perception of increased safety, reduced travel times and reduced vehicle operating costs (VOC) as perceived by road users.

4.6.2 Assumptions

The project case makes the following assumptions:

- Infrastructure upgrade works will be undertaken and completed in 2017
- Additional operational maintenance activities will be undertaken along the entire stretch of road to ensure quality, accessibility and safety of the separated bike lanes. These works will occur at the fixed and variable OPEX rates outlined in section 3. OPEX begins to be incurred in (2018), the year following construction completion

- There will be a significant increase in bike numbers in 2018, (the first year after construction is completed) – separated bike lanes are assumed to lead to an additional increase in current bike numbers of 25% on top of the annual growth rate
- As detailed in section 2.2, there will be no mode change between car usage and bike riding – increases in bike numbers will be due to mode shift from walking, public transport users and road users that previously used other routes.

4.7 Benefits

The incremental benefits likely to have a positive impact on the NPV and BCR of the project case are outlined as follows.

4.7.1 Travel cost savings

A potential benefit to the BCA would be a decrease in travel costs under the project case. This would be realised if the project case resulted in an increase in bike speeds along the route, reduced stoppage requirements (i.e. intersections), or reduction of the travel distance. The greater the travel cost savings (all other held constant), the greater the positive impact on the NPV and BCR of the project case.

Although a report focused on bike travel in Sydney assumed an increase in bike speed of 5 km/ hr[21], GHD does not consider that this would occur on St Kilda Road. The primary reason for this is that the number of intersections along the route that requires cyclists to stop, slow down or give way will not decrease, and there is no reduction of travel distance.

Complementary measures such as traffic signal phasing and timing that synchronises with bike rider and tram travel speeds could reduce travel times; however GHD considers that due to competing demands from car, trams, buses and bikes, the possibility of signal optimisation along the route would need to be assessed for impact on both bike riders and other road users. Improvements to intersection performance could have a positive impact on travel times, resulting in travel cost savings, however the eventual impact of traffic signal phasings and timings is outside the scope of this report.

Any impact on current bike travel times as a result of vehicles parking on bike lanes (blocking access for bike riders) has been assumed in the estimate of the base case travel times.

There is no change to the current traffic flow conditions assumed under either the base case or project case, and therefore it is not expected that there will be an improved travel time for bike riders.

4.7.2 Savings in crash costs

Any incremental decrease in crash costs (e.g. that arise from pedestrian/ bicycle collisions) is perceived as a benefit.

As an increase in individual types of crashes cannot be estimated, the historical crash frequency and associated crash cost has been assumed in the modelling in order to derive the total crash cost. These are outlined in Table 15 and Table 16.

Table 15: Crash rates, crashes per million km

Crash type	Crashes per million km
Fatal	0.007166

[21] City of Sydney, Inner Sydney Regional Bicycle Network – Demand Assessment and Economic Appraisal, April 2010

Crash type	Crashes per million km
Hospitalised [1]	0.086946
Minor injury	0.193080
Property damage only	0.212011

Source: Austroads 2012, Guide to project evaluation, Part 4: Project Evaluation Data, page 25

Table 16: Crash costs, $2014

Crash type	Cost ($2014 / crash)
Fatal	2,719,795
Serious injury [1]	625,862
Average casualty [1]	281,082
Minor injury	26,319
Property damage only	9,582

Source: Austroads 2012, Guide to project evaluation, Part 4: Project Evaluation Data, GHD analysis, 2014

[1] The cost of the crash type 'hospitalised' has been calculated by assuming 80% of the cost of an average casualty and 20% of the cost of a serious injury is incurred. This is consistent with GHD's experience in similar projects.

An increase in the number of bike riders is likely to result in an increase in crash costs, unless detailed design of Copenhagen style lane configurations takes into account all road users, in particular the need to increase driver awareness of bike riders. This would increase the cost of separated bike lane construction and installation, but as outlined in section 2.3.2 may reduce the incidence of crashes by up to 28%, resulting in additional crash cost savings. The impact of the increased costs and potential reduced crash rates is outside the scope of this report.

4.7.3 Health benefits

Health benefits are considered potential economic benefits to the project case and are realised a result of an increase in active transport from additional bike riders. Table 17 outlines the cost attributable as a benefit from an increase in bike riders.

Table 17: Health benefits ($/ bike km)

Health benefit mode	$ / bike km
Cycling	1.05

Source: TfNSW (2013) Principles and Guidelines for Economic Appraisal of Transport investment initiatives

Although health benefits from bike riders are also realised under the base case, an increase in bike riders under the project case results in an incremental health benefit, and an improvement to general wellbeing. The greater the uptake in bike riding, the greater the positive impact on the NPV and BCR of the project case.

4.7.4 Environmental savings, including greenhouse gas emissions, air pollution and noise

Environmental benefits are realised when there is a reduction of greenhouse gas emissions, air pollution or noise impacts. It could reasonably be expected that as there is an increase in bike riding, there may be a decline in vehicle use. This would have the likely impact of decreasing the environmental costs as users switch to the more environmentally friendly bike mode, reducing vehicle use.

As previously outlined, it has been assumed that there is no mode change from car usage towards bike riding, however it can be reasonably expected that if the shift were to occur, there would be an increase in the potential benefits. Under the project case no environmental savings are realised as there is no incremental increase in car, bus or tram use. There is zero environmental cost associated with bike use, thus the project case has no impact on environmental costs.

4.7.5 Uplift in property values

Separated bike lanes may provide a safer route option to bike riders, which could potentially improve accessibility to properties along St Kilda Road.

No consideration has been given to property value uplift within this report due to lack of Australian and international data and evidence. Further analysis of the impact on Australian and international residential and commercial property values would need to be undertaken to determine whether there is an uplift in value due to separated bike lanes.

4.8 Costs

The significant costs that are likely to have an impact on the NPV and BCR of the project case are outlined as follows.

4.8.1 Travel costs

A potential cost to the BCA would be an increase in travel costs under the project case. Travel costs are calculated as a multiple of two factors: total travel time (a variable of distance travelled and travel speed), and vehicle volumes over the travel distance (Equation 1).

Equation 1: Travel cost equation

Travel cost ($) = total travel time (hours) x travel cost ($/ hour/ person)

Travel costs will increase under the project case if there is an increase in vehicle numbers, which results in an increase to total travel hours. Travel costs will also increase if there is a decrease in speeds along the route, increases in stoppage requirements (i.e. intersections), or an increased travel distance.

It is not perceived that there will be an increase in travel time (duration) for bike riders as there is no expected change to bike speeds, route distance, or stoppage requirements. However, the assumption that there will be an increase in bike numbers results in a greater overall travel cost attributable to bikes.

Current car traffic volumes along St Kilda Road do not exceed road capacity, and it is not expected that future traffic volumes will exceed road capacity during peak periods. An increase in travel times for car users may occur in the short term while there is a change to travel routes and lane configurations. However, based on current traffic volumes along St Kilda Road, GHD does not expect that there will be a material increase in travel times for cars in the future based on the proposed changes to lane configuration.

It is also not expected that there will be an increase in traffic times for bus and tram users, as no change to current public service timetabling is expected.

The travel costs discussed in this report are shown in Table 18. Each mode splits travel between that attributable to private travel and that attributable to business travel.

Table 18: Travel cost assumptions

Travel type	Cost ($/ person/ hour)
Private travel	13.76
Business travel	44.03

Source: TfNSW (2013) Principles and Guidelines for Economic Appraisal of Transport investment initiatives pg 216

Travel costs are realised by private car occupants, on-board train time, on-board bus time, ferry travel, cycling time and walking time.

4.8.2 Vehicle operating costs

Increases in vehicle operating costs (VOC) are realised as a cost under the project case. VOC will increase if there is an increase in the number of vehicles on the roads, increases in fuel consumption or additional vehicle maintenance costs. The VOC for each mode type assessed is shown in Table 19.

Table 19: Vehicle operating cost assumptions

Vehicle type	VOC ($/ km)
Bike	0.050
Car	0.609
Bus	0.995
Tram	0.995

Source: TfNSW (2013) Principles and Guidelines for Economic Appraisal of Transport investment initiatives

The only variable assumed under the project case is an incremental increase in the number of bikes. Although the VOC associated with bikes is lower than that for cars, buses and trams, an incremental increase in VOC is realised under the project case.

Although it is acknowledged that there is a net decrease in the total vehicle km travelled, without a strategic model and further analysis GHD is not able to quantify the net decline in total car and public transport patronage. As zero net mode shift has been assumed under the project case, there is no incremental saving from public transport fares or purchase of public transport vehicles.

4.8.3 Construction costs

Installation of new bike lanes and concrete separators, as well as the changes to traffic lanes, parking spaces, foot paths and nature strips, will require an outlay of CAPEX. This will be realised as an incremental cost under the project case as CAPEX is not assumed in the base case over the appraisal period.

As outlined in section 3.3, CAPEX at a rate of $2,200,000 / lane km (construction of lanes in both directions) has been assumed under the project case.

4.8.4 Operational maintenance costs

The construction of separated bike lanes will demand an additional operational maintenance cost for activities such as repair, clearing of hazards and cleaning above that needed under the base case. This has been applied as a variable OPEX cost to the project case.

As outlined in section 3.4, a fixed OPEX cost of $3,000 / lane km is assumed, applicable to both the base and project cases. An additional variable OPEX rate of 0.2% of assumed CAPEX cost is applied under the project case.

To reduce the impact of OPEX on the NPV and BCR of the project case, the current operational maintenance programs could be reviewed to identify and implement measures to achieve cost efficiencies.

4.8.5 Foregone parking revenue

The impact of foregone revenue from a reduction in metered parking spaces has not been modelled in this BCA. During the site inspection GHD concluded that there will be no impact on parking revenue. This is based on sufficient capacity and availability of parking spaces along both the northern and southern segments of St Kilda Road during the inspection, and the proposed lane configurations.

Between Linlithgow Avenue and St Kilda Junction, parking is currently allowed in the outer carriageway and, during non-peak periods, on the main carriageway. In the proposed lane configuration, parking would be allowed during non-peak periods in the outer carriageway and full time in the main carriageway. This would result in no significant net loss of parking in either peak or off-peak periods.

Between St Kilda Junction and Carlisle Street it is proposed that there be peak hour restrictions in one direction, alternating between the AM and PM peaks. Other than during peak periods, there would be no significant net loss of parking.

It is expected that there would be sufficient parking capacity during the peak and off-peak periods. Further parking surveys would be required to confirm this assumption.

5. Results

This section of the report outlines the findings from the BCA modelling. The BCA appraisal has been undertaken using available input estimates, parameters and judgement, and based on industry experience across similar projects that have been undertaken in confidence.

The results of the BCA are outlined in Table 20. As outlined in section 4.2, projects with a BCR greater than 1.0 have net benefits over the appraisal period.

Table 20: Summary of BCA results

Scenario	NPV	BCR
Project case economic analysis results	$3,327,867	1.134

The results shown above are based on the assumptions outlined in sections 3 and 4 of this report.

5.1 Demand scenario testing

GHD has undertaken modelling for three levels of perceived future bike demand: high, medium and low. The reference project case outlined above represents the medium demand level and represents the case that GHD believes to be most likely in terms of cost estimate, traffic forecast and growth in bike numbers.

A high level of demand represents the maximum uplift in bike numbers that GHD sees possible i.e. the maximum growth that can be assumed under the project case.

A low level of demand represents the minimum uplift in bike numbers that GHD would assume is likely i.e. the minimum growth that would be assumed under the project case.

5.1.1 Medium demand level – reference project case

The key economic variables have been amended in order to undertake sensitivity testing at the medium demand level. The results of these tests are outlined in Table 21. The medium demand level assumes that bike numbers grow by 25% in the first year after separated bike lane construction is completed.

Table 21: Medium demand level – reference project case results

Sensitivity test	NPV	BCR
Standard project case scenario	$3,327,867	1.134
Increase crash costs by 10%	$4,722,160	1.191
Increase health benefit ($) by 10%	$4,741,467	1.192
Increase CAPEX by 10%	$2,290,909	1.089
Increase variable OPEX rate by 0.1%	$3,225,616	1.130

From the results in the table above, it is evident that an increase in health benefits of 10% has a larger impact on the NPV and BCR than an increase in crash costs of 10% (i.e. the impact of

savings with increased crash costs is not as great as the impact of increasing the value attributable to health benefits)[22].

An increase in either CAPEX or OPEX has the expected effect of decreasing the NPV and BCR. It would require an increase in CAPEX of 32 – 33% until the NPV neared zero and the BCR approached 1.0. This equates to a CAPEX rate of $2,904,000 / km.

5.1.2 High demand level

Modelling has been undertaken assuming that bike numbers increase at the maximum demand level that GHD believes is possible.

The high demand level assumes that bike numbers grow by 29% in the first year after separated bike lane construction is completed, in line with the growth experienced in New York City.

A number of different scenarios have been tested at the high level of demand. The results of these tests are shown in Table 22.

Table 22: High level of demand – project case results

Sensitivity test	NPV	BCR
Bike numbers grow by 29% in 2018	$3,288,592	1.122
Bike numbers grow by 29% AND crash costs increase by 10%	$4,682,884	1.173
Bike numbers grow by 29% AND health benefit ($) increases by 10%	$4,928,368	1.182
Bike numbers grow by 29% AND CAPEX increases by 10%	$2,251,634	1.080
Bike numbers grow by 29% AND variable OPEX rate increases by 0.1%	$3,186,340	1.117

Again, it is evident that an increase in health benefits of 10% has a larger impact on the NPV and BCR than an increase in crash costs of 10% (i.e. the impact of savings with increased crash costs is not as great as the impact of increasing the value attributable to health benefits). This is reasonable to expect, as the higher demand and growth in bike numbers will result in additional health benefits.

Similar to the medium demand level scenario, an increase in either CAPEX or OPEX has the expected effect of decreasing the NPV and BCR. It would require an increase in CAPEX of 31 – 32% until the NPV neared zero and the BCR approached 1.0. This equates to a CAPEX rate of $2,882,000 / km.

No sensitivity test has been undertaken based on GHD having confidence in the possibility a reduction in travel times. As outlined throughout this report, GHD does not consider that separated bike lanes along St Kilda Road will materially reduce travel times for bikes, cars, buses or trams.

[22] These results should be treated with caution as the magnitude of the crash costs and health benefit dollar amounts are not equal, and health benefits and crash costs are economic variables used in economic and project evaluations and thus are not amended for specific projects. This sensitivity testing purely shows that if crash costs are increased by the same proportion and the dollar value attributable to health benefits, the project case is more sensitive to the change in health benefit.

5.1.3 Low demand level

Modelling has been undertaken assuming that bike numbers increase at the lowest rate of growth that GHD believes is possible.

The low demand level assumes that bike numbers grow by only 15% in the first year after separated bike lane construction is completed.

A number of different scenarios have been tested at the low level of demand. The results of these tests are shown in Table 23.

Table 23: Low level of demand – project case results

Sensitivity test	NPV	BCR
Bike numbers grow by 15% in 2018	$3,426,057	1.180
Bike numbers grow by 15% AND crash costs increase by 10%	$4,820,349	1.254
Bike numbers grow by 15% AND health benefit ($) increases by 10%	$4,274,217	1.225
Bike numbers grow by 15% AND CAPEX increases by 10%	$2,389,098	1.119
Bike numbers grow by 15% AND variable OPEX rate increases by 0.1%	$3,323,805	1.174

Under the low demand scenario, an increase in health benefits of 10% has a smaller impact on the NPV and BCR than an increase in crash costs of 10% (i.e. the impact of savings from increased crash costs is greater than the impact of increasing the value attributable to health benefits).

As expected, an increase in either CAPEX or OPEX has the effect of decreasing the NPV and BCR. It would require an increase in CAPEX of 33 – 34% until the NPV neared zero and the BCR approached 1.0. This equates to a CAPEX rate of $2,948,000 / km.

5.2 Interpretation of results

Although it may seem logical that an increase in bike numbers would lead to an increase in benefits due to reduced VOC (bike VOC is less than car and public transport VOC), and increased safety cost savings and environmental cost savings, the results of the scenario tests above show that an increase in bike numbers leads to a decrease in the NPV and BCR.

The primary reason for this is that the project case has assumed an overall net increase in total vehicles along the route. This is due to the assumptions outlined in section 2.2.1 and as follows:

- Mode shift towards bike riding will primarily come from public transport patrons and pedestrians that previously travelled on foot
- Any spare capacity that is freed up in car or public transport patronage is back filled by other users
- Ultimately there is a net decrease in the total vehicle km travelled; however without a strategic model GHD is not able to quantify the net decline in total car and public transport patronage and vehicle volumes
- The resulting assumption is a zero net decline in car and public transport users (as spare capacity is filled), and an increase in bikes and rider volumes.

The increase in bike riders volumes means that more travel time is incurred, *in total*. Multiplying out the additional bike hours by the travel cost factor will result in a net cost under the project case.

Although it is assumed that there is no mode shift from cars to bikes, it can be reasonably expected that if the shift were to occur, there would be an increase in the potential benefits.

The other changes to variables are described further below.

5.2.1 Change to bike rider numbers

An increase in the growth rate of bike riders, as shown in the table above, has the impact of reducing the NPV and BCR compared to the standard project case scenario i.e. as the number of bike riders increases, the economic benefit decreases. This is primarily due to the increased number of bikes which increases travel costs and VOC. Although health benefits increase, they do not increase by an amount that exceeds the cost from travel and VOC.

This may appear illogical – it would be assumed that more bikes would result in more benefits. However, an increase in bikes results in an increase in bike related VOC (as outlined in section 4.7.2).

A decrease in the number of bike riders has the reverse effect on NPV and BCR.

5.2.2 Change to crash costs

Increasing crash costs by 10% results in an increase in the NPV and BCR compared to the standard project case scenario. This is due to the total base case crash costs increasing to a greater number than the total project case crash costs, as the number of crashes assumed under the base case is greater than that under the project case.

Decreasing crash costs have a similar, but reverse, effect on NPV and BCR, resulting in NPV and BCR figures lower than the standard project case scenario.

The interpretation of these results should be treated with caution as crash cost is an economic variable used in economic and project evaluations and would not amended for specific projects. This sensitivity testing purely shows that if the crash costs were to be increased, the NPV and BCR of the project case would also increase.

5.2.3 Health benefits

Increasing health benefits by 10% results in an increase in the NPV and BCR, for all levels of demand under the project case. This is due to an increased number of bike riders under the project case compared to the base case, and the resulting health benefit economic value that is realised.

Decreasing health benefits results in a decrease in the NPV and BCR, which demonstrates that the project case is sensitive to changes in the assumed level of health benefit.

The interpretation of these results should be treated with caution as dollar value attributable to health benefits is an economic variable used in economic and project evaluations and would not amended for specific projects. This sensitivity testing purely shows that if the health benefit dollar value was increased, the NPV and BCR of the project case would also increase.

5.2.4 Environmental costs

Changes to environmental costs have no impact on the NPV or BCR as there is no environmental cost associated with bikes, zero mode shift has been assumed and there is no increase in car, bus or tram patronage.

5.2.5 Construction costs

An increase in the assumed CAPEX rate / lane km results in an increase in the NPV and BCR compared to the standard project case scenario. The higher construction expenditure impacts on the costs of the scenario and is not counterbalanced by any factors.

Decrease in the assumed CAPEX rate / lane km results in a similar decrease in NPV and BCR.

5.2.6 Operational costs

An increase in the variable OPEX rate / lane km results in a decrease in the NPV and BCR compared to the standard project case scenario. This is due to a higher cost realisation requirement and is generally linked to an increased CAPEX rate.

A decrease in the variable OPEX rate / lane km increases the NPV and BCR, with the reverse effect of an increase being evident.

6. Conclusions and recommendations

Based on the findings of this report, GHD makes the following conclusions:

- BCR results greater than 1.0 indicates that there are net incremental economic benefits to society from the project case over the appraisal period. Under this project case, the benefits received by society, including health benefits and crash cost savings, outweigh the costs, such as investment in construction expenditure and associated ongoing operational expenses.
- The introduction of separated bike lanes along St Kilda Road has the potential to reduce the incidence of crashes currently experienced along the route by up to 28%, as bike riders would be isolated from moving and parked vehicles, and driver awareness of bike riders is increased. This could result in crash cost savings across the length of the route.
- Separated bike lanes are likely to entice public transport patrons, vehicle drivers and pedestrians to shift to bike riding by providing a safer route option and greater levels of rider comfort than previously existed. This will have the flow on effect of increasing health benefits realised from increased active transport.
- Additional costs will be incurred for the construction and operational maintenance of the separated bike lanes. To reduce the impact of the cost of operational maintenance, the current operational maintenance programs should be reviewed to identify and implement measures to achieve cost efficiencies.
- Vehicle operating costs will be realised as bike numbers (with an associated operating cost) increase, whilst there is no shift in volumes assumed for other modes of transport.

GHD makes the following recommendations with regards to next steps:

- Stakeholder consultations with relevant parties such as Department of Transport, Planning and Local Infrastructure, Public Transport Victoria, Yarra Trams and VicRoads should be undertaken. The primary purpose of these consultations should be to discuss the findings of this report and Council plans to seek opinions on stakeholder requirements and issues, prior to progressing to any future stages.
- The assumption that there would be no net mode shift from cars and public transport to bikes should be further tested in order to quantify the net decline in total car and public transport patronage. The development of a strategic model to measure the mode shift would allow more accurate estimation of costs and savings as changes to car and public transport patronage is considerate of the wider network. Selection of the most appropriate strategic model to be used (e.g. MITM or Zenith) should be based on feedback and outcomes from the stakeholder consultations.
- Further analysis within Australia (and internationally) would need to be undertaken to determine whether there is a positive or negative impact on property value due to separated bike lanes.
- In order to accurately model travel time savings, an assessment would need to be undertaken to evaluate the impact of signal optimisation and synchronisation at intersections along the route on travel times for each bike riders, vehicles and public transport users.
- Detailed design would need to be undertaken to ensure that Copenhagen style bike lanes takes all road users into account, in particular addressing the need to increase driver awareness of bike riders. The impact of the detailed design on the cost of

separated bike lane construction and installation would need to be weighed up against the potential savings from reduced crash costs.

Appendices

Appendix A – Economic Analysis Model

CITY OF PORT PHILLIP

GHD

TITLE

16-Apr-14 Version 1.0

Notes

Important information for users of this model

As with any cost benefit analysis, there are limitations to this model given the broad assumptions adopted.
This model is a rapid cost benefit analysis model which only takes into account the basic parameters that are needed to produce a benefit-cost ratio (BCR).
As such, the reasonableness of the model outputs depend on the reasonableness of the inputs.
The model projects benefits and costs into the future and it is possible that some of the assumptions underlying any projections may not materialise.
Users of the model should bear these limitations in mind when entering inputs and interpreting outputs.

