Value Management Report

Eastern Section of the M12 Motorway

December 2018
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1 Workshop overview

1.2 Background

The M12 Motorway forms part of the Western Sydney Infrastructure Plan (WSIP). WSIP was announced in April 2014 as a joint initiative of the Australian and NSW governments to fund a $3.6 billion road investment program for western Sydney.

In October 2015, Roads and Maritime Services started a strategic route options assessment for the M12 Motorway. A long list of possible corridor options were developed by combining design standards, terrain, geological and hydrological data, environmental constraints, property impacts, major utilities, and cost information. A Shortlist Options Report was produced in February 2016 which outlined the finding of the corridor options assessment. A summary of the Shortlist Options Report is included in this report.

The possible corridor options were refined and assessed at a Value Management (VM) workshop held in April 2016 to recommend a preferred route corridor. A Preferred Corridor Report was produced in November 2016 which outlined the finding of the VM workshop and announced the M12 Motorway preferred corridor. A summary of the Preferred Corridor Report is included in this report. Early in 2017, Roads and Maritime commenced work on the concept design and environmental impact statement (EIS) of the preferred corridor route (base option).

Subsequent to the announcement of the M12 preferred corridor route, two strategic planning documents were drafted: the draft South West District Plan by the Greater Sydney Commission (GSC) and the draft Southern Parklands Vision 2036 by the Western Sydney Parklands Trust (WSPT). These two plans outline future land use within the area of the M12 Motorway.

The draft South West District Plan identifies the M12 Motorway as being an important east-west transport connection that will capitalise on the economic benefits of the Western Sydney Airport, however the plan also identifies the Western Sydney Parklands as “one of Greater Sydney’s most significant corridors of scenic beauty... open spaces and ridgelines of the Parklands provide an important landscape setting for the community… bushland settings provide a visual relief to the substantial urban areas”.

The draft Southern Parklands Vision 2036 establishes a 20 year vision for the Western Sydney Parklands, which includes defining the Cecil Hills Precinct (parkland area owned by WSPT in Cecil Hills directly west of the existing M7 Motorway) as a “destination of significance for the Central and Western Cities” and envisioning a “multi-faceted recreational and tourism hub” and “passive recreational parkland playing a similar role to Centennial and Parramatta Parks”.

Therefore, the M12 Motorway preferred route corridor is in direct conflict with the future land use within the Western Sydney Parklands, as outlined by both the draft South West District Plan and the Draft Southern Parklands Vision 2036.

In March 2017, Roads and Maritime held multiple discussions with the GSC and WSPT separately on how the M12 Motorway would fit within the Commission's plans for the future in this area and how the potential impact could be reduced on WSPT owned land, in particular the Cecil Hills Precinct. In response, Roads and Maritime committed to reviewing the M12 corridor next to the Cecil Hills Precinct with a view to identifying possible options to reduce the impact on that area.

An exercise was undertaken to develop possible alignments and interchange configurations that connected the M12 Motorway from west of the Elizabeth Drive crossing to the M7 Motorway. Out of this exercise, three alternative route options were developed.

A VM workshop was then held on 26 June 2017 to provide an opportunity for representatives from a broad range of stakeholders to assess the three identified alternative options against the Base Option. The workshop involved the use of multi-criteria analysis to compare all the options and recommend either the retention of the base option or the adoption of an alternative option. This report provides an objective overview of the key aspects discussed in the workshop and the agreed recommendation.
1.3 Workshop objectives

In broad terms the objectives of the workshop were to:

- obtain a common understanding of the work undertaken to date on the project
- review the strategic options for the eastern end of the M12 Motorway and evaluate them against the established assessment criteria, as well as the strategic cost estimates for each option
- recommend a preferred option(s) to progress the project.

1.4 Workshop activities

The participant list is included in Appendix 1 and the workshop agenda is included in Appendix 2.

The workshop commenced with an overview presentation on the project including the current status of investigations. This was followed by presentations from the Greater Sydney Commission and WSPT in relation to strategic land use. Summary information is provided in Section 2.

Following the presentations, the workshop participants reviewed the project objectives, assumptions and constraints underpinning the development and evaluation of the options at the eastern end of the M12 Motorway (refer Section 2).

The participants then reviewed the appropriateness of five predetermined assessment criteria and their relative percentage weight to affirm if the weighting was representative of the value or importance placed by the workshop participants on the criteria (refer Section 4).

The project team then presented the options to the workshop participants, outlining the key engineering issues and constraints, implications on the Western Sydney Parklands (WSP) and environmental impacts (refer Section 3).

The workshop participants, seated in five sub-groups corresponding to the assessment criteria, then independently evaluated the performance of each option. The process involved determining the best performing option and assigning it a score of four (4) and then determining the relative performance of the remaining options. Brief commentary as to why the sub group evaluated the options the way they did was also collected and documented (refer Section 4).

The various sub-groups’ assessment of the options was then tabled and discussed. The scores from the five sub groups were fed into a prepared matrix excel spread sheet where the performance score for the options was multiplied against the agreed weight for the criteria and a numerical score for the option determined (refer Section 4.3).

The overall numerical score was then compared to a strategic estimate of capital cost (refer Section 4.3). Participants used this information to help identify which option should be recommended for further development.