Contents

TRAFFIC VOLUME p.a. - MEDIUM DEMAND LEVEL

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Assesment period	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
BASE CASE																					
NORTHERN SEGMENT																					
Bike volumes p.a.	1,283,710	1,348,388	1,413,033	1,477,647	1,542,228	1,606,778	1,671,296	1,735,781	1,800,235	1,864,657	1,929,047	1,993,406	2,057,732	2,122,027	2,186,291	2,250,522	2,314,722	2,378,890	2,443,027	2,507,132	2,571,206
Car volumes p.a.	11,428,150	11,542,432	11,657,856	11,774,434	11,892,179	12,011,101	12,131,212	12,252,524	12,375,049	12,498,799	12,623,787	12,750,025	12,877,525	13,006,301	13,136,364	13,267,727	13,400,405	13,534,409	13,669,753	13,806,450	13,944,515
Bus volumes p.a.	1,003,027	1,013,057	1,023,188	1,033,420	1,043,754	1,054,191	1,064,733	1,075,381	1,086,134	1,096,996	1,107,966	1,119,045	1,130,236	1,141,538	1,152,954	1,164,483	1,176,128	1,187,889	1,199,768	1,211,766	1,223,884
Tram volumes p.a.	16,471,322	16,636,036	16,802,396	16,970,420	17,140,124	17,311,525	17,484,641	17,659,487	17,836,082	18,014,443	18,194,587	18,376,533	18,560,298	18,745,901	18,933,360	19,122,694	19,313,921	19,507,060	19,702,131	19,899,152	20,098,144
Bike vol. (pvt)	1,219,524	1,280,968	1,342,382	1,403,764	1,465,117	1,526,439	1,587,731	1,648,992	1,710,223	1,771,424	1,832,595	1,893,736	1,954,846	2,015,926	2,076,976	2,137,996	2,198,986	2,259,946	2,320,876	2,381,776	2,442,646
Bike vol. (busn)	64,185	67,419	70,652	73,882	77,111	80,339	83,565	86,789	90,012	93,233	96,452	99,670	102,887	106,101	109,315	112,526	115,736	118,945	122,151	125,357	128,560
Car vol. (pvt)	6,856,890	6,925,459	6,994,713	7,064,661	7,135,307	7,206,660	7,278,727	7,351,514	7,425,029	7,499,280	7,574,272	7,650,015	7,726,515	7,803,780	7,881,818	7,960,636	8,040,243	8,120,645	8,201,852	8,283,870	8,366,709
Car vol. (busn)	4,571,260	4,616,973	4,663,142	4,709,774	4,756,871	4,804,440	4,852,485	4,901,009	4,950,020	4,999,520	5,049,515	5,100,010	5,151,010	5,202,520	5,254,545	5,307,091	5,360,162	5,413,763	5,467,901	5,522,580	5,577,806
Bus vol. (pvt)	852,573	861,099	869,710	878,407	887,191	896,063	905,023	914,074	923,214	932,446	941,771	951,189	960,701	970,308	980,011	989,811	999,709	1,009,706	1,019,803	1,030,001	1,040,301
Bus vol. (busn)	150,454	151,959	153,478	155,013	156,563	158,129	159,710	161,307	162,920	164,549	166,195	167,857	169,535	171,231	172,943	174,672	176,419	178,183	179,965	181,765	183,583
Tram vol. (pvt)	14,000,624	14,140,630	14,282,037	14,424,857	14,569,106	14,714,797	14,861,945	15,010,564	15,160,670	15,312,276	15,465,399	15,620,053	15,776,254	15,934,016	16,093,356	16,254,290	16,416,833	16,581,001	16,746,811	16,914,279	17,083,422
Tram vol. (busn)	2,470,698	2,495,405	2,520,359	2,545,563	2,571,019	2,596,729	2,622,696	2,648,923	2,675,412	2,702,166	2,729,188	2,756,480	2,784,045	2,811,885	2,840,004	2,868,404	2,897,088	2,926,059	2,955,320	2,984,873	3,014,722
SOUTHERN SEGMENT																					
Bike volumes p.a.	694,930	729,943	764,939	799,917	834,878	869,822	904,748	939,657	974,549	1,009,424	1,044,281	1,079,121	1,113,944	1,148,750	1,183,538	1,218,310	1,253,064	1,287,801	1,322,521	1,357,224	1,391,910
Car volumes p.a.	15,214,039	15,366,180	15,519,842	15,675,040	15,831,790	15,990,108	16,150,009	16,311,509	16,474,625	16,639,371	16,805,764	16,973,822	17,143,560	17,314,996	17,488,146	17,663,027	17,839,658	18,018,054	18,198,235	18,380,217	18,564,019
Bus volumes p.a.	243,024	245,454	247,909	250,388	252,892	255,421	257,975	260,555	263,160	265,792	268,450	271,134	273,846	276,584	279,350	282,143	284,965	287,815	290,693	293,600	296,536
Tram volumes p.a.	9,769,497	9,867,192	9,965,864	10,065,522	10,166,178	10,267,839	10,370,518	10,474,223	10,578,965	10,684,755	10,791,602	10,899,518	11,008,514	11,118,599	11,229,785	11,342,083	11,455,503	11,570,058	11,685,759	11,802,617	11,920,643
Bike vol. (pvt)	660,184	693,446	726,692	759,921	793,134	826,331	859,511	892,674	925,822	958,952	992,067	1,025,165	1,058,247	1,091,312	1,124,361	1,157,394	1,190,411	1,223,411	1,256,395	1,289,363	1,322,315
Bike vol. (busn)	34,747	36,497	38,247	39,996	41,744	43,491	45,237	46,983	48,727	50,471	52,214	53,956	55,697	57,437	59,177	60,915	62,653	64,390	66,126	67,861	69,596
Car vol. (pvt)	9,128,424	9,219,708	9,311,905	9,405,024	9,499,074	9,594,065	9,690,006	9,786,906	9,884,775	9,983,622	10,083,459	10,184,293	10,286,136	10,388,998	10,492,888	10,597,816	10,703,795	10,810,833	10,918,941	11,028,130	11,138,412
Car vol. (busn)	6,085,616	6,146,472	6,207,937	6,270,016	6,332,716	6,396,043	6,460,004	6,524,604	6,589,850	6,655,748	6,722,306	6,789,529	6,857,424	6,925,998	6,995,258	7,065,211	7,135,863	7,207,222	7,279,294	7,352,087	7,425,608
Bus vol. (pvt)	206,571	208,636	210,723	212,830	214,958	217,108	219,279	221,472	223,686	225,923	228,182	230,464	232,769	235,097	237,447	239,822	242,220	244,642	247,089	249,560	252,055
Bus vol. (busn)	36,454	36,818	37,186	37,558	37,934	38,313	38,696	39,083	39,474	39,869	40,267	40,670	41,077	41,488	41,902	42,322	42,745	43,172	43,604	44,040	44,480
Tram vol. (pvt)	8,304,072	8,387,113	8,470,984	8,555,694	8,641,251	8,727,663	8,814,940	8,903,089	8,992,120	9,082,042	9,172,862	9,264,591	9,357,237	9,450,809	9,545,317	9,640,770	9,737,178	9,834,550	9,932,895	10,032,224	10,132,546
Tram vol. (busn)	1,465,425	1,480,079	1,494,880	1,509,828	1,524,927	1,540,176	1,555,578	1,571,133	1,586,845	1,602,713	1,618,740	1,634,928	1,651,277	1,667,790	1,684,468	1,701,312	1,718,325	1,735,509	1,752,864	1,770,392	1,788,096
PROJECT CASE																					
NORTHERN SEGMENT																					
Bike volumes p.a.	1,283,710	1,348,388	1,413,033	1,847,058	1,927,785	2,008,472	2,089,120	2,169,727	2,250,294	2,330,822	2,411,309	2,491,757	2,572,166	2,652,534	2,732,863	2,813,153	2,893,403	2,973,613	3,053,784	3,133,915	3,214,008
Car volumes p.a.	11,428,150	11,542,432	11,657,856	11,774,434	11,892,179	12,011,101	12,131,212	12,252,524	12,375,049	12,498,799	12,623,787	12,750,025	12,877,525	13,006,301	13,136,364	13,267,727	13,400,405	13,534,409	13,669,753	13,806,450	13,944,515
Bus volumes p.a.	1,003,027	1,013,057	1,023,188	1,033,420	1,043,754	1,054,191	1,064,733	1,075,381	1,086,134	1,096,996	1,107,966	1,119,045	1,130,236	1,141,538	1,152,954	1,164,483	1,176,128	1,187,889	1,199,768	1,211,766	1,223,884
Tram volumes p.a.	16,471,322	16,636,036	16,802,396	16,970,420	17,140,124	17,311,525	17,484,641	17,659,487	17,836,082	18,014,443	18,194,587	18,376,533	18,560,298	18,745,901	18,933,360	19,122,694	19,313,921	19,507,060	19,702,131	19,899,152	20,098,144
Bike vol. (pvt)	1,219,524	1,280,968	1,342,382	1,754,706	1,831,396	1,908,049	1,984,664	2,061,240	2,137,779	2,214,280	2,290,744	2,367,169	2,443,557	2,519,907	2,596,220	2,672,495	2,748,732	2,824,932	2,901,095	2,977,220	3,053,307
Bike vol. (busn)	64,185	67,419	70,652	92,353	96,389	100,424	104,456	108,486	112,515	116,541	120,565	124,588	128,608	132,627	136,643	140,658	144,670	148,681	152,689	156,696	160,700
Car vol. (pvt)	6,856,890	6,925,459	6,994,713	7,064,661	7,135,307	7,206,660	7,278,727	7,351,514	7,425,029	7,499,280	7,574,272	7,650,015	7,726,515	7,803,780	7,881,818	7,960,636	8,040,243	8,120,645	8,201,852	8,283,870	8,366,709
Car vol. (busn)	4,571,260	4,616,973	4,663,142	4,709,774	4,756,871	4,804,440	4,852,485	4,901,009	4,950,020	4,999,520	5,049,515	5,100,010	5,151,010	5,202,520	5,254,545	5,307,091	5,360,162	5,413,763	5,467,901	5,522,580	5,577,806
Bus vol. (pvt)	852,573	861,099	869,710	878,407	887,191	896,063	905,023	914,074	923,214	932,446	941,771	951,189	960,701	970,308	980,011	989,811	999,709	1,009,706	1,019,803	1,030,001	1,040,301
Bus vol. (busn)	150,454	151,959	153,478	155,013	156,563	158,129	159,710	161,307	162,920	164,549	166,195	167,857	169,535	171,231	172,943	174,672	176,419	178,183	179,965	181,765	183,583
Tram vol. (pvt)	14,000,624	14,140,630	14,282,037	14,424,857	14,569,106	14,714,797	14,861,945	15,010,564	15,160,670	15,312,276	15,465,399	15,620,053	15,776,254	15,934,016	16,093,356	16,254,290	16,416,833	16,581,001	16,746,811	16,914,279	17,083,422
Tram vol. (busn)	2,470,698	2,495,405	2,520,359	2,545,563	2,571,019	2,596,729	2,622,696	2,648,923	2,675,412	2,702,166	2,729,188	2,756,480	2,784,045	2,811,885	2,840,004	2,868,404	2,897,088	2,926,059	2,955,320	2,984,873	3,014,722
SOUTHERN SEGMENT																					
Bike volumes p.a.	694,930	729,943	764,939	999,897	1,043,598	1,087,277	1,130,935	1,174,571	1,218,186	1,261,779	1,305,351	1,348,901	1,392,430	1,435,937	1,479,423	1,522,887	1,566,330	1,609,752	1,653,152	1,696,531	1,739,888
Car volumes p.a.	15,214,039	15,366,180	15,519,842	15,675,040	15,831,790	15,990,108	16,150,009	16,311,509	16,474,625	16,639,371	16,805,764	16,973,822	17,143,560	17,314,996	17,488,146	17,663,027	17,839,658	18,018,054	18,198,235	18,380,217	18,564,019
Bus volumes p.a.	243,024	245,454	247,909	250,388	252,892	255,421	257,975	260,555	263,160	265,792	268,450	271,134	273,846	276,584	279,350	282,143	284,965	287,815	290,693	293,600	296,536
Tram volumes p.a.	9,769,497	9,867,192	9,965,864	10,065,522	10,166,178	10,267,839	10,370,518	10,474,223	10,578,965	10,684,755	10,791,602	10,899,518	11,008,514	11,118,599	11,229,785	11,342,083	11,455,503	11,570,058	11,685,759	11,802,617	11,920,643
Bike vol. (pvt)	660,184	693,446	726,692	949,902	991,418	1,032,913	1,074,388	1,115,843	1,157,277	1,198,690	1,240,084	1,281,456	1,322,808	1,364,140	1,405,452	1,446,743	1,488,014	1,529,264	1,570,494	1,611,704	1,652,894
Bike vol. (busn)	34,747	36,497	38,247	49,995	52,180	54,364	56,547	58,729	60,909	63,089	65,268	67,445	69,621	71,797	73,971	76,144	78,317	80,488	82,658	84,827	86,994
Car vol. (pvt)	9,128,424	9,219,708	9,311,905	9,405,024	9,499,074	9,594,065	9,690,006	9,786,906	9,884,775	9,983,622	10,083,459	10,184,293	10,286,136	10,388,998	10,492,888	10,597,816	10,703,795	10,810,833	10,918,941	11,028,130	11,138,412
Car vol. (busn)	6,085,616	6,146,472	6,207,937	6,270,016	6,332,716	6,396,043	6,460,004	6,524,604	6,589,850	6,655,748	6,722,306	6,789,529	6,857,424	6,925,998	6,995,258	7,065,211	7,135,863	7,207,222	7,279,294	7,352,087	7,425,608
Bus vol. (pvt)	206,571	208,636	210,723	212,830	214,958	217,108	219,279	221,472	223,686	225,923	228,182	230,464	232,769	235,097	237,447	239,822	242,220	244,642	247,089	249,560	252,055
Bus vol. (busn)	36,454	36,818	37,186	37,558	37,934	38,313	38,696	39,083	39,474	39,869	40,267	40,670	41,077	41,488	41,902	42,322	42,745	43,172	43,604	44,040	44,480
Tram vol. (pvt)	8,304,072	8,387,113	8,470,984	8,555,694	8,641,251	8,727,663	8,814,940	8,903,089	8,992,120	9,082,042	9,172,862	9,264,591	9,357,237	9,450,809	9,545,317	9,640,770	9,737,178	9,834,550	9,932,895	10,032,224	10,132,546
Tram vol. (busn)	1,465,425	1,480,079	1,494,880	1,509,828	1,524,927	1,540,176	1,555,578	1,571,133	1,586,845	1,602,713	1,618,740	1,634,928	1,651,277	1,667,790	1,684,468	1,701,312	1,718,325	1,735,509	1,752,864	1,770,392	1,788,096

TRAFFIC VOLUME p.a. - HIGH DEMAND LEVEL

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Assesment period	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
BASE CASE																					
NORTHERN SEGMENT																					
Bike volumes p.a.	1,283,710	1,348,388	1,413,033	1,477,647	1,542,228	1,606,778	1,671,296	1,735,781	1,800,235	1,864,657	1,929,047	1,993,406	2,057,732	2,122,027	2,186,291	2,250,522	2,314,722	2,378,890	2,443,027	2,507,132	2,571,206
Car volumes p.a.	11,428,150	11,542,432	11,657,856	11,774,434	11,892,179	12,011,101	12,131,212	12,252,524	12,375,049	12,498,799	12,623,787	12,750,025	12,877,525	13,006,301	13,136,364	13,267,727	13,400,405	13,534,409	13,669,753	13,806,450	13,944,515
Bus volumes p.a.	1,003,027	1,013,057	1,023,188	1,033,420	1,043,754	1,054,191	1,064,733	1,075,381	1,086,134	1,096,996	1,107,966	1,119,045	1,130,236	1,141,538	1,152,954	1,164,483	1,176,128	1,187,889	1,199,768	1,211,766	1,223,884
Tram volumes p.a.	16,471,322	16,636,036	16,802,396	16,970,420	17,140,124	17,311,525	17,484,641	17,659,487	17,836,082	18,014,443	18,194,587	18,376,533	18,560,298	18,745,901	18,933,360	19,122,694	19,313,921	19,507,060	19,702,131	19,899,152	20,098,144
Bike vol. (pvt)	1,219,524	1,280,968	1,342,382	1,403,764	1,465,117	1,526,439	1,587,731	1,648,992	1,710,223	1,771,424	1,832,595	1,893,736	1,954,846	2,015,926	2,076,976	2,137,996	2,198,986	2,259,946	2,320,876	2,381,776	2,442,646
Bike vol. (busn)	64,185	67,419	70,652	73,882	77,111	80,339	83,565	86,789	90,012	93,233	96,452	99,670	102,887	106,101	109,315	112,526	115,736	118,945	122,151	125,357	128,560
Car vol. (pvt)	6,856,890	6,925,459	6,994,713	7,064,661	7,135,307	7,206,660	7,278,727	7,351,514	7,425,029	7,499,280	7,574,272	7,650,015	7,726,515	7,803,780	7,881,818	7,960,636	8,040,243	8,120,645	8,201,852	8,283,870	8,366,709
Car vol. (busn)	4,571,260	4,616,973	4,663,142	4,709,774	4,756,871	4,804,440	4,852,485	4,901,009	4,950,020	4,999,520	5,049,515	5,100,010	5,151,010	5,202,520	5,254,545	5,307,091	5,360,162	5,413,763	5,467,901	5,522,580	5,577,806
Bus vol. (pvt)	852,573	861,099	869,710	878,407	887,191	896,063	905,023	914,074	923,214	932,446	941,771	951,189	960,701	970,308	980,011	989,811	999,709	1,009,706	1,019,803	1,030,001	1,040,301
Bus vol. (busn)	150,454	151,959	153,478	155,013	156,563	158,129	159,710	161,307	162,920	164,549	166,195	167,857	169,535	171,231	172,943	174,672	176,419	178,183	179,965	181,765	183,583
Tram vol. (pvt)	14,000,624	14,140,630	14,282,037	14,424,857	14,569,106	14,714,797	14,861,945	15,010,564	15,160,670	15,312,276	15,465,399	15,620,053	15,776,254	15,934,016	16,093,356	16,254,290	16,416,833	16,581,001	16,746,811	16,914,279	17,083,422
Tram vol. (busn)	2,470,698	2,495,405	2,520,359	2,545,563	2,571,019	2,596,729	2,622,696	2,648,923	2,675,412	2,702,166	2,729,188	2,756,480	2,784,045	2,811,885	2,840,004	2,868,404	2,897,088	2,926,059	2,955,320	2,984,873	3,014,722
SOUTHERN SEGMENT																					
Bike volumes p.a.	694,930	729,943	764,939	799,917	834,878	869,822	904,748	939,657	974,549	1,009,424	1,044,281	1,079,121	1,113,944	1,148,750	1,183,538	1,218,310	1,253,064	1,287,801	1,322,521	1,357,224	1,391,910
Car volumes p.a.	15,214,039	15,366,180	15,519,842	15,675,040	15,831,790	15,990,108	16,150,009	16,311,509	16,474,625	16,639,371	16,805,764	16,973,822	17,143,560	17,314,996	17,488,146	17,663,027	17,839,658	18,018,054	18,198,235	18,380,217	18,564,019
Bus volumes p.a.	243,024	245,454	247,909	250,388	252,892	255,421	257,975	260,555	263,160	265,792	268,450	271,134	273,846	276,584	279,350	282,143	284,965	287,815	290,693	293,600	296,536
Tram volumes p.a.	9,769,497	9,867,192	9,965,864	10,065,522	10,166,178	10,267,839	10,370,518	10,474,223	10,578,965	10,684,755	10,791,602	10,899,518	11,008,514	11,118,599	11,229,785	11,342,083	11,455,503	11,570,058	11,685,759	11,802,617	11,920,643
Bike vol. (pvt)	660,184	693,446	726,692	759,921	793,134	826,331	859,511	892,674	925,822	958,952	992,067	1,025,165	1,058,247	1,091,312	1,124,361	1,157,394	1,190,411	1,223,411	1,256,395	1,289,363	1,322,315
Bike vol. (busn)	34,747	36,497	38,247	39,996	41,744	43,491	45,237	46,983	48,727	50,471	52,214	53,956	55,697	57,437	59,177	60,915	62,653	64,390	66,126	67,861	69,596
Car vol. (pvt)	9,128,424	9,219,708	9,311,905	9,405,024	9,499,074	9,594,065	9,690,006	9,786,906	9,884,775	9,983,622	10,083,459	10,184,293	10,286,136	10,388,998	10,492,888	10,597,816	10,703,795	10,810,833	10,918,941	11,028,130	11,138,412
Car vol. (busn)	6,085,616	6,146,472	6,207,937	6,270,016	6,332,716	6,396,043	6,460,004	6,524,604	6,589,850	6,655,748	6,722,306	6,789,529	6,857,424	6,925,998	6,995,258	7,065,211	7,135,863	7,207,222	7,279,294	7,352,087	7,425,608
Bus vol. (pvt)	206,571	208,636	210,723	212,830	214,958	217,108	219,279	221,472	223,686	225,923	228,182	230,464	232,769	235,097	237,447	239,822	242,220	244,642	247,089	249,560	252,055
Bus vol. (busn)	36,454	36,818	37,186	37,558	37,934	38,313	38,696	39,083	39,474	39,869	40,267	40,670	41,077	41,488	41,902	42,322	42,745	43,172	43,604	44,040	44,480
Tram vol. (pvt)	8,304,072	8,387,113	8,470,984	8,555,694	8,641,251	8,727,663	8,814,940	8,903,089	8,992,120	9,082,042	9,172,862	9,264,591	9,357,237	9,450,809	9,545,317	9,640,770	9,737,178	9,834,550	9,932,895	10,032,224	10,132,546
Tram vol. (busn)	1,465,425	1,480,079	1,494,880	1,509,828	1,524,927	1,540,176	1,555,578	1,571,133	1,586,845	1,602,713	1,618,740	1,634,928	1,651,277	1,667,790	1,684,468	1,701,312	1,718,325	1,735,509	1,752,864	1,770,392	1,788,096
PROJECT CASE																					
NORTHERN SEGMENT																					
Bike volumes p.a.	1,283,710	1,348,388	1,413,033	1,906,164	1,989,475	2,072,744	2,155,971	2,239,158	2,322,303	2,405,408	2,488,471	2,571,494	2,654,475	2,737,415	2,820,315	2,903,174	2,985,991	3,068,769	3,151,505	3,234,201	3,316,856
Car volumes p.a.	11,428,150	11,542,432	11,657,856	11,774,434	11,892,179	12,011,101	12,131,212	12,252,524	12,375,049	12,498,799	12,623,787	12,750,025	12,877,525	13,006,301	13,136,364	13,267,727	13,400,405	13,534,409	13,669,753	13,806,450	13,944,515
Bus volumes p.a.	1,003,027	1,013,057	1,023,188	1,033,420	1,043,754	1,054,191	1,064,733	1,075,381	1,086,134	1,096,996	1,107,966	1,119,045	1,130,236	1,141,538	1,152,954	1,164,483	1,176,128	1,187,889	1,199,768	1,211,766	1,223,884
Tram volumes p.a.	16,471,322	16,636,036	16,802,396	16,970,420	17,140,124	17,311,525	17,484,641	17,659,487	17,836,082	18,014,443	18,194,587	18,376,533	18,560,298	18,745,901	18,933,360	19,122,694	19,313,921	19,507,060	19,702,131	19,899,152	20,098,144
Bike vol. (pvt)	1,219,524	1,280,968	1,342,382	1,810,856	1,890,001	1,969,106	2,048,173	2,127,200	2,206,188	2,285,137	2,364,048	2,442,919	2,521,751	2,600,545	2,679,299	2,758,015	2,836,692	2,915,330	2,993,930	3,072,491	3,151,013
Bike vol. (busn)	64,185	67,419	70,652	95,308	99,474	103,637	107,799	111,958	116,115	120,270	124,424	128,575	132,724	136,871	141,016	145,159	149,300	153,438	157,575	161,710	165,843
Car vol. (pvt)	6,856,890	6,925,459	6,994,713	7,064,661	7,135,307	7,206,660	7,278,727	7,351,514	7,425,029	7,499,280	7,574,272	7,650,015	7,726,515	7,803,780	7,881,818	7,960,636	8,040,243	8,120,645	8,201,852	8,283,870	8,366,709
Car vol. (busn)	4,571,260	4,616,973	4,663,142	4,709,774	4,756,871	4,804,440	4,852,485	4,901,009	4,950,020	4,999,520	5,049,515	5,100,010	5,151,010	5,202,520	5,254,545	5,307,091	5,360,162	5,413,763	5,467,901	5,522,580	5,577,806
Bus vol. (pvt)	852,573	861,099	869,710	878,407	887,191	896,063	905,023	914,074	923,214	932,446	941,771	951,189	960,701	970,308	980,011	989,811	999,709	1,009,706	1,019,803	1,030,001	1,040,301
Bus vol. (busn)	150,454	151,959	153,478	155,013	156,563	158,129	159,710	161,307	162,920	164,549	166,195	167,857	169,535	171,231	172,943	174,672	176,419	178,183	179,965	181,765	183,583
Tram vol. (pvt)	14,000,624	14,140,630	14,282,037	14,424,857	14,569,106	14,714,797	14,861,945	15,010,564	15,160,670	15,312,276	15,465,399	15,620,053	15,776,254	15,934,016	16,093,356	16,254,290	16,416,833	16,581,001	16,746,811	16,914,279	17,083,422
Tram vol. (busn)	2,470,698	2,495,405	2,520,359	2,545,563	2,571,019	2,596,729	2,622,696	2,648,923	2,675,412	2,702,166	2,729,188	2,756,480	2,784,045	2,811,885	2,840,004	2,868,404	2,897,088	2,926,059	2,955,320	2,984,873	3,014,722
SOUTHERN SEGMENT																					
Bike volumes p.a.	694,930	729,943	764,939	1,031,893	1,076,993	1,122,070	1,167,125	1,212,158	1,257,168	1,302,156	1,347,122	1,392,066	1,436,988	1,481,887	1,526,764	1,571,620	1,616,453	1,661,264	1,706,053	1,750,820	1,795,564
Car volumes p.a.	15,214,039	15,366,180	15,519,842	15,675,040	15,831,790	15,990,108	16,150,009	16,311,509	16,474,625	16,639,371	16,805,764	16,973,822	17,143,560	17,314,996	17,488,146	17,663,027	17,839,658	18,018,054	18,198,235	18,380,217	18,564,019
Bus volumes p.a.	243,024	245,454	247,909	250,388	252,892	255,421	257,975	260,555	263,160	265,792	268,450	271,134	273,846	276,584	279,350	282,143	284,965	287,815	290,693	293,600	296,536
Tram volumes p.a.	9,769,497	9,867,192	9,965,864	10,065,522	10,166,178	10,267,839	10,370,518	10,474,223	10,578,965	10,684,755	10,791,602	10,899,518	11,008,514	11,118,599	11,229,785	11,342,083	11,455,503	11,570,058	11,685,759	11,802,617	11,920,643
Bike vol. (pvt)	660,184	693,446	726,692	980,299	1,023,143	1,065,967	1,108,769	1,151,550	1,194,310	1,237,049	1,279,766	1,322,463	1,365,138	1,407,793	1,450,426	1,493,039	1,535,630	1,578,200	1,620,750	1,663,279	1,705,786
Bike vol. (busn)	34,747	36,497	38,247	51,595	53,850	56,104	58,356	60,608	62,858	65,108	67,356	69,603	71,849	74,094	76,338	78,581	80,823	83,063	85,303	87,541	89,778
Car vol. (pvt)	9,128,424	9,219,708	9,311,905	9,405,024	9,499,074	9,594,065	9,690,006	9,786,906	9,884,775	9,983,622	10,083,459	10,184,293	10,286,136	10,388,998	10,492,888	10,597,816	10,703,795	10,810,833	10,918,941	11,028,130	11,138,412
Car vol. (busn)	6,085,616	6,146,472	6,207,937	6,270,016	6,332,716	6,396,043	6,460,004	6,524,604	6,589,850	6,655,748	6,722,306	6,789,529	6,857,424	6,925,998	6,995,258	7,065,211	7,135,863	7,207,222	7,279,294	7,352,087	7,425,608
Bus vol. (pvt)	206,571	208,636	210,723	212,830	214,958	217,108	219,279	221,472	223,686	225,923	228,182	230,464	232,769	235,097	237,447	239,822	242,220	244,642	247,089	249,560	252,055
Bus vol. (busn)	36,454	36,818	37,186	37,558	37,934	38,313	38,696	39,083	39,474	39,869	40,267	40,670	41,077	41,488	41,902	42,322	42,745	43,172	43,604	44,040	44,480
Tram vol. (pvt)	8,304,072	8,387,113	8,470,984	8,555,694	8,641,251	8,727,663	8,814,940	8,903,089	8,992,120	9,082,042	9,172,862	9,264,591	9,357,237	9,450,809	9,545,317	9,640,770	9,737,178	9,834,550	9,932,895	10,032,224	10,132,546
Tram vol. (busn)	1,465,425	1,480,079	1,494,880	1,509,828	1,524,927	1,540,176	1,555,578	1,571,133	1,586,845	1,602,713	1,618,740	1,634,928	1,651,277	1,667,790	1,684,468	1,701,312	1,718,325	1,735,509	1,752,864	1,770,392	1,788,096

TRAFFIC VOLUME p.a. - LOW DEMAND LEVEL

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Assesment period	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
BASE CASE																					
NORTHERN SEGMENT																					
Bike volumes p.a.	1,283,710	1,348,388	1,413,033	1,477,647	1,542,228	1,606,778	1,671,296	1,735,781	1,800,235	1,864,657	1,929,047	1,993,406	2,057,732	2,122,027	2,186,291	2,250,522	2,314,722	2,378,890	2,443,027	2,507,132	2,571,206
Car volumes p.a.	11,428,150	11,542,432	11,657,856	11,774,434	11,892,179	12,011,101	12,131,212	12,252,524	12,375,049	12,498,799	12,623,787	12,750,025	12,877,525	13,006,301	13,136,364	13,267,727	13,400,405	13,534,409	13,669,753	13,806,450	13,944,515
Bus volumes p.a.	1,003,027	1,013,057	1,023,188	1,033,420	1,043,754	1,054,191	1,064,733	1,075,381	1,086,134	1,096,996	1,107,966	1,119,045	1,130,236	1,141,538	1,152,954	1,164,483	1,176,128	1,187,889	1,199,768	1,211,766	1,223,884
Tram volumes p.a.	16,471,322	16,636,036	16,802,396	16,970,420	17,140,124	17,311,525	17,484,641	17,659,487	17,836,082	18,014,443	18,194,587	18,376,533	18,560,298	18,745,901	18,933,360	19,122,694	19,313,921	19,507,060	19,702,131	19,899,152	20,098,144
Bike vol. (pvt)	1,219,524	1,280,968	1,342,382	1,403,764	1,465,117	1,526,439	1,587,731	1,648,992	1,710,223	1,771,424	1,832,595	1,893,736	1,954,846	2,015,926	2,076,976	2,137,996	2,198,986	2,259,946	2,320,876	2,381,776	2,442,646
Bike vol. (busn)	64,185	67,419	70,652	73,882	77,111	80,339	83,565	86,789	90,012	93,233	96,452	99,670	102,887	106,101	109,315	112,526	115,736	118,945	122,151	125,357	128,560
Car vol. (pvt)	6,856,890	6,925,459	6,994,713	7,064,661	7,135,307	7,206,660	7,278,727	7,351,514	7,425,029	7,499,280	7,574,272	7,650,015	7,726,515	7,803,780	7,881,818	7,960,636	8,040,243	8,120,645	8,201,852	8,283,870	8,366,709
Car vol. (busn)	4,571,260	4,616,973	4,663,142	4,709,774	4,756,871	4,804,440	4,852,485	4,901,009	4,950,020	4,999,520	5,049,515	5,100,010	5,151,010	5,202,520	5,254,545	5,307,091	5,360,162	5,413,763	5,467,901	5,522,580	5,577,806
Bus vol. (pvt)	852,573	861,099	869,710	878,407	887,191	896,063	905,023	914,074	923,214	932,446	941,771	951,189	960,701	970,308	980,011	989,811	999,709	1,009,706	1,019,803	1,030,001	1,040,301
Bus vol. (busn)	150,454	151,959	153,478	155,013	156,563	158,129	159,710	161,307	162,920	164,549	166,195	167,857	169,535	171,231	172,943	174,672	176,419	178,183	179,965	181,765	183,583
Tram vol. (pvt)	14,000,624	14,140,630	14,282,037	14,424,857	14,569,106	14,714,797	14,861,945	15,010,564	15,160,670	15,312,276	15,465,399	15,620,053	15,776,254	15,934,016	16,093,356	16,254,290	16,416,833	16,581,001	16,746,811	16,914,279	17,083,422
Tram vol. (busn)	2,470,698	2,495,405	2,520,359	2,545,563	2,571,019	2,596,729	2,622,696	2,648,923	2,675,412	2,702,166	2,729,188	2,756,480	2,784,045	2,811,885	2,840,004	2,868,404	2,897,088	2,926,059	2,955,320	2,984,873	3,014,722
SOUTHERN SEGMENT																					
Bike volumes p.a.	694,930	729,943	764,939	799,917	834,878	869,822	904,748	939,657	974,549	1,009,424	1,044,281	1,079,121	1,113,944	1,148,750	1,183,538	1,218,310	1,253,064	1,287,801	1,322,521	1,357,224	1,391,910
Car volumes p.a.	15,214,039	15,366,180	15,519,842	15,675,040	15,831,790	15,990,108	16,150,009	16,311,509	16,474,625	16,639,371	16,805,764	16,973,822	17,143,560	17,314,996	17,488,146	17,663,027	17,839,658	18,018,054	18,198,235	18,380,217	18,564,019
Bus volumes p.a.	243,024	245,454	247,909	250,388	252,892	255,421	257,975	260,555	263,160	265,792	268,450	271,134	273,846	276,584	279,350	282,143	284,965	287,815	290,693	293,600	296,536
Tram volumes p.a.	9,769,497	9,867,192	9,965,864	10,065,522	10,166,178	10,267,839	10,370,518	10,474,223	10,578,965	10,684,755	10,791,602	10,899,518	11,008,514	11,118,599	11,229,785	11,342,083	11,455,503	11,570,058	11,685,759	11,802,617	11,920,643
Bike vol. (pvt)	660,184	693,446	726,692	759,921	793,134	826,331	859,511	892,674	925,822	958,952	992,067	1,025,165	1,058,247	1,091,312	1,124,361	1,157,394	1,190,411	1,223,411	1,256,395	1,289,363	1,322,315
Bike vol. (busn)	34,747	36,497	38,247	39,996	41,744	43,491	45,237	46,983	48,727	50,471	52,214	53,956	55,697	57,437	59,177	60,915	62,653	64,390	66,126	67,861	69,596
Car vol. (pvt)	9,128,424	9,219,708	9,311,905	9,405,024	9,499,074	9,594,065	9,690,006	9,786,906	9,884,775	9,983,622	10,083,459	10,184,293	10,286,136	10,388,998	10,492,888	10,597,816	10,703,795	10,810,833	10,918,941	11,028,130	11,138,412
Car vol. (busn)	6,085,616	6,146,472	6,207,937	6,270,016	6,332,716	6,396,043	6,460,004	6,524,604	6,589,850	6,655,748	6,722,306	6,789,529	6,857,424	6,925,998	6,995,258	7,065,211	7,135,863	7,207,222	7,279,294	7,352,087	7,425,608
Bus vol. (pvt)	206,571	208,636	210,723	212,830	214,958	217,108	219,279	221,472	223,686	225,923	228,182	230,464	232,769	235,097	237,447	239,822	242,220	244,642	247,089	249,560	252,055
Bus vol. (busn)	36,454	36,818	37,186	37,558	37,934	38,313	38,696	39,083	39,474	39,869	40,267	40,670	41,077	41,488	41,902	42,322	42,745	43,172	43,604	44,040	44,480
Tram vol. (pvt)	8,304,072	8,387,113	8,470,984	8,555,694	8,641,251	8,727,663	8,814,940	8,903,089	8,992,120	9,082,042	9,172,862	9,264,591	9,357,237	9,450,809	9,545,317	9,640,770	9,737,178	9,834,550	9,932,895	10,032,224	10,132,546
Tram vol. (busn)	1,465,425	1,480,079	1,494,880	1,509,828	1,524,927	1,540,176	1,555,578	1,571,133	1,586,845	1,602,713	1,618,740	1,634,928	1,651,277	1,667,790	1,684,468	1,701,312	1,718,325	1,735,509	1,752,864	1,770,392	1,788,096
PROJECT CASE																					
NORTHERN SEGMENT																					
Bike volumes p.a.	1,283,710	1,348,388	1,413,033	1,699,294	1,773,563	1,847,795	1,921,990	1,996,149	2,070,271	2,144,356	2,218,405	2,292,417	2,366,392	2,440,331	2,514,234	2,588,100	2,661,930	2,735,724	2,809,481	2,883,202	2,956,887
Car volumes p.a.	11,428,150	11,542,432	11,657,856	11,774,434	11,892,179	12,011,101	12,131,212	12,252,524	12,375,049	12,498,799	12,623,787	12,750,025	12,877,525	13,006,301	13,136,364	13,267,727	13,400,405	13,534,409	13,669,753	13,806,450	13,944,515
Bus volumes p.a.	1,003,027	1,013,057	1,023,188	1,033,420	1,043,754	1,054,191	1,064,733	1,075,381	1,086,134	1,096,996	1,107,966	1,119,045	1,130,236	1,141,538	1,152,954	1,164,483	1,176,128	1,187,889	1,199,768	1,211,766	1,223,884
Tram volumes p.a.	16,471,322	16,636,036	16,802,396	16,970,420	17,140,124	17,311,525	17,484,641	17,659,487	17,836,082	18,014,443	18,194,587	18,376,533	18,560,298	18,745,901	18,933,360	19,122,694	19,313,921	19,507,060	19,702,131	19,899,152	20,098,144
Bike vol. (pvt)	1,219,524	1,280,968	1,342,382	1,614,329	1,684,884	1,755,405	1,825,890	1,896,341	1,966,757	2,037,138	2,107,484	2,177,796	2,248,073	2,318,315	2,388,522	2,458,695	2,528,834	2,598,938	2,669,007	2,739,042	2,809,043
Bike vol. (busn)	64,185	67,419	70,652	84,965	88,678	92,390	96,099	99,807	103,514	107,218	110,920	114,621	118,320	122,017	125,712	129,405	133,097	136,786	140,474	144,160	147,844
Car vol. (pvt)	6,856,890	6,925,459	6,994,713	7,064,661	7,135,307	7,206,660	7,278,727	7,351,514	7,425,029	7,499,280	7,574,272	7,650,015	7,726,515	7,803,780	7,881,818	7,960,636	8,040,243	8,120,645	8,201,852	8,283,870	8,366,709
Car vol. (busn)	4,571,260	4,616,973	4,663,142	4,709,774	4,756,871	4,804,440	4,852,485	4,901,009	4,950,020	4,999,520	5,049,515	5,100,010	5,151,010	5,202,520	5,254,545	5,307,091	5,360,162	5,413,763	5,467,901	5,522,580	5,577,806
Bus vol. (pvt)	852,573	861,099	869,710	878,407	887,191	896,063	905,023	914,074	923,214	932,446	941,771	951,189	960,701	970,308	980,011	989,811	999,709	1,009,706	1,019,803	1,030,001	1,040,301
Bus vol. (busn)	150,454	151,959	153,478	155,013	156,563	158,129	159,710	161,307	162,920	164,549	166,195	167,857	169,535	171,231	172,943	174,672	176,419	178,183	179,965	181,765	183,583
Tram vol. (pvt)	14,000,624	14,140,630	14,282,037	14,424,857	14,569,106	14,714,797	14,861,945	15,010,564	15,160,670	15,312,276	15,465,399	15,620,053	15,776,254	15,934,016	16,093,356	16,254,290	16,416,833	16,581,001	16,746,811	16,914,279	17,083,422
Tram vol. (busn)	2,470,698	2,495,405	2,520,359	2,545,563	2,571,019	2,596,729	2,622,696	2,648,923	2,675,412	2,702,166	2,729,188	2,756,480	2,784,045	2,811,885	2,840,004	2,868,404	2,897,088	2,926,059	2,955,320	2,984,873	3,014,722
SOUTHERN SEGMENT																					
Bike volumes p.a.	694,930	729,943	764,939	919,905	960,110	1,000,295	1,040,460	1,080,606	1,120,731	1,160,837	1,200,923	1,240,989	1,281,036	1,321,062	1,361,069	1,401,056	1,441,024	1,480,971	1,520,900	1,560,808	1,600,697
Car volumes p.a.	15,214,039	15,366,180	15,519,842	15,675,040	15,831,790	15,990,108	16,150,009	16,311,509	16,474,625	16,639,371	16,805,764	16,973,822	17,143,560	17,314,996	17,488,146	17,663,027	17,839,658	18,018,054	18,198,235	18,380,217	18,564,019
Bus volumes p.a.	243,024	245,454	247,909	250,388	252,892	255,421	257,975	260,555	263,160	265,792	268,450	271,134	273,846	276,584	279,350	282,143	284,965	287,815	290,693	293,600	296,536
Tram volumes p.a.	9,769,497	9,867,192	9,965,864	10,065,522	10,166,178	10,267,839	10,370,518	10,474,223	10,578,965	10,684,755	10,791,602	10,899,518	11,008,514	11,118,599	11,229,785	11,342,083	11,455,503	11,570,058	11,685,759	11,802,617	11,920,643
Bike vol. (pvt)	660,184	693,446	726,692	873,910	912,104	950,280	988,437	1,026,575	1,064,695	1,102,795	1,140,877	1,178,940	1,216,984	1,255,009	1,293,016	1,331,003	1,368,972	1,406,923	1,444,855	1,482,768	1,520,662
Bike vol. (busn)	34,747	36,497	38,247	45,995	48,005	50,015	52,023	54,030	56,037	58,042	60,046	62,049	64,052	66,053	68,053	70,053	72,051	74,049	76,045	78,040	80,035
Car vol. (pvt)	9,128,424	9,219,708	9,311,905	9,405,024	9,499,074	9,594,065	9,690,006	9,786,906	9,884,775	9,983,622	10,083,459	10,184,293	10,286,136	10,388,998	10,492,888	10,597,816	10,703,795	10,810,833	10,918,941	11,028,130	11,138,412
Car vol. (busn)	6,085,616	6,146,472	6,207,937	6,270,016	6,332,716	6,396,043	6,460,004	6,524,604	6,589,850	6,655,748	6,722,306	6,789,529	6,857,424	6,925,998	6,995,258	7,065,211	7,135,863	7,207,222	7,279,294	7,352,087	7,425,608
Bus vol. (pvt)	206,571	208,636	210,723	212,830	214,958	217,108	219,279	221,472	223,686	225,923	228,182	230,464	232,769	235,097	237,447	239,822	242,220	244,642	247,089	249,560	252,055
Bus vol. (busn)	36,454	36,818	37,186	37,558	37,934	38,313	38,696	39,083	39,474	39,869	40,267	40,670	41,077	41,488	41,902	42,322	42,745	43,172	43,604	44,040	44,480
Tram vol. (pvt)	8,304,072	8,387,113	8,470,984	8,555,694	8,641,251	8,727,663	8,814,940	8,903,089	8,992,120	9,082,042	9,172,862	9,264,591	9,357,237	9,450,809	9,545,317	9,640,770	9,737,178	9,834,550	9,932,895	10,032,224	10,132,546
Tram vol. (busn)	1,465,425	1,480,079	1,494,880	1,509,828	1,524,927	1,540,176	1,555,578	1,571,133	1,586,845	1,602,713	1,618,740	1,634,928	1,651,277	1,667,790	1,684,468	1,701,312	1,718,325	1,735,509	1,752,864	1,770,392	1,788,096

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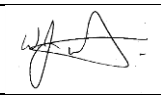
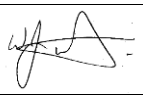
Final 2	Ainsley Nigro	Wennie van Lint		Wennie van Lint		28/04/2014

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CONTEXT

in collaboration with DAVID YOUNG

SOUTH AFRICAN SOLDIERS' MEMORIAL

CONSERVATION MANAGEMENT PLAN

St Kilda Road, Melbourne

Final Report

15 June 2016

Prepared for

City of Port Phillip

Project Team:

David Young, Heritage Consultant

Natica Schmeder, Associate

Annabel Neylon, Associate

Helen Doyle, Senior Consultant

Report Register

This report register documents the development and issue of the report entitled 'South African Soldiers' Memorial Conservation Management Plan' undertaken by Context Pty Ltd in association with David Young in accordance with our internal quality management system.

Project No.	Issue No.	Notes/description	Issue Date	Issued to
2086	1	History & significance	22 March 2016	Sandra Khazam
2086	2	Issues section	6 May 2016	Sandra Khazam
2086	3	Policy section	31 May 2016	Sandra Khazam
2086	4	Full draft report	3 June 2016	Sandra Khazam
2086	5	Final report	15 June 2016	Sandra Khazam

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CONTENTS

1 INTRODUCTION

1.1 Background

This conservation management plan was commissioned by the City of Port Phillip for the South African Soldiers' Memorial in their capacity as the owner and caretaker of the Memorial, and as the Committee of Management for the whole of Albert Reserve on which it sits.

Albert Reserve is located at 29A Albert Road, South Melbourne, at the junction with St Kilda Road. The reserve is triangular in form, sitting between two forks of the Albert Road roadway.

Figure 1. Location of the Memorial and Albert Reserve, indicated by red arrow. (Source: Melway, 2016)

Albert Reserve was laid out in the 1880s as an ornamental reserve with tree plantings established along St Kilda road c.1895, and by the late 19th century was used as a recreation reserve with a tennis court. The South African Soldiers' Memorial was erected on the St Kilda Road side of the reserve in 1923-24.

The preparation of this conservation management plan has been precipitated by two particular issues, and its content reflects this. The first was the cleaning of the four sandstone lions that flank the Memorial, about which Heritage Victoria have expressed some concerns. The second is the imminent construction of the Melbourne Metro Rail Project and the associated Domain

Station which is to be located at the Domain Interchange, adjacent to this site. Current planning for the Metro project envisages the South African Soldiers' Memorial being dismantled and relocated to allow for construction of the Domain Station.

1.2 Project objectives

Like most conservation management plans, this one seeks to document and understand the history and heritage significance of the South African Soldiers' Memorial and its site, and use this as the basis for policies that should guide its ongoing care and management into the future.

In addition, in response to the current issues affecting this site, it also includes:

- Detailed guidance on stone conservation issues, particularly an assessment of current conditions and guidelines for future conservation works;
- Recommendations for planning and executing the dismantling, storage and reconstruction of the Memorial, should this be necessary as part of the Melbourne Metro works;
- Examination in particular of the significance of the location of the Memorial, with policy and guidance that arises from this;
- Policies that arise from and seek to protect all aspects of the heritage significance of the Memorial and its site in order to assist the City of Port Phillip in developing its formal response to the proposals of the Melbourne Metro Rail Project.

1.3 Scope

The scope of this conservation management plan has been broken down into five stages in line with the structure set out in the Heritage Council of Victoria's 'Conservation Management Plans: Managing Heritage Places, A Guide' (2010):

- Understand the place:
  Document the place and its components
  Document its history and associations
- Assess significance
  Define the heritage values and the elements of heritage significance
  Revise the statement of significance
  In this stage a range of elements of local significance, not mentioned in the current statement of significance, were identified.
- Identify issues
  Assess condition
  Define conservation obligations
  Identify future needs and requirements
  Identify opportunities & constraints

  In particular, this task was intended to cover the current uses of the site, the aspirations of the many stakeholder groups, as well as the threats posed by the planned Melbourne Metro Rail Project.
- Develop conservation policies
  Define specific management policies
- Prepare an action plan
  This task had as its focus conservation works for the materials comprising the Memorial.

1.4 Study area

The study area for this conservation management plan was that land covered by the Victorian Heritage Register (VHR) extent of registration. This area corresponds with Albert Reserve, as shown on the following plan.

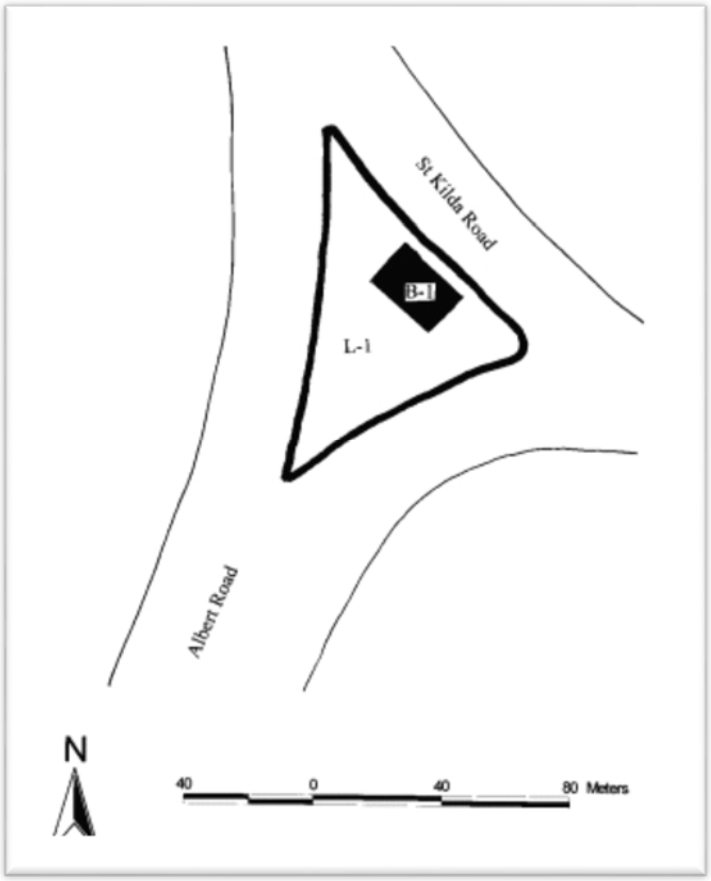

Figure 2. Extent of registration on the VHR, with the Memorial shown as B-1. (Source: Heritage Victoria)

The extent of registration is defined as follows:

1. All of the structure known as the South African Soldiers' Memorial as marked B-1 on Diagram 607726 held by the Executive Director.

2. All of the land marked L-1 on Diagram 607726 held by the Executive Director.

As the study area contains other elements assessed in this report as having local (or higher) significance, these were also taken into account when developing conservation policies. These elements are:

- The English Oak (*Quercus robur*) from Windsor Castle, planted in 1939, and the plaque at its base;
- The plaque which represents the former Firewheel Tree, planted in 1939;
- Triangular plan of the reserve, established in 1888;
- Row of 10 Golden and English Elm trees along the reserve boundary with Albert Road north c. 1900-1915;
- Row of eight English Elm trees along the reserve boundary with St. Kilda Road: three dating from c.1890, three dating from c1900-1915 and two much later plantings;

- Two English Elms, the surviving specimens representing a mixed species row planting along the reserve boundary with Albert Road south, dating from c. 1900-1915;
- Open lawn at the centre of the reserve as a setting to the memorial;
- Stone drinking fountain of 1910, built by monumental mason G. Dawe;
- Remnant areas of interwar bluestone edging around the reserve.

1.5 Project methodology

The report has been prepared in accordance with *The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance* (2013) and its Practice Notes. Its structure is based on the Heritage Council of Victoria's 'Conservation Management Plans: Managing Heritage Places, A Guide' (2010) as well as Context's standard CMP template.

Project inception and scoping

David Young and Natica Schmeder attended the inception meeting on 9 February 2016 with the City of Port Phillip's project manager Sandra Khazam, and other council staff knowledgeable about the site, Damian Dewar and Scout Morris.

This meeting provided an opportunity for Port Phillip to provide background information they had gathered regarding the history of the site, the current issues surrounding it, and the aspirations of the City of Port Phillip for the site. The scope of the project, and timelines were also determined at this meeting.

Understand the place

As a place already in the municipal Heritage Overlay and the Victorian Heritage Register, the general history of the South African Soldiers' Memorial was well known and documented. For this reason, the historical research focussed on explaining the context for the creation of the Memorial over 20 years after the cessation of the Boer War. The history of its site, Albert Reserve, was also researched and documented, as this was not included in the current heritage citations.

Although no further original plans or primary records of the Memorial's construction could be located, considerable new material was obtained through online newspaper research (via Trove), which added significantly to our understanding of the role of the Memorial in the period from the 1920s to the 1950s.

Site visits were made in order to describe the place and identify all features of interest, both natural and man-made.

Assess significance

The significance of the Memorial had already been assessed at a municipal and State level, but this was 20 years ago. A comparative analysis looking at other Boer War Memorials in the City of Port Phillip and the State of Victoria was carried out.

This and the historical research informed a revision of the current Heritage Victoria statement of significance, drawing out more strands of the Memorial's historic significance, as well as recognising elements of local heritage significance at the site.

Identify issues

This stage involved the gathering of information on the main factors affecting the future of the site, often called the constraints and opportunities. It includes issues for consideration such as statutory obligations due to heritage listing, the physical condition of the Memorial and its site, the aspirations of the City of Port Phillip and other groups. The imminent Melbourne Metro Rail tunnel project, with a new station planned at the Domain Interchange, was also a major issue to be understood and reflected in the policy.

To gather input from the numerous stakeholders, on 14 April 2016 three consultation meetings were held by the project team and the City of Port Phillip. The three stakeholder groups were: 1) Melbourne Metro Rail Authority and their consultants; 2) Military history groups and the National Boer War Memorial Association; and 3) heritage groups. Local residents group G12 Precinct Group Committee was not able to attend on the day, but they responded in writing to a list of questions.

The consultation workshops were useful not only to find out about plans for the site, and the aspirations of various groups for the future location and use of the Memorial, but also to investigate the kind of community attachments to it.

Further issues were identified through the site inspections, which included documentation of the materials and condition of the Memorial.

Develop conservation policies

Conservation policies were developed for the Memorial and all other elements of heritage significance on the site, including trees and landscaping. Policies were provided for the place as whole, its setting, the physical fabric of the structures and landscape elements, the uses and associated community attachments, and interpretation of the Memorial. The policy on new development makes special reference to the Melbourne Metro plans.

For each policy area, a high level policy in line with the *Australia ICOMOS Burra Charter* is followed by application of that policy to specific issues identified. In some cases, further discussion of how these detailed policies could be applied to current issues is provided. The high level, guiding policies should be applicable to other issues that may arise in the future, while the detailed policies should be revisited and revised regularly into the future as the issues faced change.

Develop an action plan

The action plan puts the recommendations that arise from the conditions survey and prioritises these actions. Certain actions recommended in the detailed policies were also noted in this section as a priority.

1.6 Acknowledgements

We wish to thank the following people for their input into the development of this CMP.

Those at the City of Port Phillip:

- Sandra Khazam, Art & Heritage Team Leader, who was the project manager and our liaison at the City of Port Phillip
- Tom Courtice, Strategic Transport Planner, City of Port Phillip
- Damian Dewar, Place, Strategy & Development, Coordinator City Design
- Mark Fusco, Coordinator of Parks Service, City of Port Philip
- And those who participated in the stakeholder consultation meetings or contributed to background and history research:
- Simon Adams, Precinct Manager, Melbourne Metro Rail Authority
- Maggie Baron, Planning and Environment, Hyder Consulting for Melbourne Metro Rail Authority
- Kate Gray, Associate Director, Lovell Chen for Melbourne Metro Rail Authority
- Marcus Fielding, President, Military History & Heritage Victoria
- Ian George, Deputy Chairman, National Boer War Memorial Association

- Graham Lockwood, member City of Port Phillip WWI Centenary Commemorative Committee
- Bill Woolmore, Secretary, National Boer War Memorial Association
- Margaret Bridge, Port Melbourne Historical & Preservation Society and City of Port Phillip Cultural Heritage Reference Committee
- John Briggs, heritage architect and member of City of Port Phillip Cultural Heritage Reference Committee
- Felicity Watson, Senior Community Advocate, National Trust of Australia (Victoria)
- Fraser Read-Smith, G12 Precinct Group Committee
- Fred Pratt, Victorian branch of the RSL
- Martin Zweep, Heritage Victoria

1.7 Project management and project team

The project team comprised stone conservation specialist David Young and Context Pty Ltd consultants.

David Young was the project leader and provided expert input into stone conservation issues, including the conditions survey (for which he was assisted by Rebecca Roberts, stonemason). He also attended the stakeholder consultation meetings and reviewed the document as it was developed and helped develop the conservation policies.

Context Associate Natica Schmeder managed the preparation of the report, and wrote the key factors shaping policy, the general conservation policies, and part of the comparative analysis.

Context Senior Consultant Dr Helen Doyle was the project historian, carrying out the research and history writing, as well as the comparative analysis and updated statement of significance.

Annabel Neylon surveyed the landscape and its elements, assessed their relative significant, and contributed to the issues, policies in this regard.

2 UNDERSTANDING THE PLACE

2.1 Brief Chronology

1855: A small triangular reserve is marked on the James Kearney plan of Melbourne of 1855.

1884: The triangular site is reserved for public purposes.

1888: Part of Albert Road near its intersection with St Kilda Road is retained as a Crown land reserve, set aside as a 'Tree Reserve'.

1890: An area of 1 rood was reserved as an ornamental plantation, being CA 6A, Section 58 in South Melbourne. This triangular allotment was much smaller than the current Albert Reserve, and comprises the southern corner of the current reserve.

By 1895: 10 street trees are established along the east side of the reserve (St Kilda Road).

1899-1902: The Boer War takes place in South Africa, involving the recruitment of Australian men on the side of the British.

1901: Visit to Melbourne by the Duke and Duchess of York.

1903: Monument erected in St Kilda Road on the edge of the Domain, opposite Victoria Barracks, by the Fifth Contingent of the Victorian Mounted Rifles in memory of their comrades who died in the Boer War.

1910: Memorial drinking fountain presented to the City of South Melbourne by Mayor John Cockbill. This Gothic Revival stone structure was created by monumental mason G. Dawe of Carlton. Additional English and Golden Elm trees may have been planted in both arms of Albert Road at this time.

1911: Deputation from the South African Soldiers' Association to the Lord Mayor of Melbourne requesting a site for a national memorial for the Victorians who had died in the conflict.

1911: Introduction of compulsory military training in Australia.