1.5 Recommendations

1.5.1 Workshop recommendations

The participants recommended that option three, being the option aligned in close proximity to Elizabeth Drive, is adopted as the revised preferred option because:

- it is considered to be a significantly better option when assessed against the evaluation criteria, with a relatively small additional cost to the overall cost of the project
- it protects scenic and cultural landscapes by locating the new infrastructure closer to disturbed areas (associated with Elizabeth Drive) and reducing severance (community severance –when the transport system limits people’s mobility, instead of facilitating it) impacts
• it maintains the integrity of WSPT investment for future generations and assists in the creation of “great places”
• it has the potential to mitigate the costs associated with maintaining the north – south connectivity for the WSPT
• it provides the best integrated land use and transport option
• it is expected to achieve broad community acceptance.

The recommendation supporting option three is subject to:
• demonstrating that traffic operational performance, particularly around the Elizabeth Drive/M7/M12 interchanges, is acceptable - including the provision of adequate entry/exit ramp spacing for merging and weaving
• refinement of road angles to minimise sloping at 3%
• the development of a communication strategy to inform the community of the potential change
• minimising the impact on Cumberland Plain Woodland on the north-west corner of M7/Elizabeth Drive
• confirmation of the land use impact on WSP from the 330kV easement and potential restriction on land use
• confirmation of GSC plan for service corridors along Elizabeth Drive.

The participants recommend that Roads and Maritime give consideration to widening the project objectives to incorporate reference to:
• integration with the environment and the current and future land uses
• minimising impact to the WSP whilst still facilitating current and future access to the Parklands.
1.6 Next steps?

At the completion of the workshop the following next steps were taken:

- the recommendation from this VM workshop was presented to and approved by the Roads and Maritime Executive
- the recommendation from this VM workshop was presented to and approved by the WSIP Project Executive Steering Committee
- upon approval by the WSIP Project Executive Steering Committee and the Roads and Maritime Executive, the recommendation was presented to and endorsed by the Minister for Roads
- the concept design and EIS for the project has commenced
- community consultation will take place as part of the display of the preliminary design and access strategy in collaboration with WSPT and GSC.
2 General project information

2.1 Project timeline
The M12 Motorway project development timeline is summarised below.

- In April 2014, the M12 Motorway project was announced as part of the WSIP
- The study area was subsequently announced in August 2015 and site constraints identified. In September 2015, a long list of route options were identified and assessed. This was followed by short listing and a Value Management (VM) workshop in October 2015 which helped identify route options for further investigation
- In February 2016, short listed route options were made public and were further reviewed and assessed
- In April 2016, the preferred route option was identified during a second VM workshop with the preferred route announced in November 2016.

Events around and since the holding of the second VM Workshop include:

- GSC was formed
- draft GSC District Plans were released in November 2016
- in February 2016, WSP prepared a draft Southern Parklands Vision 2036
- Roads and Maritime engaged Jacobs Arcadis Joint Venture (JAV) to undertake the concept design and environmental assessment for the M12 Motorway project.

Due to changing stakeholder requirements, Roads and Maritime consulted with GSC and WSP to review feasible alternative options for the M12 Motorway route through the Parklands.

2.2 GSC district plans
The South West District is Sydney’s fastest growing district, where urban lifestyles meet rural living. It’s rich in Aboriginal, colonial, and migrant history and heritage, and is one of the most culturally diverse communities in Australia.

The district encompasses the economic area that will evolve with the development of the Western Sydney Airport, an emerging centre of connectivity with a focus on freight, transport, and logistics. It will also offer the strategic advantage of creating a greater diversity of jobs and social opportunities for the many citizens in the centres of Penrith, Blacktown, Liverpool, and Campbelltown-Macarthur.

The draft South West District Plan (the Plan) is one of six draft District Plans developed by the GSC for each of Sydney’s districts. The Plan maps the 20-year vision for the South West District of Greater Sydney.

To achieve this vision, the Plan sets out priorities and actions that will shape the District’s future and guide policy decisions:

The priorities of key relevance for the eastern section of the M12 assessment are to:

- integrate land use and transport planning
- create great places
- protect the environment and scenic landscapes.

The plan builds on the concept of Greater Sydney’s Green Grid. The Green Grid is a long-term vision for Sydney with an appreciation of landscape and recognition of the diversity of elements and connections, including the Blue Grid of estuaries and waterways, the variety of parks and open spaces, and connections to bushland.
The objectives for Greater Sydney’s Green Grid are for a highly connected and diverse network that:

- increases access to open space
- promotes good health and active living
- creates new high quality public areas and places
- makes the urban environment more green
- enhances green spaces
- promotes green skills in bushland and waterway care and restoration
- improves access to sport and recreation
- delivers better tools for future open space planning.

2.3 Western Sydney Parklands Trust Vision

Western Sydney Parklands Trust (WSPT) has developed a 20 year Vision for the Southern Parklands. The Southern Parklands lie in the south of the WSP corridor and comprises 1500ha area (28% of the Parklands overall), which is largely underdeveloped, for recreational and leisure uses.

The Southern Parklands Vision (the Vision) identifies a series of principles which will inform planning and decision making across the Southern Parklands.

- **Conserve, protect and enhance**
  Conservation protection and enhancement of the Southern Parkland’s natural, cultural and scenic values is the foundation principle shaping the vision.

- **Engage with nature**
  Provide a range of opportunities to experience the Cumberland Plain including ‘user friendly’ managed landscapes that encourage comfortable access and build stronger connections and affinity with the natural environment.

- **Optimise the edges**
  With over 50% (or 20km) of Parkland frontage to existing and new communities, the edges of the Southern Parklands are an important opportunity to establish a new relationship with surrounding communities to facilitate awareness and encourages use.

- **Cluster and integrate**
  Clustering and integration of different uses can create unique destinations that provide viable business opportunities, enhance parkland identity, and promote active living and wellness.

- **Recreation and leisure for the city, district and neighbourhood**
  The Southern Parklands can address different roles for city, district and local users, each optimising the unique landscape and visual qualities of the place.

- **Connecting people to park, and park to people**
  Effective ‘two way’ connections include the physical routes, journeys and arrival experiences, in addition to projecting the Parklands to the community and encouraging ownership, relevance, and a sense of belonging.

- **Water in the landscape**
  The retention and expansion of water in the landscape with the inclusion of water contact and water based recreation opportunities can generate park visitation in particular through the hot Western Sydney summer.

- **Guide and influence infrastructure**
  Adjoining development and infrastructure can be positively influenced through cooperation, limiting environmental, visual and recreational impacts, and pursuing collaborative planning and design solutions.
• **Build resilience and financial sustainability**
  Provide a platform for a resilient and self-funding Southern Parklands that can evolve and adapt to meet the needs of its environment, users and administration and encourage and respond to new users and opportunities.

2.4 **Restating the M12 Motorway project objectives**

Prior to reviewing options for the eastern section of the M12 Motorway, the workshop participants reflected on the overall project objectives (i.e. what the project must achieve to be successful) as stated in the background paper distributed prior to the workshop, as a way of ensuring a common understanding. The M12 Motorway project objectives as currently endorsed by the Roads and Maritime Executive are that the M12 Motorway must:

- provide direct motorway standard east-west connection between the Westlink M7 and The Northern Road (A9) via the Western Sydney Airport at Badgerys Creek, allowing for future north-south connections
- support the provision of an integrated regional and local public transport system
- preserve local access function of Elizabeth Drive
- provide active transport within the east – west corridor
- provision for connection to Outer Sydney Orbital
- minimise environmental impacts.

The workshop participants noted that, in their opinion, the project objectives did not adequately reference the need for the M12 Motorway project to:

- integrate with the environment and the current and future land uses
- minimise impact to the Western Sydney Parklands whilst still facilitating current and future access.

The participants recommended that Roads and Maritime give consideration to widening the project objectives to address the perceived enhancement in project purpose.

2.5 **Givens and constraints**

The workshop participants reflected on the givens and constraints at this stage of project development as outlined in the background paper distributed prior to the workshop.

The group acknowledged the items as givens for the purpose of progressing the development of the project. As a result of the discussion, further items were added. The givens and constraints discussed, as well as those that were added are:

- the project must be delivered by 2026 to align with the airport opening
- the alignment west of the Parklands is fixed and will not be changed during this VM workshop. The alignment must tie into the existing preferred corridor west of Mamre Road
- the high voltage powerline to the west of the intersection of Elizabeth Drive and Mamre Road is not to be moved, and so dictates the maximum height of the alignment
- the design must achieve minimum 100 year average recurrence interval (ARI) flood immunity
- the existing road network and access to properties must be preserved. Only controlled access off the motorway will be permitted
- the WaterNSW Upper Canal and Tunnel must not be impacted
- major gas pipelines must be protected or avoided
- the alignment must meet design standards for a motorway with 110km/h design speed
- the M12 Motorway will be a surface road (i.e. there will be no tunnel construction)
- north–south connectivity across the M12 Motorway will be provided
- the budget for the project is fixed
- there will be a motorway to motorway (free flow) interchange between the M7 and M12 Motorways
- the M12 Motorway will incorporate SMART motorway provisions (i.e. provision for the new intelligent motorway management technology).
3 Route options

3.1 Option summary

The options outlined below were based on the results of a desktop review and database search of Western Sydney Parklands (WSP), and GIS mapping for registered Aboriginal Heritage Information Management System (AHIMS) sites, Aboriginal objects, potential archaeological deposits (PADs) and areas of potential archaeological sensitivity.

The strategic preferred route corridor (base option) and three alternative route options, namely option one, option two and option three, are shown in Figure 1.

Following a preliminary review by the project team, option two was deemed not to be a feasible alternative due to a number of reasons. This option has:

- the largest environmental impact
- risk associated with a significant area of geotechnical instability
- the largest requirement for imported fill
- the highest cost.

Therefore, this assessment compares the remaining two alternative route options and the base option. These three remaining options are individually described in Sections 3.3 to 3.5.

Figure 1 - identified options
3.2 Constraints

The constraints on the option development are outlined in figure 2 below.

Figure 2 - constraints on option development
3.3 Base option – preferred corridor

The Strategic Route Options Analysis (SROA) identified the preferred corridor shown in figure 3 below. This is the base option.

Figure 3 - base option (SROA preferred corridor)

**General description**

- The base option is located furthest south out of all the options
- The alignment passes between the International Shooting Centre and Wylde Mountain Bike Track (MBT), having less impact to existing facilities, however it passes through the passive recreational area identified in the Vision
- The option includes a bridge over the WaterNSW Supply Pipelines and an interchange independent from Elizabeth Drive.