1914-1918: World War I caused delays in the progression of plans for the new Boer War memorial in Melbourne.

1915: A design competition held for the Boer War memorial in Melbourne was won by Scottish architect William Shepherd Moyes.

1916: A memorial tree-planting ceremony was held in the Domain in St Kilda Road for those fallen in World War I – this is believed to be located on the land which has now been redeveloped as the forecourt of the Shrine of Remembrance.

1921: A public design competition was held for the proposed South African Soldiers' Memorial, won by Melbourne architects Irwin and Stevenson.

1923: The design was finalised and construction began.

1923: On Empire Day 1923, the first parade of Boer War veterans from Alexandra Avenue to the future site of the new South African Soldiers' Memorial on St Kilda Road (which was then unfinished).

1924: Opening Ceremony of the South African Soldiers' Memorial; responsibility for the memorial is taken over by the City of South Melbourne.

1927: Commencement of building works for the Shrine of Remembrance in St Kilda Road as a national memorial to those Australians who died in the Great War of 1914-1918.

1934: Official opening of the Shrine of Remembrance on St Kilda Road.

1939: Tree-planting ceremony takes place at the South African Soldiers' Memorial, with the planting of two specimen trees (an English Oak and Queensland Firewheel Tree).

1952: The addition of the four 'heroic lions' carved in sandstone to the perimeter of the memorial.

2.2 History

The call for a 'national' memorial for the South African War

The Colony of Victoria in 1899, although on the cusp of nationhood and transition to a state within a Federated nation, remained strongly loyal to the Crown. The war in South Africa from 1899 to 1902 was waged by the occupying British against the Boer republicans, who were descendants of Dutch settlers. Around 12,000 Australians (many of British descent or British parentage) joined the British forces in a show of imperial solidarity. Around 600 Australians were killed, and of that figure around half (265) came from Victoria. A large elaborate Gothic-style memorial to those who had died was erected in 1903-04, shortly after the end of the war, through private subscription by the Fifth Contingent of the Victorian Mounted Rifles 'in memory of their fallen comrades in South Africa',[1] and this was prominently sited on the east side of St Kilda Road on the edge of the King's Domain, opposite Victoria Barracks.[2] With the cessation of the war in South Africa, an annual march of veterans from Alexandra Avenue, along St Kilda Road to this memorial took place on Empire Day, beginning in 1904.[3]

A South African soldiers' memorial was conceived in peace time in 1911, several years before the onset of the Great War. A deputation waited on the Lord Mayor of Melbourne in 1911, seeking to achieve this objective.[4] Whilst the existing memorial on St Kilda Road adequately served the purpose of a Boer War memorial for the city, it was not a publicly erected memorial that officially represented *all* fallen soldiers in Victoria. As a result, a new memorial was proposed, to be funded by public subscription and government aid. While it was intended at the time to represent those Victorians who had died in the Boer War, it was frequently referred to in the press of the day as a 'national memorial'.[5] The motion passed by the Governor of Victoria at a public meeting in the Melbourne Town Hall in November 1911 declared that the memorial was to be erected in honour of 'the sons of Victoria who first knew war'.[6]

Plans for the new memorial were delayed considerably on account of Australia's commitment to the war of 1914-18, and subsequent readjustment to peacetime. A public design competition was held in October 1915 and a winner selected – the Scottish architect William Shepherd Moyes.[7] For reasons unknown, this design by Moyes appears to have been abandoned. There was also difficulty in securing a suitable site within the City of Melbourne. A site on the west side of St Kilda Road within the City of South Melbourne, on the border of the City of Melbourne, was proposed in 1920.

The proposed location for the memorial was a triangular public reserve at the intersection of St Kilda Road and Albert Road. This had been set aside as a 'Tree Reserve' at the request of the City of South Melbourne on 13 September 1888 and proclaimed an 'Ornamental Reserve' in 1890.[8] Whilst there was considerable opposition to the site being outside the City of

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[1] Citation 'Boer War Monument' (H0382), Victorian Heritage Register. In 1966 the Boer War monument was moved several metres into the Domain from its original location on St Kilda Road.
[2] This memorial was relocated into the Domain proper in 1966.
[3] See, for example, *Geelong Advertiser*, 6 April 1908.
[4] *Unveiling Ceremony … 1924*.
[5] *Age*, 2 November 1911; *Bendigo Advertiser,* 15 June 1911. Note that, in the end, the completed memorial's plaque reads that it is dedicated to 'the Australians who fell', not just Victorians.
[6] *Unveiling Ceremony … 1924*.
[7] *Argus*, 16 October 1915, 20 October 1915
[8] *Victorian Government Gazette*, 19 October 1888, p. 3174. The 1890 reservation details taken from the Parish Plan of South Melbourne.

Melbourne, St Kilda Road (regardless whether the east or west side[9]) was particularly suitable for the erection of memorials. This major city thoroughfare and entrance to the city had been co-opted as part of a grand civic boulevard, and redeveloped for the visit of the Duke and Duchess of York in 1901 on the occasion of the opening of the first Federal Parliament. St Kilda Road was again the entry point to the City of Melbourne in 1920, with the visit of the Prince of Wales. Referring to this occasion, historian Charles Daley described St Kilda Road as a 'truly royal highway'.[10] The site was regarded favourably because it was on a busy thoroughfare, with the Unveiling Ceremony pamphlet noting in 1924 that 'scores of thousands of citizens daily pass this site'.[11] The site was also in close proximity to Victoria Barracks and directly opposite the Domain; the functions of both these places were elevated to national importance between 1901 and 1927 when Melbourne, as the seat of Federal Parliament, was the interim capital city of the newly federated Australian nation. The Domain and its environs, with its direct imperial association with the vice-regal presence of Government House (1876), and home of the Governor-General from 1901 to 1927, presented as the appropriate place for publicly recognising Australia's part in the Empire. The Domain had other military associations. As well as providing the backdrop for the earlier Boer War memorial of 1903, it had accommodated the Engineers' Camp, the recruitment camp, and a signalling training camp during World War I. In addition, a Victorian mansion known as 'The Grange' was erected in the Domain and used as the Commanding Officer's residence. This stood near the corner of Domain Road and St Kilda Road (not far from the current site of the Shrine of Remembrance) until it was destroyed by fire in 1917.[12] The Domain itself came to accommodate a large number of memorials to the war dead and to military leaders, most notably with the Shrine of Remembrance (1927-1934) and within the immediate Shrine precinct, but also including the statues of Sir John Monash and General Blamey, and more recently the statue of Sir Edward 'Weary' Dunlop (1993) and the memorial erected to all Indigenous servicemen and women by the Indigenous Remembrance Committee (2014).

Sourcing adequate funds for the venture was hampered somewhat by competing requests for the funding of the World War I memorials. Memorialising the several hundred Victorians who lost their lives fighting in the Boer War was overshadowed by the shockingly high death tolls of tens of thousands of men suffered during World War I. As early as 1916, men from Victoria Barracks had crossed St Kilda Road and walked up the hill of the Domain to plant a stand of memorial trees, close to the site of what is now the Shrine of Remembrance.[13]

Building the South African Soldiers' Memorial

By the end of World War I, the project to build a national South African soldiers' memorial in Melbourne had gained renewed enthusiasm, no doubt swept up in the nation-wide movement to have war memorials erected in every town and city from which men had departed for the Great War. Buoyed by this earnest commitment to erect war memorials – whether for civic-minded reasons of imperial and national loyalty, or for the sake of grief and the need to mourn – a public design competition was held for a national soldiers' memorial on St Kilda Road in 1921.[14] Architects Leighton Irwin and Roy Stevenson submitted the winning design (see Figure 3 & Figure 4). Their design was finalised in 1923, submitted to the City of South Melbourne, and approved.[15]

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[9] Note that the statue of the popular Scots bard Robbie Burns had been erected on the west side of St Kilda Road in 1904.

[10] Charles Daley, *History of South Melbourne*, Robertson and Mullens, Melbourne, 1940, p. 266.

[11] *Unveiling Ceremony … 1924*.

[12] Lovell Chen, *Shrine of Remembrance CMP*, 2010, p. 9.

[13] Ken Inglis, *Sacred Places: War memorials in the Australian landscape*, Melbourne University Press, Carlton, 2005, p. 68.

[14] *Age*, 21 July 1921.

[15] Daley, 1940, p. 268.

Construction of the memorial commenced in 1922 and was completed by mid-1924. It comprised an imposing 73 foot high obelisk of grey Harcourt granite set upon a podium.[16] The durable Harcourt granite was well suited to memorials as it splits well into regular blocks, making it useful for building in an era before modern diamond sawing technology. The South African Memorial obelisk was decorated with a bronze 'crusader's sword' and a bronze plaque, affixed to the side facing St Kilda Road, and an encircling bronze wreath of eucalyptus leaves and gumnuts (instead of the classical laurel leaves).[17] The bronze plaque on the face of the plinth, designed as part of the whole by Irwin & Stevenson, expresses the state and national aspects of the memorial, reading that it was 'Erected by the people of Victoria in memory of the Australians who fell in the South African War'.

There are no names of the fallen listed on the monument itself but the names of the members of the South African Soldiers' Memorial Executive Committee are included, which historian Ken Inglis suggests may have been a self-congratulatory response by the relieved Committee members in finally succeeding in getting the project finished.[18] The siting of the memorial and the long delay in getting it financed and completed reveal something of the complex and conflicting attitudes of the population to Britain's war against the Boers, including a level of apathy and even disinterest from some quarters in Melbourne about remembering the Boer War.[19] The Great War dramatically eclipsed the losses of the Boer War, and the South African Memorial Committee would have struggled at times in the early 1920s to gain the necessary funding and support for a substantial memorial to this less significant conflict.

[16] Material published by the National Boer War Memorial Association (Victoria) states that the granite came from a quarry in Tynong. While this is known to be the source of the granite for the Shrine of Remembrance, press articles from the 1920s only record that the South African Soldiers' Memorial was constructed of *Harcourt* granite (see *The Argus*, 5 Oct. 1921, p 11 & 12 Jan. 1922, p 6).

[17] *Age*, 12 January 1922.

[18] Ken Inglis, *Sacred Places: War memorials in the Australian landscape*, Melbourne University Press, Carlton, 2005 (first published 1998), p. 68.

[19] See C.N. Connolly, 'Class, birthplace, loyalty: Australian attitudes to the Boer War', *Historical Studies*, vol. 18, no. 71, October 1978, pp. 210-232.

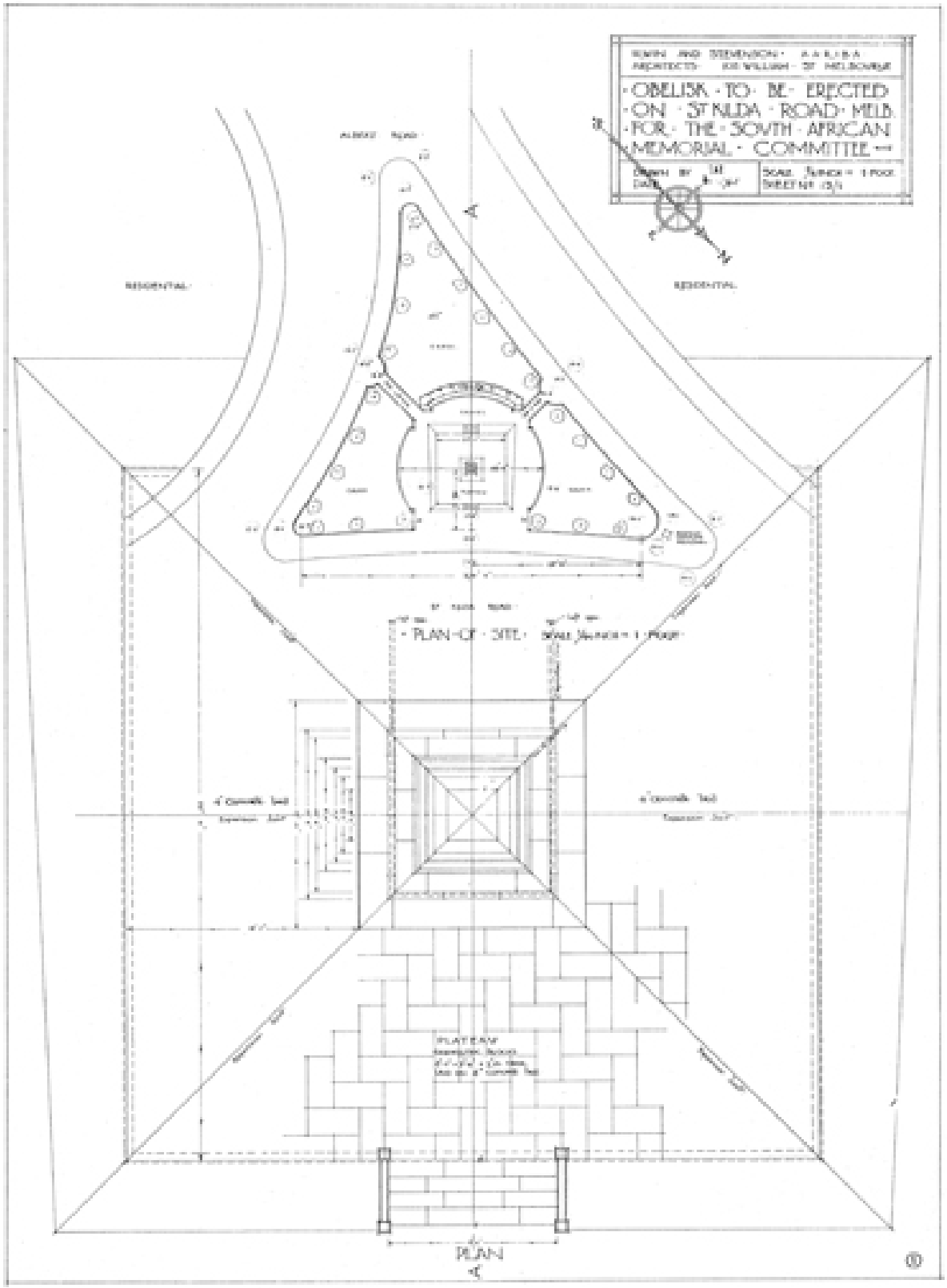

Figure 3. The original plan, 1921, showing placement of trees (source: Port Phillip City Collection, sm0414.1-2)

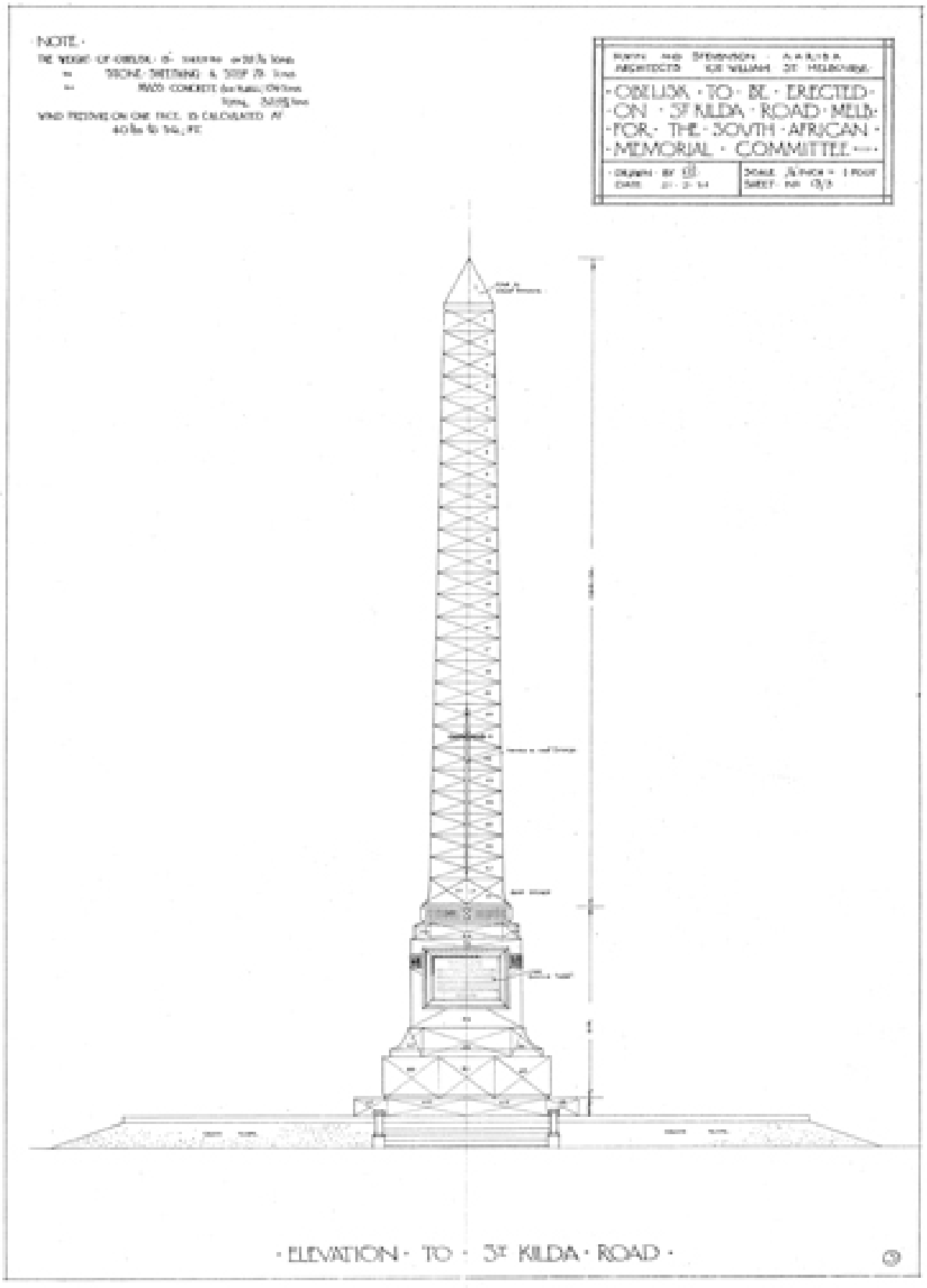

Figure 4. Drawing showing elevation to St Kilda Road, 1921 (source: Port Phillip City Collection, sm0414.1-2)

The official unveiling ceremony took place on 30 November 1924, presided over by the Governor of Victoria, Lord Stradbroke. One of the speech-makers at the ceremony, the Chief Secretary for Victoria, Dr Argyle, commented that he 'hoped another monument would be

erected on a site opposite to the memory of those who died during the Great War of 1914-1918', his words pre-empting the choice of site for the Shrine.[20] After the unveiling, the South African Soldiers' Memorial Committee formally handed responsibility for the 'perpetual care' of the memorial to the City of South Melbourne.[21]

*Figure 5. Aerial photograph taken by Shaw-Ross Aviation during the unveiling ceremony on 30 November 1924 (*Australasian*, 6 December 1924).*

[20] *Argus*, 1 December 1924.

[21] Daley, *History of South Melbourne*, 1940, p. 268; *Unveiling Ceremony … 1924*.

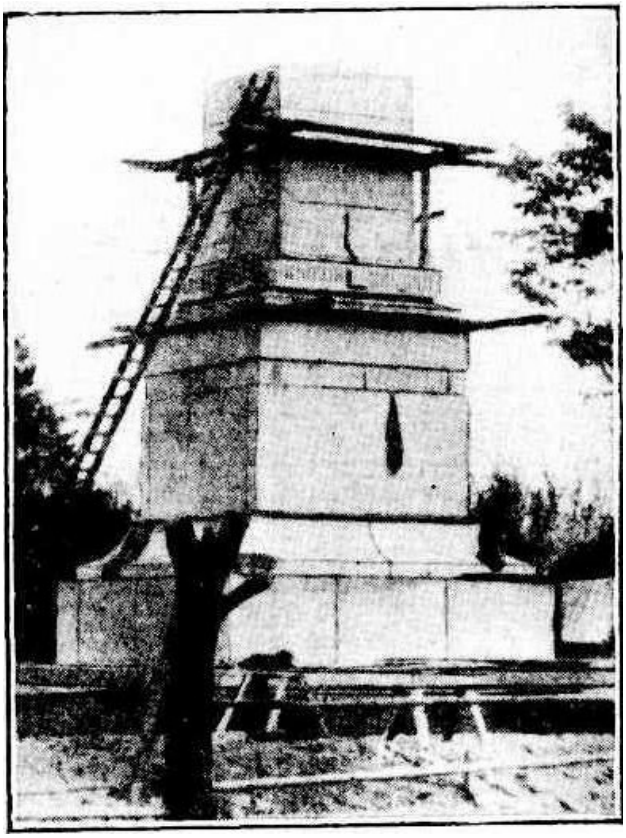

Figure 6. The memorial under construction in 1922 (source: Argus*, 22 October 1922)*

The partnership of Leighton Irwin and Roy Stevenson

Melbourne architect Leighton Francis Irwin (1892-1962) partnered with English architect Roy Kenneth Stevenson (1892-1953), a fellow returned soldier, in 1922. They had met in England following the Great War and subsequently established a partnership in Melbourne.[22] Irwin and Stevenson together designed a number of war memorials, public and institutional buildings, ecclesiastical buildings, and private residences. Both men were elected fellows of the Victorian Institute of Architects in 1929.[23]

Irwin & Stevenson's commissions for war memorials were generally won through public competitions, though the status of both men as 'returned soldier architects' also no doubt worked in their favour. In addition to the South African Soldiers' Memorial in St Kilda Road, they also designed the Camberwell Memorial Hall (1923) and the Brighton War Memorial (1927). They also proposed a design in 1927 for a new public commemorative space, to be called 'Anzac Square', at the top of Bourke Street, facing Parliament House, but this was not developed.[24]

Other notable public works by Irwin and Stevenson include the Camberwell Town Hall and Offices (1924) and the Royal Australasian College of Surgeons (c.1934) [VHR H0870]. After winning the Melbourne Public Library competition in 1924, they were appointed official architects to the Melbourne Public Library (now the State Library of Victoria).[25]

Leighton Irwin travelled to the United States and Europe in the early 1930s to study new developments in hospital design, and made public hospitals his particular speciality in

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[22] *Argus*, 28 July 1923; C. Logan in Goad and Willis (eds), *Encyclopedia of Australian Architecture*, 2012, pp. 355-356.
[23] *Journal of the Victorian Institute of Architects*, March 1929, p. 15.
[24] *Argus*, 4 March and 9 May 1927; Inglis, *Sacred Places*, 2005, p. 304.
[25] Butler, 'Irwin, Leighton', *Australian Dictionary of Biography*, vol. 9, 1983.

Victoria.[26] He was responsible for public hospitals at Boort (1933), Heathcote (1933), Mildura Base Hospital (1934) and the redevelopment of the St Arnaud public hospital (c.1937). Working independently of Stevenson, Irwin became a prolific architect of new and remodelled public hospitals in Victoria, including Box Hill Hospital. His finest work was Prince Henry's Hospital and Nurses' Home on St Kilda Road, Melbourne (1937; demolished).

Irwin and Stevenson made a significant contribution to the development of new styles for residential building in Melbourne during the interwar period, with work distinguished by Mediterranean, Moderne and Georgian Revival elements. There are significant examples of their residential work in Toorak, Hawthorn and Sandringham, as well as Irwin's own home in Holmwood Avenue, Brighton (1927).[27] Irwin and Stevenson dissolved their partnership in 1938, with Irwin continuing to practise as Leighton Irwin & Co.

Figure 7. Architects Leighton Irwin (left) and Roy Stevenson (right) (source: Journal of the Victorian Institute of Architects*, March 1929)*

The annual Empire Day commemorations

The South African Soldiers' Memorial became the focus of remembrance services from 1923 through to the 1960s – as a focal point for the annual remembrance services of the South African Returned and Active Soldiers' Association, and as a place of pilgrimage for returned soldiers, and for the families and friends of those who had lost their lives in the Boer War. The annual parade and memorial service took place on Empire Day (24 May). Several hundred Boer War veterans would march behind colours with their contingents, with music provided by the Kilties Brass Band and other municipal brass bands from Melbourne.[28] The inaugural event had taken place in 1904, but from 1904 until 1922, the finishing point for the march was the earlier Boer War memorial in St Kilda Road. In 1923, however, the annual march of veterans continued along St Kilda Road past the earlier memorial and terminated instead at the site of the new South African Soldiers' Memorial, then under construction.[29]

This annual event gained momentum through the 1920s, and the event was reported in the major newspapers each year without fail.[30] The service was presided over by the Governor of

[26] *Argus*, 16 August 1932.
[27] Butler, 'Irwin, Leighton', *ADB*, 1983; John Statham, 333 Wattletree Road, Glen Iris, report to the City of Stonnington, 24 March 2003.
[28] See, for example, *Argus*, 22 May 1922.
[29] *Argus*, 21 May 1923.
[30] This was reported each year at least to the mid-1950s (subsequent years have not been checked for the purpose of this project).

Victoria, who would lay a wreath at the memorial, with participation by the Councillors of the City of South Melbourne, politicians, and the president of the South African Soldiers' Association of Victoria.[31] A newspaper report of the march of veterans in the late 1920s mentioned the presence of men from not only the Boer War, but also 'a sprinkling of veterans of earlier wars'.[32] After the annual service there was a reunion of veterans at a venue in the central city; this would have continued until the 1960s and then no doubt petered out as survivors would have numbered only a few by that time.

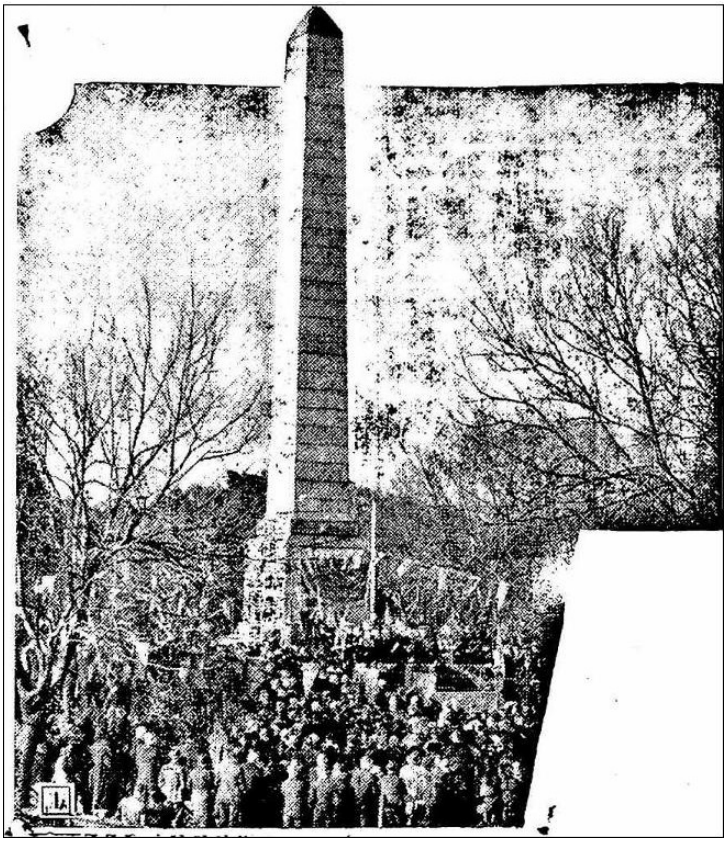

Figure 8. The annual memorial service in 1935 (source: Shepparton Advertiser*, 28 May 1935)*

Designing the memorial's landscape setting

The small triangular piece of land at the intersection of St Kilda Road and Albert Road was set aside as a 'Tree Reserve' in 1888. The MMBW detail plan of 1895 shows a row of ten street trees along St Kilda Road, in line with the east side of the reserve, and a matching row of ten trees along the median strip (see Figure 8). The MMBW plan also shows the triangular reserve to be enclosed by a fence and what appear to be gates at the corners of the reserve on St Kilda Road. In July 1923, permission was sought for two trees to be moved to make room for the memorial, indicating that there were pre-existing trees within the reservation by that time.[33]

In 1923, in compensation for the damage incurred during construction, the City of Melbourne gave the City of South Melbourne the sum of £50 to repair the damage to the ground, to re-form that footpath, and to plant lawn.[34]

A photograph of the reserve from the c. 1930s (see Figure 10) shows three (possibly four) of the 1890s English Elms extant on the St Kilda Road frontage although at least two had been removed in the middle of the row to provide a view of, and physical access, to the new

[31] *Argus*, 21 May 1934.
[32] *Age*, 29 May 1929.
[33] *Argus*, 6 July 1923.
[34] *Argus*, 1 February 1924.

memorial. The image also shows that a number of younger Elms (c1900-15) had been planted (possibly replacing earlier failed specimens) on the northern end of the St Kilda Road frontage; which accords generally with the existing planting. The Elm row on Albert Road (north) is shown as a well-established intact row in this image, although the four inter-planted Golden Elm and English Elms at the western end of the perimeter appear to pre-date those at the eastern end. There are only a limited number of mixed species plantings along the Albert Road (south) frontage at this time, including at least two English Elms which appear to be contemporary in size and date to the Albert Road north trees.