**Engineering considerations**

- Difference of 47 m in elevation between the point underneath the existing retained 500kV powerlines to the proposed interchange with the M7 Motorway, requiring 680 m distance of climb at a grade of more than 3%
- Minimal impact on existing utilities:
  - bridge over the WaterNSW Supply Pipelines and Liverpool Offtake Reservoir
  - embankment over major gas pipelines
  - avoids telecommunications towers and cables
- The proposed interchange with the M7 Motorway will be 1200 m south of the Elizabeth Drive interchange and will allow the ramps to be independent. Only minor realignment of the Elizabeth Drive ramps will be required.

**Western Sydney Parkland implications**

- Alignment is placed in the WSP between the International Shooting Centre and MTB, having less impact on existing facilities
- Impact on WSP Vision and Cecil Hills Passive Recreation Hub
- Affects the desired WSP Cecil Hills landscape character due to location.
Environmental considerations

- Impacts 17ha of threatened vegetation, of which 0.01ha is mapped potentially critically endangered vegetation (EPBC Act)
- Impacts 4.3ha of biobanking agreement sites
- Bridge over WaterNSW Supply Pipelines (listed as the Upper Canal System on the State Heritage Register) and Liverpool Offtake Reservoir would require an assessment of impact on curtilage
- Lowest noise impact on sensitive receivers, however more impact on public open space
- Impacts six registered AHIMS sites and 850m of potential archaeological sensitivity.
### 3.4 Option one

The first alternative option (option one) is shown in figure 4 below.

Figure 4 - option one

**General description**
- option one is located slightly further north than the SROA preferred corridor
- It has increased impact on the existing Wylde MBT, however reduced impact on the passive recreational area identified in the Vision
- The design is on a fill embankment over the WaterNSW supply pipelines, with an interchange independent from Elizabeth Drive.

**Engineering considerations**
- A difference of 50m in elevation between the point underneath the existing retained 500kV powerlines to the proposed interchange with the M7 Motorway, requiring 500m distance of climb at a grade of more than 3%
- Moderate impact on existing utilities:
  - embankment over the WaterNSW supply pipelines in tunnel and no impact on the Liverpool Offtake Reservoir
  - cutting over major gas pipelines will require protection
  - avoids telecommunications towers and cables
- The interchange with the M7 will be 1100m south of the Elizabeth Drive interchange and will allow the ramps to be independent. Only minor realignment of the Elizabeth Drive ramps will be required.

**Western Sydney Parklands implications**
- Alignment is placed in southern edge of the existing Wylde MTB
- Impact on Western Sydney Parklands Lifestyle and Eco Tourism area
- Affects the desired Western Sydney Parklands Cecil Hills landscape character due to footprint/cut
- Function could be retained by moving Cecil Hills Passive Recreation Hub south, but motorway would still be prominent.
Environmental implications

- Impacts 21ha of threatened vegetation, of which 0.01ha is mapped potentially critically endangered vegetation (EPBC Act)
- Impact on 13.1ha of biobanking agreement sites
- Fill embankment over the heritage listed Upper Canal System in tunnel
- Noise impacts to sensitive receivers and public open space is intermediate compared to the other options
- Impacts three registered Aboriginal Heritage Information Management System sites and 1550m of potential archaeological sensitivity.
3.5 Option three

The other alternative option (option three) is shown in figure 5 below.

Figure 5 - option three

**General description**
- Option 3 is aligned north in close proximity to Elizabeth Drive
- This option passes through the Wylde MBT, however it avoids the passive recreation area identified in the Vision
- This option requires a complex interchange due to interaction with Elizabeth Drive and Wallgrove Road.

**Engineering considerations**
- Difference of 68m in elevation between the point underneath the existing retained 500kV powerlines to the proposed interchange with the M7 Motorway requiring 1480m distance of climb at a grade of more than 3%
- Moderate impact on existing utilities:
  - bridge over the WaterNSW supply pipelines and no impact on the Liverpool Offtake Reservoir
  - embankment over major gas pipelines
  - avoids telecommunication towers, but requires relocation of telecommunications cables
- The interchange with the M7 will be adjacent to the Elizabeth Drive interchange and will require the ramps to interact with the Elizabeth Drive ramps.

**Western Sydney Parkland implications**
- Alignment is placed within Western Sydney Parklands, through the Wylde MTB facility
- Impacts less on the Western Sydney Parklands Vision Cecil Hills Passive Recreation Hub and Lifestyle and Eco Tourism area
- Possibly create connectivity constraints from Elizabeth Drive into Western Sydney Parklands at Cecil Hills
Environmental implications

- Impacts 23ha of threatened vegetation, of which 2.17ha is mapped potentially critically endangered vegetation (EPBC Act)
- Impact on 5.8ha of Biobanking agreement sites
- Fill embankment over the heritage listed Upper Canal System in tunnel
- Highest noise impact on sensitive receivers, however lowest impact on public open space
- Impacts four registered Aboriginal Heritage Information Management System sites and 1540m of potential archaeological sensitivity.
4 Assessment of options

4.1 Criteria

The criteria, measures and weightings used in this VM workshop are as shown in table 1. Additional measures included for this workshop that were not part of the other VM workshops are shown in italics.

The weightings used in this VM workshop were presented at the supplementary VM workshop for comment and endorsement. Participants generally agreed that the weighting afforded to land use needed to be increased to reflect the importance of this criteria and that the weighting afforded to project delivery should be reduced. After some discussion, the participants amended the weightings to those shown in table 1 in the column headed Supplementary VM Weightings.