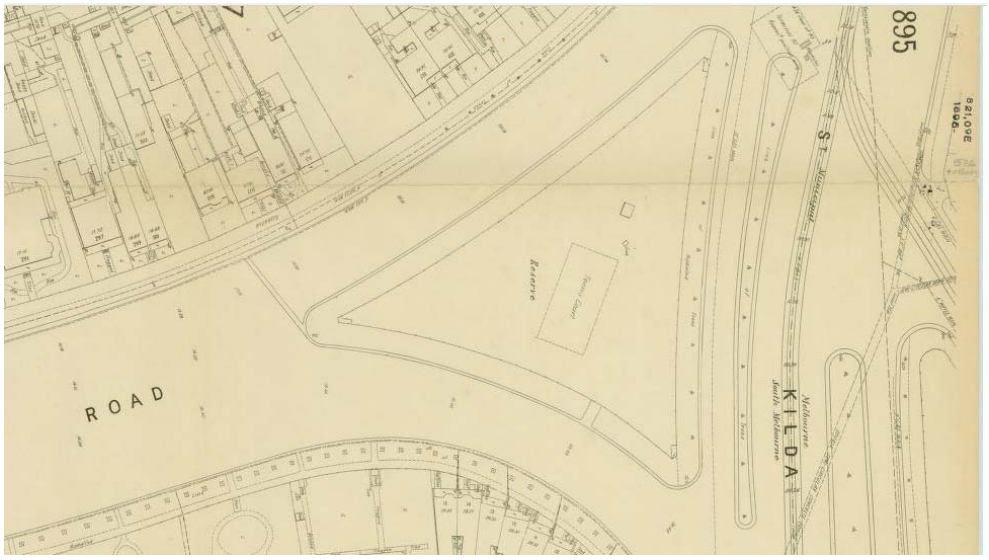

Figure 9. Extract from MMBW Detail Plan 649 for South Melbourne, showing the reserve with tennis court, in 1895 (source: State Library of Victoria)

In 1939 a tree-planting ceremony took place at the South African Soldiers' Memorial with the planting of two specimen trees: an English Oak (*Quercus robur*), also described as a 'royal oak', sourced from stock from Windsor Castle, England, no doubt as a tribute to the Empire, and a Queensland Firewheel tree (*Stenocarpus sinuatus*), selected to represent Australia. Plaques were also installed to identify these plantings.[35] The Windsor Oak planted at the South African Soldiers' Memorial was one of many propagated from acorns from Windsor Castle and grown by the curator of the Botanic Gardens at the time. The acorns were distributed during coronation ceremonies in 1937 to all of the Governments and colonies of the Empire, and grown on. Other 'Windsor Oaks' are known to have been planted in Victoria in Tatura Gardens (1939), Rochester RSL memorial grounds (1939), various school grounds and numerous sites across Australia. A flagpole sited close to the obelisk also appears in photographs of the annual memorial service in the 1930s (see Figure 7).

[35] *Age*, 30 September 1939.

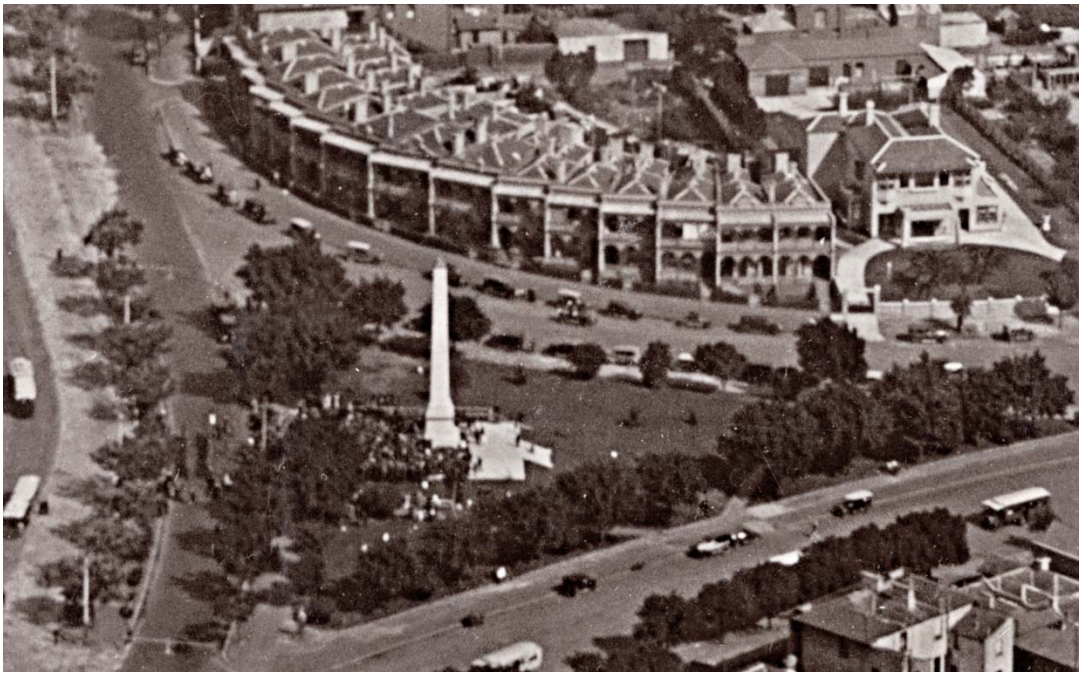

Figure 10. Detail from an aerial photo by Garrett, c1924-40, which has captured a ceremony in progress at the monument (source: State Library of Victoria)

Figure 11. View from the Shrine looking south, 1934 (source: State Library of Victoria)

Completing the memorial

While the brochure for the unveiling ceremony on 30 November 1924 depicts lions on low pedestals ringing the monument, it took twenty years after the memorial's erection for four imperial lions to be installed. Efforts had been made in 1932 to have the memorial completed,[36] but possibly owning to the lack of public funds during the Depression there were further delays. Four sandstone lions sculpted by Stanley Hammond, were finally added in 1952, fifty years since the end of the Boer War. It was also the year that Queen Elizabeth II assumed the throne after her father's death – the young queen sparked new enthusiasm in Melbourne and across Victoria for the British royalty and the cause of Empire. The four lions were seated

[36] Newspaper report cited in Lovell Chen, Memorandum, 22 January 2016

upon four stone pedestals, standing guard at the four corners of the memorial, symbolically representing the might of the British Empire, and referencing the fauna of Africa. The original design by Irwin & Stevenson had included six lions,[37] but this was later reduced to four, possibly as a cost-saving.

Stanley Hammond was a prominent sculptor in Melbourne at the time. He taught sculpture part time at RMIT for twenty-two years and was president of the Victorian Sculptors' Society in 1952 and in 1956/57.[38] Another notable work in Melbourne is his statue of the 'founder of Melbourne', John Batman (c.1962), located in the National Mutual Building Plaza, Collins Street, Melbourne.[39]

Figure 12. Sculptor Stanley Hammond carving one of the lions (source: Argus*, 19 February 1952)*

Figure 13. The 31st annual South African Memorial Service in 1934, showing the Governor of Victoria Lord Huntingfield laying a wreath (source: Argus*, 21 May 1934)*

[37] *Unveiling Ceremony, … 1924*.

[38] Ken Scarlett, *Australian Sculptors*. Thomas Nelson, West Melbourne, 1980.

[39] Scarlett, 1980.

Figure 14. The annual march to the memorial on Empire Day, 1937 (source: Argus*, 24 May 1937)*

Recognising heritage

Like other memorials to Australians who died fighting in overseas conflicts, both in the Boer War and later conflicts, the South African memorial offered the bereaved a substitute grave for their loved ones, a place of contemplation, and a place of collective remembering.

While the Boer War remembrance group no longer holds events at the South African Soldiers' Memorial, the site was included in the heritage trail and app *100 places for 100 years* Victorian War Heritage Trails, which was developed by the Victorian Government in 2014 as part of the official Centenary of Anzac commemorations.[40]

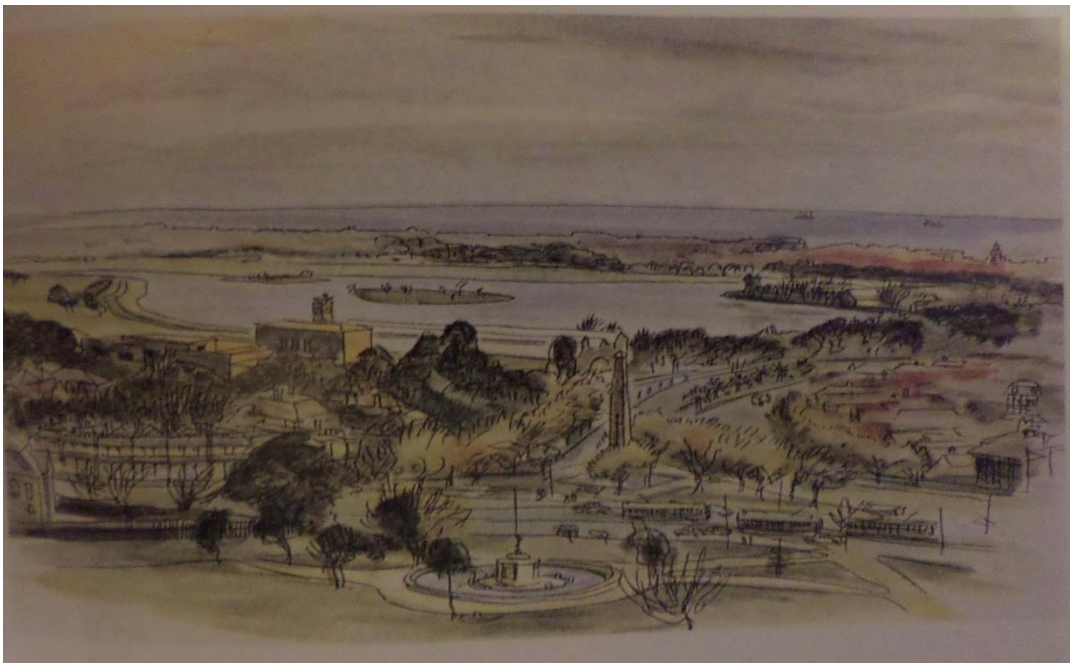

Figure 15. View from the Shine by artist Kenneth Jack, pen and watercolour, c.1948 (source: reproduced from Judith Buckrich, Melbourne's Grand Boulevard*, p. 105)*

[40] http://heritage.portphillip.vic.gov.au/Whats_on/World_War_I_commemorative_events

2.2 Description

Setting and views

The South African Soldiers' Memorial stands on a triangle of land (Albert Reserve) facing the broad boulevard of St Kilda Road and between two forks of Albert Road. The land slopes down slightly from east to west. While it has an Albert Road address, the monument and its setting are located along the St Kilda Road frontage of the triangle and address this major thoroughfare. As was shown on the 1923 plan by architects Irwin & Stevenson, the three apexes of the triangle are rounded, to allow for traffic movement, and the north and south sides along Albert Road are slightly concave (see Figure 3). Since this initial plan, car parking has been added along all sides of the triangle.

The monument is a landmark when exiting Domain Road, onto St Kilda Road. It has a far lower level of visibility when approaching from the south or north along St Kilda Road due to the mature trees along the boundaries of the triangle, and the sweeping curve of road on which it is set. The same is true when approaching from the west or along either fork of Albert Road. While the monument is located just south-west of the nearby Shrine of Remembrance, viewlines between them are partially obstructed by trees when in leaf, with the apex of the Shrine visible for most of the year.

Built form to the north and south, along Albert Road, is generally high-rise, built nearly to the property boundaries. The road reserve, however, is relatively wide, so the setting of the monument still has a spacious feel to it.

The monument was designed to be the dominant element on this part of St Kilda Road. This has been lost to some extent with the construction of the Shrine of Remembrance across from it, and particularly the high-rise towers around it and the maturing of the nearby trees.

Soft landscape elements

The Albert Road (north) and St Kilda Road frontages have long had established row plantings of Elms, while Albert Road (south) has had less consistency to the perimeter planting treatment, which is still represented in the fabric of the place today. While the three sides of the triangle retain some mature plantings of Elms, the integrity and age of each perimeter row varies. The northern side of the triangle retains its full complement (a complete row) of mature English Elms (*Ulmus procera)* and Golden Elms (*Ulmus glabra 'lutescens')*, but the southern side, which has traditionally been less complete, retains only three mature specimens of English Elm, the remaining trees a mix of juvenile (newly planted) Elms or other species, such as Sweet Pittosporum (considered a weed). Six mature specimens of English Elm survive on the St. Kilda Road frontage (three are c.1890 and three are c.1900-1915. The remaining trees having been planted in the last three decades. There is a deliberate spacing at the centre of the St Kilda Road frontage, representing the removal of a number (possibly 2-3 c1890 Elms) to allow views and access to the monument, in keeping with the 1921 plan.

A mature English Oak (*Quercus robur)*, planted as a specimen tree is located due south of the monument, in what is shown as an open lawn on the 1921 plan. This is the Windsor Oak, planted in 1939, grown by the Director of the Botanic Gardens from acorns taken from Windsor Castle. The tree and its provenance and importance is marked by a plaque in the ground. A second plaque, to the north, marks the former location of the Firewheel Tree, also planted at this time as a representation of the Anglo-Australian commitment. An immature specimen of Algerian Oak (*Quercus canariensis)* has been planted to the south of the memorial, and a semi mature Chinese Elm (*Ulmus parvifolia*) is located at the Albert Road junction end of the triangle.

Apart from the raised podium on which the monument and stone lions sit, most of the reserve is covered in open lawn. The turf in the lawn areas is in poor condition. Exceptions are sloping garden beds around the base of the monument podium, planted out with Liriope grasses and areas covered in tanbark at the north and west corners of the triangle.

Hard landscape elements

The triangular reserve is surrounded by a continuous footpath and narrow nature strips (along the Albert Road frontages only). The reserve boundary itself is marked by a single course of bluestone pitchers with cement joints. Bluestone pitchers were also used in the 1920s for delineating the edges of the Domain and the Shrine of Remembrance in the 1920s, so are likely an original feature (though relaid).

At the north corner of the footpath around the reserve, fronting St Kilda Road, is a stone drinking fountain. As noted on a (modern) bronze plaque on its base, it was: *Presented to the Citizens of South Melbourne by Councillor John Cockbill, Mayor, 1898-9, 1899-00, 1909-10. Jany. 20 1910.*

The fountain takes the form of a small Gothic market cross, as is seen in a number of late 19th century and early 20th-century stone drinking fountain in Melbourne's suburbs. This, like many others, is a display of the talent and materials of the monumental mason (here, G. Dawe of Carlton). The base of the fountain comprises two rock-faced bluestone (basalt) steps with curved corners around the entire base. Above it is a battered plinth of rock-faced bluestone with dressed margins. The stone drinking bowl is of grey granite and has a square plan form. Resting on its corners are four columns of polished red granite which support lancet arches of reddish sandstone.[41] Above that is an ovolo-profile cornice of polished bluestone, and a red sandstone spire rising to an octagonal pinnacle. The bubbler in the middle of the drinking bowl is modern, though the bronze base of the fixture may be original.

Figure 16. Mayor Cockbill's fountain when erected in 1910. (Source: Punch, *3 Feb. 1910, p 15)*

[41] *The Argus*, 21 Jan 1910, page 10 suggests the sandstone is from Apollo Bay, but its lithology indicates that it is from Sydney.

The western corner of the triangle is set off from the more formal remainder by a bitumen-paved path linking the two forks of Albert Road. It is not shown on the 1921 plan. There are two gravel-paved BBQ areas, a smaller one on the east side and a larger one on the west side of the path. All street furnishings in these areas are contemporary, including flat timber benches, BBQ units with stacked-stone sides, and plastic rubbish bins on metal posts. There is a single timber post standing adjacent to the bitumen path in the centre of the reserve. Its purpose is unknown.

Another bitumen-paved path runs NE–SW and separates the northern corner of the triangular reserve, now covered in tan bark following its use as a work site for the construction of the Domain tram interchange.

Structures: the memorial

The memorial stands on a raised podium that is square in plan. It is reached via two flights of grey granite steps, one facing St Kilda Road (four steps) and the other at the back (eight steps). The area around the monument is paved with flagstones made of exposed aggregate concrete. At the four corners of the square podium are high grey granite pedestals supporting red sandstone sculptures of stylised seated lions added in 1952. Each lion comprises two pieces, the head and forelegs, and the hindquarters. The lions face outward from the monument towards the cardinal points.

The monument itself is also of grey granite from Harcourt, in the form of an obelisk on a complex pedestal and plinth. The obelisk shaft is formed of 27 courses of stone with a pyramidal cap. A three-metre tall bronze dagger (called a 'Crusader's sword') is affixed to the lower courses on the east face (St Kilda Road side). The tall pedestal is set off from the obelisk by a fluted stone band with nailhead bosses at the centre of each side. There is a large memorial bronze plaque on the upper pedestal, facing St Kilda Road, with the words: *In Honour. Erected by the people of Victoria in memory of the Australians who fell in the South Africa War 1899-1902. Fighting for the unity of the Empire which is our strength and common heritage.* It is signed 'Irwin & Stevenson Architects'. The plaque combines classical and Egyptian motifs, including a classical pediment and nailhead bosses with the winged sun of Thebes. This combination reflects the use of the obelisk form, which was originally Egyptian but (often literally) imported by the Romans. There is a band of leaves in bronze relief, forming an encircling wreath around the pedestal, near the top of the plaque. Rather than the classical laurel, the leaves are eucalypts with prominent gumnuts, asserting an Australian identity.

On the lower pedestal is a second, much smaller and simpler bronze plaque, which appears to have been retrofitted to the monument. It records the members of the 'Executive Committee', namely: Chairman Richard Allen Esq. Jr; Vice Chairman Lieut-Col. T.M. McInerney CMG. VD; Hon. Treasurer The Lord Mayor of Melbourne; Sir James Barrett KBE, CB, CUG, MD; Howard W. Berry Esq.; CR. H.A. Austin Embling JP.; a name or two removed; and F. Leslie Bruford Esq.

In front of the monument, just off the St Kilda Road footpath, is a recent interpretive sign about 'Australia in the Anglo-Boer War' of 2001. It adopts the same materials as the monument, with a large bronze plaque mounted on a sloping granite plinth. It includes both text – in English and Afrikaans – and illustrations in bas-relief. The sculptor was Ross J Bastiaan. He is a prolific creator of memorial plaques, mostly commemorating armed conflicts, which are located around Australia and the world. One web site lists 137 plaques created by Bastiaan, between 1990 and 2001.[42]

Further details of the memorial and its materials are set out in section 4.7.

[42] 'Plaques Sculpted by Ross J. Bastiaan', on Australian Bronze Commemorative Plaques, http://www.plaques.satlink.com.au/list/chrono.htm, accessed 4 May 2016.

2.3 Ownership and use

2.3.1 Ownership

Albert Reserve, at 29A Albert Road, South Melbourne, is Crown land. The City of Port Phillip serves as the reserve's Committee of Management.

The reserve comprises two distinct parts. The eastern corner, comprising about one-third of the entire area, is Allotment 6A, Section 58, City of South Melbourne, Parish of Melbourne South. This was the original reserve as laid out in 1890. Its boundary extends further south than the reserve. The remaining two-thirds of the reserve (added by 1895) is a small part of a large road parcel – Albert Road from Kings Way to St Kilda Road (excluding the south fork of the road beside the reserve). This parcel is Allotment 2331 (Road Parcel), City of South Melbourne, Parish of Melbourne South. The Land Victoria Report on a Crown Land Parcel records its 'provisional' administrator as the Department of Environment, Land, Water and Planning, though this may apply only to that part of the parcel that actually forms part of Albert Road.

It should be noted that the Albert Reserve, in its original form as shown on the 1895 MMBW plan (Figure 9) corresponds with the current extent of the reserve, and not the smaller Allotment 6A triangle.

Figure 17. Aerial of Albert Reserve, showing: 1) the extent of the Heritage Overlay/VHR listing (HO12) shaded pink; 2) the extent of Allotment 6A, Section 58 – the smaller triangle outlined in red; and 3) the remainder of the reserve is part of Allotment 2331 (Road Parcel). (Source: Planning Maps on Line)

Ownership of the Memorial itself is separate to that of the land. Research carried out by Lovell Chen (Memo dated 22 January 2016) shows that the South Melbourne City Council took up control over the Memorial on 30 November 1924, the date of the unveiling ceremony. This control was later reassigned to the City of Port Phillip when councils were amalgamated, and has never been transferred to another group or government body.

The City of Port Phillip is also the owner of the Cockbill Memorial Drinking Fountain of 1910, which stands on the footpath at the northern corner of the reserve.

2.3.2 Use

Current use of the Memorial and its setting (Albert Reserve) appears to be entirely informal, in some sense returning to its origins as a municipal reserve. It is used for passive recreation, with modern facilities including park benches, picnic tables and electric BBQs, used by local residents, workers and other visitors. Its location among office buildings on St Kilda Road makes it a very popular lunch spot during good weather, with office workers sitting on benches, the lawn and even on the steps and plinth of the Memorial.

Pedestrian traffic across the reserve includes school students and others coming up Albert Road and walking across the tan-barked northern corner to access the crossing to the tram interchange (see Figure 20). The crossing is not aligned with existing pathways.

As noted in the history, Boer War commemorative ceremonies were held each year on Empire Day at the Memorial until at least the mid-1950s. By the late 20th century, the site was no longer used for this purpose, as there were no large-scale Boer War commemorations in Melbourne. While the creation of a National Boer War Day in 2010 has recently led to commemorative services held on or about 31 May, their location in Melbourne has been across the road, at the Shrine of Remembrance. This is discussed further in the section below.

2.4 Community associations

The associations that communities hold in relation to the Memorial and the Albert Reserve were investigated to some extent in the preparation of this report in the form of stakeholder consultation. The community groups consulted were those representing residents who live around Albert Reserve, heritage groups particularly in the City of Port Phillip, and military history ('veterans') groups. The names of the participants are found in the acknowledgements at the start of this report.

The associations held by the wider Victorian community were not investigated, as this was beyond the scope of the project.

2.4.1 Military history organisations

Widespread formal commemoration of the Boer War died away in the second half of the 20th century. Interest in the conflict and its commemoration was reawakened at the time of the centenary, 1999-2002. In 2002 Prime Minister John Howard allocated a site in ANZAC Parade, Canberra, for a national Boer War Memorial. This site was dedicated in 2008.

Empire Day (24 May), introduced in 1905 to celebrate Australia's ties with Britain and renamed Commonwealth Day in the 1950s, was originally the day when commemorative services were held at the Memorial. In 2010 National Boer War Day was introduced, on 31 May the anniversary of the signing of the Treaty of Vereeniging that ended the South African War in 1902. The nearest Sunday to 31 May is now the day that commemorative services are held for this conflict.

The Boer War Memorial website (www.bwm.org.au) records the first commemoration of Boer War Day in Melbourne in 2012, which was held in the forecourt of the Shrine of Remembrance. This same location has been used in subsequent years (including 2016). These recent ceremonies have been organised by the National Boer War Memorial Association (the NBWMA), which was tasked with raising community awareness of and interest in the Boer War, in part to warrant the creation of the Canberra memorial.

The NBWMA is committed to moving the South African Soldiers' Memorial to a location within the grounds of the Shrine of Remembrance where it would serve as the focus for Boer War Day ceremonies. They attempted to arrange this once before, in 2005. Representatives of other military history groups foresee the possibility of moving it to other sites, but all agree that the current position is inappropriate (for reasons discussed in section 4.5).

It can be said that the military history groups are seeking to reinstate the now-lapsed social significance of the Memorial, both by making it the focus of Melbourne's revived commemoration of the conflict as well as generally raising awareness of the Boer War and thus an understanding of the Memorial's importance in the wider community.

2.4.2 Heritage groups

Consultation with representatives of Port Phillip's heritage groups brought out a strong sense of the importance of the Memorial's current location. This is both its immediate and more general location. By facing Melbourne's grand, formal boulevard, the general public is reminded of the importance of the conflict and the suffering its participants endured. As a prominent feature of St Kilda Road, it also forms a part of many Melburnians' 'mental map' of Melbourne, contributing to a sense of place. Finally, as the Memorial was formally a 'gift' to the people of South Melbourne (which was amalgamated into the City of Port Phillip), there is a sense of ownership and a disinclination to 'give it away' to another municipality.

The separate and distinct history of the Memorial was also raised, with the importance of not conflating its history with that of the later Shrine of Remembrance. There was also mention of the importance of balancing the value that the wider community might place on the Memorial as a landmark in its present location, with its potential use as the focus for Boer War Day ceremonies on just one day a year.

2.4.3 Residents' groups

A list of questions about the use and importance of the Memorial was provided to the G12 Precinct Group (the 'G12'). The G12 represents the owners' corporations of 12 apartment buildings located on Albert Road, St Kilda Road, Queens Road, and Bank Street, and thus the interests of an estimated 5,000 owners and residents.

The G12's responses emphasised the importance of the Memorial's location on the prestigious St Kilda Road, and also see it as a link between the Shire of Remembrance and Albert Park. They note that it 'is a long-term point of reference in the physical environment', both for those who live and work nearby but also for all regular passers-by.

The separate horticultural significance of the mature (c1890) elm trees around the edges of the reserve was also raised, noting that 'Melbourne has one of the best collections of elm trees of any city in the world'.