Table 1 - option assessment criteria

<table>
<thead>
<tr>
<th>Criteria No.</th>
<th>Criteria</th>
<th>Measures</th>
<th>Original VM weighting</th>
<th>Supplementary VM weightings</th>
</tr>
</thead>
</table>
| 1           | Project delivery          | • Timeliness to plan and deliver, design risks, project approvals, land acquisitions, risks, or issues  
• Potential for construction staging, constructability, lead time for relocations or specific items, construction risk. | 15%                    | 10%                         |
| 2           | Land use                  | • Integrates (considers non-sterilising) with current land use and proposed land use.  
• Maintains connectivity within the Parklands  
• Provides for property access  
• Consistency with Western Sydney Priority Growth Area, draft South West District Plan and the draft Southern Parklands Vision  
• Location of interchanges affecting future land use | 20%                    | 25%                         |
| 3           | Community                 | • Number of cadastral lots/ownership  
• Number of existing businesses directly impacted  
• Community severance  
• Feedback on preference from community consultation  
• Broader community values attached to the Western Sydney Parklands  
• Number of sensitive receivers within 600m (noise). | 20%                    | 20%                         |
| 4           | Environment & Heritage    | • Number of Aboriginal sites affected  
• Number of non-Aboriginal heritage sites affected  
• Area of native vegetation affected  
• Area of Endangered Ecological Community (EEC) / Critically Endangered Ecological Community (CEEC) affected  
• Area of biodiversity offset impacted  
• Drainage lines and creek lines. | 20%                    | 20%                         |
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Criteria</th>
<th>Measures</th>
<th>Original VM weightings</th>
<th>Supplementary VM weightings</th>
</tr>
</thead>
</table>
| 5        | Functionality | • Grades, speeds, length, interchanges, connectivity to future Outer Sydney Orbital  
|          |             | • Enabling Elizabeth Drive to operate as an arterial road in the future   | 25%                    | 25%                        |
|          |             | • Impact on M7 and the rest of the network                              |                        |                            |
|          |             | • Active and public transport                                           |                        |                            |
|          |             | • Relative airport connectivity for cars and freight on the road network.|                        |                            |

### 4.2 Assessment of options

Having agreed to the criteria, the measures and the weighting, participants then formed five sub-groups corresponding to the five primary criteria.

The option assessment methodology involved participants in their respective sub groups adopting the following scoring method:

- The best option for each measure is scored as a “4”
- The other options are scored as:
  - “4” if the option is the same as the best option
  - “3” if a minor difference relative to the best option
  - “2” if a medium difference relative to the best option
  - “1” if a major difference relative to the best option.

After scoring all the measures, the scores for the options were aggregated and:

- The best option is scored as a “4”
- The other options are scored as:
  - “4” if the option is the same as the best option
  - “3” if a minor difference relative to the best option
  - “2” if a medium difference relative to the best option
  - “1” if a major difference relative to the best option.

The sub group assessments together with some commentary on the reasoning for the assessment is reproduced below.
### Evaluation matrix for the project delivery criteria

<table>
<thead>
<tr>
<th></th>
<th>Timeliness to plan &amp; deliver, design risks, project approvals, land acquisitions, risks or issues</th>
<th>Potential for construction staging, constructability, lead time for relocations, or specific items, construction risks</th>
<th>Rank and Score</th>
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<tbody>
<tr>
<td><strong>Base option</strong></td>
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<tr>
<td><strong>Sub-total</strong></td>
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<td><strong>Option one</strong></td>
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<td><strong>Sub-total</strong></td>
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<td><strong>Option three</strong></td>
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<tr>
<td><strong>Sub-total</strong></td>
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<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>

### Notes and comments on project delivery assessment

- Concept design and environmental assessment will be completed between now and late 2018/early 2019 with a view to having construction commence in 2020 and taking approximately three years to complete.
  - Timeliness
    - All options can be delivered within the assigned timeframe
    - Base option/option one/option three have no material difference other than the properties adjacent to the northbound M12 – M7 onramp north of Elizabeth Drive. Therefore option three impact is slightly greater
    - Note: It is assumed Criteria 4 (environment) will consider project approval and conditions of approval differences
    - Risk of utility authority approvals may be greater for option three.
  - Constructability and staging
    - Option three has greater access from Elizabeth Drive during construction
    - Base option and option one can only be accessed at intersecting points of Elizabeth Drive and Range Road
    - Base option and option one have potential risk that direct access to M7 may not be available during construction
    - All options have direct interface beside and over M7
    - Option three staging and constructability would be more complex
    - Base option and option one both sever WSP usage during construction
    - All are generally greenfield
    - Night work for M7 interchange not a differentiator
    - Pros/cons balance out between the three options.
Evaluation matrix for the land-use criteria

<table>
<thead>
<tr>
<th></th>
<th>Integrates (considers non-sterilising) with current &amp; proposed land uses</th>
<th>Maintains connectivity within the Parklands</th>
<th>Provides property access</th>
<th>Conserves with present Green Areas, draft South West District Plan and draft Southern Parklands Vision</th>
<th>Location of interchanges affecting future land use</th>
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Notes and comments on land-use assessment

- **Integration**
  - Base option means a land bridge will need to be considered
  - Severs Parklands (major issue): base option and option one severance is 13.7% and option three severance is 1.2%. Base option and option one result in major severances to WSP
  - Base option and option one make no consideration of intergenerational equity
  - Sterilises Parklands (visual integration important): base option and option one do not allow integration with the overall Parklands