As local observers, the G12 provided information about the day-to-day use of the Memorial and Albert Reserve. The main uses of the site are informal. It is well used both by the growing number of local apartment dwellers, for social and recreation purposes, and by local office workers who use it as a location for lunch and sometimes exercise. On weekends, there are occasional tour groups who have the Memorial in their itinerary, or passers-by who happen upon the bronze interpretive signage. The G12 emphasise that, in their opinion, even informal users show due respect when on or near the Memorial.

The G12 summarise that their official position is to 'strongly support the retention and return of the Memorial to the park' following construction of the Metro station. Also high up among their priorities, apart from retention of the elms and Windsor oak, is the retention of the passive recreation amenity of the park with 'low key and discrete' Metro station entries that do not encroach on this use and enjoyment.

3 WHY IS IT SIGNIFICANT?

3.1 Introduction

This chapter revisits the assessment of the cultural heritage significance of the South African Soldiers' Memorial.

The *Burra Charter, the Australia ICOMOS Charter for Places of Cultural Significance* (rev. 2013) defines 'cultural significance' as:

> … *aesthetic, historic, scientific, social or spiritual value for past, present or future generations.*

The Burra Charter further clarifies that:

> *Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects. Places may have a range of values for different individual or groups.*

This chapter notes the current heritage listings of the memorial, a brief comparative analysis looking at its place among other Boer War memorials, and revisits the existing statement of significance prepared by Heritage Victoria in light of the research carried out for this report. Aspects of its significance at a local level have also been added into this revised statement, as have references to the pertinent HERCON criteria. Finally, the elements that form the site are divided into groups according to their relative significance.

3.2. Previous assessments of significance

City of Port Phillip

The South African Soldiers' Memorial was assessed by Andrew Ward in the 'Port Phillip Heritage Review' of 1998. It was found to be of local significance and recommended for the Register of the National Estate (now defunct) and the municipal heritage overlay. It has been previously identified in the 'South Melbourne Conservation Study' of 1987 by Allom Lovell Sanderson Pty Ltd. The statement of significance reads:

> *This memorial is of significance as a major memorial to the Boer War and as a monumental landmark in Melbourne, dominating the St. Kilda Road, Albert Road corner. The quality of workmanship is integral to the significance of the work.*

Heritage Victoria

The South African Soldiers' Memorial was gazetted as a place on the Victorian Heritage Register in 1997. The statement of significance reads:

> *The South African War Memorial Committee was formed at a public meeting in 1911 to raise funds for a memorial to honour the soldiers who fought and died in the Boer War. The architect Irwin & Stevenson won the design competition and the memorial was completed in mid 1924. The memorial was to have originally been hexagonal in plan with six bronze lions but lack of funds resulted in a more simple design. Eventually more money was raised and the four sandstone lions, designed and sculpted by Stanley Hammond, were added to the memorial in 1952. The memorial is a grey granite obelisk set on a podium. It is embellished with a bronze dagger, plaque and a wreath that is decorated with eucalyptus motifs. The four sandstone lions are set on granite pedestals on each corner of the podium.*
>
> *The memorial is of historical, social and aesthetic importance to the State of Victoria.*
>
> *The South African Soldiers' War Memorial is of considerable historical and social significance as the major memorial associated with the Boer War in Victoria. Its monumental size and landmark position imbue the memorial with a strong, symbolic presence. It is the only memorial built in Victoria to commemorate all Australians who took part in the war, rather than local soldiers. The Boer War was a pivotal moment in Australia's history. It was the first time that volunteers from Australia and New Zealand had fought together in an overseas war and the first time these troops paraded together in Melbourne and Sydney,*

presaging the ANZAC tradition. The war was at a time of growing national consciousness for an Australia declaring its own nationhood.

The memorial is a poignant symbol of the war and conveys the profound sentiments of the Victorian community towards this important event in Australian history. The incorporation of eucalypt motifs into the bronze wreath reflects the rising nationalism of the time.

Victorian War Heritage Inventory

The South African Soldiers' Memorial is registered on the Victorian War Heritage Inventory, adopting the Heritage Victoria statement of significance.

3.3 Criteria

The Heritage Council Criteria for the Assessment of Cultural Heritage Significance, known as the HERCON criteria were adopted by the Heritage Council of Victoria in 2008. They are similar to earlier assessment criteria used for the Register of the National Estate (since defunct), known as the RNE criteria. The HERCON criteria are:

Criterion A. Importance to the course or pattern of Victoria's cultural or natural history.

Criterion B. Possession of uncommon rare or endangers aspects of Victoria's cultural history.

Criterion C. Potential to yield information that will contribute to an understanding of Victoria's cultural history.

Criterion D. Importance in demonstrating the principal characteristics of a class of cultural places or objects.

Criterion E. Importance in exhibiting particular aesthetic characteristics.

Criterion F. Importance in demonstrating a high degree of creative or technical achievement at a particular period.

Criterion G. Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons. This includes the significance of a place to Indigenous peoples as part of the continuing and developing cultural traditions.

Criterion H. Special association with the life or works of a person, or group of persons, of importance in Victoria's history.

3.4 Comparative analysis

The towns and cities of Victoria were quick to erect memorials to those who had died in the Boer War (1899-1902). Conventional memorials (that is, excluding other structures and avenues of honour) were erected at several regional cities and in many country towns, notably in western Victoria, including Geelong (1902), Ballarat (1904), Mortlake, Camperdown, Greta, Hamilton, Inverleigh, and Mansfield, as well as in some metropolitan areas, for example at Brunswick (1903), Parkville, St Kilda and Box Hill. These local memorials were generally modest structures and sometimes included the names of the local men who had died.

There are a number of early monuments in the City of Port Phillip as well. The earliest is the Edwin Knox Memorial Fountain in Cleve Gardens, St Kilda (in HO444 Middle Park & St Kilda West precinct). It was erected in 1902 in the memory of Trooper Edwin Knox, who was the first of the St Kilda volunteers to lose his life. It was a cast-iron fountain on a bluestone pedestal, though only the pedestal survives. This was followed by another 'personal' memorial in 1903: the Charles Moore Memorial Fountain in St Vincent Gardens, Albert Park (in VHR H1291), erected in memory of the first Victorian Football League player to die.

In 1905 two fairly large monuments were erected, dedicated to larger groups of soldiers. The Jubilee Memorial Fountain, Bank Street, South Melbourne (in VHR H217), commemorated both 50 years since the founding of the City of South Melbourne, as well as the 140 residents who served in the Boer War, with special mention of the eight who died. The tall, temple-like

fountain is set on bluestone steps with granite columns and canopy, brass font and two bronze plaques. The inscription on the plaque reads that it was 'designed and executed by G. Dawe. Monumental sculptor, Carlton', though the VHR statement of significant says that GH Henderson was the designer. Note that G. Dawe was also the author of the 1910 stone fountain at the corner of Albert Reserve. Arguably the most significant, in terms of its design, is the South African War Memorial in Alfred Square, St Kilda (VHR H1375). It was designed by Robert Haddon, and is clad in glazed green and gold tiles incorporating Eucalyptus leaves and gumnuts. Typical of Haddon's work, it incorporates a general classicism with sinuous Art Nouveau ornament. The monument was funded by public subscription and dedicated to the City of St Kilda soldiers who fought and died in the war.

Some Australian memorials to the Boer War had a wider reach, purporting to have a state coverage, such as the memorial at Ballarat (1904), which listed over 200 names of Victorians who died in the war. Elsewhere in Australia, other 'national' memorials erected to soldiers who died in the Boer War were erected in the capital cities of Adelaide and Hobart. The South African Soldiers' Memorial, however, was the only memorial erected in Victoria that was officially intended by the South African Soldiers' Association to serve as a 'national' memorial.

At least 54 monuments were erected to commemorate the Boer War across Victoria (not counting memorial trees, lone plaques or tablets, stained glass windows, cairns or streetlamps). Among them, the obelisk was a relatively common form, comprising 20 of them, all but the South Melbourne example of modest scale. Within the Melbourne metropolitan area, the only other obelisk is in Parkville, The Avenue, commemorating a local boy who fell in the war.

The obelisk form recalls ancient funerary monuments in Egypt and Rome. They were employed in the Italian Renaissance and later became fashionable in eighteenth-century Britain.[43] Obelisks were popularly used for memorial purposes in Victoria from at least the 1880s. A notable example was the tall obelisk erected in 1887 by squatter James Dawson at the Camperdown Cemetery to Aboriginal elder Wombeetch Puyuum ('Camperdown George'). Another obelisk is the World War I soldiers' memorial at Terang (1923).

The ceremonial planting of an Oak within the memorial reservation in 1939 represents the ongoing sentiments about Australia's loyalty to Britain and the Empire. In Britain, the Oak is also a symbol of 'remembrance' and has had a long and enduring role as the memorial tree in the English cultural landscape.

3.5 Revised statement of significance

Heritage Victoria's statement of significance has been revised, based on research and comparative analysis carried out as part of this report. It also adds information about elements of the site that are of local significance to the City of Port Phillip. New text is shown underlined while deleted text is shown with a ~~strikethrough~~.

What is significant?

A triangular ornamental reserve was created at the junction of Albert Road and St Kilda Road in the late 1880s, and enlarged to its present extent by 1895, with Elm trees planted first along St Kilda Road, and later along the Albert Road frontages. An ornamental stone drinking fountain was installed in 1910, presented to the citizens of the City of South Melbourne by Mayor John Cockbill. It was designed and constructed by monumental mason G. Dawe of Carlton.

The South African War Memorial Committee was formed at a public meeting in 1911 to raise funds for a memorial to honour the soldiers who fought and died in the Boer War. The architects Irwin & Stevenson won the design competition and the memorial was completed in mid 1924. The memorial was to have originally been hexagonal in plan with six bronze lions

[43] James Stevens Curl, *Oxford Dictionary of Architecture and Landscape Architecture*, Second edition, OUP, 2006, p. 533.

but lack of funds resulted in a more simple design. Eventually more money was raised and the four sandstone lions, designed and sculpted by Stanley Hammond, were added to the memorial in 1952. The memorial is a grey Harcourt granite obelisk set on a podium. It is embellished with a bronze dagger ('Crusader's sword'), plaque and a wreath that is decorated with eucalyptus motifs. The four sandstone lions are set on granite pedestals on each corner of the podium. In 1939 a tree-planting ceremony took place at the South African Soldiers' Memorial with the planting of two specimen trees: an English Oak (*Quercus robur*), sourced from stock at Windsor Castle, England, and a Queensland Firewheel tree (*Stenocarpus sinuatus*) to represent Australia (since lost).

How is it significant?

The South African Soldiers' Memorial and the Windsor Oak are of historical, social and aesthetic importance to the State of Victoria. The drinking fountain is of local aesthetic significance to the City of Port Phillip. The mature English Elms and Golden Elms along Albert Road and St Kilda Road are of local historical significance to the City of Port Phillip.

Why is it significant?

The South African Soldiers' ~~War~~ Memorial is of considerable historical and social significance as the major memorial associated with the Boer War in Victoria. Its monumental size and landmark position imbue the memorial with a strong, symbolic presence. It is the only memorial built in Victoria to commemorate all Australians who took part in the war, rather than local soldiers. The Boer War was a pivotal moment in Australia's history. It was the first time that volunteers from Australia and New Zealand had fought together in an overseas war and the first time these troops paraded together in Melbourne and Sydney, presaging the ANZAC tradition. The recruitment of Australians in the war waged by the British against the Boers in South Africa reflected strong ties felt by Australians to the British Empire. There are mixed meanings in Australia's participation in the Boer War, however, which took place at a time of rising Australian nationalism. The Boer War was embraced by many, including civic-minded city leaders, as part of the Australian national story, a story that became stronger in the wake of World War I and the new patriotic mood. (Criteria A & G) ~~The war was at a time of growing national consciousness for an Australia declaring its own nationhood~~.

The memorial is a poignant symbol of the war and conveys the profound sentiments of the Victorian community towards this important event in Australian history. The incorporation of eucalypt motifs into the bronze wreath reflects the rising nationalism of the time. (Criterion A)

The South African Soldiers' Memorial is of historical significance as an important element of the wider civic landscape of St Kilda Road in the vicinity of the Domain, which was conceived as a civic thoroughfare in preparation for the celebration of Federation in 1901 and the visit to Melbourne of British royalty, the Duke and Duchess of York. The memorial is part of the wider landscape of the Domain which accommodates many memorials to war and military leaders. (Criterion A)

In its capacity as a national monument, the South African Soldiers' Memorial is also of social significance to the people of Victoria as the focal point for collective grieving and remembering those Australians who died in the Boer War. Historically, it served as the site of commemorative services from the 1920s to at least the 1950s, and the English Oak tree and Firewheel tree (represented by its plaque) planted in one of the services in 1939, represents the ongoing importance of the site and connection to Empire at that time. (Criteria G & A)

The drinking fountain, which takes the form of a small Gothic market cross, is of local aesthetic significance as a fine example of the elaborate drinking fountain structures that were frequently erected in the late 19th and early 20th century as 'utilitarian' civic memorials. Also as a high-quality demonstration of the monumental mason's art with stones ranging from bluestone and sandstone to red and grey granite, in a variety of finishes. (Criterion E)

The mature surviving English and Golden Elms around the perimeter of the reserve are of local historic and aesthetic significance as they delineate the early Tree Reserve, and the

municipal desire to create green recreational spaces and attractive public thoroughfares in the late nineteenth century and early twentieth century. In particular, the intact row of English and Golden Elms along Albert Street north is an excellent example of a street/reserve row plantings and provides a strong aesthetic sense of place to both the streetscape and memorial landscape. (Criterion A & E).

3.6 Significance of elements

Introduction

As set out in the history and revised statement of significance, there are a number of historical layers at the Albert Road reserve, the memorial being only one of them. While the memorial itself is recognised as having significance to the State of Victoria, the earlier development of the reserve is a part of the history of the City of Port Phillip (which incorporates the former City of South Melbourne). While this 'layer' may not be of State significance, it should not be disregarded when preparing a conservation policy for the site and its elements.

For this reason, the tangible elements of the site have been broken down into three general categories to inform the preparation of the conservation policy. These three are: State significance, local significance, and no heritage significance.

Elements of State significance

Elements of State significance, as set out in the VHR statement of significance, are:

- The Memorial of 1924, designed by architects Irwin & Stevenson, comprising the Harcourt granite obelisk on a granite pedestal and plinth with cast-bronze 'Crusader's sword', plaques and wreath, as well as the raised podium and two sets of steps leading up to it.
- The lions of 1952, carved by sculptor Stanley Hammond, comprising four red-sandstone lions on grey granite pedestals situated at the four corners of the memorial podium.

In addition, the following should be added:

- The English Oak (*Quercus robur*) from Windsor, planted 1939, and the plaque at its base.
- The plaque representing the Queensland Firewheel Tree, planted 1939.

Elements of local significance

Elements of local significance include the following:

- Triangular plan of the reserve, established in 1888.
- Mature Elm trees around the perimeter of the reserve, planted c.1888-89 and 1900-1915.
- Open lawn at the centre of the reserve as a setting to the memorial.
- Stone drinking fountain of 1910, built by monumental mason G. Dawe.
- Interwar bluestone edging around the reserve.

Elements of no heritage significance

The following elements are of no heritage significance:

- Plantings in the informal (un-edged) garden beds around the monument.
- Semi mature and immature specimens of English Elm, Chinese Elm, Algerian Oak.
- Sweet Pittosporum tree on the Albert Road (south) perimeter.
- Footpath separating the northern corner of the reserve.
- Footpath separating the western corner of the reserve.

- Two BBQ areas, including BBQ grilles, benches, rubbish bins and gravel surface.
- Timber bollards and bench seating.

In addition, the interpretive tablet, of 2001 by Ross Bastiaan, is not of heritage significance in itself, though it does help to explain ('interpret') the importance of the monument to passers-by and also indicates the ongoing importance of the monument. Its artistic value has not been assessed.

4 KEY FACTORS SHAPING POLICY

4.1 Introduction

This section sets out the factors that should be taken into account in the development of conservation policy for the South African Soldiers' Memorial and its site. It includes issues for the place that arise from its significance, ownership and management, past and present uses, and the aspirations of Port Phillip Council as well as those of other stakeholders. As this report is being prepared during the planning phase for the Melbourne Metro, which will impact on the site, this factor is also addressed in detail as a potential threat.

This is in keeping with guidance from the Burra Charter (2013), which states:

> *Policy for managing a place must be based on an understanding of its cultural significance.* (Art. 6.2)
>
> *Policy development should also include consideration of other factors affecting the future of a place such as the owner's needs, resources, external constraints and its physical condition.* (Art. 6.3)

4.2 Constraints and opportunities arising from significance

This section draws on the expanded and revised statement of significance for the Memorial and its setting in section 3.5, the list of significant elements in section 3.6, as well as the discussion of current use and community associations in sections 2.3 and 2.4.

4.2.1 Constraints

Elements of significance

The revised statement of significance expands the scope of the current Heritage Victoria statement to include elements other than the Memorial which are of local or potentially State significance. These additional elements are the Windsor Oak, the triangular plan of the reserve, the mature elm trees, the bluestone garden bed edging, and the 1910 drinking fountain. Recognising and respecting the significance of all of these elements and their historical and physical interrelationships between them introduces more constraints on future development.

Significance of location

The current location of the Memorial and its historical (and social) significance is another constraint. As set out in the history, the South African War Memorial Committee was intent on locating the Memorial on St Kilda Road. This was both as a prestigious and prominent site, and one which already had strong military associations (memorials, barracks, Commanding Officer's residence).

Since 1921 when the site for the memorial was chosen, the military associations of St Kilda Road have expanded enormously by the construction of the Shrine of Remembrance in the former grounds of the Commanding Officer's residence. It is important to be clear that the Memorial's site indicates that it was not a part of the Shrine's development, but an earlier and important effort that deserves respect and recognition on its own.

The choice to site the Memorial on the edge of Albert Reserve, close to St Kilda Road, suggests that the Committee prized visual prominence and public exposure over a quiet and reposeful spot (such as at the centre or back corner of the reserve, or in the middle of a larger park).

The location on the South Melbourne side of the road was not the committee's first choice, however, as they considered the City of Melbourne (east) side more desirable. Even so, the completed Memorial was formally gifted to the City of South Melbourne, so has a strong historic and legal link to what is now the City of Port Phillip.

This is even more the case with the stone drinking fountain of 1910, which is a local civic memorial gifted by the mayor to the citizens of South Melbourne. The site is noted in the 1910 press as the corner of Albert and St Kilda roads, so it appears to be in its original site.

Social significance

The Memorial is of social significance as a national monument to the men who served in the Boer War, and as a focal point for collective grieving and remembrance. For this reason, along with its historical significance, the Memorial should be treated with respect both in its use and setting.

4.2.2 Opportunities

Significance of use

Often heritage practitioners are called upon to balance conflicting values of a place when preparing a conservation management policy. For example, the physical fabric of a place and its use may both be of great heritage significance, as with an early but still functioning factory. In such a case, supporting an ongoing significant use might mean sacrificing the intactness of the building fabric and allowing otherwise undesirable alterations to enable continued use of the factory as production technologies change.

In the case of the Memorial, the conflict might appear to be the historical significance of its current location versus its social significance as the focal point of Boer War commemoration services. Historical research and stakeholder consultation, however, has confirmed that the Memorial has not served as the focus of ceremonies on Empire Day for the past 50 years or so, and the newly created Boer War Day ceremonies have taken place at the Shrine of Remembrance. Considering that social significance must be a regular or long-term use/engagement with a place that relates to the current generation,[44] while the Memorial is of undoubted social significance to descendants and others who wish to honour those who served in the Boer War, it is no longer of social significance for its use as the site of commemoration ceremonies. The National Boer War Association would like to reinstate this use of the Memorial, but it would require many years before the use can again be defined as part of its social significance (generally the attachment must be intergenerational, so for a duration of 25 years or more).

To conclude, when establishing policies that arise from the heritage significance of the Memorial, its current or preferred future use would not be a deciding factor.

Prominence of the Memorial

When constructed, the Memorial was the tallest built element in its surroundings (see the c1930 photo in Figure 10), set in a streetscape of one and two-storey houses. The Elm trees along the boundaries of the Albert Reserve were still semi-mature, so it was clearly visible to passers-by travelling along St Kilda Road and entering from Domain Road.

Today, it is surrounded by high-rise office and apartment towers on both sides of Albert Road, and further north and south along the west side of St Kilda Road. There is no high-rise development on the east side due to the presence of the Domain, the Shrine of Remembrance, and Melbourne Grammar School. The Elm trees have reached maturity and are now nearly as tall as the Memorial, largely concealing it from the north and south.

The changes to the site that may be necessary with the siting of a Metro station beneath the Domain Interchange may allow a reinstatement of the prominence of the Memorial in the streetscape.

Conversely, all community stakeholders agree that it would be a very poor outcome if the Memorial became less prominent and accessible (whether due to its relocation on the site or due to the introduction of new elements) as an outcome of the Metro development.

[44] Heritage Council of Victoria, *The Victorian Heritage Register Criteria and Threshold Guidelines*, 2014, p 17.

4.3 Statutory listings

State government

As a place on the Victorian Heritage Register (H1374) the South African Soldiers' Memorial is considered to be one of the State's most significant heritage places. *The Victorian Heritage Act* 1995 identifies and protects heritage places and objects that are of significance to Victoria.

All works are subject to the requirements of the Heritage Act 1995. The Victorian Heritage Council is responsible for approving changes to the place, while the City of Port Phillip acts as a referral authority in this matter. No permit exemptions have been granted for this site.

A permit (or permit exemption) is required for works to the monument and its site such as cleaning, (re-) coating, repairs, repaving, lopping, removal or replacement of trees, and changes to hard landscaping elements. Works associated with the Melbourne Metro station will also require a heritage permit.

Local government

The Heritage Schedule of the City of Port Phillip Planning Scheme includes the South African Soldiers' Memorial as HO12. No specific controls apply, as the City is required to refer any applications for works that involve changes to the place to Heritage Victoria.

4.4 Council's aspirations

As noted in section 2.3, the City of Port Phillip is the owner of the Memorial and the 1910 drinking fountain as well as the Committee of Management of the Crown land that comprises Albert Reserve.

At present, Council's aspirations are focussed on preserving heritage significance and amenity of the site in the face of the Melbourne Metro Rail Project, as a station entrance is mooted for Albert Reserve.

In regard to the potential relocation of the Memorial, the City of Port Phillip believes that the significance of the Memorial is best served if it is retained on its present location.

To enhance the passive recreation use of Albert Reserve, Council plan to close off the southern arm of Albert Road, thereby enlarging the extent of parkland (but allowing limited vehicular access for residents of the adjacent towers).

4.5 Use

As discussed in section 2.3.1, there are tensions between the current use of the Memorial itself and aspirations and plans of external stakeholders. The current use is almost entirely informal, with the Albert Reserve used by local residents, workers and visitors for recreation. While some people come to view the Memorial and its interpretive plaque, formal remembrance ceremonies ceased by 1960.

To allow the current informal recreation uses to continue on the site, it must retain enough necessary elements to be an attractive and pleasant place. These include sufficient open space (lawn and paved areas) and shading trees for the current area of passive recreation, and a small amount of street furniture (benches, bins, BBQs) for the area of more active recreation at the western corner. This informal use has continued unbroken since the site was reserved for public purposes in 1884, followed by tree planting. The activities have changed over time, with tennis courts an early addition to the reserve.

When the Memorial was erected on the reserve, this portion of the site was given over to ceremonial and contemplative uses. This 'contemplative zone' was surrounded by lawns and trees which supported passive recreation use on a day-to-day basis. In its current form, the City of Port Phillip has also added infrastructure for BBQs at the far corner of the reserve. This 'amenities zone' is partly set off from the rest of the reserve by a path that cuts north-south,

and by the downward slope of the site. This serves to buffer the Memorial from uses that are not in keeping with quiet contemplation and respect that it deserves.

The current uses and zoning are potentially in conflict with the plans to locate an entrance to the Metro station in Albert Reserve, particularly if the new station envelops part of the reserve (whether above ground or as a sunken courtyard), and even more so if there are large above-ground structures that dominate and harden this patch of greenery set amongst dense development.

The Boer War Memorial Association is concerned with the *formal* use of Albert Reserve, with the Memorial as a focus to past Empire Day ceremonies. In their assessment, the site is no longer an appropriate location for commemorative ceremonies, as they wish to have hard-stand are *in front of* the Memorial that will fit 200 seated and 500 standing people, a troop of 12 mounted troopers, a 19-piece pipe band, four 3-metre-square tents (for seating, information and catering), and parking for an ambulance and catering van. Also desirable is flood lighting and access to power for a PA system.[45] As seen in the historic photo (Figure 10), in past ceremonies the nearest lane of St Kilda Road was roped off, with attendees also standing on the lawns to either side of the Memorial. The Association members consider the cost of closing off part of the road too prohibitive to consider this solution today. They are also unhappy about the predominance of informal use around the Memorial and the heavy traffic on St Kilda Road, and would like it to be moved to a quiet and 'respectful' site befitting its importance. When asked what could be done to improve the site to make it suitable for Boer War Day ceremonies (including enlarging Albert Reserve to the south), the Association members were quite firm in their assertion that this was not possible at the present site.

Even if the Memorial is not moved, the military history groups agreed that Memorial should remain physically accessible to the public for quiet, reflective, respectful contemplation.

4.6 Views of external stakeholders

Government agencies

Heritage Victoria

Heritage Victoria is the responsible planning authority to grant permits for works and alterations to the Memorial and its site.

While the entire extent of Albert Reserve is covered by the VHR registration, the only feature that is officially under their jurisdiction is the Memorial itself, and not any of the other significant elements (1910 drinking fountain, mature trees, landscaping). This means that Heritage Victoria would normally not consider impacts to these other elements when assessing a permit application. However, all permit applications are also forwarded to the City of Port Phillip for comment, and Council is asked to note any impacts to locally significant elements, which can allow their inclusion in the decision-making process. Heritage Victoria also encourages the preparation of and consults existing conservation management plans when informing their approach to a site.

Permit applications for the works associated with the Melbourne Metro project have not yet been lodged with Heritage Victoria, so they could not yet comment on the proposed changes to the site. They do note, however, that it is important to ensure that the Memorial retains its strong presence on St Kilda Road and visual relationship with the Shrine of Remembrance. Another major concern in evaluating any application and providing permit conditions will be to ensure high quality in planning and expertise when carrying out the recording, dismantling, storage, reconstruction and conservation of the Memorial.

[45] Letter from Ian George, Deputy Chair, National Boer War Memorial Association, 4 May 2016.

Melbourne Metro Rail Authority

As of April 2016, the Melbourne Metro Rail Authority (MMRA) had decided that a new underground rail station would be located at the Domain Interchange, where Domain, St Kilda and Albert roads meet. They had completed a reference design to be issued to tenderers, which puts the station box beneath St Kilda Road and station entrances on either side of the road: at the south-east corner with Domain Road (abutting or encroaching on the Shrine of Remembrance), and across the entire east side of Albert Reserve where the Memorial now stands, necessitating its dismantling and relocation. The next step will be a detailed concept plan that is to take into account stakeholder feedback.