- **Connectivity**
  - Base option and option one have limited connectivity
  - Option three supports and preserves connectivity (both visual and scenic)

- **Property access**
  - Similar impact for all three options

- **Consistency**
  - Option three performs the best, base option and option one perform poorly

- **Location of interchanges**
  - Option one and base option sterilises more of the Parkland for future generations due to the location of the interchanges. Option three performs the best

- **General**
  - There is a need to balance the value of “green” land and “grey” infrastructure. There needs to be an integration of grey and green spaces, preserving landscape character, protecting creek systems, value of “natural capital”. Overall, option three performs best.
### Evaluation matrix for the community impact criteria

<table>
<thead>
<tr>
<th>Base option</th>
<th>No. of cadastral lots/ownership impacted</th>
<th>No. of existing businesses directly impacted</th>
<th>Community severance impacts</th>
<th>Feedback on preference from community consultation</th>
<th>Broader community values attached to the Western Sydney Parklands</th>
<th>No. of sensitive receivers within 600m (noise)</th>
<th>Rank and Score</th>
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Refer to Note 1 below

### Notes and comments on community impact assessment

- **Number of lots impacted**
  - Issue with number of lots vs ownership vs use – numbers mean base option may be best but the ratio ignores value of lots lost. Hence, option one scored the best followed by base option and option three when assessed as number of lots impacts.

- **Number of existing businesses impacted**
  - No significant differentiation
  - May impact future businesses

- **Community severance**:
  - Cecil Park/Mt Vernon community concerned about amenity, but may not appreciate potential value of Parklands
  - Can real and perceived residual impacts be mitigated, including the community to the north and the mountain bike community
  - Rankings based on a broad assessment of community severance

- **Feedback**:
  - As feedback was only available for options that have previously been presented to the community, this criteria was not scored.
  - It is assumed that broader community values would favour the Parklands – option three preferred

- **Noise impacts on sensitive receivers**:
  - The base scored higher due to permanence of residents compared to short-term users of the Parklands. This also took into account night time noise for residents.
Note 1.
While the sub total scores for the three options were quite close, the group considered that the scores for community severance and broader community values were of a higher significance than the other criteria in this category. Given the Southern Parklands Vision is expected to generate ~8 million visits per year; the broader users of the WSP were prioritised over the other groups. It was also noted that the Wylde MBT can be relocated within the Parklands, and the amenity issues to sensitive receivers can be mitigated through the design process.
### Evaluation matrix for the environment & heritage criteria

<table>
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<tr>
<th></th>
<th>No. of Aboriginal sites affected</th>
<th>No. of non-Aboriginal heritage sites affected</th>
<th>Area of native vegetation affected</th>
<th>Area of EEC/CEEC affected</th>
<th>Area of biodiversity offset impacted</th>
<th>Drainage lines/Creek lines impacted</th>
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### Notes and comments on environment and heritage assessment

- **Number of Aboriginal sites affected**
  - Cutting of M7 on Cecil Hill, 20,000+ artefacts found as part of M7 studies, potentially highly sensitive area. Unique ridgeline leading to Prospect Reservoir is a historic route
  - Number of sites is not a good measure because sensitivity is unknown
  - Further investigation required to determine sensitivity, to find ‘the bigger story’
  - The further away from the ridgeline, the better (generally) to preserve Aboriginal heritage
  - Best option is option three which avoids the ridgeline by going north
  - The area near Elizabeth Drive is already disturbed and has lower archaeological potential
  - Second best option is base option, due to the distance away from the ridge itself
  - Option one is least preferred because of its proximity to the ridgeline

- **Non-Aboriginal heritage sites affected**
  - Impact to Upper Canal is a major consideration
  - Not much difference between option one and option three because they cross over the WaterNSW Tunnel
  - Base option has the road crossing over the open channel as a bridge, therefore slightly less desirable
- Area of native vegetation – N/A
  - All options impact equally
  - Table agreed this is more of a land use issue rather than environment. It is a WSPT amenity issue and not scored

- Area of Endangered Ecological Community (EEC)/Critically Endangered Ecological Community (CEEC) affected
  - Best options are base option and option one based on the impacted area that is given in background paper – equally best solutions
  - Option three has more affected area compared to option one and base option – least desirable option, medium difference
  - Will need to be offset

- Biodiversity offset/biobank
  - Option one is least desirable, impacts 13 ha – big difference, least preferred and has more impact compared to other options
  - Base option impact is 4.3 ha and option three impact is 5.8 ha – both equally best
  - Biobank sites have in perpetuity protection

- Drainage lines/creek lines – N/A
  - Creek lines are transient. This criteria is not relevant to differentiation of alignments. Some areas do get wet, but there is no major impact on creek/aquatic lines because major creek lines are further west, not in the Parklands
  - Not scored

- Overall
  - Option three and base option scored 14. Option one scored 11. It is considered worst in terms of biodiversity impact and Aboriginal heritage. It is rated as 1 because it is a considerable difference in terms of bio-banking impact.
### Evaluation matrix for the functionality criteria