Current plans call for Albert Reserve to become a construction site for the project, which would require the removal of some (or even all) trees from the site.

The potential threats to the heritage significance of the site related to these plans is addressed in section 4.8, below.

Adjoining landowners and local community

Local community

As detailed in section 2.3, residents in neighbouring apartment buildings and representatives of Port Phillip heritage groups have a sense of 'ownership' of the Memorial and consider it an important part of their environment. Those who live and work nearby express their appreciation of the recreation aspect of the reserve by using it regularly.

Both groups strongly support the retention of the Memorial on Albert Reserve, as well as the retention of the mature trees, both within an appropriate setting that is not disrupted by an intrusive Metro station entrance.

Shrine of Remembrance

The National Boer War Memorial Association sought to have the Memorial moved to the site of the Shrine of Remembrance in 2005, and are again seeking for this to happen as part of the Metro construction works. They see it as a once in a lifetime opportunity to add the South African Soldiers' Memorial to what they see as its rightful place among the group of State memorials in the Shrine reserve. Such a location would also allow them to hold large Boer War Day ceremonies without the need to pay to close off a road. The Association has suggested three possible sites, all located within the northern approach to the Shrine itself (at the north end of Birdwood Avenue, at the base of the Shrine, and half way in between).

The Trustees of the Shrine of Remembrance has advised that they are not seeking to have the Memorial relocated to the Shrine. They also state that they support the City of Port Phillip's opinion that the significance of the memorial is best served if it is retained in its present location.

This is in keeping with the guidance set out in the 'Shrine of Remembrance Conservation Management Plan' (Lovell Chen, 2010) which was prepared for the Trustees. (As both the Shrine and the Memorial are on the Victorian Heritage Register, Heritage Victoria would also have to approve a move to the Shrine, and they are also likely to be guided by the CMPs for both places.)

The Shrine CMP emphasises the importance of views to the Shrine from the north and states in the policy for new development that:

> *No development should be contemplated which intrudes on the main ceremonial approach to the building, or which is visible in the middle or long distance views to the Shrine from the north.*
>
> *Any new buildings or structures should be recessive in scale and design and should not compete with the main Shrine building.* (page 147)

The CMP discusses moving around existing memorials or introducing new ones (including those from other sites), but they are much smaller in scale, ranging from tree plaques to statues and memorial plantings. The specific policy for the placement of memorials is:

The placement of memorials on the Reserve should be undertaken in a manner which does not impact on the significant elements and characteristics of the place.

Again, as the northern approach to the Shrine is of such significance, none of the proposed relocation sites in the Shrine reserve appear to meet the policies of the Shrine CMP, and it is unlikely that any other prominent site in the reserve will either.

The CMP does, however, allow for the option of adding new memorials that are *small items* such as tree plaques, or even low-scale memorial gardens. This policy (#21) appears to admit the possibility of adding a small, low-scale Boer War memorial (for example, a bronze plaque on a low plinth) to the Shrine site, which could serve as the focus of Boer War Day ceremonies.

4.7 Condition

The Memorial

Obelisk

Overall the obelisk (including its shaft, complex pedestal and plinth) is in very good condition. This is not surprising, given the durable nature of the Harcourt Grey Granite of which it is principally composed.

There is some cracking of the granite blocks, notably a large one in the plinth on the SW side, and several smaller ones near the top of the pedestal on the northern corner. Cracking of the plinth block is likely to be due to post-construction settlement, while the reason for the group of smaller cracks near the top of the pedestal, which may be related to localised movement, should be investigated as the memorial is being dismantled.

A characteristic feature of the Harcourt granite are dark spots apparently randomly distributed through the stone. Known as xenoliths, these are relics of the previous rock types, remnants that were not absorbed by the advancing magma. It is important to be clear that they are natural features of the stone and are not defects. It is equally important to distinguish them from other marks and stains, such as from oils and paints which may indicate vandalism or previous activities at the site. There are greasy or oily stains in several places on the pedestal and faint evidence of painted graffiti that has largely been removed from the southeast face of the pedestal.

Candlewax used by skateboarders has been cleaned from the edge of the plinth on the southeast side. There are grey-green copper stains from run off from the bronze wreath and plaques that vary in intensity around the pedestal. On the south-western side of the pedestal greenish stains on some horizontal (water-retentive) surfaces are due to algae. Some reddish iron-oxide staining is apparent on coved mouldings, most obviously on the cavetto moulding at the base of the obelisk shaft and between the upper and lower pedestals. See under sandstone lions, below, for explanation of the origin of this staining.

Bronze elements including the sword, plaque and wreath are showing signs of corrosion producing greenish corrosion products and the run-down stains noted earlier. Given that the bronze elements were treated, repatinated and waxed in 2009,[46] they should be thoroughly investigated when the memorial is dismantled and appropriate conservation measures taken.

One of the more unusual aspects of the memorial's construction is the use of leaded joints between the granite blocks. The bedding mortar appears to be a hard cement-sand mix (as would be expected of the time and for the granite), but the joints are finished ('pointed') with lead, about 15–20 mm deep, tamped into place with a specific tool, the marks of which remain evident on most surfaces. Presumably the lead is effective at cushioning the thermal expansion and contraction of the outer face of the granite blocks. Most of the accessible leadwork appears in reasonably good condition though there are some losses. An unfortunate result of

[46] City of Port Phillip files.

the use of lead is grey staining of the granite on either side of the joints. This may be due to a lead compound (e.g. white lead) binding dirt to produce the grey stain. This will need to be investigated as part of dismantling and storing the memorial, so that the granite can be successfully cleaned prior to reconstruction.

Podium

The podium is paved with flagstones, approximately 1200 x 600 mm, laid in a herringbone pattern. The flagstones are made of a fine-grained exposed aggregate concrete, in which the aggregate appears to be crushed Harcourt granite, giving a grey colour. Much of the podium has a darker brown colour which may be due to wear or to the same reddish iron-oxide staining that occurs to the stones of the memorial.

The slabs are dry laid on a concrete base and the combination has failed to provide a stable bed leading to uneven surfaces and potential trip hazards. These were attended to in 2010–2011, but some unevenness remains, or has redeveloped. Though not yet a concern, it will need to be monitored. Some slabs are cracked and broken. Two slabs near the northwest edge of the paving appear to be painted in a pale yellow colour, though this is disguised by the grey-brown overall dirt/staining of the podium. Gaps between some slabs are being used as informal ashtrays for cigarette butts.

Steps to the front and rear of the podium are Harcourt granite and have low pillars and sloping balustrades of the same stone. The granite is in good condition, though there is some loss of mortar from the joints between steps, particularly from those facing into the reserve.

Lion pedestals

The four pedestals carrying the lions are a little over two metres tall and made again of Harcourt granite. The pedestals are a simple design with three courses of plain stonework sitting on a coved plinth. Joints are pointed in a fine white sand and cement mortar with a slightly recessed flush finish.

The pedestals are in good condition, though their plain finish makes even slight colour variations more obvious. There is some discolouration of the granite due to water percolation producing light-coloured areas adjacent to the joints; in one case, on the west side of the southern pedestal, the discolouration is distinctly yellowish. Other pedestals, notably the south side of the western pedestal, show grey run-down staining which may indicate water penetration into the structure. Thick black ?paint splashes are evident on the west side of the northern pedestal, and on the paving below. Fortunately the splashes are relatively small and are partially disguised by the texture of the granite.

Sandstone lions

The four lions are carved from sandstone from Sydney, their age and appearance suggests the Maroubra or Bondi quarries as possible sources. All four lions are essentially the same Moderne design and are made from two blocks of sandstone. They are distinguished by the signature of the sculptor, Stanley Hammond, which differs on each lion. Some lions show patterns of dots across the surface which probably result from the use of calipers to transfer measurements from an original macquette to the stone.

The sandstone itself is in reasonable condition with generally sound surfaces, though is there is some cracking and also biological staining in the form of algae, lichens and other microflora. There are small vertical cracks in the same anatomical position above both knees of the eastern lion, another small vertical crack in the right foot of the northern lion, while horizontal cracking is evident in the base of the western lion, on the north side, and to a much lesser extent in the front base of the eastern lion.

There is some small spalling along the bottom edges of the lions. In places the spalling looks old (perhaps during installation) while in others in appears to be more recent, and possibly due to the use of hard mortars.

Considerable variation in the appearance of the lions, and from one side of a lion to the other, is a result of their orientation and position. The sides of lions that face the prevailing west and southwest weather tend to be greenish in colour due to the growth of algae, while the opposite sides can be cleaner but redder. Figure 18 shows the east-facing lion with strong red-brown iron-oxide staining on the right (north) side. This iron staining comes from the nearby trams in the form of tiny iron filings that are thrown up by metal wheels on metal rails, and land on surfaces where they rust to iron oxides. The sides of the lions facing away from the trams, and also those further from the trams, have less iron staining.

Figure 18. Eastern lion showing strong iron-oxide staining on the right (northern) side closest to the St Kilda Road trams. In contrast, the left (southern) side has little rust staining and some green algae, as it faces the prevailing weather.

Lichens have colonised upper surfaces of the lions, particularly the heads (manes), backs and rumps, and also on the flat surfaces of the forelegs and bases (see Figure 19). Lichens grow into the surface of stones and their removal can be problematic as they leave behind shallow 'craters' which may hold water and promote its entry into the stone. This has been the case with recent (2009) cleaning, though fortunately the 'craters' are very shallow (<1mm) and the damage to the stone is not great.

Figure 19. Back and hind-quarters of the eastern lion showing vertical cracks towards the knees in both legs and a spotted appearance due to growth of microflora, particularly lichens. Previous removal of the lichens (in 2009) has left shallow 'craters' in the surface of the stone, such as the one in the centre of the image. The iron-stained case-hardened surface of the stone has been lost from these 'craters', risking increased rates of stone decay.

Of all the lions, the northern one is the greenest, on account of algal growth due to prolonged wetting beneath the canopy of the adjacent elm tree. The tree also poses a mechanical threat to the lion, should branches break and fall on it.

The two blocks of each lion are jointed with a dense, rich cement mortar that is finished with a yellow pointing in fine sand and cement. Most of these joints are cracked with some loss of the pointing, which reveals cracking of the hard cement beneath. There is also some failure and loss of pointing of the bed joints beneath the lions. Open joints allow water penetration into the stones which is not desirable as it cannot readily escape, except through the face of the stones, where it may lead to decay.

Previous cleaning

There have been several phases of cleaning of the memorial, the most recent in 2009, when the bronzes were attended to (as noted above) and the lions treated to remove the microflora, and in 2011, when the paving was cleaned. There is evidence of other cleaning which is probably much older, namely removal of iron oxide staining from the tops of the lion pedestals (and probably from the pedestal of the obelisk) using high-pressure water or abrasive cleaning of some form. The faint outline of planks laid on the plinth of the memorial (presumably to support scaffolding) is testament to previous interventions.

Threats to the fabric

Putting aside the Metro Rail project, threats and potential threats to the fabric of the memorial include:

- ongoing decay of the sandstone lions, due to water entry and to biological growths such as lichens and algae, particularly to the northern lion under the tree canopy, which is also at risk of mechanical damage from falling tree limbs;
- vandalism, such as graffiti and also skateboarding;
- unintentional damage due to stains from spilt food and drinks;
- lack of conservation maintenance of bronzes and mortar joints;
- poorly planned and executed cleaning and maintenance works; and
- lack of attention to the podium paving which could become a trip hazard.

Impact of the Metro Rail project on the fabric

Dismantling, transporting, storing and reconstructing the memorial to enable construction of the Domain Station of the Metro Rail project risks damage to the various components of the memorial, including:

- chipping, spalling and breakage of stone blocks, of which the sandstone lions are the most susceptible;
- abrasive damage to the surface of the sandstone lions — even slight abrasion will produce unacceptable colour changes if the iron-stained case-hardening is removed;
- damage to bronze elements from sharp or abrasive implements;
- damage caused by unknown factors, including the condition of any corroding ferrous (or other) material that may be used as locating or centring pins for the blocks of the obelisk, and which may prove difficult to extract without damage to the adjacent blocks;
- damage during storage, such as accumulation of salts or pollutants in an unprotected environment; and
- damage to parts of the memorial during related works, such as the removal of the adjacent trees.

Each time the memorial is dismantled, moved, stored, moved again, and re-erected the chance of mechanical damage is increased.

Conversely, dismantling and reconstruction of the memorial does present some opportunities, including removal of any corroding fixings, and cleaning of the various components under potentially more ideal (i.e. protected) conditions, but these do not outweigh the risks identified above.

Drinking fountain

As described in section 2.2, the drinking fountain is made of bluestone (steps at base, tapered plinth, and cornice), polished grey granite (drinking bowl), polished red granite (columns), and sandstone (lancet arches, spire and pinnacle). Though a little worn and dirty in places, it is generally in good condition (see Figure 20).

There are some losses of detail, such as small sections of projecting mouldings, one of which, in the bluestone cornice, has been repaired with an indented piece. Other losses are relatively minor and might be accepted as evidence of age and wear and tear.

There are horizontal cracks developing near the bases of the sandstone lancet arches; i.e. just above the red granite columns. These may reflect an inherent weakness running across the (single) block of stone, but may also be due to swelling and shrinking of clay minerals in the

sandstone, as a result of a perched water-table effect produced by impermeable granite and relatively impermeable bedding mortar.

Figure 20. Drinking fountain showing some small losses of moulding details, and iron and biological staining of stonework. In the background, note pedestrian traffic across the tan-barked northern corner of the Reserve (see section 2.3.2).

Dirt and biological growths are accumulating on the sandstone above and below the bluestone cornice, and on the underside of the cornice as well. The grey granite drinking bowl and the bluestone steps and tapered plinth are strongly stained with iron oxides.

As with the Memorial, dismantling, storing and reconstructing the drinking fountain to enable construction of the Domain Metro station risks damage to the stone elements, particularly to the sandstone arches, spire and pinnacle. It also provides the opportunity for careful cleaning and conservation of the more fragile elements, and reinstatement of a working bubbler.

Trees

The Elms along Albert Road (north) are generally in very good condition, with limited decay and canopy dieback. The mature English Elms along St Kilda Road are the earliest on the site, and while they have been subject to the most root disturbance through various surface level and material changes to St Kilda Road over the past 115 years, are in fair condition. Those mature Elms on Albert Road (south) are in fair-good condition. Many of the earlier trees on this frontage have been lost and a recent replanting attempt has been made. The Windsor Oak is not a particularly fine specimen for its age, and is exhibiting some upper canopy dieback, and limited trunk decay. Generally the immature and semi-mature specimen trees and replacement row plantings on the site are in good condition.

The condition of the mature trees on St Kilda Road is linked to previous and ongoing moisture, oxygen and nutrient stress, combined with possible pathogen attack. The root zones of these trees in particular have had major impacts through various changes to the layout, ground levels, materials changes of St Kilda Road, as well as the construction of the memorial and ongoing works to the site over time.

As tree age, they become more susceptible to decline through pathogen attack and root zone disturbance or restriction. Mature Elms such as these are susceptible in particular to root disturbance, and the construction of the Domain Station, its entrance and exit points, and the proposed use of much of the reserve as a construction site will have a significant impact on the trees, that is likely to result in their long term demise. As the nature of the works is so substantial, and involves tremendous ground disturbance as well as the potential for mechanical and material damage, there are unlikely to be steps which can be taken to adequately protect the trees during construction, or to lessen the impact of the proposed works.

The good condition of the Elms on Albert Road indicate that their likelihood of survival is better than that of those on St Kilda Road, and measures may be put into place to either conserve, or to remove and restore after the construction phase.

4.8 Threats

Threats to the condition of the physical fabric of the Memorial have been addressed above.

A bigger picture threat to the significance of the Memorial is its gradual loss of prominence in the St Kilda landscape, due both to the construction of high-rise towers around it and the growth of the elms along the boundaries of Albert Reserve, which obscure it in views from the north and south.

Council's plan to enlarge the triangular reserve southward, to encompass the south arm of Albert Road brings with it the potential loss of legibility of the historic extent and plan of Albert Reserve, particularly if this coincides with the loss of the elms along the southern boundary and of the bluestone edging.

The biggest current threat is the construction of the Domain station as part of the Melbourne Metro Rail Project. As at May 2016, the Metro tunnel project is still in the planning and design phase with construction expected to commence in 2017, subject to the necessary planning and environmental approvals.[47]

The location of the below-ground station 'box' and the approximate location of exits in the middle and on either side of St Kilda Road are shown on the map below. There is also note that there will be above-ground ventilation shafts serving the station, the precise location and design of which have not been decided.

[47] 'About the Project' and 'Project Timeline' on http://melbournemetro.vic.gov.au/, accessed 22 May 2016.

Figure 21. Map showing location of the Domain Station (underground) as well as the three proposed station entrances. (Source: Melbourne Metro website, accessed 22 May 2016

Potential negative impacts of the Metro development include:

- Loss of the State-significant Windsor Oak;
- Loss of the locally significant elm trees around the eastern part of the site, or the whole site;
- Creation of a Metro station entrance along the eastern frontage of Albert Reserve, necessitating dismantling and possible relocation of the Memorial and the 1910 drinking fountain. The station entrance itself, as well as ventilation shafts in the vicinity, may also have a negative visual impact on the site, of a yet unknown scale;
- Reduction in the open active and passive recreation space of Albert Reserve, particularly if there are exits into the reserve making it a thoroughfare and if the station has an appreciable above-ground footprint (either as a sunken courtyard or above-ground structure).
- Loss of the contemplative environment appropriate for the Memorial.

5 POLICY

The *Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance* (revised 2013) and its Practice Notes provide guidance on the conservation of cultural heritage places. The conservation policy for the South African Soldiers' Memorial and its site is based on the principles contained within the Charter.

The following policy is informed by the revised assessment of the heritage significance of the Memorial and its site, as well as the constraints and opportunities set out in Chapter 4. The intention is to provide over-arching policy direction for the long-term management and conservation of the place, as well as particular reference to and guidance on the urgent issues facing the site in 2016.

This section is broken down into broad policy areas, each with an overarching 'general policy' that can be applied to any issues that may arise in the future. Each section then has more detailed policies that flow from the general policy, addressing specific issues that have arisen in the preparation of this report. In some cases this is followed by a discussion of how this detailed policy might apply in sample circumstances.

5.1 Place as a whole

General policy

Retain all of the heritage values of the South African Soldiers' Memorial and its site ('the place'), both tangible and intangible.

Policy basis

The South African Soldiers' Memorial, including its site and associated elements, is significant for a range of reasons, both the State and local level. The tangible elements of significance – the Memorial itself, the locally significant 1910 drinking fountain, mature trees and elements of hard landscaping – have this significance embodied in their physical fabric as well as in their location relative to each other and to St Kilda Road. The intangible values of the Albert Reserve as a place of recreation since the 19th century are still strong. Those of the Memorial itself have diminished since it ceased to be the focus for annual Boer War commemorative ceremonies in the late 1950s. Despite this, its significance is still interpreted by signage for the general public and it still serves as a point of contemplation for the few.

Detailed policies

5.1.1 Consider all heritage values, both tangible and intangible, when making decisions about the management of and changes to the Memorial and its site.

To ensure that all elements of heritage significance at Albert Reserve area appropriately recognised, the City of Port Phillip should prepare a revised place citation – based on the history, description and statement of significance in the conservation management plan – and adopt it as a reference document to the planning scheme.

5.1.2 The City of Port Phillip should seek to have the Victorian Heritage Register citation updated to include the revised statement of significance in regard to in regard to the newly identified element of State significance (Windsor Oak of 1939) and the additional expression of the historical and social values of the site.

5.1.3 While the elements of local significance are not mentioned in the current Victorian Heritage Register place citation, they should still be taken into account in all decision-making processes.

Aspects of local significance that should be particularly taken into consideration when managing or planning changes to the place include its on-going historic use as a recreation reserve, the rows of Elm trees and hard landscaping delineating its triangular form, and the 1910 drinking fountain.

5.1.4 Heritage Victoria should be consulted before undertaking any works to the Memorial to see if a heritage permit or permit exemption is required.

A permit (or permit exemption) is required for works to the monument and its site such as cleaning, (re-) coating, repairs, repaving, lopping, removal or replacement of trees, and changes to hard landscaping elements. Works associated with the Melbourne Metro station will also require a heritage permit.

5.2 Setting

General policy

Retain the heritage significance of the South African Soldiers' Memorial and site inherent in its current location.

Policy basis

As set out in the history, the South African Soldiers' Association were intent on situating their memorial along St Kilda Road, the city's grandest boulevard, and one which was already home to a number of other military sites and memorials. The Memorial was situated close to the edge of the road, to increase its public prominence, both from St Kilda Road and from the intersection of Domain Road across from it. Since the choice of an appropriate site clearly occupied much effort on the part of the SAS Association, as illustrated by their deputations and failed earlier attempts to site it on the City of Melbourne side of the road, this is an important element to preserve in the face of the Melbourne Metro project.

While the National Boer War Memorial Association would like to relocate the Memorial to the grounds of the Shrine of Remembrance, this would not only impact on the significance of the Shrine of Remembrance but also diminish the separate and earlier history of the Memorial by conflating it with the Shrine.

The locally significant 1910 drinking fountain also has long links with this site, and appears to be in its original location, at the corner of Albert and St Kilda roads, where it was erected as a gift from South Melbourne's Mayor Cockbill. Again, St Kilda Road was likely chosen for its prominence, while the South Melbourne side was chosen because it was a gift to the citizens of this former municipality.

Detailed policies

5.2.1 The Memorial should remain in its original location, that is, on Albert Reserve, near the middle of the St Kilda Road frontage, set only slightly back from the road (as at present) so as to retain visual prominence.

While the construction of the Melbourne Metro tunnel and Domain Station will most likely require the dismantling of the Memorial, this does not preclude reconstructing the Memorial in the same (or very close to the same) place on Albert Reserve vis-à-vis St Kilda Road. This could be over a covered underground concourse, with discrete exits at the edges of the reserve. This approach is illustrated further in Section 5.7 Uses and activities.

5.2.2 The 1910 drinking fountain should remain in Albert Reserve in a position visible from St Kilda Road, in or close to its current spot, without interfering with views to the Memorial.

The construction of the Melbourne Metro tunnel and Domain Station will most likely require the dismantling of the drinking fountain. Once works are complete, it should be reconstructed at its current location. If this is not possible, due to the location of permanent Domain Station infrastructure, an alternative location should be chosen on the footpath around Albert Reserve where it will still be visible from St Kilda Road. This should be subject to retaining good visibility to the Memorial from St Kilda Road, so a spot along the St Kilda Road frontage nearer to the Memorial may not be appropriate.

5.3 Structures

General policy

The physical fabric of the built elements on the site – the South African Soldiers' Memorial and the 1910 drinking fountain – should be conserved and retained in their present form.

Policy basis

While of differing scales and levels of significance, both the Memorial and the drinking fountain are significant for their high-quality stonework. Inappropriate cleaning and maintenance can damage this stonework and diminish their significance.

In addition, the carefully designed nature and inter-relationship of the various elements that make up the Memorial should be recognised and protected, particularly if it is to be dismantled as part of the Melbourne Metro works.

Detailed policies

5.3.1 Retain and conserve the layout and fabric of the Memorial, including the obelisk, the four lions on their plinths, the paving and the steps up to it.

The position and distance of the lions around the obelisk should be reinstated precisely if the Memorial is dismantled and reconstructed.

It may be acceptable to slightly enlarge the area of paving around the obelisk, but the boundary between the original paving and the new should be subtly delineated.

5.3.2 No additional symbols or plaques should be affixed to any part of the Memorial (obelisk and its pedestal and plinth, lions on pedestals, steps).

Any new commemorative or interpretive elements should be mounted on their own low plinth, as has been done with the Ross Bastiaan interpretive signage. If a low wall is built around the Memorial, this would be another appropriate location.

5.3.3 Consult with Heritage Victoria before undertaking any works to the Memorial, including cleaning and repairs.

5.3.4 All works to the Memorial and to the drinking fountain should be guided by people with the appropriate skills, such as stone and metals conservators.

5.3.5 Dismantling, storage and reconstruction of the Memorial and drinking fountain should be carefully planned and managed to minimise damage, and to ensure the accuracy of reconstruction. A detailed topographic survey of the Memorial and Albert Reserve should be undertaken prior to any works.

5.3.6 The 1910 drinking fountain should be reconditioned so that it can be used again.

5.4 Landscape

General policy

The locally significant layout and hard landscaping of Albert Reserve should be retained and conserved.

Policy basis

Albert Reserve was established in the early 1890s by the former City of South Melbourne, and it has served the local (and wider) community since then. It had taken its current triangular plan and size by 1895, with curved sides to accommodate the north and south arms of Albert Road which enclose it. This triangular plan was reinforced by rows of Elm plantings along its three sides, as well as interwar-era bluestone edging.

Detailed policies

5.4.1 The triangular plan form of Albert Reserve should be preserved and remain visually legible.

5.4.2 The park-like nature and elements, such as open lawn and perimeter Elm rows trees, should be retained.

Reinstate the areas of open lawn, the Windsor Oak and replant perimeter plantings of Elm rows on Albert Road north and south after works are completed. Given the projected future risk of Dutch Elm disease to Victoria's Elm populations, it is acceptable to replant the Elms with row plantings of a single Elm species which is disease-resistant and exhibits similar aesthetic characteristics to English and Golden Elms.

Reinstate the lawn in the northern corner of the site to replace the tan bark.

5.4.3 The location, form and materials of the historic bluestone edging which survives on the pathway entrance from Albert Road south should be recorded, and if possible, reused in any new design elements.

If Council's plans to enlarge the reserve to encompass the south arm of Albert Road should go ahead, this shared pedestrian-vehicular space should remain visually distinct from the historic extent of Albert Reserve. For example, the boundary might be indicated by a change in level or change in paving, as well as by retaining the current bluestone edging along the boundary between these two spaces.

5.4.4 Limit the number of new paths introduced to those that enhance the significant uses and their mutual separation – recreation and commemoration – of Albert Reserve.

The north-south path at the western end of the reserve appears to be a recent addition, but it serves a useful purpose of separating the more active uses from the rest of the reserve.

If the Domain Station entrance is located at Albert Reserve, care should be taken that paths are not introduced that make the reserve into a throughway for passengers and other pedestrians. It is not appropriate to have station entrances/exits within the boundaries of the reserve with their associated access paths. Instead, all station foot traffic should be directed around the reserve, not through it.

5.4.5 Re-instate the smooth lawn on the approaches and surrounds to the memorial

The existing low plantings on the four corners of the memorial, and the adjacent immature Algerian Oak are not significant and detract visually from the memorial itself. The appropriate planted setting for this memorial is smooth swathes of well maintained lawn sweeping up to the hard landscaping around the memorial (see also 5.6.1).

5.5 Trees

General policy

The trees of local and state significance on the site should, where possible, be retained and conserved.

Policy basis

The Windsor Oak and Firewheel tree planted in 1939 as part of the Boer War commemoration that year were situated as a pair to the west of the Memorial. The loss of the Firewheel tree has diminished the symbolism of the paired Anglo- Australian planting (representing England and Australia). Other trees which have been planted over the past 20 years, including an Algerian Oak and Chinese Elm are considered to make no particular contribution to the cultural heritage value of the landscape.