<table>
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<tr>
<th>Grades, speeds, lengths, interchanges, connectivity to future OSO</th>
<th>Enabling Elizabeth Dr to operate as an arterial road in the future</th>
<th>Impact on M7/ rest of the network</th>
<th>Impact on active/public transport</th>
<th>Relative airport connectivity for cars and freight on the network</th>
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### Notes and comments on functionality assessment
- Option one provides best grading and operating speeds
- Option three provides lowest quality grading
- There is flexibility to alter interchanges for all options
- Option three may impact on Wallgrove Road and Elizabeth Drive, but the impact would be minor
- The location of the interchange with the M7 would dictate impact on M7 most significantly
- The base option takes traffic off the M7 before it is impacted by the climb to Elizabeth Drive
- Option three would require M7 northbound traffic to climb to Elizabeth Drive before exiting, however it would allow M12 traffic entering the M7 northbound to merge on a downhill section, reducing the impact of the merge
- Option one would require northbound M7 traffic to climb only part way up the hill before exiting, however it would still require M12 traffic to merge uphill.
4.3 Evaluation matrix for the M12 eastern end strategic options

Following the sub-group’s assessment, the relative ranking given to each option for the respective criteria was then multiplied by the weighting of the criteria, and a total score and overall ranking was determined for each option.

The relative capital costs for the eastern section of the alignment was then expressed as a percentage of the strategic estimate of cost compared to the base option.

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<th>Project Delivery</th>
<th>Land Use</th>
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<th>Environment &amp; Heritage</th>
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<td>Sub-total</td>
<td>40</td>
<td>100</td>
<td>80</td>
<td>80</td>
<td>75</td>
<td>375</td>
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Participants seated in five sub-groups were asked to reflect on the assessment and if possible recommend a preferred option.

**Sub-group one**

Sub-group one recommended option three because:

- it delivers on the vision for a “parkland city”
- it maintains the integrity of WSP investment for future generations
- Option three will potentially mitigate the costs associated with maintaining the connectivity for the base case and option one
- it provides the best integrated land use and transport option
- it will facilitate the creation of great places
- it protects scenic and environmental landscapes
- the value of the benefits outweighs any cost implications in both the short and long term to metropolitan Sydney
- it will have broad community acceptance.
Sub-group two
Sub-group two recommended option three because:
- it best meets the overall project objectives for the community in the Parklands.

subject to:
- time to develop and implement a communication strategy to inform the community of the potential change
- working with WSPT to coordinate communication activities
- confirming impact on Cumberland Plain Woodlands on the north-west corner of M7/Elizabeth Drive.

Sub-group three
Sub-group three recommended option three because:
- It is considered to be a significantly better overall option when assessed against the evaluation criteria with a relatively small additional cost in major infrastructure terms.

Subject to:
- determining if State Infrastructure Contribution can be accessed to assist with increased cost. Is separate funding available to pay for improved green space/land use outcomes?
- Traffic operational performance is acceptable, particularly Elizabeth Drive/M7 interchange.

Sub-group four
Sub-group four recommended option three because:
- the overall benefits to the environment and future land use outweigh the impacts
- the additional cost would be justified in the long term
- the cost should not be the only determinant of value
- Option three would keep infrastructure disturbed areas localised and concentrated.

Subject to:
- confirmation of the land use impact on WSP from the 330kV easement and potential restriction on land use
- completion of all environmental field investigations, assessments and design refinement
- clarification as to whether the costs include additional costs of offsetting
- sensitivity analysis around weightings – would different weightings result in different result
- GSC plan for service corridors along Elizabeth Drive.

Sub-group five
Sub-group five recommended option three because:
- provides a better land use outcome
- offers potential improvements to M7/M12 interchange.

Subject to:
- traffic modelling to prove appropriate level of service for M7/M12 interchange
- refinement of road angles to minimise sloping at 3%
- adequate entry/exit ramp spacing for merging/weaving
- the design considers the implications on Elizabeth Drive.
5 General workshop conclusions

At the completion of the workshop, the participants drew the following conclusions:

- the workshop has demonstrated the strategic importance of land use planning. The recommendation of option three responds to and reflects the significance assigned to this issue
- this exercise is a demonstration of how collaborative action can improve project outcomes
- more ongoing community and stakeholder engagement will be required for this project
- the recommendation of Option 3 is still subject to appropriate funding being made available to realise the outcome.
### Appendix 1. Workshop Participants