The Elm rows on Albert and St Kilda Roads, planted in the late nineteenth and early twentieth century defined the reserve as a public recreational space, as well as contributing to the beautification of the public streets, embodied by the fine boulevard design of St Kilda Road in the late nineteenth and early twentieth centuries.

The reserve, without its perimeter plantings loses a layer of complexity and historical use, becoming a memorial space only, rather than a locally important public recreation reserve in which a highly significant memorial is located. While the views to the memorial from St Kilda Road are considered to be of great importance, the views from Albert Road as considered to be less significant.

The condition of the rows of trees along St Kilda Road and Albert Road south are fair to good, and are likely to require replacement or significant work to retain their health and safety in the next 25 to 40 years. Both these row plantings have reduced integrity through tree loss over time or in Albert Road south's case, have never been a formal single Genus row. These rows do not have the same aesthetic value as the row along Albert Road north, which is in excellent condition and highly intact to its planting date around the turn of the century.

The trees planted along St Kilda Road were planted as part of the broader work undertaken to plant the newly designed grand boulevard of St Kilda Road. Along other parts of St Kilda Road there remain fine stands and rows of trees which are in relatively good condition, and retain a fair to good degree of integrity.

Detailed policies

5.5.1 Trees in the reserve should be managed so that they have a minimal negative impact on the physical preservation of the Memorial.

One of the mature elm trees along the St Kilda Road side of the reserve is now overhanging the northern sandstone lion, causing ongoing moisture problems and posing a potential mechanical threat should a branch fall. Ongoing management of the site should include the pruning of this tree back from the lion, and ongoing intensive monitoring so that the problem does not reoccur.

If the Melbourne Metro project should require the removal of this problematic Elm tree, then care should be given if there is an opportunity for replanting to ensure that the replacement tree is far enough away from the lion once it reaches its mature spread.

5.5.2 Discourage new specimen trees within the contemplative zone of the reserve.

Specimen trees planted close to the memorial will, as they mature, detract from the visibility and setting of the memorial, and may cause material damage to the fabric of the memorial in the future. This does not apply to the Windsor Oak, which, while in the contemplative zone, is considered to be of sufficient significance to warrant its retention.

5.5.3 Remove or retain trees along the St Kilda Road frontage as required. Replanting is not essential.

The trees on the St Kilda Road frontage are an incomplete row of varying planting date, and some trees have a limited useful life expectancy. As they have matured, the trees along St Kilda Road have somewhat obscured the views to the memorial, particularly when in leaf. While these trees are considered to be of local historic significance, they are not the only, or best example of their type within St Kilda Road from the same period. Their removal may provide an increased visibility of the memorial, and strengthen visual links between the Domain, the Shrine and the memorial.

If it is necessary to replant the tree avenue along the St Kilda Road side of the reserve, their number and locations should be planned so that good visibility to the Memorial is retained over the long term. This could be achieved by replanting fewer replacement specimens, designed to frame rather than obscure the memorial, all of which were recessed from the perimeter by a setback of approximately 3.0m.

5.5.4 Replant the Albert Road south perimeter row planting with English Elm or species of Elm with similar aesthetic characteristics.

The plantings along the two arms of Albert Road are important to retain and consolidate through replanting as they assist in defining the recreational context as a public space for nearby residents

(historically) and other user groups.

The perimeter row along Albert Road south is in fair condition only, has low integrity, and has been added to and interplanted with inconsistent species over several decades. This has resulted in a reduced aesthetic significance for the reserve as a whole. The two earlier specimens of Elm in the row are not particularly fine examples of their species and are exhibiting crown dieback and trunk decay.

Removal and replanting the row would allow greater flexibility of the use of the reserve during Melbourne Metro works, as well as benefiting the reserve in the long term, as a single species replacement row would strengthen the sense of place and enclosure of the reserve as a public recreation space, while providing an appropriate and consistent foliaged backdrop to the memorial in the future. The use of an alternate Elm species (other than English Elm) may be considered due to potential pathogen threat.

5.5.5 The row of Golden Elms and English Elms on Albert Street north should be retained and conserved.

The plantings along the two arms of Albert Road are important to retain and consolidate through appropriate replanting as they assist in defining the recreational context as a public space for nearby residents (historically) and other user groups.

Of the row plantings which surround the three sides of the reserve, the row of Golden Elms and English Elms on Albert Street north is the most intact and in the best condition. It is one of the better row plantings within the municipality, and provides a strong aesthetic to both the northern side of the reserve and to the streetscape of Albert Road north. Its matching row on the other side of Albert Road north has been diminished over time, and lacks the integrity of this row planting.

If the row must be affected by the Melbourne Metro works, it is desirable that either as few trees as possible are removed and stored securely off site, and those which remain are well protected during construction. It is desirable that the original trees are to be re-instated in their original locations once works are completed, and that plans are prepared showing how the trees will be successfully re-established in their original locations. Where the row must be removed in the majority, or its entirety, it should be replanted like for like, although the use of an alternate Elm species may be considered due to potential pathogen threat.

5.5.6 The Windsor Oak (c.1939) and its plaque should be retained and conserved.

The Windsor Oak is considered a significant element of the memorial and should be retained and protected in its current location during any construction works. If it cannot be retained in situ, a plan for its removal and conservation off site must be prepared for the duration of the works, and the tree re-instated in its original location, with the associated plaque on completion of the works.

5.5.7 The Queensland Firewheel Tree (c.1939, now removed) should continue to be represented by its existing plaque.

The Queensland Firewheel Tree, planted as an Anglo-Australian symbolic gesture in 1939 was located nearby (north) of the Windsor Oak tree, and planted at the same time. The significance of the plantings is in that the dual planting represents the values and loyalty which Australians felt to the empire, rather than its specific position in the landscape, or contribution to the setting of the memorial. The Firewheel tree no longer survives, although the plaque remains. A replacement of the same species was established in 2012, but has not survived either. The shape and layout of the reserve limits the number of canopy trees which can be supported without impacting on the memorial, or being impacted upon by the existing plantings. It is important to recognise the importance of the pair of trees (Windsor Oak and Firewheel Tree) and what their paired planting represented. However, these values are adequately represented by the existing plaque.

The position of the plaque should be recorded and removed for secure storage prior to any works

commencing on the site. It should be replaced in the same location once works are complete. An area of 1.0m surrounding the plaque should remain clear of vegetation to ensure its visibility.

5.5.8 Non-contributory plantings located in the amenities zone of the reserve should be managed and retained or removed as required.

Plantings in the amenities zone of the reserve will have a limited impact on the significance of the local or state values of the place.

5.5.9 Discourage new specimen tree plantings within the passive recreation zone.

New plantings to either side of the memorial in this zone will lead to obstruction of views of the monument in the future. There may be some capacity for establishing new garden beds of low character if required.

5.5.10 The existing boundaries of the reserve on Albert Street north and south should continue to be defined by rows of Elm tree plantings.

Consideration of any enlargement of the reserve should continue to define the boundaries of the historic reserve perimeter through rows of Elm tree plantings. See Detailed Policy 5.7.1 for further information.

5.6 Living connections & traditions

General policy

Seek to preserve the social significance of the South African Soldiers' Memorial as a solemn place for remembrance of the Boer War and the people who served in it.

Policy basis

While the continuity of use of the site for Boer War commemorative services has been lost, and so is no longer part of its social significance, it could be a positive step for the appreciation of this site if such services were re-introduced in the future.

The Memorial has retained its social significance as a monument to all Australian soldiers who served in the war, and will have particular meaning to the descendants of those who died in this conflict. With the cessation of formal ceremonies on this site, however, awareness of this significance may have lessened among daily visitors to the site whose use of it is more casual.

Detailed policies

5.6.1 Encourage an appropriate relationship toward the significance of the Memorial among users of Albert Reserve by creating a quiet, contemplative space around the Memorial that inspires respect for its solemn commemorative function.

One way of reversing the current dynamic of people sitting on the base of the Memorial and looking outward, as well as defining a contemplative zone around it, would be to build a low wall on two sides (north and south) around the Memorial's hardstand with seats or benches along this wall, facing inward. This would encourage people to look at and contemplate the Memorial. Additional interpretation could be installed atop the low boundary wall if desired.

5.6.2 Support the reinstatement of Boer War commemorative services on this site, should the National Boer War Association or other organisation so request, subject to the constraints created by the scale of the site and the presence of other significant elements on it.

The most obvious way for this to occur is to hold ceremonies partially on the roadway, in front of the Memorial, as was done historically. It would not be appropriate, for example, to remove trees or remove the historic boundaries of Albert Reserve to facilitate such ceremonies.

5.7 Uses and activities

General policy

Encourage a separation of uses at Albert Reserve to support the tangible and intangible significance of the place.

Policy basis

The policy on uses and activities overlaps with those on living connections and traditions, and they should be read together.

The original and ongoing use of Albert Reserve as a place of recreation contrasts with the Memorial which calls for solemn remembrance of past sacrifice. This has been the case since the Memorial was erected in the 1920s, and is part of the complexity of the site. It is not impossible for contrasting uses to coexist comfortably with each other, and subtly delineated zoning of the reserve can contribute to this.

This has already been done to some degree by zoning the amenities (BBQ) use to the far western corner of the reserve, which is partly separated from the rest by a north-south path.

Due to downward slope of the site and the relative small size of the BBQs, seating and rubbish bins, the amenities infrastructure does not visually intrude on the appreciation of the Memorial from St Kilda Road. This is not a specific use of heritage significance, so alternatively it could be removed without any impact on the heritage values of Albert Reserve.

Apart from this amenities zone, two other zones already exist to some degree and can be strengthened further. The first is the 'contemplative zone' which encompasses the Memorial as well as the immediate area around it (including the St Kilda footpath in front of it), extending westward to encompass the 1939 Windsor Oak and Firewheel tree plaque. The north and south corners of the triangular site, and the space between the 'contemplative' and 'amenities' zones comprises a passive recreation zone, mainly of lawn and trees. This use has, in fact, spread to cover the Memorial and its curtilage, though in a way that is not always desirable.

The approximate boundaries of the three defined zones are depicted on the plan below. Also shown are possible locations for entrances to the Metro station, which should be kept as far away from the contemplative zone as possible.

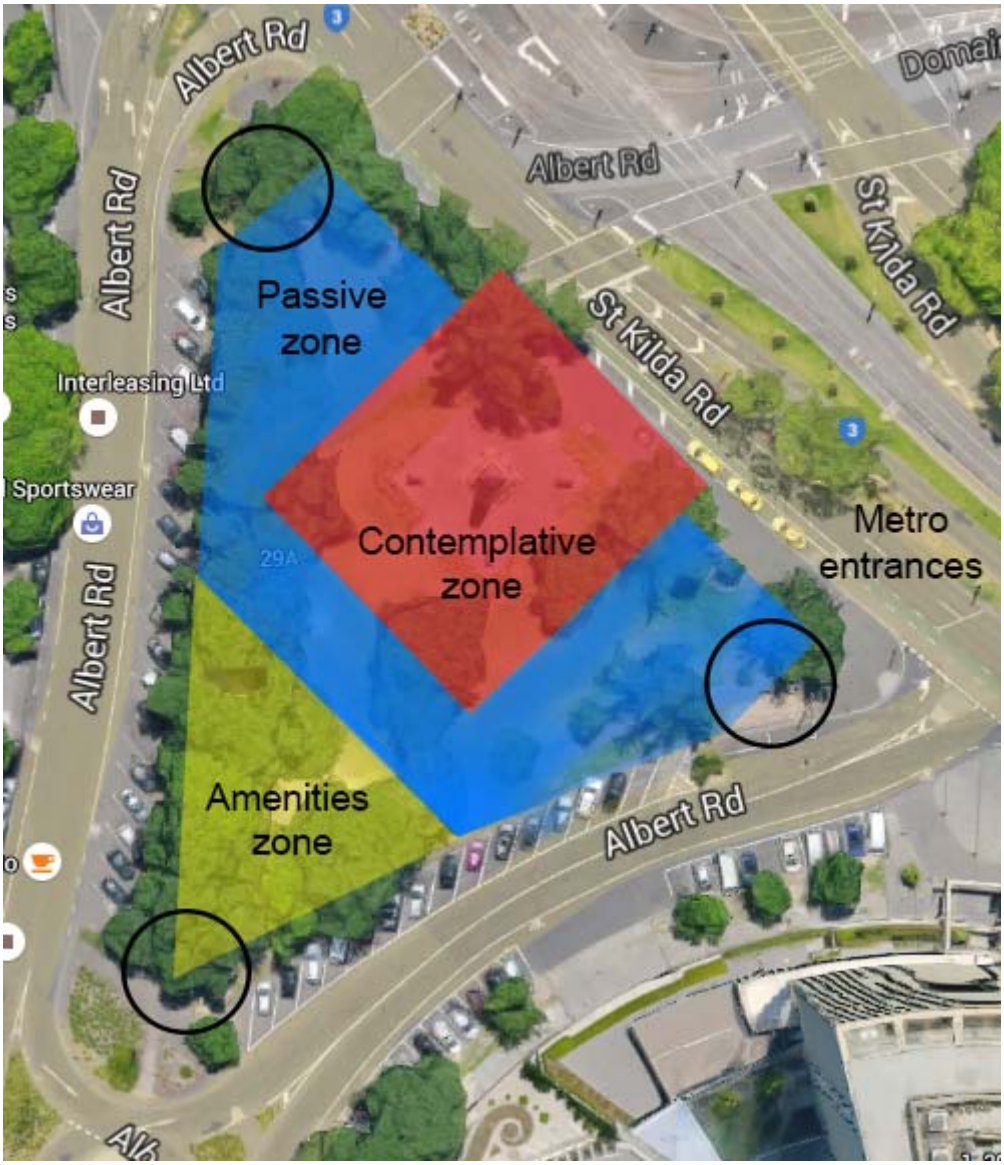

Figure 22. Plan showing the approximate boundaries of the zones in and around Albert Reserve. The contemplative zone (red) surrounds the Memorial on all four sides, it in turn is surrounded by the passive zone (blue). The amenities zone (yellow) is set well away from the contemplative zone. Metro entrances (black) should also be kept well away from the contemplative zone.

Detailed policies

5.7.1 Set aside the Memorial and a curtilage around it as a place of quiet contemplation by defining a contemplative zone.

As discussed in the policies on Living connections & traditions (5.6.1), one way of contributing to this would be to add a new physical boundary around the Memorial which would encourage visitors to contemplate the Memorial instead of sitting on it. Other hard and soft landscaping approaches may be appropriate so long as they are low in height, do not visually dominant views to the Memorial, and are subtly differentiated from the 1920s and 1950s fabric.

Council should limit activities in the contemplative zone and vet all proposals for new activities based on whether they are related to this use, and whether they have the potential to damage significant fabric.

5.7.2 Provide separation between the contemplative zone and incompatible uses, such as more active recreation, transport and retail, by surrounding it with a buffer zone of passive recreation.

The passive zone should contain only trees and lawn, with mulched areas as appropriate.

5.7.3 Consider an amenities zone for the western corner of the reserve.

If the amenities zone is retained, it should remain in the lower western corner of the reserve, far removed from the contemplative zone, with furnishings that are small in scale and have a simple, contemporary design.

If any new uses are introduced, they should be kept as far away from the contemplative zone as possible, and outside or at the very edges of Albert Reserve. For example, entrances to the new Domain Station should not be located within the contemplative or passive zones, but should be as far away as possible from the memorial. These could be at the three corners of the reserve.

Incompatible uses, such as those associated with the Domain Station, could be introduced at a below-ground level – even beneath the contemplative zone – provided they do not impact on views to, or appreciation of, the Memorial.

5.8 Interpretation

General policy

Enhance understanding and appreciation of the South African Soldiers' Memorial with restrained and non-intrusive interpretation.

Policy basis

Like most war memorials, the South African Soldiers' Memorial interprets itself to the public through the bronze plaques mounted on its plinth, which record the reason for its construction and those who were involved. The Memorial was constructed of high-quality, expensive materials including granite and bronze, and all elements were the design of distinguished architects.

These plaques are joined by the recent bronze tablet by Ross Bastiaan, which stands before the Memorial, which provides a brief history of the Boer War, symbolically both in English and Afrikaans.

With the recent revival of interest in the Boer War, nurtured by the National Boer War Memorial Association, there may be a desire in the future to place new memorial plaques on the site, for example, lists of fallen Victorian soldiers.

Detailed policies

5.8.1 New interpretive signage and memorial plaques should not be allowed to clutter or visually dominate views to the Memorial, but should enhance its presentation.

Restraint should be exercised in deciding what new signage is necessary.

Lighting of the Memorial is another way of enhancing its presentation and increasing its visual prominence, so long as this does not require any alterations to the physical fabric of the Memorial.

5.8.2 New interpretive signage should not be mounted on the Memorial (the obelisk or the lions and their pedestals).

Like Ross Bastiaan's interpretive plaque, new interpretive material and signage should be mounted on a separate structure. These structures should be low-lying, not be internally lit, and not visually dominate the site.

If a low wall is built around the Memorial to assist in delineating the contemplative zone, the top or faces of this wall may be an appropriate place to mount new plaques.

5.8.3 New interpretive signage and memorial plaques should be of quality design and materials befitting the Memorial.

Generally this will mean that new signage and plaques should be made of bronze, mounted on granite plinths, and that all elements should be designed and executed by appropriate professionals.

5.8.4 Retain existing plaques marking the location of the Windsor Oak and Firewheel Tree.

5.9 New development

General policy

New development should be planned, designed, located and carried out in a way that has the least possible impact on the heritage values, tangible and intangible, of the South African Soldiers' Memorial and its site.

Policy basis

This policy section addresses the planned works to build the Melbourne Metro tunnel and the associated Domain Station. There are other policies and discussions that will apply when planning and carrying out these works in other sections of this policy chapter, which should also be referred to. The map showing zones of use in section 5.7 is also referred to.

As a site of State-significance, which also includes elements of local heritage significance, planning for the works and new station should seek to find a design and methods that minimise the primary impacts on the significance of the site, instead of planning as if it were a greenfield site and then seeking ways to mitigate impacts after the fact.

The design and materials of the built structures on the site – the Memorial and 1910 drinking fountain – are of a very high quality, and this should be reflect in the care taken in any works to them, especially their dismantling and reconstruction.

Detailed policies

5.9.1 All structure and hard landscaping elements of State or local significance should be protected in-situ during construction works or – in cases where this is not possible – dismantled, stored and reconstructed in as close to their original position as possible.

These significant elements include:

- *The Memorial, including the sandstone lions and their plinths, the paved area and two sets of steps;*
- *The 1939 plaques marking the Windsor Oak and former location of the Firewheel tree*
- *The 1910 stone drinking fountain*
- *The bluestone edging around the reserve*

5.9.2 If the Memorial and/or the 1910 stone drinking fountain are to be dismantled, stored and reassembled, then recognised stone and metals conservation professionals should develop the methodology for these works, and ensure that they are carried out by appropriately skilled people.

5.9.3 New development should be kept outside of the contemplative zone unless it enhances this use.

Appropriate development that enhances its contemplative use would include seating from which to view the Memorial, low boundary walls around this zone, lighting of the Memorial, and interpretive and commemorative plaques.

5.9.4 No new development should be carried out in the passive zone.

Works in this zone should be limited to care and renewal of the lawn, trees, mulch, garden beds, etc.

5.9.4 New development outside of Albert Reserve should not obstruct views to the Memorial from St Kilda Road or Domain Road.

Care should be taken when deciding on the location of above-ground elements, such as ventilation shafts, to ensure that they are not in front of Albert Reserve or between the Memorial and Domain Road.

5.9.5 New development should be kept to a minimum in areas of the reserve outside of the contemplative and passive zones, and kept as near to the reserve boundaries as possible. This new development should be as small in scale, low in height, and unobtrusive in appearance as possible.

Ventilation shafts should not be located within Albert Reserve.

The Domain Station concourse should be underground, beneath pavement level, with discrete entrances set well apart from the Memorial, for example, at the three corners of the reserve. As the north corner is the most visible one, when viewed from Domain Road, only stairs should be locating at this side. The southern corner would be more appropriate for stairs and a small lift structure. The entrances to Parliament Station provide a good example to follow (but without the below-ground lightwells). This approach will allow the Memorial to be reinstated in its original location, but set above the (not-visible) station concourse. An entrance at the western corner of the reserve should be considered as a way of limiting current pedestrian traffic across the passive zone.

5.10 Research, investigation and recording

General policy

Record all research and interventions into the physical fabric of the South African Soldiers' Memorial and its site.

Policy basis

Documenting information about any changes to the place will prove invaluable in the future when site managers and heritage professionals are trying to understand the site's evolution and significance of its elements, and also when deciding on appropriate conservation treatments. New understanding about the history of the memorial and the reserve will also provide useful information for future managers.

Detailed policies

5.10.1 All works to the Memorial should be thoroughly documented in plans, photos and reports. This should include the production of as-built construction drawings once the Memorial is reconstructed.

5.10.2 All research, historical documents and images (and copies of them), and documentation of works to the Memorial and its site should be lodged with an appropriate archive or archives.

Appropriate archives might be that of the City of Port Phillip Heritage Centre, the State Library of Victoria, and Heritage Victoria.

5.11 Management and decision-making

General policy

Long-term and day-to-day management of the South African Soldiers' Memorial and its site should be in accordance with its significance, obligations of its Victorian Heritage Register inscription, best-practice materials conservation, and the policies of this conservation management plan.

Policy basis

There has been a lack of communication between the City of Port Phillip and Heritage Victoria in the past, leading to works being undertaken without a permit or permit exemption. This has led to a more proactive approach on the part of Council, which should be continued into the future.

Detailed policies

5.11.1 A maintenance plan should be developed, for endorsement by Heritage Victoria, to ensure that the Memorial and its site are cared for appropriately by Council staff, consultants and contractors.

The maintenance plan should be commissioned during the reconstruction of the memorial and should be prepared by appropriately skilled conservation professionals. The plan should take account of the need for rapid response to graffiti or other vandalism.

5.12 Adoption, implementation and review

General policy

The final conservation management plan for the South African Soldiers' Memorial and its policy and recommendations should be adopted by the City of Port Phillip, provided to other decision-makers, and reviewed at regular intervals.

Policy basis

Responsibility for the day-to-day management and care of the Memorial and Albert Reserve rests with the City of Port Phillip, and the conservation management plan sets out how Council can best manage the site to retain its heritage significance.

At the time of writing, there are two other major decision-makers who will influence the future of the place. This is the Melbourne Metro Rail Authority, which is planning the Domain Station and associated works, and Heritage Victoria, which is the responsible planning authority.

Once the Metro Tunnel and Domain Station works are complete, the site will necessarily be somewhat different than in 2016, so the specific guidance set out in this conservation management plan will no longer apply, and new issues may have arisen.

Detailed policies

5.12.1 The City of Port Phillip should adopt the final version of this conservation management plan as an agreed document guiding the care and management of the Memorial and Albert Reserve, and shaping its policy in regard to the Melbourne Metro works.

5.12.2 Provide the final version of this conservation management plan to the Melbourne Metro Rail Authority and to Heritage Victoria.

5.12.3 Review this conservation management plan once the Melbourne Metro works are complete.

This revised version should include documentation of the works to the Memorial, 1910 drinking fountain and the larger site.

6 ACTION PLAN

6.1 Introduction

This chapter sets out the actions that flow from the policy developed in the previous chapter.

6.2 Implementation strategies

6.2.1 Approach Heritage Victoria with the aim of updating the Victorian Heritage Register citation to include the revised statement of significance in regard to the newly identified element of State significance (Windsor Oak of 1939) and the additional expression of the historical and social values of the site. (Policy 5.1.2).

6.2.2 To ensure that all elements of heritage significance at Albert Reserve are appropriately recognised, prepare a revised place citation – based on the history, description and statement of significance in the conservation management plan – and have it adopted by Council it as a reference document to the planning scheme (Policy 5.1.1).

6.2.3 Adopt the final version of this conservation management plan as an agreed document guiding the care and management of the Memorial and Albert Reserve, and shaping its policy in regard to the Melbourne Metro works (Policy 5.12.1).

6.2.4 Commission a detailed topographic survey of the Memorial and Albert Reserve to provide a basis for planning for any changes, including re-instatement of the Memorial and its associated elements of heritage value (Policy 5.3.5).

6.2.5 Liaise with the Melbourne Metro Rail Authority to ensure design of the Domain Station entrances are consistent with the policies of this conservation management plan. (Policies 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.9)

6.2.6 Liaise with the Melbourne Metro Rail Authority to integrate a new engineered footing for the Memorial into the structural design of the Domain Station concourse and entrances (Policy 5.2.1). The new footing should allow for the Memorial to be resited in essentially the same location as at present, and should provide for additions to the (north and south) sides of the Memorial podium to allow construction of low walls and seating (Policy 5.6.1).

6.2.7 Commission development of a methodology for dismantling, transport, storage, repair, conservation and reconstruction of the Memorial and drinking fountain (Policy 5.3.5) and Firewheel Tree Plaque (Policy 5.5.7). This should be undertaken by experienced stone conservators, stonemasons and engineers (Policy 5.3.4). The methodology should:

- set out the works and activities in clearly defined stages;
- include protocols for recording the process of dismantling and reconstruction, and for numbering and documenting all the components;
- identify requirements for transport and storage of components;
- anticipate detailed investigation and treatment of the conservation needs of all elements, particularly the bronzes, the sandstone lions and the stones of the drinking fountain; and
- include preparation of draft specifications for the reconstruction of the Memorial and drinking fountain. The draft specifications are intended to enable costing of the works, and should be revised once the dismantling, storage and conservation treatments have been undertaken.

6.2.8 Repair and conservation of the fabric of the Memorial and drinking fountain will involve:

- re-attachment of broken pieces using dowels and adhesives;
- reducing visibility of various oil stains and paint splashes using solvents;

- reducing stains along joints using chelating agents or other appropriate method;
- biocide treatment of microflora on sandstone;
- dirt removal using poultices or micro-abrasive cleaning, or both;
- injection of thin resins into cracks in sandstone;
- possible treatment of the sandstone lions with water repellents;
- use of more elastic mortars for jointing than those made of cement.

6.2.9 Develop design solutions for relocating the drinking fountain that are consistent with the policies of this conservation management plan (Policies 5.2.2, 5.3.6).

6.2.10 Commission maintenance plans for the Memorial and drinking fountain. Ideally these should be commissioned during the reconstruction works, so that they can be fully informed of all issues that may affect future maintenance. The maintenance plans should provide for rapid response to painted graffiti (Policy 5.11.1).

6.2.11 Implement the proposed zoning of Albert Reserve into contemplative, passive and amenities zones as shown in Figure 22 (Policy 5.7)

6.2.12 Investigate feasibility of removing, storing and replanting the Windsor Oak, and grow new saplings from acorns of the tree. (Policy 5.5.6)

6.12.13 Prepare replanting plan detailing the location and species of new trees, landscape features, lawns, garden beds and amenities etc. in adherence with Policies 5.4 and 5.5.

6.12.14 Undertake a feasibility study to consider the conservation and storage off site of the row of Elms on Albert Road north (Policy 5.5)

6.2.15 Permits for the various stages of the works will be required from Heritage Victoria (Policy 5.1.4).

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