<table>
<thead>
<tr>
<th>External Stakeholders</th>
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</thead>
<tbody>
<tr>
<td>Suellen Fitzgerald</td>
<td>Western Sydney Parklands Trust</td>
</tr>
<tr>
<td>Aidan Werry</td>
<td>Western Sydney Parklands Trust</td>
</tr>
<tr>
<td>Erin Saunders</td>
<td>Department of Planning and Environment</td>
</tr>
<tr>
<td>Glenn Snow</td>
<td>Department of Planning and Environment</td>
</tr>
<tr>
<td>Charles Wiafe</td>
<td>Service Manager, Traffic and Transport, Liverpool City Council</td>
</tr>
<tr>
<td>Stephen Joannidis</td>
<td>Manager Development Engineering, Liverpool City Council</td>
</tr>
<tr>
<td>Walter Sinnadurai</td>
<td>Transportation Planner, Penrith City Council</td>
</tr>
<tr>
<td>Roshan Aryal</td>
<td>Manager, Built Systems, Infrastructure Operations, Fairfield City Council</td>
</tr>
<tr>
<td>Philip Saverimuttu</td>
<td>Fairfield City Council</td>
</tr>
<tr>
<td>Susan Harrison</td>
<td>Office of Environment and Heritage</td>
</tr>
<tr>
<td>Glen Archibald</td>
<td>Northwestern Roads</td>
</tr>
<tr>
<td>Debra Robinson</td>
<td>Department of Infrastructure &amp; Regional Development</td>
</tr>
<tr>
<td>Daniel Sward</td>
<td>Department of Infrastructure &amp; Regional Development</td>
</tr>
<tr>
<td>Andrew Hargraves</td>
<td>Greater Sydney Commission</td>
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<tr>
<td>Barbara Schaffer</td>
<td>Government Architect Office</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Roads and Maritime Services</th>
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</thead>
<tbody>
<tr>
<td>Kathryn Lister</td>
<td>Communication and Stakeholder Engagement</td>
</tr>
<tr>
<td>Jessica McLeod</td>
<td>Communication and Stakeholder Engagement</td>
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<tr>
<td>Greg Jackson</td>
<td>Urban Design</td>
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<tr>
<td>Anthony Eland</td>
<td>Environment Manager</td>
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<tr>
<td>Sarah Baker</td>
<td>Senior Environmental Officer</td>
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<tr>
<td>Kit Wong</td>
<td>Utility Specialist</td>
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<tr>
<td>Anthony Broekhuysye</td>
<td>Project Officer</td>
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<tr>
<td>Yujin Song</td>
<td>Project Officer</td>
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<tr>
<td>Vernon Stanton</td>
<td>Design Manager</td>
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<tr>
<td>Anastasia Dolgacheva</td>
<td>Project Officer</td>
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<tr>
<td>Dorota Mears</td>
<td>WHS Partner</td>
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<tr>
<td>Graham Richardson</td>
<td>Project Director</td>
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<tr>
<td>Deanne Forrest</td>
<td>Senior Project Manager</td>
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<tr>
<td>Nigel Robinson</td>
<td>Aboriginal Heritage Officer</td>
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<tr>
<td>Peter Williams</td>
<td>Acting General Manager, WSPO</td>
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<tr>
<td>Craig McFarlane</td>
<td>Project Manager Motorway Operations</td>
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<tr>
<td>James Li</td>
<td>Manager Motorway Network Operations</td>
</tr>
<tr>
<td>Caitlin Polo</td>
<td>Environmental Officer (Cadet)</td>
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</tbody>
</table>
## Jacobs Arcadis JV Consultant Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
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<tbody>
<tr>
<td>Tim Rodham</td>
<td>Project Manager</td>
</tr>
<tr>
<td>Richard Russell</td>
<td>Design Manager</td>
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<tr>
<td>Tim Coleman</td>
<td>Environment Manager</td>
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<tr>
<td>Myfanwy Peebles</td>
<td>Communication and Stakeholder Engagement</td>
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### Hassell

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
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<tbody>
<tr>
<td>Joshua Small</td>
<td>Urban Design</td>
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<tr>
<td>Mal Graham</td>
<td>Urban Design</td>
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### Workshop Facilitator

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
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<tbody>
<tr>
<td>Ross Prestipino</td>
<td>Facilitator, ACVM</td>
</tr>
<tr>
<td>Chris Laird</td>
<td>Co-facilitator and Reporter, ACVM</td>
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## Appendix 2. Workshop Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Facilitators</th>
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<tbody>
<tr>
<td>9.00 am</td>
<td><strong>Coffee/ Tea</strong></td>
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<tr>
<td>9.15 am</td>
<td><strong>Introduction</strong></td>
<td>Graham Richardson, RMS</td>
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<tr>
<td></td>
<td>• Welcome and context of the project <em>(2 mins)</em></td>
<td>Ross Prestipino</td>
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<tr>
<td></td>
<td>• Description of the workshop process</td>
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<td></td>
<td><strong>Information Phase</strong></td>
<td>Deanne Forrest, RMS</td>
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<tr>
<td></td>
<td><em>During this phase, a short presentation is made outlining project background, overview, what the project is meant to achieve, other data and where we are up to in the planning (15 mins)</em></td>
<td>Andrew Hargraves, GSC</td>
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<tr>
<td></td>
<td>• Greater Sydney Commission Perspective <em>(5 mins)</em></td>
<td>Suellen Fitzgerald, WSPT</td>
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<td>• Western Sydney Parklands Perspective <em>(5 mins)</em></td>
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<td><strong>Analysis Phase</strong></td>
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<td></td>
<td>• Restate project purpose and objectives <em>(what must the project achieve to be successful?)</em></td>
<td>All</td>
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<td>• Givens/Constraints we are working within</td>
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<td>• Restate the weighted assessment criteria used to previously evaluate the strategic options</td>
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<td></td>
<td><strong>Review and Assessment of the Options at the eastern end of the project</strong></td>
<td>Richard Russell, JAJV</td>
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<td>• Review of the Options</td>
<td>All</td>
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<td></td>
<td>- Presentation of the options</td>
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<td>- Analysis of the options <em>(what's good about them, what's not so good)</em></td>
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<td>• Evaluation of options using the established assessment criteria and the relative strategic cost estimates</td>
<td>All</td>
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<td><strong>The Way Forward</strong></td>
<td>Deanne Forrest, RMS</td>
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<td>• Recommend a preferred option(s) to progress the project</td>
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<td>• Summary of workshop outcomes</td>
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<td>• Where to from here?</td>
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<td>1.30 pm</td>
<td><strong>Lunch and Close</strong></td>
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